

Choosing, Designing, & Building a Hydraulic Log/wood Splitter

- Part 1 - "**Deciding on what type of log/wood splitter will best fit your needs**" - Covers 4 common styles of hydraulic log/wood splitter & pros/cons of each. (I expect a lot of feedback on the pros/cons.)
- Part 2 - "**Working with larger rounds**" - Log Lifts, Davit Arms, Cranes, Grapples, & vertical splitting.
- Part 3 - "**Wedge options**" - If you plan to build a dedicated horizontal log/wood splitter, you can use a multiple edged wedge system. However if plan build a vertical or horizontal/vertical combination you will be limited to a single edged wedge.
- Part 4 - "**Parts of the hydraulic circuit of a log/wood splitter**" - Allows you the chance to compare 2 stage pumps, cylinder tonnage/cycle time, & discusses the rest of the components in the hydraulic circuit.
- Part 5 - "**Putting your log/wood splitter together**" - Beam size, designing the sled for the wedge or push plate as appropriate, positioning the cylinder, ...

What type of log/wood splitter would work best for me?
Would it be better to build or buy?
How big (tonnage) do I need?
What can I do to make it work for me, not it work me?

These are commonly asked questions when considering buying or building a log/wood splitter. This is a simplified 5 part discussion of the commonly used types of hydraulic wood splitters. Since this forum is about building your own, I will be using mostly photos of splitters which have been home built found on the "TractorByNet" and "Arboristsite" forums for illustration purposes. As these photos have been posted for general viewing, I hope I have not infringed on anyone by using them. However, if anyone would like their photo removed from this posting, please send me a private message & I will be happy to remove it. For those who are gracious enough to let others benefit from their knowledge & hard work, a heartfelt thanks! (If I did not use a photo of your splitter, please don't be offended. I tried to choose ones which allowed me illustrate specific points while using the least number of photos. There are lots of great splitters shown in the various threads.) I labeled each photo with a reference name as I will be referring back to them as we go along. The term "round(s)" will be used to refer to any cut piece of wood ready to be split.

As with all threads, comments are encouraged. I have a couple of requests:

- 1 - Please try to stay on topic for the part of the designing/building a log/wood splitter thread being addressed.
- 2 - Please use photo reference names given & do not repost the photos. This will help to keep the tread smaller for those with slower internet connections.

Deciding on what type of log/wood splitter will best fit your needs.

(Part 1 of 5 threads)

1 - **Dedicated horizontal (DH):** They will typically have a fixed wedge attached to the beam with the cylinder pushing a sled/slide which pushes the wood into the wedge. Several are shown from a very simple to commercial grade.

Pros: You can have it at waist height, the split wood is pushed away from the operator, allows for several add-ons which help to protect your back & cut down your splitting time. (Log lifts, davit arms, cranes, out feed tables, multiple edged wedges)

Cons: If you don't add a way to lift the heavy rounds, you will have to grunt hard or noodle them into a workable size. (Yes some 3 pt hitch DH splitters can be lowered down but you still have to roll it up a ramp or lift it up to load it onto the splitter.)



DH - 1

DH - 1 - This is a very simple design which uses the tractor hydraulics & an open center valve. While you can get by without having the open center valve by having someone on the tractor running the splitter, I would not recommend it. 1. Without the oil continuously circulating, the heat generated while splitting will build up in the cylinder & hoses which can cause premature oil breakdown & wear on the seal. 2. If the same person who places the wood on the splitter is the same one who is operating the valve, the risk of having an accident/crushing/cutting a hand/finger is greatly reduced. (If the loader makes a last moment decision to adjust the piece of wood to be split while the valve operator initiates a splitting cycle, it can turn very messy.)



DH - 2

DH - 2 - This splitter has it's own hydraulic system where the hydraulic pump is powered off the tractor's power take off (pto) shaft. Out feed tables were added to catch the split wood & tubing was added to the sides of the beam to help support the round being split. ** Note ** The builder added to the out feed tables to extend them in front of the wedge. By placing the round on top of the table before starting to push it into the wedge, it will help to keep the wood from being pushed into the edge of the table.



DH - 3a



DH - 3b

DH - 3a/b - This splitter was mounted sideways which helps keep the front end of the tractor on the ground, makes it easier to park in a building, & to maneuver/turn in tight places.



DH - 4

DH - 4 - The builder of this splitter chose to use tubing on the out feed table to allow debris to fall to the ground. A log lift was added to make lifting the "Big" ones easier as you can see. If you look close you can see a stop on the opposite side from the log lift to help keep the rounds from rolling off the beam onto the operator.



DH - 5

DH - 5 - This splitter has a longer log lift table with no gaps. The builder uses it not only as a log lift, but also as a staging table for rounds waiting to be split. An oil cooler with a boxed fan located on the other sided was added to beat the summer heat, 100+ temperatures. The fan is connected to a 200 watt power inverter running off the battery which the engine keeps charged. This splitter also has trailer hitch on the back to pull a small trailer which holds 1/2 a cord, (4x8x2' high sides with a toolbox on the tongue), & the builder's chainsaws / accessories.
**** Note**** The filter is shown on the suction side of the pump. This is not a good idea & has since been move to the return side between the oil cooler & the reservoir.

2 - Dedicated Vertical (DV): Any splitter which is designed to split vertical will have the wedge fastened to the cylinder rod/ram. For DV - 1, the following pros/cons apply.

Pros: While you have to wrestle the large rounds into place, you do not have to lift them.

Con: You are working close to the ground. LOTS of bending!!! The splits fall at your feet in the way.



DV - 1

DV - 1 - A simple 3 pt hitch design which would take little space to store. Uses the tractor's hydraulics.



DV - 2

DV - 2 - This one is a bit more elaborate. It has a log lift on one side & an elevator on the other.

DV - 2+3 have similar pros/cons to a DH except for multiple wedge options.



DV - 3a



DV - 3b

DV - 3a/b - This is a commercial splitter which goes a step further. It is self propelled with the elevator in line with the wheels. In the second picture you can see the log lift on the right hand side.

3 - Horizontal / Vertical (H/V): As the name implies, you can pivot the beam from horizontal to vertical. Again since it can be used vertical, the wedge is mounted to the cylinder rod/ram instead of the beam. This type of splitter is readily available at most tractor supply stores & major lumber yards. Unless you have part of the materials on hand, it would be hard to build one for less than you could purchase one new.



H/V -1

H/V -1 -If you look at the back side of the axle which is also the hydraulic reservoir, you will see the pivot point & the place for a pin to lock it into an upright position on the lower portion of the bracket.

While in **vertical mode**, the same pros/cons as a DV.

Pros: While you have to wrestle the large rounds into place, you do not have to lift them.

Cons: You are working close to the ground. LOTS of bending!!!

In **horizontal mode**:

Pros:

Cons: The beam is generally too low to be a comfortable working height. The split wood falls at your feet in your way.

4 - Splitters which are mounted to the loader of a tractor/skid loader or the hoe portion of a back hoe (LM): For photo identification, I will call them loader mounted (LM) splitters. Some have the wedge mounted to the cylinder & some have them fixed to the beam. They are dependent on the equipment's hydraulic system. These splitters can be used to pick the wood up, move, split & drop the splits into a pile, trailer, or truck.



LM - 1

LM - 1 - This one can be rotated to work sideways or be pointed downward.



LM - 2

LM - 2- More commonly used with a skid loader where there is better visibility.

Pros: Able to handle the large rounds with ease. LM - 2 appears to have a 6 way wedge fixed to the beam.

Cons: Uses lots of fuel, increased wear & tear on expensive equipment. It takes time to maneuver the vehicles around, harder for several people to work together.

5 - Bi-directional splitter (BD): They can split the rounds in both directions of the cylinder travel.



BD - 1

BD - 1 - Has a double sided wedge.

Pros: Cuts your cycle time in half. Can keep 2 people busy loading & moving the split wood.

Cons: Greater risk of injury with second loader having no control over the wedge - It requires very good teamwork & keeping your hands on the sides of the rounds not the ends. Some do not have the log/split catcher & should be upgraded to have them. They really help to decrease bending over & smashed toes.



BD - 2

BD - 2 "Tempest EF-3 Wood Splitter" It uses a wedge system at both ends with a push block in the center.

Pros: Cuts your cycle time in half, pushes the split wood onto out feed tables, uses multiple edged wedges. Out feed tables fold over toward the middle for transport.

Cons: Pushes the split wood in 2 different directions - Not a problem if you have 3 or more workers or if you have crates or elevators under the out feed tables to catch the split wood. All splits are a fixed size - A plus if you are making bundle wood, but where are the bigger pieces you need to keep the wood stove going all night or while you are at work? Also leaves lots of debris. You have to stand on the log lift for proper body alignment while splitting.