

MGA Judson with SU HIF44

This is how to convert a MGA Judson from the Holley carburettor to an SU HIF44.

Why is this a good idea? The main reason is that the original Holley 1904 is a fix jet carb, and this means that it is impossible to jet it so that it runs with the right mixture across the power range. It runs too rich in the lower rev range, and too lean in the upper rev range, or with a richer jet for the top end it is far too rich in the lower end, which makes starting a real pain. Compromising means running lean in situations where power is required for longer periods where the accelerator pump is inadequate (going hard up a mountain or long fast runs on a highway). Running lean is why Judsons have the reputation of destroying engines. Why did Judson use the Holley if it was such a poor choice? Probably because it was then a widely used and familiar carb for American mechanics. One of my neighbours in Zurich is an American Car specialist mechanic, and he recognized it immediately.

So what do you need?



The main components are a HIF44 or HIF6 carb and a new carb manifold for the Judson. The Manifold is made from 60mm square tubing according to the drawing below. The HIF has to be one with a left side fuel entry as you look in the direction of air flow. Most have the fuel inlet on the other side, so this will have to be modified to avoid the fuel entry being in contact with the exhaust manifold. The carbs are functionally the same, the HIF44 has metric threads, the HIF6 has imperial threads.

The complete shopping list for parts is as follows : The first block with part numbers are all available from leacyclassics.com, who also offer free shipping, so I have used their standard BMC part numbers, which you will have to translate to Moss USA numbers. Although you may get a used carb cheaper on ebay, it will not be much cheaper and will have no guarantee.... The whole assembly uses BMC standard parts wherever possible. Total cost for the shopping list in 2012 was about \$350 US plus the manifold – made by a Swiss metalworker this cost \$450 each for three, but we had to have a few tries to get things right so you should save a lot here.

1 x Fuel Hose 16" 12H722
3 x SU HIF gaskets JZX1142
1 x SU BBA needle CUD1124
1 x choke cable clip 516962A
1 x pin assembly AUE34
1 x MGA Choke cable for RHD car AHH5333 (LHD is too short)
1 x SU phenolic spacer 112866
SU carb FZX1320 (this will have to be modified by you)
3 x trunnions ACC5062K
1 x vacuum advance adapter PHP10043
4x bolt 5/16 UNF x 1½ inch GHF104
4 x Nylock 5/16 nuts GHF222
2 x Bolt 3/8 x 3 inch UNC BH506241
5 x 3/8 copper washer 6K464

The following parts have to be sourced in different places, but I make suggestions where you will find them

<p>A rear brake cable for a bicycle – Amazon or your local cycle shop</p>	
<p>Judson Paper Gaskets (make your own, easy enough to do with a craft knife and some THICK gasket paper)</p>	<p>Or buy a set from George Folchi</p>
<p>SU Abutment Plate for HIF 44 carb (search on ebay). This was a standard part for later classic Minis and BL Metros so is not hard to find on ebay.co.uk</p>	 <p>A silver metal abutment plate with a large central circular hole and four smaller holes around it. It has two threaded studs protruding from the top edge. The part is set against a red background.</p>
<p>Air filter K&N Type 56-9330: do a search on Amazon for this with free shipping</p> <p>This is an offset filter</p>	 <p>A circular air filter with a dark red pleated filter element and a silver metal top cap. The filter is shown from a top-down perspective.</p>
<p>A method to secure the accelerator cable to the abutment plate. I suggest the adjuster from a bicycle side pull brake. This is correctly termed a 6MM Barrel Adjuster. This costs a couple of dollars. I had an old Metro carb with a similar adjuster, so I used that, but the principle is the same. Buy two so you have the correct second nut to secure it in place</p>	 <p>A silver metal barrel adjuster with a knurled grip on one end and a threaded section on the other. It is shown at an angle.</p>
<p>R-clips to hold the trunnions in place at the carb linkages. I found these in ebay and prefer them to split pins for ease of R&R</p>	 <p>A small, silver metal R-clip, which is a simple hook-shaped fastener used to hold trunnions in place.</p>

A short section of 6mm brass dowel to plug the original fuel inlet in the carb. I found this at the local model store.	
1 x 1/4 BSP female hose tail for the fuel hose	
1 x 1/8 BSP male hose tail for the oil feed from the MMO oiler	

Step 1

Get your parts ordered and have your manifold made up.
Drawing is at the end of this document

It should look more or less like this when you are finished – This one has a small irregularity in the opening to the SC, but it's not critical.
The hole for the bolt on the left has a reinforcing sleeve, the one on the right has a plate welded each side to avoid restriction on the airflow.



Step 2.

Modify the carb.
You will have to dismantle the float chamber to do this.
Take off the float cover (four screws underneath the carb.)

Then remove the jet by removing the screw here



Then remove the float by unscrewing the screw on the body of the carb

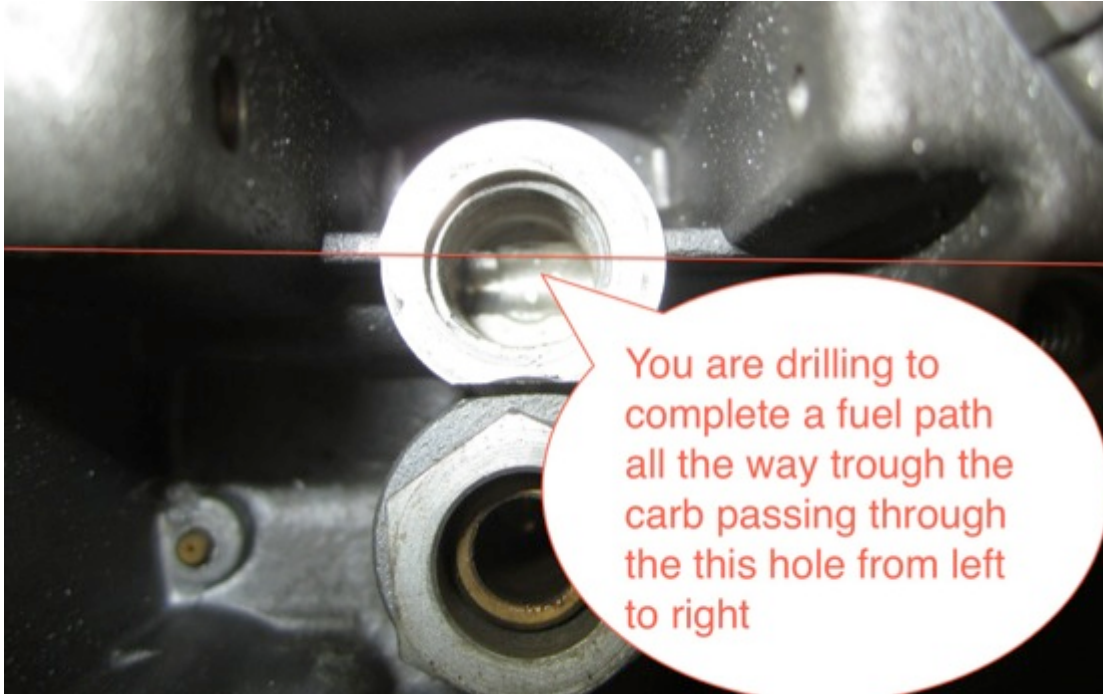


Now remove the needle valve with a ½ inch socket – the needle is already loose so do not lose it



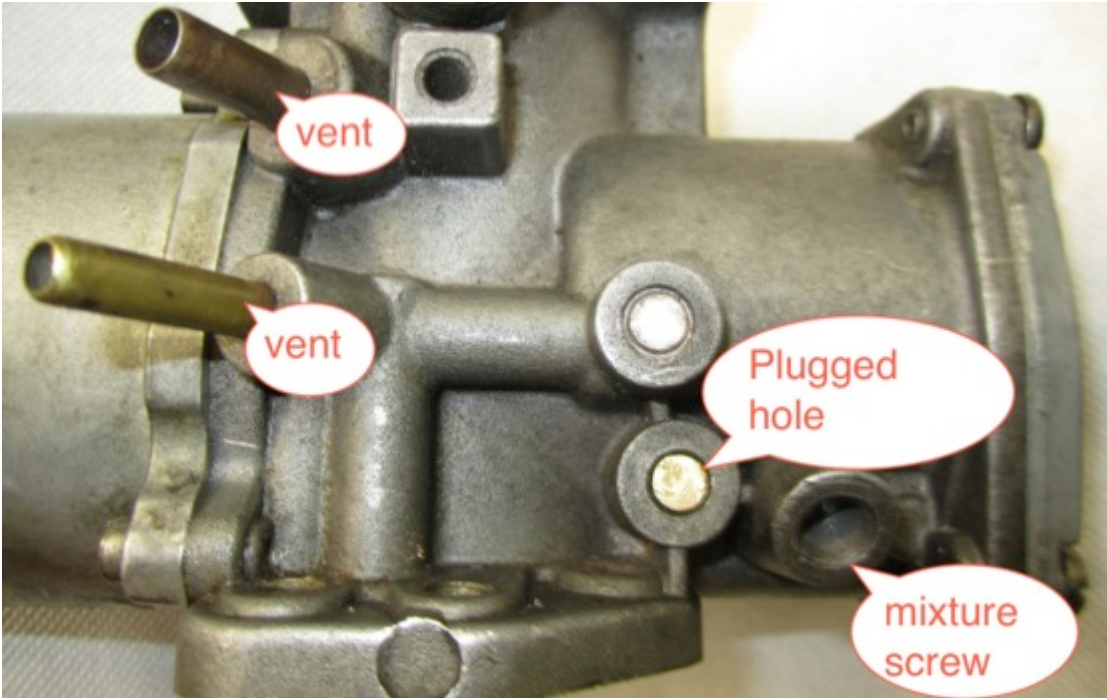
Then you need to pull out the fuel inlet pipe that is fitted. You will be reusing this so do not damage it. It is only a press fit into the casting, so use a 5mm tap to grip the inside of the tube firmly and then pull out.

Then use the vacant hole as a pilot to drill straight through the casting and out of the other side for the new fuel inlet. I used a 6mm drill for this. You will be able to see the drill bit at the bottom of this hole, you are basically drilling on the path of the red line, but at the bottom of the hole.

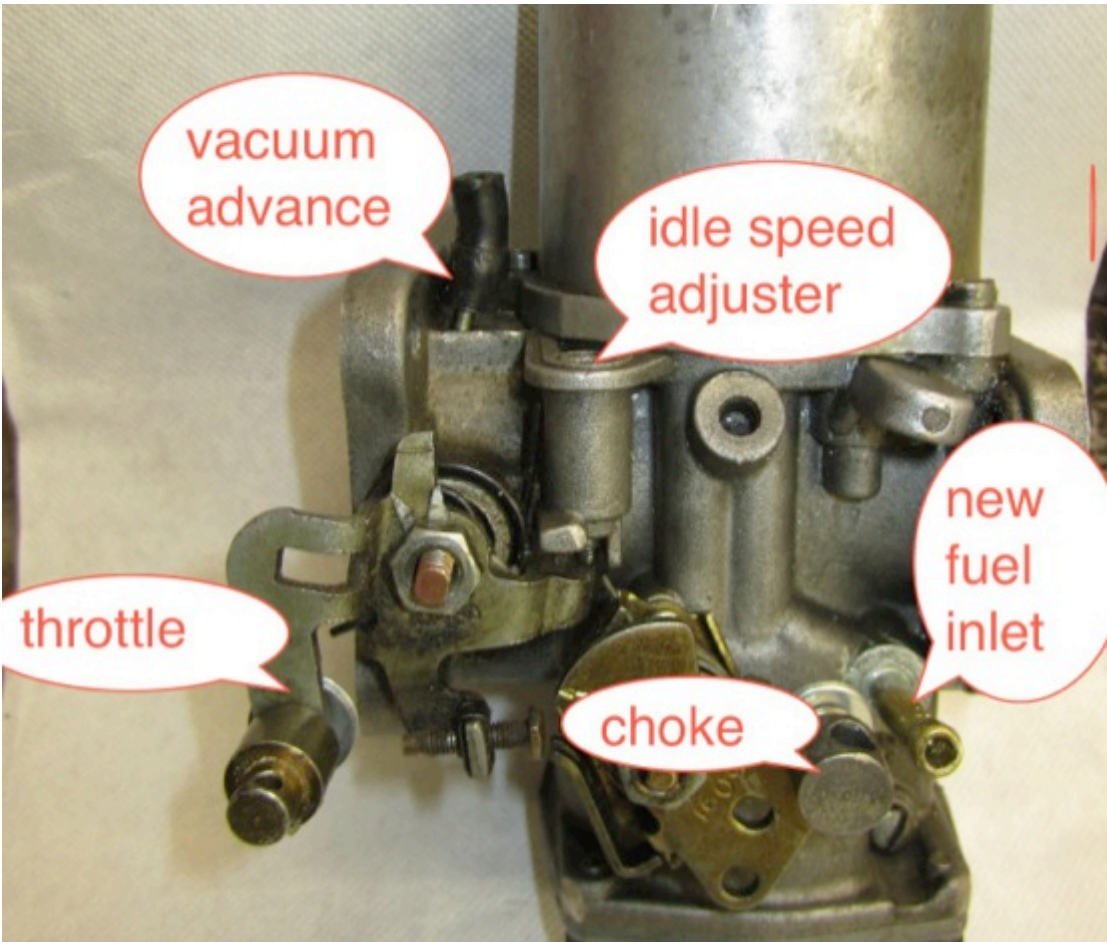


Press the carefully extracted fuel inlet tube into the new hole and then plug the vacant hole with a piece of brass dowel. Both these pressings must be tight to avoid fuel leaks.

The filled hole should look like this – I also used some epoxy to make sure it would be leak free. I have labelled the other important things too



Thoroughly clean out everything and reassemble the carb float chamber. You should now have something like this



Remove the dashpot cover and piston. Install the correct BBA needle and set the carb

to the default settings listed in the file for a single carb.

As an aside, the “obvious” thing to do would be to drill the boss above the choke linkage and mount the choke cable there. It doesn’t allow enough travel to operate the choke, so don’t try this....

Step 3.

Remove the Judson from the car, leaving the head manifold and heat shield in place.

Remove the original carb manifold from the Judson. **Keep in a safe place, it is made of unobtainium.**

Mount your new manifold to the Judson using the new 3” bolts with a new copper washer under the head of each bolt.

Assemble the carb to the manifold in the following order from the manifold outwards

1. Gasket JZX1142
2. Abutment plate
3. Gasket JZX1142
4. Spacer 112866
5. Gasket JZX1142
6. Carb
7. Gasket for filter
8. Air filter

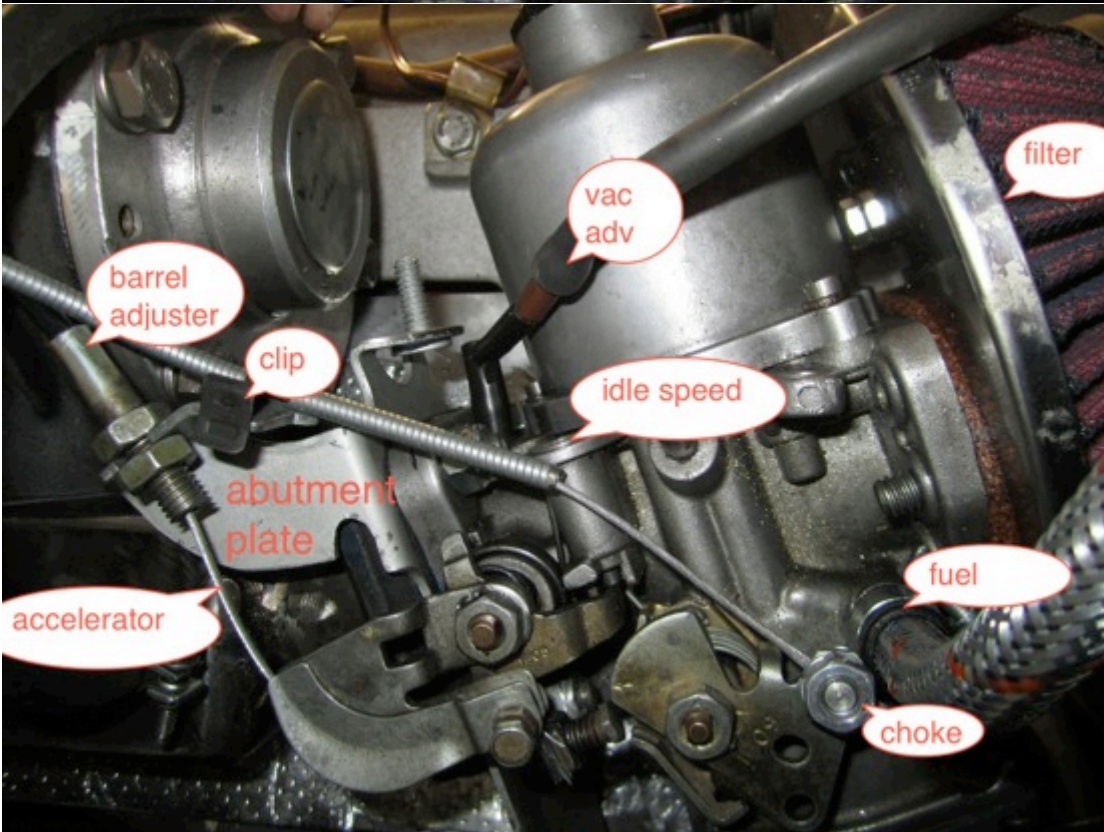
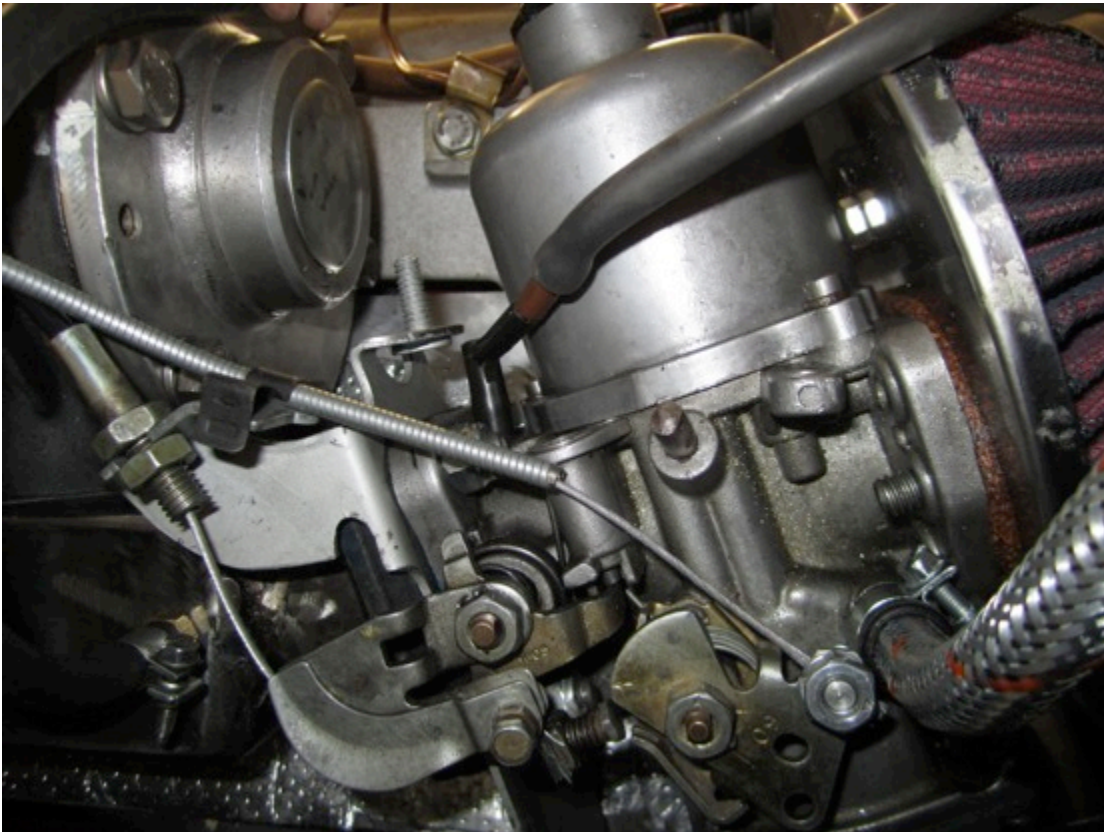
For access reasons I also fit the choke cable to the linkage using a trunnion and a R-Clip, with washers to space out and make things stable. You need to fit the fuel hose to the carb and **make sure that the hose clip is positioned to permit free movement of the choke linkage.** Do not fit the choke cable to the abutment plate yet. The accelerator cable is also fitted at the carb linkage, not forgetting the barrel adjuster between the sheath and the trunnion. **It is not possible to mount the carb to the Judson when the supercharger is in the car and the access to these cable mounting points is extremely limited when everything is in the car, so do it on the bench!**

You can then mount the Judson back onto the car. This is much easier than with the Holley, because the abutment plate sits on the steering knuckle and holds the unit at the right place to be able to start the front bolt for the head manifold, then lift the back of the assembly to insert the rear bolt.

When you have the unit in the car, attach the choke cable to the abutment plate – the clip 516962A slides into a slot in the plate and then clamps the cable to the plate with a spring action. The standard LHD choke cable is NOT long enough to allow correct operation, so you do need a RHD cable.

Now fix the accelerator cable also to the abutment plate using the barrel adjuster. See the picture for details (this is a different version of the same carb, and here you see that the linkages are different. This is because this is a single carb, not half of a pair. If you can find a carb like this I would recommend it because the cable linkages and attachments are better.) But the one in the earlier photos is also perfectly useable.

I attach the picture with and without annotations so you can see what is going on. It looks more complicated than it really is!



The other end of the accelerator cable (at the pedal) is also modified to make adjustment much easier. Remove the old cable from the car and remove the split pin and old trunnion at the pedal. Take your last remaining trunnion ACC5062K and thread the loose end of the new cable through it. Don't forget to use the small metal ferrule supplied with the new cable at each end, or the sheathing will eventually wrinkle back and leave you with no accelerator effect. Fix the new trunnion to the accelerator pedal in place of the old one, and adjust the cable so you have a fraction of free play, and the carb accelerator linkage is at rest. Tighten the trunnion to clamp the cable. You will not need a spring here any more.

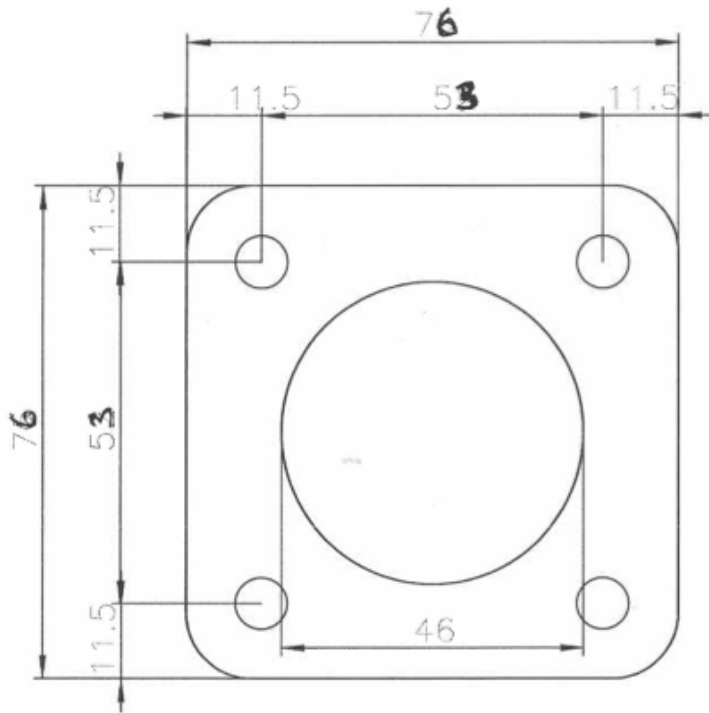
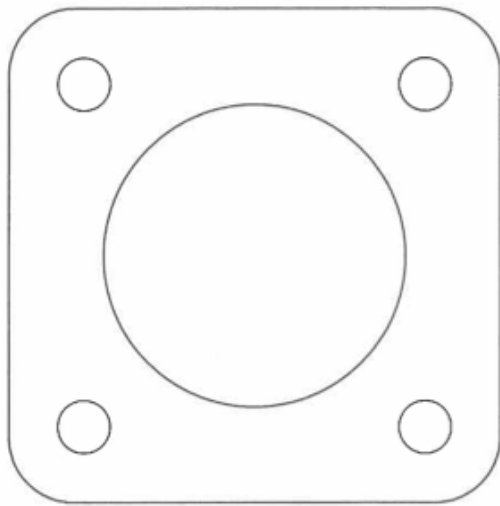
Now you attach the fuel pipe from the carb to the bulkhead fuel supply and check there are no fuel leaks and nothing is loose (don't forget to retighten the belt idler for the Judson belts and turn the fan a full revolution by hand to make sure there will be no contact between blades and the idler pulley.)

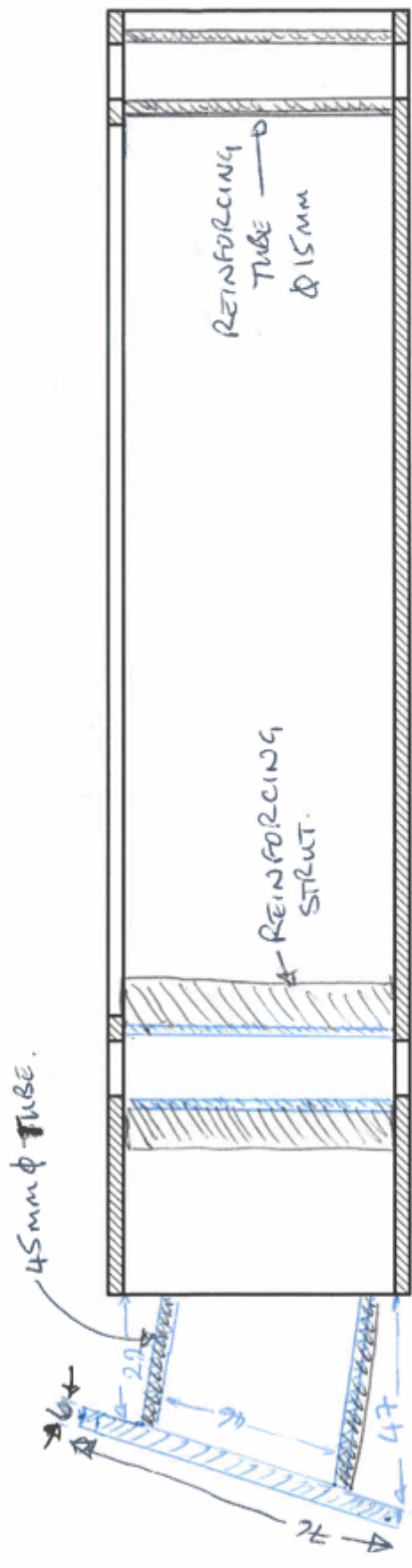
You can now start the car and set up the carb.

Easy wasn't it!

Developed by Dominic Clancy and Neil Ferguson in 2012.
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MEASUREMENTS IN MILLIMETRES.

