

# **Brassmasters**

**Scale Models**

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## **Detailing Kit for Hornby A4 Locomotive and Tender**

## **Instructions**

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## 1 Introduction

1.1 This etch was developed as part of the Brassmasters EasiChas kit for converting the Hornby A4 locomotive and tender to EM or P4 gauge. However, this detailing kit is suitable for all 4mm gauges.

1.2 There are a number of components provided. These are, working from the front:

- overlays for the main frames in front of the cylinders with bogie wheel splashers, door opening gear etc.
- bogie brackets
- replacement piston valve guides
- return crank bearing cover
- replacement reach rod and brackets
- brake hanger brackets
- footplate support brackets
- replacement damper operating linkage
- tender guard irons

## 2 General Notes

2.1 Numbers shown in square brackets [ ] in the instructions refer to the etch (D for the loco detailing etch) and part numbers, e.g. [D2] is part 2 on the etch. The part number appears on the separate etch diagram.

2.2 Some of the parts are small and easily damaged, so do please take care. Parts should be removed from the sheets as and when needed by use of a small scalpel etc., and the tabs and etch cusp removed with a small fine-cut file.

2.3 All folds and bends are made with the half-etched line on the inside unless otherwise stated.

2.4 On some parts it is necessary to emboss rivet / bolt heads from the reverse sides by use of a punch.

2.5 There are half etched test rivet holes on the back of the etch edging strip. Use these to get used to forming uniform rivets.

## 3 Dismantling the locomotive

3.1 The valve spindle guides fitted to the front and rear of the Hornby cylinders are very delicate and susceptible to being broken off. There is also a projection down from the body over the motion bracket. These are also fairly delicate, and are glue fitted, they often are loose and it is worth removing these and replacing when work is complete. Take care when handling and working on the body.

3.2 To remove the body from the chassis first unclip the lubricator drive from the lubricators on the right hand side of the loco by pushing the link gently upwards. Alternatively undo the rear right hand crankpin and remove the lubricator drive crank. Undo the rear left hand crankpin and remove the speedo drive crank (if fitted). Undo the large screw above the bogie (this is a very tight fit and requires some effort on the two new locos we have dismantled). Push the chassis forward in the body and then withdraw the chassis leading end first. Put the body to one side. Keep the screw for future use.

3.3 Remove the bogie and its bracket by undoing the screw at the back end of the bracket. Ease the bracket over the lug on the back of the cylinder moulding. Keep the screw for future use.



## 4 Front chassis overlays

4.1 Emboss the rivets in the two front chassis overlays [D1 and D2].

4.2 Curve two of the bogie wheel splashers [D3] to match the radius of curve above the bogie wheel. NOTE: the two should be of opposite hands. See Photo 1 of the completed left hand frame overlay.



4.3 Solder the splashers into position. The angled corner should be to the outside and towards the front of the loco.

4.4 Bend up the left hand side door opening gear bracket [D4]. Cut a piece of 0.8mm brass wire to 4 mm long. Holding the bracket [D4] roughly in position on the left hand chassis overlay' insert the brass rod between the bracket and hole in the chassis overlay. Move the bracket round until the rod is perpendicular. Solder the rod in place, and then solder the bracket in place.

4.5 Bend up the right hand side door opening bracket [D5]. Place a piece of 0.45mm wire through the hole and solder with 1.5mm extending in front of the hole. Use this wire to locate the bracket in position on the frame. Solder the wire in place, and then solder the bracket in place. See Photo 2.

4.6 If required for your chosen loco, bend up the right hand side outer side door opening bracket [D6]. Cut back the 0.45mm wire fitted in 4.5 flush with the outside face of the bracket. Fit the outer door opening bracket on the right hand side by soldering the outer bracket to the inner bracket. Cut a piece of 0.8mm brass rod to length, placing between the outer bracket and the inner bracket, and solder into place.



4.7 Take the triangular buffer beam brackets [D7]. Solder to the two chassis overlays above the riveted strip. (Note - Photos 1 and 2 show the test assembly where the brackets had a fold over front edge. The kit ones do not.)

4.8 Cut two pieces of 3/32" tube to a length of 4.8 mm and chamfer both ends so that they locate in the recesses in the buffer spring housings [D8]. Fold up the two buffer spring housings [D8] by first bending the two small pieces at the end of the thin arms at 90 degrees. Then fold the two thick arms at 90 degrees. Finally bend the thin arms trapping a piece of tube. See Photos 3 and 4. Solder together. Cut two short lengths of 1.0 mm diameter wire. Insert the wire through the buffer washer [D9] and the smaller hole in the end of the buffer spring housings ensuring that the wire does not protrude into the tube. Trim the wire to length. Solder together. Ensure that the larger hole in the end of the buffer spring housing and tube pass over the inner end of the Hornby buffer – open up if necessary with an appropriate size drill. Do not attach to the chassis overlays at this stage.



4.9 If vertical frame guard irons are required for your chosen period, emboss the rivets on the lifeguards [D10 and D11]. Attach to the front end of the chassis overlays.

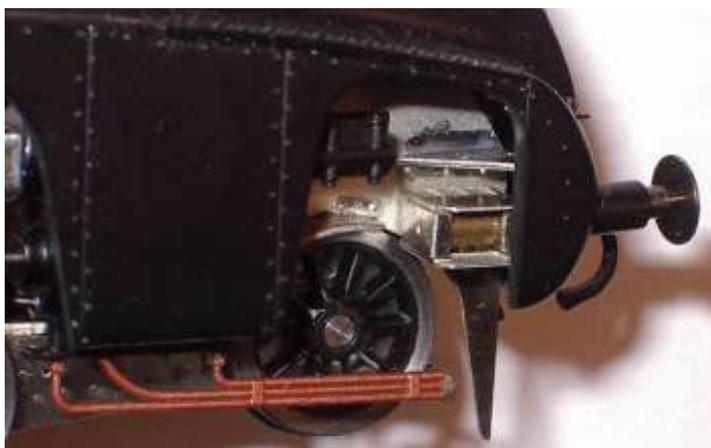
4.10 When fully detailed, fold the top locating flange of the frame overlays over at 90 degrees.

4.11 Unscrew the plastic front frames from the inside of the Hornby body. Remove the bogie wheel splashers from each side. Remove part of the loop for screw fixing each side so that the chassis overlay sit flat. The plastic front frames will be re-attached by gluing later.

4.12 Carve the side of the plastic screw mounting posts inside the front of the Hornby body to allow the frame overlays to sit flat when the plastic front frames are re-attached to the body.

4.13 Glue the plastic front frames into position inside the front of the Hornby body using cyanoacrylate or epoxy resin.

4.14 Holding the frame overlays in place carefully align the buffer spring housings with the back of the Hornby buffer and mark the position. Remove the frame overlays and attach the buffer spring housings. Again holding the frame overlays in place check that the buffers are free to move. See Photo 5 (still with washer and cosmetic bolt not fitted, but with a replacement bogie/wheels that is not included in this kit!)



4.15 Attach the frame overlays into position each side of the plastic front frames using cyanoacrylate or epoxy resin. Note that it may now be a little awkward to fit the chassis to the loco as the rear chassis tongue has to clip under the cab, rather than sliding in first (but it still works with a little force) – try fitting it and you will see what I mean! Alternatively, remove a small part of the splashers.

## 5 Replacement valve spindle guides

5.1 The Hornby model has the valve spindle guides glued onto the front and rear of the cylinder mouldings. These are very delicate and are liable to be broken off and lost. They are also not quite the correct shape.

5.2 Take the four valve spindle guide fronts [D12, D14, D16 and D18] and file a curve on the front face towards the bottom. Note that the two vertical half etched lines will fit over the vertical part of the full etch 'TT' on the valve spindle guide backs [D13, D15, D17 and D19]

5.3 Bend up the four valve spindle guide backs [D13, D15, D17 and D19] at right angles where the half etch becomes full etch (detail to front). Solder the appropriate valve spindle guide fronts to the valve spindle guide backs.

5.4 Carefully continue the curve onto the bottom part of the backs and also curve the top edge of the part of the valve spindle guide fronts nearest the cylinder.

5.5 Attach the valve spindle guides to the front and rear of the cylinder moulding using cyanoacrylate or epoxy resin, ensuring the holes in the rear face of the cylinder are not obstructed. See Photo 6 and 7 of the prototype and replacements (these are in the corresponding positions)



## 6. Footplate support brackets

6.1 There are two large footplate support brackets each side of the loco, one behind the driving wheels and one on the Cartazzi truck frame.

6.2 Fold up the larger bracket [D20 and D21] by first breaking off the small outer section at the first fold line, and then bending at 90 degrees at the second bend line with the bend line to the inside of the bend. See Photo 8 (Note – the smaller outer section has not been broken off).



6.3 The representation of part of the bracket moulded on the front of the firebox sides of the Hornby body will need to be removed to clear the new bracket. See Photo 9, original on left, bracket filed off on right (damper lever is also removed).



6.4 Re-attach the body. Attach the brackets to the outside of the Hornby chassis, using cyanoacrylate or epoxy resin, with the bent tab behind the wheel so that the bracket is just above and level with the rear of the plastic brake hanger and using the loco footplate as a guide. (As a check, the bracket with the small hole is fitted to the right hand side of the loco). See Photo 11

6.5 Fold slots with the

6.6 smaller bracket completed



the smaller bracket [D22 and D23] to 90 degrees along the bolt detail on the inside of the bend.

Curve the flanges [D24] to match the inner edge of the bracket. When satisfied with the shape attach to the smaller before removing the handling piece. See Photo 10 of the brackets.

Photo 10

6.7 Test fit the brackets to the Cartazzi truck frame immediately in front of the moulded spring hanger in-line with the rivets and with the riveted flange towards the front of the loco. If necessary remove a little from the top. (If you are fitting the replacement reach rod (section 8.) it is easier if you complete this section before attaching this bracket) Fix using cyanoacrylate or preferably epoxy resin (the plastic is difficult to fix to). See Photo 11 (which shows replacement wheels/chassis not applicable to this kit)



## 7. Brake hanger brackets

7.1 If there is sufficient clearance, attach the brake hanger brackets [D25] to the top of the brake hangers on the leading and middle wheels only.

## 8. Replacement reach rod

8.1 Remove the original reach rod from the Horny body

8.2 Fold up the reach rod safety loop [D26] using a piece of scrap etch to push the loop into the guide [D27]. Bend over the two legs and trim to length.

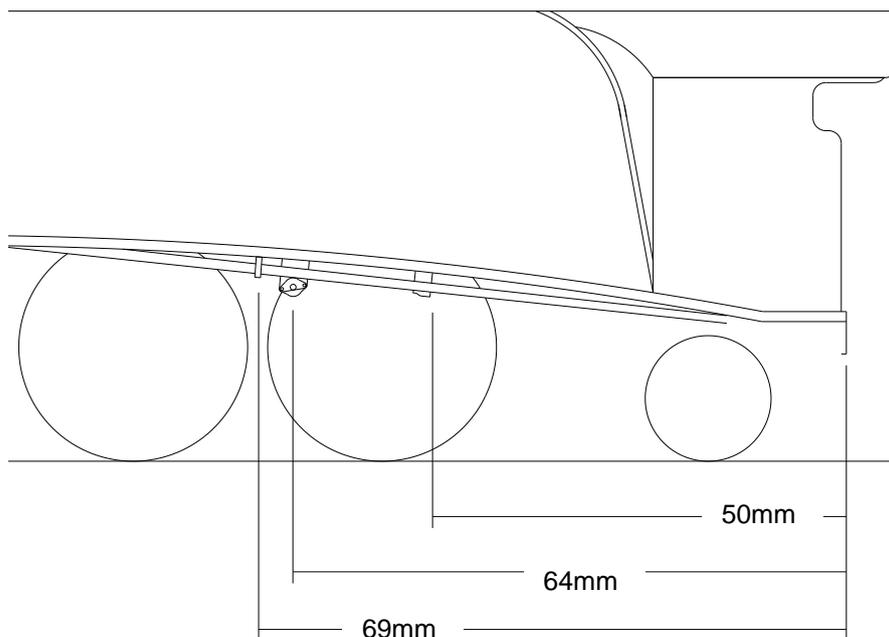
8.3 Fold up the reach rod guide bracket [D28].

8.4 Attach the reach rod joint [D29] to the front of the reach rod [D30]. The joint is arranged with the end with two prongs towards the rear and the other end just covering the half etched spot on the reach rod.

8.5 On the Hornby model the reach rod is located too far towards the back of the loco and too near the edge of the footplate. Place the front end of the reach rod over the top of the 'L' shaped lifting link and mark where the tail of the reach rod ends under the cab. Using a square file, on the underside of the footplate file the inside edge of the cab opening to provide a new location for the tail of the reach rod.

8.6 Attach the reach rod, reach rod safety loop and reach rod guide bracket to the underside of the footplate using cyanoacrylate or epoxy resin as indicated in Diagram 2.

**Diagram 2 – Reach rod safety loop, bracket and speedo bracket position**



## 9 Speedo drive

9.1 Late in their career locos were fitted with BR speedo equipment. See Photo 54. A casting for the speedo drive is available separately from Brassmasters if required for the period modelled. The support bracket and drive crank are provided as part of the detailing kit.

9.2 Bend up the speedo bracket [D31]. Attach to the loco body behind the reach rod using cyanoacrylate or epoxy resin (see Diagram 2). See also Photo 13 of the prototype.

9.3 Attach the speedo casting (available separately) to the speedo bracket and, if necessary, bend the outer end of the speedo so that it is directly over the centre of the rear driving wheel.



## 10 Replacement damper linkage

10.1 Remove the Hornby damper linkage from below the right hand cab

10.2 For a simple replacement reduce the size of the forward attachment point on the Hornby body and attach the replacement damper linkage [D32] using cyanoacrylate or epoxy resin

10.3 For a more detailed replacement, solder together the two parts of the right hand damper bracket [D33].

10.4 Reduce the size and thickness of the forward attachment point on the Hornby body until it forms simply a location point for the new bracket. See Photo 9 above.

10.5 Attach the damper bracket to the damper linkage using a piece of 0.45mm wire through the hole in the two parts, with the longer leg of the bracket towards the front of the loco. Attach the assembly to the Hornby body using cyanoacrylate or epoxy resin

10.6 Solder together the two parts of the left hand side damper bracket [D33 and D34] with a piece of 0.45mm wire through the hole. Trim to length.

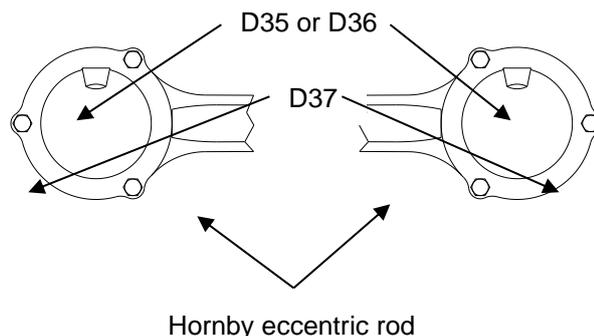
10.7 Attach the bracket to the left side of the Hornby body in the same position as the right hand bracket, again with the longer leg of the bracket towards the front of the loco, using cyanoacrylate or epoxy resin

## 11 Return crank bearing cover

11.1 There are two types of return crank bearing back depending on whether it is covering the Hornby rivet or a replacement valve gear rivet. For Hornby use the one with the larger hole [D35] and for the replacement valve gear rivet use the one with the smaller hole [D36].

11.2 Emboss the bolt heads on the return crank bearing backs. Solder the return crank bearing fronts [D37] onto the appropriate return crank bearing backs. They are assembled with the raised section on the bearing front towards the top and the rivet pattern, on the first bearing back, with a single bolt on the left hand side and, on the second, with a single bolt being on the right hand side (see Diagram 3).

### Diagram 3 – Return crank bearings

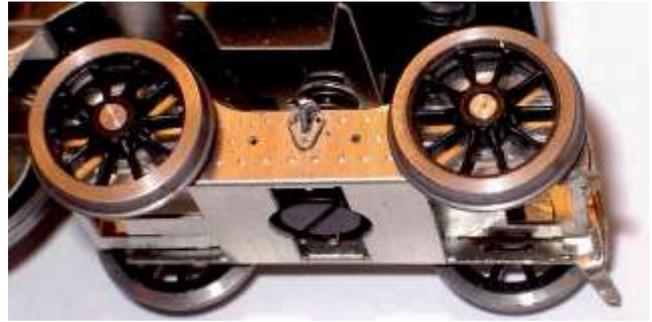


11.3 Reduce the thickness of the rivets connecting the eccentric rods to the return cranks.

11.4 Attach the bearings to the front of the eccentric rod over the top of the rivet connecting it to the return crank. Ensure that the rivet is still free to rotate.

## 12 Bogie Brackets

12.1 Form rivets and fold up the two bogie brackets [D38], attach the tiny triangular web [D39] and fit to central top of the front bogie See Photo 14 (Note – this shows brackets fitted to the replacement EasiChas bogie)



## 13. Tender guard irons.

13.1 Emboss the rivets on the tender guard irons [D40 and D41]

13.2 Attach guard irons to the inside face of the Hornby side frames using cyanoacrylate or epoxy resin. These are almost impossible to see but Photo 15 shows the shape of the prototype (covered in grease & fluff!)



## Etched Component List

D1	Front chassis overlay left	D22	Small footplate support bracket left
D2	Front chassis overlay right	D23	Small footplate support bracket right
D3	Bogie wheel splasher (4)	D24	Small footplate bracket flanges (2)
D4	Door opening gear bracket left	D25	Brake hanger bracket (4)
D5	Door opening gear bracket right	D26	Reach rod safety loop
D6	Outer door opening gear bracket	D27	Reach rod safety loop guide
D7	Buffer beam brackets (2)	D28	Reach rod guide bracket
D8	Buffer spring housing (2)	D29	Reach rod joint
D9	Buffer washer (2)	D30	Reach rod
D10	Frame guard iron left	D31	Speedo bracket
D11	Frame guard iron right	D32	Damper linkage
D12	Front valve spindle guide front left	D33	Damper bracket (3)
D13	Front valve spindle guide back left	D34	Damper bracket left (1)
D14	Front valve spindle guide front right	D35	Return crank bearing back large hole (2)
D15	Front valve spindle guide back right	D36	Return crank bearing back small hole (2)
D16	Rear valve spindle guide front left	D37	Return crank bearing front (2)
D17	Rear valve spindle guide back left	D38	Bogie bracket (2)
D18	Rear valve spindle guide front right	D39	Bogie gusset (2)
D19	Rear valve spindle guide back right	D40	Tender guard iron left
D20	Large footplate support bracket left	D41	Tender guard iron right
D21	Large footplate support bracket right		

## Other Components List

0.45 mm brass wire	1.0 mm brass wire
0.8 mm brass wire	3/32" brass tube

## Diagram 1 - Loco Detail Etch

