



TELORVEK EFI 4.6 Sequential Fuel Injection System MK-93

WIRING INSTRUCTIONS

Thank you for purchasing the absolute finest of wiring kits for the Ford Motor Co. 4.6 MARK VIII 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. Custom installations are available from Tanks Inc. (320-558-6882) and Rock Valley (800-344-1934).

Should you eliminate any 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**

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 accessible 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.**

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!

Important! We have supplied three sizes of terminals for your use on the panels itself. The Yellow is for 10-12 gauge wire, Blue for 14-16 gauge wire and red for 18 gauge wire. Each individual bag instructions will be marked as to which terminal to use.

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 #60 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 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->4) and (INJ 5->4) to **#4**. Now connect the remaining eight wires as follows using the red terminals, Tan (INJ 1->64) to **#64**, White (INJ 2->65) to **#65**, Brown (INJ 3->66) to **#66**, Lt Blue (INJ 4->67) to **#67**, Black (INJ 5->68) to **#68**, Lt Green (INJ 6->69) to **#69**, Dk Blue (INJ 7->70) to **#70** and Dk Green (INJ 8->71) to **#71**.

Bag #61 IGNITION COIL: The 4.6 engine has two coil packs, one for the left spark plugs and one for the right spark plugs. The coil packs are mounted to each head in front of the engine. The left coil pack connector has Red, Tan and Lt Blue wires and the right coil pack connector has Red, White and Orange wires. After attaching the connectors to the coils run the wires back to the Telorvek panel. Connect the Red wire (LF IGN COIL->10) and (RT IGN COIL->10) using the blue terminals to **#10**. Using the red terminals connect the Tan (LF IGN COIL->12) to **#12**, Lt Blue (LF IGN COIL->13) to **#13**, White (RT IGN COIL->14) to **#14** and the Orange wire (RT IGN COIL->15) to **#15**.

Bag #62 IGNITION CONTROL MODULE CONNECTION: The ICM requires some of the wires to be shielded from any electrical interference, that is why six of the wires (Pink, Gray, Purple, Dk Blue, Dk Green, 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 **#26**. After the connection is made wrap the exposed wire from the shielded harness to **#26** with electrical tape. Using red terminals the other five wires in the shielded harness are connected as follows, Pink (ICM 3->16) to **#16**, Gray (ICM 1->17) to **#17**, Purple (ICM 7->18) to **#18**, Dk Blue (ICM 5->19) to **#19** and the Dk Green (ICM 4->20) to **#20**.

Connect the seven remaining wires running from the ICM connector as follows: Red (ICM 6->7) to **#7**, Yellow (ICM 2->11) to **#11**, Tan (ICM 11->12) to **#12**, Lt Blue (ICM 12->13) to **#13**, White (ICM 8->14) to **#14**, Orange (ICM 9->15) to **#15** and Black (ICM 10->23) to **#23**.

The remaining purple wire is for the tach connection if desired. Connect the purple wire to #11 on the panel and run it to the tach.

WARNING !!!

The distributorless ignition system (DIS) on this engine is a high energy system operating in a dangerous voltage range which could prove to be fatal if exposed terminals or live parts are contacted. Use extreme caution when working on the vehicle with the ignition on or the engine running.

Bag #63 CRANK POSITION SENSOR (CPS) : requires the wires to be shielded from any electrical interference.

NOTE!

The crank shaft position sensor and cylinder ID sensor utilize the same type of sensor connector. Be sure to plug the correct harness into the correct sensor.

Carefully uncoil the harness and plug it into the CPS located on the right front of the engine down by the balancer. Run 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 **#26**. After the connection is made wrap the exposed wire from the shielded harness to **#26** with electrical tape. Connect the remaining two wires as follows: Dk Blue (CPS->19) to **#19** and the Dk Green wire (CPS->20) to **#20**.

Bag #64 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->25) to **#25**, Tan (MAF->22) to **#22** and the Lt Blue (MAF->21) to **#21**

Bag #65 CYLINDER ID (CID): requires the wires to be shielded from any electrical interference.

NOTE!

The crank shaft position sensor and cylinder ID sensor utilize the same type of sensor connector. Be sure to plug the correct harness into the correct sensor.

Carefully uncoil the harness and plug it into the CID located on the left front of the engine. Run 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 **#23**. After the connection is made wrap the exposed wire from the shielded harness to **#23** with electrical tape. Connect the remaining two wires as follows: Dk Blue (CYL ID->40) to **#40** and the Gray (CYL ID->73) to **#73**

Bag #66 COOLANT TEMPERATURE SENSOR: After attaching the plug to the sensor located on the lower front of the engine, underneath the alternator run the two wires to the panel. Connect them using the red terminals, Lt Green wire (ECT->35) to **#35** and the Gray wire (ECT->72) to **#72**.

Bag #67 THROTTLE POSITION SENSOR (TPS): Plug into the sensor located in the rear of the engine on the throttle body and run the wires back to the panel. Using the red terminals run the Brown (TPS->37) to **#37**, White (TPS->36) to **#36** and Gray (TPS->72) to **#72**.

Bag #68 EXHAUST GAS RECIRCULATION VALVE POSITION SENSOR & EGR SOLENOID: Plug in the connector to the EGRVP located on the left rear of the engine. Using red terminals run the Lt Green wire (EGRVP->38) to **#38**, Brown wire (EGRVP->37) to **#37** and the Gray (EGRVP->73) to **#73**.

Plug the connector into the EGR solenoid located on the left rear of the engine. Using a the red terminals run the Red wire (EGR SOL->5) to **#5** and the Brown wire (EGR SOL->39) to **#39**.

Bag #69 INTAKE AIR TEMPERATURE SENSOR (IAT): Plug the connector onto the IAT sensor located on the top rear of the engine near the throttle body. Run the wires to the Telorvek Panel and using the red terminals connect the Yellow wire (IAT->41) to **#41** and the Gray wire (IAT->74) to **#74**.

Bag #70 KNOCK SENSOR (LEFT & RIGHT): The knock sensors are located under the intake manifold. A factory harness (Ford Part #F3LY-12B559-A) is plugged into the sensors and exits to a four gang connector (with only two wires) at the rear of the engine. The connector supplied will plug into that connector. After making the connection run the wires to the Telorvek panel. Using the red terminals, connect the Gray wire to **#75** and the Yellow wire to **#42**.

Bag #71 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.** **NOTE:** If you are using headers the O2 sensors should be mounted in the collectors. It may take longer than normal for the engine to change over to closed loop due to the distance the sensors are from the engine. The O2 sensors must reach a certain temperature before they will produce a signal.

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->9) and (RIGHT O2->9) that runs from both sensors to **#9**. Connect the Black wires from both sensors (LEFT O2->24) and (RIGHT O2->24) to **#24**. Now using the red terminals connect the Dk Blue (LEFT O2->43) to **#43**, Lt Blue (RIGHT O2->44) to **#44** and both Gray wires (LEFT O2->76 & (RIGHT O2->76) to **#76**.

Bag #72 IDLE SPEED CONTROL: The ISC is located on the rear of the engine in the throttle body. Plug in the connector and run the wires back to the panel. Using the red terminals, connect the White wire (ISC->53) to **#53** and the Red wire (ISC->6) to **#6**.

Bag #73 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 Dk Green wire (VEH SPD SEN->46) to **#46** and the Black wire (VEH SPD SEN->25) to **#25**.

Electronic speedometers can be connected to terminal **#46** to pick up the VSS signal. This is a standard Ford 8000 pulse per mile signal.

Bag #74 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 White wire (TRANS SPD SEN->47) to **#47** and the Gray wire (TRANS SPD SEN->77) to **#77**.

Bag #75 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->49) to **#49**, Gray (VIP 1->74) to **#74**, Pink (VIP 1->48) to **#48**, Lt Green (VIP 1->51) to **#51**, Lt Blue (VIP 1->50) to **#50** and the White (VIP 2->52) to **#52**.

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 (51->SES LT) to **#51** 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 (94->SES LT) connects to **#94** 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.

Bag #76 INTAKE MANIFOLD RUNNER CONTROL SOLENOID (IMRC): The IMRC is located on the left rear of the engine. Plug in the connector and run the wires back to the Telorvek panel. Using the red terminals, connect the red wire (IMRC SOL->6) to **#6** and the Lt Green wire (IMRC SOL->55) to **#55**.

Bag #77 OCTANE ADJUST: The ECM measures voltage across the octane adjust connector and uses this information to modify ignition spark advance. Leave this connector plugged together but if you experience detonation while driving, un-plug this connector or use higher octane gasoline. Using the red terminals connect the Gray (OCTA ADJ->77) to **#77** and the Dk Green (OCTA ADJ->54) to **#54**.

Bag #78: Not Used

Bag #79 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->104) to **#104** 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.

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.

FUEL PUMP RELAY

The relay housing mounted in the cover of the Telorvek panel is the FUEL PUMP relay. The relay can be ordered under Airtex part #1R1061, Standard Motor Products part #RY116 or GM part #14100455

4R70W Electronic Controlled Overdrive Transmission Wiring

(Bags #80, #81, #82)

Bag #80 4R70W TRANSMISSION CONNECTIONS: The 4R70W 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 Yellow wire (TRANS 1->82) to **#82**, Pink (TRANS 3->80) to **#80**, Orange (TRANS 5->79) to **#79**, Purple (TRANS 6->83) to **#83**, Gray (TRANS 9->78) to **#78** and the White (TRANS 10->81) to **#81**. Using blue terminals, connect the Red (TRANS 2->95) to **#95**, Red (TRANS 7->95) to **#95** and the Red (TRANS 8->96) to **#96**.

The Purple wire (113->BRAKE SW) connects to **#113** 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 #81 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 Ron Francis Wire Works wiring kit, 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->110) to **#110** and the Gray wire (MLPS->78) to **#78**.

Bag #82 TRANSMISSION CONTROL SWITCH (TCS) & TRANSMISSION CONTROL INDICATOR LIGHT (TCIL): The ECM has the capability to lock-out fourth gear of the transmission with a push of a button. Pushing the momentary contact switch 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 (93->TCS) to **#93** and the Tan wire (112->TCS) to **#112** and run both wires to the TCS switch. You may connect the wires to either terminal on the switch.

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 White wire (111->TCIL) to **#111** and the Red wire (94->TCIL) to **#94** and run both wires to the TCIL light and make the connections.

NOTE: The only transmission "FORD" put behind the 4.6 Mark VIII engine was the 4R70W electronic controlled automatic transmission. If you have decided to run a manual or another type transmission, trouble codes pertaining to the 4R70W transmission will set and store in the ECM. Wiring bags #74, #80, #81 and #82 will not be used.

Bag #83 CANISTER PURGE SOLENOID: Plug the connector into the Canister Purge Solenoid. Using a blue terminal connect the Red wire (CAN PURGE->5) to **#5** and the Gray wire (CAN PURGE->45) to **#45** 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->50) 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 OR INJURY WHILE FOLLOWING THIS PROCEDURE. After making sure all the air is out of the lines, turn the key off and remove the jumper wire.

We're trying...

Ron Francis Wiring has made every effort to ensure 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 (KOE0) : For this test the fault must be present at the time of testing. For intermittents , refer to continuous memory codes.

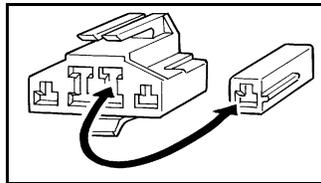
ENGINE RUNNING ("R") SELF TEST: The sensors are checked under operating conditions and at normal operating temperatures.

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 one 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->74) located in the large VIP connector and the white wire (VIP 2->52) located in the single connector as shown in the drawing below.



Trouble Code Chart

<u>ECM CODE</u>	<u>CONDITIONS</u>			Definition
	KEY: 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

ECM CODE	CONDITIONS			Definition
	KEY: O= Key On Engine Off R= Engine Running C= Continuous Memory			
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 heated oxygen sensor switch during KOER, indicates lean (Bank #2)
137		R		Lack of heated 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 limits, 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 limits, 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)
184			C	Mass Air Flow higher than expected

ECM CODE	CONDITIONS			Definition
	KEY: O= Key On Engine Off R= Engine Running C= Continuous Memory			
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 of ignition diagnostic monitor input to PCM/Spout circuit grounded
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)
312		R		Air system misdirected
313		R		Air system not bypassed
314		R		Air system inoperative (Bank #2)
326		R	C	EGR circuit voltage lower than expected

ECM CODE	CONDITIONS			Definition
	KEY: O= Key On Engine Off R= Engine Running C= Continuous Memory			
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
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

ECM CODE	CONDITIONS			Definition
	KEY: O= Key On Engine Off R= Engine Running C= Continuous Memory			
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)
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

<u>ECM CODE</u>	<u>CONDITIONS</u>			Definition
	KEY: O= Key On Engine Off R= Engine Running C= Continuous Memory			
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.

Circuit	Description	EEC pin#	Panel #	Ford Color	Kit Color
361	Ign, Lf/Rt Injectors		4	Red	Red
361	Ign, Can Purge, EGR Sol		5	Red	Red
361	Ign, IAC, IMRC		6	Red	Red
361	Ign, ICM, MAF		7	Red	Red
361	Ign, VCRM	37,57	8	Red	Red
687	Ign, LF,RT O2		9	Gray/Yellow	Orange
16	Ign, LF, RT coil		10	Red/Lt Green	Red
11	ICM 2	4	11	Tan/Yellow	Yellow
97	LF ign coil,ICM 11		12	Tan/Lt Green	Tan
98	LF ign coil,ICM 12		13	Tan/Lt Blue	Lt Blue
95	RT ign coil, ICM 8		14	Tan/White	White
96	RT ign coil, ICM 9		15	Tan/Orange	Orange
929	ICM 3	36	16	Pink	Pink
395	ICM 1	56	17	Gray/Orange	Gray
259	ICM 7	16	18	Orange/Red	Purple
349	ICM 5,CKP Sensor		19	Dk Blue	Dk Blue
350	ICM 4,CKP Sensor		20	Gray	Dk Green
967	MAF	50	21	Lt Blue/Red	Lt Blue
968	MAF	9	22	Tan/LT Blue	Tan
570	ICM 10		23	Black/White	Black
570	LF,RT O2	40,60	24	Black/White	Black
570	MAF,VSS	6,20	25	Black/White	Black
48	ICM,CPS Shield		26	Black	Clear
354	ECT Sensor	7	35	Lt Green/Red	Lt Green
355	TPS	47	36	Gray/White	White
351	TPS,EGRVP	26	37	Brown/White	Brown
352	EGRVP	27	38	Brown/Lt Green	Lt Green
360	EGR	33	39	Brown/Pink	Brown
282	CID	24	40	Dk Blue/Orange	Dk Blue
743	IAT	25	41	Gray/Yellow	Yellow
310	LF,RT Knock Sensor	23	42	Yellow/Red	Yellow
94	LF O2	43	43	Red/Black	Dk Blue
74	RT O2	44	44	Gray/LT Blue	Lt Blue
101	Canister Purge	11	45	Gray/Yellow	Gray
150	VSS	3	46	Gray/Black	Dk Green
970	Trans Speed Sensor	5	47	Dk Green/White	White
915	VIP 1,VCRM 23	19	48	Pink/Lt Blue	Pink
914	VIP 1,VCRM 21	18	49	Tan/Orange	Tan
926	VIP 1,VCRM 18	22	50	Lt Blue/Red	Lt Blue
658	VIP 1,S.E.S LT	17	51	Pink/Lt Green	Lt Green
209	VIP 2	48	52	White/Pink	White
264	IAC	21	53	White/Lt Blue	White
243	Octane Adjust	29	54	Dk Green	Dk Green
99	IMRC	32	55	Lt Green/Black	Lt Green
555	Injector 1	58	64	Tan	Tan
556	Injector 2	59	65	White	White
557	Injector 3	39	66	Brown/Yellow	Brown
558	Injector 4	35	67	Brown/Lt Blue	Lt Blue
559	Injector 5	15	68	Tan/Black	Black
560	Injector 6	12	69	Lt Green/Orange	Lt Green
561	Injector 7	13	70	Tan/Red	Dk Blue
562	Injector 8	14	71	Lt Blue	Dk Green

Circuit	Description	EEC pin#	Panel #	Ford Color	Kit Color
359	ECT,TPS	46	72	Gray/Red	Gray
359	EGRVP,CID	46	73	Gray/Red	Gray
359	IAT,VIP 1	46	74	Gray/Red	Gray
359	LF,RT Knock Sensor	46	75	Gray/Red	Gray
359	LF,RT O2 Sensor	46	76	Gray/Red	Gray
359	Octane Adj, Trans Sp	46	77	Gray/Red	Gray
359	MLPS,Trans 9	46	78	Gray/Red	Gray
923	Trans 5	49	79	Orange/Black	Orange
480	Trans 3	53	80	Pink/Yellow	Pink
925	Trans 10	38	81	White/Yellow	White
237	Trans 1	51	82	Orange/Yellow	Yellow
315	Trans 6	52	83	Pink/Orange	Purple
640	IGN, Trans Control Sw		93	Red/Yellow	Red
16	IGN, S.E.S LT,TCIL LT		94	Red/Yellow	Red
361	IGN, Trans 2,7		95	Red	Red
361	IGN		96	Red	Red
37	Battery,VCRM 4,5,	1	97	Yellow	Yellow
37	Battery,VCRM 6,Hi Sp F/P		98	Yellow	Yellow
16	VCRM 17		99	Red	Red
386	VCRM 2,3		100	Lt Blue	Lt Blue
386	To cooling fan		101	Lt Blue	Lt Blue
789	Hi Sp F/P, VCRM 10		102	Brown/White	Brown
787	VCRM 24,Hi Sp F/P		103	Pink/Black	Tan
787	To inertia sw/FP		104	Pink/Black	Tan
570,651	VCRM 16,22		105	Black/White,Black/Yellow	Black
570,57	VCRM 1,8		106	Black/White,Black	Black
57	VCRM 15		107	Black	Black
331	VCRM 11	54	108	Pink/Yellow	Pink
347	VCRM 9	10	109	Black/Yellow	Yellow
199	MLPS	30	110	Lt Blue/Yellow	Yellow
911	TCIL	55	111	White/Lt Green	White
224	TCS	41	112	Tan/White	Tan
511	Brake Sw Input	2	113	Lt Green	Purple

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.

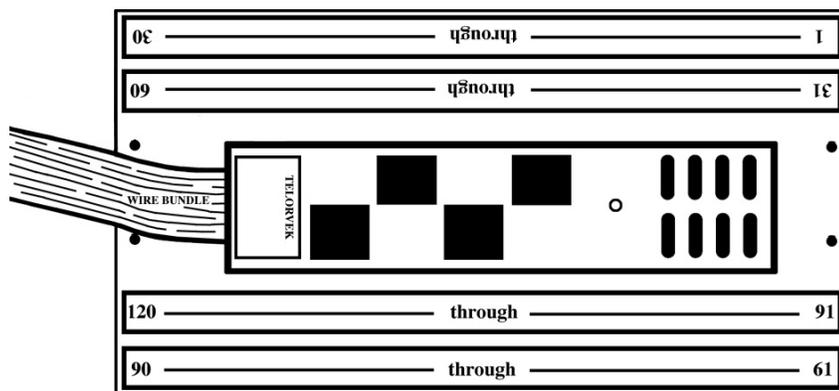
Fuse Block #1	
Fuse Designation	Fuse Size Block #1
Left & Right Injectors	15 AMP
Engine Control Module (ECM) Canister Purge & EGR Solenoids IAC, IMRC, ICM, MAF, VCRM	15 AMP
Left & Right O2 Sensors	20 AMP
Left & Right Ignition Coils	20 AMP

Fuse Block #2	
Fuse Designation	Fuse Size Block #2
Transmission Control Switch S.E.S & TCIL Transmission & Transmission Control Switch	15 AMP
VCRM	10 AMP
Engine Control Module (ECM)	30 AMP
VCRM (Fuel Pump & High Speed Relay)	30 AMP

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.



Copyright Infringement



Ron Francis Wiring has taken the extra effort to produce a quality, easy to understand instructions. We will aggressively prosecute any other harness supplier who attempts to copy this material!!