

## LF44 Frames for BR Standard 5MT 4-6-0

Components recommended to construct a complete chassis  
Motion set LM44 Cylinders LC5  
Bogie LS4 Crossheads LS9  
6 off Markits 6'2" 20-spoke drivers (WH211)  
3 axles 6 crankpins and washers (RM2)  
2 sets 3'0" 9-spoke bogie wheels (WH30)  
Gearbox GB5/20 with Drive Extender  
Mashima MH1624 motor

This etch contains sideframes, brake shoes, brake pull rods and balance weights to produce a basic chassis of the correct scale dimensions and appearance which can be used as a substitute for an RTR or kit chassis. Cylinders, motion, crossheads and bogie to complete the chassis are all available from our range - see panel above. A separate fret of 00 spacers is included, which can be exchanged for EM (LS10) or P4 (LS60) by returning them to us in a stamped, self-addressed envelope.

We recommend the Mashima MH1624 motor with our gearbox GB5/20 and Drive Extender for this model, and can supply the latter two together with Markits driving and bogie wheels if required.

As supplied the frames are suitable for the Bachmann model.

Please note that all bends should be made with the half-etched lines to the inside and reinforced with a fillet of solder.

### Assembly Instructions

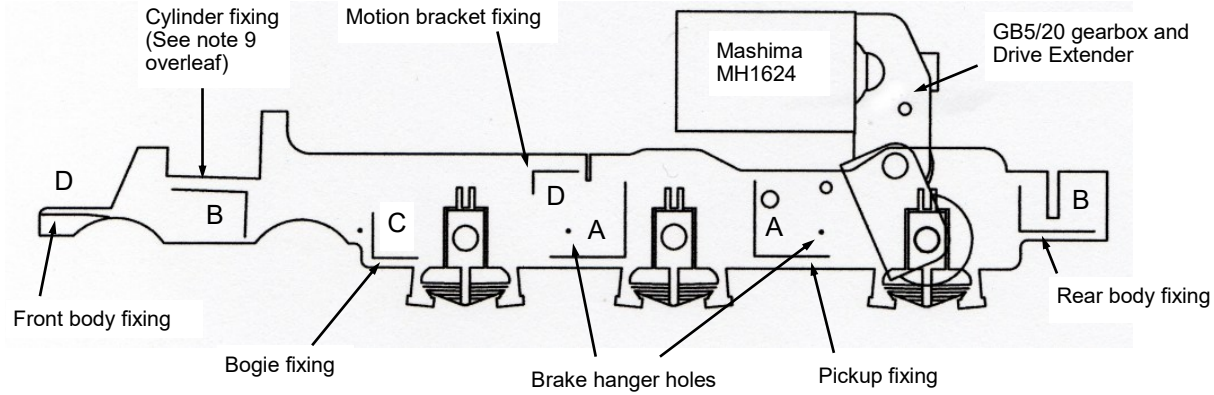
1. The frames may be assembled rigid, or with sprung axles using our hornblocks and springs (code LS55). If you wish to spring the chassis cut through the spring hangers using a piercing saw and remove them together with the centre portion of etch within the hornway. The sides of the hornways are etched at approximately 5.85mm to ensure that any slight variations in the width of the machined grooves in the hornblocks do not result in any one of them having a loose fit within the hornway. Each hornway must be carefully dressed with a file to achieve a good sliding fit to each hornblock, which should then be marked up or placed into a labelled bag to ensure it is assembled into the hornway to which it has been precisely matched. Take time and care over this stage, removing material slowly and from each face equally. The hornblock must drop freely under gravity but must not show any fore and aft play which might cause the coupling rods to bind.
2. For rigid axle assembly, carefully open out the axle bearing holes in the frames until the bearings are a close fit, ensuring the bearing flanges fit snugly against the frames. This is best done using a five sided broach. If you are using our chassis jigs (see below), DO NOT solder the bearings in place at this stage. Open out the holes for the brake cross-shafts to 0.75mm.
3. Select the appropriate frame spacers - the size and position of them will depend on the siting of the body fixings and your preferred motor/gearbox and pick-up arrangements. Our own preferences are, where possible, for a tongue and slot fixing at the front bufferbeam and a single bolt fixing under the cab, together with wiper pick-ups mounted below the chassis. A suitable layout of spacers is shown to suit this and our gearbox GB5/20 with Drive Extender and Mashima MH1624 motor (sketch 1).
4. If you are springing the chassis drill out the holes at each side of the hornways and those in the separate spring etches to 0.5mm, as shown in sketch 2. The frame spacers fold to right angles on the half-etched line. Solder your chosen ones to one of the frames, then assemble by clamping the other side frame to the first using the wheelsets to check alignment before soldering the second side frame. This crucial stage of the assembly can be achieved more easily and with greater accuracy by using our frame assembly jigs (code LS16 for 00, LS17 for EM and LS61 for P4). Full instructions are provided with them.
5. For a sprung chassis insert the spring and hornblock, ensuring that they are placed into the correct hornway only. Note the grooves on the hornblocks are not on the centre line. This allows you to choose a greater or lesser amount of sideplay on each axle. Use 0.45mm wire to locate the spring detail and solder in place, using the minimum of flux. This captures the hornblock, and the protruding shackle should ensure that the bottom of the hornblock is slightly above the bottom of the chassis, giving approximately 1mm of movement only. Do not be tempted to file too much material from the top of the centre shackle. Greater travel should not be necessary and there is then a risk that the spring may become dislodged if there is too much downward travel. See sketch 2.

6. With the frames assembled, solder lengths of 0.7mm wire through the brake hanger holes then thread on and solder the brake shoes in place. Alignment of them is made easier if something of suitable thickness is used to space out the brake shoe from the frame, with a wheelset fitted to ensure correct spacing relative to the wheel treads.
7. Lengths of 0.7mm wire are next threaded through the bottom brake hanger holes on one side of the chassis, through both sets of brake pull rods (ensuring that they are the correct way round) and then through the second set of brake hangers. Solder the wire to the brake hangers, then slide the pull rods outwards to line up with the inner edges of the frames and solder them to the wire.
8. Finally, solder on fixing nuts for cylinders, bogie, motion bracket and pick-ups as required. The position of the fixing nut for the motion bracket is crucial, since it must line up with the hole in the bracket itself. To ensure that it does, temporarily fit the bracket in position on the frames and bolt it in place before soldering the nut to the spacer.
9. The cylinders (LC5) are secured to the frames by a bolt passing up through the frame spacer and screwing into a nut soldered to the underside of the cylinder stretcher. The bolt must be trimmed to be flush with the top of the cylinder stretcher to avoid fouling the underside of the smokebox moulding.
10. To fit the Bachmann body to the chassis the rear 2mm of the representation of the loco frames beneath the smokebox will need to be removed.

The chassis can now be washed to remove any flux residues, but before painting we suggest that you fit the cylinders, motion bracket and wheels and check the fit of the body. You may find some slight filing of the motion bracket is required to enable it to sit low enough to avoid raising the body and fit snugly under the running plate. If you next assemble the bogie then the frames and bogie can be painted together and left to harden whilst the motion is assembled.

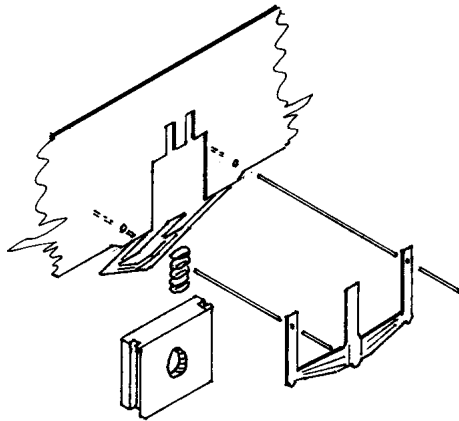
Our preference is for wiper pick-ups made from 26swg phosphor bronze wire as per sketch 3. The wire is soldered to PCB strip which is bolted to a frame spacer. We recommend that, if possible, you arrange the pick-up to be "bolt on" since this allows for easy removal and adjustment of the wire wipers. Pack LS23 provides all the parts.

Sketch 1



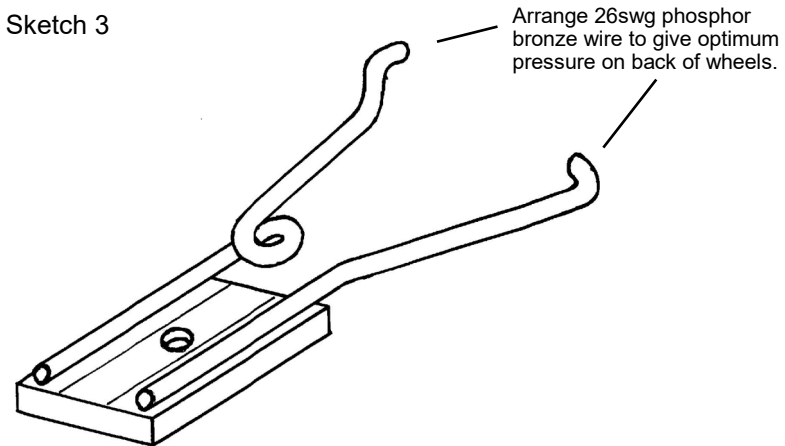
|          |             |
|----------|-------------|
| Spacer A | 10mm x 10mm |
| Spacer B | 10mm x 6mm  |
| Spacer C | 6mm x 6mm   |
| Spacer D | 6mm x 3mm   |

Sketch 2



Hornblock fitting

Sketch 3



Suggested pickup arrangement