RON FRANCIS Wiring

TELORVEK TPI
WIRING INSTRUCTIONS FOR
TH-100 (96-99 Vortech)
4.3,5.0,5.7,7.4 Fuel Injection System
W/4L60-E or 4L80-E Transmission

Thank you for purchasing the absolute finest of wiring kits for the General Motors fuel injection. We have taken considerable time to work out the circuitry so that you, the customer will understand at least some of what this is all about. We ask that you follow our instructions closely. We recommend a high pressure in-tank fuel pump. Custom installations are available from Tanks, Inc. (phone # 320-558-6882) and Rock Valley (phone #800-344-1934).

Computers in automobiles as well as the computers we use in our home or office are getting more and more sophisticated. The auto makers have the capability now to incorporate much more computing power into a small package. In complying with federal law auto makers have toughened the emission outputs of their engines, which in the future will be even tougher.

In 1996 "ALL" automobile manufactures implemented the OBD II diagnostic system mandated by the Federal Government. This system monitors all computer controlled functions "closely" and will set trouble code(s) if it senses a problem or a device is removed from the system. This system also monitors exhaust emissions as well. In the past car makers have used one or two O2 sensors in the exhaust manifold(s) to monitor fuel calibration. In 1996 they have added two more, one in each exhaust pipe on the exhaust side of the catalytic converters. These are used to monitor their performance and set a trouble code if a defective converter is detected.

NOTE 1997 4.3 engine installers: Now that the automotive manufactures have made tremendous improvements in the emission outputs of their engines, they have now turned there attention to capturing and utilizing all fuel vapors generated by gasoline moving around the fuel tank as the vehicle is being driven down the road. This is accomplished by the canister purge tank, EVAP vacuum switch and fuel pressure sensor. This system requires that the fuel tank be sealed when the gas cap is on and the use of a non-vented gas cap. The pressure/vacuum in the tank is monitored by a pressure sensor installed in the fuel tank. The PCM controls excess pressure/vacuum through the EVAP vacuum switch and the vapors are utilized through the canister purge tank. Failure to install these devices will cause trouble codes to set.

IMPORTANT: Should you eliminate a sensor, your injection system will not work at its peak and will probably be in some variation of back up mode. There are many factors that will help you get a trouble free start up that you must consider.

Note: If your engine is a model year 1998 or newer and you have the computer out of that year vehicle, you will need to swap to the 1996 or 1997 model year computer. This is due to anti-theft circuitry built into the 1998 and newer computer as well as some pin out changes. The most common and affordable computer should be GM part #16244210.

DIAGNOSTIC PROCEDURES

It would be impossible to cover all the procedures that GM requires to diagnose all possible problems a fuel injection system could have in a set of installation instructions. If this is the first time you worked with a fuel injection system, we highly recommend purchasing a shop manual from the year, make and model the engine and computer came from. The book will not only help with diagnosing problems but will also teach you about the engine you just installed.

WARNING!

After the kit installation is complete and it is necessary to diagnose a starting or drive ability problem, follow the procedures recommended in the shop manual. All voltage tests must be preformed using a HIGH impedance, digital voltmeter. DO NOT use a test light on this system! DAMAGE WILL BE DONE to the engine computer if a test light is used on this system.

You will need all stock parts and sensors. The back page of the instructions is a list of optional accessories we offer and some of the General Motors part numbers you may need.

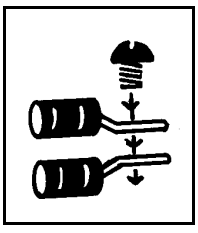
STARTING INSTALLATION

Since there are so many individual circuits to complete, we recommend that you connect them in the order that we prescribe. Disconnect the battery before starting and do not reconnect until instructed.

TELORVEK PANEL LOCATION: (BEFORE DRILLING ANY HOLES) The location of the TELORVEK panel and engine control computer (ECM) can be any where you choose **INSIDE the vehicle.** They should be mounted in an accessible location, under the dash, under the seat or in the trunk are good. A lot of wires will be connected to the panel so the more accessible the panel the easier the wire connections will go. After the Telorvek panel installation is complete, only the fuses need to be readily available.

If mounting the panel under the dash or seat, leave enough extra wire so it can be pulled down from under the dash or from under the seat after all the connections are made. The reason for this, the panel can be used as a BREAKOUT BOX for diagnosing (trouble shooting) problems in the future. Some diagnostic procedures require taking volt readings on wires to find a problem. It is a lot easier to sit in a seat then bending over a fender.

IMPORTANT: Check to be sure you have all the bags required for the installation. Each bag contains at least one sensor connection and approximately 20 feet of wire to reach the TELORVEK panel. We suggest opening bag #20 (Mass Air Flow Sensor) first. Plug the connector into the sensor and run the wires back to the TELORVEK panel. If they reach, then all the other sensor connections will also, because the MAF sensor is always mounted on the front of the engine.



We have packaged three sizes of terminal forks. The red terminals are for the 18 gauge wires and the blue are for 16-14 gauge wires and yellow are for 10-12 gauge wires. Use the red forks when installing terminals on the wires unless other wise directed.

Always put the first terminal under a screw with the fat wire side down as in the drawing. Install any second terminals just the opposite as this will allow the screw to hold squarely and tight. The insulation from one terminal should not interfere with the one next to it.

Use a crimping tool that is designed for insulated terminals. If the tool punctures the insulation (plastic) or damages it in any way, you are using the wrong tool. The proper tool will only "flatten" the plastic and if the handles are squeezed completely, the proper crimp has been made. Get in the habit of test pulling at each terminal as you crimp it to the wire.

Any sensor that is difficult to hook-up should not be eliminated. All sensors are important if you desire your conversion to run as good as a factory engine. Eliminating any part of this kit WILL cause some portion of the EFI to work improperly.

Ron Francis Wiring fuel injection wire harnesses are "ALL" designed to follow the electronic circuitry of the vehicle your engine was removed from! Following this simple procedure allows our fuel injection harness customers to have their vehicles diagnosed by "ANY" GM dealer or reputable repair facility familiar with diagnosing fuel injection electronic systems.

Ron Francis Wiring does not re-engineer electronic circuitry that a vehicle manufacturer has spent millions of dollars on testing and designing. Our goal is to allow an "easy", "neat", "pain free" installation through quality installation instructions and a state of the art wiring kit.

If your vehicle experiences starting or runability problems, 99% of the time it is some sort of mechanical, NOT A WIRING PROBLEM. Fuel injection engines still run similar to carbureted engines, the difference being that the engine computer receives "inputs" from various sensors throughout the engine. The computer then uses this information to calibrate fuel delivery and engine timing.

Diagnosing a NO SPARK situation is the same on a computer controlled fuel injection engine as it is on a carbureted engine. Spark control, even though it may be done slightly different depending on engine year and make, is still essentially the same. A rotor is turned allowing spark to be provided to the plugs, the same as in a carbureted engine.

Thank you for purchasing our products!

Ron Francis Wiring has made every effort to assure a quality product and can assure you that this system works well in your application. Once you have confirmed proper installation, any trouble you experience will be a defective part or seat of the pants repair. Your unit can be tested at any General Motors Dealership with no difficulty.

Bag #20 MASS AIR FLOW SENSOR (MAF): Plug the connector into the MAF sensor located in the intake air tube between the air filter and the throttle body and run the wires back to the panel. Connect the yellow wire MAF A->17 to #17, black MAF B->26 to #26 and the pink MAF C->19 to #19.

Bag #21 INTAKE AIR TEMPERATURE SENSOR (IAT): Plug the connector into the IAT sensor located in the intake air tube between the air filter and the throttle body and run the wires back to the panel. Connect the tan wire IAT A->9 to #9 and the black IAT B->10 to #10.

Bag #22 MAP SENSOR (4.3,5.0,5.7 engines): The MAP (Manifold Air Pressure) sensor is located in the center of the intake manifold. Plug the connector into the sensor and run the wires back to the panel. Connect the black wire MAP A->10 to #10, lt green wire MAP B->12 to #12 and the gray wire MAP C->13 to #13.

Bag #22 MAP SENSOR (7.4 engines): The MAP (Manifold Air Pressure) sensor connection is located on the right front of the engines near the fuel injectors. Plug the connector into the sensor and run the wires back to the panel. Connect the black wire MAP A->10 to #10, lt green wire MAP B->12 to #12 and the gray wire MAP C->13 to #13.

Bag #23 ENGINE COOLANT TEMPERATURE SENSOR: The sensor is located on the top right front of the engine near the thermostat housing. Plug the connector into the sensor and run the wires back to the panel. Connect the black wire ECT A->32 to #32 and the yellow wire ECT B->31 to #31.

BAG #24 THROTTLE POSITION SENSOR (TPS): The TPS sensor is located on the side of the throttle body. Plug the connector into the sensor and run the wires back to the panel. Connect the gray wire TPS A->34 to #34, black wire TPS B->32 to #32 and the dk blue wire TPS C->33 to #33.

Bag #25 IDLE AIR CONTROL (IAC): The IAC is located on the right rear of the throttle body. Plug the four gang connector into the IAC and run the wires back to the panel.

Connect the wires to the panel as follows: white IAC B->40 to #40, black IAC C->41 to #41, lt green IAC A->39 to #39 and lt blue IAC D->42 to #42.

Bag #26 IGNITION COIL & COIL DRIVER: The ignition coil and coil driver are located on the right side of the intake manifold. Plug in the connectors and run the wires to the panel. Using the blue terminals connect the orange IGN COIL A->52 to #52. Using the red terminals connect the orange COIL DR A->20 to #20, white COIL DR B->14 to #14 and the black COIL DR C->26 to #26.

The purple wire IGN COIL B->TACH running from the ignition coil connector connects direct to a dash mounted tachometer. If you are not installing a tach in your vehicle cut off this wire at the connector and discard.

Bag #27 CAM SHAFT POSITION SENSOR: The cam shaft position sensor is located in the distributor. Plug the connector into the distributor and run the wires to the panel. Connect the brown wire CAM SHAFT B->37 to #37, CAM SHAFT A->38 to #38 and the pink CAM SHAFT C->20 to #20.

Bag #28 INJECTORS: The 4.3, 5.0/5.7 and 7.4 engines require different types of injector connectors as well as wiring connections to the panel. Follow the paragraph below that pertains to the type of engine you are installing.

4.3 Engine Bag #28: Uncoil the injector harness and plug it into the fuel metering body located on the intake manifold towards the rear of the engine. Run the wires back to the panel and connect the lt blue INJ A->4 to #4, dk green INJ C->6 to #6, black INJ F->1 to #1, lt green INJ G->5 to #5, dk blue INJ K->3 to #3 and yellow INJ M->8 to #8. Using blue terminals connect the pink INJ B->18 to #18.

5.0/5.7 Engine Bag #28A: Uncoil the injector harness and plug it into the fuel metering body located in the middle of the intake manifold. Run the wires back to the panel and connect the black INJ A->1 to #1, dk blue INJ D->3 to #3, lt blue INJ E->4 to #4, purple INJ H->2 to #2, yellow INJ J->8 to #8, dk green INJ M->6 to #6, lt green INJ N->5 to #5 and the red INJ S->7 to #7. Using blue terminals connect the pink INJ B->18 and the pink INJ K->18 to #18.

7.4 Engine Bag #28B: Uncoil the injector harness and plug it into the fuel metering body located on the rear, center of the intake manifold. Run the wires back to the panel and connect the black INJ A->1 to #1, yellow INJ B->8 to #8, lt blue INJ C->4 to #4, dk blue INJ D->3 to #3, dk green INJ E->6 to #6, lt green INJ F->5 to #5, red INJ G->7 to #7 and the purple INJ H->2 to #2. Using blue terminals connect the pink INJ J->18 and the pink INJ K->18 to #18.

Bag #29 CRANK SHAFT POSITION SENSOR: The CPS is located on the lower right front of the engine. After plugging in the connector run the wires back to the panel. Connect the pink CRK SHAFT A->19 to #19, purple CRK SHAFT B->35 to #35 and the yellow CRK SHAFT C->36 to #36.

Bag #30 EMISSIONS: Enclosed is the wiring for the Linear EGR Valve, EVAP Vacuum Switch and Canister Purge Solenoid. All of the devices must be wired into the system or trouble codes will set in the ECM.

LINEAR EGR VALVE: Plug the Connector into the valve located on the front of the intake manifold on the 4.3,5.0,5.7 engines and on the left side of the intake manifold on the 7.4 engines. Plug in the connector and run the wires into the panel. Connect the white wire EGR A->60 to #60, black EGR B->11 to #11, brown EGR C->59 to #59, gray EGR D->13 to #13 and the pink EGR E->21 to #21.

EVAP VACUUM SWITCH: This switch is located on the right side of the manifold. Plug in the connector and run the wires back to the panel. Connect the brown wire EVAP SW A->104 to #104 and the black EVAP SW B->25 to #25.

CANISTER PURGE SOLENOID: The CPS is located on the right side of the intake manifold. Plug in the connector and run the wires back to the panel. Connect the pink wire PURGE SOL A->54 to #54 and the dk green wire PURGE SOL B->90 to #90

Bag #30A AIR PUMP 7.4 California engines only: The air pump is located on the right front of the engine and is driven by the serpentine belt. The ECM controls the pump clutch through the air pump relay mounted in the cover of the panel. Install the relay (Airtex part #1R1061, Standard Motor Products part #RY116 or GM part #14100455) in the housing or the pump will not operate and a trouble code will set.

Plug in the connector into the air pump and run the wires back to the panel. Using blue terminals connect the pink wire AIR PUMP A->89 to #89 and the black wire AIR PUMP B->25 to #25.

Bag #31. KNOCK SENSOR WIRING (4.3,5.0,5.7 Engines): This sensor will inform the computer of detonation and readjust the timing accordingly. The knock sensor must be used because it advances and retards the timing. Connect the single dk blue to the sensor located on the rear of the engine on the 4.3 and is on the right side of the engine on the 5.0 and 5.7 engines. Connect the KNOCK->16 wire to #16. The second knock sensor wiring is not used with this engine.

Bag #31A. KNOCK SENSOR WIRING (7.4 Engine): Requires using two knock sensors. Connect the dk blue wires to each sensor located on the left and right side of the engine block and run the wires back to the panel. Connect the KNOCK->16 wires both to #16.

Bag #32. OXYGEN SENSOR (4): Starting in 1996 the federal government has mandated the automotive manufacturers to implement the use of OBD II systems. This systems monitors the efficiency of all emission control devices. Installed in the factory exhaust system are now four O2 sensors. These sensors monitor fuel calibration as well as catalytic converter performance. **NOTE: The ECM processes the information it receives from all four O2 sensors. The use of aftermarket catalytic converters may not have the same characteristics as the factory units. This may lead to false trouble codes.**

This area of the vehicle is hot so keep the wires away from the exhaust. Follow the paragraph below on how to mount the O2 sensor in the exhaust.

4.3 Engines: The 4.3 engine in a stock application used a single exhaust system utilizing one catalytic converter. If you are using headers you must run a pipe from both headers into one catalytic converter. After the converter you then can continue with dual exhaust if you choose. The front O2 sensor should mount in the left and right front manifolds or header collectors. The Rear O2 sensor mount at the entrance and exit of the catalytic converter. Connect the BNK 1 SEN 1 O2 harness to the left front O2. Connect the BNK 2 SEN 1 O2 harness to the right front O2. Connect the BNK 1 SEN 2 O2 harness to the O2 sensor at the entrance of the catalytic converter. Connect the BNK 2 SEN 2 O2 harness to the O2 sensor at the exit of the catalytic converter. Now run all the wires back to the panel. Using red terminals connect the tan BNK 1 SEN 1A->43 to #43, purple BNK 1 SEN 1B->44 to #44, black BNK 1 SEN 1C->27 to #27, white BNK 1 SEN 2A->45 to #45, lt green BNK 1 SEN 2B->46 to #46, black BNK 1 SEN 2C->27 to #27, dk green BNK 2 SEN 1A->47 to #47, gray BNK 2 SEN 1B->48 to #48, black BNK 2 SEN 1C->28 to #28, lt blue BNK 2 SEN 2A->49 to #49, dk blue BNK 2 SEN 2B->50 to #50 and the black BNK 2 SEN 2C->29 to #29. Now using blue terminals connect the pink BNK 1 SEN 1D->22 and the pink BNK 1 SEN 2D->22 both to #22. The two remaining pink wires BNK 2 SEN 1D->23 and the BNK 2 SEN 2D->23 both connect to #23.

5.0, 5.7, 7.4 Engines: In the stock application these engines use a dual catalytic converter, single muffler type system. If you are using headers the front O2 sensor mount in the left and right header collectors. The Rear O2 sensors mount at the exit of the catalytic converter. Connect the BNK 1 SEN 1 O2 harness to the left front O2. Connect the BNK 2 SEN 1 O2 harness to the right front O2. Connect the BNK 1 SEN 2 O2 harness to the O2 sensor at the exit of the left catalytic converter. Connect the BNK 2 SEN 2 O2 harness to the O2 sensor at the exit of the right catalytic converter. Now run all the wires back to the panel. Using red terminals connect the tan BNK 1 SEN 1A->43 to #43, purple BNK 1 SEN 1B->44 to #44, black BNK 1 SEN 1C->27 to #27, white BNK 1 SEN 2A->45 to #45, lt green BNK 1 SEN 2B->46 to #46, black BNK 1 SEN 2C->27 to #27, dk green BNK 2 SEN 1A->47 to #47, gray BNK 2 SEN 1B->48 to #48, black BNK 2 SEN 1C->28 to #28, lt blue BNK 2 SEN 2A->49 to #49, dk blue BNK 2 SEN 2B->50 to #50 and the black BNK 2 SEN 2C->29 to #29. Now using blue terminals connect the pink BNK 1 SEN 1D->22 and the pink BNK 1 SEN 2D->22 both to #22. the two remaining pink wires BNK 2 SEN 1D->23 and the BNK 2 SEN 2D->23 both connect to #23.

Bag #33 FUEL PUMP (NOTE 1997 4.3 ENGINES REFER TO WIRING BAGS #39 & #40. DISREGARD THIS BAG) : The fuel pump relay is located in the cover of the TELORVEK panel and is pre-wired. A relay must be installed in the connector (Airtex part #1R1061, Standard Motor Products part #RY116 or GM part #14100455) or the pump WILL NOT operate. Connect the tan 87->FUEL PUMP wire to #87 on the panel and run it to the fuel pump. The tan wire then connects to the positive terminal on the pump. The black FUEL PUMP GRND wire connects to the "-" terminal on the pump and connected to a good ground.

Bag #34 OIL SWITCH: This switch normally is located in the rear of the engine near the distributor. Plug in the connector into the oil pressure switch. Run the wires back to the panel and connect the red OIL SW D->86 to #86 and the tan OIL SW C->87 to #87.

Bag #35 SERVICE ENGINE SOON LIGHT (S.E.S) and DATA LINK CONNECTOR. (DLC): The DLC is the diagnostic link for computerized testing at your local GM dealer or a hand held scanner. We have supplied a Cover for the DLC to dress up the appearance. Please consider a very accessible location for this important part. Mount the connector in the desired location and run the wires back to the panel. Connect the purple wire DLC 2->97 to #97, black DLC 4->30 to #30, white DLC 8->98 to #98, tan DLC 9->99 to #99, lt green DLC 12->100 to #100, orange DLC 13->101 to #101, dk green DLC 14->102 to #102 and the red wire DLC 16->53 to #53.

The S.E.S light can be any two wire un-grounded 12 volt lamp located on the dash board or where ever desired. Connect the pink 21->SES LT to #21 and the brown 96->SES LT to #96. Run the wires to the SES LT and make the connection. Connecting a S.E.S light on the dash is not necessary, the yellow L.E.D light on top of the TELORVEK panel performs the same function.

4L60-E or 4L80-E Transmission Wiring

At the time your order was placed you were asked what type transmission you were installing. If you are installing the 4L60-E or 4L80-E automatic transmission we have provided the correct wiring for the transmission. The 4L60-E & 4L80-E transmission are fully automatic rear wheel drive electronically controlled transmissions. Shift points are controlled by the ECM. Shift schedules and torque converter lock-up are also controlled by the ECM and are influenced by transmission temperature.

Below are the installation instructions for both the 4L60-E & 4L80-E transmissions. Follow the paragraph that pertains to your transmission:

Bag #36 AUTOMATIC 4L60-E or Bag #36A 4L80-E TRANSMISSION: Un-coil the large harness and plug the connector into the transmission. Run the wires to the TELORVEK panel.

☞ NOTE ☜

Due to the amount of wires necessary to operate the 4L60-E & 4L80-E transmissions and to follow GM color codes, some wire colors had to be duplicated. READ the printing on the wires carefully before connecting them to the TELORVEK panel.

4L60-E Transmission Wiring: Connect the wires to the TELORVEK panel as follows: lt green TRANS A->65 to #65, yellow TRANS B->66 to #66, dk blue TRANS C->67 to #67, lt blue TRANS D->68 to #68, pink TRANS E->64 to #64, dk green TRANS L->69 to #69, black TRANS M->70 to #70, brown TRANS U->63 to #63, pink TRANS N->71 to #71, tan TRANS P->72 to #72, brown TRANS R->73 to #73, brown TRANS S->75 to #75 and the purple TRANS T->76 to #76.

4L80-E Transmission Wiring: Connect the wires to the TELORVEK panel as follows: lt green TRANS A->65 to #65, yellow TRANS B->66 to #66, dk blue TRANS C->67, lt blue TRANS D->68 to #68, pink TRANS E->64 to #64, dk green TRANS L->69 to #69, black TRANS M->70 to #70, pink TRANS N->71 to #71, brown TRANS R->73 to #73, tan TRANS P->72 to #72 and the brown TRANS U->63 to #63.

TRANSMISSION INPUT SPEED SENSOR (4L80-E Transmission Only): This sensor is located on the left side of the transmission just forward of center. Plug the connector into the sensor and run the wires back to the panel. Connect the red TRANS SPD A->77 to #77 and the dk blue TRANS SPD B->78 to #78.

More Transmission Information

The ECM tells the 4L60-E & 4L80-E transmission when to shift from gear to gear. The ECM is also looking for certain signals produced by the transmission. If these signals are not received by the ECM, codes WILL SET.

Bag #37 BRAKE SIGNAL (TORQUE CONVERTER CUT OUT): Mounted in the cover of the Telorvek panel is the relay housing for the TCC cut out. This relay disengages the torque converter when the vehicles brakes are applied. A relay (Airtex part #1R1061, Standard Motor Products part #RY116 or GM part #14100455) must be installed in the housing in order for it to function. The purple wire 62->BRAKE SW connects to #62 and run to the cold side of the brake switch (hot only when the brakes are applied). This color matches our complete vehicle wiring kit.

Bag #38 SPEED SENSOR: A VSS signal input is needed on all General Motors TPI engines. If the ECM does not see that input a **CODE WILL SET.** The VSS input helps control transmission shifts, some of the EGR and IAC functions. Plug the connector into the sensor and run the wires to the TELORVEK panel. Connect the purple VSS A->79 to #79 and the lt green VSS B->80 to #80.

Electronic Speedometer Connection: #108 on the Telorvek panel is the VSS signal output terminal. This terminal produces a 4000 pulse per mile signal. Follow the instructions supplied with your speedometer for the correct wiring procedures for your speedometer.

NOTE

The remaining two bags (#39 & #40) were supplied if your kit was ordered for a 1997 4.3 engine only. These bags contain wiring for the fuel tank pressure sensor, fuel tank sender module, fuel pump and fuel level sending unit. The PCM also requires a fuel level input signal which is needed for the control of the emission control devices. A complete description of these items can be found in your 1997 C/K shop manual.

Located in bag #40 is the factory connector for the fuel tank sender module and the fuel pump/level sender if you decide to use the factory pump/level unit that installs in the fuel tank. If this unit is un-useable in your application, the connector can be removed and the wires installed on after market fuel pumps and fuel tank sending units.

Bag #39 FUEL TANK PRESSURE SENSOR 1997 4.3 engines only: This sensor installs in the top of the fuel tank and monitors pressure/vacuum in the tank. The fuel tank and fuel cap must be non-vented. After plugging in the connector run the wires back to the panel. Connect the black wire TANK PRESSURE A->11 to #11, dk green TANK PRESS B->81 to #81 and the gray TANK PRESS C->15 to #15.

Bag #40 FUEL TANK SENDER MODULE, FUEL PUMP/FUEL LEVEL 1997 4.3 engines only: In the stock application, the fuel tank sender module was located under the dash on the right side of the vehicle near the blower motor. This module must be wired into the system. Plug the connector into the module and run the wires back to the panel. Connect the pink wire FTSM A->24 to #24, gray FTSM b->15 to #15, purple FTSM C->58 to #58, white FTSM D->57 to #57 and the black FTSM M->56 to #56. The lt green FTSM L->FUEL GA wire connects direct to the dash mounted fuel gauge.

If you are using the stock fuel pump/fuel level unit in the tank, the connector supplied will plug direct into the unit. If not, remove the connector and wire the sending unit and pump as follows. The purple FPSM A->58 and the black FPSM D->70 are the wires needed for the fuel level input to the PCM. Connect the purple wire to the center stud of the sending unit located in the tank and run it to #58 on the panel. Connect the black wire to one of the mounting screws holding the sending unit in the tank and run it to #70.

The tan FPSM B->87 and the black FPSM C->30 are the wires needed for the electric fuel pump. Connect the tan wire to the positive terminal on the pump and run it to #87. Connect the black wire to the ground terminal on the pump and run it to #30.

OTHER HARNESS CONNECTIONS

The terminals listed below are the remaining factory computer connections running out of the PCM. These are not used in an aftermarket applications due to the incompatibility with aftermarket parts. If you wish to attempt to make connections to these terminals, a shop manual will be needed. Ron Francis Wiring does not offer any wiring connections to these terminals.

#83: A/C Relay Control.
#84: Skip Shift Indicator Lamp.
#105: Clutch Signal.
#106: VSS Output (Radio/Cruise).
#107: VSS Output (Anti Lock Brakes).
#108: VSS Output (Speedometer).
#109: Cruise Control.
#110: 4 Wheel Drive Low Signal.
#111: 4 Wheel Drive Engaged Signal.

FINISHING UP

The TELORVEK panel has four ECM connectors running from it with different color plugs. Plug the connectors into the computer.

Three connections remain, battery hot, ignition and battery ground. These three wires are running out of the TELORVEK panel along with the wires to the computer. Un-coil them and wire as follows:

BATTERY CONNECTION: The red wire out of the plug connects to a battery (hot all the time) source. Run this wire to the positive battery post if the TELORVEK panel and battery are mounted in the rear of the vehicle or to the starter solenoid if the panel is mounted towards the front of the vehicle. If your vehicle is equipped with a master disconnect, connect this wire to the hot side of the switch.

IGNITION CONNECTION: The orange wire is connected to a keyed ignition source (hot with the key in run and crank).

NOTE: After you wired in the ignition connection, check it with a test light, make sure this wire remains hot with the key in the run position and crank position.

BATTERY GROUND: The Black ground wire from the plug runs direct to the battery. Do not consider grounding the battery to the frame and then the engine to the frame. Run the battery ground directly to the engine.

STARTING THE ENGINE

You have now made all of the connections necessary to TRY to start your car. If you try now, you will be disappointed since you did not hook up the battery. You can do so now. If you turn the key on but do not crank engine, you will hear the fuel pump for about 2 to 4 seconds before it stops. This will indicate the pump is ready. During normal operating it is best if you do not wait until the pump stops as this is not an indication that the pressure is up. There is no need to "pump" the throttle to start a fuel injected car.

Telorvek Panel Fuse Designation & Size

The harness has a total of eight fuses. Shown below is a diagram of what each fuse protects.

Top, Front View Of Fuse Blocks

Fuse Row #1	
Fuse Designation	**Fuse Size Block #1**
(IGNITION FEED) Injectors, ECM, MAF, Crank Position Sensor, Coil Driver, Cam Shaft Position, EGR, S.E.S	20 AMP
(IGNITION FEED) Ignition Coil	20 AMP
(IGNITION FEED) O2 Sensors FTSM (97 4.3 only)	20 AMP
(IGNITION FEED) Transmission	10 AMP

Fuse Row #2	
Fuse Designation	**Fuse Size Block #2**
(IGNITION FEED) Canister Purge Solenoid TCC Relay, Vacuum Sw	15 AMP
(BATTERY FEED) Air Pump	20 AMP
(BATTERY FEED) Fuel Pump Relay, Oil Switch	15 AMP
(BATTERY FEED) ECM, DLC	10 AMP

Fuel Pump Relay

TCC Relay

Air Pump Relay

RELAY CENTER: In the cover of the TELORVEK panel are three relays the ECM uses to control fuel pump, TCC control and the air pump. The ECM can not handle heavy load items and it requires a relay to handle the load and the ECM then controls the relay. The harness has a total of three relays. All relays in the harness require Airtex part #1R1061, Standard Motor Products part #RY116 or GM part #14100455.

TROUBLE CODE DEFINITION

The ECM looks for certain parameters from each sensor it controls. If it sees one out of specification it will set and store a trouble code. Not all codes will light the service engine soon light. There is two types of trouble codes:

HARD CODE: A hard code will light the S.E.S light and in most cases (not all) put the ECM into a back-up (open loop) mode. When this happens the timing remains fixed (will not advance or retard) and the engine will run only taking the input from the TPS sensor. This usually causes a rich condition as well.

SOFT CODE: A soft code will not light the S.E.S light. This type of code will set, store in the ECM. This type of code WILL NOT put the computer into a back-up mode or cause any running problems.

READING TROUBLE CODES: Trouble codes are read by using a scanner. These units are expensive and will require you to take your vehicle to a qualified technician.

96-97 4.3,5.0,5.7,7.4 CK TROUBLE CODES

PO101 MAF System Performance
PO102 MAF Sensor Low Frequency
PO103 MAF Sensor High Frequency
PO106 MAP System Performance

PO107 MAP Sensor Low Voltage
PO108 MAP Sensor High Voltage
PO112 Intake Air Temp Low Voltage
PO113 Intake Air Temp High Voltage

PO117 ECT Sensor Low Voltage
PO118 ECT Sensor High Voltage
PO121 TPS System Performance
PO122 TPS Low Voltage

PO123 TPS High Voltage
PO125 ECT Excessive Time To Closed Loop
PO126 Insufficient ECT For Stable Operation
PO131 O2 Bank 1 Sensor 1 Low Voltage
PO132 O2 Bank 1 sensor 1 High Voltage
PO133 O2 Bank 1 Sensor 1 Slow Response

PO134 O2 Bank 1 Sensor 1 Insufficient Activity
PO135 O2 Bank 1 Sensor 1 Heater Circuit
PO137 O2 Bank 1 Sensor 2 Low Voltage
PO138 O2 Bank 1 Sensor 2 High Voltage

PO140 O2 Bank 1 Sensor 2 Insufficient Activity
PO141 O2 Bank 1 Sensor 2 Heater Circuit
PO143 O2 Bank 1 Sensor 3 Low Voltage
PO144 O2 Bank 1 Sensor 3 High Voltage

PO146 O2 Bank 1 Sensor 3 Insufficient Activity
PO147 O2 Bank 1 Sensor 3 Heater Circuit
PO151 O2 Bank 2 Sensor 1 Low Voltage
PO152 O2 Bank 2 Sensor 1 High Voltage

PO153 O2 Bank 2 Sensor 1 Slow Response
PO154 O2 Bank 2 Sensor 1 Insufficient Activity
PO155 O2 Bank 2 Sensor 1 Heater Circuit
PO157 O2 Bank 2 Sensor 2 Low Voltage

PO158 O2 Bank 2 Sensor 2 High Voltage
PO160 O2 Bank 2 Sensor 2 Insufficient Activity
PO161 O2 Bank 2 Sensor 2 Heater Circuit
PO171 Fuel Trim Lean Bank 1

PO172 Fuel Trim Rich Bank 1
PO174 Fuel Trim Lean Bank 2
PO175 Fuel Trim Rich Bank 2

PO2018 Trans Fluid over temperature
PO300 Engine Misfire Detected
PO301 Cylinder 1 Misfire Detected
PO302 Cylinder 2 Misfire Detected

PO303 Cylinder 3 Misfire Detected
PO304 Cylinder 4 Misfire Detected
PO305 Cylinder 5 Misfire Detected
PO306 Cylinder 6 Misfire Detected

PO307 Cylinder 7 Misfire Detected
PO308 Cylinder 8 Misfire Detected
PO325 Knock Sensor Circuit
PO327 Knock Sensor Low Voltage

PO336 Crank Shaft Sensor Performance
PO337 Crank Shaft Sensor Low Frequency
PO338 Crank Shaft Sensor High Frequency
PO339 Crank Shaft Sensor Intermittent

PO340 Cam Shaft Sensor Circuit
PO341 Cam Shaft Sensor Performance
PO401 EGR System
PO410 AIR System

PO420 Catalytic Converter Bank 1 Low Efficiency
PO430 Catalytic Converter Bank 2 Low Efficiency
PO441 EVAP System No Flow During Purge
PO500 VSS Circuit
PO502 VSS Circuit Low Input

PO506 IAC System Low
PO507 IAC System High
PO560 System Voltage Malfunction
PO704 Clutch Switch Circuit
PO711 Fluid Temp Sensor Range & Performance

PO712 Fluid Temp Sensor Low Input
PO713 Fluid Temp Sensor High Input
PO719 TCC Brake Switch
PO724 TCC Brake Switch High

PO740 TCC Solenoid Electrical
PO742 TCC Stuck On

PO748 PC Solenoid Valve Circuit
PO751 1-2 Shift Solenoid
PO753 1-2 Shift Solenoid Electrical

PO756 2-3 Shift Solenoid Performance
PO758 2-3 Shift Solenoid Electrical
PO785 3-2 SS Valve Assembly CKT Electrical
P1106 MAP Sensor Intermittent High Voltage
P1107 MAP Sensor Intermittent Low Voltage

P1111 IAT Intermittent High Voltage
P1112 IAT Intermittent Low Voltage
P1114 ECT Intermittent Low Voltage
P1115 ECT Intermittent High Voltage

P1121 TPS Intermittent High Voltage
P1122 TPS Intermittent Low Voltage
P1133 Insufficient Switching Bank 1 Sensor 1
P1134 Transition Time Ratio Bank 1 Sensor 1

P1153 Insufficient Switching Bank 2 Sensor 1
P1154 Transition Time Ratio Bank 2 Sensor 1
P1345 Crank Shaft Position/Cam Shaft Position correlation
P1351 Ignition Control High Voltage

P1361 Ignition Control Low Voltage
P1381 No Electronic Brake Control Module
P1406 EGR Valve Position
P1415 Air Bank 1

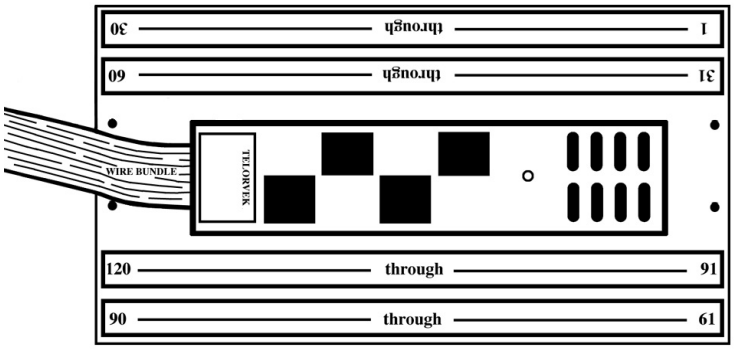
P1416 Air Bank 2
P1441 EVAP Flow During Non-Purge
P1508 IAC System Low RPM
P1509 IAC System High RPM

P1810 Pressure Switch Circuit Malfunction
P1812 Transmission Fluid Over temperature
P1860 TCC PWM Solenoid Electrical
P1864 TCC PWM Solenoid Circuit
P1870 Transmission Component Slipping
P1875 Four Wheel Drive Circuit Performance
P1886 3-2 Control Solenoid Circuit

Numbered terminal block cover strip reference.

The drawing below is for your reference on the correct positioning of the Telorvek fuel injection panel terminal block cover strips.

When connecting wires to the panel be sure the numbered terminals match the drawing below.



Optional Accessories

GM Part

Electronic Control Module 4.3,5.0,5.7,7.4 (96)	16244210	
Electronic Control Module 4.3,5.0,5.7,7.4 (97)	16229684	
Knock Sensor Module 4.3	16208961	
Knock Sensor Module 5.0	16214729	
Knock Sensor Module 5.7	16208981	
Knock Sensor Module 7.4	16208991	
Fuel Pump Relay	14100455	FP-25
TCC Cut Out Relay	14100455	FP-25
Air Pump Relay	14100455	FP-25