

# BRIQUETTE PRESSES FOR ALTERNATE FUEL USE

BY JASON DAHLMAN AND CHARLIE FORST

Published 2000

---

## ECHO APPROPRIATE TECHNOLOGY NOTE

---

### INTRODUCTION

Briquettes made from materials that cost little or no money to obtain, such as old newspaper or partially decomposed plant waste, can be an alternate fuel to charcoal, firewood or coal, and may cost less. Depending on materials used to make the briquettes, they may burn cleaner than coal. Finally, turning “throw-away” materials into a fuel source is attractive because it is a sustainable process. Many different methods and technologies exist for pressing briquettes. Each has its own unique advantages and disadvantages. This document describes two designs for briquette presses and includes an additional design from Haiti.

### MATERIALS TO USE FOR BRIQUETTES

One of the most commonly used materials is shredded newspaper. Small woodchips and sawdust also work well. Plant waste can make good briquettes, but it is best to compost the plant waste for a two or three weeks so that it will stick together when it is pressed. Adding a small amount of wood ash to the mix makes briquettes harder and makes them burn longer. The addition of manure can achieve the same effect.

To prepare materials for pressing, soak them in water. The easiest way to test if a material will make a good briquette is to soak it in water, grab a handful of the material and press it into a ball in your hands. If the material forms into a ball that retains its shape and doesn't fall apart, it will most likely press into a good solid briquette. Some people choose to use a binding agent in their recipe in order to increase the binding capacity of their materials. Some good binders include: fish waste, molasses, wood ash, manure, corn starch or wheat starch. Most materials will not need a binding agent if you build a press that is able to exert a sufficient amount of pressure. Experiment with materials that are locally available in order to come up with a good briquette recipe, and also experiment with the proportions of the recipe to find a good, long-burning briquette. For example, 100% shredded newspaper will work for making briquettes, but they burn better if some small woodchips or a small amount of crushed charcoal is added.

After the briquettes are pressed they will be moist. It is important to fully dry them before using for fuel. A few days in the hot sun should be sufficient. When burning the briquettes, we usually break them apart rather than just burning them whole. Breaking them creates more surface area and causes them to burn hotter.

### LEVER ARM BRIQUETTE PRESS

The Lever Arm Briquette Press is built almost entirely out of lumber. The pressing is achieved through a simple lever mechanism. It is easy to understand and does not require special parts (as opposed to screw presses and hydraulic jack presses). However, the press is quite large and heavy so it is hard to transport and requires two people to run it efficiently. Also, this design only allows for pressing briquettes while some other designs can also be used as oil presses.

Figure 1



Figure 1: Lever Arm Briquette Press Measurements:

- A- 215 cm (86 inches)
- B- 80 cm (32 inches)
- C- 85 cm (34 inches)
- D- 180 cm (72 inches)

Figure 2

Figure 2: Close-up of the hinge mechanism that generates the pressure.

- A- 30 cm (12 inches)
- B- 30 cm (12 inches)

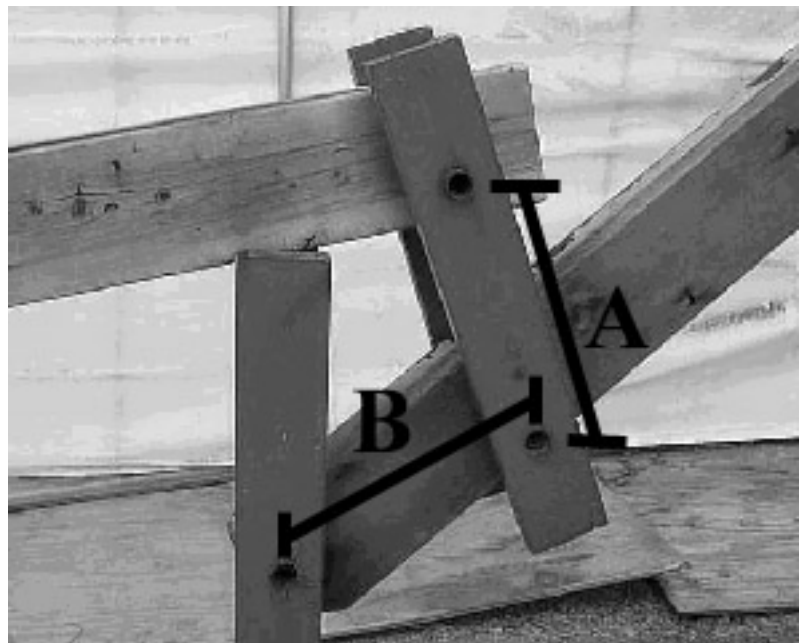


Figure 3



The mold for the briquettes is made from a piece of PVC pipe 40 cm (16 in) long with a 7.5 cm (3 in) diameter. Drill holes all around the pipe so that water can escape when the briquette is pressed. Use a sturdy piece of flat wood as a base on which to press your briquettes (Figure 3). We have found that it is best to cut a wooden disk about 3 cm in height with a diameter slightly smaller than the diameter of the PVC pipe. Screw it down onto the flat wooden base. The pipe will then fit directly over the wooden disk and will not slide when pressure is applied from the press.

A piece of PVC pipe with a smaller diameter can be used to form a hole in the center of the briquette (figure 3). If the center pipe is to be used, partially bore a hole into the base board the same size diameter as the small pipe so that it can be inserted into the hole. This will help keep it in the middle of the mold when you fill it with your briquette material. Though the hole is not needed and has no effect on the burning of briquettes, we have found that briquettes dry faster when they have a hole in the center.

To press more than one briquette at once, we fill the mold about half full of material, place a thin plastic disk in the mold to keep the two briquettes separate, and then fill the mold the rest of the way.

Lift the handle of the press and place the full mold under the compaction arm of the press. Place a ramming block (figure 4) on top of the slurry in the mold. Lower the handle and press the ramming block down into the briquette mold. Water will flow out the holes as you press the slurry.

Now the briquettes are partially pressed. Slide the briquette mold down to the far end of the press which is lower than the end with the lever. Re-press the mold with the ram block in order to fully compact the slurry (figure 5).

Figure5



Figure 4





Figure 6

The briquettes are now pressed. The only thing left to do is remove the briquettes from the mold. Different methods have been used for this process. We decided to build a small wooden frame for the extraction of our briquettes (figure 6). The frame is designed so that our briquette mold will rest on its edges. Then we press it one more time to force the briquettes from the bottom of the mold (figure 7).



Figure 7

There are other good methods for extracting the briquettes. Such as attaching a smaller lever to the press that is connected to a hinged piston. The mold is then placed on a ledge below the piston. When the lever is pressed, the piston is inserted into the mold and the briquettes are pressed out the bottom. On the other end of the spectrum is the simple method of laying your mold on its side and banging out the briquette using a ramrod and a hammer. This method is not recommended, but it gets the job done when nothing else is available.

## CAR JACK BRIQUETTE PRESS

The Car Jack Press uses a car jack to exert pressure. The foot of the jack has been removed in order to allow it to fit inside the briquette mold. Below are the dimensions for the frame of the press.



- A- 70 cm (28 inches)
- B- 15 cm (6 inches)
- C- 90 cm (36 inches)
- D- 30 cm (12 inches)
- E- 55 cm (22 inches)
- F- 5 cm (2 inches)

[Please note that the plywood on the back of the press is not a necessary addition.]

The briquette mold can be prepared in the exact same fashion as it was for the lever press. Place the mold under the frame and secure the jack between the crossbar and the briquette mold.



Briquettes are pressed and extracted as previously described.

An advantage of the car-jack design is that it can generate enough power to be used as an oil press with just a few simple modifications. Use a piece of PVC pipe similar to the one used as your briquette mold (you probably will not want to use the same one because of risk of contamination). Construct a wooden disk that will fit snugly down the pipe.



Fill your pipe with seeds and cover them with the wooden disk. Press the seeds the same way you would press briquettes. Be sure to place a groove in the bottom of the surface that you're pressing on to act as a guide as the oil flows. Also, slightly angle the bottom surface so that the oil will flow down, and do not forget to place a receptacle underneath to catch the oil.



One important consideration: some seeds are very hard and our simple car jack won't produce enough force to press oil out of them. If you're extracting oil from very hard seeds, a similar press can be constructed using metal instead of wood and using a hydraulic jack. If you make a heavy duty press, the cylinder that's filled with seed will have to be made out of metal or extra heavy duty 3/8 inch PVC pipe rather than regular PVC pipe. A working model like this has been used in Haiti for pressing cacao. A hydraulic press can generate 8000 pounds of pressure per square inch. Materials like wood and regular PVC pipe would not hold up under those conditions.

