

BEARINGS, SERVICE & ASSEMBLY

IMPORTANT Bearing maintenance is important. You should replace bearings **ONCE PER YEAR** or as soon as you notice any looseness from wear. If they are too loose, severe damage to both the rotor and the stator can result. Check the clearance often making sure you can insert two business cards (or something the same thickness) between the rotor magnets and the stator if the machine is adjusted for maximum power. You can also raise the stator all the way which reduces the downward attraction of the magnets to make it easier to feel roughness or looseness in the bearings when turning the rotor by hand. Even if the bearings are not worn, changing them once per year will help keep the area free of corrosion and make future bearing changes easier. This machine uses three stainless steel 6203 ball bearings with contact seals.

Bearing changes will be easier if the rotor is first raised as far as it will go as this will reduce the magnetic attraction. See the section on output adjustment for this.

First, the turbine runner must be removed. The Stream Engine can be equipped with either of two types of turbine runner, the standard turgo or the low-flow runner. The turgo is removed from the shaft by first securing the magnet rotor on the top of the machine from rotating using the supplied ¼" diameter steel pin inserted into one of the holes in the edge of the rotor. Then the turgo runner can be unscrewed from the shaft by turning it in a counter-clockwise direction, just like a nut would be. If you cannot hold the runner securely with your hands, you may have to drive wooden wedges between the runner edge and the housing to keep it from moving and then turn the rotor. The low-flow runner can be removed by unscrewing the center bolt using a 5/16" (8mm) Allen wrench. With either runner removed, you will now have access to the four 7/16" (11 mm) nuts that secure the generator to the housing. Once the generator is removed, you will need to unscrew the stainless steel shaft adapter in the case of the low flow runner by turning it with the supplied longer pin. Now you can proceed to remove the shaft and magnet rotor of either type of machine by following these directions:

1. Lift the shaft and rotor assembly out of the generator stator (the black plastic part). This may require extra force like the use of a press if there is corrosion.
2. Unscrew two 7/16" (11 mm) bolts and washers that retain the bearings (older machines have 4 Phillip head screws).
3. With the Stream Engine sitting inverted, push out the bearings from the housing or tap the bearings out with a block of wood. This may require a press in some situations.
4. Insert new 6203 bearings. Using stainless steel bearings will keep corrosion to a minimum, extend bearing life, and make future bearing changes easier.
5. Reassemble.

Note: Replace the washer and the spacer above the turgo or the shaft adapter with the spacer above the washer as shown in the following pictures.

NOTE: BE VERY CAREFUL HANDLING THE ROTOR ASSEMBLY. THE MAGNETS ARE EXTREMELY POWERFUL AND WILL ATTRACT ANY NEARBY STEEL OR IRON OBJECTS. AVOID PUTTING FINGERS WHERE THEY COULD BE PINNED BETWEEN THE MAGNETS AND ANY STEEL OR IRON.

Pin inserted to hold rotor



Unscrew turgo wheel



Turgo removed



Turgo with its washer and spacer



Low flow wheel with center bolt



Unscrew center bolt with 9/16"(14mm) socket or wrench



Shaft adaptor of low flow wheel



Remove generator mounting nuts and washers



Generator removed for low flow version



Remove low flow wheel shaft adaptor



Shaft adaptor, washer, and spacer

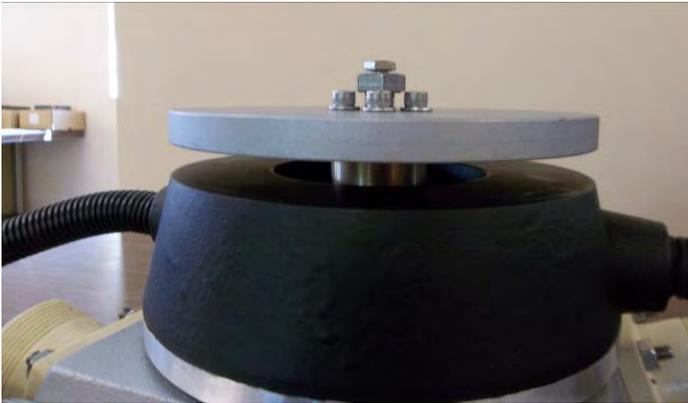


Once either style of wheel is removed the rotor should be raised until the magnetic attraction is low enough to separate the rotor from the stator. This is more easily done if the generator is placed back on the housing.

To increase this distance and reduce the magnetic flux level, first insert the 1/4" pin supplied in one of the holes in the edge of the rotor. Then the smaller 7/16"(11 mm) head bolt is loosened while using the pin to keep the rotor from turning. Now you can turn the larger 3/4" bolt, which will force the rotor up. Each full turn of the bolt will move the rotor vertically 0.050"(1.25 mm).



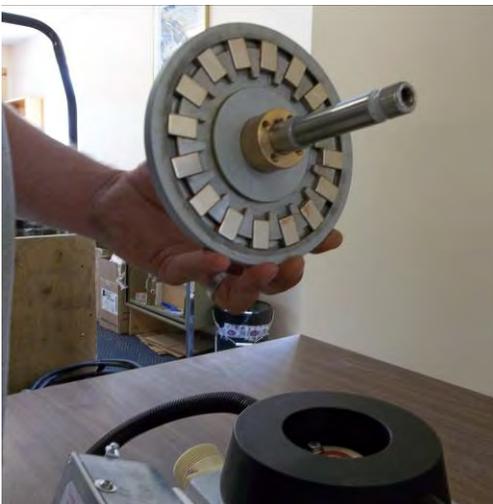
Rotor raised



Carefully lift rotor



Magnetic rotor shaft hub assembly removed



Remove bearing retaining bolts



Invert stator to remove bearings



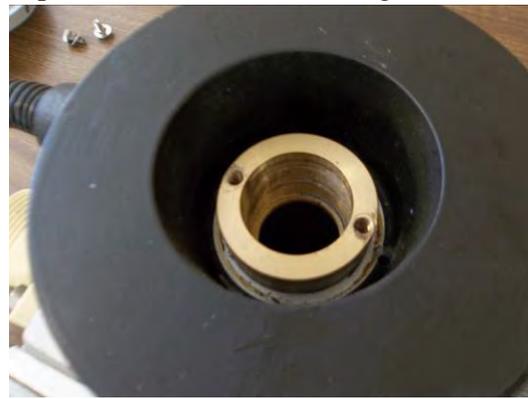
Carefully tap with a piece of wood if needed



Bearings removed



Top side of stator with bearings removed



Clean bearing carrier



Press in 3 new bearings



Bearings inserted, reassemble



If low flow version, replace shaft adaptor



Be sure to replace spacer first, then washer



Spacer and washer placed



Shaft adaptor replaced



Tighten shaft adaptor



Readjust height of rotor



Lowering rotor height and locking in place. Final adjustment for power output should be done after the turbine is reinstalled and the power output is read with the digital multi meter.



Minimum rotor height air gap at least 0.020" (0.5mm)

Generator replaced, ready for runner



Replace turgo runner, hand tighten

Replace low flow runner with center bolt, tighten bolt



**** Always turn the rotor by hand before starting the machine to check for rubbing**.**
Remove the pin in the rotor edge before starting the machine.