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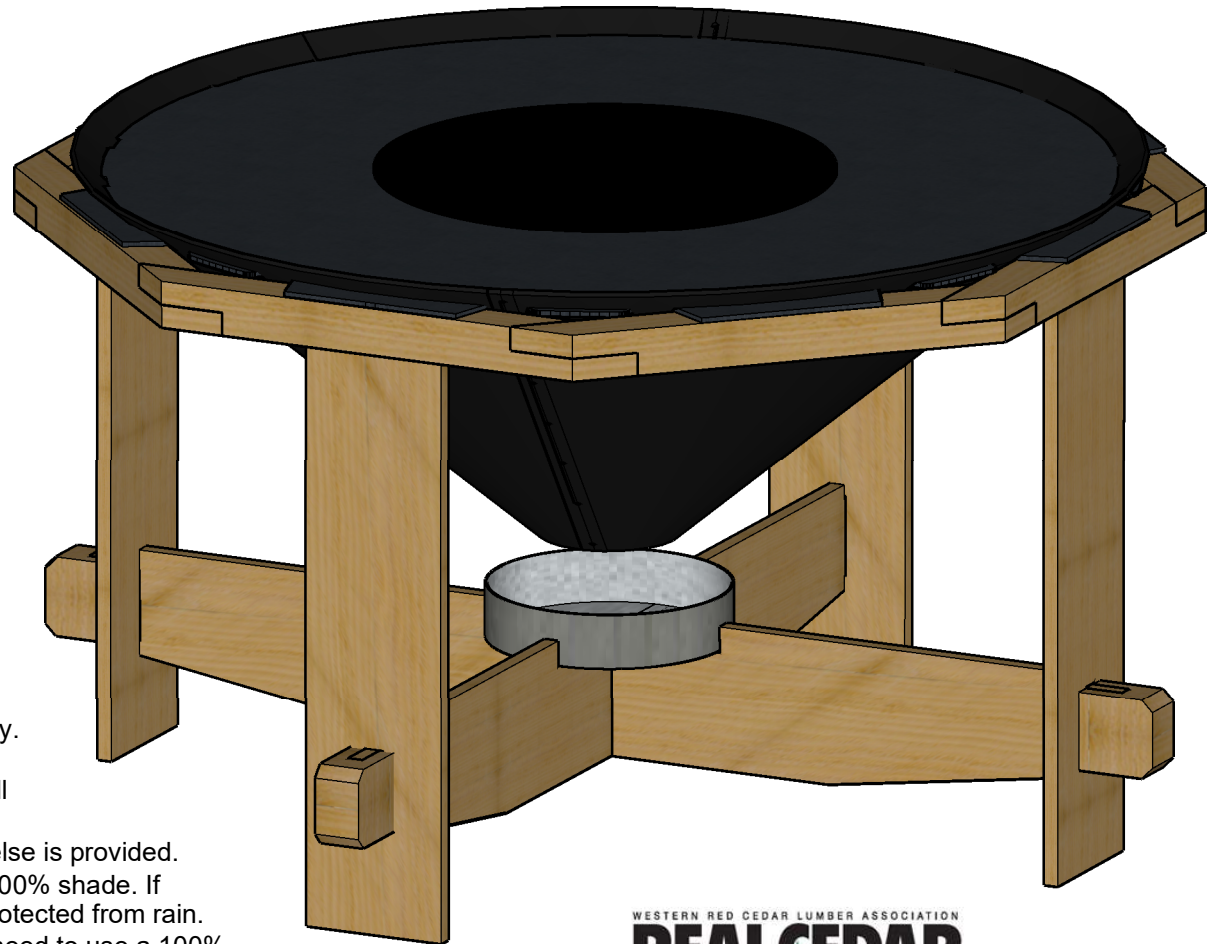
**GRUB
CONE**TM

Black Soldier Fly Larvae Composting Bin

Some things you should know...

Understanding these concepts / conventions will help guide you through assembly.

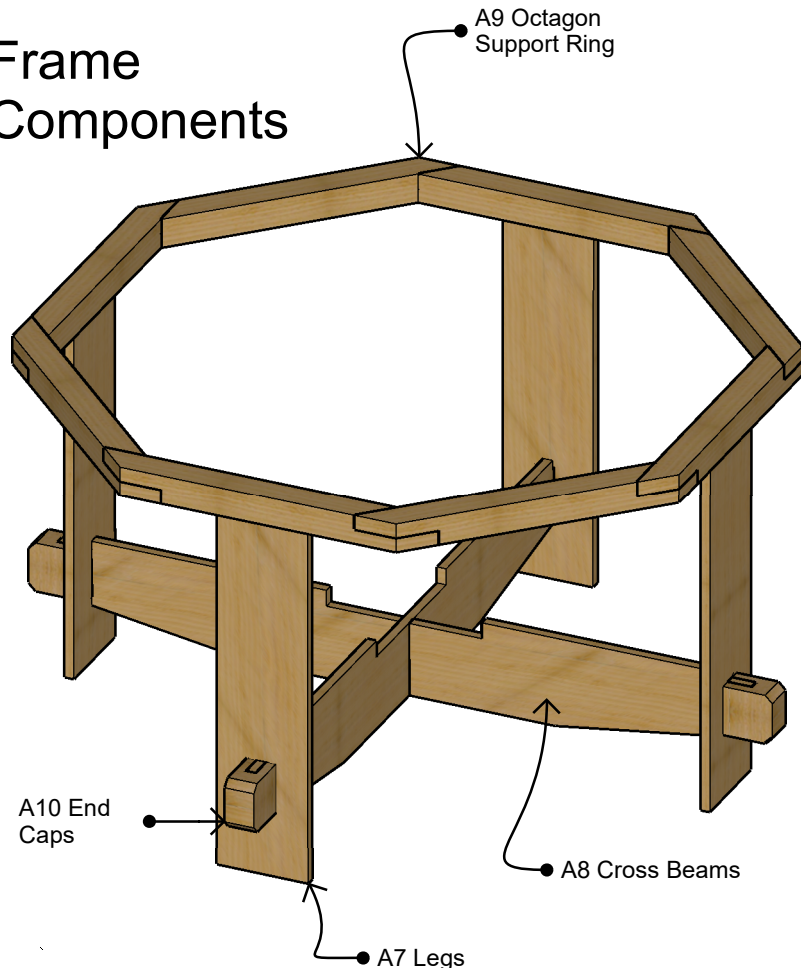
- Having a flat hard area is required for proper assembly. A hard surfaced porch or driveway for example.
- We estimate about 1 hour for a person of ordinary skill to assemble. You need to have strong hands.
- You need a hammer and a cordless drill. Everything else is provided.
- Finished product will need to be located outdoors in 100% shade. If inside, open outdoor access is required. Should be protected from rain.
- If you decide to seal the wood (not required) you will need to use a 100% non-toxic low VOC sealer such as AgriLifeTM Lumber-Seal, Cedar-Seal or equal. Don't want poisons around your grubs ;-)



You Tube Watch assembly support video at YouTube (search GrubCone) or on the GrubConeTM product page at www.roostandroot.com/product/grubcone

Help Hotline: 877-741-2667
support@roostandroot.com

Frame Components

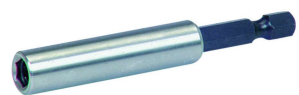


A - Components List:

- A1** - Inner Cone Set (2)
- A2** - Outer Cone Set (2)
- A3** - Top (1)
- A4** - Lid (1)
- A5** - Floor (1)
- A6** - Aluminum Catch Pan (1)
- A7** - Legs (4)
- A8** - Cross Beam Set (2)
- A9** - Octagon Support Ring (1)
- A10** - Crossbeam End Caps (4)

B - Tool Kit Contents List:

- B1** - 44 Long Black Nylon Screws (2 extra)
- B2** - 5 Short Black Nylon Screws (1 extra)
- B3** - 1 Medium Black Nylon Screw (Lid)
- B4** - 44 Black Nylon Spacers (2 Extra)
- B5** - 50 Black Nylon Nuts (3 Extra)
- B6** - 5 Green T20 Screws (1 extra)
- B7** - 1 Bit Holder
- B8** - 1 T-20 Torx Bit
- B9** - 1 Small Bottle Wood Glue
- B10** - Hammering Block of Wood



B7 Bit Holder



B8 Bit



B5 Nut



B4 Spacer



B9



B2



B3



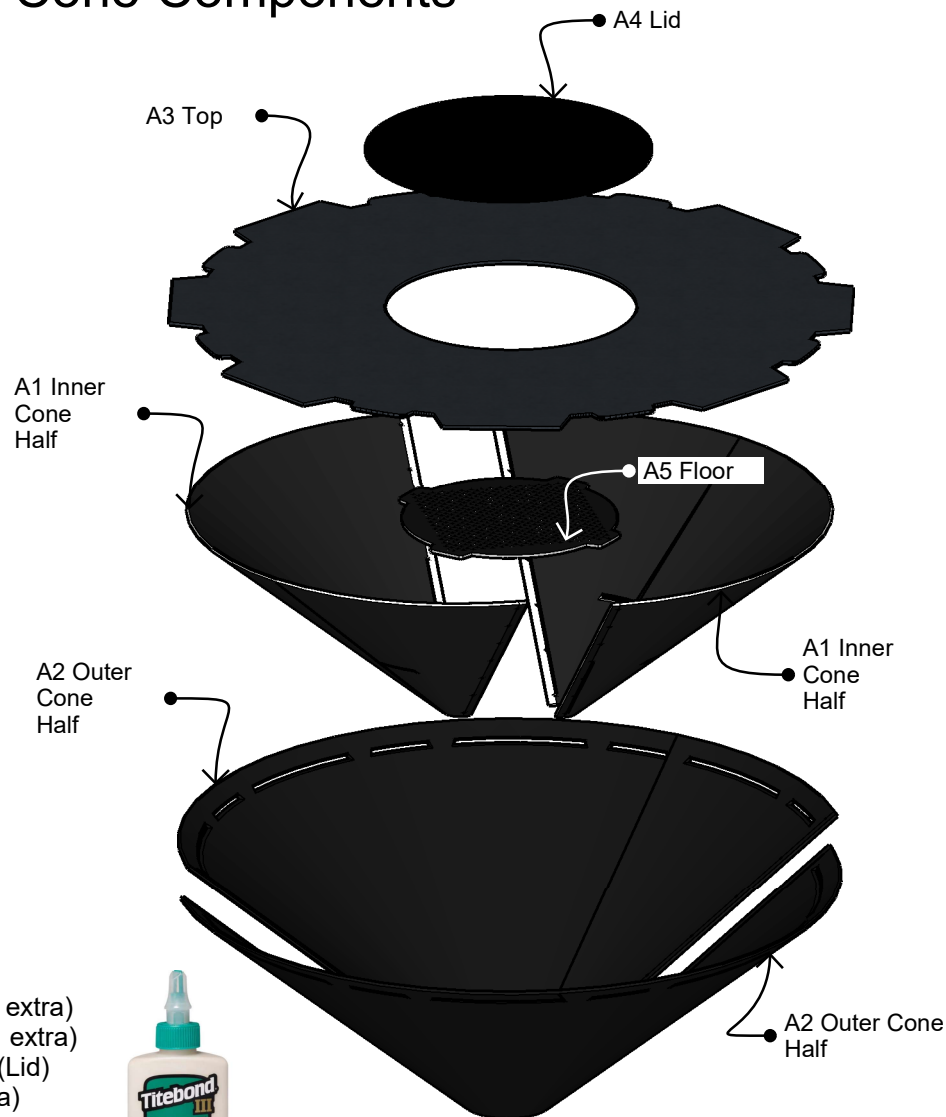
B1



B6 Green
T-20 Screw

Black Nylon Screws

Cone Components



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Parts ID

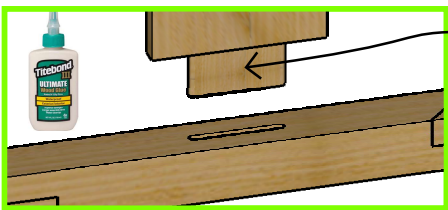


Fig 1A

Smear glue on both sides of leg before inserting.
Make sure no debris is in the hole before inserting leg

Gently Tap 4 Legs
 Into Slots In Octagon
 Frame Using Hammer
 And Block Of Wood
 To Protect Leg

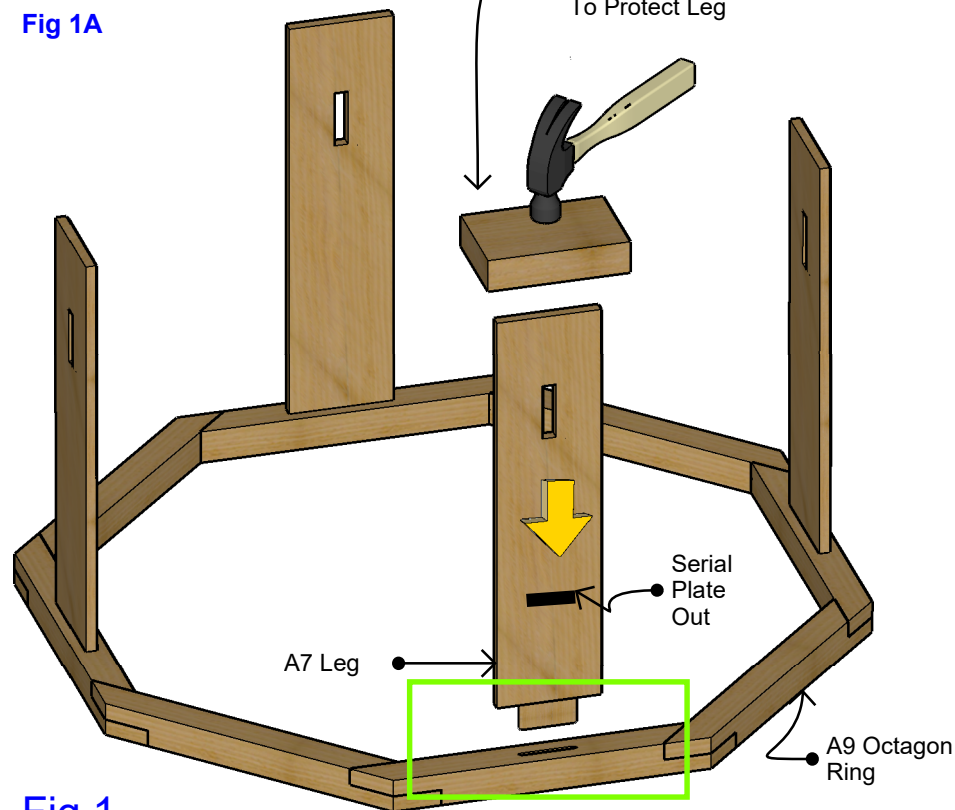


Fig 1

:-) Here we go !

Fig 1 - Attach Legs To Octagon Ring: Place **A9 Octagon Ring** upside down on a hard flat surface. Smear a layer of provided wood glue onto **A7 leg** as indicated in **Fig 1A** and using your hammer and provided block of wood and gently tap in all 4 **A7 Legs**. Wipe up any excess glue with a damp rag.

Fig 1B & Fig 1C - Cross Beams: Position **Lower A8 Cross Beam** between any two Legs and gently spread Legs and insert Lower Cross Beam. Repeat for **Upper A8 Cross Beam** and interlock centers as illustrated in Figures 2 and 2A. Cross Beams add strength AND provide a spot for **A6 Aluminum Catch Pan**.

Fig 1D End Caps: Using **B9 Exterior Wood Glue** smear a liberal coating onto ends and sides of ends of each **A8 Cross Beam** and while pushing **A7 Leg** into shoulder of Cross Beam force fit a **A10 End Cap** over End of Cross Beam and hold in Place with a **B6 Screw** while glue dries. End Caps lock Cross Beams into legs. Repeat for all for 4 End Caps.

Fig 1B

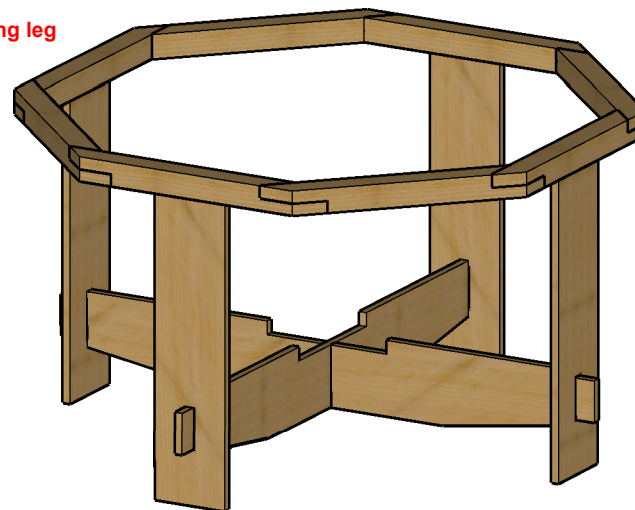


Fig 1C

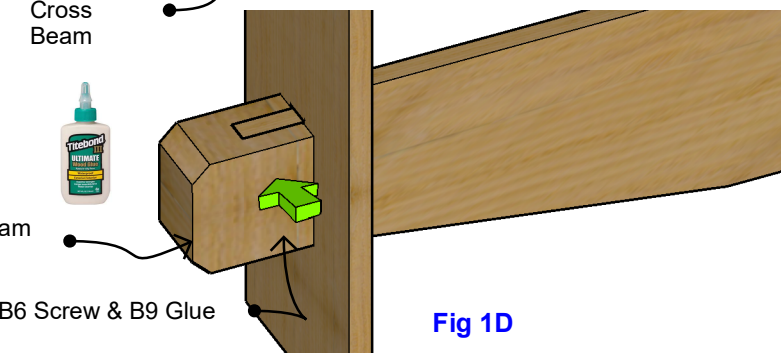
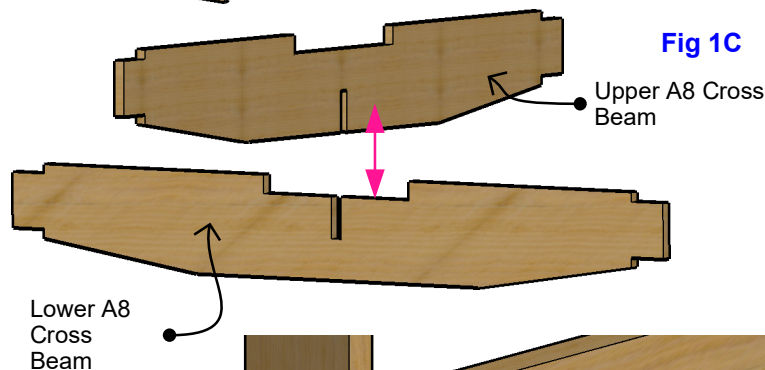




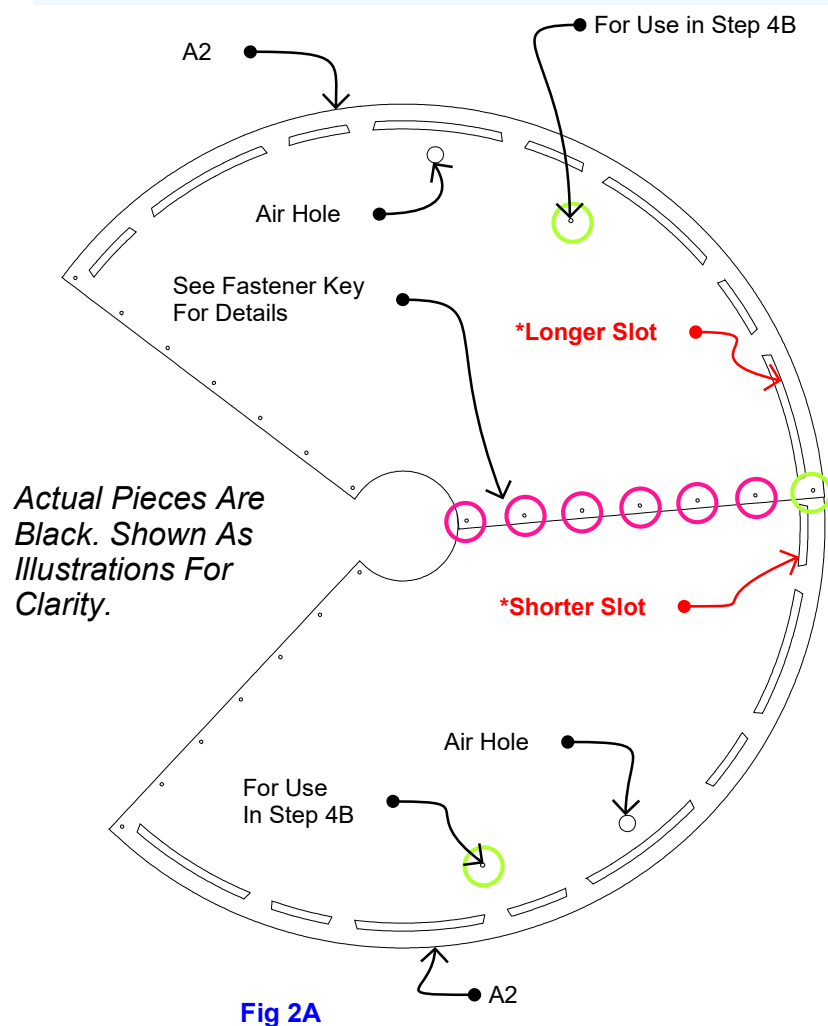
Fig 1D

A First connect halves of outer cone referencing Fig 2A below for positioning and orientation and fastener key to the right.

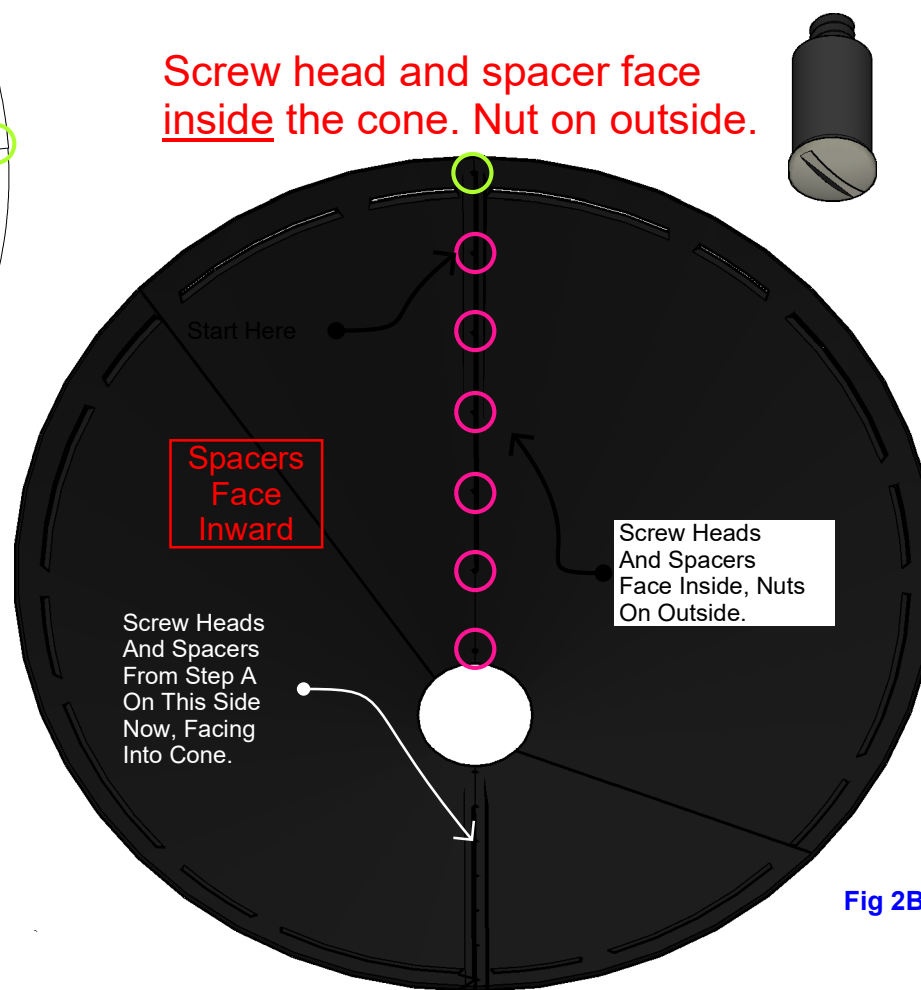
Fastener Key

-  Long black nylon screw, spacer & nut. Nut on bottom side, screw head and spacers face up.
-  Omit for now.

B Next, roll the cone halves up to connect the other edges and form the cone shape, Fig 2B. Use fasteners in the same positions and combinations that you used in Step A above. It's easiest to start at the #2 position from the top and work your way down.



Screw head and spacer face inside the cone. Nut on outside.



Hand-tighten fasteners or use small hand tools. Either is good.

Shorter Slot Next to Longer Slot at Seams

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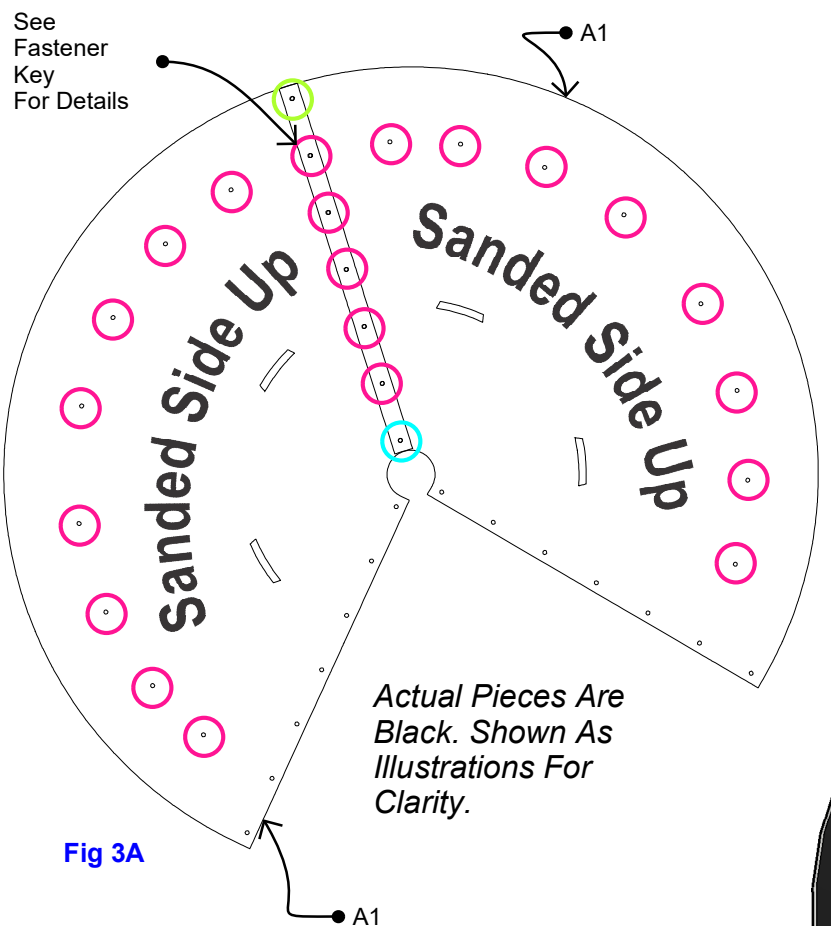
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A2 Outer Cone

Step
02

A First connect halves of inner cone referencing Fig 3A below and fastener key to the right. Have the sanded side facing up.

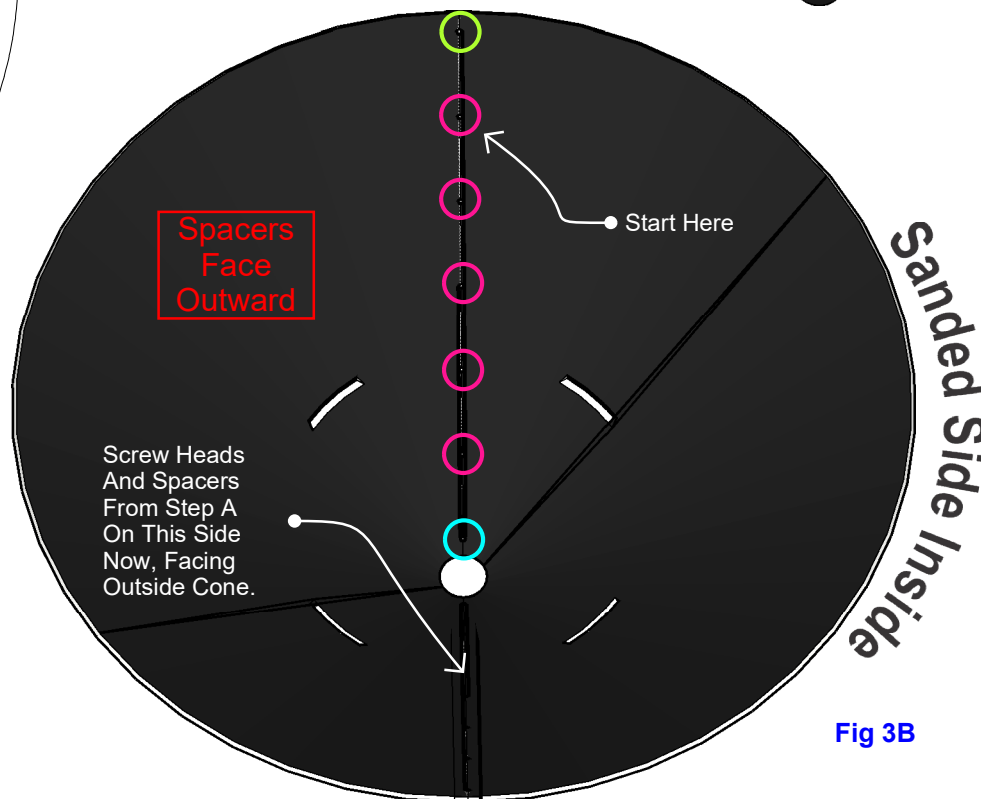


Fastener Key

-  Short nylon screw & nut. No spacer.
-  Long nylon screw, spacer & nut. Nut on top side, screw head and spacers face down.
-  Omit for now.

B Next, roll the cone halves up to connect the other edges and form the cone shape, Fig 3B. Use fasteners in the same positions and combinations that you used in Step A above. It's easiest to start at the #2 position from the top and work your way down. **Sanded side should be facing inward.**

Screw head and spacer face outside the cone. Nut on inside.



Hand-tighten fasteners or use small hand tools. Either is good.

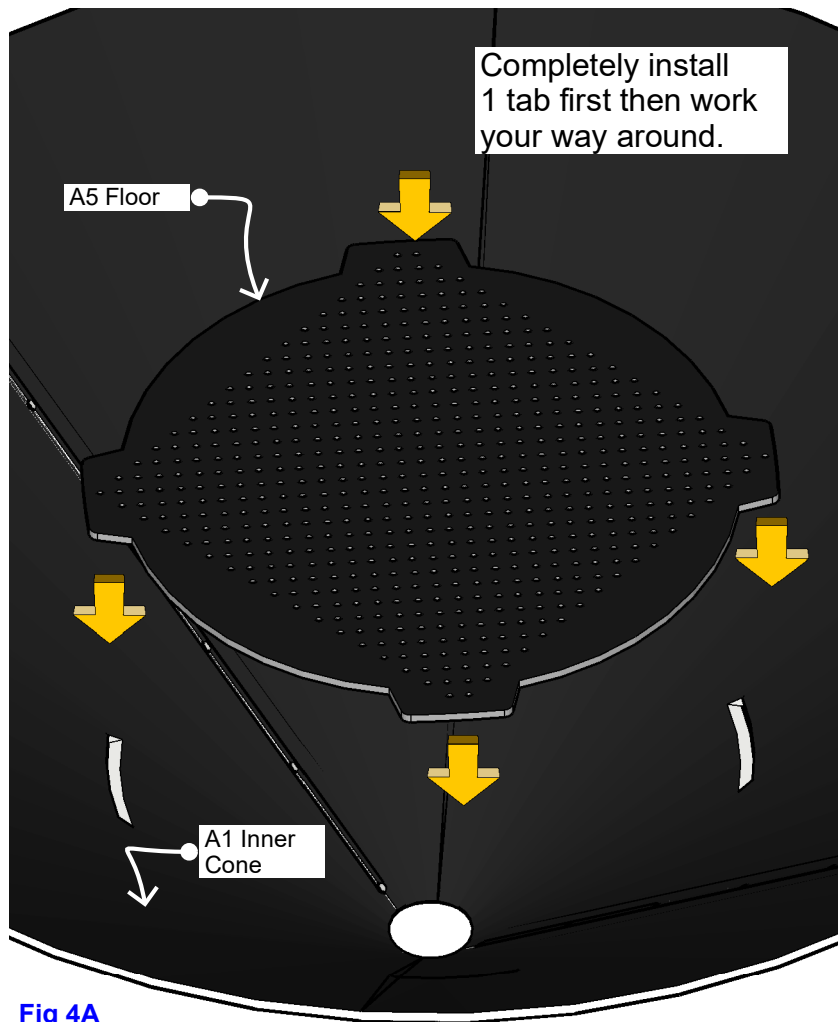


Fig 4A

A Take the A5 floor and force fit tabs of floor into slots in the A1 Inner Cone. The 100% Recycled HDPE Plastic is very tough and won't break. Fully insert 1 tab first and then work your way around in a circle to snap into place. It will take a person with strong hand strength to get floor snapped in.



B Inset A1 Inner Cone assembly into A2 Outer Cone Assembly and rotate A1 Inner Cone to where the holes at seams align with empty holes in A2. Seams of two cones will be pretty much opposite of each other. Using long black nylon screw, spacer between cones, and nut... affix Inner Cone to Outer Cone.

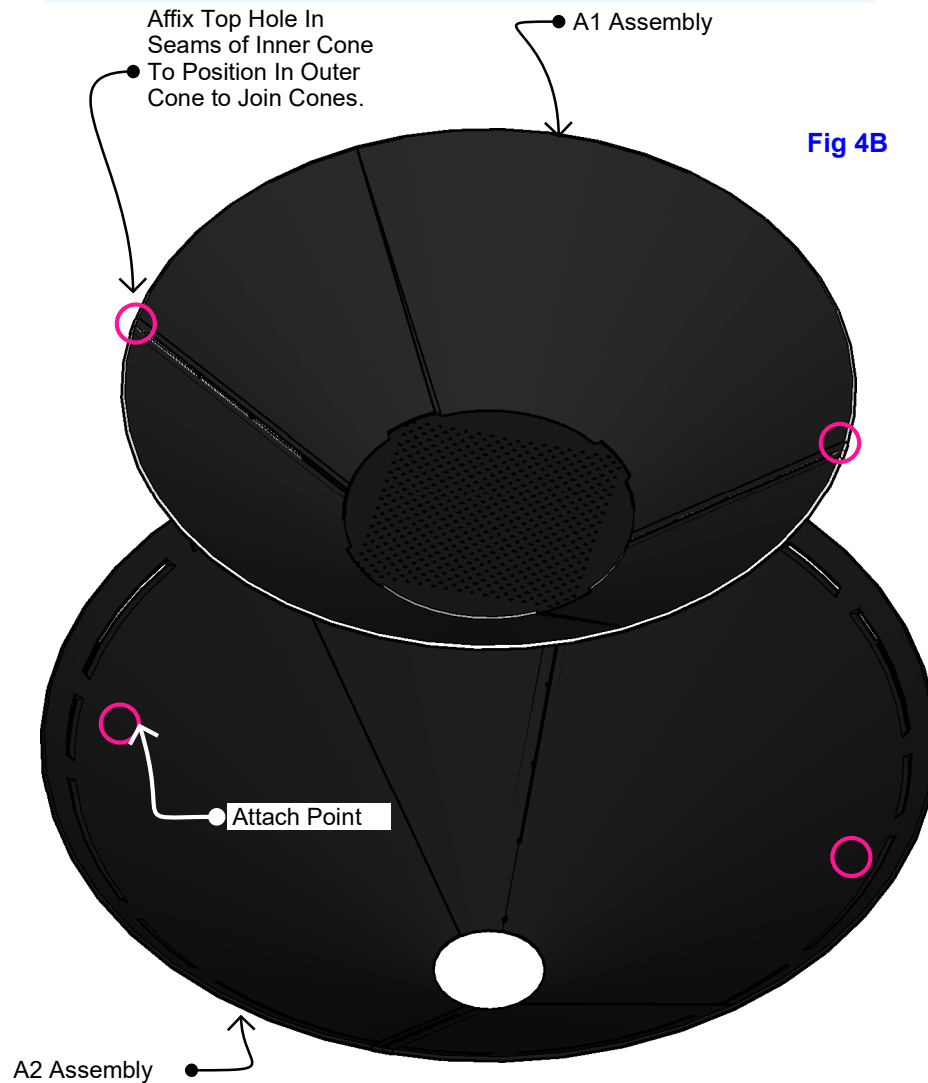
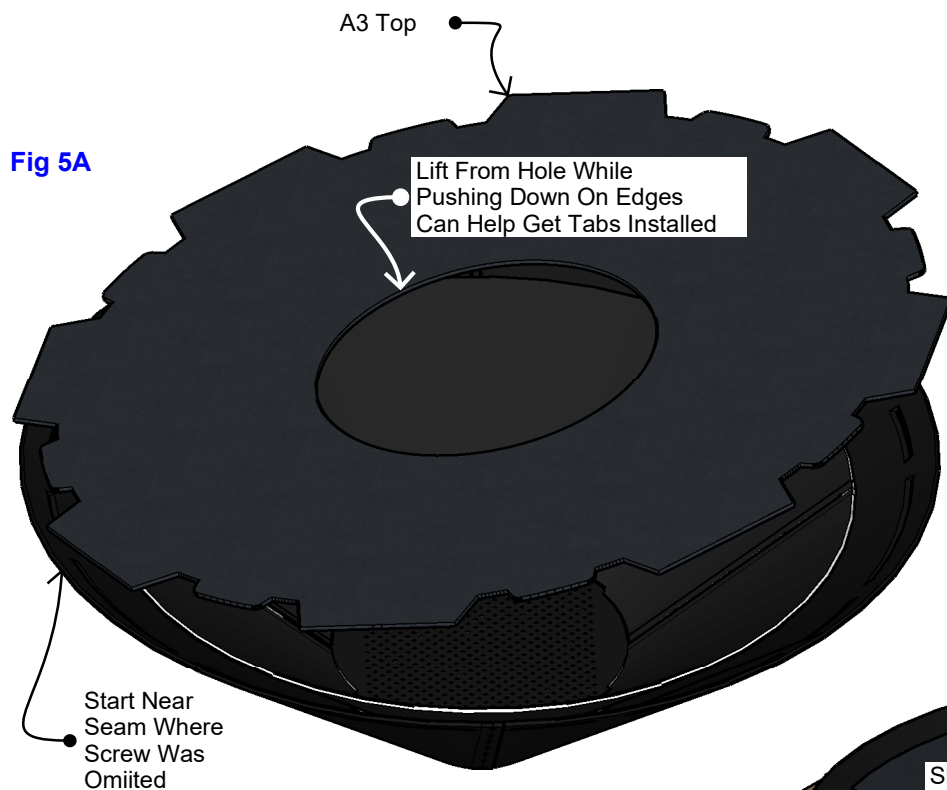


Fig 4B

See Fig 2A For Attach Point Illustration If Needed.

Screw heads and spacers (shown in white for visibility) sit between cones to keep them apart.

Fig 5A



A Force fit A3 Top into slots of Cone Assembly starting near seam. Fully insert each tab working back and forth until top is lodged into place. Lifting center of lid up while forcing a tabs into place can help. Do not worry about harming plastic. Strong hands are required.

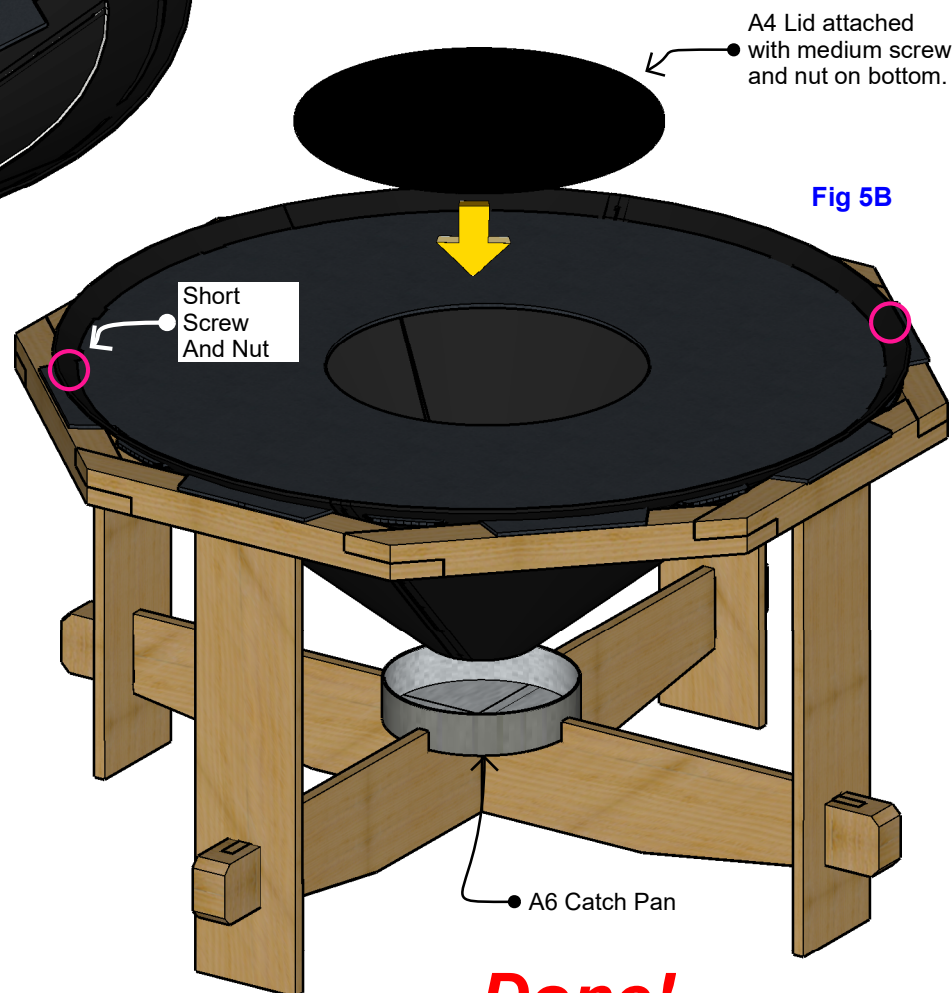


Lid fit is tight as weight of full cone hangs from the tabs around the octagon frame. Work tabs fully into slots before moving to the adjacent tab, then moving back to other side to "work" the lid into tab slots fully. Make last tabs to insert along a seam.

B Now, install a short black nylon screw and nut in upper holes of A2 assembly.

Using medium black screw and nut, affix A4 Lid over opening of A3 Top installing through hole in each. Hand tighten.

Place A6 Catch Pan in position under cone.



Done!

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Lid & Catch Pan

Step
05

Use Guidance

See www.roostandroot.com/product/grubcone for additional details.

Where To Put Your GrubCone™

For your GrubCone™ to work there are several environmental considerations. (1) Shade (2) No rain (3) Moderate temperatures (4) Access to the outdoors. On a covered porch, under an awning, a carport, in a room with a window or door opened to the outside are several examples of locations that could work. Daytime temperatures are best not to exceed 100°F and nighttime temps not below 70°F will produce optimum results. Moderately higher and lower temps can produce less than optimum results. Continued extremes from this optimum range can halt production.

Establishing a BSFL Colony

Black Soldier Flies are indigenous to most areas of the US except extreme North areas subject to seasonal temperature limitations. If you will fully load the cone to the top side walls of the inner cone you will attract Black Soldier Flies. This phase will take from 3 to 6 weeks depending on your locale. During this time, nuisance flies (and other insects) and stronger odors will be present. Against belief, a fully established colony does not smell and nuisance flies naturally want nothing to do with an established colony as the larvae consume the flies eggs.



Initial loading of GrubCone™.

What To Put Into Cone

BSFL will feed on organic waste. The obvious organic waste in most of our lives is food waste. Food scraps and rotten food that you would throw away is prime. Fruits and fruit peels work best. Meats and vegetables work well too. Coffee grinds and tea bags are great. Chicken bones will work in an established colony but aren't good to establish. Fish scraps are great. Molded bread? Perfect. You get it. **Add water if needed to keep very moist, but not soggy wet.**

We will not recommend using human or animal waste... even though it would work.

SOME paper soaked in food "juices" can work (corrugated cardboard can work) but in general, BSFL do not eat paper.



Adult Black Soldier Fly.

What Happens Next

Adult Black Soldier Flies (technically mouthless wasps) come and lay their eggs on or near the food in the cone. Adult flies only live 10 days. Three to six weeks later, you will notice larvae (aka grubs) on the waste in the cone. Mature larvae, in an attempt to escape the heat and pupate into adult flies, will climb up the inner cone walls or burrow down through the holes in the floor, and either way, fall into the catch pan.



Immature larvae.

What To Do With Grubs

There are several things you can do with the grubs you find. If you have chickens, feed them as treats. They can be fed to other birds and larger fish. Got a pig, feed them too ;-). You can sprinkle on ground or in a tray for local wild birds. You can just throw them back into the GrubCone™ and they will eventually pupate.



Mature grubs.

Adding More Food Scraps

You can fill up the cone with as much food scraps as the cone will hold. A fully active GrubCone™ can consume 2 lbs or more of scraps each day with a grub production of about 1:5. Leave lid cracked open a little in hotter climates or for hyper active colonies. Adult flies get in through holes in sides or around top tabs... or a small crack in lid.

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Basic Use

Use Guidance (continued)

Shutting Down Your GrubCone™

At the end of the season, snap out the top of the GrubCone™ and empty the "fry" into a garden or spread as top soil. Wash and store for next season.



A more Complete List of What We've Put In A GrubCone™

- Any and all vegetables or vegetable scraps rotten or not.
- Any fruit scraps, rotten or not.
- Any meat scraps edible to humans or not.
- Coffee grinds
- Breads, rotten or not.
- Garden trimmings
- Grass clippings (so so)
- Chicken bones
- Fish heads and guts
- Dead chickens (see not on what does not work)
- Chicken poop
- Rotten animal feed

Some Things We Know Don't Work So Good In A GrubCone™

You're not like going to break a GrubCone™ but over the years we've learned some limitations.

- Watermelon rinds don't work so well.
- Avocado skins
- Quills in feathers do not go away. Rest of bird does.
- Paper does not work.
- Paraffin
- Mammal bones go away slowly.
- Fish bones, not so much.
- Mammal feces. There are pathogen concerns that are complex. You're a mammal :-)



Notes:

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Basic Use (continued)