



# Tech Articles

## What Happens When You Push Those Buttons?

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It seems those of us in the Fiero community spend a lot of time discussing the things that often go bad with our cars. Things like weak brakes, cracked exhaust manifolds, low power, and poor handling get lots of attention. Yet some things on the Fiero work just fine, seldom break and need no improvement. I thought it was time we looked at one of those things.

The Fiero heater and A/C controls are one of the least troublesome components on the car. Instead of using cables or vacuum as was common practice in those days, GM was actually ahead of the times and decided to use electric servos to operate the system. Lucky for us as many of these systems are still functioning nearly 30 years later. So this will be more of a “how it works” than “how it breaks” article.

The visible part is the control panel just above the radio (Image 1). If you don't have A/C you have two sliding knobs for Hot-Cold and modes plus a rotating knob for blower speed. The slides move three cables that I have never seen fail. Unless a pencil or mouse nest gets into the air box doors you likely won't have a problem here and can enjoy never having to fix the air conditioning. Air conditioned cars will still have a sliding knob for temperature and a rotating knob for blower speed but have a row of seven buttons for selecting the modes and engaging the A/C compressor. The '84 has all black buttons and knobs. '85-'88 cars have all gray knobs and buttons except the “off” button is still black. The part number for an '84 is 16018322 and the '85-'88 is 16040702. The '85-'88 was also available from AC Delco as part number 15-71397. As of June 2012 about 20 were still available. Those of you scrapping cars, please save these as soon used parts will be the only ones available. The only part on the control panel that can be changed is the blower speed switch. The GM number is 16023827 and AC Delco 15-71327. Aftermarket ones have been available but the last two I got mounted differently.

The audible parts are the two electric servos or actuators. When you push a button you should hear the buzz-whir-whine-clunk noises as these electric motors move the air control doors to the position selected. One actuator controls the “modes” of A/C, Heater, Vent, and Defrost by moving three air doors. This part does most of the work. It is located just above the center floor tunnel ahead of the radio (Image 2). The part number for this mode actuator is 3052051. I never heard of any aftermarket replacement and since so few failed GM must not have kept any spares as a recent check showed none in stock. So again, please save the old ones. The other actuator only operates when Max A/C is selected. It does this by moving an air door from letting in outside air to recirculating the air in the car. It is also located above the center tunnel but well hidden between the air distribution box and the firewall. It is visible when looking under the dash from the left above the gas pedal (Image 3). The part number for this Max A/C actuator is 3052050. Again, GM has none in stock and an aftermarket replacement is not available. Save the old ones!

The silent part of this system is the Hot-Cold lever, which moves a cable that moves a door on the right top of the air box. This is used on both A/C and non A/C cars. The cables are self-adjusting and seldom fail. The most common problem is damaging the plastic cable end pin on the control lever when the control panel is removed.

The last part of the system is the blower fan. Power comes from the fuse block Heater/A/C fuse to the blower speed switch on the control panel. The switch selects “off” and three fan speeds. On low and medium speeds power is fed through the blower resistor to reduce the voltage and therefore the speed. On high speed the switch activates the high speed blower relay. This relay lets 12 volt power flow directly from a fusible link to the blower motor, bypassing the resistor.

While the air distribution system is very reliable it sometimes does fail. Most common is the blower won't operate at some or all speeds. If it works on some speeds (usually high) you know the blower motor is OK. If it operates on all speeds but “high” it is likely the high blower relay (Image 4). If it doesn't operate at any speed it may be the blower motor. In the front trunk unplug the power wire to the blower motor and apply 12 volts to it. If it still doesn't run, you have a bad motor. If the motor tests OK next check the resistor (image 4) located to the right of the A/C drier. Unplug it, remove the two screws attaching it to the air box and remove the resistor. If it is bad, you may be able to see a broken resistor coil wire. If not, check it with an ohmmeter to determine if it is bad. This part is readily available but different ('84-'85 and '86-'88). Also look inside the opening of the air box for mouse fuzz. If you find some, clean it out as the hot resistor coils may contact this material and start a fire. If the resistor is OK you have

a more rare failure, a blower switch. Remove the four radio fascia screws and the fascia. Remove the three control panel screws and pull the control out a few inches. It will be restricted from moving too much by the heater cable. Unplug only the blower switch and either test it or even easier plug in another switch to test.

Another problem is an actuator motor failure, usually the mode one as the Max A/C one only works on Max A/C. Actuators fail either by the motor spinning free or not running at all. If an actuator just spins, it is bad. If it doesn't run at all you have options to test it. You could unplug the actuator and plug in a test one or electrically test it. However, both are so hard to get to I don't recommend this. Better to plug in a test control panel. If you don't have an extra test panel lying around you can temporarily borrow one from another car. Since the heater cable holds the panel in and removal can damage the cable pin you can remove only the circuit board. Remove the screw holding the aluminum cover over the circuit board, swing it up and out to remove. Remove the lamp socket, the three screws holding the circuit board and remove the circuit board with buttons (Image 5). Plug only this into the other car and test. If the actuator now works you need a control panel. If not, you need an actuator.

To completely remove the control panel you must remove the heater cable. It is held onto the pin by a round push on clip. You cannot save the clip, so don't try. I cut it with wire cutters and squeeze it with pliers. Pulling on it will break the plastic pin. If you break it or find a used one that is broken it can be saved. Sand the pin end flat, drill a hole in it and tap for a 2-56 screw. Hold the cable on with the screw and a flat washer (Image 6).

To replace the mode actuator, first remove the radio. You will see the actuator hiding to the right of the vertical support for the dash. Squeeze the release tab and remove the wiring plug. Remove the three screws and the actuator will be loose. This is the tough part. The actuator shaft arm is connected to two levers inside the air box housing. While holding the actuator as far out as possible, peek in the lower right corner of the opening and look for the forked retainer clip. You may now say a few words to the engineer who put the clip on the front side out of sight. With a screwdriver spin the clip so the non-forked end faces to the right. Place a small magnet at the bottom of the opening to catch the clip if it falls. Using small needle-nosed vise grips, grasp the clip and pull it off. Then the arm pin will pull out of the two levers and you can remove the actuator (Image 7). Reinstalling the clip is frustrating but not impossible. In the unlikely event you have a bad Max A/C actuator, crawl under the left side of the dash, remove the wiring harness plug and three screws. Now, that engineer was kinder to us and the clip is not only facing out but the lever is on the outside.

Since there aren't any new actuators, we will be forced to use salvaged ones from here on. How will you know they are good? First you must identify the two different ones (Image 8). Mode actuators have five electrical contacts and a straight arm. Max A/C actuators have three contacts and a zig-zag arm. To test a mode actuator, connect ground to the contact #1 (nearest the middle of the housing). Using a 2 amp fused jumper wire apply 12 volts to the other contacts and see if the motor moves. Contact #2 will be Defrost, #3 is for Vent, #4 is Bilevel, #5 position is empty, and #6 is Heater (floor). The Max A/C actuator has only three contacts. Again place ground at contact #1. Contact #2 is Max (recirculate) and #3 is Norm (fresh air). In effect just make sure the arm moves and stops at a different spot with each contact powered. If it does, you have a good used actuator. Just don't hold the actuator when you do this as they are powerful and can bite.

Hopefully your air distribution system is still working after 24-29 years. If it does fail, I hope this helps and that those of you scrapping cars remember to save these parts for us.

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