

**Accutach Company**

Accurate Automotive Instrumentation Products

# **1994-1998 Calibration Kit**

## **User's Manual**

**Revision 1.0**

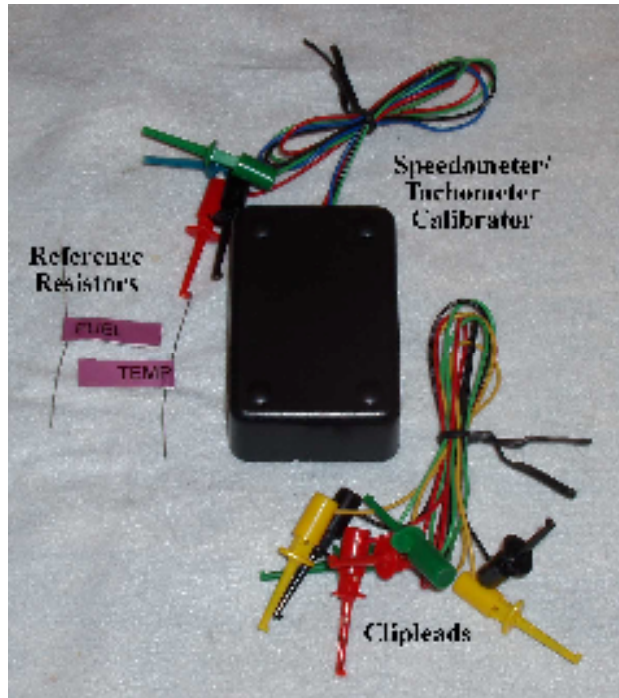
**Accutach Company**  
**[www.accutach.com](http://www.accutach.com)**

# **Accutach 1994-1998 Cluster Calibration Kit User's Manual**

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## Accutach 1994-1998 Cluster Calibration Kit User's Manual



The Accutach 1994-1998 Cluster Calibration Kit contains a set of tools that enables anyone to accurately place needles on most 1994-1998 Ford instrument clusters, and those of many other makes around those model years. The kit includes an electronic circuit that can be used to provide a very accurate reference signal for calibrating electronic speedometers and tachometers. It is designed to calibrate most electronic tachometers and speedometers, but it has not yet been tested with all. Please refer to [www.accutach.com](http://www.accutach.com) for a list of vehicles for which it is known to work.

The instrument clusters referenced in this manual are from 1994-1998 Ford Mustangs. Although this manual uses Mustang clusters as illustration, this kit will work for all Ford instrument clusters of that vintage, as well as those of many other makes. The location of the meter/gauge connections may vary on other clusters, but the same basic connections are used for all electronic speedometers and tachometers of that vintage. Prior to using this kit to calibrate gauges other than 1994-1998 Fords, please verify that the senders are the same as those in the Mustang. Feel free to contact Accutach to work with us if you are not sure.

If you remove the needles of your instrument cluster for any reason (such as the installation of aftermarket gauge faces) you will definitely want to use this kit to accurately recalibrate the needles on the new gauge faces. You may want to use this kit to simply check the calibration of your gauges as they age.

Oil Pressure and Temperature gauge calibration can be checked with the cluster in the vehicle if you can get access to the senders. Volt gauge calibration can also be checked with the cluster in the vehicle, but the cluster must be removed to check the calibration of the speedometer and/or tachometer. Please see Appendix A, B and C for information on how to remove the cluster from the vehicle, how to remove the front cover from the cluster and how to remove the needles from the gauges, respectively.

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### **Calibration Kit Contents (and what you will need to supply)**

Each calibration kit contains an electronic Speedometer/Tachometer Signal Generator, a set of four test clip-lead wires, and a pair of calibration resistors. Not in the kit, the user must supply a well regulated 12 volt supply such as a charged vehicle battery. A battery charger is not well enough regulated to work. A standard metal dinner fork will be helpful for removing the needles if need be. A piece of clean, soft lint-free cloth can help protect the gauge faces as the needles are removed. A Digital Voltmeter (DVM) would also be helpful for calibrating the voltage gauge, but is not needed if you know your battery supplies very close to 12 volts.

### **General Calibration Process**

The gauge calibration process is done on a per-gauge basis. While the calibration of the Speedometer and Tachometer can not be checked with the instrument cluster in the vehicle, the other gauges calibrations can be checked with the cluster in the car. As the calibration process is described for each gauge, we will describe the in-vehicle calibration test for that gauge if it can be checked in the vehicle.

The calibration process illustrated in this manual is for stock gauges with stock senders only. We also describe how to calibrate stock gauges with stock senders and aftermarket graduated gauge faces (gauge faces with numbers) as well. However, if you have installed any upgrades from Accutach's 1994-1996 or 1997-1998 Cluster Upgrade Kits (oil pressure and/or temperature gauges), please follow the calibration procedures in the Upgrade Kit Manual for those gauges.

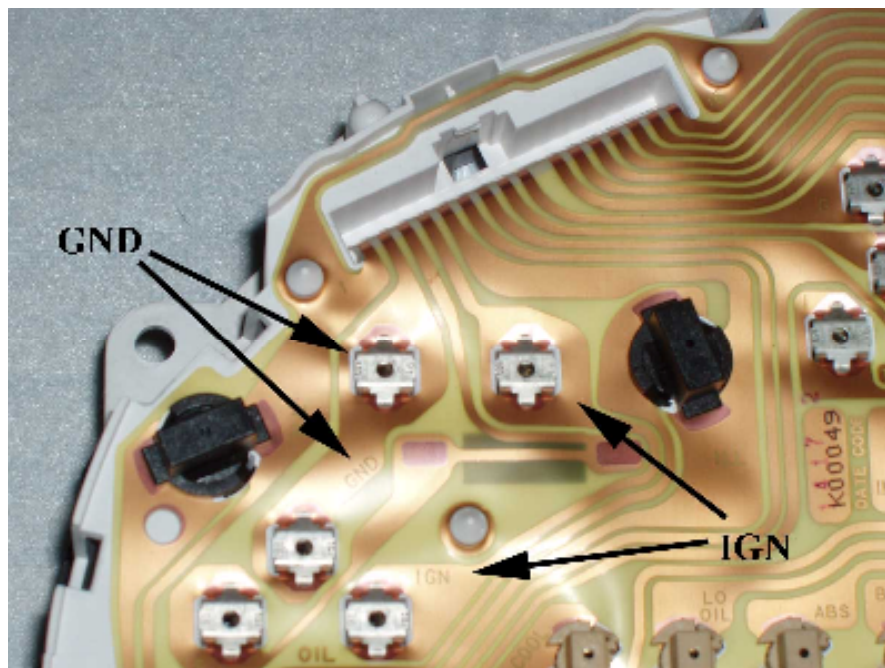
You will want to do the calibration process near your 12 volt, well regulated power supply. If it is to be done using the battery in your vehicle, be sure you have a clean, level non-conducting surface on which to work, such as a piece of cardboard over the engine compartment or a wooden or plastic table next to the fender. Your workspace will need to be close enough to connect your clipleads to the 12V power source and ground. If you can't get close enough, you may need to find a couple of wires to extend 12 volt power and ground to your work surface.

In general, ensure that you do not connect the power to anything backwards, and ensure that none of the wires or clipleads short to power, ground or each other. For the pictures in this manual, we try to use red clips for power and black clips for ground, and other colors for signals.

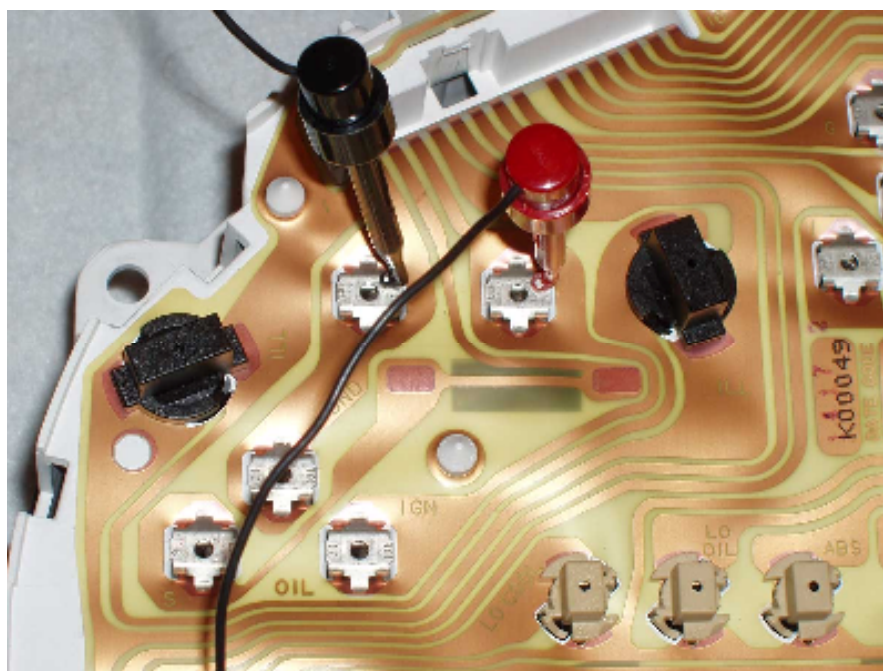


## Voltage Gauge

With the instrument cluster removed from your vehicle (Appendix A), locate the terminals on the back of the voltage gauge on the back of the cluster:



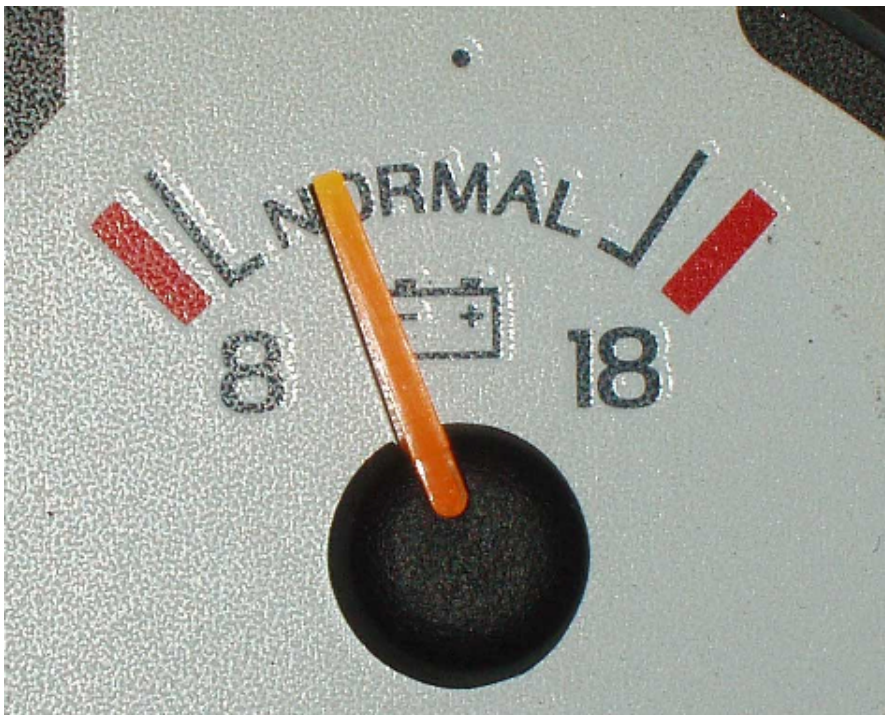
Using a pair of clipleads, connect the voltage gauge “IGN” terminal on the back of the cluster (behind the voltage gauge) to battery positive (we used a red clip). Connect the voltage gauge “GND” terminal on the back of the cluster to chassis ground (we used a black clip).



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If you have access to a DVM, check the battery voltage to ensure it is close to 12V.

*Stock Gauge Face:* Assuming the battery voltage is close to 12V, the voltage gauge needle should be pointing between the “N” and the “O” in “NORMAL”, on a stock gauge face:



*Aftermarket Voltage Gauge Face:* The voltage gauge needle should be pointing at the 12V mark.

If the needle does not point to the correct location, follow the procedure in Appendix C to CAREFULLY remove the needle and replace it in the correct calibration location described above.

To check the calibration of the voltage gauge while the cluster is still in the vehicle, simply turn the key on, engine off. If you have a DVM, check the battery voltage to ensure you have 12 volts. Check to see if the needle points at the correct point per above for either your stock or aftermarket gauge face.

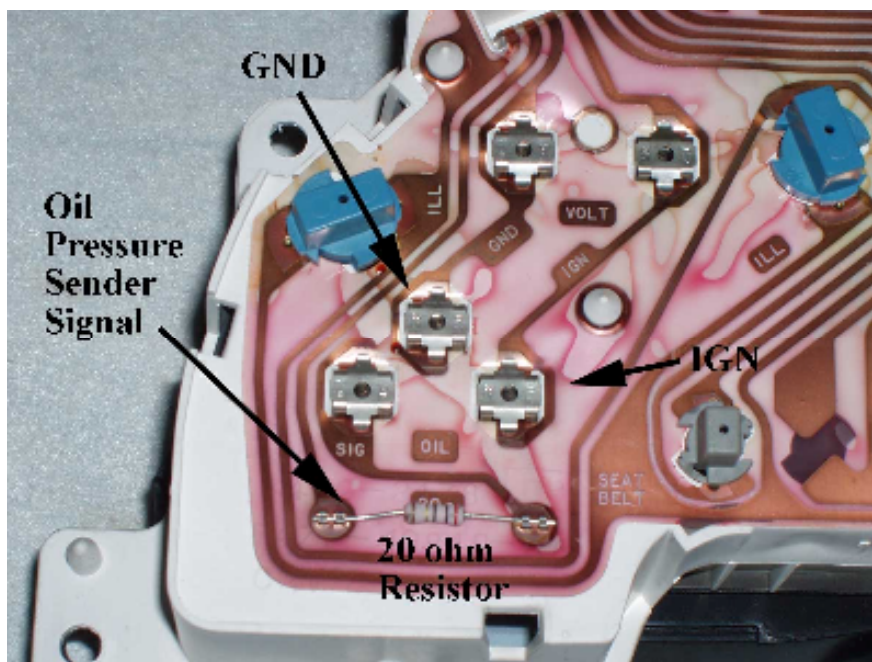
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### Oil Pressure Gauge

Starting sometime around 1990, Ford decided to replace their analog oil pressure senders with a grounded pressure switch that is open (infinite resistance) below 6 PSI and closed (0 resistance) above 6 PSI. For model years 1996 and earlier, Ford limited the needle movement to a high-normal level by adding a 20 ohm resistor on the back of the cluster. For model years 1997 and 1998, Ford eliminated the resistor and replaced the gauge movement with one that went to a high normal level when the oil pressure switch is closed. It is possible that the transition occurred before the end of model year 1996, so be sure to check which one you have.

#### *94-96 Style Oil Pressure Gauges*

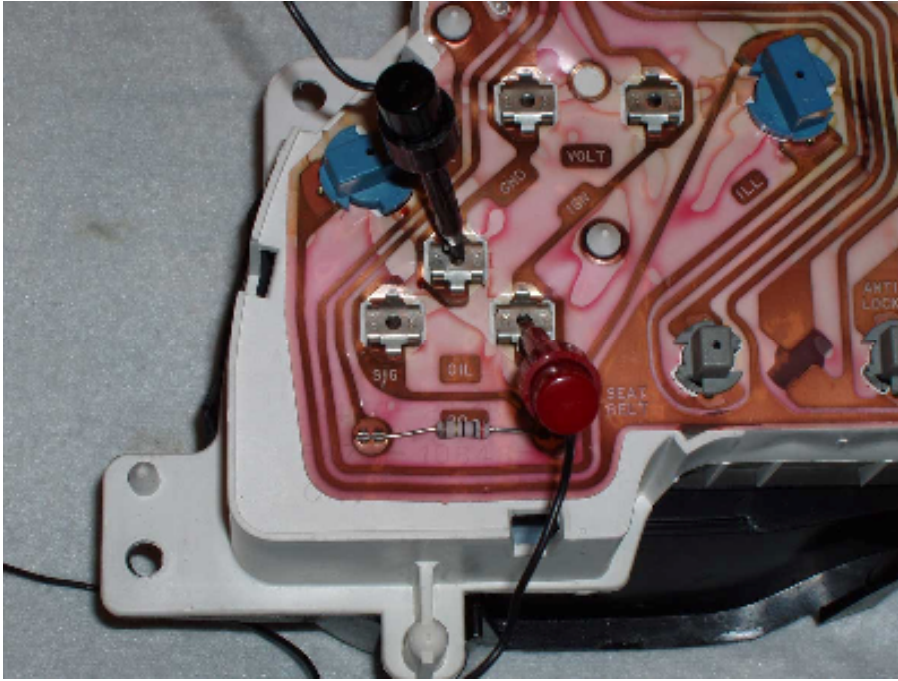
(This assumes you have not installed an Accutach Cluster Upgrade unit. If you have installed an Accutach Cluster Upgrade unit, follow the calibration instructions for that unit, not these instructions.) With the instrument cluster removed from your vehicle (Appendix A), locate the terminals on the back of the oil pressure gauge on the back of the cluster and locate the 20 ohm resistor.



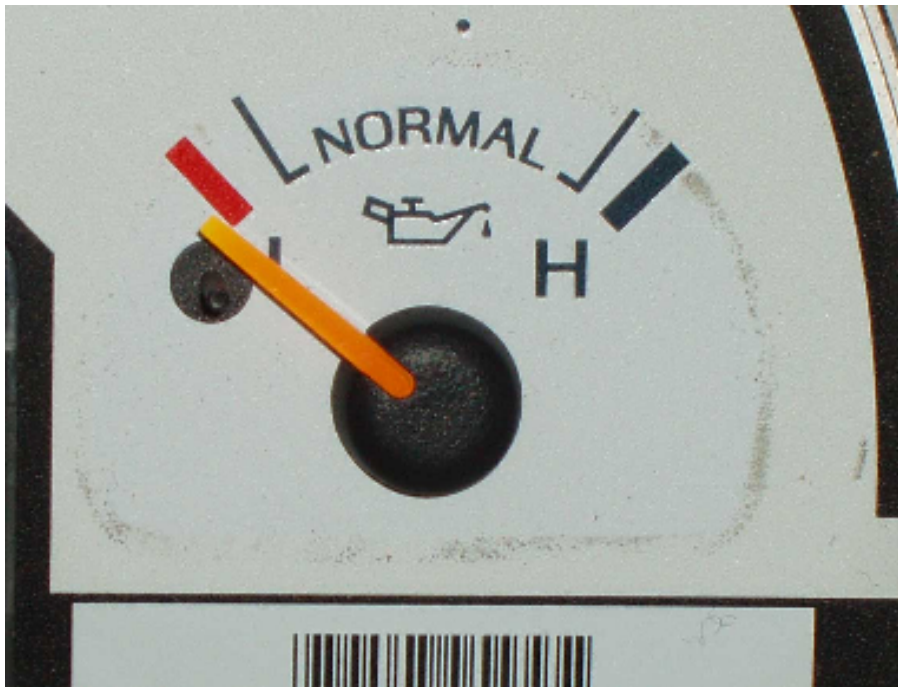


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Using a pair of clipleads, connect the oil pressure gauge “IGN” terminal to battery positive. Connect the voltage gauge “GND” terminal to chassis ground.



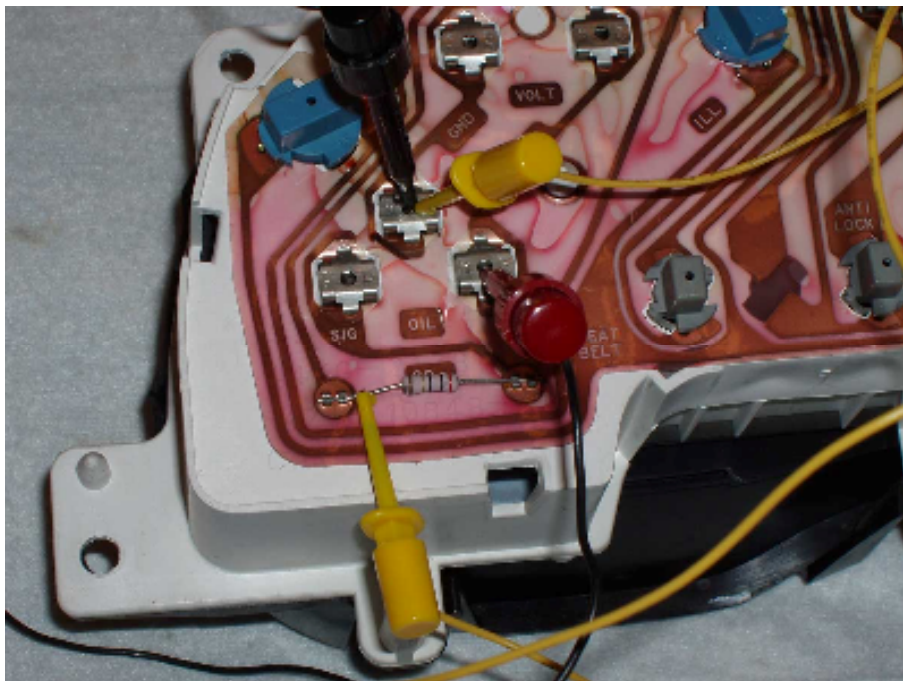
*Stock oil pressure gauge face:* The needle should point below the red “L” low oil pressure mark.



*Aftermarket oil pressure gauge face:* The needle should point below the 10 PSI mark.

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Using a third cliplead, connect the left side of the 20 ohm resistor to chassis ground.



*Stock oil pressure gauge face:* The needle should point somewhere in the high-normal range.



*Aftermarket oil pressure gauge face:* The needle should point at an angle similar to that shown on the stock face above.

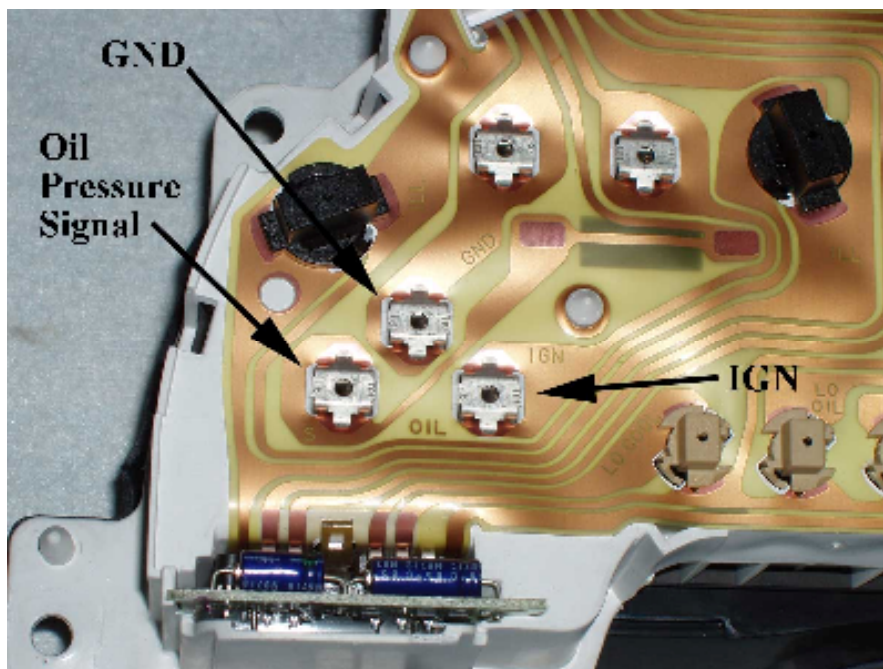
If the needle does not point to the correct location, follow the procedure in Appendix C to CAREFULLY remove the needle and replace it in the correct calibration location described above. Remove the signal lead to check that the needle goes back below the red “L” mark.



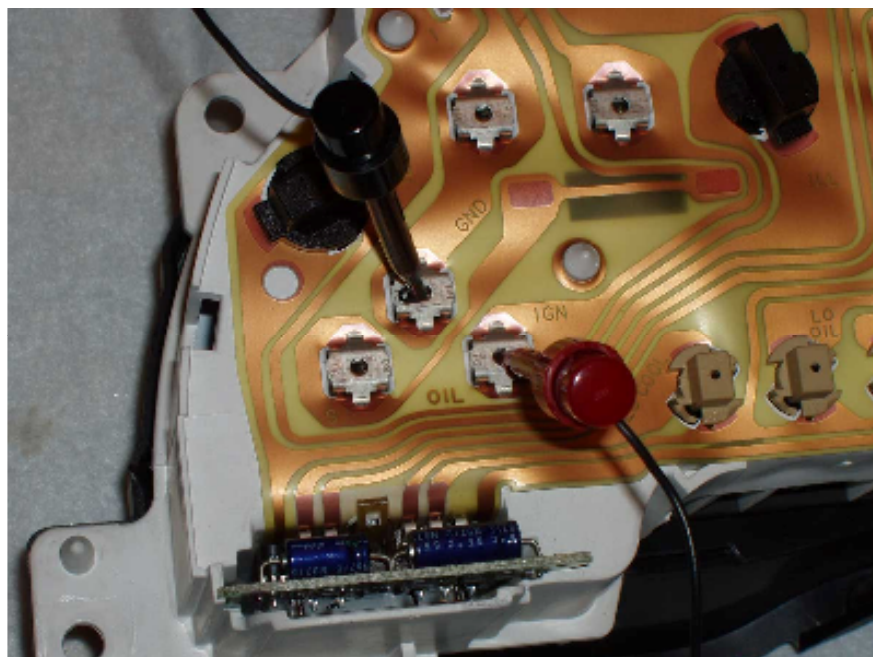
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### 97-98 Style Oil Pressure Gauges

(This assumes you have not installed an Accutach Cluster Upgrade unit. If you have installed an Accutach Cluster Upgrade unit, follow the calibration instructions for that unit, not these instructions.) With the instrument cluster removed from your vehicle (Appendix A), locate the terminals on the back of the oil pressure gauge on the back of the cluster.

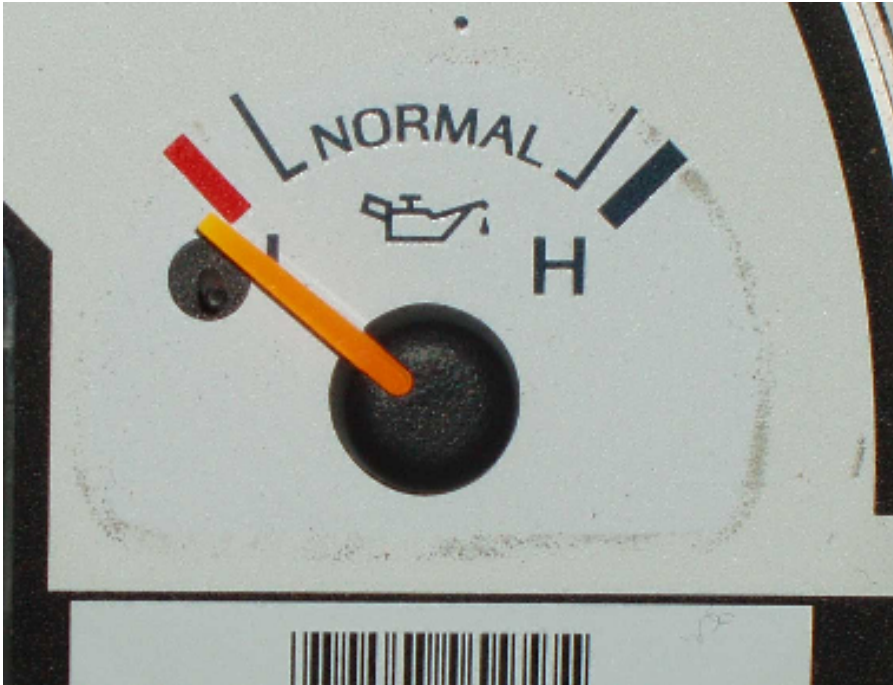


Using a pair of clipleads, connect the oil pressure gauge “IGN” terminal to battery positive. Connect the voltage gauge “GND” terminal to chassis ground.



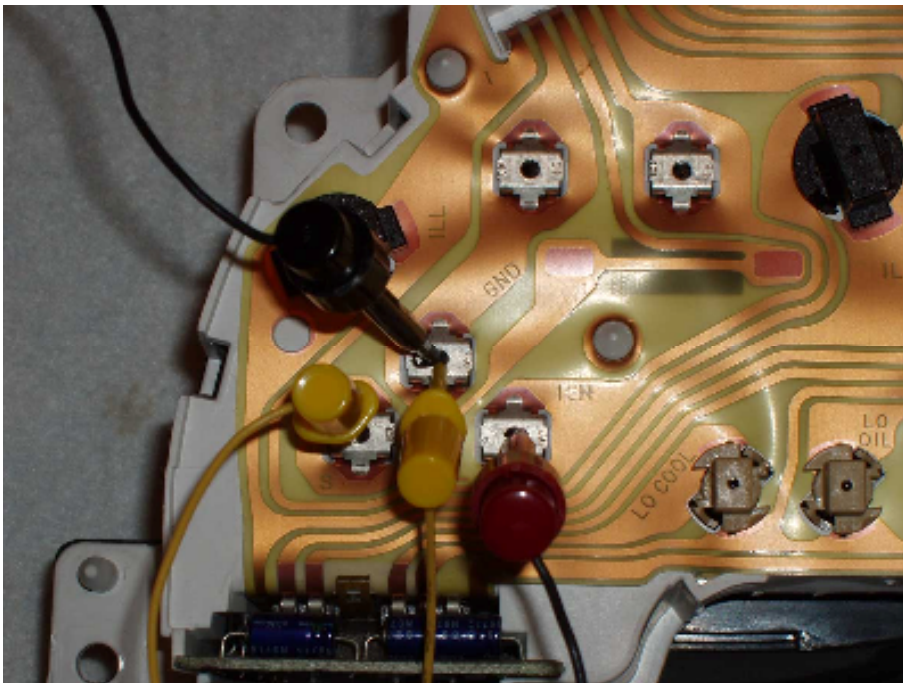
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*Stock oil pressure gauge face:* The needle should point below the red “L” low oil pressure mark.



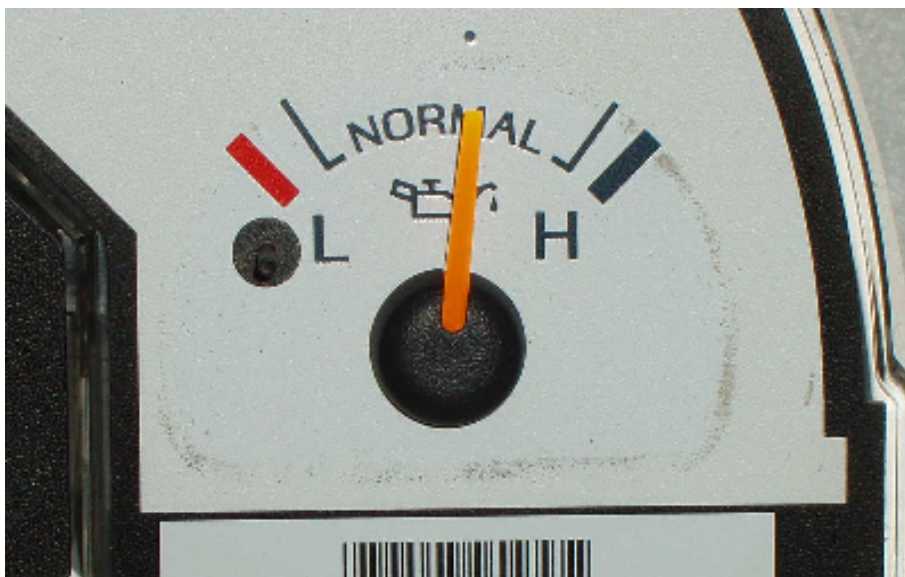
*Aftermarket oil pressure gauge face:* The needle should point below the 10 PSI mark.

Using a third cliplead, connect the “S” terminal to chassis ground.



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*Stock oil pressure gauge face:* The needle should point somewhere in the high-normal range.



*Aftermarket oil pressure gauge face:* The needle should point at an angle similar to that shown on the stock face above.

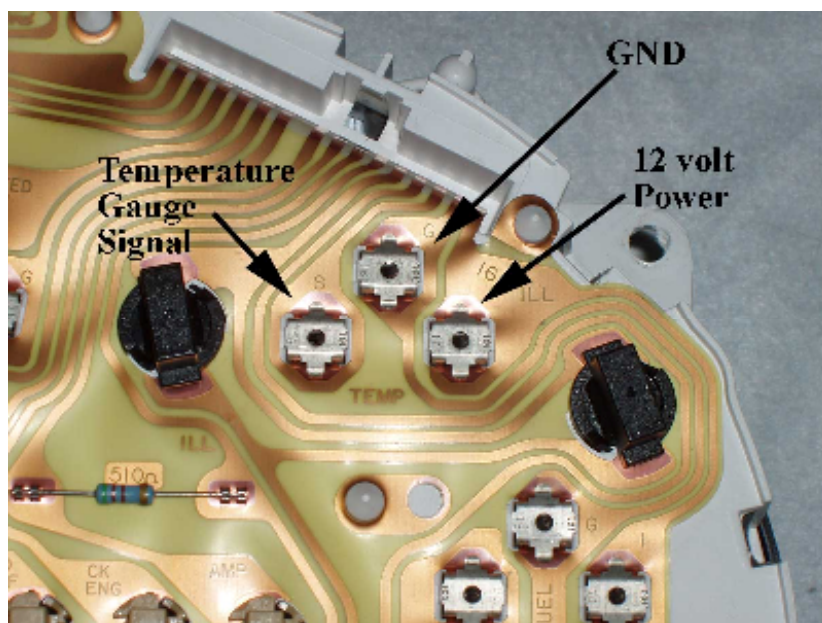
If the needle does not point to the correct location, follow the procedure in Appendix C to CAREFULLY remove the needle and replace it in the correct calibration location described above. After you are done, remove the cliplead connected to the “S” terminal to check that the needle goes back below the red “L” low oil pressure mark.

To check the calibration of either style oil pressure gauge while the cluster is still in the vehicle, turn the key on, engine off and check that the needle is at the low point described above, then start the engine and check if the needle is at the high-normal point described above.

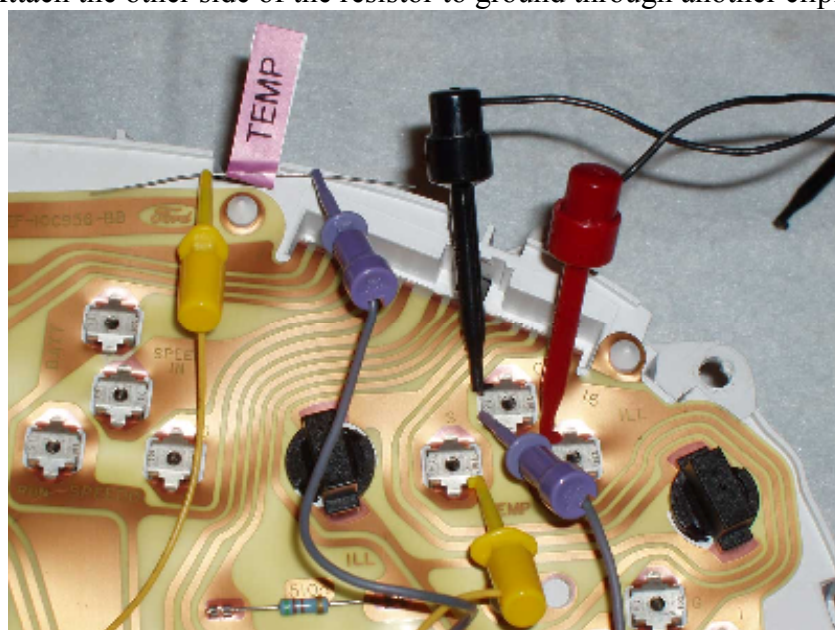


### Coolant Temperature Gauge

(This assumes you have not installed an Accutach Cluster Upgrade unit. If you have installed an Accutach Cluster Upgrade unit, follow the calibration instructions for that unit, not these instructions.) With the instrument cluster removed from your vehicle (Appendix A), locate the terminals on the back of the temperature gauge on the back of the cluster:

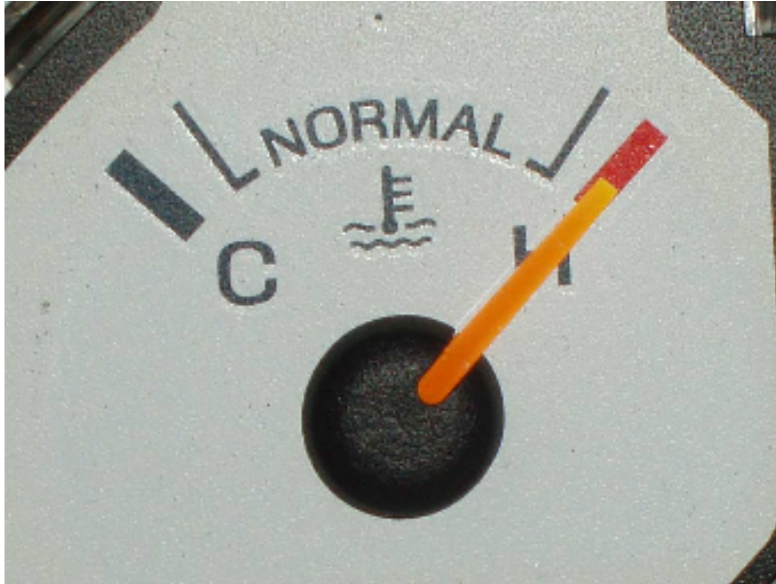


Using a pair of clipleads, connect the oil pressure gauge “ILL” terminal to battery positive. Connect the “G” terminal to chassis ground. Attach a third cliplead to the temperature gauge “S” (sender) terminal behind the temperature gauge. Attach one side of the temperature gauge calibration resistor to the other end of the third cliplead. Make sure these wires do not short to anything else. Attach the other side of the resistor to ground through another cliplead.



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*Stock temperature gauge face:* You should see the needle go to the red “H” mark.



*Aftermarket temperature gauge face:* You should see the needle go to a little above the 250 degree mark.

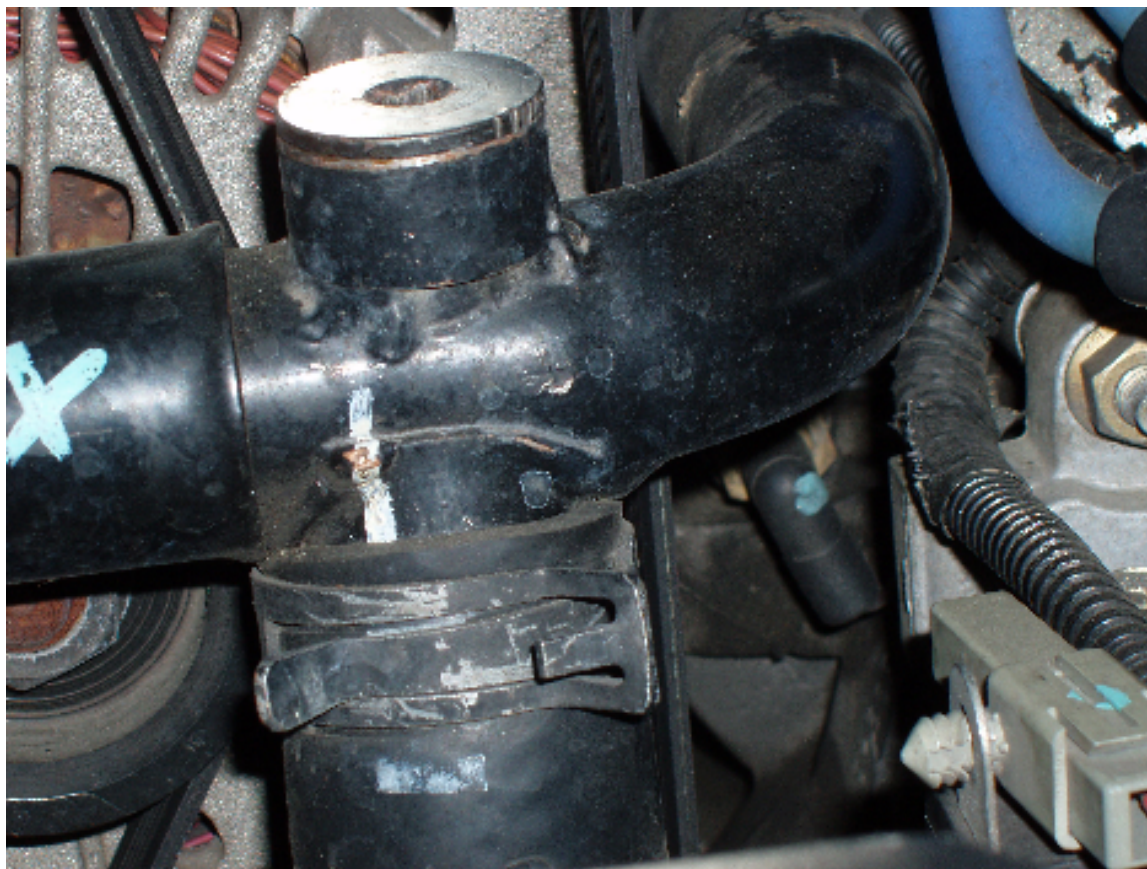
If the needle does not point to the correct location, follow the procedure in Appendix C to CAREFULLY remove the needle and replace it in the correct calibration location described above.

To check the calibration of the coolant temperature gauge while the cluster is still in the vehicle, you must first identify the temperature gauge sender and its signal wire.

*Identifying the Coolant Temperature Sender Wire:* Make sure you identify the correct coolant temperature sender. Some vehicles have one sender for the PCM and another sender for the gauge. Prior to sometime in 1996, Ford used a one terminal temperature gauge sender with the sender body making the ground connection to the engine through the sensor bung, and a two terminal temperature sender for the PCM. After some point in 1996, Ford changed to a two terminal sensor for the temperature gauge sender in addition to the two terminal PCM temperature sender. In both cases, for Mustangs, the coolant temperature sender wire is a red wire with a white stripe. In the case of the two wire sender, the ground wire at the sender connector is a yellow wire with a red stripe. In V8 Mustangs, we have evidence that Ford put the two temperature senders on either side of the coolant crossover tube, so double check to make sure you have identified the correct coolant temperature gauge signal for your vehicle, not its PCM temperature sender.

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Here is a picture of a connected single terminal temperature gauge sender connector with the red wire with a white stripe, which happens to be on the driver's side of this vehicle:

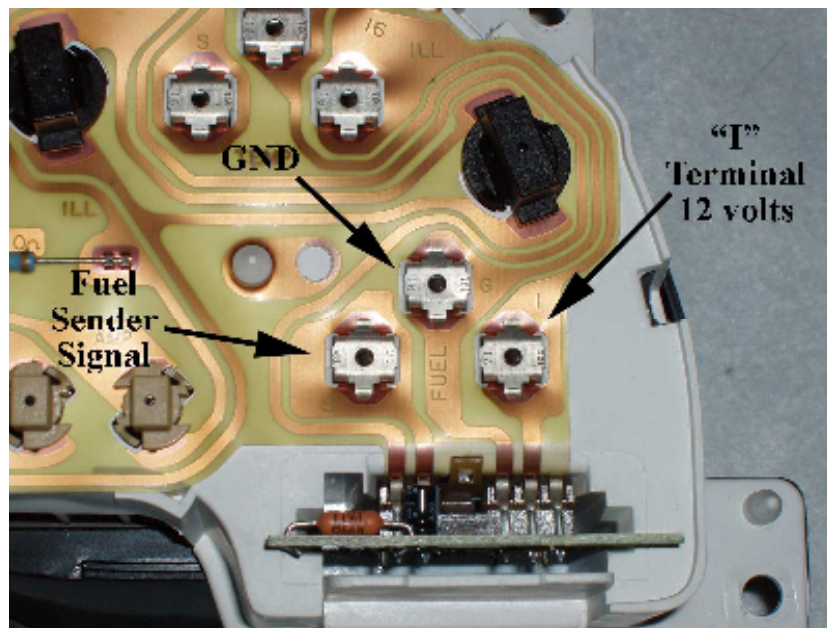


Disconnect the wiring harness connector at the temperature gauge sender. Connect a cliplead to the connector pin for the red wire with a white stripe. Connect the other end of that cliplead to the temperature gauge reference resistor. Use another cliplead to connect the other side of the temperature gauge reference resistor to chassis ground. Turn the key on, engine off and you should see the temperature gauge go to the Red "H" mark or a little above the 250 degree mark per above.

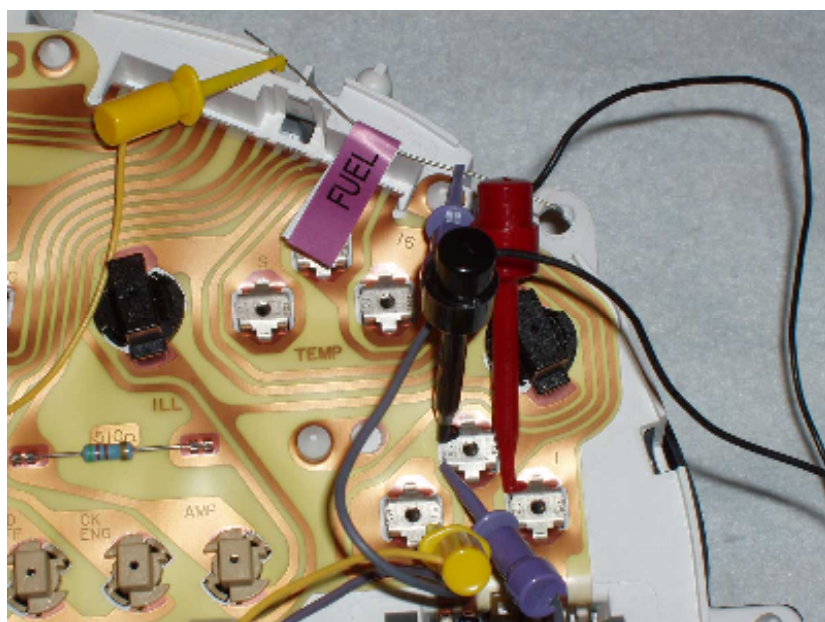


## Fuel Level Gauge

With the instrument cluster removed from your vehicle (Appendix A), locate the terminals on the back of the fuel level gauge on the back of the cluster:

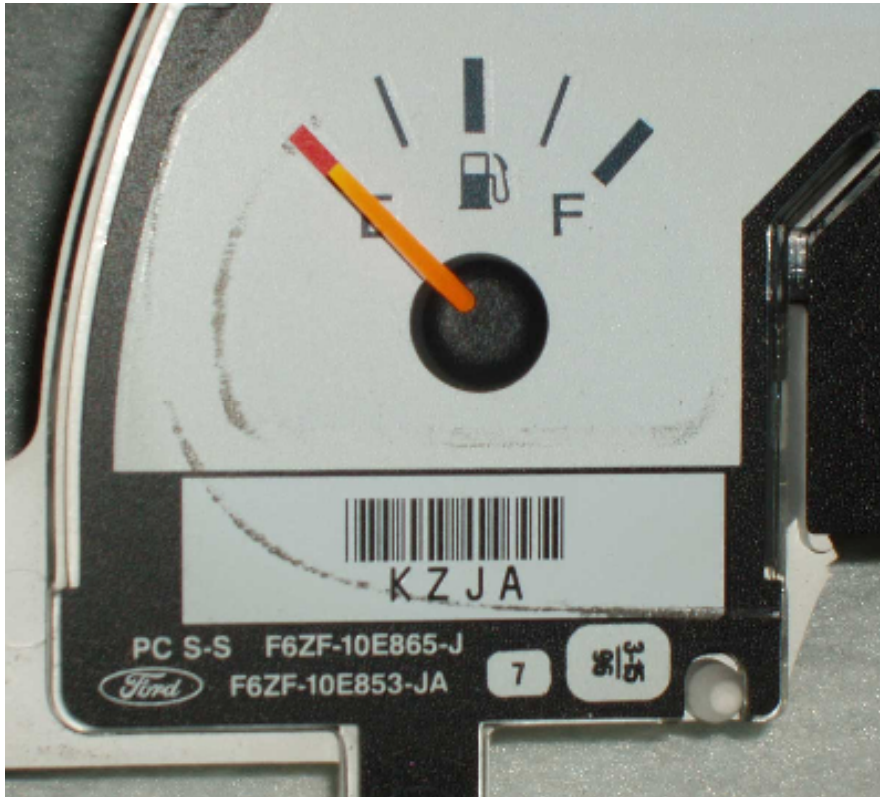


Using a pair of clipleads, connect the fuel level gauge "ILL" terminal on the back of the cluster (behind the temperature gauge) to battery positive. Connect the "G" terminal behind the fuel level gauge to chassis ground. Attach a third cliplead to the fuel level gauge "S" (sender) terminal behind the fuel level gauge. Attach one side of the fuel level gauge calibration resistor to the other end of the third cliplead. Make sure these wires do not short to anything else. Attach the other side of the resistor to ground through another cliplead.



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*Stock or aftermarket fuel level gauge face:* You should see the needle go to the red “E” mark.



If the needle does not point to the correct location, follow the procedure in Appendix C to CAREFULLY remove the needle and replace it in the correct calibration location described above.

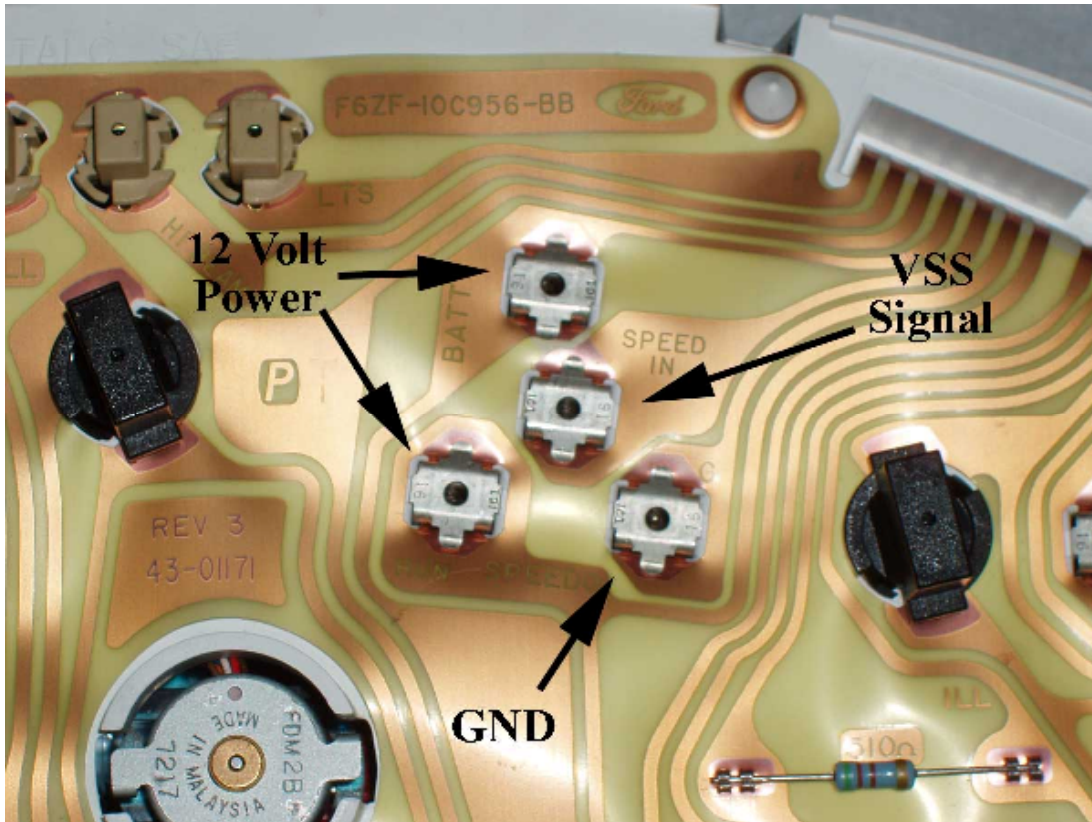
To check the calibration of the coolant temperature gauge while the cluster is still in the vehicle, you must first identify the temperature gauge sender and its signal wire.

Identifying the Fuel Level Gauge Sender wire: At the fuel level sender there is a wiring harness connector that includes the fuel level signal wire. You must identify the correct wire for your vehicle. In Mustangs, this wire is a ??? wire with a ??? stripe. Disconnect the connector and identify the fuel level signal pin on the wiring harness connector. Connect a cliplead to that connector pin. Connect the other end of that cliplead to the fuel gauge reference resistor. Use another cliplead to connect the other side of the fuel gauge reference resistor to chassis ground. Turn the key on, engine off and you should see the fuel gauge go to the red “E” mark per above.

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### Speedometer

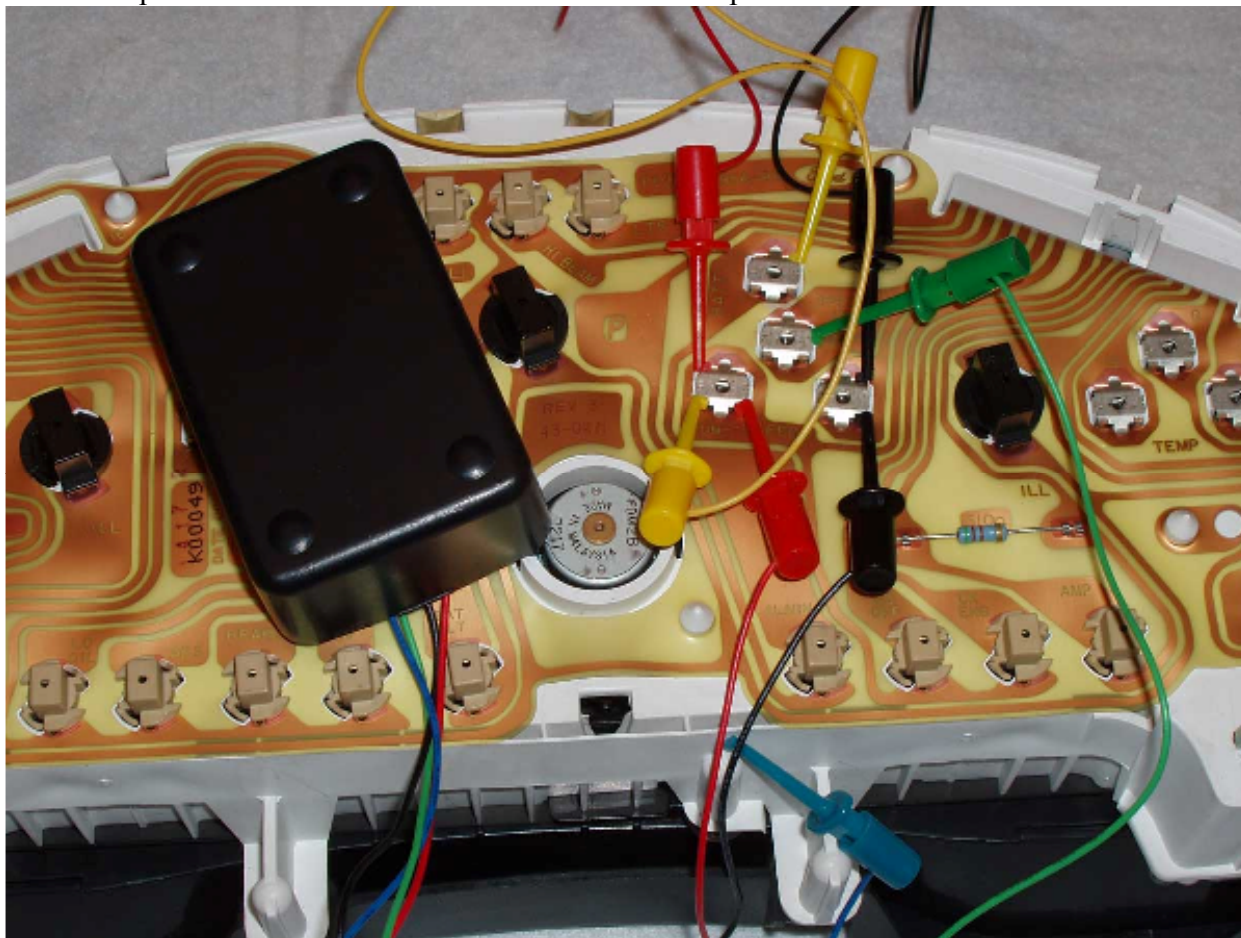
With the instrument cluster removed from your vehicle (Appendix A), locate the terminals on the back of speedometer on the back of the cluster:





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Using a pair of clipleads, connect the Speedometer “BATT” terminal on the back of the cluster (behind the speedometer) to battery positive. Connect the “G” terminal behind the speedometer to chassis ground. Using a third cliplead, connect the “RUN” terminal on the back of the speedometer to the “BATT” terminal. This powers the speedometer. Connect the black ground lead of the Accutach Speedometer/Tachometer Calibrator to the “G” terminal, and connect the green speedometer reference signal lead of the Accutach Speedometer/Tachometer Calibrator to the “SPEED IN” terminal on the back of the speedometer. Connect the red power lead of the Accutach Speedometer/Tachometer Calibrator last. This powers the calibrator:



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*Stock or aftermarket speedometer face:* The speedometer needle should go to 45 MPH.



If the needle does not point to the correct location, follow the procedure in Appendix C to CAREFULLY remove the needle and replace it in the correct calibration location described above.

Unhook the Speedometer/Tachometer Calibration Unit's red power prior to unhooking the clipleads to avoid risking damage to the calibration unit.

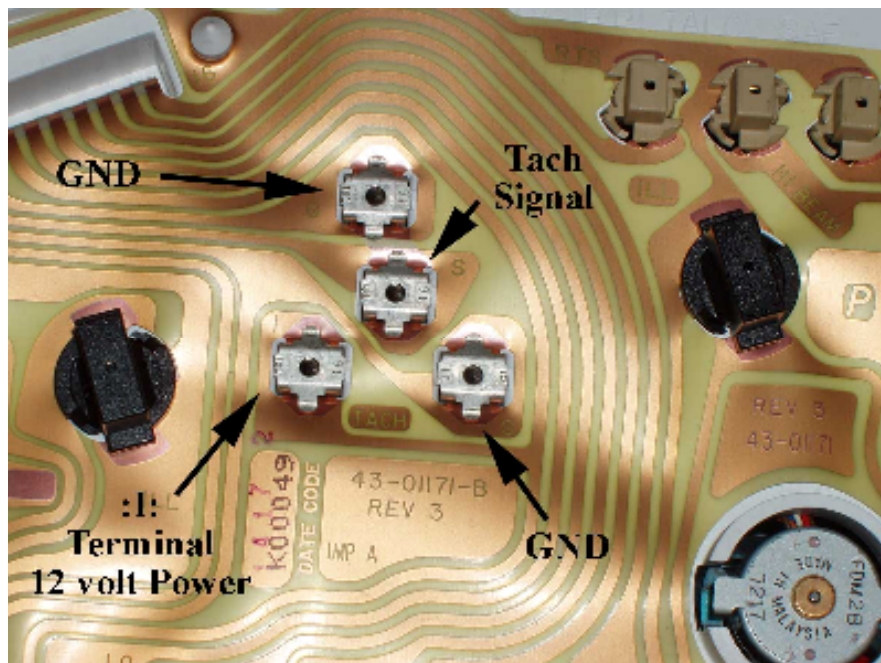
**Note:** The calibrator will be adding mileage to the cluster odometer at a 45 MPH rate while you have the speedometer powered up and the calibrator connected to the speedometer and running.



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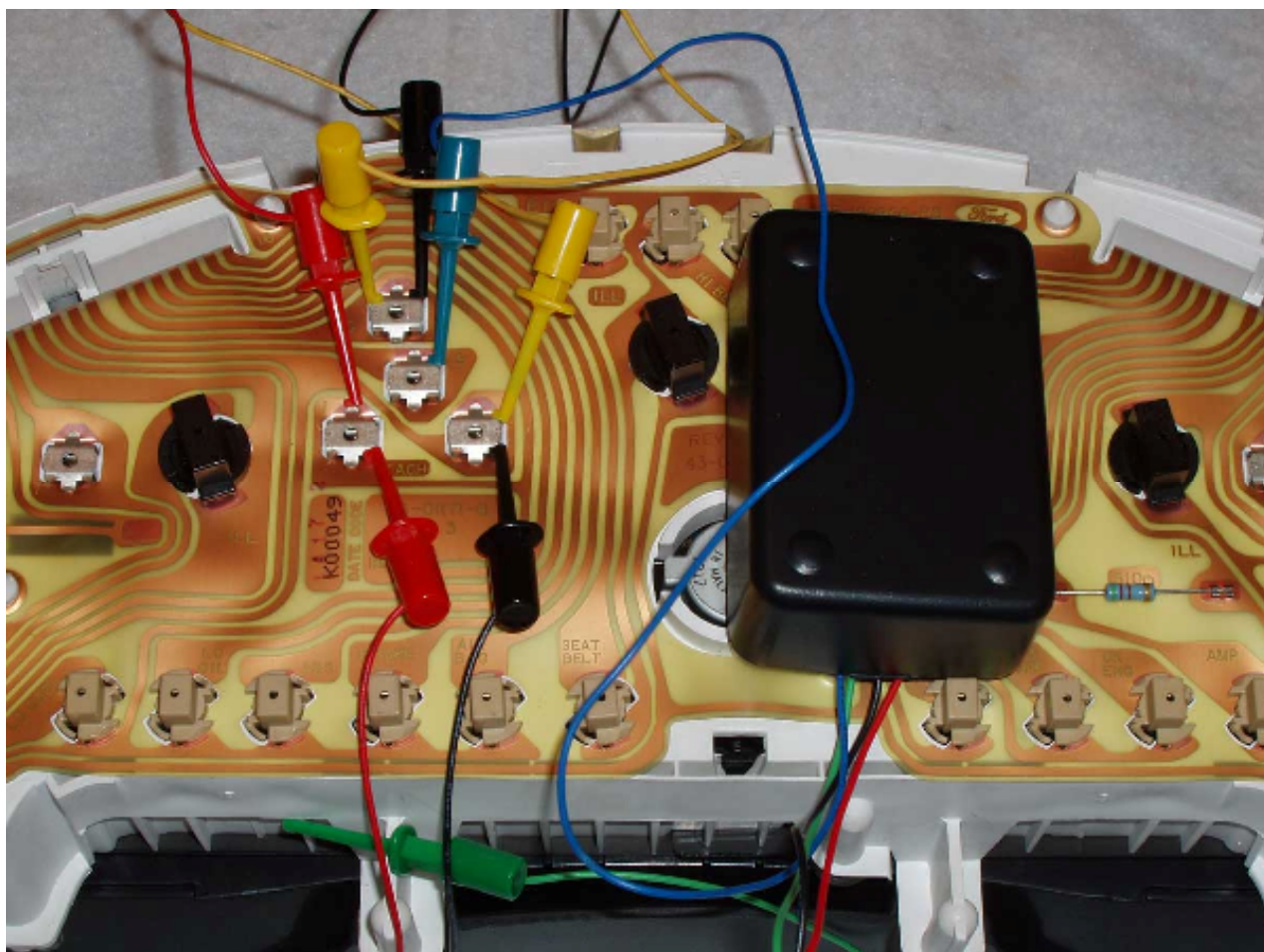
### Tachometer

With the instrument cluster removed from your vehicle (Appendix A), locate the terminals on the back of tachometer on the back of the cluster:



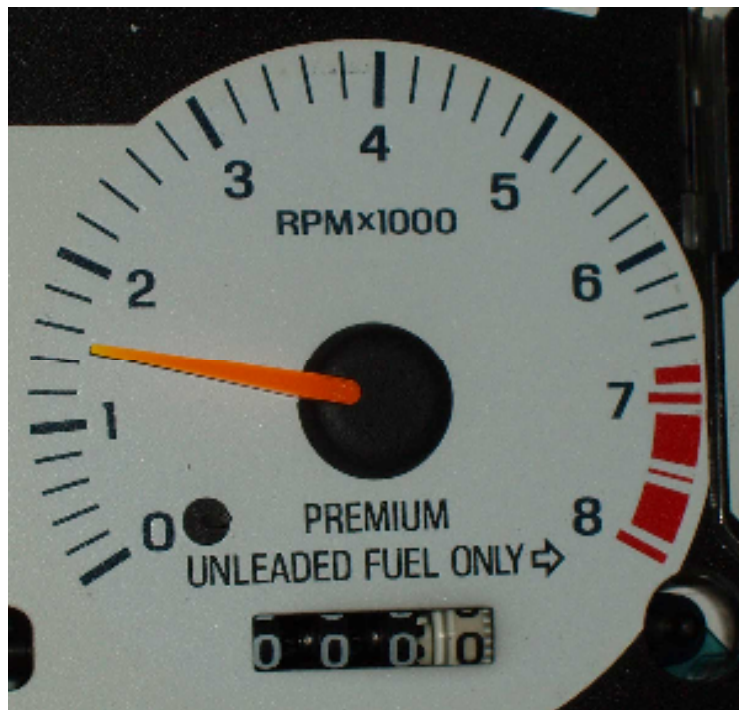
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Using a pair of clipleads, connect the tachometer “I” terminal on the back of the cluster (behind the tachometer) to battery positive. Connect one of the “G” terminals behind the tachometer to chassis ground. Using a third cliplead, connect the other “G” terminal on the back of the speedometer to the first “G” terminal. This powers the tachometer. Connect the black ground lead of the Accutach Speedometer/Tachometer Calibrator to one of the “G” terminals, and connect the blue tachometer reference signal lead of the Accutach Speedometer/Tachometer Calibrator to the “S” terminal on the back of the tachometer. Connect the red power lead of the Accutach Speedometer/Tachometer Calibrator last. This powers the calibrator:



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*Stock or Aftermarket Tachometer Face:* The tachometer needle should go to 1500 RPM for a V8 Cluster, 2000 RPM for a V6 Cluster and 3000 RPM for a 4 cylinder cluster. (V8 tach shown)



If the needle does not point to the correct location, follow the procedure in Appendix C to CAREFULLY remove the needle and replace it in the correct calibration location described above.

Unhook the Speedometer/Tachometer Calibration Unit's red power lead prior to unhooking the clipleads to avoid risking damage to the calibration unit.

### Calibration Complete

At this point, calibration of the gauges in your cluster is complete. You may now replace the cluster front cover (Appendix B) and replace the cluster into the vehicle (Appendix A)

Thank you for using the Accutach 1994-1998 Cluster Calibration Kit.

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### **Legal Information**

#### **Accutach Company Limited Warranty**

This Accutach Company product is warranted to be free of defects in workmanship and materials for a period of one year from the date of purchase. This warrantee is for the original purchaser only, and warranty claims must include authentic, dated proof of purchase. If a problem is suspected, the customer must contact Accutach directly in order to discuss the issue. Should it be necessary for the product to be returned to Accutach, the customer should first obtain an RMA (Returned Material Authorization) number from Accutach. Upon the return of the product, Accutach will determine if the product was damaged from abuse or a defect. Accutach will, at its sole discretion, return, repair or replace the product. This warranty covers only the cost of the product and not that of installation or removal. See [www.accutach.com](http://www.accutach.com) for contact information.

#### **Returns and Restocking Fee**

A 15% restocking fee will be charged for any returns for refund.

#### **Disclaimer**

The users of Accutach Company products do so at their own risk. Accutach is not responsible for any damage or injury resulting from the use of its products in any way. The use of Accutach Company products constitutes the user's acceptance of all of Accutach's terms and conditions.



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### Appendix A Instrument Cluster Removal and Reinstallation

1. Unhook the vehicle's negative battery terminal.
2. Using the small Allen wrench, pull out on the metal tab (in the headlight knob slot) that releases the headlight switch knob from the shaft. Remove the headlight switch knob. This may take some pulling to get it off the shaft.



3. Remove the screws that hold the instrument cluster bezel on.
4. Remove the instrument cluster bezel.

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5. Remove the screws that hold the instrument cluster into the dash.



6. Carefully pull the cluster out far enough to disconnect the two cluster wiring connectors one on either side of the back of the cluster.
7. Remove the cluster from the car.

Reassembly is the reverse of the disassembly process from step 13 to step 1.

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### Appendix B Instrument Cluster Front Cover Removal

Prior to removing the instrument cluster front cover, you will need to remove the cluster from the vehicle (Appendix A).

In order to get access to the needles for removal, you will need to remove the 8 TORX screws that hold the front cluster cover on the cluster and then remove the cluster front cover:



View with the cover off the Cluster:



To replace the cluster front cover, place the front cover on the alignment pins of the cluster and replace the 8 TORX screws.



### Appendix C Gauge Needle Removal

Gauge needles will need to be removed if the gauge faces are to be replaced or if the gauges need to be recalibrated for any reason, such as aging. Prior to needle removal, the cluster will need to be removed from the vehicle (Appendix A) and the front cover will need to be removed from the cluster (Appendix B).

You will need a standard metal dinner fork to remove the needle. You will need a piece of clean, dry, lint-free cloth to protect the gauge face from scuff marks.

Note how far the needle is pushed down onto the gauge shaft relative to the gauge face. Place the cloth on the face of the gauge on the side you will be leveraging with the fork. Slide the fork tines on either side of the gauge post, under the needle center as in this picture:



With the cloth under the fork and the fork under the needle on either side of the shaft, CAREFULLY pry up on the needle with the fork. Be very gentle as you pry, because the needles are very fragile and can be easily broken.

After the calibration equipment is set up and turned on for the gauge whose needle is to be replaced, CAREFULLY push the needle onto the gauge shaft until it is on as far as it was prior to its removal. If you push the needle too far onto the shaft, it may bind, resulting in inaccurate reading. If you push the needle on the shaft in the wrong position for calibration, simply remove the needle and try again until you are satisfied with the needle calibration.