

Tortoise Adaptor Plate (Pack of 5)

The P4Track Company

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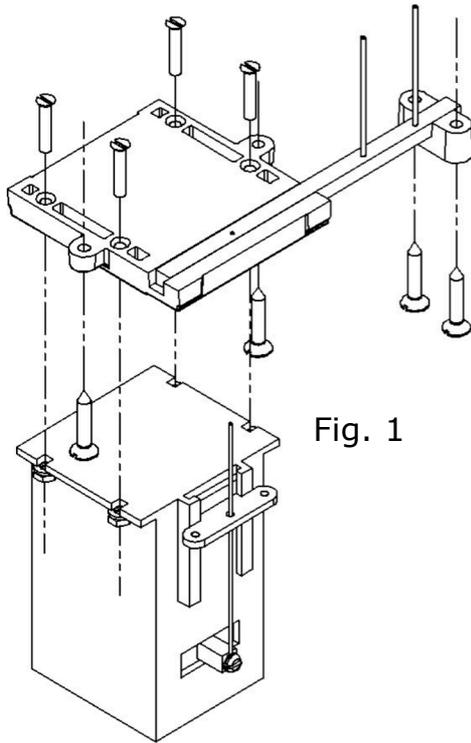


Fig. 1

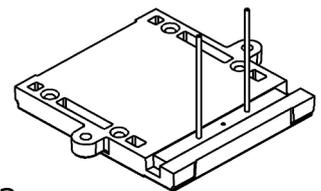
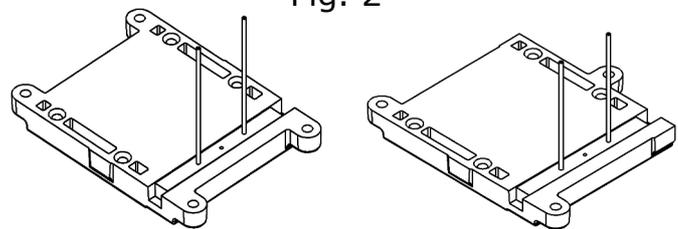


Fig. 2



Instructions

Introduction

The Tortoise Adaptor Plate consists of a simple set of mouldings designed to enable the widely used Tortoise Switch Machine (produced by Circuitron of Romeoville, IL, USA) to be adapted to provide a concealed 'twin tube' connection to the switch rails of a turnout.

It has been produced as part of the NewTrack project which is creating a range of accurate and easy to assemble 4mm scale turnout kits to P4 standards. The Adaptor Plate can, however, be used for any gauge or scale for which the Tortoise is a suitable switch machine.

In addition to a Tortoise switch machine and the Adaptor Plate mouldings, you will need 4 x 6BA countersunk screws 15mm long with nuts and washers and between two and six 3mm countersunk wood screws, of a length to suit the baseboard thickness (baseboard thickness + 5mm is a good guide). You will also need some metal tube (brass, 1/16"OD, 1.0mm ID will do), some wire to provide a sliding fit in the tube (nickel silver 0.9mm dia will fit the brass tube nicely) and the usual modelling equipment - soldering iron, needle files, pin chuck, drills, scalpel and a junior hacksaw.

Using the Adaptor Plate

An exploded view of an arrangement of the complete drive system is shown in fig. 1. The Tortoise switch machine, bolted permanently to the Adaptor Plate using the 6BA screws, nuts and washers, drives the slider using the wire supplied with the Tortoise. The slider has two short lengths of brass tube fitted in it, spaced slightly further apart than the running rails. The pieces of tube pass through holes in the baseboard, positioned under the ends of each switch blade and sufficiently large to allow for the throw of the switch. Shaped pieces of the nickel silver wire, fitted in the tubes and soldered to the switch rails, provide the final connection.

First, decide on the particular arrangement you will use. Fig 2 shows some additional possibilities. The Adaptor Plate has been made as flexible as possible with six screw attachment lugs, only two or three of which typically need to be used, and also a slider support to allow the Tortoise if necessary to be mounted to one side of the switch rails it is driving. Prepare the Adaptor Plate by cutting off any unused lugs which would clash with the baseboard structure or other under-baseboard equipment.

Next, prepare the slider. Obviously, you are free to use any method you choose to connect the slider to the switch rails. The one described here has been successfully used for NewTrack P4 turnouts and all dimensions relate to P4 standards and 18.83mm gauge track. Mark the top surface of the slider with two indents, 20.5mm apart and on the slider centre line. Using a 1.6mm drill in a pin chuck, drill two holes at the indent positions - take it slowly, constantly checking that the hole is perpendicular to the slider. Cut two pieces of the brass tube, long enough to reach the top of the track underlay when the tube is fully inserted in the slider (baseboard thickness + underlay thickness + 4mm is what is needed). Clean up the ends of the tubes (placing in a drill chuck and using a needle file to soften the corners and flatten the ends is one way - but take care!). Place the slider on a flat surface and press a piece of tube into each hole - press vertically and make sure the tube finishes flush with the bottom of the slider. Measure the spacing of the tubes at their 'free' end, which should be 20.5mm, and note what it actually is (less than 19.5mm is probably unacceptable).

Cut two pieces of 0.9mm nickel silver wire, approx 15mm long. Clean up one end so it can easily enter the top of the brass tube inserted in the slider and bend the last 3mm at the other end to a tight right angle. Holding the straight section of the wire in a pin chuck, the bent section then needs to be shaped with a needle file (a triangular one is best). In shaping the bent section, the aim is to produce a flat top surface 2mm long with a small upstand to locate the switch rail. If the tubes were less than 20.5mm apart, the flat sections should be a little less than 2mm; if more, then a little more than 2mm. The end result with the wires inserted in the tubes is that the inner faces of the small upstands should be 16.5mm apart.

Now for assembly. Before the turnout is glued down, place it in position and mark where the brass tubes will need to come through the baseboard. Remove the turnout and drill vertically through the baseboard at the marked positions. On the underside of the baseboard, draw a line through the centres of the drilled holes to show where the slider centre line must be. Open out the drilled holes to create slots which allow enough throw of the brass tubes to throw the switch.

Using the slider centre line as a guide, attach the Adaptor Plate to the underside of the baseboard using 3mm countersunk woodscrews. It may be easier to position the Plate first without the slider in position, but the slider then needs to be installed so that the nickel silver wires can be slid into position in the tubes and soldered to the switch rails. A piece of card the width of the space between the timbers with a slot in its end just wide enough to take the wire will be found helpful in lifting the wires into position. For soldering, the switch rails are best held half open with card spacers behind both switch rails. Use as little solder as possible to solder the upstand to the switch rail and do not hold the soldering iron in position for long. The risk of damaging plastic components will be reduced if the adjacent P chairs have been left loose and are removed. Alternatively, use metal clips on the switch rails as heat sinks. If any solder reaches the flat section of the wire, it must be scraped clean. If all has gone to plan, the clearance when the switch is fully thrown between the open switch rail and the stock rail will be between 1.4mm and 1.6mm.

With the switch in its mid-position (pieces of card behind both switch rails will hold them in this position), mark the slider at the centre position in the square cut-out in the Adaptor Plate and make pencil marks to show which way round the slider should go. Remove the Adaptor Plate and slider (leaving the wires soldered to the switch rails), drill the marked position in the slider 0.9mm diameter and open out the hole towards the top of the slider so that the Tortoise operating wire can move to angled positions each way but without sideways slop. Bolt the Tortoise to the Adaptor Plate using the 6BA screws and install the operating wire in accordance with The Tortoise instructions. Cut off the operating wire so that it does not extend above the top of the Adaptor Plate, even in the centre position. Refit the slider onto the wires (the same way round as before!) and place the Adaptor Plate assembly in position, making sure the operating wire passes through the hole in the slider. Screw the Plate to the baseboard, connect the Tortoise to its power supply and test.

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