Steam Era Models
C/- P.O. Rhyll, Victoria, 3923.

# VICTORIAN RAILWAYS QB WELL WAGON

## Prototype Notes

QB1 was constructed at the VR Newport workshops in 1902. That was the sole representative of the class until a construction program saw numbers 2-5 built in 1912 and 6-11 in 1913. All were originally fitted with swing motion diamond frame freight bogies, buffers and draw hooks. They were equipped with auto couplers in 1931, at which time they were also fitted with IZ style buffers. Buffers were removed and shunter's steps were fitted in 1957. There was little other change to the fleet until around 1973/74/75 when a repair program saw them placed on XB (XSC Black Spring) roller bearing bogies, a revised handbrake applied, the headstocks replaced and extra lashing fixings added to the sides. Several wagons were also fitted with container locks at this time. At least four have been preserved, with two at the Castlemaine and Maldon Railway and, in 2004, two were being used by a contractor in the removal of the overhead wiring on the Gippsland line between Warragul and Pakenham.

It seems that over the years, any time that a special load warranted it, fixings were welded to the QB's to hold the load in place. Sometimes, but not always, the fixings were removed with a cutting torch afterwards and the prototypes examined for this model show many instances where this occurred. We have endeavoured to provide a typical range of fittings for these wagons, but ultimately you will need to decide how you fit it out. The model caters for QB6 as found at Muckleford in late 2003.

## General Assembly Notes

The majority of this kit is brass, therefore the method of choice for assembly is soldering. However, this does not preclude the use of Epoxy Resin glues or Cyanoacrylate for assembly. **The kit has been designed to make it possible to entirely assemble it using glues rather than solder.**

By far the strongest assembly method is solder. The kit designer highly recommends the use of solder paste rather than wire for assembly. It has a number of advantages. It is clean, easy to place small quantities using a pin and because it can be placed before use of the iron, leaves one hand free to hold parts. The use of a resistance soldering unit (RSU) or hot air gun is highly recommended when using paste.

If you are not comfortable with soldering, the next choice would be an epoxy resin glue such as Araldite, or finally a medium cure speed super glue. There is no shame in using adhesives to assemble the kit, in fact it is recommended for some parts of the kit that are simply too difficult to solder.

## Tools Required or Recommended

Sharp knife such as a Stanley knife with snap-off blades, or a scalpel.
Fine pointed tweezers.
A set of needle files.
Wire cutters.
Needle nose pliers.
A small bench vise or 70mm Brass butt hinge (see notes below)
Pin vice for holding twist drills.
A 150mm 'Mill Smooth' file.
Glass fibre burnishing tool.
Emery paper, 300 grit.
A range of metric twist drills including: 0.35mm, 0.4mm and 2.0m

The kit does not contain paints or couplers. It is designed to accept Steam Era Models "Auto Couplers II" or Kadee No 5 or 58. The mounting is designed to place both coupler types at the correct height.

## Spare Parts

The are some spare parts on the etched brass fret, particularly the very small parts that vanish in a ping and cannot be found until after the model is finished and painted.

## Assembly Techniques and Tips

Remove parts from the etched fret using a sharp knife with a chopping motion on a hard surface, such as masonite, to cut through the attachment tags. Clean off any tag remaining from all parts with a needle file.

The best soldering iron is a temperature controlled iron, but any iron with a rating of 50 to 80 watts is suitable. If using solder wire choose a fine gauge solder wire with low flux content. We highly recommend the use of solder paste rather than solder wire. An excellent paste is available from Steam Era Models.

The 70mm brass butt hinge recommended in the list of tools may need some explanation. Properly set up, it is an excellent tool for bending etched brass parts if you do not have a bench vice. Any size hinge can be used, but 70mm is the ideal for this kit. Clamp the new hinge in a vise with the two halves closed. Draw-file the closed edge of the two halves until they are level and smooth. You can now use the hinge to clamp the etched brass sections as close as possible to the fold line and bend against a hard surface, such as a laminate table top.

Some parts require you to drill or open up holes using fine diameter twist drills. This should always be done by hand using a pin vise to hold the twist drills. Do not use a Dremel or electric drill. It is very easy to drill too far and ruin the part.

A sheet of 12.5mm MDF or Craftwood is excellent as a working surface. It will not burn too easily, does not conduct heat away and soaks up most adhesives. To hold parts in place while soldering, another trick is to use Blu-Tac. Make a small mound of Blu-Tac and bed the part into it to hold it in place. Do not heat the parts for too long however as the Blu-Tac will soften.

In several places rivets must be formed where it is not possible to etch them in the normal way. In these cases it is necessary to press a sharp pointed instrument into the half etched recess on the back surface while the part is supported on a piece of masonite.

**IMPORTANT NOTE:** As a general rule, half etched lines go towards the inside of a fold. The only exceptions are on the underside of the main deck and in the floor of the well.

## Wagon Assembly

The kit can be assembled as one of two principal variants:

***Type I***. A wagon prior to Ca. 1974, with swing motion diamond frame bogies, a handbrake at both ends and straight headstocks.

***Type II***. A wagon following the 1974 rebuild program with roller bearing bogies, angled headstocks and handbrake at one end only, operable from both sides.

Refer to Figure 1 for an illustration of the main structure.

Separate the wagon ends, part No. 7, from the fret. Fasten the uncoupling lever bracket (34) to the back of the headstocks and make the appropriate alterations to the headstocks, as listed below.

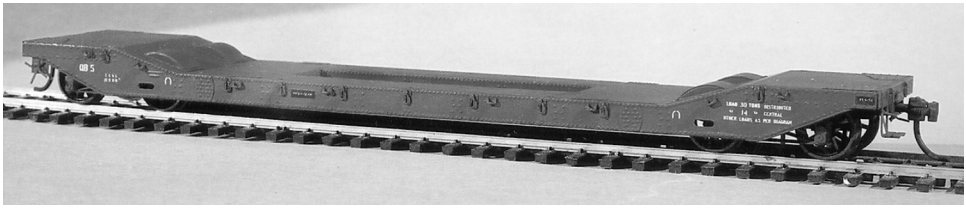
***Type I with buffers***: Press out rivets 'A', drill and enlarge holes 'B' to 2.0mm and trim the headstocks along the dotted line. The buffers required are 'Large IZ' buffers, available separately from Steam Era Models.

***Type I without buffers***: Press out rivets 'A', drill holes 'C' and 'D' to 0.35mm or #80 and trim the headstocks along the dotted line.

***Type II***: Open out slots 'E'.

With the top section uppermost, bend up the angles on the outer edge of the sides to 90º. Parts Nos. 33 & 35 form a continuation of the reinforcement angle at the bottom of the sides. There is a half-etched recess on the back designed to accept these parts. Attach parts 33 and 35 on the appropriate side, as shown in Figure 1. Bend the headstocks and sides down slightly then back again to make the edge visible. Now attach the top gusset plates, (23) to the top surface of the end as shown in Figure 2. If soldering, sweat this skin section onto the top surface with a small amount of solder paste in between. As a guide, the gusset rivet pattern is a continuation of that on the deck.

From the underside, gently bend up the wheel arch splasher sides at 90º to the deck. Form the splasher tops (9) to the correct curve by rolling, taking care that the fold lines are to the inside of the curve. The best technique is to use a screwdriver shaft of around 6mm diameter and a sponge mouse mat. Roll the top a little at a time and check the



Model illustrated has been fitted with couplers (not included).

Figure 1

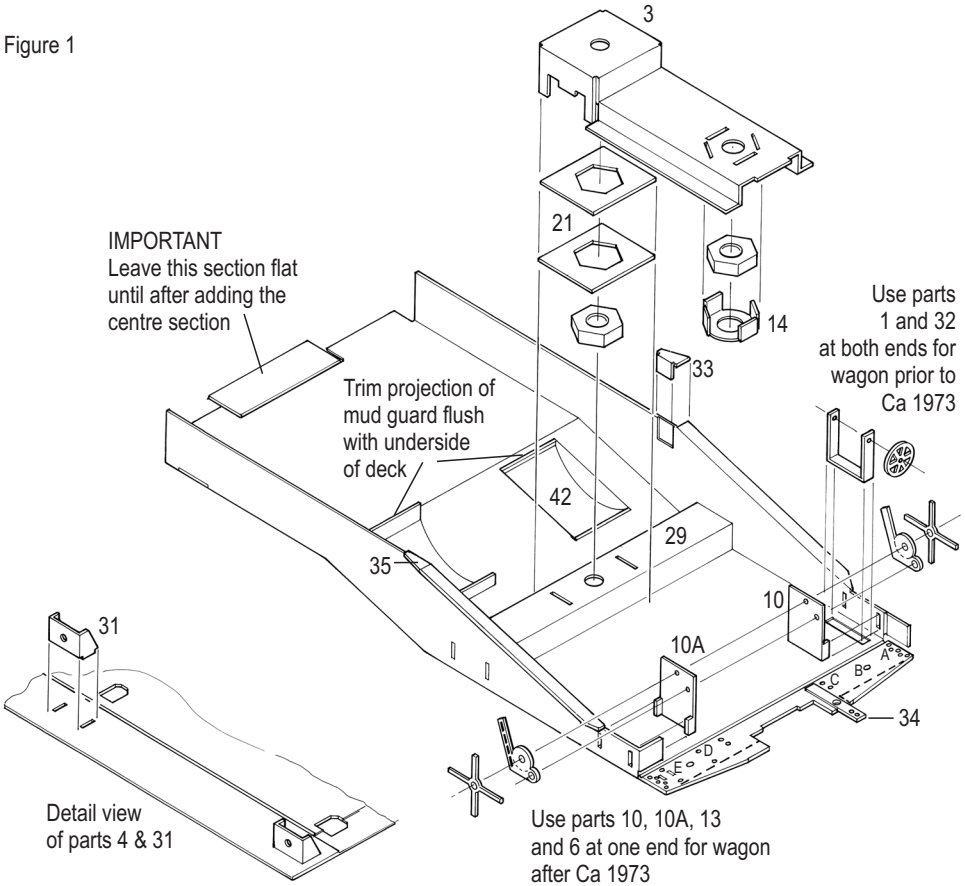


Figure 2

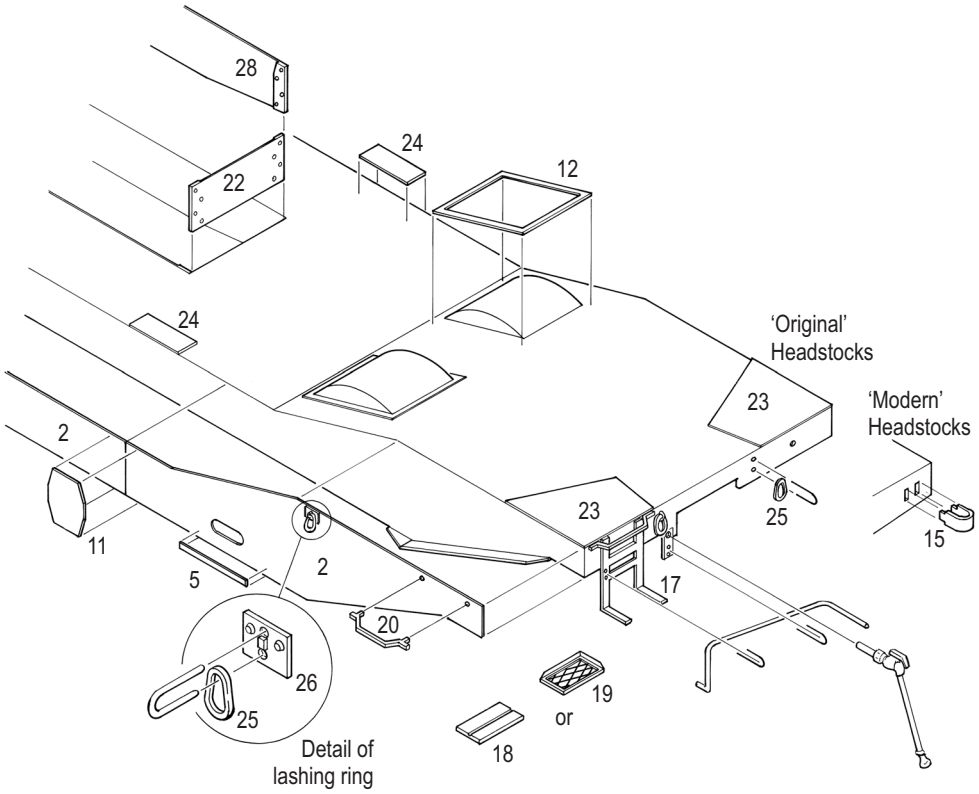
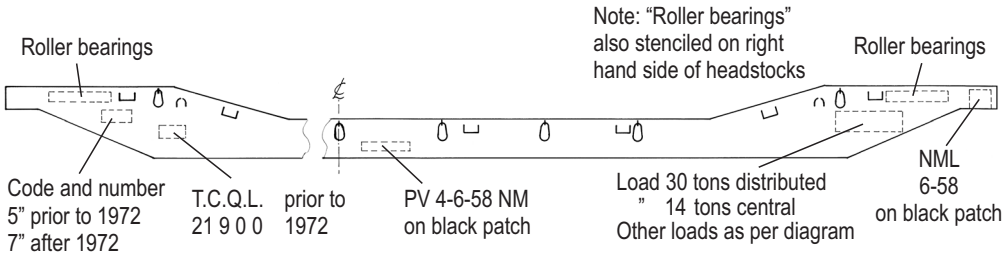



Figure 3



fit. When happy with the result, bend the end tags down and trial fit to the wagon end section. Fasten in place from the underside. Fasten the wheel arch flanges (12) in place around the splasher. Use a file to remove the parts of the splasher tops that protrude below the deck, as this will affect the ability of the wagon to take tight curves.

Bend the slope into the deck, taking care not to bend too far, then bend the two side plates of the end section down at 90º to the deck. The tab on the side plate should engage in the slot in the top surface, but do not fasten for the moment. Fold up an underframe bolster (29), and gently insert between the sides. A small dab of solder or adhesive on the inside, against the side plate, will hold this in place for the moment. Carefully file flush any tag projecting from outer face of each side. Now fasten the sides to the deck, while engaging the tab and slot.

Bend the small tabs at the end of each side in at 90º and then bend the headstocks up at 90º and fasten.

Fold the coupler/bogie mounting (3) to shape. Start with the inner bends in the coupler support, then the outer bends and finally the bends in the bogie pivot box. Form a nut cage (14) to shape and use it to attach an M2 nut to the coupler mounting. File flush any tags projecting above the surface of the coupler mounting face. Place two securing plates (21) and an M2 nut in the bogie pivot box and then carefully position the assembly over the underframe bolster. Tags in the bogie pivot locate in slots in the underframe bolster and a tag on the end of the coupler support locates in a notch in the headstock.

If building a type I wagon, fit a handbrake to ***both*** ends using parts 1 and 32. Bend each part 1 into a 'U' shape and secure it to the underside of the deck so that it locates in the half etched recess. Thread a short length of 0.4mm wire through the holes in each bracket and attach a hand wheel to the wire. Trim the excess wire. There is provision in the rim of the hand wheel to fit a handle, using a short piece of 0.25mm wire.

If building a type II wagon, fit the 'modern' hand brake to ***one*** end using parts 10, 10A, 6 and 13. Bend the tags on brackets 10 and 10A at 90º and attach the brackets so that the tags locate in the slots etched in the sides. Gently file flush any protrusion of the tags above the surface of the side plates. Thread two lengths of 0.4mm wire through the holes in the brackets and then attach the ratchet levers (13) so that the detailed side of the lever is to the outside. Trim the outer wire flush with the face of the lever. Now attach the spider wheels (6) over the inner wire and then trim the wire flush with the face of each spider wheel. Bend the spokes in the spider wheels out at about 10º

Prepare the end section side skin, part No.2 for attachment to the side. The best way to align this skin correctly is to also install one of the lashing rings at the same time. Strip the insulation off the wire-wrap wire and cut sections about 20mm long. Make a long 'U' of the wire about 10mm long and thread a ring (25) onto the wire. Feed the two ends of the wire through the holes in a ring attachment bracket (26). The bracket is fastened with the rivets towards the top, as shown in the detail view on Figure 2. Either tin the back of the side skin or place a smear of solder paste on the back surface. Now pass the two ends of the wire through the corresponding holes in the side skin and the wagon side plate. Pull it tight against the side. This will fix the position of the skin very accurately. Align the top edge of the skin to the top edge of the side sheet. Solder or fasten in place, taking care that the skin lies flat against the side plate with no buckles. Repeat for the skin on the other side.

Attach the long thin doubler plates (5), to the side skins. These are placed along the bottom edge below the axlebox inspection holes. There is an obvious gap in the rivet pattern where the plate is fitted. Also fit the larger plates (24) on the top deck. The plates are against the edge, covering the tag and slot used for assembly alignment. Again, there is a gap in the rivet pattern.

Remove the wagon centre section (4) from the fret and lay it upside down (with the SEM logo showing) on the workbench. Fit the 6 stanchion supports (31) to the slots in the centre section, as shown in the detail view on Figure 1. Turn the centre section over and file flush any tag that protrudes. These brackets may be omitted if you do not plan to fit the stanchions.

Fold the wagon centre section to shape but do not form the ramped end of the well yet. The 3 sections of the wagon fit together with an area of half etch at the join. This area is intended to make the join as invisible as possible, but at the same time, correct alignment is also important. Test fit the ends to the centre, and when satisfied with the fit, fasten in place. The half-etched section is quite thin and fragile. Take care not to distort it.

Fold the well end section attached to the ends down at 90º, then fold the corresponding part of the ramp up to overlap it on the outside. A set of tags is provided to effect correct positioning. Fasten in place.

The wagon at this stage will be quite weak at the joins, but the later addition of the side skin will strengthen the model. Lay the model on a flat surface and fashion a sanding block from a piece of 300 grit emery paper and a piece of wood approximately 20mm square. Gently sand the joins on the top surface where the ends meet the centre section to remove any trace of the join.

Prepare the well side skins (22 & 28) by pushing through the rivets on the reverse side. Fasten these into the well area. Add the side pieces first, followed by the ends.

Next, the side skins are attached to the wagon. The best method here is to sweat-solder the skins in place. Prepare the two surfaces with the fibreglass burnishing tool and gently remove any curve to the skin. It is important to make sure it is flat before trying to attach it. Smear a thin coat of solder paste on the wagon side. Prepare two lashing rings and use their wire 'U' bolts to align the skin. Apply heat with either a hot air gun or an RSU and the solder surface tension should suck the skin to the side of the wagon. Add the octagonal doubler plates (11) so that they cover the joins in the side skin sections.

Fit the remaining lashing rings to the sides and ends of the wagon. Rings are only fitted to the headstocks of a type I wagon without buffers. If you are modelling a type II wagon, you may wish to fit the more recent load attachments (8). These should be folded to a 'U' shape and added to the sides, in the positions shown on the painting diagram.

Fit the brake hose casting to the support bracket to the left of the coupler. Make a small curve in the hose towards the wagon centre to ensure rail clearance. If buffers are not being fitted, bend the shunter's steps to shape and attach either the wooden (18) or mesh (19) step. The wooden steps were used prior to the late 1960s. Fasten the step frame to the headstocks over the top of the small buffer holes. For a type II wagon, bend the nudge loops (15) into a U shape and fasten in the slots at the right hand end of the headstocks. Bend an uncoupling lever to shape from 0.3mm wire and attach to the shunters step frame and the bracket to the left of the coupler with 'U' bolts fashioned from the 'wire wrap' wire. The handle should swing freely. Clear out the holes in the sides and ends for the shunter's grab irons (20) with a 0.35mm or #80 drill and fit the grab irons in place.

The bogies can now be fitted to the wagon. Thread the small washer (36) onto the M2 x 5mm screw and fit to the bogie. Place the larger washer (37) between the bogie and the wagon. When the screw is tightened it will bind in the smaller diameter hole in the body bolster, locking it in place. Adjust the screw depth until the bogie swings freely with minimal freedom to rock sideways. Because the roller bearing bogies have smaller wheels, two washes should be placed between the body and the bogies at each end of the Type II wagon. A fourth spacer can be made from waste area of the etched fret. Attach the couplers with the M2 x 5mm screws provided, making sure that the screws do not bottom out against the deck. It may be necessary to file a very small amount from the end of each screw.

The cast stanchions were fitted to early examples of the wagons and it is your choice as to whether you fit them or not. They were removable, so you can fix them in place or just fit them when required. Hopefully, the lashing rings should all be loose enough to permit them to be swung up, to be used to hold down a load.

## And Finally.

When solder assembly operations are complete, the entire model can be immersed in a bath of methylated spirits to dissolve the flux prior to painting. After 30 minutes in the methylated spirits, place the model in a warm water bath with a little dishwashing liquid, swishing the water around for 2 to 3 minutes. Rinse in clean running water then leave to air dry.

Paint the model with a coat of Steam Era Models Etch Grey followed by a coat of Wagon Red. Keep the coats light to avoid loss of detail. Apply the decals as per the diagram and apply a final coat of clear flat finish to seal the decals.