

Mainframe Profiled Kit – to include:

2 off Mainframes	12mm
1 off Front Buffer Beam	12mm
1 off Front Pony Stretcher	12mm
1 off Pony Pivot Stretcher	12mm
1 off Foot-well front Stretcher	12mm
2 off Foot-well side frames	12mm
1 off foot-well rear frame	10mm
1 off floor plate	10mm
1 off Rear Pony Stretcher	10mm
1 off Rear Buffer Beam	12mm

The frame assembly can be fully bolted using 50 x 50 x 6 angles, M12 and M8 machine screws, or partially welded (cross stretchers and foot-well)

1. Check fit of all inter-locking tabs, use grinder to ease if necessary.
2. Drill and bolt 50 x 50 x 6 angle, 1920mm long, to the top edge (flush) of each frame – left hand and right hand.... Starting at the back edge, to allow for the buffer beam fixing angle at the front.  
Fix using M8 x 30 bolts with nuts say every 100mm, except for the rear 450mm, where the frame needs to be drilled and tapped (to keep clear of the fire-box / ash-pan assembly)
3. Assemble mainframes with front pony stretcher, pony pivot stretcher (note, the hole is slightly off centre, and should be towards the **back** of the loco). The Foot-well front stretcher bolts on using 2 pieces 50 x 50 x 6 angle, 220 long. Note the bottom end of the angle is cut back 40mm on one face to clear the brake cross-shaft bearing on the main frame. *See drawing*  
Drill and bolt (angles) or weld the two front stretchers.  
Check for squareness before fully welding or tightening bolts.
4. Assemble by welding the foot-well assembly, noting that the 25mm dia hole in the floor plate goes to the front of the bottom plate. This is the pivot point for the rear pony truck.
5. Bolt on front buffer beam, using 4 pieces of 50 x 50 x 6 angle, 320mm long
6. Bolt on rear buffer beam, using 2 pieces of 50 x 50 x 6 angle, 245mm long, and 2 pieces of 50 x 50 x 6 angle, 170 long on the inside.

Next job – horn guides and spring hangers.....

Part 2.

**Wheels and axles:** See drawing for profiles

Driving wheels are ideally made from EN8 (although one can use other mild steels) blanks cut to 310mm diameter, from 40mm thick plate.

They are best turned on a face plate, enabling the boring of the 50mm dia. axle hole and the turning of the tread (and flange) in one go without removing it from the face plate. This ensures that the bore is concentric with the tread. The treads of the wheels should be the same diameter to within a couple of thou (of an inch), but other dims (such as root radii etc) are not especially critical, as long as the flange isn't thinned down from the 6mm shown. Treads are turned to a 2 degree taper, and flanges have a 20 degree face. Since the wheels are tucked behind the frames, it isn't necessary to machine the face or back, unless you want to.....

Axles are from 50mm dia mild steel. They should be cut say 2mm over length, both ends faced (down to correct length), and both ends centre-drilled (which will make it easier to mount a complete wheel-set in the lathe in the future – should it be necessary)

Driving Axles 2 off @ 550mm long  
Pony Truck Axles 2 off @ 480 long  
(finished length)

Wheels can be welded to axles, using 180 amps.....

I use three lengths of scaff tube, accurately cut to the back-to-back dimension (244mm) and clamp both wheels together with the axle pushed through into position to keep them square to each other, and then weld one wheel to the axle. When done, weld the other wheel. This ensures that you are only imposing one element of contraction to the assembly, whereas if you were to tack and weld both wheels, the back-to-back would be measurably smaller.

Alternatively, more conventional fixing methods can be used.....

Part 3.

**Horn Guides Spring Hangers and Spring Beams:** See drawings

Each Horn guide is made from 15mm x 50mm flat, each 155 long for the driving axles, and 115 long for the pony trucks. This is welded / tacked to a piece of 8mm x 40mm flat as the same lengths, all of which needs (accurately) drilling 12mm dia to correspond with the holes in the frames.

Please note that the dimensions given give the gap between necessary for the take-up bearings that I used, and it may be sensible to buy your bearings first in order to check the distance between faces.....

The grease-way is easily drilled (5mm dia) by starting the hole centrally, and then skewing the drill 45 degrees of so to line up with the top drilled blind hole (to be tapped M6) – I used a hand drill, and had no problems.

### Spring Hangers.

As drawn, they are squares of 50 x 40 x 10 mild steel, drilled centrally about 16mm dia. or thereabouts (i.e. generous clearance for the 12mm dia spring beams). My 'Priest' actually has them made from 40 x 40 x 10, which is perfectly acceptable. The important thing is their position, their thickness (not less than 10mm) and the fact that they are welded with sufficient penetration top and bottom.

I would recommend welding them on after the frames have been assembled, as this will prevent unnecessary distortion

### Spring Beams – driving axle.

Each beam is from 40 x 12 flat, 278 long, with a 160 x M12 coach bolt (with the head chopped off) welded to the side. Alternatively, thread a 160 length of 12mm dia bright steel bar over a length of 75mm or so. A piece of 25 x 50 flat is welded centred to the underside as a bearing plate. This bears on the top (chopped off) face of the take-up bearing.

### Spring Beams – Pony Truck.

Each beam is from 25 x 25 square, 212 long, with a 140 x M12 coach bolt (with the head chopped off) welded to the side. Alternatively, thread a 140 length of 12mm dia bright steel bar over a length of 75mm or so. A piece of 25 x 25 square is welded centred to the underside as a bearing plate. This bears on the top (chopped off) face of the take-up bearing.