



Hunslet 0-4-0 'LILLA'

(ex Cilgwyn & Penrhyn Quarry Railways)
7mm Scale kit for 16.5mm or 14mm Gauge

Introduction

This kit can be assembled to produce a 7mm scale model of the narrow gauge Hunslet locomotive 'Lilla' (ex-Cilgwyn and Penrhyn Quarry Railway) to run on either 16.5mm or 14mm gauge track. The kit, designed for ease of assembly, has comprehensive illustrated instructions

An 'Antex' 25 watt soldering iron, 'Fry's Powerflo Flux' and 145 degree or 60/40 solder are recommended. Please familiarise yourself with the kit before commencing. The loco appeared with different modifications at various stages of its life. Some the variants can be accommodated with this kit. At one stage it had dumb buffers and simple centre coupling hook' At a later stage, and in its present state, it has a centre combined steel buffer and coupler. Both can be accommodated with this kit or you may wish to use your own coupling system.

The kit has etched nickel silver (0.015") inner and outer (dummy) chassis, with two sets of spacers (one for 14mm and one for 16.5mm gauge) designed to give correct relative positioning of the frames. Two sets of spacers are supplied: one for 16.5mm gauge and one for 14mm. Make sure that you use the correct spacers. The etched brass (0.012" body has pre-rolled tank, boiler, smokebox and firebox. Cast fittings are a mixture of white metal (w/m) and lost wax (l/wl) brass. Wheel bearings, handrail knobs (HRK) and wire are supplied.

Name/works plates are available

If you want to build an accurate model of this particular loco it is essential to have a clear idea with photographs, of your requirements. This kit, produced from measurements made of 'Lilla', is designed to produce a model of the loco in its Penrhyn / preservation form. There are a limited number of additional components, which will enable a model to be made with some of the Cilgwyn features. The crosshead driven water feed pump, which was a feature of the loco in its Cilgwyn days, is NOT a feature of this kit.

The basic kit requires gears, wheels; pick-ups and motor (see below) to produce a complete unpainted running model. To complete an unpainted running model you require the following components:

- a) 2 Romford extended axles (for either 14mm or 16.5mm);
- b) 2 Romford 15mm insulated wheels (RP25 profile);
- c) 2 Romford 15mm plain wheels (RP25 profile);

- d) (Alternatively use 4 Romford 15mm insulated wheels (RP25) with pick-ups wired on both sides of the chassis.)
- e) Paxolin (copper clad) plus brass, phosphor bronze or nickel silver wire;
- f) Mashima 1220 motor;
- g) Ultrascale 38:1 gears.

Please Note: At present EDM Models cannot supply these components

PROTOTYPE NOTES

'Lilla' was supplied new by Hunslet Engine Co (w/no 554 of 1891) to the Cilgwyn Slate Co Ltd at Nantlle in North Wales. The loco was used on their main line from the slate mills to the west tip. This was a duty shared with Manning Wardle 'Jubilee 1897'(see kit St2). In 1923 'Lilla' was sold to Penrhyn Quarries for £150 as Cilgwyn no longer had any use for her. No other locos were built to the same design. 'Lilla' is essentially an enlarged version of the famous smaller quarry Hunslet (see kit SL1) that resembles the Dinorwic 'Port' class (see kit SL4) in appearance.

On arrival at Penrhyn 'Lilla' went into the workshops at Coed-y-Parc where some very extensive repairs were carried out, some of which altered her appearance. The crosshead driven boiler water feed pump, on the right hand side, was removed and replaced by an injector (she now had two). The original dumb buffers and centre coupling were removed and replaced by a combined centre coupler fitted with a buffer plate (to be compatible with the rest of the Penrhyn stock). A new smokebox door and chimney were also fitted. Other alterations were made, probably at this initial stage. These included the removal of the front sandboxes from the footplate and the rear pair from the cab bunker tops. The whistle was relocated from the cab roof to a bracket mounted on the cab front. Extensive repairs were required to the tank, which necessitated the fitting new half lower sides and bottom. Numerous other alterations were made which did not significantly alter the loco's appearance.

'Lilla' was employed mostly in the quarry at Penrhyn, although there are some references to her working as a shunting loco at Port Penrhyn. There seems to be considerable doubt that she was employed on the 'main line' between the Port and quarry. In 1955 'Lilla' was withdrawn from service after failing a boiler test. She languished outside at Coed-y Parc until purchased for preservation in 1963. During preservation, the loco has travelled widely. Currently she is based at the Festiniog Railway in working order and painted in the attractive lined black Penrhyn livery. A visit to see the loco is strongly recommended. Special thanks are due to the Festiniog Railway for their assistance.

Useful references

- 'Narrow Gauge Railways in North Caernarvonshire', Volume 2. 'The Penrhyn Quarry Railways' by JIC Boyd
- 'Quarry Hunslets of North Wales' by Cliff Thomas.

ASSEMBLY INSTRUCTIONS

STAGE 1, CHASSIS

- a) Two sets of spacers for the inner frames are supplied. For 16.5mm gauge use front/rear 2 x (105); middle 2 x (104). For 14mm gauge use: front/rear 2 x (107); middle 2 x (106). The outer (dummy) frames fit against the extended spacer tabs - do not file down.
- b) Assemble the inner chassis using sides (62) (please note these are not handed) and the appropriate spacers. Solder wheel bearings (shoulders to the outside) into inner chassis sides - the chassis bearing holes will need opening up slightly. Remove excess metal from the outsides of the shoulders so that the wheels run freely, with minimum side-play, when fitted.
- c) Solder on end plates (69), in which there are three pairs of slots: the outer dummy frames (60) slot into the outer pair; 14mm frames fit into the inner set and 16.5mm frames go into the middle pair (see diagram).
- d) The motor and gears can be fitted at this stage. If they are fitted later, a partial dismantling job will be necessary. Fit correctly quartered wheels (right-lead). The gearwheel can be left loose until the rods have been fitted and set-up. Take care not to lose the gear wheel screw. The motor (Mashima1220) with flat faces to front and rear, fastened to mount (NG14J), fits behind the rear wheels and sits back at a slight angle in the firebox. If fitting axles for 14mm gauge, position the spacer, which is on the NG14J fret, in between the motor and the mount, to enable the motor to clear the wheel flanges. Solder 0.45mm wire through brake hanger holes in (52) and the lug on the bottom edge of the chassis, just in front of rear wheels. Thread brakes (91) on wires on each side - rear wheels only- make sure the brakes and wheels do not touch. Pass 0.45mm wire through hole in lug just ahead of front wheels. Clip brake pull rod (67) over lug wires and position outside of wheels without touching them. Remove excess wire from outside of rods. Bend up lower firebox/ashpan assemblies: left (30L); right (30R), and solder to inner chassis sides (tabs/slots).
- e) The following instructions apply to the fitting of coupling rods to Romford RP25 wheels for either 16.5mm or 14mm gauge. If fitting wheels from another manufacturer, follow their fitting instructions. Secure the wheels tightly to the extended axles with Romford axle nuts. Run a 10BA nut down the threaded part of the extended axle up to the axle nut and tighten. Pass a lost wax cast crank over the end of the axle up against the nut. Check that the outer frames (60), when slotted into (69), will just clear the cranks, if not, fit a 10BA washer between the nut and the wheel. As a rough guide you should not need a washer for 16.5mm, but one may be needed for 14mm, BUT DO CHECK. Line-up, by eye, as closely as possible, three of the cranks with holes in the wheels and solder cast

cranks to the nuts. The fourth one is soldered after final adjustment when fitting the rods (next section). Cut off extended axles, level with crank bodies.

- f) Laminate coupling rods: inner (99); outer (100) and fit to crankpins. When free running is achieved, solder fourth crankpin to nut (see above) on extended axle. Solder brass collars to front crankpins only and file down, to ensure crosshead will be missed when fitted. As an alternative you can use etched collars (87), again, on the front wheels only.
- g) To fit top wiper pick-ups, solder copper-clad (Paxolin) strip into cut-outs in tops of inner chassis (62). Remember to cut a gap in the copper on the insulated side. Use nickel silver, phosphor bronze or brass wire, soldered on underside of copper-clad, for contact with the wheels. If fitting insulated wheels on each side, carry out the above procedure on both sides.
- h) Fit outer frames (60), which fit in the outer pair of slots in (69) and up against the outer extended tabs of the spacers. When all is finished the outer frames can be soldered in place. Add brass bearings (31) around rectangular cut-outs in (60) - make sure that the cranks are missed. At Cilgwyn, the loco had guard irons fitted at front and rear of the outer frames. To fit these drill out the marker holes at lower front and rear of (60) and fit guard irons (61) using short bits of wire as bolts. Fit frame brackets (6) to front of frames. The guard irons were removed at Penrhyn.
- i) Fold up cylinders (84), bend down tabs and solder a short 8BA bolt through each hole. Fold up slide bars (73) with half-etched marks on the outside. Solder together and remove half-etched cross pieces (see diagram). Assemble into cylinders and MAKE SURE that you make a right and a left-handed pair. Fit half-etched strips (72) to outer faces of slide bars. Solder front-end covers (85) & (86) to cylinders, drill out middle hole and insert a l/w cylinder oil pot. Add rear flange (77) and wrapper (38). Fit cast w/m stuffing glands to cylinders and ensure that l/w cast crosshead will move in them freely. Secure each cylinder to outer frame with an 8BA nut screwed onto the bolt in the cylinder.
- j) Fabricate connecting rods by lamination of inner (f 01) and outer (102). Use 168A nut and bolt to attach to cast crosshead and assemble into cylinders; cut piston rod to required length. Use brass collar, or etched variety (87), to secure to crankpin.
- k) Lamination of two (71) produces a motion bracket. For the left hand solder together with the half etched circles are inside (can't be seen), but for the right side solder with half etched circles outside and drill out these areas (the loco originally had a crosshead pump with pipe work passing through the hole). Solder motion brackets into slots in outer frame (60). Adjust cylinder position and cut slide bars to length. Solder frame pieces (70) into slots in (60) just behind each motion bracket. Add lost wax brake lever/pivot to hole in right rear of (60) and l/w brake pivot to corresponding hole in left side.

STAGE 2, CAB & FOOTPLATE

- a) Dimple out rivets in footplate (3), fold down front buffer beam and solder on outer beam (25). Solder valances (2), into half-etched strips along edges of footplate and up against front buffer beam. Laminate rear buffer beam: inner (1) and outer (24) (dimple rivets along top) and solder to underside of footplate up against rear edges of valances. Solder cast springs into slots in footplate. Solder a long 8BA bolt down through hole in front of footplate and another into half etched circular panel under cab floor. Solder cast springs into slots in footplate (centre of spring should be 1mm above footplate).
- b) At Cilgwyn, the loco was fitted with a pair of dumb buffers and a separate centre coupling on each buffer beam. For this variant, cut four slots in the lower part of each outer buffer beam to correspond with those in the inner beams. Fold up buffer bodies (82) and add bent face plate (80) and solder into slots you've just cut (position with wider portion to the middle). In its Penrhyn/preservation guise there is a central buffer/coupler and no dumb buffers. For this variant (do NOT cut slots) fold up and dimple rivets in brackets (66) and solder centrally to top and bottom edges of cut-out in beam centre - ensure that the Penrhyn l/w cast coupler will pass through. Solder buffer plate (81) to centre of each l/w Penrhyn coupler and bend sides of plate back slightly. Fit couplers, either Cilgwyn or Penrhyn type, and coupling links at final stage (4c).
- c) Dimple rivets in cab rear sheet (28) and fold strip at base to the inside (the half etched spectacle rim lines on (28) are on the inside). Attach rims (10) to outside of (28). Solder pre-formed handbrake housing (17) to formers (29) - line up centre marks and (29) fits inside and against the edge of (17). Solder housing assembly to outside of back sheet in the rectangular cut-out and add rivet bracket (5) around outside. Trim (5) so that its bottom edges are level with the base of the housing. Remove excess metal from the inside face of the housing. Dimple rivets and fold bracket (26) then solder to inside of cab sheet, level with bottom of the housing: note the cut-out in (26) to miss the housing. Solder rivet strips (16) to inside of back Sheet - one below (26) and the other above the folded base strip. Attach doors (27) (open or shut) to outside of back sheet. Add strip (20) along top edges of doors - half etched ends of (20) are at top and face to loco front (these ends pass around hand rail wire later, so DO NOT DAMAGE them). Add strip (21) along bottom edge of doors and trim excess.
- d) Dimple rivets in cab front/sides (11); solder beading (4) around each upper curved side opening (end of (4) is at the edge of the vertical lower edge of the opening). Attach spectacle rims (10) to outside of cab (half etched spectacle rim lines are INSIDE) and fold up cab assembly. Solder grab handle brackets (18) to inside of cab - position up against beadings (4) and the shoulder on (18) is against the cab side.

- e) Attach cab assembly (11) to footplate (tabs/slots). Dimple rivets and fold up internal bunkers (left (42): right (43)), add coal doors (7) and fit assemblies to footplate, inside of cab: against cab front sheet and sides (tabs/slots). If fitting rear cab sand boxes: fold up (left (74); right (75)) add cap (76) and locate each on top coalbunkers against cab front and side sheets. Assemble reverse lever by folding double the tabs on (12) & (15) and solder together with folded tabs facing each other. Laminate lever (103) and attach to (15): use a short piece of wire to make a movable reverse lever-bend/solder wire so that it all stays together. Attach assembly to slot in footplate adjacent to right bunker. Fold (14) and fit into slot in cab front (this supports the rear end of the tank later). Fold up and add tool bracket (89) to inside of cab sheet, level with two pairs of dimpled rivets in outer front cab sheet.
- f) Assemble firebox from pre-formed wrapper (49) and backhead (37) (line up centre marks and (37) fits inside and around the edge of (49). Dimple rivets in (37), add edge strip (33) and round off outer edges. Add firebox door (35) and the following lost wax (l/w) castings: regulator handle & gland; 2 x Salter safety valves; gauge glasses; safety valve bonnet (position with holes at sides and two facing into cab (rear holes)) and hand valves. The body of each Salter safety valve is attached to the backhead, in between the gauge glasses and regulator, with the arms (cut to length) fitting in the two rear holes in the bonnet. Solder firebox assembly onto footplate (tabs/slots) up against cab front sheet. Glue cast Mm pressure gauge to inside of cab sheet.
- g) Offer chassis up to footplate assembly and check that motor is not fouled: if it is, remove any necessary metal from base of front cab sheet. Cut motor shaft so that it does not foul firebox - BUT TAKE GREAT CARE that you do not damage the motor bearings by overheating the shaft during cutting. This is especially the case if you are using a slitting disc. Do the job gradually.
- h) Solder cab back sheet centrally to rear edge of footplate and solder top corners to rearward upper extensions of side sheets. Pass handrail wire vertically down from the top corners created and down through holes in footplate. Wrap half etched ends of (20) around wire and solder. Pass handrail wire through holes in grab handle brackets (18) in cab opening and solder bottom ends to footplate. Trim excess. Fit l/w cast handbrake stanchion to hole in right rear of cab footplate: the stanchion leans back at a slight angle and the handle fits in the housing in the rear cab sheet.
- i) Fold up cab steps (left (9); right (8)) and solder to footplate under cab opening: up against rear buffer beam with outer edge of step level with the edge of the buffer beam. Fit drain cock pull lever (65) to front right cut-out in running plate (3) and slot inside cab. Fit reverse pull lever (64) to right hand cut-out in (3) (between wheels): rear end of lever fits lower slot in right of cab front sheet. The folded front ends of (64) & (65) are soldered to underside of (3).

- j) Bend roof (36) to cab profile, dimple rivets and add rivet strip (44) centrally across inside of roof. Solder folded short lengths of wire to underside of roof so that they slip into the front cab corners when the roof is fitted. Attach a similar piece to the centre of the rear edge of the cab so that it fits against the cab rear sheet. The roof can then be clipped in place and removed, as required. There is a choice of whistle positions: at Cilgwyn the whistle was roof-mounted - drill out hole just behind safety valve hole and fit. In preservation/Penrhyn days the whistle is attached to the cab front. For this variant fold up and fit whistle bracket (68) to front cab sheet, immediately below the narrow slot and add whistle. Copper pipe work passes from whistle base and through the hexagonal hole below.

STAGE 3, TANK, BOILER & SMOKEBOX

- a) Dimple rivets in pre-formed tank wrapper (51) PLEASE NOTE: if you are fitting tank patches (31A) do not dimple the rivets in the lower sides of the wrapper that are covered by the patches. Assemble tank from wrapper (arrow to front) and formers: front (41); middle (39); and rear (40). The front and rear formers fit inside the wrapper right up against the edges, and the centre marks on each former line up with those on the wrapper. Fit the outer formers first and commence soldering from the centre marks and finishing with at the fold lines. When all formers are in place fold under the bottom strips to make the tank base. Solder HRKs into tank holes and, if required, fit tank patches (31A) to lower portions of tank sides (hole in (31A) to bottom rear to line up with corresponding hole in tank).
- b) Attach front tank overlay (34) to tank front former (41) and remove excess from edges. Fit lubricator bracket (95) to short vertical slot in (34) - solder from inside. Add short rivet strip (94) alongside (95) on the inside. Solder lost wax injectors (these are handed) into holes (may need opening up) towards tank rear. Solder from the inside. PLEASE NOTE: before fitting, open up (0.5mm) the holes in each end and top collar of the injector (this is to take the copper pipe work later).
- c) Construct smokebox from pre-formed inner wrapper (48) and formers (front (45); rear (46)): the formers fit inside the wrapper up against the edges and line up centre marks, (as you did with the tank). Solder half etched wrapper (47) centrally over smokebox: the rivets are to the rear and the front edge of (47) lines up with that of (48). Drill out hole (0.4mm) in right of (47). Pass support (22) through (46) and into twin slots in (48): solder in place and remove excess from (22) so that it is flush with (45). Add ring (23) to smokebox front (line up on centre holes) and add two spacers (13) to smokebox rear. Solder smokebox assembly centrally and squarely to the tank front - support (22) fits the slot in front former (41). Fold brackets (79) and solder to tank front and non-etched panels on rear of wrapper (47). Add l/w lubricator to bracket. Add weight to tank, if required.

- d) Solder l/w cast clack valves to holes in pre-formed boiler (50). Attach front of boiler (the cut out in the boiler is at the rear, cab end) to rear of smokebox (tabs/slots). Add bent wire (balance pipe) to holes at front in undersides of tank. The whole assembly can now be attached to the cab front: support (14) fits the slot in (40). Check that the boiler does not foul the motor. If it does, remove metal from boiler. Solder all in place and attach rivet strip (32) to outside of cab front and around the rear edge of the tank.
- e) Fit injector pipe work (use 0.5mm copper wire) and operating levers as follows: FRONT collar: wire curves down, almost touching the footplate and into the clack valve base. On the right side the wire passes below the drain cock pull lever. TOP collar: wire loops over between clack feed pipe and tank side and passes through small hole in footplate by the rear spring. REAR collar: LEFT side - wire passes below tank to cab inside; RIGHT side - wire curves up to pass through circular hole in cab front. Add lever (63) to vertical spindle on each injector and add pull lever (78), which passes through hole in cab front - position so that all levers are horizontal and solder. Remove excess from spindle top.

STAGE 4, FINISHING OFF

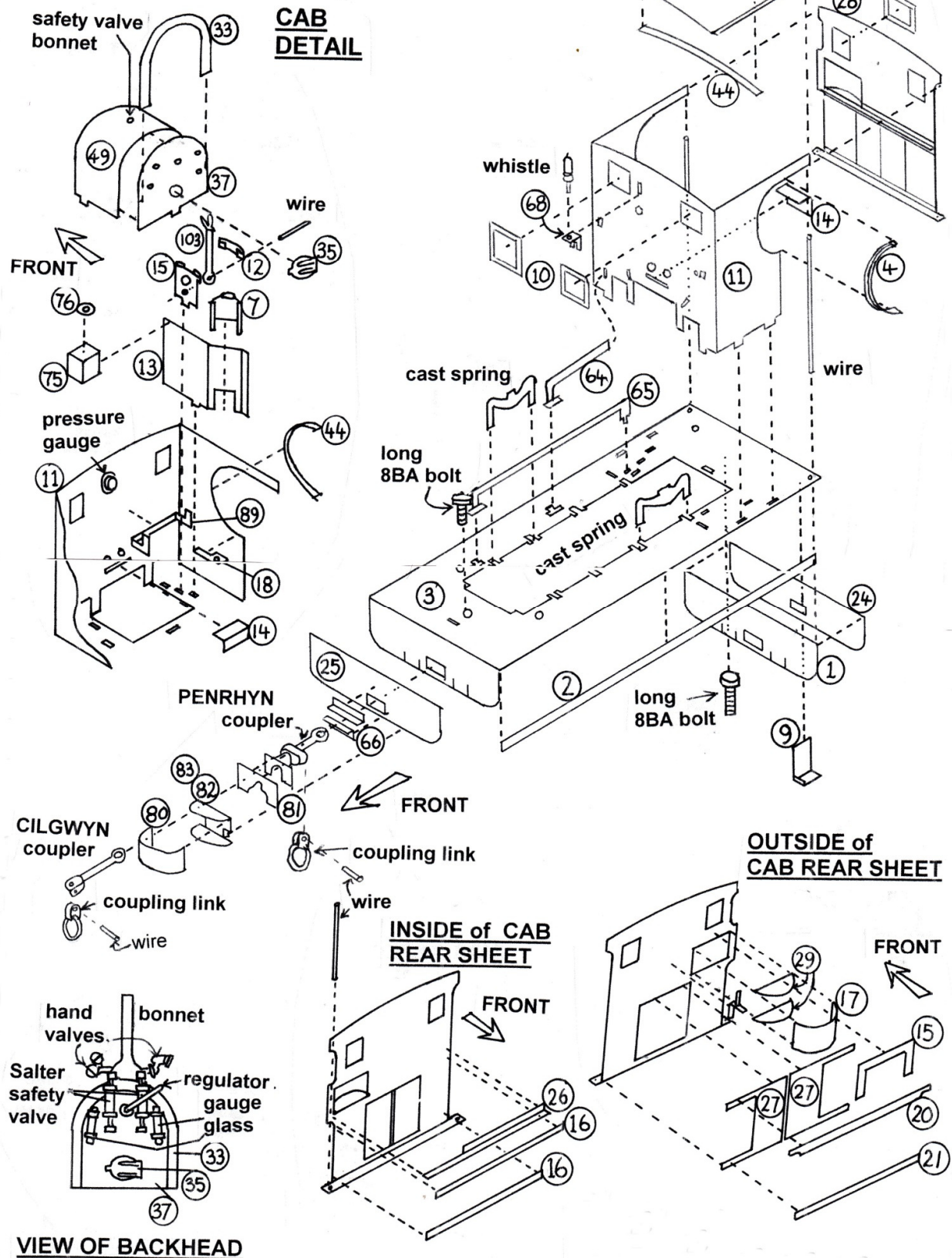
- a) If required, add w/m cast sandboxes to front of footplate, adjacent to smokebox. These were only fitted at Cilgwyn quarry. The operating lever mechanism can be constructed from wire and (96), (97) & (98) – I'll leave you to sort this, but I'm willing to assist if you wish.
- b) Add following castings: l/w dome (lubricator on top); w/m chimney; tank filler; frame top extensions (to footplate and against either side of smokebox). Attach appropriate lamp irons - choice of (90), (92) & (93) to positions of choice i.e. smokebox top front, chimney front and middle of cab rear sheet. Secure body to chassis using 8BA nuts on the long body fixing bolts fitted to footplate.
- c) Fit appropriate l/w couplings (Penrhyn or Cilgwyn) by feeding required couplers through holes in buffer beams and pass looped ends over same bolts and fasten with 8BA nuts. Use wire to connect a l/w coupling link to each coupler.

(Originated by Pete Stamper, October 2002 Revised EDM Models May 2013)

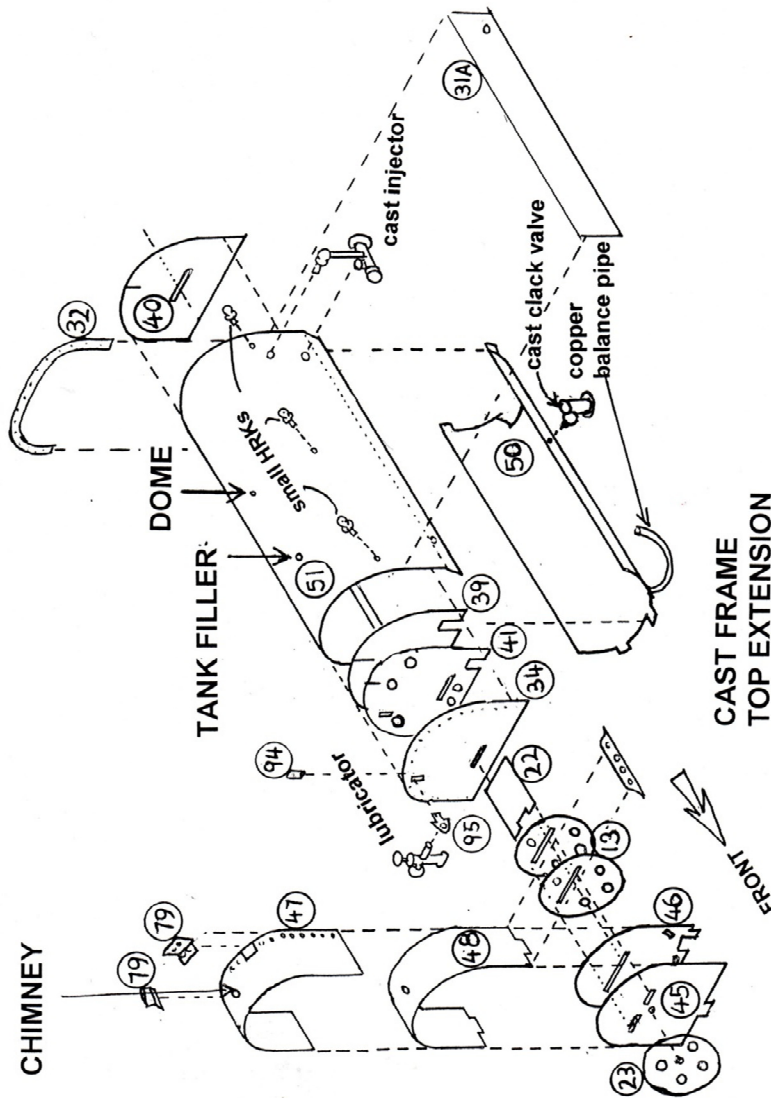
RIGHT BRAKE LEVER



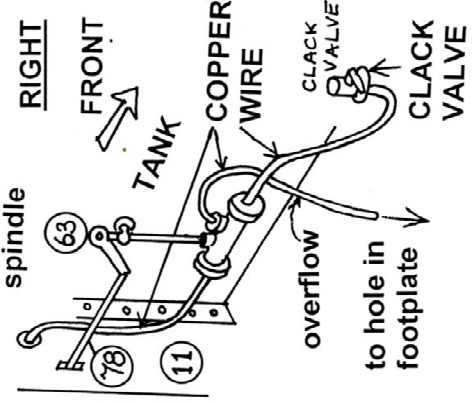
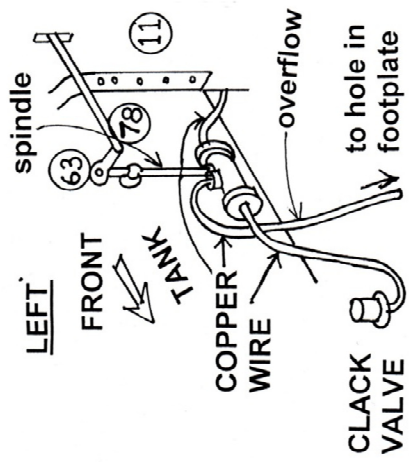
STAGE 2 CAB & FOOTPLATE



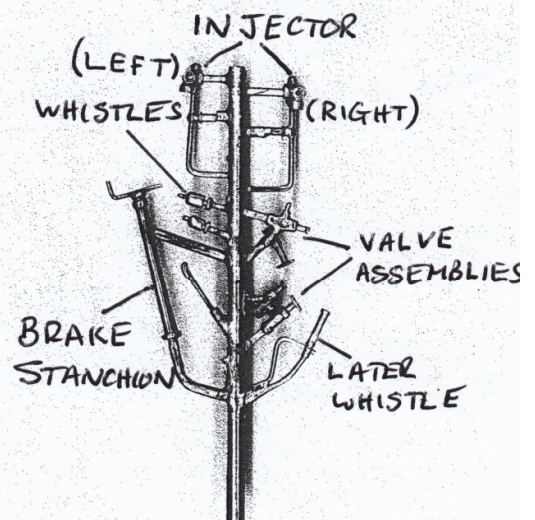
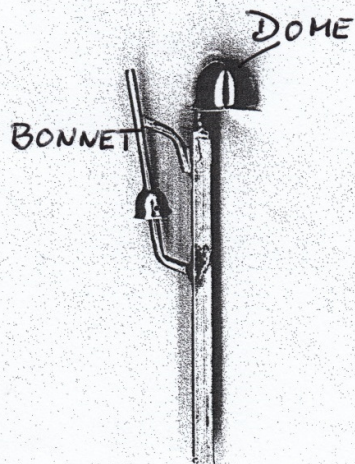
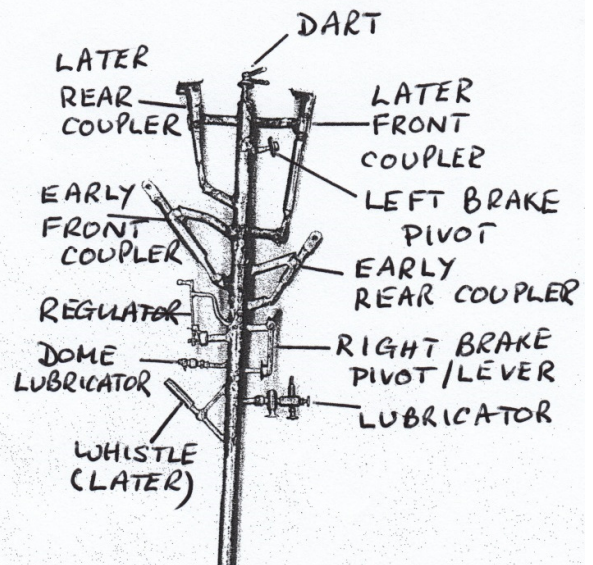
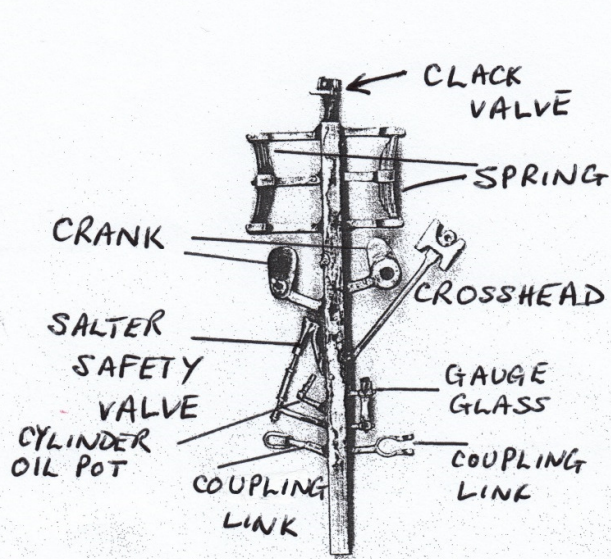
STAGE 3 TANK/SMOKEBOX

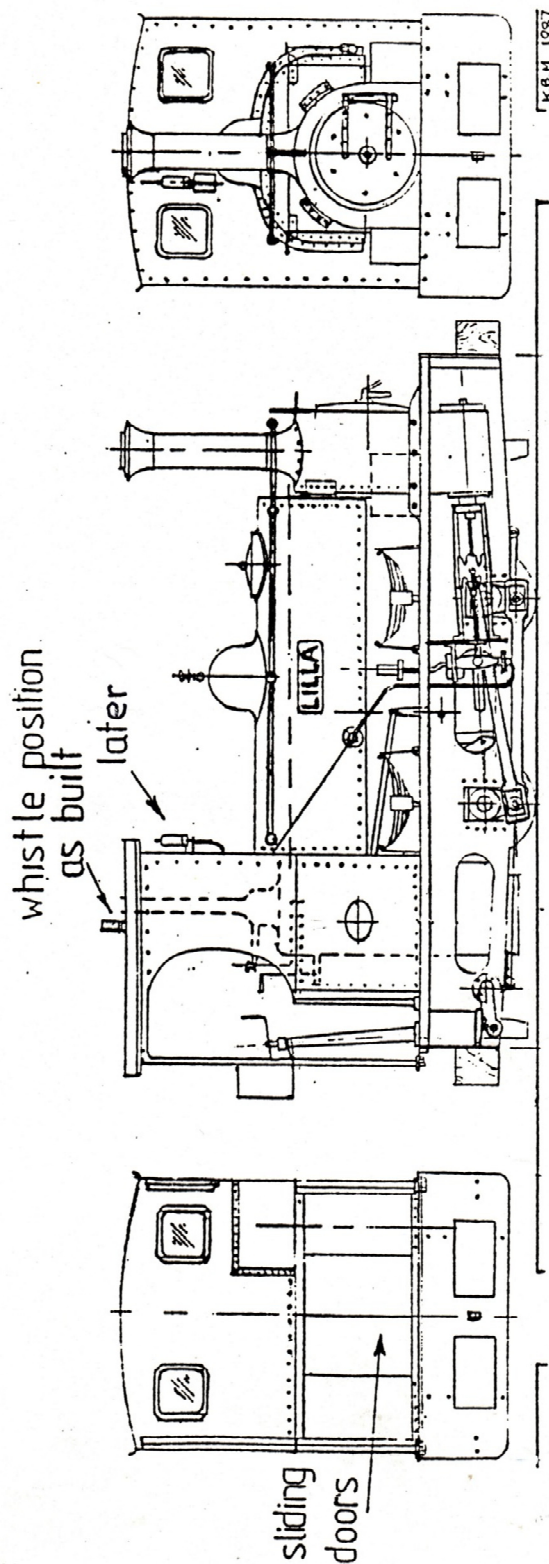


INJECTOR DETAIL

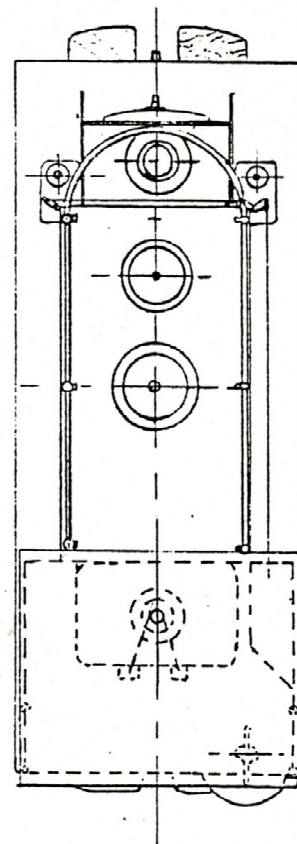


LOST WAX COMPONENTS





sand pots, wood
block buffers &
cross head
driven feed water
pump later
removed



LILLA

DRAWING BASED ON
MAKERS DIAGRAMS
& PHOTOGRAPHS

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