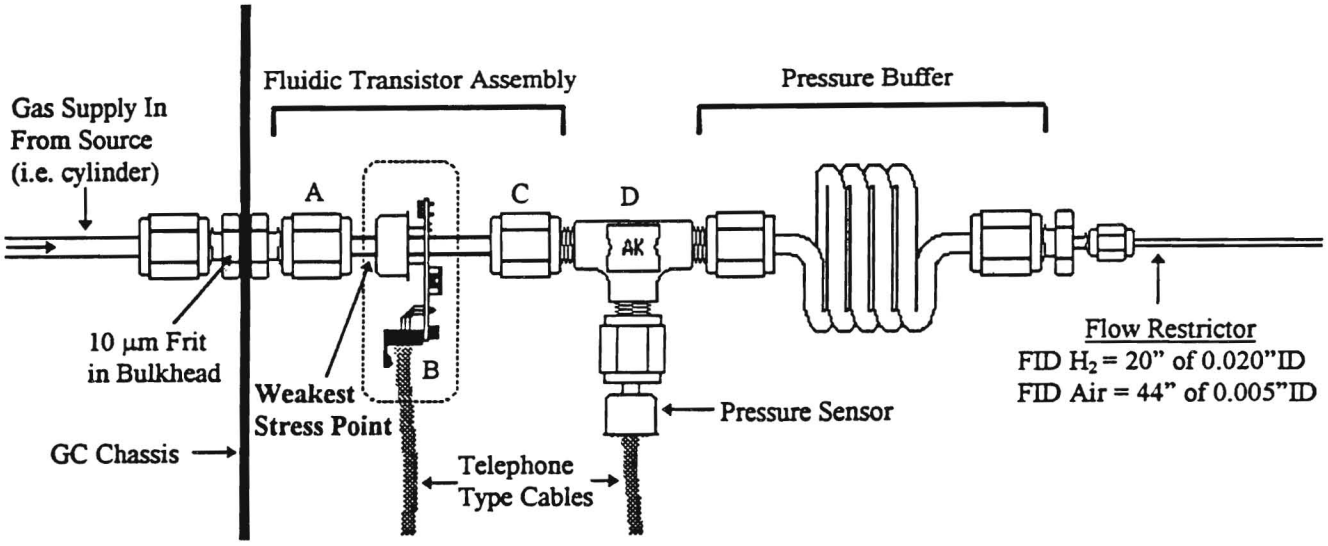
Chapter: INJECTORS AND GAS VALVES

Topic: EPC System - Fluistor Removal and Installation



SRI 8610C gas chromatographs come equipped with an extremely stable electronic pressure control (EPC) system. An electronically controlled fluidic transistor (fluistor) constantly maintains pressure based on the readings from a pressure sensor located immediately downstream from the fluistor. The gas supply is then routed through a pressure buffer, into a flow restrictor line and then on to serve its designated function. There is also a 10 µm particle filter frit in the bulkhead immediately upstream from the fluistor assembly. This frit prevents particles that could effect the operation of the fluistor from getting into the system. Malfunctions associated with the EPC system may require replacement of these devices. Extreme care must be taken when removing or installing a fluistor assembly. Excess torque or stress on fluistor components, especially on the **weakest stress point** indicated in the above diagram, can damage this delicate device.

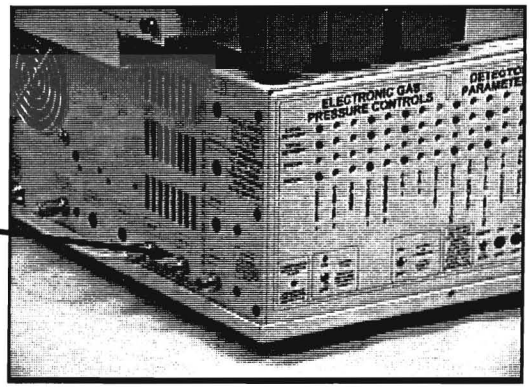
The perspective shown in the diagram above is with the base plate removed looking up from the bottom up with the GC tilted back 90° resting on its backside. To gain access to the EPC systems, begin by turning off all gas supplies to your GC, as well as AC power to prevent electrical shock. Then use a screwdriver to remove the screws around the perimeter of the base plate attaching it to the GC chassis. If your GC is equipped with a purge and trap, remove any sparge vessels containing liquid to prevent contamination of sparge gas supply when GC is tilted. Next, tilt GC back 90° and allow it to rest on its backside. The base plate should now lay flat in front of GC. EPC systems should be now be clearly visible as shown in diagram.

To remove a fluistor assembly, you will need (1) 7/16" and (1) 3/8" open end wrench. Use of inappropriate tools can strip or damage delicate parts. Place a 3/8" wrench on point D (see diagram above) and a 7/16" wrench on point C. Use the 7/16" wrench at point C to loosen the fluistor nut completely from the T-fitting while using the 3/8" wrench at point D to prevent the T-fitting from rotating. Also use your fingers to support the insulated circuit board at point B and prevent any unnecessary torque on the indicated **weakest stress point** during this process. Next, place a 7/16" wrench on point A and loosen the fluistor nut completely from the bulkhead. You should now be able to pull the detached T-fitting slightly to the right and maneuver out the fluistor assembly. Once the fluistor assembly is free, follow the corresponding telephone type cable to the circuit board and detach it. The connector is identical to the type used for telephone connections.

Replacing the EPC Fluistor

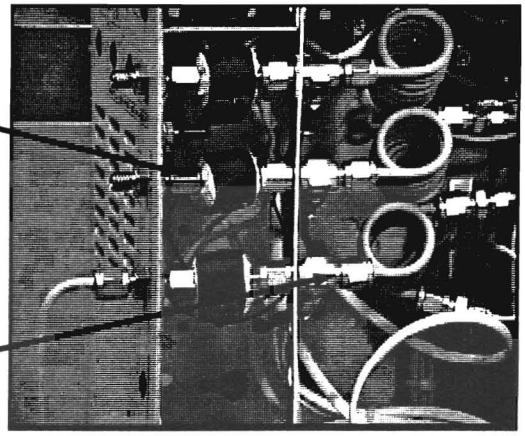
The Electronic Pressure Control module (fluistor) used on SRI Gas Chromatographs may fail in a "stuck open" or "stuck closed" mode. If the fluistor is stuck closed, then replacement of the fluistor is probably the only option. If the fluistor is stuck open, then the gas pressure supplied to the GC appears as the actual pressure. Sometimes it is possible to reverse the fluistor and with a quick blast of gas pressure blow out the particle which may be preventing the tiny valve from closing completely.

The fluistors are physically connected to the inside of the gas bulkhead fittings which are located on the left hand side of the GC.

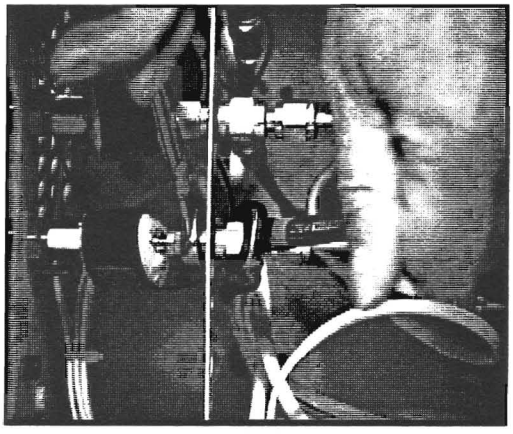


The fluistors are mounted to the bulkhead fittings with a swagelok nut and ferrule.

The downstream side of the flusitor is connected to a brass swagelok tee fitting which also has the pressure sensor and buffer volume connected.



It is important to loosen and remove the downstream side nut and ferrule first. Be sure to use two wrenches (7/16" size). Hold the tee fitting with one wrench while loosening the other nut. Try not to twist the fluistor, as this will damage it.



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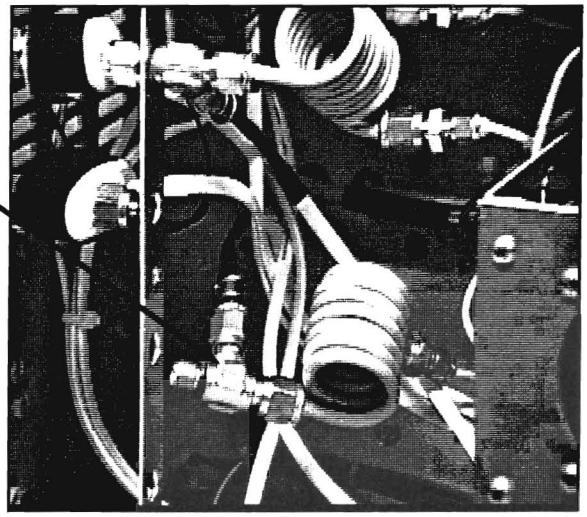
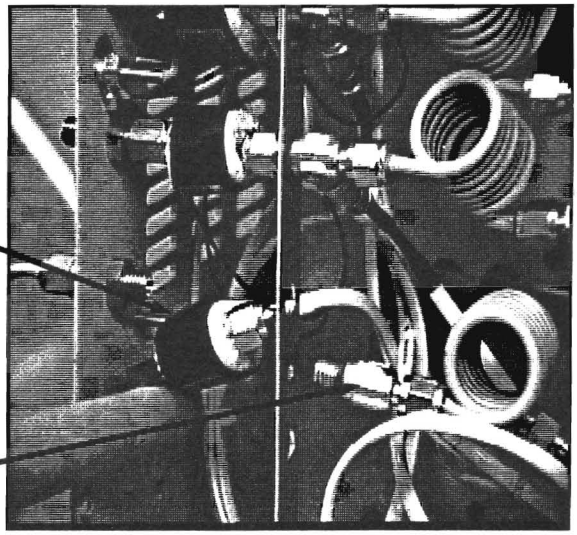
Replacing the EPC Fluistor

Remove the tee fitting from the fluistor by sliding it to the right. On some GCs, the tee may be a tight fit in the aluminum support bracket. In this case it may be easier to remove the pressure sensor and buffer volume tubing from the tee, and then unscrew the tee out of the aluminum support bracket.

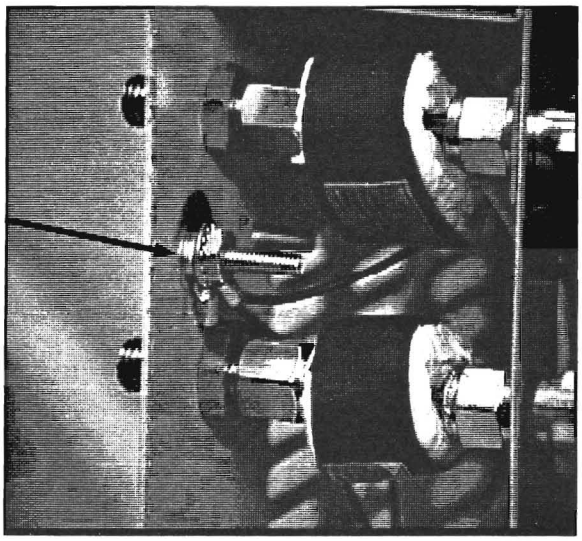


Loosen the nut holding the fluistor to the bulkhead fitting and wiggle the fluistor free.

If the fluistor is stuck open, turn the fluistor around and reconnect the downstream side to the bulkhead fitting. Turn the GC power on, and suddenly apply gas pressure to the bulkhead. 50% of the time, this will dislodge a microscopic particle allowing the fluistor to then operate normally. If this does not work, then proceed to replace the fluistor.



The black ground wire coming from the fluistor is connected to chassis ground at this screw stud. Loosen the #6 nut, and slip the ground wire off the stud. Be careful to leave all the other black wires from the other fluistors still attached to the stud.



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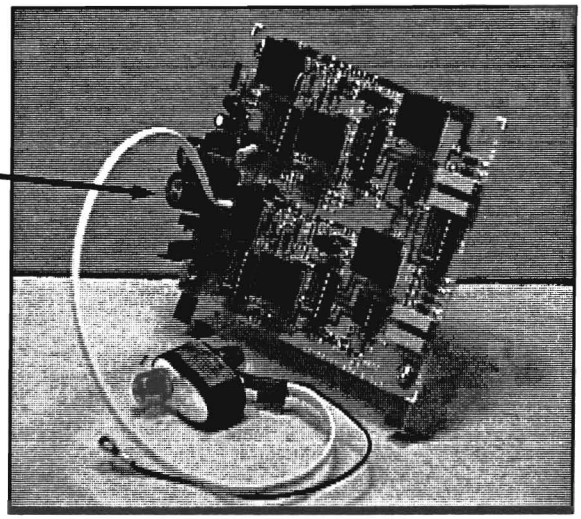
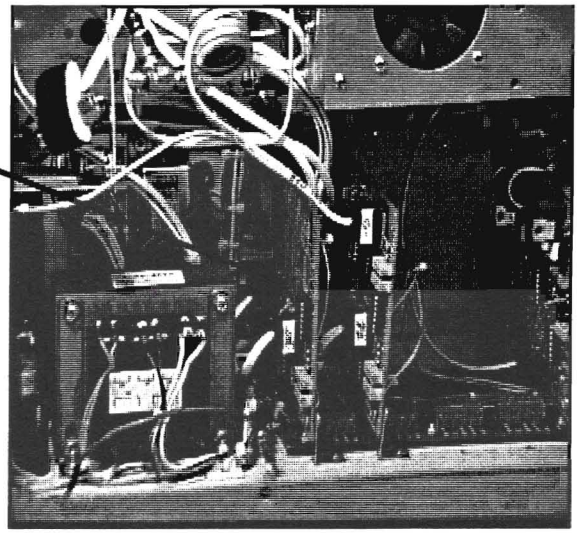
Replacing the EPC Fluistor

The fluistor connects to the EPC circuit board with a plug in telephone type cable. The fluistor and circuit board are shown here removed from the GC for the sake of clarity.

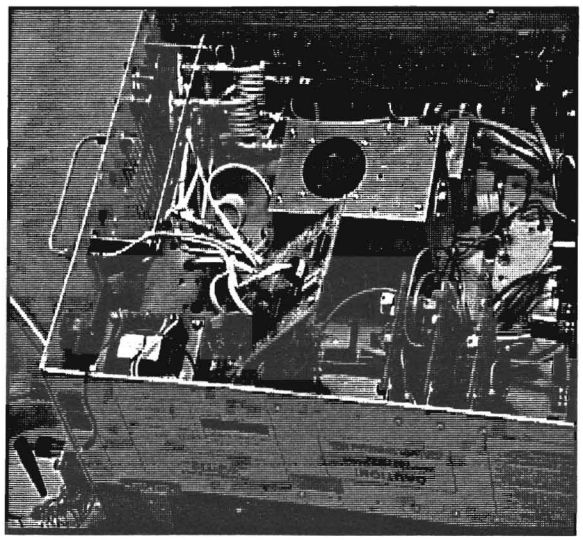
UNPLUG the GC POWER cord before proceeding further.



In some cases it will be possible to unplug the fluistor cable from the EPC board without removing the board from the GC. A pair of long nosed pliers is helpful. The socket may be hard to reach however.



It may be easier to remove the EPC circuit board from the GC in some cases. The circuit board is secured with two screws from the back of the GC, and a single captive screw. You will need a long regular screwdriver to loosen the captive screw. As illustrated, it is recommended to tilt the GC as shown for best access. With the three screws loosened, the circuit board can be wiggled free and the fluistor cable will then be easy to disconnect. To install the new fluistor, reverse the disassembly steps, being careful not to twist the new fluistor as you re-connect the swagelok fittings.



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