

Using MPFB2 to create a figure for a specific position.

I thought it might be useful to show how I used the MPFB2 program to create a driver in specific pose in a specific loco. something that can't be achieved by just getting a figure commercially. I should say that I use SketchUp but I assume that TinkerCad must have similar functionality.

I wanted a driver for the F & B 0-4-2 that I am currently building, with his left hand holding the regulator handle and his right hand on the cab side sheets whilst he looked around the front sheet.

I began by creating a figure in MPFB2 in the standard A-shape. I chose the "Decimeter" units setting because the Metre is too small and the Centimeter is too large. The Decimeter is still big when exported but I'll deal with that later.

Having created the figure and clothed it to suit, next Save it as a .blend file.

Then export it as an stl, making sure that nothing changes before doing so. AFTER exporting the stl, back in Blender, just move one of the figure's arms slightly and Save it again – you'll see why later.

Now open the stl in Cura and turn it, if necessary, to stand vertically on the plate. Then click on the scale button.

This will probably show the height (Z axis) as being about 230mm, which is of course a mite big, but make a note of the exact measurement including all the decimal places!

I had decided that my driver would be a little Welshman about 5ft 6in tall so I adjusted the scale to give a height of 87.5mm and the other axes then automatically adjust to suit.

Then re-export this as an stl with a different name.

In Sketchup I have a model of the loco, constructed from all of the individual grouped drawings, although I only need the cab and its fittings for now. Make a copy and work on that to avoid accidents.

So the next step is to import the Driver stl into the loco drawing. Check that it is 'grouped' and then turn it to orient it to be facing in the right direction.

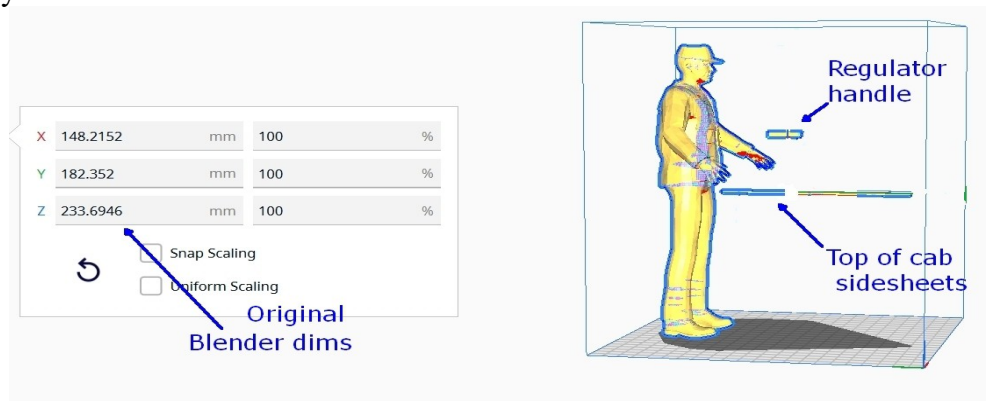
Slide the driver stl into the cab and position him on the footplate where you want him to be standing, making sure that his feet are actually ON the floor, not above or below.

Now draw a couple of lines from his feet to a fixed location on the loco (I used the corner of the cab doorway). Select these lines plus the driver stl and group them all to fix them.

Next 'explode' the cab until you can identify and select the areas that you want the driver to interact with - in my case, the top of the cab sidesheets and the regulator handle - and then delete everything else in the loco.

Now select the driver figure, the location lines, and the area's he will interact with, and group the whole lot together, then copy it and paste to a convenient spare space. The chosen interaction bits will probably appear to be floating in space, but as long as they are in the group that's fine. Check that you have included everything, and if you have accidentally included extraneous bits, clean them up. Finally regroup everything and export as an stl. You can now delete the remains of the loco drawing.

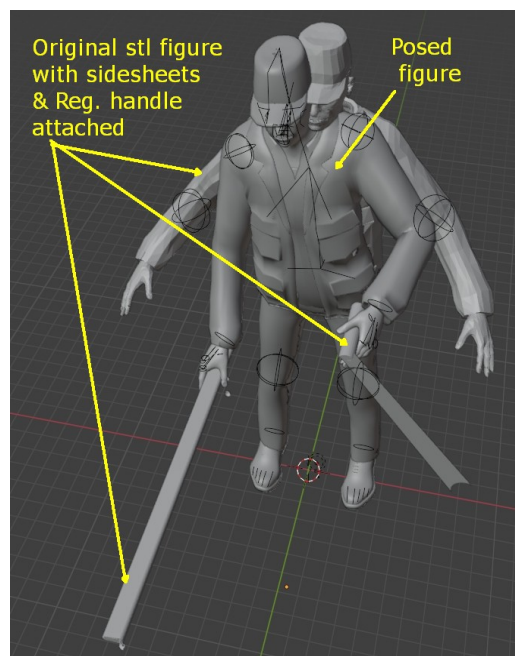
Import this stl back in to Cura and orient it to stand on the plate, then rescale it to the exact same Z height as the original Z height that you noted earlier and rotate it as required to be the way it was originally.



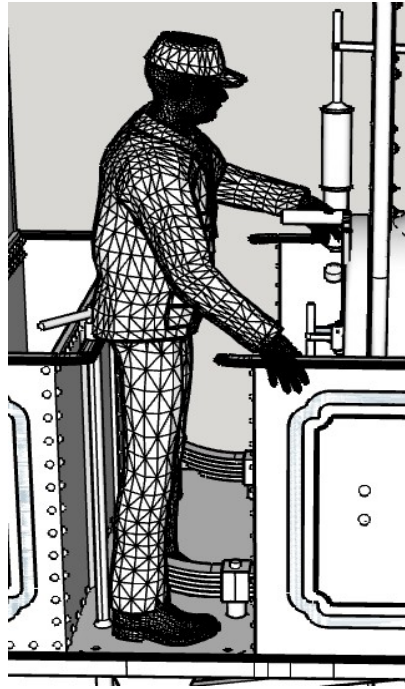
Check that your figure drawing in FPMB2 is in Object mode and then import the stl and manoeuvre it to sit exactly on top of your original drawing. However, one of the originals arms should be slightly visible, from when you moved it earlier.

So now you unselect the imported stl then select the original figure by clicking on the arm that sticks out of alignment. (That's why we moved it slightly!)

Now switch to Pose mode and then you can grab the Helper circles and move the hands/arms to exactly where you want them on the cab fittings which are showing on the stl - just be careful about moving his feet from their synchronised position with the stl. If necessary zoom in on the hands and alter individual fingers as you wish.



Once you are satisfied, you can export the posed figure as an stl, resize it in Cura and put it into the loco drawing as before, to check that it fits.



If happy you can now save the figure in Blender and set up the stl to print, preferably in resin rather than FDM. *(In this picture he is straight off the printer to check fit and he still needs cleaning up)*



The same principle could be used in other situations of course... a signalman pulling a lever, a porter holding a trolley or lady pushing a pram, or whatever.