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HEC Instrument Cluster Diagnostics
(99 and 2000 models)

Photos and video by Mustangworld.

Free Digital speedo, Tach, Engine temp, oil pressure and Metric speedo ?
Ford decided to include a cool hidden feature in the instrument cluster starting in 99 and also in 2000. With a simple press of the trip button and turn of the key you could not only test your instrument cluster (gauges), oil pressure and speedo senders, but get a real time digital readout of your speed, tach and other info AS you drive your stang.

This info is based on the diagnostics procedure sent in a while ago from some cool readers (Adam) located here off the main page. We decided to give you a visual step by step, because the procedure is fairly easy and you don't need to worry about messing up your stang or changing the programming, only enjoy the feature for what it's worth.. and you can't beat the price (free).

Also thanks to Steve 99 Cobra for posting all the trouble codes you could read through the instrument cluster. Most having to do with the operation of the gauges and ignition systems. NOT OBDII codes, though how cool that would be if in the future Ford included a full diagnostic OBDII scanner in your stang.. oh well.. mabye in 2002 :-).

OK... HERE WE GO!

1. Put the key in the ignition, but don't turn it. Push and hold the trip / reset counter button. Don't release it.

2. Next turn the key to the accessory on position. NOT starting your stang, but just to the first click. Leave the key there.

3. Look at your display while you are holding down the button. When you see it say "test" (like shown in the pic), then LET GO the button. You have only a few seconds to do this.

4. What will happen next is all your analog needles will "sweep" to their max positions and then drop back to normal. The digital readout will say "GAGE" like shown.

5. Push the button once and the next diagnostic is all the segments in the digital display will show up lit. Like the pic shows.

6. Push the button again and the readout will say "bulb" and light up all the bulbs like the batt, traction control and other cluster bulbs.

Neat huh ?.. :-)

7. Push the button again and the ROM version is displayed.

8. Push the button again and you get the EE level. Part of the id.

9. Push it again and you see the hex value for the manufacturing test date.

10. Push it again and you will get any diagnistoc trouble codes or DTC's (if any). See table below for a list of codes. This code is for an oil pressure switch failure (example).

11. THE COOL PARTS START HERE. push it again and you will see "eng" followed by your speed in miles per hour. We were standing still but if we were moving, we could get a digital speedo reading in real time.

12. Push it again and you will see an "M" followed by your METRIC speed reading.

13. Push it again and you will see a "tac" followed by your tachometer numbers. All updated in real time. The engine was off here so it was 0000. CLICK HERE for a video 126k Mpeg of the digital tach in action. (recorded from our Mustangworld project 00 stang)

14. Push it again and you see your fuel level, see chart below for what the numbers mean.

15. Push it again and you see your oil pressure. The engine was off so ours read 255.

16. Push it again and you will see your engine temperature "deg" see chart below for what the numbers mean.

17. Push it again and the battery voltage input to your cluster is shown (current battery level) 0 - 255. See chart below for normal settings.

18. Push the button again for the RH codes (there are a few screens of them and they flash).

19. Eventually you will end up at the Cr code, this shows the current RUN/START here it shows "-h" meaning in the key was in the start position.

20. You will make it to the PE codes then back to the "GAGE" and the cycle starts all over again. **TO EXIT the diagnostic mode**, press and hold the trip meter for 5 seconds or until your odometer is displayed again. You can also just remove your key and it will return to normal.

To see your digital speed / tach, etc.. as your stang drives
All you do is once in this diagnostic test mode, simply start your stang and the display will revert to this mode again and you can scroll through until the digital speedo is showing and see your speed digitally.

Here are the DTC trouble codes (thanks Steve 99 Cobra):

9202 Fuel sender open circuit
9204 Fuel sender short to ground
9213 Anti-theft number of programmed keys is below minimum
A103 or 9232 Antenna not connected-defective transceiver
9317 Battery Voltage high
9318 Battery voltage low
9342 ECU is defective
9356 Ignition run circuit open
9364 Ignition Start circuit open
9600 PATS Ignition Key Transponder Signal is Not Received - Damaged Key or non-PATSKey
9601 PATSReceived Incorrect Key-Code from Ignition Key Transponder (unprogrammed Encoded Ignition Key)
9602 PATS Received Invalid Format of Key - Code From Ignition Key Transponder (Partial Key Code)
9681 PATSTranceiver Signal is Not Received (Not Connected, Damaged, or Wiring)
A139 PCM ID does not match between Instrument Cluster and PCM

A141 NVM Configuration Failure (No PCM ID exchange between Instrument Cluster and PCM)
A143 NVM memory failure
5284 Oil Pressure Switch Failure
D027 SCP Invalid or Missing Data for Engine RPM
D041 SCP Invalid or missing data for Vehicle Speed
D043 SCP Invalid or missing data for Traction Control
D073 SCP Invalid or missing data for engine coolant
D123 SCP Invalid or missing data for Odometer
D147 SCP Invalid or missing data for vehicle security
D262 Missing SCP message.

What to do if you get a trouble code
First off don't panic, these are not OBDII codes, call your local Ford dealer and they will give you more info. Some of these codes are NORMAL like when the dealer needs to program a new key for your stang, an unprogrammed key will be inserted for this procedure, you may get a code 9601, this does not mean you have a problem with your stang. You can clear codes by disconnecting your battery for a while and reconnecting.

For the written procedure showing the values and chart for each test see the first article on the HEC instrument cluster diagnostics.

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HEC Instrument Cluster Diagnostics

This is a basic set of instructions for putting your 99 Mustang instrument cluster into a diagnostic mode. Doing this allows you to view the actual data being calculated by the ECC and other systems.

Written by Cornholio Productions for Mustangworld

Activating Test Mode

To enter the HEC Dealer test mode, depress and hold the instrument cluster **SELECT/RESET** button, turn the ignition switch to the **RUN** position, and then continue pressing the **SELECT/RESET** button (5 seconds) until **tESt** is displayed in the odometer. The **SELECT/RESET** button must be released within 3 seconds of the odometer **tESt** display to begin the dealer test mode.

Depress the **SELECT/RESET** button to advance through the following steps until **dtc** is displayed. Depressing the **SELECT/RESET** button will display any stored continuous DTCs before proceeding to the next step.

Odometer Display	Description
GAGE	Activates gauge sweep of all gauges, then displays present gauge values. Also carries out the checksum tests on ROM and EE. If the gauge sweep is inoperative, INSTALL a new instrument cluster.
All segments illuminated	Illuminates all odometer segments. If any odometer segment is inoperative INSTALL a new instrument cluster.
bulb	Illuminates all micro-controlled indicators and LEDs. Install a new indicator or LED as necessary.
r	Returns to normal operation of all micro-controlled indicators and LEDs and displays hexadecimal value for ROM level. (used when requesting assistance from the hotline). If alternating flashes for FAIL and ROM level are displayed, INSTALL a new instrument cluster.
EE	Displays the hexadecimal value for EE level (used when requesting assistance from hotline). If alternating flashes of FAIL and EE level are displayed replace instrument cluster.
dt	Displays hexadecimal coding of final manufacturing test date (used when requesting assistance from hotline).
dtc	Displays continuous DTC's in hexadecimal format. Pressing the **SELECT/RESET** button will display any DTCs stored before proceeding to the next step.

enG	Displays the English speed in MPH. Speedometer will indicate present speed within tolerances. Display will show 0 if input in not received. If input is invalid for one second or more, or if speed is 0.
m	Displays the metric speed data in kph. Speedometer will indicate present speed within tolerances. Display will show 0 if input in not received. If input is invalid for one second or more, or if speed is 0.
tAc	Displays the tachometer data received from the PCM via the SCP network within tolerances. Tachometer will indicate present RPM. Display will show 0 if input is no received, if input received is invalid for one second or more, or if engine RPM is 0.
FUEL	Displays the code (0-255) for the fuel sender input to the HEC. The fuel gauge will display a filtered fuel level value. This filter will keep the pointer from moving suddenly or erratically. **255** open send +/- 0 **232** full stop +/- 0 **215** Full mark +/- 10 **178** 3/4 mark +/- 8 **138** 1/2 mark +/- 7 **93** 1/4 mark +/- 5 **41** E mark +/- 4 **54** Low Fuel (0-59) **0-18** short (0-20 max)
OIL	Displays the code (0-250) for the oil pressure switch input to the HEC. Oil pressure gauge will indicate present oil pressure. Normal oil pressure (greater than 6psi) will display a value between 000 and 176. A low oil pressure or an inoperative engine oil pressure switch (less than 6 psi) will display a value greater than 176.
dEGC	Display of engine temperature in Degrees C input from cylinder head temperature sensor. **49 C** "C" mark **60 C** Normal band start **120 C** Normal band end **-40 C** No SCP message for 5 seconds
bAtt	Displays the code (0-255) for the battery voltage input to the HEC. Battery voltage gauge will indicate present battery voltage. **93-102** 6.2-9.1 volts, low voltage **115-124** 8.5-10.7 volts, Normal band start **215-225** 15.8-18 volts, Norm band end **230-241** 16.9-19.1 volts, high voltage
rhEo	Displays the present decimal rheostat dimming input, 0-255 (used when requesting assistance from the hotline)
rhi rhS rho	Not used.
Cr	Displays the current **RUN/START** sense input. Display will show -h for high input with the ignition switch in the **START** position and -L for low input with the ignition switch in the **RUN** position.
PA-PE7	not used.
GAGE	Repeats the display cycle

Source: Helms 99 manual. For more information a 99 manual can be purchased from Helms see link here.

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