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SAR Brill Model 75 Railcar & Trailer 3D Printed Version



Photo Noel Reed

The Prototype: Following the success of the Brill model 55 railcars introduced to the SAR in 1924, Commissioner Webb placed an order for the larger model 75 type. One pattern car was ordered complete from the Brill company and 24 chassis were ordered, with the cars to be completed by the Islington workshops. The model 75 was a standard type used in the USA. The broad gauge cars were numbered 30 to 47 and narrow gauge cars were numbered 100 to 106. Twenty broad gauge trailers (200 - 219) and four narrow gauge trailers (300 - 303) were also constructed. In 1928 railcar 44 and trailer 200 were sold to the Victorian Railways and worked in the Echuca area. A second order of 11 railcars entered service in 1930, numbered 44 (replacement) and 50 – 59. (Broad gauge cars 48 and 49 were converted from narrow gauge cars 104 and 105).

The original Winton petrol engines began to be replaced with Gardner diesels in 1937. In 1947 it was decided to modify the railcars so that they could work in multiple unit up to a maximum consist of two trailers with a power car at each end. This meant that the front radiator was ineffective on the trailing power car, so additional roof radiators were fitted to the MU cars.

To improve the comfort for passengers on longer country runs, starting in 1938 some cars were converted with back-toback seating similar to that in the Centenary cars, and fitted with what was described as an "improved interior". These became known as "milk bar" cars because of the seating pattern. The example in the National Rail Museum (No 41) is a milk bar car. A tabulation showing the conversions of the various cars is given at the end of these notes.



Photos courtesy Johnny's Pages

Paint Schemes: When introduced the cars were painted a brown colour. After 1936 the cars were repainted in the Hawthorn Green and Cream Centenary scheme with silver roof, and silver on the insides of the rear vestibule stairs. Lettering was gold with drop shadows of red and black (a little hard to reproduce in N scale). The radiator was black and the

front extension beneath the radiator was silver (see photo top above). Various patterns of safety stripes and Dayglo stripes were applied to the cab ends to improve visibility.

For More Information:

Much of the information used in the development of the kit and presented here was gleaned from the notes of the *Modelling the Railways of South Australia Convention* pp 3-473 – 3-520 and the line drawings in that article, as well as the SAR line drawing. The article gives a complete listing of all the cars and their history.

Steam Locomotives and Railcars of the SAR (MERM, 1986) also has information and more photographs.

Johnny's Pages: <u>http://www.johnnyspages.com/classic_pictures_menu_files/classic_jack%27s_pictures_files/railcars.htm</u> has a wonderful collection of photographs of Brill 75s in action and some of the photos in these notes are courtesy of that site.

The Comrails web site: <u>http://www.comrails.com/sar_locos/r_b_brill75.html</u> is a wonderful source of information on these (and other) cars.

Volume 5 of *A History of the South Australian Railways* by Ron Stewien has a full history and also colour photos on p49, 57, 60, 61 and 64.

Train Hobby Publications *Railway Stations - Greater Metropolitan Adelaide* has a photo of No 43 on p20 illustrating the full front safety stripe scheme. *Country Branch Lines South Australia The Broad Gauge* has a photo on p12 of No 39 and a trailer showing the Dayglo safety stripe pattern.

The Kit: This version of the kit consists of 3D printed parts from Shapeways, rather than the urethane of the original cast version. This simplifies some aspects of the construction.

The kit represents the original or "maximum capacity" configuration of the cars and provides the option of the roof radiators or the original. The kit consists of a three-part body with additional parts for underfloor details and etched brass cowcatcher, headlight and taillight. Three optional parts are provided if the version with roof radiators is to be modelled: different front radiator and two roof radiators. The kit is intended to use the Tomytec TM-10R mechanism. Assembly of the printed components should be done with cyanoacrylate adhesive (superglue). Note that two alternative nose parts are included: one for the original petrol powered SAR railcars with original radiator, also suitable for modelling US prototypes and one for the SAR roof radiator version (see photos).

Note: Before starting, read through the instructions and give consideration to painting the nose and steps before final assembly – it will be easier to mask and paint these parts before assembly. However, obtaining the correct fit for these components should be completed prior to painting and final assembly.

- 1. Clean up the body, nose and step parts to remove any remaining wax or oil. It may be necessary to smooth out some of the surfaces by rubbing with fine sandpaper.
- 2. Test fit the steps, so that they fit neatly in the end of the body. Check that the steps fit neatly under the doors. The bottom of the rear extension should fit flush with the bottom of the body sides. If necessary, sand or file to achieve the required fit. It is recommended that the hole for the coupler be located and drilled before assembling this part to the body. When a good fit is achieved, the steps should be glued to the rear of the body.
- 3. Test fit the nose piece, so that it fits neatly in the cab end of the body. If necessary, sand or file to achieve the required fit. The bottom of the nose should fit flush with the bottom of the body sides. It is recommended that the holes for the coupler and cowcatcher be located and drilled before assembling this part to the body. When a good fit is achieved, the nose casting should be glued to the body.



Version with Roof Radiators:

If it is desired to model the version with roof radiators the nose part with the sloping radiator should be used. It will



4. Mechanism: It is necessary to trim a small amount (approx. 0.5 mm) from the front of the mechanism to match the internal curved profile of the cab (see diagram). The portion marked red in the diagram should be removed. Check that the mechanism fits between the body sides. The mechanism can be inserted into the body, with the rear steps and front radiator attached, by inserting the rear of the mechanism above the rear steps at an angle, see diagram. The mechanism can then be pushed to the rear enough to be lifted clear of the front radiator portion. It can then be brought forward and lifted up against the stops, including the rear stops which also locate the mechanism forward against the front cab wall (see diagrams).





Step 1 Insert rear of mechanism above rear steps, push to rear. Step 2 Lift mechanism to clear front radiator

5. Couplers: it is recommended that Microtrains Z scale couplers be used, to give a more realistic size for this diminutive vehicle. However, space has been allowed to accommodate N scale 1015 couplers if desired. They should be fitted to the bottom of the nose extension and the rear extension of the steps, drilling using the centre marks provided. You should drill on the centreline 2.5 mm back from the outer edge.



Adelaide Railcar Sidings 1969 Photo M. Jenkins

6. Fit the bogie side frames into the holes on the sides of the bogies in the chassis. They should be a light press fit and should not require any adhesive. If they are too loose, apply cyanoacrylate cement (superglue), if too tight, carefully drill or ream out the holes in the bogies to suit. The smaller units are applied to the front power bogie which has exposed wheels as seen in the drawing below, the outside frames are for the rear bogie.



South Australian Railways 75 Class 'Maximum Capacity' Brill Railcar

Drawing by Hugh Williams courtesy of MRSAC

7. Details: the battery box and air cylinders should be glued to the underside of the mechanism on the left hand side and the fuel tank to the right. For locations see the drawing below or the drawing in the MRSAC notes on p3-517. Paint these parts before fitting to the mechanism.



Underframe and brake detail looking down from roof to frame. There are a number of differences in position of detail from vehicle to vehicle. Details of underframe and brake detail taken from several sources, so these should be considered generic rather than actual. Drawing by Hugh Williams courtesy of MRSAC

8. The horn is formed from a brass pin by bending into a Z-shape and should be fitted into a hole drilled above the left hand centre pillar of the driver's cab (see photos).

9. Headlight: the headlight is to be laminated out of a total of four circular pieces. The second from the front also contains





the mounting frame. The parts should be cut from the etch fret using a craft knife or sprue cutters, but leave the central frame member attached for ease of handling during assembly. The front piece has the raised outline of the headlight. The parts can be assembled either by soldering or with superglue, after carefully cleaning in vinegar and then water. Once the four circular elements have been combined to give the depth of the lamp, remove the assembly from the etch



then the pin on the bottom of the frame should be bent backwards at 90°. The pin can then be inserted in a 0.75 mm hole drilled centrally in the roof at the front.



The rear light is similar, but with three laminations and a vertical pin.

10. Cowcatcher: separate from the fret. The half-etched line for the fold in the lower bar is on the *back*. Then, while holding the top bar and two side bars of the cowcatcher flat with steel rules or similar, gently raise the centre of the lower bar by inserting a narrow tool under it, so as to form the shape of the cowcatcher. The pins on the upper bar are inserted into two 0.7 mm holes drilled at 10.25 mm centres on the underside of the front extension. The cowcatcher upper bar should sit just below the Microtrains Z scale coupler box.



Trailer:

- 11. Check the fit of the floor into the bottom of the body, as in Step 2. *Be careful not to file the detail off the side of the air tank, which is proud of the floor edge* (voice of experience here). The floor should rest up against the stops and then be flush with the bottom of the body walls. Next, check the fit of the steps, so that they fit neatly into the floor openings. Finally insert the floor into the body and check that the steps make a neat fit into the door openings in the end of the body. Check that the steps fit neatly under the doors. If necessary, file or sand the steps or floor to obtain the required fit. It is recommended that the holes for the couplers be located and drilled before assembling the floor to the body. When a good fit is achieved, the steps should be glued to the rear of the floor.
- 12. The bogies require wheels and axles. They are designed to take either Fox Valley 36" wheels with 0.540" axle length, or MicroTrains wheels. The detail plastic has proven durable even with metal wheelsets. The bogies can be fitted

using MicroTrains pins. The mounting holes, for which centres are marked on the floor casting, should be drilled to 5/64" to accept the pins.

- 13. Couplers: it is recommended that Microtrains Z scale couplers be used. However, space has been allowed for N scale 1015 couplers if desired. They should be fitted to the bottom of the floor, drilling using the centre marks provided.
- 14. Taillight: the taillight should be laminated and fitted as for the power car (Step 9 above).

Trailer and Power Car:

- 15. Painting: first wash the model in warm soapy water, rinse and dry. Apply an etch primer, then the appropriate colour scheme (see notes on paints below).
- 16. Apply decals: the SAR is located on each side centrally on the upper letter panel above the windows. The number is applied centrally below the windows on either side (see photographs). The number on the front was located either on the panel below the driver's window or centrally above the cab when associated with the Dayglo stripes see photographs of your chosen prototype. At the rear the number was applied to the panel below the window on the right (as seen looking at the rear, see photo above.) If the overall front safety stripe decal is to be applied, then the front area beneath the roof line and forward of the front doors should be painted either black or red, depending on the prototype to be modelled (refer to photographs of your chosen prototype). However, the window surrounds are still cream (refer to photographs). The yellow stripe decal should be carefully cut out cut out the spaces for the radiator and the windows and then applied over the nose. In this case the front number is applied to the black patch under the driver's window.

For the trailer the numbers on the ends were located on the panel below the window on the right, as seen facing each end.

Paint Colours

For the green and cream Centenary scheme: Humbrol No 3 Brunswick Green is a good representation of the green. For the cream, Humbrol No 41 Ivory has a white colour, while No 74 Linen (matt) has more of a cream hue. It is possible to add a few drops of No 7 Light Buff to No 41 to get closer to the cream colour. Roof silver, step interiors silver, front extension silver, radiator black.

For the underbody a matt black and suitable weathering would be appropriate.

Acknowledgements

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Photos this page all courtesy Johnny's Pages

Tabulation of Changes to Broad Gauge Cars

No	Milk Bar	MU/ Roof Radiators	Notes
30	13/7/39	Yes	
31		Yes	
32		Yes	
33			
34		Yes	
35		Yes	
36		Yes	
37		Yes	
38		Yes	
39		Yes	
40	10/12/40		
41	24/4/40		
42		Yes	
43		Yes	
44		Yes	Second (replacement) 44
45		Yes	
46	13/8/40		
47		Yes	
48			To N.G. as 104, 7/7/36
49			To N.G. as 105, 9/5/44 and again 6/57
50			
51		Yes	
52		Yes	
53		Yes	
54	22/4/39	Yes	
55	6/5/38		
56			
57			
58		Yes	
59			

Tabulation of Changes to Broad Gauge Trailer Cars

No	Milk Bar	Notes
200		Second (replacement) 200, intended to be N.G. 304
201	14/12/40	
202	8/5/40	
203		
204	21/8/40	
205	19/7/39	
206		
207		
208	22/5/39	
209	1/6/39	
210		Altered to provide accommodation for 3 horses
211		
212		
213		
214		
215		
216		
217		
218		
219		
220		Built as N.G. trailer 301, converted to B.G. 8/30
221		Built as N.G. trailer 300, converted to B.G. 8/30