

SE-C2-kit : Supreme Coffee Stirling

Assembly Instructions

These parts are included with your Stirling engine kit:

1. Base Plate (12 holes around the circumference, material depends on engine type)
2. Top plate (12 holes around the circumference plus three holes of different sizes, material depends on engine type)
3. Two black rubber O-rings
4. Acrylic Glass Ring
5. 12 Brass Connectors (.12 inch diameter brass tubes)
6. 24 Stainless Steel Bolts (Phillips No 1 type)
7. Displacer Piston (colour depends on engine type)
8. Brass Displacer Piston Sleeve
9. Aluminium Flywheel Stand
10. Flywheel Stand Bolt
11. Brass Power Cylinder
12. Steel Power Piston and Steel Pin
13. 2 Silicone Tube Connectors
14. Flywheel Axle Assembly
15. Flywheel Spokes
16. Nut
17. Flywheel Rim
18. 2 Bearings
19. Displacer Push Rod Assembly
20. Displacer Piston Pin
21. Washers

These tools are needed for assembly and are not included with the kit:

- G. Two Phillips No 1 screw drivers
- H. One Phillips No 2 screw driver
- I. Super glue and possibly some acetone to remove excess super glue
- J. Non-dissolving household glue or epoxy resin
- K. Clean and dry piece of cloth
- L. One or two Q-Tips

Assembly:

- C. **Install the 12 Brass Connectors (5) onto the Base Plate (1) by using twelve (12) Stainless Steel Bolts (6).** Insert the bolts to the countersunk side of the plate and hold the brass connectors between two fingers on the opposite side. Turn the bolt with the screw driver as far as you can. You will probably turn the bolt for only half a revolution until you can't hold the brass connectors anymore. This should be sufficient to hold the connectors in place. (The brass connectors are not threaded. The thread will be forged due to the stainless steel bolts.) Now place the Base Plate on an even surface with the Brass Connectors pointing upward.
- D. **Place one O-Ring (3) on the Base Plate.**
- E. **Place the Acrylic Glass Ring (4) on top of the O-Ring.** Push the Acrylic Glass Ring down to evenly slide the O-Ring into the groove of the Acrylic Glass Ring. In order to create an air tight seal the O-Ring should look even all the way around.
- F. **Place the other O-Ring (3) into the groove on top of the Acrylic Glass Ring.**
- G. **Install the Displacer Piston (7).** First, glue the Displacer Piston Pin (20) into the center hole of the displacer piston (7). Use household glue that does not dissolve the foam or use epoxy resin. Make sure the pin is square to the displacer piston. Once the glue has set, insert the steel pin of the Displacer Piston Assembly into the small hole of the Brass Displacer Piston Sleeve on the lower side. Adjust the foam disk so that it is parallel to the top plate (perpendicular to the steel pin). Make sure not to bend the steel pin. Slide the Displacer Piston up and down several times to ensure free movement. It should slide up and down due to its own weight. In case it doesn't, clean the steel pin with a dry and clean piece of cloth and possibly a degreasing solvent. In this case make sure not to dissolve the foam displacer.
- H. **Mate both Plates** by placing the top plate assembly on top of the base plate assembly. When doing this hold the steel pin of the Displacer Piston to avoid that the Displacer Piston falls out of the sleeve until the Top Plate is in place.
- I. **Complete the Main Chamber Assembly.** Start out by inserting two opposite bolts (6) on the upper side. Tighten the two opposite pairs of upper and lower bolts with two screw drivers just until both O-Rings and the acrylic glass ring stay in place. Then complete the assembly by inserting the remaining 10 bolts and tightening each pair. It does not take much tightening of the bolts to achieve an air tight fit. Too much tightening will just result in a curvature of both plates and possible cracks in the acrylic glass. (You can easily check air tightness later by inserting the Power Piston (12) into the Power Cylinder. If the Power Piston "jumps" on the enclosed air cushion, the main chamber is air tight. If the main chamber is not air tight, the piston will almost "free fall" inside the cylinder.)
- J. **Install the Glass Power Cylinder (11) into the largest hole on the Top Plate** by using super glue. Apply an even amount of glue around the groove of the cylinder brass base. Then place the cylinder into the hole and turn it for approximately 90 degrees to even out the glue in the gap.
- K. **Install the Flywheel Spokes (15) to the Flywheel Axle Assembly (14).** Slide the Flywheel Spokes all the way over the Axle. Also slide the Nut (16) over the Axle and tighten. Typically the spokes have a "nice" side. You may want to turn this side to the front of the engine. Although, this does not have any effect to the engine function. Slide one Washer (21) over the Axle.
- L. **Install the Bearings (18).** Insert the bearings into both sides of the Aluminium Flywheel Stand.
- M. **Install the Flywheel Shaft Assembly** by sliding it into the bearings previously placed into the Flywheel Stand. Slide the Flywheel Shaft Assembly all the way through until the washer touches the bearing. Slide two or three more washers (21) over the end of the shaft on the opposite side of the Aluminium Flywheel Stand. The number of washers used should be chosen so that you still leave some minimum "play" for the Axle to shift. Zero "play" will probably result in unnecessary friction.
- N. **Install the displacer push rod assembly (19) to the shaft.** The offset between both push rods should be 90°. It does not matter which way you install the offset since this only determines the flywheels direction of rotation. Use a small drop of super glue to keep the displacer push rod assembly in place.
- O. **Install one Silicone Connector (13) between the Displacer Piston Steel pin and the push rod.** Set the distance so that the displacer does not touch the Upper or the Base Plate during a full revolution of the Flywheel.
- P. **Install the other Silicone Connector (13) to the Power Piston (12)** by sliding it over the pin a little less than half way.
- Q. **Insert the Power Piston (12) into the Power Cylinder (11).** Prior to doing this the Power Piston and cylinder should be cleaned carefully from hand grease and other possible contamination. Use a clean and dry cloth for the Power Piston and a Q-Tip for the inside of the Power Cylinder. Only touch the Power Piston at the pin thereafter. Once the Power Piston has been inserted into the vertical cylinder it will start sliding down slowly due to its own weight at a slow rate. In case it almost free falls the engine housing is not air tight.
- R. **Install the Flywheel Rim (17)** by "clicking" it over the spoke tips. The Flywheel Rim cross section is asymmetrical. It can only be installed with the large diameter sliding over the spoke tips. Start by placing two spokes into the groove of the Flywheel Rim. Then carefully move the remaining 5 spokes towards the groove. The direction of inserting the spoke tips should follow the direction of where the curved spokes are pointed.
- S. **Connect the Power Piston** with the push rod by sliding the Silicone Connector over the push rod end. Set the clearance between the Power Piston steel pin tip and the push rod tip to approximately 1/8th of an inch to assure good flexibility of the connector.

For Technical advice, please contact us :
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