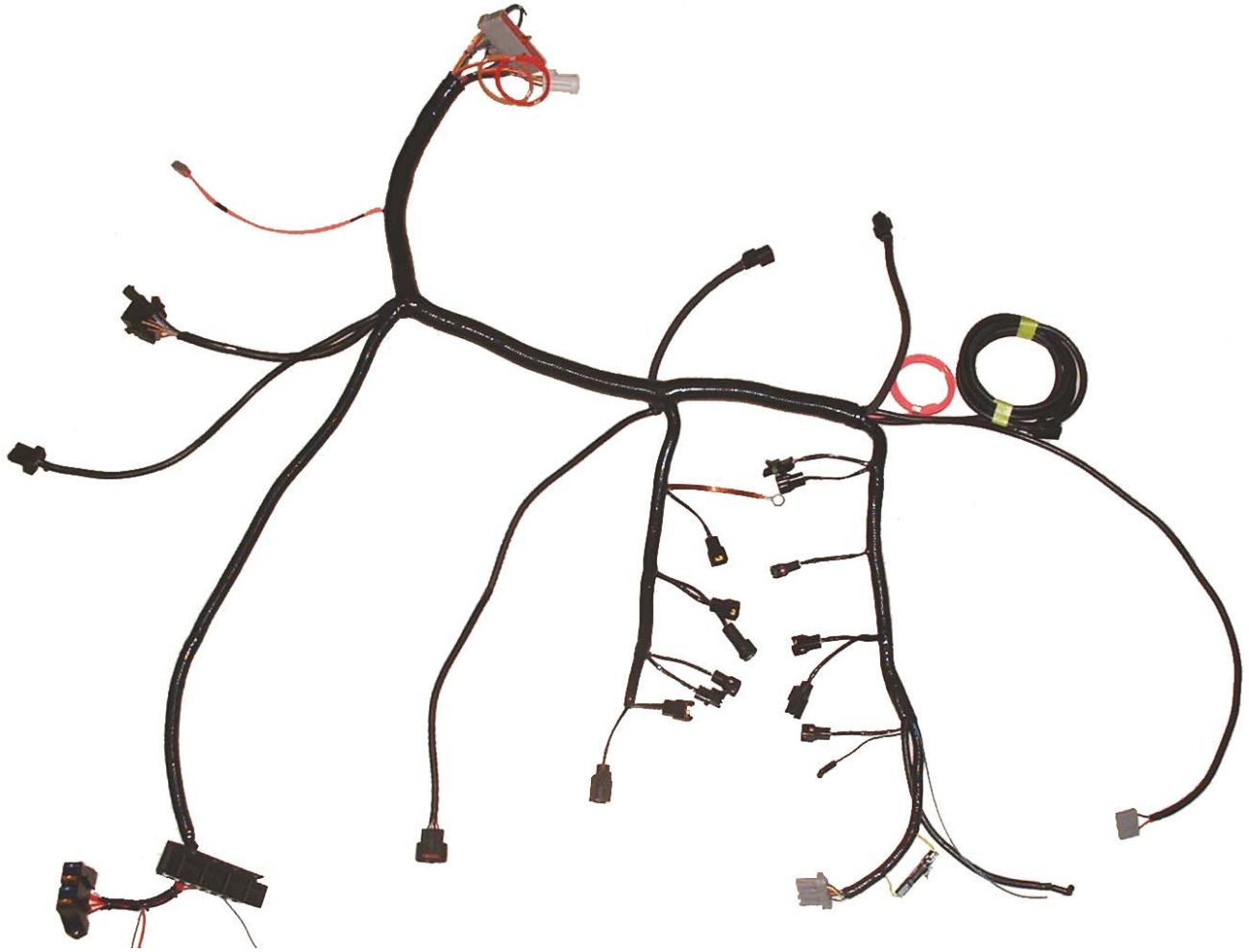
RJM Injection Technologies

EFI Harness Installation Manual

for Classic Fords



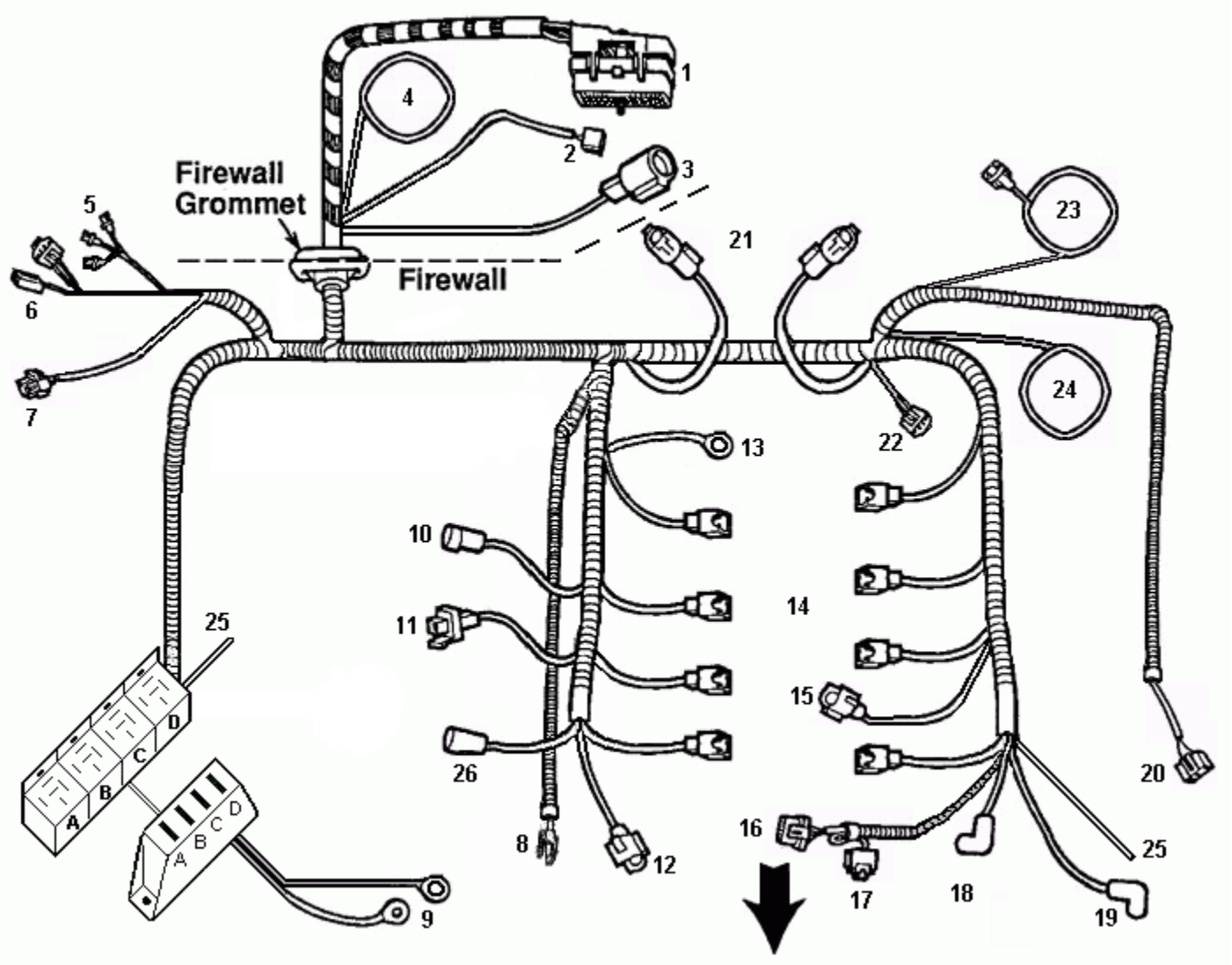
- Make sure that all the components you have are compatible before installing them. This harness was designed for 89-93 Mustang Mass Air 5.0L technology.
- The fuel rail will dictate which side the intake faces, make sure you have the correct one. This harness is set up for a passenger side facing intake when in stock form. Your harness may vary depending upon options selected.
- The Air Charge Temp sensor (ACT) sensor should be mounted in the lower intake manifold.
- The distributor should be specific for your engine (5.0L / 5.8L) and have the TFI Ignition Module mounted onto the side.
- The harness is designed for a “High Output” firing order of 1-3-7-2-6-5-4-8 in its stock form. Your camshaft and computer should match this order, but is not necessary. Do not alter the wiring harness to any other firing order.
- Ford EFI systems were not intended for use with long tube headers. The Oxygen Sensors will be less accurate due to dissipated exhaust heat further down stream from the cylinder head. However this harness will work with all exhaust systems.
- Always disconnect the battery when working on vehicles 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.

10/05/2009

Pre-Installation Instructions:

Install the lower intake, fuel injectors, and fuel rail on the engine if it is not already installed. Remove the upper intake if it is installed; install stock fuel pressure regulator and plumb fuel lines with appropriately rated line. Use caution when working on fuel system, which can be 40 PSI even when the engine is off. To release fuel pressure, remove the fuel pump fuse, 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) Transmission Controller Connection
4) Tachometer & Engine light connections
5) Transmission ID Plugs
6) Self-Test connectors
7) Barometric Pressure sensor
8) Mass Air sensor
9) Battery connections
10) Throttle Position sensor
11) Idle Air Bypass
12) Engine Coolant Temp Sensor
13) Ground
14) Injectors
15) Air Charge Temp sensor
16) TFI Distributor connector
17) SPOUT Connector
18) Temp Gauge sender
19) Oil PSI Gauge sender
20) Ignition Coil plug
21) R & L Oxygen sensors
22) Body connection
23) Vehicle Speed sensor
24) Fuel Pump Power
25) AC Compressor Wire
26) Alternator connection

Installation Instructions:

1 Lay the harness into the engine compartment with the relay and fuse blocks on the passenger side.

2 Remove the last bolt holding the lower intake down on the passenger side. Install #13 engine ground and torque the bolt back down to specifications. This is extremely important and should be the first connections made!

3 Install all eight fuel injector connectors starting with cylinder #1 and working your way around. Connecting the injectors now helps get the majority of the harness into position.

4 Connect #12 Engine Coolant Temp sensor, #15 Air Charge Temp sensor, and #18 Temp Gauge sender before moving away from the intake.

5 Connect #19 Oil PSI Gauge sender. Route Oil PSI Gauge sender wire carefully away from hot exhaust headers.

6 Route #21 Right & Left O2 sensors, #23 Vehicle Speed sensor, and #24 Fuel Pump power wires down to their locations under vehicle. Route #23 Vehicle Speed sensor and #24 Fuel Pump power connectors along the left frame rail. Keep them away from hot exhaust moving parts like driveshaft.

7 Weld exhaust bungs into both sides of the exhaust approximately 9-12 inches from the last cylinder head exhaust port or 3" from the collector. Clean any debris from oxygen sensor ports and threads.

a) Use a small amount of anti-seize on the O2 sensors threads when installing.
Use 8in long Oxygen sensors with shorty headers.
Use 16.5in long Oxygen Sensors with long tube headers.

b) Connect #21, oxygen sensors to their connectors and attach any free harness to the firewall or frame to keep them from falling against the exhaust.

8 Install Vehicle Speed Sensor between the transmission and speedometer cable. Route #23 Vehicle Speed Sensor connector along the left frame rail and plug into the Vehicle Speed Sensor.

9 #24 is a 14Ga pink wire marked "INERTIA → F-P" to power 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.

10 Carefully route #20 Ignition Coil connector along firewall and fender to the coil. Keep Radio power wires and antenna cables away from Ignition Coil to prevent future distortion or interference.

11 For this harness to work you must connect it to the body harness so it turns on with the dash key. #22 is responsible for connecting your engine temp and oil PSI gauges to the engine and your ignition key to the harness

a) If you have the original Ford body harness find the 3 pin engine connector at the firewall above the drivers side valve cover.



Use the supplied adaptor to connect the EFI harness to the Body harness:



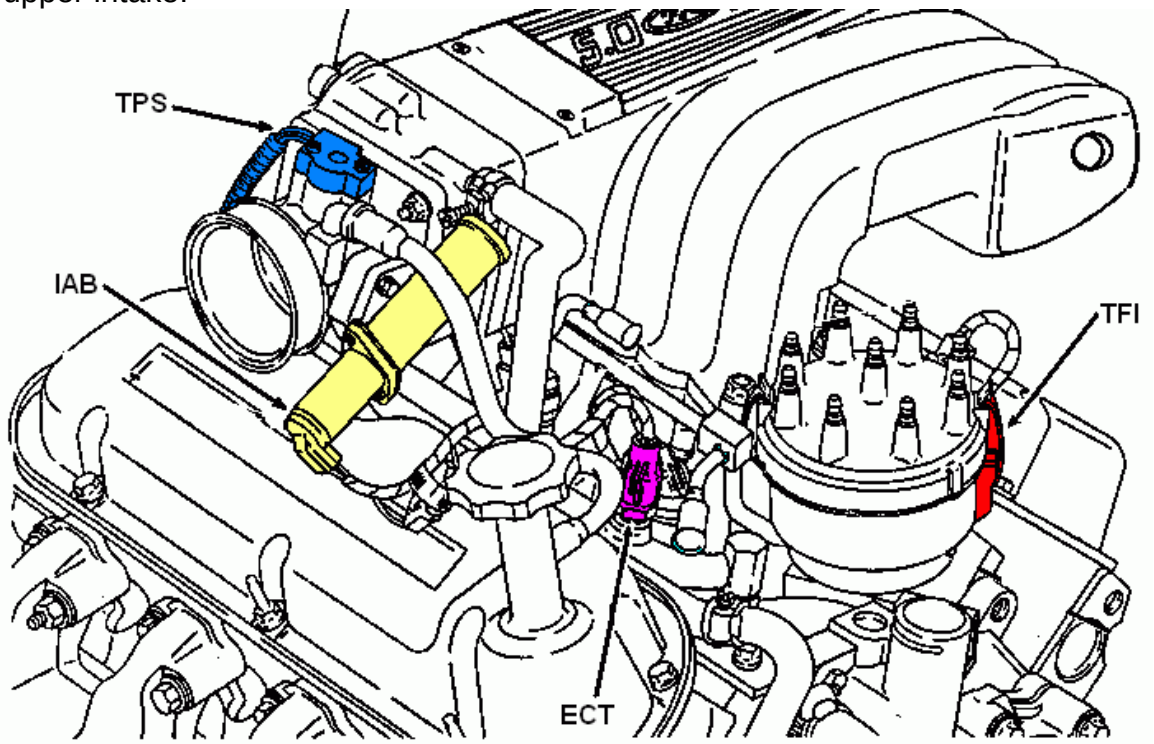
b) If you have an aftermarket body harness or your factory body harness is in poor condition, connect the EFI harness to the body harness with the 3ft supplied adaptor. Connect the bare wires to the Body harness as follows:

	Ignition Run	**Engine Temp Gauge**	**Oil PSI Gauge**
RJM Injection EFI harness	Orange	Blue	White
Original Ford Harness	Red / Green	Red / White	White / Red
Centech Body Harness	Dark Blue	Blue	Orange
Painless Harness	Blue / White	Blue	Orange
Digital Dash	-	WATER	OIL

12 Before you install the distributor make sure the engine is at TDC for cylinder one, and you have mounted the TFI to the side of the distributor. Drop the distributor so the rotor is aligned with the 1 molded into the cap. Make sure there is enough room to rotate the distributor in the block 1/8th turn. You will need to rotate it to set the base timing of 10° BTDC.
Connect #16 to the TFI on the Distributor to the harness and make sure that #17 SPOUT connector is connected firmly. Only disconnect the SPOUT to check and set the base timing.

13 After connecting #22 to the body harness you can install the upper intake plenum onto the lower intake, and install the throttle body to the upper intake. Now would also be a good time to finish the vacuum system.

14 Connect #10 Throttle Position Sensor and #11 Idle Air Bypass before leaving the upper intake.



15 Route the passenger side of the harness along the firewall and fender. Mount the Relay & Fuse blocks securely to the inner fender. Mount them upright, if the relays can retain water they will fail prematurely.

16 Mount the Barometric Pressure sensor to the firewall or inner fender and connect it to the harness at #7.

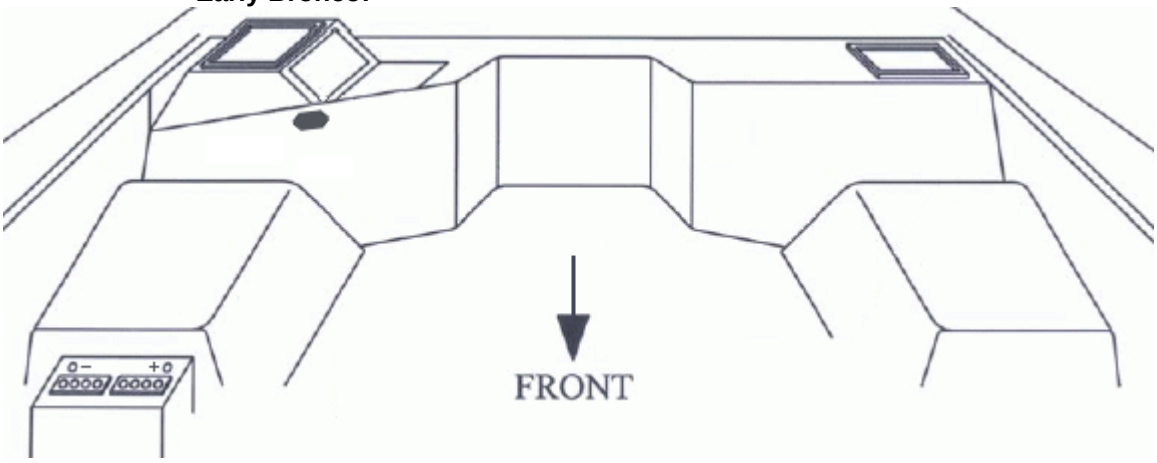
17 Install #8 the Mass Air Flow sensor, air filter and air tubes. Connect the MAF to the harness

18 Locate where in the firewall you will route the harness to the computer and other under dash connections. This harness was designed for the hole to be cut near the passenger fender.

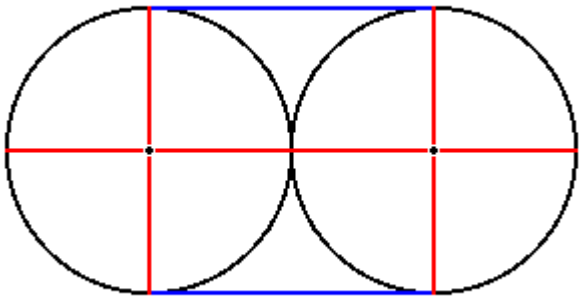
Classic Mustang:



Early Bronco:



Cut a 1.5” X 3.0” oval hole, using the template provided below. Use a 1.5” hole saw, and then connect the 2 round holes to make an oval. Mount the computer and feed the under dash section of the harness into place.



19 Locate #5 the transmission identification terminals near the Self-Test connectors. You need to plug the male connector labeled “TRANS” into one of the female connectors labeled “AUTO” & “MAN.” Depending on which computer type you are using. You need to identify your computer as an automatic or manual transmission computer by its sticker.

a) For an automatic computer; connect “TRANS” into the Black “AUTO” plug.

b) For a manual computer; connect “TRANS” plug into the Gray “MAN” plug.

20 You must use an Inertia Switch to turn off the fuel pumps in the event of a crash. Under the dash is connector #2 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 of fire or loss of life. Before moving on, tap the switch until the red button springs up, and then reset it. This will get you familiar with how it works.

21 #4 is 3 wires under the dash near the computers 60-pin connector, one of them is green marked “TACH.”

a) If you have a tachometer hook the green “TACH” wire to the input terminal marked “S” on the gauge.

b) If you have a digital dash connect the green wire marked “TACH” to the dash input terminal marked “TACH."
Do not leave bare wires open under the dash if you don’t have a tachometer!

22 The other 2 wires with #4 under the dash near the computers 60-pin connector is for the Check Engine Light, one is red marked "MIL PWR”; the other is tan marked “MIL.”

a) If you have a simple light, connect the wires to the light, it does not matter which wire is connected to which side of the light. Feed the wires and light back threw the dash and press it into the hole.

b) If you have a digital dash connect the tan wire marked “MIL” to the dash input terminal marked “CHECK." Seal off the red “MIL PWR” wire.
Do not leave bare wires open under the dash if you skip the check engine light!

23 Under the dash with the computers 60-pin connector is a round connector #3. This connector is ONLY for Baumann Electronic Transmission controller. If you do not have an electronically controlled transmission, LEAVE #3 ALONE! #3 has been sealed and is safe to simply tie it up in a safe location.

a) If you have a Baumann Electronic Transmission controller that came with the Transmission harness it will plug into this port. You will have to cut off the factory seal.

b) If you have an older controller that did not come with a Transmission harness please contact Baumann or RJM Injection, for a pigtail or new harness and instructions on how to connect to this EFI harness.

24 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 power tools to install this connector!

25 Next to the fuse & relay blocks are a large 10Ga red wire and a thinner 18Ga purple wire.

a) Connect the large Red wire to battery positive or the starter solenoid.

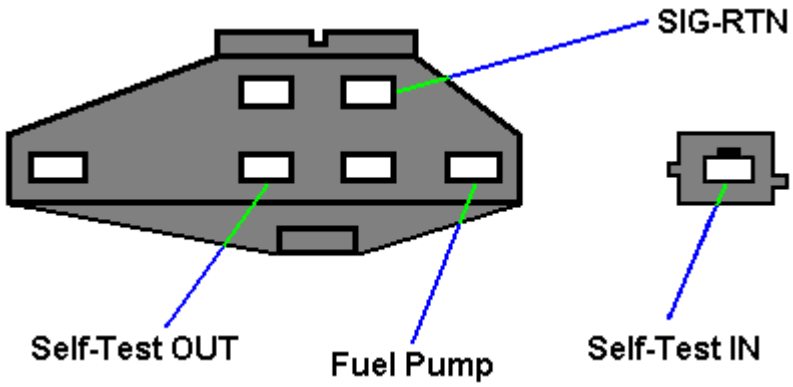
b) Connect the small Purple wire to a start ONLY signal on the starter solenoid. If the Purple wire is hot 12 volts after the engine starts it will run poorly

26 #26 is ignition power wire for your alternator. It is **NOT** meant to charge the vehicle, but to turn the alternator ON when you turn the key to RUN. Consult your alternator installation manual for further instructions.

27 #25 is a wire provided for you AC compressor. Connect the bare wire marked "AC" near the compressor to the positive side of the connector. Connect the bare wire marked "AC" near the relays to the compressor power wire from the vehicle.

28 If this is the first fuel injection installation on this vehicle run the fuel pump(s) for 30-60 seconds to prime the fuel system. To do this, ground the terminal on the end of the larger Self-Test connector.

29 Please take the time to run a Self-Test at #6 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. To do this, ground the terminal in the single smaller Self-Test connector.



33, 81, 82, 84, 85, 44 & 94 are whats called "Soft-Codes" which do not effect the engines fuel / spark programming. Soft-Codes harmlessly stay dormant in the computer. They're only purpose is to help you repair those systems back to original factory specs. Soft Codes will not turn on the Check Engine Light.

There is a resistor pack already built into the harness for the EGR Valve Position Sensor. No other resistors are required.

Again, codes 33, 81, 82, 84, 85, 44 & 94 are normal when the smog solenoids CANP, EGR, TAB & TAD are deleted.

11	Self-Test passed	
12	RPM too high during Engine Running Self-Test.	Engine Running test failed
13	RPM too low during Engine Running Self-Test.	Engine Running test failed
14	Erratic PIP signal occurred, resulting in a possible engine miss or stall.	Hard Fault
15	Computers memory test failed.	Hard Fault
16	IDM signal not received.	Hard Fault
17	RPM too low before Engine Running Self-Test.	Engine Running test failed
18	IDM circuit failure or SPOUT connector open	Hard Fault
19	RPM to erratic for Engine Running Self-Test.	Engine Running test failed
21	ECT sensor out of self test range 0.3 to 3.7 volts.	Hard Fault
22	MAP/BP sensor out of self test range.	Hard Fault
23	Closed throttle TPS voltage higher or lower than expected.	Hard Fault
24	ACT sensor out of self test range 0.3 to 3.7 volts.	Hard Fault
26	MAF sensor was out of self test range.	Hard Fault
29	Insufficient input from vehicle speed sensor.	Soft Code
31	EVP circuit below minimum voltage of 0.24 volts.	Hard Fault
32	EVP circuit below minimum voltage of 0.24 volts.	Hard Fault
33	EGR valve inoperative.	Soft Code
34	EVP circuit above the closed limit of 0.67 volts.	Hard Fault
35	EVP circuit above the maximum limit of 4.81 volts.	Hard Fault
41	Right HEGO sensor circuit indicates system lean	Hard Fault
42	Right HEGO sensor circuit indicates system rich	Hard Fault
43	HEGO lean at Full Throttle.	Hard Fault
44	Right HEGO sensor circuit indicates Smog Pump inoperative.	Soft Code
45	Smog Pump inoperative.	Soft Code
46	Smog Pump inoperative during self-test.	Soft Code
47	Measured air flow too low during Engine Running Self-Test.	Engine Running test failed
48	Measured air flow too high during Engine Running Self-Test.	Engine Running test failed
51	ECT sensor has failed above 4.6 volts, 20°F	Hard Fault
53	TPS circuit has failed above maximum 4.5 volts.	Hard Fault
54	ACT sensor has failed above 4.6 volts, 20°F	Hard Fault
56	MAF circuit above maximum voltage of 4.5volts.	Hard Fault
61	ECT sensor has failed below 0.2 volts, 250°F	Hard Fault
63	TPS circuit has failed below minimum 0.6 volts.	Hard Fault
64	ACT sensor has failed below 0.2 volts, 250°F	Hard Fault
66	MAF sensor went below 0.4 volts during the last 80 drive cycles.	Hard Fault
67	Neutral safety circuit failure.	Soft Code
72	Insufficient MAF/MAP change during Dynamic Response Test (user error).	Engine Running test failed
73	TPS senor did not exceed 25% rotation during Dynamic Response Test (user error).	Engine Running test failed
77	System failed to recognize brief WOT during Dynamic Response Test (user error).	Engine Running test failed
81	Smog Pump Solenoid 2 inoperative.	Soft Code
82	Smog Pump Solenoid 1 inoperative.	Soft Code
84	EGR Vacuum Solenoid inoperative.	Soft Code
85	Canister Purge Solenoid inoperative.	Soft Code
87	Fuel pump relay failure	Hard Fault
91	Left HEGO sensor circuit indicates system lean	Hard Fault
92	Left HEGO sensor circuit indicates system rich	Hard Fault
94	Left HEGO sensor circuit indicates Smog Pump inoperative.	Soft Code
95	The fuel pumps are disconnected	Hard Fault
96	The fuel pump relay did not send power to the fuel pumps	Hard Fault
98	Hard fault present.	Hard Fault
99	EEC system hasn't learned to control idle.	Hard Fault

1993 Mustang 5.0L Compatible Parts		Brand	Part #
A9L equivalent computer (manual trans)		Ford	F3ZF-12A650-DB
		Standard	EM073
		Cardone	78-4352
A9P equivalent computer (auto trans)		Ford	F3ZF-12A650-FB
		Standard	EM680
		Cardone	78-5611
Mass Air Flow Sensor (stock 1988-93 55mm)		Ford	E9ZF-12B579-AA
		Standard	MF0872
		Cardone	74-9502
Idle Air Bypass (IAB)		Ford	F0AE-9F715-BA
		Ford Motorcraft	CX1824
		Standard	AC21
Air Charge Temperature Sensor (ACT)		Ford	F2DZ-12A697-A
		Ford Motorcraft	DY674
		Standard	AX3
Barometric Pressure sensor (BP)		Ford Motorcraft	DY530
		Standard	AS13
Engine Coolant Temperature sensor (ECT)		Ford	F2AF-12A648-AA
		Ford Motorcraft	DY681
		Standard	TX6
Heated Oxygen Sensor (HEGO) 8" pigtail		Ford	E9SF-9F472-AA
		Ford Motorcraft	DY605
		Standard	SG23
		Bosch	13942
Heated Oxygen Sensor (HEGO) 16.5" pigtail		Ford	E7TF-9F472-CA
		Standard	SG40
		Bosch	13953
Throttle Position Sensor (TPS)		Ford	E8ZF-9B989-AA
		Standard	TH72
Vehicle Speed Sensor (VSS)		Standard	SC37
Fuel Inertia Cutoff Switch		Ford	XF3Z-9341-AA
Fuel Injector stock 19lb/hr (single)		Ford	F1ZZ-9F593-C
		Standard	FJ68
Fuel Injector stock 19lb/hr (set of 8)		Ford Racing	M-9593-C302
Fuel Pressure Regulator		Ford	F4CZ-9C968-A
		Ford Motorcraft	CM4764
		Standard	PR15
Distributor 5.0L Roller Cam		Ford Racing	M-12127-C302
		Cardone	302892
Distributor 5.0L Standard Cam		Cardone	302880
Distributor 5.8L Standard Cam		Cardone	302884
Distributor 7.5L Standard Cam		Cardone	302886
Distributor Steel Gear for Roller Cams		Ford Racing	M-12390-F
Distributor Iron Gear for standard Cams		Ford Racing	M-12390-D
Distributor Cap, Rotor, and Base Kit		Ford Racing	M-12106-B302
Cap		Standard	FD168X
Cap Base		Standard	FD166
Rotor		Standard	FD307X
Coil		Standard	FD478
Distributor Module (TFI)	**! Replace !**	Ford Motorcraft	DY425
Distributor Stator (PIP)	**! Together !**	Ford Motorcraft	DU30C