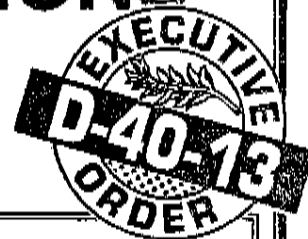


INSTALLATION INSTRUCTIONS

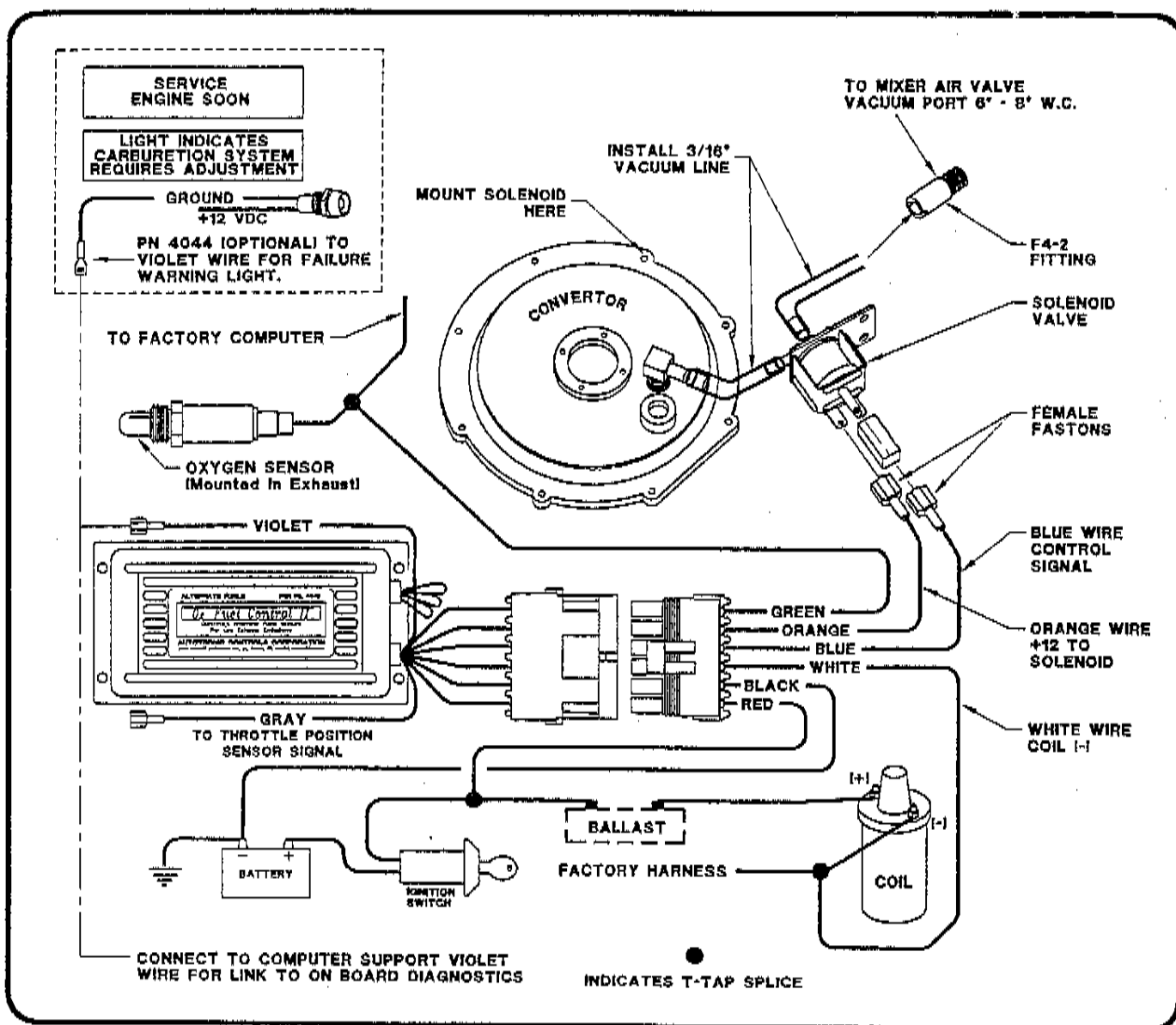
O₂ FUEL CONTROL II PN 4046



PARTS INCLUDED IN THIS KIT:

- 1 O₂ AIR/FUEL MIXTURE CONTROL
- 1 SOLENOID VALVE
- 3 WIRE TAP CONNECTORS
- 1 AIR FILTER FOR SOLENOID
- 3 INSULATED MALE FAST-ON
- 1 1/4" RING LUG CONNECTOR

- 2 FEMALE FAST-ON
- 1 6-PIN MALE CONNECTOR
- 4 #4 x 3/4 SELF TAPPING SCREWS
- 1 1/8 NPT ORIFICE ELBOW
- 1 INSTALLATION INSTRUCTIONS



Now Legal By Executive Order For Sale Or Use In California On Pollution Controlled Motor Vehicles

OPERATION

The *O₂ Fuel Control II* regulates the air/fuel (A/F) mixture ratio when a vehicle is powered by alternate fuels. This control of the A/F mixture ratio is based on the voltage signals produced by the vehicle's factory O₂ sensor which is mounted on the exhaust system.

When the vehicle is operating on gasoline, the factory O₂ sensor supplies a voltage to the vehicle's computer. Then the computer sends signals to the fuel system to make adjustments to the A/F mixture, which keeps it at the stoichiometric ratio for gasoline: 14.7 parts air to 1 part fuel. This precise mixture control improves exhaust emissions, driveability, and fuel economy.

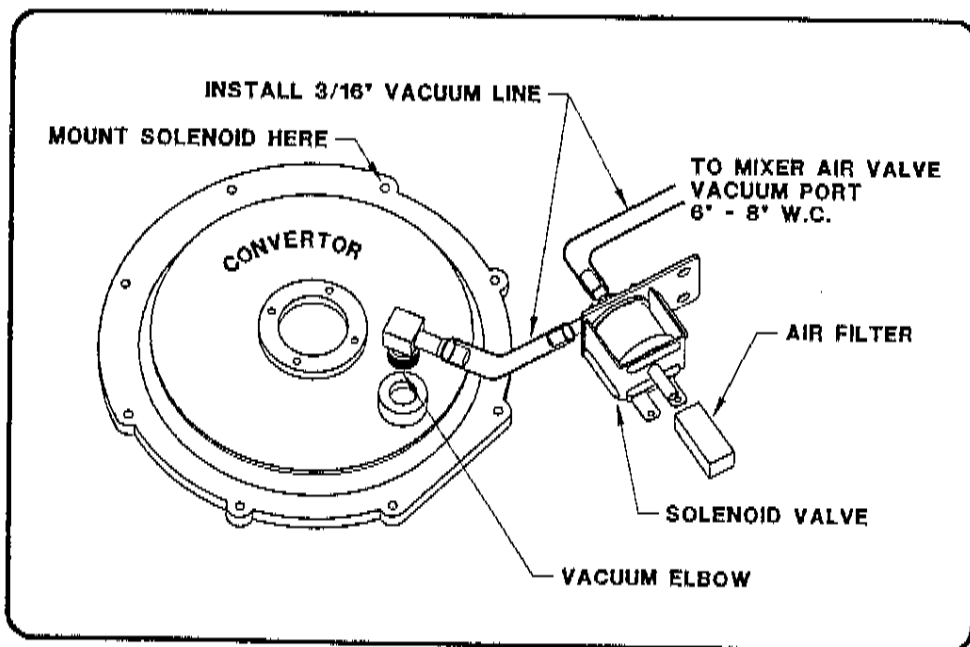
The *O₂ Fuel Control II* performs the same regulating of the A/F mixture when the vehicle is switched to alternate fuel. It interrupts the factory's O₂ sensor signal and then varies the A/F mixture by activating a Solenoid Valve, that varies a vacuum draw on the convertor diaphragm. (The mixer metering valves should be calibrated for a slightly richer mixture.) When the Mixture Control unit receives signals from the O₂ sensor, the solenoid valve will pulse on and off to lean the slightly richer mixture.

This pulsing action of the Solenoid Valve keeps the A/F mixture at the stoichiometric mixture for the particular alternate fuel. For Propane this is 15.5:1 A/F ratio, and for CNG it is 16.8:1 A/F ratio. Consequently, all the benefits of precise regulation of the alternate fuel's A/F mixture are now available: improved exhaust emissions, driveability and economy.

HARDWARE INSTALLATION

Mount the Unit - Use the four sheet metal screws supplied in the parts kit to Mount the unit so that its cable will reach the factory O₂ sensor signal wire, and the alternate fuel convertor. Do not mount it on the engine or near the exhaust manifold. Extreme heat from these locations can damage the unit. The unit is moisture resistant, however, do not mount the unit where water will collect in the case.

Mount the Solenoid Valve - Remove one of the screws which holds the convertor cover. Use this screw to secure the Solenoid Valve to the Convertor cover.



Install the Vacuum Elbow In the Convertor - Thread the plastic Vacuum Elbow into the Convertor cover at the available hole. Tighten it just snug enough to ensure there is no air leakage, but not so tight as to break the threads on the elbow.

Position the orifice elbow hole to the bottom side or downward direction of the elbow to prevent water from accumulating.

Using 3/16-in. vacuum line (not included), connect the Vacuum Elbow, as pictured, to the Solenoid Valve's side port. Now use some vacuum hose to connect the other port (as pictured), of the Solenoid Valve to the Mixer's air valve vacuum port. The air valve vacuum is located in the area between the air valve mixer and the intake throttle butterfly. A balance line is not required with this system.

ELECTRICAL CONNECTIONS

Fast-On, T-Tap connections are supplied for installation convenience. Use a non-conductive white grease or silicone inside the splice device for a better seal, however, soldered and sealed connections are always best.

The 6-pin Male Weathertight connector's bare wire ends attach to these points:

PIN & WIRE	CONNECTION LOCATION
A - RED	Switched +12 volts DC power to unit.
B - BLACK	Negative Ground on engine or battery.
C - WHITE	RPM signal to unit. Connect to Coil (-).
D - BLUE	Control signal to Solenoid Valve.
E - ORANGE	+12 volts power to energize solenoid.
F - GREEN	O ₂ sensor signal input to unit.
Single GRAY	Throttle Position Sensor signal.
Single VIOLET	Controlled ground for Computer Support failure diagnostics or optional failure warning LED.

A - RED: Connect the RED wire to a +12V source that is activated by the ignition switch, and which is before any ballast resistor. Coil (+) is suggested. This wire, is hot on both fuels, to provide for smooth fuel switching.

B - BLACK: Crimp the supplied 1/4-inch ring lug to this wire and attach it to a (-) ground point. At the vehicle's battery negative ground terminal is best, but it can be connected to an engine block or frame bolt if the connection is free of paint or grease.

C - WHITE: Connect to the coil's tach (-) wire. On Distributorless Ignition System (DIS) connect to one of the coil (-) wires or tach output wire.

For GM DIS Vehicles . . .

Many new GM vehicles are equipped with a Direct Ignition System (DIS), and therefore no coil(-) to trigger the O₂ Fuel Control II. Instead of triggering from coil(-), trigger the O₂ Fuel Control II directly from the "Ref Pulse Input".

STEP 1 - Follow the spark plug wires to the DIS coil pack. The coil pack will have a connector with five wires. Find the PURPLE/WHITE TRACER (Ref Pulse Input).

STEP 2 - After locating the PURPLE/WHITE TRACER wire and connect the WHITE coil(-) input from the O₂ Fuel Control II to it. *Cut only one RED loop.*

For FORD DIS and EDIS Vehicles . . .

On DIS ignitions, connect (T-Tap) O₂ Fuel Control II's WHITE tach wire to the factory (SAW) spout connector wire (DIS YELLOW/GREEN) located on the driver's side above the fenderwell, next to the DIS ignition module.

On 1991 to 1993 4.0L EDIS Ignitions of Ranger Truck and Explorer find spout between battery and headlights. Connect (T-Tap) the WHITE tach wire to the PINK (SAW) spout connector wire. *Cut only one Red wire loop for 6 cylinder.*

On 1991 to 1993 4.6L EDIS Ignitions connect (T-Tap) the WHITE tach wire to the PINK (SAW) spout wire located on the driver's side above the fenderwell, next to the ignition module. **Do not cut any Red loops.**

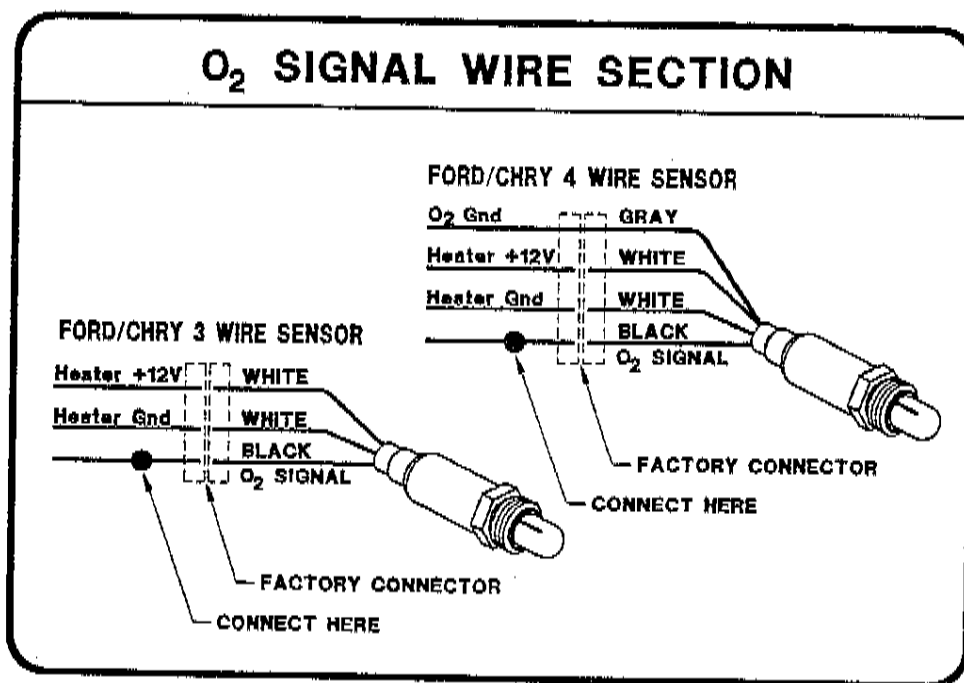
For CHRYSLER/DODGE DIS Vehicles. . .

Connect WHITE tach wire to one coil(-) driver wire at DIS module. Cut all the Red jumper wires on the *O₂ Fuel Control II* for proper response.

D - BLUE: Crimp one of the supplied insulated female fast-on connectors to this wire and then attach it to one of the male spade ends of the Solenoid Valve. It does not matter which one. Note: This is the controlled ground wire that makes the valve turn on/off.

E - ORANGE: Crimp the insulated female fast-on connector to this wire and then attach it to the other male spade end of the Solenoid Valve. (Note: This is +12VDC.)

F - GREEN: Splice into the factory *O₂* sensor's 0-1V signal wire. Many of the Computer Supports already provide an *O₂* sensor signal (Green Wire) for the 4046 to hook to. Keep away from Spark Plug wires.



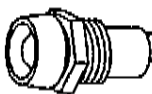
Single GRAY: Use a T-Tap to splice into the factory Throttle Position Sensor (TPS) signal wire. This wire is commonly located in the center of the throttle position sensor. The TPS is usually found opposite of where the throttle cable connects at the air inlet. The signal wire can be identified by measuring the voltage on the wire and noticing the volts (.7 to 4.5V) increase as the throttle opens. Note: If TPS option is not used, ground the Gray wire. Keep away from Spark Plug wires.

Single VIOLET: Controlled ground wire for Computer Support Device failure indication or optional dash mounted failure warning light. (Optional LED warning light, PN 4044, ordered separately.) The *O₂ Fuel Control II* has continuous closed loop diagnostics monitoring. Unit's diagnostic logic is capable of detecting errors in the final control signals and, through the Computer Support Device, activate the factory "Check Engine" light or turn on a dash mounted failure warning light until correct closed loop operation is obtained. Failure warning light (when illuminated) indicates steps should be taken

to correct the closed loop operation. Examples: Adjust air/fuel mixture, verify good O₂ sensor condition, and/or check for proper O₂ Fuel Control operation.

Optional Failure Warning Light

RED - Switched +12 Volts DC Power.



**BLACK to VIOLET Wire For Optional
Warning Light.**

CALIBRATING THE UNIT

Cylinder Select Function - The *O₂ Fuel Control II* is built with cylinder select snip wire loops that match the control speed of the feedback to the size engine being controlled. This function can also be used to increase the control rate on advanced set-up applications. For example, on an 8 cylinder engine, the more red loops cut, the faster the control rate. Too fast of a control rate may result in oscillating idle RPMs.

Red Wire Loops

None Cut - 8 cyl. engine w/distributor.

1 Cut - 6 cyl. engine w/distributor.

2 Cut - 4 cyl. engine w/distributor.

All Cut - DIS engine w/multiple C-.

NOTE: Cut wire loops at different lengths to prevent shorting, and install provided heat shrink caps to all cut wires.

Adjusting The Idle And Cruise Mixtures . . .

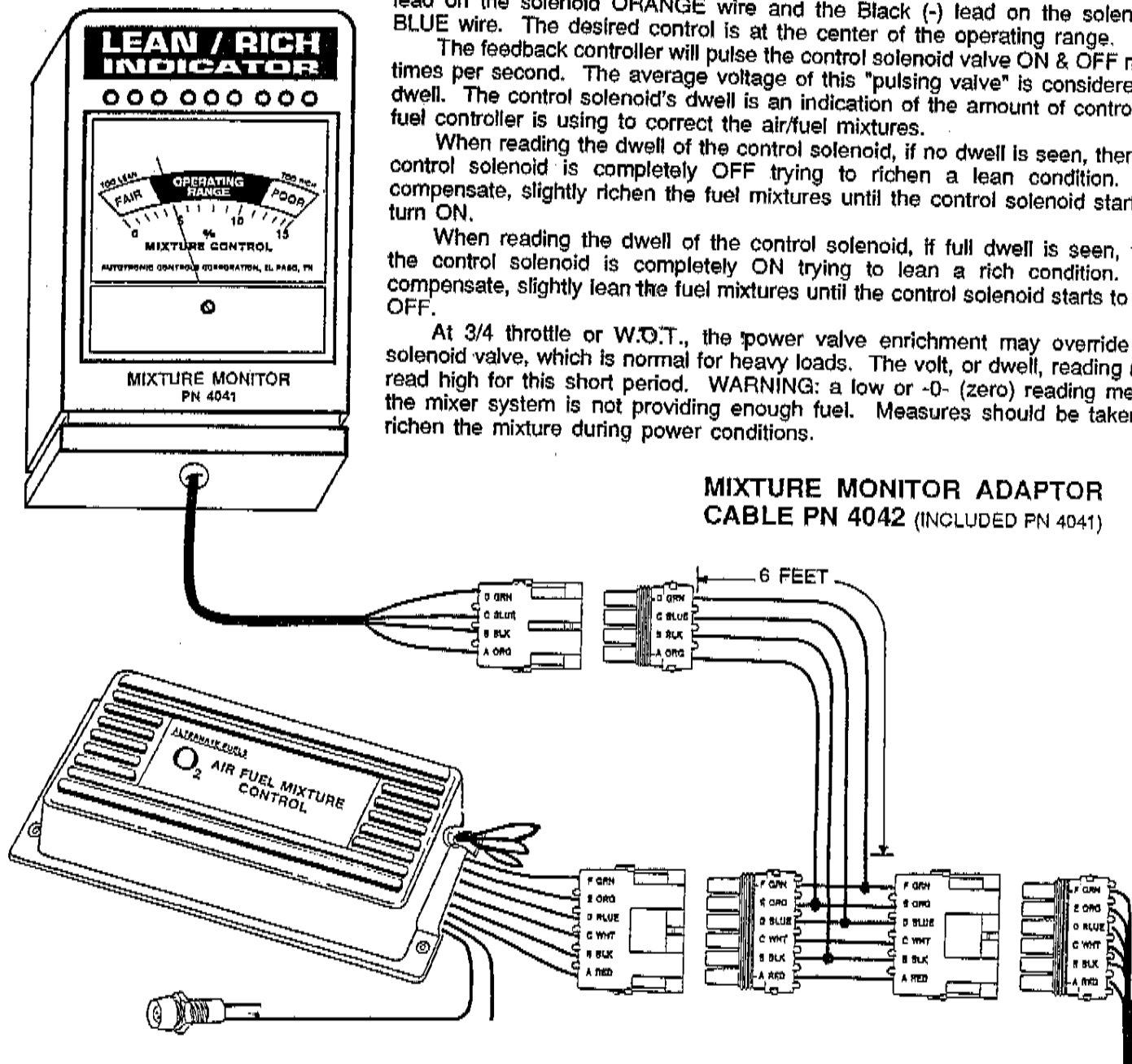
Install the *Mixture Monitor, PN 4041*, in line with the unit's 6-pin connector as pictured. An analogue voltmeter can be used as a substitute with the Red lead on the solenoid ORANGE wire and the Black (-) lead on the solenoid's BLUE wire. The desired control is at the center of the operating range.

The feedback controller will pulse the control solenoid valve ON & OFF many times per second. The average voltage of this "pulsing valve" is considered its dwell. The control solenoid's dwell is an indication of the amount of control the fuel controller is using to correct the air/fuel mixtures.

When reading the dwell of the control solenoid, if no dwell is seen, then the control solenoid is completely OFF trying to richen a lean condition. To compensate, slightly richen the fuel mixtures until the control solenoid starts to turn ON.

When reading the dwell of the control solenoid, if full dwell is seen, then the control solenoid is completely ON trying to lean a rich condition. To compensate, slightly lean the fuel mixtures until the control solenoid starts to turn OFF.

At 3/4 throttle or W.O.T., the power valve enrichment may override the solenoid valve, which is normal for heavy loads. The volt, or dwell, reading may read high for this short period. **WARNING:** a low or -0- (zero) reading means the mixer system is not providing enough fuel. Measures should be taken to richen the mixture during power conditions.



Rich/Lean Logic . . .

As the fuel controller sees a RICH mixture from the O₂ Sensor (above .450 volts) it starts pulsing ON the control solenoid valve until a correct air/fuel ratio is reached.

As the fuel controller sees a LEAN mixture from the O₂ Sensor (below .450 volts) it starts pulsing OFF the control solenoid valve until a correct air/fuel ratio is reached.

With this in mind, a desired set point is from 7-9 volts, or 40-50% (percent) dwell. This will allow the control valve equal control in both the RICH and LEAN directions.

Calibrating The Orifice Elbow . . .

As received, the feedback controller comes with an orifice elbow that has a calibrated .078" orifice hole. This orifice is calibrated to deliver smooth controls of the air/fuel mixtures on most V8 and V6 engines. If desired, more control can be gained by plugging the factory drilled orifice and drilling a smaller orifice. Example: 1/16" (.062") drill size, or 3/64" (.047) drill size.

NOTE: Too small of an orifice size will cause oscillating idle RPM's and a lean stumble on sudden accelerations due to an "over" restricted orifice size.

NOTE: The solenoid filter port & the orifice together to allow the front cover to breathe freely.

AFFIX THE C.A.R.B. DECAL

This Label is required to aid in passing the California Smog Check Program. This Label must be installed in an underhood location that is readily visible near the carburetor/manufacture decal.

This vehicle is equipped with a feedback mixture control which works in conjunction with a computer support device to maintain the mixtures and prevent false service codes during the alternate fuels operation.

Device: O₂ FUEL CONTROL II Part No. 4046 CARB E.O. #D-40-13

To be used in conjunction with conversion support device listed in E.O.

Idle & Power Adjustments: Use the Mixture Monitor Part No. 4041 -- Set within operating range or use a voltmeter across the solenoid terminals and adjust mixtures between 4-12 volts.

Autotronic Controls Corp., 1490 Henry Brennan Dr., El Paso, TX 79936 (915) 857-5200

AUTOTRONIC OBD SUPPORT DEVICE APPLICATIONS

The *O₂ Fuel Control II* may also be used in conjunction with a variety of Autotronic Controls Computer Support Devices.

APPLICATION	NOMENCLATURE	PART No.
GM: All	GM Computer Support	8690
Ford:		
Taurus, Sable (3.0L & 3.8L, SEFI)	Ford Conversion Support T	8697
Crown Vic, Grand Marquis (4.6L, SEFI)	Ford Conversion Support II	8696C
Explorer (4.0L, SEFI)	Ford Conversion Support II	8696C
Ranger (3.0L, SEFI)	Ford Conversion Support III	8693
Trucks (4.9L to 7.4L, MPFI)	Ford Conversion Support IV	8695
Chrysler/Dodge:		
All Trucks (SEFI)	Chrysler Support I	4121
All Cars (SEFI)	Chrysler Support II	4122
All Trucks (TBI)	Chrysler Support IV	4124
All Cars (MPFI)	Injector Simulator	8789-9

NOTES:**LIMITED WARRANTY**

Autotronic Controls Corporation warrants this product to be free from defects in material and workmanship under normal use and if properly installed for a period of one year from date of purchase. If found to be defective as mentioned above, it will be replaced or repaired if returned prepaid along with proof of date of purchase. This shall constitute the sole remedy of the purchaser and the sole liability of Autotronic Controls Corporation. To the extent permitted by law, the foregoing is exclusive and in lieu of all other warranties or representations whether expressed or implied, including any implied warranty of merchantability or fitness. In no event shall Autotronic Controls Corporation be liable for special or consequential damages.

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The logo for Dual Curve features the words "Dual Curve" in a stylized, italicized, outlined font. The "D" is particularly large and prominent. Below the text, there is a graphic element resembling a lightning bolt or a stylized "V" shape.

AUTOTRONIC CONTROLS CORPORATION
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