

PaceMaker Traction Pack

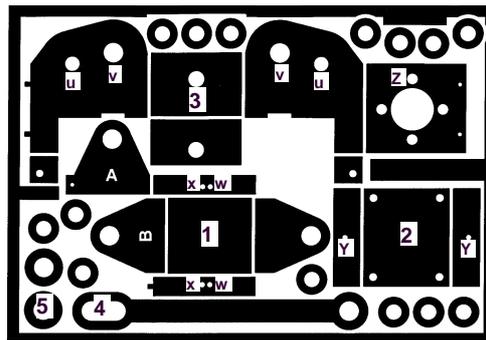


FIG. 1

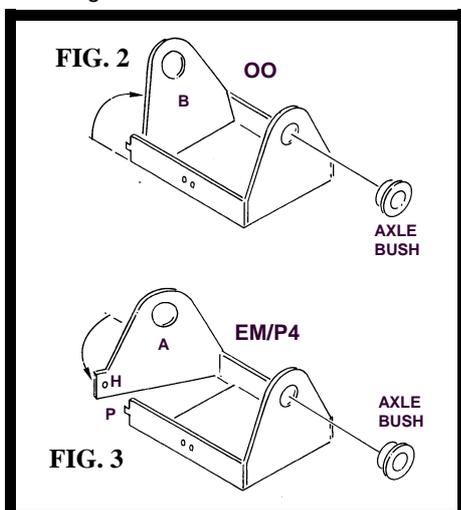
This drive unit can be used to replace the power sledge and trailing axle of the Hornby Pacer, giving better and more reliable running. Equally suitable for 00/EM/P4, it can be adapted for other four-wheel railbuses such as the popular Airfix/Dapol kit. Two gear ratios are available - 27:1 for continuous-run systems and 36:1 for small terminus-to-fiddle-yard layouts where fairly low speeds are the rule. For ultra-slow running we can supply 48:1 gearsets on request.

The suggested motor is the Mashima 1220, which gives the right kind of speed/power combination (the maximum with 27:1 gears is about a scale 50mph) and fits snugly into the chassis moulding. A flywheel should ideally be added for super-smooth starts and stops and to carry the unit over momentary dead spots. If you need higher speeds, you could fit the faster-revving DS10/H1024 open-frame motor - the slow running won't be as good, however, and there is no room for a flywheel. Although only one axle is driven - as on the real thing - there is plenty of power and adhesion for a two-car set, but there is no reason why the second car cannot be motorised if required, to follow prototype practice. The etched trailer car components are identical to those used in the power car and we can supply these, without gears for £5.50 including postage.

Any make or gauge of 10.5mm diameter disc-pattern wheels on a 2mm axle can be used with this unit but, for good current pick-up, you should remove the chemical blackening on the tyres. 00 modellers using proprietary track should note that the kit has been designed for scale wheels and reasonably generous curves. It is unlikely that a remotored Pacer would be comfortable on curves of 2ft radius or less, and certainly not on 'first radius' trackwork. In these circumstances it may be preferable to retain the original trailing axle arrangement

Preparation of the Hornby Pacer chassis is straightforward. **Remove the motor bogie**, the pivot bogie and all related fittings until you are left with just the basic chassis moulding. Remove the moulded boss ahead of the powered wheelset and file the surface smooth. At the rear wheels, remove the large circular moulded boss, the exhaust pipe and the lateral raised strip on the central area (near the boss), and dress the surface until it is flat and smooth. If you want to fit a flywheel to the new motor unit, remove the angled hood (H) to the rear of the large chassis opening.

Before cutting any components from the fret, open out the various holes in the etches, as indicated in Figure 1. Their size is important to the alignment of moving parts and the more care you take to get a perfect fit, the better your model will run. Use a reamer to **open out holes** marked U so the gear shaft is a close fit. Deburr by twiddling with a large drill bit. Open up holes V so the axle bushes are also a tightish push-fit. The holes on the pivot mount are marked W (for 00) or X (for EM/P4). Open out **one pair only**, so that a length of 0.7mm wire will just pass through. Now open out the holes Y to the same size as W OR X. Check the motor screws will pass through holes Z in the motor mount. If you ream them very slightly oversize, it will allow for subtle adjustment of the gear mesh. Trim the gear shaft to 13.5mm - in 00, it may brush against the backs of the wheels if cut over-length.



Assemble the **rocking axle** first to get a feel for the kit. For an OO model refer to Figure 1, snap off section A from the cradle (1) and bend up section B as shown in Figure 2. The ends of the box will now protrude slightly and should be filed until they are flush with the sides. For an EM/P4 model, refer to Figure 1, snap off section B from the cradle (1) and then fold section A until the small hole H locates on the pin P, as shown in Figure 3. (Open the hole out slightly if necessary)

For all gauges, bend up the sides of the cradle and fold the two arms through 90 degrees and check they are parallel to one another. Solder the box thus formed at the corners for extra strength. Now solder the axle bushes in place with their shoulders on the outside of the box. Bend the sides of the pivot mount (2) through 90 degrees and check the cradle fits snugly inside it. - if it's too tight, the cradle won't rock (!). Push the 0.7mm wire through the appropriate holes but do not glue it in place yet. Keep the clearances tight - the cradle should be able to rock up and down, but if there's any fore-and aft slop on the axle, it could cause derailments. Put the cradle assembly to one side for the time being.

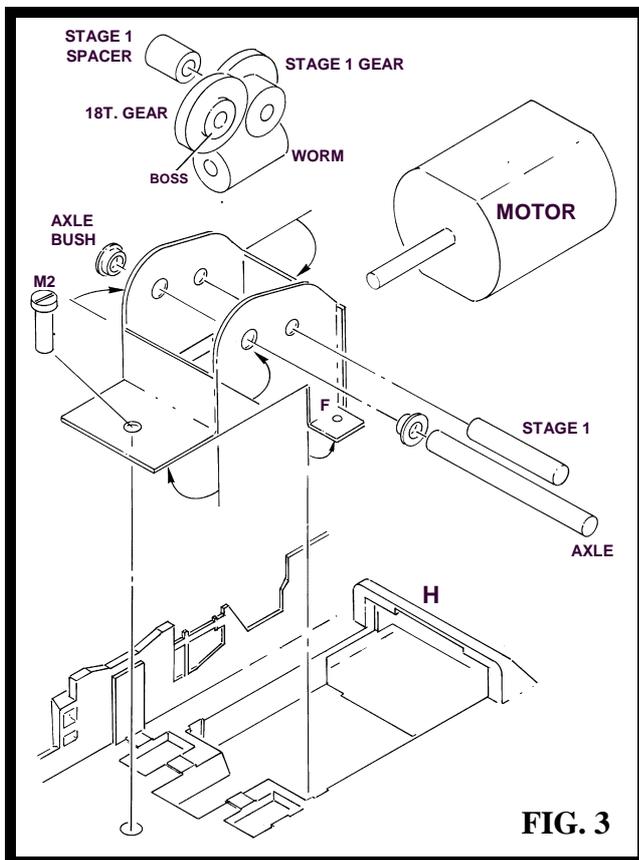


FIG. 3

Remove the **mainframe** (3) from the fret and clean off any stubs, being careful not to file off the tabs used for part location. Solder the axle bushes in place and then fold into a box shape as shown in Figure 3 (all fold lines are on the inside). Small pins on the side of the unit locate into holes in the motor mounting plate and these hole may need enlarging slightly with a needle file. Use a suitable piece of wood to push together the surfaces to be joined and when satisfied, tack-solder them in place. This joint must be square or the mesh of the worm could be affected.

If you've folded the mainframe accurately, the gear shaft and axle will be a comfortable fit through their holes. If they're stiff, or won't go in at all, don't force anything (and still less, don't enlarge the holes). Check for squareness - looking at the work through a magnifying glass helps - and tweak as necessary. You should now find the shafts will fit, and you can solder the mainframe along the folds to reinforce the assembly. Repeat all these steps for the identical components for the unpowered trailer car. **Paint** the mainframes and rocking axle units matt black and allow 24hr for the paint to harden.

If you're not bothering with a **flywheel**, cut off the motor shaft at the brushgear end using a carborundum cutting disc in a mini-drill. If you are fitting a flywheel - 1/2in diameter fits neatly and invisibly but larger flywheels will call for modifications to the seating unit - trim 2mm off the rear shaft. (These dimensions apply to a Mashima 1220 with standard length shafts.)

The **worm** provided may be either brass or nylon, according to type and gear ratio (the two are not interchangeable) and should be pushed onto the motor shaft until its mid-point is 6mm from the motor face. Some brass worms supplied to us are fractionally tighter than others and if they aren't an easy push-fit, they can be gently forced on to the shaft in a vice (the alternative is to ream them to a good fit). If necessary, secure with a small drop of superglue or Loctite 601 at the outer end. Nylon worms are an interference fit and do not need glueing.

Slightly loosen the screw holding one of the carbon brushes so the tag can be turned round through 90 degrees, then tighten it again with both tags facing towards the 'label' side of the motor - this makes for easier wiring-up. Now screw the **motor** in place with the flat sides at top and bottom; the plain (non-label) side is the one visible on the underside of the model. Push the **gearshaft** through the mainframe, with the double gear and collar. Glue one end only of the gearshaft in place with superglue or Loctite 601 and allow to cure. Centre the double gear under the worm and lightly turn the motor shaft over by hand. If there's a tight spot, loosen the motor screws and adjust the motor position.

Offer the wheels to the mainframe and see how many washers are needed on either side to eliminate sideplay. Aim for running clearance only. Take one wheel off its **axle**, add washers and then push the axle through the bush, through the 18-tooth single gear (this is an interference fit, but it might profitably be eased with a reamer before fixing) and out the other side. Note that the boss on the 18-tooth gear is nearest the sideframe, away from the double gear. Add more washers and the second wheel, then check the back-to-back and adjust as necessary.

Centre the double gear against its collar and then, using the minimum force necessary, slide the single gear into mesh. Push the axle to the limits of its sideways travel - you should be able to see no more than 0.5 mm of daylight between the faces of the two gears. Turn the motor over by hand to check for tight spots. Using wander leads from your controller, **run the mechanism** in for half an hour, gently at first and then gradually increasing the revs. The gears are virtually self-lubricating but can be lightly smeared with a plastics-compatible light grease if required. Metal-on-metal surfaces, such as axle bearings, should be lightly oiled.

Slot the M2 bolt through the hole in the **completed PaceMaker**, through its hole in the floor of the power car and secure it with a nut on the upper side of the floor. File a flat on one side of the nut so it clears the moulding. You will also need to cut away a small part of the step in the seating unit to clear the nut and bolt. Optional extra fixing holes (F), suitable for 14BA bolts, are situated on the fold up lugs. To reduce noise levels, pack the gap between the motor and chassis with Blu-tack or similar.

Fit wheels and washers to the rocking axle and then offer this assembly up to its location as shown in Figure 4. Use a small amount of glue to temporarily fix it in place. Now place the model on a level surface and check the position of the wheels in relation to the axlebox centre. Make any necessary adjustments to the position of the assembly and then carefully remove the pivot wire. With the pivot mount still glued in place on the floor, spot through two of the four corner holes, countersink the holes in the etch slightly, and secure the mount with 14BA countersunk bolts pushed up through the floor. Refit the wire and secure at one end with glue. If necessary, the ride height can be adjusted by shimming under the pivot mount. Repeat with the axle units for the non-powered trailer car.

Most modellers have their own preferred method of fitting **pick-ups**. We suggest that the pick-ups are mounted on strips of Paxolin, located in the rectangular cutouts above the wheels. To do this, tin some 4mm wide copperclad

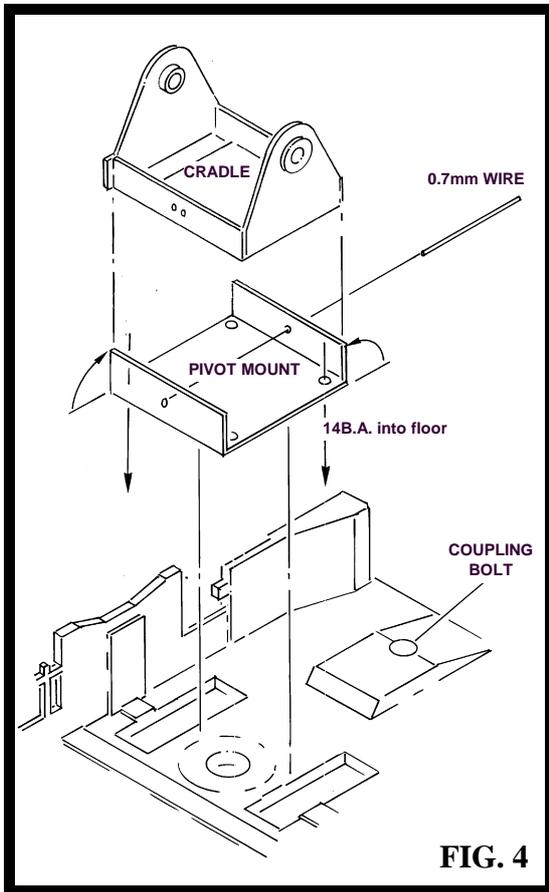


FIG. 4

sleeper strip and cut four 8mm lengths. Using two-part epoxy, glue them above the rectangular wheel cut-outs (tinned side up) and allow to cure. They will be used as anchor points for the new pick-ups.

Drill two 0.33mm holes upwards through the strips, at the front end (the end nearest the headlights) of the cutout. Bend a length of 0.33mm wire into a small 'L' shape and push the longest end down through the hole in the Paxolin. Cut four lengths (20x50mm for the front, 2x100mm for the rear) of insulated wire and solder these, along with the tops ends of the pick-ups, to the Paxolin strips (be quick with the iron or the epoxy and/or plastic chassis might suffer). Route the insulated wires neatly away from the strips (making sure they do not obstruct the seating unit, when fitted) and solder the other ends of the wires to the motor terminals. For an even better job, you can solder the wires onto **bussbars** mounted above the central well, which can then, in turn, be connected to the motor terminals using removeable connectors. These bussbars will also provide a convenient connecting point for other power supplies and/or feeds, such as trailing car pick-ups, headlights, carriage lights, etc.

The pick-ups will need tweaking and bending to get the best electrical contact on the faces of the tyres, but they don't want to exert so much pressure that they act as a brake on the non-powered wheels. Check that each one is working properly before trimming off any excess wire. Fill the well in the chassis with lead and **test-run** (the trailer could benefit from a little weight also). If the running is intermittent, check that (a) the wheels are clean and shiny, and free of blackening (b) that the track itself is clean and most importantly (c) that the pick-ups are doing their job - with the wheels on the track, lift each end of the chassis up in turn to check that all pick ups are working.

The effective distance between pivot centres on the **coupling** (5) (shown in Figure 5) can be adjusted to suit the curves on your layout. For tight curves, solder the washer near the outermost end of the slot and for generous curves towards the inner end. If possible, fix the washer (6) temporarily in place and try the two-car set around your curves. Attach either end of the coupling bar to the chassis with suitable sized bolts through the holes in the floor (see Fig. 4). For double insurance and very little extra effort, we suggest you fit pick-ups to the non-powered trailer car as well. You can improvise plug-and-socket connections between the cars using short lengths of brass capillary tube, and arrange the wires to simulate **jumper cables**.

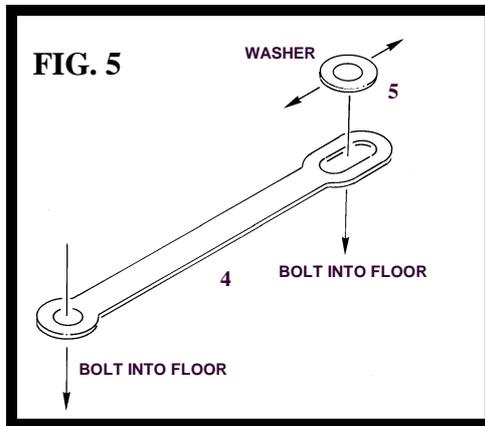


FIG. 5

HIGH LEVEL

PaceMaker

*Traction Pack for upgrading
Hornby models.*

*27, 36 or 48:1 ratios available
for Mashima 1220 Motor*

*Includes compensated
trailing axle assembly*

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