

LF1 Frames for LMS 4-6-0 Jubilee/Scot/Patriot (original or rebuilt)

Components recommended to construct a complete chassis:

| | | | |
|------------|-----|------------|-----|
| Motion set | LM1 | Cylinders | LC1 |
| Bogie | LS5 | Crossheads | LS8 |

6 Markits 6"9" drivers (WH214 plain rim for Scot and original Patriots, WH215 bevel rim for Jubilees and rebuilt Patriots)
3 axles, 6 crankpins and washers
2 sets 3'3" 10 spoke bogie wheels (WH32)
Gearbox GB5/20 & Drive Extender and Mashima 1624/6/8 motor or
Gearbox GB1/20 or 3/20 and Mashima MH1624 motor

This etch contains sideframes, brake shoes, brake pull rods and wheel balance weights to produce a basic chassis of the correct scale dimensions and appearance which can be used as a substitute for a kit or RTR chassis. Cylinders, motion, crossheads and bogie to complete the chassis are all available from our range - see the 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. The balance weights included are suitable for Jubilees and Patriots. Balance weights suitable for a Royal Scot are also available (LS52).

We recommend our gearbox GB5/20 and Drive Extender with a Mashima MH1628 motor for this model, and can supply the first two as well as Markits driving and bogie wheels.

As supplied the frames are suitable for the Bachmann ex Mainline/Dapol and ex Airfix/Dapol models of the original and rebuilt Scot/Patriot and the original Jubilee, and the Hornby unrebuilt Patriot. They can be adapted to fit the new Hornby Rebuilt Scot/Patriot, the new Bachmann Jubilee and original Patriot, the K's/Nucast Jubilee and Wills/SE Finecast original Scot.

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

Note: The holes for the brake hangers have been etched in the wrong place. Pending a re-draw, drill 0.75mm holes 1.5mm vertically above the existing ones.

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 so as 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 only 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 in 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 and a single bolt fixing at the rear, together with wiper pick-ups mounted below the chassis. A suitable layout of spacers is shown (sketches 1 and 2) to suit this and our gearbox GB5 and DE with a Mashima MH1628, or our gearbox GB1/3 and Mashima MH1624 motor. See also Sketch 6.

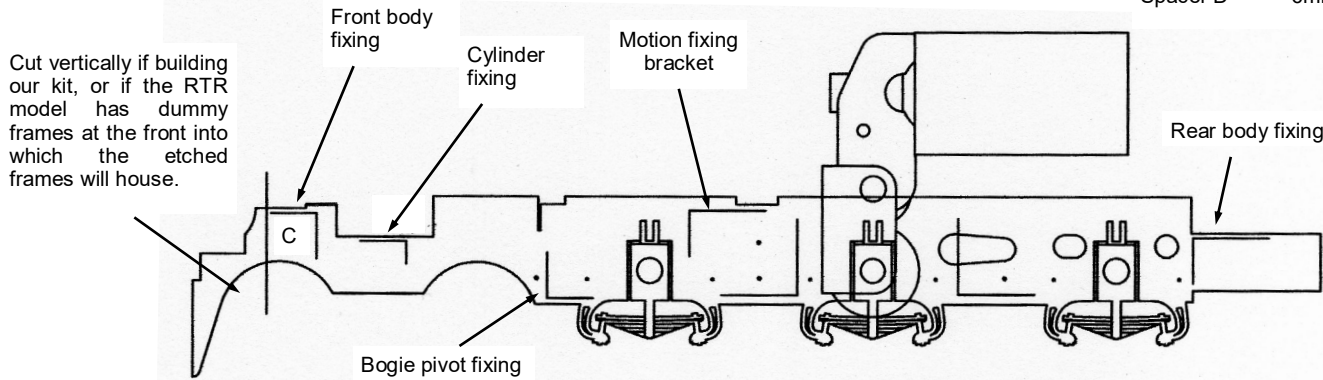
4. If you are springing the chassis drill out the holes at each side of the hornways and those in the separate spring etches to 0.5mm as shown in sketch 3. The frame spacers fold to right angles on the half-etched line. Solder your chosen ones to one of the frames, then assemble by clamping the other 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. If you are springing the chassis using our hornblocks please note that you will need a set of four turnings (code LS59) which are intended to locate in the hornways during this stage of assembly.
5. For a sprung chassis insert the springs and hornblocks, ensuring that they are placed into their correct hornways only. Note that the grooves in the hornblock 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 a minimum of flux. This captures the hornblock and the protruding centre shackle should ensure that the bottom of the hornblock is slightly above the bottom edge of the chassis giving approximately 1.0mm 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 could become dislodged if there is too much downward travel. See Sketch 3.
6. Solder lengths of 0.7mm wire through the brake hanger holes. Solder the brake overlays to the brake rear etches (sketch 4) then thread on and solder in place. Alignment of them is made easier if something of suitable thickness is used to space out the brake shoes from the frame, with a wheelset fitted to ensure correct spacing relative to the wheel treads.
7. Finally, solder on M2.0 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.

The chassis can now be washed to remove 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 is required to obtain a perfect fit. If you next assemble the bogie then the frames and bogie can be painted together and left to harden whilst the motion is assembled.

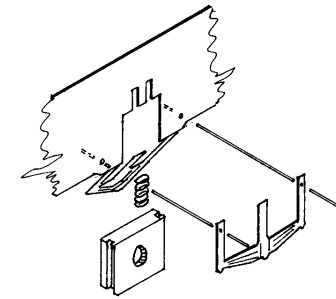
Our preference is for wiper pick-ups made from 26 swg phosphor bronze wire as per Sketch 5. The wire is soldered to PCB strip which is bolted to a frame spacer. We recommend that, if possible, you arrange the pick-up to be "bolt on" since this allows for easy removal and adjustment of the wire wipers. Pack LS23 provides all the parts.

Sketch 1 Suggested spacer positions with GB5 and Drive Extender
(Shown with a Mashima MH1628)

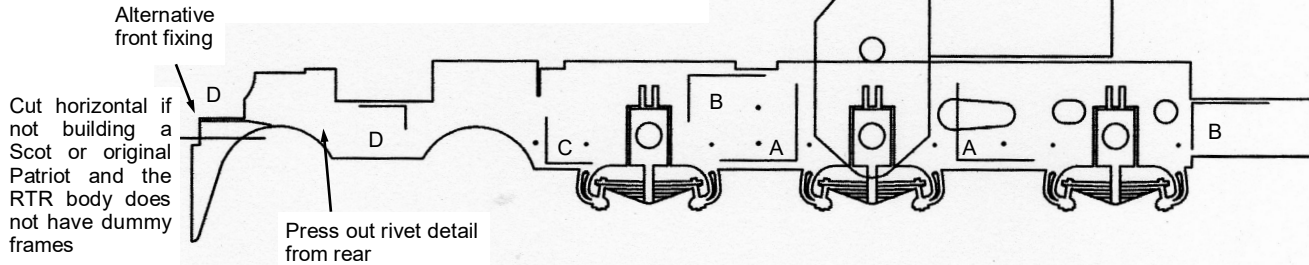
- Spacer A 10mm x 10mm
- Spacer B 10mm x 6mm
- Spacer C 6mm x 6mm
- Spacer D 6mm x 3mm



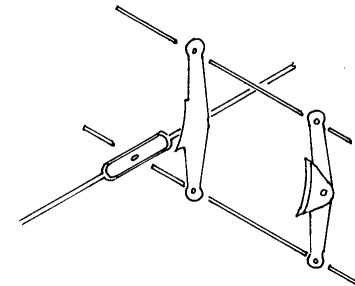
Sketch 3 Hornblock fitting



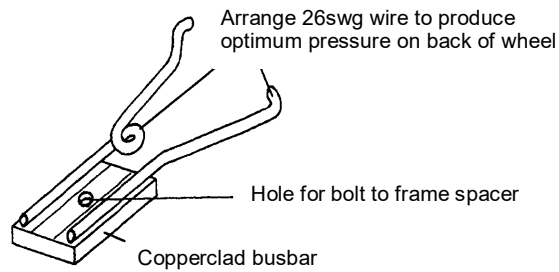
Sketch 2 Suggested spacer positions with GB1/3
(Shown with a Mashima MH1624)



Sketch 4 Brake shoe assembly



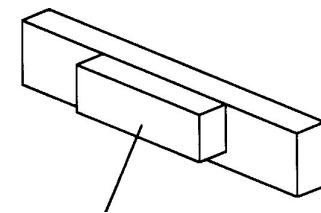
Sketch 5 Suggested pickup arrangement



We can supply a pickup set comprising wide track pcb, phosphor bronze wire, fixing nuts and bolts and insulated wire. Code LS23

For tender locos a second pickup set can be used in the tender and the current fed to the locomotive using our loco-tender pack Code LS24

Sketch 6 Suggested front body fixing



Add a packing piece 10mm x 4mm of 40thou plasticard to back of bufferbeam to create a slot here. Ensure the bottom of the plasticard is flush with the bottom of the bufferbeam.