

Tomco Techtips

TM

ISSUE 3

How to read trouble codes on Ford's EEC-III

The EEC-III is one of the engine control computer systems used by Ford since midyear 1978. (We will cover the others in later issues.) This procedure uses an inexpensive voltmeter and other generally available test devices instead of the special diagnostic tester originally specified by Ford. Just follow these steps to get the service codes from cars using this system.

1. Connect the negative lead from an analog (pointer type) voltmeter to the green thermactor air bypass diverter (TAB/TAD) solenoid. (Fig. A) This is usually found on the passenger side of the carburetor. (Don't confuse this with the EGR valve and throttle kicker solenoids which are usually found on the driver side of the carburetor.)

2. Connect the positive lead to the positive battery post.

3. Set the voltmeter to the 12v battery post.

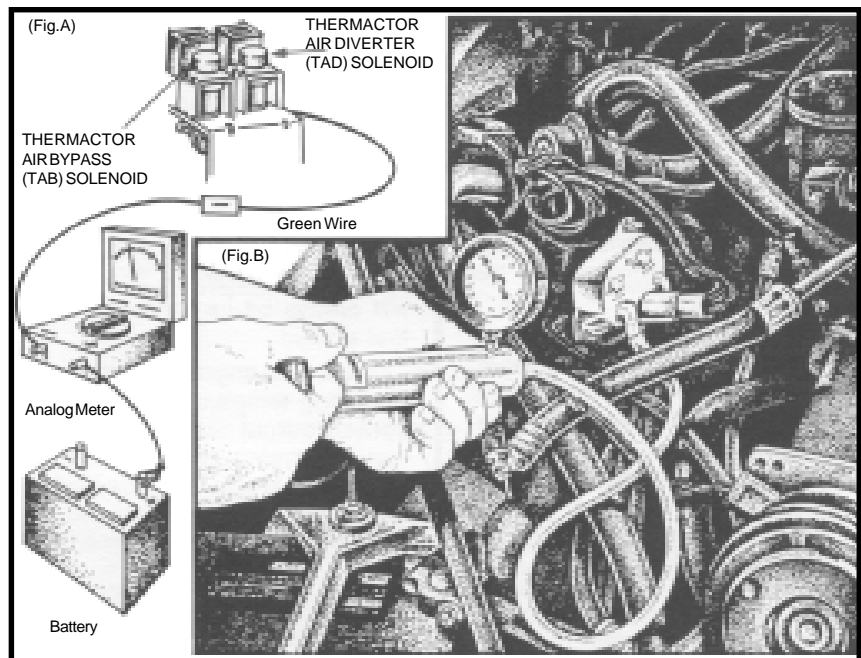
4. Connect a 12v test light to the canister purge ground circuit.

Caution: This is not the bowl vent solenoid.

5. Start the engine and run it at 2000 rpm for approximately one minute. Then return to idle.

6. Apply 20" Hg vacuum to the barometric pressure/manifold absolute pressure (BP/MAP) sensor vent port for eight seconds. Then release the vacuum. (Fig. B)

The throttle kicker (TKS) plunger will move rapidly in and out to signal that the self test has begun. Then it will remain out for approximately 1 1/2 minutes, signaling that the system is in its diagnostic routine. Finally it will return to curb idle and the system will begin to give service codes.



7. To read the service codes, watch the pointer on the voltmeter. Codes are displayed as needle sweeps. (Example: 3 sweeps, pause, 1 sweep equals code 31). The voltmeter needle will continue to sweep until all codes in the memory have been displayed. Then the 12v test light you connected earlier will come on signaling the end of the test.

Next, the computer will energize the throttle kicker which will raise the rpm to 1500 for 15 to 20 seconds, then return to idle. If you are not sure of these codes, repeat the test.

The following chart lists the service codes and the components or circuits they indicate for Ford's EEC-III. Keep in mind, this is a condensed, basic service code chart. This procedure is much handier than searching through large service manuals. However, for specific information, check the service manual for the model and year of the car.

EEC-III SERVICE CODE CHART

Service Code	Instruction
11	VIP Test "Pass Status"
12	Engine RPM Out-of-Spec
21	Engine coolant temperature sensor shorted, open or out of range
22	Manifold absolute pressure sensor shorted or open
23	Throttle position sensor shorted, open or out of range
24	Air charge temperature sensor shorted, open or out of range
31	EGR valve inoperative
32	EGR valve position sensor shorted, open or out of range
41	Fuel control system always lean
42	Fuel control system always rich
43	Engine coolant temperature-VTC3; cold VIP test
44	Secondary Air system inoperative

How to test for open/closed loop status and rich/lean exhaust condition on GM cars.

This sample tests tells you if the engine is running in the open or closed loop status, and also indicates whether its exhaust condition is rich or lean. It requires no special equipment. GM describes this test as placing the computer into the field service mode.

First, with the ignition off, jump the A and B terminals of the assembly line connecting link (ALCL). (As you may remember from the last issue, this was accomplished using a jumper tool or bent paper clip. However, in that test we turned the ignition on, but did not start the engine). To perform this test, you will start the engine and observe the CHECK ENGINE or SERVICE ENGINE SOON light

OPEN/CLOSED LOOP TEST

The SERVICE ENGINE SOON light will begin to flash. Count the number of flashes per second. A rate of two and a half flashes per second indicates the system is in open loop operation. The system will always be in open loop when first started.

Once the engine coolant reaches operating temperature and the O2 sensor output voltage begins to vary, the system enters closed loop operation.

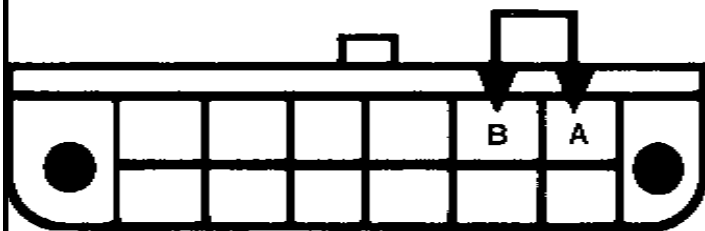
If the system fails to go into closed loop operation, this indicates that the engine coolant temperature sensor may not be functioning properly. Both should be checked and replaced with a new Tomco, Inc. unit if necessary.

RICH/LEAN FUEL MIXTURE TEST

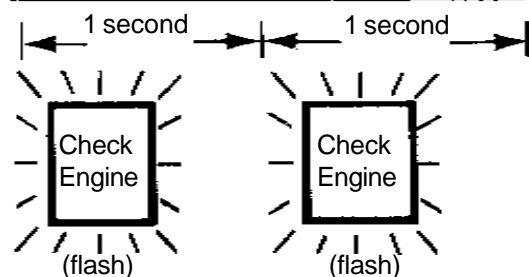
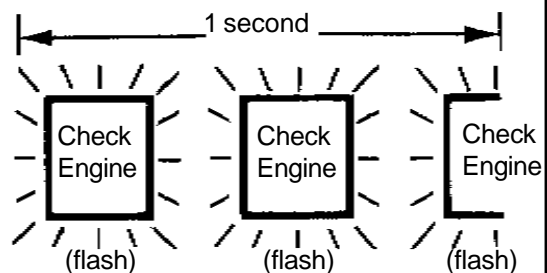
The O2 sensor monitors the status of the air/fuel ratio in the exhaust. This status is indicated in the way the SERVICE ENGINE SOON light flashes.

At this point, the light is flashing about one time per second. If the flashes are short, so that the light appears to be OFF more than ON, you are reading a lean mixture. If the flashes are long, so that the light appears to be ON more than OFF, you are reading a rich mixture.

DIAGNOSTIC CIRCUIT CHECK



ALCL CONNECTOR
(Look for letters on the ALCL terminals)



1 flash per second=closed loop

Two new service aids for GM computer-controlled carbs.

How to repair GM carburetors with stripped lean mixture adjustment screw threads.

This repair kit can save your customer \$600 to \$800 for a new carburetor. Tomco, Inc. offers a repair kit with everything you need to repair the lean mixture screw threads in the bowl casting of four barrel Quadrajets or two barrel Dual Jet computer-controlled carburetors.

Here's how it works. First, remove the mixture control solenoid and all components, float and pin assembly. Then place the carburetor or fuel bowl on a firm base, making sure the linkage is clear.

Now apply Loctite 271 (included in the kit) to the knurled section of the repair stud. Place the driving tool over the threaded shank of the stud. Put the knurled end of the stud in the counter bore of the adjustment stud screw hole and drive it into the hole and drive it into the hole until the shoulder seats against the casting.

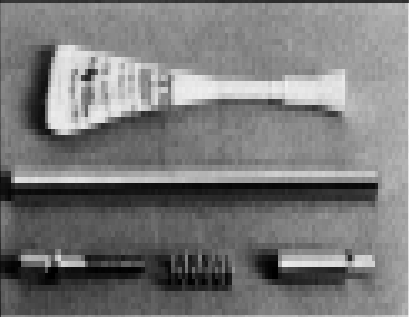
Replace all components and make the necessary adjustments. A new spring and adjusting cap are included in the kit, as are complete instructions.

Now you can make "on the bench" mixture adjustments to GM carburetors.

This handy tool kit allows you to adjust the lean mixture screw, rich stop screw, and idle air bleed valve on GM computer-controlled Quadrajets and Dual Jet carburetors. These adjustments must be made for correct carburetor function. The wrench is also needed for the final on-the-car mixture control solenoid "dwell" setting.

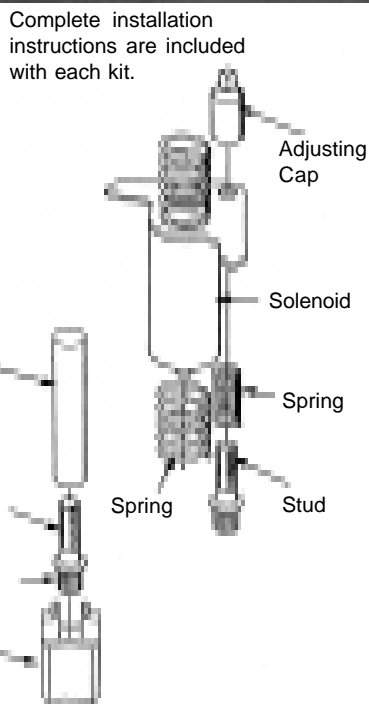
The kit contains a lean mixture gauge, a lean mixture screw adjustment wrench and a plunger travel gauge for making the rich stop screw adjustment. The kit also contains complete instructions.

Both kits are available from your local Tomco, Inc. jobber. Order No. 13725 adjustment tool kit and No. 13726 repair kit.

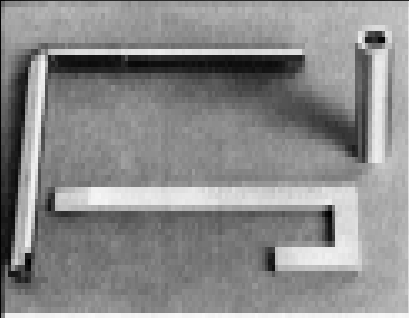


This kit saves the expense of a new 4 barrel Quadrajets or 2 barrel Dual Jet computer controlled (CCC) carburetor when the threads for the lean mixture adjusting screw in the bowl casting strip out. A knurled repair stud and adjusting cap replace the original adjusting screw.

Complete installation instructions are included with each kit.

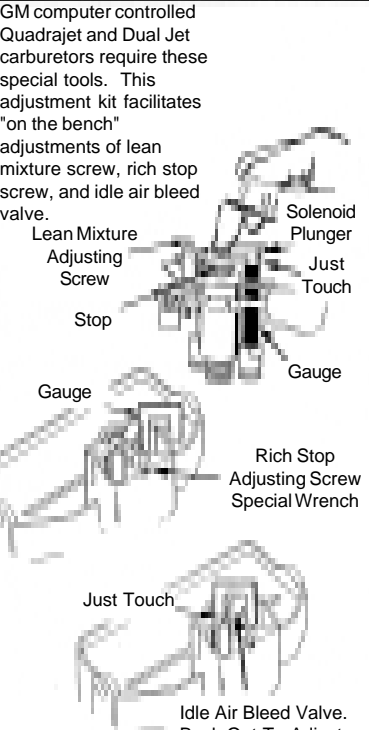


LEAN MIXTURE SCREW REPAIR KIT #13726



Idle Air Bleed Valve.

GM computer controlled Quadrajets and Dual Jet carburetors require these special tools. This adjustment kit facilitates "on the bench" adjustments of lean mixture screw, rich stop screw, and idle air bleed valve.



MIXTURE CONTROL ADJUSTMENT KIT #13725


Idle Air Bleed Valve. Back Out To Adjust.



NEW CONSOLIDATION!

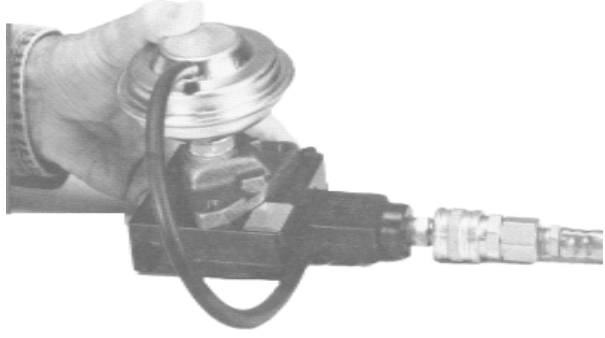
Tomco, Inc. builds your tune-up sales with 60% fewer part numbers.

Whether it's fuel injection kits, carburetor kits, choke pull-offs, choke thermostats or carburetor floats, you'll cut your inventory while you build sales at Tomco, Inc. fuel system parts. Call or write for more information.



Update yourself and your mechanics on engine performance controls

This 40 minute tape gives you an overview of the 10 most important engine performance controls. The tape covers location, function and troubleshooting tips. It also demonstrates the new EGR valve tester. Order part number 8-V for VHS format or 8-B for Beta format. Send check or money order for \$29.95, plus \$2.50 for shipping and handling for each tape to the address below.



Test all types of EGR valves with Tomco, Inc. tester.

This hand-held tester allows positive testing of all types of EGR valves. It is easy to use, inexpensive and operates on shop air. It comes with complete instructions and storage case. Call or write for more information.

One Tomco, Inc. Oxygen Sensor replaces 68 of other brands, imports included!



One part fits all.

Tomco, Inc. part number 11011 fits all cars and trucks, domestic and import, using one or two-wire oxygen sensors.

Easy to install.

Just remove the old sensor and splice the new sensor onto the existing connector. Everything for the job is included in the package. Call or write for more information.