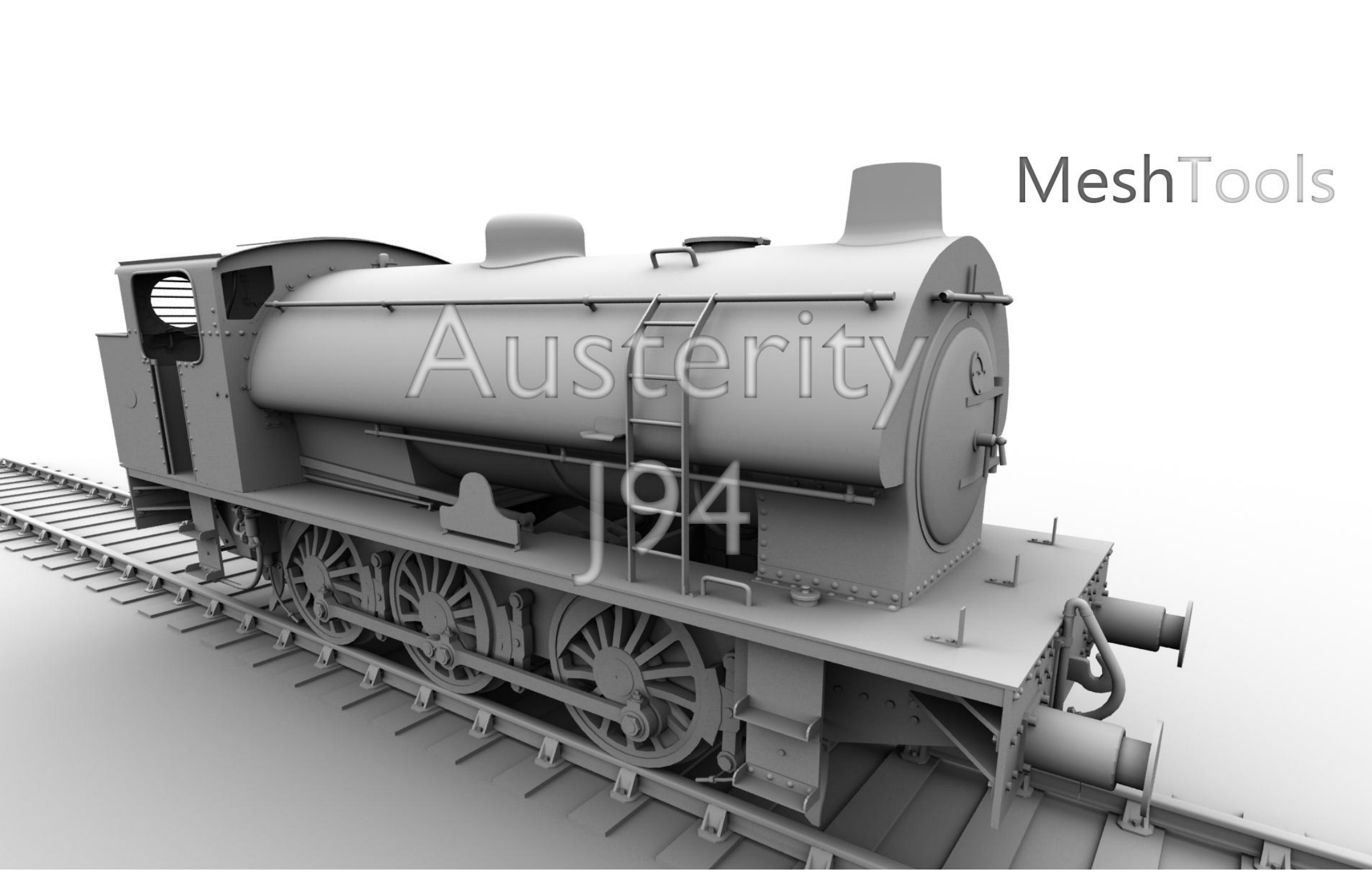

MeshTools
Austerity
J94

Contents

Background

The Hunslet "Austerity" was an 0-6-0ST shunting engine designed by R.A. Riddles for the War department. The designed evolved many years before from the Class 48150 0-6-0ST produced by Hunslet, these small tank engines were then developed by Hunslet into the class 50550 a much heavier and more powerful engine. Riddles took the design of the 50550 and simplified it making it more suitable for cheap and quick production. In total 377 Austerities were produced for the War Department up until 1947. The engines were built by various firms including Hunslet, Andrew Barclay Sons & Co, W.G Bagnall, Hudswell and Clarke, Robert Stephenson's and Hawthorns and the Vulcan Foundry.

After the war the War Department had no further need for the "Austerities" and they were sold to various companies including the LNER which after modifications to make them suitable for their service and became Class J94, the Nederlandse Spoorwegen where they became NS Class 8800. Further examples were sold for industrial use in collieries and mines etc.

After the war the NCB ordered 77 new austerities for use in its collieries and these were produced between 1948 and 1964. The NCB continued to use these austerities well into the 1970s and 80s long after steam on the mainline had come to its end. The J94s of the LNER and later BR were finally withdrawn in 1967 having found use on the difficult branch line of the Cromford and High peak Railway.

Technical data - Hunslet Austerity

- Introduced: 1943
- Power Classification: 4F
- Configuration: 0-6-0ST
- Total Built: 485
- Length: 30'. 4. "
- Width: 8'.9"
- Height: 12'. 6.81"
- Weight: 48T. 5C
- Coal Capacity: 2.3 Tons
- Water Capacity: 1200 Gallons
- Tractive Effort: 23870 Lbf
- Estimated Power Output: 790HP
- Fire tube heating surface: 873 Sq Ft
- Firebox heating surface: 88 Sq Ft
- Total Heating Surface: 961 Sq Ft
- Cylinder Size: 18' x 26'
- Driver Diameter: 4'. 3"
- Boiler Pressure: 170 Psi

Controls

Each engine has two versions, a standard [Std] and an advanced [Adv] version. The need for both arose when creating the script as we found that the AI simply could not drive the engine, in addition the loco brake did not function via the HUD. Since the HUD must be fully functioning we had to do 2 versions the simple and the advanced engines.

The advanced version contains the advanced scripting which allows for steam brake only engines, proper simulation of the engines steam brake including how maximum application force depends on the boiler pressure, better simulation of the vacuum brakes, two dampers, notched reverser, exterior animations and various controlled emitters. This version is auto fireman compatible, but is not HUD compatible and is not AI compatible.

The Simple version has basically had the entire script removed, it is mostly designed for people who want to just hop in and drive without the fuss of notched reversers, having only a steam brake on some engines, vacuum brake leakage and so on. This version is also AI compatible unlike the advanced version.

All scenarios have a standard and advanced version using the respective standard and advanced engines, allowing drivers of any skill to drive them without having any fuss and having to edit the scenarios themselves.

When you enter the Austerity's cab you will probably notice two things, firstly you are on the wrong side, but that is down to some misinformed designer putting the driver on the right (but not to worry he also allowed you to drive from either side). Secondly you will likely notice some interesting controls, but before you touch them it may be wise to know what they all do! Here are some key one's for you to learn (and you will be tested later!).

The Regulator

The regulator controls how much steam from the boiler enters the cylinders, the further it is opened the faster you will accelerate. Essentially if you want to meaningfully get somewhere you will probably want to open this, but be careful how much you open it since the engine may slip. The Regulator can be controlled by using either your hands or the **A** and **D** key to respectively increase and decrease the regulator setting.

The Reverser

The next important control you will want to learn is the reverser, this works essentially like gears on a car, moving the reverser closer to the centre is like moving up through the gears of a car meaning you can go faster. It works by limiting the amount of steam which enters the cylinder and allows the steam to expand more efficiently hence you will be able to go faster without emptying your boiler and making the fireman rather grumpy. To move the reverser you must first release the reverser lock by pressing **E**, then the **W** and **S** to move it forward and back.

The Reverser on the Austerity is of a pole type, it has 3 notches in either direction and a mid gear notch. It is fitted with a r lock which locks the reverser into a notch and prevents it moving while the regulator is opened. To release the lock the **E** key must be used, but caution must be used to not release the lock while the regulator is open more than a third otherwise the reverser could fly into full forward or reverse taking your arm with it!

Cylinder cocks

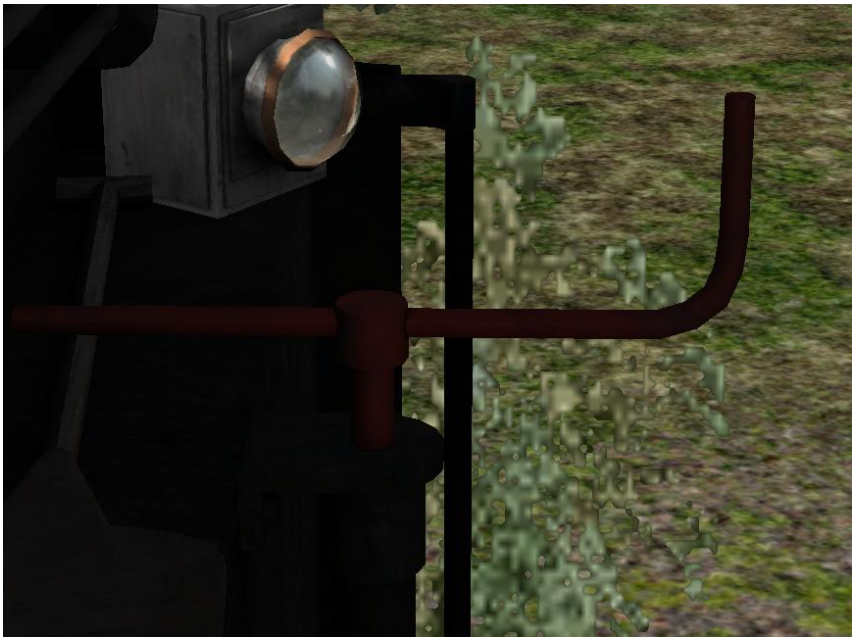
The cylinder cocks allow any steam which has condensed in the cylinders to be exhausted out of the cylinder preventing damage since water really doesn't like to be compressed. A secondary effect of the drain cocks is that it aids warming of the cylinders when the regulator is opened. They can be found under the reverser pole. The previous driver will have left the cylinder cocks open to prevent the engine moving while it stands idle (and so you don't forget to open them before moving off). The drain cocks should be opened when starting after being stationary for a prolonged period of time and left open for around 5-6 revolutions of the wheels. They are controlled by the **C** key.

Steam Brake

Now you have got going you probably want to know how to stop, Not to worry the Austerity is rather good at this. The steam brake will work on the **engine only.** The brakes are quick acting and will stop you rather quickly if you are running light engine or with a short train. Remember the effectiveness of the steam brake diminishes at lower pressures so at very low pressures the handbrake will be more effective means of stopping. The brake can be controlled on both sides of the cab or with the **]** and **[** keys to apply and release the brake respectively. When using the simple controls the **;** and **'** keys are used. The steam brake handle has an Neutral position in which the brake is neither released or applied (this is at about 40%), to apply the brake the handle is pulled back, the further it is pulled back the **faster** it applies. to release the brake the handle is pushed forwards, the further it is moved the quicker it releases.

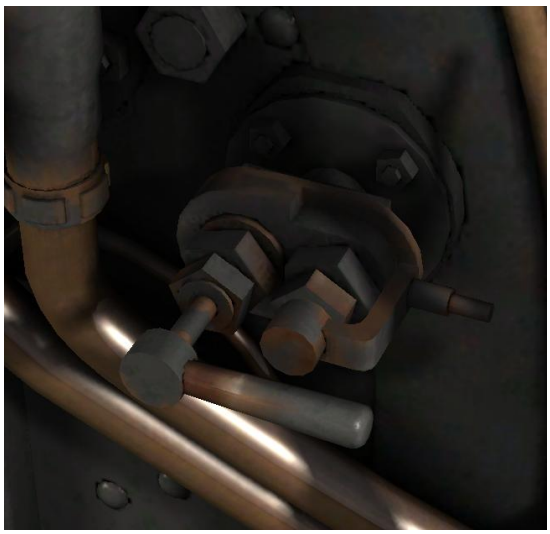
N.B The steam brake has to warm up first otherwise its application will be much slower to apply, the use of the steam brake will warm it up and once it's up to temperature it will take a while to cool.

The Handbrake



Despite what some people may say the handbrake is the only truly fail safe brake and will probably work 99% of the time. But let's not worry about brake failures (they won't happen honest). The handbrake is less effective compared with other forms of braking being slower to apply, less effective and requiring the fireman to screw it down. It however doesn't require steam pressure to operate and hence will be your brake of choice when moving about the shed near the end of a long shift.

Blower/Sander



The blower is the left valve in the picture above, it is used to create a draught through the boiler when the regulator is shut, it's useful for creating pressure quickly when stationary ready for an assault on a hill! Although it does absolutely nothing when the regulators open since that creates a draught as well, so it mainly just wastes steam. Make sure however it is open a bit when shutting the regulator and is wide open when going through tunnels to prevent a blowback of the fire into the cab, which would really ruin your day! To open and close the blower the **N** and **shift N** keys are used respectively

The sander on the Austerity is of a Steam type, the steam being used to inject the sander in front of the drivers. Sand is used to aid adhesion in poor conditions (basically it makes you slip less!). To apply sand the **X** key is used

Injectors

Injectors are used to put water into the boiler, their operation is as follows: The water regulator is opened for the respective injector, this is located on the far left and right of the cab, being used for the left and right injectors respectively. This can also be open and closed by the **k** and **Shift K** keys for the left injector and **L** and **Shift L** for the right. Next the steam valve is opened gradually to allow the injector to pick up, this can be done with the **I** key for the right injector and **O** for the left, the same key is used to turn them off. Remember also open the water valve before starting the injector, and after you have shut the steam valve otherwise steam will erupt from the injector and make a very loud noise!

Dampers

On the Austerity there are two dampers, they are used to allow air into the firebox thereby heating up the firebox through improved combustion. They are located to the left of the firebox doors on the floor. To open and close the left damper the **M** and **Shift M** key are used, and for the right the **Ctrl M** and **Ctrl Shift M** keys are used.

Additional

I'm sure you'll know where the firebox doors are, to open them the **F** and **Shift F** key are used. Also you will probably know how to make the fireman shovel coal into the fire, this can be done by the use of the **R** and **Shift R** key, alternatively the coal door on the floor at the back of the cab can also be used to control the rate of firing by opening and closing it.

The Cab also has a lamp in it which can be used to illuminate the cab when its dark, this can be turned on by the **Ctrl H** key and off again with the same key.

The windows and roof ventilator on the J94 can also be opened and closed to suit your needs by using the mouse.

Liveries

0-6-0ST "Austerity" BR Class J94

0-6-0ST "Austerity" LNER Class J94

Scenarios

30 Wagons	30 wagon challenge. Haul 30 wagons up Woodhead. If your wheels start slipping remember to use the sanders. It's not as hard as it looks but it's a long steep incline so be careful, and there is no need to rush stay at a steady 30 mph!
Coal Run	Shunting heavy coal wagons at Wath. Be careful! These wagons are full of coal, they are very heavy, and I suggest not going over 20 mph. They are also unfitted and you can only rely on the handbrakes and the steam brake. You must shunt and deliver coal to Penistone. Make sure your keep the boiler pressure up for maximum steam brake efficacy.
Guard's Van Tour	A guard's van tour through the Woodhead tunnel travelling to Guide Bridge. Do not go above 30mph. You will cause a back log of traffic so look out for any red lights for overtaking trains. Enjoy the trip!
Shunting Duties, Part 1/Part 2	You have plenty of shunting tasks to complete! I suggest you start straight away! You'll start off your day at Deepcar yards collecting wagons and move them up to Penistone, then complete the rest of your shunting duties at Penistone. Remember to use your handbrake for accurate and efficient braking. Also remember to use the brake van hand brakes to prevent wagons from rolling away! Check your task list for objectives.
Free Roams:	
	Guidebridge Shunt Full Load Start of the day

All scenarios support the standard version and the advanced version, they are defined using [Std] for standard and [Adv] for Advanced.

Reskinning/Sound Policy

Our (Meshtools) reskin policy for the J94 Austerity addon is as follows:

We generally allow reskins of our work to be done. Permission needs to be sought before doing said reskin, to do this contact us at Meshtools by filling in a support form on our website at http://www.meshtools.co.uk/contact ,

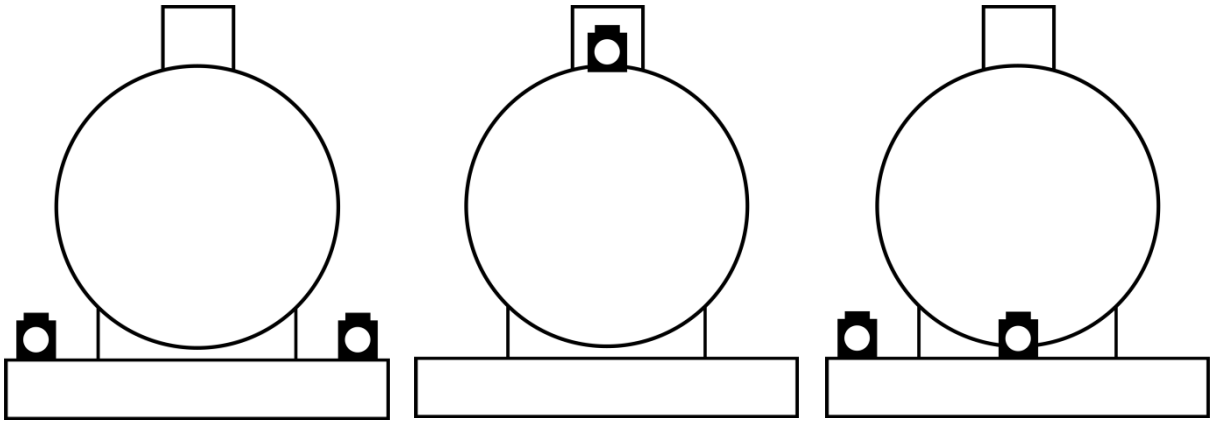
We would also like for you to inform us how your reskin is going and if any improvements can be made to make reskinning easier. Approval should also be sought before uploading it to any site as a quality control check.

The reskins must not include the shape files, child object files, simulation files, script files, sound files or animation files, but it can include the loco bins if needed.

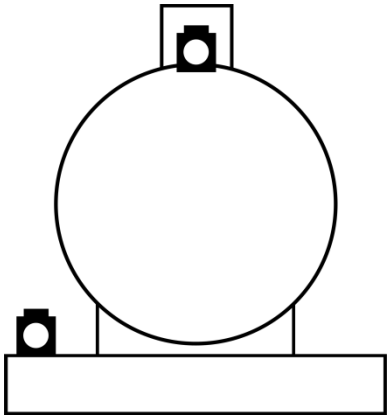
No modifications at all must be done to the sounds, any sound modifications must be done from scratch and not based on the included sound files (sound files includes: .xml and .bin files). Sound modifications if done must not use or include any audio files such as .wav or .dav files included with the addon. Permission must be sought before doing any sound modifications.

Head codes

The engines also have toggleable head code lamps which can be turned off and on while in play. To do this simply hold down **Ctrl** Key followed by either **1**, **2**, **3** or **4**.

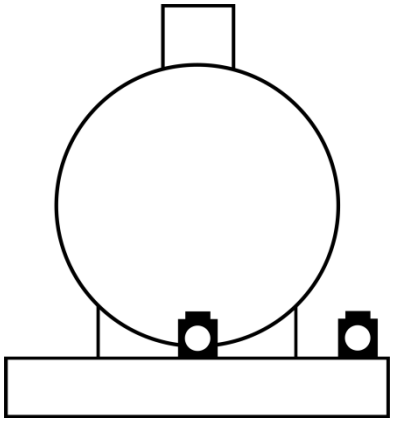


CLASS A	CLASS B	CLASS C
Express passenger or a breakdown train.	Stopping passenger, rail motor or a breakdown train returning from job.	Parcels, fish, livestock, milk, fruit or perishables all XP stock.



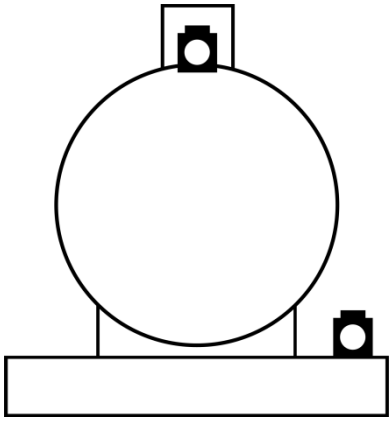
CLASS D

Express freight or livestock with at least 30% XP connected to loco.



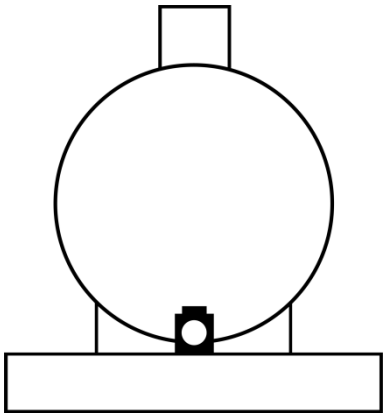
CLASS E

Express freight with at least 4 fitted vehicles connected to the loco or a short unfitted express freight.



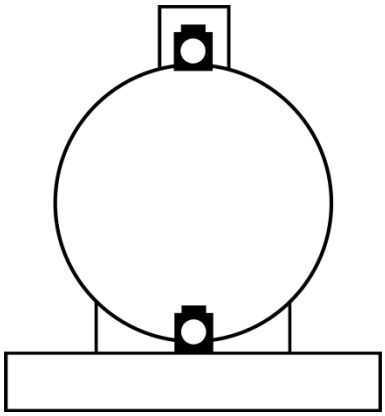
CLASS F

Express freight all unfitted stock.



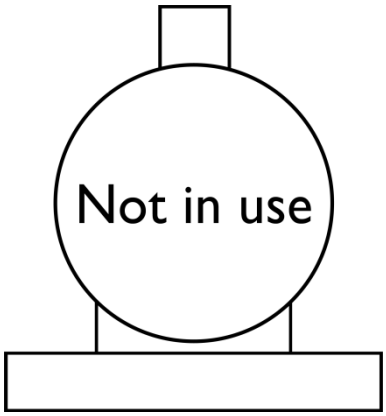
CLASS G

Light engine or engine with one or two brake vans attached.



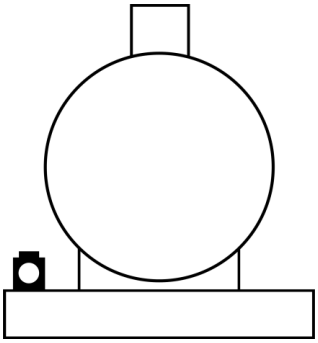
CLASS H

Through freight or ballast train.



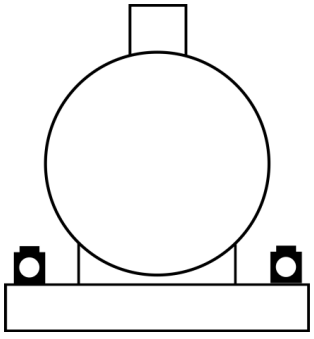
CLASS I

Was not used.



CLASS J

Through mineral or empty wagon train.



CLASS K

Pick-up or branch freight or mineral/ballast train on a short hual run.

Credits

Thank you to all those who those who helped out, contributed and gave their own time in helping out with this project! Without them it wouldn't be where we are today!

Also, thank you for taking some time to go through and read this manual, we hoped it helped answer some of your questions or any problems you've been having! I'd also personally like to thank you for purchasing this addon and supporting us. We hope to bring you a lot more exciting addons in the future!

Major contributors:

Michael Whiteley: 3D modelling, texturing, animation, route building, scenarios, research and live steams.

Edward Fisk: Sounds, simulation/physics, scripting, quality control, support, research and Live streams.

Additional contributors:

Simon Hall: Programming/scripting and testing.

Pete Gillam: Additional Programming/scripting and testing.

References:

Jeff Day: Additional cab pictures

Stephen Hunter: Whistle hoot sound

Testers:

Our group of enthusiastic beta testers!

RailSimulator beta testers

Chris Barnes

Connor Barrett

Andy Lawton

Thanks to!

The volunteers of…

The East Lancashire Railway

http://www.eastlancsrailway.org.uk/

Peak Rail

http://www.peakrail.co.uk/

RailSimulator.com for publishing and additional support and assets.