



VOL. 1. NO. 16

NOVEMBER 15, 1927

Adjusting the Distributor on Late Series Sixes and Eights

THE late series cars both Sixes (526-533) and Eights (443) have ignition distributors in which the breaker cam has one-half as many lobes as the motor has cylinders. The cam operates two contact breaker arms which are arranged so that each one furnishes the spark for one-half the cylinders.

The advantage in this construction is that the breaker arms operate only half as fast as in the previous type. The slower speed is an advantage in several ways.

It gives a fuller and better spark at high car speeds. The spring pressure required to make the contact arm follow the cam at high speeds is less, which results in longer point life and quieter operation.

With this construction the distributor must be timed on two successive cylinders, 1 and 5 on the Six and 1 and 6 on the Eight, unless the two contact breakers are known to be set in exactly the right relation to each other. This setting, or synchronizing as it is called, is one of, if not the most important step in the timing of the motor. If the breaker points are not synchronized correctly some cylinders will be fired early and others late causing ragged and uneven running and in some cases it will increase the tendency to vibrate.

On the 526 and 533 cars the distributor has a three lobed cam and two sets of contact breaker points connected in parallel. Both the breaker arms must be open to break the circuit and so cause a spark in the cylinder. To do this when one breaker

is opened, it is held open by the cam until the opposite one has closed and opened when it, in turn, is held open until the first one has been closed and opened again.

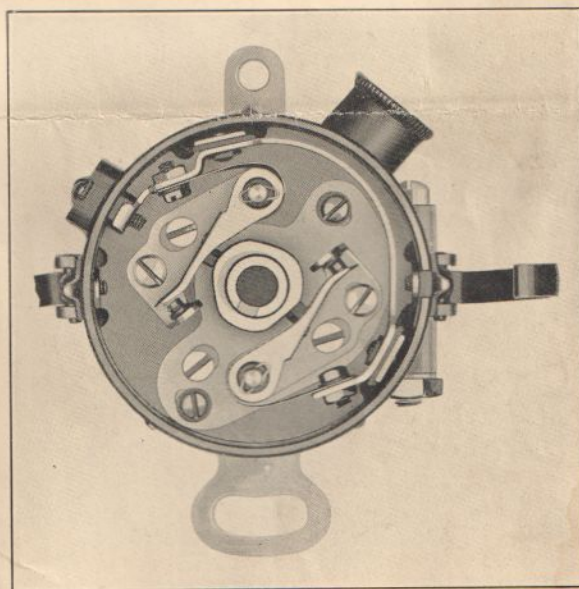


FIGURE ONE

Looking down on the six distributor showing one breaker being held open while the other has been closed and is just about to open again.

Since the breakers fire alternate cylinders, it is very apparent that if the cylinders are to fire at evenly spaced intervals the breakers must be set accurately at the proper angle to each other so that they will break contact alternately every 60° of distributor rotation, or 120° of engine rotation.

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To make it possible to set these points accurately the synchronizing tool, S. T. 682, shown in Figure 2, has been developed.



FIGURE TWO
S. T. 682 Synchronizing Tool for use on 526-533 distributors.

It consists of a T-shaped metal stamping with a spring arrangement at the base of the T, so that it may be attached to the distributor. The shank is offset and the top bar curved so that when attached to the cam the top edge will fit flush with the rim of the distributor case. The outer edge of the tool is graduated in degrees, the marks on one side being just 60 cam degrees or 120° engine degrees from the similar marking on the other side. If one breaker arm is seen to open at let us say 5° on the M-side, the other breaker should open just 60° later or at the point marked 5° on the N-side.

It is not necessary to remove the distributor from the motor to synchronize the points altho if the unit has been removed for any other reason it can be done very easily and quickly on the bench.

The stationary arm should be set first to the proper clearance and then the moveable arm set to break with the proper clearance—.020"—in the correct relation to it.

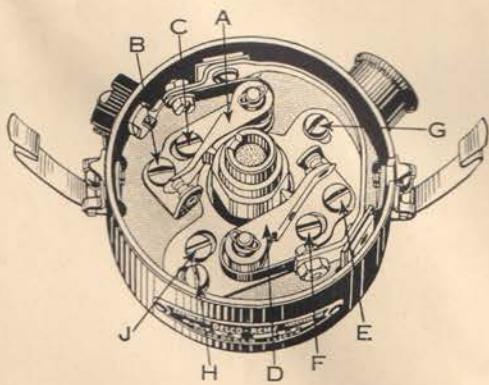


FIGURE THREE
The distributor used on the Packard 526-533 with the distributor head and rotor removed.

Turn the distributor shaft until the rubbing block of the stationary breaker arm A, Fig 3 is on the high point of a cam. Loosen lock screw B. The stationary contact point is adjustable and is controlled by eccentric screw C. Turn screw C to adjust until the gap to .020" measured with a thickness gauge S. T. 657 or common feeler.

Lock the adjustment by tightening screw B and recheck.

Now turn the distributor shaft until the rubbing block of the adjustable arm is on a high point of a cam. Loosen lock screw E and adjust the breaker gap, by turning eccentric screw F, to .020". Lock the adjustment by tightening screw E and recheck the opening on both breaker points.



FIGURE FOUR
S. T. 657 a handy thickness gauge in a fibre case. It has two blades, one .020" for the distributor breaker gap, and one .025" for the spark plug gap.

Attach the Synchronizing Tool S. T. 682, Figure 2, to the distributor cam. The spring on the M-side (see Fig. 2.) of the tool should engage the slot in the top of the cam. The tool itself is not marked but the following rule may be applied in case of doubt. Turn the tool in the direction of distributor rotation and engage the spring on the leading side in the slot.

Now turn the distributor shaft in the direction of rotation — clockwise — until the numbered graduations on the leading M-side of the tool are close to the near edge of the slot in the distributor rim. Turn very carefully now and note the number that lines up with the edge of the slot at the instant the contact points of the stationary arm A break contact.

As the instant of contact breaking is difficult to detect accurately, a timing light or ammeter should be connected across the distributor so that it will burn as long as either point is closed. The point of contact opening will be indicated by the light going out or the ammeter hand falling to zero.

Note carefully the reading on the tool registered with the edge of the slot at the instant of contact opening. Continue to turn in the direction of rotation for 60°. This is indicated by the near edge of the slot lining up, with the previously noted, on the trailing or N-side of the tool. The breaker arm should break contact at this point. If it does not, loosen lock screw H and turn the eccentric screw J.

...the light, at this
... G and H.

...mechanism and gap at both
... The points should be synchronized
within two degrees, that is, the stationary arm
breaks contact at, let us say 20 on the leading side,
then the other set must break contact not sooner
than 19, nor later than 21 on the trailing side.

Before replacing the rotor, soak the felt packing
in the top of the cam with light oil. This acts as a
reservoir for the oil which feeds out thru holes in
the cam face lubricating the rubbing blocks.

The distributor on the late Eight (443) is
similar to the one used on the earlier models in that
it has a four lobed cam and two sets of contact
breaker arms. The difference is that each set of
contact points is connected in a separate primary
circuit with a separate coil. With this arrangement
the effect is the same as two distributors firing
alternate cylinders. The points are set to fire every
45° of distributor travel or every 90° of engine
travel, and this relation must be accurately set
and maintained for smooth even running. Failure
to have the points of contact breaking evenly
spaced will cause some cylinders to fire early and
others late, with the result that the motor will
run unevenly, may be short of power, may spark
knock excessively altho it seems to be timed
correctly, or any one of a number of things that
are caused by incorrect timing, all depending, of
course, on how much they are out of time.

In order to set the points easily and quickly in
their proper relation to each other, tool No. S. T. 685,
Fig. 5, has been developed.

Before using the tool the
breaker gap should be set.
Turn the distributor shaft
until the stationary arm A,
Fig. 6, is on a high point of the
cam. Loosen lock screw B and
turn eccentric screw C until
the breaker point gap is .020"

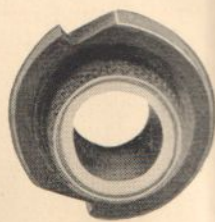


FIGURE FIVE
S. T. 685 Breaker
gauge for use on
the 443 distributor.

measured with S. T. 657, or an ordinary feeler
gauge. Tighten lock screw B and recheck. Turn
distributor shaft until the adjustable breaker
arm D is on a high point of the cam. Loosen
lock screw E and turn eccentric screw F until
the breaker opening is .020". Tighten lock screw
E and recheck.

Loosen the screw in the center and remove the
breaker gauge. If the distribu-

tor has been removed from the motor tighten the
center screw, if it has not leave it loose so that
the breaker gauge may be turned freely on its
shaft. Rotate the gauge until the breaker arm
rubbing blocks drop into the notches as shown in
Fig. 6. Loosen lock screws G and H and hold the

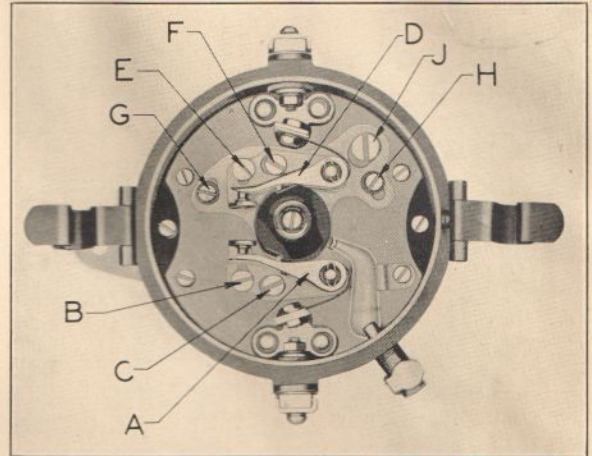


FIGURE SIX
The distributor used on the Packard 443 shown with the
distributor head, rotor and cam removed and with the
breaker gauge S. T. 685 in place.

notch firmly against the heel of block on the sta-
tionary arm and turn eccentric screw J until the
heel of the block on the adjustable arm D is in
firm contact with the other notch. Tighten the
lock screws and check. This can best be done by
holding the gauge firmly against the rubbing
blocks and raising each breaker arm separately.
When properly set a slight friction should be
felt as the arms are raised.

If the distributor has been removed from the
engine the procedure is the same except that the
drive coupling should be held in a vise and the
screw in the center of the cam tightened to lock the
gauge in place. Then rotate the distributor case to
hold the stationary arm rubbing block snug against
the gauge while adjusting the moveable arm as
before.

After the adjustment has been made and checked
the cam should be replaced and the motor timed in
the regular way.

The tools referred to may be purchased thru the
parts department on regular parts orders, under the
following tool numbers and at the prices shown:

- S.T. 657, Thickness Gauge \$.55
- S.T. 682, Synchronizing Tool \$.25
- S.T. 685, Breaker Gauge \$1.50

Answers to Questions Contained in Letter No. 15

1. Insufficient clearance between the ends of the piston rings will cause a light motor knock and will also cause excessive cylinder wear. The ring clearance can be checked by removing the ring from the piston and placing it in the cylinder bore. The clearance should be .010 to .016 of an inch.

2. Motor knocks caused by loose pistons or by tight piston pin bushings will be most noticeable when the motor is cold and are apt to disappear as it becomes warm.

3. Stiffening the front springs results in a stiff, jerky ride, particularly at rather slow speeds and on fairly good roads. It will be found that the front springs and the front stabilator adjustment have a much more pronounced effect on the ride of the rear seat than would be considered possible.

4. It is dangerous to arch the springs higher in order to prevent their striking through, because if the riding clearance is increased the spring loading is increased correspondingly and breakage is more likely to result.

5. It is necessary to leave a slight clearance between the window glass and the runway in order

to allow for the expansion of the runways when they become wet. If this is not done the windows will be hard to operate in rainy weather.

6. If the clearance between the sides of the glass and the runway is so great as to cause a rattle the clearance can be reduced by the use of felt liners between the runway and the window frame.

7. Oil will usually be found around the outside of the chassis lubricator, because there is an oil relief in the plunger cylinder which prevents oil which has passed the plunger from working up around the handle. If it were not for this relief oil would work all the way up to the handle and get on the hand of the person operating the plunger.

8. If the valve cover gasket becomes oil soaked it may swell inward so as to press against the valve spring collar, and force the valve sideways against the guide. The center of the gasket should be cut out so that it will not bear against the valve mechanism. (This condition has been taken care of in the new construction by eliminating the center of the gasket.)

Note—Hereafter the questions and answers to them, will both appear in the same issue.

In Union There is Strength

SEVERAL of our Distributors and Dealers have informed us that they are using the "Ask Me Another" questions, as the basis, for conducting semi-monthly service meetings. In addition, to mechanical subjects, other important subjects are discussed. Better contact with owners; better shop methods; cleanliness; promises; diagnosis; follow-up methods; operating expenses and control; these and other important features of service work are all hashed over and many decided improvements are the result of these get-together

meetings. *These meetings pay dividends.*

There is many a modest mechanic carrying around a brilliant idea, which he would no doubt be glad to give us, if we would only give him an opportunity. God didn't give all the ideas to any one man. Einstein, occupying a mediocre government job, advanced a theory that made the greatest, of the great, sit up and blink.

Let's give all of our service men an opportunity, to display their initiative, in helping to build stronger or more efficient service stations.

Whenever we hear some sledge hammer mechanic singing the blues because he got the air for "butchering" a repair job, we feel like singing to him the second line of "Hail! Hail! The Gang's All Here!"

Do you have a service sign on your building or do you believe in making it as hard as possible for owners to find you? Surely, you aren't afraid they will!

"Cleanliness is next to Godliness." How many inches of grease covers your shop floor?

If your valve seat reamer chatters, tighten the bushing. The increased friction will dampen out the vibration.

Maybe the pen is mightier than the sword but we've noticed that a speed wrench reigns supreme around a service station.

Does it hurt your pride to use the words "sir," "please" and "thank you?" If so, look out for the proverbial fall.

Fill in blank spaces. A dainty white glove . . .
a steering wheel
grease the devil.

We wonder if all the "antiques" and "relics" been cleaned out from under the shop benches we wonder!