BIODIESEL

DIY SYSTEM

Contents

Hy in this guide I will show you how to produce biodiesel using a DIY system.

Tools:

First of all these are the tools you are going to need for this project.

One tool you will need is a for making holes and screwing.

Another tool is the to cut a piece of pexiglass.

Also we will use the on the rubber hose.

We will also use the for screwing.

The we will use to measure.

Another tool we will use is the to cut the pvc pipes.

The we will use to weld the pvc pipes.

We will also use the  .

The is a another tool we will use for marking.

We will also use the to cut some wires.

Another tool is the .

Also we will use the .

The we will use to refine some edge.

Another tool is the to scale some caustic soda.

With this we will measure the temperature inside the tank and barrels.

Also we will need the to pulverize some water in the barrel.

The we will need to homogenize the mixture in the barrel.

These are the tools you will need for this project.

Materials:

1 tank washing machine

2 barrels

2 canteens

2 buckets

Some polycarbonate sheet

Some Plexiglas sheet

Some PVC pipes

Some PVC elbows

Some PVC tees

1 draining pump

Some PVC valves

1 bag of caustic soda

1 impurities filter

1 sieve (or homemade sieve)

Some wires and cables

1 cable plug-in

4 wooden boards 9.8 inches long

Some self-drilling screws

1 thermostat with a probe

1 switch on/off

1 socket bulb + 1 bulb

Some wire connectors

1 adhesive tape

1 half meter rubber hose

Step 1: building the system.

The recipient you see in this image is made from a washing machine tank, along sides plated with 4mm polycarbonate.

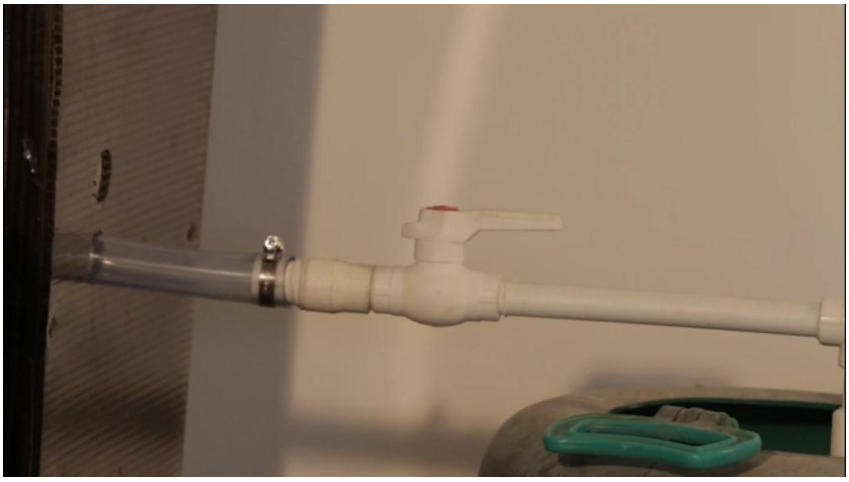
I’m attaching a rubber hose at the bottom of the tank, which will be exiting on the side of the recipient.

This will be the drain for the oil which will boil inside the tank, moving it in the first barrel.

I am welding the tap with a short and long PVC pipe which will connect to the hose.

For welding, you will need a PVC welding tool.

I will make the connection using a steel collar.



I will continue the welding from the barrel to the pump which will drain the biodiesel mixture form a barrel to another.

I was thinking that I can use this old barrel that we also used making the ethanol, but it was dripping so I replaced it with a new one.

I drill holes at the bottom of the both barrels for the taps, which will connect the barrels.

I will continue with the piping system. The dimensions doesn't have to be exact, you can measure and weld the PVC pipes depending on where you will create the system.

Now I will mount the draining pump, then continuing with the welding process.

I drill holes on top of both barrels for the taps, then connect them with PVC.

I will use a steel ribbon with some self-drilling-screws to hold in place the pipes.

I’m using the PVC tape because it makes the connection with the taps more much easier to do.

I will pull out the cable from the pump and connect it to a switch.

Now I’m adding water inside the recipient. Let’s see if the pump work’s.

Well it works fine, so we can move to the next step.

Step 2: Building and connecting the electric part.

Now, I'm going to start building the box panel for the system.

I'm using 4 wooden boards, 9.8 inches long.

Keep in mind that the size doesn't have to be precise, you can build this anywhere you want.

I will connect the pieces together using some self-drilling screws.

I’m measuring the box to cut a piece of plexi-glass which will be the cover for the box.

I’m using an angle grinder to cut the cover.

I drill a hole on the cover where I will add the socket bulb. I’m refining the edge with a metal file.

The other holes I drill are for the thermostat, which will set the boiling temperature.

The hole I’m drill at the top of the box, is for the thermostat probe which will measure the temperature inside the tank and stop the thermostat from boiling further the oil.

Now I’m making the hole for the switch using the angle grinder.

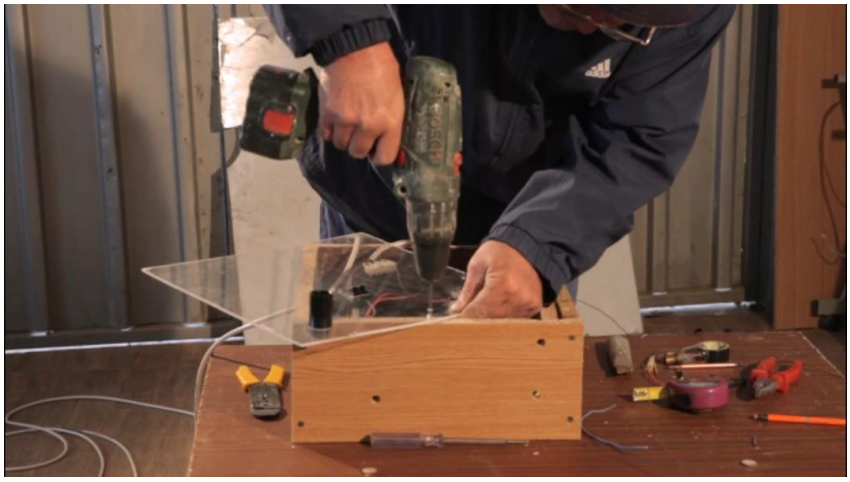
I’m using adhesive tape to secure the cable.

I’m connecting the cable coming from the box panel to the tank. Be careful because as you see, you have to connect the plus to plus, and minus to minus, and the mass is connected to the steel, like I did, on the steel sheet where I mounted the polycarbonate sheet.

Now I’m introducing the plug-in cable inside the box where I will make the connections between the socket, thermostat and the switch.

Make sure you use adhesive tape to secure where the cable is bare-headed.

The holes I’m making are for the screws which will secure the cover in place.



Now I’m making the connection between the pump and the panel.

I’m screwing the bulb into the socket, and I’m connecting the cable to the plug.

Working on the system, an idea just popped up, and I’m going to put it to test.

I’m cutting a pipe and add another one to the system, then connect a filter so the biodiesel can be filtered.

This air pump we will use to mix the composure.

Here I'm making a sieve to filter the impurities, and I'm attaching two L steel pieces.

Step 3: Making the mixture and mixing it.

To make the mixture for the methanol we will need 1 scissors, protection mask, protecting gloves, 1 bag caustic soda, some fabric material (this will be used to filter the oil), 1 funnel or you can make one like I did from a plastic bottle, 1 scale, 1 thermometer.

We need up to 120 g of caustic soda.

Then we put the caustic soda in a canteen with water, then mix everything together. We will do the same for the other.

We put the sieve on the top of the tank, and then we filter the used cooking oil from impurities.

As you can see, there are a lot of impurities into the oil.

We set the thermostat at 60 degrees Celsius / which is the equivalent of 140 degrees Fahrenheit.

After 10 minutes we measure the temperature with the thermometer and we see that is 70.7 degrees Celsius.

Then we transfer the oil from the vat in the first barrel, adding the two canteens with methanol.

After this is done, we transfer the mixture from one barrel to another, several times, checking the temperature in the process.

After this process, we will close the pump and we are going to let it settle for 30 minutes, so we can get out the glycerin.

You can see the difference now.

We transfer the mixture from the first barrel to the second, then we are going to raise the temperature inside the barrel with a heating coil.

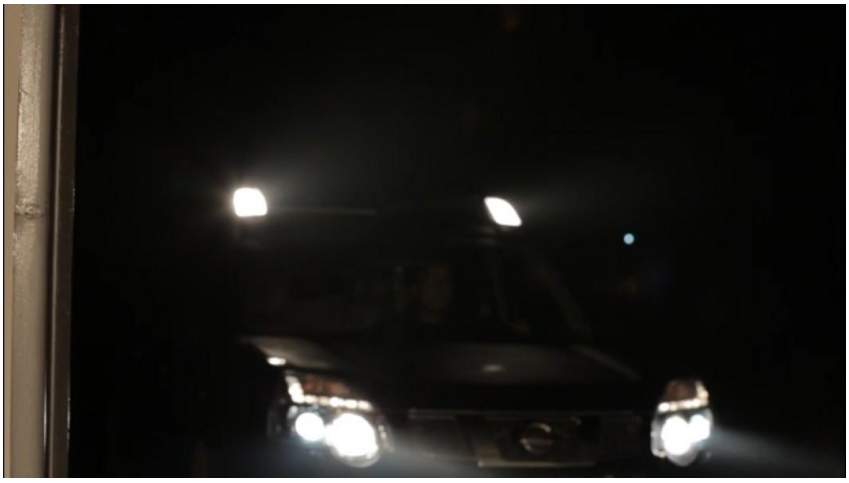
Now we vaporize some water in the barrel and we let it settle at the bottom then we extract it. After this we add water and use the air pump to mix the mixture with water and homogenize.

Step 4: Extracting and using the biodiesel.

After this process we extract the water and we connect the filter to the tap, and start extracting pure biodiesel.

The biodiesel works on my diesel heater, and on my car too.

My car is using diesel, but from now, you bet, it will use biodiesel.



I hope you enjoyed this guide.

I wish you all the best.