



DINORWIC QUARRY HUNSLET'PORT' CLASS NARROW GAUGE O-4-O Saddle Tank

7mm Scale kit for 16.5mm or 14mm Gauge

Introduction

This kit, which has been researched by Jonathan Matthews and designed by Pete Stamper, can be assembled to produce a model in 7mm scale of a narrow gauge locomotive. This takes the form of the Dinorwic 'Port' class quarry Hunslet. The model can be constructed to run on either 16.5mm or 14mm track. The kit has been thoughtfully designed for ease of assembly and comes with comprehensive and illustrated instructions.

An 'Antex' soldering iron, 'Fry's Powerflo Flux and 145 degree or 60/40 solder are recommended. Please familiarise yourself with the kit before commencing, especially as to which prototype variant you require. several different versions can be produced from the kit.

The kit has etched nickel silver (0.015") inner and outer (dummy) chassis, with spacers designed to give correct relative positioning of the frames. Two sets of spacers are supplied: one for 16.5mm and one for 14mm gauge. 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 and lost wax brass. Wheel bearings, handrail knobs (HRK) and wire are supplied. Nameplates and works plates are available.

If you want to build an accurate model of a particular loco it essential to have a clear idea, with photographs, of what is required. Do the research before you start building! Please read through the instructions, before you grab the hammer and nails, and familiarise yourself with the kit.

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

- a) 2 Romford extended axles (for either 14mm or 16.5mm);
- b) 2 Romford 12.5mm insulated wheels (RP25);
- c) 2 Romford 12.5mm plain wheels (RP25 profile);
- d) Paxolin (copper clad) plus brass or nickel silver wire;
- e) Mashima 1220 motor;
- f) Ultrastyle 38:1 gears.

PLEASE NOTE

All nameplates for these locos are available from EDM Models.

See our website www.ngtrains.com

This kit has been produced from measurements made of **Dolbadarn** preserved and presently located at the Llanberis Lake Railway. Thanks are due to the staff at the Llanberis Lake Railway who made us very welcome. The invaluable assistance of Don Townsley, for the supply of information and permission to use drawings, is also gratefully acknowledged.

The kit represents the last three locomotives supplied by The Hunslet Engine Company Limited to the Dinorwic Slate Quarries, and indeed the last new steam locomotives to be supplied to the North Wales slate industry. The works numbers, year of manufacture and name/number carried are as follows:

Works Number	Year Built	Initial Name	Final Name
1429	August 1922	No.1	Lady Joan,
1430	August 1922	No.2	Dolbadarn
1709	September 1932	Michael	

The locos were a development of the well-known **Alice** class, which were first introduced in 1886. The later locos differed from the **Alice** class in having a higher-pitched (domed) boiler, full-depth buffer beams and (luxury) an enclosed cab. The first two, when new, were delivered directly to Port Dinorwic, where they worked the port lines. **Michael** was delivered new to the quarry, where it was subsequently joined by the other two locos on transfer from the port. Initially, **Michael** retained its cab whilst at work in the quarry. Enclosed cabs were unsuitable for use in many parts of the quarries, due to restricted headroom in tunnels. As a result, the upper halves of the cabs were removed, in about 1950, when transferred to such workings. After removal, the cab tops were stored at Giffach Ddu.

When delivered, the locos were fitted with a single 'banana-shaped' sprung buffer in the centre of each buffer beam. The single buffers were replaced by a pair of dumb buffers on each beam, when the locos were transferred to quarry workings. Both of these buffer variants can be accommodated with this kit. When delivered the locos had a short chimney, which they kept throughout their lives, except for **No 1**. When it was at the Port, **No 1** had a long chimney but on transfer to the quarry in the early 1960s it lost its cab and received a short chimney.

Lady Joan now lives at the Bredgar and Wormshill Light Railway

In 1952 **Dolbadarn** was altered and fitted with a lower pitched, dome less Alice boiler and tank, features that were retained until its withdrawal in 1967. On withdrawal, all three locos were preserved. In preservation '**Dolbadarn** has been rebuilt to its original form with a domed boiler and enclosed cab. '

Michael emigrated to Canada but is now back in the UK as part of the Statfold Collection and currently (2017) awaiting restoration.

Useful references

- 'Dinorwic Mysteries' by Vic Bradley (Narrow Lines;
- Issues gg & gg, 7mm Narrow Gauge Association;
- 'Narrow Gauge in Caernarvonshire' Volume 3 by J I C Boyd;
- 'Narrow Gauge Charm of Yesterday' by Ivo peters;
- 'Slates to Velinhelli' by D C Carrington & T F Rushworth;
- 'Heyday of the Welsh narrow gauge' (colour) by Peter Johnson.
- 'industrial Locomotives of North Wales', by Vic Bradley and published by the Industrial Railway Society
- 'Quarry Hunslets of North Wales' by Cliff Thomas

A visit to the Llanberis Lake Railway to see Dolbadarn, Bedgar to see Lady Joan or Statfold for Michael is strongly recommended.

ASSEMBLY INSTRUCTIONS

STAGE 1 CHASSIS

- 1) Two sets of spacers for the inner frames are supplied. For 16.5mm gauge use: front (101); middle front (110); middle (99); middle rear (102) and rear (100). For 14mm gauge use: front (108); middle front (111); middle (105); middle rear (104) and rear (103). The middle front spacer (110) or (111) serves as a platform in which lead can be placed to balance the weight of the motor; omit this if not required. The outer (dummy) frames fit against the extended spacer tabs - do not file down these tabs.
- 2) Solder wheel bearings (shoulders to the outside) into inner chassis sides: these are not handed but remember to make a right and a left-handed pair. Assemble the inner chassis using the correct spacers. Remove excess metal from the outsides of the shoulders so that the wheels run freely, with the minimum of side-play, when fitted.
- 3) Solder 0.45mm wire through brake hanger holes and fit brakes (86) on each side; to rear wheels only. You can laminate 2 x (86), if you wish, but ensure that the brakes line up with, but miss the wheels when fitted.
- 4) Solder on end plates (80), in which there are three pairs of slots: the outer dummy frames slot into the outer pair; 14mm frames fit into the inner set and 16.5mm frames go into the middle pair (see diagram).
- 5) Fit correctly-quartered wheels (right lead). The motor and gears can be fitted at this stage. If they are fitted later, a partial dismantling job will be necessary. The gear wheel can be left loose until the rods have been fitted and set-up. The motor (Mashima 1220) with flat faces to front and rear, (fastened to mount (94)), fits behind the rear wheels and sits back at a slight angle in the body of the firebox.
- 6) The following instructions apply to the fitting of Romford RP25 wheels for 14mm or 16.5mm gauge. Secure the wheels 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 will miss the cranks, if not, fit a 10BA washer between the nut and wheel. Line-up, by eye, three of the cranks with holes in the wheels and solder cranks to the nuts. The fourth one is soldered after final adjustment when fitting the rods. Cut off extended axles, level with cranks. As a guide you will probably not need washers for 16.5mm, but for 14mm, one or two washers will be needed on each side.
- 7) Laminate coupling rods: inner (74); outer (75) 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 (106), again on the front wheels only.
- 8) To fit top wiper pick ups, solder copper-clad (Paxolin) strip into slots in tops of chassis. Remember to cut a gap in the copper on the insulated side. Use phosphor bronze, nickel silver or brass wire, soldered on underside of copper-clad, for contact with the wheels. If fitting insulated wheels on both sides, repeat the above procedure on the other side.

- 9) Fit outer frames (72); remember to fit the same on each side! The outer frames fit in the outside pair of slots in (80) and up against the outer extended tabs of the spacers. When all is finished the outer frames can be soldered in place.
- 10) Fold up cylinders (81), bend down tabs and solder an 8BA screw through hole. Fold up slide bars (70) with half-etched marks on the outside. Solder together and remove half-etched cross pieces. Assemble into cylinders and remember to make a right and a left-handed pair. Fit half-etched strips (1171 to outer faces of slide bars. Solder front end plates (8S) & (S9) to cylinders, drill out middle hole and insert an HRK. Add rear flanges (90) and wrappers (62). Some locos had external drain cocks (109); fit if required on underside of cylinders. Fit cast white metal stuffing glands to cylinders and ensure that piston rods will move in them freely.
- 11) Fabricate connecting rods by lamination of inner (77) and outer (76). Use 168A screw and nut to attach to cast crosshead and assemble into cylinders; cut piston rod to required length. add bearing brass (44) to each and use brass collar or etched variety (106) to secure to crankpin.
- 12) Lamination of two (115) makes a motion bracket, which is soldered into slots in outer frame top. Dimple rivets and fold up brackets (84) and solder to outer frames and motion brackets (back & front side). Cut slide bars to length.
- 13) Fit handbrake bracket (39) to slot in outer right frame side only. Attach lost wax cast brake pivot (in hole on left) and lost wax pivot/lever to right (in hole). Add brake pull levers to inner faces of outer frames - locate on brake pivots and short lengths of wire at front.
- 14) some locos had re-railing beams attached to the frames. If fitting these, use folded up (112) and locate in a position corresponding to the prototype you are modelling. Fit frame brackets (11) to front edges of outer frames. Solder rivet brackets (26) onto frame and around cylinders.

STAGE 2 FOOTPLATE, CAB CONSTRUCTION & FIREBOX

- 15) Dimple rivets in footplate (59). Fold down front buffer beam and solder on outer buffer beam (5). Laminate rear inner (13) and outer (14) buffer beams. Dimple rivets in (7) and fold up to make bracket, which will be fitted (NOT YET!) to the bottom of the front buffer beam. If dumb buffers are to be fitted, cut the slots (slitting disc) in outer front buffer beam, corresponding to the slots on the inner front beam. The tabs on the dumb buffers (7S) fit just above the bracket (7), so cut the slots to sufficient depth to allow this. Solder bracket (B) to bottom edge of front buffer beam. Repeat the above procedure for the rear buffer beam, using bracket (8) in place of (7).

Alternatively, the locos were fitted with a sprung 'banana-shaped' central buffer. If you are fitting this type do not cut the slots but add bottom brackets (7) and (8). Laminate two buffer heads (20), attach two cast springs through the holes and file off excess. Drill (0.9mm) the dots in the centre of the circular un-etched regions of each buffer beam and fit the cast brass springs with 'banana' attached. This job can be left until the finishing stage, if you prefer. Also, some locos were fitted with chain haulage hooks on the rear buffer beams. If these are required, fit bases (83) and hooks (82)" Solder assembly to footplate at the transverse half etch line at rear. Solder valances (61) into half etched tines along edges of (5g), up against front and rear buffer beams. assemble into slots in buffer beams. The dumb buffer blocks, if required, can be added now or later. Assemble blocks by folding up (78) (these are handed), curving plates (30) (rivets outside) and adding to fronts

- 16) Fold up cab step backs (9) add rivet strips (10) and solder assemblies to underside of footplate, up against rear buffer beam and in line with half etched marks on (59). Fold up spring supports on footplate and glue or solder springs (small pivot to rear) to supports.
- 17) Assemble firebox from pre-formed wrapper 1271, rear former (28) and front former (19): do not remove cross piece in (19) until the assembly job is completed. Line up alt centre marks and fit both formers inside (27), flush with edges. Remove cross piece in (19) (see diagram), fold forward the firebox sides and solder on spacer (31): ensure that slots line up. Round off front edge of firebox and add front spacer (35) (slots line-up) Add throat plate (22) to extended firebox sides.
- 18) Dimple out rivets in backhead (29) and solder against rear former (28). Remove excess metal from edges and add rim (34). Round off rear edge of firebox and add half-etched bands (oops! these are adjacent to (26) on fret)-aligning marks on {271for position. Attach firebox door (40), hinge (44) and use a short length of wire for hinge. Attach cast backhead fittings: 2 x gauge glasses; 2 x injectors; regulator gland and handle (see stage 3 diagram). Use wire for any pipework you wish to add. Add flange (46) to top of firebox plus cast blower valve.
- 19) Solder firebox assembly to the footplate (tabs/slots for location). The firebox must be positioned so that front spacer (35) is adjacent to the pair of transverse stots in the footplate (see diagram). The cab fits into the gap, created by (35), between firebox front and tank rear. Fold up support bracket (56) and solder (pointing forward) through slot in front of firebox assembly.
- 20) Offer the completed chassis up to the footplate/firebox assembly and check that the motor will fit into the firebox. The motor should slope backwards at a slight angle into the firebox.

If the fit is tight, remove a small amount of metal from bottom of throat plate in order to achieve a fit.

- 21) Assemble reversing lever quadrant by folding over tabs on both of (85) and soldering them together- the folded tabs face each other. Laminate two (33) to make lever and smooth appropriately. Assemble into quadrant using a short piece of wire through bottom holes to produce a moveable lever. Solder quadrant into slots in footplate to right of the firebox side.
- 22) The cast handbrake stanchion can be fitted now or later into the hole in the footplate in between the quadrant and firebox. Dimple rivets in bunker (47), fold up and add door (45).

FULL ENCLOSED CAB VERSION

- 23) Dimple rivets in bottom and sides of cab back sheet (2), fold up the bottom strip perpendicular to cab sheet- this strip is on the inside of the cab sheet. Solder spectacle rims (25) to outside of cab sheet; leave 0.5mm of tags and position at top and bottom to represent hinges. Solder rear cab doors (48) over cut-out (open or shut) to outside of (2) (i.e. opposite side to perpendicular strip- see diagram). Solder short pieces of wire through holes in (4g) and attach clasp (162). Attach rivet strip (68) along top of rear doors (48) (top edge of (48) and (68) are on same level). Solder strip (65), level with (68), to inside of (2). Add strips (60) to inside and outside bottom edges of (2). Remove excess from strip ends before fitting.
- 24) Fold up cab hinges (4), dimple rivets in doors (21) and pass wire through holes in (4). Solder doors top and bottom to wire, which fits in the half-etched strips in (21). The hinge/door assemblies are soldered into the half-etched panels in (2) after attaching the latter to the cab sides. If you prefer, the doors can be fitted in a fixed position.
- 25) Dimple rivets in cab etch (1) and solder spectacle rims (25) to outside; leave 0.5mm of each tag and position top and bottom to represent hinges. Construct cab by bending about relieving lines to produce cab sides (remove bending marks with fine abrasive paper). Solder cab rear sheet assembly in place between rear edges of cab sides. Remove cross pieces in cab openings and at front. Solder door hinge assemblies into half-etched panels in (2): ensure that doors will move freely. Solder bunker assembly to inside left-hand side of cab and up against the cab front. The cab assembly, which fits into slots in footplate and into the gap between firebox front and tank rear, is added after fitting the tank/smokebox assembly in stage 3. Fit cab roof (66) (suitably curved and riveted) at finishing stage.

HALF-CAB VERSION

- 26) Dimple rivets in bottom strip and sides of rear cab sheet (63). fold up bottom strip and side panels. Solder rear doors (48) (open or closed) over outside of cut-out in (63). Fold strip (67) and attach (plain edge upwards) to top edge of (63) and over top edges of doors. Fix strip (64) to top of (67). Add rivet strips (60) to inner and outer bottom edges of (63) and strip (65) to the top inner edge. Solder short lengths of wire through holes in (48) and add clasp (162). remove excess wire. Add door assemblies (see (i) above for assembly instructions) to half-etched panels in (63): ensure that doors will move freely. If not fitting doors, solder half-etched strips (67) (in the half cab etch (50)) into the etched panels in (63).

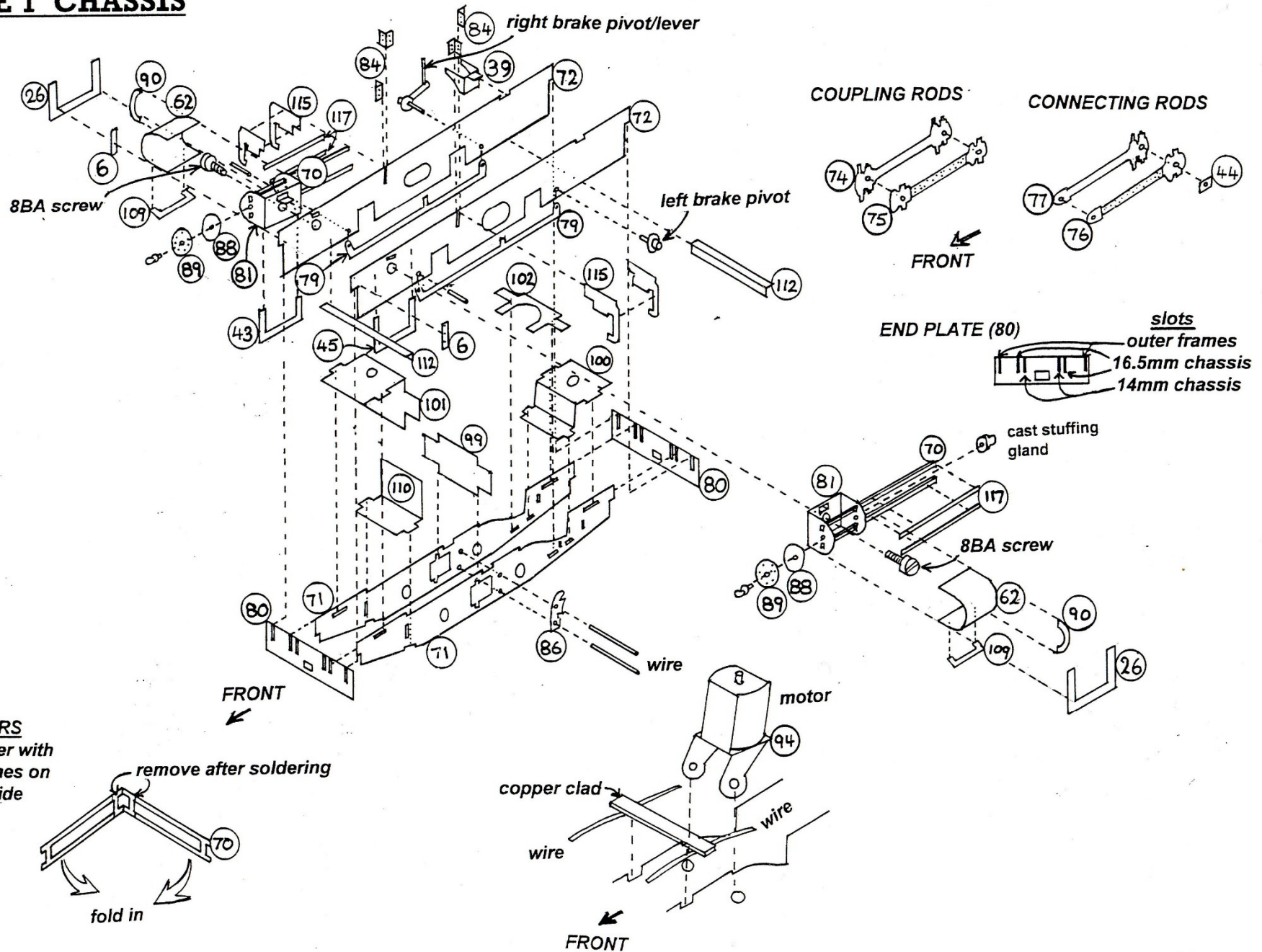
- 27) Drill a 1.2mm hole 6mm from bottom and 13mm from centre on RIGHT hand side of cab front (50). Check prototype and dimple out appropriate rivets in cab sides/front in etch (50). Construct cab by bending sides about relieving lines (remove bending marks with fine abrasive). The locos had different cab-side finishes at different times. Options are as follows:
- Leave as it is;
 - add side beading (32);
 - add both (32) and top beading (42) (right) and (43) (left).
- 28) Solder bunker assembly to inside left-hand side of cab and up against the cab front. Fold bracket (3) and attach centrally to cab front. The pressure gauge is fitted to this at finishing stage. Fit cab assembly to footplate (tabs/slots), after first removing the cross-piece in (50).
- 29) For chassis/body mounting solder a 0.5" 8BA screw through hole in footplate front and solder another centrally to underside half etched panel towards rear.

STAGE 3. TANK. SMOKEBOX & FINISHING OFF

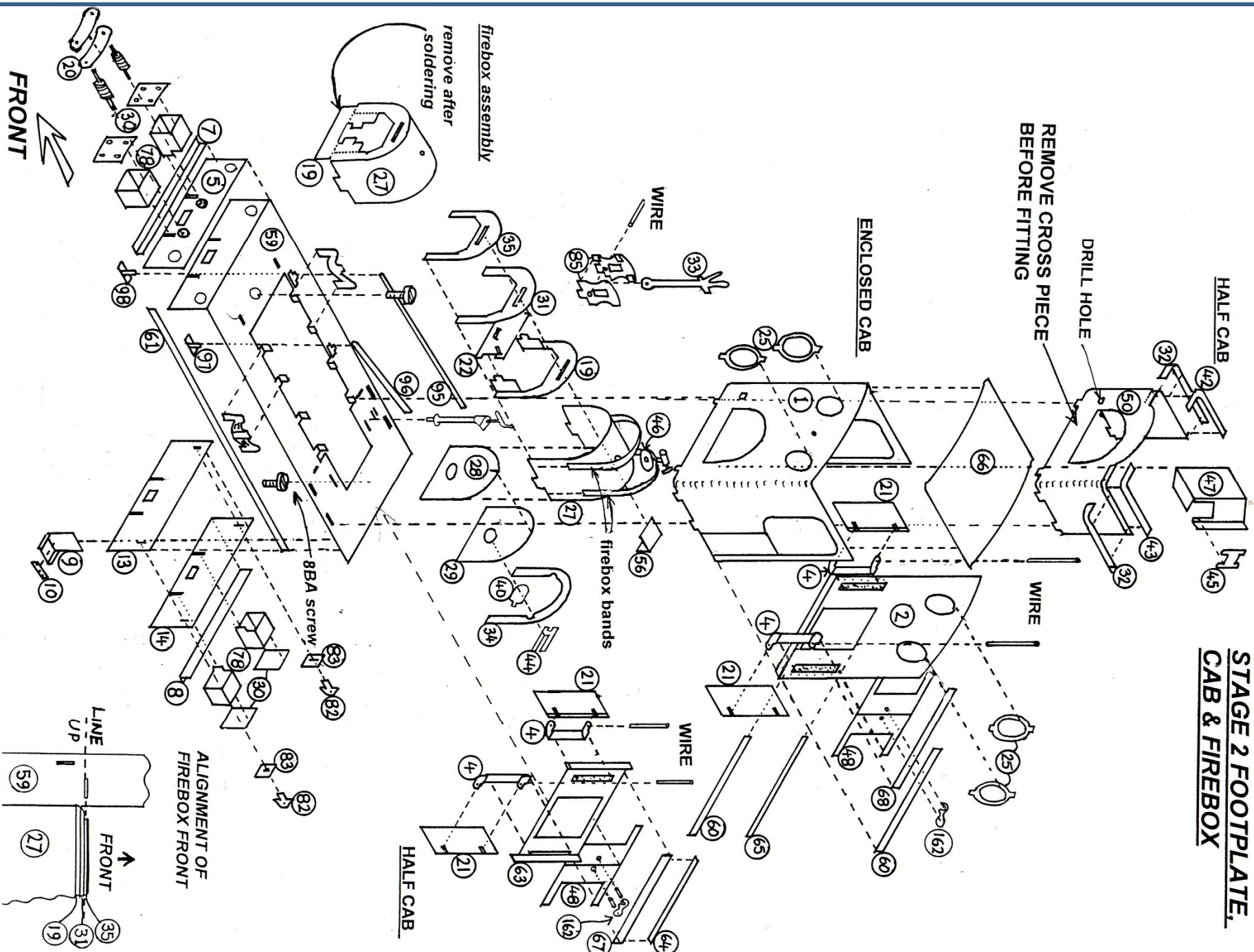
- 30) Some locos had sandboxes fitted to the tank sides. If modelling these drill out (0.5mm) the three holes marked 'S' on the inside of the pre-formed tank/wrapper. Assemble tank from wrapper (arrow to front) and formers: front (18) (this is just above part (17)); middle (16) and rear (17). The front and rear formers fit inside the wrapper right up against the edges.' The centre marks on each former should line up with the corresponding marks on the tank. Start with front and rear formers and finish with the middle one. Commence soldering at the at the centring marks and finish at the half-etched fold lines on the wrapper. When all the formers are in place fold the bottom strips under to make the tank base. Solder in short handrail knobs (HRKs) from the inside. Fold and solder support (5f) forward through slot in front former (18). Two lubricator brackets were fitted to the tank front. Solder support brackets (93) into slots in the tank front and add flanges (g1) to the inside edge of each bracket. Add cast lubricators to outer edge of each (93) bracket, now or at the finishing stage.
- 31) Construct smokebox from pre-formed inner wrapper (12) and front former (24) and rear former (23). Line up centring marks. The formers fit inside the wrapper right up against the edges. Use fine abrasive paper to round off slightly the front and rear smokebox edges. Solder half etched wrapper (15) centrally over smokebox - the two small un-etched panels are to the rear. Solder two spacers (57) to smokebox rear - stots should all line up and do not cover slots in (23) for boiler tabs. Attach ring (58) to smokebox front - bottom of ring is level with the smokebox base.
- 32) Solder smokebox assembly centrally and squarely to front of tank assembly - the support (55) in tank front fits into slot in smokebox rear. Add weight to tank, if required. Fit preformed boiler (arrow to front) tabs go into slots in smokebox rear. Fold up top riveted tan/smokebox brackets (8A) and solder to tank front and onto un-etched panels on rear top of smokebox wrapper (15).
- 33) Offer above assembly up to firebox front - support (56), which sticks out of firebox front fits into slot in tank rear. Remove any excess metal, if necessary, from length of boiler. When a good fit is achieved solder the whole assembly together; tabs/slots for smokebox location.

- 34) Fit full cab (full or half (front, only)) into stots in footplate and into gap between firebox front and tank rear. The rear cab sheet is located centrally on the rear edge of the footplate. Fit rivet strip (11) (full cab version only) up against cab front and tank top. The half-cab front fits in between firebox front and tank rear and into slots in footplate. The rear cab half sheet assembly (63) etc fits centrally to the rear edge of the footplate.
- 35) For blower pipe, thread 0.3mm wire along right underside of tank and into a hole drilled centrally in right hand side of smokebox, level with tank bottom. Add cast cylinder top covers to footplate to line up with smokebox rear. Each cover tapers down from front to rear of smokebox. Add the following to respective holes in tank top: inspection plate (49) (rear hole); cast tank filler (front hole); dome (with single whistle hole in dome to rear) to centre hole. Fit chimney, smokebox door and dart.
- 36) Add handrail wire (0.45mm brass) to tank. Some locos had two rails; one on each tank side. Others had a continuous one which passed from one side, curved round the front of the chimney to the other side. In the latter case the handrail passes through a short HRK in the chimney front. Drill out hole in chimney and fit HRK. Even locos that had two-piece handrails retained a HRK in the chimney, presumably left in place when the one-piece one was removed. Fit cast brass safety valves to two front holes in dome and whistle (lever pointing towards cab) in rear hole. Pass a piece of 0.3mm wire from whistle lever and through hole in cab front.
- 37) Fold up and pass pivot (97) (drain cocks) from underneath through front opening in right footplate. Repeat for pivot (98) (reverse lever), in rear opening. Attach pull lever (95) to pivot (97) and lever (96) to (89). Both pull levers pass through the hole in the right cab front.
- 38) Drill 0.5mm holes (positions marked) in each sandbox side and top (this has a filler cap) and glue in 0.45mm wire. Drill a 0.9mm hole in the base of the sandbox and attach washer (106) around hole. Glue sandboxes in lower centre hole on each tank side. The wire in the top of the left-hand sandbox passes through a long HRK, which will have to be bent slightly, and into the upper hole in the tank side. Thread link (119) over the top wire and solder (t t9) to a length of wire (pull lever), which passes, horizontally, from a hole in the left hand cab side. Repeat process for the right-hand side but omit the long HRK part. The pull levers were disconnected when the locos were in their half cab version. Attach a piece of 0.9mm wire into bottom hole in each sandbox and bend to fit inside edge of footplate.
- 39) Sometimes the locos had a tool box mounted on the rear of the tank (consult prototype). To assemble box, fold up body (53) and solder to base (51). Add folded supports strips (36) to underside of base and solder strip (54) around base of body. Fold up and add lid (52). Fit assembly to tank rear.
- 40) Combine the body and chassis. If required, fit the Dinorwic couplers (longer one at front) by passing them through the holes in the buffer beams and over the 8BA screws on the underside of the body. Fasten with 8BA nuts.

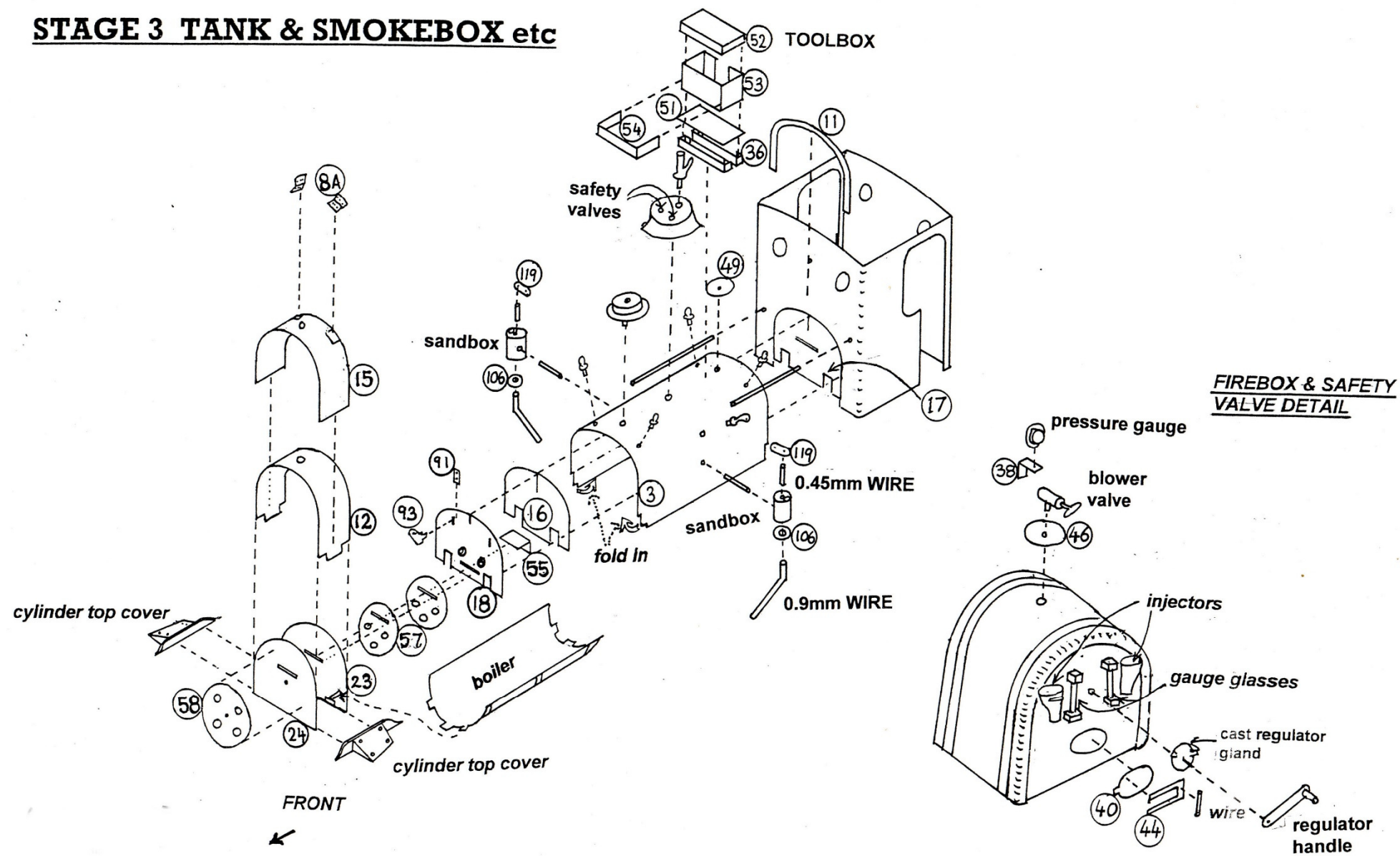
STAGE 1 CHASSIS

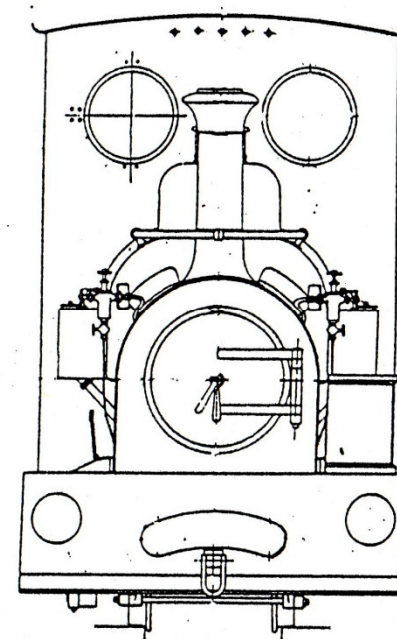
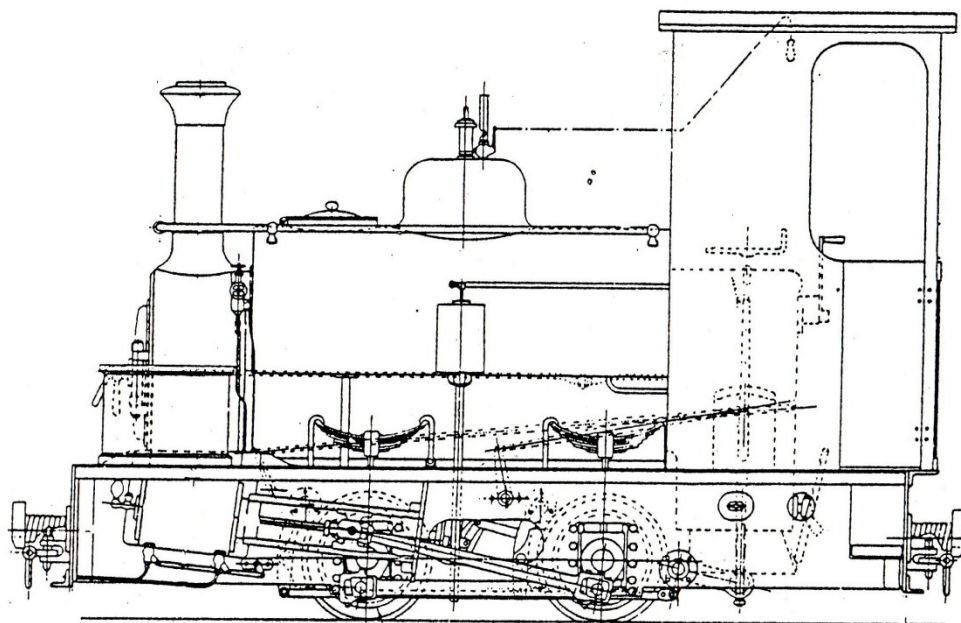


STAGE 2 FOOTPLATE, CAB & FIREBOX



STAGE 3 TANK & SMOKEBOX etc





HUNSLET DINORWIC 'PORT' class loco
(drawing by Don Townsley)