

**Disassembly & Cleaning of Ringed 2 Cycle Alcohol Fueled  
Engines**  
**1/16/08**

Engine running tired? Doesn't perform as well as it used to? Been in storage for a while? Turns over with difficulty when starting? Problem could be a varnished engine due to congealed oil in the bearings, cylinder and piston ring. With a little time and minimal effort, the engine can be cleaned and brought back to life with no replacement of parts.

**Disassembly:**

1. Remove carburetor, engine head, head gasket (if there is one), back plate, and muffler. If the back plate has an O ring, remove it.
2. Remove the cylinder by gently prying under the flange with a screwdriver. If it is stuck as it usually is, don't force it. You're bound to gouge things if you try too hard. Pre-heat an oven to about 250 degrees and place the partially disassembled engine in to "soak" for 10-15 minutes. Differential expansion between the Aluminum crankcase and steel cylinder will make removal of the cylinder much easier. Be sure you use an oven mitt when handling the hot engine. If the cylinder is still stuck, you can use a wood or plastic punch placed at the bottom of the cylinder to lightly tap out the cylinder from inside the crankcase. Be sure you're tapping the cylinder and not the piston skirt.
3. Mark the outside of the connecting rod so you will know how to put it back. Remove the connecting rod from the crank pin. This takes some fiddling. Rotate the crankshaft pin to the 11:00 o'clock position when viewed from the back of the engine. Lever the connecting rod off with a screwdriver. It will pop off.

**Cleaning:**

1. Find a 1- quart crock-pot and fill it with green antifreeze. A pot of this size will easily accommodate the engine parts and muffler of a .60 size engine. Put the temperature controls on high and heat the fluid. You might want to do this in a well ventilated area because of the vapors emitted in the "cooking" process
2. Put all the pieces of the engine into the pot, cover the pot and "cook" the pieces for about 3 hours. About every hour, remove the crankcase using barbecue tongs and spin the crankshaft by hand to loosen bearing crud. Use an oven mitt; the parts are hot!

3. After 3 hours of soaking, remove the parts from the antifreeze using barbecue tongs and wipe the parts with an old T-shirt. Most of the crud will easily come off. Anything that's left can be removed with light sanding using 600 wet/dry sandpaper. If the engine was really gunked up, a second soaking in the crock pot usually works to remove all varnished material from the surfaces.
4. Flush all parts with hot water and let dry.
5. Polish the outside of the cylinder with 600 wet/dry sandpaper. Using 320 or finer crocus cloth, cross-hatch the inside of the cylinder to aid in the oil distribution to the piston ring during initial operation of the engine.
6. Spray all steel parts (especially the bearings) liberally with WD-40.

### **Re-assembly:**

1. Place the connecting rod on the crank pin in the same orientation it was before disassembly (remember your mark?). Should go on easily with the crank pin at the 11:00 o'clock position.
2. Rotate the crank pin to the 6:00 o'clock position. Insert the cylinder into the crankcase until it meets the top of the piston. Make sure the cylinder exhaust port is aligned with the crankcase exhaust port. If the cylinder is hard to insert, pre-heat the crankcase/piston assembly in an oven at 250 degrees for about 10 minutes.
3. Seat the ring/piston into the cylinder by gently pushing and rotating the cylinder while holding the piston skirt straight with the cylinder walls from the bottom. The inside of the cylinder is tapered at the bottom to allow the ring to compress and enter the cylinder.
4. Install the cylinder gasket, if there is one, and bolt the head on. Install the back plate, carburetor, muffler and glow plug.
5. Run the engine on the ground in a rich condition for 1 tank full of fuel to seat the ring against the resurfaced cylinder. Tighten all bolts when the engine has cooled. Make 2 flights in a slightly rich condition to finish the breaking in process.

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