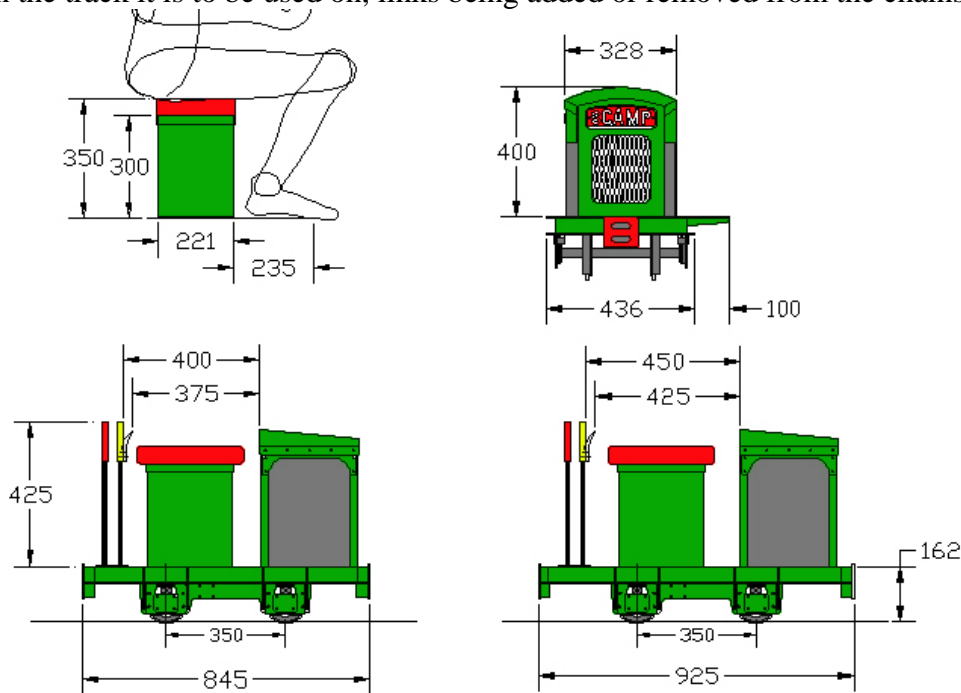


SCAMP, the little loco with a big heart.

Design copyright Colin Edmondson July 2016

The initial thoughts behind this design were to design a small loco that would be easy to build, would come apart for transporting in the back of an average car, yet be strong enough to do a decent job of work. The only way to make a loco heavy enough to provide traction and braking and yet keep it light enough to lift easily was to sit the driver on board. The challenge then became to see how small it could be made! To give you an idea of the size, here are some dimensions. The seat box can be supplied in a lower version suitable for children. To allow a driver of more generous dimensions to drive one, a longer version was drawn out with 50mm more posterior room, this is now the standard version.

The final drive ratio is up to you, a choice between a light speeder or a hauler. I chose to use taperlock sprockets on the axles, as they can be quickly removed and replaced with different ones depending on the track it is to be used on, links being added or removed from the chains to suit.



Short frame

long frame

Once the preliminary sketches appeared on facebook, comments were noted and other variations added. Although this was never intended to be a scale model of any particular loco, taking a few details from various prototypes gives a general flavour of a full size loco.



Bonnet choices, inspired by the Lister Railtruck and the Orenstein and Koppel, and the Scamp with cab rear sheet. The Lister bonnet can be customised with your own name.

The next decision to be made was the choice of engine and transmission. I initially went for the ubiquitous Suffolk lawnmower engine as many people have access to them and they are easily available at a sensible price. Later, at customer request, I added a 1.8hp Loncin engine option for those who want a new engine in their loco. A small forwards – reverse gearbox is not, to the best of my knowledge, available commercially, and I didn't want the expense of the Eaton hydrostat drive unit, common though it is. I decided to stick with easily available commercial parts and try using two identical permanent magnet motors, one driven by the engine via a slipping belt clutch and used as a dynamo and an identical one to drive the wheels. With a suitable reversing switch fitted between them equal speeds in both directions would be available. The system proved to work better than I could ever have hoped for, the match of around 1.5hp from the engine and the 36v 800W dynamo and motor being pretty well perfect and giving good engine braking as well. Releasing the clutch lever meant that drive was lost, giving a degree of fail-safe to the control.

A later development was to feed the supply from the dynamo into a cheap pulse wave modulator (PWM) controller before going on to the reversing switch, to give better slow speed control and smoother starts. In this mode the clutch can be dispensed with, being locked in but still available as a backup if the controller fails with a few minutes work changing wires over. Engine braking is not available in this mode, nor is it fail-safe. For those who can't weld and don't have a friend whose arm can be twisted, a bolted together version is now available, with the same choice of bonnets, but at a slightly higher price. This is now the standard version.



The prototype was finished with a Lister bonnet, simply because I like them. The seat box is a very convenient place to keep all those useful bits and pieces. The loco is easy to change from sitting facing left to facing right, a simple matter of lifting off the seat, switch box and levers and re-fitting them to the opposite side.



Scamp proved able to haul two heavy fully laden coaches round our Mid-Cheshire club track, which has some quite stiff gradients, without any hesitation. The optional Loncin engine has a greater reserve of power, not noticing the gradients at all.

For easy transport the loco breaks down in minutes into sub-assemblies. Undo one screw and the bonnet is released, undo a bolt, a cable and a connector and the complete engine and generator sub-assembly lifts out. The seat box just lifts off, then what is left is easy to lift into the back of a car. It is just possible for one person, easy for two. This also makes maintenance work on the frame very easy, as with the engine removed it can be turned upside down on the workbench. The engine/dynamo unit is also easier to work on out of the loco. A footrest extension simply plugs into the side of the frame, see photo below.



A quick build

The frame and body are bolted up by yourself from completely laser cut parts, bringing construction time down to a minimum. One working day should see all the assemblies finished, and provided all the parts are to hand a second days work should see the loco complete and ready to test prior to stripping and painting. The finish is up to you, I sprayed mine as the weather was conveniently warm but powder coating is a lot tougher and longer lasting. Build time for the welded version is a little longer.

The cost? It is possible to build a loco using a second hand engine but all other parts new for £1070, a new Loncin engine pushes this up to around £1280. A completely built and painted loco with a new engine should be around the £2350 mark.

Specification. 7 1/4" narrow gauge or 10 1/4" fine scale profile wheels will fit. The kit includes all the laser cut steel parts to make the frame, seat box, foot rest, axleboxes, clutch and brake levers, bonnet mounted throttle lever (not shown), brake rigging and the bonnet of your choice. It comes with fully illustrated instructions and a full shopping list.

Engine choice- Suffolk Punch mower or Loncin 1.8hp,
Slipping belt clutch to dynamo, drive motor 36v 800W.

PWM controller between dynamo and reversing switch.

Chain (05B) drive to 15mm layshaft, chain (06B) to both axles.

Motor and axleboxes are adjustable for setting the chain tension.

5" wheels, 20mm axles. Brake blocks work on all four wheels.

Decisions to be made before ordering a kit; do you want the long (standard) or short frame, will it fit crossways in your car, can you fit on the seat? Do you prefer the Lister style bonnet and dummy Lister side weights (not shown), the Orenstein and Koppel style bonnet or the Scamp tapered bonnet with polished stainless badge? Do you want a cab rear sheet?

What will it cost? (For guidance only, prices will change in line with the cost of the laser cut steel). A full set of laser cut parts for bolting together as detailed above, with the basic bonnet option of your choice, will cost **£665** (July 2016). The optional mirror polished stainless steel SCAMP badge and grille surround kit is **£28**, and the cab rear sheet is **£15**. The dummy Lister side weights are **£20**. The Lister style bonnet can be customised with your choice of name for an extra **£10-15**, ask for details. The cost of the other bought parts comes to about £400, plus say £20 for a secondhand Suffolk engine or £100 for a new Loncin engine. Add around £75 for painting and the build cost comes to between **£1085** for the most basic Suffolk engined version and **£1200** for a loco with a Scamp bonnet and a new Loncin engine.

Fully built locos are available from Chris Dixon at CMD Engineering, please contact him for a price. cmdengineering@ymail.com

I supply this kit in good faith as one enthusiast to another, you build and use it at your own risk. colin@colinedmondson.com



Removable footrest

