## Instructions - Metromodels EFE trailing bogie upgrade

This bogie & wheel modification & upgrade will allow you to significantly improve the running qualities of your EFE tube train models. This is achieved by replacing the existing poor quality EFE bogies/non pin-point steel wheels with our high quality replacement plastic bogies fitted with precision machined brass shouldered 'top-hat' bearings & pin-point free running wheel-sets. The conversion is straight forward using these illustrated instructions.

For instructions relating to motorising your EFE train, please refer to the instructions included with the EFE100 Tenshodo/EFE DIY motorising kit.

If you have any questions or you would like us to complete this conversion work for you please contact us.

Parts list:- 1x MM bogie moulding, 2x pin-point wheel-sets, 4x brass shouldered bearings, , 1x fibre washer, 1x etched brass coupling (per pair of bogies)

Tools required:- 'Plastic Weld' or suitable plastic adhesive, small cross head screwdriver, small slot headed screwdriver, mini hacksaw/mini circular rotary saw fitted with steel/diamond cutter discs, selection of small files, drill & 2.5mm drill bit, side snippers/cutters, 'Stanley' knife or similar small modelling knife

Step by step instructions:-

- 1. Remove the existing EFE bogies from the die cast chassis. Use a small cross head screwdriver to carefully prise each bogie away from the chassis. The bogies will unclip & come away complete. Images 1 & 2
- 2. Dismantle the EFE bogie assembly. Using both of your thumbs press the two retaining clips located on the top surface of the bogie together towards each other. This will release the plastic base retaining plate & will allow the axles/wheels & a steel clip to be removed from the under-side of the bogie. You will then have separated the constituent parts of the bogie the wheels/axles/steel clip & the black plastic bogie frame. The wheels/axles/steel clip can be put aside as these are not required. Note the pair of protruding retaining split pins at the centre top of the bogie frame. These are the means by which the bogie is connected to the chassis. We will retain these & use them together with the two bogie side-frames on the replacement MM bogie. Images 3 & 4
- 3. Prepare the Metromodels replacement bogie. Remove the two wheel sets from the bogie. (the wheels have been initially fitted to the bogie for safe transit only) Using a hack-saw or suitable fine saw, cut the cylindrical shaped 'top hat' spacer moulding away from the top of the MM bogie moulding. File down any rough edges on the top surface of the MM bogie & ensure the top surface is completely smooth. To reduce wear, improve running & ensure long life, we recommend that you cut off each pair of the moulded pinpoint bearings that protrude from the outer side of each MM bogie. Once removed replace each of these with one of the four shouldered brass bearings enclosed. Once you have cut off the plastic bearing it will leave a hole. From the inside, insert a brass bearing into each of the holes created & then clip each wheel set into place ensuring that the pinpoint axle locates into the pinpoint bearing. Check that all wheels run freely & adjust as necessary. The Metromodels bogie is now ready for the remaining conversion work. Put it to one side for now. Images 5,6 & 7 (note that the pinpoint brass bearing fitting process is not illustrated)
- 4. Cut the bogie side-frames & the retaining clips away from the EFE plastic bogie frame.
  - a. Using a mini saw or side snippers/cutters cut the two bogie side-frames away from the EFE bogie assembly as shown. Put these to one side for now. Images 9 & 10
  - b. Using a mini saw fitted with a steel or diamond cutting disc, cut the retaining clip moulding away from the bogie frame as shown. Images 12, 13, 14, 15 & 16
- 5. Retaining clip moulding preparation. File down any rough edges on the base of the retaining clip moulding. This is now ready to be used to clip fit the replacement bogie to the chassis. Images 16 & 17
- 6. EFE bogie side-frame preparation. File down & remove 1mm depth of the surface plastic of the rear face of each of the side-frames. When the plastic has been removed use a small file to ensure that the surface is smooth & flat. Next, drill two 2.5mm holes in the rear face of each of the side-frames. Use the template provided to determine the correct position of these holes. This will allow the side-frame to correctly fit onto the pinpoint bearings moulded onto the sides of the MM bogie. Do

not worry if you drill straight through the EFE bogie side-frame into the front face. This is easily done as the side-frame is not very thick. Just use filler or plastic cement to fill the hole. Paint the filler with black enamel paint when dry. Images 11, 25-28

- 7. Glue the EFE side-frames onto the side of the MM bogies. Make sure that you fit the side-frames correctly the right way up/round! Ensure that the bogie side-frame locates correctly, with no gap between the MM bogie side & the EFE bogie side-frame, before gluing the side-frame into place.
- 8. Fit the bogies to the chassis. Place a single fibre washer around the raised die cast bogie spigot on the underside of the chassis image 33. Locate the bogie over the fibre washer & spigot so that the centre hole of the bogie is directly over the spigot. Clip each bogie into place by inserting the split pin, from the underside of the bogie, through the centre hole of the bogie & into the centre of the spigot. Carefully push it into place until it 'clips' into position in the spigot. Once the split pin is fitted, ensure that the bogie moves freely. Adjust as required. If the bogie is not free moving, then you need to carefully remove the split pin and file down the top side of the bogie & all the surfaces of the split pin ensuring that they are completely smooth. Images 33 & 35
- 9. **Couplings** One 30mm long (26.5mm hole centre to centre) etched brass metal coupling is enclosed for each pair of bogies supplied. Couple each pair of bogies together as shown in the image. These metal couplings are designed to allow your cars to travel freely over points & curved track without fouling each other. They replace the plastic couplings included with the EFE model which are taped to the underside of the plastic plinth on which your model is mounted.
- 10. Put your train on the track & test run. Adjust bogies/wheels as required.



























