

Electronic Fuel Pressure & Vac/Boost Gauge Installation in a '99/'01 Cobra

I. Parts and materials

Just prior to beginning my supercharger installation, I put a pair of gauges in the Cobra that enabled me to monitor what would soon become critical information: fuel pressure and vacuum/boost level. After I had installed my gauges, enough people asked me for help with their own installations to warrant this document. I hope it comes in handy.

I selected an Auto Meter instrument cluster bezel and electronic gauges for my installation. Except for those noted, all the parts and materials depicted in the photo below were provided with their respective Auto Meter gauge kits.



Figure 1 Various vacuum/boost and fuel pressure gauge components

NOTES: First, the instrument cluster bezel is available in only unpainted black from Auto Meter, and must be painted to match any other color interior. The one in the above photo has already been painted to match my parchment interior.

Second, the model 5764 that I bought and installed has been discontinued. If you opt for the Auto Meter model 5763, your gauge won't come with the black memory module shown above.

I purchased the interior paint that I used on the bezel from Late Model Restoration Supply (www.50resto.com), and I selected lacquer-based paint because, unlike enamel, lacquer dries VERY quickly. Lacquer also dries from the inside out, which enabled me to build up several good coats in less than an hour.

I picked up the short length of rubber hose shown in the photo and a couple hose clamps at Auto Zone, so I could put a sleeve around the nylon line that must be run between a vacuum port on the engine and the sending unit for the VAC/BOOST gauge.

The right-angle adapter visible in the above photo came from [Maximum Motorsports](http://MaximumMotorsports.com) as part of a mechanical fuel gauge assembly. I didn't need the gauge, but I hadn't been able to locate the adapter separately, so I spent \$40 for this adapter. Oh, well, a man's gotta do what a man's gotta do.

Additional materials that I bought to complete my installation:

1. 20 feet of various sized plastic flex tubing
2. Assorted black tie wraps
3. Three rolls of "Stretch & Seal" self-sealing silicone tape
4. Molex crimp tool and assorted Molex connectors
5. 18-gauge wire nuts, 4 each
6. In-line type AGA fuse holders w/ 1A fuses, 2 each
7. Conduct-Tite #86698 [Posi-Lock](#) connectors, 2 each
8. Blue (color-coded by size) 3M Scotch-Lok connectors, 3 each

II. Sending unit installation

1. Disconnect the ground cable from the NEG battery terminal.
2. Remove the driver's seat from the car (2 bolts, 2 nuts and 1 electrical connector).

NOTE: When you remove the rear seat bolts, their two retaining nuts will fall to the floor beneath the car – retrieve the two nuts. After you have removed the four fasteners, you can pivot the chair up toward the windshield and disconnect its single multi-pin electrical connector at the carpet.

3. Slide under the dash with a flashlight or drop light and find the large wire bundle wrapped in black tape and plastic flex tubing that feeds through the factory grommet near the clutch. Then, remove the tape and tubing from that wire bundle.

NOTE: Before you crawl under the dash, throw some padding onto the seat bracket studs in the floor of the passenger compartment to protect your back.

4. Next, move around to the engine bay side of the grommet and remove a few inches of wrapping from the wire bundle on that side of the firewall.
5. Obtain a fish wire or line and a long, thin tool to use as a probe. A cabinet maker's flat blade screwdriver works well as a probe, and I recommend using a jacketed a 6-foot length of 16-gauge or heavier wire as a fish line. The advantage to using jacketed wire is that the jacket is reasonably slick, so it won't abrade the insulation on the wires already feeding through the firewall. Whatever you select, make sure it's strong enough to withstand at least a 25-lb tug.
6. Bend about an inch of your fish line over the end of the probe. Then, using electrical tape, encapsulate the fish line on the end of the probe.
7. Liberally coat the outside of the probe's tape capsule with silicone plumber's grease (available at your local hardware store).
8. Now, from below the dash on the interior side of the car, carefully work the probe back and forth as necessary while pushing it through the wire bundle inside the grommet and into the engine bay.
9. When the probe is protruding far enough into the engine bay to grab the end of the fish line, pull a couple feet of the line through the grommet and cut the line free from the end of the probe. Then, slide the probe back out of the grommet from the interior side. Now, you should have a strong line, to which you can tie the electrical harnesses for your gauges' sending units, running from the interior of the car through the factory grommet and into the engine bay.
10. Next, mount your sending units. I used the special right-angle adapter fitting mentioned above to enable me to mount my fuel pressure sending unit to the Schrader valve on my fuel rail without gutting the valve. Then, I simply tie-wrapped the sending unit for my vacuum/boost gauge to the large factory wiring harness running along the firewall.

NOTE: Apply a wrap of Teflon tape to all threads before installing the fuel pressure sending unit.

WARNING: Do not over-tighten the fuel system fittings! Overtightening these fittings can cause them to leak.

11. Now, connect the wiring harnesses to the sending units and run the harnesses to the factory grommet in the firewall along paths of your choosing. (Refer to Figure 2, below.)

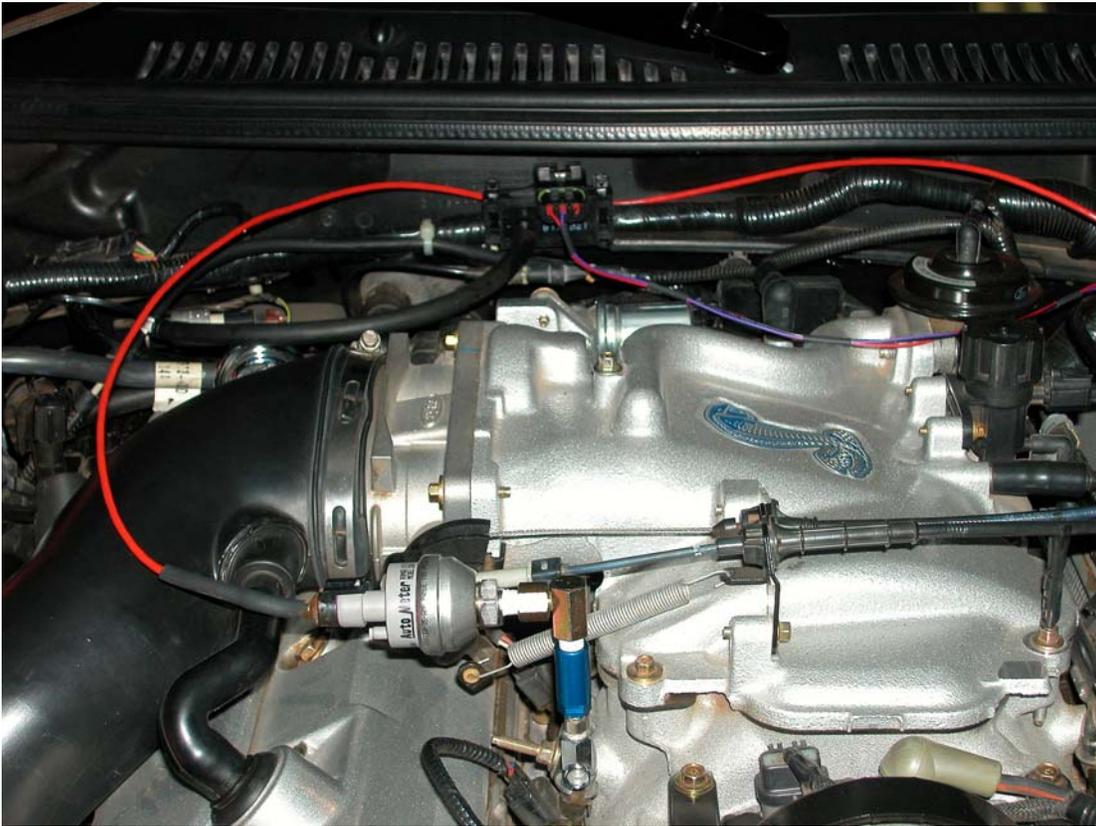


Figure 2 Fuel pressure and vacuum/boost sending units

12. If your sending unit harnesses have connectors already installed on both ends, which most do, you'll next need to cut each harness at a point of your choosing somewhere along its length before you'll be able to slide it through the factory grommet in the firewall. (The motivation for purchasing the Molex crimp tool and connectors should now be apparent.) I cut both of my harnesses about 18" short of the firewall, but you may elect to locate your cuts such that you can reconnect the harnesses on the dash side of the firewall.

NOTE: The only wires you will need to pull through the firewall are those that connect directly to the sending units. DO NOT pull the power and ground wires – either for gauge lighting or for the gauge electronics – through the firewall. Those will connect inside the passenger compartment at the dash. Since I chose to install my harness splices on the engine bay side, I next pulled the gauge side of the harnesses into the engine bay from the dash side. You may end up pulling your harness through in the opposite direction, depending on which side of the firewall you want your splices to end up.

13. Shape the appropriate end of your fish line into a hook and feed the wiring harnesses through the eye in the hook. Then, fold the ends of all these wires back against themselves, wrap the whole mess with electrical tape, and slop a bunch of silicone plumber's grease on the resulting tape capsule.
14. Now grab the free end of your fish line and CAREFULLY pull the new wire bundle through the firewall grommet. After you've pulled a couple feet of the bundle through, use a pair of side cutters to clip the wire bundle free from the fish line right where the tape capsule begins to cover the bundle. Your fish line should now be free. Pull it out of the grommet and discard it.

- After pulling the sending unit harnesses through the fire wall, splice the cut ends together. I used polarized Molex connectors to reconnect mine. You may want to first position the gauge ends of the harnesses at your chosen gauge locations and clip off any excess wire, leaving just enough harness length to reach the back of each new gauge PLUS an additional 18" or so to enable you to pull the gauge away from its mounting location far enough to disconnect the harnesses when/if necessary.

III. Gauge Lighting Circuit

To provide correct gauge illumination and dimming capabilities, the power for your gauge lighting power must be obtained from a source that is different from the power for your gauges' electronics.

- Mount your gauges in whatever pod, panel, or bezel you have selected for your installation.
- Using 18-gauge wire nuts and wire, connect the lighting pigtails from your gauges in parallel with lengths of wire, and then connect this circuit to a pair of supply leads. Don't worry for now about where you will connect the circuit into the car's electrical system.

NOTE: Wire nuts work best for light bulbs like these that will eventually burn out and require replacement.

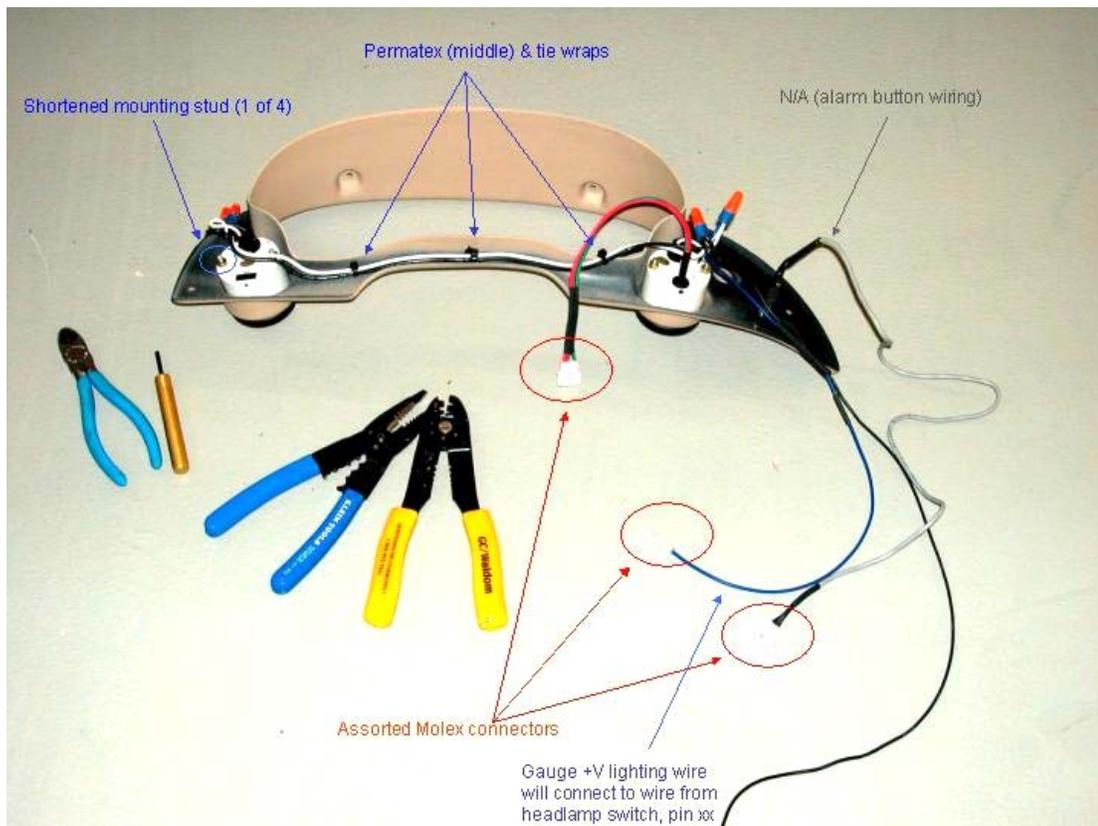


Figure 3 Gauge lighting circuit

The figure above shows my lighting circuit (white and black wires) connected between the gauges that I have mounted in the Auto Meter instrument panel bezel, and my supply leads hot (BLUE hot and BLACK ground) connected to one end of the lighting circuit.

IV. Dash Wiring

1. Remove the instrument cluster bezel.
2. Remove the Torx fasteners securing the instrument cluster, unplug the two electrical connectors (C250 and C251) from the back of the cluster, and set the cluster aside.
3. Remove the fasteners securing the main headlamp switch to the dash and swing it around, so you can see the embossed terminal designations.
4. First, let's look at the dash wires you'll need to locate and tap into with BLUE 3M Scotch-Lok connectors:

GAUGE LIGHTING POWER

Circuit name:	Instrument Panel Lamps Feed
Circuit number:	1045
Circuit function:	Provides voltage-variable power to dim gauge lighting
Hot when:	headlights or park lamps are switched on
Connector:	C228 (Main Light Switch Connector)
Connector location:	In dash, on back of Main Light Switch (park/headlights)
Connector pin number:	"I"
Wire insulation color:	DK BLU/WHT
Recommended added wire color:	BLU

Pin identifications embossed in the plastic connector block are as follows: B1, IGN (not used), and DN (not used) near one end, B2, R, and D1 near the center, and I, H, and D2 at the other end. You will need to tap into the wire at the I ("eye") pin location.

Tying the lighting power for your Auto Meters into this wire will provide your new gauges with the same control and dimming capability as the factory gauges in your instrument cluster.

GAUGE INSTRUMENTATION CIRCUIT POWER

Circuit name:	Instrument Cluster
Circuit number:	20
Circuit function:	Provides +12V gauge power
Hot when:	ignition switch is in EITHER Start or Run position
Connector:	C251 (Instrument Cluster connector #2)
Connector location:	In dash, on back of instrument cluster

Connector pin number:	12
Wire insulation color:	WHT/LT BLU
Recommended added wire color:	In-line fuse equipped with RED wire

Pin identifications on this connector block are numbered 1 – 20.

There are (2) plug-in connectors that attach to the back of the instrument cluster. The connector in which you are interested is the larger of the two.

Most switched power circuits in your car are hot only when the ignition switch is in the Run position. Using one of those circuits will not allow the auto-calibration functions built into many electronics gauges to operate properly. This circuit is hot in BOTH Run, and Start. Tying the circuitry power for your gauges into this connector will enable the gauges' auto-calibration circuits to do their jobs. Even if your gauges are not equipped with auto-cal functions, you can still use this same circuit.

Be careful that you correctly identify the wire from pin #12. When I first connected my own gauges, I didn't realize that there are multiple wires in this harness with identically color insulation. I grabbed the first WHT/LT BLU wire I came across and spliced into it. Believe me when I say that you'll get NO love from the electrical system if you connect into the wrong WHT/LT BLU wire – it's part of the right turn signal circuit.

GROUND CONNECTIONS

Circuit name:	Ground
Circuit number:	1205
Circuit function:	Completes circuits through chassis ground at battery
Hot when:	Always
Connector:	C251 (Instrument Cluster connector #2)
Connector location:	In dash, on back of instrument cluster
Connector pin number:	1
Wire insulation color:	BLK
Recommended added wire color:	BLK

You will connect a separate ground wire for each of the three new circuits from pin #1 of this connector. (Refer to the instructions below for details.)

5. Using a BLUE Scotch-Lok connector, attach a new length of gauge lighting circuit wire to the wire at the I ("eye") pin location of connector C414. The figure below shows the Scotch-Lok and new wire attached to the correct wire on C414.



Figure 4 Gauge lighting circuit power tap

6. Tie two (2) separate inline fuse holders into the wire on pin #12 of connector C251 with a second BLUE Scotch-Lok connector. (You'll need a 1A fuse for the power to each gauge's electronics.)
7. Connect three lengths of black wire (one for your gauge lighting circuit and one for each gauge's electronic circuitry) into the wire on pin #1 of C251 with a third BLUE Scotch-Lok connector.
8. At this point, you should have a fistful of unterminated wires hanging out of your dash: (1) a blue lighting power wire (if you followed the recommended color), (2) a pair of red gauge electronics power wires originating at a pair of inline fuse holders containing 1A fuses, and (3) a trio of black ground wires.
9. Pair up each of the three ground wires with one of the hot wires and terminate each pair with a Molex connector.

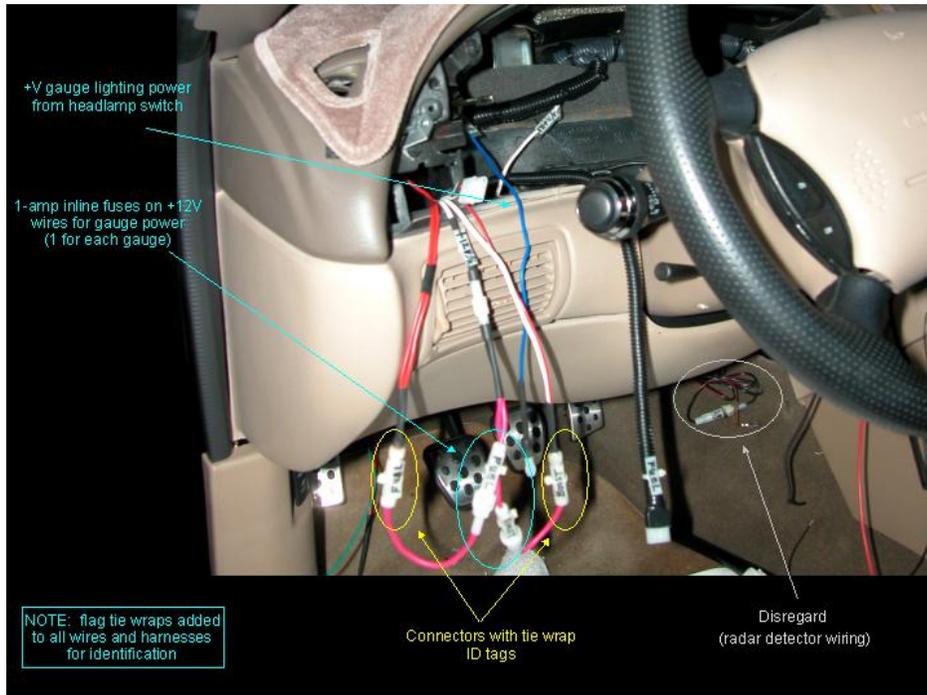


Figure 5 Gauge power and lighting circuit wires

10. Install the opposite gender Molex connector on your lighting circuit supply wires and on the power circuits for your gauge electronics.
11. Neaten up all your wiring with plastic flex tubing, and wrap all your harness ends at the connectors with Stretch-and-Seal self-sealing tape.

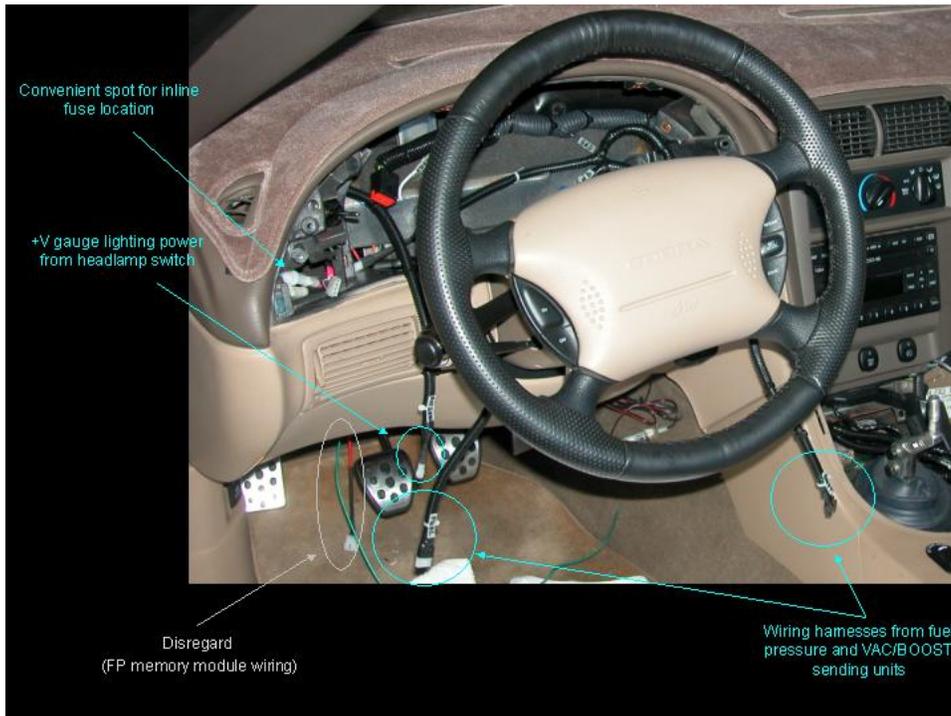


Figure 6 Wiring ready for connection to gauges

12. Reinstall and reconnect your factory instrument cluster and headlamp switch.
13. Install your gauge pod or bezel, and connect the power and sending unit circuits.



Figure 7 Completed gauge installation

14. Reinstall your driver's seat.
15. Reconnect your negative battery cable.

FINITO!

Take your car out for a spin to ensure that your new FP and VAC/BOOST gauges work as advertised.

Obviously, If you have not yet installed your FI equipment, only the VAC portion of your VAC/BOOST gauge will function until you actually have some boost to throw at it, but you SHOULD be able to watch manifold vacuum vary from about 18 – 20 in Hg vacuum at idle up to 0 at WOT.

Your fuel pressure should range from about 25 to maybe 70 psi, depending on the engine's status and what you're doing with the throttle.