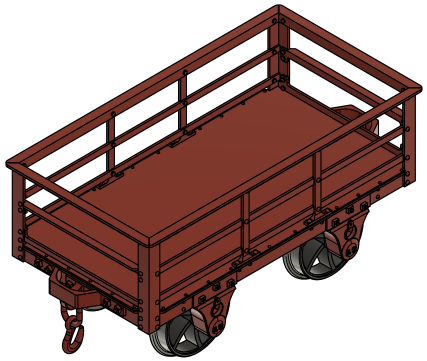
3D Printed Festiniog Railway Iron Body Slate Wagons

Assembly Notes



The first stage is to take stock of what constitutes the kit. There are two options for bodies: With and without couplings, to which are added separate couplers in Brass from my range or to the builder's own design. The bodies in each case are made from Nylon powder, fused together in a process known as Selective Laser Sintering (SLS), giving them a somewhat granular property very well suited to old rusty Iron. They are strong and somewhat flexible.

Added to the bodies are Axleboxes, which are available in many styles to suit the required prototypes. These are formed from UV light cured acrylic resins, and when compared to the SLS Nylon bodies are hard and brittle.

Couplings, where separate, are available in Bronze or Brass which offer a superior appearance to the plastic add weight and are stronger. The plastic couplings are tough and functional, however I do believe spending the extra on metallic ones to be beneficial.

Assembly is straightforward – each of these 3 core components is simply attached to one another, following any cleaning up of the parts that may be deemed necessary. Axleboxes should be exposed to daylight for a while before use which will cure any remaining resins, and thereafter cleaned by immersion overnight in solvent, white spirit is fine but preferably more aggressive cellulose or automotive paint thinners, it will not damage the plastic, but will remove any residues from he printing process and usually causes the translucent material to turn opaque off-white. Nylon parts can be used as supplied, however it may be desirous to smooth off the finish somewhat. This is best done after undercoating, and I have found the best tool to be a Fibreglass Pencil rubbed over the cured paint. And the paint/abrasion cycle repeated as many times as is necessary to attain the desired level of smoothness.

Painting can be started before assembly as the wheels will become permanently trapped in the assembly process. I find it worthwhile to fit the axleboxes in place without pins and paint the whole lot at this stage, separating the axleboxes later, the securing pins being touched in afterwards.

On to actual assembly! The order is as follows: Couplings first, then wheel bearings into axleboxes, axleboxes onto wheels, wheel/box assembly into body and finally pin them in place with the securing pins.

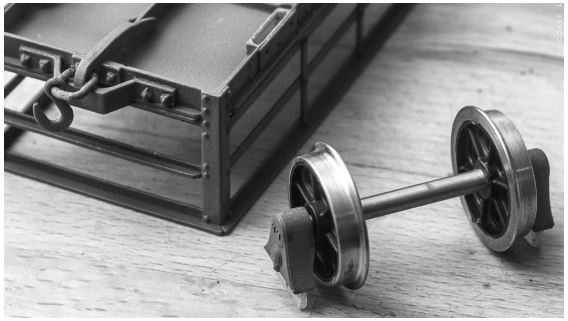
Couplings normally require the holes in the headstocks opening out slightly with a broach/small drill bit, likewise the hole for securing the tail. A dab of glue between coupling and headstock and finally a 16 or 14BA hex headed nut and bolt through the tail will lock it in place. It is imperative the latter is done before fitting wheels, as they cannot be accessed once the wheels are secured.

3D Printed Festiniog Railway Iron Body Slate Wagons

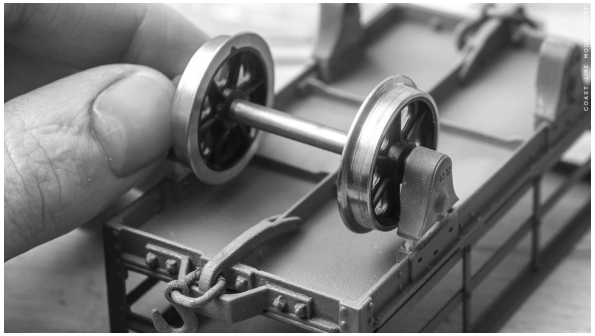
Assembly Notes

The bearings should be pressed into place using the axle as a drift to help. It should also be noted that 3 Ton Slate wagons require the bearing seat to be drilled further in order that the bearing is recessed as far as possible into the axlebox. It is also a good idea to file the top hat portion from the bearings in order to create necessary clearance for the wheels to turn freely.

In order that free wheeling is achieved, it may be necessary to trim the plug part of the axlebox which fits in the socket behind the solebar in the body. This is best achieved with a few light file strokes to the front face only at a slight angle as shown in the diagram. Dry fit test the axlebox and wheel assembly and test for free wheeling. A tiny amount of drag is normal, and is normally completely removed once the axleboxes are permanently secured. The best test I have found is to temporarily fit the axleboxes with 14BA screws pushed in from the outside, and the wagon rolled down a gentle incline,



which will highlight any sticking. Continue to file the axlebox plug until all sticking is gone, then you can fit the proper axlebox securing pins and remove the temporary ones.

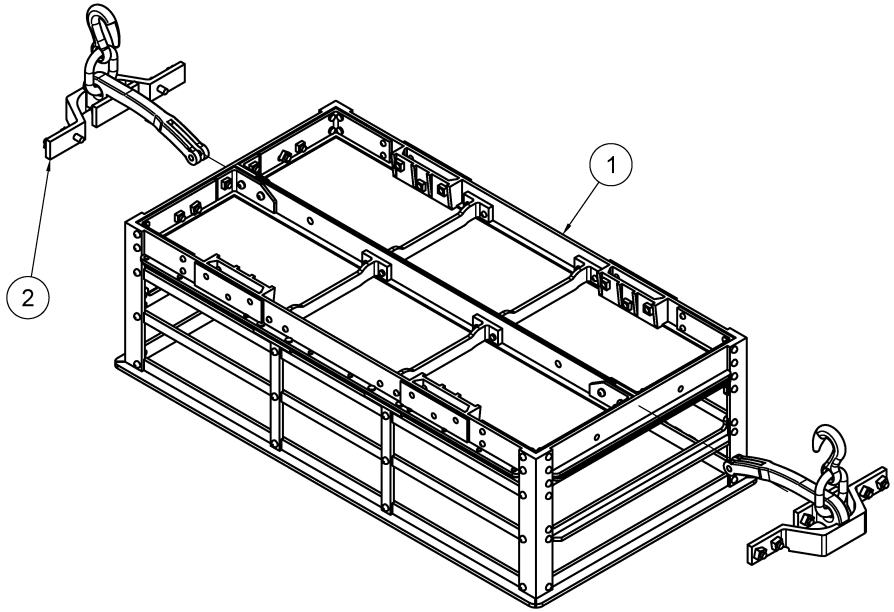


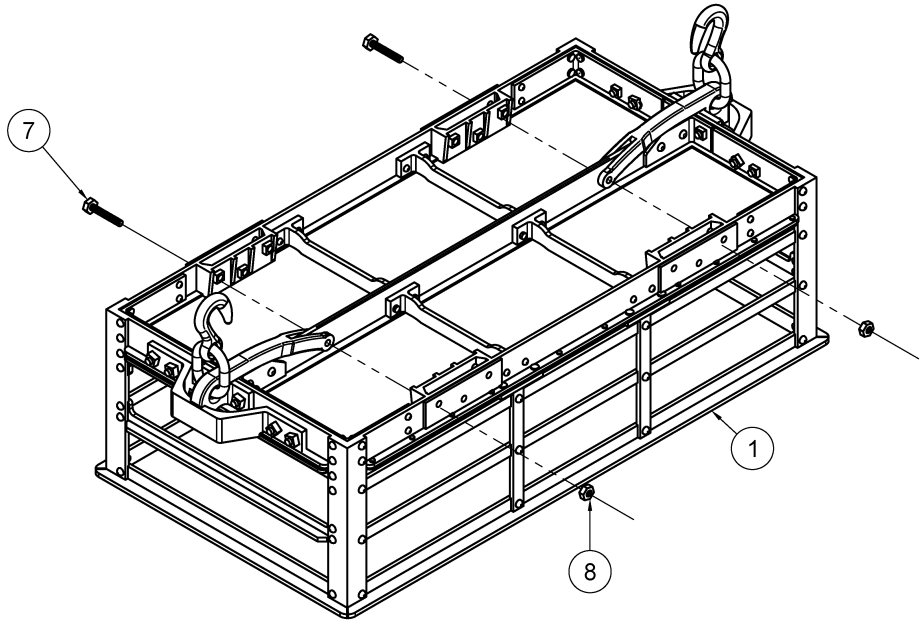
Axlebox securing is achieved by first pressing the axleboxes firmly into place in the sockets in the wagon body (don't forget the wheels!) and then passing a 1mm drill bit through the 3 holes in the solebar and through the axlebox. Into this hole can now be glued the 3 square headed fixing pins. You could use a length of 14BA stud and a nut should you prefer hexagonal fixings instead of the square provided, to model a modern repair for example.

That is it! Now you can touch in the unpainted securing pins to match the rest of the model and apply final livery.

3D Printed Festiniog Railway Iron Body Slate Wagons

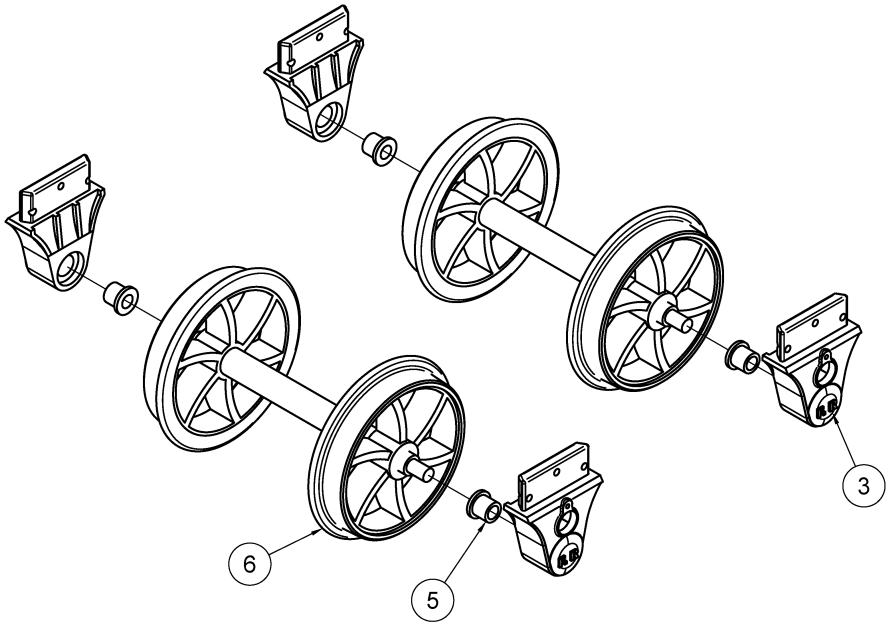
Assembly Notes

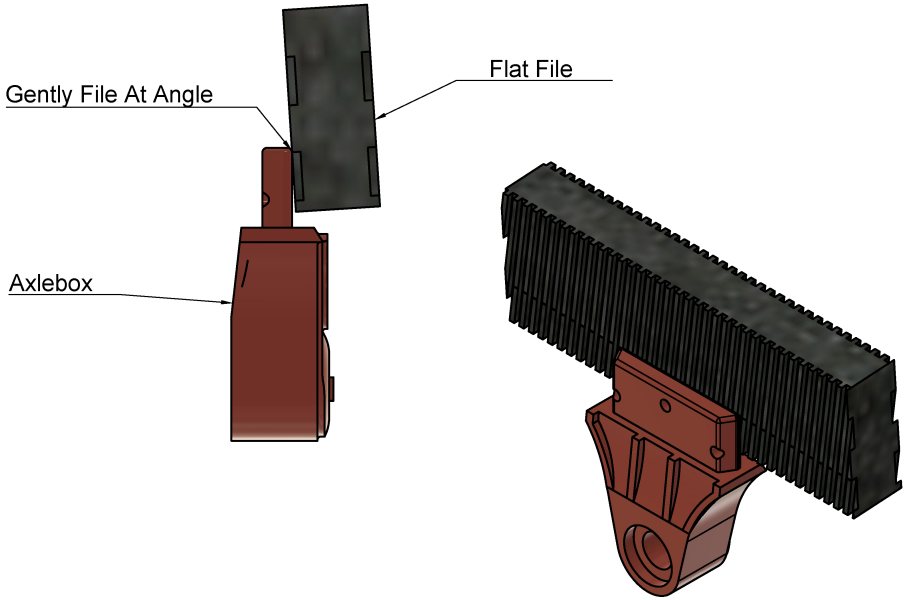




3D Printed Festiniog Railway Iron Body Slate Wagons

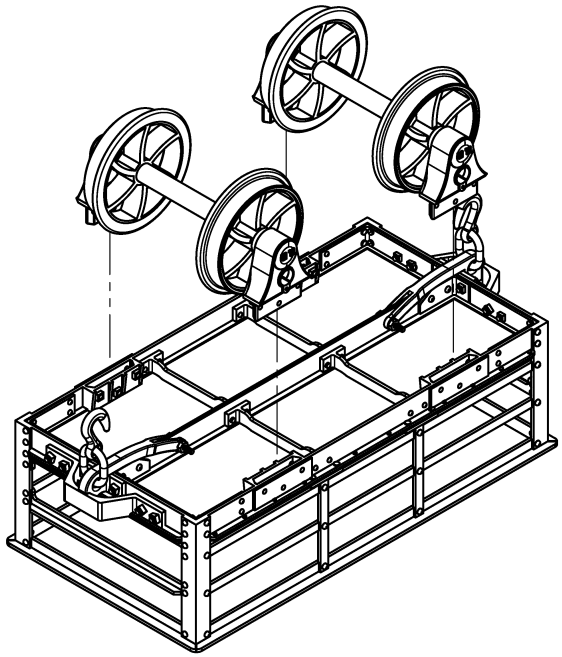
Assembly Notes

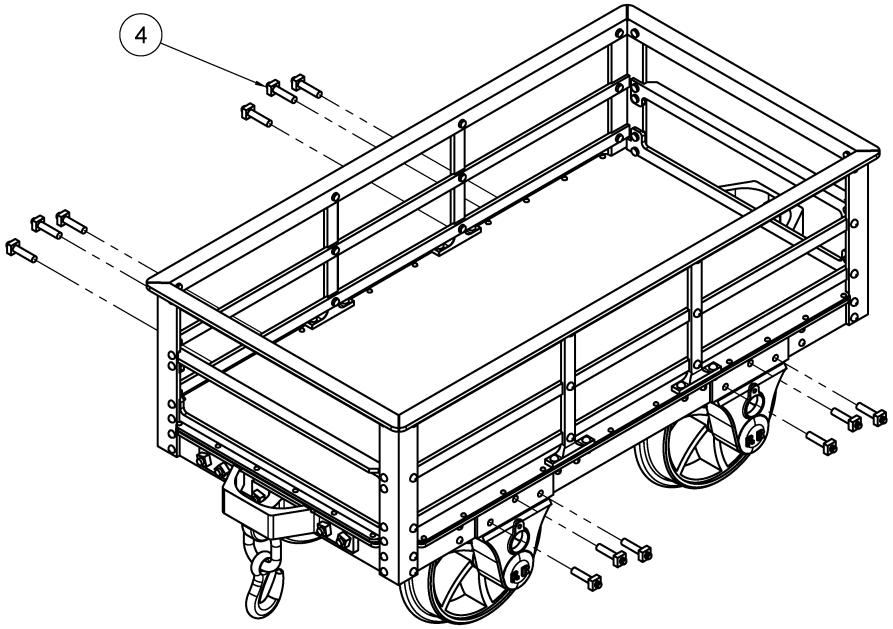




3D Printed Festiniog Railway Iron Body Slate Wagons

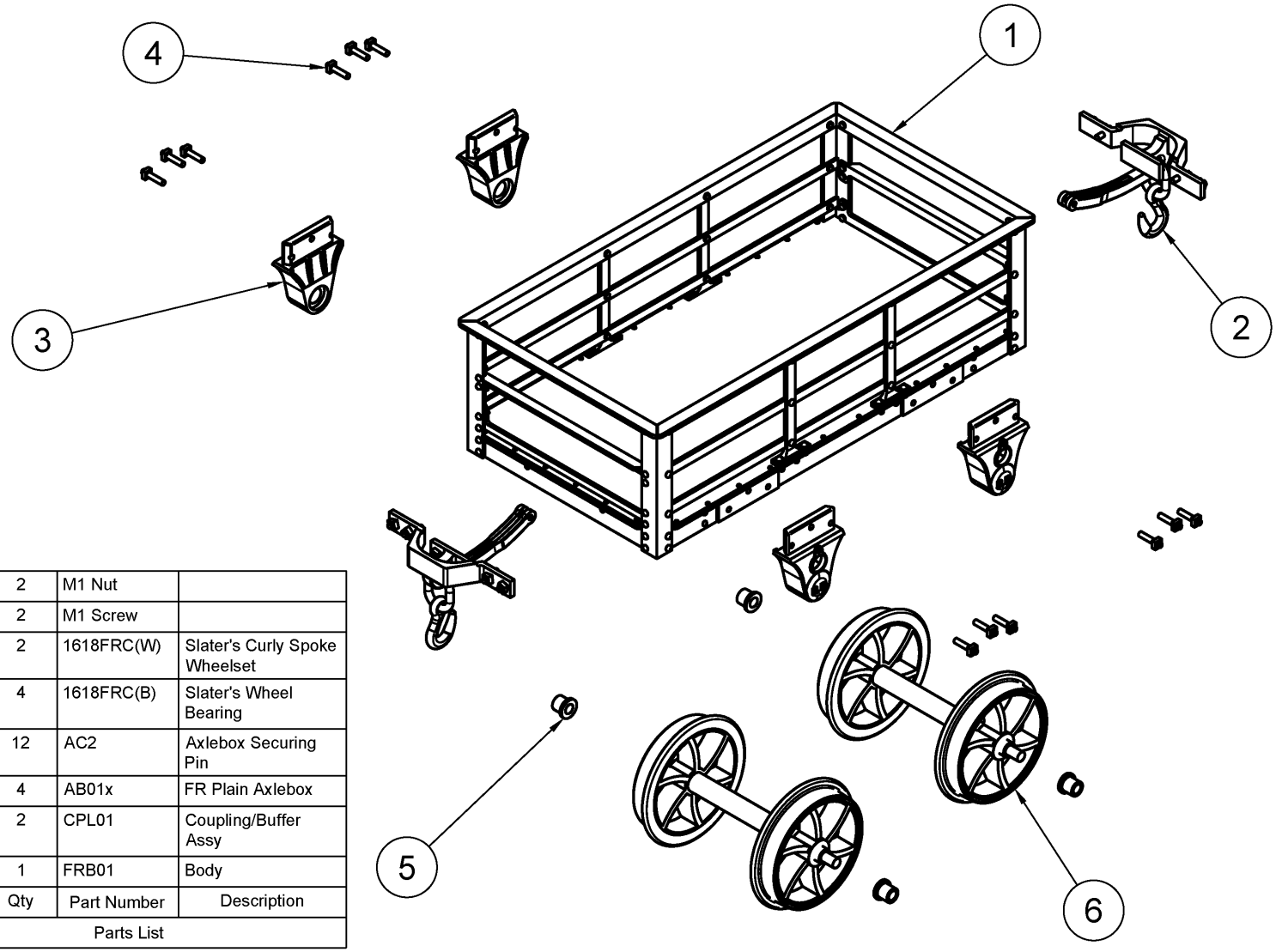
Assembly Notes





3D Printed Festiniog Railway Iron Body Slate Wagons

Assembly Notes



Item	Qty	Part Number	Description
8	2	M1 Nut	
7	2	M1 Screw	
6	2	1618FRC(W)	Slater's Curly Spoke Wheelset
5	4	1618FRC(B)	Slater's Wheel Bearing
4	12	AC2	Axlebox Securing Pin
3	4	AB01x	FR Plain Axlebox
2	2	CPL01	Coupling/Buffer Assy
1	1	FRB01	Body

Parts List

3D Printed Festiniog Railway Iron Body Slate Wagons

Assembly Notes

Additional Notes for wagons with slightly different constructions requirements (The foregoing drawings are all based on plain FR 2 Ton Slate Wagon)

LNWR Slate Wagon – No Difference save in cosmetics.

FR 2 Ton with Rail Spine – Couplings do not have a tail and are attached by M1 Hex Headed Nut and Bolt directly to the headstocks.

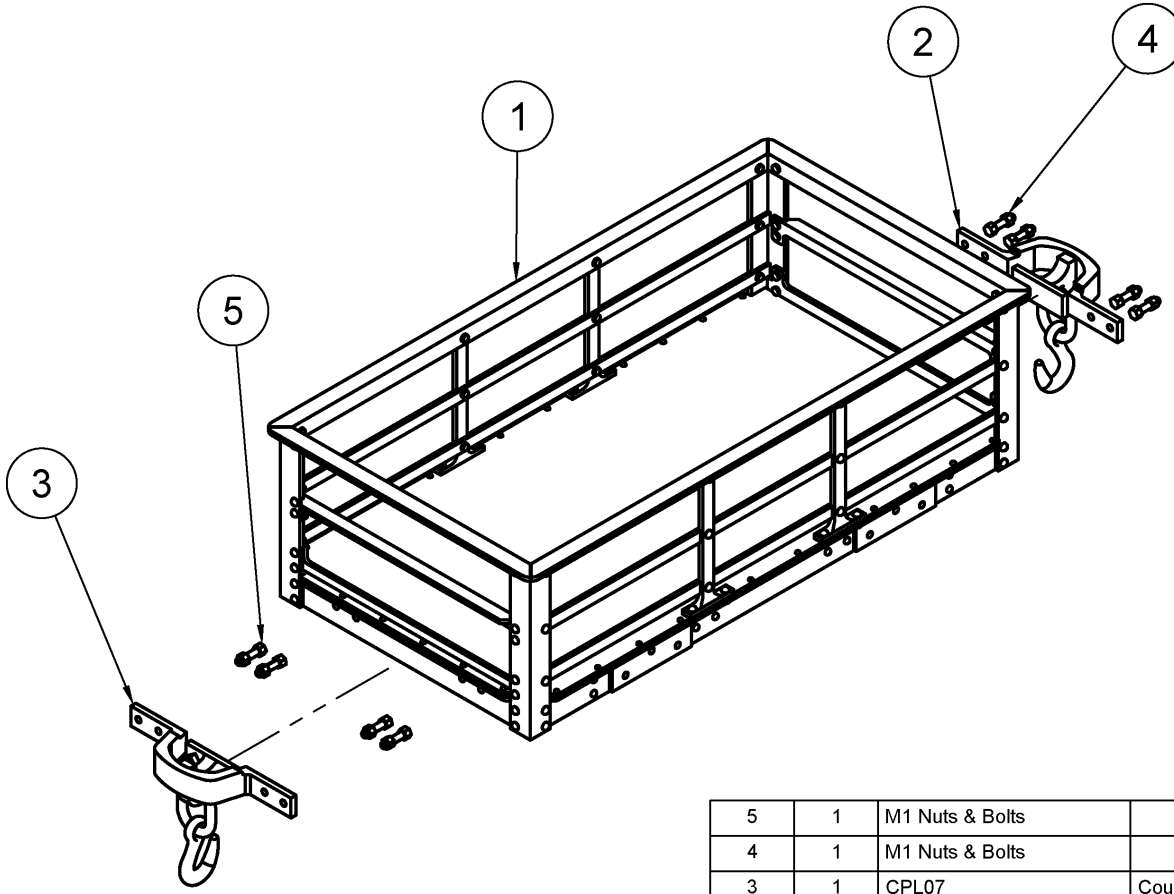
FR 3 Ton Slate Wagon – As per 2 ton, however the bearing locating hole in the axleboxes will need deepening by 0.5-1.0mm. Use a 5mm drill and go slowly, it is very easy to drill the axlebox material.

FR Slab Wagons – Essentially a slate wagon underframe. The wooden slab bearers can either be made from wood strips, or printed ones are available complete with a set of axleboxes. These can be secured by counterboring the bearer mounting hole and bolting in place as per the prototype. Do this before fitting axleboxes and wheels. Chain tie down rings will need to be fitted – suitable wire rings can be found from Jewellery suppliers.

FR Iron Bolsters – The bolster is supplied loose as on the prototype, however it can be attached using a pin or screw through the pivot centre.

3D Printed Festiniog Railway Iron Body Slate Wagons

Assembly Notes

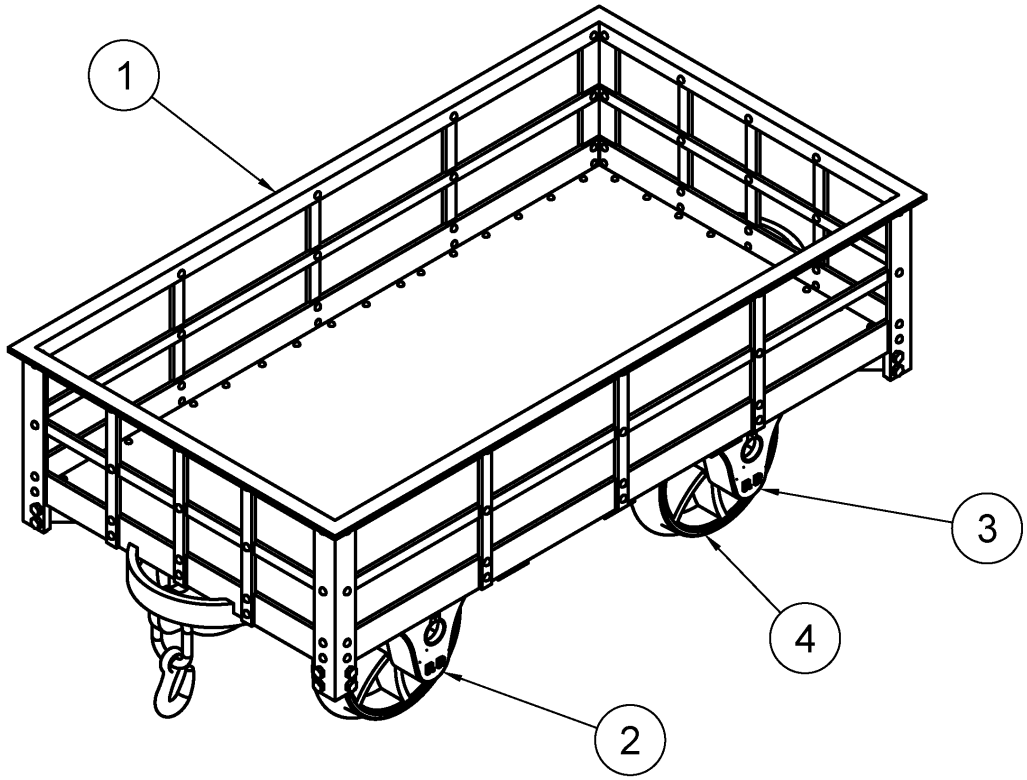


Item	Qty	Part Number	Description
1	1	FRB11	Body
2	1	CPL07	Coupling/Buffer Assy
3	1	CPL07	Coupling/Buffer Assy
4	1	M1 Nuts & Bolts	
5	1	M1 Nuts & Bolts	

Parts List

3D Printed Festiniog Railway Iron Body Slate Wagons

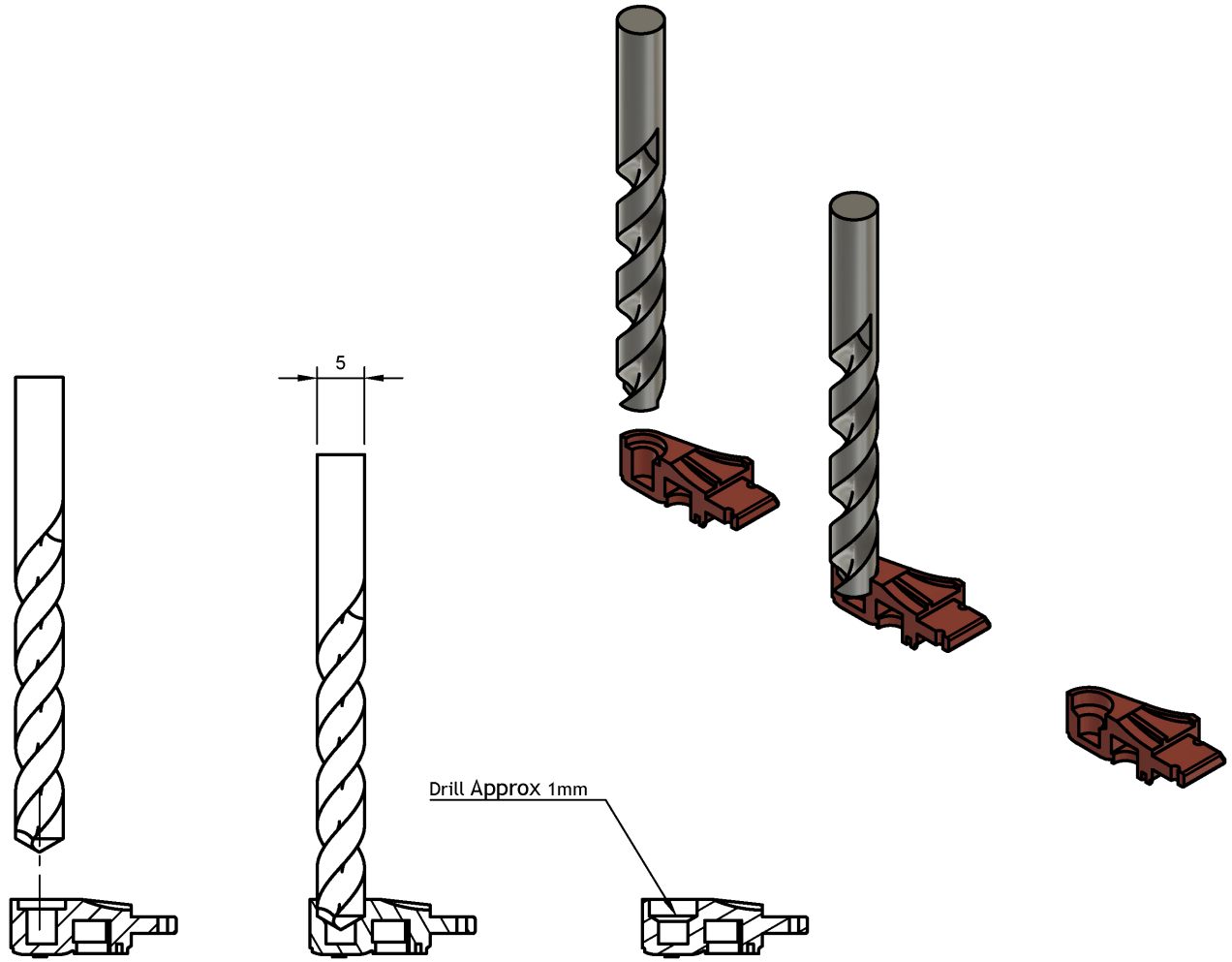
Assembly Notes



Parts List			
Item	Qty	Part Number	Description
4	2	161FRC	Slater's Curly Spoke FR Wheels
3	2	Drilled Axlebox (AB01x)	Axlebox Modidfied by Drilling as Shown
2	2	AB01x	Open Plain Axlebox
1	1	FRC13	Body with Couplings

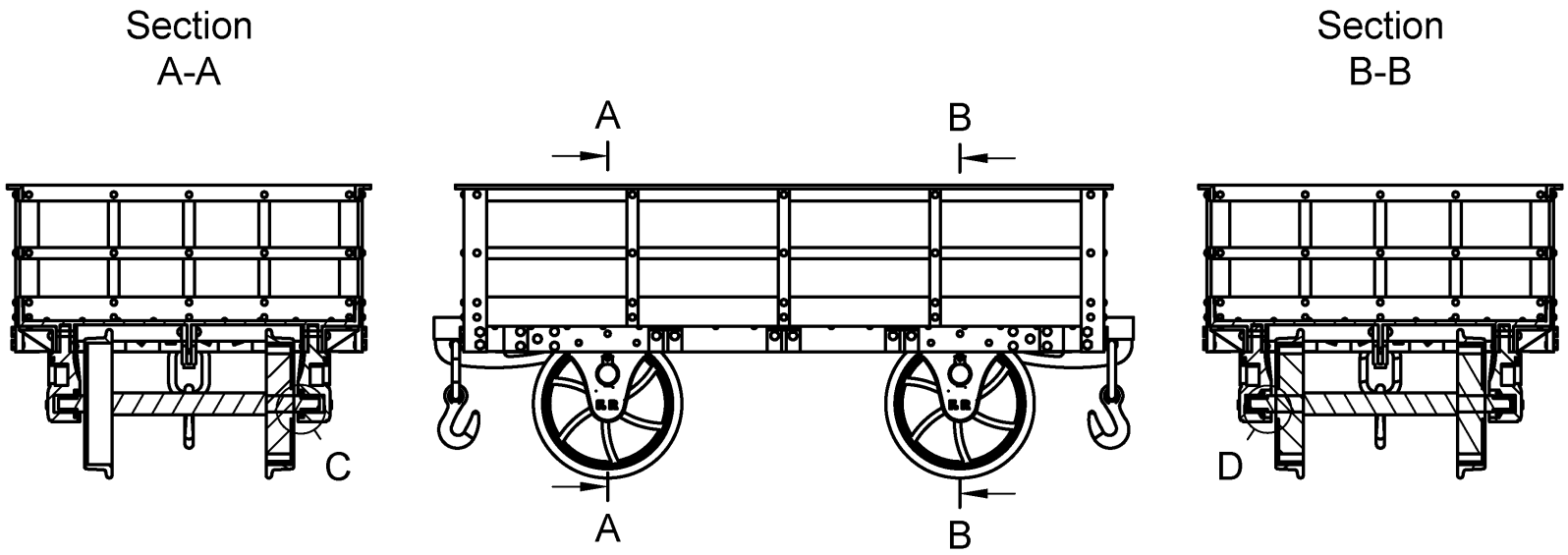
3D Printed Festiniog Railway Iron Body Slate Wagons

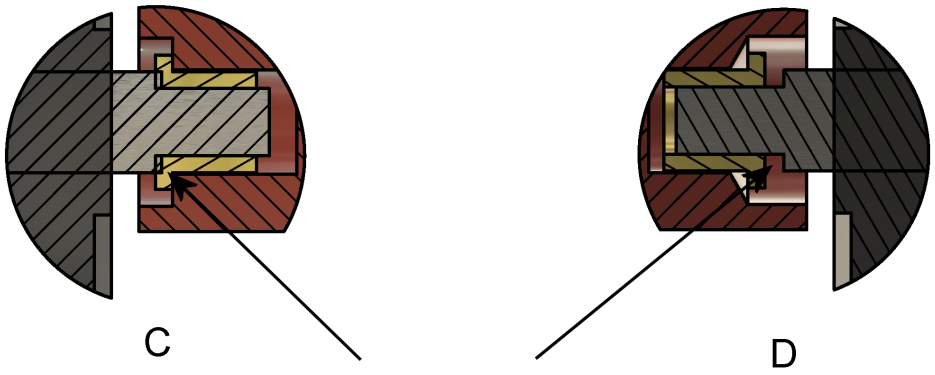
Assembly Notes



3D Printed Festiniog Railway Iron Body Slate Wagons

Assembly Notes

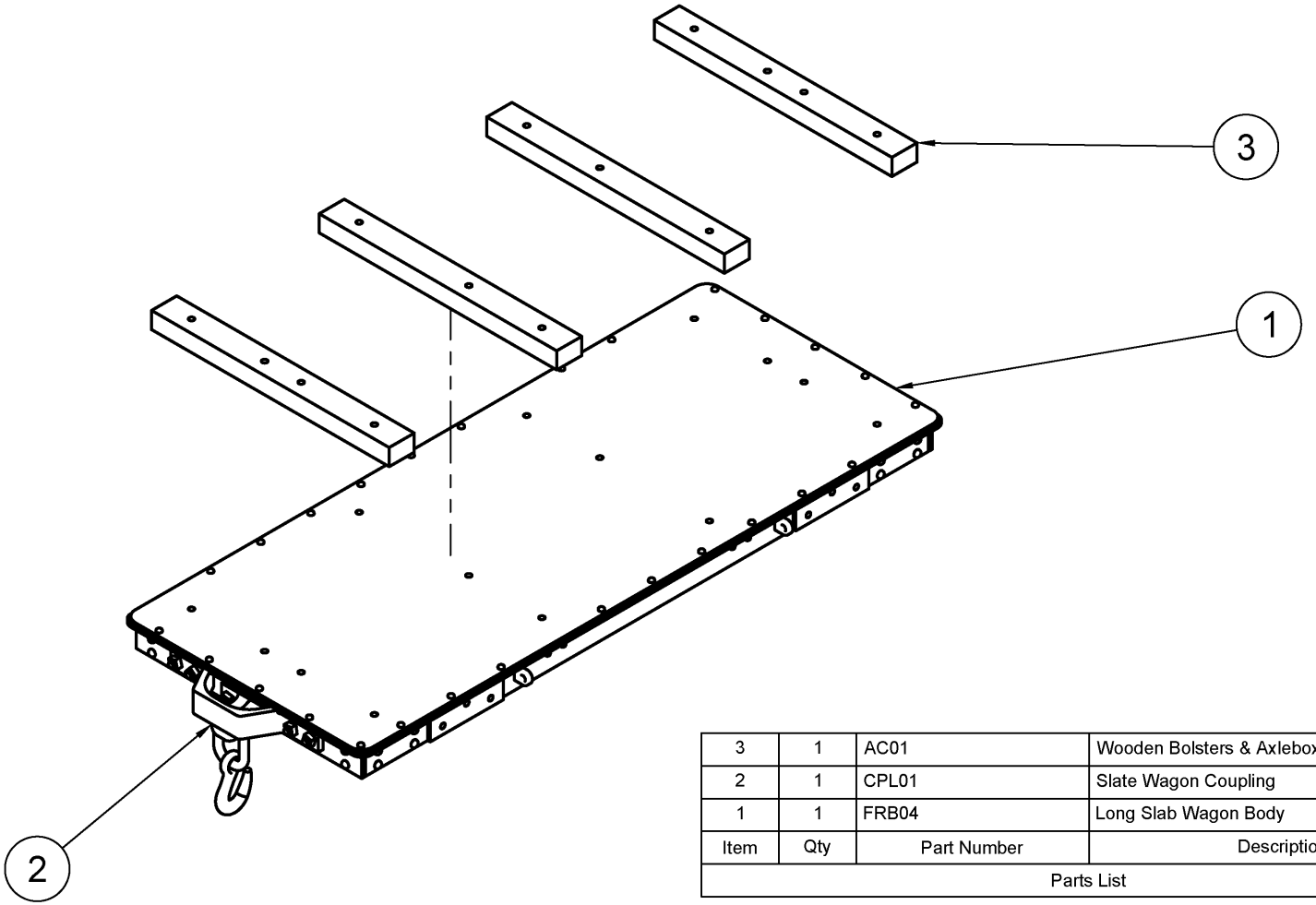




Drill Axlebox to Avoid Bearing
Clearance Issues

3D Printed Festiniog Railway Iron Body Slate Wagons

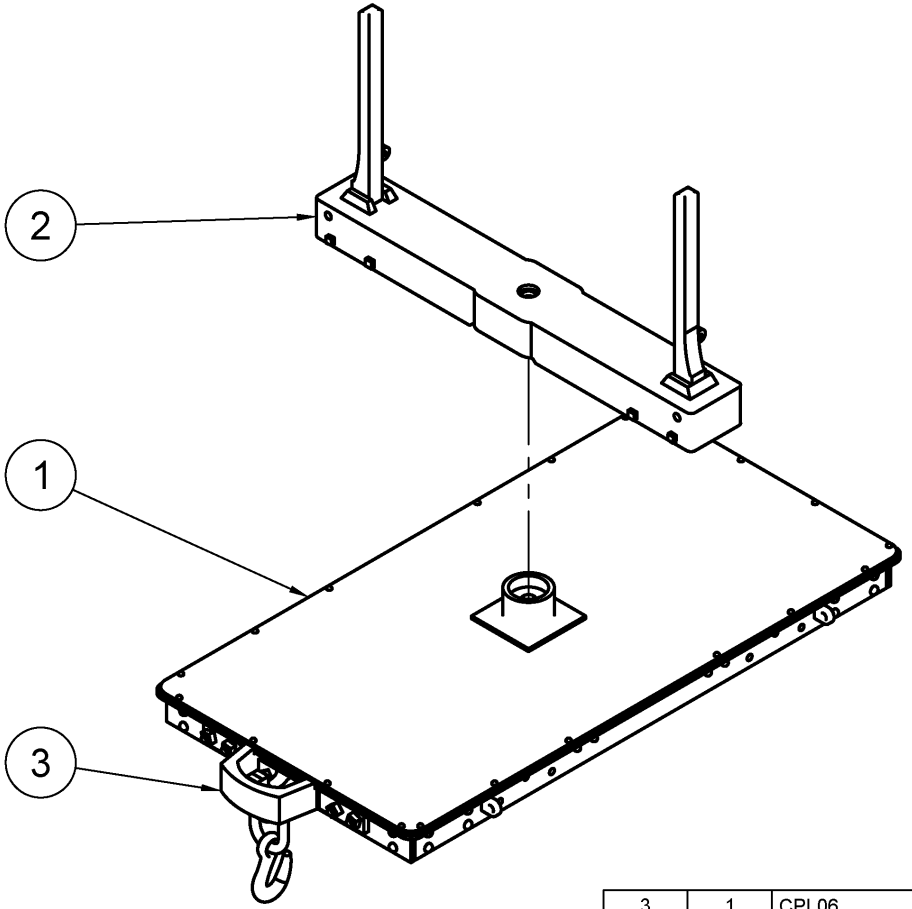
Assembly Notes



Parts List			
Item	Qty	Part Number	Description
3	1	AC01	Wooden Bolsters & Axlebox Set
2	1	CPL01	Slate Wagon Coupling
1	1	FRB04	Long Slab Wagon Body

3D Printed Festiniog Railway Iron Body Slate Wagons

Assembly Notes



Parts List			
Item	Qty	Part Number	Description
3	1	CPL06	Close Coupling Buffer & Couplings
2	2	FRB08(b)	Swivelling Bolster
1	1	FRB08(a)	Bolster Wagon Body