



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

## VICTORIAN RAILWAYS DIESEL ELECTRIC RAIL MOTOR

### Prototype Notes

In 1928 Newport Workshops constructed a rail motor using parts supplied by St. Louis Car Company of the U.S.A. Power was provided by a six cylinder Winton petrol engine. Numbered 55RM, the design was generally similar to contemporary "Gas Electric" cars built by St. Louis Car Company and E.M.C. for various American Railroads.

A further nine railmotors, 56 to 64RM, were constructed at Newport Workshops in 1930/31 to a generally similar design, although these nine copies differed in a number of areas, being 8" longer over the body and having quite different bogies. Power was again provided by a Winton 220Hp petrol engine.

In 1951/52 these Petrol Electric Rail Motors had their Winton petrol engines removed, to be replaced by twin GM six cylinder diesel engines. The existing generator and electrical equipment was retained. The only external alterations caused by this repowering was a change to the exhaust system, and the ventilator grill in the left side engine room door was set into a smaller hinged door. Now known as DERMs, these railmotors soldiered on for another forty years providing branch line passenger service as well as some shorter mainline services to destinations such as Kyneton, Leongatha and Seymour.

56RM was refurbished for the Benalla-Yarrowonga service in 1976, being equipped with larger, more comfortable seats, similar to the Z type passenger cars. Externally, Fletner ventilators replaced the torpedo vents on the roof. 55RM and 61RM were extensively altered in 1978, with the radiators removed from the front of the car and roof, and the engine/generator repositioned to run longitudinally rather than transversely. This kit is suitable to construct a model of any of the railmotors 56 to 64RM (but not 56 or 61RM after their refurbishment) as operating from 1952 until their withdrawal in the late 1980's.

As would be expected, various changes were made over the years, and these changes need to be accommodated with the choice of optional parts and selection of a kit with appropriate motor bogie sideframes. The principal alterations made after the 1952 change to diesel traction are as follows.

**1958/59:** Cowcatchers made from 1/2" n.b. black pipe were removed and replaced with a simplified and more robust design made from steel plate. At the same time the single tone air whistle above the driver's windscreen was removed and replaced with a RVB three chime horn located on the roof. Also the three piece driver's windscreens were replaced with single panes of glass and it would seem that it was at about this time that the arched window in the van compartment was sheeted over and a cover of mesh and angle iron framing placed over the radiator front.

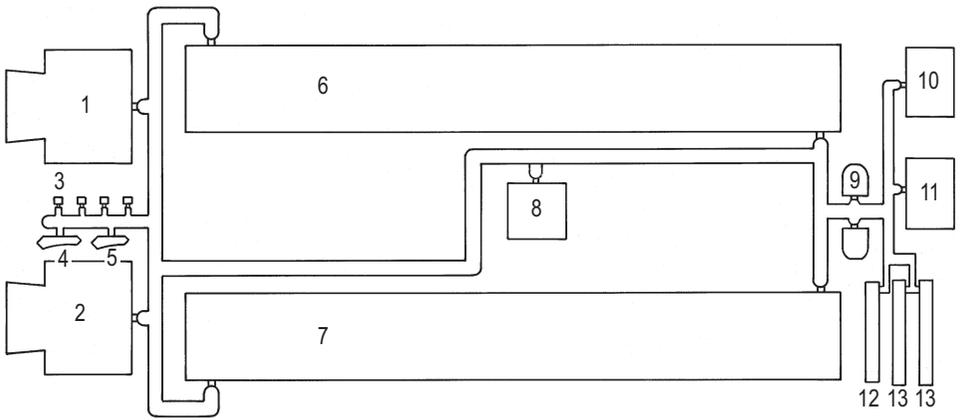
**1963/64:** The brake equipment was extensively altered when the trailing end hand brake was removed and a separate brake cylinder, each with its own auxiliary reservoir and triple valve, was provided to operate the rigging on each bogie. Prior to this alteration there was just one brake cylinder, with attendant auxiliary reservoir and triple valve, to apply the brakes on both bogies. It was at about this time that the Smith's combustion heater was installed on the underframe blowing heated air through ducts running down each side of the passenger saloon at floor level.

**1965/68:** The plate frame motor bogies, with which the rail motors had been equipped when built, were replaced with a cast steel design. This same change had been made to suburban electric stock and the cast bogies presumably came from swing door cars being scrapped at the time.

### Necessary Equipment

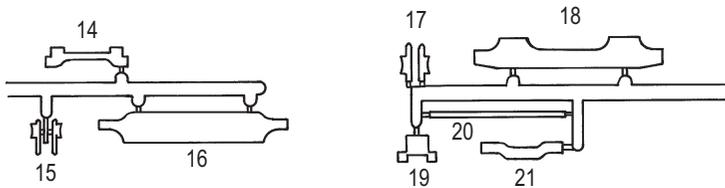
Tools required are a sharp knife such as X-acto or surgeon's scalpel, an assortment of needle files, a pair of fine pointed tweezers for applying small parts, a pair of needle nosed pliers and a small model maker's vise for bending the handrails and a pair of wire cutters. A small soldering iron is required for making the electrical connections. A selection of small drills and a piercing saw are also useful.

Adhesives required are a solvent cement such as Steam Era Models Polystyrene Cement for plastic to plastic joins, and a tube of super glue for securing metal parts such as the handrails.



**Body**

- |                    |                       |                            |
|--------------------|-----------------------|----------------------------|
| 1. Rear end        | 6. Right side         | 11. Post 1958 radiator     |
| 2. Front end       | 7. Left side          | 12. Vestibule cross member |
| 3. Marker lamps    | 8. Handrail jig       | 13. Body cross members     |
| 4. Rear sun visor  | 9. Van window blanks  |                            |
| 5. Front sun visor | 10. Pre 1958 radiator |                            |



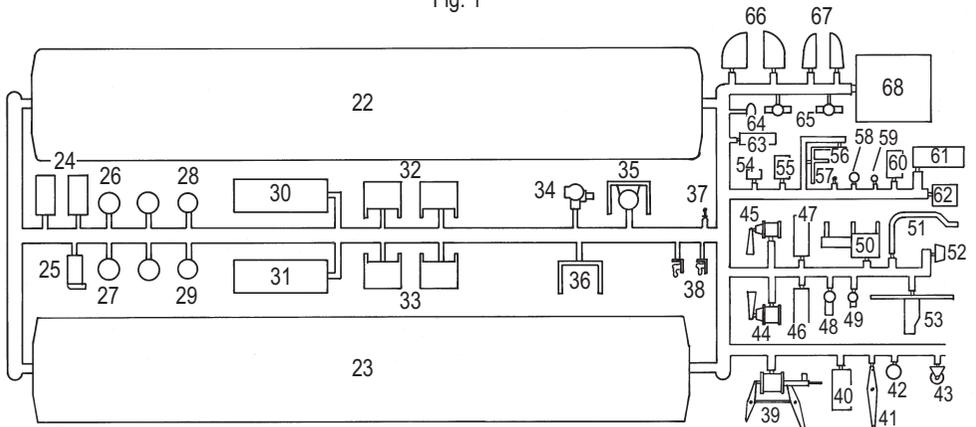
**Cast Bogie**

14. Headstock  
15. Brake shoes  
16. Sideframe

**Plate Bogie**

17. Brake shoes  
18. Sideframe  
19. Secondary suspension  
20. Pedestal Tie  
21. Headstock

Fig. 1



## Roof Floor and Details

- |                            |                                 |                             |
|----------------------------|---------------------------------|-----------------------------|
| 22. Roof                   | 38. Triple valves               | 54. Front headlight bracket |
| 23. Floor                  | 39. 14" Brake cylinder          | 55. Rear headlight bracket  |
| 24. Bolster plates         | 40. Base for 14" brake cylinder | 56. Radiator plumbing       |
| 25. Handbrake gearbox      | 41. Handbrake lever             | 57. Radiator vent pipe      |
| 26. Main reservoir ends    | 42. Auxiliary reservoir         | 58. Heater flue base        |
| 27. Main reservoir bodies  | 43. Handbrake pulley            | 59. Heater flue cap         |
| 28. Water reservoir end    | 44. 12" Brake cylinder          | 60. Exhaust silencer        |
| 29. Water reservoir body   | 45. 8" Brake cylinder           | 61. Handrail jig            |
| 30. Fuel tank bottom       | 46. Base for 12" brake cylinder | 62. Cover for whistle       |
| 31. Fuel tank top          | 47. Base for 8" brake cylinder  | 63. Roof step               |
| 32. Battery box fronts     | 48. Auxiliary reservoir         | 64. Torpedo vent            |
| 33. Battery box bodies     | 49. Auxiliary reservoir         | 65. Headlights              |
| 34. Air compressor         | 50. Smith's heater              | 66. Air duct grilles        |
| 35. Compressor motor       | 51. Heater flue                 | 67. Roof canoe panels       |
| 36. Compressor support     | 52. Handbrake pulley            | 68. Roof radiator           |
| 37. Handbrake guide pulley | 53. Brake lever support         |                             |

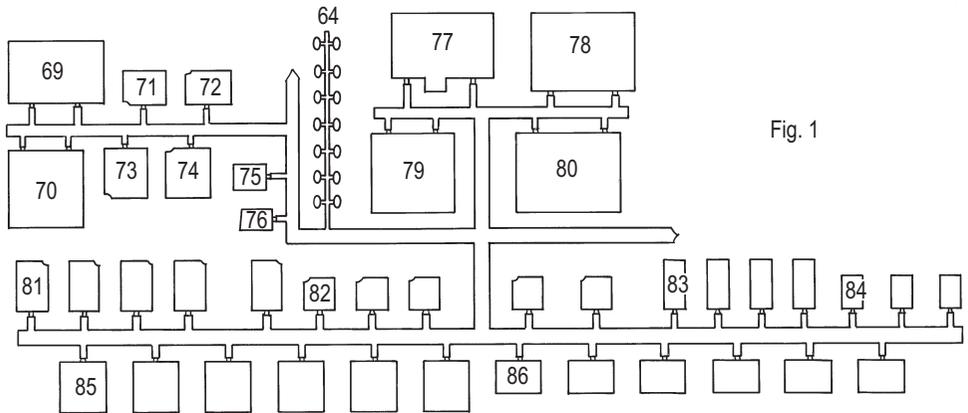


Fig. 1

## Interior

- |                                 |                         |                              |
|---------------------------------|-------------------------|------------------------------|
| 69. Air duct                    | 75. Railfan seat back   | 81. Six passenger seat back  |
| 70. Rear driver's partition     | 76. Railfan seat base   | 82. Four passenger seat back |
| 71. Left hand double seat back  | 77. Saloon partition    | 83. Triple seat base         |
| 72. Right hand double seat back | 78. Van partition       | 84. Double seat base         |
| 73. Left hand triple seat back  | 79. Toilet partition    | 85. Six passenger seat base  |
| 74. Right hand triple seat back | 80. Vestibule partition | 86. Four Passenger seat base |

## Assembly

Figure 1. identifies the parts on the runner systems. Each part is attached to the runner by a small "gate". When removing a part, cut close to the runner, then carefully trim and file the gate to the part. Leave parts on the runners until called for in the instructions and do not twist them off, as they may be damaged.

### Preparation of sides and ends

Cut off the hooks moulded on the back of the sides and ends. Do not cut off the cylindrical pins moulded on the back of the ends and behind the right side vestibule door. If the arched windows in the van compartment are to be blanked off, remove the window sash detail using round and square needle files and a sharp knife.

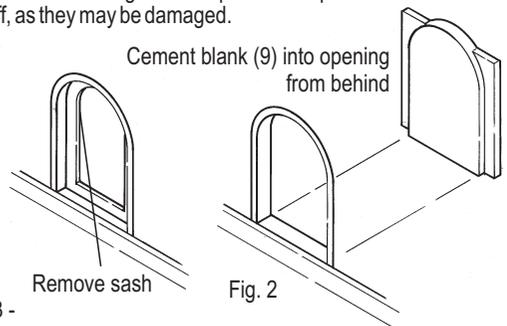


Fig. 2

When built, the rail motors had wide steps under the van compartment side doors. When the motor bogie was changed to a cast steel frame with flip top axle box lids, it was necessary to reduce the width of these steps to allow the axle box lids to hinge up. Extra framing has been moulded in the steps to cater for this variation. Trim the excess framing away with a sharp knife.

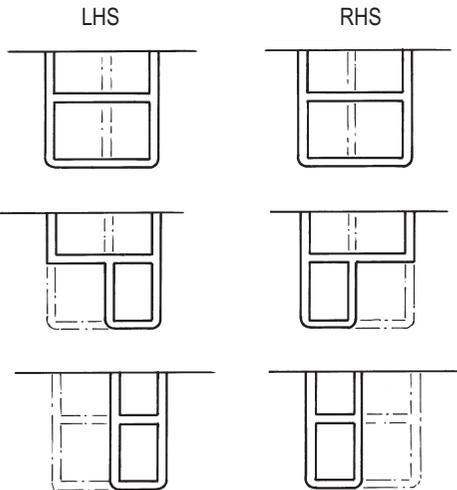


Fig. 3

(i) Plate frame bogie

(ii) Cast bogie 57, 59, 64 RM

(iii) Cast bogie 56, 58, 60-63 RM

Cut away sections drawn in dotted lines.

## Handrails

Holes have been moulded in the sides to accept formed wire handrails. A jig is provided to assist with bending these handrails to shape from the wire supplied.

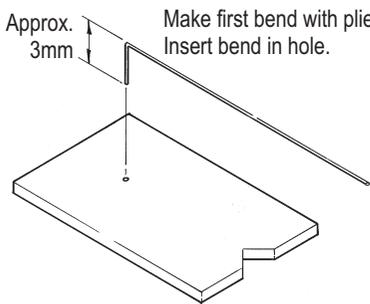
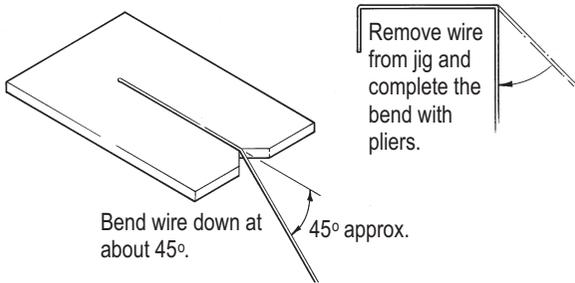
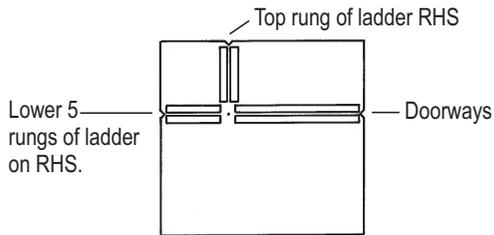


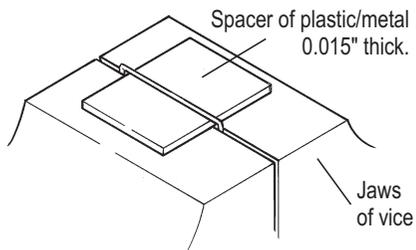
Fig. 4

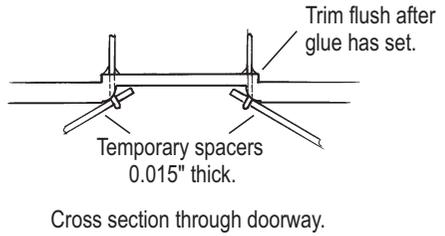
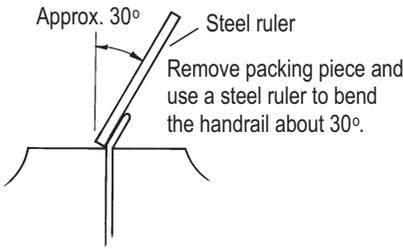


An optional added touch is to add a sideways bend in the doorway handrails.



Detail of jig (8)



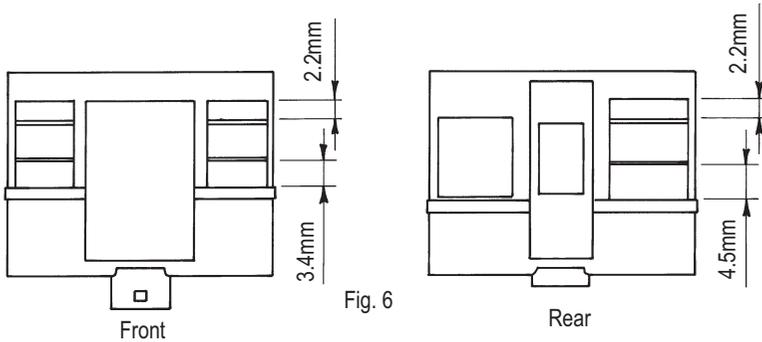


Push the ladder rungs in flat against the body side and secure from behind with super glue.

### Rod cowcatcher

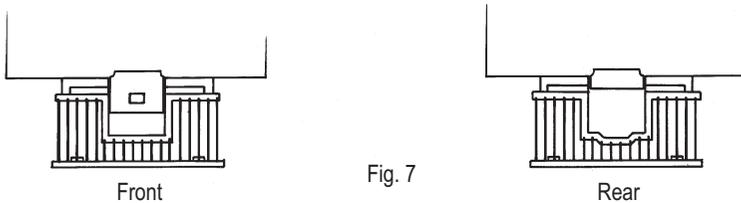
For those modelling the period prior to 1958/59, rod cowcatchers are provided in the form of brass investment castings. Trim each casting from its sprue with a fine toothed piercing saw. Clean up any flash and extraneous casting dregs with various shape needle files. Trim the plate cowcatcher mouldings and the bumpers from the end mouldings, but leave the detail of the coupler striker plates in place.

If the rod cowcatcher is fitted, the driver's windscreens need dividing bars added. Trim the window frame at the top so that the window opening extends up to the opening in the external sheeting. Add the dividing bars from 0.010" x 0.030" strip (top) and 0.010" x 0.020" strip (bottom). Because the sun visor obscures the top portion of the windscreen, you may prefer to leave the opening as it is, and just add the bottom dividing bar.



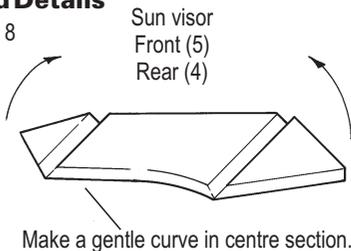
Check the fit of the cowcatchers against their respective ends. The rear cowcatcher has a joggle in the framing under the coupler.

Glue each cowcatcher to its respective end with super glue.



### End Details

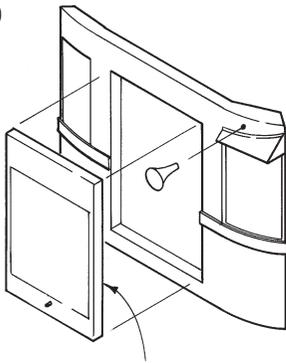
Fig. 8



Fold each end 90°

Cement each visor above its respective windscreen, with the top edge against the strip moulded on the end.

Fig. 9



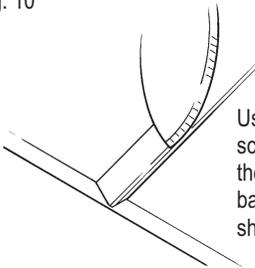
Round off back corners.

Select the appropriate radiator front. DERMs fitted with rod cowcatchers should use part 10, whilst those with the plate cowcatcher use part 11.

Carefully cut the hooks off the back of this moulding. The fit of this part in the recess moulded in the front is improved if the back corners are rounded off slightly by scraping the edges with a sharp knife. Secure the radiator in the recess in the front with a bare minimum of cement.

If a rod cowcatcher is fitted drill 1.0mm on the mark above the driver's windscreen. The largest trumpet, taken from the three chime horn, will locate in this hole. DO NOT add the trumpet until after the model has been painted and the decals are applied.

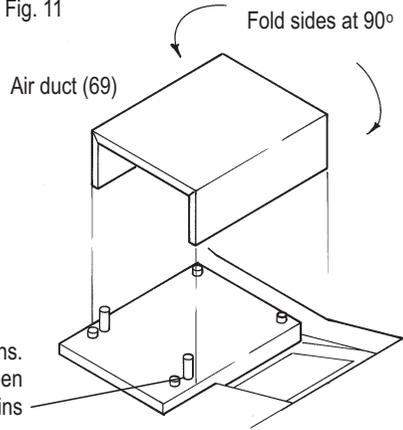
Fig. 10



Use the point of a scalpel to make the grooves in the back of the air duct sharper.

Note: The duct must not extend below these long pins. This will allow the floor to locate between the long and short pins

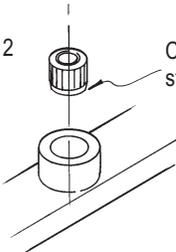
Fig. 11



### Assembly of body.

Glue one side to an end to make an 'L'. The pins/recesses moulded in the back of the mitred corners help with alignment. Once the cement has started to hold, cement these two sub assemblies together to make an open box.

Fig. 12



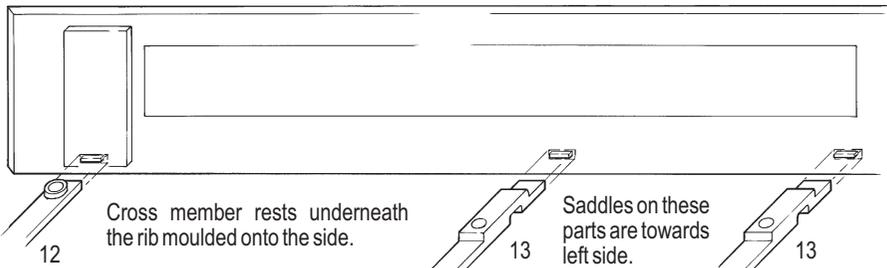
Chamfer to help start insert.

Four screws and four threaded inserts are provided in a separate small plastic bag. Press one threaded insert into the recess moulded in each of the body cross members.

Very carefully add a droplet of super glue on the end of a pin to the edge of the threaded insert. Do not let the super glue enter the thread.

Cement the cross members into the body, bridging from one side to the other.

Set the body aside for the cement to fully harden.



Cross member rests underneath the rib moulded onto the side.

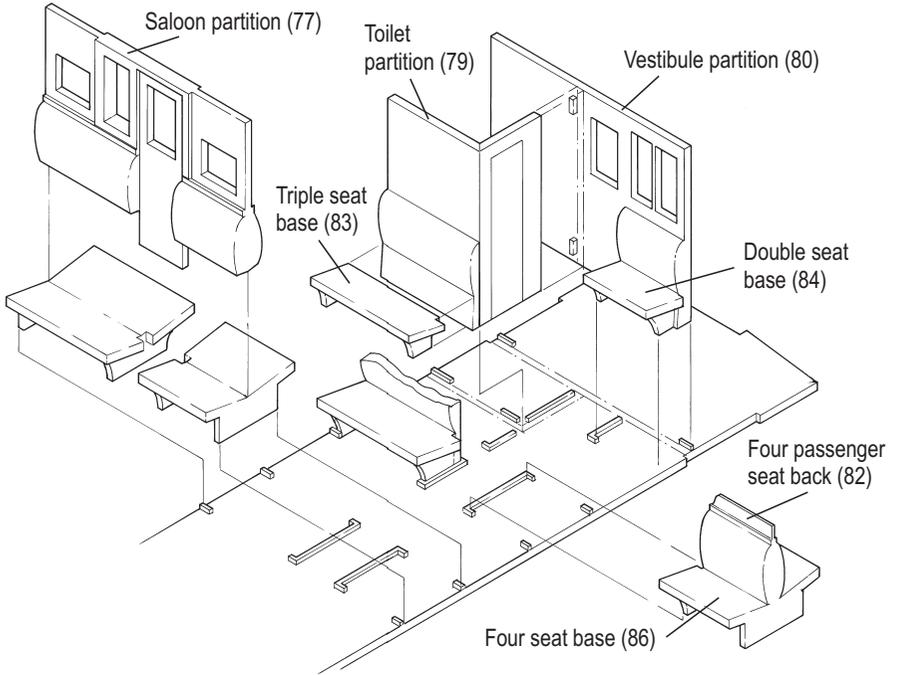
Saddles on these parts are towards left side.

## Interior Detail

Partitions and seats are moulded in beige plastic, so they may be left unpainted to represent varnished woodwork. The seat cushions were dark green in second class (between saloon partition and van) and dark blue/black in first class.

Fig. 13

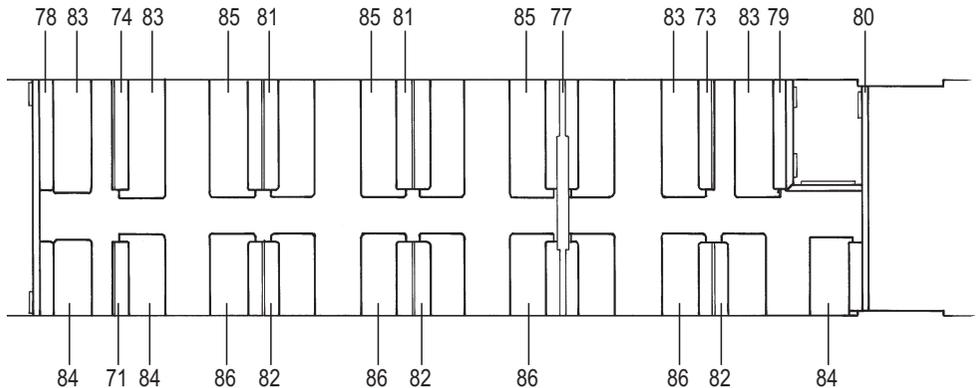
Note: Use a scalpel to make the groove in the back of the toilet partition sharper - as shown in Fig. 10. Then fold partition 90°.



Do not fit the railfan seat, or rear driver's partition in place at this time. These parts are installed after painting and glazing.

Fig. 14

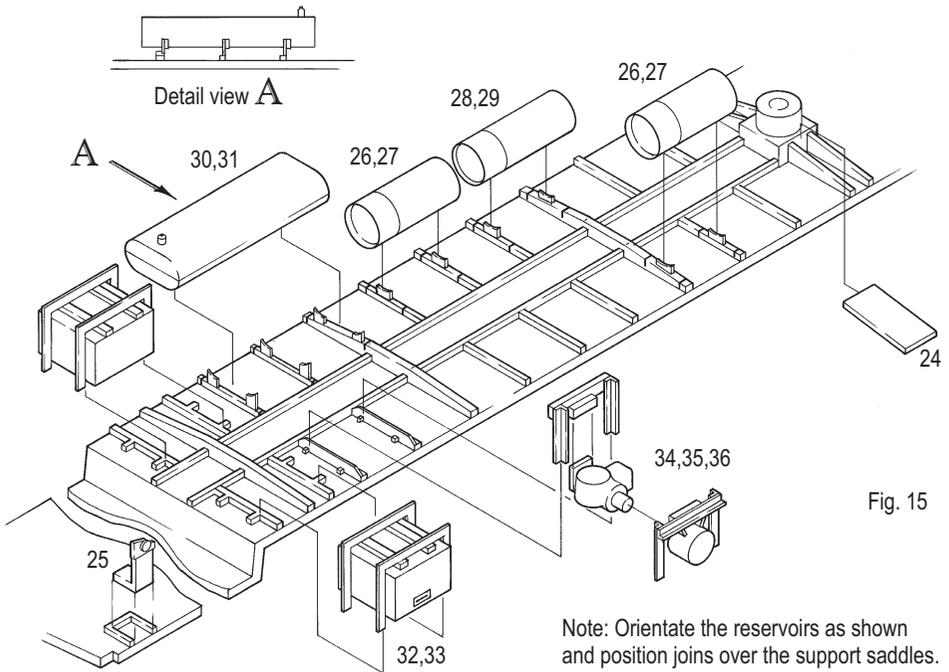
Plan view of saloon seating.



Note: Trim the outer ends of the seat bases adjoining the van and vestibule partitions, so that the aisle is wider in front of the doorways.

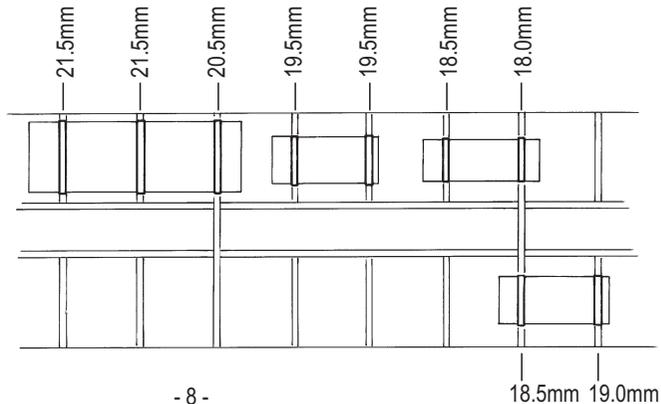
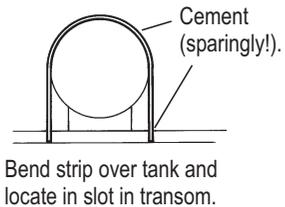
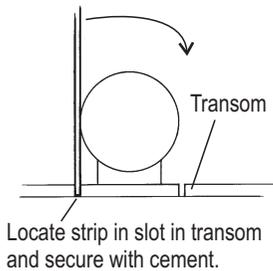
## Underframe detail

Cement the 'Common' underframe detail components to their respective locations on the underframe.



Note: Orientate the reservoirs as shown and position joins over the support saddles.

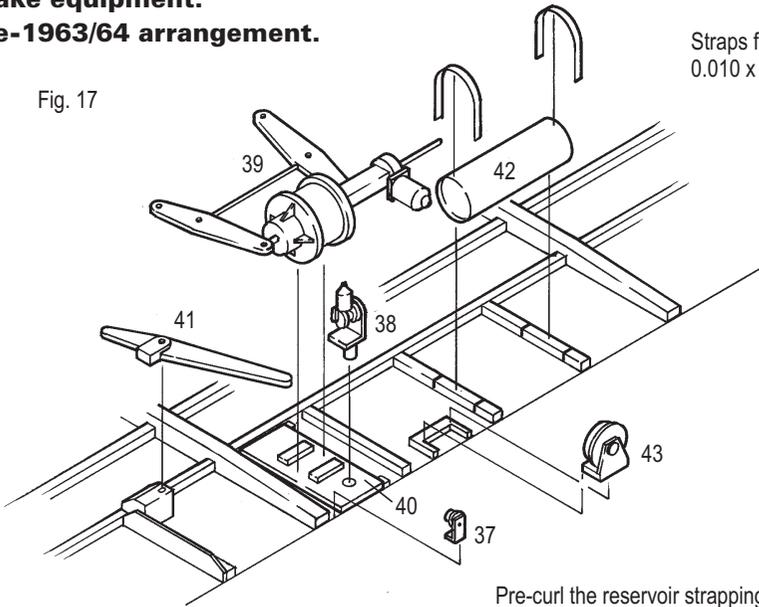
Add strapping to the reservoirs and fuel tank, cut from the 0.010" x 0.030" strip provided, to the lengths shown in the diagram below. Allow an hour for the cement securing the reservoirs to harden, before adding the strapping.



When securing the strapping, use a citrus type cement such as Steam Era Models "polystyrene cement" or "Microscale Microweld". If M.E.K. is used the strapping may crack on the bends.

**Brake equipment.  
Pre-1963/64 arrangement.**

Fig. 17

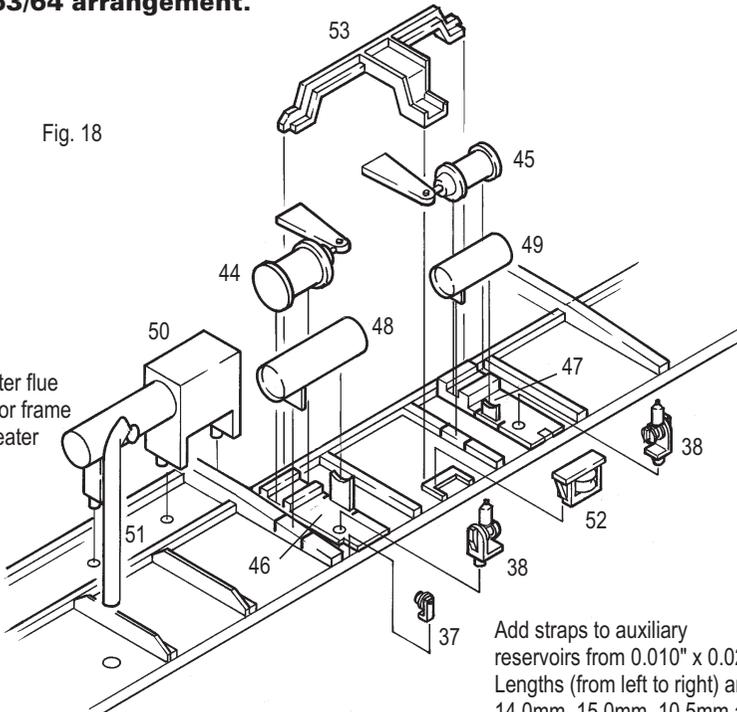


Straps from 12.5mm lengths  
0.010 x 0.020" strip

Pre-curl the reservoir strapping around some rod  
(about 2mm diameter) before cementing in place.

**Brake equipment.  
Post-1963/64 arrangement.**

Fig. 18



Cement heater flue  
to compressor frame  
as well as heater  
and floor.

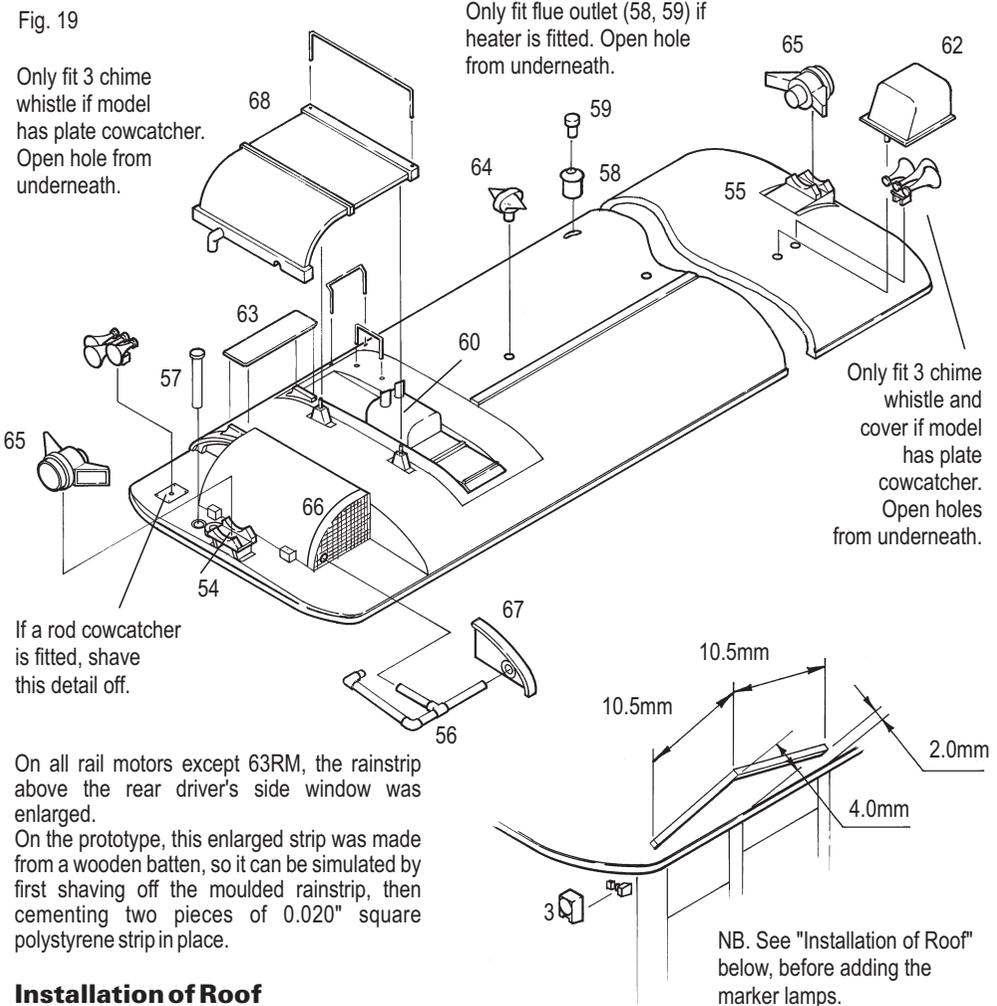
Add straps to auxiliary  
reservoirs from 0.010" x 0.020" strip.  
Lengths (from left to right) are  
14.0mm, 15.0mm, 10.5mm and 10.5mm.

## Roof Details

Bend two handrails and the air-bleed pipe for the radiator from the 0.010" wire provided, using the bending jig (item 61). The procedure is the same as for the body handrails. Put a sideways bend of about 30° in the long roof grab-iron, using the same techniques as was used for the door handrails. This will ensure that this handrail stands square off the roof.

Secure each piece of wire in its respective location with super glue. Each should stand off the surface by about 0.015". When the glue has dried, trim the excess flush underneath.

Cement the roof details in position. Start with the headlight brackets, so that these parts are firm when adding the headlights. Check the position of the radiator and trim the small pipe projecting out the front of the bottom tank, so that it lines up with the flange on the roof. The bottom tank sits down on the small blocks at the front, and the holes in the undersurface of the top tank locate over the pins on the top of the two supports moulded on the roof.



## Installation of Roof

For a vehicle with plate frame drive bogie, cement the roof to the body, ensuring that the overhang is even all around. Do not add the marker lamps at this stage.

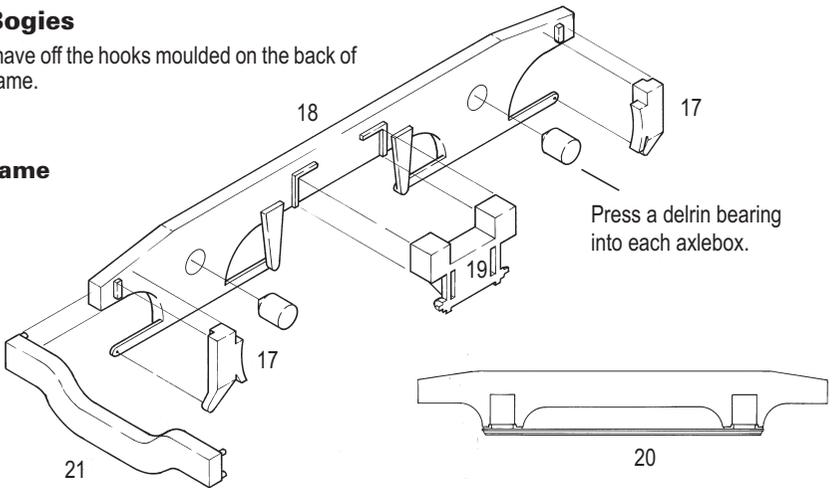
For a vehicle with cast drive bogie, the roof may be left off until after the body has been painted and the windows glazed. Cement the marker lamps to the brackets at each corner of the body.

## Motor Bogies

Carefully shave off the hooks moulded on the back of each sideframe.

## Plate Frame

Fig. 20



## Cast Frame

Fig. 21

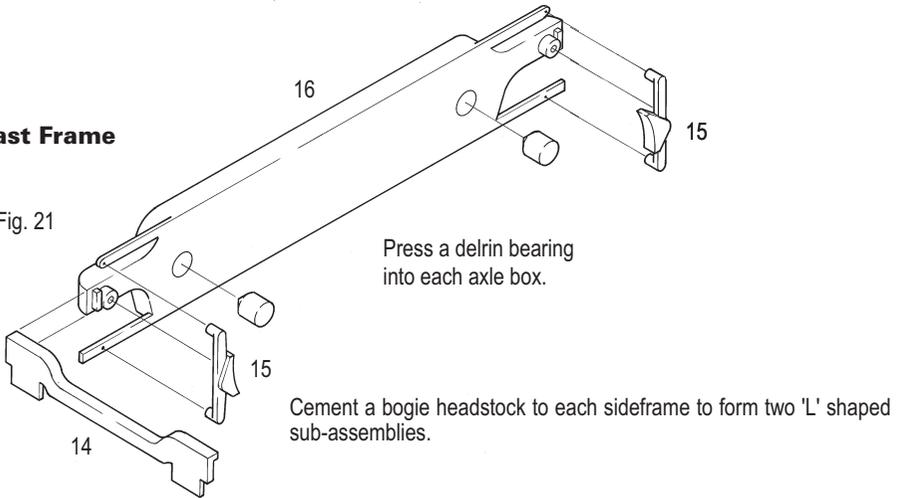
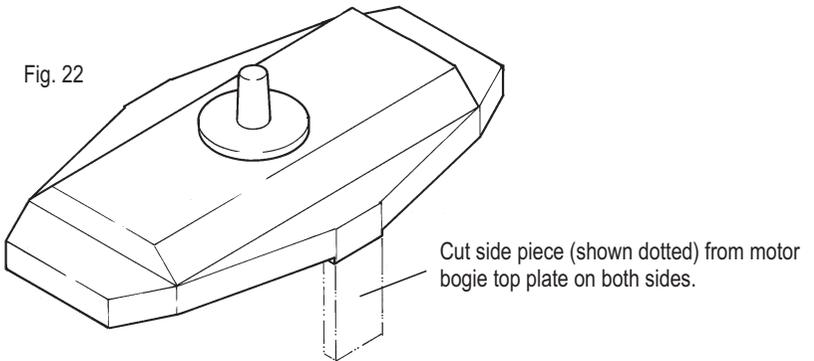
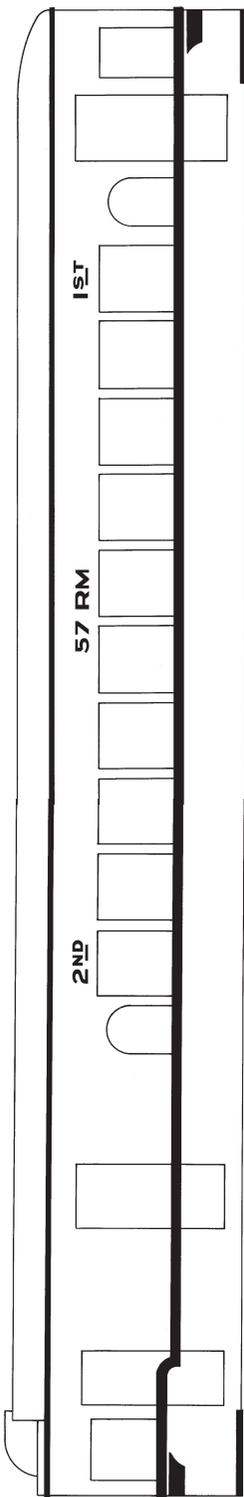


Fig. 22



Cement the two sideframe/headstock sub-assemblies to each other, trapping the motor bogie between the sideframes. Ensure axle ends are located in the delrin bearings.



Same panel is also  
on main reservoir on  
opposite side.

A	4	6	58	J
B	4	6	58	J
V	15	4	57	NM

## Painting and Decals

For best results, wash the assembled model (but not the motor bogie) in warm soapy water, rinse well, and set aside to dry.

When first converted to diesel traction, a number of DERMs retained their dark red/brown bodies with black and yellow tiger stripes on the ends. e.g. 62RM featured this colour scheme when photographed at Whittlesea on 6 Nov. 1959. (Newsrail, Nov. 1995, P.336). Most, however, were painted in a blue and gold (yellow) colour scheme.

For a blue and gold colour scheme, paint the body and plate cowcatchers (if fitted) dark blue, such as SEM Diesel Blue, or Humbrol Lufthansa Blue. Roof and roof details are a dull brown such as Humbrol Matt Dark Earth. Paint the bogies, side steps, radiator core, the underframe and its equipment black, as well as the rod cowcatcher (if fitted) and the number boxes of the headlights.

Apply decals to diagram to represent the period appropriate to your model. When the decals have dried spray an overall coat of clear flat, such as Testor's Dulcote, to seal the decals and provide a uniform flat finish.

## Cast Frame Drive Bogie

A vehicle with cast frame motor bogie has the 'Chevron' colour scheme.

Prior to 1972, sides were lettered 1st and 2nd as shown. After this date 'Second' class was abolished and the initial response was to paint over 2nd, with the 1st left in place. From the mid 1970's onwards most vehicles were lettered FIRST and ECONOMY although e.g. 60RM was photographed in 1977 lettered 1st and ECONOMY. From the mid 1980's no class lettering was provided.

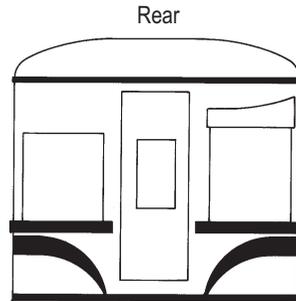
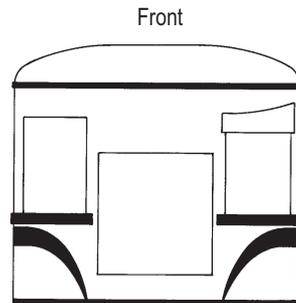


Fig. 23

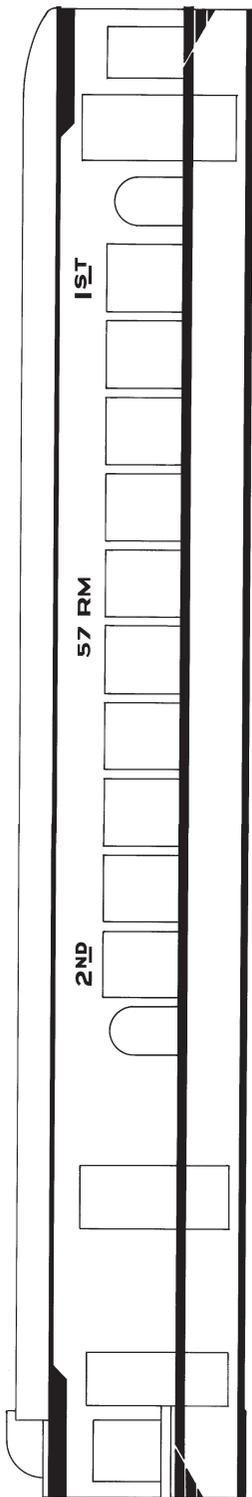


## Plate Frame Drive Bogie

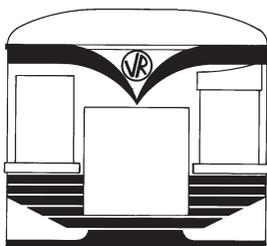
For those who wish to paint the red with tiger stripe colour scheme, vehicle class/number and 1st and 2nd are provided in silver. No decals are provided for the stripes as this is best done with paint and masking. Refer to photo's from the period, e.g. Nov. 1995 Newsrail, for details of this scheme.

A vehicle with plate frame motor bogie has a 'winged' colour scheme. Two styles of wings are provided. As always, if you wish to represent a particular vehicle at a particular time it pays to track down a photograph.

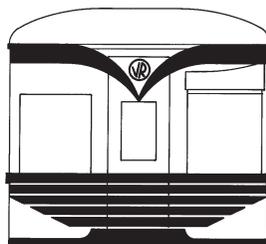
When the paint and decals are thoroughly dry, clean the paint/decals from the marker lamp brackets and cement the marker lamps in place. Paint these lamps yellow with a deep red lens. Now that the decals are applied the air horn can be pushed through the holes above the drivers windscreens and secured from behind with super glue. Paint the trumpet yellow.



Rear



Front



A	4	6	58	J
B	4	6	58	J
V	15	4	57	NM

Same panel is also on main reservoir on opposite side.

N.B. The set of eyebrows with the small VR shirt button goes on the rear end over the door.

Fig. 24

Note: For best results apply the wings to the rear end in several pieces, cut out as shown below.

Apply the triangular pieces to the end sheeting and the sides of the door pillars. Cut a patch to go on the door from the style of wings not being used.

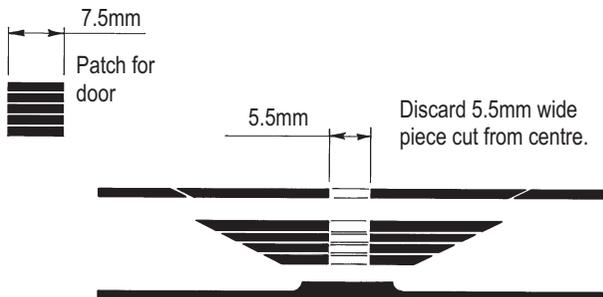
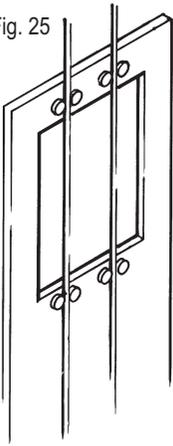


Fig. 25



### Glazing

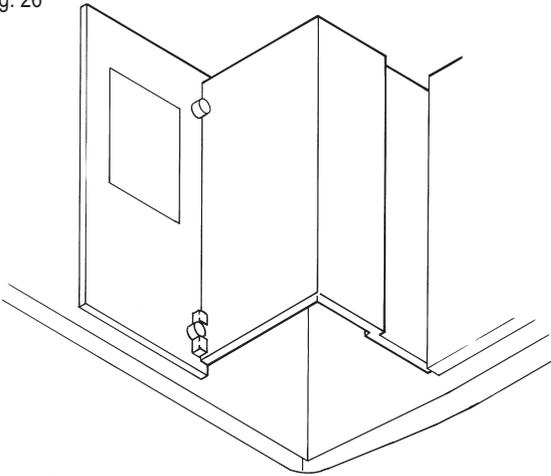
When the paint is well and truly dry, the body may be glazed. Cut pieces from the clear polystyrene sheet provided and secure in the recesses moulded in the back of the sides and ends, with a bare minimum of solvent. The safest method is to lay each piece of clear polystyrene in its respective recess and then touch a brush of solvent cement to the edges. Allow capillary action to carry the cement between the body and the glazing.

Do not forget to scuff the back of the toilet window with fine emery paper, or paint it pale grey, to render it translucent.

After glazing, cement lengths of the 0.010" plastic rod across the van door and van compartment windows. The pins moulded in place set the spacing.

Headlights may be glazed with a 3.2mm diameter disc of clear polystyrene or a #128 'MV' Lens.

Fig. 26



### Rear Driver's Partition

Use a scalpel to make the groove in the back of the rear driver's partition sharper, as shown in fig. 10.

Fold rear driver's partition into an 'L' shape.

Cement the partition against the edge of the end door and against the projections moulded on the back of the side door.

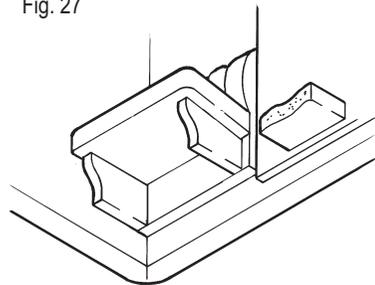
### Railfan Seat

Cement the railfan seat base to its back.

Cement the assembled railfan seat to the side wall. Ensure that the base of this seat is flush with the under side of the vestibule cross member.

If your model has a cast frame drive bogie, and the roof has not been installed on the body already, now is the time to do it. Ensure that the roof overhangs the sides and ends evenly all round. Apply the cement from inside, so as not to mark the paint finish.

Fig. 27

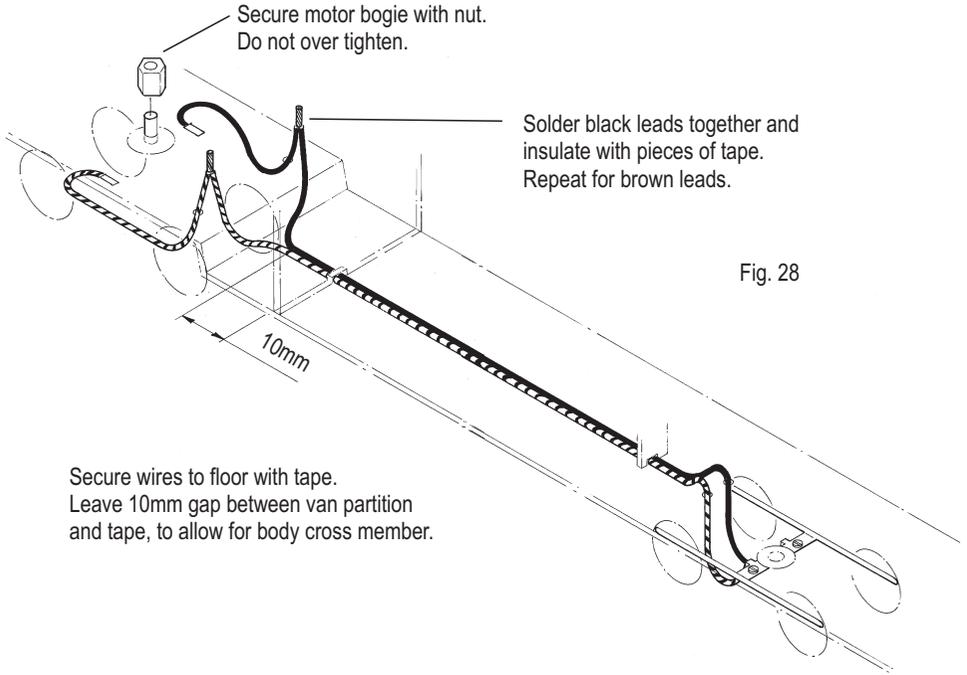


Cement the seat to the side, so that the base is even with the bottom of the vestibule cross member.

## Wiring

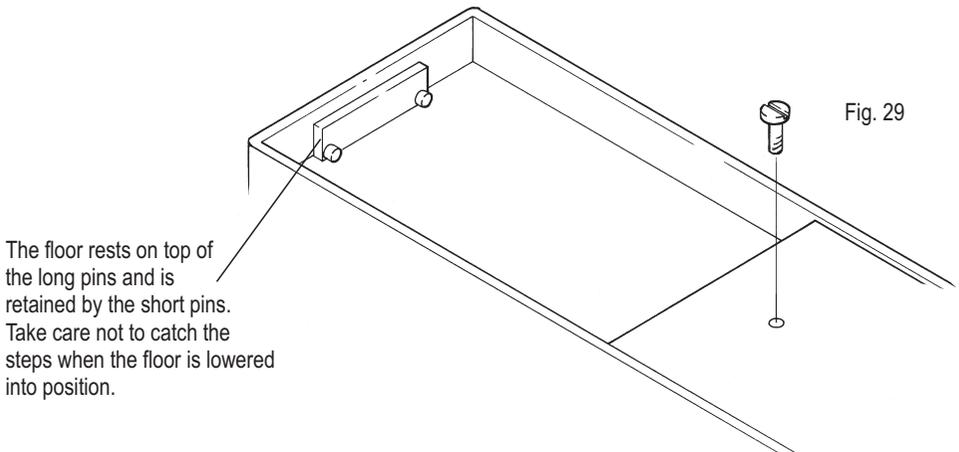
Thread the wires from the trailing bogie through the holes in the floor, under the saloon partition, along the floor against the double seats and under the van partition. If the wires are kept in line with the cutouts in the partitions they will locate in the recesses in the body cross members upon final assembly.

Thread the wires from the motor bogie through the holes in the van floor.



## Final Assembly

Set the body upside down on the roof. Carefully lower the floor into the body so that the seats and partitions thread in between the body cross members.



Secure the floor to the body with the four M1.4 screws provided. Take care not to push down on the heads until the threads are started, otherwise the knurled 'nuts' may be pressed out of the body cross members. Do not over tighten the screws.

## Couplers

Because of the close proximity of the motor bogie it is not possible to install a standard Kadee coupler at the front end. Nevertheless, it is possible to install a Kadee Coupler head, but the 'delayed uncoupling' won't work.

Cut the shank of a No. 5 coupler 1.5mm behind the coupler head. Carefully file the shank until it is a press fit in the opening in the coupler striker plate. Press the coupler into place and secure from behind with super glue.

At the rear end, either a Kadee No. 5 or SEM Auto Coupler II can be secured to the mounting pad provided with a #2 x 1/4" screw. Note that this coupler must be removable to allow the floor to be removed for detailing with passengers.

Those who have installed the older style rod cowcatcher will find that the cowcatcher fouls the coupler trip pin on an adjacent vehicle. It will therefore be necessary to be selective about what vehicles the DERM is coupled to, and either cut off the trip pin or rotate it 180° on those vehicles. For this reason, the trip pins on the DERM's couplers might as well be cut off as well.

## Operation

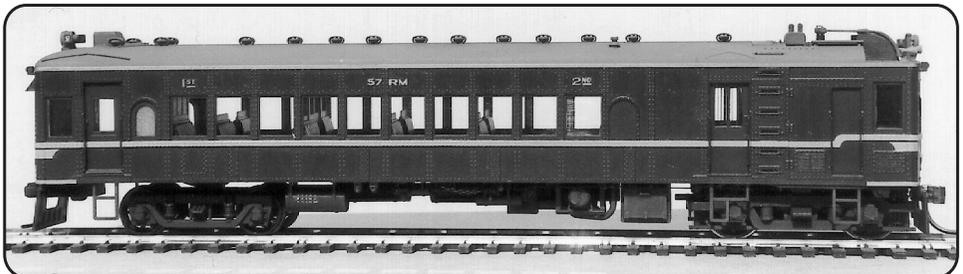
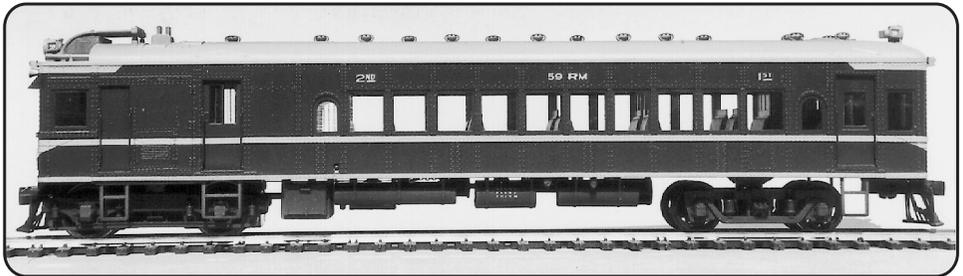
Your DERM will now operate, although for best results it is recommended that weight be added to improve traction and electrical pickup.

Secure about 60g of lead centrally in the roof. A piece about 3mm x 25mm x 100mm is about right. Hold it in position with tape and place the lead so that it overlaps the van and saloon partitions. These partitions will prevent the weight falling down.

Your DERM is now complete and ready for many hours of enjoyment. The motor bogie was lubricated before despatch and should not require attention before many hours of operation. When lubricating, use only plastic compatible lubricants, such as Labelle #102 and #108.

## Lost Parts

This kit contains a number of small parts such as the screws, threaded inserts and marker lamps, which are easy to lose. Please take care with assembly, but if you should send a part into orbit, send a stamped, self addressed envelope to us, with details of what is required, and we will provide a replacement.



Models illustrated have been fitted with couplers, brake chain and headlight lenses (not included).