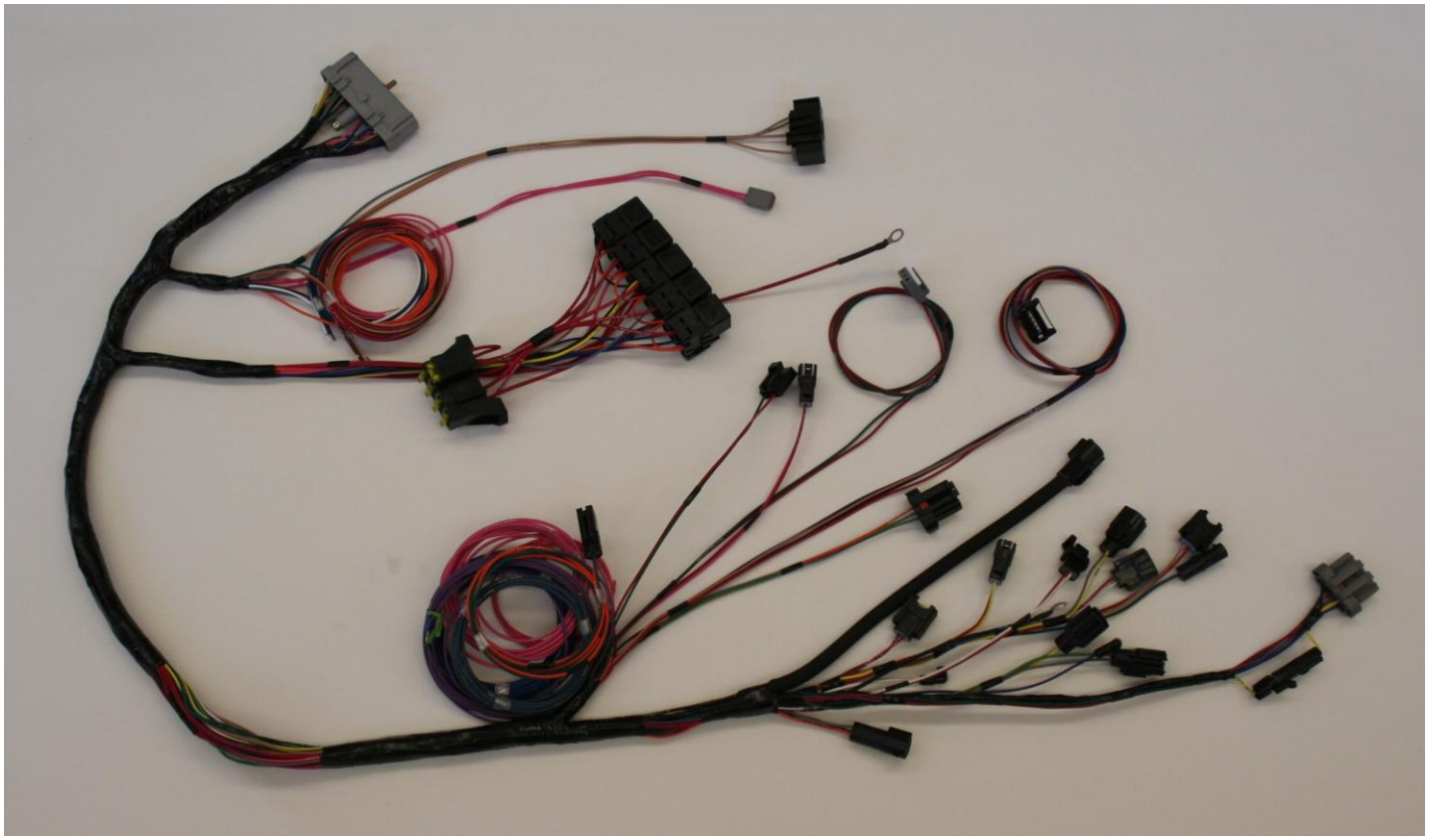
RON FRANCIS Wiring

Ford 2.3 Turbo Harness
Installation Manual



Part Number: MG-65

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Pre-Installation Notes:

- This system is designed to install a Ford 2.3 Turbo engine into a Ford Ranger or other similar Ford bodied vehicle.

- This harness is designed to use a 1987-88 Turbo Coupe ECM (calibration code LA2 or LA3) **UNLESS YOU HAVE SPECIFIED THE USE OF AN EARLIER MOTOR**. We have supplied circuitry for an electric fan but a 1987-88 Turbo Coupe (calibration code: LA2, LA3 or similar) must be used to take advantage of those features.

  *****Note***** If you have specified the use of an earlier motor (pre 1987-1988) you will note that there may not be an Air Intake Temperature Sensor on your intake (located at the rear of the upper intake near the knock sensor). For these early motors we have included the Air Intake Temperature Sensor connection but it is not used.

  Additionally, the Vane Air Flow Meter has been properly wired for your application but your ECM will not be able to control electric fans as they were not programmed for that feature. There is a three way connector near the ECM connector. This connector determines how the Vane Air Flow Meter is configured. Please do not disconnect this circuit.

- Make sure that all the components you have are compatible before installing them.

- This harness includes provisions for emissions (EGR) but are not necessary unless your local emissions law require you to use them.

- This harness is designed so that once installed on the engine, the harness can run to the passenger or driver's side, depending on the application.

- Ford EFI systems were not intended for use with long tube headers. Oxygen sensors are less accurate (due to dissipated exhaust heat) when mounted further down stream from the cylinder head. However this harness will work with all exhaust systems. Please use a 1987-1988 Turbo Coupe Oxygen Sensor.

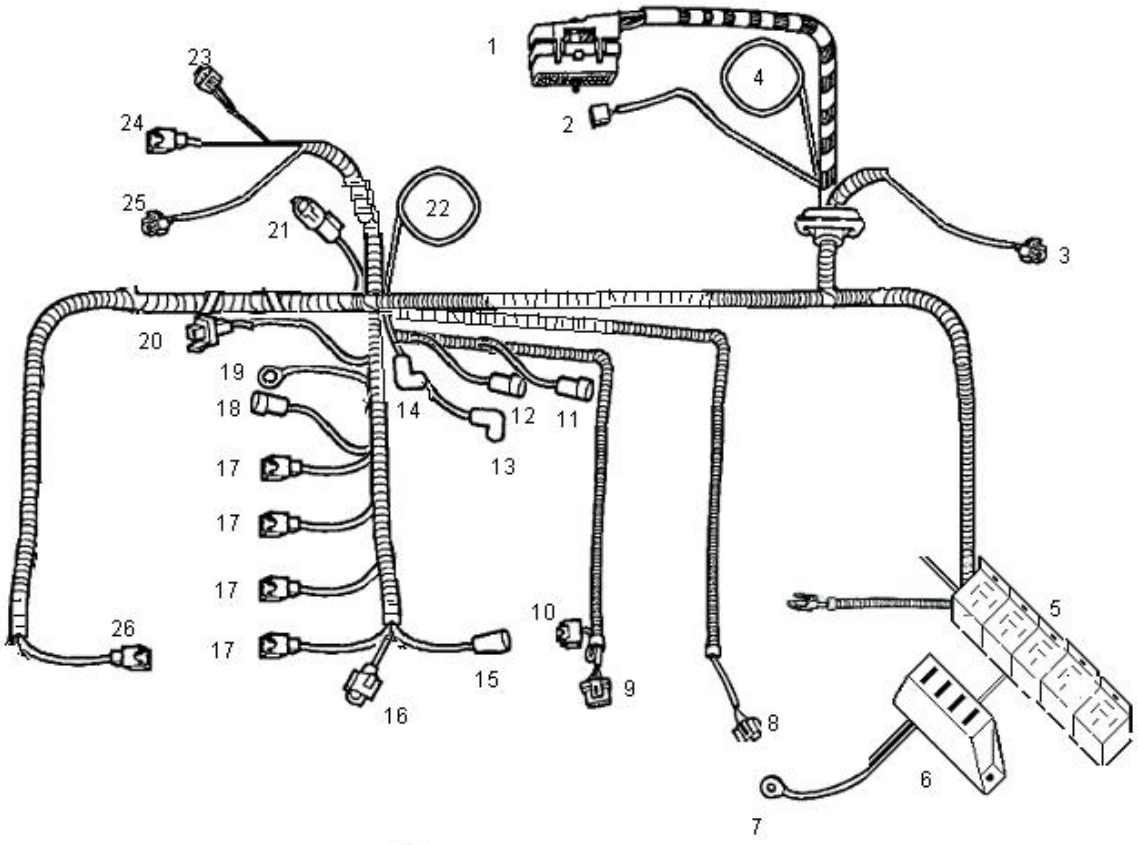
- Always disconnect the battery when working on vehicle's fuel or electrical systems. Any electrical spikes can damage parts of the fuel injection system.

- Use extreme caution if and when welding on any vehicle with a fuel injection system.

- We have supplied an install kit that includes four sizes of zip loom, two sizes of tie wraps, two rolls of wrap tape and a fire wall grommet. Once you have finalized the wire paths for the harness, use the install kit to finish off the harness. Proper planning and patience will create a good looking job when complete.

Pre-Installation Instructions:

Install the lower intake, fuel injectors, and fuel rail on the engine if not already installed. Remove the upper intake if it is installed and install stock fuel pressure regulator. Plumb fuel lines with appropriately rated line. Use caution when working on fuel system, 40-100PSI can be held within system. To release fuel pressure, remove fuse or relay to fuel pumps, then start engine and allow it to stall. Crank starter for several seconds to insure all pressure has been released.
Before installation spread out the harness in a well lighted open area to identify all the connectors and become familiar with what will need to be done.



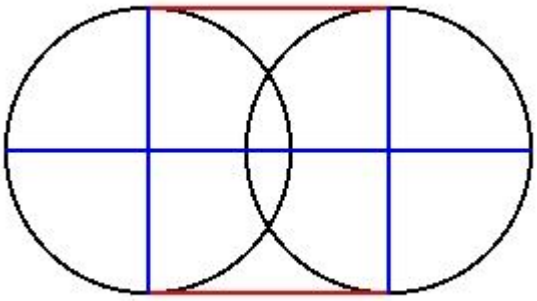
1) Computer Connector
2) Inertia Fuel Cutoff Switch
3) VIP Self Test Connectors
4) Tachometer & Engine Light, Ignition Feed
   Oil Press, Water Temp Gauge Feeds
   A/C Comp Signal & Overboost buzzer
5) Relay Center
6) Fuse Center
7) Main Battery Feed
8) Ignition Coil Connection
9) TFI Distributor Connector
10) Spout Connector
11) Air Charge Temp Sensor
12) Knock Sensor
13) Water Temp Sender Lead
14) Oil Pressure Sender Lead
15) Alternator Connection
16) Engine Coolant Temp Sensor
17) Injectors (4)
18) Throttle Position Sensor
19) Ground Connection
20) Idle Speed Control
21) Oxygen Sensor Connector
22) Fuel Pump Lead, Vehicle Speed Sensor
    Lead, A/C Comp Signal, Fan Lead,
    Overboost Lead
23) Barometric Air Pressure Connector
24) Boost Control Solenoid Connector
25) EGR Connector
26) Vane Air Meter

Installation Instructions:

Refer to the diagram for item locations. All wires are marked indicating their use.

1 Once mounted on the engine, this harness is designed to run either way on the firewall (left or right). NOTE: If you are installing on a 1993-94 Ford Ranger, this harness will enable you to connect to the ECM down on the driver's side firewall.

2 If applicable, locate where on the firewall you wish to route the computer plug and other dash connections. Using the grommet supplied, cut the appropriate hole in the firewall. Use the following template for the grommet:



3 Pass the engine section of the harness through the firewall. Route as much of the harness as possible before mounting the computer or covering the harness. This ensures a quality installation.

4 Begin positioning the harness by connecting the four injector connectors (item 17) into the injectors. Injectors 1 & 2 have **Red** and **Tan** wires, Injectors 3 & 4 have **Red** and **Yellow** wires. The wires are marked for identification.

5 An alternator "exciter" wire (item 15, **Green** wire) is provided for your convenience. This is not a circuit capable of charging your vehicle. This wire simply turns the alternator on when your key is on. On most Ford late model (2G & 3G) alternators, this wire would be attached to the wire that is Green with a Red Stripe.

6 Connect the Engine Coolant Temp sensor (item 16, **Yellow** and **Grey** wires marked CTS) in the center of the intake. Then connect the Air Charge Temp sensor (item 11, **Lt Green** and **Grey** wires marked ACT) and the Knock sensor (item 12, **Yellow** and **Grey** wires marked Knock) at the rear of the intake. If your application does not have an Air Charge Temp sensor, please reconsider using this sensor along with a LA2/LA3 ECM from a 1987-99 Turbo Coupe.

7 Carefully extend the TFI connector (item 9) under the intake and connect at the distributor. This connector has **Green**, **Red**, **Black**, **Yellow**, **Dk Blue** and **Purple** wires, many are marked TFI.

8 Connect the Oil PSI Gauge sender (item 14, **White** wire with 90 degree boot) at the rear of the engine. Then route the Water Temp Gauge sender (item 13, **Dk Blue** wire with 90 degree boot) down the side of the block and connect to the sender.

9 The upper intake can now be installed. Be sure to use new gaskets to prevent vacuum leaks.

10 Connect the Throttle Position sensor (item 18, **Dk Green**, **Orange** and **Grey** wires marked TPS) and the Idle Speed Control/Idle Air Bypass (item 20, **White** and **Red** wires marked IAB).

11 The ground wire (item 19, **Black** wire) should now be attached to an engine bolt with metal showing. No paint or powdercoating can be present at the ground location. The stock grounding point was at the back of the upper intake. Connecting the ground to a bolt mounting the upper and lower intake is fine. Be sure the engine and battery are grounded to the frame as well.

12 Working your way to the other side of the engine (passenger side), connect the oxygen sensor (item 21, **Grey**, **Black** and **Dk Green** wires marked R-O2) to its connector and be sure to attach any free harness to the firewall or frame to keep them from falling against the exhaust before initial start up.

13 Route the Vane Air Meter wiring and connector around the passenger side of the vehicle and connect to the Vane Air Meter (item 26).

14 At the rear of the engine there are several connectors and wires where you have the freedom of mounting location. Route the Vehicle Speed sensor and the Fuel Pump power connectors down along the frame rail. Keep them away from hot exhaust moving parts like the driveshaft.

a) Install Vehicle Speed Sensor (item 22, **Orange** and **Dk Green** wires marked VSS) between the transmission and speedometer cable. Route the Vehicle Speed Sensor connector along the frame rail and plug into the Vehicle Speed Sensor.

b) The 14Ga pink wire (item 22 marked **Inertia->FP**) is for power to your fuel pump(s); you will need to splice this wire if you are using 2 fuel pumps that are not mounted together. Make sure the fuel pump(s) are well grounded.

c) Mount the Barometric Pressure Sensor (item 23, **Dk Green**, **Orange** and **Grey** wires marked BAP) to your firewall and connect it to the harness.

d) Mount the Boost Control Solenoid (item 24, **Red** and **Pink** wires marked BCS) to your firewall and connect it to the harness.

e) Mount the EGR, if you are using it, (item 25, **Red** and **Dk Green** wires marked EGR) to your firewall and connect it to the harness.

f) Also included in this area of the harness (item 22) are several free wire leads that can:

-connect to the lead running to your A/C compressor to provide the correct signal to the ECM. This is a **Lt Blue** wire marked AC

-connect to a boost pressure switch (overboost buzzer)This is a **Pink** wire marked Overboost

-connect to an ECM controlled electric fan (lead is provided but fan must be grounded) This wire is **Lt Blue** is marked Primary Fan.

15 Carefully route the Ignition Coil connector (item 8, **Dk Green** and **Red** wires marked IGN / IDM) along firewall and fender to the coil. Keep Radio power wires and antenna cables away from Ignition Coil to prevent future distortion or interference.

16 Item 4 is a group of wires under the dash.

Color	**Printing**	**Purpose**
Orange	Keyed Run	Ignition Power Supply
Purple	Start	Start Signal for ECM
Green	Tach	Tachometer
Tan	MIL Check Engine	Check Engine Light Negative
Red	MIL Check Engine Positive	Check Engine Light Positive
Lt Blue	AC Comp	A/C Compressor Signal
Dk Blue	Temp	Water Temp Gauge Feed
White	Oil	Oil Pressure Gauge Feed
Pink	Overboost Buzzer	Connect to Overboost Buzzer

a) Connect the Orange wire marked “Keyed Run” to the keyed ignition switch hot wire. This wire must have +12 volts with the key in run and start positions.

b) Connect the Purple wire marked “Start” to the keyed ignition start wire. This wire must have +12 volts only when the key is in the start position.

c) The Green wire marked “Tach” is for your tachometer. Connect to your tach. Refer to the tachometer manufacturer information for any additional details.

d) Connect the Tan marked “MIL” and Red marked “MIL Power” to your check engine light. This must be a light that is not self grounding and needs two leads, both power and ground.

e) Connect the Lt Blue marked AC Comp to your A/C system.

f) Connect the Dk Blue to your water temp gauge.

g) Connect the White wire to your oil pressure gauge.

H) Connect the Pink wire to an Overboost Buzzer if you have one. This is just a ground circuit. The buzzer must have power supplied to it for proper operation.

17 It is advised that you use an inertia switch to turn off the fuel pump(s) in the event of a crash. Connector item 2 is for the Inertia Fuel Cutoff Switch. Mount the Inertia Switch completely upright and connect it to the harness. Mounting the switch any other way or bypassing this switch can cause risk or fire or loss of life. Before continuing, tap the switch until the button on top pops up and reset it. This will confirm its action and get you familiar with how it works.

18 Connector #1 is for the computer, make sure the computer pins are not bent or damaged. Then connect the harness with a 10mm socket. DO NOT use air or power tools to install this connector!

19 Mount the Relay and Fuse Center in a suitable location. Next to the Fuse & Relay blocks is a large 10Ga red wire. Connect the 10Ga Red 3/8" terminal to Battery Positive or the starter solenoid post running to the battery.

20 Please take the time to run a Self-Test at item 3 prior to starting the engine. This will clue you in to any connections you missed, and give you a base line to compare future tests against. See next page for procedures.

21 If this is a new fuel injection installation on this vehicle run the fuel pump(s) for 30-60 seconds to create fuel pressure for the injectors. To do this, ground the terminal on the end of the larger Self-Test connector marked ECM 22->VIP. See next page for procedures.

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 problems refer to continuous memory codes.

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

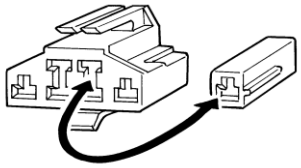
CONTINUOUS MEMORY CODES: These codes are issued as a result of information stored while the vehicle was in normal operation.

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 grey wire (VIP->CTS SPL) located in the large VIP connector and the tan wire (ECM 48->VIP) located in the single connector as shown in the drawing below.

Trouble Codes - some may Not apply to your application



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

No codes = unable to indicate self test
Code not listed = Not applicable to this engine

Fuse and Relay Key	
Fuse and Relay Designation	**Fuse Size**
O2, EGR, BCS, Alternator (Relay A)	20 AMP
Fuel Pump (Relay B)	20 AMP
Coil & TFI Module ECM, Injectors & ISC (Relay C)	20 AMP
Fan Relay (Relay D)	20 AMP

Tech Line Number: 610-485-1981

Warranty Information

All Detail Zone Performance products are warranted for 1 year from purchase date. There are no other representations, warranties or conditions expressed or implied, statutory or otherwise except those herein contained. Warranty does not cover any defect which is the result of improper installation or modification of the system or any of its components by purchaser.

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