

A (Relatively) Economical R107 Blower Unit Rebuild

A Step-by-Step Tutorial by GlueckAuf

Few major components on the Mercedes-Benz R107-series roadsters are as needlessly expensive to replace rather than repair as the climate control system's heater blower motor assembly. The only part that's subject to wear and tear is the electric motor that turns two fans, which in turn drive air from the cars external vents into the climate control system.

The motor itself is relatively inexpensive—as Mercedes parts go, anyway—at less than \$150 from several sources. But as many owners have discovered, it's removing the two centrifugal fans from the old motor and reinstalling them on the new motor that has proven to be the most challenging—and *expensive* when it went wrong—step in the process.

Because of their press fit and spokeless, puller-defeating design, breaking one or both of these fans is all-too-easy to do. Unavailable individually as a spare part, the fans are very rare and thus very costly on the used parts market. Breaking one can nearly quadruple this job's cost as usually the entire heater blower unit must then be purchased.

This guide will show you the technique I successfully used to recently rebuild my own, original heater blower assembly on my 1987 560 SL, the center point of which is the *easy* and *safe* transfer of your original fans from the old motor to the new.

To perform this job you'll need the following:

1. **Replacement Bosch blower motor** (ADSITCO.com's part # 083-0714, \$134.10 with online discount, less shipping, as of this writing. The original German Bosch motor's part # is 0 130 063 021, while the Brazilian-made Bosch replacement motor's last three digits are ~013.)
2. **Phillips #2 bit screwdriver.**
3. **Socket wrench, 10mm socket, an approximately 10" extension, and a deep-well 13/16" (spark plug) socket** (the latter two are to be used together as a mandrel to press the first, leftmost fan onto its new motor shaft).
4. **Needle nose pliers**
5. **Workbench** with good lighting.
6. **Cooking pot and range**, large, at least 6" deep.
7. **Permanent marker** that can withstand boiling water.
8. **Ruler** with fine graduations (millimeters preferred).
9. **Kitchen sink, parts cleaning brush, and detergent.**
10. **Snap ring pliers** (preferred, but not essential if you have the needle nose already)
11. **Wire coat hanger**
12. **Wire cutters** capable of cutting a wire coat hanger
13. **Vise Grip** locking pliers, medium-size

Cautions:

- *This repair procedure involves immersing parts in boiling water and installing those parts by hand while they're heated to over 200 F. Use appropriate means, like temperature-resistant gloves, a thick rag, or the wife's potholders to avoid painful burns.*
- *Take the common-sense precautions to avoid causing a fire, like keeping flammable items well clear of the burner of your stove while working this step. Don't leave a hot stove unattended.*

Blower Motor Unit Removal

1. Remove air cleaner assembly and set aside. Cover the engine air intake to prevent foreign objects from falling into it.
2. Remove eight Phillips screws securing the blower motor access cover plate to the firewall. Carefully remove the cover plate and its rubber gasket, inspect them for damage, and set aside. **If either the cover plate or its gasket are cracked or torn, consider replacing them. This lid must provide a water-tight seal for the blower motor well or rain will enter, causing unseen, expensive, and difficult-to-repair rust.**



Figure 1. After removing the air cleaner and sealing the engine air intake, remove the eight Phillips screws that hold the heater blower motor well cover plate in place. Remove the cover and gasket. Unplug the blower motor cable.

3. Pull off the blower motor power cable from its receptacle. Remove two Phillips screws from the resistor block receptacle where it mounts to the firewall. Pull the resistor block receptacle from its mounting position and move it and its cable to expose one of the four blower housing mounting nuts beneath it.

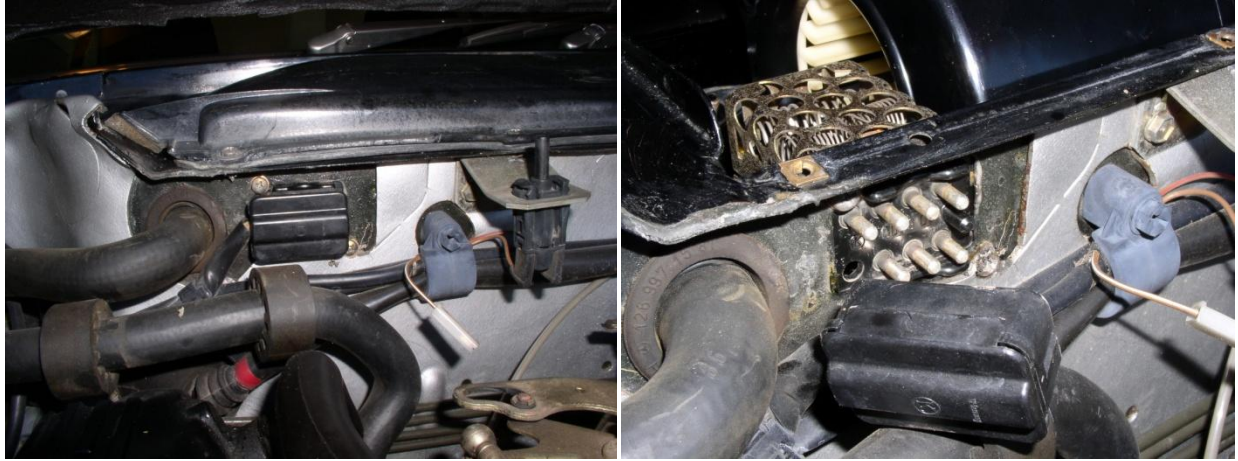


Figure 2. Unplugging the heater blower cable exposes the two Philips screws that mount its receptacle to the firewall. Unscrew these, pull the resistor block receptacle rearward from the firewall, and drape the cable out of the way.

4. Remove four flared base 10mm nuts securing each corner of the heater blower motor assembly from their mounting studs. If any of the nuts is rusted or stubborn, use penetrating oil to loosen them.



Figure 3. Four M6 studs hold the heater blower housing in the well. After blower unit is removed, inspect the condition of the rubber gasket. Look for and remedy any rust issues you discover, and give the well a good cleaning.

5. Lift the heater blower assembly, power cord, and resistor block receptacle out of the well. Tilt the back of the housing slightly upward to clear the well and the hood. Bring the assembly to the workbench.



Figure 4. Untouched for the twenty-three years after it left the factory, my '87 560 SL's heater blower unit was long overdue for a refresh. Noisy and arthritic in operation, one motor bearing was stiff and the other worn out with about $\frac{1}{4}$ " (6mm) of radial play at the fan.

6. Clean out any dirt, leaves, or other debris from the heater blower unit well and vacuum it out with a shop vac or household vacuum cleaner and soft brush attachment. Clean the AC evaporator fins if dirty, oily, or covered with debris with a small amount of odorless general purpose spray cleaner and a soft brush. Check the condition of the lower gasket and replace if torn, dried out, or cracked. Remedy any rust you find inside the well.

Blower Motor Unit Disassembly and Marking

1. Using needle nose pliers remove 8 small housing clips and set them safely aside. Using snap ring pliers (preferred) or by two-handed spreading your needle nose pliers, remove the large housing clips on the front center and rear center of the housing. *(Caution: The two large center housing clips are very strong, and simply prying them off risks cracking the plastic housing. It's safest to spread them with a tool first to relieve their considerable tension before removing them from the housing and likewise, when reinstalling them back on the housing. Wear eye protection.)*

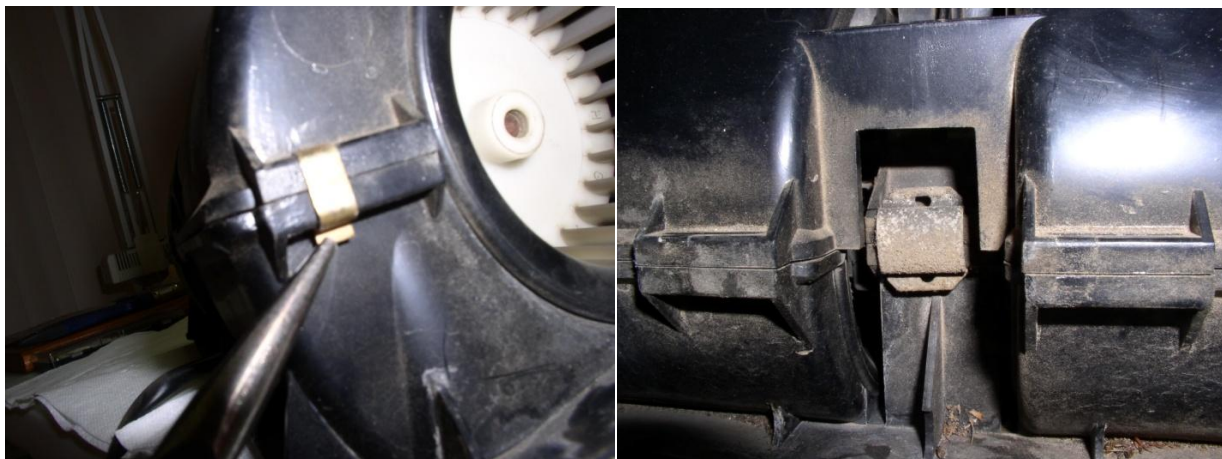


Figure 5. Remove the eight small and two large clips that hold the clamshell halves of the unit together.

2. Position the housing so its front is facing you. Use the permanent marker to mark both halves FRONT. Mark the left and right outer air intake guides OUTER-LEFT and OUTER-RIGHT. (Note that the flat edge of both goes against the *bottom* of the lower housing.)
3. Carefully raise the top half of the housing clear of the lower half. Be aware that all or parts of four guides—two, one-piece circular ones on the outsides; and two, split polygonal ones on the insides—may come off with the top of the housing.

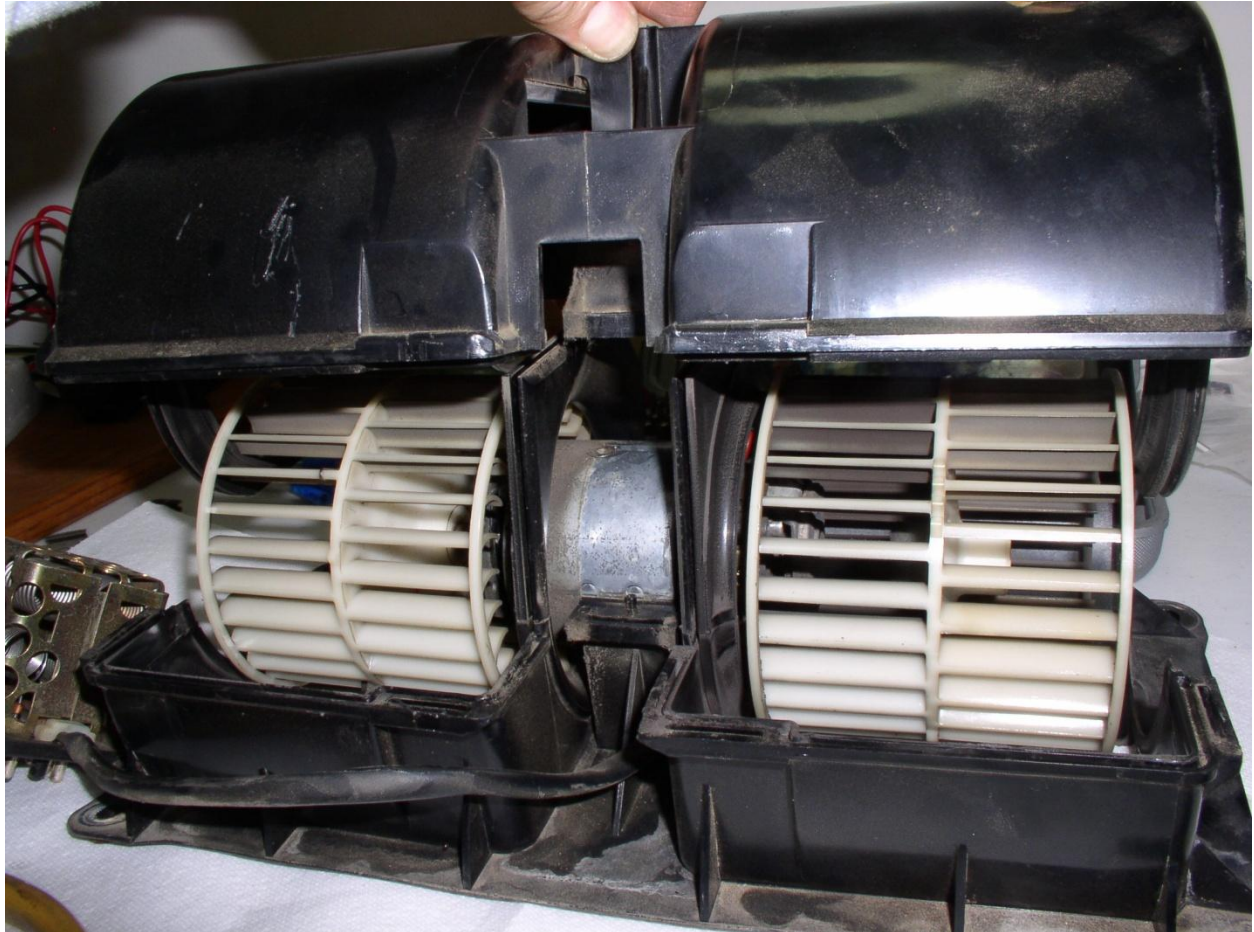


Figure 6. Separating the halves of the heater blower unit. Air intake guides (4) will either stick to the top or bottom half.

4. Mark the two inner guides' four parts INNER-LEFT-TOP, INNER-LEFT-BOTTOM, INNER-RIGHT-TOP, and INNER-RIGHT-BOTTOM with the permanent marker.
5. Inspect both fans' full 360-degree circumference for damage. **If there are any cracks, broken fins, or stripped hubs, the fans are unserviceable and must unfortunately be replaced.** Check e-bay or Mercedes parts providers for replacement parts or a new heater blower unit.
6. If serviceable, mark the fans with the permanent marker as follows to ensure a balanced reassembly:
 - 6.1. Mark the left fan LEFT and the right fan RIGHT.
 - 6.2. Mark OUTER on the outer halves of each fan.

- 6.3. Mark both fans with a single alignment arrow so that you can reinstall them in exactly the same rotational position on the shaft relative to one another (to retain factory balance).
- 6.4. Mark the position of each factory-installed balancing clip (in case one or more fall off while removing, cleaning, or reinstalling the fans.)
- 6.5. If needed, mark the left and right motor shafts at the place they enter the inside fans' hubs.
(Twenty-three years of fossilized dirt build-up sufficed for me.)

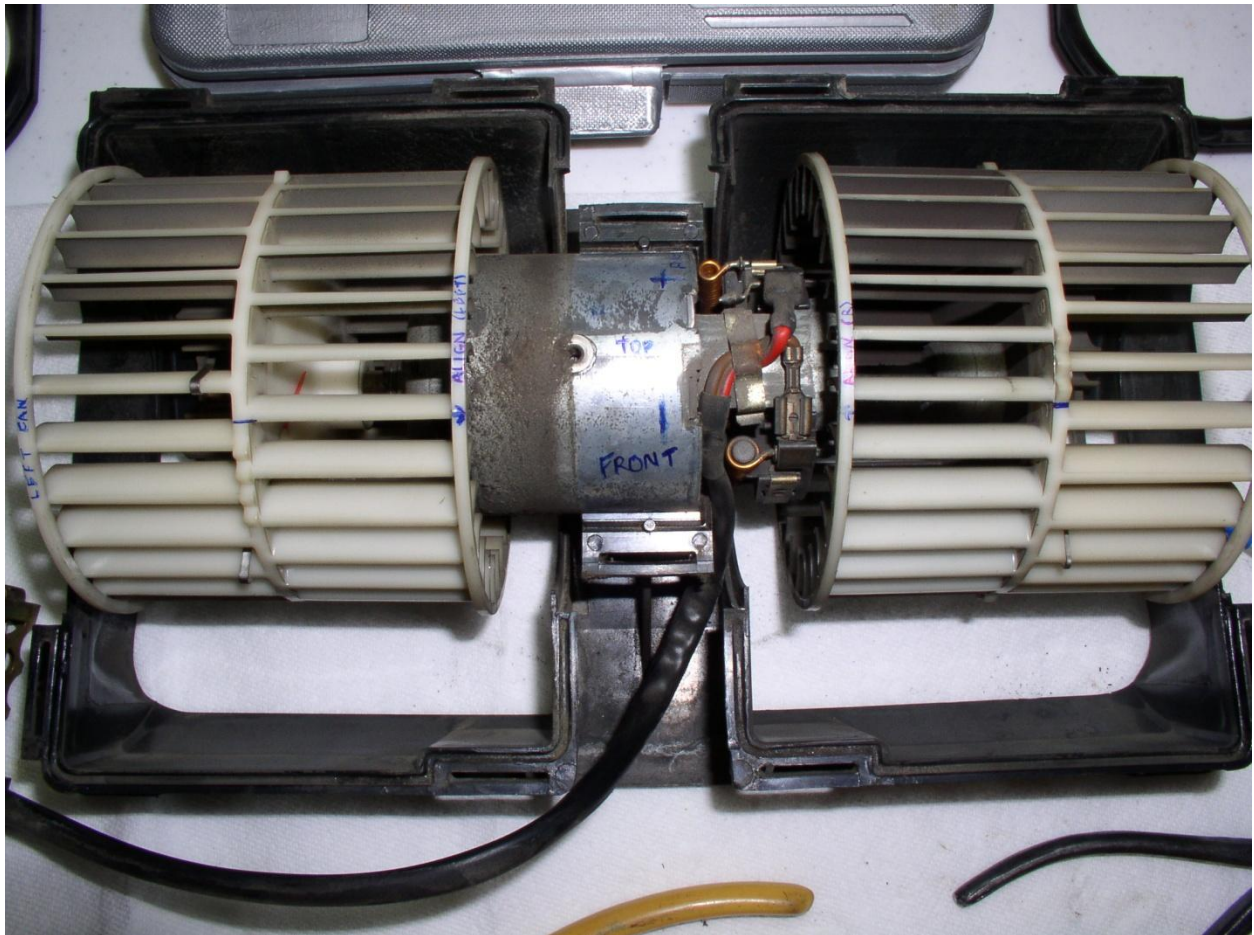


Figure 7. Mark everything to aid a proper and balanced reassembly. (Air intake guides removed for clarity)

TIP: A digital camera is a great aid to capturing the important details of the original fan alignment and balance and the housing's proper assembly. Take lots of shots of the housing, the fans, and the guides for reference when assembling.

7. Set the upper housing half and the guide pieces safely aside.
8. If not already removed, take off the pinned, upper halves of the inner guides and set them aside.
9. Lift the fans and motor and attached power cable/resistor block receptacle from the lower housing and set it aside.
10. Remove the spring clip from the motor that holds down the power cable. Carefully remove the male and female spade connectors from the old motor. (Per the pictures, I left my motor's power

cable and resistor block receptacle in place, but it made fan removal a little more difficult than it had to be.)

Clean up all parts

1. Wash up all housing parts in hot soapy water, rinse, and allow to dry. A parts cleaning brush will help get the decades of dirt out of the nooks and crannies.



Figure 8. Wash all parts gently, but thoroughly. They accumulate a lot of crud in twenty plus years.

2. Clean up the 10 housing clips and account for all of them before you drain the sink.
3. Do NOT immerse or wash the resistor block receptacle. Only wipe off its outer surface and its cable with a damp cloth.
4. Renew your fan markings if the washing faded them.

Fan Removal and Reinstallation on the New Motor

1. Moving to the kitchen, bring a large pot of tap water to a full boil in an old pot the wife won't crown you with if you ruin it with car crud.
2. Immerse one fan into the boiling water up to the top of its hub, allowing it to heat up for about two minutes, holding the opposite fan securely by its reinforced center section.

Cautions:

- ***Avoid applying pressure to the fragile fins or either end of the fan! Hold fans by center only.***
- ***Do NOT allow the fan to rest on the bottom of the pot where the much higher temperature of the metal, vice the boiling water, may melt or distort the plastic fan.***

3. Withdraw the fan from the water, quickly wrap its center with a rag or pot holder to protect your hands from the heated plastic and drips of boiling water, and, holding against the reinforced center section of both fans, counter-rotate the two fans against one another while gently pulling the

heated fan toward the end of the shaft as you turn it, as if unscrewing it from the shaft. The heated fan should turn relatively easily at first, but will become more resistant as it cools. Work quickly, but don't use excessive force to twist or pull on the fan, lest you risk breaking it. If the fan gets too difficult to turn easily, heat it again for a few minutes in the boiling water and resume turning it off of the shaft until it's free.



Figure 9. Boiling water expands the plastic fans at a safe, controlled temperature, 212 F (100C), allowing them to be removed from the motor shaft without the excessive, ill-applied force that often breaks them--and your wallet!

4. Clamp Vise Grip pliers very tightly to the now-vacant shaft, immerse the opposite fan into the boiling water, and repeat the previous Step 3 on the second fan. **NOTE: This may leave burrs on the motor shaft—okay if you're discarding the old motor, but you may want to use an alternate method such as a soft-jawed vise, if you're reusing, rebuilding, or exchanging the old motor.**
5. Once removed, clean up the fans using a soft brush and a soft touch. Each fan has some number of small metal balancing clips that were installed at the factory. Be careful not to push them off while cleaning. Do not drain the sink until you account for all of the clips. If one or more has fallen off, determine its location by the marks you applied earlier and return it to the correct fin.
6. Return to the workbench with the old motor
7. Lay the old and new motors side by side on the workbench and measure the depth the fans were originally mounted on the old motor as evidenced by the residual dirt or your previously-made mark. Mark the *new* motor's shaft at this same depth with the permanent marker. Double-check the marks' accuracy, and then return to the kitchen with the new motor and a 13/16" spark plug socket inserted into a long extension.