2. DISTRIBUTOR MINOR REPAIR AND ADJUSTMENTS

In loadomatic-type distributors the spark advance is regulated entirely by the vacuum differential at the carburetor.

The spark advance characteristics are controlled by two breaker plate springs, working against the distributor spark control diaphragm (fig. 11). The amount of spark advance obtained is determined by the amount of vacuum supplied to the distributor, and by adjustment of the breaker plate springs.

The 8-cylinder distributors, used with four barrel carburetors, incorporate a new double diaphragm for better control of breaker plate advance characteristics. The purpose of the second diaphragm is to provide a rapid spark retard at the acceleration tip-in point. The primary spark control diaphragm (closest to the distributor body) operates in the same manner as the single type diaphragm.

The 6-cylinder carburetor incorporates a nylon distributor vacuum passage check ball which, at high engine speeds, prevents venturi vacuum bleed back into the manifold and assures maximum spark advance.

A vacuum operated spark control valve is attached to the carburetor throttle body on all 8-cylinder engines to control manifold vacuum to the distributor and regulate spark advance. This feature improves engine performance and increases overall fuel economy.

a. Operation of Distributor Double Diaphragm.

The secondary spark control diaphragm (fig. 12) forces a quick, momentary spark retard while the distributor vacuum line, carburetor vacuum passages, and primary spark control diaphragm are normalizing to the new pressure conditions which develop when the spark control valve closes the manifold vacuum passage in the carburetor. This provides the sudden retard necessary to prevent "tip-in" detonation. As soon as the vacuum passage pressures normalize, the primary spark control diaphragm again resumes full control of advance characteristics.

The secondary spark control diaphragm (furthest from the distributor body) is not connected either to the breaker plate or the primary spark control diaphragm. There is merely an air chamber between the two diaphragms. The secondary spark control diaphragm is held in an outward position by straight intake manifold vacuum working against a calibrated spring. This spring is located under the hex head plug in the center of the secondary diaphragm housing. The manifold vacuum is taken from the base of the carburetor throttle body. When the throttle is opened suddenly for rapid acceleration, manifold vacuum drops quickly, and the spring loaded secondary spark control diaphragm moves toward the primary spark control diaphragm. The resulting air pressure between the two diaphragms pushes the primary spark control diaphragm inward, providing a quick spark retard. In this way "ping" or detonation at the tip-in point of acceleration is definitely reduced if not entirely eliminated.

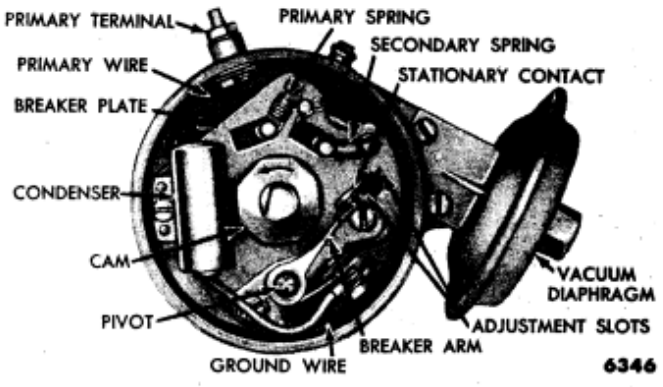


Fig. 11—Distributor—Typical

b. Operation of Spark Control Valve.

The spark control valve retards distributor spark advance during acceleration at low speeds to prevent excessive "ping" (detonation). When the throttle is opened to a setting greater than that required to maintain existing engine speed, manifold vacuum drops sufficiently to permit the spark control valve to close, cutting off the manifold vacuum passage to the distributor, thereby providing the spark retard needed to prevent objectionable "ping." As engine speed approaches the throttle setting, manifold vacuum builds up sufficiently to open the spark control valve, permitting manifold vacuum to effect the advance of the spark timing to meet engine requirements.

Through use of the spark control valve, a distributor advance curve has been established to provide the best spark advance under road load conditions without incurring "ping" on acceleration.

A schematic drawing of the spark control valve and the related vacuum passages in the carburetor is shown in fig. 13. Operation is as follows:

The inner side of diaphragm "A" is subjected to manifold vacuum while the outer side is exposed to atmospheric pressure. Spring "C" is calibrated to allow valve operation at approximately 6.5 inches of mercury manifold vacuum. Since vacuum passage "D" is above the throttle plate closed position, the spark control valve is

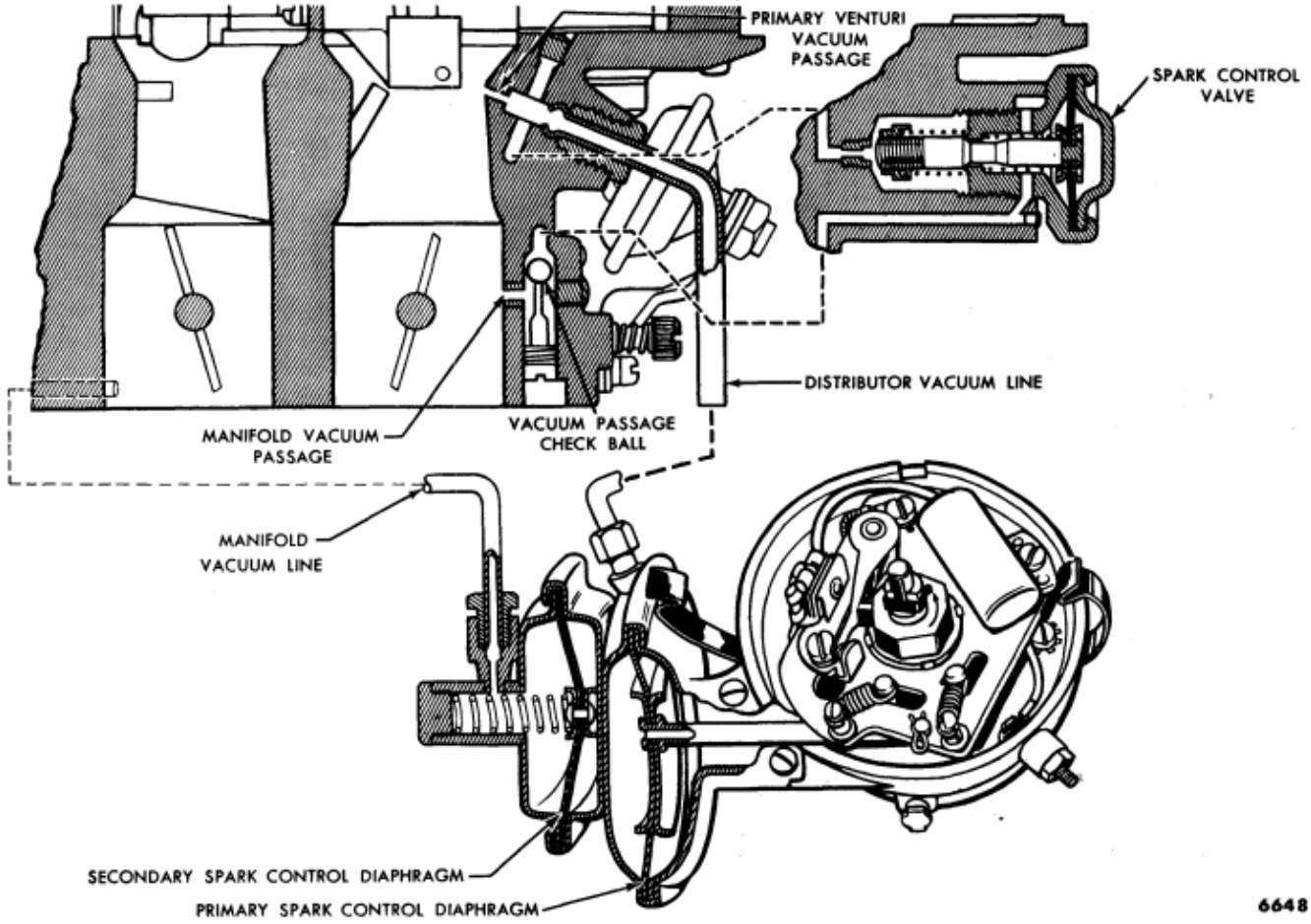


Fig. 12—Distributor Advance Controls

normally closed when the engine is not running or is only operating at idle speed.

When the vehicle is being operated at steady part throttle under normal road load conditions, manifold vacuum is above 6.5 inches of mercury and valve "B" is open, permitting manifold vacuum to effect distributor spark advance. Sudden opening of the throttle for acceleration causes a drop in manifold vacuum. When this drop reduces manifold vacuum below approximately 6.5 inches of mercury, the spark control valve closes, cutting off manifold vacuum to the distributor which results in a retard of spark timing. With the valve closed, spark advance is controlled entirely by venturi vacuum which is low at reduced engine speeds.

As engine speed approaches the throttle setting, manifold vacuum increases sufficiently to open valve "B" allowing manifold vacuum to again act on the distributor advance mechanism.

When operating the vehicle at high speeds, at or near full throttle opening, manifold vacuum is low and will not hold the spark control valve open. Under these conditions, venturi vacuum is high and is the sole control of spark advance. With the spark control valve closed, venturi vacuum will not bleed back into the manifold, and the best possible spark advance is assured.

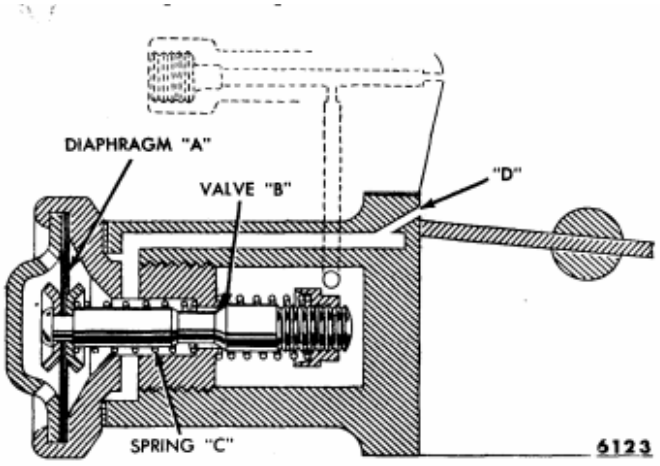


Fig. 13—Spark Control Valve Diagram