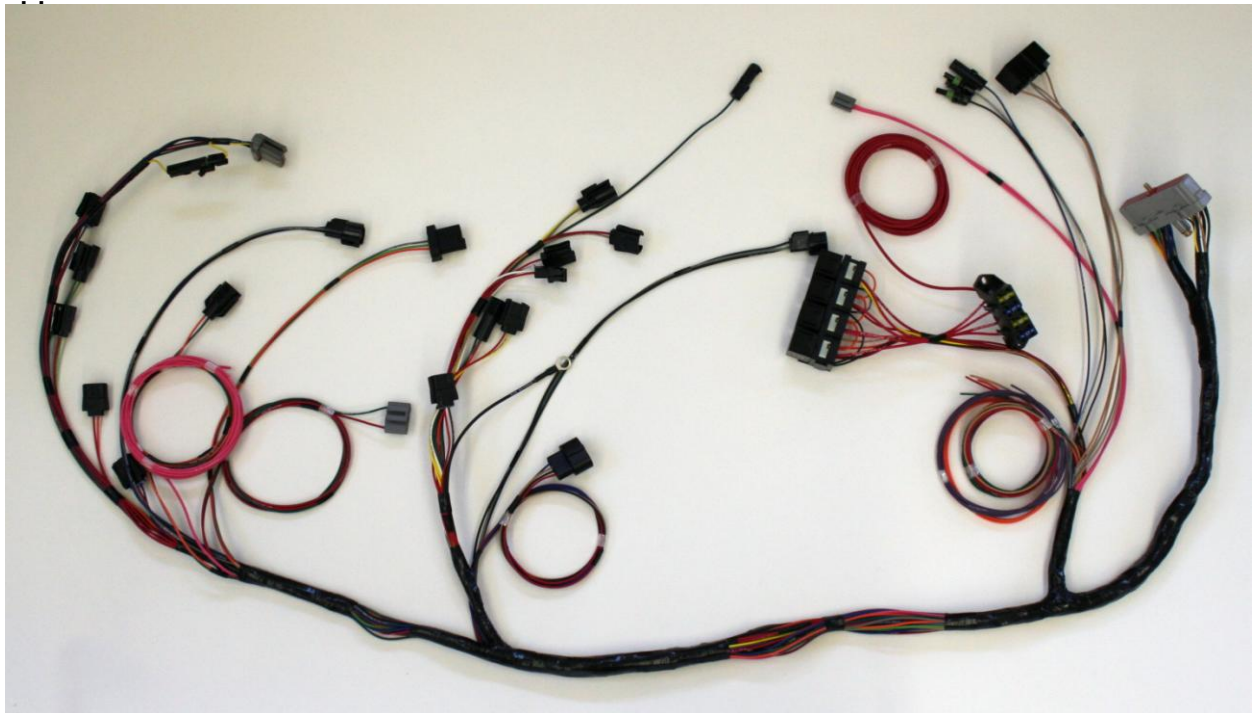


RON FRANCIS *Wiring*

Ford 5.0 EFI Harness Installation Manual for Wiring Kit



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Part Number: Cobra-75

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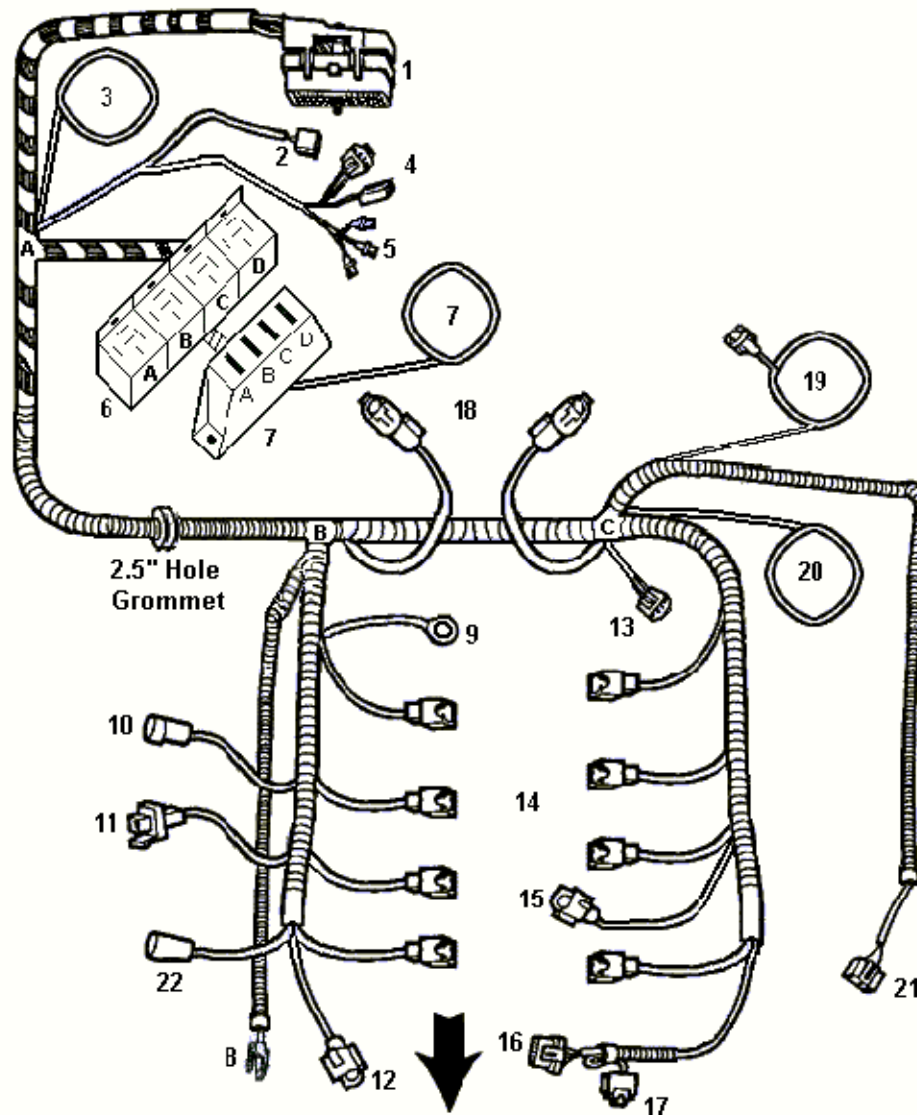
Pre-Installation Notes:

- This system is designed to install Mass Air Flow based Ford EFI 5.0 & 5.8 engines.
- 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.
- This harness does not include provisions for emissions and is not intended for installation on emission controlled vehicles.
- The distributor should be specific for your engine (5.0L / 5.8L) and have the TFI Ignition Module mounted onto the side.
- This harness is set up for a “High Output” firing order of 1-3-7-2-6-5-4-8 in its stock form. Make sure your camshaft and computer match this order.
- Ford EFI systems were not intended for use with long tube headers. The 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.
- 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.

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 pump(s), then start engine and allow it to stall. Crank starter for several seconds to insure all pressure has been released.

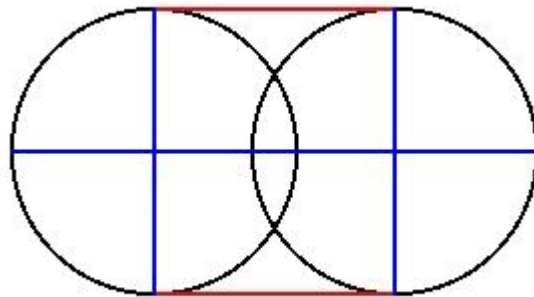
Before installation spread out the harness in a well lighted open area to identify all the connectors and become familiar with what will need to be done.



- | | | |
|---|--------------------------------|-------------------------------|
| 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** Lay the harness into the engine compartment with the relay and fuse blocks on the passenger side.
- 2** Locate where in 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** Remove the last bolt holding the lower intake down on the passenger side. Install #9 engine ground and torque the bolt back down to specifications. This is extremely important and should be the first connections made!
- 5** 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.
- 6** Connect #12 Engine Coolant Temp sensor and #15 Air Charge Temp sensor.
- 7** Route #18 Right & Left O2 sensors, #19 Vehicle Speed sensor, and #20 Fuel Pump power wires down to their locations under vehicle. Route #19 Vehicle Speed sensor and #20 Fuel Pump power connectors along the left frame rail. Keep them away from hot exhaust moving parts like driveshaft.

- 8 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 threads when installing Oxygen Sensors. Use SG23 Oxygen sensors with short headers. Use SG40 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.
- 9 Install Vehicle Speed Sensor between the transmission and speedometer cable. Route #19 Vehicle Speed Sensor connector along the left frame rail and plug into the Vehicle Speed Sensor.
- Electronic speedometers can be spliced into the DK GREEN wire to pick up the VSS signal. The DK GREEN wire runs from the Vehicle Speed Sensor to the ECM This is a standard Ford 8000 pulse per mile signal.**
- 10 #20 is a 14Ga pink wire 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.
- 11 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.
- 12 #3 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

- 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.
- ***This circuit should only be hot when the key is cranking the engine. The intent is that the system retards timing during crank to help the engine start up. If you connect this wire to always hot with key on you will experience an undesirable rev limiter at 2000-3000 RPM's.**
- C) The Green wire marked "Tach" is for your tachometer. Connect to your tach. Refer to the tachometer manufacturer's 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.

- 13 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.
- 15 Install the Mass Air Flow Meter, air filter and air tubes. Connect the MAF to the harness connection #8.
- 16 Mount the Barometric Pressure sensor to the firewall or inner fender and connect it to the harness at #13.
- 17 Before you install the distributor, make sure the engine is at TDC for cylinder #1 and you have mounted the TFI to the side of the distributor. Drop the distributor into position 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 $1/8^{\text{th}}$ of a turn. You will need to rotate it to set the base timing to 10 degrees BTDC.

Connect #16 to the TFI module on the distributor and make sure that #17 SPOUT connector is connected firmly. Only disconnect the SPOUT to check and set the base timing.

- 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 which computer you have your local Ford dealer should be able to help.
 - a) If your computer is for an automatic transmission; connect "TRANS" plug to the Black "AUTO" plug.
 - b) If your computer is for a manual transmission; connect "TRANS" plug to the Gray "MAN" plug.
- 19 It is advised that you use an inertia switch to turn off the fuel pump(s) 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 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.

- 20** 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!
- 21** Next to the Fuse & Relay blocks is a large 10Ga red wire connect this 10Ga Red 3/8" terminal to Battery Positive or the starter solenoid.
- 22** #22 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.
- 23** Please take the time to run a Self-Test at #4 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.
- 24** If this is the first 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.

Codes 33, 44, 81, 82, 84, 85 and 94 are what's called "soft" codes and do not affect the engine fuel or spark programming. These codes will set due to the smog solenoids CANP, EGR, TAB and TAD being removed. Soft codes harmlessly stay dormant in the computer. Their purpose is to help aid in the repair of those systems. Soft codes will not turn on the Check Engine Light.

There is a resistor pack already installed in this harness for the EGR Valve Position Sensor. No other resistors are required.

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.

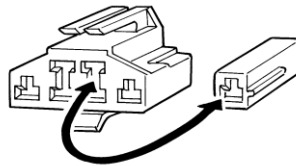
ENGINE RUNNING SELF TEST: The sensors are checked under operating conditions and at normal operating temperatures.

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

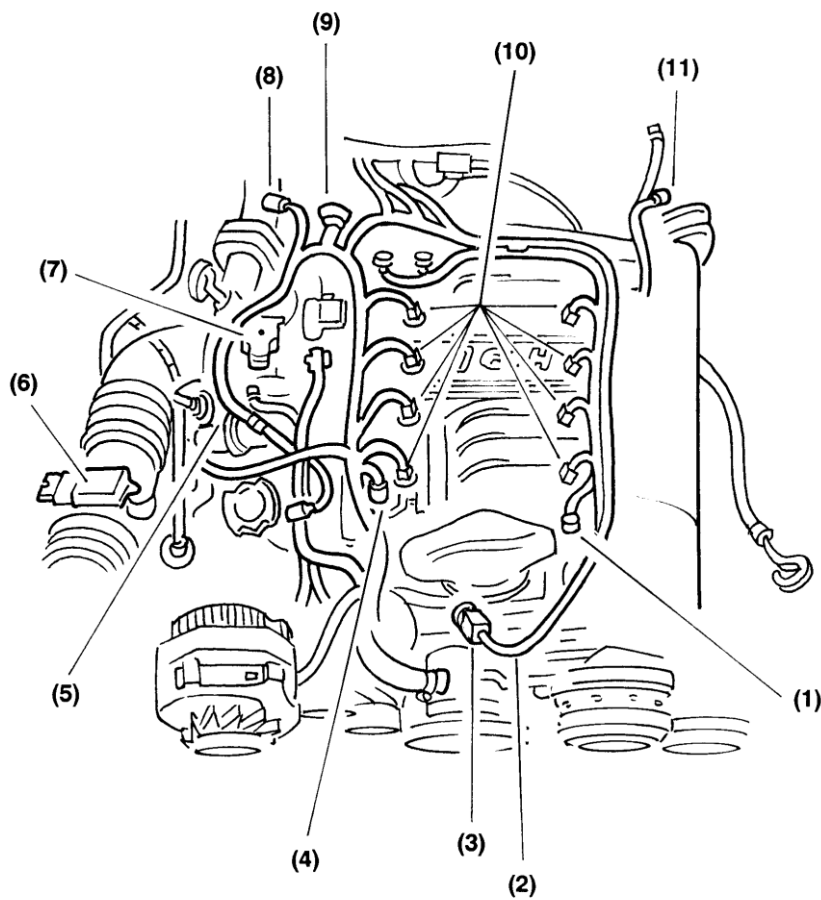
- 11 System PASS
- 12 High RPM
- 13 Low RPM
- 14 PIP circuit failure
- 15 ECG memory failure
- 16 RPM low for EGO test
- 18 SPOUT /IDM circuit failure
- 19 ECG internal voltage failure
- 21 ECT out of test range
- 22 MAP /BP out of test range
- 23 TP out of test range
- 24 ACT of test range
- 26 MAF 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

The following diagram shows some of the sensor locations on a typical Ford 5.0 engine. The sensors not shown are mounted remote (off the engine) on the stock vehicle application. Your installation may require these items not to be mounted in the same location as on a factory installation. The numbers before the sensor names correspond to the numbers shown in the drawing.

- 1) Air Charge Temperature Sensor
- 2) Shorting Plug
- 3) TFI Ignition Module
- 4) Coolant Temperature Sensor
- 5) Idle Speed Control
- 6) Mass Air Flow Sensor
- 7) Throttle Position Sensor
- 8) Right O2 Sensor
- 9) EGR Valve Position Sensor
- 10) Injectors
- 11) Left O2 Sensor



COMPATIBLE FORD 5.0 AND ASSOCIATED PARTS		
ECM FOR MANUAL TRANSMISSION (A9L)	FORD	F3ZF-12A650-DB
	STANDARD MOTOR PRODUCTS	EM073
	A1-CARDONE	78-4352
ECM FOR AUTO TRANSMISSION (A9P)	FORD	F3ZF-12A650-FB
	STANDARD MOTOR PRODUCTS	EM680
	A1-CARDONE	78-5611
MASS AIR FLOW METER	FORD	E9ZF-12B579-AA
	STANDARD MOTOR PRODUCTS	MF0872
	A1-CARDONE	74-9502
IDLE AIR BYPASS VALVE	FORD	F0AE-9F715-BA
	STANDARD MOTOR PRODUCTS	AC21
AIR CHARGE TEMP SENSOR	FORD	F2DZ-12A697-A
	STANDARD MOTOR PRODUCTS	AX3
BAROMETRIC AIR PRESSURE SENSOR	FORD MOTORCRAFT	DY530
	STANDARD MOTOR PRODUCTS	AS13
ENGINE COOLANT TEMP SENSOR	FORD	F2AF-12A648-AA
	STANDARD MOTOR PRODUCTS	TX6
OXYGEN SENSOR WITH 8 INCH LEAD	FORD	E9SF-9F472-AA
	STANDARD MOTOR PRODUCTS	SG23
	BOSCH	13942
OXYGEN SENSOR WITH 16 INCH LEAD	FORD	E7TF-9F472-CA
	STANDARD MOTOR PRODUCTS	SG40
	BOSCH	13953
THROTTLE POSITION SENSOR	FORD	E8ZF-9F989-AA
	STANDARD MOTOR PRODUCTS	TH72
VEHICLE SPEED SENSOR	FORD	E9TZ-9E731-A
	STANDARD MOTOR PRODUCTS	SC37
INERTIA SWITCH	FORD	XF3Z-9341-AA
	AIRTEX	1S3906
FUEL INJECTOR (STOCK 19 LB/HR) ORANGE	FORD	F1ZZ-9F593-C
	STANDARD MOTOR PRODUCTS	FJ68
FUEL PRESSURE REGULATOR	FORD	F4CZ-9C968-A
	STANDARD MOTOR PRODUCTS	PR15

COMPATIBLE FORD 5.0 AND ASSOCIATED PARTS		
DISTRIBUTOR 5.0 WITH ROLLER CAM	FORD RACING	M-12127-C302
	A1-CARDONE	302892
DISTRIBUTOR 5.0 WITH STANDARD CAM	A1-CARDONE	302880
DISTRIBUTOR 5.8 WITH STANDARD CAM	A1-CARDONE	302884
DISTRIBUTOR 7.5 WITH STANDARD CAM	A1-CARDONE	302886

Fuse and Relay Key	
Fuse and Relay Designation	Fuse Size
O2 & Mass Air Flow Sensor (Relay A)	15 AMP
Fuel Pump (Relay B)	20 AMP
Coil & TFI Module (Relay C)	15 AMP
ECM, Injectors, IAC (Relay D)	20 AMP

Tech Line Number: 610-485-1981

When calling please have the harness serial number handy. The serial number can be found on your paperwork or on the grey ECM connector. You will have to loosen the ECM to find it.

Warranty Information

All Ron Francis Wiring 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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