

# THE DINGHAM AUTOCOUPLER

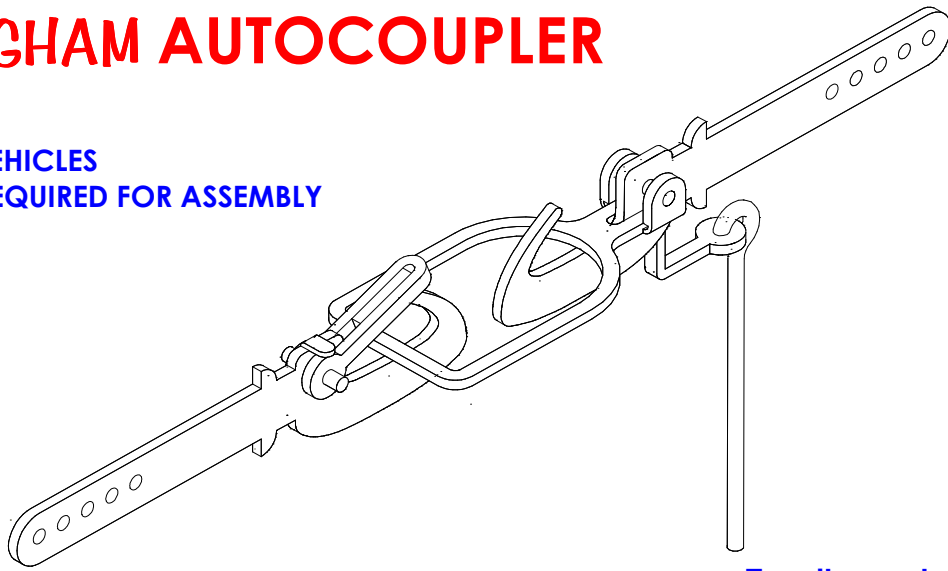
for 4mm : 1ft

PARTS FOR 20 VEHICLES

SOLDERING IS REQUIRED FOR ASSEMBLY



D I N G H A M



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## The DINGHAM Autocoupler

The DINGHAM Autocoupler was developed for use on *Lofthouse-in-Nidderdale*, the O Gauge layout of the Skipton and District Railway Society. The 4mm version of the coupler is based on entirely new artwork.

Every train that runs on *Lofthouse* is shunted in public view for one reason or another. Goods trains have brake vans attached or detached, banking engines are attached to the rear of up trains and pilot locos are detached from double-headed down trains. There is also a daily pick-up goods in the timetable. Finally, passenger locos are run round trains and non-passenger vehicles, such as horseboxes are set down or picked up from the yard.

*Lofthouse* needed reliable and unobtrusive autocouplers and we could find nothing on the market that satisfied all our requirements. So – no alternative but to develop a coupler that did. Now, these couplers are commercially available as the DINGHAM Autocoupler.

The coupler uses a latch and loop system and is intended primarily for single-ended use – i.e. the loop is always on the right-hand end of stock and the latch on the left, or *vice versa*. However, on layouts where locos are turned, it may be possible to fit locos with a latch *and* a loop at each end, so enabling automatic coupling and uncoupling whichever way locos are facing.

### The DINGHAM Autocoupler's unique combination of features –

- **Quick and easy to fit to new or existing stock** – the DINGHAM Autocoupler mounts through the existing coupler slot on the buffer beam, or a hole can be drilled in the beam and hidden behind one of the drawgear endplates supplied on the etch.
- **Reliable in operation** – the geometry of the DINGHAM Autocoupler has been carefully worked out to ensure that it is self-jigging in assembly and is virtually 100% reliable in operation.

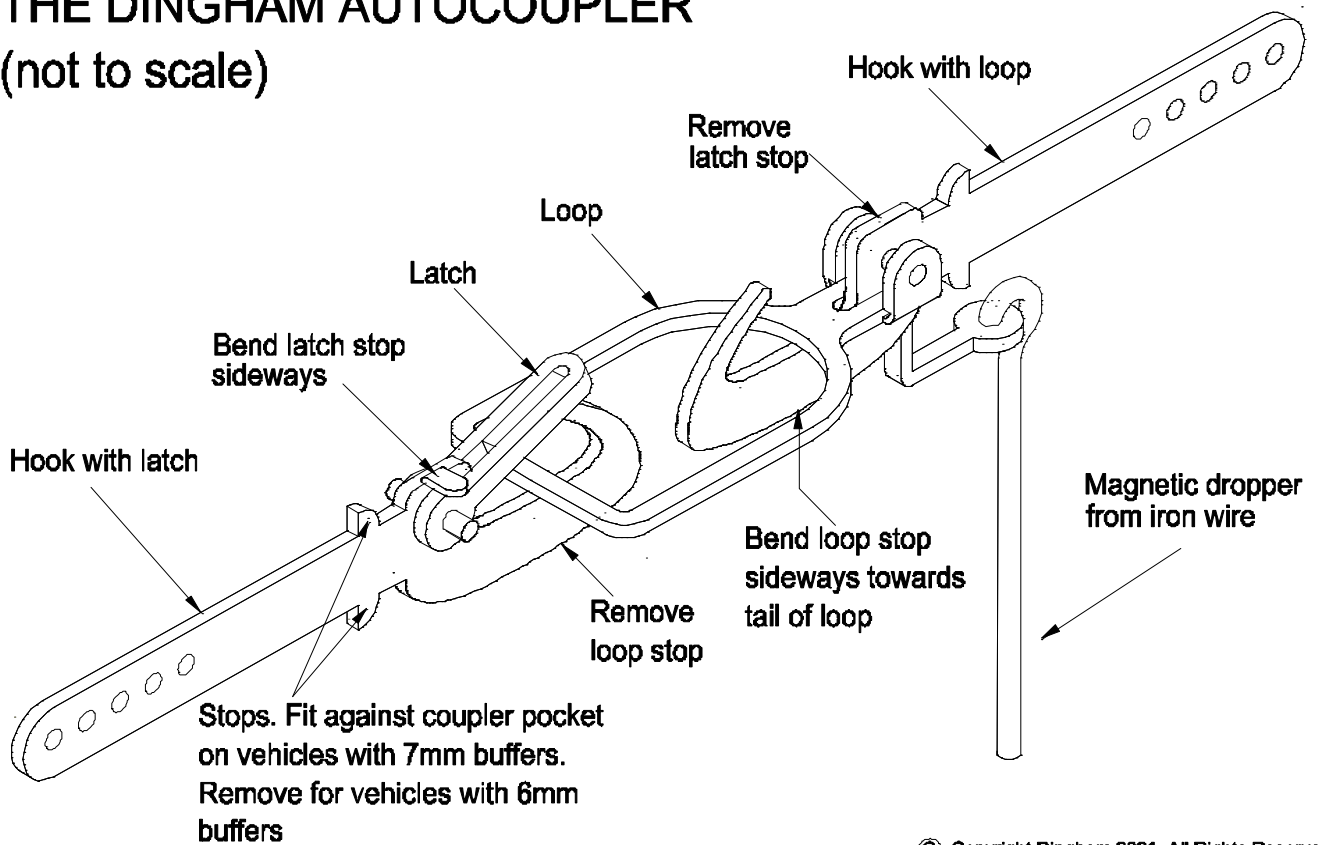
- **Easy to set up** – the vertical adjustment of the DINGHAM Autocoupler almost takes care of itself by virtue of its fitting in the existing coupler slot. In any case, the coupler is fairly tolerant of deviations from the ideal height. Longitudinally, the coupler is self-jigging for stock with buffer lengths of 1ft 6in (most unfitted wagons) or 1ft 8½in (fitted wagons, most locos and many coaches). Spacers are provided for fitting the couplers to stock with longer buffers.
- **Robust** – when stock is put back in the box, the only vulnerable part of the coupler – the loop – flips upwards out of the way and is protected by the buffers.
- **Fully compatible with scale 3-link and screw couplings** – an essential feature for club layouts running members' stock or home layouts running visiting vehicles.
- **Electromagnetic operation with latching mechanism** – the hinged loop and latch mechanism of the DINGHAM Autocoupler means that, once uncoupled, it stays uncoupled until the operator wants to couple up again. This means that only one electromagnet is required for a fan of sidings and also provides –
- **Ability to uncouple vehicles at will in a moving train** – as a train is propelled over the electromagnet, wagons can be uncoupled at will whilst the train is on the move. No more having to stop over the magnet and then perform an unprototypical back and forth shuffle to uncouple and place a fixed loop on top of a fixed latch.
- **Unobtrusive** – the latched hook is only slightly larger than the prototype. The loop is etched as thinly as possible consistent with adequate strength.



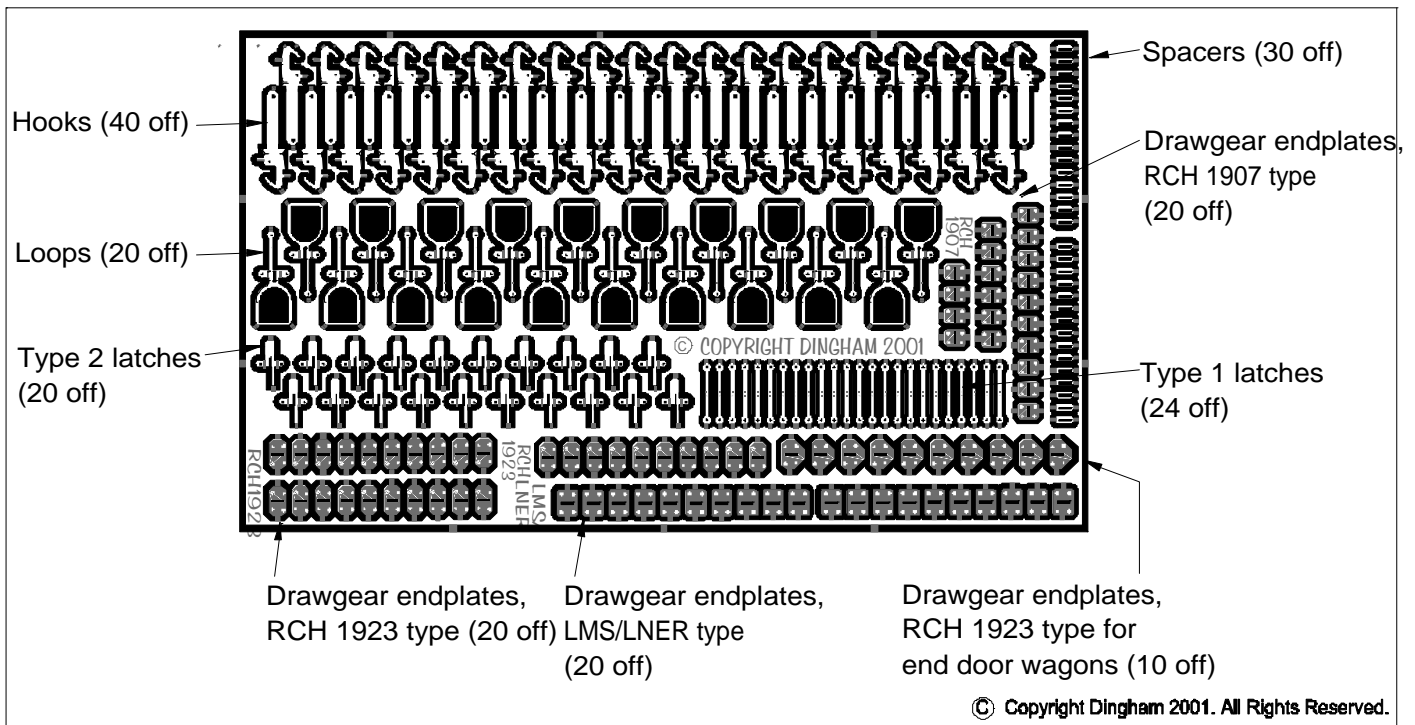
D I N G H A M

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# THE DINGHAM AUTOCOUPLER (not to scale)



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NOTE: The RCH 1923 type drawgear endplates are handed. The larger etched nuts are screwed to the ends of the wagon to the other, whilst the smaller nuts are on bolts that pass only through the wagon headstock. Handed pairs are provided side by side on the etch.

The RCH 1923 type drawgear endplates for end door wagons have an upwards extension which fits over the end door sill to help retain it in position. The ends without the door on these wagons have normal drawgear endplates. Correctly handed normal plates are provided on the etch adjacent to the end door endplates.

# THE DINGHAM AUTOCOUPLER – ASSEMBLY AND FITTING INSTRUCTIONS – 4mm VERSION

The coupler is intended for single-ended use. This means vehicles must always face the same way on the layout. Each vehicle has a hook with loop at one end and a hook with latch at the other. Coupling takes place automatically as vehicles are pushed together. The loop slides up the hook on the next vehicle, passes under the tip of the latch and drops into the slot in the hook. Uncoupling can take place when vehicles are buffered-up by means of magnetic action on a dropper suspended from the tail of the loop under the buffer beam. The magnet pulls the dropper down and the loop is lifted, flipping the latch upwards, then dropping back on top of the latch and preventing re-coupling. Properly adjusted couplers on 4-wheel wagons will couple and uncouple readily on curves of 3ft radius or less.

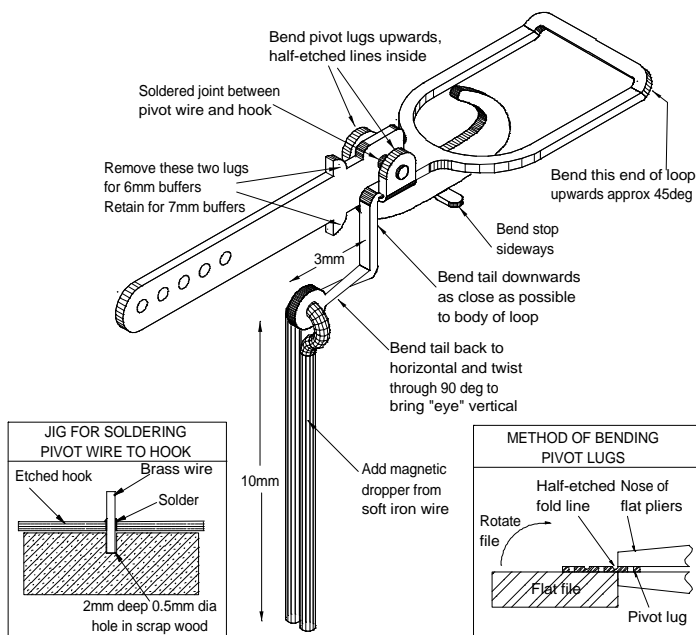
Two types of latch are provided on the fret. Try both and see which you prefer. Type 1 is less obtrusive and its operation is slightly more reliable, but type 2 is probably easier to assemble and fit.

**IMPORTANT:** For dependable working, the coupler relies on the correct relationship between the positions of the hooks and the buffer faces of vehicles. If the hook is set too far back, it may be difficult to couple vehicles on curves. If the hook is set too far forward, the coupler loop will be pushed against the back of the slot in the opposing hook when propelling, and the friction between loop and hook will prevent uncoupling. Non-scale buffers are common on proprietary 4mm scale rolling stock. If the buffer length is less than 6mm (scale 1ft 6in), the couplers cannot be made to work properly and the buffers should be replaced with scale-length items. Parts are included to allow the couplers to be fitted to all vehicles with buffer length greater than 6mm and the couplers are self-jigging for the two most common scale buffer lengths of 1ft 6in (6mm) and 1ft 8½in (7mm).

**NOTE: THE COUPLERS SHOULD BE CHEMICALLY BLACKENED ON COMPLETION. THEY WILL NOT WORK IF PAINTED.** Carr's metal black for nickel silver or Birchwood Casey Super Blue are suggested. Some users of the 7mm version of the couplers have successfully used spirit-based felt-tipped pen for blackening. In either case, it is important to clean and degrease the couplers before blackening. (Shake them in hot detergent solution in a small jar.) This not only helps with the blackening, it also removes flux and other residues which may impair easy working.

## Hook with Loop (diagram below)

(a) *Prepare the hook.* Solder a short piece of 0.5mm brass wire into the pivot hole in the hook. (Make a simple jig by drilling a 0.5mm hole about 2mm deep in a piece of wood). Trim so that the total length of the pivot wire is about 3mm, with equal lengths protruding at either side of the hook. Remove the upper half-etched latch stop. If fitting to a vehicle with 6mm buffer projection, remove the lugs on the shank. Retain the lugs for buffers of 7mm or longer.



(b) *Prepare the loop.* Bend the pivot lugs upwards through 90deg (half-etched lines inside). The correct technique (see diagram) must be used here otherwise the loop will be distorted. Grasp the pivot lug in flat nosed pliers with the ends of the pliers level with the nearside of the half-etched fold line. Then take a flat file, place against the body of the loop and the ends of the pliers and rotate the file to bend the body of the loop 90deg upwards. Repeat for the other pivot lug. Bend the front of the loop upwards at about 45deg. Bend the tail of the loop downwards through 90deg making the bend as close to the body of the loop as possible. Bend the last 3mm of the tail back to the horizontal. Put a 90deg twist in the horizontal portion as shown. With a cutting broach or 0.6mm drill, open up the holes in the pivot lugs to give a sloppy fit on the 0.5mm pivot wire.

(c) *Fit loop to hook.* Holding the loop vertical in relation to the hook, place one pivot hole then the other over the pivot wire. If necessary, part the pivot lugs slightly to do this and squeeze them gently back into position after fitting. Swing the loop into its normal position as shown in the diagram and bend the half-etched stop sideways towards the tail of the loop.

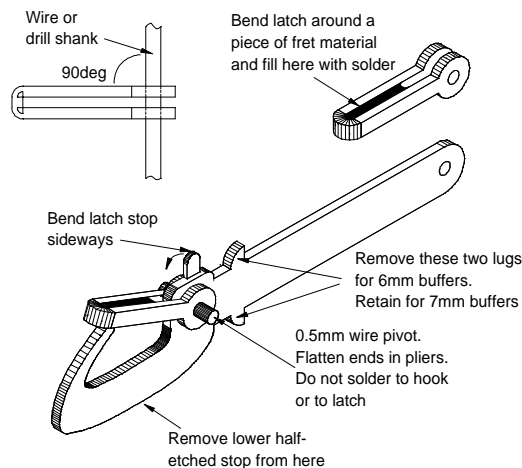
(d) *Fit a magnetic dropper.* Make a magnetic dropper from the 0.3mm soft iron wire supplied. Trim its total length to 10mm. It should clear the railhead by 1mm.

## Hook with Type 1 Latch (diagram right)

(a) *Prepare the hook.* Remove the lower half-etched loop/latch stop. Depending on buffer length, remove or retain the lugs on the shank (see above).

(b) *Prepare the latch.* Fold the latch around the edge of a piece of fret material (half-etched dots inside) to ensure the correct distance between the legs. Pass a length of 0.5mm wire through the two holes in the latch. If the wire and latch are not at 90deg, push the latch gently sideways until they are. Fill the end of the latch with solder as shown. File the latch flat, top and bottom. Any unevenness may impair the working of the coupler. With a cutting broach or 0.6mm drill, open up the pivot holes to give a sloppy fit on the 0.5mm wire.

(c) *Fit latch to hook.* Flatten about 0.5mm of one end of a piece of 0.5mm brass wire by squeezing in pliers. Position the latch over the hook and pass the wire through the pivot holes in latch and hook. Cut off the wire 0.5 – 1mm from the opposite side of the hook and flatten this end also in the pliers. Fold the upper latch stop sideways.

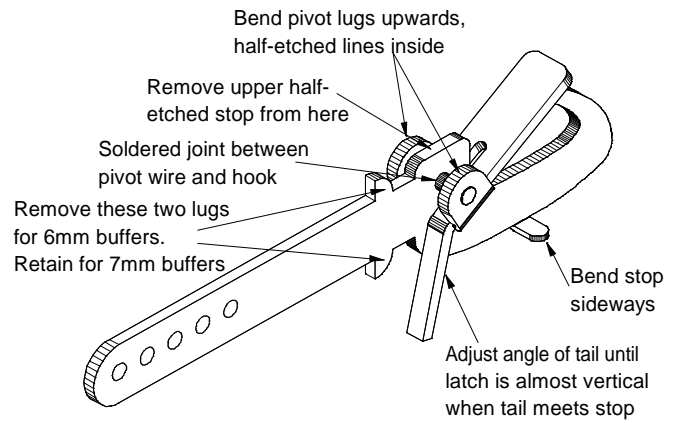


## Hook with Type 2 Latch (diagram right)

(a) *Prepare the hook.* Prepare the hook by soldering in a pivot wire in exactly the same way as for the hook with loop.

(b) *Prepare the latch.* Bend the pivot lugs upwards through 90deg (half-etched lines inside). Bend the tail of the loop downwards through approx 45deg. Open up the holes in the pivot lugs with a broach or 0.6mm drill to give a sloppy fit on the 0.5mm pivot wire.

(c) *Fit latch to hook.* Use the same method as described for fitting the loop. Bend the half-etched stop sideways, towards the latch tail then adjust the angle of the tail until the latch is almost vertical when the tail meets the stop.



## Fitting Couplers to Vehicle

**IMPORTANT:** CHECK THE LENGTHS OF THE BUFFERS ON YOUR STOCK – IF POSSIBLE, SPRUNG BUFFERS SHOULD BE ADJUSTED TO EITHER 6 OR 7MM PROJECTION. For all buffer lengths, the couplers *must* be fitted so that the hook projects the same distance from the beam as the buffers (see diagram right for method). THE CENTRE HEIGHT OF THE COUPLER SLOT SHOULD BE 14MM ABOVE THE RAILHEAD. If it differs much (more than about 0.5mm) from this height, remove the existing drawgear endplate from the buffer beam, drill a 2mm hole at the correct height, and use one of the etched drawgear endplates provided.

The couplers are fitted in the same way as the usual 3-link or screw couplings – through the coupler slots in the buffer beam. They should be secured by adhesive (cyanoacrylate or epoxy). Holes are provided in the shank for fixing by spring and split-pin. However, rigid fixing is to be preferred, because it gives positive positioning and more reliable operation.

If no coupler slot or pocket is provided, or if it will not fit the shank on the hook, drill a 2mm hole through the beam centred at 14mm above rail height. Cover it with one of the drawgear endplates provided on the etch, and fit the coupler through the slot.

## Double-Ended Operation

On many layouts, rolling stock is never turned, so single-ended couplers are no problem.

However, to allow locos to be turned, it *may* be possible to fit double-ended couplers. A loop *and* a type 1 latch (but not a type 2 latch) can be fitted at both ends of the loco. In assembling double-ended couplers, first solder the pivot wire into the hook. Then bend the type 1 latch until the eyes on the ends are about 3mm apart and place over the pivot wire. Squeeze the eyes of the latch together adjacent to the pivot wire and fill the end of the latch with solder. Finally add the loop in the usual way. It is emphasised that the couplers will almost certainly not work as well in this set-up as in single-ended mode.

## Operating with DINGHAM Autocouplers

Electromagnets are recommended for actuating DINGHAM Autocouplers. Suitable magnets are available from DINGHAM. Permanent magnets, with a lifting and lowering mechanism (lift the magnet to actuate the couplers), may also be used. If using permanent magnets, make sure that a pole of the magnet is facing upwards. (The magnetic field is strongest near the poles).

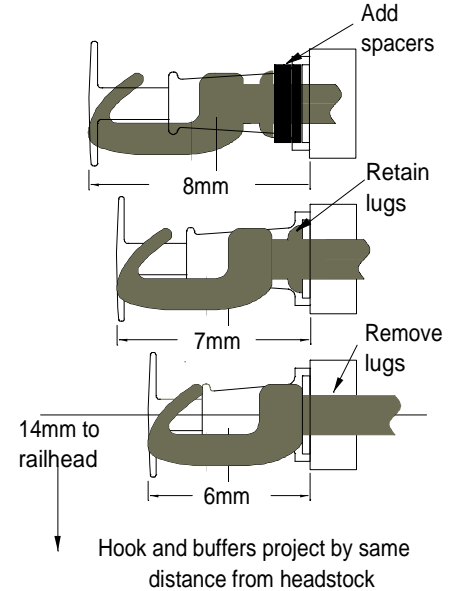
Examples of operation are given below.

**Example 1:** A passenger train enters a station where the service terminates and the loco runs round. The train is stopped with the coupling between loco and train over a suitably placed magnet. The loco now eases back on the train (a movement of about 2 – 3mm and quite prototypical, because the buffers have to be compressed to allow the screw coupling to be unhooked). If the magnet is now briefly energised, latched uncoupling will take place, and the loco can move away from the train at any time.

**Example 2:** For shunting a yard, magnets can be placed at the entrance to a fan of sidings. Only one electromagnet may be required, though it is often advantageous if several are provided. As a train is propelled into the yard, any coupler may be uncoupled by energising the magnet as that coupler passes over it. The vehicles will remain uncoupled so long as they are propelled steadily.

**Example 3:** The diagram below shows the arrangement of magnets on the layout for which the DINGHAM Autocoupler was developed.

A more detailed account of positioning magnets for realistic operation is included in the instructions for the DINGHAM electromagnets which can be accessed as a pdf on the DINGHAM website.



## Lofthouse-in-Nidderdale Skipton and District Railway Society

