

*The  
E/K Display  
Manual*



*Installation &  
Configuration*

For V4 HW; V1.2 SW  
Visit [www.HT4100.com/MPG.html](http://www.HT4100.com/MPG.html) for the latest version.

**If your kit included an oil pressure sensor, its calibration number is:**

\_\_\_\_\_

Should you ever perform a factory reset in configuration mode, the number above will need to be re-entered into Setting #6.

## Table of Contents

|                 |    |
|-----------------|----|
| Quick Start     | 1  |
| Installation    | 6  |
| Setup & Config  | 13 |
| Menu Summary    | 16 |
| Troubleshooting | 24 |
| TCC Section     | 27 |

## Quick Start Guide

Only 5 connections are needed for basic operation to display engine temp, oil pressure and system voltage. Connect additional wires for added functionality, such as torque converter lockup or an alarm for out-of-bounds conditions.



*Eldorado / Seville 1984-85 shown.*

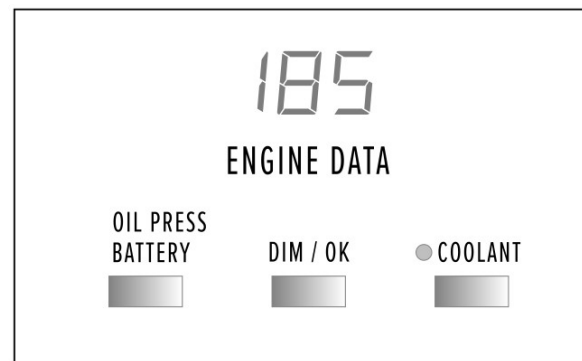
The function buttons are designed to respond much like the original system, complete with delay. Press the left button for OIL PRESSURE; press it again for BATTERY (System Voltage). Press the right function button to return to COOLANT TEMP, which is the startup default.

Your selection will remain displayed unless a situation arises which requires your attention; in that case, the out-of-bounds variable will be displayed and your factory chime will sound (if connected).

The DIM/OK button serves two purposes. Under normal conditions, each press of this button will step the display through 3 intensities (Normal, Medium & Dim). If you've connected the Park Light and Rheostat wires, your dashboard instrument panel brightness knob will override this feature when park or head lights are on.

The second purpose of this button is to acknowledge ("OK") an alert and "unlock" the display. It will also silence the chime if active.

## **Coolant Temperature Display**



*Eldorado / Seville 1982-83 shown.*

- Tap the **COOLANT TEMP** button to display the current engine temperature.
- Temperature is always shown as 3-digits to help differentiate it at a glance from Oil Pressure. The display has an effective range from 0°F to 275°F, which is the range of the sensor.
- The display can also be set to show Celsius; see the **Setup Section** for details.

## Coolant Temperature Display - Cont'd

The controller features two pre-settable **Over-Temperature Alerts** plus a **Hot Start Delay** option.

**Level 1 Alert:** Should the engine reach your Level 1 temp, the display will default to show Coolant Temp and the chime will sound momentarily to get your attention to let you know things are starting to heat up. You can even connect your existing Coolant Temp dash light to illuminate at the same time.

**Level 2 Alert:** This is a more serious alert. The factory warning light was designed to come on if engine temps were in the 250F+ range. I personally think this is too high, especially for an older engine. When the Level 2 temp is reached, the display will lock on to Coolant Temp at full brightness, and the chime will sound continuously. - Press the **"DIM/OK"** button to silence the chime and unlock the display.

**Hot Start Delay:** "Hot Start Delay" lets you set an amount of time you'd like the controller to ignore engine temp after a hot restart to give your engine a chance to cool down as coolant circulates. This avoids nuisance alarms.

See the **Setup Section** on how to configure these options.

## Oil Pressure Display

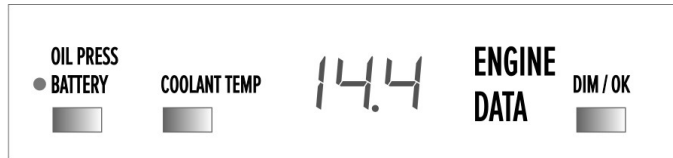


- Tap the **OIL PRESS / BATTERY** button once to display engine Oil Pressure.
- Oil Pressure is displayed in PSI from 0-60. For values less than 10, the leading zero is blanked to aid in readability at low pressure.
- Should oil pressure fall below a user-specified minimum value for more than 3 seconds, the display will switch to full brightness, change to show the current oil pressure if not already, and sound the chime. Press **"DIM/OK"** to silence the chime.

See the **Setup Section** to:

1. Enable the alert feature (off by default).
  2. Customize a minimum oil pressure value.
  3. Skip directly to Battery directly when the button is pressed, should you not want to install the pressure sending unit and wiring at this time.
- Since this unit is likely to be used with carbureted engines which can sometimes stall out upon cold-start, a timer is built-in that ignores "loss of oil pressure" for the first 90 seconds after "good oil pressure" is first detected. This helps prevent nuisance alarms.

## Battery Display



- Selecting BATTERY will display the instantaneous system voltage. The display has a 0.1V accuracy and a range from 6.0 to 20.0 volts.
- Should system voltage ever exceed 16.0V, the chime will sound momentarily to alert you to a possible electrical system problem. The display will also switch over to show voltage if not already selected. The chime will not sound again nor will the display default back to BATTERY until after a key-cycle.

### Good to Know

- Due to voltage drop, measurements directly at the alternator or battery may be slightly higher or lower, however the displayed value gives a good indication of an under or over-charge situation. This is also typical of most OEM systems and factory gauges.
- While unusual, a bad voltage regulator, defective battery or loose batt connections can cause the alternator to output such high voltages. Operating above 16 volts will dramatically shorten the life of incandescent bulbs and may lead to damage of onboard electronics (HEI, Radio, Climate Control, etc).

## Installation Guide

For best results, please read through the complete installation instructions before you start cutting wires.

If you're planning on only basic operation, the driver side under dash is a good location with access to the fuse block. If you intend to operate more advanced features such as the TCC lockup, then the passenger side is preferred as it gives you access to the ECM's wiring. You may also be able to leverage the existing grommet on the passenger side used for the old MAP sensor tubing/radio antenna cable to run your engine bay wiring (Eldo/Seville).

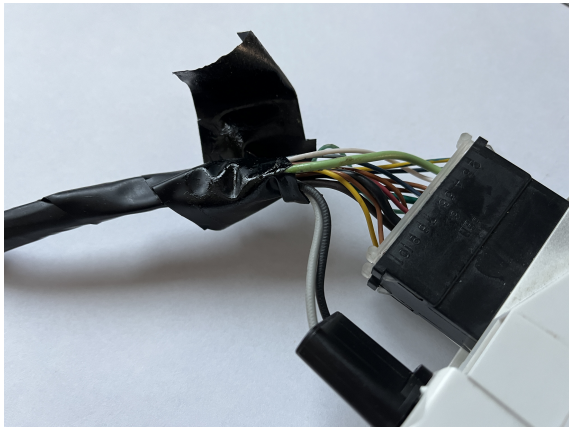
The controller enclosure can be screw-mounted, or tie straps threaded through the screw holes to secure around an available bracket or wire harness bundle.

**Coolant Temp:** NTK EF0008 / GM 12146312. The threads are pre-coated, but teflon tape can be added if necessary. Install this sensor in the path of flowing coolant for an accurate reading. The mating connector is Dorman 85100; wire polarity does not matter.

**Oil Pressure:** VDO 360-003 / SEN-10-2. Like many analog gauges, the ground return for this sensor is through the engine block and ground strap back to frame and body. But unlike an analog gauge with vague markings, the E/K readout is precise to 1 PSI. For an accurate reading, ensure your ground straps are in place and ground points are clean. Do NOT use teflon tape on the sensor's threads. In extreme cases, a separate wire can be run from the controller's Ground terminal to the engine block directly.

**Display:** To connect to your existing display, remove the woodgrain trim bezel from the dash center. On Eldo/Seville, it's attached by two Philips head screws located at the top of the trim piece. Tilt the trim down and away, then remove the two self-tappers that secure the display itself. If you have a dual-shaft radio, you will also need to remove the radio knobs (they pull straight off) as well as the nuts behind them.

Now, twist-out the backlight bulb, unplug the display and set it aside. The factory connector & wiring will no longer be used, so tuck it back into the dash, but first unwrap enough harness tape so that the backlight bulb can still reach the display module (see photo).



Fish the new connector & cable through the rear dash cutout to the display and plug it in. Then reinstall the lamp and screw the display back into place, but don't install the trim yet.

**Acrylic Lens:** Carefully using a small flat head screwdriver or knife tip, lift the retaining tab on the display housing to free the original plastic insert. Remove the lens, **being very careful not to touch the dark plastic filter with your fingers** or you'll leave fingerprints. Wear latex gloves if you have them.

Now, install the new laser-cut plastic insert, holding it by its edges. If you smudge the backside or leave a fingerprint, use a soft microfiber or lens cleaning cloth to avoid scratches.

**Take your time, being careful to make sure all corners and tabs are engaged.** Some finessing may be required for a good fit depending on the age and production run of your housing. The '82/83 Eldo & Seville housings are especially problematic with a small engagement area on the originals and age has not improved things. If you flex the housing's plastic finger inward on this version to give it "a set" after removing the original lens it tends to grip the new insert better.

Then reinstall the woodgrain trim being careful not to over-tighten the screws. Just snug them up. Now it's time to wire up the controller.

**General Tips:** For best results and accurate measurements, all connections should be soldered/shrink-wrapped; avoid plastic splices and taps. Any holes drilled through the firewall should use a grommet to prevent wire chaffing. Take care to avoid hot surfaces/exhaust when routing in the engine bay. And as always, check both sides of the firewall before breaking out the drill.

## Connection List Summary

**#1 Switched 12V+ :** This circuit is powered when the key is in the On/Run position. This is the unfused **Pink Wire** that leaves the ignition switch and feeds the fuse block and relay center. Be sure to use the included inline fuse when you connect, as this is your protection from jump starting and reverse battery connections.

**#2 Ground:** A reliable ground connection is extremely important. Not only can a poor ground result in erratic readings, this is also the ground return path for the TCC solenoid should you choose to enable that feature.

**#3 Oil Pressure:** This is the single wire that runs to the pressure sending unit. Note one end of the wire has a ring terminal already attached to it (turn-key kit).

*If you don't wish to monitor oil pressure, you can disable this option by going to Config Setting #6 and setting it to "0". The display will now automatically jump to BATTERY when the button is pressed.*

**#4 Park Light Circuit** (optional): This tells the controller when the park/headlights are on so it can dim the display. A connection to terminal **#8** is also required for this feature. If you don't want to connect wires #4 and #8, you can always press the **DIM/OK** button for 3 levels of brightness at any time.

**#5 & #6 Temp Sensor:** These connect to the engine temp sensor. Polarity (+/-) doesn't matter. Note the wire pair already has the connector attached to one end (turn-key kit), so snake the cut end through from the engine bay side and trim to length.

**#7. Alarm/Chime** (optional): This terminal "grounds out" when active. You can connect this to the factory chime on the passenger side of the dash, or to the low side of a 12V buzzer. For the factory chime, see chart below for connecting. The chime is between the radio and glove box on the Eldo/Seville and visible with the liner removed.

**#8. Rheostat** (optional): This connects to your dash light circuit to provide controlled dimming with your other factory displays. A connection to terminal **#4** is also required for this option to work. This circuit can be picked up by tapping the gray wire at any dash backlight, such as the one for the Fuel Data display bulb, or Windshield Wiper bulb, or even the gray wire in the 4-pin power connector at the back of the radio.

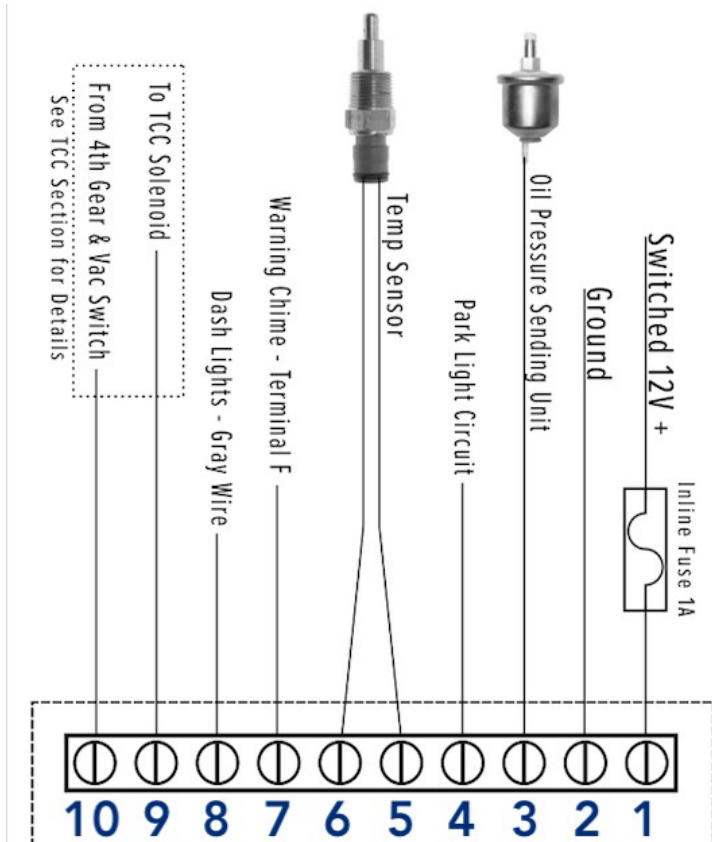
**#9. TCC** (optional): The factory torque converter clutch solenoid is fed by a +12V fused circuit. The TCC terminal "grounds out" when active, just like the factory ECU to energize the solenoid. Circuit #10 must also be connected as an input.

**#10. 4<sup>th</sup> Gear Input** (optional): This is fed from the transmission's 4<sup>th</sup> gear switch (and aftermarket vacuum switch) to let the controller know when conditions have been met to engage the TCC. Circuit #9 must also be connected.



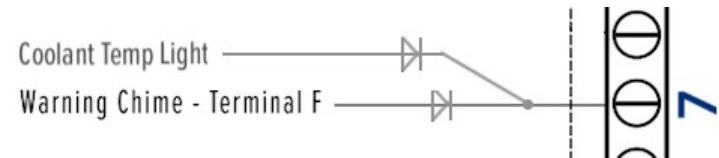
*This oil pressure wire and the two wires for the coolant temp sensor need to be run to the engine bay. **If you drill a hole in the firewall, be sure to install a grommet to keep the wires from shorting out.** Alternatively, you may have some newly unused circuits you can pick off at the ECM if you've done an engine swap.*

When making connections to the unit, strip only as much insulation as needed (< 1/4") for full insertion into the terminal strip. Permanent damage can result if wire strands short out to adjacent terminals. Do not over-torque the screws.



As a backup, it's generally good practice to tee the Oil Pressure sensor with a pressure switch (such as a PS12T) connected to your Oil light. On HT4100 cars, see my Electrical Swap guide online for the appropriate under-hood wire to reroute.

If you wish to wire your Coolant Temp light to illuminate when the chime sounds (especially handy on Eldo/Seville models with analog speedometer), use the included diode splitter (Econo & Turn-Key kits), or a pair of 1N4001 diodes wired as shown. On power-up, the light will then come on briefly as a bulb check.



For RWD & Diesel cars, consult your factory wiring diagram if in question. For 1982-85 HT4100 DEFI vehicles, the following circuits are available at the ECM. The Coolant Lt, 4<sup>th</sup> Gr Sw and TCC wires can be cut and rerouted to the display unit. Tap into Grd, 12V and Chime ckts without cutting. The ECM is still required for Climate Control so should remain installed and powered.

**NOTE:** The Grd Wire referenced in the chart below originally terminated to the engine block. Ensure this ring terminal is in place on your existing engine. 1982-85: Firewall bulkhead connector Terminal V (blk/wht wire).

-If in doubt, Ohm it out.-

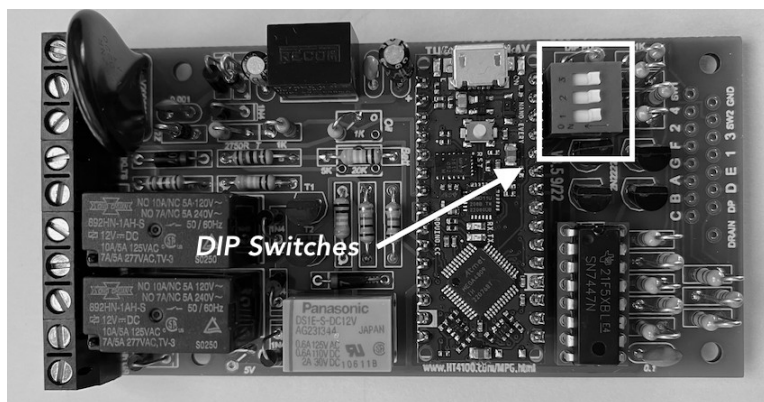
| 1982 DEFI (all)      | Connector  | Cavity | Wire Color  |
|----------------------|--|--------|-------------|
| 12V IGN              | ECM BLU  | 8      | Pnk/Blk     |
| Ground               | ECM BLU  | 1      | Blk/Wht     |
| Coolant Lt           | ECM ORG  | 12     | Drk Grn     |
| Chime                | Chime  | A      | Lt Grn      |
| 4 <sup>th</sup> Gear | ECM RED  | 6      | Grn-Drk/Wht |
| TCC                  | ECM ORG  | 9      | Tan/Wht     |
| Park Lts             | BRN Wire in 2-pin Connector at Radio. Is 12V w/Park-HdLts On |        |             |
| Rheo                 | Gray Wire at Radio, feeds dash illumination bulbs.           |        |             |
| 1983-85 DEFI (all)   | Connector  | Cavity | Wire Color  |
| 12V IGN              | ECM RED  | 16     | Pnk/Blk     |
| Ground               | ECM RED  | 13     | Blk/Wht     |
| Coolant Lt           | ECM ORG  | K      | Drk Grn     |
| Chime                | Chime  | F      | Lt Grn      |
| 4 <sup>th</sup> Gear | ECM RED  | 22     | Grn-Drk/Wht |
| TCC                  | ECM RED  | 19     | Tan/Wht     |
| Park Lts             | BRN Wire in 2-pin Connector at Radio. Is 12V w/Park-HdLts On |        |             |
| Rheo                 | Gray Wire at Radio, feeds dash illumination bulbs.           |        |             |



## Setup Section

E/K Display setup is straightforward, utilizing a combination of DIP switches and a software menu directly accessible through the display which can be changed at any time to allow customization.

You'll find 3 DIP switches on the circuit board that should be set during initial installation.



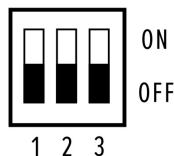
**DIP 1:** This sets the units for the Coolant Temp display. Move “up” for Celsius, “down” for Fahrenheit.

**DIP 2:** This sets the type of 4<sup>th</sup> Gear Switch you have should you want to use the TCC feature. 1982-85 Cadillacs use a 4<sup>th</sup> gear trans switch that **-opens-** when you're in 4<sup>th</sup> gear. Leave the DIP switch down for this transmission. If you're running a non-stock trans with a switch that **-closes-** (grounds out) in 4<sup>th</sup> gear, move this switch up.

**DIP 3:** This enables or disables the TCC feature. If you aren't using the TCC option, leave the switch “down” to disable it. *See the TCC section at the end of this manual for more info.*

With wiring complete and DIP switches set, install the housing and screws and proceed to customizing your settings in the Configuration Mode.

|                               | Up / On                          | Down / Off                      |
|-------------------------------|----------------------------------|---------------------------------|
| 1: Temp Display Units         | °C                               | °F                              |
| 2: 4 <sup>th</sup> Gear Input | Switch Closes in 4 <sup>th</sup> | Switch Opens in 4 <sup>th</sup> |
| 3: TCC Lockup                 | Option Enabled                   | Option Disabled                 |



## Configuration Mode

The Config Mode allows you to customize the display directly from the front panel.

- To enter Config Mode, turn ignition key to ON. Press and hold the **Coolant Temp** button approx. 5 seconds until the display changes to show the software version number. The chime will sound (if connected) and the status LEDs will illuminate to indicate “menu mode”.



- Tap the **OIL PRESS/BATTERY** button to step through the available settings (0-12) shown on the next page.
- The **DIM/OK** button is used to “enter” the desired setting, and after review or changes are made, press it again to save & exit back to the main menu. When you are finished with all changes, simply turn the ignition key to OFF, or advance to “0” and press **DIM/OK**. This second option is handy if your engine is running and you don't want to restart. Either method will save all entered data.
- **Settings #0-5 are intended for all users.**
- **Settings #6-11 are specialized and do not normally require adjustment.**
- **Setting #12 will reset the unit to factory default values.**

## Menu Summary

For simplicity, the OIL/BATT button will be referred to as “left” and the COOLANT button referred to as “right” for the following actions.

---

### All Users:

0. Exit Config Mode, Return to Normal Operation
1. Alert Temp 1
2. Alert Temp 2
3. TCC Lockup Delay
4. Hot Start Delay
5. Oil Press Alarm Enable & Min Pressure Alert

### Expert Level:

6. Oil Pressure Cal & Display Skip
7. Real-Time Oil Pressure PSI/ADC Value
8. Oil Pressure Offset
9. Voltage Display Offset
10. Rheostat Cutoff Value
11. TCC Diagnostics
12. Reset to Factory Defaults

***If the default values on the following pages for #1-5 are acceptable to you, no changes are necessary. #6-11 do not normally require adjustment.***

### 1: Level 1 Temp Alert (t1):

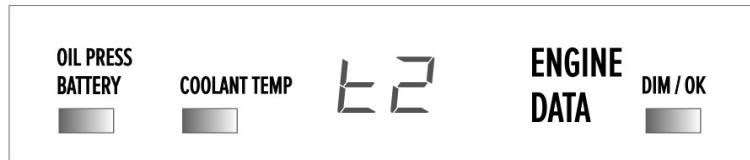
Default: 235F



This is your “it's starting to get hot” temp which triggers a momentary chime. Adjustable from 180°F to 265°F in 5° steps. Press left button to decrease, right button to increase temp. This setting is always in Fahrenheit even if Celsius is selected for the primary display. Press DIM/OK to save & exit.

### 2: Level 2 Temp Alert (t2):

Default: 245F



This is your “engine overheating, better shut it down” temp which sounds a continuous chime. Adjustable from 180°F to 265°F in 5° steps. Press left button to decrease, right button to increase temp. This setting is always in Fahrenheit even if Celsius is selected for the primary display. Press DIM/OK to save & exit.

### 3: TCC Lockup Delay (tcc):

Default: 5 Sec

**Note:** This setting is only available if you have DIP switch 3 “on” to enable the TCC option.



When the torque converter clutch locks, engine RPM naturally drops and engine load changes. This can sometimes result in the vacuum switch opening, which unlocks the TCC, and a repetitive lock/unlock cycle begins.

The factory ECM included a delay to allow engine load to stabilize to help prevent such an occurrence. The E/K controller does the same thing, and allows custom adjustment from 1 to 15 seconds. This sets the delay for torque converter clutch engagement after “go” conditions are met.

Left button decreases, right button increases delay in 1 sec increments. Press DIM/OK to save & exit.

*Be advised there is no delay when momentarily tapping the brake pedal unless vehicle speed or engine load are unable to support TCC application. This is intentional and works just like the original system.*

#### 4: Hot Start Delay (td):

Default: 1 Min



Let's say it's a hot day, your engine has been working hard, and you pull up to the pump for gas. When you shut the car off, engine temperature will start to rise since coolant stops circulating. You hop in after topping off the tank, start the engine, and drive away. Your engine temp may momentarily be higher than your Temp Alert settings. To avoid a nuisance alarm, Hot Start Delay allows you to specify an amount of time that engine temp is ignored after startup.

Delay is set in minutes from 0.0 to 9.5. *E.g. 0.5 = 30 seconds.* Left button decreases, right button increases in 30 sec increments. Press DIM/OK to save & exit.

#### 5: Oil Pressure Alarm:

Default: OFF

This sets the minimum oil pressure in PSI that will trigger the warning chime.

Adjustable from 2 to 10 PSI. Many GM factory switches are set between 4 & 5 PSI. Left button decreases, right button increases in 1 PSI increments.

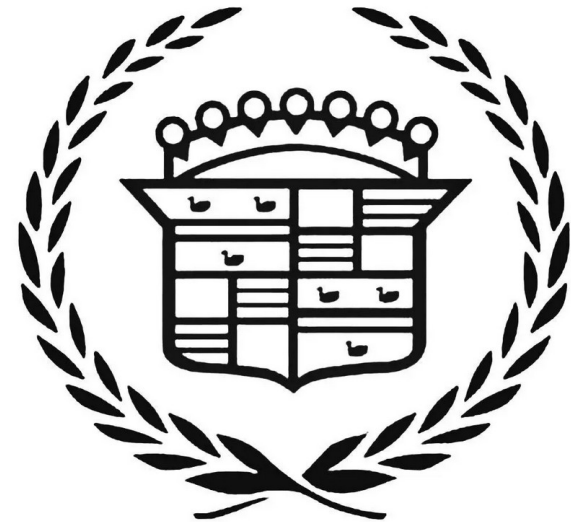
**You can also disable the alarm feature entirely by tapping the left button until "88" appears.** Press DIM/OK to save & exit.

#### 12: Restore Factory Defaults:

To reset all settings to their default values, step to setting #12, then hold in the DIM/OK button for approximately 5 seconds until the display shows "888", then release. If you have the factory chime connected, it will momentarily sound for additional confirmation. Key-Off to exit.

Note: if you have a custom calibration number for your oil pressure sensor, be sure to first record its value from setting #6. If supplied with this kit, its number is recorded inside the front cover of this manual.

***Congratulations, your E/K Display setup  
is now complete!***



## Expert Level Settings

The following settings are intended for calibration and should only be changed with a clear understanding of what you're doing and why. Most users will never need to adjust them.

The **Troubleshooting Section** should be consulted before making any changes.

---

**6: Oil Pressure Cal (cXX):** Default: 50

### To Skip Oil Display

Set this value to 0 to automatically skip the Oil Pressure display should you not want to connect up the sensor at this time.

### For Adjustment

(See also #7 & #8)

The E/K display is designed to work with oil pressure sending units that increase in resistance from 10-180 ohms as pressure increases. This resistance is converted into a voltage which the controller interprets as a digital value (ADC). The transfer function of this sensor is pre-programmed into the controller.

The controller assumes a nominal 5 ohm resistance (+/-10%) in the wiring and connections through the sensor body, engine block, ground straps, etc. Add this to the sensor's 10-ohm value at 0 PSI, and it equates to 15 ohms with engine off. You can measure this with an ohmmeter between the controller's Grd wire and the Oil Pressure wire (disconnected from the controller) to see how close your system is.

Should you have unusual system resistance, changed sending units, or feel accuracy could be improved, the ADC value can be padded with this setting. A change up or down of 10 points is roughly equivalent to 5 ohms. It effectively "shifts" the ADC value along the transfer curve. See chart under #8. **Before adjusting this value, all attempts at improving ground path/connection between controller and sensor should be made.**

### 7: Display Current Oil Pressure:

This is not an adjustable setting, but instead intended as a diagnostic aid.

The purpose of this display is to allow you to check PSI in real time without having to exit out of Config Mode. Any change you make to ADC Shift or Sensor Offset is immediately reflected here without any filtering or conditioning as is done in the main Oil Press display.

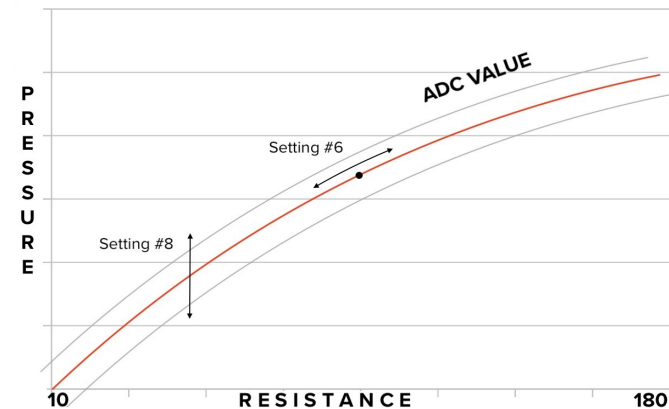
With engine running, oil pressure is displayed in PSI (the Oil Press status LED will also flash). Press the left button to toggle between PSI and the equivalent ADC value. Press DIM/OK to exit.

### 8: Oil Pressure Sensor Offset (>XX):

Default: 5

While Oil Pressure Cal (setting #6) moves the interpreted value along the transfer curve, this setting moves the entire curve up or down in units of PSI.

Keep in mind this affects the X/Y zero crossing point, so this setting should generally NOT be used to "fix" a high or low pressure reading, or 0-PSI will either be reached too soon (false alarms), or not at all. Setting #6 should be referenced first.



### 9: Battery Display Offset:

Default: 1.0

The Battery voltage display is calibrated before shipping with an accuracy of 0.1V. The voltage-divider circuit uses metal-film resistors with a 1% tolerance. In the unlikely event a voltage offset is required, this setting will do it.

The base value is 1.0 which is "zero" offset. Each tap of the right button will add 0.1V to the measured value up to "1.9". Each tap of the left button will subtract 0.1V from the measured value down to "0.1". Press DIM/OK to save & exit.

### 10: Rheostat Cut-Off Value:

Default: 270

Adjustable from 150 to 400, this is the threshold at which the display turns off entirely when your park/head lights are on and you dim the dash lights with the rheostat.

When you first select this setting, the value shown is the actual ADC reading from your rheostat (turn your park lamps on).

Press DIM/OK to advance to the adjustable setting. Left button decreases the value in steps of 10, right button increases. The lower the number, the greater the range before the display goes dark.

### 11: TCC Diagnostic Test (tcs):

This is an output circuit test. Press the COOLANT button to force the TCC output "On" for as long as the button is held. The display will also shows the current value of the "4<sup>th</sup> Gear Input". See TCC Section for details. "0" = Grounded. "1" = Floating/Open-Circuit.

### 12: Restore Factory Defaults:

To reset all settings to their default values, step to setting #12, then hold in the DIM/OK button for approximately 5 seconds until the display shows "888", then release. If you have the factory chime connected, it will momentarily sound for additional confirmation. Key-Off to exit.

## Troubleshooting

**Version Info & Chime Test:** With power-on and Coolant Temp being displayed, hold in the COOLANT TEMP button for approximately 5 seconds until the version number appears, then release button. The unit will also cycle the warning chime output as an aid to ensure it's wired correctly. Display will then advance to Config Mode and show 0. Turn key off to exit.

### Display is Completely Dead:

- Is the Ignition key On and other Acc's Powered?
- Turn up dashboard rheostat if headlights are on, or ensure headlights are switched off to force full display brightness. Is inline fuse good? Check power and ground connections at each end.
- With controller cover removed, a green indicator should be visible on the processor if power is received and board is operating.

**If lit:** Unit is getting power. Check connector at back of display.

**If not lit:** Check for power at the board's power and ground screw terminals. Check fuse & other end of ground wire.

- Double check connector at back of display to ensure it's properly seated.

**Oil Pressure reads "0" with engine running:** This indicates the controller is getting a signal from the sensor, but it's either out of range high or low. Disconnect sensor lead and display should flash "888" when Oil Pressure is selected. If so, likely cause is a failed pressure sensor.

**Oil Pressure flashes "888":** This signifies an open circuit condition with the oil pressure sending unit. A quick test if it's the sender or the wiring is to ground the wire at the sensor. The display should then show '0' when Oil Pressure is re-selected.

**Oil Pressure shows erratic values:** Typically a failing sending unit or an intermittent connection from the sender.

- Are engine ground straps present? Clean and tight? Is there teflon tape on the threads of the sender preventing a good ground connection?

-Increased resistance to the engine block means increased resistance from the sender to the display module.

**Oil Pressure reads high or low:** Verify ground path from sensor body to engine block, engine block to body/frame with a meter set on resistance. If you've changed sensors, you may need to recalibrate. If all connections are clean and readings are only a few ohms, consult Setting #6.

**Battery Voltage reads high or low:** Verify voltage at the 12V+ and Grd terminals with a voltmeter to first rule out a wiring problem. If compensation is needed, Setting #9 can be used to adjust the offset of the displayed value.

**For TCC Troubleshooting:** See the TCC Section.

**Temperature shows a consistent, yet unexpected value:** Check DIP switch 1 to ensure it's set for the units you expect. Coolant sensor could have failed; unplug sensor and display should read 000.

**Temperature shows "000":** Coolant Temp will display "000" if in fact the temperature is actually 0°F or below. If "000" is displayed when it's obviously warmer than that, either the sensor has failed, or the wiring from the sensor to the unit is open-circuit. Check screw terminals, wire pair and sensor connector under hood.



## Torque Converter Lockup Feature

The factory Cadillac ECM was responsible for locking up the torque converter clutch when certain criteria was met. This included engine load, engine temp, wheel speed, checking the trans 4<sup>th</sup> gear switch, ensuring the brake pedal was not depressed, and providing a delay. The problem is, after an engine swap, the ECM can no longer perform this function.

Of course, aftermarket solutions exist, but decent ones that include a delay feature are moderately expensive, and the 4<sup>th</sup> gear switch in the THM325-4L transmission works opposite of most OD transmissions. Such controllers also don't consider engine temperature, and many require dropping the pan to swap out the switch or to install a custom solenoid.

The E/K display solves this problem in several ways. It prevents TCC operation until the engine has reached a minimum of 145°F. It works with both N.C. & N.O. 4<sup>th</sup> gear switches, it allows for a user-defined delay to prevent short-cycling, and the brake switch is still part of the system. When all conditions are met, the TCC terminal provides a ground signal to the stock transmission solenoid which is exactly how the factory ECM worked.

On the input side, the 4<sup>th</sup> gear (hi-gear) switch is monitored, but an adjustable aftermarket vacuum switch is required.

These are available from Jeg's, Amazon, Summit, eBay, etc. The reason one isn't included with the kit is so that you have freedom of choice, and a warranty directly with the manufacturer in case of trouble.

You want a switch that offers adjustability and has both N.C. & N.O. terminals to allow for closing at either high or low vac, depending on your trans type.



Example of Compatible Vac Switch: Superior "K013"

- If your trans has a pressure switch that **opens** in high gear (found with HT4100 models), connect the vac switch **in parallel** with the "4<sup>th</sup> GR" input as shown on the next page. Set DIP Switch 2 "down", and enable the TCC option by setting Switch 3 "up". Consult the instructions supplied with the vac switch to select the terminals that give "**open circuit**" under low engine load (high vac).
- If your trans has a pressure switch that **closes** in high gear, wire the vac switch **in series** with the trans switch. Set DIP Switch 2 "up", and enable the TCC option by setting Switch 3 "up". Consult the vac switch instructions to select the terminals that give a "**closed circuit**" under low engine load (high vac).



For Transmissions Originally Mated to an HT4100 Engine:

These transmissions use pressure switches that open in high-gear. The two wires you need (TCC & 4<sup>th</sup> GR) are available at the ECM and can be cut/re-routed to the controller. Consult the table in the wiring section for connector ID and exact cavity numbers. The diagram below is for reference only; note connector/cavity numbers shown are for 1983-85.

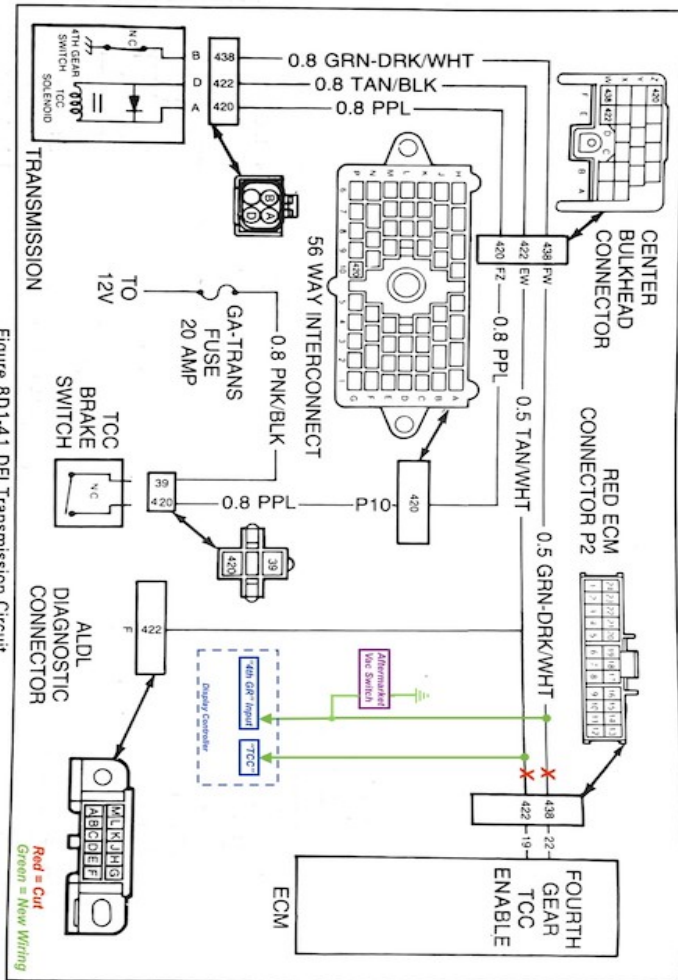
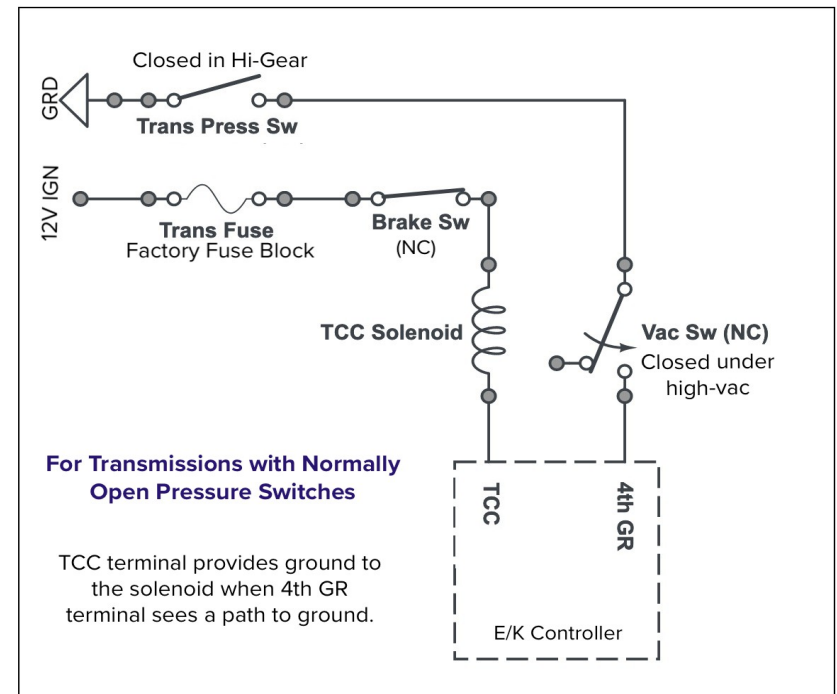


Figure 8D1-41 DFI Transmission Circuit

For Transmissions with N.O. Pressure Switches:

These transmissions use pressure switches that close in high-gear; ground is typically internal to the trans. Wire the vac switch in series as shown below.

Most GM vehicles provide 12V through the brake switch to the solenoid as illustrated, just reroute the other end of the solenoid to the TCC terminal on the E/K Controller. When conditions are satisfied (ground signal received on the "4<sup>th</sup> GR" input), a relay activates, providing ground to the solenoid.



**For Transmissions with Normally Open Pressure Switches**

TCC terminal provides ground to the solenoid when 4th GR terminal sees a path to ground.

## TCC Troubleshooting

TCC not engaging? Don't overlook the simple things...

- Vacuum switch adjusted correctly?
- Vehicle at speed with trans in 4<sup>th</sup> gear?
- Engine temp greater than 145°F as shown on the display?
- Delay in setting #3 reasonable?
- Is the brake pedal switch connected and adjusted correctly?
- Is the factory Trans Fuse good?
- Is the 4-pin connector plugged in at the trans?
- DIP switches 2 & 3 set correctly?



The E/K display has a diagnostic feature to help determine if the issue is on the input side, or the output side, without having to crawl under the dash to disconnect wiring.

With key on, but engine off, go to **Configuration Mode** per the **Settings Section** and enter setting #11.

Now, press the COOLANT TEMP button. This will force the TCC solenoid on for as long as you hold it in. Not only should you hear a click from the E/K display controller, but you should hear the solenoid click in the transmission. If you don't hear a click from the trans, you either have a bad solenoid, or an open connection.

For the input side of things, start your engine and return to setting #11.

Take note of the display, which shows the status of the "4<sup>th</sup> Gear Switch" input terminal. "0" means the input is grounded, "1" if it's open-circuit.

For the stock '82-'85 trans, the display should show "0" unless the vehicle is at speed in 4<sup>th</sup> gear AND the engine vacuum switch wired in parallel is at high-vac (low load).

If the display fails to change to a "1" during a high-speed test drive, either the trans switch isn't opening in 4<sup>th</sup> gear, or the vacuum switch isn't opening at high vacuum (low load). To rule out the trans switch, unplug the vacuum switch and go for another drive. If it now works correctly, either the vac switch has failed, is misadjusted, or is not receiving correct engine vacuum.