

Tomco Techtips

TM

ISSUE 4

Ford's Microprocessor Control Unit (MCU)

In Issue 3, we covered "pulling codes" from Ford's EEC-III system. We will cover the EEC-IV in a later issue.

The microprocessor control unit (MCU) computer system was first introduced by Ford in 1980 on California cars equipped with the 2.3L engine. Later, it was used with various 4, 6 and 8 cylinder engines.

After 1985, MCU was only available on 5.8L cars with the optional police package, or on Canadian production.

This system can be identified by the processor's location in the engine compartment. Further identification is its long, narrow connector located in the center of the case. The MCU controls engine air/fuel ratios, air injection, and, on some models, canister purge, spark retard, and also idle speed.

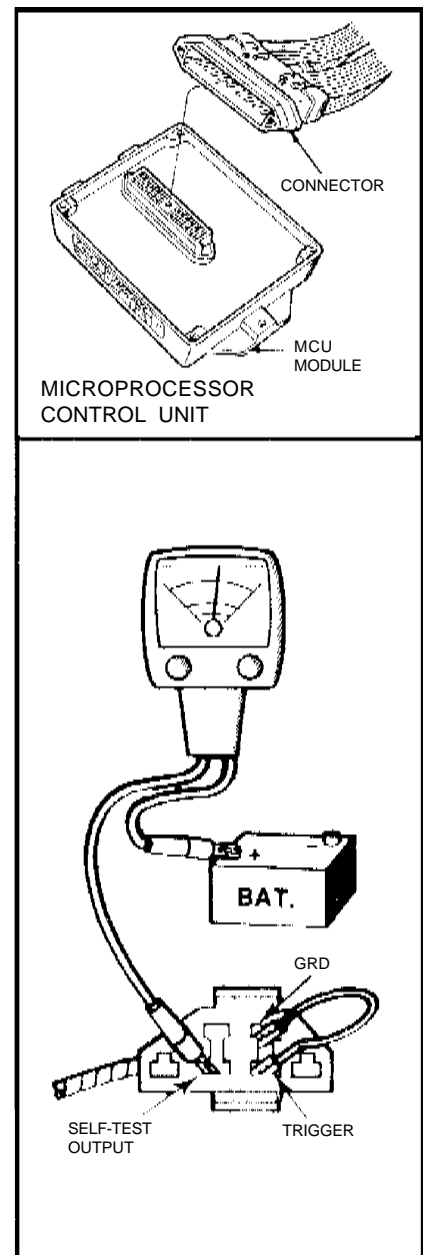
The MCU system is similar in many respects to the EEC systems. The major difference is that the MCA system does not completely control ignition timing.

DIAGNOSIS

The microprocessor control unit can diagnose a malfunction currently present. It does not have a memory. Diagnosis output is through a self-test connector, similar in appearance to the EEC-IV, except that it does not have the separate single connector lead.

CHECKING FOR CODES

- 1) Check vacuum hoses for leaks, cracks or improper routing. Check electrical connections. Ensure that all connections are clean and tight.
- 2) Warm engine to normal operating temperature. If air cleaner must be removed, leave all vacuum hoses attached.
- 3) Turn Ignition off. Locate self-test connector and insert a jumper wire between ground and trigger sockets (see illustration). Connect the positive lead of a pointer-type voltmeter to vehicle battery positive terminal, and the negative lead to self-test output socket. Set voltmeter on 0-20 volt scale.



4) On 4 cylinder engines, disable canister purge system by disconnecting and plugging hose from engine side of canister purge valve. On V-8 engines, remove PCV valve from valve cover.

Key On, Engine Off Test - Turn all accessories off, turn key on, but do not start engine. Watch voltmeter for code pulses which should appear within 30 seconds. Ignore any initial surge of voltage. Record code(s).

Note:

Service codes are shown by voltage pulses. The first digit is indicated by a series of pulses, then the needle drops to zero for two seconds, then the second digit of the code is displayed. After all service codes are displayed, a four second pause will occur, and then the codes will be repeated.

Note:

If voltmeter does not pulse but shows steady high or low readings, refer to a service manual for more detailed test procedures.

FORD MCU SYSTEM SERVICE CODES

CODE	4 CYL.	6 CYL.	8 CYL.
11	System OK	System OK	System OK
12			Idle Speed
25			Knock System
41	Fuel Lean	Fuel Lean	Fuel Lean
42	Fuel Rich	Fuel Rich	Fuel Rich
44	Thermactor	Thermactor	Thermactor
45	Thermactor	Thermactor	Thermactor
	Diverter	Diverter	Diverter
46	Thermactor	Thermactor	Thermactor
	By-Pass	By-Pass	By-Pass
51	Low Temp	Low Temp	High/Low Vac
	Switch	Vac Switch	Switch Open
52	Idle Tracking	WOT Vacuum	
	Switch	Switch Open	
53	WOT Vacuum	Crowd Vacuum	Dual Temp
	Switch Open	Switch Open	Switch Open
55			Mid-Vac Switch
			Open
56		Closed Throttle	
		Vac Switch	
		Open	
61			High/Low Vac
			Switch Closed
62	Idle Tracking	WOT Vacuum	*Altitude
	Switch Closed	Switch Closed	Switch
63	WOT Vacuum	Crowd Vacuum	
	Switch Closed	switch Closed	
65	*Altitude		
	Switch		
66		Closed Throttle	
		Vac Switch	
		Closed	

*Not on all Models

ENGINE RUNNING AND NON-CODE TESTS

Engine running and non-code tests may be made after the vehicle has passed all other diagnosed tests. Refer to one of the service manuals for tests. When one of the diagnosed codes indicates a problem, check out the circuit

- wiring, connectors, and the device itself - following procedure in the Ford Manual, or in one of the independent publications. One of the sources for this information is the Mitchell Ford Motor Co. MCU/EEC Driveability Pro-

cedures and Adjustments manual. Contact your local Mitchell representative or call Mitchell toll-free 1-800-854-7030. (In California 1-800-421-0159

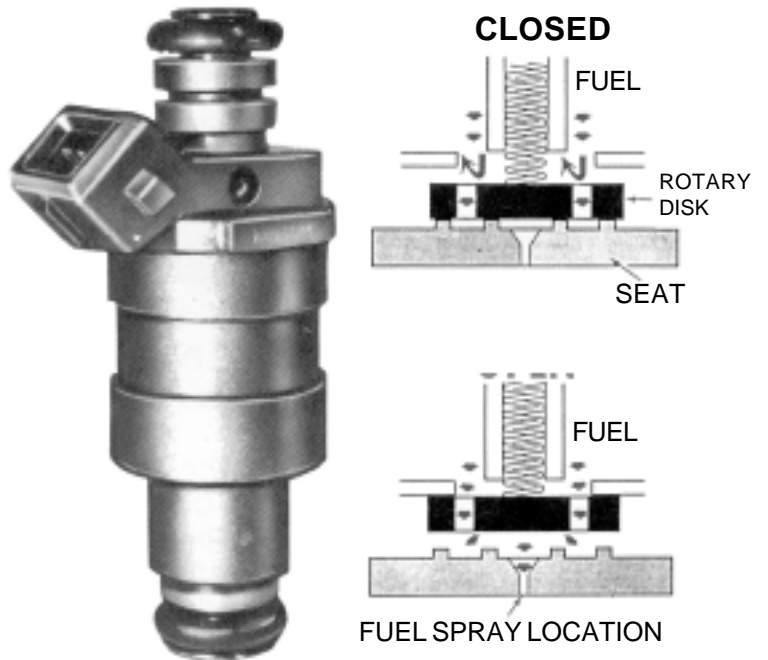
NEW! *Engine Performance Controls*

DISK TYPE PORT FUEL INJECTORS

Port fuel injection is one of the major technical advancements responsible for today's fine performing and economical vehicles. But this advancement has had its drawbacks in that original equipment "pintle" type injectors tend to plug up with fuel deposits, particularly in short run operation.

The Tomco injector uses a rotary self-cleaning disk instead of a pintle. Fuel spray is shot from high inside the injector, well away from excessive heat.

The Tomco multi-point port fuel injector design overcomes the plugging problem by locating the disk and its seat up in the injector body away from combustion chamber heat. The disk has a rotating, self-cleaning feature similar to the disk type fuel inlet valve found in Tomco Carburetor kits. The small lightweight disk also minimizes injector noise and permits the injector to more closely follow the fuel requirements of the engine.



THE INJECTOR USES A SELF-CLEANING DISK INSTEAD OF A PINTLE.

DISK 2 NEW OXYGEN SENSORS

TOYOTA FLANGE TYPE SENSOR

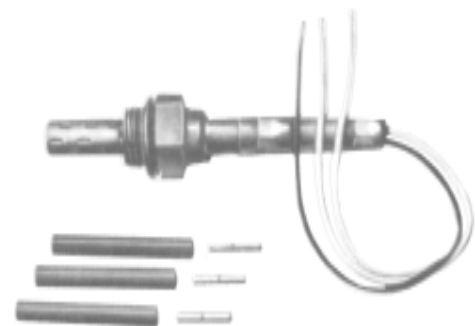
Computer controlled Toyota vehicles have used oxygen (O₂) sensors identical in their sensing and output characteristics to other foreign and domestic vehicles. Replacement sensors in the aftermarket have not been available because of the flange type mounting these sensors employ. Tomco's Toyota sensor #11013 uses flange type adapter assembled to universal sensor #11011 to solve this problem.



TOYOTA FLANGE TYPE O₂ SENSOR

3 WIRE HEATED SENSOR

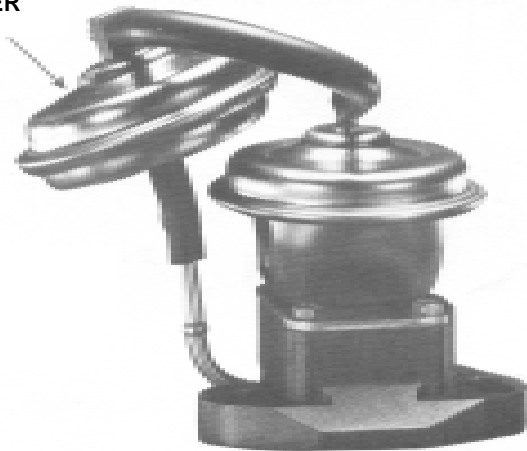
Certain late model foreign and domestic vehicles used a heated (3 wire) O₂ sensor. These sensors employ a 12 volt heater to decrease the warm up time of the sensor. These sensors all have the same output characteristics. They differ only in the length of the leads and the type of connector. Tomco solved the problem availability of the correct lead length and connector type by using crimp type connectors and heat shrink tube insulations on the universal heated type sensor #11014.



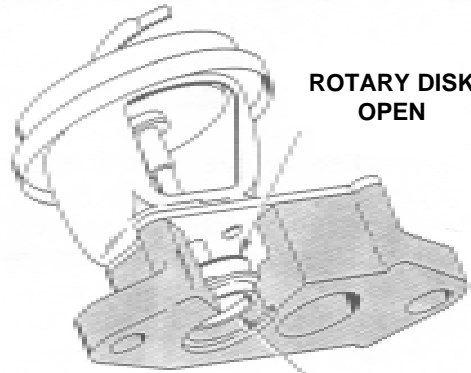
3 WIRE HEATED SENSOR FOR LATE MODELS

NEW HEAVY DUTY ROTARY DISK EGR VALVE

BACK-PRESSURE
TRANSDUCER



ROTARY DISK
OPEN



SEAT (ORIFICE)

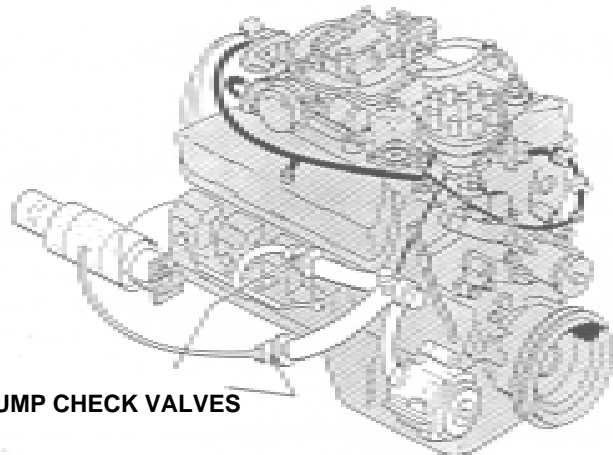
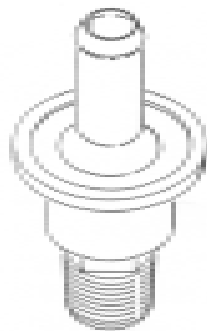
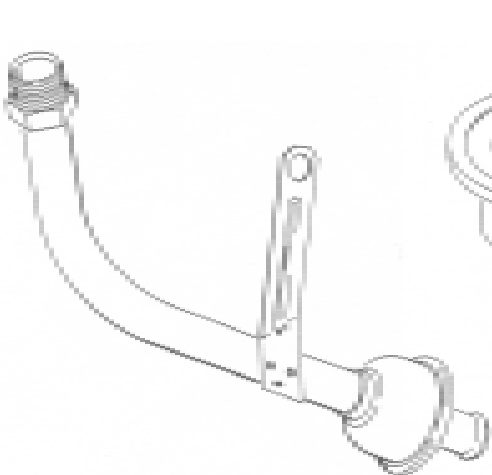
EGR valves are no longer just an engine accessory to meet emission standards. They play a vital part in eliminating detonation, ping or spark knock. Late model O.E. design valves have used a back pressure feature to

control the valves function. Clogging of the small back pressure passage in the diaphragm shaft by carbon deposits is a common problem with these type valves. Leakage at the valves seat has resulted in rough idle or stall-

ing complaints.

Tomco's new heavy duty valves use a remotely located back pressure transducer and a self-cleaning rotating disk valve seat to solve these problems.

A.I.R. PUMP CHECK VALVES



A.I.R. PUMP CHECK VALVES

Air pump check valves are one-way valves in the air supply tubes to the exhaust system. They prevent exhaust gas back flow into the A.I.R.

Pump System which would damage the system. They can also be found in the Air Tube to three-way catalytic convertor and are then called converter check valves.

Underhood exhaust leak noise or exhaust bypassing the valve are failure symptoms.

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