

**SKILL
BUILDER KIT**

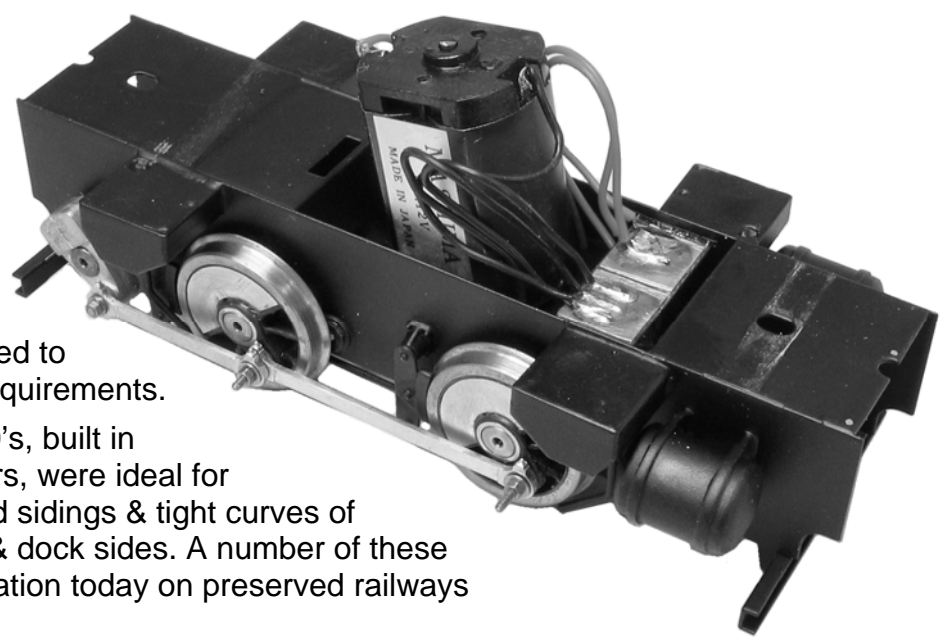
CONNOISSEUR MODELS

- 0 Gauge -

Drewry 153hp Diesel Mechanical Shunter Parts Identification & Chassis Assembly Instructions

Prototype

The Drewry Car Co supplied bespoke Diesel Mechanical Shunting Locos to operators throughout Britain & across the world.



They were configured to individual railways requirements.

These 153hp, 0-4-0's, built in considerable numbers, were ideal for working the restricted sidings & tight curves of factories, gasworks & dock sides. A number of these locos remain in operation today on preserved railways & heritage sites.

This **Skill Builder Kit** is intended to aid the newcomer to 0 gauge diesel era modelling to enjoy the construction of a sophisticated etched kit. Which once completed will have a level of finish & detail that will enable it to sit alongside their existing collection of the excellent factory produced locomotives from Heljan, Dapol & Minerva.

This is achieved through the physical parts design & photo instructions illustrating the step by step assembly of parts & the tools & techniques used. Assisting the modeller to build up their skills & confidence to tackle a wide variety of future etched metal kit building projects. **Looking for a starter, diesel, loco kit? Then this is it!**

Parts Required To Complete

Slater's Drewry Shunter Wheel Pack (Slater's Catalogue Number 7839id)
This pack contains 4 X wheels, 3 X axles, 6 X crankpins, all that's required.

Plunger Pickups if desired (Slater's Catalogue Number 7157)

Available From Slater's Plastikard, Old Road, Darley Dale, Matlock, Derbyshire, DE4 2ER, Telephone 01629 734053.

1833 Motor and 40/1 Gear set, *available from Connoisseur Models.*

**Jim McGeown, Connoisseur Models, 1 Newton Cottages,
Nr Weobley, Herefordshire, HR4 8QX, Telephone 01544 318263**

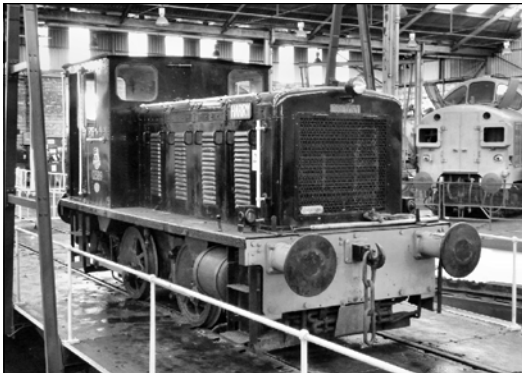
Prototype Inspiration



Above. Tramway fittings, Bressingham museum.



Above. East Greenwich Works, South Eastern Gas Board.



Left. Harry, Barrow Hill Roundhouse, www.barrowhill.org

By using “Drewry 153hp Diesel Shunter” as a search term on the internet interesting information can be found.

Below is a selection of screen shots & links from April 2020



Priam, William Cory & Sons Ltd
www.kentrail.org.uk/north_end_sidings.htm



Rea Bulk, Birkenhead Docks, www.flickr.com/photos/martynhilbert/21975693585

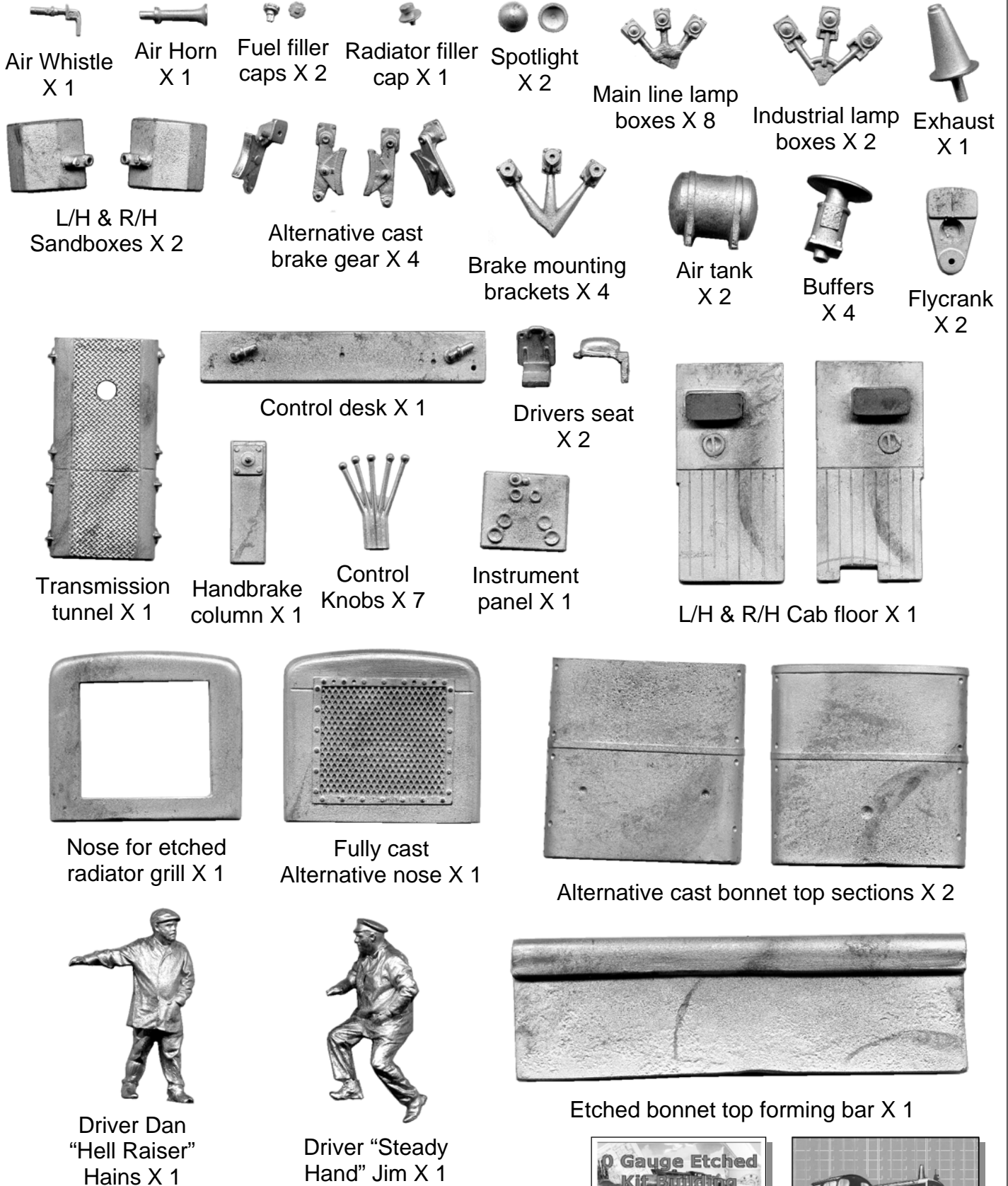


Southerham, Spa Valley Railway
https://commons.wikimedia.org/wiki/File:Tunbridge_Wells_shed_-_Southerham.JPG



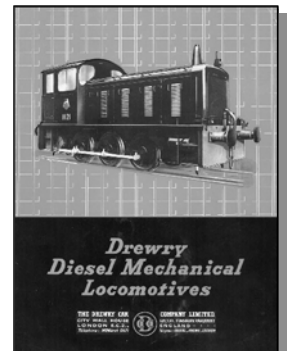
Teucer, formally of Butterley Engineering
John Stein www.flickr.com/photos/65480188@N07/26760839104/in/photostream/

Casting Identification

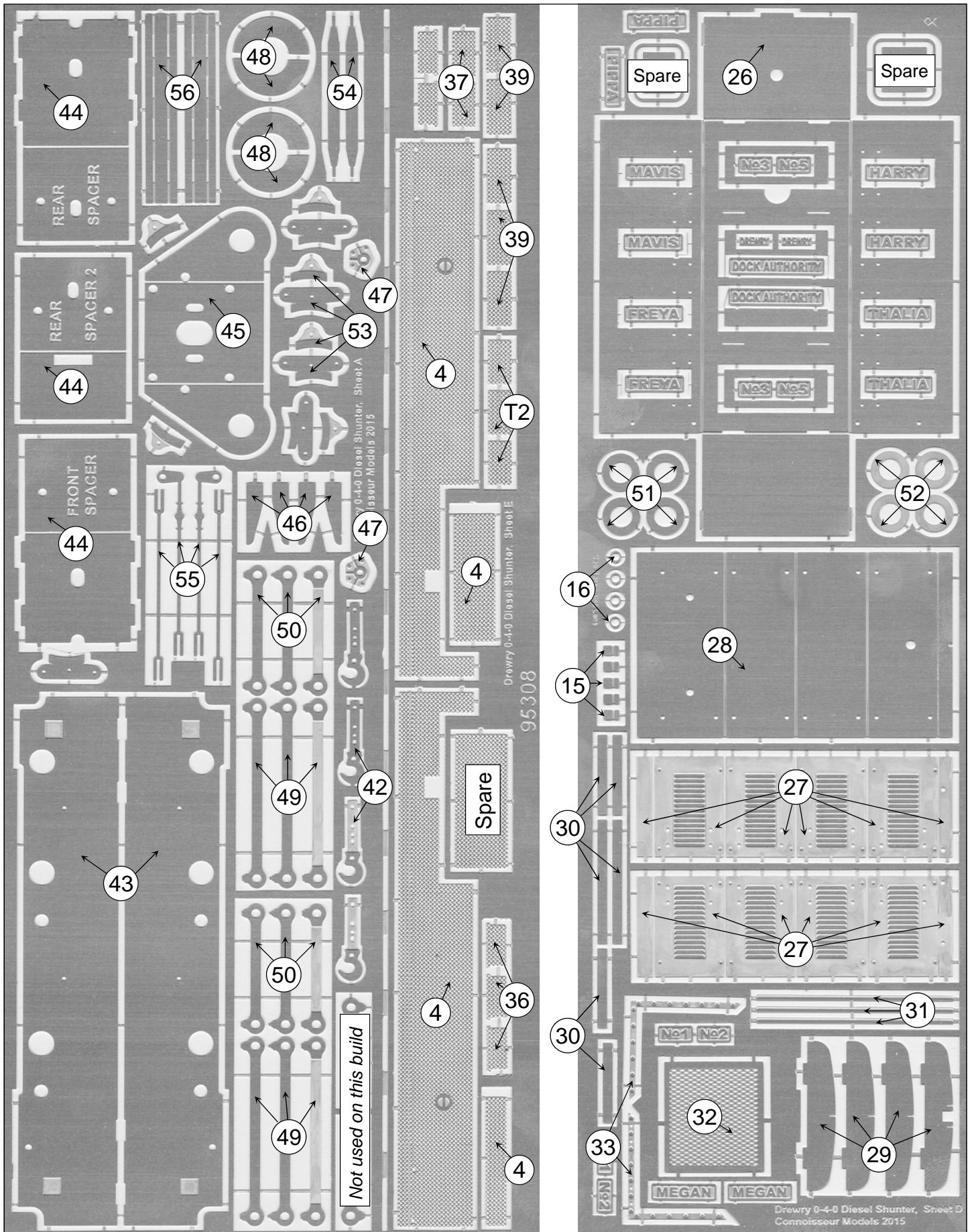


Additional resources are available to download & print off from my website (www.jimmcgeown.com/Print Outs.html) or if preferred contact me & I will be pleased to send a printed version.

**Scan of Manufacturers Catalogue from 1957.
Etched Kit Building Hints & Tips.**

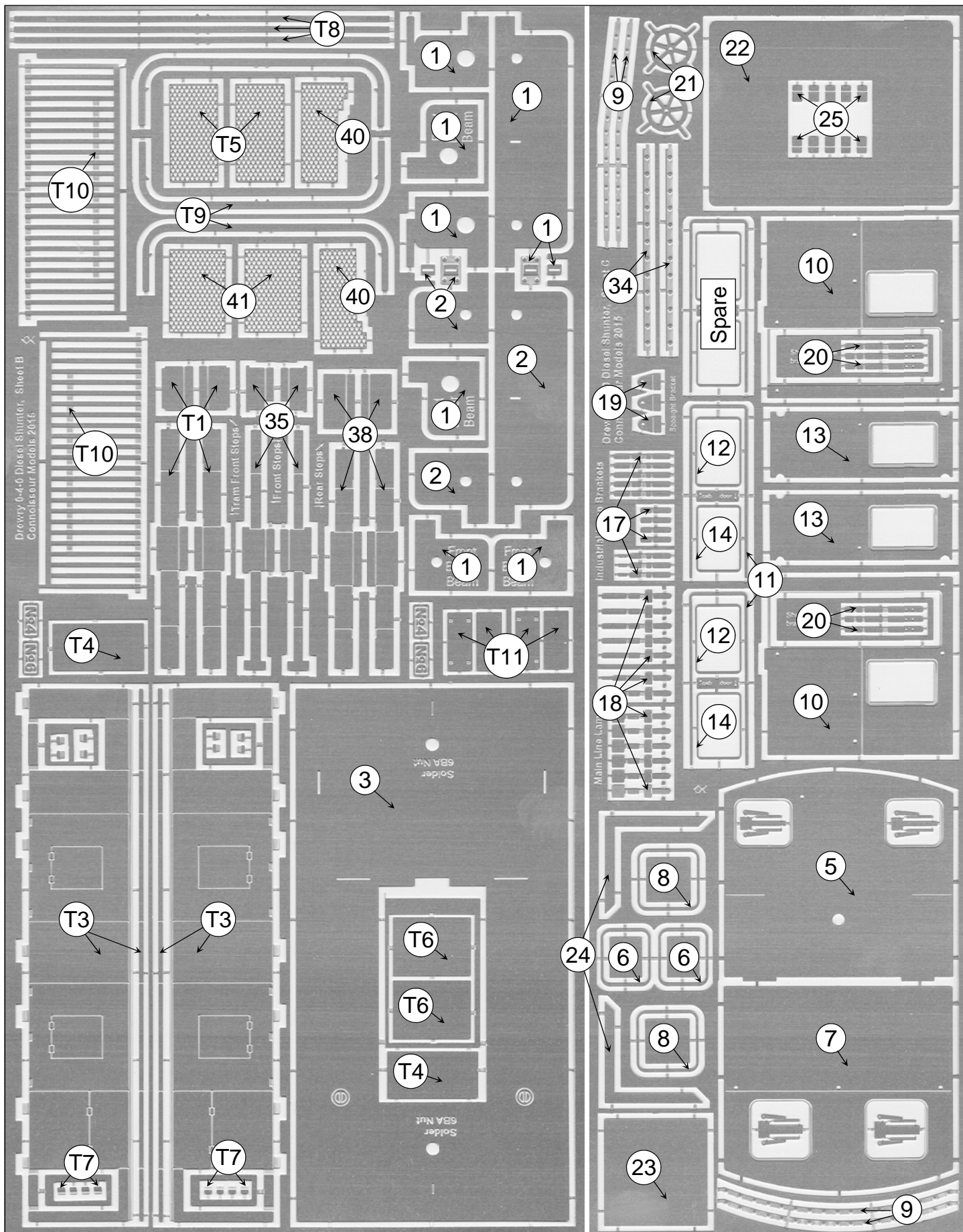


Etched Parts Identification



Sundry Parts:- 2 X pieces copper clad PCB. 2 X electrical wire for pickups. 6 X axle bearings. 2 X 6BA short screws. 2 X 6BA nuts. 2 X thick & 2 X thin axle spacer washers. 35 X short handrail knobs. 4 X brass grab handle pillars. 6 X coupling links. 1" X 2.4mm brass rod. 2" X 1.4mm copper rod.

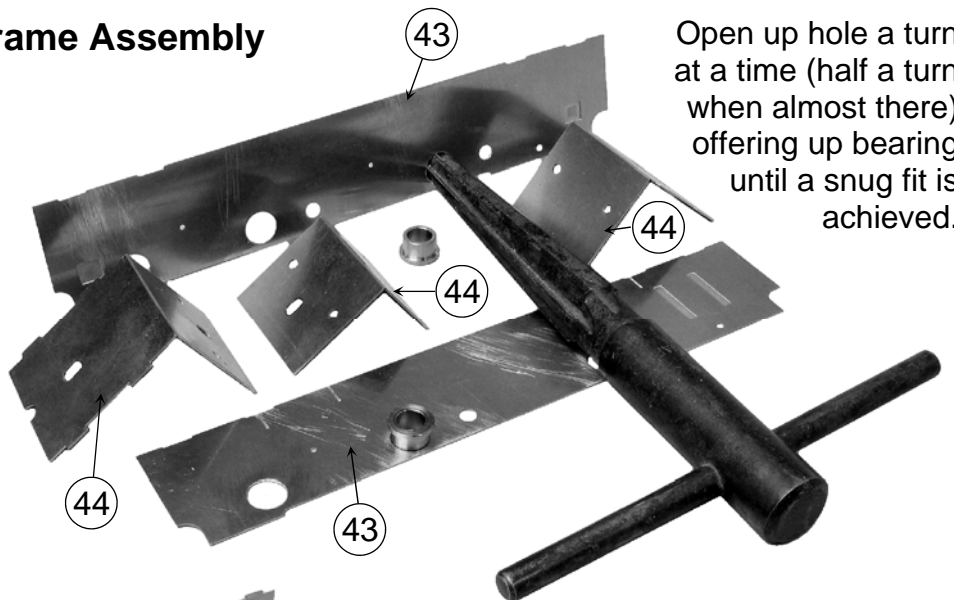
Wire:-
 3 X 0.45mm brass wire.
 4 X 0.7mm brass wire.
 3 X 0.9mm brass wire.
 6" X 24swg tinned copper wire.



Stage 1, Chassis Sideframe Assembly

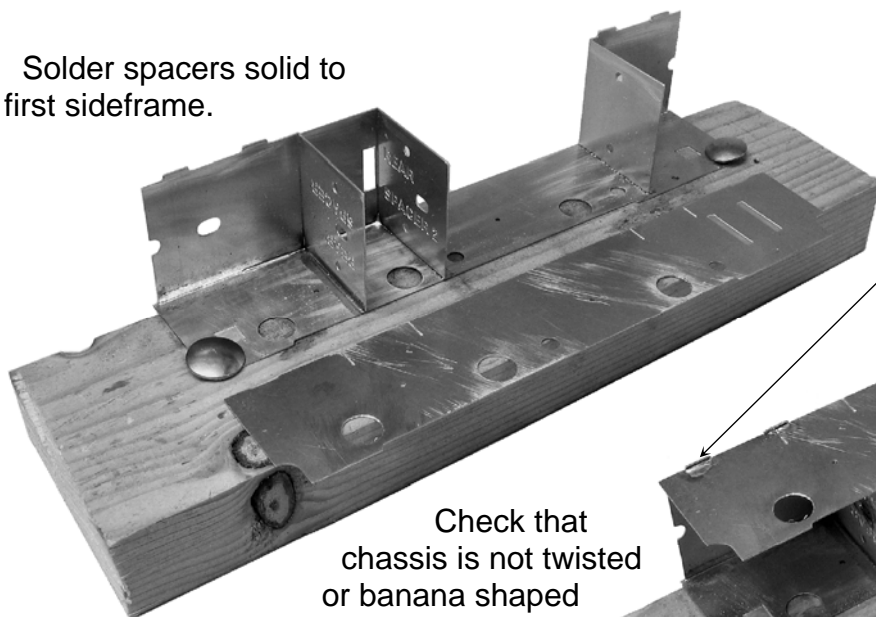
The etching process can not produce holes of consistent diameter. So holes are designed deliberately undersize so that they can be opened up gently with a tapered reamer/broach to accurately accept a component.

Fold up spacers & check for snug, but not tight, location of tabs into sideframe location cutouts.

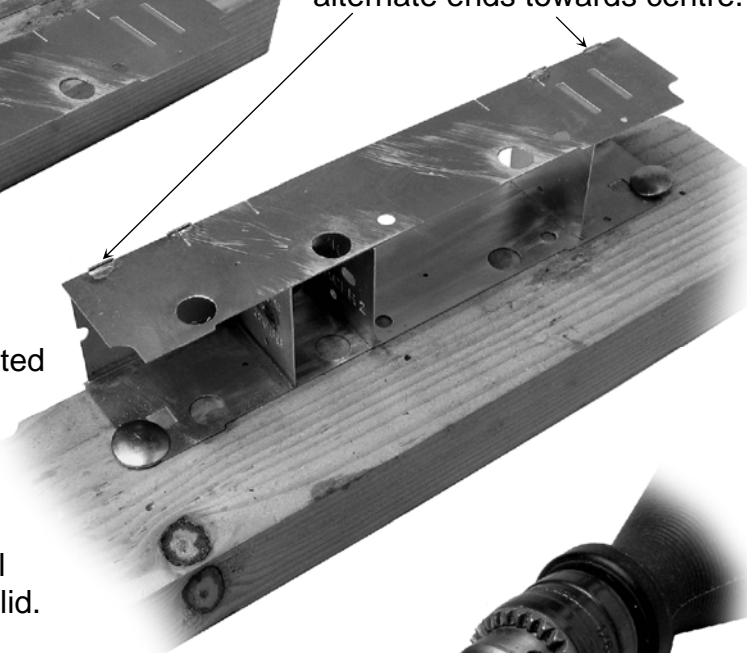


Open up hole a turn at a time (half a turn when almost there) offering up bearing until a snug fit is achieved.

Solder spacers solid to first sideframe.



Tack solder second side frame at tabs only. Work from alternate ends towards centre.



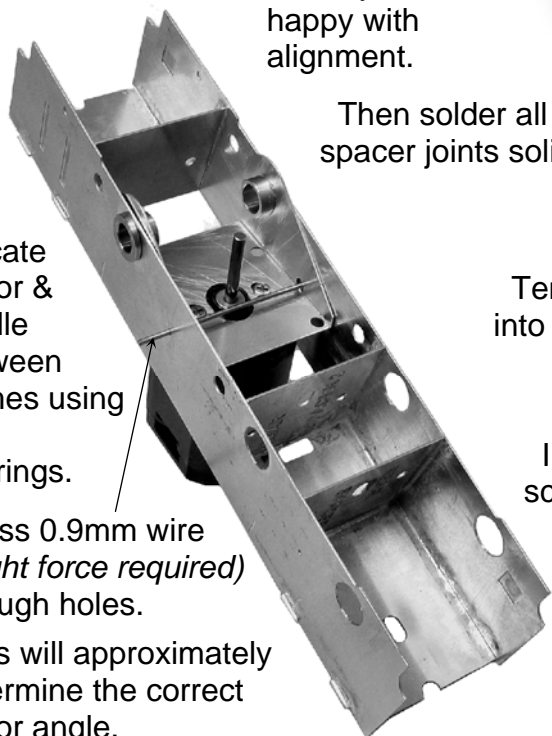
Check that chassis is not twisted or banana shaped & that you are happy with alignment.

Then solder all spacer joints solid.

Locate motor & cradle between frames using lose bearings.

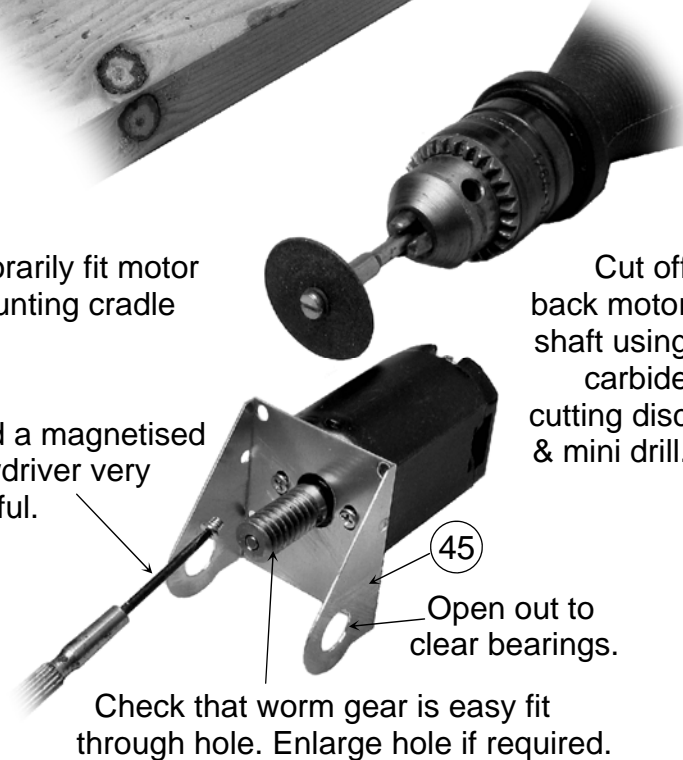
Pass 0.9mm wire (slight force required) through holes.

This will approximately determine the correct motor angle.



Temporarily fit motor into mounting cradle

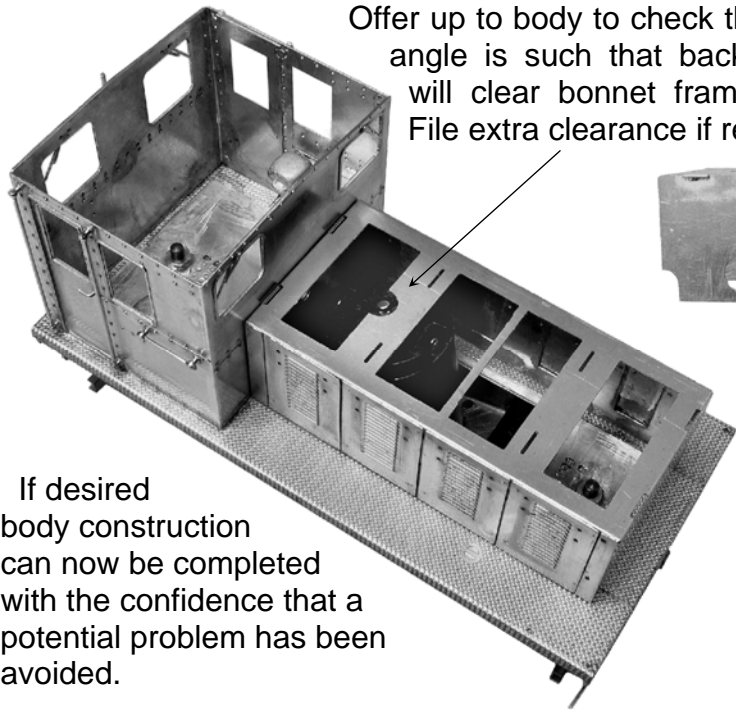
I find a magnetised screwdriver very useful.



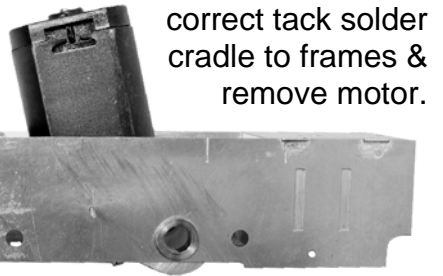
Cut off back motor shaft using carbide cutting disc & mini drill.

Open out to clear bearings.

Check that worm gear is easy fit through hole. Enlarge hole if required.



Offer up to body to check that motor angle is such that back bearing will clear bonnet frame cutout. File extra clearance if required.

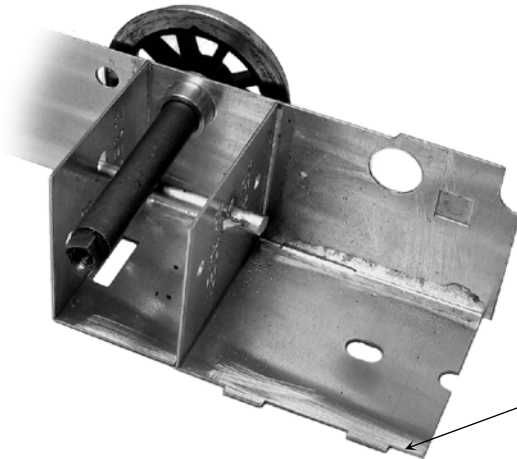


When clearance is correct tack solder cradle to frames & remove motor.

If desired body construction can now be completed with the confidence that a potential problem has been avoided.

With bearings fitted the motor mounting cradle can be soldered to frames at every place possible to achieve maximum strength & rigidity.

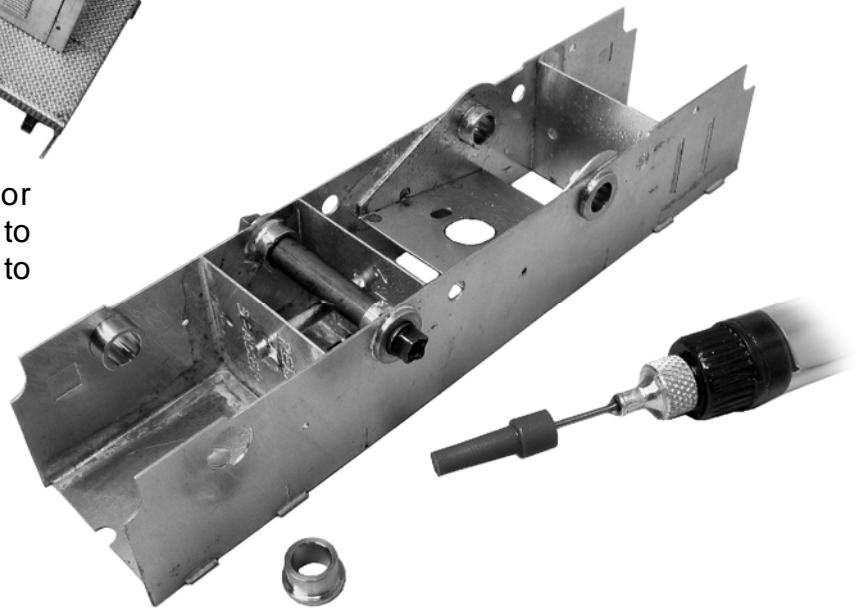
Stage 2a, Sloppy Axle Compensation



Second sideframe omitted for photo purposes only.

With an axle passing through bearings solder a length of 2.4mm brass rod so that it bears down on the axle. Remove the axle and file (*sharp/new half round file*) the top & bottom of the bearing hole into a slight oval.

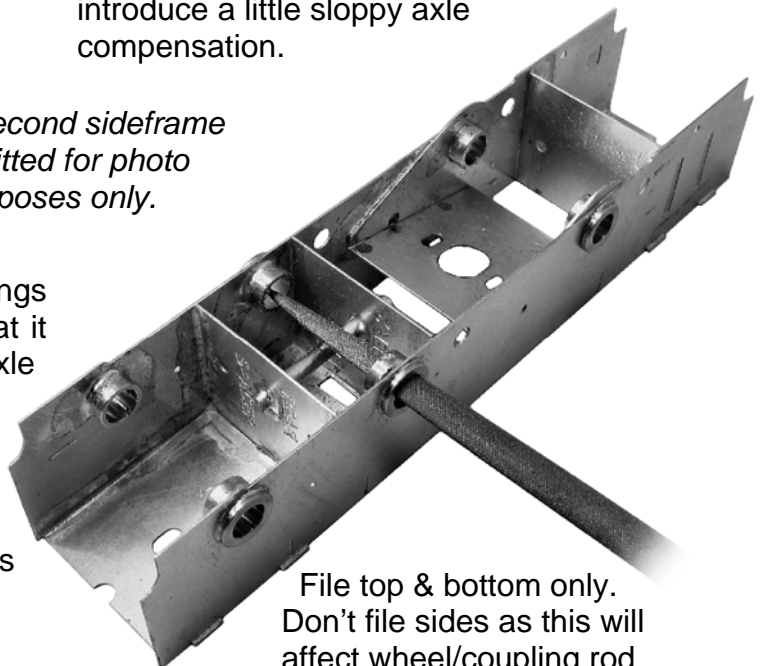
Refit the axle & you should have a slight rock of about 5 thou on each side, this does wonders for electrical pickup.



Stage 2, Fitting Bearings

Pass a well oiled axle through bearings to aid alignment as they are soldered generously into frames.

An optional refinement is to introduce a little sloppy axle compensation.

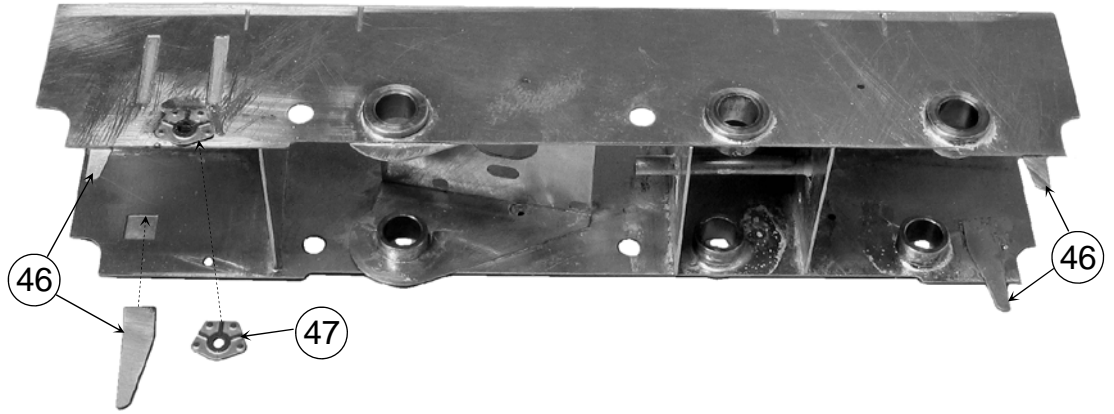


File top & bottom only. Don't file sides as this will affect wheel/coupling rod centres matching.

Stage 2b

Fit guard iron brackets locating end into etched rebate to aid positioning.

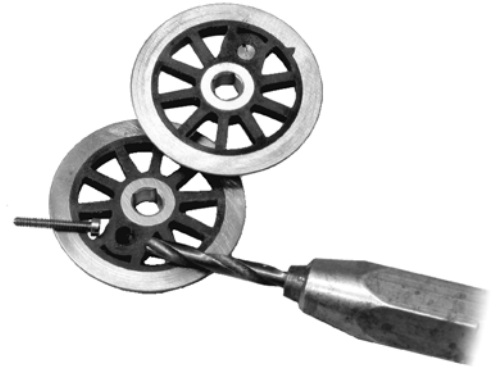
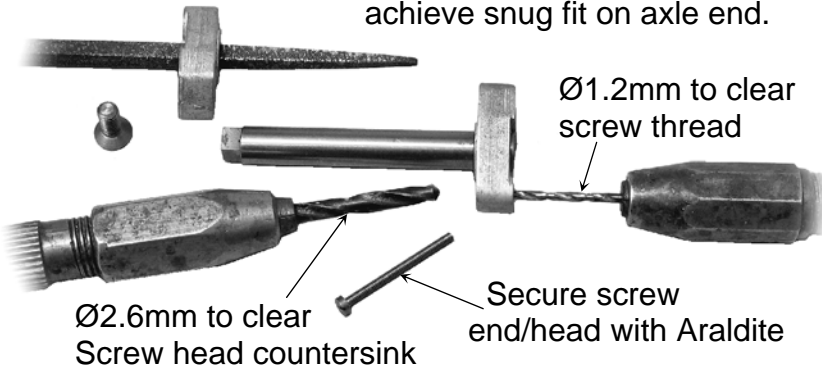
Fit brake cross shaft bracket overlays.



Stage 3, Flycrank & wheel Preparation

The cast flycranks are designed to be used with Slaters axle & crankpins in exactly the same way as their wheels.

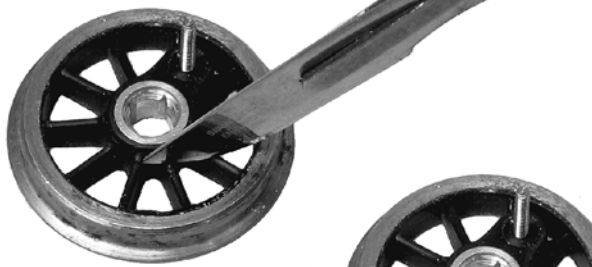
Gently dress square hole in flycrank to achieve snug fit on axle end.



Drill Ø2.6mm countersink hole for crankpin screw head. The screw is intended to self tap into the plastic but I feel this provides insufficient strength.

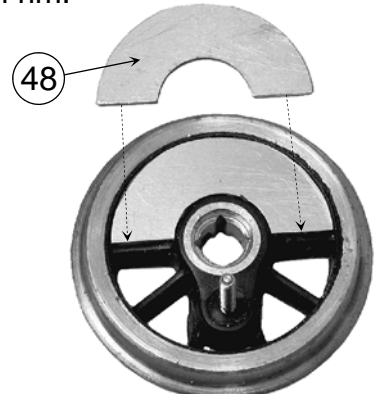
Cut nicks at joint of spoke and wheel boss on bottom four spokes (*horizontal spokes may also require slight dressing*).

So fill hole with Araldite before making last few turns of crankpin screw, so that the head is encapsulated.



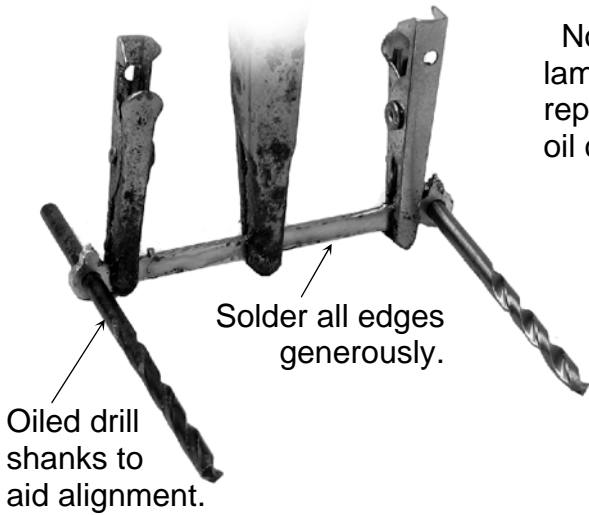
Pare away curved sections back towards nicks to leave level spoke tops.

Fit balance weights using a generous application of Araldite. An etched rear rebate should aid positioning just below turned wheel rim.



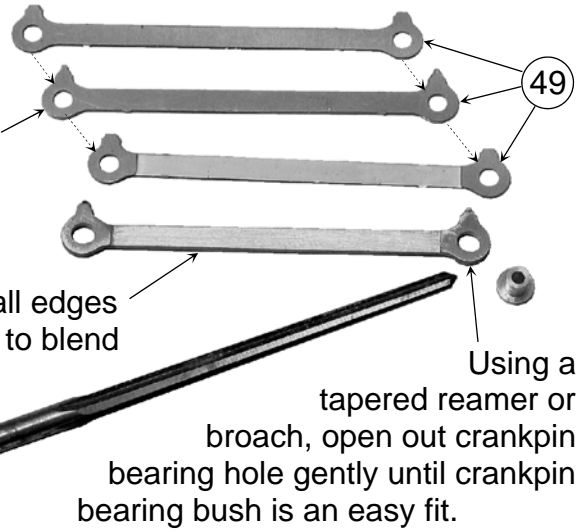
Also dress square axle ends so that wheels are a gentle push on & (*more importantly because of brake block clearances*) pull off fit.

Stage 4, Coupling Rods



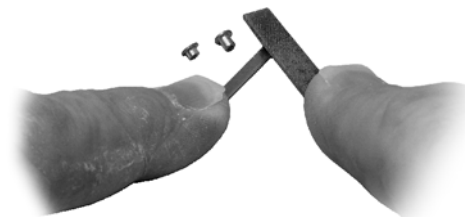
Note centre lamination has a representation of oil corks.

Note how all edges are dressed to blend into solid.



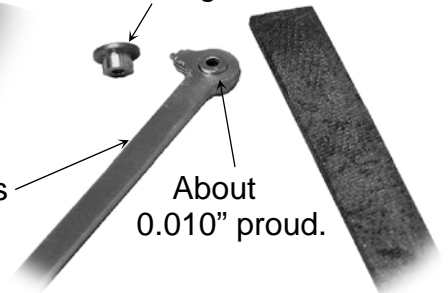
I recommend reducing the length of four of the bushes to prevent sloppy side play in the rods. Place a bush onto a block of wood then place a coupling rod face down over the bush. By pressing down on the rod with your finger you should be able to gently file the bush until it is about 0.010" proud of the rod.

As supplied just over 3mm length.

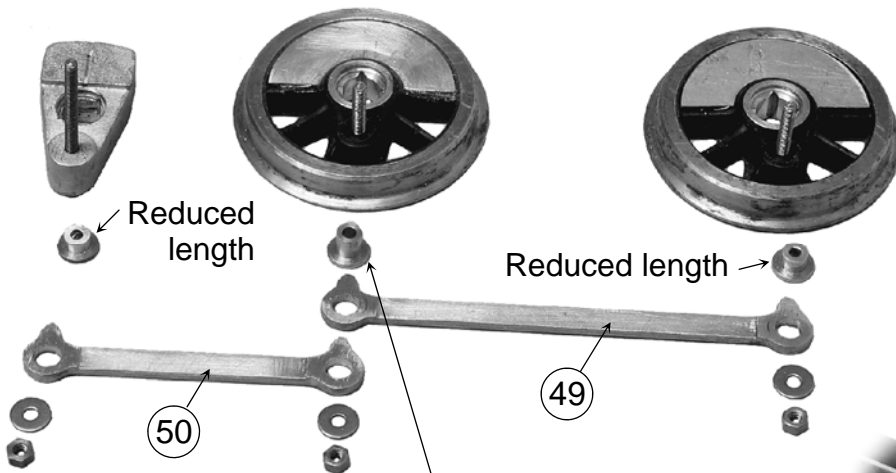


Front face downwards so that if file slips the visible face will not be damaged.

File down to about 2mm length.



These bearing bushes are not soldered into the rods but locked onto the crankpin with a nut & washer. So it is important that they will revolve freely in the holes in the rods.

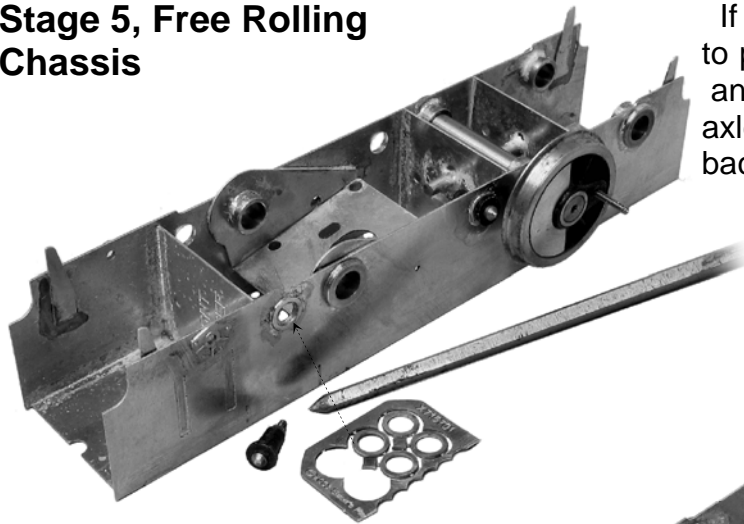


As supplied the bush is just long enough to accommodate two rods. If there is any slight tightness reduce the thickness of boss (front face) on bottom rod.

A magnetised screwdriver & 12BA nut spinner are useful tools to aid handling of the washers & nuts.
 Romford Ref: SPINBA12 or SPINBASET.
www.eileensemporium.com
 (information correct March 2020)

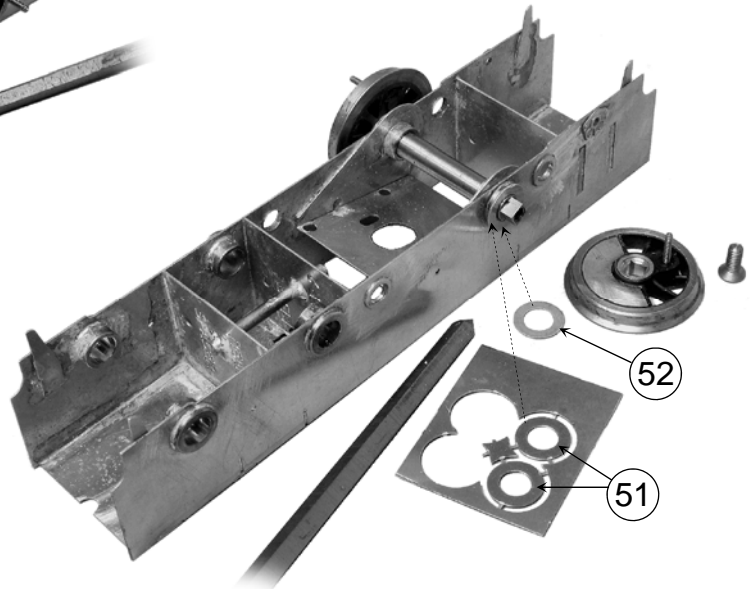


Stage 5, Free Rolling Chassis

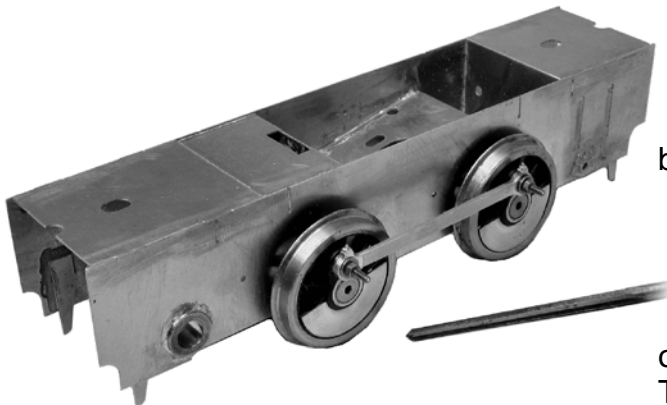


Included in packet with Slater's pickups are (use if required) etched spacing washers. I fitted them but then dressed the faces back slightly.

If using Slater's plungers open pilot holes up to provide snug fit. Make up a sample pickup and using this check with sample wheel and axle that pickup point will run correctly on back of flange avoiding V shaped notch.



If required bearings can be eased out, using tapered broache, to allow free revolving of axle. Packing washers (full & Half thickness) to reduce sideplay can be slipped onto axle end, always a good idea for gearwheel axle, if required on others. On this build I found a full thickness each side and a single half thickness one side only was about right but you may need half thickness both sides.



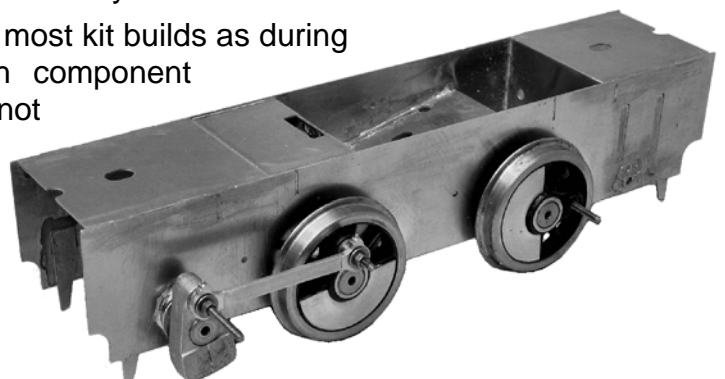
Fit reduced length bushes onto the crankpin screws & fit the wheelset coupling rods. Gently locking them into place with the washers and nuts. Check that the wheels will turn without binding or tight spots.

At this stage you are looking to push the chassis along the bench without the wheels skidding. If not achieved remove a rod & using a tapered reamer or broach gently open out each crankpin hole an equal amount. Try again & if required then repeat for rod on other side until satisfactory.

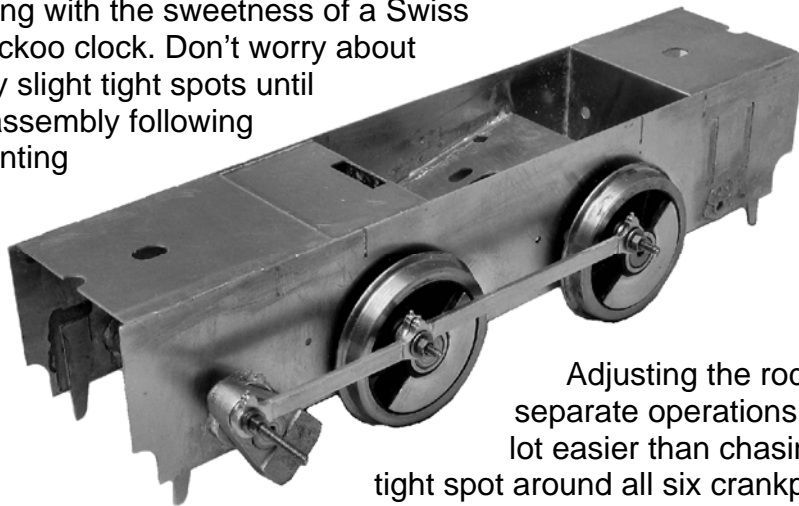
Remove wheelset rods, fit long bush on rear wheel crankpin & shortened onto flycrank, and repeat procedure for wheelset to flycrank rods.

Its usual for this operation to be required for most kit builds as during construction imperfections occur with each component fitted and these tend to compound. Its not precise but you will soon get the feel for what clearance is required for this technique.

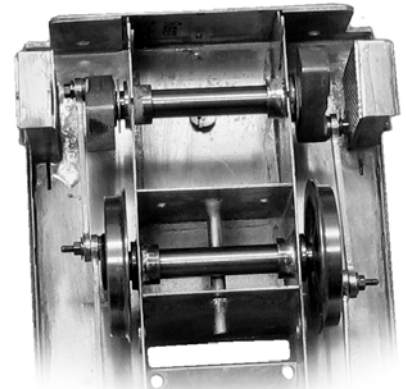
To give you an idea, the turned bush is just over $\text{Ø}2.4\text{mm}$, on this build the wheelset rods required all four holes opening to $\text{Ø}2.6\text{mm}$ & wheel to flycrank rods $\text{Ø}2.7\text{mm}$.



Fit all rods. Hopefully the chassis will roll along with the sweetness of a Swiss Cuckoo clock. Don't worry about any slight tight spots until reassembly following painting



Cut down & dress ends of flycrank crankpins. Then check clearance for rotation between cab steps.

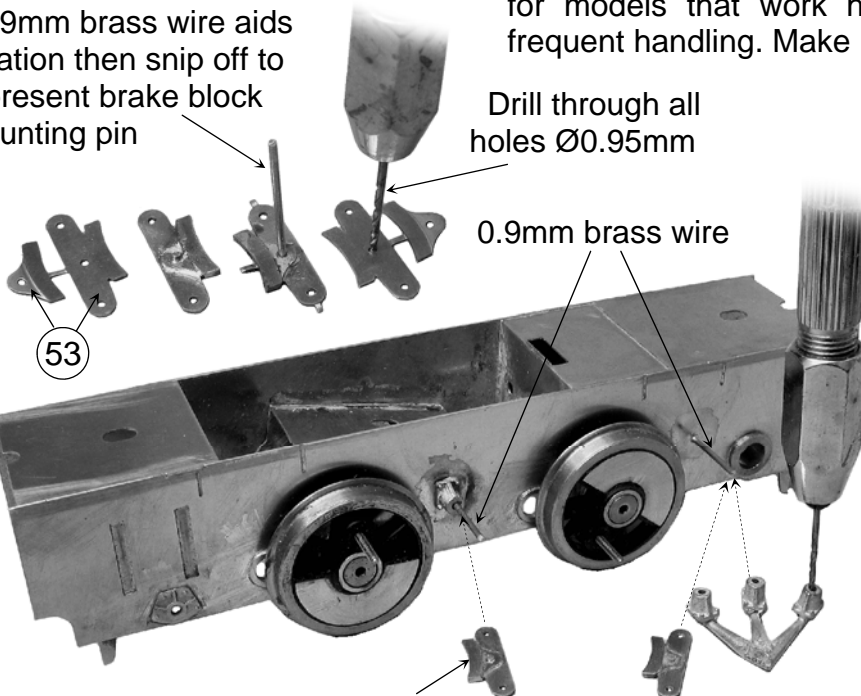


Adjusting the rods in separate operations is a lot easier than chasing a tight spot around all six crankpins.

Stage 6, Brakegear

0.9mm brass wire aids location then snip off to represent brake block mounting pin

Etched brake hangers & blocks prove very durable for models that work hard on a layout & receive frequent handling. Make up L/H & R/H pairs.



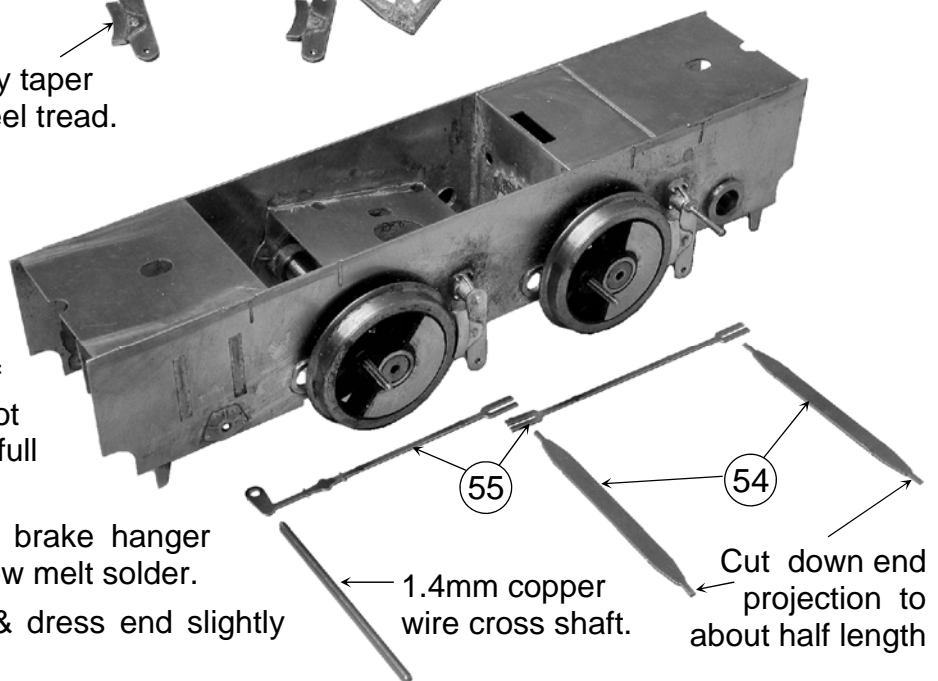
Drill Ø0.95mm through cast mounting brackets (*drill part way through from each side*). Then separate into individual brackets & slide onto cross wires. Solder bracket base to sideframe using °70 low melt solder.

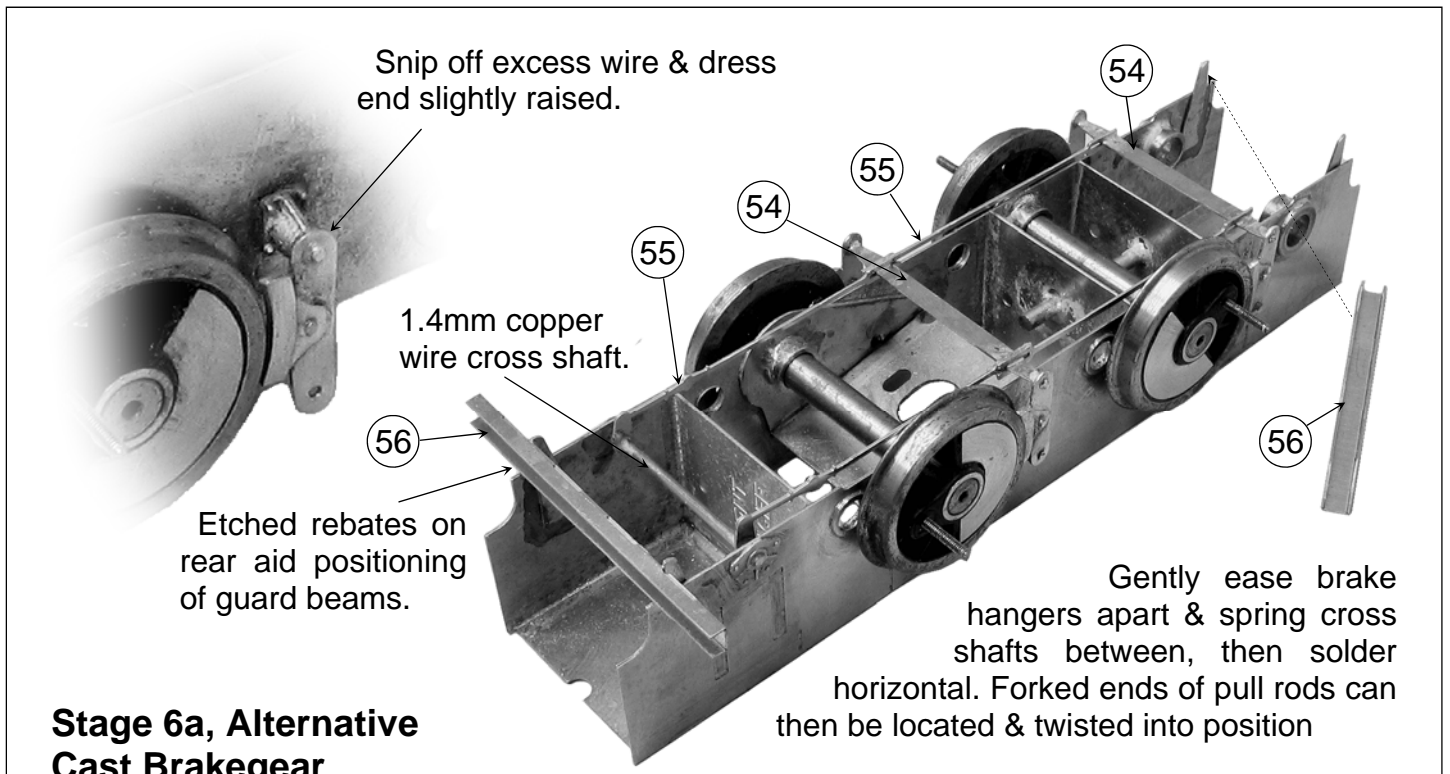
Using a half round file slightly taper brake block edge to clear wheel tread.

Fit brake hangers onto wire ensuring brake block matches radius but clears wheel tread to prevent electrical short circuit. If you work quickly the front face of the brass hanger can be spot soldered to the wire at full temperature.

Alternatively tin the rear of brake hanger with °145 & secure with °70 low melt solder.

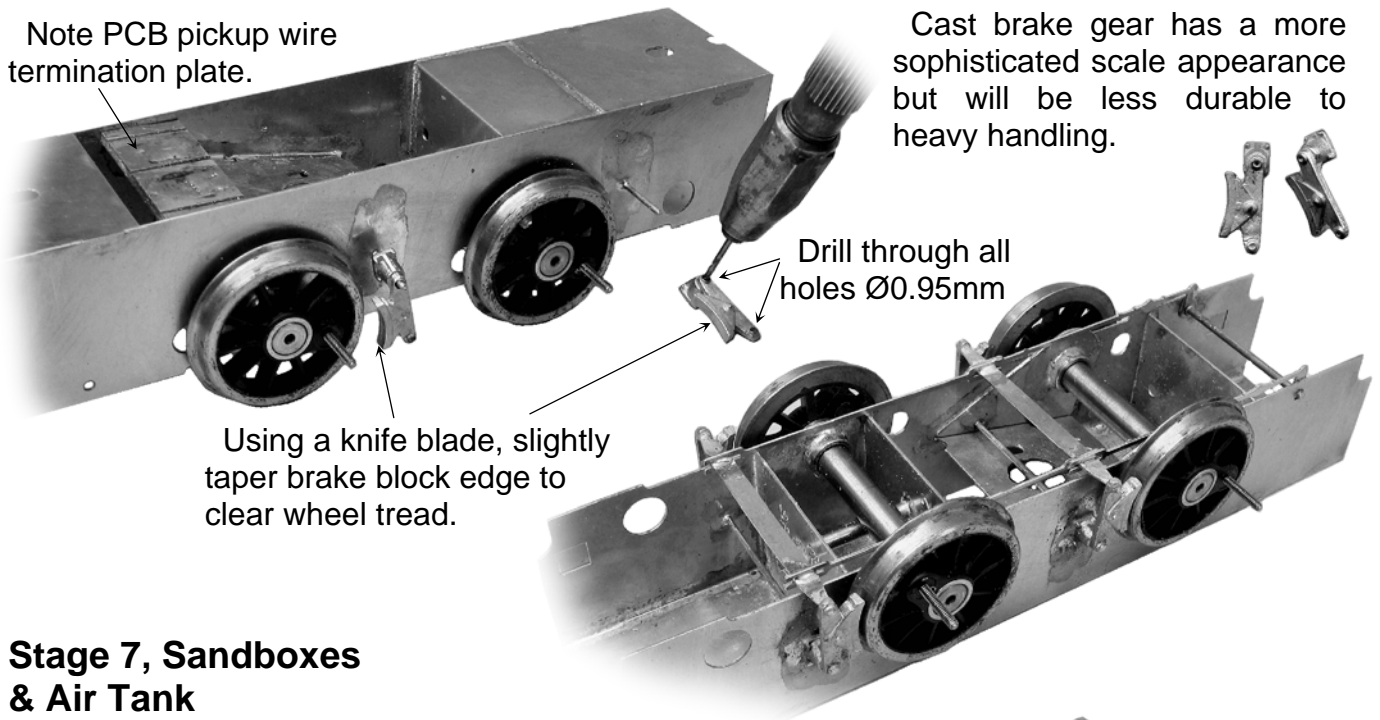
Then snip off excess wire & dress end slightly raised.





Stage 6a, Alternative Cast Brakegear

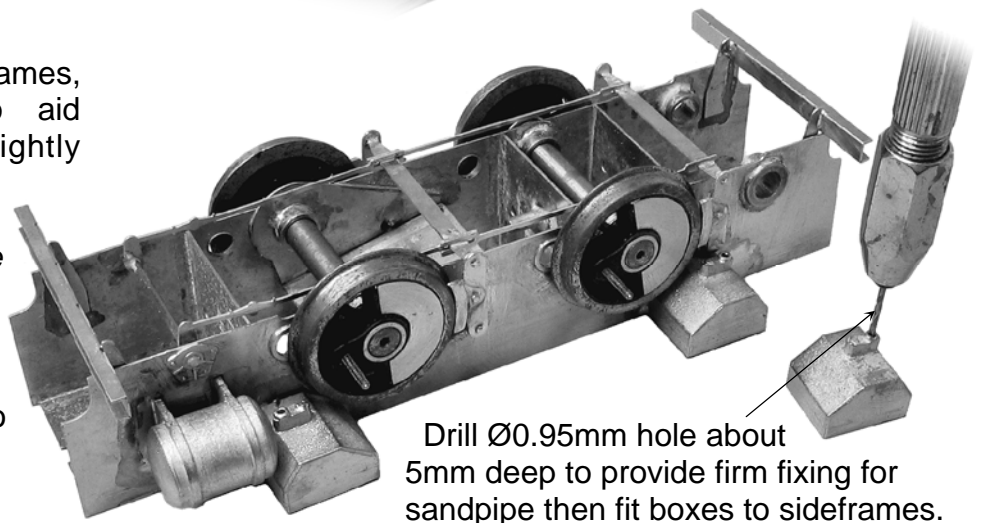
Note PCB pickup wire termination plate.



Stage 7, Sandboxes & Air Tank

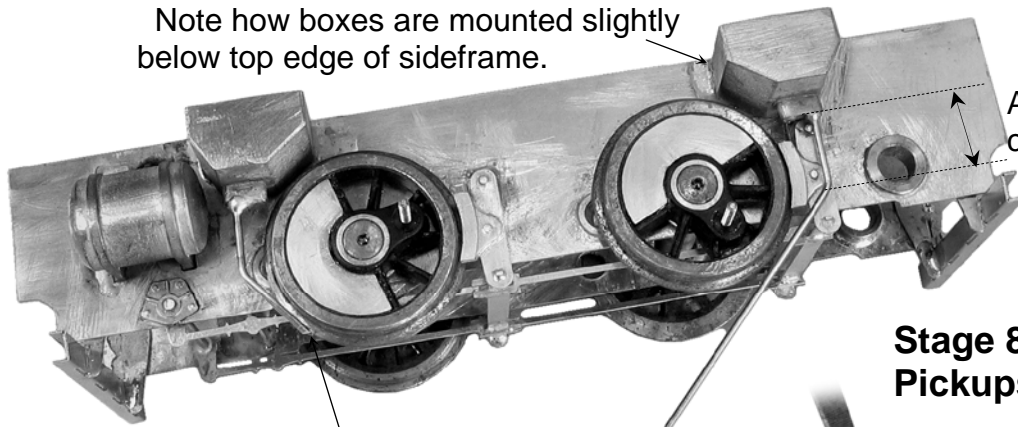
Fit sandboxes to sideframes, note etched marks to aid positioning. Mount slightly below top edge of sideframe (*well above as you have chassis upside down on a flat surface*) by using a thin piece of card packing.

Fit airtanks locating into etched rebates.



Note how boxes are mounted slightly below top edge of sideframe.

About 9mm between casting & bend.



0.9mm brass wire sand pipes, fit over length to aid manipulation & positioning, then trim to clear rail top.

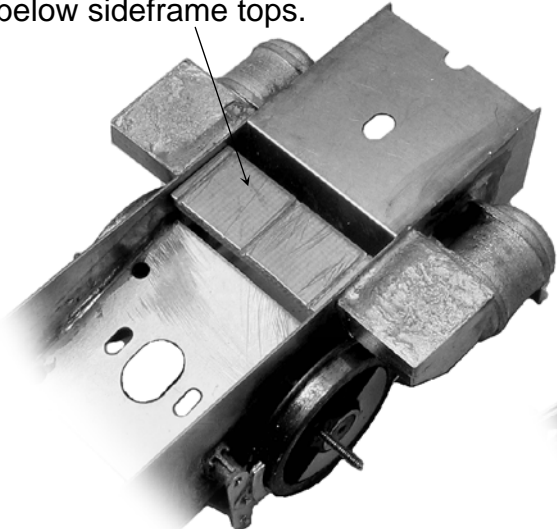
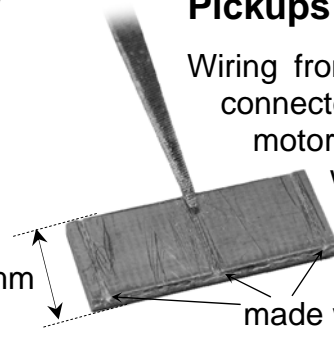
Note double sided PCB, wire termination plate, positioned slightly below sideframe tops.

Stage 8, Pickups & Electrics

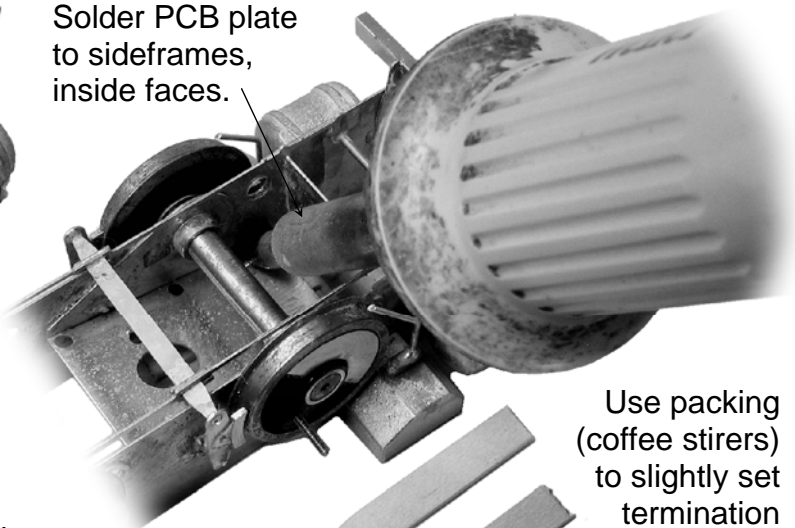
Wiring from pickups can be connected direct to the motor tags but there is wisdom in having a termination plate.

8mm

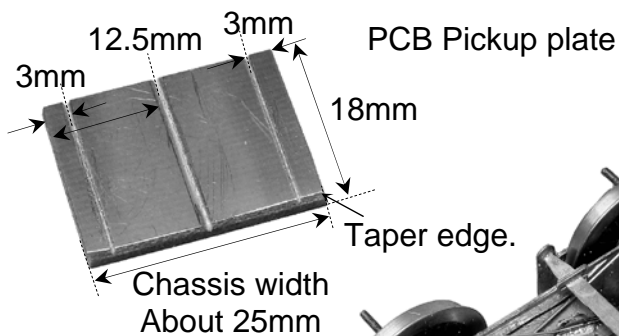
Insulating gaps made with triangular file



Solder PCB plate to sideframes, inside faces.

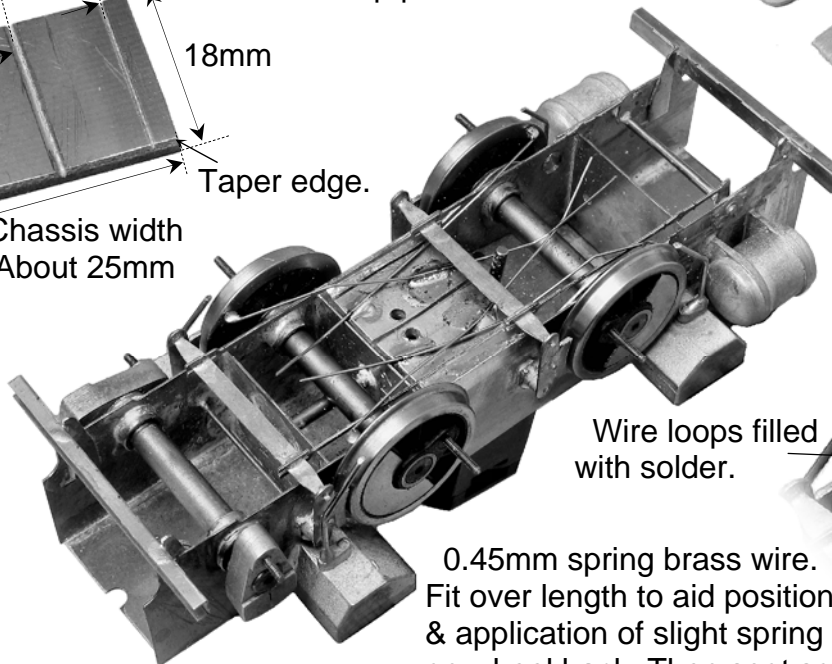


Use packing (coffee stirrers) to slightly set termination plate below sideframe tops.



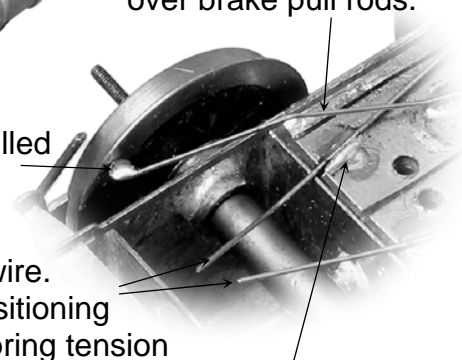
A suggestion for a wire wiper pickup system.

Wire formed to pass over brake pull rods.

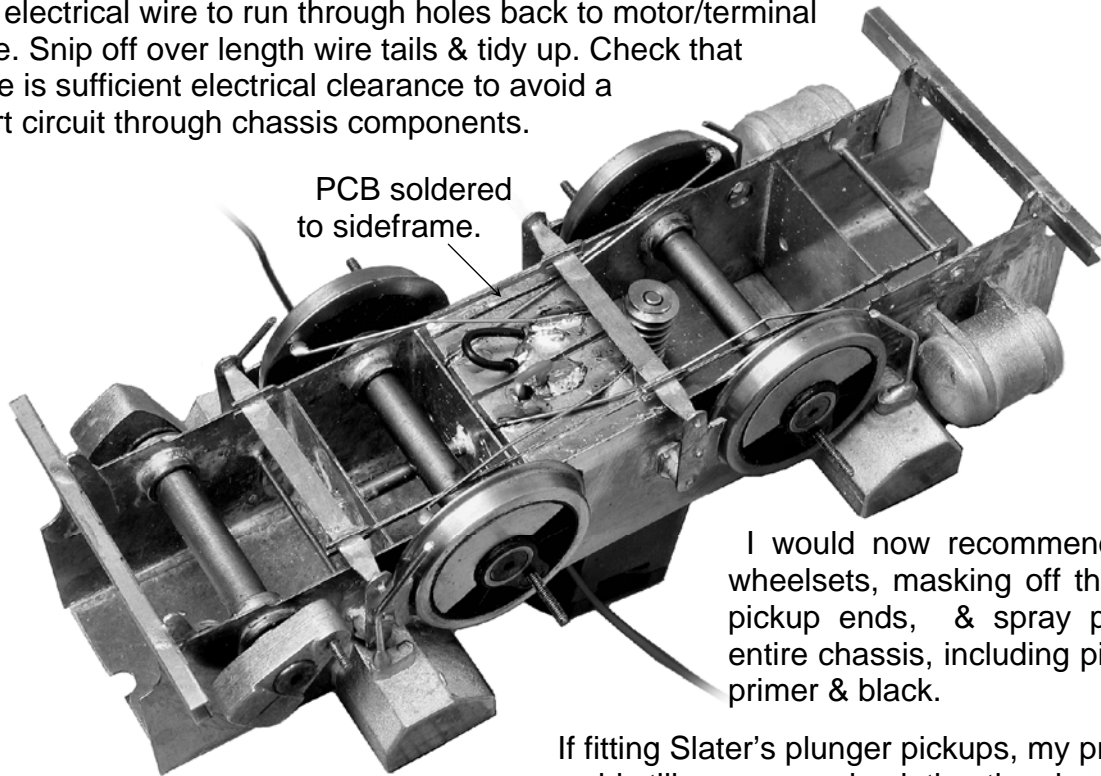


Wire loops filled with solder.

0.45mm spring brass wire. Fit over length to aid positioning & application of slight spring tension on wheel back. Then spot solder into position.



Fit electrical wire to run through holes back to motor/terminal plate. Snip off over length wire tails & tidy up. Check that there is sufficient electrical clearance to avoid a short circuit through chassis components.



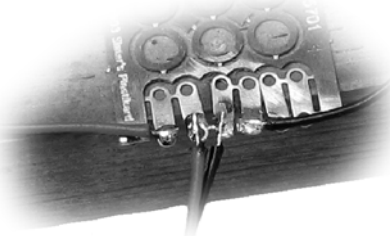
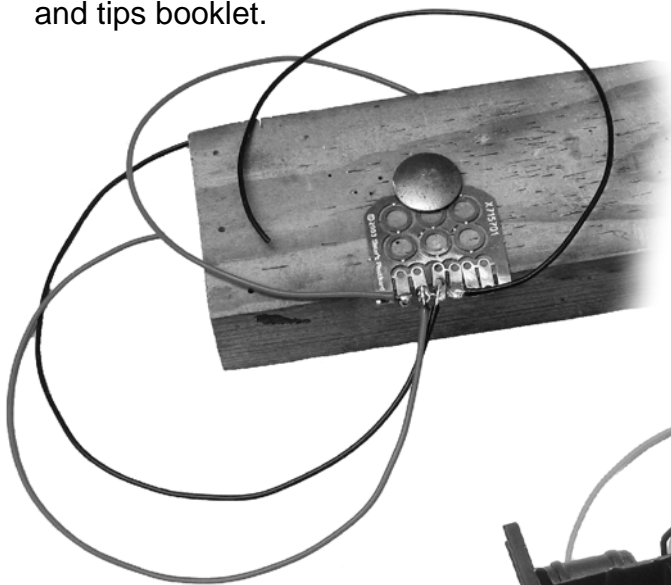
PCB soldered to sideframe.

I would now recommend removing wheelsets, masking off the wire loop pickup ends, & spray painting the entire chassis, including pickups, with primer & black.

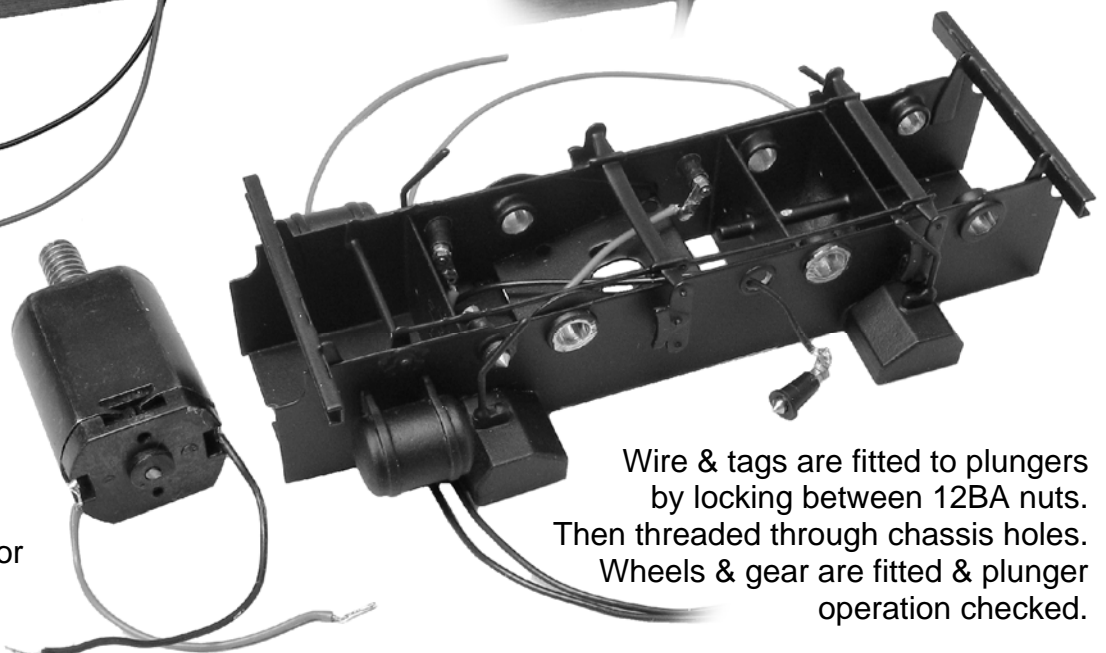
If fitting Slater's plunger pickups, my preference, I would still recommend painting the chassis now.

During reassembly I would fit the Slater's plunger pickups and wiring. If you are not familiar with the techniques for fitting pickups, motor & achieving a sweet running chassis. Then on my website ([www.jimmcgeown.com/Print Outs.html](http://www.jimmcgeown.com/Print%20Outs.html)) downloadable detailed help sheets cover these operations in full detail or please contact me for a free copy of my hints and tips booklet.

Solder lengths of wire (around 90mm long) to the tags included with Slater's pickups. Then snip out of fret to separate.



Flying leads soldered to motor terminal tags.



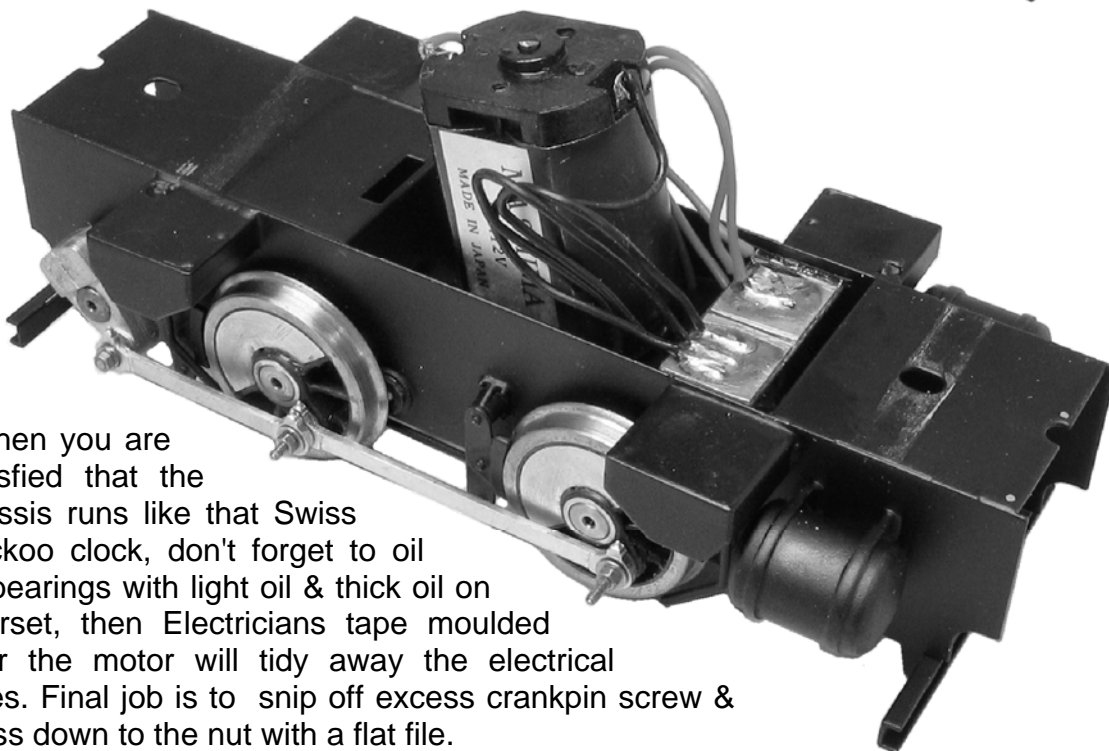
Wire & tags are fitted to plungers by locking between 12BA nuts. Then threaded through chassis holes. Wheels & gear are fitted & plunger operation checked.

Painting is covered in more detail in my downloadable hints and tips booklet, ([www.jimmcgeown.com/Print Outs.html](http://www.jimmcgeown.com/Print%20Outs.html)) or please contact me for a free printed copy of my hints and tips booklet. This chassis has been painted using, rattle can type, car touch up spray paint from Halfords (their own brand). Undercoat with, grey, Etch Primer & finish with Matt Black.

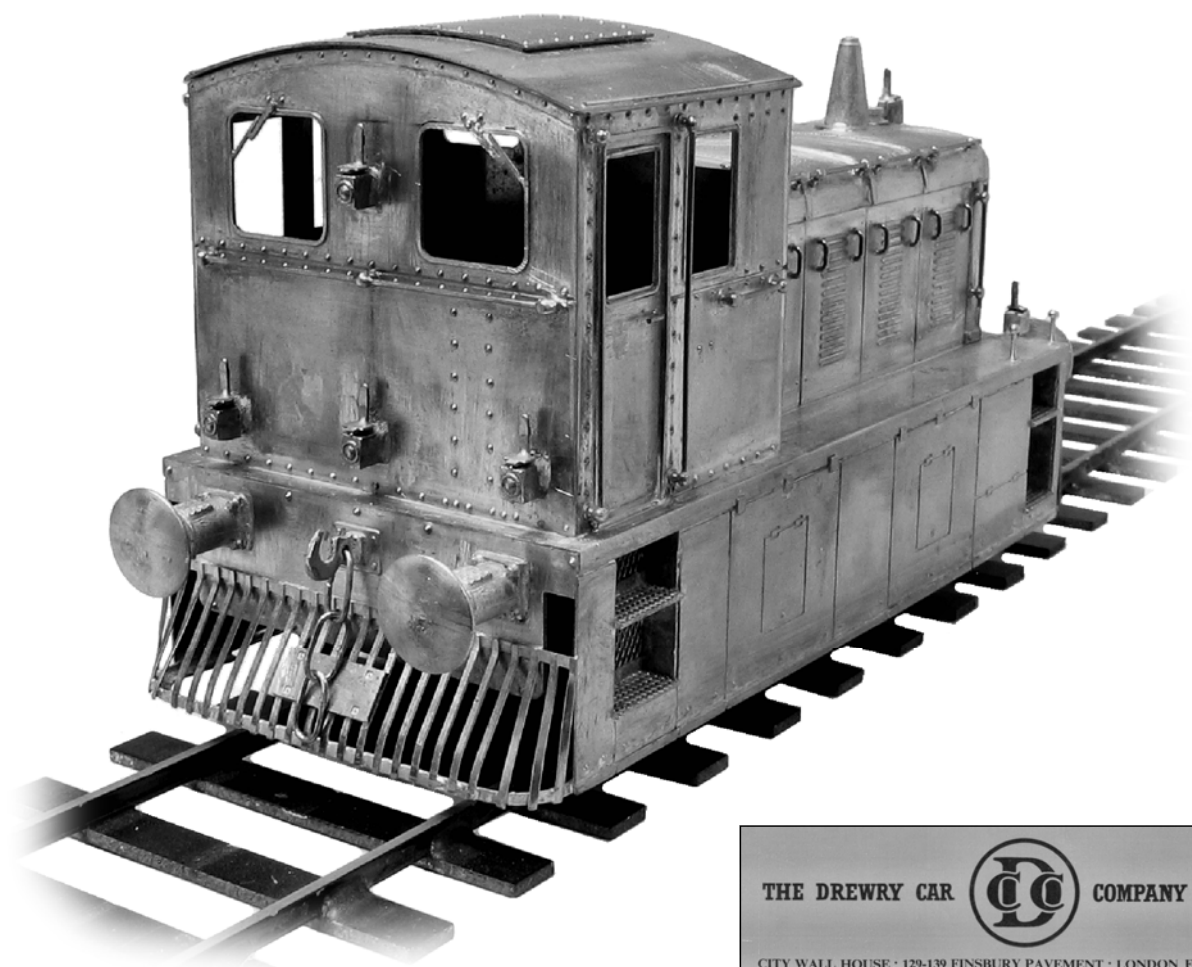
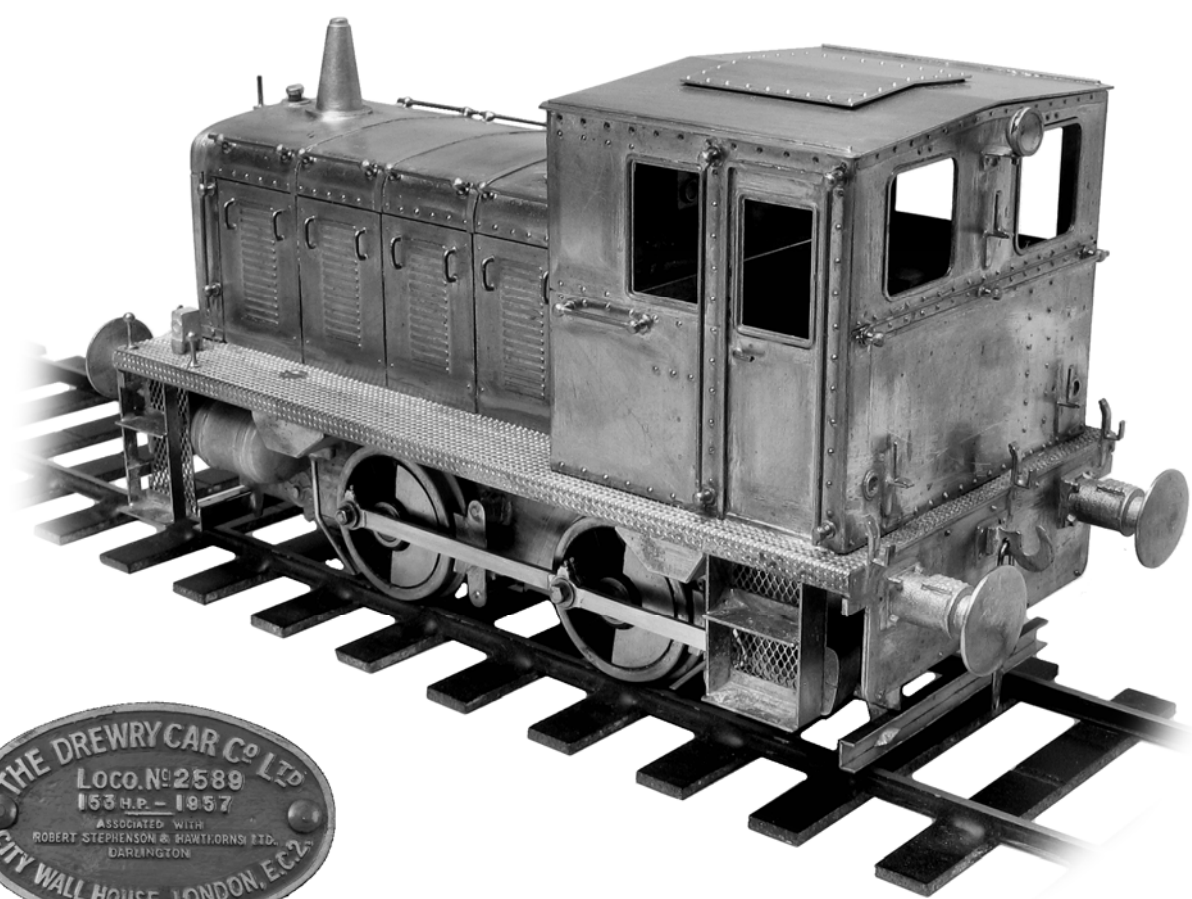
Stage 9, reassembly & Finishing


Secure pickup housings with a dab of Araldite applied using a match stick onto the inside face of the sideframes. When hardened reassemble flycranks & rods & check for free running. Sometimes swapping wheels around will address any tightspot that may have appeared but if unsuccessful find the tight rod and slightly oval the crankpin holes with a round file. Then route wires to termination plate & fit motor.

Flying leads from motor should be positioned for ease of unsoldering so that they can be swapped over to change motor direction. I leave a generous loop of wire from the pickups to make handling easier when soldering at the PCB termination plate.



When you are satisfied that the chassis runs like that Swiss Cuckoo clock, don't forget to oil all bearings with light oil & thick oil on gearset, then Electricians tape moulded over the motor will tidy away the electrical wires. Final job is to snip off excess crankpin screw & dress down to the nut with a flat file.



THE DREWRY CAR  COMPANY LIMITED.

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Telephone: MONarch 0671 - - - Telegrams: INNEAL, PHONE, LONDON