



**LM35 Motion Set for Gresley  
LNER D49/1 Shire  
4-4-0**

COMET MODELS components complementing this motion set are:

Frames	LF35	Bogie	LS11
Cylinders	LC4	Crosshead	LS9

This motion set etch is designed to fit our loco frame pack LF35. All folds should be made with the half-etch to the inside, and reinforced with solder. All parts are numbered on the etch and are identified in the instructions by the number in brackets. Where components are handed they are marked on the etch 'L' for left (nearside) and 'R' for right (offside). We recommend that all holes are drilled before you remove them from the fret, with the exception of the coupling and connecting rods which are best drilled after assembly. Drill to 0.85mm for rivetted joints.

**NOTE:** Crossheads and pins are NOT supplied in this pack, but are available separately - COMET MODELS pack LS9.

We strongly recommend that the cylinder and motion bracket assemblies are arranged to bolt on to the frames so that everything can be stripped down and re-assembled as required, otherwise you are sure to finish up with an axle nut or whatever hidden behind the motion. A little forethought when positioning the frame spacers for chassis assembly will facilitate this.

Parts list

- |                               |   |
|-------------------------------|---|
| 1. Coupling rods              | 8. Valve rod                              |
| 1a. Coupling rod overlays     | 9. Return crank                           |
| 2. Connecting rods            | 10. Eccentric rod                         |
| 2a. Connecting rod overlays   | 11. Expansion link                        |
| 3. Motion bracket             | 12. Lifting links                         |
| 4. Expansion link inner pivot | 13. Lifting arms                          |
| 5. Slide bars                 | 14. Valve rod fork                        |
| 6. Union link                 | 15. Valve spindle guides                  |
| 7. Combination lever          | 16. Eccentric rod big end bearing overlay |

Assembly sequence

- Fix the outer coupling rod overlays (1a) to the plain inner rods (1).
- Fix the outer connecting rod overlays (2a) to the plain inner rod (2). Note the rods are handed, the half-etch on the inner rod being to the inside (see sketch).
- Using the rivets supplied assemble the union link (6) to the combination lever (7) and the combination lever to the valve rod (8). Note the combination lever is outside both the union link and the valve rod. Note the assemblies are handed. Solder a short length of 0.7mm wire in the front hole of the valve rod. If you wish to include the lifting links refer to step 9.
- Assemble the return crank (9) to the eccentric rod (10) and the eccentric rod to the expansion link (11), noting that the eccentric rod is outside the return crank and the expansion link is outside the eccentric rod. If you wish to add the bearing overlay (16) you will need to make this a soldered joint using a bright plated steel household pin (not supplied) inserted from the rear, soldered on the outer face of the eccentric rod, then cut and filed flush. This presents a flush surface onto which to glue the overlay.

- Fold up the slide bars (5) as per the sketch and check that the crossheads are a good sliding fit, fettling as required. Assemble the connecting rods to the crosshead (pack LS9) using the plain wire in the crosshead pack as the pivot, noting that the connecting rod fits into the fork of the crosshead. Assemble the union link (6) to the outside of the crosshead drop link - insert the pin from the front, solder it to the inner face of the drop link, then cut and file flush. Fold the valve spindle guides (15) as shown and fix to the rear of the cylinder valve chests.

- Fit the crosshead assemblies into the slide bars and locate and solder the slide bars to the cylinders (Comet pack LC4), at the same time locating the front of the valve rod between the valve spindle guides (see sketch). Note the small folded tab at the front of the slide bars should be to the top on the outer slide bar.

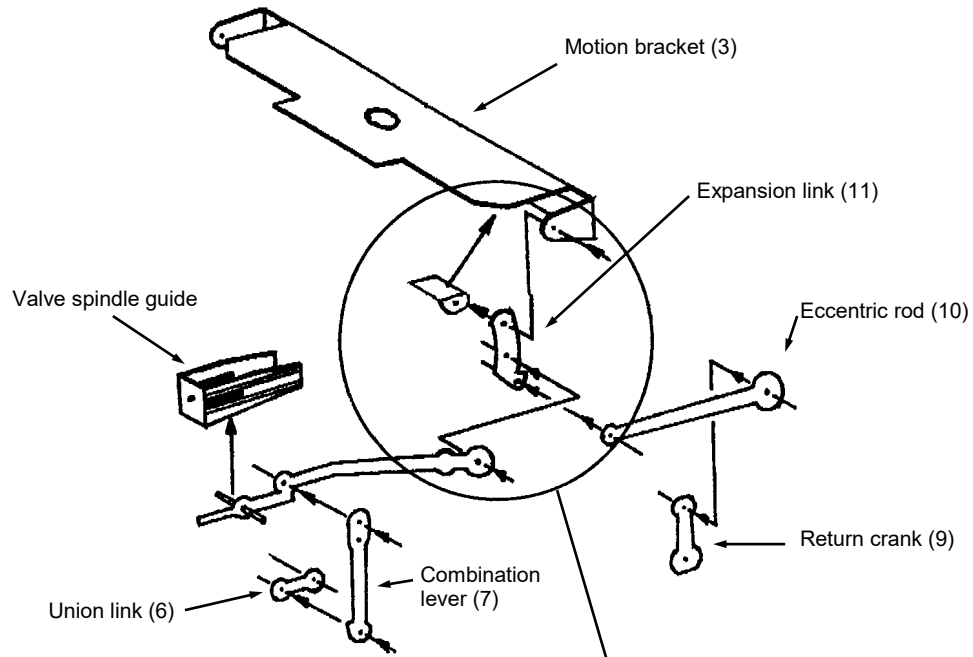
- Fold up the motion bracket (3) and expansion link inner pivots (4) as per the sketch. Fit the expansion link and inner pivot using 0.7mm wire. Insert a paper washer to prevent soldering everything solid.

**NOTE:** Refer to the sketch for the nearside valve gear, but remember to transpose from left to right when assembling the offside gear.

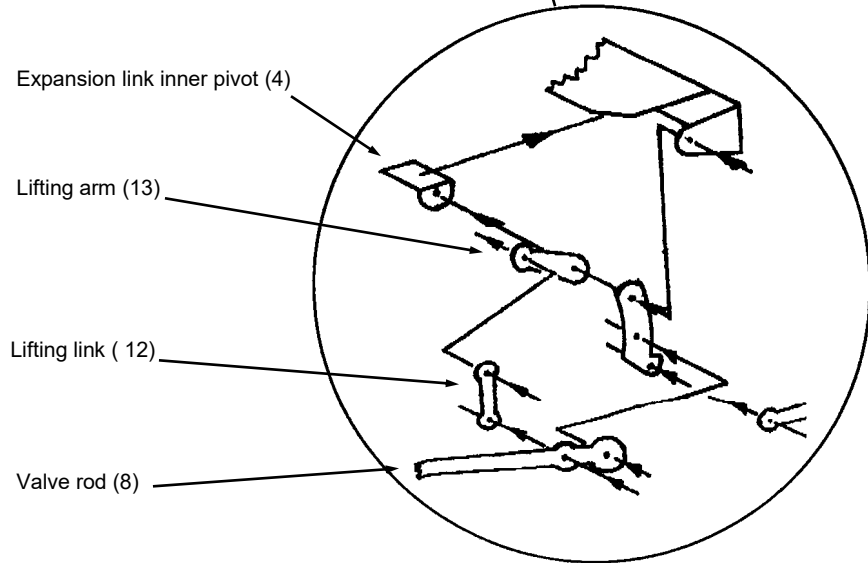
- Assemble the motion bracket and cylinders to the frames, making sure they are bolted securely. Place the connecting rod over the driven crankpin and fix the return crank outside this allowing a few degrees of forward lead on the return crank.

- Sufficient components are provided to allow the lifting arms/links to be modelled, although this will involve cutting clearance holes in the footplate of the body moulding. If you wish to add these firstly rivet the lifting link (12) to the valve rod and the other end of the lifting link to one end of the lifting arm (13) at step 3. When fitting the valve gear to the motion bracket at step 7 the free end of the lifting arm locates on the pivot wire, inside the expansion link (see sketch). If desired you can also 'fork' the end of the valve rod. Bend the ends of the valve rod fork (14) through 180° with the half-etched line to the outside of the bend. Feed the valve rod and valve rod fork onto a length of 0.7mm wire and solder together as per the sketch, with the lifting links and expansion link in place. We suggest that you use short lengths of 0.7mm wire to pivot the expansion link and lifting link, rather than rivets.

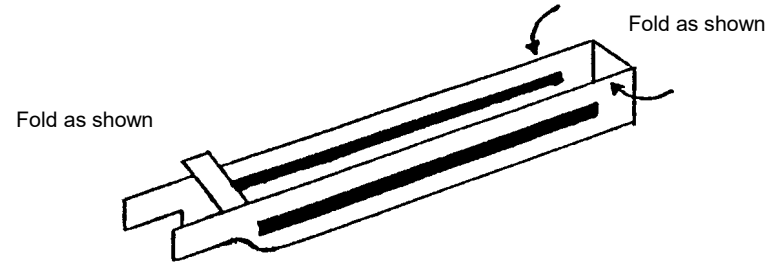
Motion bracket / valve gear assembly



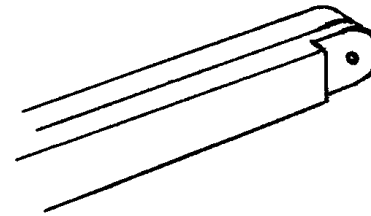
Assembly using lifting arm / lifting link



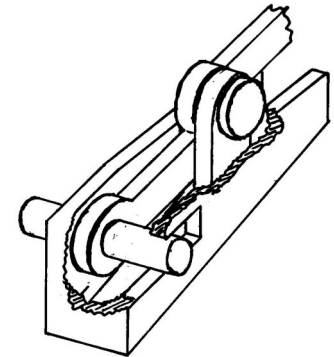
Slide bar assembly



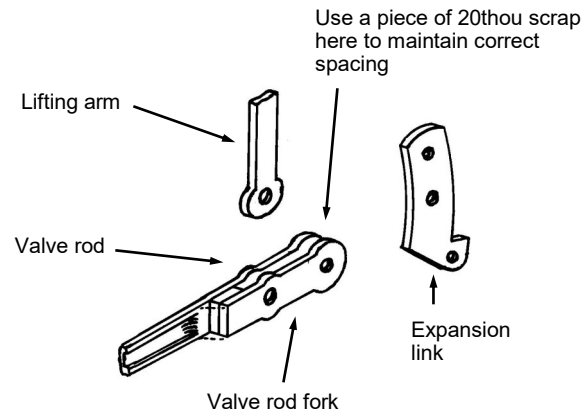
Connecting rod



Close up of fitting of the end of the valve rod in the valve spindle guide, using 0.7mm wire as the spindle



Expansion link / valve rod



Fold through 180° as shown - half-etched line to outside of fold



Expansion link overlay