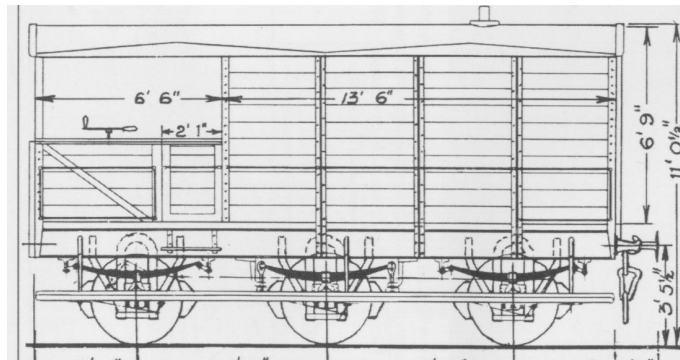


Masterclass Models 2mm GWR Toad Brake Van instructions



Historical Notes

In 1886 the Great Western began building a design of Brake Van (Toads in the GWR telegraphic code) that would continue largely unchanged to nationalisation over sixty years later. Its chief feature was that unlike other companies it had only a single verandah. The last batch was built at Swindon in 1949-50 as BR diagram 1/502.

The main variations covered by the kits are as follows

- Length. Up to 1914 the vans were of 20' in length (13' wb) including some with six wheels for heavy freight traffic. From then on the design was lengthened to 24' (16' WB) to improve running at speed. Both lengths survived well into BR days.
- End windows. Until 1923, the windows were fixed, and had two panes. After this date, opening windows were fitted, and almost all of these had a single pane set around 5" higher than previously.
- Verandah sides. All of the shorter vans, and the first diagram of the longer variety (diagram AA11) were built with planked sides and ends to the verandah. From then on, these were metal, and this design was retrofitted to many of the older vans.
- Cabin side sheeting in steel over the lower planking was introduced with diagram AA15 (1918). Again this was later fitted to many earlier vans. The height of this sheeting was increased with diagram AA23.
- The last GWR diagram (AA23, 1942) and BR Diagram 1/502 (1950) had cabin side sheeting extending slightly higher up the body side, and side stanchions that extend directly down below the floor, rather than turning under.
- Handrails. Diagrams AA1-AA12 were built with normal handrails with flattened ends used as the mounting point (Type 1). AA13-AA21 were built with continuous handrails from gas pipe and joints (Type 2). AA23 had a new form of corner joints to the handrails (Type 3).
- The chimney was centrally located on AA1-AA11. Offset from AA12 onwards.
- Axlebox springs. The 20' vans were built with swing-link springs - except the 6 wheel vans which had a J hanger on the central axle. With AA11, these were replaced with J Hanger springs of a longer length. Part way through the construction of AA15, these reverted to a swing link, but retaining the longer length and using a heavier design of spring.
- Footboards. The continuous lower footboard originally had a low rear board, and was suspended by rods from the front of the solebar (3 on the 20' vans, 4 on the 24'), and was aligned with the level of the axles. With AA13, the rear board was made higher, and this change was retro-fitted to most earlier designs. Part way through the construction of AA15, the rods were replaced with L angle inclined from the rear of the solebar. With AA19, a hybrid design was adopted, with the outer supports of rod, the inner ones of L angle. During the build of AA20, the level of both upper and lower footboards were lowered, the former to be level with the bottom of the solebar, the latter by 4" below the axle centres.

Diagram details (excludes PW and specialist vans)

Diagram	Year	Number	Length	Notes
AA3	1889 - 1901	840	20'	4 wheel. Diagram number assigned retrospectively.
AA1	1900	62	20'	6 wheel
AA2	1902	278	20'	Heavyweight version of AA3
AA12		19	20'	Built from surplus PW Brake Van parts. Offset chimney (cannot be directly built from kit)
AA11	1912	35	24'	Prototype of long Toad design. Wooden verandahs and central chimney (cannot be built from kit)
AA13	1913-8	256	24'	Wooden body sides, steel sided verandahs. J Hanger springs.
AA15	1918-27	278	24'	Steel panelled body sides from new.
AA18	1926-7	14	24'	
AA19	1927-31	221	24'	RCH parts used for first time
AA20	1934-43	354	24'	
AA21	1939-40	100	24'	Vacuum fitted (vacuum cylinder on verandah)
AA23	1942-9	276	24'	
1/502	1950	74	24'	BR build of AA23

Parts required

1 x	Toad etch
8 x 2-041	Rolling stock axle bearing cups (4 for the underframe, 4 as location guides)
2 x	6mm spoked or 3-hole disc wagon wheels
4 x 2-443	Plain wagon buffers (or similar according to prototype) Brake standard and sandbox castings

0.3mm brass or nickel silver rod for handrails
0.7mm brass or nickel silver rod for the chimney
castings for the sandboxes
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 Assembly

1. Cut out the underframe etch (part 1) from the fret.
2. 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, or you may choose to leave it flat until steps 4 and 5 have been completed. Fit the wheels into the underframe and adjust for free running without excessive slop. Remove the wheels.
3. If fitting DG or similar couplings, foldup boxes are provided as mounting points. If not required, leave them flat.
4. Cut out the inner and outer solebar etches (parts 4 and 5). If cast axleboxes and springs are preferred, remove the etched ones provided. Alternative parts are provided if building AA13 or AA15.

5. Now fit the inner solebar overlay to the underframe, using the bearing cups as locating lugs. Fit the outer solebar overlay. Cut or file off the bearing cups flush with the solebar overlay.
6. Fold up and solder the axlebox etches (parts 6), file off the remaining tab, and locate in place. Ensure you have them nice and square. Spares are provided in the case of mishap.
7. Cut out and fold up the brake gear (part 2). Fold up the brake gear stretchers (part 3) and locate into the holes in the brake blocks. Solder each assembly into the slots in the underframe.
8. Insert the wheels, and check that they do not foul the brakegear. Remove them again.
9. Cut out the upper footboards (part 7) and attach to the underframe (on the underside of the solebar for AA23, into the slot in the solebars for all other diagrams).
10. Cut out the lower footboards (part 8 or 8b) and fold up. Noting the detail differences found in the prototype information section, mount these at the correct height using either the angle section attached to the underframe (AA15-18), rod supports fashioned from 0.3mm wire (AA1-AA15) or a combination (AA19 onwards). When using the rod supports, any corresponding angle sections need to be removed from the underframe. I have found the easiest way to get an accurate result is to solder the footboard to the axleboxes, checking that the footboard is horizontal, and then solder the supports in place.
11. Four 1mm holes are provided in the underframe to fix it to the body, either with bolts, or axlebox cups.

Body Assembly

12. Decide which sides you will use – planked (part 13a) or steel sheeted (part 13b). Discard those that will not be used. Do **not** cut out the sides you will use at this point.
13. If you have chosen sides with steel sheeting, cut out the overlays (part 14) and solder them onto the sides, taking care they are located correctly. The sheeting forms a lip at the bottom and ends of the sides, which is used to locate the floor and ends.
14. If building a van with steel verandahs, solder the verandah side overlays (part 16b) onto the verandah side steel plating (part 15). Note that for the long Toad, a special jig is provided for this to do both parts at once using axle bearing cups as locators, and that the handrail supports must be folded up from these parts before soldering them in place. Then cut out the combined assemblies and solder to the body sides.
15. If building a van with wooden verandahs (short vans only), solder the overlay (part 16a) directly to the body side, using the handrail holes as location guides.
16. Cut out the individual side stanchions (part 18) and store safely. Do **not** cut out the stanchion base plates (part 17) as these are now all soldered to the sides before cutting out either part from the etch. Location holes are provided in the etch surrounds to allow this to be achieved. The easiest way to do this is to cut out the sides *including their etch surround* from the main etch. Once they are soldered, cut out the combined sides with overlays from the etch and add the side stanchions in the slots provided.
17. If building a van with steel verandahs, solder the verandah end steel plating (part 22) onto the verandah end (part 21).
18. Solder the end overlay (part 23) to this assembly, or to part 21a if building a van with wooden verandahs. Add the verandah end stanchions (part 24). There are location holes in the etch surround which align with the buffer holes in the verandah end to help with alignment.
19. If building a van with steel sheeting, solder the end steel plating (part 26) onto the end (part 25, or 25b if building a van in pre-1918 condition with fixed windows).
20. If building a van with planked lower sides, choose which end part you will use (part 25c, or 25a if building a van in pre-1918 condition with fixed windows).
21. Cut out the end stanchions (part 28) and store safely. Solder the four end stanchion plates (part 27) to the selected end before cutting either from their etched surround using the location holes provided. Add the end stanchions.

22. Similarly choose the inner partition to use (part 29 or 29a). Solder the overlay plates (part 30) to the partition.
23. Cut out the floor (part 11). Add the side assemblies from step 16, verandah end from step 18, end from step 21 and partition from step 22 to form the van body. The ends fit inside the sides. Check everything is precisely aligned (particularly the vertical alignment of the verandah sides and ends which is critical to the lips fitting correctly) and that the underframe fits snugly between the bufferbeams.
24. Fit the verandah side and end lips (parts 19 and 20) to the top of the verandah sides and ends. These are most easily handled by cutting them from the etch with a portion of the surround, which is used as a handle whilst soldering them in place.
25. Fold the verandah end seat support (part 32) into a U shape and fix in place inside the verandah. Fit the verandah seat top (part 33) to this.
26. Solder the verandah door frames (parts 34) to the inside of the doors.
27. For diagrams AA13 and AA15, two additional boxes were fitted each side of the verandah next to the doors (parts 35 and 36).
28. Form the roof (part 12) to the correct profile and fit in place. The chimney can be formed from a piece of 0.7mm rod and for strength there is a hole in the floor as well to locate this.
29. Fit the handrails. On the diagrams AA13 to AA21 the prototype handrails form a continuous loop using gas pipe and joints, and care is needed to simulate this using wire.

References

1. Model Railway Constructor May 1976 (p181). James Snowdon
2. Model Railway Journal issues 3 (p113), 92 (p31), 114 (p257) and 181 (p57). Various authors
3. The 4mm Wagon Part 3 (pp98-105). Extensive chapter on building a 4mm model of the GWR AA23 diagram. Geoff Kent, Wild Swan.
4. GWR Goods Wagons (pp460-488), Atkins, Beard & Tourret, Tourret Publishing
5. <http://www.flickr.com/photos/chrishiggs/sets/72157603335199856/>