

Kerr Stuart Skylark

For 2' 3" Narrow Gauge

by Richard Maxted.

Introduction

This is a “work in progress” as is most of my stuff. **Version 4** is bottom to top revision that incorporates much I have learnt from producing my Barclay P class Atlantic. The changes in this version are:

- Moving to a single model for both cab and exterior
- Huge reduction in number of duplicate files and texture files
- Making the “leaning out” driving position with all controls animated
- Updated textures and especially metal reflections
- Changed couplers to correct Norwegian type
- Added injector water droplets and new steam textures
- Added random short whistles and other sound file changes
- Lights that can be placed on front and rear brackets and light up
- Changes to physics to modify power and couplings

What has not changed are the things that will affect any consists or scenarios that have been made with the locomotives.

History & Sources

There are several sources of information about the Kerr Stuart Skylark class of locomotives and most of them conflict with each other.

What is clear is that Kerr Stuart developed the Skylark class in the early 1900's and from the first they were built by Kerr Stuart “on spec” and held ready for purchase off the shelf. The Campbeltown & Machrihanish purchased a Skylark class (works 717) “Princess” in 1900. She was named after Princess Louise; a daughter of Queen Victoria who married the Duke of Argyll. She was used primarily for coal duties but hauled the occasional coach or milk train. Princess never left the C&MLR. She ran dry by accident, damaged her firebox crown and was left as parts to keep other locos running. She had already been sold for scrap by the time the C&MLR closed in 1934.

Lovetts purchased “Skylark” (works 802) in 1903 and she was used in the construction of the Leek and Manifold (hence my interest). After the contract she spent time on other projects before ending up at the Admiralty to go to Riddham Docks. After WW1 she was sold as surplus equipment to a contractor before being purchased by Colonel Stephens for the Snailbeach District Railway in 1922. She was scrapped 1946.

Hadfield’s Foundry in Sheffield purchased eleven of them between 1902 and 1915. Works number 811 was purchased in 1903 for East Hall clay pits.

The Skylark class locos were made to a number of gauges and with inside or outside frames. The number and location of the sandboxes seemed to vary and quite a few also carried equipment boxes on their water tanks. I have modelled two versions based on the original Skylark, with one sandbox, and Princess from the Campbeltown & Machrihanish (CMLR) that had two boiler top sandboxes .

There are no preserved original locos. There is one running in Australia but that has been significantly modified in the past and carries a completely different boiler, steam system and smoke chest. Some of the class survived into the late 1950's.

There is very little hard evidence about the design of the Skylark class beyond their weight, cylinder sizes, and driving wheel diameters. Apparently, the coal bunker was so narrow that coal frequently got stuck in it. Photographs of “Skylark” in her later life on the Snailbeach Tramway show her pulling 10 Snailbeach hoppers. Princess was used on the CMLR to pull a single coach and a couple of milk wagons or for coal hauling duties. The sense I have is a loco of only limited power.

There is also little data about colour schemes of locomotives but there is a picture in the Campbeltown and Machrihanish book by N. MacMillan of Skylark in her maker’s photo. So I do know the loco had her name painted on the tanks and roughly the kind of lining scheme that was used. Photographs of both Skylark and Princess in later life show clearly worn and grubby locomotives. In the books I have on the C&MLR and L&MVLR there are sections which describe the colour schemes and hint that Princess carried the basic Kerr Stuart scheme through her entire working life.

Modelling the Locos

Because there is so little data, I have had to use a fair amount of guess work and extrapolation to model these locos. In particular in regard to the physics and the cab. The loco is modelled using scale drawings but these are I think drawings from photographs. I have also had to make several assumptions about the layout of Stephenson's valve gear - and also some simplification.

The known facts are the diameter of the driving wheels (2' 3") and the cylinder sizes (7.5" x 12"). Using a number of standard equations and a bit of extrapolation it is possible to calculate a steam demand of sorts, a tractive effort, and an HP. Using ratios based on many other known performance data this produces an engine which has a rather low power to weight ratio and quite high fuel consumption at speed.

I have had to guess from first principals the entire layout of the cab. I have used other Kerr Stuart designs (especially the Wrens) as a guide. The entire layout of the vacuum and air brake systems are pure imagination based on systems I wanted to model and then trying to work out how they would have connected up. The controls, like the injectors and other cab elements are, however, models of real railway cab controls.

The locos generally seem to have been at best steam braked as most photographs show no brake pipes at all. Princess was supposedly vacuum fitted in later life but this seems to have been the exception. I have modelled the locos with either only handbrake, or a vacuum brake based on a Metcalfe design, or a Westinghouse air brake.

Version Control

Version	Description	Date
1	Initial release Skylark and Princess in Lined, Black and Old colours	Jan 2015
1b	now includes missing steam and smoke	Jan 2015
2	New Whistles, Changes to sounds, ground shadows	April 2015
3	Better Smoke and Sound, New textures, tweaked physics	August 2015
3b	Corrects the missing stationary smoke texture	August 2015
4	Substantial Revision of entire asset	March 2020
4a	Revision to include missing Air Brake version files and texturing	March 2020

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For freeware that you develop for yourself or for release as freeware on any website or system, you have an absolute and total right of ownership. This package contains only assets made by me – it does not need any other downloads. It does use unmodified generic Railworks wagon sounds and a driver. You may use it, clone it, modify it, rebadge and rebrand it.

It may not be used where payment is sought or other commercial activities. I reserve absolutely the right to determine what is commercial. Charityware is commercial but is likely to be granted access.

Installing the Loco

The update installs from the RWP file but a good .zip file manager like 7-Zip can actually open an RWP like any other file anyway.

I have included some basic preloads for Quick driving as light engines. My separate consists package has many other preloads and consists that use my stock. My assets will always be under **richardmxted**. All my Narrow gauge assets will be in the **NarrowGauge** tick box under this. The locos show up in the selection lists as Skylark - Old -(VB) etc.

In version 4a the key directory structure and filenames remain the same. However, I strongly recommend deleting the old files in the Skylark directory before installing this update to get the most benefit from the update

The Models

The models fall into three broad categories, new, used and worn, reflecting the weathering of the liveries. In each group there are models of both Skylark and Princess. I have also spread the types of braking systems between categories as well.

Clean Liveries

Skylark is the DEFAULT loco that is absolutely essential as all other models share many elements from this loco.

This is a completely fictional livery although the lining and name painting matches closely the makers photograph in location. She also carries the correct makers plate.

Skylark is modelled with a Westinghouse air brake system.



Princess is identified by her twin sand boxes carried on the boiler.

This version is painted in a fictional livery based on North British Railway that I originally thought was the livery used on the C&MLR. This version of Princess carries a Davies and Metcalfe vacuum brake system. There is a suggestion that Princess was vacuum fitted but there is a complete absence of photographs showing this.

This is Princess as new in a simple white lining scheme. It is an unweathered model with vacuum brakes. I have deliberately tried to include a basic “new” colour scheme in black.

Used Liveries



This is a black livery where I have tried to produce a workhorse for any route. The livery is moderately weathered to match the condition of a working industrial locomotive that is still being maintained.

The livery includes this air braked version of Princess and Skylark that has some faint numbers on the bunker but no name on the tanks

... and this version of a hand brake only Skylark that has no numbers or name but is left blank.

The name and numbers painted onto the locos are a single texture and so copying these textures between locomotives can allow different name and number combinations.



Worn Liveries



The “worn” liveries are updated versions of the “old” liveries in previous versions. The paint work has faded to grey and the locomotive names are almost invisible. The loco’s have steam leaks and the cabs are filthy.

There are versions of both Princess & Skylark in both vacuum and hand brake models in this livery.

One of the vacuum braked version of Princess in this livery still retains the faintest trace of her single white lining on the tanks.



Features

Hand Brake

Use the [and] keys to increase and decrease the hand braking. You can also move the animated brake in the cab. It is quite possible to lock this locomotive's wheels by over enthusiasm.

Air Brake

You pull the brake lever towards you to apply the brakes. They will lap and hold an application. When you release the brakes you should hear the compressor / air pump working. In the older locos these tend to operate with clouds of steam from leaking joints. The cab dial shows the pressure in the equalising reservoir and the brake pressure. This is not correct as the dial should show main reservoir pressure and not brake pressure. However, this requires a level of scripting I have yet to master !.

Vacuum Brake

The vacuum brake has been completely changed in version 4. The main brake lever now operates in the ordinary fashion by pulling backwards to brake. The brakes also have a "running" position. Pushing fully forward engages the large ejector so rapidly releasing the brakes. In some locos using this produces a steam leak where it enters the smokebox.

The small ejector is the front lever on the brake unit and gives finer control. This uses the J key as a toggle to eject a small amount of air allowing the brakes to be eased back for fine adjustment.

Lights

New for version 4. There are lights available front and back. Press H to scroll between no lights / front / back. This puts the light in the right place as a model but you need to add paraffin to the light (Press P) to make it light up. The lights are markers and not designed to light up the route.

The models for the lights are child objects called into being by a script and can be used on other stock. However, as yet, they only show up on the loco not coaches etc.

Sander

Use the cab lever or toggle using X. Although Princess is fitted with two boiler top sanding boxes only one is operational - you'll have to assume the other has jammed solid.

Injectors

The small injector water feed turns on using the lever located by the reverser or key L. Then turn on the feed steam using the far right wheel or Key O. You should hear the water feed lever squeal and the steam is pretty obvious. If you turn the steam off then don't forget to turn off the water as well as you will soon empty the tanks. If you look outside the water spills from the overflow ! There is also a large injector fitted for rapid filling or a quick dose of cooling water using levers and wheels or keys I and K.

Blower, Dampers and Cylinder Cocks

The blower is the low centre left wheel. You can see the effect of the blower by the quantity of smoke it produces. The dampers are on a kick lever by the brakes. The cylinder cock lever is now working in this release - it is by the dampers and under the large injector water lever.

Boiler Pressure

Safety valves start to trickle below 160psi and the large valve kicks in shortly afterwards. The boiler pressure gauge is quite accurate but has a bit of "lag" in it. The boiler is fairly responsive and the blower will quickly build pressure. It is easy to over prime the boiler. The water gauges are dummy items as I could not get these to work satisfactorily.

Fire

The ideal fire for getting a good boiler going is about 150lbs of coal. The loco has a habit of not using much coal at all unless you are really hammering the throttle and reverser in which case you may see a very rapid burn. It is only a small firebox hole but you can open the door by the usual dragging it open.

Whistle

No idea what the originals were like and I have changed this in version 4 - again. There is no animated control for the whistle as animated string just looked like a solid steel bar. There is a looped whistle so you can hold down the spacebar for a long blast. There are also random "right-away" whistle blasts you can make by using the B (Bell) key.

Mods & Reskins

The textures are used in a complex but not unpredictable manner. The models use a common texture set structure but with many versions. All textures are alpha shine and bump mapped using the TrainBumpSpecEnvMask.fx shader. The textures also contain glass objects such as windows and gauges which are mapped using the TrainGlass.fx shader.

It should be possible to recolour the locos using the green or NBR Olive parts of the texture as a guide. However if you are keen to do a complex version then a quick question via UKTS means I should be able to send you the base textures in a layer format.