

## **0.75 CUBIC METER SKIP ASSEMBLY INSTRUCTIONS.**

### **1.0 Introduction:**

Hesketh Scale Models & The Model Works Australia have taken great care in creating a scale model that as closely as practical replicates the original **DOLBERG 0.75m<sup>3</sup> Muldenkipper**, whilst at the same time allowing construction of the model without the need for specialist tools.

To assist in the assembly of the kit the following sequence and tools are recommended.

In accordance with accepted standards for etched kits, fold lines will always be on the inside face of the final piece *unless noted otherwise in the instructions.*

We recommend that the following tools be used in the assembly of the kit:

- 600 grit emery paper.
- Sharp hobby knife.
- Fine flat file.
- Straight flat nose pliers.
- Tweezers.

Piece of MDF board (300 x 300 approx.)

### **2.0 Tools:**

- Soldering iron.
- Resin core solder.
- Bakers fluid or similar soldering acid.
- Etch folding tool (see further note below).
- Steel ruler with square edges (approximately 1mm thick).
- 10mm wood dowel or piece of bar stock about 30mm long.
- 5mm wood dowel or bar stock about 60mm long.
- A note about the folding tool; folding the etches will be much simpler and more accurate with the use of a folding tool. If, however, such a tool is not available, good fold lines can be achieved with the use of a good steel ruler (must have sharp square

edges), a single edge razor blade and a piece of unused 6mm MDF board.

Excellent Photo Etch folding tools may be procured from various sources via the internet.

### **3.0 Before fabrication starts:**

The photo etch sheets will have remaining resist on its surface, which, if not removed makes soldering difficult. Therefore, before any pieces are removed from the frets the following preparation should be done:

- Place the etch sheet on a flat piece of MDF board.
- Fold a section of 600 grit (or finer) emery paper into a 30mm square.
- Place the emery paper on the etch and with your thumb rub the emery paper in a series of straight lines over the etch maintaining only light pressure on the emery paper. Go in one direction only and *do not use a circular or backwards/forward motion* since that increases the risk of catching a piece in the fret and bending it.
- Repeat on the other side of the fret.

The etch will now have a nice clean surface for soldering.

Removing etched pieces from the fret requires some care in order that the very fine pieces are not distorted or otherwise damaged. Removal of individual pieces may be best achieved by; placing the fret on the MDF cutting board,

- Using a sharp hobby knife cut at each tab using a guillotine action e.g. a downward and rearwards motion.
- Once the individual piece has been removed from the fret and before bending the piece file the edges at all tab points with a fine file.

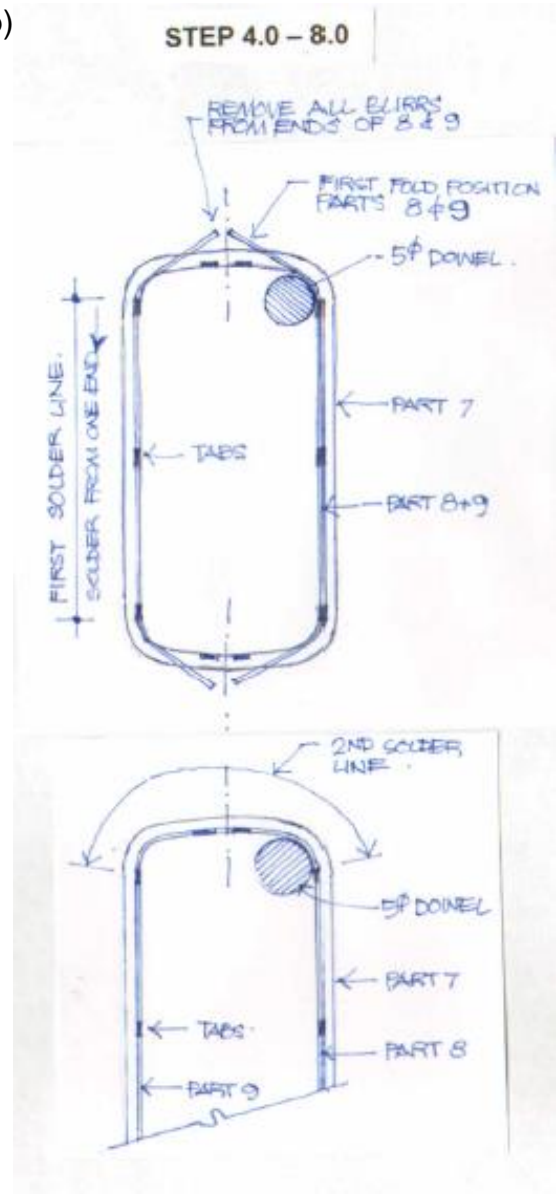
Make sure that you also slightly dress the top and bottom surface to remove all burrs.

If you have a jewellers saw in your toolkit, the individual pieces can be removed from the fret by using a fine blade. Place the fret on a sacrificial piece of 3mm MDF board and cut simultaneously through the brass and MDF at all tab points. This method generally results in less distortion to the part.

## Section A: Main Frame – (standard skip and braked skip)

### Standard Skip

- 1.0 Remove parts 7 and 10 (main frame upper and lower) from fret. File burr from all edges, particularly in the inside end part of the frame.
- 2.0 Remove parts 8 and 9 (frame sides) from fret and remove all burrs. *Note: it is very important that the burrs at the ends of these parts are completely removed. The ends will not fit correctly if any burrs remain.*
- 3.0 Punch the rivets to part 8 and 9.
- 4.0 Hold each side piece against the main frame bottom member (this has the holes for the axle bearings). Using a piece of wood dowel (see tools list) partially form the end curves (ensure that the rivets face outwards) on each piece.
- 5.0 Place the partially shaped part 8 on the bottom frame member ensuring that it is properly in place in the notches and tack solder the section at *one end notch only. DO NOT SOLDER PAST THE TAB AT THIS STAGE.* Once one end is secure and the side member square to the bottom member, solder the entire line between the two sections, starting at the original tack point, working through the centre to the opposite end. *Tip: do not solder piecemeal since you will risk buckling the brass due to localised expansion.*
- 6.0 Repeat step 5 on the opposite side member.
- 7.0 Using the 5mm dowel now complete the end curves until the side members properly fit the bottom frame profile, ensuring that the tabs properly connect and there is no overlap between the opposing members at the coupler junction. Complete the soldering of the entire side plates to bottom frame.
- 8.0 Place the upper frame member over the assembly completed in step 7 ensuring that all the tabs are properly engaged. Starting at one end, solder the top frame member to the side member working towards the opposite end in one gradual movement.
- 9.0 Fold channel reinforcing bar (part 12) and solder to the top of the frame at exact centre point.
- 10.0 Select the preferred coupler format (parts 11,11a or 11b) note that part 11b will match the prototype. If using part 11b slightly bend the centre face inwards on both edges of the buffer plate, e.g. into the side with the fold line, fold the assembly ensuring that the buffer face is square to the top and bottom. Place a bead of solder on the inside faces.
- 11.0 Position the coupler assembly over the ends of the frames ensuring that the edges match the two tabs on the frame and the inside face of the coupler pin is in line with the inside face of the frame. Solder top and bottom.



- 12.0 Remove the coupler pins (part 13) from the fret and fold.  
*Note: this is the only instance on the kit when the etched fold line is to the outside.* Hold the two faces together and solder.
- 13.0 Place the coupler pin inside the opening on the coupler pocket with the hook facing inwards and the bottom of the pin flush with the bottom of the coupler. Solder the pin in place on the bottom plate. *Tip: ensure that the frame is correctly orientated with the wheel bearing holes at the bottom before soldering the pins in place.*

*Note: the wheel journals and wheels will not be placed on the frame until completion of the bin support frames.*

## Braked Frame

- 1.0 Remove parts 7 and 10 (main frame upper and lower) from the fret. File burr from all edges, particularly on the inside end part of the frame
- 2.0 Remove parts 8 and 9 (frame sides) from fret and remove all burrs. *Note: it is very important that the burrs at the ends of these parts are completely removed. The ends will not fit correctly if any burrs remain.*
- 3.0 Punch the rivets to parts 8 and 9.
- 4.0 Hold each side piece against the main frame bottom member (this has the holes for the axle bearings). Using a piece of wood dowel (see tools list) partially form the end curves (*ensure that the rivets face outwards*) on each piece.

*Note: ensure that both sides of the frame are correctly orientated with the rivet positions centred on the wheel bearing end of the frame. The longest end between the rivet position and the end of the frame is the brake stand end of the frame.*

- 5.0 Proceed as per steps 5 to 13 above (as per standard skip).

*Note: the wheel journals, wheels and remainder of the brake gear will not be placed on the frame until completion of the bin support frames.*

## Section B: Bin Assembly

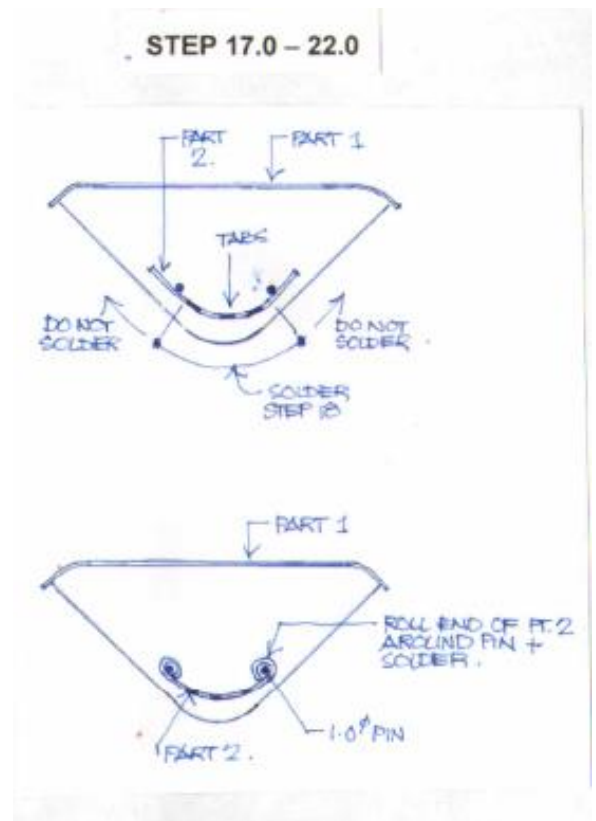
The following section sets out the bin support frame construction. Note that both the braked and standard frame have identical items.

- 1.0 Remove part 1 from the fret and remove all tab points with a flat file.
- 2.0 Punch all rivets marked out with a fine dot on the inside and outside faces of the bin etch. *Tip: if you have a jewellers saw it is useful to cut approximately 1.0 mm deeper into the junction of the sides and the base of the bin whilst this is still in a flat format. This additional cut will allow the curved section to better conform to the curve on the end panels.*
- 3.0 Fold part 1 in the following sequence:
  - Fold the edge angle section on the top edge of both end faces of the bin, leaving the end sections straight at this stage.
  - Fold the long edge angle on both sides of the bin.
  - Fold one end panel perpendicular to the side.
  - Using a piece of 10mm wood dowel form the curve at the bottom of the bin.
  - Fold the second end panel into position.
- 4.0 Tack solder the ends to the sides at the top corners only at this stage.
- 5.0 Form the curved ends on the end angles to match the curve of the end panels on all four corners (do not solder at this stage).
- 6.0 Remove parts 3 and 4 from the fret and remove all burrs. Emboss the rivets.
- 7.0 Bend part 4 to conform to the curve at the base of the bin.
- 8.0 Hold part 3 inside the end of the bin and tack solder on one end against the top edge of the bin on one side only.
- 9.0 Compress the loose end of part 3 downwards forcing the curved section into the bottom of the bin. Solder at the top edge.
- 10.0 Repeat steps 8 and 9 on the opposite end.
- 11.0 Place the correct part 4 inside the bin with the ends of the piece in line with the top edge of the bin side panel. Solder one end.
- 12.0 Put pressure on the loose end of part 4 forcing it to conform to the bottom curve of the bin and tight against part 3. Solder the loose end to the bin.
- 13.0 Repeat steps 11 and 12 on the opposite end.
- 14.0 Remove parts 6 from the fret and shape the individual pieces to match the top bin corner locations (remember that these pieces need to be handed to suit the opposing corners) Solder part 6 to each corner.
- 15.0 Holding the corner parts in tweezers now permanently solder parts 3, 4 and 6 into a cohesive single joint at each

corner of the bin. *Tip: if the bin was correctly formed prior to soldering there is no need to solder the joint between the ends and sides of the bin. If there is a gap, use low temp solder to fill the join after all other soldering to the bin is completed.*

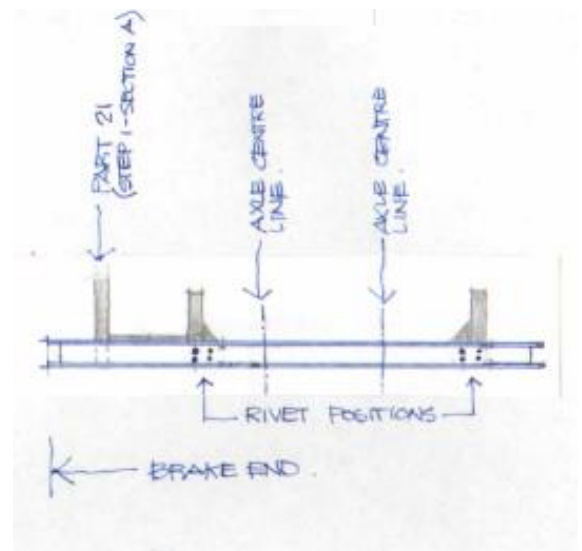
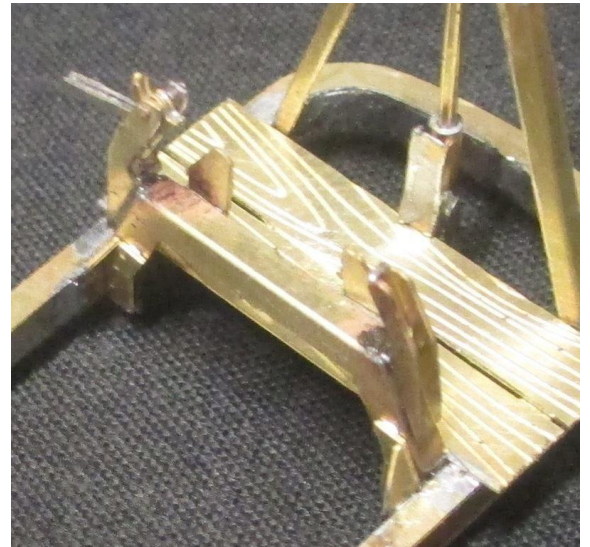
- 16.0 Remove part 2 from the fret and remove all burrs.
- 17.0 Form the initial curve to allow part 2 to fit into the 3 slots in part 1's ends. *Tip: since part 2 will require subsequent further forming it may be easier if you anneal the part prior to placing it in position on the bin. This can easily be done with a butane cigarette lighter.*
- 18.0 Tack solder part 2 to the ends, soldering only in the centre portion, (Do not solder past the holes above the part).
- 19.0 Place a length of 1mm wire through the hole in part 1 and feed through the same hole on the opposite end. Using flat nosed pliers placed parallel to the bin end wrap the loose portion on part 2 around the wire forming a complete loop around the wire.
- 20.0 Repeat procedure 19 on the remaining three positions on part 2.
- 21.0 Completely remove the wires and complete the soldering of part 2 to the bin in all four positions.
- 22.0 Cut four pieces of 1mm wire  $\pm$  5mm long and insert in each loop of part 2 placing it flush with the inside face of the bin. Solder the pieces in place. Cut off the excess ends on the outer face and file flush.
- 23.0 Remove part 5 from the fret and emboss the rivets. Fold the angle.
- 24.0 Mark the position of the angles (second rivet down from the top) on the bin ends with a felt tip pen. Place the angle with the riveted side on the lower side and solder to the sides. *Tip: it is not necessary to solder the angle to the bin over the entire length. It is much easier to solder the last 2mm at each end only.*

This completes the bin fabrication.



## Section C: Bin Support Frames

- 1.0 Remove parts 14, 15, 16, 17 and 18 from the fret and clean off all burrs.
- 2.0 Fold all edges of part 14 and place a bead of solder inside the angles, making sure that the joins between the sections are connected.
- 3.0 Place part 14 upside down on a piece of MDF, hold in place and position parts 15 in the rebates on the underside of part 14 (with the slopes facing outwards and folds facing down) and solder in place (allowing room to fold part 15 later). *Tip: hold part 15 with the tip of a needle file or similar.*
- 4.0 Punch rivets in part 17 and 18 and fold on all fold lines. Solder the joins to form a cohesive part. *Tip: do not forget to open up the holes in part 18 using a pointed scribe or similar prior to folding.*
- 5.0 Place part 14 flat on a piece of MDF board with part 15 facing upwards. Position part 18 on the right side and part 17 on the left side. Solder 17 and 18 into the respective positions on part 14. Repeat for the second frame.
- 6.0 Fold part 15 at right angles to part 14.
- 7.0 Punch rivets in parts 16 and fold each part. Set aside until step 9.
- 8.0 Place the completed support frames in position in the main frame with the open side of the angles facing towards the ends of the main frame (the position of parts 14 and 16 should correspond to the rivets on the main frame as shown). Ensure that they are vertical and square to the main frame with the base of part 14 level with the underside of the main frame. *Tip: on the basic frame verify that the bearing holes are to the bottom.*
- 9.0 Place part 16 into position at each frame connection point and solder in place.
- 10.0 Remove part 19 x 2 (handles) from the fret and fold. Run a solder bead on all sides of the parts and remove all burrs. Clear the hole with a 0.5mm drill or needle file.
- 11.0 Place part 19 into the respective part 18 on the frames and insert a piece of wire. Solder the wire in place ensuring that part 19 remains free to move.



## Section D: Axle Bearings, Wheels & Brake Gear

- 1.0 Cut four individual white metal bearings from the strip provided in the kit using fine side cutting pliers or jewellers saw. The cut should be made approximately 0.5mm on each side of the hex nut on the underside of each journal, with a file of emery board clean-up the cut end ensuring that it remains square.
- 2.0 Check for burrs etc on each of the "bolts" on the mounting face of the casting. Trial fit into the etched holes on the underside of the main frame.

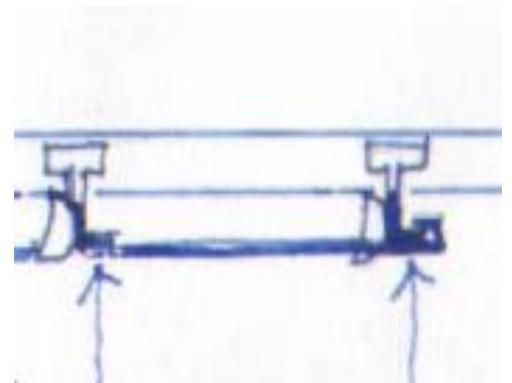
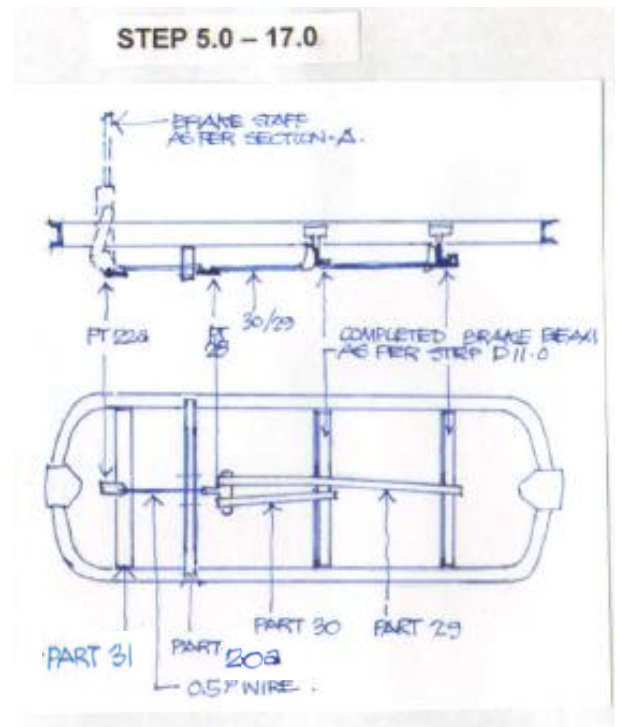


- 3.0 Place two castings on one side of the frame and solder / glue in place. Ensure that they are positioned straight and square onto the frame. *Tip: use low temp solder and place the solder onto each side of the journal on the bottom of the main frame. Do not solder the inside face of the journal since that risks damaging the running face of the bearing. If using CA adhesive ensure that the castings are completely clean of the release agent and only use a minimum amount of adhesive between the bearing & frame flange.*
- 4.0 Place an axle into the fixed bearing and slip a second bearing over the loose end. Position into etched holes on the opposite frame member. Solder or glue as for step 3. Repeat with the second axle.

This completes the standard skip.

**For the braked skip the following further steps are required:**

- 5.0 Remove parts 22a and 28 from the fret. Open up the etched holes with a scriber or needle file.
- 6.0 Solder part 22a to the unconnected end of part 23 at the base of the brake staff (section D).
- 7.0 Remove part 20a from the fret and fold into a shallow "vee". Solder to the main frame directly below the bin support frame.
- 8.0 Form a right angle on a short piece of 0.5mm wire to fit through the hole in part 22a, the wire should be long enough to reach just past part 20a.
- 9.0 Position part 28 onto the wire at part 20a again by creating a small right angle through the hole. Solder in place. *Tip: this task will be much easier if you tack solder the wire to part 20a prior to placing part 28 into position.*
- 10.0 Remove parts 25 from the fret and fold.
- 11.0 Remove part 26 (punch the rivets) from the fret and solder to the end of the longer section of part 25 (rivets facing inwards) noting the orientation of the angle which should face in the opposite direction of the brake shoes.
- 12.0 Remove parts 27 from the fret and solder each to the inside face of each brake shoe ensuring that the face lines up.
- 13.0 Position the completed brake beams inside the main frame behind each wheel with the brake shoe as close as possible to the wheel. Solder part 26 to inside of the main frame.



- 14.0 Remove parts 29 and 30 from the fret and clean off all burrs and punch rivets.
  
- 15.0 Solder part 30 to part 25 leaving the fold tab sticking out past the brake beam. Solder opposite end to part 28.
  
- 16.0 Solder part 29 to the brake beam as per step 15 and solder the opposite end to part 28.
  
- 17.0 Fold the tabs on parts 29 and 30 completely over the brake beam angle.

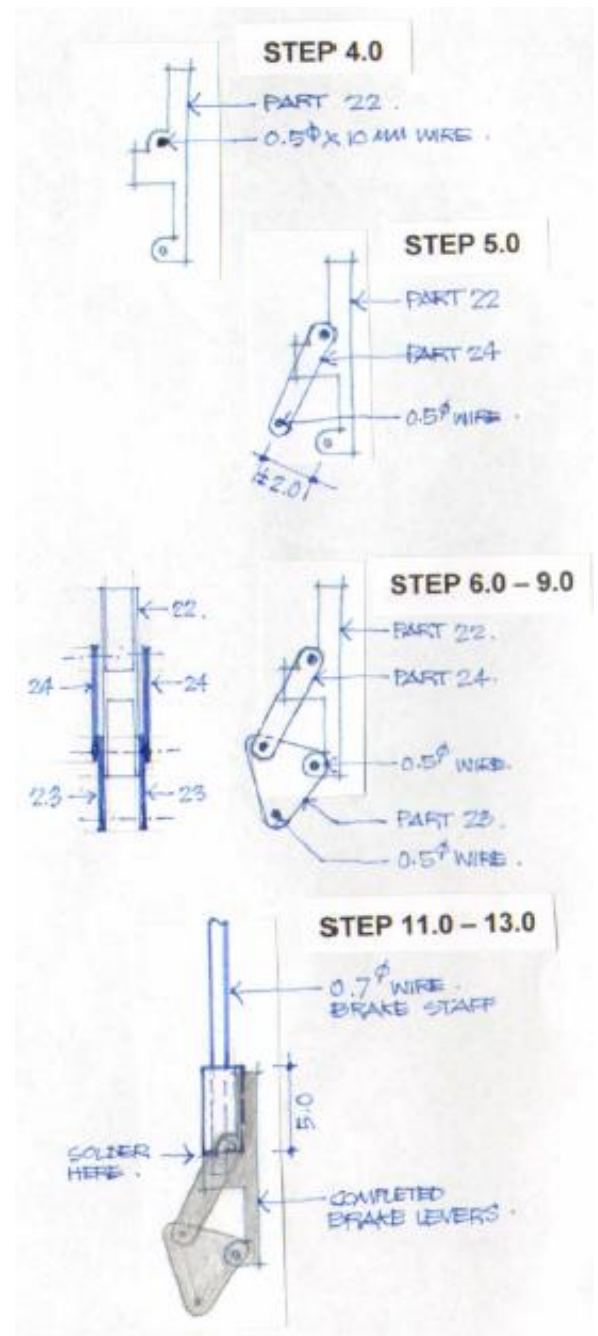
## Section D: Brake Staff Assembly (Braked Skip only)

The following sequence allows for the construction of the brake staff and associated gear. Note that all part numbers relate to the braked skip frame etc.

- 1.0 Form support frame (part 21), place a bead of solder inside the folds.
- 2.0 Ream hole in top of frame to 0.8mm to allow brake staff to clear.
- 3.0 Form bottom support bracket (part 22) in the following sequence:
  - Long fold at the top of the part must be folded first.
  - Bring 2 sides together by placing a piece of 1.5mm wire inside the fold lines.
  - Solder along the edge of the initial long fold line.
- 4.0 Place a piece of 0.5mm wire ( $\pm 10$ mm long) through upper holes in part 22.
- 5.0 Place levers (part 24) over the wire (placed in step 4.0) on each side of part 22. Levers should be angled backwards  $\pm 2.0$ mm from the bottom holes in part 22, ensuring that the levers are parallel. Solder the upper connection to part 22.
- 6.0 Place a piece of 0.5 mm wire ( $\pm 10$  mm long) through the bottom holes on part 22. Tack solder the wire in place.
- 7.0 Place part 23 on each side of the wire at the base of part 22. Use the hole at the apex of the triangle in part 23. *Note: do not solder part 23 in place at this stage.*
- 8.0 Line up the holes in part 23 with the lower holes in levers (part 24) and feed a piece of 0.5mm wire through the toggle plates (part 23) and the levers (part 24) with the toggle plates on the outside of part 24.
- 9.0 Place a piece of 0.5mm wire ( $\pm 10$ mm long) through the remaining holes of part 23.
- 10.0 You can now solder all the parts placed in steps 6.0 to 9.0. Use a minimum amount of solder when doing this.
- 11.0 Cut a piece of 0.7mm wire ( $\pm 30$ mm long).
- 12.0 Cut a piece of 1.5mm tubing 5mm long and place over 0.7mm wire. Solder in place on one end of the wire.
- 13.0 Place the wire/tube assembly into the upper section of part 22 (assembly completed in steps 3.0 to 10.0) ensuring that the bottom of the tube is against the curved bridge in part 22 and the shaft is parallel with part 22. Solder the tube to the bridge section of part 22.

### The following steps complete the brake frame and place the brake staff into place:

- 1.0 Place the brake support frame (as completed in step 1.0 above) between the main frame members, lining the legs of

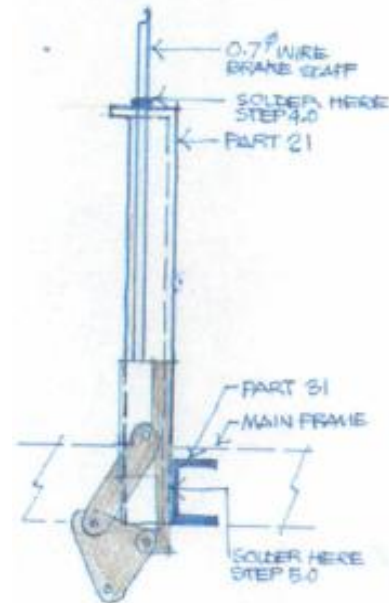


the brake frame with the tabs in the main frame. The bottom of the brake frame must be flush with bottom of main frame.  
*Note: ensure that you are at the correct end of the main frame and brake support frame is correctly orientated.*

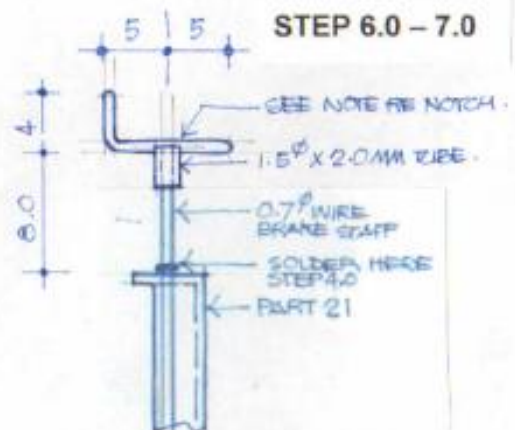
- 2.0 Fold part 31 into a channel format.
- 3.0 Place part 31 into main frame against part 21, level with the underside of the main frame and solder in place. *Note: do not solder the "wood" floor in place at this time.*
- 4.0 Insert the completed brake staff through the hole in brake support frame (part 21) feeding it in from below. Place the completed brake staff assembly against the cross beam (part 31) in a position where the beam is central between the upper and lower pivots in part 22. Hold the bottom portion of the brake staff in place and solder the joint between the brake staff and brake frame (part 21).
- 5.0 Centralise the completed brake staff on the cross beam ensuring that the brake staff is vertical. Solder the brake staff to the cross beam. *Tip: it is suggested that low temp solder be used for this joint to safeguard against undoing the complex connections at the bottom of the brake shaft.*
- 6.0 Cut the brake staff 8mm above the top of the upper end of the support frame and place a 2mm piece of 1.5mm tube onto the end. Solder in place level with the top of the shaft. *Tip: to provide a better seating area and increased contact area to solder the handle to, it is recommended that using a cut-off disc in the Dremel or a fine triangular file you form a shallow "vee" in the top of the shaft.*
- 7.0 Form the handle from 0.7mm brass wire to the shape shown on the sketch. Solder to the top of the brake shaft ensuring that it is central to the shaft and vertical.
- 8.0 Place the "wood" floor (part 19) to the top of the main frame with one edge against the brake frame ensuring an equal overlap on both sides of the main frame. Solder to the main frame from above.

*Tip: you can further enhance the appearance of the "wood" floor by cutting a line on the join between the "boards" for  $\pm$  5 to 8 mm from each end.*

## STEP 1.0 – 5.0



## STEP 6.0 – 7.0



**This completes the model.**