

Exclusive First Editions (EFE)

London Transport - Tube stock conversion

This Manual sheet has been compiled from notes provided by Peter Watson as a result of his early experimentation with these models. Doug Fairhurst has provided the additional notes and photographs in order to give the modeller a choice of ideas on how best approach this conversion. It assumes normal 2-rail pickup, unlike the London Underground prototype (4-rail) and the Island Line trains (3-rail)

There are two main methods by which these units can be converted.

- a) Using a Black Beetle motor bogie.
- b) Using the Tenshodo (SPUD) motor unit.

The description shown here is based upon the Black Beetle unit and was inspired by the desire to have a working model (A four-car unit) ready for the EMGS Test Track at expoEM 2003. Those who attended would not be disappointed and the model ran faultlessly and more or less continuously throughout the two days of the show.

The four cars are powered using only one Black Beetle fitted with 10.5mm spoked wheels to EM standards, supplied to order by Branchlines, at no additional cost. The pin points on the axle ends need to be removed.

The idea behind the use of only one power unit was to

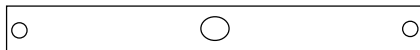
- a) See if it was possible.
- b) Reduce the overall expense.

The description that follows is for the four-car unit and using a Black Beetle. An alternative approach is also considered at the end of this article.

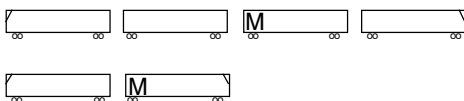
Firstly it was decided that the BB was to be suspended from a bar held in place by screws and nuts at either end, to aid the ride height adjustment.

To construct this suspension bar a flat piece of brass 55mm x 6.5mm x 1mm is required.

1. Mark the middle and centre punch, then mark the position of two holes 50mm apart about the centre. Drill the centre hole 4mm and the two other holes to take the screws that you are going to use to mount to bar. It is suggested that M 2.5 countersunk 20mm long are the most suitable.



2. The next task is to remove the body from the coach that is going to be motorised, pick a position near to the middle of the rake that is to be powered, in the case of a 4-car unit this would be bogie number five from the 'A' end. (If a 2-car conversion is being undertaken, using a Black Beetle and following this method - select the non-driving end.) See diagram below.



M = motor bogie position

3. Remove the four screws, two either end and retain. (On 2-car conversions, motorisation would be in one of the driving cars. The bodies of these is only held on with three screws. One at a central point at the driver's (motorman's) end and two at the corners at the opposite end of each

coach. The centre one can only be accessed if the motor bogie is rotated to one side. (The photograph over shows the general layout of the interior)

4. Next remove the bogies using a six-inch rule, or equivalent, with a twisting action between the underside of the body and the bogie, put to one side. They will 'pop off'.

5. For this conversion there is no need to remove the seating unit from the underframe. Now, using a razor saw cut through the moulded seat to remove approximately 58mm, the door bulkhead will act as a guide, and retain for possible re-use.

6. Take the mounting bar and using a 4mm screw and nut, fix (*using the bogie pivot hole*) to the underside of the body. Mark the bar so that you can fix it the correct way round on final assembly and now using the bar as a jig, drill two holes through the underside of the coach. Remove the bar making sure that you can assemble it the same way round, this will ensure that the mounting hole for the BB will be on the same line as the original bogie.

7. Now is the time to cut the clearance hole for the BB. Using the bogie-mounting hole as the datum, the hole needs to be 24mm wide and 42mm long about this mounting hole. Keep checking as you go to make sure that you are not taking too much material from the wrong place!

8. Countersink the two fixing holes on the under side and fit the screws using nuts and washers, check that the mounting bar fits making adjustments as needed (ensure correct way round) On the face that will be in contact with the BB mounting boss solder a piece of 0.3mm dia. wire across the hole from side to side, think about it! To act as a pivot. Using nuts and washers mount the bar between the screws and fix to BB.

9. Check that BB is free to move and rotate without catching, adjust the ride height to the approx position.

10. Now for the non-powered bogies. Careful inspection will show that the keeper plate is just a clip fit and once mastered you will never forget. However, take note of the letter 'F' moulded into the bogie frame and the keeper plate - It is 'F' to 'F' on reassembly, remove the wheels and flat springs, remove 0.5mm from the backs of each axle box to accommodate the extra width required to take EM wheels, in this case Alan Gibson 10.5mm spoked wheels with pin points removed. Once the clearance had been checked the bogies are re-assembled using silicone grease on the axles.

11. The last, almost, job is to modify the powered bogie to fit the BB. Remove the centre - cut away only the centre portion of the plastic bogie leaving the small cross member sprues. Mount the remaining 'frame' around the BB. The cross members will need to be trimmed for a press fit. It is suggested that a drop of Superglue is used to retain the frame around the BB. When satisfied you are ready to re-assemble all the cars to their bogies, slip the body onto the powered car and check the ride height using the adjacent cars. Check that the mounting bar is horizontal and lock nuts etc with nut lock or similar. The unit is ready for testing.

12. It is suggested that you will need to build into the powered coach approx 90grams of additional weight over the BB for satisfactory adhesion if constructing a 4-car unit.

13. The above method should hold if using a SPUD though some of the dimensions may need to be modified. You will more than likely need more than one unit to power a four car set, as the motor in the SPUD is considerably smaller than the one in the BB.

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London Transport - Tube stock conversion cont.

The alternative approach is to follow the instructions that are supplied with a Motorising Kit supplied by Harrow Model Shop. (Noting that 00 wheels are provided as standard and replacement EM sets would have to be substituted)

The main difference is that the motor bogie (a Tenshodo SPUD reference WB-26-B) is mounted in the motorman's position.

To achieve this arrangement the moulded seating assembly needs to be removed from the underframe. The seats are held in place by four small screws which are 'hidden' by the underframe detail. This underframe detail is glued to the chassis but can be removed quite easily by working a thin knife along the edges.

A hole is cut into the floor (as per earlier explanation) and part of the seating area removed as well.

Preparation of the motor bogie unit is quite straightforward. The centre of the sideframe unit is removed and the moulding is press fitted around motorbogie (When in the correct position a touch of Super Glue is sufficient.)

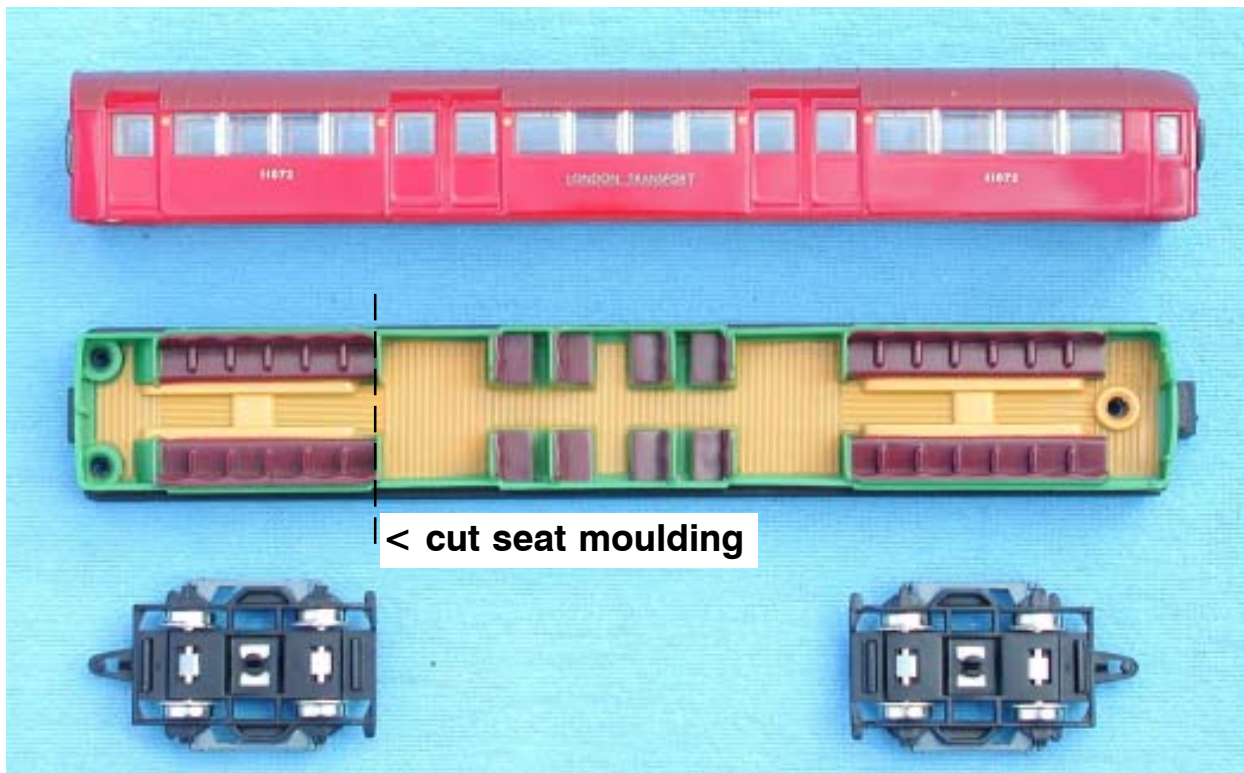
The underframe detail is then matched back with the chassis and the seating unit re-fitted. There is no need to glue back the underframe as the following operation will explain.

The bogie in the kit is provided with a bracket which is attached to the floor area by a single screw and nut. (The measurement for affixing this bracket is not critical as it is 'slotted' to allow a small amount of forward and aft movement to adjust the bogie to the correct position.) This screw also provides the means by which the underframe is retained (rather than gluing). Once fitted the motor bogie can be attached to the bracket.

A weight is provided (37 grams) which sits immediately behind the motor bogie

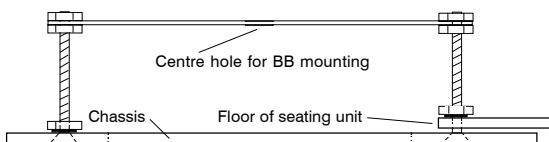
Having the motor bogie in the forward 'driving' position may affect performance if a four-car unit were subsequently constructed.

Component parts for the conversion showing relationship between chassis, underframe and bogies.



General arrangement of mounting bar using the Black Beetle. Not to scale.

Shows mounting bar stretched across the two support screws and held in position by adjustable nuts. Depending on the accuracy of the chassis cut out it may be necessary to drill through the seat mounting gas well.



Additional information :

Branchlines :

P.O.Box 31, Exeter, EX4 6NY.
Tel/FAX : 01392 437755

The Harrow Model Shop :

190-194 Station Road.
Harrow, HA1 2RH.
Tel : 020 8863 9788

The Engine Shed :

745 High Road, Leytonstone,
London, E11 4QS.
Tel : 020 8539 3950