

## 2mm Scale Association GWR DC underframes – parts 2-361, 2-362 and 2-363

### Historical Notes

The Dean-Churchward either-side brake was patented in 1902, and was fitted in various forms to most GWR wagons from then until the 1920s, when the company reverted to RCH standard Morton brakes. There were three main divisions in the development of this gear, known as DC I, DCII and DC III.

DC I: Initially with both brake actuating handles (short quadrant levers quite unlike the normal levers found on other companies' stock) at the same end of the vehicle, the brake was actuated by a swan-shaped lever which passed behind the axleguard and in front of the wheel. Brakes were fitted only on the same side of the wagon as the lever. A pillar immediately behind the brakes supported the rod, and therefore a V hanger was only present on the lever side. Later, to satisfy Ministry of Transport regulations, certain DC I equipped wagons were converted to have both brake handles at the right end of the wagon side. This was known as DC I cross-cornered, and the linkage connecting the two sets of brake handles ran down the centre of the wagon. DC I brakes suffered from being impossible to fit with vacuum braking, and difficult to adapt to longer wheelbase stock. They were thus only used on short wheelbase unfitted wagons and vans. Nevertheless once fitted, they tended not to be removed unless vacuum fitting was needed, and many survived through to nationalisation.

DC II: This brake also had both handles at the same end of the wagon. It however has V hangers on both sides, and the resulting spindle which ran across the wagon allowed a vacuum cylinder to be linked to it. With this arrangement it became possible to fit brake blocks on both sides of the wagon. Some fitted vehicles were equipped with 8-shoe clasp brakes.

DC III: A cross-cornered variant of DC II, with both brake handles at the right hand ends. This soon came to be the standard brakegear to be fitted to all stock, except where single ended levers were needed, for example china-clay end tipping wagons where the brake levers were fitted at the opposite end from the tipping doors, to avoid them becoming clogged.

A comprehensive description of DC brakegear is found in Reference 1, including some fascinating works photos where the brakegear has been painted white for clarity, presumably to aid future generations of railway modellers.

The Association kits build DC braked underframes for three common wheelbases. They can be built either with bufferbeams provided for scratchbuilt wagons, or without bufferbeams to use with various Association and other body kits.

- 2-361: 9' - widely used under MINK vans (Association kits 2-525 and 2-526) and OPEN wagons. Also suitable for the Parkwood china clay wagon. Builds DC I, II and III versions.
- 2-362: 12' – for MINK C vans (NGS kit 2-521) and LOCO coal wagons (Parkside kit 2-524). Builds DC II and III versions.
- 2-363: 11'6" – for MEX cattle wagons. Builds DC II and III versions. This kit also provides etched door parts to convert the Association BR Cattle Wagon kit (2-561) to a GWR version

### Assembly instructions

#### Parts required

1 x 2-361 or 2-362 or 2-363	DC underframe etch.
4 x 2-041	Rolling stock axle bearing cups
2 x 2-209	6mm plain spoke wagon wheels (or similar according to prototype).
4 x 2-441	Ribbed wagon buffers (or similar according to prototype).
1 x 2-346	Turned brass vacuum cylinder (vacuum fitted underframe only)

0.3mm brass or nickel silver rod

solder and tools

## General

Certain parts of the etch are very delicate, and therefore care is needed when cutting both them and adjacent parts out. Spares are provided of certain small or delicate items.

Although it is possible to assemble the kit using superglue, for these instructions soldered construction is assumed.

Unless otherwise indicated, fold lines for 90 degree folds are on the inside of the fold, for 180 degree lines on the outside of the fold.

Parts on the etch are numbered. An enlarged picture of the etched fret is provided for clarification. Study this and the instructions carefully before beginning assembly.

## Underframe

1. Cut out the underframe etch (part 1) from the fret. It is now necessary to decide which version of the underframe is to be built, and remove certain parts from the underframe accordingly. For DC I brakegear, remove the V hanger on the side which has the two triangular hangers at each end. If building a non-fitted underframe, also remove the vacuum cylinder mounting found on the same side. The underframe is provided with three triangular hangers on the corners for the brake handles. In each case one has to be removed. For DC I or DC II single ended brakegear, the lone one at the opposite end is removed. For DC I or DC III cross-cornered brakegear, the two remaining should be diagonally opposite one another, so the third one is removed.
2. If the underframe is to be used with a body kit including bufferbeams, remove the inner bufferbeams from the etch, and shorten the underframe to match the body.
3. Bearing cups may be soldered in place before or after folding the underframe into a U section, according to preference. Fold up the underframe sides into a U shape. Fit the wheels into the underframe and adjust for free running without excessive slop. Remove the wheels.
4. If fitting DG or similar couplings, foldup boxes are provided as mounting points. If not required, remove or these flat as they impeded the building of certain brakegear configurations.
5. Cut out the inner and outer solebar etches (parts 3 and 4). The outer solebar is provided with a selection of drop bars. According to the prototype selected, fold those required through 180 degrees, ensuring they are in front of the profiled outer face, solder in place, remove those not required, and carefully file down so the top of the solebar is flush. Shorten the solebars to match the underframe length. If cast axleboxes are preferred, remove the etched ones provided. Now fit the inner and outer solebars to the underframe, using the bearing cups as locating lugs.
6. Fold up and solder the axlebox etches (part 6), file off the remining tab, and locate in place. Ensure you have them nice and square. Spares are provided in the case of mishap.
7. If bufferbeams are being fitted, fold up the inner bufferbeams on the underframe. Select square or angled ended bufferbeams (part 5) as appropriate, and solder into place, ensuring they are accurately located over the buffer holes, and that the etched channel section faces inwards.
8. If fitting clasp brakes (9' wheelbase only), fold up the clasp brake etch (part 15), including the two centrally located tabs, and solder in place in the underframe. Fold up the two brake stretchers (part 14) into an inverted top hat shape, and spring into place between the brake blocks.
9. If fitting normal brakes, cut out the brake gear (part 2). If building a two shoe brakegear, remove the redundant side brakes – it's the one with the gap in the support. If building DC I brakegear, fold down the support arm, and strengthen the fold with solder. Solder the brakegear in place on the underframe. **Important**

**note:** for DC II brakegear, due to an orientation difference, the brakegear has to be folded in the opposite to normal orientation, that is with the fold lines on the outside of the fold.

10. Insert the wheels, and check that they do not foul the brakegear. Remove them.
11. For cross-cornered brakegear, additional supports are needed (parts 8 and 9). For DC I cross-cornered, parts 8 are required, they locate in slots close to the centre-line of the underframe, and face in the opposite direction to those on the solebars. These cannot be included if DG couplings are used. For DC III brakegear, parts 9 are required, they locate in slots off centre and face in the same direction as those on the solebars. They may require trimming to clear the body kit.
12. Select the brake rodding. 0.3mm brass rod is used to provide the transverse rods. According to the brakegear type, different longitudinal levers are needed:
  - DC I single ended – brake lever part 13. This passes in front of the wheel and behind the axleguard. It may need some thinning to clear the wheels.
  - DC I cross-cornered – rodging part 12. This passes down the centre of the underframe.
  - DC II single ended – rodging part 10. Locate in the centre of the underframe.
  - DC III cross-cornered – rodging part 11. This is offset to one side of the underframe, and it should be clear from the arrangement of the supports at the end of the underframe where it needs to be located.
13. Thread 0.3mm brass wire though the handles at the ends, and through the central V hanger, making sure you include the brake rodging as described above. Leave wire protruding from the handle supports to thread the brake handles on to. Carefully solder in place.
14. Fit the brake handles (part 7) in place. These should be kinked close to the circular end (see prototype photos) but this can be omitted if desired. Trim off excess wire from the brake handle and V hangers.

## References

1. GWR Goods Wagons pp51-59, Atkins, Beard & Tourret, Tourret Publishing