P.T.O. Driven Buzz Saw

Bill of Materials

Material	Amount
3″x 3″x 1/4″ angle	40′
2″x 2″x 1/4″ angle	16′
2″x 8″x 1/4″ channel	4′
2″x 1/8″ flat	5′
3″x 1/8″ flat	3′
1″x 1″x .063″	2′
2″x 2″x .250″	16′
2″ cold roll	48″
14 gauge	1 sheet
1/2″x 1/2″x 1/8″ angle	5′
1/2″x 3″ flat	2′
3/8″ bolts and washers	10
Right angle gear box	1
Hitch pins	4
36″ Blade	1

This P.TO. Driven Buzz Saw is equipped with a 36" diameter blade which allows the operator to cut a 15" log without turning the material. It is designed to be carried on a tractor with the 3 point hook up. Built from the ground up on a rugged steel frame, this unit is designed to stand up to heavy duty use.

Construction of Main Frame

The first step of construction consisted of cutting six pieces of 3"x 3"x 1/4" angle iron 46 inches long. Cut a 60 degree angle on one end of each piece and a 30 degree angle on the other end of each piece. These will form the "A" frame structure which will serve as the main frame of the cutting unit. Then cut two pieces of 3"x 3"x 1/4" angle iron 39 inches long.

Connect two of the 46" pieces at the 30 degree end to form a "V". Tack the pieces together and form one more so there is a left and a right side. Put another 46" piece at the bottom overlapping the two angled pieces. This will form the bottom or base of the main frame. Be sure to make both sides the same and tack weld. Using a cutting torch cut the overlapping edge of the bottom angle iron pieces so that they are flush with the 46" pieces headed upward.

Once the two sides of the main frame are equally matched put the 39" pieces in the corners of the angled sides. Tack these two pieces so that the two sides are joined and make up the main frame. After checking to see that all pieces are square, the main frame structure can be welded.

Three Point Hook Up

The three point hook up is constructed with 2"x 2"x .250" square tubing and 1/2"x 4" flat iron. Using the 2"x 2"x .250" tubing, cut one piece 38-1/2" long. Mount it to the main frame at 11" from the top. Cut a piece 14" long, a piece 20" long, and cut a 45 degree angle on one end of each piece. Put the 45 degree ends together squarely and tack. Place this under the 38-1/2" piece, square it, and tack weld it to the bar and main frame. Do the same procedure to form the other side of the three point hook up.

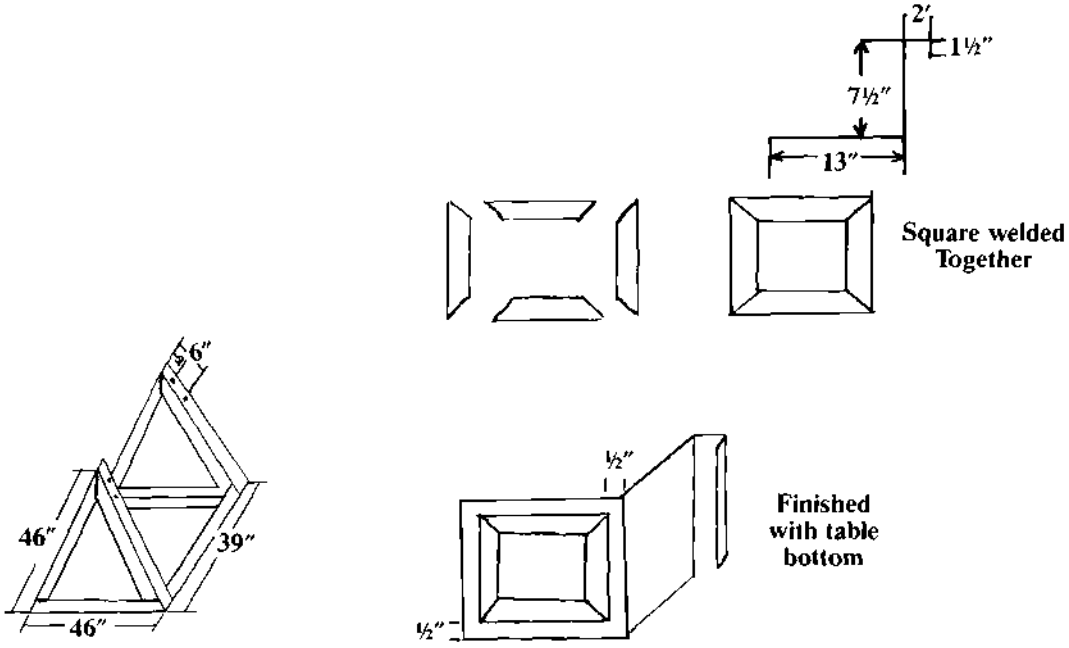
Next, cut four pieces of 1/2"x 4" flat iron 5" long, and drill a 13/16" hole at 1-1/2" down from one end. These will be used for mounting the hook up pins. Notch these pieces so that they will fit over the 2"x 2"x .250" square tubing. Mount two of these pieces to the center of the 38-1/2" long tubing. These need to be mounted with a 2" spacing between them. These will be used to connect a tractor third arm. Of the remaining two pieces mount one on each side of the frame at 24" apart. These will be used to mount the 13/16" pins for tractor hook up. Weld entire structure.

Fabricating and Mounting Table for Gear Box

A right angle gear box must be used so that the saw can be driven from the power take off unit on a tractor. A table or base must be constructed so that the gear box can be mounted to the main frame of the saw. This table is fabricated by using 3"x 3"x 1/4" angle iron and 8" channel iron. Start by cutting two pieces of the angle iron 39" long. A 60° angle must be cut on each end of each piece so that it will fit into the main frame structure. These are mounted at 8" from the bottom of the main frame and welded.

Cut the 8" channel iron 45-1/2" long and cap both ends using 1/4"x 2" flat iron. This will allow the channel iron to mount flush with the outside edges of the 39" long angle irons. Center the channel iron on the angle iron braces and weld.

In order to mount the gear box to the 8" channel base, 2 pieces of 2"x 2"x 1/4" angle cut 10" long will be needed. These need to be slotted. The slots can be formed by drilling a 3/8" hole at 3/4" from one end and 4" in from the other end. Using a soapstone, draw a line connecting the outer edges of the holes. Cut out the marked area with cutting torch and smooth out the cut edges with a double cut file. This will form a clean, straight 3/8" slot to allow for adjustment of the gear box. One piece is tacked on at 13-1/2" from the left side facing the 3 point hook up, and the other piece at 17-3/4" from the other end. These must both be mounted square with the slotted part facing



upward. Before welding, place the gear box on the slotted angle irons and check that it fits correctly. Then they can be welded.

The power take off will drive the right angle gear box, which will drive a 8" pulley, which will drive a 3" pulley mounted to the *2"* shaft turning the blade.

Mounting the Blade Shaft

The shaft is made from 2" diameter cold roll 47" long. It is threaded 2" on one end. It needs to have a 3/8" key way 8" long. This key way must start at 15-3/4" from the threaded end. The key way is for securing the 3" drive pulley.

The shaft is mounted to the main frame by using two *2"* pillow block bearings. Drill two 5/8" holes at 2" down from the top of the frame and two holes at 6" from the top of the frame. Mount one bearing flush with the end of the shaft then slide the 3" drive pulley over the key way. Then mount the other bearing so that there will be 9-1/2" of shaft beyond the bearing. This is the threaded end of the shaft at which the cutting blade will be mounted.

Belt Safety Guard

A belt safety guard must be constructed and mounted to this unit to protect the operator from danger of getting hands, feet, or clothing into the drive belts.

This guard is made with l/8"x 4" flat iron and 3/4"x #9 expanded metal. When forming this guard, the shaft, gear box, and drive belts must be in place. The flat iron is bent and formed by heating it with a torch making sure that it is in line with the pulleys. Leave at least 3/4" clearance around the belts. When the bending is complete, weld, grind, and sand the connecting joint. This piece will serve as the outer portion of the guard. Lay this piece on a piece of 3/4"x #9 expanded metal and trace around it with a soapstone marker. Cut the traced area, with a torch and weld the expanded metal to the 1/8"x 4" flat iron. The guard mounts to the frame structure using two pieces of 1/8"x 2" flat iron with 3/8" holes in them.

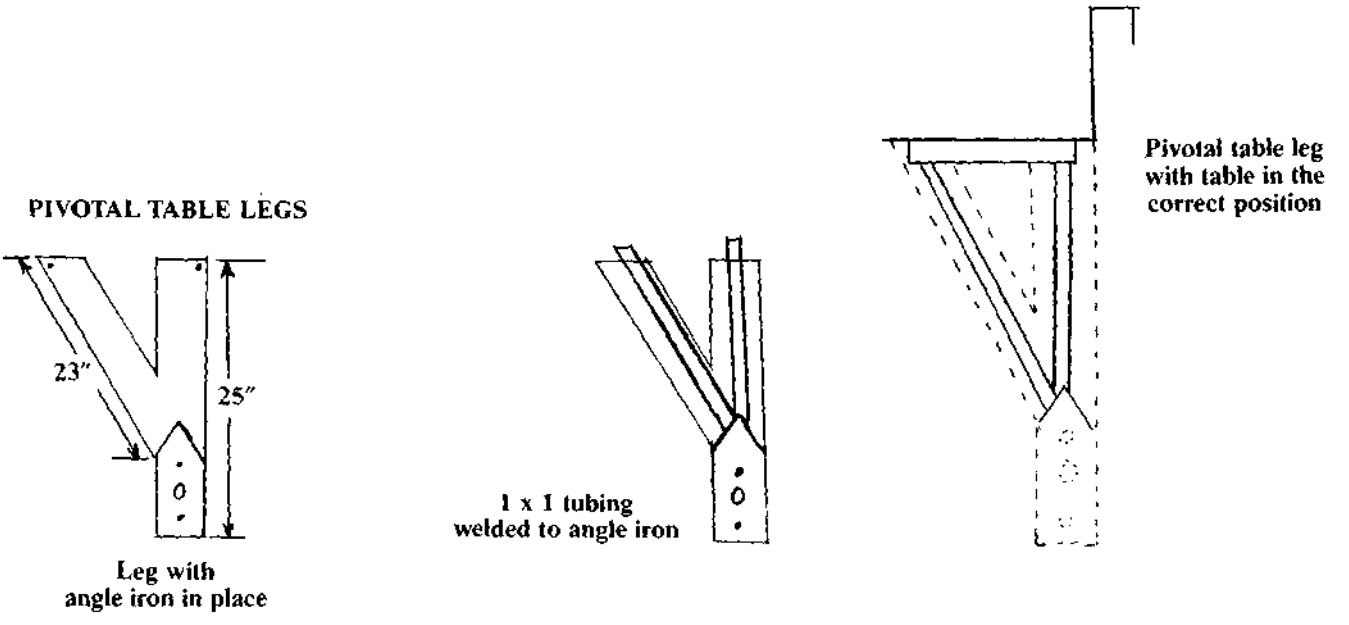
Fabricating Pivotal Table Legs **and Table Top**

The pivotal legs are made of 3"x 3"x 1*1 A"* angle iron. Cut two pieces 23" long and cut a 25° angle on one end of each. Cut two more pieces 25" long. Drill two 3/8" holes, one at 3/4" high and the other at 5-1/2" high. Drill a 1" hole between the two 3/8" holes. These holes will be used for the pivot bearings.

At this point connect the 25° pieces to the other two pieces. Weld the angled end at 5-3/4" high with the angle iron facing the same direction. When these have been joined, weld a piece of 2"x 1/4" flat 4-3/4" long at 9-1/2" from the bottom of the leg which the bearing is mounted to. Weld a 8-1/2"x 3/8" carriage bolt in the center of the flat iron at a 70° angle. After these are together, cut a 2"x 1*/2"* notch in the main frame at 22" from the bottom. File and clean cut with a grinder. These slots will accommodate the 8-1/2"x 3/8" carriage bolt, thus allowing the table to pivot inward toward the main frame.

To mount the legs to the main frame cut a 1-1/2" hole at 13" from the bottom of the main frame. Bolt on a stationary hook up pin. The legs with the bearings slip onto these pins, allowing the table to pivot. The table top mounts onto these pivotal legs.

The table on this saw consists of two components. One is 4' long and the other is 8-1/2" long. Both are 13" high with a 2" and a 1-1/2" bend. The 4' table is mounted to the legs with two pieces of 2"x 1/4" angle iron. These angle irons have a piece of 1/4" flat stock welded on the ends with a 3/8" hole drilled in them. These are the mounting brackets so the table can be mounted to the legs. The angle irons are welded to the sheet



metal table top at 1/2" from the front and 4" from one side. The other piece is mounted at 1/2" from the back and 4" from the side, and welded.

The smaller table is mounted to the legs by connecting two pieces of l"x l"x .063" square tubing to a piece of 2"x 2"x 1/4" angle iron at 5" from the bottom of the leg. Cut two pieces of 2"x 2"x 1/4" angle iron 12" long and two pieces 7-3/4" long. These will form the frame for the small table. Place the small sheet metal table on this angle iron frame and weld. Then, weld the]"x l"x .063" pieces of tubing to the angle iron on the legs. Place the framed table top on 1" tubings. Make sure the two tables are level and lined up and weld the 1" tubings to the angle iron frame.

Main Blade Guard

The main blade is built from 14 gauge sheet metal. Cut two 38" diameter circles to accommodate the 36" blade that will be used. Using a piece of 1/8"x 2" flat, bend and tack weld it to the sheet metal circles along the outer edge. When it is tacked all the way around, take the other circle and tack it to the 1/8"x 2" flat. Weld the entire structure. Then grind and sand the welds to assure a smooth, finished appearance.

Draw a line down the center of the circle and from the center draw a 30° line to the edge. Cut this portion out with a torch. This opening will allow mounting the guard over the blade. The guard must be reinforced using l/2"x l/2"x 1/8" angle iron.

To mount the guard to the frame, cut two pieces of l"x l"x .063" tubing. Cut one 8" long with a 60° angle at each end. Weld this piece onto a piece of 1/8"x 2" flat 3" long. Drill a 3/8" hole into the flat iron. These will bolt to the main frame. The other tubing is cut 6" long with a 3" piece of flat. Weld the 8" piece at 8" in from the cut edge and 14" down from the top of the guard. The 6" piece is welded at 10" below this and 6" from the curved edge.

Weld two 3/8" bolts to the guard 10" from the cut edge and 8" from the curved edge. These will be used to mount the moveable guard.

Moveable Blade Guard

The moveable blade guard moves when the table pivots. This is a safety feature so that the blade is enclosed when the table is in the back position.

The guard is made from the cut out portion of the main blade guard. Use a piece of l/8"x 3" flat and the remaining pieces from the other guard. Measure up 6" and draw a line. Then measure over 6" and draw a line at a 70° angle connecting the two lines. Cut this portion out with a torch. Grind both pieces evenly. Drill a 3/8" hole at 2" from the bottom and 2" from the angled side. Using a 3/8" bolt and cutting the head off, mount it at 6" down and 9" over. Weld onto the side that will be facing the main frame. Use a piece of l/8"x 3" flat to join the two sides together to form the enclosed guard. Grind smoothly and sand. The arm that connects the guard to the table is a piece of l/4"x 1" flat 15" long with two 3/8" holes at the ends. This will allow the guard to pivot as the table moves.

Painting

In order to prepare the unit for painting, it is necessary to remove all slag and weld particles. The entire structure must be sanded and wiped down with a metal prep solution. This will allow the paint to stick readily to the metal surfaces. A primer sealer is used to eliminate having to sand between paint coats. Paint all of the parts with three even coats of paint.

After the unit is dry all parts can be assembled, including mounting the 36" diameter blade.