

## 72 Mustang Mach 1 tachometer cluster and gauge conversion

Dated: 02-17-2009 (drafted by a Chevy person working on his first Ford -not good-)

Revised: 11-05-2010

**The following information pertains to how I went about converting the standard dash cluster with warning lamps (no clock, no gauges) to a tachometer performance cluster. I also installed new Auto Meter (oil press, water temp, voltage) gauges into a new center dash console.**

I purchased a used tach cluster wire harness on Ebay that was originally in a 73 mustang. The harness was damaged but all I wanted or needed was the **12-pin plug** for my conversion.

I purchased a new center dash console for the gauges. I also purchased two used center consoles with gauges off of Ebay (it took 2 purchases to just get 3 good gauges). But I decided to not use the gauges because I wanted a voltage gauge in place of the worthless AMP gauge. Also the AMP gauge requires wiring modifications that I didn't want the extra hassle. I modified one of the rear gauge enclosures for **AutoGage 1 1/2" gauges**. These gauges have somewhat the same look as the factory gauges. The original sending units for the warning lamps will be removed and be replaced with the new units that came with the gauge kit.

If you are adding factory gauges, you will need to replace the sending unit for oil pressure (the existing one for the warning lamp will not work). You will need to run a **regulated 12v power supply** to the factory gauges. Install a metal terminal onto a new wire and run the wire from the 12-pin plug (pin 8) to the factory oil & temp gauges. I personally would not waste my time trying to wire in a factory AMP gauge. The original oil pressure & temperature signal wires that were used for the warning lamps in the dash cluster will be reused for the gauges.

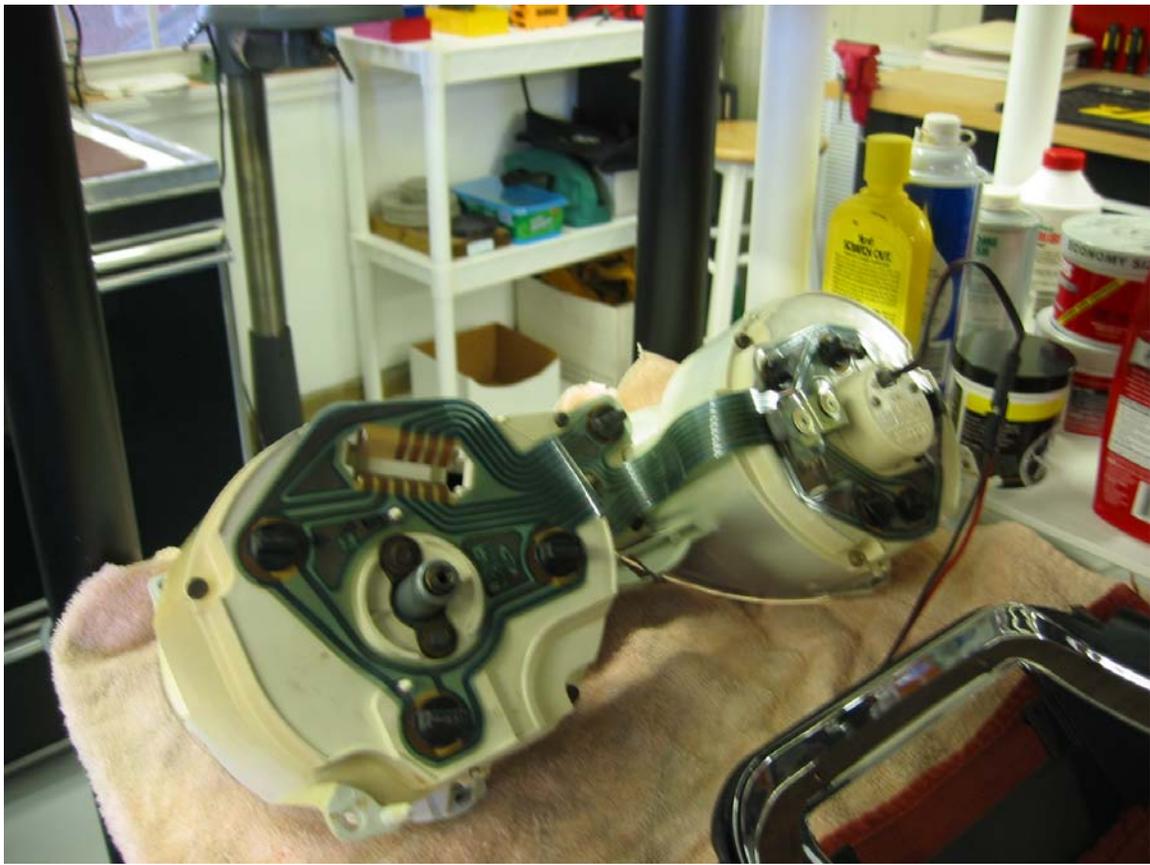
I'm saving the factory gauges, original center dash console, and the original speedometer cluster with the 18-pin plug for the next owner. This will give them the option to revert back to the original configuration or convert to factory gauges.

The standard non-tach cluster wiring harness [C-29] has an 18-pin plug (No Tach) where the tach cluster wiring harness has a 12-pin plug (Tach). **A 12-pin plug is a must have requirement.** If you can't locate a tach cluster wiring harness, it would not be that difficult to take the existing 18-pin plug and cut a section out and glue back together. More detail information is available later in this document pertaining to this idea.

### Getting started steps:

- **Disconnect the negative battery cable.**
- Remove the steering wheel and turn signal handle (gives needed room to work).
- Remove the dash pad.
- Remove the steering wheel collar (helps in removing the speedometer bezel).
- Remove the instrument cluster. (I disconnected the speedometer cable from the transmission to get extra slack to pull the speedometer cluster out to where I could remove the cable).
- Remove the center dash console if adding gauges.
- Disconnect the ignition switch plug (optional).

**This picture shows the printed circuit for the tachometer cluster. The first 2 pins of the 12-pin circuit (location 1-2) are not being used. You see why the 18-pin plug for the standard cluster will not fit unless modified.**



## Comparing the 18-pin circuit to the 12-pin circuit:

The pins marked in **red** will be pulled out of the existing 18-pin plug and inserted into the tach 12-pin plug. The pins marked in **blue** will be pulled out and rewired to a signal stud on the oil pressure or temperature gauges. Missing wire (center clock) for the existing 18-pin plug is marked in **green**. Only the oil pressure and water temperature wires will have the metal terminal removed so they can be wired to the center console gauges.

### WIRE CHART 1:

18-pin NT			Tach 12-pin Pin
Pin	Wire circuit/color	Description.....	Pin
1	-no pin-	-none-	
2	-no pin-	-none-	2
<b>3</b>	<b>2/white-lt blue stripe</b>	<b>RH turn signal</b>	<b>3</b>
<b>4</b>	<b>3/lt green-white stripe</b>	<b>LH turn signal</b>	<b>4</b>
<b>5</b>	<b>297/black-lt green hash</b>	<b>Accy feed from ignition switch</b>	<b>7</b>
	<b>48/black</b>	<b>Blind circuit (hold resister wire)</b>	
<b>6</b>	<b>29/yellow-white stripe</b>	<b>Fuel gauge to fuel sender</b>	<b>6</b>
7*	-no wire -	Regulated voltage to gauges	8
8**	-no wire-	Alternator warning lamp	
<b>9</b>	<b>31/white-red stripe</b>	<b>Oil pressure lamp</b>	
<b>10***</b>	<b>54/lt green – yellow stripe</b>	<b>center clock 12v</b>	<b>1</b>
<b>11</b>	<b>977/purple-white stripe</b>	<b>Brake warning lamp</b>	<b>9</b>
<b>12</b>	<b>39/red-white stripe (2)</b>	<b>Water temperature lamp</b>	
<b>13</b>	<b>640/red-yellow hash</b>	<b>Warning lamps feed</b>	<b>10</b>
<b>14</b>	<b>57/black</b>	<b>Ground circuit</b>	<b>11</b>
15	-no pin-	-none-	
16	-no pin-	-none-	
<b>17</b>	<b>12/lt green-black stripe</b>	<b>High beam lamp</b>	<b>5</b>
<b>18</b>	<b>19/lt blue-red stripe</b>	<b>Instrument panel lamps feed</b>	<b>12</b>

\* **No wiring going to pin 7.** This wire was included only if the factory gauges were installed. It was used for the regulated power source (60/black – light green dots) for the gauges.

\*\* There was external wiring to the ALT warning lamp thus pin 8 of the 18-pin plug wasn't being used. You could put a red lamp cover over the bulb and mount a socket below the dash if you want the ALT warning lamp to be seen. **The ALT warning lamp circuit will not be altered by this conversion.**

\*\*\* The clock wire (pin 10) of the 18-pin plug is not used with the 12-pin plug so I inserted it into pin 1 of 12-pin plug. **This is a blank terminal slot and will work to protect this live clock 12v wire.** The center floor console clock has an existing wiring harness for power.

**If you can't find a tachometer performance cluster harness or plug. Read the following.**

### **Create a 12-pin plug from an 18-pin plug:**

I had a plan if I couldn't locate a 12-pin plug. My plan was to cut a section out of the 18-pin plug and re-glue the two end sections back together to form a new plug. The 2 plugs are the same except for the length (18-pin plug is 11/16" longer than the 12-pin plug).

#### **The following steps would form a new plug:**

- Use a small power band saw or hand blade with a fine tooth for cutting plastic.
- Align the plug on its side so you can read the pin numbers 1 – 9.
- First cut would be at pin 4 against the **left side** support. This would create 2 sections: **A** (pins 1-3 & 16-18) and **B** (pins 4-9 and 13-15).
- Cut section **B** at pin 7 against the **left side** support. This would decrease the size of section **B** by 11/16" [6 pins (2 rows of 3 pins)]. Section **B** now has pins 7-9 & 10-12.
- Super glue the 2 sections (A&B) together to form a new 12-pin plug. Thus the name **AB**

**Wire chart 2 shows the different pin numbers for the newly formed AB plug as compared to the standard 12-pin tach plug (wire chart 1).**

**WIRE CHART 2 for the 12-pin plug comparison:**

<b>Factory plug</b>			<b>AB plug</b>
<b>Tach</b>			<b>Tach</b>
<b>Pin</b>	<b>Wire circuit/color</b>	<b>Description.....</b>	<b>Pin*</b>
1	54/lt green – yellow strip	Center clock 12v (not used)	1
2	-no pin-	-none-	2
3	2/white-lt blue stripe	RH turn signal	3
4	3/lt green-white stripe	LH turn signal	7
5	12/lt green-black stripe	High beam lamp	8
6	29/yellow-white stripe	Fuel gauge to fuel sender	9
7	297/black-lt green hash	Accy feed from ignition switch	10
	48/black	Blind circuit (hold resister wire)	
8	-no wire -	Regulated voltage to gauges	11
9	977/purple-white stripe	Brake warning lamp	12
10	640/red-yellow hash	Warning lamps feed	16
11	57/black	Ground circuit	17
12	19/lt blue-red stripe	Instrument panel lamps feed	18

**\* The AB plug pin numbers are the actual pin numbers that were left on the original 18-pin plug after sections A and B were glued together. Pin locations 4-6 and 13-15 have been removed.**

**Example:** The Brake warning lamp wire (**pin 11**) from the 18-pin plug would go to the factory 12-pin plug (**pin 9**). If using a newly formed AB plug, the Brake warning lamp wire would instead go to (**pin 12**). **Same location, just the actual numbering is different on the AB plug.**

**Move the wires from the 18-pin plug to the 12-pin plug.**

Use wire chart 1 as a reference to move the wires. If using an AB plug, wire chart 2 shows the new replacement pin numbers.

To remove a wire terminal from the 18-pin plug, put forward pressure on the wire while inserting a small jeweler type screwdriver under the metal terminal to push in the holding tab (**bend upward**). You should be able to pull on the wire to remove the terminal.

**Label the wire with the pin number before going to the next wire or insert the wire directly into the new 12-pin plug.** Be sure to label the 2 signal wires (oil & temp) that will connect over to the center console gauges. The temperature signal is the terminal that has 2 wires connected together.

This picture shows both plugs during the wiring change.



Before reinstalling the terminals into the new plug, be sure to **bend the tab back out** (**bend down**) so that it clicks when the metal terminal is fully pushed into the plug. Give a slight tug on the wire to make sure it won't come back out.

## Wiring the tachometer:

### From 72 Mustang wiring diagrams:

At the ignition plug [C-28] there are two **red-light green striped wires** (circuit 16) connected together at one pin location. One wire goes to the fuse panel and the other to the coil.

On the tach performance version, the two wires are the same size wire (gauge). The wire going to the fuse panel also goes to the input lead of the tach. The output lead is a resister wire (larger size) and goes to the engine harness plug [C-27] (to the coil).

On the standard non-tach version, the two ignition wires (red-light green striped) are different sizes. The smaller sized wire goes to the fuse panel. **The larger wire size is the resister wire going to the engine harness plug [C-27] (to the coil).**

The resister wire (**1.3-1.4 ohms**) terminates at the harness plug [C-27]. This ballast resister wire is made of tungsten to with stand heat and it is best to not cut this wire because it can't be restored in any good way. **Exiting the plug [C-27] on the engine side is a standard non-resister red-light green striped wire going to the coil. This is the wire that needs to be cut for the tach conversion.**

**Note:** If the tach fails the engine will stop (no 12v to the coil). Make sure that the new wiring is long enough to reach below the tach cluster so you will have room to disconnect the tach leads and be able to insert a jumper.

To check the **internal wiring of the tach** use a good volt-ohm meter and select the ohms R time 1 scale and measure across the 2 leads coming out of the tach. If the meter reads open or no resistance at all, the tachometer's internal electric circuit is defective.

Some printed articles say it is ok to cut the resister wire at the ignition switch for power to the tach and then splice back to it the return lead from the tach. **I decided on not compromising the resister wire.** This is my preference because I want to allow the next owner to be able to revert back to original without any damage to the resister wire.

### **A little more work but doesn't compromise the resistor wire.**

**Parts:** 1.5 ohm Ballast Resistor, 2-prong trailer plug (comes with both ends still connected), wire end connectors, and wire splices.

**Revised 11-5-2010:** (There is another wiring **method #2** to also provide a constant 12 volt to the Pertronix Ignitor Ignition in the Distributor. Put the resistor in the engine compartment so you can connect a wire to the distributor. New **instructions** are noted below the original instructions.)

- On the top of the fuse panel is a **green** [C-27] plug that connects the under dash wiring harness to the engine harness.
- From the **engine side** of the [C-27] harness plug remove the black wrapping tape from the harness in the middle of the dash opening to give easy access to the wires.
- Locate the **red-light green striped** wire. Before you cut double check by using an Ohmmeter to check continuity between this wire and the red-light green striped wire at the ignition switch. Cut the wire at a middle point in the dash opening to give equal wire length to each side.
- Mount a **ballast resistor** on the right hand side frame support between the dash cluster and radio. I used an existing hole in the support for 5/16" bolt.  
**Ignore above for method #2: Mount the new ballast resistor on the back of the engine intake manifold using one of the two bolts that holds the throttle cable bracket (under the air cleaner and out of view).**
- The cut wire coming from the [C-27] green plug (ignition switch) will not be used. If you followed this wire back through the plug you would see that it is the resistor wire from the ignition switch going to the coil. I applied liquid electric tape to the end of the wire to protect it from being grounded.
- Make up a new wire with a connector that will reach from the cut wire going to the coil and to the ballast resistor.  
**Ignore above for method #2: The wire from the tachometer will be spliced into the wire going to the coil.**
- **Match the tach plug leads** for color (**red-to-red**) to the trailer plug connection so you will know which end to cut for length. Cut the trailer plug wire into two sections (long & short). **The short section wires must be long enough to be connected together for a jumper.** The long section will require you to splice longer wires to both ends to be able to reach from the ignition source and the ballast resistor to down below the tack cluster. Make a jumper plug by connecting the short section wires together.

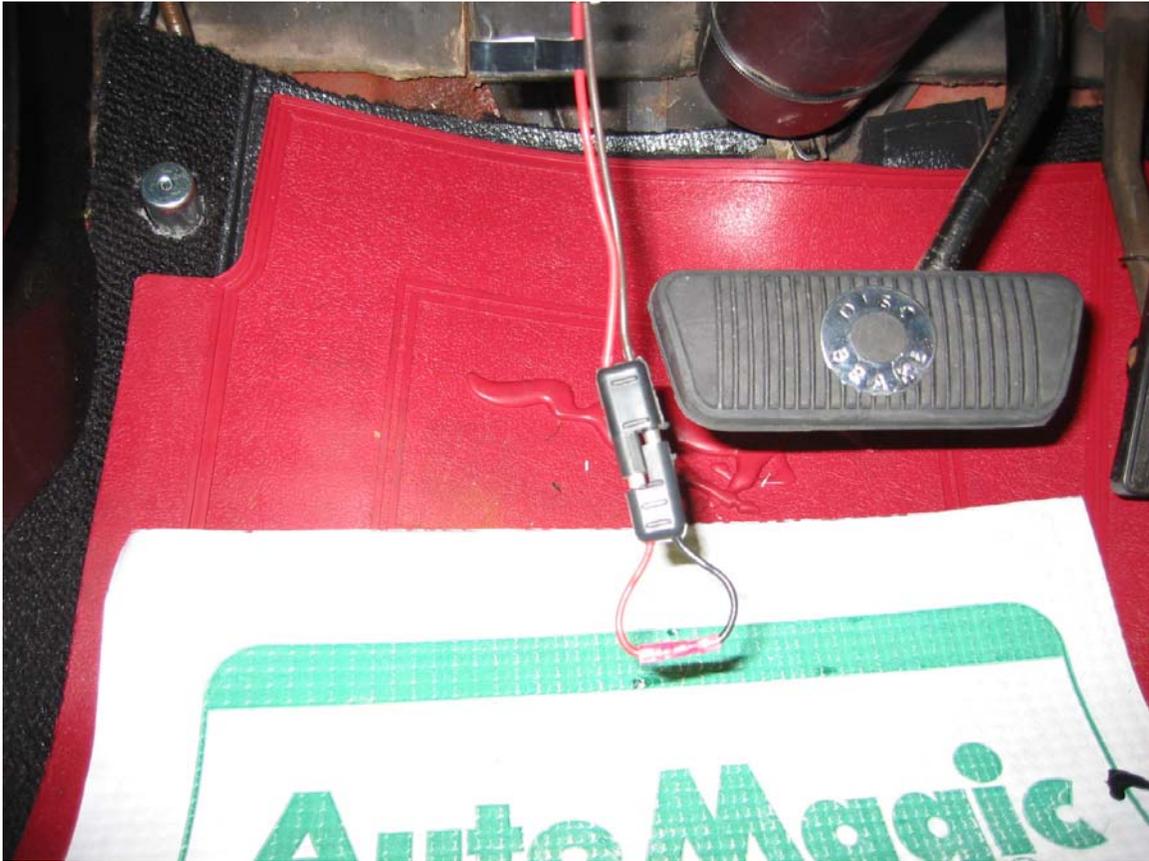
- Install a connector to the tach lead trailer plug **black wire (male pole)** and connect the wire to the other end of the ballast resistor.  
Ignore above for method #2: Splice the tach lead trailer plug (black wire male pole) to the red-light green striped wire going to coil.
- Locate the two red-light green striped wires at the ignition plug [C-28]. **Do not mess with the larger of the 2 wires (it would be the resistor wire).** Splice into the smaller wire and connect to the tach lead trailer plug **red wire (female pole)**.
- **Method #2: In the engine compartment; unplug and remove the wiring harness that goes to the coil, temp sender, AC compressor, and carburetor. Remove wrapping so you can cut the red-light green striped wire (coil wire).** From the harness plug side, splice a wire to the ballast resistor (12v input terminal). From the coil side splice a second wire to the ballast resistor (8-12v output terminal). Add an extra wire to this harness that will go from the constant 12 volt input side of the ballast resistor to under the coil location. Wrap this wire to the existing wiring harness to keep the factory look. At the coil location connect this wire to the Pertronix Ignitor lead (red wire). The Pertronix Ignitor (**black wire**) connects to the negative post of the coil. Now you can reinstall the harness.

**This picture shows the Ballast Resistor that I mounted on the right side of the dash support. Behind the cluster plug you can see the 2 signal wires that were removed from the 18-pin plug now going to the oil pressure and temperature gauges. On the left side of the picture you can see the wire bundle where I spliced into the wire going to the coil.**



**For method #2: The ballast resistor will be mounted in the engine compartment using one of the two bolts that hold the throttle cable bracket (under air cleaner and out of view).**

**The picture on the next page shows the new trailer plug with the jumper currently inserted for testing. I made this connection long enough so the original tach plug would hang down to the bottom of the dash for easy access. This allows the tach to be bypassed if it fails. If the tach fails, no 12 volts to the coil.**

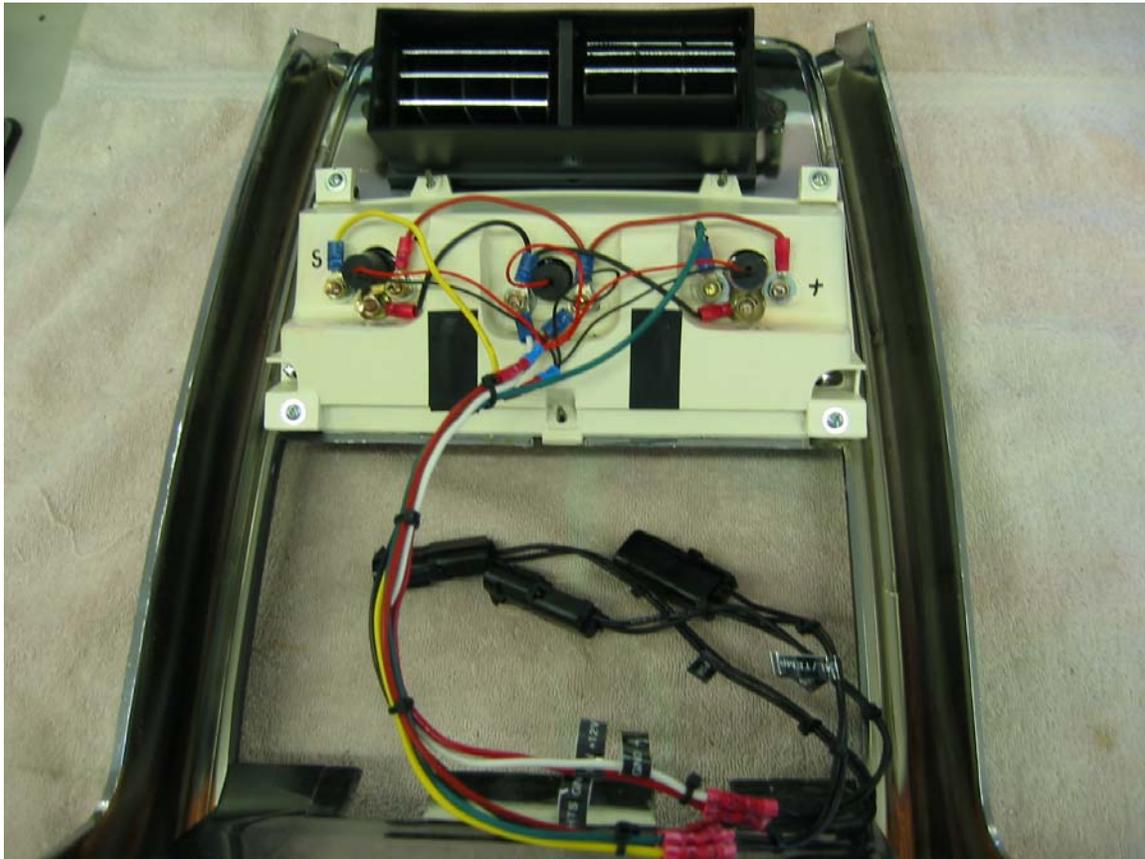


- **Test:**
  - Connect the negative battery cable.
  - Connect the ignition switch plug.
  - At this time the dash cluster may be tested for dash lights, turn signal lamps, brake light, and high beam lamp.
  - From under the dash; unplug the tach plug and test the trailer plug by inserting the jumper plug. Turn the ignition switch on. Should have 12 volts at the positive side of the coil. **When testing the output of the resistor it requires a current load to read any voltage drop.**
  - Remove the jumper and connect the trailer and tach plugs together to complete the conversion.
  - Start the engine to test the tach movement and give the **resistor time to heat up. A new Ballast resistor is going to smoke at first to burn off the oil used in the manufacturing process. Don't get caught off guard when this happens like I did.**

## Wiring the center console dash gauges:

- I use three different 2-wire disconnect plugs (male/female) for wiring up the gauges. **I pre-wired the gauge cluster using 3 plugs.** I also made the plug wires long enough so the console could be tested without being installed in the dash.
- **Plug 1** (oil press & water temp signal) – Connect the two signal wires that were removed from the 18-pin dash cluster to this plug. The wire color for the oil pressure wire is white with a red stripe. The wire color for the temperature wire is red with white stripe (2 wires).
- **Plug 2** – (gauge lights) Spliced into the wires leading to the heater control lamp plug [C101] for the gauge lights. Used the light blue-red stripe wire for power and black wire for ground.
- **Plug 3** – (gauge power and ground) spliced into the trailer plug 12v wire going to the tach for the gauge power. Connected the gauge ground wire to the radio ground screw in the frame.

**This picture shows the modified factory rear gauge housing for the new AutoGage (Auto Meter) 1 1/2" gauges. Broke down the wiring into 3 different plugs.**



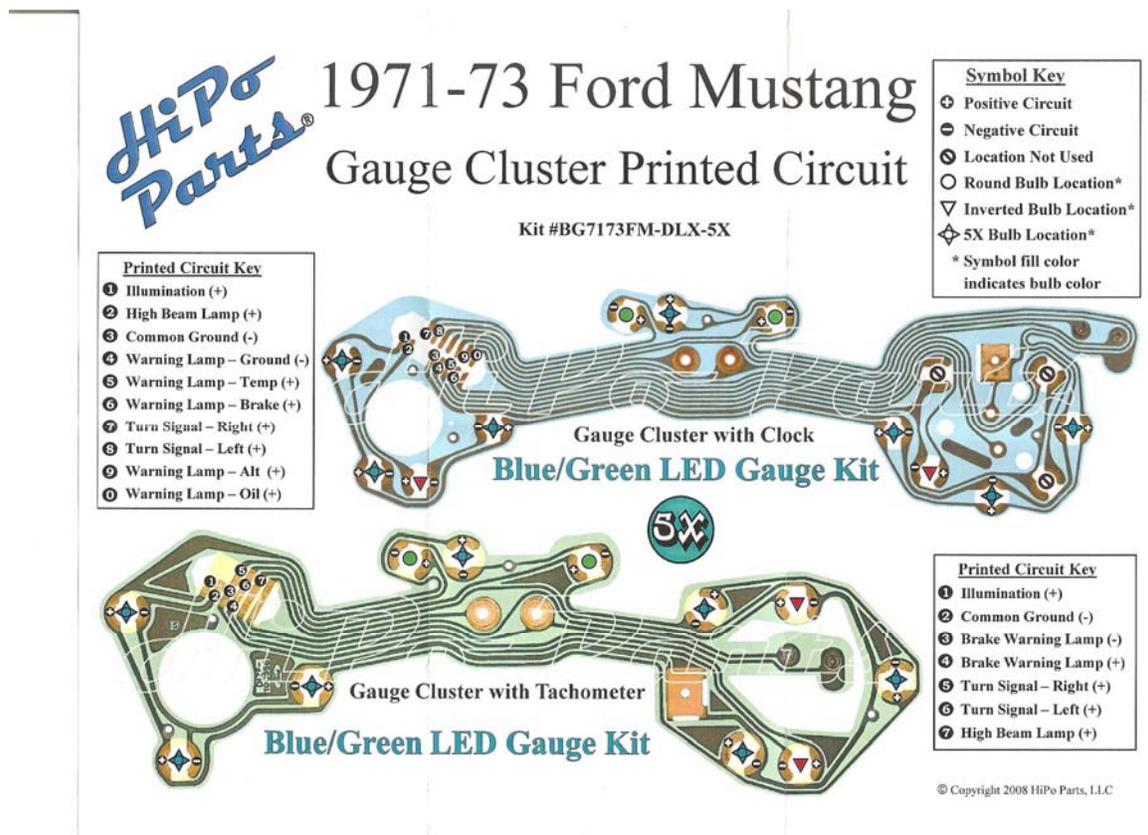
- **Test:**
  - Connect the negative battery cable.
  - Turn the light switch on to test the gauge lights.
  - Start the engine to test the gauges.

**This picture shows the installed gauges. At this time I'm not planning on having my Mustang be 100% original so I wanted to have updated gauges (oil, temp, volt) without a worthless Amp gauge. I am keeping spare rear housing so I could go back to the factory gauges.**



## Misc. notes:

I replaced the standard light bulbs in the dash with **LED bulbs** to help overcome the existing poor lighting of the cluster gauges. You will need to inspect the condition of the blue lamp filters. Replace any filters that appear cloudy, frosted, discolored, or melted. I purchased the 5X LED Gauge Cluster Light Kit off Ebay. Because the new turn signal lamps are now green LEDs, I was able to do away with the plastic green filter on the back of the speedometer bezel.



I noticed there were 2 wire plugs not connected to anything (one each under the dash by the doors). I traced the wiring (53/black-lt blue stripes) down to find out that they were for courtesy lamps. Could not locate any existing socket location so I purchased 2 sockets (that will screw in under the dash) with bulbs. Mounted the sockets and connected the wiring together. **I now have light shining down on the floor mats when the door is open or when the courtesy lights are turned on.**

Installed a Custom Autosound USA-230 radio. For the **accessory power (red wire)** I spliced into the existing harness [C-102] for the factory radio. Either one of the 2 wires (296/white with purple stripe) will work. For the **constant 12v source (orange wire)** I spliced into the existing harness [C-86] for the center floor console clock. It also has 2 wires (54/light green with yellow stripe) either one will work.

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**Re-install the dash parts in reverse order of how you removed them.  
This should complete the conversion for the tachometer and gauges.**

**Hope this document was helpful.**

No guarantees (implied or not) that the conversion instructions listed in this document will work for everybody. It worked for my **72 Mach 1** so it's reasonable that it should work for anybody with a 71-73 Mustang.

**GOOD LUCK!**