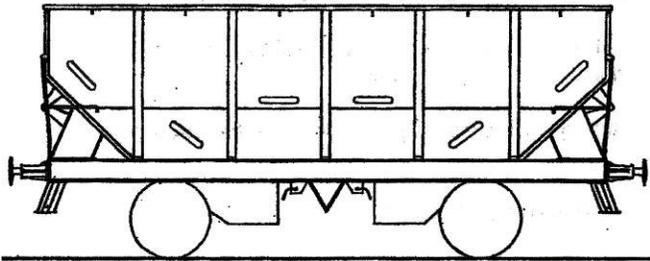




NGSK0160 Kit 16

**BR 21T
Coal Hopper
HTO/HTV**



Kit contains plastic parts, plastic chassis,
and wheels to complete one wagon.

*To complete this kit you will need: Liquid Plastic
Cement, Superglue, Paint, Transfers & Varnish*

This is not a toy. Only suitable for persons over the age of 14. May contain small parts and sharp edges. Keep away from small children.

Getting Started

First, read the instructions thoroughly all the way through and be sure you are confident that you have identified all the parts. It is recommended that you adhere to the suggested order of assembly, though with experience, you may choose to deviate. The etched parts are optional and their omission will not detract from a completed model.

General Notes On Construction

Naturally, the N Gauge Society wants you to achieve the best results you can. These simple guidelines should help:

- Read the instructions through fully before you begin
- Use a sharp knife to separate the parts from the sprues
- Clean off any flash or moulding pips with sharp knife and wet 'n' dry sandpaper
- Check fit before gluing
- Use a small paint brush to sparingly apply liquid plastic cement when joining parts
- Photographs of the prototypes will help you

But above all TAKE YOUR TIME!!

The Prototype

This model is based upon the standard BR design to diagram 146 fitted to a standard 12 ft wheelbase chassis, though this itself was heavily based on the standard LNER design from the 1930s. Unlike the Dapol model (which represents a riveted body) this kit represents a wagon of all welded construction (it appears that riveting required less skill than welding and was thus easier for contractors as opposed to BR workshops).

Some 16,800 wagons were built to this diagram between 1952 and 1958, numbered B413950- B29799 inclusively, apart from a batch of 50 (B419200-B419249) which were converted for grain traffic. In 1958, a further 1,000 hopper wagons were built with identical body construction but mounted on chassis fitted with roller bearings and incorporating self-contained buffers (numbered B429800-B430799).

Livery and Lettering

Most wagons received standard BR grey for unfitted vehicles with white letters and numbers on black patches. Handrails were white, and underframes black.

Fitted wagons were BR Bauxite for the body with white lettering and handrails, and black underframes; note that a vacuum cylinder (not included) should be added to one end if modelling a vacuum braked wagon.

During their long life the styles of lettering changed many times, as did the placement. Changes were often made by patch painting and only when convenient, so some in the 1970s still had mainly 1950s style markings. As a result at any time there would be a wide range of different patterns of markings to be seen on these. Many of wagons were re-bodied and fitted in the 1970s, but the new bodies are not the same as the kit, having only 2 vertical stanchions. The decals are mostly for the unfitted versions with a few fitted. There are enough for normal markings for at least three wagons for any period.

Lettering (wagon number, TOPS code) tended to be on the vertical part of the hopper, on the second panel from the left. The earliest had the number and tonnage on a black panel of varying sizes. Around 1964 "HOP 21" started to be added at the top of the panel, and boxes started to appear round the lettering on a few wagons. In 1966 a K suffix was added to the number to indicate it was a 21T wagon as an aid to the NCB (these letters were added fairly quickly, but were only used for a few years and dropped when repainted). The TOPS code HTO/HTV was introduced about 1972. The tonnage became 21.5T with metrication in the 1970s. The two markings ZDV are for when some were transferred to the engineers department late in their lives. Fitted wagons were bauxite with no black panel behind the numbers.

The tare weight (something like 9-9) could be on the next to right panel of the body on a black background. Usually though it was on the solebar on the right or occasionally centre right. Later it was added to the number panel. The word "Closed" with an arrow appeared above the hopper handles (towards the centre of the solebar), with the arrow on the outside. The wheelbase (WB 12-0) was on the solebar, usually to the right of the right-hand "Closed" but sometimes on the extreme right. The black panel with small writing (maintenance dates etc.) appeared on wagons in later years on the body panel one from the right, often on the lower angled part.

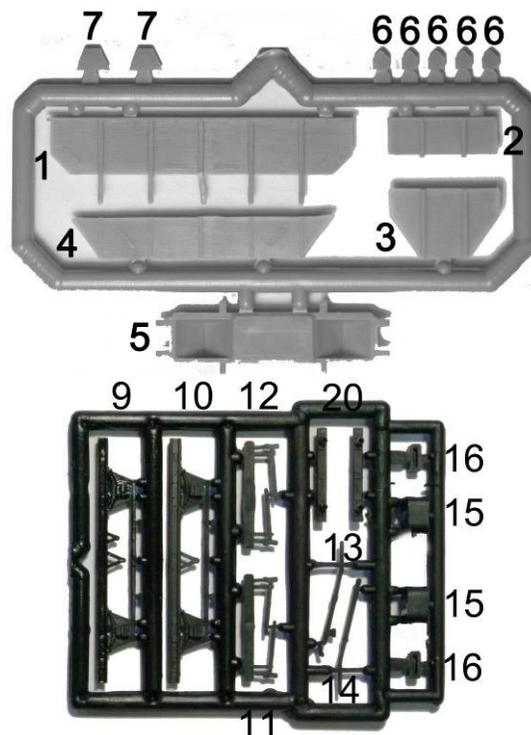
The oval maker's plate was on the left of the solebar, over the axlebox. The lettering was picked out in white when new but often never again and so as it became unreadable it can be left off. Electrification flashes were added on the top of the ends from around 1960, some wagons had them on both left and right ends, some only on the left.

There were two special brandings. "House Coal Concentration" appeared across the centre two panels on some fitted wagons when built around 1957. Some wagons were branded "Charringtons" on the top of the central four panels for use on block trains (the number was on the extreme left body panel). The letters may have been on red panels or on a completely red body or on grey or all of these for different wagons (photos of them are very rare).

Parts

Two sprues are packaged with this kit. Unpack the separately packaged Parkside chassis. Use the following photograph and table to identify all the parts. Keep all the parts in a container or re-sealable bag to avoid loss and only remove parts from the sprues as you need them.

Part Number	Quantity	Description
1	2	Upper Side
2	2	Upper End
3	2	Lower End
4	2	Lower Side
5	2 (1 spare)	Discharge Chutes
6	10	Side Gusset
7	4	End Gusset
8	1	Brass detail etch (shown on Page 5)
9	1	Chassis Side (left)
10	1	Chassis Side (right)
11	1	Brake Gear (left)
12	1	Brake Gear (right)
13	1	Brake Lever (left)
14	1	Brake Lever (right)
15	2	Coupler Pocket
16	2	Coupler Pocket Plug
17	2	Coupler (not shown)
18	2	Wheelset (not shown)
19	4	Brass Buffer Heads (not shown)
20	2	Chassis Headstock



References

- *British Railways Wagons (The First Half Million)* by Don Rowland: P52 and 53
- *British Railways Unfitted And Vacuum Braked Wagons In Colour* by Trevor Mann P45 and P46
- *Working Wagons Volume 1 1968 – 1973* by David Larkin: P20 and P21
- *Working Wagons Volume 2 1974 – 1979* by David Larkin: P20
- *Wagons of the Early British Railways Era (1948 – 1954)* by David Larkin: P40 and P41
- *Wagons of the Middle British Railways Era (1955 – 1961)* by David Larkin: P44 to P47
- *Railways In Profile Series No 1 (Opens and Hoppers)* by Geoff Gamble: P39 to P41
- [http://paulbartlett.zenfolio.com/ 'Paul Bartlett wagon photographs'](http://paulbartlett.zenfolio.com/) Paul Bartlett's useful web site

Construction

This kit has an all-plastic body with a Parkside chassis kit and the optional extra of an etched brass detailing pack to provide all handrails, footsteps, hopper operating levers, etc.

Even in its basic form, this kit is not recommended for first time kit builders. The shape of the hopper body combined with the need to build up the chassis means great care must be taken to ensure that the model is built square and true. However, all the parts are manufactured to the highest standards possible and, given a little patience and a degree of care, it is perfectly possible to build a fine model of this prototype.

It is suggested that the chassis is constructed first, exactly as per the instructions in the Parkside chassis kit. Next, build the hopper body, checking the fit against the chassis. Finally, if desired, the etched detailing can be added. It may be easiest to leave the chassis and body separate until after painting.

Only a few basic tools are required – a sharp craft knife, wet 'n' dry sandpaper, a selection of small drill bits (in particular 0.6mm) and tweezers (preferably fine point). A liquid polystyrene glue such as Mekpak is best, using a small paint brush to apply small amounts to joints.

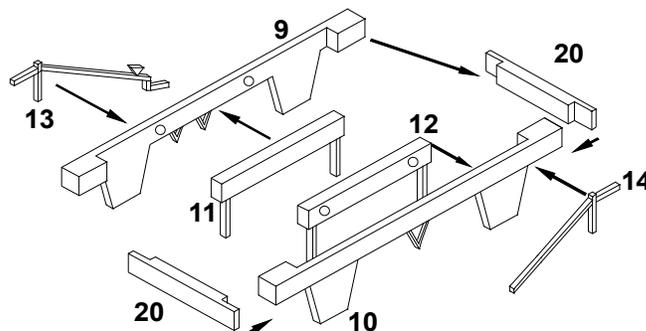
NOTE Some details are omitted from some diagrams for clarity.

Chassis

1. Remove the moulding pip on the front face of the brake gear (**Parts 11,12**). The front face is the one with two dimples at the outer ends.
2. Glue the left brake gear (**Part 11**) to the rear of the left chassis side (**Part 9**).
3. Glue the right brake gear (**Part 12**) to the rear of the right chassis side (**Part 10**).

HELPFUL HINT *Locate the dimples on the front of the brake gear to the pips on the rear of the chassis. Occasionally, shrinkage in the sprue as it leaves the mould can mean that both pips do not quite align to the dimples – in this case, remove one of the pips, as the remaining pip is sufficient to accurately locate the two parts as long as they are kept level at the top.*

4. Glue the left-hand brake lever (**Part 13**) to the left-hand chassis side (**Part 9**) and the right-hand brake lever (**Part 14**) to the right-hand chassis side (**Part 10**). Bend the brake levers inwards very slightly as this will help them to make contact with the V-hangers.
5. Glue the Chassis Headstocks (**Part 20**) to the chassis sides. Make sure that both sides and both ends are square. It is advisable to temporarily fit the wheelsets (**Part 18**) at this stage to ensure that chassis is square and that the wheelsets fit and turn correctly.



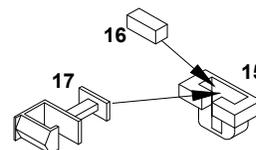
HELPFUL HINT *Joints glued with liquid plastic cement can shrink slightly as the glue evaporates and the joint hardens. This can cause the chassis sides to bow inwards slightly. Check regularly that the chassis sides do not bow inwards as the glue dries as this may restrict the turning of the wheelsets. If in doubt, add thin cardboard shims between the W-irons and the wheels to keep them correctly spaced and leave the joints to harden overnight.*

Buffers

6. The brass buffer heads included in the Parkside chassis kit have a shank diameter of 0.7mm. By drilling out the holes in the buffers on the ends slightly less than this (for example, 0.6mm) then the brass buffer heads can be an interference fit to the ends by very carefully pushing them on. Do not force! If they are too tight a fit, then enlarge the holes in the buffers. If the brass buffer heads are a loose fit, then secure them with a very small drop of superglue.

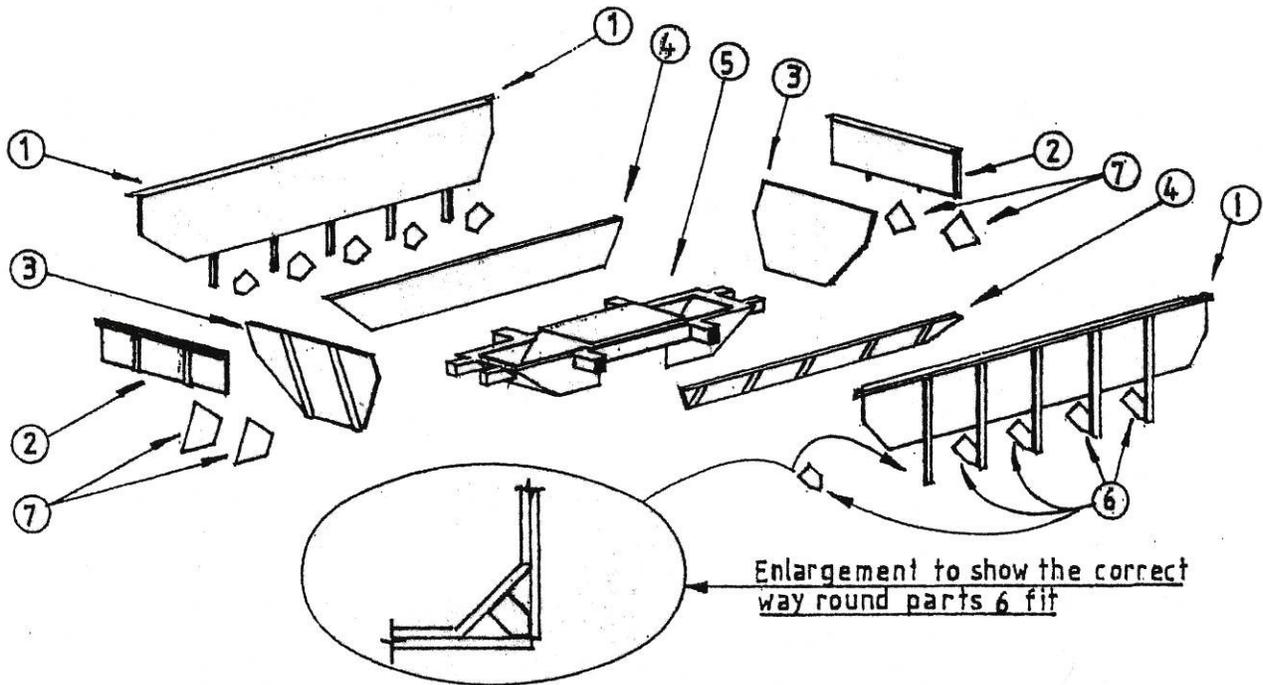
Couplings

7. Place the coupler (**Part 17**) into the coupler pocket (**Part 15**) and insert the coupler pocket plug (**Part 16**) above it so that the hollow face of the coupler pocket plug is facing upwards. The coupler pocket plug is usually an interference fit; if it is slightly loose, apply glue very sparingly in order to avoid gluing the coupler to the coupler pocket.
8. Glue the assembled couplings behind the headstock – there are two protruding notches that will keep it aligned in the centre. Only use the minimum amount of glue necessary so that the coupling still moves up and down. Note that you may choose to leave the couplings off until the wagon has been painted.

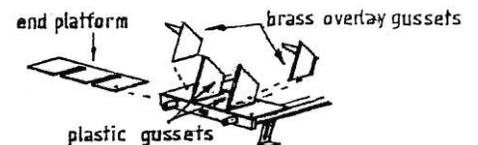


Hopper Body

9. Glue an Upper Side (**Part 1**) to an Upper End (**Part 2**) to form an L-shape. This is best done upside down on a flat surface. Repeat for the other Upper Side and Upper End. Then glue the two L-shapes together, ensuring that all four corners are square. When satisfied that all is square and true, place on one side for the joints to fully harden.
10. With the upper side/end assembly still upside down, very carefully glue the Lower Ends (**Part 3**) and Lower Sides (**Part 4**) into the rebates provided to help construction. When satisfied that all is square and true, place on one side for the joints to fully harden.



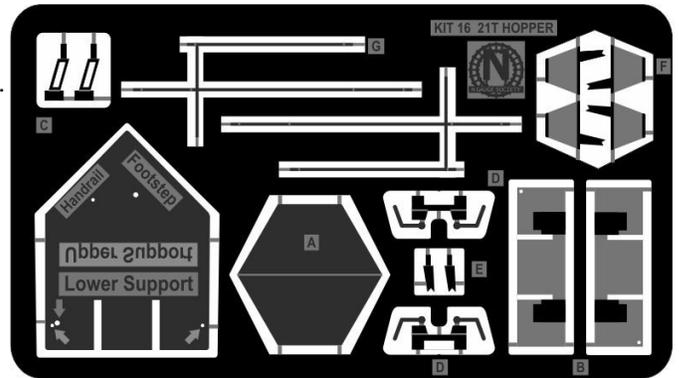
11. The Discharge Chutes (**Part 5**) may now be glued to the lower sides/ends. While the glued joints are still soft, check to ensure that all is square and true as there will still be time for adjustment. Once satisfied, allow time for the glue to fully harden before continuing.
12. Glue the Side Gussets (**Part 6**) between the Lower Side (**Part 4**) and the vertical stanchion from the Upper Side (**Part 1**). There are five Side Gussets per side. Note the correct orientation of the Side Gussets, that is, the flat end joins to the Lower Side while one edge of the 'arrowed' end joins to the bottom of the stanchion. Place the hopper body on one side for these joints to harden.
13. Remove the end platforms (B) from the etch, clean up and fix in place on top of the chassis at its outer ends. Ensure they are the correct way round and flush with both sides and the outer edge of the buffer beam. These parts are half etched on their undersides to aid accurate location. A handrail location hole will be found on the outer right hand corner of these platforms which, once they are firmly secured in place, should be drilled through using a 0.35mm drill bit.
14. The body and chassis may now be glued together, once more checking carefully to ensure all is square and true.
15. The End Gussets (**Part 7**) may now be glued in place, fitted with the steeper angle butting up to the hopper end and placed centrally over the strengthening ribs found on the end.



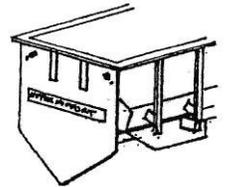
16. This completes the model in its basic form and it is ready for painting. The next section details how to take the model a stage further with the optional etched detail parts.

Fitting The Etched Detailing Parts

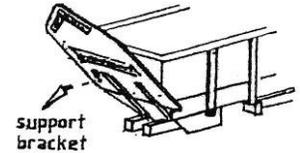
17. A very useful jig is included on the etch which will enable the accurate location of all holes for handrails and their supports, together with footstep location. Remove this jig from the etch and clean up any of the remainder of the tabs.



18. Take the hopper body and locate the jig on the vertical face of one of the ends with the engraved words 'upper support' showing. Push the jig up against the underside of the capping rail and drill through the two holes indicated by the engraved arrows using a 0.35mm drill.

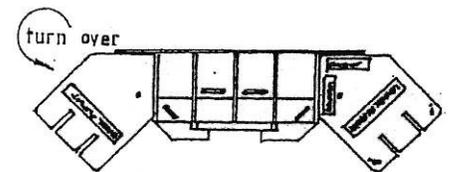


19. Turn the jig over to reveal the words 'lower support'. This time turn the jig around and locate it over the sloping portion of the end and with the two slots fitting over the strengthening ribs. Slide the jig down on these ribs until it stops at the junction of the vertical and sloping face of the hopper end. Using a 0.5mm bit, drill through the location hole indicated by the arrow. [NOTE: early versions of the jig incorrectly have this hole on the right. If you have one of these, turn it over. The correct hole is the inner and larger of the two holes close together.]



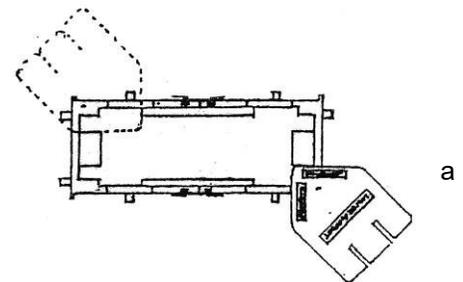
20. Repeat steps 18 and 19 at the opposite end of the wagon body.

21. Place the jig on the side of the hopper body at the right-hand end with the word 'handrail' visible and adjacent to the first vertical stanchion and the word 'footstep' adjacent to the underside of the capping rail. Using a 0.35mm bit, drill through the location hole immediately below the word 'handrail'. Then turning the jig over, but maintaining the same relevant positions, place it at the left hand end of the side and drill through the same location hole with the same drill as before.



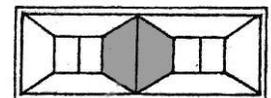
22. Repeat step 21 on the opposite side of the hopper body.

23. Only one step is fitted to each side of the chassis at the left-hand end in both cases. Place the wagon chassis upside down. Remember that with the chassis this way round, you will in fact be drilling your holes in the right-hand corners! Place the jig on the chassis with the word 'footstep' visible and up to the side of the coupling housing and the side of the jig with the word 'handrail' up against the axle box spring. Once in place, drill 0.5mm hole through the location hole found beneath the word 'footstep'.

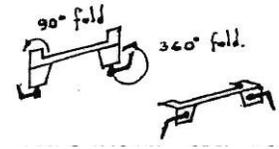


24. Repeat step 23 in the diagonally opposite corner, and this completes the use of the jig.

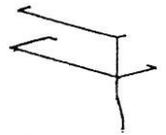
25. Cut the hopper division plate (A) from the fret, clean up and fold to form an inverted 'V'. Place it in the hopper and adjust until it fits neatly and centrally between the discharge chutes (shown shaded grey on the diagram. When satisfied, glue in position.



26. Remove the two chassis footsteps from the etch, clean up and then fold the steps at right angles to their supports. Once done, push each footstep into its pre-drilled hole and secure.
27. Remove the hopper discharge handles and their support brackets (D) from the etch, clean up and then fold the handles themselves through 180° to rest on top of their supports. Secure with a spot of superglue. Then fold the location lugs at 90° to the handles and their supports and fix to underside of the wagon solebar centrally around the V-hanger.



28. Cut the end handrail support brackets (E) from the etch, clean up and glue into the 'lower support' holes pre-drilled in each end of the wagon.
29. Before uniting the body with its chassis, it should be pointed out that many of these wagons had the lower part of the central stanchion on each side of the body cut back at a 45° angle (presumably to prevent railway workers bashing their heads when using the discharge handles). Now is the time to replicate this feature if required, by filing a 45° angle on the stanchion and its gusset approximately 1.0mm deep. Once done, the body can be glued onto its chassis, taking great care to ensure all is square and true.
30. The plastic end gussets (**Part 7**) should now be cut from their sprue, cleaned up and glued in position with the steeper angle butting up to the hopper end.
31. The etched end gussets with their handrail supports (F) may then be cut from their carrying frame, cleaned up and fixed, with the half etched detail showing on the outside faces of the plastic gussets (see drawing for step 26).
32. The handrails themselves (G) may then be cut from the etch, cleaned up (very gently) and bent to shape as shown, fitting them into the pre-drilled holes or onto the support brackets as appropriate, in each case secured with a drop of superglue. This is a vulnerable part of the kit so handle with care.



Weight

33. Plastic kits can be light, and some modellers find that a little weight improves running qualities. There is plenty of room inside the hopper body to fit a little bit of lead weight which can be disguised with a load of coal.

Painting

34. The secret to a good finish is in preparation and planning ahead.
35. Paint the wagon body grey or bauxite (or other livery as appropriate).
36. While the chassis is already black, it will benefit from a coat of matt black to remove the plastic finish.
37. Give the wagon body a coat of gloss varnish as this will help transfers to adhere (a separate transfer sheet is available from the N Gauge Society – **NGST0160**).
38. After transfers have been applied, paint the wagon with a matt varnish.