



Midland Railway, Midland Scottish Joint Stock LMS & LNER

Clayton 31ft 6-wheel arc roof carriages

Introduction

These notes apply to all five MR Clayton 6-wheel carriages in the 51L range:

Diagram 493: 5 compartment third, 762 built 1882-95 in 12 lots; the most common MR carriage type.

Diagram 494: 4 compartment lavatory third, 42 built 1889-90 in 2 lots

Diagram 504: 3 compartment brake third, 237 built 1882-92 in 10 lots

Diagram 516: 4 compartment luggage composite, 202 built 1884-88 in 3 lots

Diagram 516L 4 compartment lavatory composite, 19 converted 1892 from luggage composite

Seven vehicles split across D493, 504 and 516 were built to a lower height for the West Bridge branch, and are not covered by the kits.

The prototype

Many hundreds of these arc roof carriages were built for MR and MSJS services over the period 1882 to 1895. Indeed, many were built by the G&SWR and the NBR as well as by the MR itself. As built they were oil lit but between 1892-1902 they were fitted with gas lighting, initially with fish tail burners and a single gas pipe. From 1908, gas mantles with pilot burners were introduced requiring a second roof-mounted gas pipe. Torpedo roof vents began to be fitted after 1906 (earlier over lavatories). All vehicles had the automatic vacuum brake with Westinghouse brakes also being fitted to the Scottish Joint stock. From 1901, carriages were fitted with internal alarm chains connected to the brakes via pipes and valve on one end of the carriage only.

Selected numbering detail: see references for detailed information.

D493 all third

MSJS: 8

MR pre-1902: 1217, 1709-81

MR post-1902: 3, 492, 572, 931, 988, 992, 1002, 1205, 1210, 1767

LMS pre-1933: as MR post-1902 but most 'ciphered' with 0 prefix; i.e. 492 became 0492, all except no. 3

LMS post-1933: 26459-63, 26466-71. All withdrawn by November 1934.

D494 lavatory third

MR pre-1902: 874; no further information available

D504 brake third

MR pre-1902: 865, 1247

MR post-1902: 149, 154, 204, 819, 971, 1053, 1067, 1182, 1341, 1368, 1383, 1400, 1441, 1502, 1600.

Probably also 2725-30

LMS post-1923: as MR post-1902 but mostly 'ciphered' with 0 prefix

LMS post-1933: 27721-33. Probably also 27734-9 (ex-MR 2725-30). All withdrawn by April 1937.

D516 luggage composite

MSJS: 31-55

MR pre-1902: 488, 873-912

MR post -1902: 901, 2855, 3384, 3540, 3675-3712

LMS post-1923: probably included 3845-51, 3854. All withdrawn by 1933.

D516 converted to lavatory composite

19 converted in 1892

MR pre-1902: 577, 877; no further information available

References

Midland Carriages, An Illustrated review; D Jenkinson & R Essery, pp4-5, 109-111, 115-118, 137-138

Midland Railway Carriages, Volume 2, R E Lacy & G Dow, pp257, 264, 433

Historical Carriage Drawings Volume 2, LMS and Constituents, D Jenkinson, p94

Midland Railway carriages Volume 1, R E Lacy & G Dow, pp104-111, 121

Midland Record no.18, pp66-67, but note the end drawing is the wrong way round

Midland Record no.20, p1 probably shows a D493 third

Construction notes

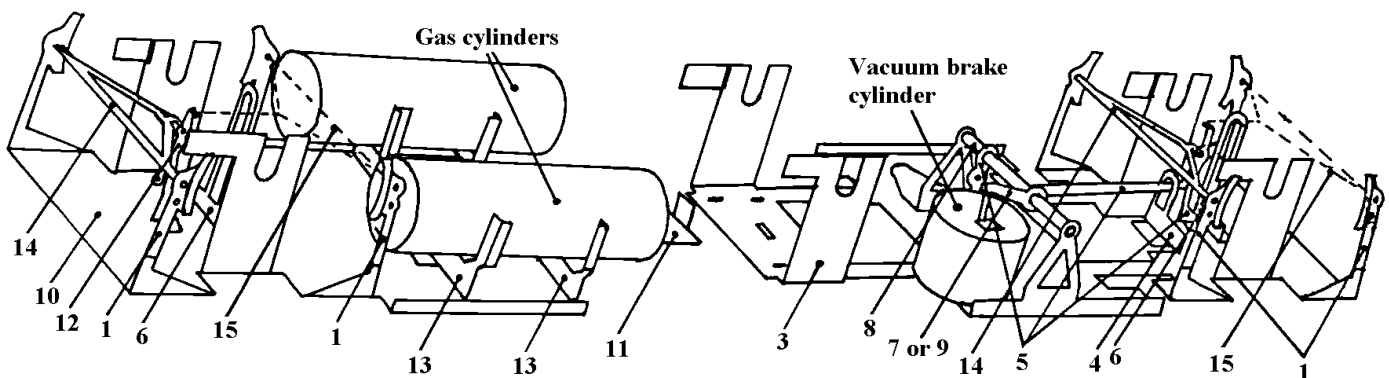
This model requires Mansell pattern 14mm carriage wheels, bearings and paint to complete.

Please read these instructions before starting to build your model. Examine all the parts and familiarise yourself with their assembly. Remove any moulding flash or etch attachment points and ensure all parts fit correctly. We suggest wet fine emery paper (1200 grit) to clean up flash marks. Carry out a dummy run before assembly. Assembly is best carried out using ordinary solder for etched components or low melt solder for white metal. An epoxy resin such as Araldite and glues like UHU, Multibond or Thixofix can also be used. For small parts use superglue. To obtain the best results a combination of several techniques will be needed.

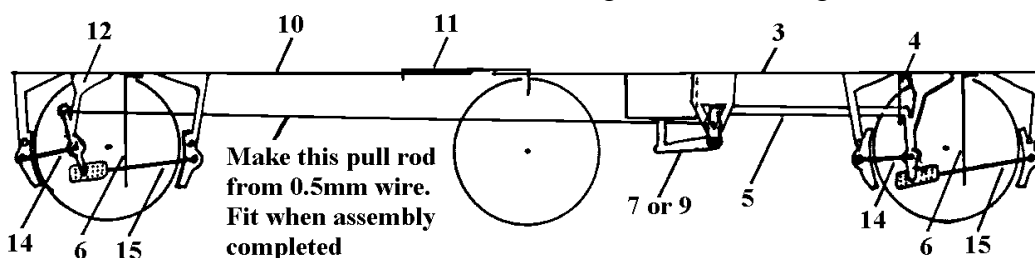
Most sharp bends are given by a half-etched line, which is always on the inside of the bend. In order to achieve a third layer of rivet detail on some components, dimples are etched into the reverse side of the sheet. Before assembly these should be raised. It is sufficient to press onto a piece of solid card with, for example a slightly blunt dart point; attention is drawn to this procedure by the phrase "raise rivets".

This is the suggested order of assembly but there are many ways of assembling this or any other model. The part numbers quoted are those etched on the frets.

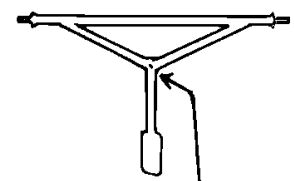
Underframe



Bogie and half-bogie

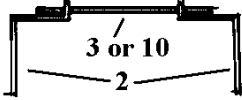


Make this pull rod from 0.5mm wire. Fit when assembly completed



Twist parts 14 & 15 by 90deg here before fitting

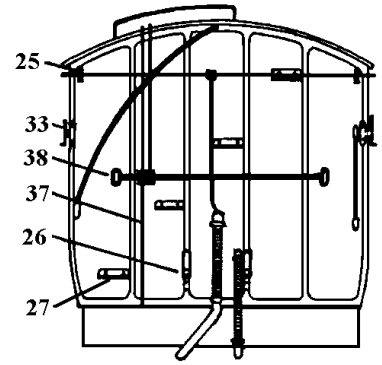
Brake rigging

- 1) Brake block detail x8. Fit to 3) and 10) on their front (numbered) side.
 - 2) Wheel bearing brackets for 1.5mm axles x6. These parts are for EM and P4 only; ignore them if building in OO. For EM or P4 only, break off the wheel bearing brackets on 3) and 10) by repeated bending at the half-etched line, and fit in their place parts 2) as shown, using the slots slightly inboard. This gives the wider back-to-back required for these versions. 3) and 10) are used without modification in OO. However, if using 2mm axles, modellers in all gauges will need to break off the brackets on 3) and 10) as described above, and replace them with the six wheel bearing brackets on the small loose fret.
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- 3) Bogie frame. Bend to shape and add parts:
 - 4) Short safety loop.
 - 5) Brake linkage hanger and pushrod.
 - 6) Long safety loop.
 - 7) D504 brake third only: brake cylinder lever.
 - 8) D504 brake third only: handbrake drop arm and lever.
 - 9) All diagrams except D504 brake third: brake cylinder lever. 7) and 8), or 9) are fitted together with the brake cylinder casting (position marked on underside of bogie frame) and the shaft. This is cut to 16mm long from the 0.7mm brass wire supplied.
 - 10) Half bogie frame. Bend to shape and add parts:
 - 11) Linking hook. This connects to 3) when in service; fit from above.
 - 6) Long safety loop.
 - 12) Brake linkage hanger.
 - 13) Gas cylinder brackets x2. Omit if building the original oil lit version.
 - 14) Brake block connecting bars, short pull rods x2. Fit between the brake blocks at the inner end of 3) and the outer end of 10). Add the gas cylinders if required.
 - 15) Brake block connecting bars, long pull-rods x2. Fit between the brake blocks at the outer end of 3) and the inner end of 10). With care, these can be sprung in place without gluing to permit easy changing of wheels. For extra security, glue the brake blocks only, if the other end is left unglued, the wheels may still be changed without too much difficulty.
 - 16) Floor. Raise rivets on axleguards. Bend solebars/upper steps and axleguards.
 - 17) Spacers x4. Fit two to underside of floor at each bogie screw hole, and fix bogie screws securely from above.
 - 18) Headstock detail x2 (on body fret). Raise rivets, assemble to floor together with buffer bodies (fit bushes first), side chain eyes and coupling hooks, Bend headstock ends and bottom to shape and bend the headstocks down. The two brackets for fitting the ends should be bent outwards slightly to conform to the tumblehome.
 - 19) Upper steps, top layer x2. Fit onto upper steps on floor.
 - 20) Solebar detail x2 (on body fret). Raise rivets, except on step bracket just right of centre. Be sure to fit these the right way up - the step brackets reach to the bottom edge, not the top. The spring axlebox castings should now be fitted between the axleguards and the back of the solebars: the springs with long hangers are for the centre wheels. At some stage in the 19th century all six springs were changed to the short variety, and you have sufficient short hanger springs to do this.
 - 21) Lower steps/brackets x2. Raise rivets at top of brackets and bend, noting that the brackets are cranked out slightly just below the top steps.
 - 22) Lower steps, top layer x2. Bend and attach to 21), thread the step brackets through the slots in the upper steps and fix to the solebars.

Body

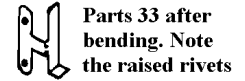
- 23) Inner sides x2. Curve lower part to match tumblehome of ends. This may be done by gently bending over a kitchen work surface for example. Bend back the edge flaps (top flap slopes upwards to match roof curve) and bend door hinges out.
- 29) Outer sides x2. Curve tumblehome of lower part and fit to inner sides, easing gently over door hinges which act as locations (a dry run advised first).
- 30) Door ventilators x10. Attach one above each door/lavatory window.
- 31) Window bolection mouldings x20. Either attach in place to each compartment window (only D493 uses all 20), or prime and paint mahogany whilst still on the fret and fix after the sides have been painted.

- 32) Centre door hinges x12. Only D504 and D516 (luggage) use all 12.
- 24) Alarm gear end. Raise rivets and curve lower part to tumblehome.
- 26) Lamp irons x2. Bend first, then fit.
- 27) End steps x4. Bend and fit.
- 33) Corner lamp irons x2. These are fragile and are best soldered for strength.
- 25) Alarm gear 'ears' (post 1901) x2, Add a 33.5mm long piece of 0.5mm brass wire between them, projecting equally each side, and a vertical piece down to the vacuum pipe location.



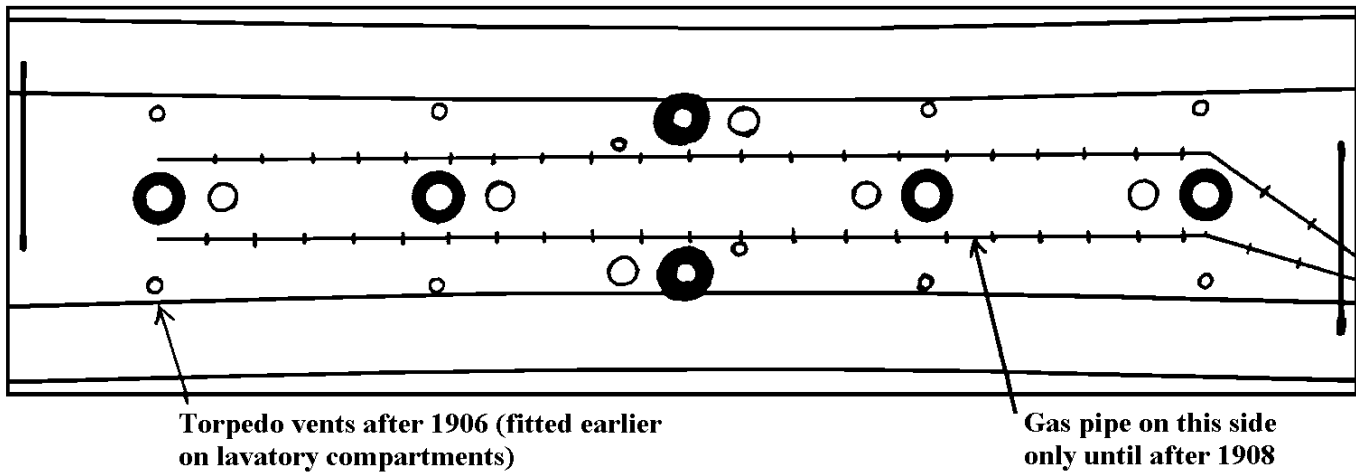
Add handrails from 0.5mm brass wire, long on left, short on right.

- 28) Plain end. Raise rivets and fit 26), 27), 33) and handrails as for the alarm gear end.



Attach the ends to the sides and then to the floor. We have no information about which end had the alarm gear on D504; the other coaches are symmetrical.

Roof



Layout of roof fittings on D516 lavatory composite

An etched metal roof is provided which should be curved to match the profile of the ends. Fit the roof furniture guided by the diagram: either oil (cylindrical) or gas lamp tops, central on each compartment with the lamp rests alongside them. No lamps were fitted to the luggage compartment of the D516 luggage composite. D493 and D504 have five equally spaced lamps, with the rests always to the same side of the lamp. If torpedo ventilators are to be fitted, drill holes 8mm either side of each lamp top and as shown on any lavatory compartments. On lavatory compartments, the oil lamp bases should be bent to be horizontal, and fill the gap between the casting and the roof with epoxy putty etc. The two gas lamps for lavatory compartments are already shaped to fit.

Fit end handrails bent from 0.5mm brass wire. If gas lit, add the roof top gas pipes 37), either single or double (after 1908).

Interior

Cut out the plastic inner floor (not pre-printed for D504 – use the supplied paper templates and 0.030" plasticard). The supplied printed sheet is not soluble in common solvents. However it is brittle, so use a new blade in your scalpel. Cut out and add the partitions. Test-fit to the body, ensuring sufficient space of the subsequent addition of glazing. Prepare seating from the sections supplied. Prior to 1892, third class seat backs were some 7" lower than first class seat backs.

Painting

Paint the body/underframe, roof, interior, bogies and wheels as separate units and fix together on completion.

Livery (these notes assume the few survivors did not receive the 1935 LMS livery)

Bodyside and end panels, door droplight frames: crimson lake (new – withdrawal).

Bodyside mouldings: black (new – withdrawal), lined both sides with 3/8" wide gold (new – c. WW1) or yellow (c. WW1 – withdrawal). Each gold/yellow line edged both sides in 1/16" wide vermilion (new – 1885), then only the side adjacent to black (1885 – date unknown), then both sides as before (date unknown – withdrawal). A vermilion line always painted across the bottom of the body, immediately above the solebar. A matching line sometimes painted at the top, immediately below the roof overhang.

Window bolections: mahogany (new – withdrawal).

End mouldings and "ironwork": unlined black (new – withdrawal).

Roof: lead grey overall (new – withdrawal), although some vehicles may have been painted black between the edge and the rainstrip (inclusive) from around 1900 onwards.

Solebars and headstocks (including step brackets): crimson lake, lined in yellow (new – 1902); unlined red (1902 – 14); unlined black (1914 – withdrawal).

All other underframe detail: unlined black (new – withdrawal), except that the wooden parts of the wheels were often Indian red.

Interior: timber colour with blue seating in 1st class and red in 3rd.

We suggest the following Precision Paints:

Crimson Lake	P350	Lining gold	P362
Lemon straw (yellow)	P356	Coach roof light grey	P365

The model may be lined in the conventional way, i.e. by painting the raised mouldings in yellow/gold followed by drawing in the central black area using a technical pen. However the following method of painting and lining the sides has also been suggested. Spray first with etch primer, then with brown primer, then crimson lake finish. Simple card masks can be used for the different colours of solebars etc. When thoroughly dry scrape the raised moulding (except window bolections and door joint moulding below the waist) until clean and bright. Be very careful not to touch the scraped surface with the fingers. The black centres of the moulding should be drawn in using a technical pen (Rotring, Staedtler etc) of about 0.5mm wide filled with non-etching plastic film ink, which is fairly quick-drying. Leave a gold edging of bright brass showing on each side of the moulding, except that the black is taken right to the outer edges of the side and against the window bolections. The rounded corners are drawn in freehand. Any mistakes are readily scraped away and redrawn. The beading at the bottom edge of the side represents the packing between body and underframe; there was no head on the side itself. Before starting painting, the lower edge should therefore be made bright and clean and covered with a tape mask trimmed with a knife and rule to approx 2mm from the lower edge of the side, so that when the black edging is drawn in the gold line is within the bottom panel. A coat of clear lacquer will protect the finished side against handling, as the ink is not waterproof.

Insignia

Class markings: sans serif FIRST, THIRD or LUGGAGE in waist panel (new – c. 1906/7); large serif 1 or 3 centred in lower door panel (c. 1906/7 – withdrawal).

Company name: sans serif MR or M.R or M [door] R centred in the waist panelling (new – c. 1902); sans serif MIDLAND centred in the waist panelling or serif MIDLAND against a black background centred in the eaves panelling (c. 1902 – 1923); serif LMS centred in the waist panelling (1923 – withdrawal).

Heraldic emblem: in two lower door panels either side of the centre on composites only (new – c. 1906/7).

Running numbers: sans serif, usually in the waist panelling (new – withdrawal).

The insignia layout for D516 is shown in the sketch on page 6; D493 was laid out similarly. Lavatory vehicles had M R in the waist panel below the lavatory window. D494 was lettered thus pre-1906:

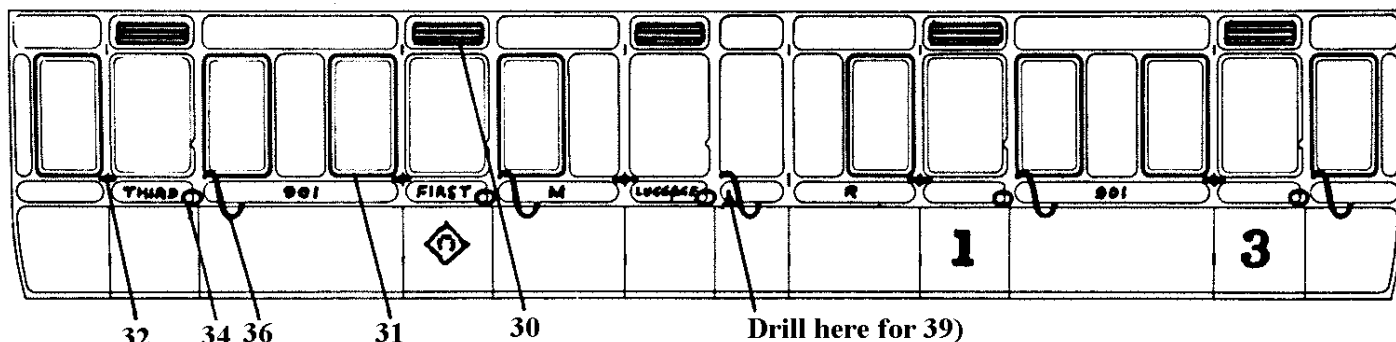


MSJS vehicles: letters MSJS left of centre and number once only right of centre, either side of the centre compartment on the third, one compartment further out on the luggage composite. Lavatory vehicles

probably like luggage composite. Brake third probably had MSJS in place of left hand number on MR carriage.

Press-to-fix type lettering transfers are provided. With a scalpel or sharp knife cut round each item through the tissue top layer but **not through the thick backing paper**. Peel the tissue away from the backing, put face down in position and press gently. If the position seems incorrect, remove and replace. When satisfied, press firmly, soak the tissue with water and peel off when it has released (about 30 seconds). Wash away surplus gum and blot dry. Varnishing of transfers is not essential, though obviously it provides additional protection against handling etc. Some oil-based varnishes can cause 'gold' transfers to tarnish rapidly. Cellulose lacquer can be applied with great care from an airbrush provided that the first coating is applied from far enough away to produce a matt finish. When this is hard dry additional light coats can be applied from progressively closer distances until the desired gloss 'is produced. This information is given in good faith, but we cannot accept any responsibility for the results as the conditions of use are outside our control. We therefore suggest trials on scrap material before working on the model itself.

Finishing



Pre-1906 lettering shown this end. Coat of arms on first class doors only.

Post-1906 lettering shown this end. Coat of arms and LUGGAGE omitted. Letters M R and vehicle numbers placed as before.

Side details and lettering on D516 luggage composite

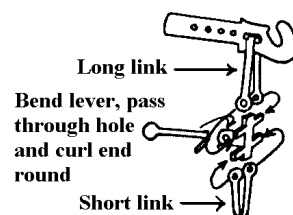
Now fit:

- 34) Door handles (ring) x10. Fitted to the carriages as built; or
- 35) Door handles (T) x10. Fitted to the LMS survivors. D494 and D516 (lavatory) only require 8.
- 36) Grab handles (commode handles), S-shape x10. For later period replace with straight wire through the same holes. D494 and D516 (lavatory) only require 8.

They can be polished as groups by rubbing the part of the fret to which they are attached on paper wetted with metal polish, particularly the commode handles. Remove surplus polish, then apply cellulose lacquer or varnish. When hard, cut from the fret, bend, push through the holes in the sides and fix from behind with epoxy or non-stringing adhesive. On the double doors of late surviving D504 and D516 (luggage), omit the commode handle, drill a small hole in the waist panel of the right hand door and fit luggage door handles 39).

Drop the wheels in place and retain by turning back the flaps of the bearing brackets. You may wish to solder on a piece of wire to replace this flap from the outside. Fit the half-bogie onto its pivot screw, then the bogie, engaging it with the hook on the half bogie. Arrange them so that the vee hanger on the bogie appears behind the extra bolt heads on the solebar. Fit the retaining nuts, leaving them loose enough to allow up and down play. Prevent unscrewing with a dab of thread lock, a soft glue or paint to allow removal if necessary. Add the brake pull rod from 0.5mm brass wire.

Fit the buffer heads and their springs, bending over the buffer tails to retain them. Add the couplings, safety chains (5 links each side) and hooks, vacuum brake



hoses (to the left of the coupling hook at the alarm gear end and to the right at the other) and steam pipes. Joint Stock vehicles also have Westinghouse hoses fitted on the other side of the coupling hook. These end details should all be painted black.

Cut out the windows from the printed sheet, discarding any not required for your chosen diagram. Glue the quarter light glazing into the recesses in the back of the inner sides, and the droplight glazing to the back of the inner sides. Lavatory window glazing is fitted similarly, ensuring the pattern is central in the opening. A non-stringing clear adhesive is best. Note the small corner cut outs to clear the handle holes near the right hand quarter lights.

Fix the roof in place; narrow strips of double-sided tape could be used as an alternative to glue. If gas-lit, glue the gas pipe(s) to the end, and add gas control handle 38), and paint black. On the preserved D516 (luggage), the gas control and alarm gear had been at the same end, though this may not always have been so. Bend the projecting part of any roof gas pipes to fit down the end and paint the vertical part black.

The most recent version of these assembly instructions will be available on the 51L web site: www.51l.co.uk. For further help or information please email: andrew@modelsignals.com

Wizard Models

Wizard Models stocks a wide range of items for the 4mm scale modeller.

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