A Bunch of Tidbits About My Non-Air Conditioned C15 Heater

[A note-taking work in progress.]

Kelly Craig

HEATER CIRCUIT WIRING and CONTROL PANEL

1.1 As the truck comes from the factory, there is no off position for the blower. It is constantly on low speed, when the ignition is in the run position and the switch isn't on a higher speed.

2.1 The blower speed is changed via a resistor. The terminal with the highest resistance would be for the low speed setting. The next higher resistance for the medium setting, and high speed is direct, bypassing the resistor.

NOTE: As a general rule, resistors open when they go bad.

3.1 Both the blower motor and the blower resistor are located on the passenger side of the firewall.

3.2 If your rig does not have air conditioning, both the blower motor and resistor are very easy to access from under the hood.

4.1 Power to the heater control switch comes from the fuse panel located under the dash, at the far left.

5.1 The fuse for my 1978 C15 is located at the very top right on the fuse block. It is labeled "**20 A**," "**HTR**," and has an **arrow** pointing to the fuse.

5.2 As of the date of this writing, Net searches to determine the proper fuse size for a 1978 Chevy C10 or GMC C15 give conflicting results. For example, several claim the system uses a 25 amp fuse. Others say 20 amps. Too, contrary to my firsthand experience with my 78, a few claimed the system uses an inline fuse.

5.3 Adding to the conflict and confusion about the proper fuse size is, wire diagrams for my truck show it to have 14 gauge, or even 16 gauge wire. 14 gauge would make the wires only capable of handling 15 amps. 16 gauge is even more limited.

5.4 I haven't measured the actual amperage of my running blower yet, but indication is, it runs at 15 amps. As the bushings wear, that will increase.

5.5 Inasmuch as fuses serve the purpose of protecting wiring from getting so hot the insulation melts, and worse, there is a clear conflict between what the fuse panel claims should be

used for the circuit and the indicated wire sizes. That is, the circuit should only have a 15 amp fuse for a 16 gauge wire. This is aside that the additional 5 amps isn't likely to melt the insulation, and it's likely shorts would push the fuse beyond its limit.

6.1 For those unaware, though the resistor reduces the voltage to the DC motor to reduce speed, that voltage drop can be read across the resistor(s). As such, merely running on lower speeds via lower voltages will not allow you to run smaller wire, because the same amount of power is consumed. It's just being consumed across the resistor(s) and in the blower motor, rather than just at the motor.

7.1 Regarding that 15, or more, amps the blower uses, many had to replace the heater switches over time. I had to replace one on my 69 1/2 ton, and I'm replacing the malfunctioning one on my 78 step side. Part of the inspiration for the writing of this document.

8.1 My 1978 C15 doesn't use a relay to handle the amperage across the wires and switch, but other rigs do. It's probable this greatly extends the life of the switch, as well as reduces other potential problems from using undersized wires.

8.2 A relay could be installed in systems like mine, but it would not be a simple, five minute task:

(a)(i) A new 12 gauge lead would have to be run from a 12 volt source to the relay, for it to use to feed the 3 resistor fan speeds via the connections currently activated by the switch.

(a)(ii) This wire lead could be from a constant on 12 volt source (e.g., the battery), since it is only used when the relay is activated. Alternately, it could be from a source providing power only when the ignition is in the run position.

(a)(iii) If a power source other than a direct connection to the battery is used, the wire lead feeding the 12 gauge relay power lead must, also, be a 12 gauge wire, and it should be fused.

(b) Each of the three leads from the heater switch would, instead of feeding the resistor and the motor directly, activate three separate relay circuits that feed the three fan speed positions (low, medium and high).

(c) Finally, the relay needs to be able to handle the amperage of the circuit. Generally, a little overkill never hurt anyone and saved problems down the road.

(d) The relays commonly used on other rigs equipped with them have 5 terminals. A relay capable of being used to upgrade my system would have to have 7 terminals, 6 for the 3 blower speed circuits (power in for each speed, and power out, when the relay is activated), and 1for the battery input. If case does not provide the ground for the relay activating circuit, another terminal would be needed for ground.

9.1 Power is supplied to the fuse only when the engine is running. There is no power to the switch when the key is at the off or accessory position.

10.1 The wire supplying power from the fuse panel is brown and is 14 gauge.

> NOTE: In electronics, you, generally, can go to a heavier gauge wire, but you cannot go to a lighter one.

10.2 In addition to that the brown lead coming from the left, the fuse panel, the switch power lead can be recognized by that a second wire, also brown, ties with it at the female plug on the back of the switch, but the second goes off to the right, to the blower resistor. All the other terminals have only one wire, and each of those run to the blower resistor.

11.1 The standard heater switch control for a non-air conditioning pickup is, a 3-position switch.

11.2 This boils down to that the off position (all the way down) is really the low fan speed position.

12.1 The control panel takes a 194 bayonet bulb, or an LED equivalent, powered by the instrument panel circuit.

13.1 If you remove the plug from the back of the heater switch, turn the key to run (engine off), and read voltages at each of the plug terminals, you should get around 12 volts at each contact.

13.2 The reason you read around 12 volts at each plug terminal is because power is constantly applied to the blower slow speed circuit when the ignition is in the run position,

13.3 With the key in the run position, power feeds from the fuse panel to the low speed terminal. The other brown wire connected to this terminal bypasses the switch and carries that power directly to the low speed resistor circuit. Because all the resistor terminals tie to each other, the power feeds through the resistors and back to the other speed terminals at the switch plug.

13.4 If you unplug the connector at the resistor, it removes the resistor from the circuit and voltage will no longer be read on other plug terminals (medium and high speed) at the switch plug when the ignition is in the run position.

14.1 LMC Trucks sells heater controls with both 3 position switches and 4 position switches. Because I am not a fan of constantly running fans, I opted for the 4 position switch for my 3 speed blower control.

14.2 A 4 position switch allows me to cut the brown lead that goes between the low speed plug and the blower resistor, thereby removing it from constant power to the low speed circuit with the

key on, then to connect it to the second terminal-switch position, the medium to the nex and high to the last terminal. With nothing on the first terminal, it becomes a true off position and the three remaining positions allow me to go to low, medium (connecting to the resistor) and high (going straight to the motor).