Repairing the E-Class Seat-Control Switch

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Photos in this article by the author.

Invest a little time, and save yourself $130.

It's often appropriate to toss a failed automotive part into the recycling bin, but that can be a waste. One such case is the seat control switch assembly in the inside door panel of 1996–2003 E-Class cars. These switches, particularly the forward-back switch, are used often, so they eventually break. A replacement costs about $130. After a failed seat-control on our E320, we decided to try a repair before buying a new unit.

For instructions on removing the inner door panel, which contains the seat control, see "Working on E-Class Doors" in our May/June 2003 issue. Once you have the door panel off, flip it over and find the black plastic seat-control module. You had to unplug the seat-control cable from it to remove the panel from the door. The module is held in the panel by four spring catches near its four corners and sticking above the flat terrain (Figure 1). Pulling upward on the module, actuate the catches individually, using a thumbnail to push them inward; on the fourth actuation the module will spring free of the panel.

Figure 2 is a front-view of a left-side unit; the right-side is a mirror image. This collection of five seat-control switches is a fine example of good ergonomic engineering. It's shaped like a side-view of the seat, and to move the seat you simply move this effigy as you want the seat to move. It is simple, direct, requiring no written instructions or legends on the switches. The three memory push buttons, in a vertical column behind the seat-effigy, are lit by yellow LED's integral with the switches and are unlikely to need replacement.

To reach the inner workings of the module, individually actuate 10 spring-catches around its periphery (early examples use three small Phillips screws). These catches, unlike those holding the module in the door, are not obviously placed but are visible, deeply recessed behind small slots in the four sides of the module. Using a small-bladed screwdriver, press each catch inward while exerting upward force on the lid. The back of the module, which must be so removed, is shown in Figure 3.

Eventually the lid will break free, and you will see the back of the circuit board (Figure 4). To remove the board from the module and see the switches, just pry off the headrest button. Using two small-bladed screwdrivers, one under the top and one under the bottom of the headrest effigy, pry it off gently. The circuit then falls out of the shell, and you can see the workings of this engineering marvel. At first it's disappointing—just five double-pole/double-throw momentary toggle switches and four push-buttons. There are no active electronics here (Figure 5).

The question is, what broke? Why does the forward-back switch, the middle one in the lineup at the bottom of the circuit, no longer actuate the seat motor? Turns out this same failure-mode affects many circuit boards in Mercedes-Benz cars—a solder-joint is cracked. One of the four pins on the forward-back switch no longer makes perfect contact with the circuit, as the solder bonding it to the board has succumbed to metal fatigue. A quick touch with a soldering iron, using a tiny amount of lead solder, and the seat-control switch assembly is repaired. You can find these failures and confirm repair using an ohmmeter. Measure the resistance between each pin and another node in the circuit connected to the pin by printed wiring. If you see a difference in resistance between the pin and the solder holding it, you have found the failure.

It's usually possible to see the crack in the solder, but in this case the fault was extremely subtle, so we used a microscope (Figure 6). The failure is just below the number 2 on the circuit board in Figure 4. In the microscope you can see that the solder stratified when it cooled during manufacture, becoming a weak point. Look closely, and you may see a hairline crack on the lower side of the solder blob. This was not an obvious failure; a brief, naked-eye examination would not have found it.

The module reassembles easily. Just drop the circuit back into the shell, snap the lid back on, and push on the head-restraint knob. The module then snaps back into the door panel.

This was an easy fix, but eventually one of the toggle switches may fail. In that case, you can use another failed unit to make one operational unit. Find a good toggle switch on a junked module, de-solder it from the circuit board, and solder it into the unit to be repaired. When a new one is $130, anything is possible!

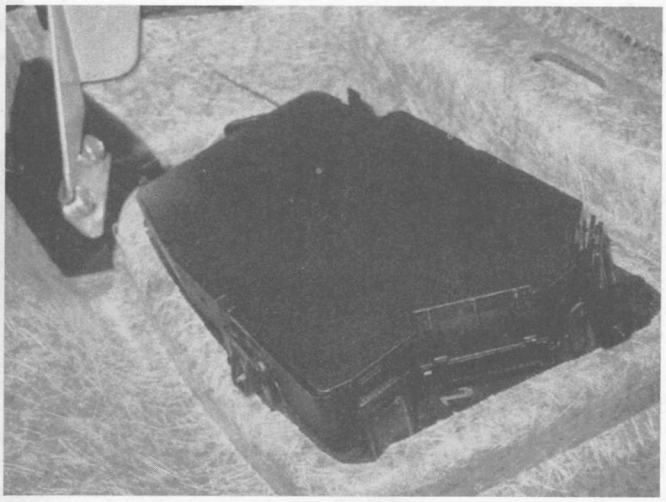

Figure 1. Freshly removed from the door, the switch module is visible, clipped into the back of the panel. It comes out easily by pressing four latches.

Figure 2. The module is a marvel of ergonomic, if not electrical, engineering.

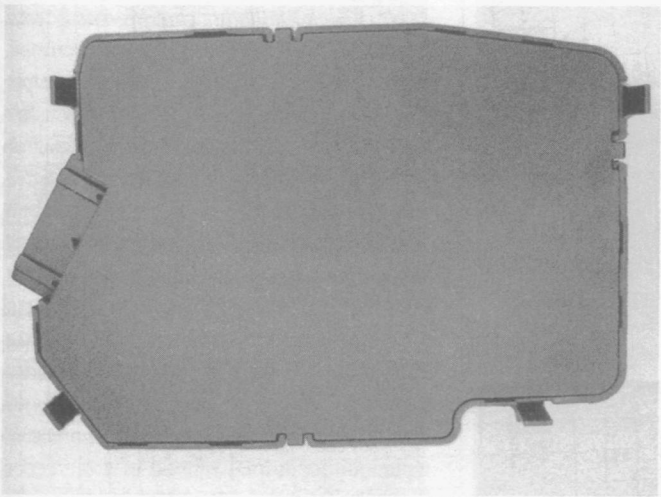

Figure 3. The back of the module. Removing the lid on the back is not as straightforward as taking the module out of the door panel; you must release 10 hidden latches.

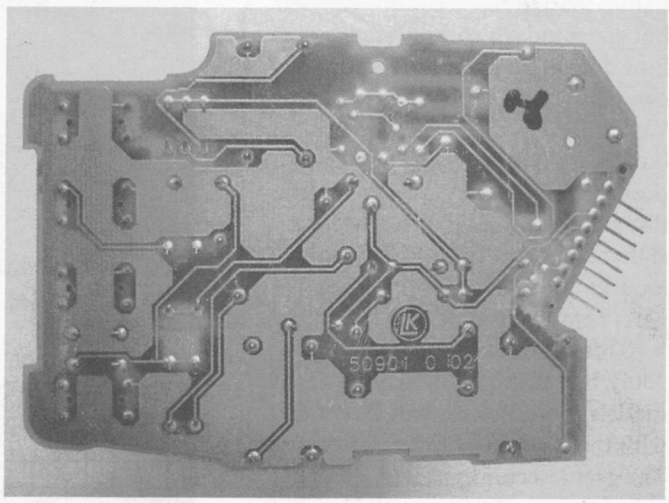

Figure 4. The circuit board, from the back. The failure is solder blob, right under the number 2 on the circuit board part number.

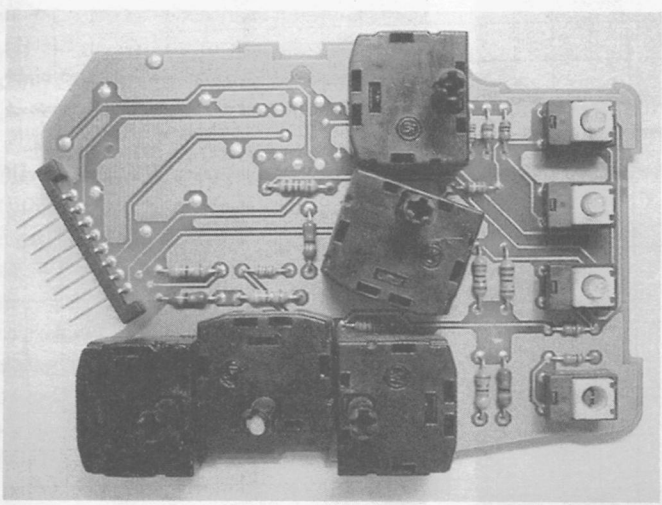

Figure 5. The circuit board front, showing the switches. All toggles are the same type of switch and, if necessary, could be interchanged with toggles from another board.

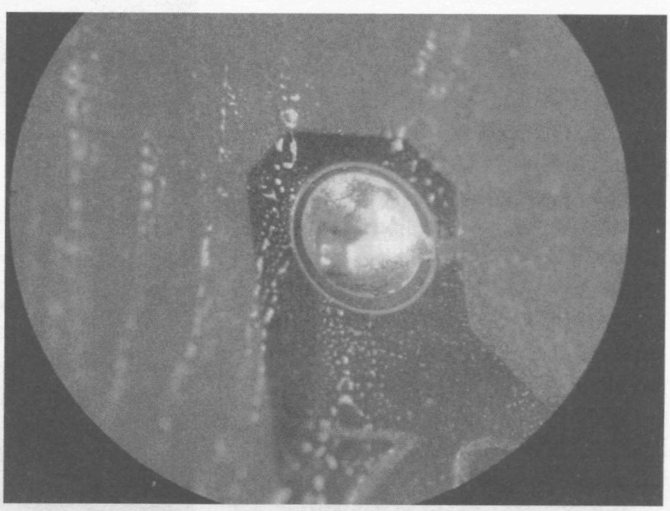

Figure 6. The failure-point, seen through a 20x stereo microscope.