



C/- P.O. Rhyll, Victoria, 3923.

VICTORIAN RAILWAYS WT WATER WAGON

Prototype Notes

The first of the 2000 gallon capacity water tank wagons represented by this kit, WT 10, was built at Newport Workshops and entered service during October 1899. Another fifty wagons, numbered 11 to 60, were built at Newport Workshops through to September 1902. From July 1912 through to November 1915 a further one hundred and five WT wagons numbered 101 to 205 were also manufactured at Newport Workshops.

These wagons were auto-coupled during the mid 1930s and lost their buffers and gained shunters' steps from late 1954. Amongst the last four wheeled wagons to be withdrawn, the WT wagons disappeared from regular service by the mid 1980s.

The WT wagons were used to:

- Carry water to stations and departmental residences not provided with reticulated water supplies.
- Provide auxiliary water supply for locomotives coupled to tenders.
- Provide water supply to fixed locomotive water tanks.

In times of drought trains of WT wagons were a familiar sight in the Mallee and Wimmera.

The change to metric capacity nominally occurred in 1972. Some WTs were stencilled with both metric and imperial capacity and many never had litre capacity emblazoned on them at all. The original 2000 gallons became 9000 litres. Decals are provided in this kit for both.

General assembly Notes

While this kit is highly detailed, it is a model of a quite small prototype. Therefore some parts are quite small and fiddly to fit. In an effort to minimise the difficulty in assembling the parts into a successful and satisfying model, many techniques have been employed in the design to assist the modeler. These are explained at length in the assembly instructions.

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 assemble it using glues rather than solder.**

By far the strongest assembly method though is solder and because the kit does not use any low melt metals, such as whitmetal, it could be regarded as a good kit on which to develop soldering skills. The kit designer highly recommends the use of solder paste rather than wire for assembly as 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.

The instructions generally recommend the fastening method for all components. Where an object is to be attached using glue you will be instructed to glue it, if soldering is the best method, you will be instructed to solder it. Where the choice is up to you, the instruction will simply be to fasten it.

Tools Required or Recommended

Sharp knife such as a Stanley knife with snap-off blades, or a scalpel.

Small bench vise.

Fine pointed tweezers.

A set of needle files.

Wire cutters.

Needle nose pliers and chain nose pliers.

60mm Brass butt hinge (see notes)

Pin vise for holding twist drills.

A 150mm 'Mill Smooth' file.
Piercing saw.
Glass fibre burnishing tool.
Emery paper, 300 and 600 grit.
A range of metric twist drills including: 0.3mm, 0.5mm and 2.1mm
A 'Dremel' tool with a small cutting burr is also useful.

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

Spare Parts

There 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

Clean off any flash or attachment tags from all parts prior to attaching them. All cast brass surfaces should be cleaned prior to soldering or gluing, as there is a fine coating on the brass that needs to be removed. A brass wire suede shoe brush is ideal for this purpose. Smooth the parts using the 600 grit emery paper. The cast brass items are attached to the sprue by rods that are often used for mounting the part. These rods are always well in excess of the length required. Always cut the part off, using a pair of side cutters or a piercing saw, close to the sprue with sufficient length to trim later.

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.

The 60mm 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. Any size hinge can be used, but 60mm 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 tabletop.

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.

Some parts have half etched dots in the back face. Where required, a rivet can be raised on the opposite face by pressing into this recess with a pointed object.

IMPORTANT NOTE: Where an etched brass component has a fold line, the half etched line goes to the inside of the fold.

Chassis Assembly

Refer to Figure 1.

Before starting on assembly, it would be wise to remove the etched handrail parts from the fret and store them to prevent any damage occurring during handling.

Prepare the main chassis, part No. 2. Remove the two half etched washers from the square holes and store them for later. Using the brass hinge or a suitable vice with smooth jaws, bend the side of the chassis at the inner fold on each side of the chassis underside. Then bend the outer fold back the other way at 90°. This will be difficult to do and will need a pair of vise grips or similar to hold the hinge shut. Even so, a perfect 90° bend will not result. By backing the hinge out a fraction and trying again you can eventually get the angle correct. Now bend the tags at either end of the headstocks up at 90°, using a pair of needle nose pliers. Gently bend the headstocks down by using a flat hard surface, then tidy up the bend with long nose pliers.

Again, using the hinge, bend the sides of the chassis spine, part number 5, down into a 'U' shape. Do not bend the tabs at this stage. Bend the tags on the nut cages at 90° and use them to attach an M2 nut to the spine at each end. After fastening the cages, smooth the opposite face to remove any projections of the tags. Bend the small bracket in the centre of the spine up at 90°.



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

Figure 1

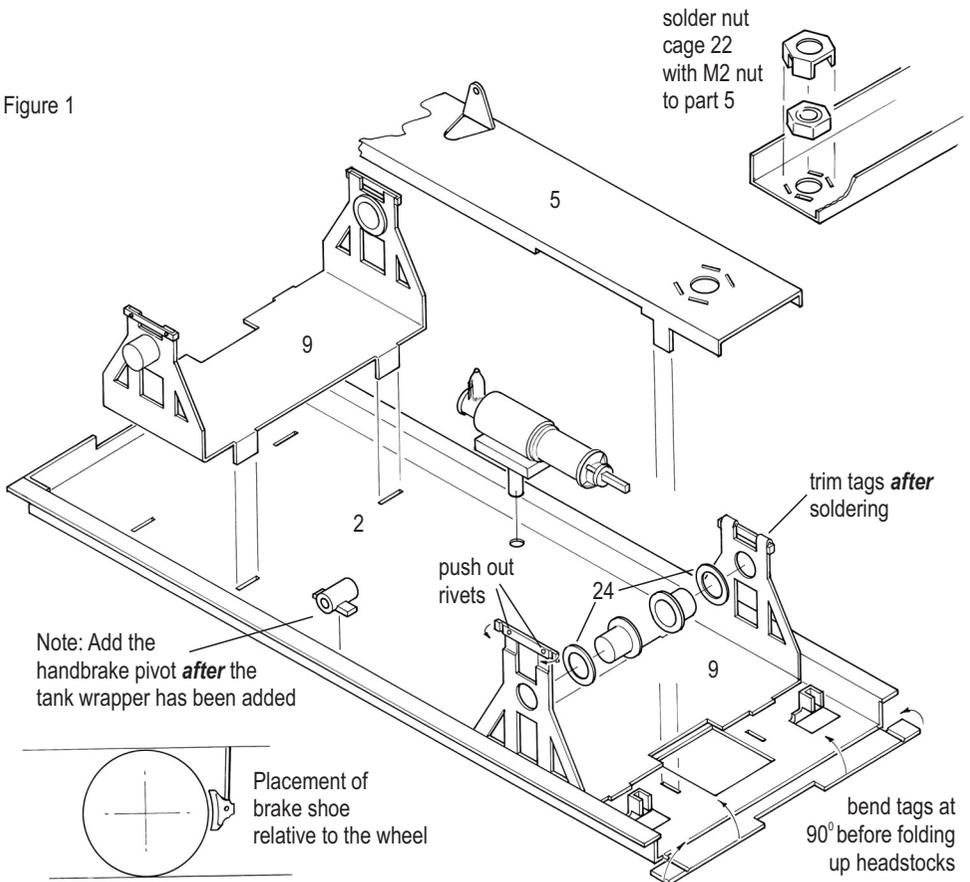


Figure 2

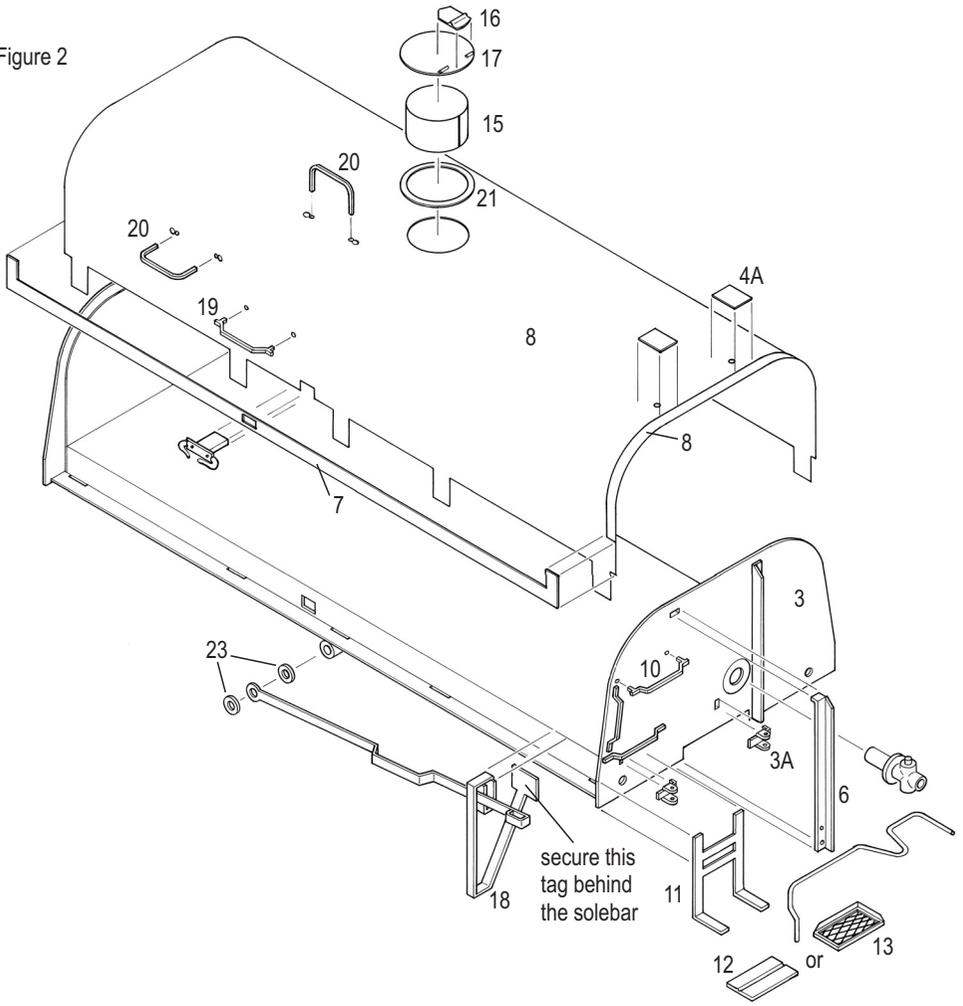
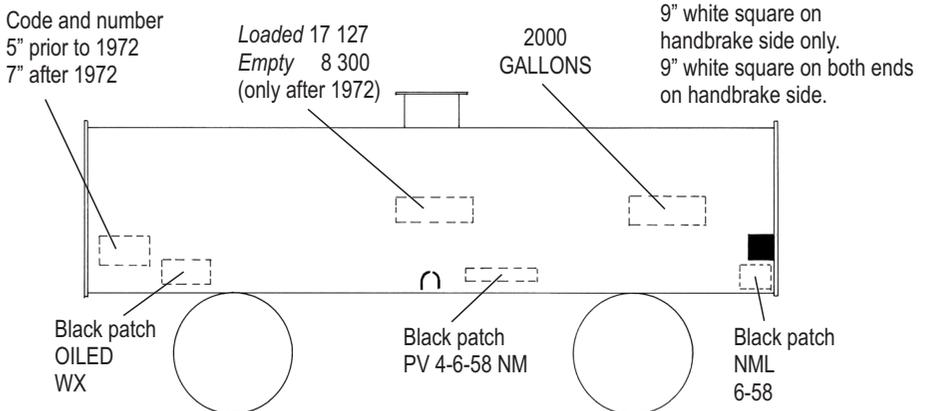


Figure 3



Remove the two W iron etchings, part No. 9, from the fret and press out the 'rivets' located in the keeper plates at the ends of the pedestals. Fold the keeper plate fully back on top of the bottom end of the W iron. Bend down the two tiny tabs on the ends of the keeper plate to lie along the side of the W iron. While the W irons are still flat, insert a bearing through a spacer washer, part No 24, and then through the hole in the W iron and secure. Now bend the W irons at the fold above the top of the irons at 90°. Finally bend down the four mounting tags along the sides.

Attach the W iron assembly to the chassis by inserting the tabs in the slots in the chassis and bending the tabs over towards the axle centre-line on the upper side of the chassis. Push the tabs flat against the top surface. It is not necessary to fix these tabs, as the spine will hold it in place anyway.

Fit the spine to the chassis with the 'X' and its arrow pointing away from the Steam Era Models logo. Fold the tabs down flat on the upper side away from the nut-cage and fasten with a small drop of solder or glue.

Prepare the cast brake cylinder assembly and fasten to the chassis with the piston rod end pointing in the direction of the arrow on the underside of the chassis. Trim off any remaining vestige of the mounting rod on the upper surface of the chassis. It should not protrude any more than the existing fold over tabs.

Prepare each cast axle box and spring assembly and clean out any extraneous lumps from the axle hole using a Dremel tool and small burr. Give the hole a final cleanout with a 2.1mm drill held in a pin vice. Check the fit by placing the casting over the bearing projecting from the W iron. It may be necessary to gently adjust the springs so that the ends meet the bottom of the solebar. When everything fits correctly, fasten in place, using solder or glue to attach the ends of the spring to the solebar, from the rear side.

Bend the brackets for the brake shoes up from the floor at 90° and then bend the sides in at 90°, as shown on figure 1. Reinforce the main bend to the floor with a small fillet of solder. Gently spring the W irons apart and install the wheels. Clean up the brake shoe castings and insert the cast hanger in the channel of the etched bracket. Squeeze the bracket closed around the cast hanger, using needle nose pliers. Check that the centre of the shoe is close to the centre line of the axle, as shown in Figure 1. Adjust if necessary and secure with glue or solder. Allow about 0.4mm clearance between the brake shoe and the tread of the wheels.

Body Assembly

Refer to Figure 2.

Remove the small etched parts Nos. 3A and 4A from the tank end assemblies 3 and 4. Remove the ends from the fret and clean up the tags, but **do not separate** the two halves of each assembly. The tank end with the majority of rivet detail is on the outside, and the etching process will have imparted a slight curve into this part. Gently remove the curve by stroking with the fingers.

Bend the two fixing tabs on the inside of the structural section a little away from flat. Clean the reverse side of the assembly and bend the two parts back so that they lie flat with the back of the metal on the inside. Check that they are correctly aligned, however the connecting tags should take care of this, and fasten the two together. If you are soldering the model, then the best method of fastening here is to sweat the two parts together, using solder paste and a hot air gun or RSU. File the tags off the bottom as they have served their purpose.

Insert the fixing tabs in the slots in the headstocks and bend them down towards the rail. At this time, also fasten the two tabs on the ends of the headstocks to the sides of the solebars.

Now place the resin casting on top of the underframe and check that the top is flush with the half etched step on the back of each end. If this is not the case, then you may need to snug down the fastening tabs on the top surface of the chassis, under the resin casting.

Remove the tank wrapper from the etched fret. It will have a slight curl caused by the etching process and will be quite springy. **Do not heat the part to anneal it.** Work the wrapper between fingers and thumbs to remove most of the curl. Form the main bends around a metal rod of about 8mm in diameter. Check the wrapper on the resin casting until a good match is achieved. Do not be tempted to attach the wrapper until the match is as close as you can achieve. It will not improve once you fix it down.

Cut the centre tab back to a length of 1mm on one side only. This side will go on the same side as the brake cylinder. Pass the fixing tabs through the lower edge of the solebar, on the side of the chassis with the brake cylinder. Bend the tabs over fully and fasten to the inside of the solebar, making sure that they hold the wrapper tight to the bottom lip. If you are gluing, you must allow the glue to fully harden before proceeding with the next step.

Insert the resin casting into position, place the wrapper tabs into the slots on the other side and gently pull each tab down to tighten the wrapper before bending them over to secure it. Fasten the tabs to the back of the solebar.

Attach the solebar angle overlay, part No. 7, to the bottom of the solebar, spotting it from one end to the other. Make sure it lies flat against the solebar.

Clean up the tank end angle, part No. 8, and trim the excess off the end just short of the first rivet. Spot onto one end and work your way over the top of the tank and down the other side, keeping the angle hard up against the tank ends. Cut off the far end to fit, so that this strip butts up against the solebar angle overlay.

Attach the four small patches, part No. 4A, to the top of the tank at the ends. The correct position is to centrally cover the small hole either side of centre, hard up against the angle and with the side that has 4 rivets away from the tank end.

Fasten the filler turret collar, part No. 21, to the central hole in the tank. Prepare the turret body, part No. 15, by rolling it on a mouse mat with a rod approximately 5mm in diameter, making sure the rivet side is down. Reduce the size of the rod and roll again, steadily increasing pressure until the ends meet. Tidy up the overlap with chain nose pliers. Overlap the metal by about 0.2mm with the rivets on the outside. Fit the turret into the hole with the join aligned along the longitudinal centre line of the tank and the two rivets on the outside to the top. Insert the small resin casting to help this part to keep its shape and fasten in place.

Fasten the hinge to the turret top, as shown in the drawing, and then attach the turret top to the turret. The top of the hinge should point to the same end as where the turret body join is located.

Press out the rivets at the bottom of each tank end angle iron, part No 6. Fold each part using a small vice to hold one half and then push the projecting half over with a steel ruler. Also bend the small tag at the top end at 90°. Note that these parts are handed, so refer to figure 2 for the correct orientation and attach the angles to the tank body. The small tag at the top of each angle locates in an etched slot in the end.

Fasten the two cast stopcocks in the holes in the tank ends with the shaft to the top. Fasten the cast towing hitches in place on the solebars, hooks pointing slightly up, as well as the cast handbrake pivot bearing on the opposite side to the brake cylinder. Locate the flat tab on the pivot bearing in the small slot in the chassis floor.

Bend the ratchet brake assembly, part No. 18, into the shape shown in figure 2. Fasten the assembly to the solebar, immediately to the right of the spring anchor. Attach the large tab to the inside of the solebar slightly closer to the headstocks. Fold up the brake handle, part No. 14, as shown and attach to the pivot bearing with a 20mm length of 0.5mm wire and spacer washers, part number 23. The inner end of this wire will be supported in the fold up bearing in the underframe spine. Trim any excess wire.

Alternative shunter's steps are provided. Two wooden boards were used up until the late 1960s, from which time they were replaced with steel mesh treads. The mesh step requires you to bend the etched sides at right angles to the step, with the etched side in. Use a small vise with smooth jaws to hold the part while bending. Attach the chosen step to the frames, part No 11, before attaching each step assembly to the headstocks.

Attach the 3 shunters grab handles, part No. 10, on the rear of the tank. You may need to drill out the holes with a #80 or 0.35mm drill.

Remove the uncoupling lever brackets from their etched fret and place them on a flat surface. Hold the edge of a steel ruler over the central section and bend the tags with holes in them up at 90°, forming a U section. Bend the small locating tag down at 90° and attach the brackets to the end of the tank, with the body of the bracket to the left of its locating slot.

Bend an uncoupling lever from 0.3mm wire as shown in the diagram and place in the uncoupler brackets. Insert a short piece of 0.3mm wire through the two holes in the uncoupler brackets, fasten, and trim off the excess. The lever should swing freely.

The handrails on the body of the tank are of two different types, as shown on figure2. You will need to drill the holes a little deeper into the resin core to mount these handrails.

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. Handle the cleaned model with rubber gloves, so that oils from the skin do not interfere with paint adhesion. Attach the couplers of your choice with the M2 x 5mm screws provided. The coupler box will project from the face of the headstocks by about 1mm.

Paint the model with a coat of Steam Era Models Etch Grey followed by a top 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.