ECHLIN Ignition SERVICE BULLETIN

THE ECHLIN MANUFACTURING COMPANY BRANFORD, CONN.

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NAPA ECHLIN INTRODUCES TO YOU THE CHRYSLER LEAN BURN SYSTEM

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For 1976 Chrysler Corporation introduced the Electronic Lean Burn System.

It is the philosophy at Chrysler Corporation that exhaust emissions can be controlled within the engine. The Electronic Lean Burn System is an extension of this concept which allows the engine to operate more efficiently than engine control systems currently in use.

With the use of the Electronic Lean Burn System, it is possible to eliminate several items of emission control hardware including: The EGR System, the OSAC System, the air pump, the catalytic converter and the associated heat shields (except California), and the conventional distributor vacuum advance unit. By eliminating the catalytic converter, cars equipped with Electronic Lean Burn Systems are not required to use Lead Free gasoline.

The lean burn system introduces an entirely new technique for meeting Emission requirements. That is, engines can run on extremly lean mixtures. Hydrocarbon (HC) and Carbon Monoxide (CO) drop to low levels at an air fuel ratio of about 15.5-1. This is approximately the ratio used in today's engines; however, the Nitrous Oxides (NOx) emissions peak at this point. Engines using the lean burn system run on air/fuel ratio near 18-1. Here's an important point to keep in mind about the lean burn system engines. NOx Emissions drop dramatically due to cooler combustion and the presence of excess air. The leaner mixtures are delivered to the engine by a conventional carburetor calibrated to deliver smaller quantities of fuel in proportion to the air passing through it.

This use of lean mixtures allows much of the oxygen which enters the engine to pass through the engine and into the exhaust system without combining with the fuel in combustion. In the exhaust system, it can be used to control HC. However, HC begins to rise slightly in the air/fuel ratio ranges used with lean burn. To maintain control of HC, the ignition timing is retarded during operation conditions which produces high HC. This retarded timing results in higher exhaust gas temperatures throughout the exhaust system. The increased temperature of the exhaust gases facilitates oxidation of a significant amount of the unburned HC to CO2 and H2O as the gases pass through the exhaust system. In effect, the exhaust system is a part of the emission control system.

Carbon Monoxide (CO), which represents incomplete combustion normally associated with rich mixtures, drops off and remains low through the lean burn system range.

Up until the present time it has been impossible to mass produce engines that could run satisfactorily on these lean mixtures. There are simply too many variables that can effect engine performance, such as, temperatures, engine speed, how and where the car is driven, etc.

Also, until the present time mechanical methods (distributor vacuum advance and distributor centrifugal advance) have been used to control the timing of the spark to ignite the air/fuel mixture in the combustion chamber. These mechanical methods are simply too slow to compensate for the fast changing variables an engine must perform under.

The Electronic Lean Burn System is able to instantly calculate all the variables and ignite the spark at precisely the right moment for optimum driveability, economy, and emission control.

Sensors are located throughout the engine that monitor all the critical and fast-changing conditions that affect engine performance.

These sensors monitor the following:

- Engine speed
- Intake manifold vacuum
- Throttle position--whether idling, cruising, accelerating or slowing down
- Rate of change in throttle position
- Air temperature entering the carburetor
- Engine coolant temperature

The sensors feed all this information into a computer. The computer then instantly determines the exact moment at which the mixtures in the combustion chambers should fire for the best combination of driveability, economy, and emission control.