

Breaker Point Service

A series on understanding, service and repair of the points and distributor

It sounds simplistic: set the breaker points with a feeler gauge to factory spec and you are good to go. If only it were that simple and easy. The points are merely one small part of a very complex system. If any one part of that system is worn or out of adjustment, the engine will not run properly.

The intake and exhaust valves are critically timed to open and close at a particular point in the cycle of the engine. If the valves are timed improperly, a perfect distributor is still not going to solve problems. Conversely, if the valve timing is perfect, but the spark does not occur at the precise point specified by the manufacturer, the engine will run rough.

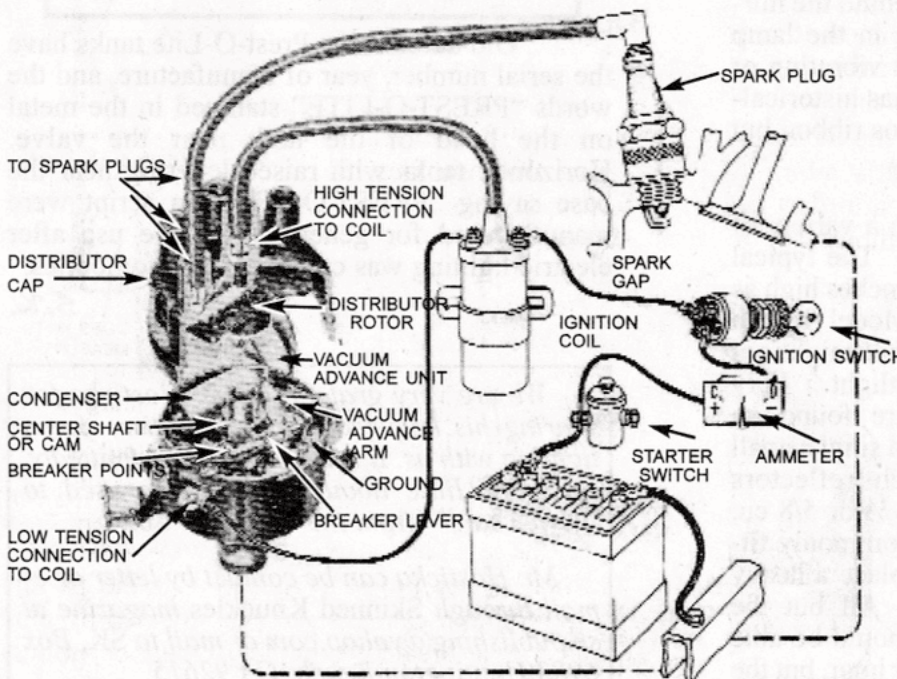
We will look at the distributor with the assumption that the valve train is in good order,

the timing chain or belt not stretched or otherwise damaged, and that the distributor has been used to set the timing of the valves according to manufacturer's specs.

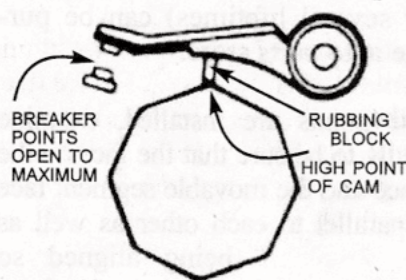
The ignition system consists of a number of components – on some engines more than others, but for the standard single breaker point ignition, you will find the following: the coil, the distributor, spark plugs and a series of wires connecting everything.

The distributor is a two-part unit. The top of the distributor is actually a timer or, if you prefer, a rotating switch. The high voltage current flows through the conductor in the heavy wire coming out of the tower of the coil to the center post of the distributor cap. Under the distributor cap is an insulated block with a metal strip running from the center to the outside edge. It is called the rotor or rotor button. It fits onto the center shaft of the distributor and rotates with the shaft. As it rotates, it passes very close to the contacts which lead to the sparkplug wires set around the circumference of the distributor cap. The charge of high-voltage electricity passes to each terminal in turn, and then through the sparkplug wire to the sparkplug. The spark must occur just when the piston reaches a certain specified point in the cylinder, based on top dead center (TDC).

The lower segment of the distributor is essentially a switch. It interrupts the flow of electricity to the coil, allowing a magnetic field in the coil to develop and then collapse. Inside the lower portion of the distributor are the breaker points, a condenser and the center shaft with a number of 'corners' or high points. Normally the number of high points will equal the number of cylinders in the engine. The condenser not only helps to build up the voltage in the secondary coil windings, but also reduces arcing between the points.



As the center shaft of the distributor rotates, the 'corners' contact the rubbing block of the points, pushing the movable segment away from the other parts, separating the point faces.

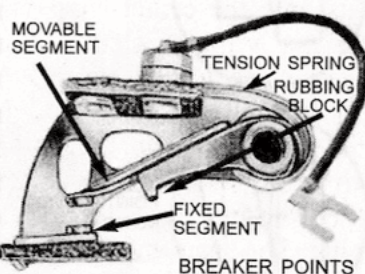


When the rubbing block is resting on the very highest spot of the shaft corner, the point faces should be separated an amount equal to the specifications in the service manuals. Generally, the gap is about 0.020", although a manufacturer may call out a specification higher or lower than that.

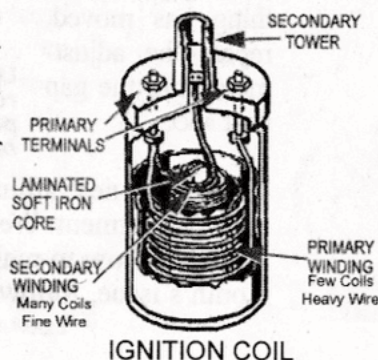
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The breaker points are two segments: a movable segment and a fixed segment. The fixed segment is grounded and adjustable. The movable segment is always 'hot'; that is, there is a continuous flow of electricity to it. The movable segment is not adjustable. The only adjustments

are from wear – wear at the movable point face, and wear at the rubbing block or wear (weakening) of the tension spring. When that wear is excessive, the set of points both movable and fixed should be changed. If properly adjusted, and with everything else in good order, the points should last hundreds of thousands of openings and closings.



The coil, actually an electrical transformer, consists of two circuits – the primary or high tension circuit and the secondary circuit. The coil is constructed of internal windings, one set which transforms the voltage (in the case of the primary circuit) from the six (or twelve) volts of the

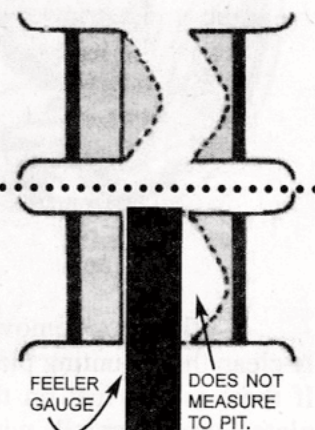


battery to several thousand volts. The coil relies on the development of a magnetic field to transform the low voltage to the higher levels. This high voltage, often 10,000 to 20,000 volts or more, create the spark which goes through the distributor cap to the spark plug wires to the spark plugs and which eventually ignites the fuel in the engine. The secondary circuit, the switch, opens and closes the flow of electricity through the coil. The secondary circuit goes directly to the distributor and to the breaker points. As the points open and close they are actually switching the flow of electricity on and off. Well, not exactly, but it is easier to describe it that way. As the breaker points open and close, the switched flow of electricity allows the magnetic field in the coil to build up and collapse.

Setting the points consists of removing the distributor cap, lifting off the rotor, and cranking the engine, preferably by hand, until the rubbing block is resting directly on the top of the high point or corner of the center shaft.

Before any adjustments are made, a careful examination should be made of the point faces. There often will be a transference of metal from one face to the other. Sometimes a magnifying glass will be necessary to examine the point faces.

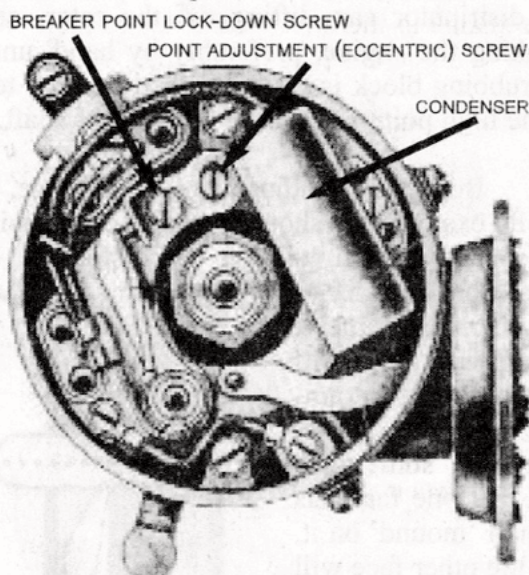
You will sometimes find that one face has a small 'mound' on it, and the other face will have a 'pit.' If not too extreme, leave the point faces alone. 'Dressing' the points (filing the faces flat) will actually reduce the contact surface area. The pits and hills are due to a condenser which is not properly matched to the points. The problem can generally be avoided by purchasing a breaker point set: breaker points, rotor, cam lube and a new condenser.



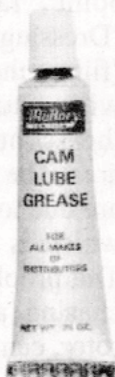
Obviously enlarged for the illustration, but the 'hill' and the 'pit' are not too extreme. Filing the high spot down (lower) does not allow an accurate gap measurement.

If the 'hill' or the 'pit' is extreme, replace the breaker points and ancillary parts. Most sets of breaker points are similar – they may vary a little in appearance, but the operation is the same. The movable segment has a wire which attaches to the input from the coil. It will also have a spring which exerts a measured amount of tension against the points to assure good contact and prevent point bounce, and the segment is secured with a screw.

The fixed segment is most often secured by one screw. The second screw, an eccentric, need not be removed. It is used for adjustment of the point gap. Make a drawing or take a photograph of how the points are fitted. Do the same with the condenser. Most condensers are mounted outside of the distributor housing, but some are mounted adjacent to the points under the distributor cap.

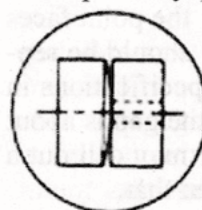


When you remove the points, thoroughly clean the mounting plate of all oil and grease. If there is any rust on the mounting plate, use a small wire brush to remove it to assure a good ground. Make sure that no dust or rust particles remain in the distributor. Install the new condenser and points exactly in reverse of how they were removed. Generally a tiny capsule of special cam grease will come with the kit. Use it sparingly. Just a tiny drop of the grease on the center shaft and its

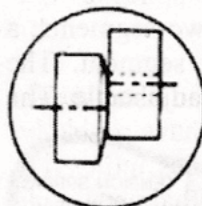


high spots is all that is needed. Excess grease can get onto the point faces fouling them and causing failure or poor operation. If the grease does not come with the kit, a small tube (probably enough for several lifetimes) can be purchased at a large auto parts store.

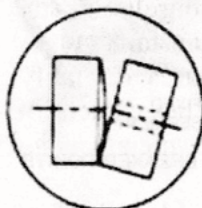
Once the points are installed, examine them very carefully to be sure that the faces – the fixed segment face and the movable segment face – are perfectly parallel to each other as well as



CORRECT POINT ALIGNMENT



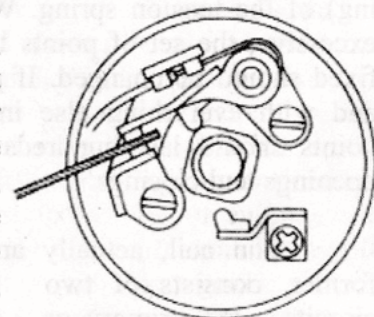
MISALIGNED POINTS



POINT FACES NOT PARALLEL

being aligned so that the point faces match up. Crank the engine over very slowly, by hand is best, until one of the edges of the high spot on the center shaft is directly under the rubbing block of the movable segment. That is the maximum opening for that segment of the points. Use a clean feeler gauge of the correct thickness and adjust the fixed segment by

loosening the lock-down screw just a little and then turning the adjusting screw until there is just a slight drag on the feeler gauge. Tighten the lock-down screw, and recheck the point gap. If anything has moved, repeat the adjustment until the gap is at spec.



Use a feeler gauge of the correct thickness to set the points. Make sure the gauge is held parallel to the point faces.

The next adjustment is the dwell or cam angle adjustment. We will discuss dwell or cam angle and how to make the adjustments in next month's issue, followed by rebuilding details

S.K.