Schools class Dapol conversion



Items needed to complete the project

6.5mm bogie wheels 3-051 2 pairs

13mm Driving wheels 3-015 2 pairs

Front bogie bearings Frame bush 3-133 1 pack

Schools conversion bearings 3-227 1 set

Gear muffs 3-102b 1 pack

Trailing axle muffs 3-103 1 pack

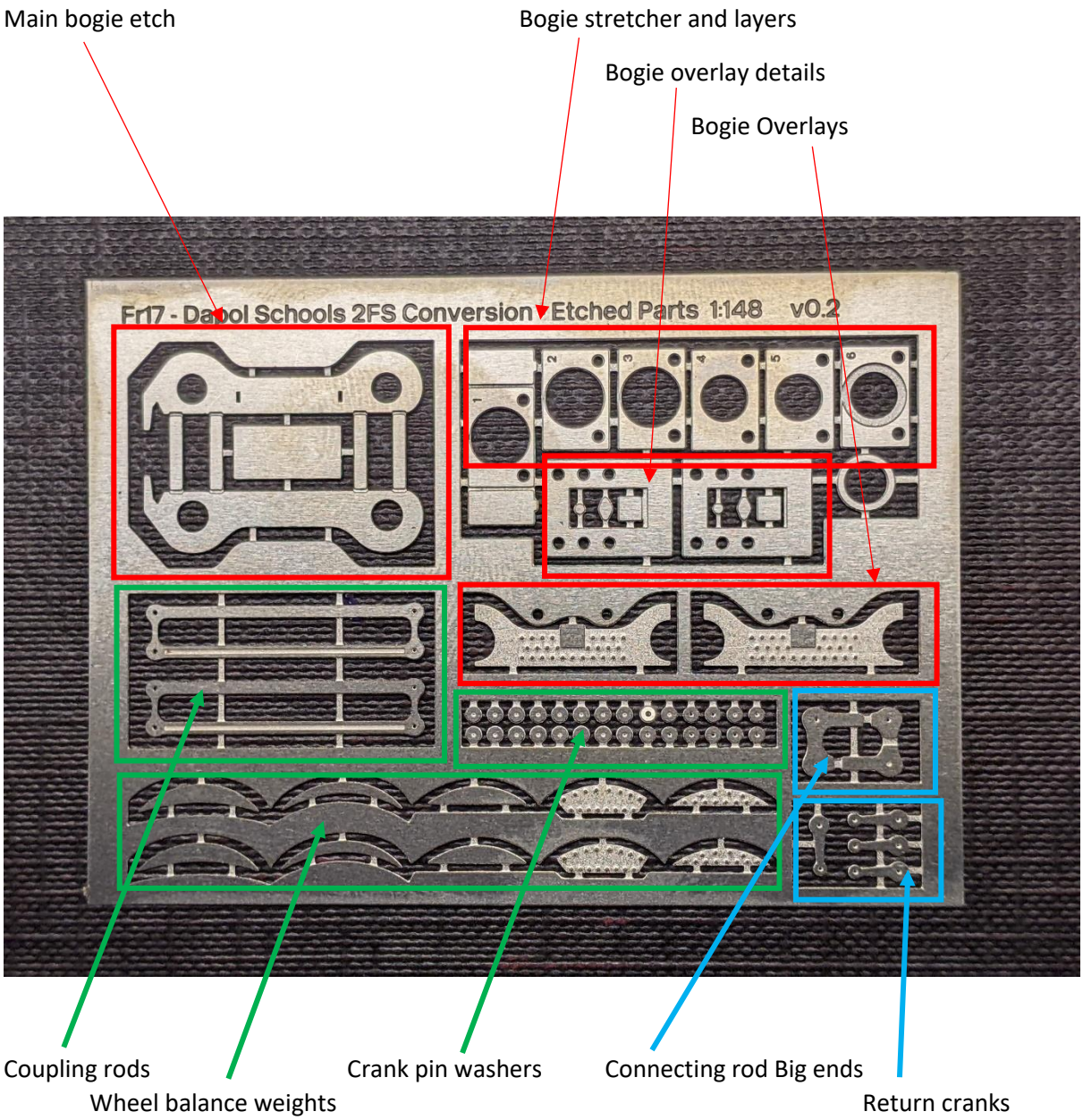
Gears M0.3 20 tooth currently 3-393 2 gears

Crank pin 3-127 or 3-125 depending on wheel type

Double-sided pcb – 0.5mm thick if soldering, alternatively 20thou plasticard and epoxy glue

General Description

The conversion builds a new front bogie, and allows new coupling rods to be used along with the existing connecting rods (with new big ends) and replacement crank. The items do not include any tender parts as the Dapol wheels can be turned. Alternatively use one of the other association kits to produce a tender sub-chassis. The main drive system has to be disassembled, but uses the existing Dapol intermediate gears in the revised drive train.



Method

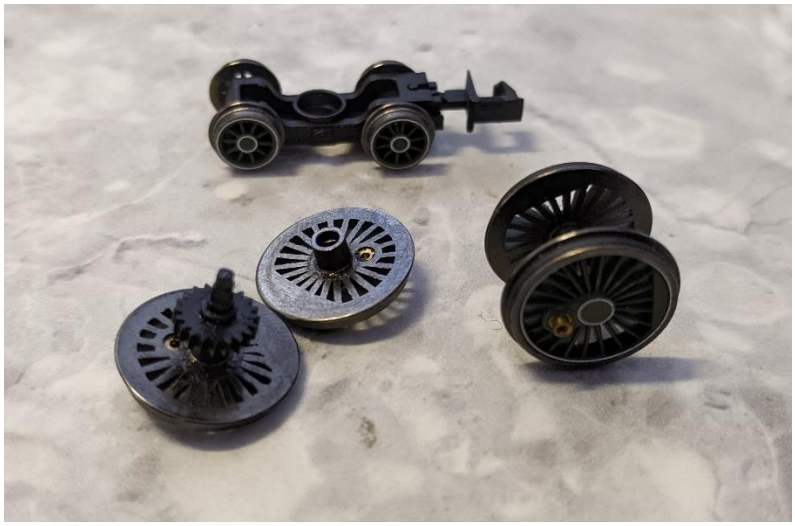
First disconnect the tender drawbar and connecting wires, withdraw the drive shaft and put the tender to one side.

Underneath the loco, undo the front bogie, be careful to retain the screw and spring.

Undo the screws on the leading drivers. It is suggested to use tape to stop the valvegear flapping around, taping it to the footplate. Remove the screw on the rear driver and take off the coupling rod. Unclip the plastic plate with spring and brake detail from the chassis.

Now remove the chassis from the body. Be careful of the phosphor bronze strips inserted at the rear of the chassis.

Lever the driving wheels out along the axle line. The wheels have a large central hub with a square drive hole. The Dapol mechanism includes a square plastic drive which retains the wheels. A screwdriver either side of the bearing will allow the wheel to be removed.



Take the chassis, support it on the side and undo the screws, and lever out the plastic block with worm drive at the top. This will allow you to remove one side of the chassis and reveal all the gears. Be careful to note the position of gears – maybe take a photo.

Tap out the bearings and replace with the 2mm versions.

Take the gear muffs and fit the gears. Trim the muffs so that they will sit easily and rotate inside the bearings and line up with the other gears – there is a slight bias to one side.

Refit the two sides of the chassis. Gently push the 2mm drivers in, just far enough to grip the muffs and test that everything rotates correctly. Adjust at this stage to get a smooth motion.

After preparing and painting the driving wheels with the appropriate balance weights and crank pins, fit the wheels fully and gauge the back to back with quartering. Because the drivers are geared, quartering is not super-sensitive, but try to keep it as accurate as possible for smooth running. Once happy that everything rotates and maintains position, fit the coupling rods loosely and keep tweaking. Once happy, secure the rear crankpin washer using the usual paper insert to avoid the joint being soldered up, leaving the chassis in the state shown below.

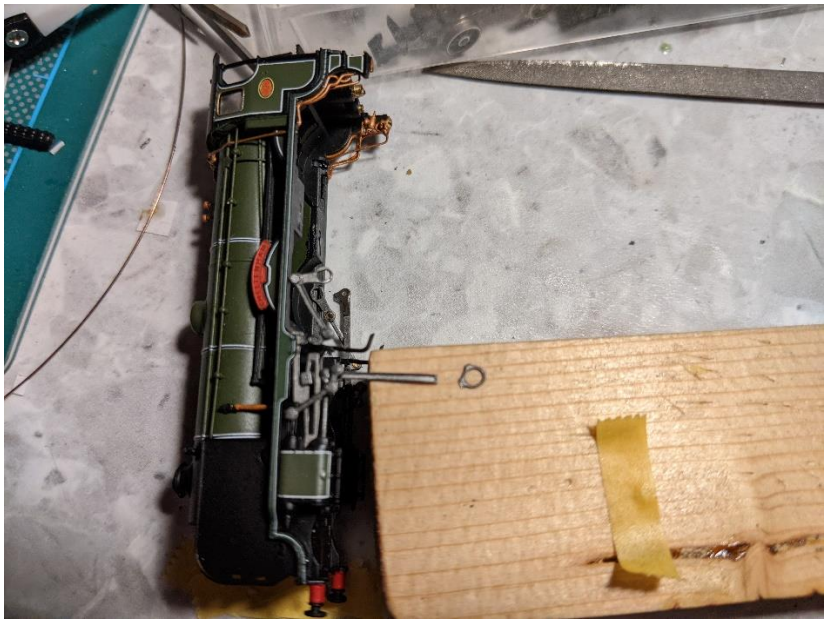


If everything is good, refit the worm and check motion.

Next take the body and support it on its side and use a block to allow work on one side valve gear.

File the pin on the original return crank, leaving the link hole free and set the crank aside.

Cut off the big end on the original connecting rod as per photo.



Only remove the minimum amount.

Fold up and solder the replacement big end, these are handed. Leave the longer leg with solder on the inside with the extra thickness on top. When the original connecting rod is sweated onto this, the front faces will be flush.



Bend up the return crank (2 spares are included) and use a crank pin to connect the small end of the replacement crank to the original small valve rod.

Repeat for the other side, refit the worm and block, then replace the chassis in the body and place the big ends on the front crank pins. Position the return cranks and solder in place in lieu of a crank pin – usual methods apply.

Place a screwdriver in the drive joint inside the cab, rotate and check everything still moves smoothly.

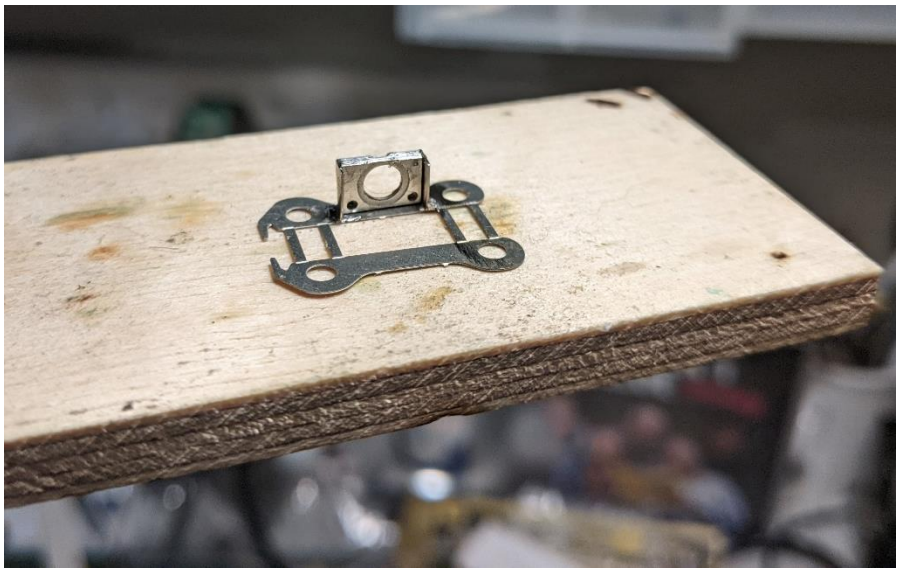
Replace the lower plastic plate under the chassis and ensure everything is fully home. The clearance is very small and one corner being proud caused wheelspin on the prototype which was eliminated once fully home.

At this stage, if the tender wheels have been turned and fitted, or a replacement chassis has been done, it will be possible to re-assemble the loco and test before fitting the replacement front bogie.

Front Bogie

Take the Bogie stretcher part 1 and sequentially solder layers 2 – 6 on top, using drills in the small holes to keep the alignment. The final circle is for packing above or below the build as required. Fold up the wings of the first part (the etch lines are on the inside of the fold).

Take the main bogie etch and remove the central rectangle, but leave the links across the bogie at this stage. Place the stretcher with the tabs into the side with the slots and solder to this side.



As can be seen in the picture, the folded part will end up on the top, with part 6 at the bottom.

Then fold up the bogie and either solder a small piece of double-sided PCB, or use epoxy and some plasticard.

Prepare the overlays by leaving the main overlay in the etch frame and remove the overlay detail square, use the small holes to align, and solder the square onto the square, then the diamond, then the circle, removing the tags as each layer is secured.

Then add the overlays to the bogie. Solder main bearings to the bogie frame, with the flange on the inside of bogie and file back so the outer faces are flush. The objective is to keep the bogie as narrow as possible. Now cut the links between the two sides, leaving the two sides insulated.

Keep the muffs for the bogie wheels fairly short so that once gauged, the maximum side-play is available. Due to the original design, axle side-play is essential, but this will limit the minimum radius that can be negotiated by the loco. It would be possible to add a link and remove the original mounting pilar, but this is outside the scope of this etch.

When attaching the new bogie, it was found that the spring was a little too long and lifted the front, reducing the traction. Cutting 2 to 3 turns off the spring was the ideal mix on the prototype, but experiment with this aspect.

It was found that turning the original Dapol tender wheels worked well. As the association wheel turning service is currently unavailable, the alternatives are find a member with a lathe, most likely through the area group network, or build a sub-chassis to take association wheels and bearings.