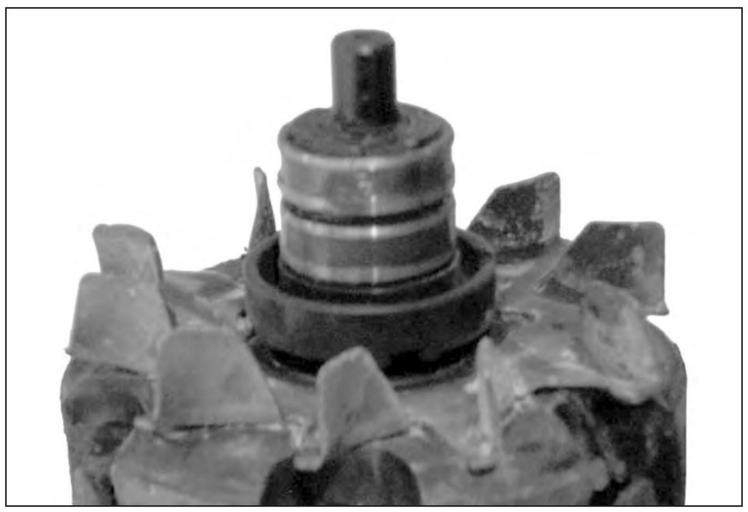
Keeping Lead Secure When Replacing Slip Rings

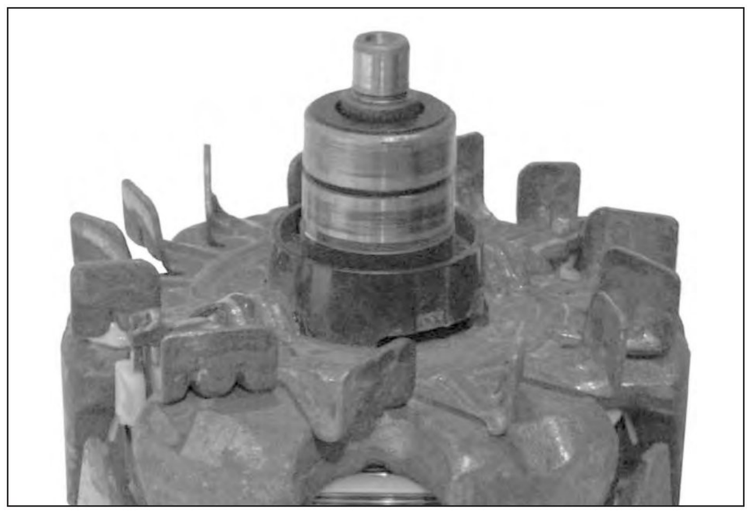
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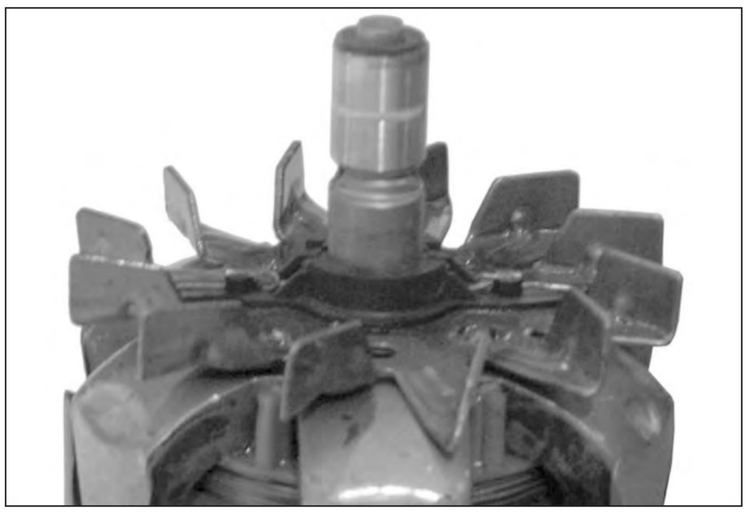


Slip ring replacement is a bigger part of your business than ever, and with the ever-increasing cost to replace a rotor and the short life of some slips, here are some simple mechanics to remember.

1. Test the rotor to ensure it is worth replacing the slip rings. We recommend reading amp flow, magnetic strength and doing an AC Hi Pot test at 500 VAC. After you have determined that you will be replacing the slip rings, cut the leads that come out of the pole pieces about one-quarter of an inch from the OEM weld or solder connection. This will give you a good surface to connect the new slip ring to.
2. Disconnect the leads from the slip ring to cut coil connection from the pole piece. Sometimes this may require cutting a slot through the steel fan with a Dermal and a cut off wheel. Some slip ring leads are held in place by a plastic upright protrusion, which can be cut right above the wire. This allows the lead to be easily pulled through the cut and when reassembled this plastic can easily be melted back together with a soldering iron or gun or reassembled with epoxy.
3. Measure and record the position of the inside slip ring to the pole piece or the end of the shaft and then remove the slip ring. Sometimes it pays to deepen the slot cut between the two segments in the slip ring, so you have an easier place for the puller to fit (bearing splitter type). Slip ring removal requires a bearing separator and a two-jaw puller, a bearing splitter and a timing gear puller, a Jiffy Puller and a plate or two pry bars.
4. This step is very important and must be done. Clean the surface where the new slip ring will be located on the pole piece and/or fan. Sand blasting can be used to enhance the adhesive characteristic of the epoxy that will hold the leads in place. We recommend using a Dermal tool with a coarse wire wheel on it and then using 40 grit sandpaper to rough up the surface. Then clean the area with a fast drying non-petroleum base cleaner like isopropyl rubbing alcohol. This will ensure the best possible bond for the epoxy or cement you will be using. If this is not done, the epoxy will lift and crack.
5. Clean the contact point on the old connection that comes out of the pole piece.
6. Cut the new slip ring leads so they will overlap the connection that comes out of the pole pieces for a better connection when soldered or silver soldered.
7. If you are going to solder the new slip ring to the old connection, tin (flux and melt solder over the connection surface) both slip ring leads and the old connection to the rotor coil. It is good to remember that some slip rings use steel instead of copper for the slip ring leads and the tinning process is a must in this situation. If you are going to silver solder the new slip ring in, make sure there is no solder on the surfaces to be silver soldered. Special note: Most solders like 40/60 and 60/40 melt at approximately 360 degrees F. These melting ranges are not working on some applications today. There are solders that will take this temperature up to over 800 degrees F and are still







easy to flow with standard soldering tools like 97-tin/3-copper which melts at approximately 480 degrees F and/or silver solder which melts at approximately 1300 degrees F. If you have not yet seen our DVD on the latest in soldering techniques, it would be worthwhile to get one. It will show you all of the soldering processes used in our industry.

8. To install the new tinned slip rings, position the slip ring over the shaft so the leads line up with the leads coming out of the pole pieces. Using a pushing tool that just clears the rotor shaft OD install the slip ring. For the best results an arbor press should be used. A spacer may be necessary to protect the fan on the pulley end. Use the dimensions you recorded in Step 3 to ensure the correct slip ring position.
9. Form the slip ring leads as tight as possible against the fan or pole piece, and position the leads for easy soldering. Make sure all of the surfaces are clean.
10. Since the soldered surfaces are pretinned, all that will be required for the solder connection is holding these connections and heating them up until the solder flows and then holding them together until the connection cools. If silver soldering, there are special tools available to hold the connections in place and melt the silver solder.
11. After soldering or silver soldering, clean the surfaces where the slip ring lead will contact the pole piece and/or fan again.
12. There are many epoxies available to hold the slip ring leads in place, make sure you are using a rigid set epoxy that will hold up to 250 degrees F and will not be affected by gas or oil. Many of the epoxies on the market today will not meet these specifications. There are ceramic cements available that will hold in excess of 1000 degrees F if the application requires a very high temperature. Make sure you let the material completely cure—not just set up—or it will de-bond and come loose.
13. Re-insulate using varnish, spray insulation or sprayed epoxy. Pay specific attention to the coil and bobbin area inside the pole pieces.
14. Turn and polish the slip rings and then retest as in Step 1.
15. Do not remove any pole piece material from the rotor OD.

The key things to remember are that the surface must be rough for the epoxy or cement to stick properly and to let the epoxy or cement cure completely. Rotor balance is also important, so keep the applied material as even side to side as possible.

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