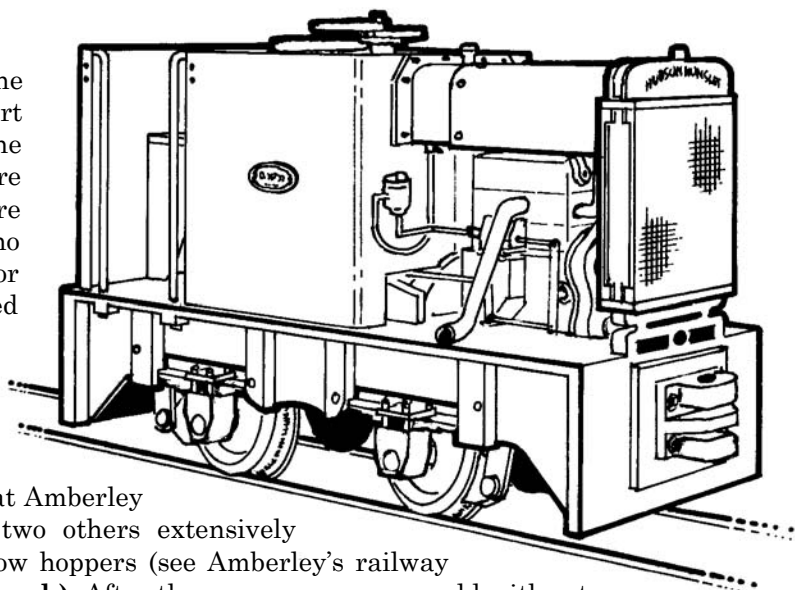


NONNEMINSTRE MODELS

INSTRUCTIONS FOR HUDSON HUNSLET 25HP 4WDM LOCOMOTIVE FOR 16.5MM GAUGE

BACKGROUND & HISTORICAL

These 2ft gauge locos were ordered by the Ministry of Supply during WW2 from Robert Hudson's of Leeds, who subcontracted the construction to Hunslet of Leeds. They were made available to companies who were engaged on work for the war effort but who could not obtain or afford replacement or additional motive power. Some also were used within MoD establishments. Most were fitted with Alisa Craig RFS2 2-cylinder diesel engines (as modelled in the kit) but a later batch was provided with McLaren engines. Examples of both can be seen within the narrow gauge railway collection at Amberley Museum & Heritage Centre, along with two others extensively modified by a local tileworks to go under low hoppers (see Amberley's railway website at www.amberleynarrowgauge.co.uk). After the war many were resold, either to their current operators or to others as surplus. They found use within the quarry and peat industries and many received cabs of home-made origin and other modifications to suit individual needs. Many were later fitted with electric start equipment as they are blighters to start by hand! Later ones were produced and marketed by Hunslet themselves and are distinguishable by just having 'Hunslet' on the radiator header tank instead of 'Hudson Hunslet'. Except for one or two odd pipes the whole of the engine bay is on view and the kit is ideal for producing many home-brewed variations that evolved.



CONFESSION

Although 7mm scale is 1:43.5, in order not to compromise the overall look of the loco, especially when viewed end-on, we have actually made it to 1:40. Some larger versions were in fact made to the same general design (see the 2' 6" gauge one on the Sittingbourne & Kemsley).

GENERAL ASSEMBLY

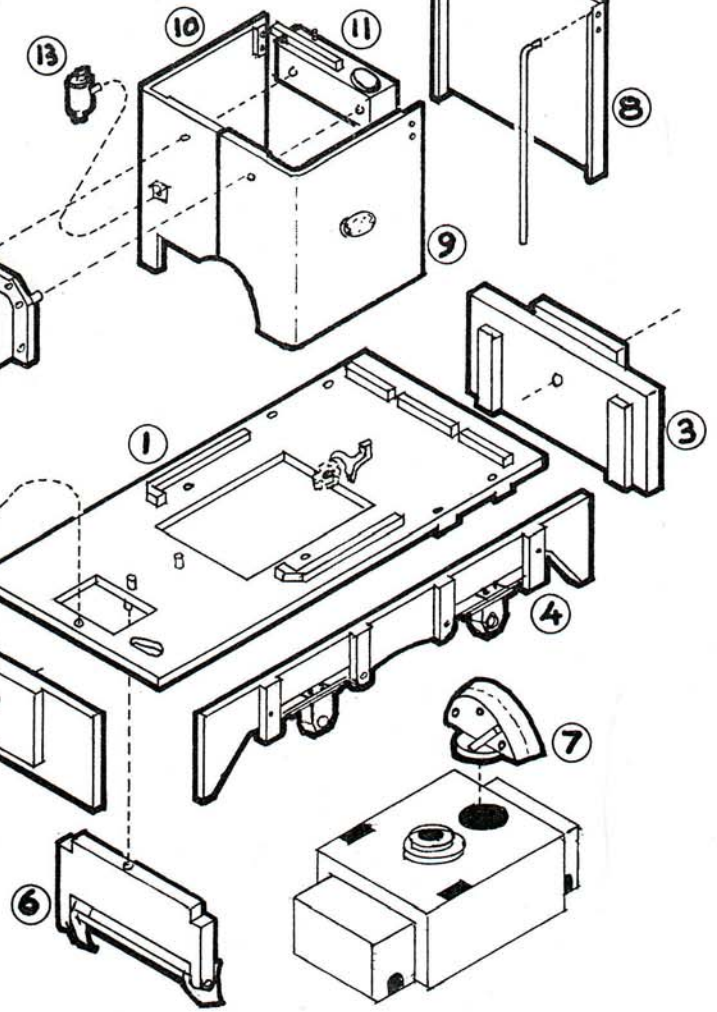
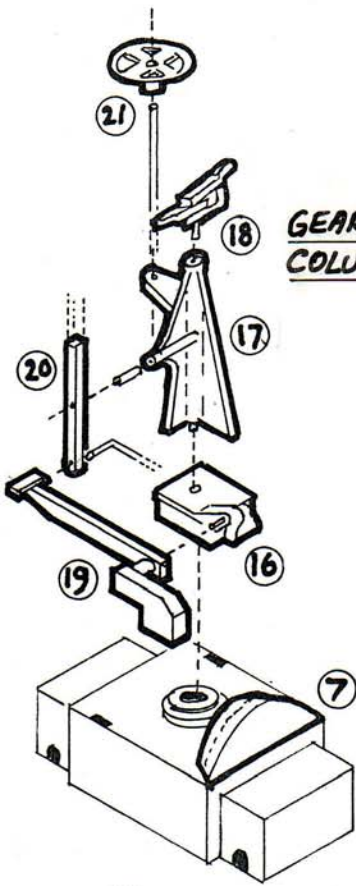
Before commencing construction, please read through the instructions and check through the parts. A dry run is perfectly feasible, but please follow the sequence of construction. Either low-melt solder, twin-pack epoxy resin (Araldite Rapid, Devcon etc.) or cyanoacrylate adhesive (superglue) can be used – if soldering, certain small parts might still be better fitted with adhesive. Remember that low-melt solder does not take to nickel silver or brass wire – tin the wire first with suitable solder (such as Carr's 145 or 180) and then the low-melt will satisfactorily fuse with that. The recently released Carr's 100 does satisfactorily solder brass or nickel silver to whitmetal but care is needed. With all the works 'on view' and no side panels or cab to hide a multitude of sins, careful and clean construction will repay itself.

In addition you will require a Tenshodo/Hanazono SPUD 24.5 WB motor unit. For those using 14mm gauge, the Wrightlines B102 unit (which is basically a Spud with the motor turned sideways to allow the wheels to move in) can be used although some cutting away of the engine and gearbox will be needed. The same inherent 14:1 gear reduction though is still present, and whilst some controllers can provide quite smooth low-speed running, this is sometimes at the expense of extra heat, and Spuds will melt if used for long times like this! If you're willing to panel in the engine sides then a nice high-motor double-reduction option becomes viable.

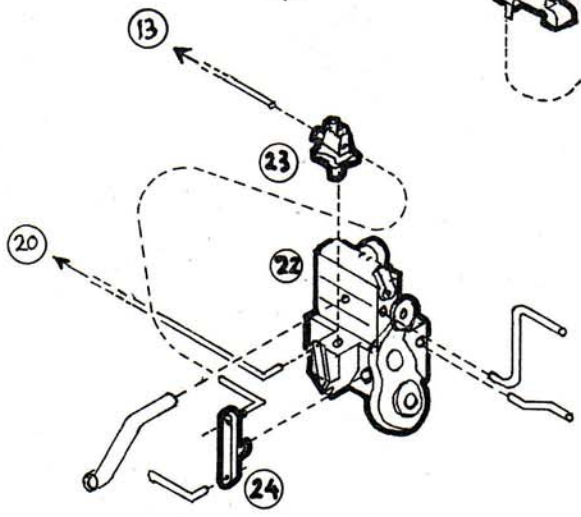
If any parts are missing or damaged, contact us and we can arrange replacement. We can also help if you damage any parts during assembly.

If you enjoy building kits then fork out for a copy of 'Whitmetal Locos – A Kitbuilders Guide' by Iain Rice, published by Wild Swan (ISBN 0906867770). It's well worth the pennies.

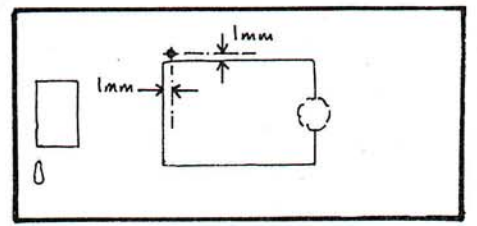
**GEARCHANGE
COLUMN ASSEMBLY**



**MAIN CHASSIS AND BODY
ASSEMBLY**

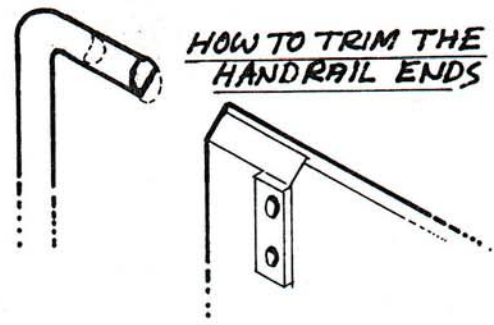
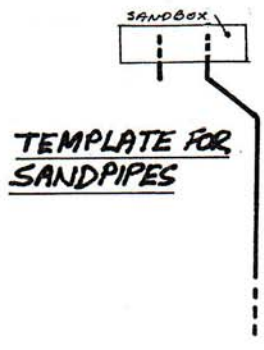
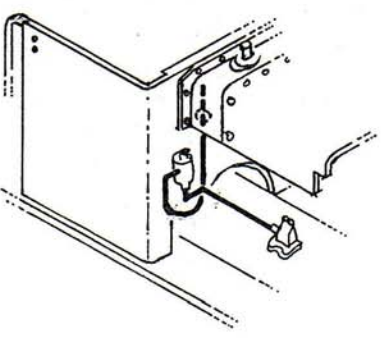


ENGINE ASSEMBLY



**DRILL EXTRA HOLE IN FOOTPLATE
0.5mm ϕ**

**FUEL SYSTEM
PIPEWORK**



TOOLS REQUIRED

Normal modellers hand tools, such as pliers, some medium and small files, small drills and a pin chuck in which to hold them. Sizes of drill required are 0.50, 1.00, and 1.50mmØ but if you have boxed set of Expo-drills it's sometimes easier to go up a bit especially when trying to poke fiddly bits of wire into holes! Also not included is a driver figure but thoughts on that are given later.

A sheet of finely-squared graph paper is helpful to check squareness as construction proceeds. Also handy are a flat reference surface and a small engineer's square.

POST-BUILD CRISIS

If after any stage you suddenly decide something is amiss, don't despair! If you have used epoxy resin adhesive or superglue then dunk the whole thing in some paint stripper for a few hours and it will then fall apart! Wash well in clean water, clean up and start again. With care you can put paint stripper over a single glue seam, wait until it softens, then gently pull apart, wash and clean up, all without having to dismantle the whole thing. If you've used low-melt solder, place something non-metallic in the bottom of a small saucepan; add one kit plus water to cover well, slowly bring to the boil. It should then fall apart in the water after a gentle prod. Remove from heat, allow to cool, then clean up.

PARTS LIST – Refer to exploded diagram.

1	Footplate (1)	15	Bonnet Top (1)
2	Front Frame End (1)	16	Gearbox Top (1)
3	Rear Frame End (1)	17	Gearchange Stand (1)
4	Sideframe (2)	18	Gearchange Levers (1)
5	Coupler Block (2)	19	Clutch Lever (1)
6	Brake Gear (2)	20	Throttle Lever (1)
7	Flywheel (1)	21	Brake Wheel (1)
8	Backsheet (1)	22	Engine Block (1)
9	Left Sidesheet (1)	23	Fuel Pump (1)
10	Right Sidesheet (1)	24	Governor Lever (1)
11	Sandbox (1)		- 1.00mmØ wire x 80mm (4)
12	Seat (1)		- 0.50mmØ wire x 80mm (2)
13	Fuel Filter (1)		- 1.50mmØ wire x 30mm (1)
14	Radiator (1)		

CONSTRUCTION

FOOTPLATE & CHASSIS

Firstly, modify the Tenshodo/Hanazono SPUD unit as follow: check it works ok first as you will invalidate the warranty! Remove the axle projections to leave the wheel faces flush. That's it! But to make life easy and check clearances as construction proceeds, remove the keeper plate, then the wheelsets followed by the motor. Snap off the projections from the brush gear that came up through the plastic body casing (to help prevent short circuits). Fit the Flywheel (7) with superglue, and then refit the wheels and keeper plate (leave the motor securely wrapped up for fitting later). The spud is not permanently fixed – a few lumps of BluTak or similar wedged up the sides will do.

Check the Footplate (1) is square and flat. Clean up all round to remove remains of casting runners, etc. A sheet of finely-squared graph paper can be used to check supposedly square components for accuracy – distortion can occur during casting.

Fit the Front Frame End (2) to the underside of the footplate – no join to show in finished job. Now push the Spud unit into place **WITH THE FLYWHEEL TOWARDS THE FRONT END OF THE LOCO, NOT TOWARDS THE REAR AS SHOWN ON THE DIAGRAM** (the brake ratchet pawl is in the way which should indicate something's amiss). Fit the Sideframes (4)

ensuring axleboxes are in line with the wheel centres. Now fit the Rear Frame End (3). Fill any gaps between the Frame Ends and Sideframes with a small fillet – on the prototype the frame is a one-piece cast iron unit.

Drill the dimples on the top of the Brake Units (6) 1.00mmØ and fix to the underside with enough clearance to let the Spud unit fall out. The front one partly projects into the space where the engine will go so file away to clear flush with the front edge of the rectangular opening.

Drill all the dimples on the top of the Footplate 1.00mm Ø **PLUS AN EXTRA ONE AS PER SEPARATE SKETCH** 0.50mmØ (this will act as a location and later anchor for the clutch lever counterweight). Also drill the dimples in the Frame Ends (2 & 3) 1.00mmØ. Fit the Coupler Blocks (5) to each end, then drill 1.00mmØ from top and bottom of each for coupling pins (not supplied). If you use steel pins then those natty little magnetic shunter's poles that are used in the 4mm scale world can be used. 3-link 4mm scale coupling chains (not supplied) can be used but check how tight your curves are first! If you use some form or 'proprietary' coupling, such as Kadees, then make them pivotable or a loose fit in the coupler block.

GEARCHANGE COLUMN

The Gearbox/Gearchange Column/Clutch/Handbrake assembly is now easier to make up before doing any body panels whilst open access is available. It is designed to bridge across the top of the Spud unit **BUT IS NOT FIXED TO IT** and to be anchored by the Handbrake Column and the Clutch pedal counterweight. Do all this with the Spud in place.

Drill the top of the Gearbox Top (16) 1.00mmØ and try it on top of the Spud – it will be necessary to trim the front until it slips over the boss on the Spud and sits down behind the Flywheel. Drill the top and handbrake column bracket dimples on the Gearchange Column (17) 1.00mmØ and then the throttle lever spigot 0.50mmØ. Fix the column onto the gearbox top and keep it square in all planes. Drill the dimple on the Clutch Pedal unit (19) 1.00mmØ, and then cut off the excess to the front of the pedal to the marked line. Fix onto the side of the gearbox top so that the counterweight sits on the footplate – it should cover the 'extra' 0.50mmØ hole drilled earlier.

Run the 0.50mmØ drill up through the footplate from the underside to spot mark the underside of the counterweight, then drill it about 1.5mm deep. Fix the Gearchange Levers (18) to the top of the column with the levers in the 'slightly back' position, and evenly angled – in reality this is the top gear, reverse, position! Drill the Brake Wheel (21) 1.00mmØ and cut a piece of 1.00mmØ wire 23mm long. Fix the wheel to one end so that the wire just projects enough to make a boss, and check that when the wire enters the ratchet pawl cast onto the footplate floor it will be all nice and square – it probably won't be so ease the hole on the column bracket until it is then fix the wire to the column. You can now see how the whole unit bridges the Spud without being fixed to it. Eventually the assembly will be fixed to the main footplate. Trim the Throttle Lever (20) to the marked line and then drill both dimples 0.50mmØ. Insert a small piece of 0.50mmØ wire into the column and then add the lever – set it just back from vertical. Trim off excess wire leaving just a tiny bit showing. Put this assembly away safely for now!

ENGINE ASSEMBLY

Clean up the Engine Block (22). Drill the two dimples on the underside 1.00mmØ and trial fit the engine over the two spigots on the Footplate – it probably won't go! Open out the holes a bit and either file away a bit more of the brake gear or a bit off the front of the engine where it drops down below the Footplate. Make sure that the back of the engine doesn't foul the Flywheel on the Spud. Drill 1.00mmØ the two dimples on the front of the engine for the water pipes and also for where the Governor Lever (24) and the Fuel Pump (23) will go. Drill the top hole only on the lever beneath the fuel pump 0.50mmØ and cut a slot with a piercing saw or similar behind the lower bit of the same lever (to tuck away the bit of wire from the Governor Lever 24). Drill for the Exhaust Pipe 1.50mmØ. Drill both dimples in the Governor Lever (24)

0.50mmØ and from both ends into the Fuel Pump (23) 0.50mmØ (careful – chances are your holes will meet inside but offline – the classic way to break small drills!) Fix the governor Lever (24) to the engine block, keeping it vertical and with the longer part to the top. Fix the Fuel Pump (23) to the block. Make up a fan belt from 0.50mmØ wire as shown (make the join at the bottom centre where it can't be seen) and fix round the pulleys. Fix a piece of 0.50mmØ wire from the bottom of the Governor Lever to the slot and also a piece from the top into the Fuel Pump. Make the exhaust pipe from the 1.50mmØ wire (we tried tubing but it necks too much!) by following the rough template shown on the drawings page – it should end up horizontal in line with the edge of the footplate. Drill the end about 1.00mmØ to make it look hollow. Although you might think it's part of the bodywork, the Radiator (14) is part of the engine system. Drill the two dimples on the back 1.00mmØ but don't go too deep or you'll have a hard time making good the holes which will appear on the front! Fit the Radiator to the Footplate keeping in mind the following: it must be dead centre and dead square, and with the lower portion flush with the front edge of the footplate. Trim and file gently as necessary for a good fit, and make sure that when you do fix it permanently you fix it well!. Try the engine assembly behind the radiator in situ – the fan belt may be too tight to the radiator back to allow it to come back vertical – gently file the back of the radiator until it does. Now make up the top and bottom water hoses from 1.00mmØ wire – just keep trimming, bending, tweaking. Open out the holes in the back of the radiator if it helps. When happy, fix the pipes to the engine, then the engine to the footplate, then the radiator to the footplate. Drill the starting handle dimple 1.00mmØ. (At this stage, if you fit the gearchange column assembly and paint the whole thing mucky rust you have a superb derelict loco to dump outside your industrial works!)

BODYWORK

Now it's time to get on with the bodywork proper. Keep things square and neat! When doing the patterns the idea was that the two prongs on the back of the Bonnet (15) would go through the side panel returns (9 & 10) and the Sandbox (11) would locate over the prongs from the inside. That was the idea – in practice the prongs break off when juggling things, so to make life easy we won't use them!

Check the return on the Left Side (9) is square at 90° and then fix to the Footplate hard up against the locating ridge and getting it dead square to the footplate plus keeping an eye on the front view from the radiator. On the Right Side (10) is a dimple for the Fuel Filter (13) – drill this 1.00mmØ and countersink the back. Drill the two dimples (one on the side and one on the bottom) of the Fuel Filter (13) 0.50mmØ. Fix the filter to the front and trim off the projection at the rear. Now fix the Right Side (10) to the footplate after checking for square and trying to keep the top edges as near as possible in line. Don't worry if there's a gap between the fronts nor be afraid to remove metal if required. You can always kiss off the top with a fine file. Remove the two prongs from the back of the Bonnet (15) and it will also help to flatten off the back with a file – it tends to bow a bit. The bonnet fits with the top of the flange level with the top of the body panels and it will be necessary to gently file the front to get a nice fit onto the back of the radiator and to get it level. Use the filler cap to get a line up with the joint between the two body panels to keep everything nice and centred. Before fixing the bonnet, on the underside is a dimple – drill 0.50mmØ. Now fix the bonnet – easy enough at the rear but awkward to go up into the back of the radiator. We cheated and used a big blob of solder between the top water hose and the underside of the bonnet!

Drill the underside of the Sandbox (11) 1.00mmØ in the two dimples for the sandpipes. Fix the Sandbox to the inside of the body panels so it's central and the top is about 1mm down. Cut one of the 1.00mmØ wires into two and bend up the sandpipes to the shape shown to start with – the top bend should be just beneath the sandbox and the bottom of the pipe should be in lines with the bottom of the frame ends, so just keep trimming back a little at a time. Just make sure that when you finally fix them they are symmetrical!

Hold the Backsheet (8) in place on the footplate, pinch the Seat (12) to it centrally with forefinger and thumb. Remove together and fix seat to backsheet. Before fixing the backsheet to the footplate it's easier to make the handrails.

Cut a piece of the 1.00mmØ wire in half, and using a pair of square edged pliers bend an end over to 90° about 5mm from one end. Hold it against the sidesheet with the top in line with the top edge and mark the bottom about 0.5mm below where it comes through the footplate boss – cut off square. Now trim back the top until the end is in line with the plate on the inside of the sidesheet – in reality this is the continuation of the handrail. Now gently file away at about 45° the area where it touches the sidesheet – see sketch. The idea is to get the handrail dead in line with the sidesheet edge as possible and there might not be lot left of the overlap by the time it gets there! Do the other one (watch out – they're handed!) Make sure they are well fixed but check that all this handling hasn't pushed the sidesheets in a bit – tease them out if necessary. Now fix the Backsheet/Seat (8 + 12) and the remaining two handrails – the tops have a lot less to play with!

Almost there now! Remember the 'extra' 0.50mmØ hole put into the footplate? Secure a piece of 0.50mmØ wire in it, protruding about 1mm. With the Spud in place, set the Gearchange assembly on top (not fixed!) and fix the handbrake column to the ratchet pawl and the clutch counterweight onto the wire. Use plenty of solder, glue, or whatever to keep it all together for that is all that keeps this lot in place – it literally flies over the Spud. Make sure the Spud can be popped in and out without catching anything.

Now to finish with some small details, fiddly wire bits, etc. See the sketch on how to pipe the fuel line from tank to filter and then from filter to pump in 0.50mmØ wire. Also needed is the throttle rod – a piece of 0.50mmØ wire from the lever just below the fuel pump to the bottom of the Throttle Lever (20) – keep twiddling and tweaking until you get it right!

No driver figure is included in this kit because there are so many 'stances' to choose from – the Phoenix range from S&D Models gives a wide variety to chop and join. Some of the popular stances are:

- Driver stands with backside against right sidesheet handrail, right hand on throttle lever, left hand on backsheet top, and right foot close to clutch pedal.
- Driver stands in middle, looking forward with right hand on throttle lever, left hand on brake wheel, right foot near clutch pedal
- Driver sitting, right hand on throttle lever, left hand on brake wheel, right foot near clutch pedal.

Just remember that a loco of this type looks silly travelling without a driver, and just as silly parked up with one! Possibly devise some removable figure(s)?

The only colour scheme we have come across for 'as delivered' is all-over mid-Brunswick green but once into industry then anything was possible!

With construction finally complete, remember to give the finished model a good clean up in some powder household cleaner (Vim, Shiny Sinks etc.) followed by serious rinsing (do NOT use an ultrasonic cleaning tank on any whitemetal items as it causes the surface to erupt with any trapped air pockets) then when dry a light coat of Halfords primer or similar.

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