
**TOOLS NEEDED**
- Phillips Screwdriver
- 600 Grit Abrasive Paper or a Nail File
- Cutters

**PARTS NEEDED**
- Two 2.5 x 8mm (small) Screws
- 12 Neodymium Magnets [nee-oh-dim-ee-uhm]
- 18.2g (.04lbs) of Magnet Wire 30awg Standard
- One Rotor
- One Stator

**1. MAGNET MARK**
It’s a good idea to mark the same pole/side on each magnet as you take them apart, or on the TeacherGeek magnet alignment block.

**2. ROTOR BUILD**
Snap magnets around the rotor, alternating magnet polarity.

**TIPS**
- Use a table with a sharp edge to break magnets apart.
- Magnets can be removed by gently pushing them up and out with a straight screwdriver.

**3. STATOR BUILD**
Turn two 2.5 x 8mm screw into neighbouring stator holes.

This guide will take you through the process of creating a standard single phase alternator. Other alternator configurations can be found at TeacherGeek.com.

Alternator Construction

Stator [stey-ter]
The portion of the alternator that remains fixed. An electrical current is induced in its coils when rotor magnets pass.

Rotor [roh-ter]
The rotating member of the alternator containing a circular array of magnets.
3A. Get Your Wire

How much wire do you need? One stator needs around .04lbs (18.2g) of wire. Use the chart below to find the length you will need and the total number of wraps you should have on each stator coil.

If you have a turbine 12 Pack, you will have to split/share the provided wire between stators.

3B. Remove Insulation

Scrape, Sand or file .75in (19mm) of enamel off the end of the magnet wire.

3C. Wrap the Coils

Label each stator tooth with a number and arrow indicating the coil wrap direction.

Wrap the un-insulated wire end around terminal “A”. Then neatly coil the wire around each stator tooth. The chart aside recommends how many wraps to have on each coil. When you have finished coiling around all stator teeth, trim and remove insulation from the wire end and wrap it around terminal “B.”

Alternator performance changes based upon the gauge wire used and wraps per coil.

The arrows show the direction to coil the wire around each stator. Notice that every other coil is wound in the opposite direction.

<table>
<thead>
<tr>
<th>Gauge</th>
<th>Weight</th>
<th>Length</th>
<th>Wraps per Tooth/Coil</th>
</tr>
</thead>
<tbody>
<tr>
<td>28</td>
<td>.04lb</td>
<td>90ft</td>
<td>30</td>
</tr>
<tr>
<td>30</td>
<td>(18.2g)</td>
<td>190ft</td>
<td>50</td>
</tr>
<tr>
<td>32</td>
<td></td>
<td>230ft</td>
<td>60</td>
</tr>
</tbody>
</table>

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4. Prepare for Mounting

Insert two #10 x 1in machine screws and ream the center hole. This will prepare the stator for mounting.

Ream using one of the following:
1. TeacherGeek Reamer (best)
2. 15/65 or 6mm drill bit

! Note: Only ream the center hole. Do not ream the rotor, or any other hole.

Your alternator is now ready to be put on a turbine or attached to a gearbox.