



# TELORVEK EFI 1994-95 5.0 Sequential Fuel Injection System (MG-90)

## WIRING INSTRUCTIONS

Thank you for purchasing the absolute finest of wiring kits for the Ford Motor Co. 5.0 fuel injection engine. 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 using the FORD Mustang, high pressure in tank fuel pump. Custom installations are available from Tanks Inc. (phone #612-558-6882) and Rock Valley (phone #800-344-1934). There are some valuable HOW-TO's on our website ([www.thedetailzone.com](http://www.thedetailzone.com)) under PROJECTS that can help you with your install.

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: FORD diagnostic procedures are very detailed, lengthy and impossible to cover in this set of instructions. Purchasing the FORD ENGINE/ EMISSIONS DIAGNOSIS shop manual will help you learn about the engine you installed and guide you through the correct diagnostic procedures Ford recommends. **This book is available through your local Ford dealer or Helm Inc. Helm is the distributor for the shop manuals for General Motors and Ford Motor Company. Helm can be contacted at 800-782-4356 or on their web site [www.helminc.com](http://www.helminc.com)**

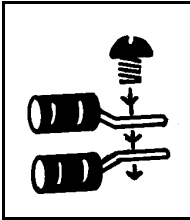
### WARNING!

**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.**

### 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.

There will be many connections to the TELORVEK panel so plan the location of the panel in an area with room to work. We suggest mounting the panel in an assessable location, in the trunk, under the seat or under the dash are good. In order to allow for the proper spacing between the computer and the Telorvek panel, plug the connector into the computer (ECM) and mount the panel and computer. **For safety, disconnect the ECM connector until finished the installation.** A poor installation will result in a poor running car. **The number referred to from this point on will be the location on one of the terminal blocks located on the TELORVEK panel.**



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.

After all wires are connected to the engine, wire tie them together or use 3/4 inch Zip loom to protect them. This can be done before any connections are made to the panel. Since all wires are marked, running the entire group to the panel at one time is fine. Some terminals on the panel may not be used!

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**Important!** We have supplied three sizes of terminals for your use on the panels itself. The Yellow is used on the 10-12 gauge wire, Blue is used on 14-16 gauge wire and Red is used for the bulk of the smaller wires. Each individual bag instructions will be marked as to when to use the yellow, blue or red terminals.

Time to start the installation. In order to install the injector connectors the upper air intake manifold will have to be removed. By doing this you will have access to the injectors. **A NEW gasket should be used when reassembling because a vacuum leak will cause a drivability problem.**

**NOTE**

**You will be moving around to different terminals on the TELORVEK panel to make connections. For this reason extra care is needed when making all connections to the panel.**

**Bag #20. INJECTORS:** The injector wiring is made up in two harnesses, one for the left bank of injectors and one for the right bank. Locate the right injector connector with the Red and Tan wires and connect it to cylinder number (1) injector one. Now plug in the rest of the injector connectors (injectors 2, 3, 4) in that half of the harness. In the left half of the injector harness locate the injector connector with the Red and Black wires and connect it to injector number (5). Plug in the rest of the injector connectors (injectors 6, 7, 8) and run all the wires from both halves of the harness to the Telorvek Panel. Using the blue terminals connect the Red wires (INJ 1->6) and (INJ 5->6) to **#6**. Now connect the remaining eight wires as follows using the red terminals, Tan (INJ 1->12) to **#12**, White (INJ 2->13) to **#13**, Brown (INJ 3->14) to **#14**, Lt Blue (INJ 4->15) to **#15**, Black (INJ 5->16) to **#16**, Lt Green (INJ 6->17) to **#17**, Purple (INJ 7->18) to **#18** and Dk Blue (INJ 8->19) to **#19**.

**Bag #21. IGNITION COIL:** Mount the ignition coil on the left or right front fender well. Plug in the connector and run the wires back to the Telorvek panel. Using blue terminals connect the Red wire (IGN COIL->9) to **#9** and using red terminals connect the Purple wire (IGN COIL->11) to **#11**. The other purple wire in this bag is for the TACH connection if desired. Plug the wire into the short purple wire running from the ignition coil connector and run it to the tach.

**Bag #22. MASS AIR FLOW SENSOR:** Attach the connector to the M.A.F sensor located in the air intake tube between the intake manifold and air cleaner. Using a blue terminal run the Red wire (MAF->7) to #7. Now using the red terminals run the Black (MAF->27) to #27, Tan (MAF->21) to #21 and the Lt Blue (MAF->20) to #20.

**Bag #23. COOLANT TEMPERATURE SENSOR:** After attaching the plug to the sensor located on the top front of the motor next to the distributor run the two wires to the panel. Connect them using the red terminals, Lt Green wire (ECT->22) to #22 and the Gray wire (ECT->68) to #68.

**Bag #24. INTAKE AIR TEMPERATURE SENSOR (IAT):** Plug the connector onto the IAT sensor located in the air intake duct between the air cleaner and throttle body. Run the wires to the Telorvek Panel and using the red terminals connect the Yellow wire (IAT->23) to #23 and the Gray wire (IAT->68) to #68.

**Bag #25. IDLE SPEED CONTROL:** The ISC is located on the rear of the intake manifold. Plug in the connector and run the wires back to the panel. Using the red terminals, connect the White wire (ISC->39) to #39 and the Red wire (ISC->7) to #7.

**Bag #26. THROTTLE POSITION SENSOR (TPS):** Plug the connector into the sensor located in the throttle body and run the wires back to the panel. Using the red terminals run the Brown (TPS->41) to #41, White (TPS->40) to #40 and Gray (TPS->70) to #70.

**Bag #27. EXHAUST GAS RECIRCULATION VALVE POSITION SENSOR (EGRVP):** Plug the connector onto the EGRVP. Using red terminals run the Lt Green wire (EGRVP->42) to #42, Brown wire (EGRVP->41) to #41 and the Gray (EGRVP->70) to #70.

**Bag #28. IGNITION CONTROL MODULE CONNECTION:** The ICM requires some of the wires to be shielded from any electrical interference, that is why four of the wires (Pink, Dk Green, Lt Blue, Solid Strand) in the connector are wrapped. **Carefully** uncoil the harness and plug it into the ICM then run all the wires to the Telorvek panel. Remove the tape and shielding material back only as far as it is necessary for the length of the wire to be cut and allowing enough wire to make the connections on the panel. In the shielded harness there is a solid strand wire with no insulation, install a blue terminal on it and connect it to #25. After the connection is made wrap the exposed wire from the shielded harness to #25 with electrical tape. Using red terminals the other three wires in the shielded harness are connected as follows, Pink (ICM 2->46) to #46, Dk Green (ICM 1->45) to #45 and Lt Blue (ICM 6->44) to #44.

Connect the three remaining wires running from the ICM connector as follows: Purple (ICM 5->11) to #11, White (ICM 3->43) to #43 and Red (ICM 4->9) to #9.

**SHORTING/SPOUT PLUG:** This connector is on a PINK WIRE and is exposed from the shielded harness near the distributor. It must be disconnected in order to set the engine timing. Reconnect it after your timing is set. This procedure may cause a trouble code to set and the check engine light to come on. To clear the trouble code disconnect the battery for 5 minutes.

**Bag #29 DISTRIBUTOR:** The distributor wiring requires the wires to be shielded from any electrical interference, that is why the Orange, Gray, Dk Green, Black, Lt Blue and Solid Strand in the connector are wrapped. **Carefully** uncoil the harness and plug it into the distributor then run all the wires to the Telorvek panel. Remove the tape and shielding material back only as far as it is necessary for the length of the wire to be cut and allowing enough wire to make the connections on the panel. In the shielded harness there is a solid strand wire with no insulation, install a blue terminal on it and connect it to #25. After the connection is made wrap the exposed wire from the shielded harness to #25 with electrical tape. Using red terminals connect the remaining wire as follows, Orange (DIST->48) to #48, Gray (DIST->47) to #47, Dk Green (DIST->45) to #45, Black (DIST->24) to #24, Red (DIST->3) to #3 and Lt Blue (DIST->44) to #44.

**Bag #30. OXYGEN SENSOR (2):** This area of the vehicle is hot so keep the wires away from the exhaust. Two sensors are required per engine. **Install each sensor as close to the block as possible.** Plug in both connectors into the O2 sensors following the wording printed on the wires (Left to the left O2, Right to right O2) and run the wires to the Telorvek panel. Using the blue terminals connect the Orange wires (LEFT O2->10) and (RIGHT O2->10) that runs from both sensors to **#10**. Connect the Black wires from both sensors (LEFT O2->26) and (RIGHT O2->26) to **#26**. Now using the red terminals connect the Red (LEFT O2->49) to **#49**, Yellow (RIGHT O2->50) to **#50** and both Gray wires (LEFT O2->69) & (RIGHT O2->69) to **#69**.

**Bag #31. V.I.P. SELF TEST:** Mount both connectors inside the vehicle under the dash and run the wires to the Telorvek Panel. Using the red terminals connect the Tan (VIP 1->51) to **#51**, Gray (VIP 1->71) to **#71**, Pink (VIP 1->52) to **#52**, Lt Green (VIP 1->54) to **#54**, Lt Blue (VIP 1->53) to **#53** and the White (VIP 2->55) to **#55**. The remaining Lt Green & Red wires are for the dash mounted service engine soon (S.E.S) light. The light must be a two wire un-grounded light. Connect the Lt Green wire (54->SES LT) to **#54** on the Telorvek Panel and run it to a dash indicator light and connect it to one of the wires running from the light. The red wire (65->SES LT) connects to **#65** on the panel and run to the other wire running from the light. This light is not required as the yellow light on top of the Telorvek Panel has the same function.

## AOD-E Automatic Transmission Wiring

**Bag #32. AOD-E TRANSMISSION CONNECTIONS:** The AOD-E transmission is a electronically controlled four speed automatic transmission. Plug the connector into the transmission and run the wires to the Telorvek panel. Using the red terminals, connect the Orange wire (TRANS 1->77) to **#77**, Brown (TRANS 3->75) to **#75**, Gray (TRANS 9->72) to **#72**, Orange (TRANS 5->74) to **#74**, Pink (TRANS 6->78) to **#78** and the White (TRANS 10->76) to **#76**. Using blue terminals, connect the Red (TRANS 2->67) to **#67**, Red (TRANS 7->67) to **#67** and the Red (TRANS 8->66) to **#66**.

The Purple wire (95->BRAKE SW) connects to **#95** using a red terminal and runs to the cold side of the brake light switch. This wire should only have 12 volts with the brake pedal depressed.

### **Bag #33 TRANSMISSION CONTROL SWITCH MODULE (TCSM) & TRANSMISSION**

**CONTROL INDICATOR LIGHT (TCIL):** The ECM has the capability to lock-out fourth gear of the transmission with a push of a button. The TCSM receives a signal from the transmission control switch to operate the transmission control indicator light and to tell the transmission to lock out fourth gear. Mount the TCSM in the vehicle in a dry area. Plug in the connector and run the wires to the Telorvek panel. Using the red terminals connect the Red wire (TCSM->73) to **#73**, Lt Green (TCSM->80) to **#80**, Orange (TCSM->79) to **#79**, Tan (TCSM->81) to **#81** and the Black (TCSM->28) to **#28**.

The TCIL light must be a two wire un-grounded light. Mount the light in the dash where it is visible while driving. Using the red terminals, connect the Lt Green wire (80->TCIL) to **#80** and the Red wire (66->TCIL) to **#66** and run both wires to the TCIL light and make the connections.

**Bag #34 TRANSMISSION CONTROL SWITCH:** Pushing the momentary contact TCS button will light the TCIL and lock-out fourth gear in the transmission for city driving. Pushing the button again will turn the TCIL off and release the lock-out allowing the transmission to shift into fourth gear for highway driving.

Mount a momentary contact switch in dash or near the shifter lever. Using the red terminals, connect the Red wire (73->IGN TCS) to **#73** and the Tan wire (81->TCS) to **#81** and run both wires to the TCS switch. You may connect the wires to either terminal on the switch.

**Bag #35. TRANSMISSION SPEED SENSOR:** The transmission speed sensor is located on the left front of the transmission case. This sensor combined with other sensors inputs determine proper shift points and torque converter lock-up. After plugging in the connector run the wires back to the panel. Connect the Dk Green wire (TRANS SPD SEN->113 to **#113** and the Gray wire (TRANS SPD SEN->72) to **#72**.

**Bag #36. VEHICLE SPEED SENSOR:** Install the connector onto the speed sensor located in the speedometer assembly on the transmission and run the wires back to the Telorvek panel. Using the red terminals connect the Black wire (VEH SPD SEN->27) to **#27** and the Gray wire (VEH SPD SEN->115) to **#115**.

**Bag #37 MANUAL LEVER POSITION SWITCH (MLPS):** The manual lever position switch is located on the left hand side of the transmission. The MLPS controls neutral safety, back-up and lever position functions. We have included wires in the MLPS connector to allow you to get full use out of the switch. Connect the circuits in the switch as follows:

**NEUTRAL / SAFETY:** The heavier gauge Lt Blue (MLPS->IGN SW) and the Purple (MLPS->START SOL) wires are for the neutral safety circuit. Locate the wire that runs from the ignition switch to the starter solenoid. Cut the wire and connect the Lt Blue wire (MLPS->IGN SW) to the wire running from the ignition switch and the Purple wire (MLPS->START SOL) to the wire running from the starter solenoid. **NOTE:** If you are wiring this circuit to a Ron Francis Wire Works wiring kits, these wires will be a color for color match.

**BACK-UP LIGHTS:** Connect the Dk Green wire (BACK UP LT FEED) to a 12 volt ignition source. This wire should have 12 volts only with the key in the run position. Run the other Dk Green wire (MLPS->BACK UP LT) to the rear of the vehicle and connect it to both back-up lights. The lights must be grounded.

**LEVER POSITION CIRCUIT:** Run the Yellow and Gray wires to the Telorvek panel. Using the red terminals, connect the Yellow wire (MLPS->112) to **#112** and the Gray wire (MLPS->71) to **#71**.

## T50-D Manual Transmission Wiring

**NOTE:** If you have decided to run the T50-D manual or another type transmission wiring bags #32, #33, #34, #35 and #37 will not be used. The wiring for the vehicle speed sensor (bag #36) will be used on the T50-D manual transmission.

**Bag #38 NOT USED**

**Bag #39 ELECTRIC RADIATOR COOLING FAN:** The ECM determines when the electric radiator cooling fan operates. The ECM monitors coolant temperature and vehicle speed to determine when operation is required. Mounted in the cover of the Telorvek panel, are the connectors for the cooling fan relays. Due to the way this ECM operates, one fan requires two relays. Our system wires up one fan only. The fan relay connectors are below the fuel pump relay. A typical 5 prong ISO automotive relay (for reference: GM relay part #14100455) must be installed in each connector or the fan will not operate.

Connect the Lt Blue wire (COOLING FAN->109) to terminal **#109** and Black (COOLING FAN->101 to **#101** using blue terminals, and then run the wires out to the cooling fan.

**Bag #40 FUEL PUMP & INERTIA SWITCH:** We have included the wiring necessary for the Ford inertia switch. The inertia switch cuts off the electric fuel pump in the advent of an accident. Mount the inertia switch in the rear of the vehicle in a dry area. Using the blue terminals, plug in the connector to the inertia switch and run the Tan wire (INERTIA SW->100) to **#100** on the Telorvek panel. Run the other Tan wire (INERTIA SW->PUMP) to the electric fuel pump. Hook the wire to the positive terminal on the pump. From the negative terminal on the pump connect a wire and run it to a good ground.

**FUEL PUMP RELAY:** Located in the cover of the Telorvek panel, is the connector for the fuel pump relay. This connector is the first connector below the fuses. A typical 5 prong ISO automotive relay (for reference: GM relay part #14100455) must be installed in the connector or the pump will not operate.

**NOTE:** The inertia switch has a red button on top of it that must be set (pushed down) in order for the fuel pump to operate. If the pump fails to operate check the inertia switch making sure the red button is in the down position.

**Bag #41 EGR SOLENOID:** Plug the connector into the EGR solenoid. Using the red terminals run the Red wire (EGR SOL->5) to **#5** and the Brown wire (EGR SOL->35) to **#35**.

**Bag #42 AIR DIVERT & AIR BYPASS SOLENOIDS:** Controlled by the ECM, these solenoids control the fresh air flow into the exhaust reducing the hydrocarbon and carbon monoxide content of the exhaust.

**BYPASS SOLENOID:** Plug the connector into the bypass solenoid and run the wires to the panel. Using the red terminals connect the red wire (BYPASS SOL->4) to **#4** and the white wire (BYPASS SOL->37) to **#37**.

**AIR DIVERT SOLENOID:** Plug the connector into the air divert solenoid and run the wires to the panel. Using the red terminals connect the red wire (DIVERT SOL->5) to **#5** and the brown wire (DIVERT SOL->36) to **#36**.

**Bag #43. CANISTER PURGE SOLENOID:** Plug the connector into the Canister Purge Solenoid. Using red terminals connect the Red wire (CAN PURGE->4) to **#4** and the Gray wire (CAN PURGE->38) to **#38** using a red terminal.

## FINISHING UP

Connect the large pre-wired **orange** wire to the ignition circuit of your ignition switch. This is an ignition feed that is controlled by the ignition switch. This is not an accessory feed and must remain hot even when the engine is cranking.

Connect the large pre-wired **red** battery feed wire to a battery feed. This is a battery feed that must remain hot even with the key off. Make sure this is a good connection. If you have a Master Disconnect switch, install this wire on the battery side of the switch so it will remain hot with the Disconnect off.

The **black** ground wire from the TELORVEK Panel runs direct to the battery. Run the battery ground directly to the engine not the frame first. This includes rear mounted batteries.

## 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.

### Priming the Fuel System

The fuel system can be primed by grounding the fuel pump lead in the V.I.P Self Test Connector. This lead is a Lt Blue wire (VIP 1->53) located in the large V.I.P Test connector on the short end of the connector. With the key off, run a jumper wire from the connector to ground. Turn the key on and carefully bleed off any air pressure at the schrader valve until fuel runs out. CARE SHOULD BE TAKEN TO AVOID ANY SPILLAGE WHILE FOLLOWING THIS PROCEDURE. After making sure all the air is out of the lines, turn the key off and remove the jumper wire.

### Initial Timing Procedure

- (1) Transmission in Park.
- (2) Connect an inductive timing light.
- (3) Disconnect the shorting connector located in line on the PINK wire running from the distributor to **#46** on the Telorvek panel. The connector is located a few inches from the ICM connector.
- (4) With the engine running check/adjust timing.
- (5) Shut the engine off, reconnect the shorting connector and check for timing advance to verify distributor is advancing beyond the initial setting.

### We're trying...

Ron Francis Wiring has made every effort to assure a quality product and can assure you that this system works well in your application. Most of the 'problem' calls we have had to date are basic trouble shooting questions which have nothing to do with the TELORVEK system we sold you.

We are committed to offering the most user friendly wiring systems available and support this with many years experience in the wiring and fuel injection fields. Please be certain that all connections are correct and tests run before calling. Your unit can be tested at any Ford Motor Company Dealership with no difficulty.

## USING THE CHECK ENGINE LIGHT

The check engine light performs just the same as it would in any newer car, when the key is turned on (engine not running) the light will stay on until the engine starts. When the check engine light comes on during engine operation, it is an indication of a fault in the system. It will be necessary to have the computer perform a self test diagnostic procedure. The self test is divided into three specialized tests:

**KEY ON ENGINE OFF SELF TEST (KOEO) :** For this test the fault must be present at the time of testing. For intermittent , refer to continuous memory codes.

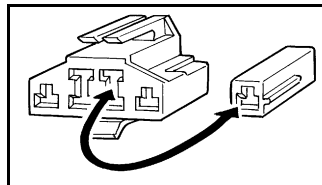
**ENGINE RUNNING ("R") SELF TEST:** The sensors are checked under operating conditions and at normal operating temperatures.

**CONTINUOUS ("C") MEMORY CODES:** These codes are issued as a result of information stored while the vehicle was in normal operation.

**READING THE CHECK ENGINE LIGHT:** A service code is reported by a flash of the check engine light. All service codes are three digit numbers, such as 112. The light will display on flash, then, after a two second pause, the light will flash twelve times. All self test codes (if any) will be displayed and then a delay of six seconds, a single half second separator flash and another six second delay and then the continuous memory codes will be flashed.

If the light remains on after the engine is running then follow the procedures below to have the check engine light flash trouble codes.

Locate the V.I.P self test connectors and connect a jumper wire between the gray wire (VIP 1->71) located in the large VIP connector and the white wire (VIP 2->55) located in the single connector as shown in the drawing below.



### Trouble Code Chart

<u>ECM CODE</u>	<u>CONDITIONS KEY:</u>			Definition
	O= Key On Engine Off	R= Engine Running	C= Continuous Memory	
111	O	R	C	System Pass
112	O		C	Intake Air Temp sensor circuit below minimum voltage
113	O		C	Intake Air Temp sensor circuit above maximum voltage
114	O	R		Intake Air Temp higher or lower than expected
116	O	R		Engine Coolant temp higher or lower than expected
117	O		C	Engine Coolant temp sensor circuit below minimum voltage



<u>ECM CODE</u>	<u>CONDITIONS KEY:</u> O= Key On Engine Off R= Engine Running C= Continuous Memory			<u>Definition</u>
118	O		C	Engine Coolant temp sensor circuit above maximum voltage
121	O	R	C	Closed throttle voltage higher or lower than expected
				Indicates throttle position voltage inconsistent with the MAF sensor
122	O		C	Throttle position sensor circuit below minimum voltage
123	O		C	Throttle position sensor circuit above maximum voltage
124			C	Throttle position sensor voltage higher than expected
125			C	Throttle position sensor voltage lower than expected
126	O	R	C	MAP / BARO sensor higher or lower than expected
128		R		MAP sensor vacuum hose damaged or disconnected
129		R		Insufficient MAP / Mass Air Flow change during dynamic response test
136		R		Lack of oxygen sensor switch during KOER, indicates lean (Bank #2)
137		R		Lack of oxygen sensor switch during KOER, indicates rich (Bank #2)
139			C	No heated oxygen sensor switches detected (Bank #2)
144			C	No heated oxygen sensor switches detected (Bank #1)
157			C	Mass Air Flow sensor circuit below minimum voltage
158	O		C	Mass Air Flow sensor circuit above maximum voltage
159	O	R		Mass Air Flow higher or lower than expected
167		R		Insufficient throttle position change during dynamic response test
171			C	Fuel system at adaptive limit, heated O2 sensor unable to switch Bank 1
172		R	C	Lack of heated O2 switches, indicates lean (Bank #1)
173		R	C	Lack of heated O2 switches, indicates rich (Bank #1)
175			C	Fuel system at adaptive limit, heated O2 sensor unable to switch Bank 2
176			C	Lack of heated O2 switches, indicates lean (Bank #2)
177			C	Lack of heated O2 switches, indicates rich (Bank #2)
179			C	Fuel system at lean adaptive limit at part throttle, system rich (Bank #1)
181			C	Fuel system at lean adaptive limit at part throttle, system lean (Bank #1)

<u>ECM CODE</u>	<u>CONDITIONS KEY:</u> O= Key On Engine Off R= Engine Running C= Continuous Memory			Definition
184			C	Mass Air Flow higher than expected
185			C	Mass Air Flow lower than expected
186			C	Injector pulsewidth higher than expected
187			C	Injector pulsewidth lower than expected
188			C	Fuel system at lean adaptive limit at part throttle, system rich (Bank #2)
189			C	Fuel system at rich adaptive limit at part throttle, system lean (Bank #2)
193			C	Flexible fuel sensor circuit failure
211			C	Profile ignition pick up circuit failure
212			C	Loss off ignition diagnostic monitor input to PCM/Spout circuit rounded
213		R		Spout circuit open
214			C	Cylinder identification circuit failure
215			C	PCM detected coil #1 primary circuit failure
216			C	PCM detected coil #2 primary circuit failure
217			C	PCM detected coil #3 primary circuit failure
218			C	Loss of ignition diagnostic monitor signal left side
219			C	Spark timing defaulted to 10 degrees - Spout circuit open
221			C	Spark timing error
222			C	Loss of ignition diagnostic monitor signal right side
223			C	Loss of dual plug inhibit control
224			C	PCM detected coil 1,2,3 or 4 primary circuit failure
225		R		Knock not sensed during dynamic response test
226	O			Ignition diagnostic module signal not received
232			C	PCM detected coil 1,2,3 or 4 primary circuit failure
238			C	PCM detected coil 4 primary circuit failure
241			C	ICM to PCM pulse width transmission error
244			C	CID circuit fault present when cylinder balance test requested
311		R		Air system inoperative (Bank #1)

<u>ECM CODE</u>	<u>CONDITIONS KEY:</u> O= Key On Engine Off R= Engine Running C= Continuous Memory			Definition
312		R		Air system misdirected
313		R		Air system not bypassed
314		R		Air system inoperative (Bank #2)
326		R		EGR circuit voltage lower than expected
327	O	R	C	EGR circuit below minimum voltage
328	O	R	C	EGR closed valve voltage lower than expected
332		R	C	Insufficient EGR flow detected
334	O	R	C	EGR closed valve voltage higher than expected
335	O			EGR sensor voltage higher or lower than expected
336		R	C	Exhaust pressure high / EGR circuit voltage higher than expected
337	O	R	C	EGR circuit above maximum voltage
338			C	Engine coolant temperature lower than expected (thermostat test)
339			C	Engine coolant temperature higher than expected (thermostat test)
341	O			Octane adjust service pin open
411		R		Cannot control RPM during KOER low RPM check
412		R		Cannot control RPM during KOER high RPM check
415	O	R		Idle air control system at maximum adaptive lower limit
416	O	R		Idle air control system at upper adaptive learning limit
452			C	Insufficient input from vehicle speed sensor
511	O			PCM read only memory test failure
512			C	PCM keep alive memory test failure
513			C	PCM internal voltage failure
519	O			Power steering pressure switch circuit open
521			C	Power steering pressure switch circuit did not change states during KOER
522	O			Vehicle not in park or neutral during KOEO test
524	O		C	Low speed fuel pump circuit open (battery to PCM)
525	O			Vehicle was either in gear or A/C was on during self test

<u>ECM CODE</u>	<u>CONDITIONS</u> KEY: O= Key On Engine Off R= Engine Running C= Continuous Memory			Definition
527	O			Park / neutral position switch circuit open or A/C on during self test
529			C	Data communication link or PCM circuit failure
532			C	Cluster control assembly circuit failure
533			C	Data communication link or electronic instrument cluster circuit failure
536		R	C	Brake on / off circuit failure / not actuated during KOER test
538		R		Insufficient RPM change during KOER dynamic response test
539	O			A/C on during self test
542	O		C	Fuel pump secondary circuit failure
543	O		C	Fuel pump secondary circuit failure
551	O			Idle air control circuit failure
552	O			Secondary air injection bypass circuit failure
553	O			Secondary air injection diverter circuit failure
554	O			Fuel pressure regulator control circuit failure
556	O		C	Fuel pump relay primary circuit failure
557	O		C	Low speed fuel pump primary circuit failure
558	O			EGR vacuum regulator circuit failure
559	O			A/C on relay circuit failure
563	O			High speed fan control circuit failure
564	O			Fan control circuit failure
565	O			Canister Purge circuit failure
566	O			3-4 shift solenoid circuit failure
578	O	R		A/C pressure sensor circuit shorted (VCRM)
579	O	R		Insufficient A/C pressure change (VCRM)
581	O	R		Power to fan circuit over current (VCRM)
582	O	R		Fan circuit open (VCRM)
583	O	R		Power to fuel pump over current (VCRM)
584	O	R		Power ground circuit open (pin #1) (VCRM)

<u>ECM CODE</u>	<u>CONDITIONS KEY:</u> O= Key On Engine Off R= Engine Running C= Continuous Memory			Definition
585	O	R		Power to A/C clutch over current (VCRM)
586	O	R		A/C clutch circuit open (VCRM)
587	O	R	C	Variable control relay module communication failure
617			C	1-2 shift error
618			C	2-3 shift error
619			C	3-4 shift error
621	O			Shift solenoid 1 circuit failure
622	O			Shift solenoid 2 circuit failure
624	O		C	Electronic pressure control circuit failure
625	O			Electronic pressure control driver open in PCM
626	O			Coast clutch solenoid circuit failure
627	O		C	Torque converter clutch solenoid circuit failure
628	O		C	Excessive converter clutch slippage
629	O			Torque converter clutch solenoid circuit failure
631	O			Transmission control indicator lamp circuit failure
632		R		Transmission control switch circuit did not change states during KOER test
634			C	Manual lever position switch voltage higher or lower than expected
636	O	R		Transmission oil temp higher or lower than expected
637	O		C	Transmission oil temp sensor circuit above maximum voltage (-40 F indicated circuit open)
638	O		C	Transmission oil temp sensor circuit below minimum voltage (-290 F indicated circuit shorted)
639		R	C	Insufficient input from transmission speed sensor
641	O			Shift solenoid 3 circuit failure
643	O		C	Torque converter clutch circuit failure
645			C	Incorrect gear ratio obtained for first gear
646			C	Incorrect gear ratio obtained for second gear
647			C	Incorrect gear ratio obtained for third gear

648			C	Incorrect gear ratio obtained for fourth gear
649			C	Electronic pressure control higher or lower than expected
651			C	Electronic pressure control circuit failure
652	O			Torque converter clutch solenoid circuit failure
654	O			Manual lever position sensor not indicating park
656			C	Torque converter clutch continuous slip error
657			C	Transmission over temperature condition occurred
998			C	Hard fault present (FMEM mode)

### Breakout Box Circuit Diagnosis

The Telorvek panel can be used as a BREAKOUT BOX for testing circuits running to and from the EEC Processor. Listed below is the Ford circuit number, circuit description, E.E.C processor pin number, Telorvek panel number the circuit runs to, Ford wire color and the color of wire we used. Following the diagnostic procedures that can be found in the ENGINE / EMISSIONS DIAGNOSIS SHOP MANUAL that can be purchased at your local Ford dealer all trouble codes can be diagnosed.

<b>Circuit</b>	<b>Description</b>	<b>EEC pin#</b>	<b>Panel #</b>	<b>Ford Color</b>	<b>RFW Color</b>
361	Ign, Air By-Pass/Canister Purge Sol		4	Red	Red
361	Ign, EGR Sol/Air Divert Sol		5	Red	Red
361	Ign, Injectors LF & RT		6	Red	Red
361	Ign, ISC, MAF	37,57	7	Red	Red
361	Ign, CCRM		8	Red	Red
361	Ign, Positive Coil,ICM		9	Red	Red
687	Ign, LF,RT O2		10	Gray/Yellow	Orange
11	ICM 5,NEG Coil		11	Tan/Yellow	Purple
555	Inj #1	58	12	Tan	Tan
556	Inj #2	59	13	White	White
557	Inj #3	39	14	Brown/Yellow	Brown
558	Inj #4	35	15	Brown/Lt Blue	Lt Blue
559	Inj #5	15	16	Tan/Black	Black
560	Inj #6	12	17	Lt Green/Orange	Lt Grn
561	Inj #7	13	18	Tan/Red	Purple
562	Inj #8	14	19	Lt Blue	Dk Bl
967	MAF	50	20	Lt Blue/Red	Lt Blue
968	MAF	9	21	Tan/LT Blue	Tan
354	ECT	7	22	Lt Green/Red	Lt Grn
743	IAT	25	23	Gray	Yellow
48	GRND, Dist		24	Black	Black
48	GRND, ICM,Dist Shield		25	Clear	Solid
57	GRND, LF,RT O2	20,40	26	Black	Black
969	GRND, MAF, VSS	6,60	27	Black	Black
57	GRND, TCSM		28	Black	Black
360	EGR	33	35	Brown/Pink	Brown
200	Air Divert Sol	34	36	Brown	Brown
190	Air Bypass	31	37	White/Orange	White
101	Canister Purge	11	38	Gray/Yellow	Gray
264	ISC	21	39	White/Lt Blue	White
355	TPS	47	40	Gray/White	White
351	TPS,EGRVP	26	41	Brown/White	Brown
352	EGRVP	27	42	Brown/Lt Green	Lt Grn
648	ICM 3	4	43	White/Pink	White
875	ICM 6, DIST		44	Black/Lt Blue	Lt Blue
644	ICM 1, DIST		45	Dk Green	Dk Gn
929	ICM 2	36	46	Pink	Pink
395	DIST	56	47	Gray/Orange	Gray
259	DIST	16	48	Orange/Red	Orange
94	Left O2	43	49	Red/Black	Red
74	Right O2	44	50	Lt Blue/Red	Yellow
914	VIP 1	18	51	Tan/Orange	Tan
915	VIP 1	19	52	Pink/Lt Blue	Pink
926	VIP 1, CCRM 18	22	53	Lt Blue/Orange	Lt Bl
658	VIP 1, S.E.S LT	17	54	Pink/Lt Green	Lt Gen
209	VIP 2	48	55	White/Pink	White

<b>Circuit</b>	<b>Description</b>	<b>EEC pin#</b>	<b>Panel #</b>	<b>Ford Color</b>	<b>RFW Color</b>
640	IGN, S.E.S LT		65	Red/Yellow	Red
361,640	IGN, Trans 8, TCIL		66	Red	Red
361	IGN, Trans 2, Trans 7		67	Red	Red
359	IAT, ECT		68	Gray/Red	Gray
359	Left & Right O2	46	69	Gray/Red	Gray
359	TPS, EGRVP		70	Gray/Red	Gray
359	VIP 1, MLPS		71	Gray/Red	Gray
359	TSS, Trans 9		72	Gray/Red	Gray
298	TCSM, TCS		73	Pink/Orange	Red
923	Trans 5	49	74	Orange/Black	Orange
924	Trans 3	53	75	Brown/Orange	Brown
925	Trans 10	38	76	White/Yellow	White
237	Trans 1	51	77	Orange/Yellow	Orange
315	Trans 6	52	78	Pink/Orange	Pink
1012	TCSM	41	79	Tan/White	Orange
911	TCSW, TCIL		80	White/Lt Green	Lt Grn
224	TCSM, TCS		81	Tan/White	Tan
810	Brake Switch	2	95	Lt Green	Purple
38	Battery, CCRM 3,4		96	Black/Orange	Yellow
37	Battery, CCRM 8,10	1	97	Yellow	Yellow
37	Battery, CCRM 11		98	Yellow	Yellow
16	IGN, CCRM 13		99	Red/Lt Green	Orange
238	CCRM 5, Inertia Sw	8	100	Dk Green/Yellow	Tan
570	CCRM 15, Rad Fan GRND		101	Black/White	Black
57	CCRM 16		102	Black	Black
228	CCRM 14	55	103	Dk Blue	Dk Bl
639	CCRM 17	32	104	Lt Green/Purple	Lt Grn
331	CCRM 22	54	105	Pink/Yellow	Pink
638	CCRM 6, CCRM 7		106	Orange/Lt Blue	Dk Bl
638	To High Speed Fan		107	Orange/Lt Blue	Dk Bl
229	CCRM 1, CCRM 2		108	Red/Orange	Lt Blue
229	To Low Speed Fan		109	Red/Orange	Lt Blue
347	CCRM 23		110	Black/Yellow	Brown
198	CCRM 21	10	111	Dk Green/Orange	Dk Gn
199	MPL	30	112	Lt Blue/Yellow	Yellow
970	TSS	5	113	Dk Green/White	Dk Gn
883	AC Pressure Sw	42	114	Pink/Lt Blue	Brown
679	VSS	3	115	Gray/Black	Gray

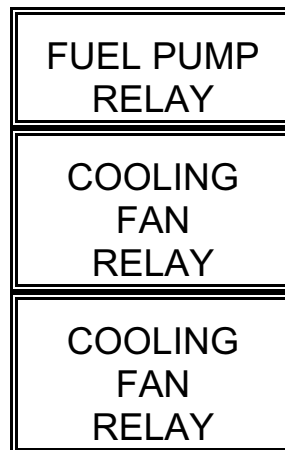


## Fuse Designation & Size

The harness has a total of eight fuses. Shown below is a diagram of what each fuse protects. The illustration is the front view of the Telorvek panel.

Fuse Block #1	
Fuse Designation	Fuse Size Block #1
Air By-Pass, Air Divert Solenoids Canister Purge, EGR Solenoids, Injectors, MAF, ISC, CCRM, Coil, ICM	20 AMP
Left & Right O2 Sensors	20 AMP
S.E.S Lt, Transmission, TCIL	15 AMP
TCSM, TCS	20 AMP

Fuse Block #2	
Fuse Designation	Fuse Size Block #2
Electric Fan	30 AMP
Electric Fan	30 AMP
Engine Control Module (ECM)	20 AMP
Fuel Pump	15 AMP



**RELAY CENTER:** In the cover of the TELORVEK panel are three relays the ECM uses to control fuel pump and the cooling fans. 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 the relays in the harness require typical 5 prong ISO Automotive Relays. For reference: GM part # 14100455.

**WARNING:** The relays must be installed in the connectors for the fuel pump and cooling fans to function properly.

### 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.

