

TELORVEK IV

Ford Turbo 2.3 Fuel Injection System (**MG-60**)

WIRING INSTRUCTIONS

Thank you for purchasing the absolute finest of wiring kits for the Ford Motor Co. 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 an high pressure in tank fuel pump. Custom installations are available from Tanks Inc. (phone 320-558-6882) and Rock Valley (phone 800-344-1934). There are some valuable HOW-TO's on our website (www.thedetailzone.com) under PROJECTS that can help you with your install.

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

Though this kit will work on 1983 through 1988 2.3 Turbo and Non Turbo 4 cylinder applications, we recommend that you use an ECM from a 1987-88 Thunderbird Turbo Coupe. There are several reasons for this but the biggest being that the 87-88 Turbo Coupe ECM can handle an electric fan and has a separate air charge temperature sensor. If you swap to this newer computer you will have to acquire the correct Vane Air Meter and Air Charge Temperature Sensor.

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.

The Detail Zone 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” FORD dealer or reputable repair facility familiar with diagnosing fuel injection electronic systems.

The Detail Zone 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 sensor sends a signal to the engine computer allowing spark to be provided to the plugs, similar to a carbureted engine.

Thank you for purchasing our products!

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.

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 TELORVEK panel and computer in an accessible location anywhere you desire out of the weather. **For safety, disconnect the ECM connector until finished the installation. Under the dash, under the seat or in the trunk are good. There are a lot of wires so allow room to work. 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 two sizes of terminals for your use on the panels itself. The Blue, used for the larger sizes of wires and red for the bulk of the smaller wires. Each individual bag instructions will be marked as to when to use the blue terminals. All others will use the red terminals. Time to start the installation.

Bag #60A. INJECTORS: Locate the 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) and run all the wires from the harness to the Telorvek Panel. Using a blue terminal connect the Red wire (INJ 1->14) to **#14**. Now connect the two remaining wires as follows using the red terminals, Tan (INJ 1->19) to **#19** and Yellow (INJ 3->20) to **#20**.

Bag #61 ENGINE GROUNDS: The Black wire marked (FRT ENG GRD->25) is connected to a bolt in the front of the intake manifold and using the blue terminal run it to number **#25** on the panel. The Black wire marked (REAR ENG GRD->25) is run from a rear manifold bolt and using a blue terminal connect it to number **#25** on the panel.

Bag #62A. EXHAUST GAS RECIRCULATION SOLENOID: Plug the connector into the EGR solenoid and using a blue terminal run the Red wire (EGR->32 to **#32** and use a red terminal on the Dk Green (EGR->33) to **#33**.

Bag #63. THROTTLE POSITION SENSOR: Plug into the sensor located on the throttle body and using red terminals run the Black (TPS-> 45) to **#45**, Orange (TPS-> 41) to **#41** and Dk Green (TPS-> 42) to **#42**.

Bag #64. IDLE SPEED CONTROL: The ISC is located on the throttle body and after plugging in the connector, run the White (ISC-> 28) to **#28** and the Red (ISC-> 27) to **#27** using red terminals to connect them to the panel.

Bag #65. COOLANT TEMPERATURE SENSOR: After attaching the plug to the sensor located in the front of the engine, run the two wires to the panel and connect them using the red terminals, yellow wire (CTS-> 38) to **#38** and the Black wire (CTS-> 44) to **#44**.

Bag #66A. MASS AIR FLOW SENSOR: Attach the connector to the M.A.F sensor. Where you connect some wires depends on whether you have an AIR CHARGE TEMP SENSOR (ACT) or not. Using the red terminals run the Orange (MAF ->40) to **#40**, the Black (MAF->46) to **#46**.

The next two wires are not printed as where they attach to the panel depends on whether your application has an Air Charge Temperature Sensor. Please follow the directions carefully.

If you have an AIR CHARGE TEMP SENSOR: Using the red terminals run the White to **#35**, the Lt Green to **#34**.

If you DO NOT have an AIR CHARGE TEMP SENSOR: Using the red terminals run the White to **#34**, the Lt Green to **#37**.

Bag #67. BAROMETRIC/MANIFOLD PRESSURE SENSOR (BAP/MAP): Locate the sensor, which is typically mounted on the firewall of the engine compartment. Attach the connector and using the red terminals run the Orange wire (MAP/BAP-> 40) to **#40**, Lt Green (MAP/BAP-> 43) to **#43** and the Black (MAP/BAP-> 46) to **#46**.

Bag #68A. OXYGEN SENSOR (1): This area of the vehicle is hot so keep the wire away from the exhaust. One sensor is required on this engine. **Install the sensor as close to the block as possible.** Ford used several connectors for this sensor so we have supplied you with one that can be attached to your oxygen sensor wire pigtail. Once you have attached the terminal and housing to your oxygen sensor, run the wire to the Telorvek panel. Using a blue terminal connect the Dk Green wire marked (O2-> 10) to **#10**

Bag #69. TFI IGNITION MODULE CONNECTION (Distributor): The TFI module requires some of the wires to be shielded from any electrical interference, that is why four of the wires (Dk Blue, Black, Yellow, 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 **#24**. After the connection is made wrap the exposed wire from the shielded harness to **#24** with electrical tape. Using red terminals the other three wires in the shielded harness are connected as follows, Dk Blue (TFI->5) to **#5**, Black (TFI->7) to **#7** and the Yellow (TFI->6) to **#6**.

The remaining three wires in the TFI connector not wrapped in the shielded harness are connected as follows, (using blue terminals) Red (TFI->2) to **#2**, (using red terminals) Purple (TFI->3) connects to **#3**, and the Dk Green (TFI->8) to **#8**.

The Purple wire (STARTER SOL-> 3) coiled separate runs from the **(S)** post of the starter solenoid and using blue terminals connected to **#3** on the Telorvek Panel.

SHORTING PLUG: This connector 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.

NOTE: If the TFI module is not mounted on the side of your distributor and your distributor has a round connector running out of it, you have two options: 1) Either change your distributor to the type with the TFI module mounted to it or 2) Call us for a wiring update. 610-485-1981.

Bag #70. IGNITION COIL: After attaching the connector to the coil run the wires back to the Telorvek panel. Connect the Red wire (IGN COIL-> 2) using a blue terminal to **#2** and the Dk Green wire (IGN COIL->8) using a red terminal to **#8**. The other Dk Green wire in this bag is for the TACH connection if desired. Plug the wire into the short Dk Green wire running from the ignition coil connector and run it to the tach.

Bag #71. 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 Orange wire (SPEED SENSOR->48) to **#48** and the Dk Green wire (SPEED SENSOR->47) to **#47**.

Bag #72.V.I.P. SELF TEST: Mount both connectors inside the vehicle under the dash and run the wires to the Telorvek Panel. There are three Tan wires, read the printing on the wires themselves and connect them to the proper terminal on the Telorvek Panel. Using the red terminals connect the Tan (VIP 1->11) to **#11**, Tan (VIP 1->13) to **#13**, Tan (VIP 2->12) to **#12**, Black (VIP 1->45) to **#45**.

Connect the Tan wire (13->SERVICE ENG) to **#13** 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 other wire running from the light is connected to a ignition source. This light is not required as the yellow light on top of the Telorvek Panel has the same function.

Bag #73.FUEL PUMP RELAY & INERTIA SWITCH: Mount the fuel pump relay connector close to the Telorvek panel. Using the blue terminals run the Tan (F/P RELAY->11) to **#11**, Pink (F/P RELAY->36) to **#36** and the Orange (F/P RELAY->29) to **#29**. The Red Wire (F-P RELAY IGN) has a black connector to install onto **one of two** wires depending on whether you use an inertia switch or not - SEE BELOW.

The short Red wire with the black connector (FP RELAY->31) is a bypass wire used only if an inertia switch "IS NOT BEING USED". This wire plugs into the red wire running from the fuel pump relay (F-P RELAY IGN) and connects to #31. If the inertia switch IS USED, this wire is discarded. Follow the inertia switch wiring paragraph below to complete the fuel pump wiring. The fuel pump must be grounded.

INERTIA SWITCH: The inertia switch is designed to disconnect the ignition voltage from the fuel pump relay in the event of a accident. This kills the engine and the pumping of fuel to prevent fire. After mounting the inertia switch, plug the connector with the two red wires into the switch and run the wires to the Telorvek panel. Connect the Red wire (INERTIA->31) to **#31**. Plug the other red wire (INERTIA->FP REL) into the mating connector running from the fuel pump relay, red wire marked (F-P RELAY IGN). The fuel pump must be grounded

NOTE: The fuel pump WILL NOT operate without the inertia switch connected or the short bypass wire connected to #31.

Bag #74. AIR CHARGE TEMPERATURE SENSOR: IF YOUR ENGINE IS NOT EQUIPPED WITH AIR CHARGE TEMP SENSOR DO NOT INSTALL THIS BAG AND PAY CLOSE ATTENTION TO HOW THE MASS AIR FLOW SENSOR IS WIRED. Install the connector onto the air charge temperature sensor. Run the wires to the Telorvek Panel and using the red terminals connect the Lt Green Wire (AIR TEMP->37) to **#37** and the Black wire (AIR TEMP->44) to **#44**.

Bag #77. KNOCK SENSOR: Locate the sensor mounted in the engine block. Install the connector and run the wires to the Telorvek Panel. Using the red terminals connect the Yellow Wire (KNOCK->15) to **#15** and the Black wire (KNOCK->46) to **#46**.

Bag #78. ELECTRIC FAN: Allowing the engine computer to control the fan works far better than any other control such as wired direct or with a toggle switch. Let the computer control the engine temperature as it should for best performance.

Both relay sockets in the TELORVEK panel are pre-wired and both are for the electric fan function. Using the blue terminals connect the Blue PRIME FAN->49 to **#49** and run the wire to the fan. The fan must be grounded as well.

WARNING!!

Don't forget to install the relays in the connectors located in the cover of the TELORVEK panel. The fan WILL NOT operate unless the relays are installed. Use GM part #14100455 or equivalent in both connectors.

Bag #79. BOOST PRESSURE SWITCH: MAY NOT BE USED IN YOUR APPLICATION. This sensor was originally located on the right hand shock tower. Install the connector and run the wires to the Telorvek Panel. Using the red terminals connect the Pink Wire (BOOST PRES->27) to **#27** and the Black wire (BOOST PRES->24) to **#24**.

Bag #80. BOOST CONTROL SOLENOID: This sensor was originally located on the right hand apron. Install the connector and run the wires to the Telorvek Panel. Using the red terminals connect the Pink Wire (BOOST CNTRL->21) to **#21** and the Red wire (BOOST CNTRL->26) to **#26**.

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.

NOTE: The short orange and pink wires with the gray connector running out of the computer connector is for the wide open throttle air conditioning compressor clutch disengagement connection. This is not used in an aftermarket application.

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 Tan wire (VIP 1->11) 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.

Initial Timing Procedure

- (1) Transmission in Park.
- (2) Connect an inductive timing light.
- (3) Disconnect the shorting connector located in line on the Yellow wire running from the distributor to #6 on the Telorvek panel. The connector is located eight inches from the distributor 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...

The Detail Zone 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. Once you have confirmed our simple electrical tests are OK, set the timing and any trouble you experience will be a defective part or seat of the pants repair.

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 till 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: For this test the fault must be present at the time of testing. For intermittent , refer to continuous memory codes.

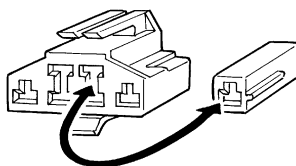
ENGINE RUNNING SELF TEST: The sensors are checked under operating conditions and at normal operating temperatures.

CONTINUOUS 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 two digit numbers, such as 2-3. The light will display two flashes, then, after a two second pause, the light will flash three 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 black wire (VIP 1->45) located in the large VIP connector and the tan wire (VIP 2->12) located in the single connector as shown in the drawing below.



Trouble Codes

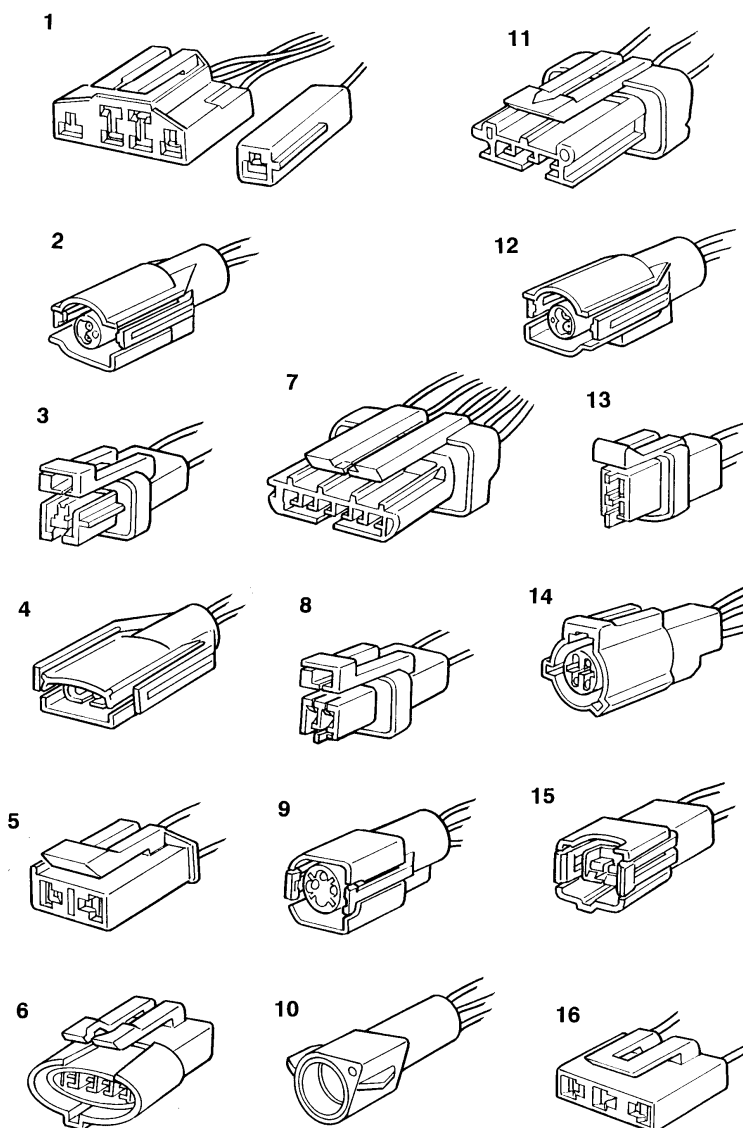
11	System PASS	53	TP circuit above maximum voltage
12	High RPM	54	ACT indicated -40°F/circuit open
13	Low RPM	56	MAF circuit above max voltage
14	PIP circuit failure	61	ECT indicated 254°F/circuit grounded
15	ECG memory failure	63	TP circuit below minimum voltage
16	RPM low for EGO test	64	ACT indicated 254°F/circuit grounded
18	SPOUT /IDM circuit failure	66	MAF circuit below minimum voltage
19	ECG internal voltage failure	67	Neutral drive switch circuit open
21	ECT out of test range	74	Brake on/off circuit open during self test
22	MAP /BP out of test range	75	Brake on/off circuit closed/ ECG input open
23	TP out of test range		
24	ACT of test range	77	Brief WOT not sensed during self test
26	MAF out of test range	79	A/C on defrost on during self test
29	Vehicle speed sensor problem	81	Air management 2 circuit failure
31	EVP voltage below minimum	82	Air management 1 circuit failure
32	EVP voltage below closed limit	84	EGR Vacuum Regulator circuit failure
33	EGR valve opening not detected	85	Canister purge circuit failure
34	EVP voltage above closed limit	87	Fuel pump primary circuit failure
35	EVP voltage above maximum	91	HEGO (L) sensor lean or defective
41	HEGO (R) sensor lean or defective	92	HEGO (L) sensor rich
42	HEGO (R) sensor rich	94	Thermacter air system inoperative (L)
44	Thermacter air system defective (R)	95	Fuel pump secondary circuit failure
45	Thermacter air upstream during self test	96	Fuel pump secondary circuit failure
46	Thermacter air not bypassed during self test	98	Hard fault present FMEM mode
51	ECT indicated -40°F/open circuit		

No codes = unable to indicate self test

Code not listed = Not applicable to this engine

Ford EFI Connections

- | | |
|--|---|
| 1) V.I.P Self Test | 9) EGR Valve Position Sensor
-not used in this application |
| 2) Air Charge Temperature | 10) Throttle Position Sensor |
| 3) Air Divert Solenoid
-not used in this application | 11) Barometric Pressure Sensor |
| 4) Speed Sensor | 12) Coolant Temperature Sensor |
| 5) EGR Solenoid | 13) Idle Speed Control |
| 6) Mass Air Flow
-different in this application | 14) Oxygen Sensor
-different in this application |
| 7) TFI Ignition Module | 15) Injectors |
| 8) Air By-Pass Solenoid
-not used in this application | 16) Ignition Coil |



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 Row #2	
Fuse Designation	Fuse Size	Fuse Designation	Fuse Size
Ignition O2 Sensor	10 AMP	Electric Fan	30 AMP
Ignition Coil, TFI Ign Module	20 AMP	Electric Fan	30 AMP
Ignition Injectors	15 AMP	Ignition MAF, ECM	10 AMP
Ignition IAC, Boost Switch	10 AMP	Battery Fuel Pump Relay, ECM	15 AMP

COOLING FAN RELAY
COOLING FAN RELAY

RELAY CENTER: In the cover of the TELORVEK panel are two relays the ECM uses to control the cooling fan. 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 two relays. All the relays in the harness require GM part # 14100455 or equivalent.

WARNING: The relays must be installed in the connectors for the cooling fan to function properly.

Copyright Infringement



**The Detail Zone
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!!**