

## How to fix your blown Dashboard Mute Circuit

The dash MUTE button is not just a simple switch. There's a printed circuit board behind the dash switch panel that allows the MUTE button to operate in a "toggle" mode – press it once and it's ON, press it again and it's OFF. This toggle circuit uses an integrated circuit to drive a transistor to switch +12 volts to trigger the factory head unit to mute. When +12v is present on the mute wire the HU mutes the volume. When 12v is turned off the HU un-mutes.

If the dash mute wire is incorrectly wired to ground or to another wire on your head unit (connecting to a speaker lead is a common mistake) the mute circuit transistor will be putting +12v into a low resistance circuit (almost a direct short), and it will overheat the transistor in a matter of seconds, destroying it. The typical symptom of a blown transistor is that the dash MUTE LED stays on all the time, possibly dimly, and the HU will either never mute or stays muted all the time. The only cure is to either replace the entire circuit board for the mute circuit (not cheap) or to replace the transistor. Replacing the transistor is inexpensive (it costs less than \$1) but it's a good deal of work to pull out the circuit board, and then you have to be pretty handy with a soldering iron to swap the transistor. And it's not a guaranteed fix, as it's possible something else is fried, but in most cases it does work.

Below is a photo of the dash switch circuit board, about life-size. Getting the circuit board out of the car is more work than changing the transistor, as you have to remove the dash bezel, and to do that you have to drop the steering column. I'm not going to give you detailed instructions for that procedure so you may want to get a shop manual or ask on-line for help. If you have never done it before it will probably take 30 minutes or so to get the dash switch panel out. The PCB board is sandwiched between the front of the panel and the back cover but it's not hard to remove.

The part circled in red is the MUTE transistor, marked on the board as TR3. It's a general purpose PNP transistor in a SOT-23 surface-mount package. I've successfully used an ECG 2409 which is a generic replacement part that you can find at a good electronics store or possibly at Fry's if there are any near you. Radio Shack will not have them. If the parts store person starts asking questions about voltage and current ratings, tell him it's for switching 12 volts DC and 10ma (milliamps). If you still can't find one locally, send me an email and if I have any sitting around I'll send you one.

If you're not experienced working with SMT (surface-mount) devices or don't have de-soldering tools you may want to "cheat" when removing the transistor from the board. Instead of de-soldering the entire part at one time you can use a very sharp razor knife to cut the transistor leads close to the body of the transistor. This allows you to remove the transistor body and then de-solder each lead one at a time, which is much easier if you're less experienced.

Once the transistor is off the board be sure to clean up the board, using a magnifying glass to be sure there are no solder splashes that could short out adjacent traces. When soldering the new transistor in place you can apply a small blob of solder to **one** of the PCB pads then use tweezers to hold the transistor in position while re-melting the solder blob so it melts over the transistor lead. Then check using a magnifying glass to be sure all 3 leads are perfectly aligned on the solder pads before soldering the remaining leads.

Once the new transistor is on the board you should test it in the car by re-connecting the harness and testing to see if the Mute LED works correctly.

