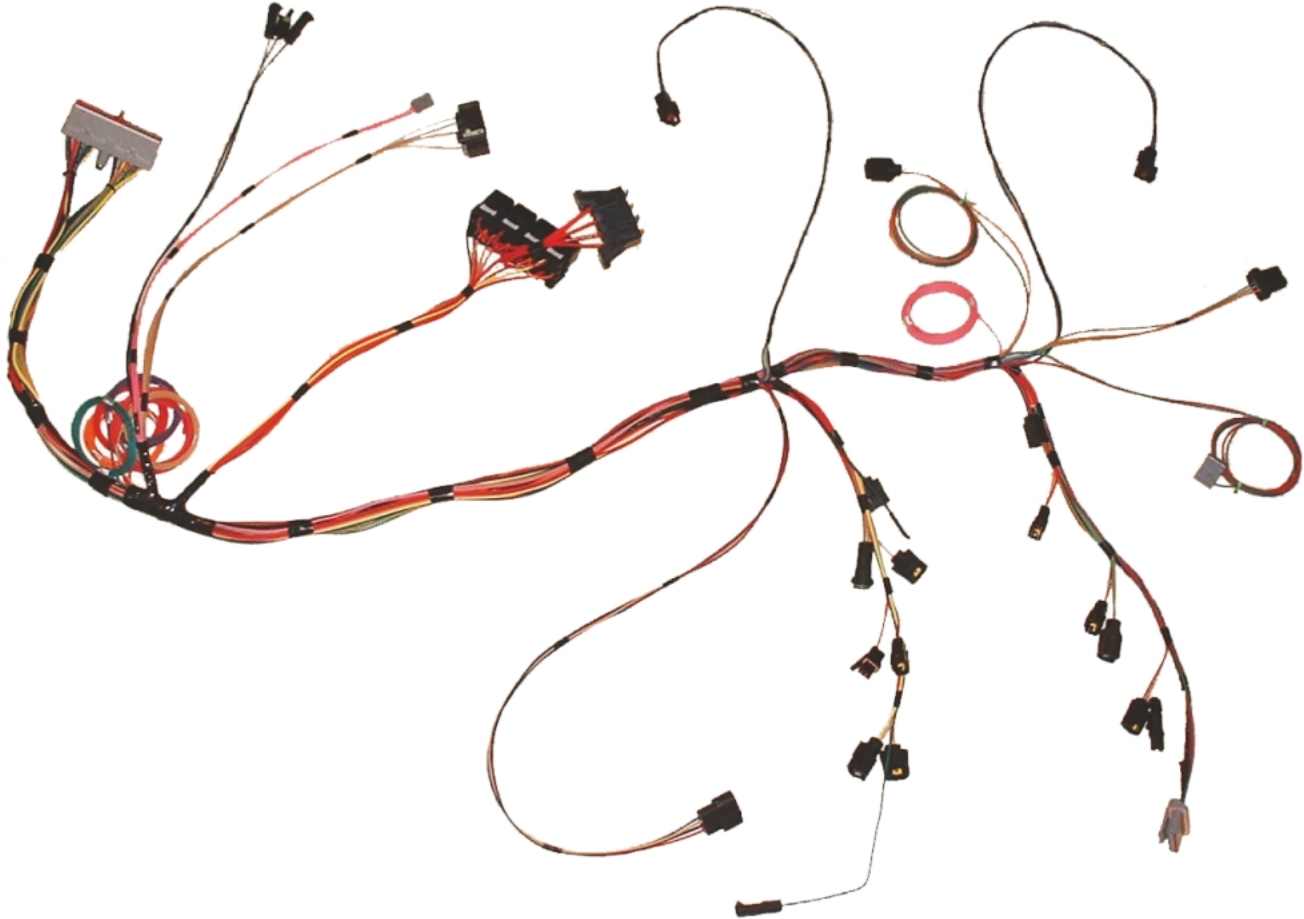


## EFI Harness Installation Manual

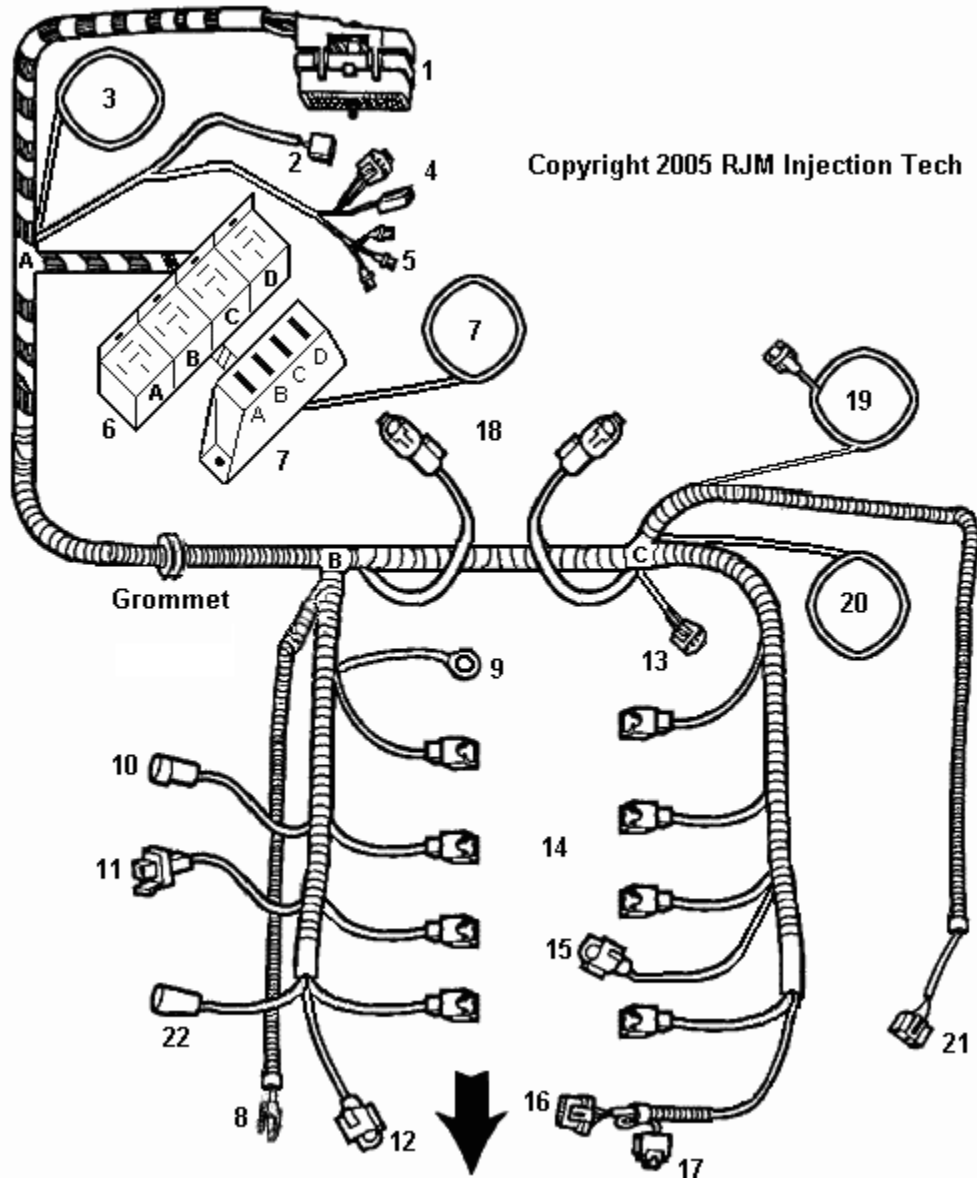


- Make sure that all the components you have are compatible before installing them. Intakes are fairly interchangeable, make sure the upper and lower intakes match, and the lower intake has a port for the Air Charge Temp sensor (ACT) sensor.
- The fuel rail will dictate which side the intake faces, make 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 distributor should be specific for your engine (5.0L / 5.8L) and have the TFI Ignition Module mounted onto the side.
- The harness is set up 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 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 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.

## 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.

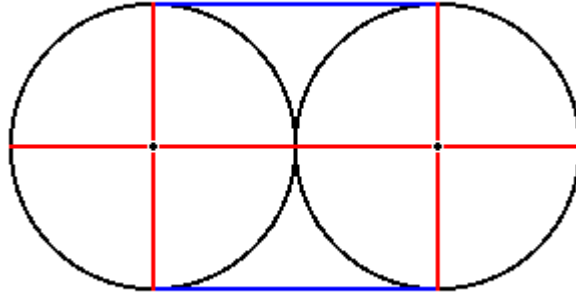
Before installation spread out the harness in a well lighted open area to identify all the connectors and become familiar with what will need to be done.



- |   |                                |                               |
|---|--------------------------------|-------------------------------|
| 1) EEC Computer connector                                       | 8) Mass Air sensor             | 16) TFI Distributor connector |
| 2) Inertia Fuel Cutoff Switch                                   | 9) Ground                      | 17) SPOUT Connector           |
| 3) Ignition, Start, Tachometer & Check Engine Light connections | 10) Throttle Position sensor   | 18) R & L Oxygen sensors      |
| 4) Self-Test connectors   | 11) Idle Air Bypass            | 19) Vehicle Speed sensor      |
| 5) Transmission ID Plugs  | 12) Engine Coolant Temp Sensor | 20) Fuel Pump Connection      |
| 6) Relay Block  | 13) Barometric Pressure sensor | 21) Ignition Coil plug        |
| 7) Fuse Block and Battery connection                            | 14) Injectors                  | 22) Alternator connection     |
|   | 15) Air Charge Temp sensor     |                               |

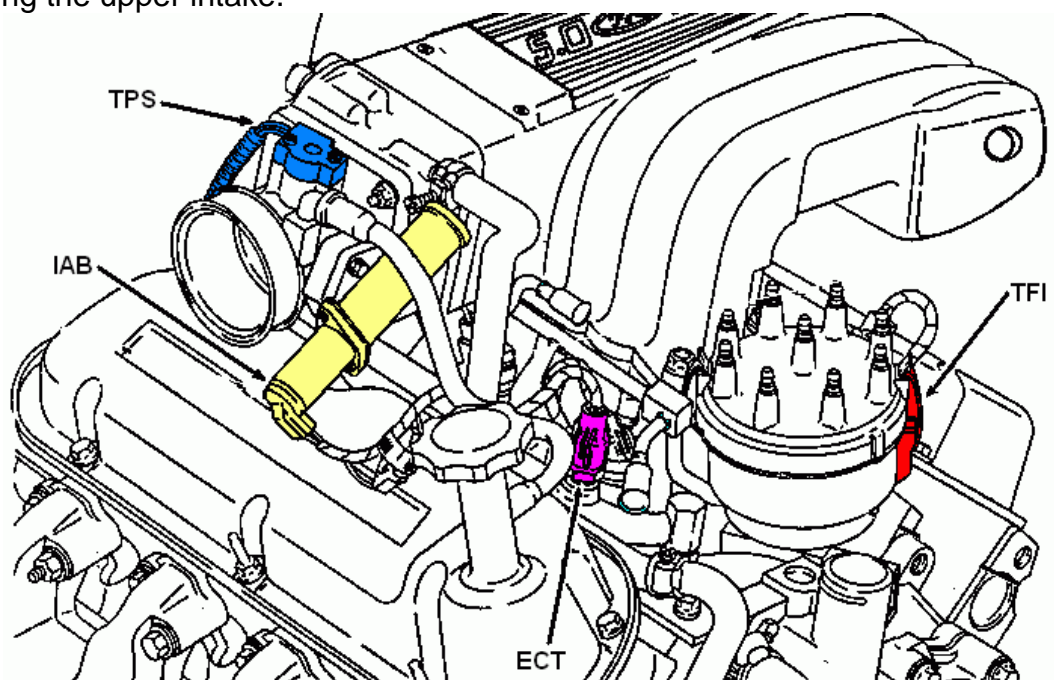
## Installation Instructions:

- 1 Cut a 1.5" X 2.75" 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.



- 2 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 insures a quality installation.
- 3 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!
- 4 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.
- 5 Connect #12 Engine Coolant Temp sensor and #15 Air Charge Temp sensor before moving away from the intake.
- 6 Mount the Barometric Pressure sensor to the firewall or inner fender and connect it to the harness #13.
- 7 Carefully route #21 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.
- 8 Route #19 Vehicle Speed sensor, and #20 Fuel Pump power wires down to their locations under vehicle. Keep them away from hot exhaust moving parts like driveshaft.

- 9** 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 #18, oxygen sensors to their connectors and attach any free harness to the firewall or frame to keep them from falling against the exhaust.
- 10** Install Vehicle Speed Sensor into the between transmission and speedometer cable. Then plug connector #19 to the Vehicle Speed Sensor.
- 11** #20 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.
- 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** 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. Connect #10 Throttle Position sensor and #11 Idle Air Bypass before leaving the upper intake.

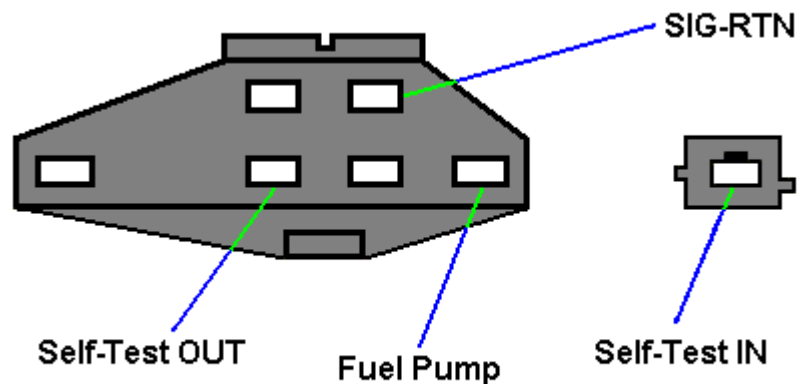


- 14** Install the Mass Air Flow sensor, air filter and air tubes. Connect the MAF to the harness #8.
- 15** After the engine connections are made, you can route the under dash section and mount the EEC Computer, Inertia Switch, Relay & Fuse blocks.
- 16** You must use an Inertia Switch to turn off the 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.
- 17** #3 is a group of 5 wires under the dash:

<b>Color</b>	<b>Marked</b>	<b>Purpose</b>
Orange	KEYED RUN	Ignition Power Supply for EFI Harness
Purple	START	Start Signal for Computer
Green	TACH	Tachometer
Tan	MIL	Check Engine Light Negative from EEC
Red	MIL PWR	Check Engine Light Positive

- a)** Connect the Orange wire marked “KEYED RUN” to the keyed ignition switch. This wire must have +12 volts with the key in RUN and START positions.
- b)** Connect the Purple wire marked “START” to a start signal on the ignition switch. This wire must have +12 volts ONLY when the key is in the START position. If the Purple wire is hot 12 volts after the engine starts it will run poorly.
- c)** The Green wire marked “TACH” is for your tachometer. Consult your tachometers installation manual for further instructions.  
Do not leave bare wires open under the dash if you don’t have a tachometer!
- d)** Connect the Tan and marked “MIL” and Red wire marked "MIL PWR" to the check engine light. It does not matter which wire is connected to which side of the light.  
Do not leave bare wires open under the dash if you skip the check engine light!
- 18** Locate #5 the transmission identification terminals near the Self-Test connectors. You need to plug the male terminal into one of the female terminals, depending on which computer type you are using. The male plug is labeled “TRANS” and the female plugs are labeled “AUTO” & “MAN.” You need to identify your computer as an automatic or manual transmission computer by its sticker. If you are unsure of which computer you have your local Ford dealer should be able to help.
- 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.

- 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** Next to the Fuse block is a large 10Ga Red power supply wire. Connect this wire to Battery positive or the starter solenoid. You do not need to add a fuse; the harness is 100% protected.
- 20** #22 supplies ignition power 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.
- 21** 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.
- 22** 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 what's 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 too 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 sensor 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

<b>1993 Mustang 5.0L Compatible Parts</b>		<b>Brand</b>	<b>Part #</b>
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)	<b>! Replace ! ! Together !</b>	Ford Motorcraft	DY425
Distributor Stator (PIP)		Ford Motorcraft	DU30C