

## **2' 3" Narrow Gauge**

# **Allen Eezi-tip Skips**

**Version 4.0**

by

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### **Introduction**

This is a "work in progress" to develop a series of 2'3" narrow gauge items & assets as a FREE resource for Railworks. The gauge was chosen to enable use of the already existing Railworks assets developed for the Tallylyn and Phorum Peninsular pay ware routes.

### **The Ubiquitous Skip**

Of all the narrow gauge stock the most common was the V-tipping skip. It was even more common than slate wagons - of which there were quite a few. Based on a remarkably simple concept the V-Skip enabled huge quantities of material to be moved around with very little effort and without any kind of specialised unloading or loading facilities. Skips were used in both the mineral extraction industry and by construction firms in large numbers. Used by many other sorts of other companies as well, skip manufacturer was big business and so many firms produced them.

Probably the best known were the Hudson Rugga type. In fact so well known that Rugga became a generic name for a skip. The Decauville company was also a major manufacturer in Europe but did not make the same impact in this country as Hudsons. Amongst the other manufacturers the most prolific was probably W.G Allen. At their works at Tipton, Staffordshire, W.G Allen & Sons (Tipton) Ltd produce a great variety of railway and other equipment and from 1920 they started producing a bolted together skip with an outside channel. This contrasted with the Hudson designs all of which had inside channels on welded frames. This 1920 "Koppel" type skip - based on the Decauville design was replaced in 1932 by the design relying more on pressed steel but which had few other redeeming features and greatly increased cost. This was replaced in 1939 by the Eezi-tip design which took full advantage of modern manufacturing methods and so simplified construction considerably. This skip design was to continue into production until the 1960s.

### **The Eezi-tip Skips**

The "Eezi-tip" range had a standard set of body capacities of 13½, 18, 27 and 40 cubic feet. Much of the literature refers to skips having a capacity of a cubic yard ( 27 cubic feet ); however it is clear that most skips varied around 18-27 cubic feet capacity. Its design was a great departure from earlier ones, replacing the straight rocker angle with a curved one and a welded frame. Because the body ends are formed from pressed steel plates the corners could therefore be curved to help stop rotting at the butt joints. Oddly the retaining catch reverted to the 1920 simple pattern.

Skips intended for locomotive haulage were normally fitted with a longitudinal stiffening bar down the centre line of the frame, in order to protect it from buffing shocks. The wheels are 1ft 0in diameter and the wheelbase 1ft 9in

The outside frames and unusual design made this an appealing model - not least for a learning experience in 3DCrafter. Also Hudson Ruggas are so well known that something out of the ordinary seemed like a nice idea.

## Version Control

As mistakes are rectified I will issue a new release. Each release will contain all the stock previously released so that you will only need to keep a copy of the latest release.

Release	Description	Date
v1.0	Original release with 3 skips, 1 flat and loader	July 2011
v2.0	Post RW2011 Release with updated graphics. Animation changed. Skip Frame & Wheels now have a separate graphic to the body. Any bump maps have been removed.	October 2011
v3.0	Further work on animation and also release of fuel bowser	November 2011
v3.1	Missing Fuel Bowser added - sorry ! Updated animation	June 2012
v4.0	New Pocklington Wagons added. Sound file update	July 2012

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## The Skips Described & Illustrated



This is the DEFAULT SKIP.

It is a black painted Eezi-tip Skip of 18 cu ft capacity. It is modelled using scale drawings.

This is a slightly battered skip with a fair amount of rust and flaking paintwork.

In reality skips were not often moved around in the upright tipped position as there was no means of

retaining the skip in an upright position other than a well placed brick - although they were often left upright when parked.

The nature of animation for loading & unloading in Railworks means that the skip will tip when both loading and unloading - see the Finer Technical Points section for a set of flimsy excuses as to why this is.



This is the GREEN SKIP. It is exactly the same model as the default skip and is a simple reskin.

Like the Black skip this skip now has separate graphics for the frame so that they can be "weathered" in different ways.

It is a repainted skip that is already showing signs of a bad rust problem coming through the paintwork on the skip body.

The modelled rust and bumps are quite different textures to the black skip to give reskinning some variation.



This is the GREY SKIP. It is exactly the same model as the default skip and is a simple reskin. It happens to be my favourite version.

It uses both the rust textures of the green and black skips to give a very rusty and worn out look. This is what the green skip looked like before it was given a new lick of paint.



I have also included a FLAT TRUCK. It uses the Grey Skip frame but has a 4 wooden planks nailed to wooden frames. You can see the frame under the planks and you can also see how some tie downs have been bolted onto the skip frame - not that anyone uses them ! There is no load for this wagon (yet!). Because there is no skip body this is a very light wagon.



A new addition to the fleet in Version 3, the FUEL BOWSER is based on those used by Garsides at their sand works. The fuel was for the machines on site and not the locos themselves.

In practice there was an awful lot of coiled hose on these judging by the pictures but to make this was going to take an age and use up a very large amount of computing power to draw. So assume that there is spare hose somewhere.



This is the first of a new set of wagons in version 4.0. It is based on the body that was welded to a frame that looks like an Allen frame at Pocklington Nursery in York. The nursery was used by the GNER to supply flowers for all its hotels and stations in the York area and it had its own little narrow gauge line that even went into the green houses.

This wagon is called OPENA. It has planking sides, a metal frame and a plywood floor. The colours are my own as the original was grey.



This is OPENB and is just like the previous except that one plank on each side has been removed.

There are no loads ( as yet ) for these wagons as I find load building really hard to get something that looks right. I suspect that in reality the loads for these would have been soil, compost, and weeds !



WAGONC and WAGOND (below) are essentially the same except that WAGONC has a plywood floor and WAGOND a metal one.

These are not prototypical wagons in that I can find no pictures of them running without sides but it must have happened - and anyway they happen to be my favourite design.



## Installing the Skips

Should be simplicity itself as I hope I have added an RWP file that works. Don't forget that if you have a good .zip file manager like 7-Zip you can actually open an RWP like any other file anyway.

You will then need to go into your route editor and enable them using the infamous blue cube. My assets will always be under **richardmaxted**. All my Narrow gauge assets will be in the **NarrowGauge** tick box under this.

## Using the Skips

The skips will be found under the wagons symbol in the normal fly-out. They are all capable of connecting to each other.

### Passenger Views

Pressing "5" now brings up a passenger view sitting on the floor of flat wagons - legs dangling over the edge. This is quite an amusing way to travel !

### Loading & Unloading

The skips can be loaded at the start of a scenario using the normal loading fly-out on the right hand side of the screen. They are supplied with three loads but when you download them I have ( 'cos I thought it the most likely load ) loaded them all with sand.

The available loads are rocks, stones & sand. ( These pics are of V1.0 trucks !)

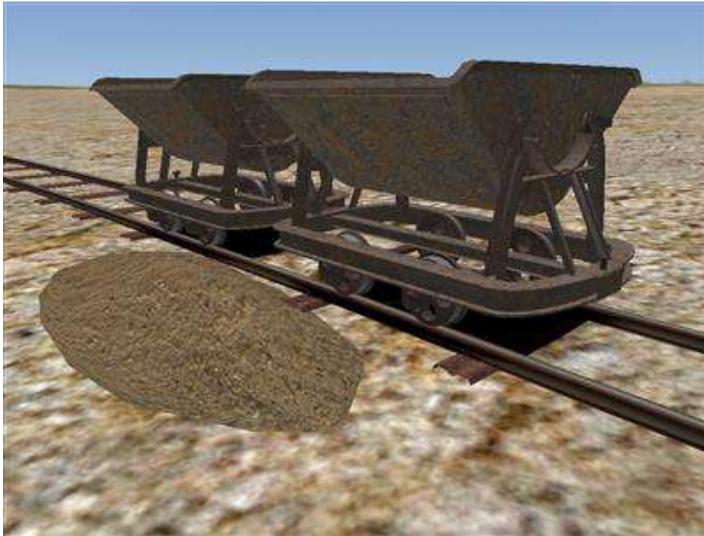


To swap the loads is a really simple task - see *Finer Technical Points* below - as is creating new loads. *Final Technical Points* also describes the unloading animation in more detail.

## Load Transfer Points

In additions to loading the skips at the start of a scenario it is also possible to set up transfer points either in the route editor or as part of a scenario so the skips can be unloaded during a session. To do this you can use either the simple HUD or T and SHIFT T key presses.

The skip loads are "Bulk Freight" and have been tested with all of the default loaders and unloaders and seem to work. However, most of the default loaders are far too bulky or structures that don't really suit the typical operations that skips were used for - as most loading and unloading was carried out without any sort of complex loaders. As a result I have supplied a simple unloader / loading point to match the skips.



It is a pile of.. well, sand at the moment. But actually it uses the same texture as the skips so it is possible to change the load just like the skips - again see the Finer Technical Points section.

The beauty of this is that the pile of sand does not have to sit near the track - it can be around the track, under the track, alongside the track, or above or below it in a loading bay. In fact it can be where ever the pile of sand would be in reality.

It is also possible to place a line of unloading points together - creating a line of sand - which actually gives a more realistic operation as the skips can each be loaded or unloaded in turn without moving the train.

## Couplings

Skips were rarely coupled with more than a chain placed around a spur on the wagon.



This coupling is part of the free download and does not require permission to be used elsewhere.

The coupling is only shown when the wagons are hooked together, Uncoupled only the upright spur is displayed.

Because the chain is short, to keep the wagons linked closely I have had some problems linking them together which I hope has been solved.

However, a persistent problem has been getting the hook up to engines to show. This wagon is in fact coupled to the engine and all aspects of the coupling seem to work - except the display. I have no idea why.



## Finer Technical Points

### ***Where to find the files***

All of my future and current 2'3" narrow gauge assets will be located in subdirectories of ~

*Assets/richardmaxted/NarrowGauge*

So far as the Skips are concerned the relevant directories under this are~

- ◆ RailNetwork / TransferPoints/Yard/SkipLoader – contains the loader/unloader
- ◆ Couplings – contains my own design of skip couplings
- ◆ Freight/NGAllenSkips – contains the skips themselves ( and my other NG Stock )
- ◆ RailNetwork/Audio - contains the new wagon sound file

Under the Freight directory each skip type has its own separate directory

- ◆ Default - contains the Black Skip and also is where the other skips get their wheels from so you must retain this directory
- ◆ Green - the Green Skip which is a clone reskin of the Black Skip
- ◆ Grey - as above but for the Grey Rusty skip
- ◆ Flat - the flat wooden platform on a skip frame.
- ◆ Fuel - the Geo. Garside Fuel bowser
- ◆ Open - the Pocklington Nursery Wagons

### ***Swapping the loads***

The skip load is a generic texture named "skipload.TgPcDx" which is located in the skip's texture directory. In the default skip's texture directory you will find three files called

- ◆ skipload.TgPcDx.rock
- ◆ skipload.TgPcDx.stone
- ◆ skipload.TgPcDx.sand

To swap the load you delete "skipload.TgPcDx" in your skip of choice and copy which of the above files you wish to use renaming them to "skipload.TgPcDx".

### ***Swapping the loader / unloader load***

You can make the texture for the loader match the type of loads you are using. The skip loader also uses the generic texture named "skipload.TgPcDx" which is located in the loaders texture directory. In the default skip's texture directory you will find three files called

- ◆ skipload.TgPcDx.rock
- ◆ skipload.TgPcDx.stone
- ◆ skipload.TgPcDx.sand

To swap the loader texture you delete "skipload.TgPcDx" in the loaders texture directory and copy which of the above files you wish to use renaming them to "skipload.TgPcDx".

### ***Adding new loads***

Because the skip load is a generic texture named "skipload.TgPcDx" it is possible to create new versions to change the load in the skips ( and on the loader-unloader). You will need to convert "skipload.TgPcDx" to a .dds file using a program such as RWTools. The texture is a

simple one (see below) with no alpha or other bits. Simply replace it with a 1024 x 1024 bitmap orientated so the front of the skip is at the top of the graphic.

### **Repaints and Additions**

The texture for the bodywork used to be called the same for every skip - "ironplate.TgPcDx". This also contained the wheel textures as well. With the advent of Railworks 3 I took the time to relook at all the texturing. Obviously Stencil Shadows are no longer needed and the original bump mapping was now giving far too coarse roughness to the skip body. In version 2.0 I decided to do away with bump mapping altogether as I think the skips look better this way. I have also moved to having a separate texture for the body of the skip and the rest of the frame. However, I have had another go at bump mapping in Version 3 for the fuel tank which I think works quite well. There are no winter textures.

#### Texture Types used

Type	Wheels	Frame and supports	Body	Loads
alpha Specular		skipframe.TgPcDx	ironplate.TgPcDx skipwood.TgPcDx	
alpha Spec + bump	skipframe.TgPcDx		skipfuel.TgPcDx truckbody.TgPcDx truckbodyM.TgPcDx	
ordinary				skipload.TgPcDx

### **Wagon and other dimensions**

The wagons are small - the wheel base and distance between the buffers seems to be at the outer edges of the capability of the simulation. This is not surprising as the distances are often only mm.

I have not been able to find an unladen weight for a skip so I used 0.25 tons ( 500lbs ) and 0.15 tons for the flat which I suspect is still too heavy. I have calculated the weights of some common loads to set a general "capacity" for the load of 0.9 tons.

Material	mass per cubic ft	skip capacity for 18 cubic feet	18 cubic feet skip capacity
Sand ( dry )	100 lbs	1800 lbs	0.90 ton
Basalt Rock	120 lbs	2160 lbs	1.08 ton
Crushed Limestone	97 lbs	1746 lbs	0.87 ton

### **Unloading animation**

As already described it has been quite difficult to get the unloading and loading of the skip to work in a satisfactory manner. Railworks needs the animation for both operations to be the same. In reality they are differing operations as loading a skip needs no "tip". In version 3 I am still far from happy about the animation - it is too slow but I cannot get it to load correctly at a faster tip speed.

In addition I can't find a way to bring in a new structure during an animation. Therefore the load has to present throughout the animation. It cannot be hidden or called into being part way through. The only work around I could think of was to spin it upside down when unloaded ( so that it is see-through ) and then turn it right side up when loaded.

However, it became clear that you could see this spinning operation. With the advent of Railworks this is the only option to hide the load. It also requires a "slow" action now. Having spent a great deal of time on trying to correct this I suspect that this will have to wait until a future release to be solved. I still can't decide if this animation is just plain annoying or not - time and you, the users, will tell. If anyone has a good idea I would be most grateful.

### **Brakes**

The wagon is modelled in the blueprint with brakes. These are Air Brakes. However they seem to have no perceptible impact on the simulation of the wagons.

This is so not right as to be almost laughable were it not for the fact that something in the physics of Railworks means that the performance of unbraked very light wagons is even worse. There are effects coupling up to already existing braked stock that I have spent far too long trying to solve and simply adding brakes sorts it out.

If you want to try it without brakes than please do. However, I would suggest that if you do not know where this section is or how to do it then this is probably not a job to do as a first time go at changing a blueprint.

### **Suspension & Super-elevation**

There is no suspension in these wagons and so I am not sure if they work with super-elevation or not. Suspension is achieved in RW2012 by adding:

```
<SuspensionStiffness ></SuspensionStiffness>  
<SuspensionDamping ></SuspensionDamping>
```

parameters to the bogie.bin file when the model is put through the blueprint editor for the first time. The values added are usually expressed in 6e7 type notation. The original problems with a zero value seem to have been resolved and so a zero value is now used.

### **Sounds**

This is a major update for version 4.0. Wagons use three basic sets of sounds for the couplers, the bangs & clanks and the rail noises. When I updated the rail sounds I found that the track joint noises were muted inside the cab. This is obviously fine for a large loco but for narrow gauge you can hear the wagon sounds all the time. As a result I have made my own wagon sounds file called RMNGStock. This has no inside muting, the flange curve squeal sounds with sharp curves, and the volume increases at low narrow gauge speeds.

The sound file is in:

*Assets/richardmaxted/NarrowGauge/RailVehicles/Audio*

These audio files replace BG\_Steam files. It is possible to add this reference to any narrow gauge wagon by editing the .bin file line :

```
<BogieAudioControlName d:type="cDeltaString">richardmaxted\NarrowGauge\RailVehicles\Audio\RMNGStock</BogieAudioControlName>
```