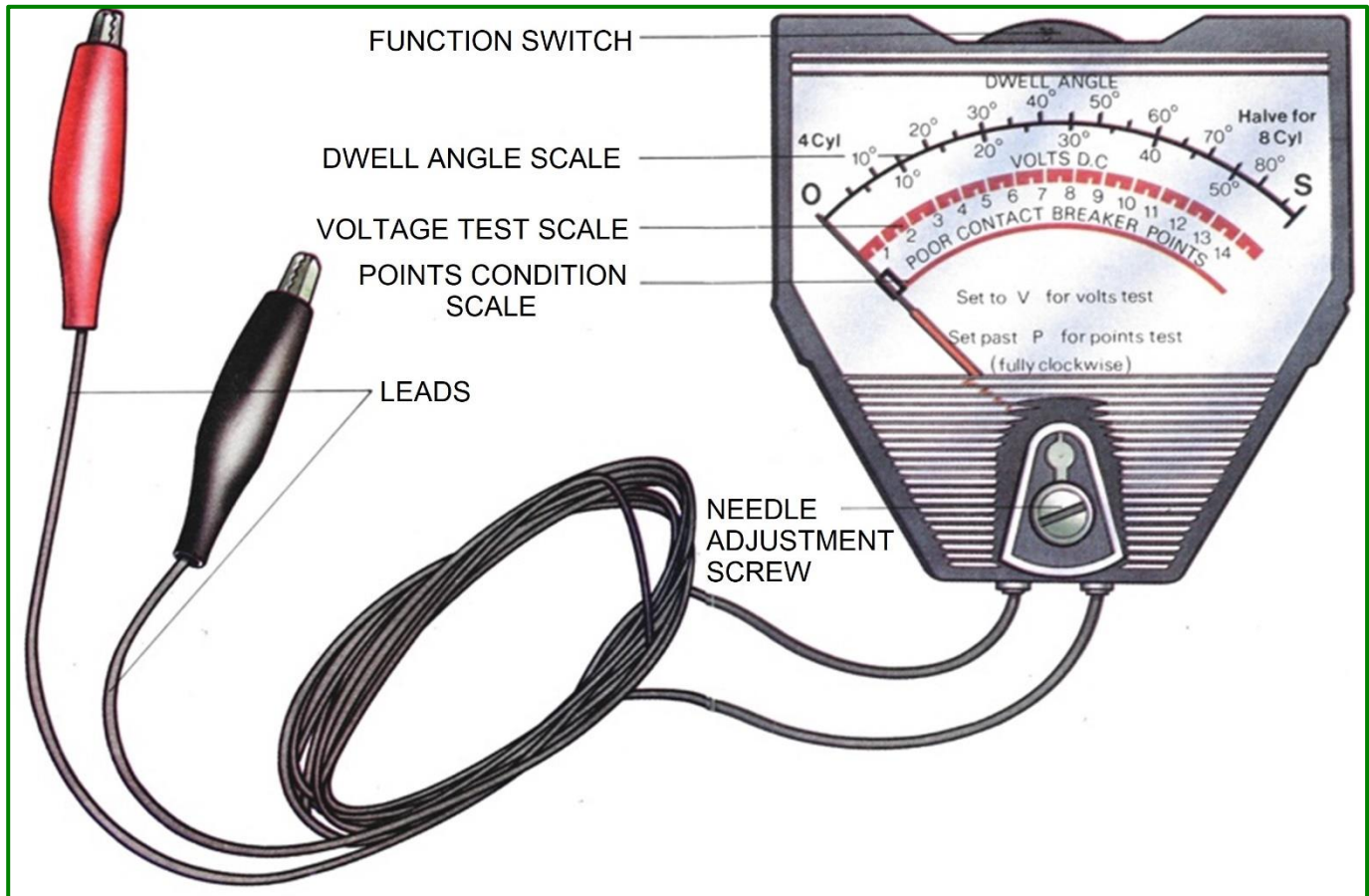


TECHNICAL NOTES SERIES

JOWETT JAVELIN – PA, PB, PC, PD & PE JOWETT JUPITER – SA & SC



A typical analogue dwell meter.

These notes have been assembled in a format that, as much as possible, they assist those who have never attempted such Jowett repair tasks as described in this document. They have been written to cater for younger Jowett Car Club members who may have limited mechanical knowledge.

If a reader of these notes does not feel confident about the procedure described here, then the brake component and associated parts should be taken to a reputable repair professional – if available.

PART XXXVII – IGNITION SYSTEM OPERATING A DWELL METER

The Jowett Car Club of Australia Incorporated is not responsible for any inaccuracies or changes that may occur within this document. Every effort has been made to ensure accuracy. It is not a Jowett Car Club publication and, therefore, the Club has no control over its contents. These Technical Notes have been compiled by using the information that was available, which was deemed accurate at the time.

Compiled by Mike Allfrey – May, 2023.

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WARNING!
ASBESTOS COULD BE PRESENT IN
GASKETS, FIBRE WASHERS & BRAKES



INTRODUCTORY COMMENT FOR TECHNICAL NOTES

These introductory notes should be read prior to reading Part XXXVII of the Technical Notes Series. The Jowett Technical Notes Series have been an ongoing activity for several years. That means that some techniques and specifications may have been superseded in later notes on the same, or associated topics in the series. Also be aware that some topics and recommendations may be specific to certain Engine Serial Number ranges. It appears that, in Australia, the various State Main Agents did not carry out Service Bulletin information during Jowett active times. A set of known Service Bulletins is in Part III.

Some of the notes are restorations of what was written by members of the Jowett Car Club (UK), the Jowett Car Club (NZ) and by members of the JCCA.

Over the years of involvement with matters Jowett, and with the dawning of the personal computer age, a personal decision was made to help members of the Jowett Car Club of Australia Inc. with technical information. Included with the Technical Notes are 'restored' versions of the Javelin and Jupiter Maintenance Manuals and the associated Spare Parts Catalogues. Future generations will prefer to flick through images on their personal device screens, rather than leafing through pages in a tattered and oil stained book to access information.

The term 'restored' has been used because it soon became apparent that, as with our efforts in restoring Jowett vehicles, we desire excellent quality of workmanship in the reproduction of Jowett related documentation. Not for us the crude, and crooked, photocopies that have been issued over the years. These have, even though accurate at their time, become partly out of date.

Hence the decision to 'restore' the publications and documents that have come to hand.

It should be noted that the Javelin and Jupiter Spare Parts Catalogue is a combination of all the catalogues that were to hand (from 1948 to 1953).

The Maintenance Manuals were originally written on the assumption that they would be used by skilled motor mechanics who had attended service training courses conducted by Jowett Cars Limited and after works closure, were made available for owners who had reasonable mechanical knowledge of motor car maintenance and overhaul.

Included with the Technical Notes Series is a Lucas Overseas Correspondence Course, which can be of great assistance when trouble-shooting electrical problems related to your Jowett, or any other British vehicle of the same period.

Please be aware that this is an ongoing project

Mike Allfrey – February, 2024

Introduction – Adjusting Ignition Cam Angle

When fitting new contact-breaker points in the distributor, the normal way of checking the gap between them is with a feeler gauge. This method can, without due care, load the moving point spring, which can alter the cam angle (dwell angle). Such error can influence the meter's reading.

Using A Dwell Meter – Version 1

Contact points that have been in use for some time develop a peak on one face that corresponds with a crater on the other, caused by spark erosion as the points open. When this happens, a feeler gauge no longer gives an accurate measurement of the gap.

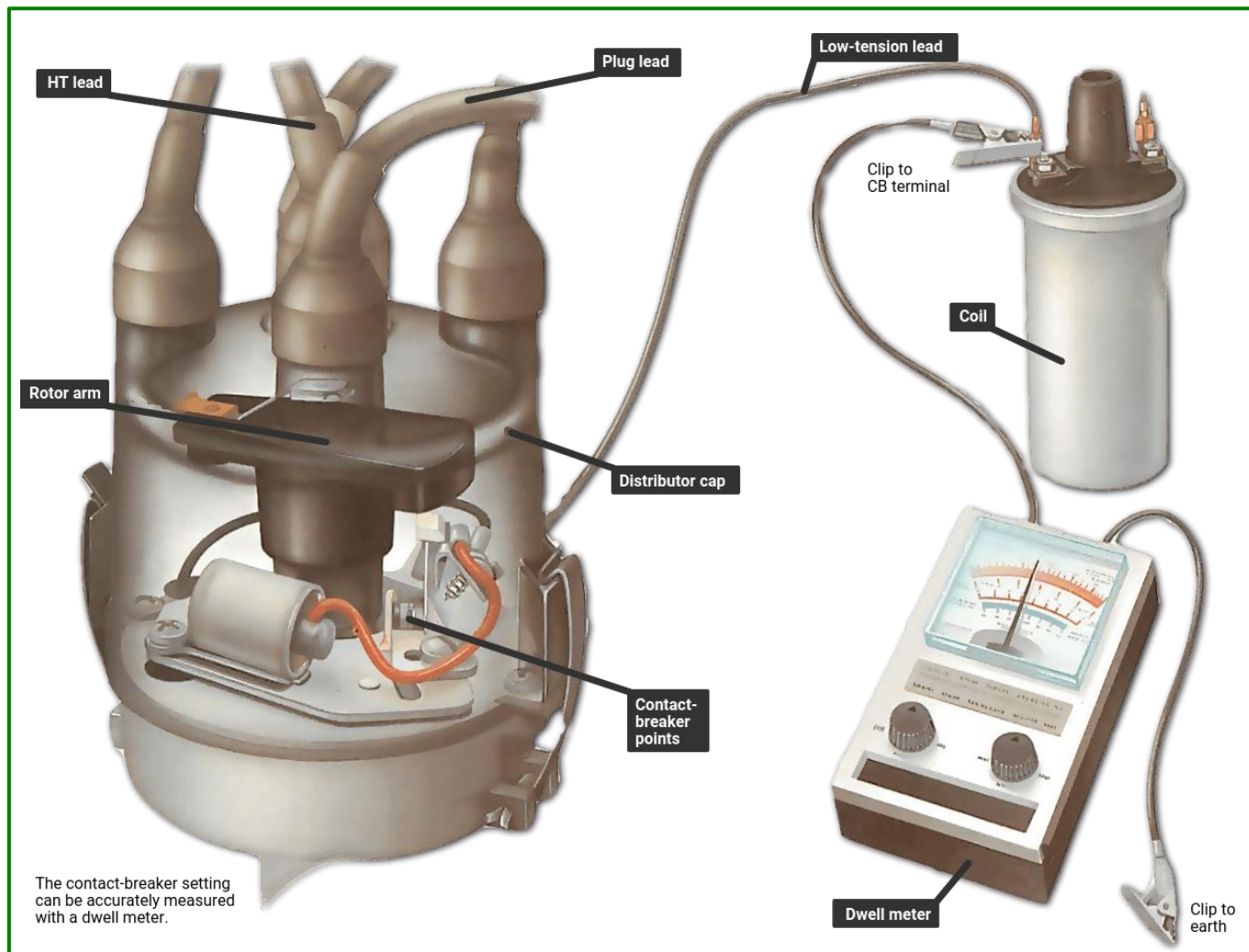
A dwell meter measures the angle of rotation of the cam through which the points are opened and closed, and registers the dwell angle – the period when they are closed.

It can therefore be used to check the gap on worn points with more accuracy than a feeler gauge, and can be used, without removing the distributor cap and with the engine running. The meter can also, of course, be used when fitting new points.

A dwell meter is usually part of an instrument used for various mechanical checks. Such instruments may be sold as analysers or test meters, and have to be switched to *DWELL* for a reading. *Figure 7* illustrates a typical coil ignition system with a dwell meter connected for test purposes.

How A Dwell Meter Works

When the distributor shaft is rotating, the contact-breaker points open as the heel of the moving point is pushed outwards by a lobe of the cam, and close while it is over the flat area between two lobes.



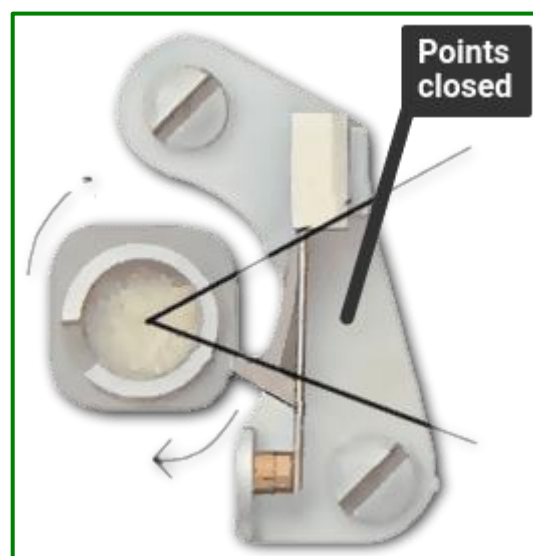
Above: Figure 1. Not a Jowett ignition system, but it suffices.

The Dwell Angle

If, for example, the angle of rotation between the centres of the lobes on the cam is 90° , the dwell angle – the period with the contact heel over the flats and the points closed – may be 52° ; the remaining 38° are taken up by the action of opening and closing. This would be a typical dwell angle for a four-cylinder engine.

Right: Figure 2. Points fully closed during dwell angle, shown direction of rotation opposite to that for the Jowett.

A dwell meter connected between the distributor or ignition coil and earth registers the dwell angle on a scale, and must remain steady at the prescribed figure while the engine is running. If the dwell angle is not the same for all cylinders, the result can be rough running and poor fuel economy because the exact moment the spark-plug fires varies from cylinder to cylinder.

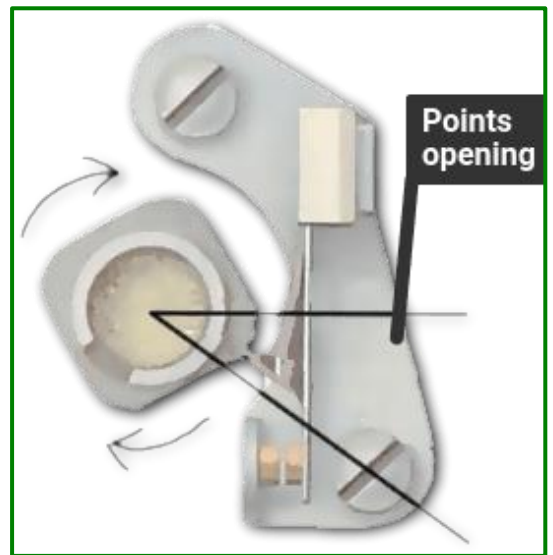


Points Opening Angle

Right: Figure 3. Points opening as the lobe of the cam starts to lift the contact-breaker heel. Cam rotation opposite to that on a Jowett Javelin and Jupiter

The dwell angle varies according to the make of car; check it in the service manual (for Jowett Javelin and Jupiter the dwell angle is, for Lucas DKY-H4A $49^\circ \pm 4^\circ$, and for Lucas DM-2 $60^\circ \pm 3^\circ$). The contact points gap, when fully open for Lucas DKY-H4A distributor is 0.010 – 0.012-in., and for DM-2 distributor is 0.014 – 0.016-in.

NOTE: There are usually two scales on the dwell meter, one for four-cylinder engines and one for six-cylinder engines. Or, in some instances, one scale for four-cylinder and the other for eight-cylinder engines.



Connecting The Dwell Meter

Follow the dwell meter maker's instructions. On the Jowett distributor there is a low-tension lead terminal on the distributor body and one meter lead should be connected to that terminal, or to the 'CB' (contact-breaker) terminal on the coil, and the other lead to earth (chassis). The connections must be sound and able to withstand engine vibration and movement.

Some meters will have to be set to zero before they can indicate an accurate reading. If the meter has such an adjuster, connect the meter as shown in *Figure 1*. Select 'Dwell' on the meter's selector device. Disconnect the low tension lead between the coil and the distributor and connect the black lead on the meter to the live coil terminal. The red lead has to be connected to a good earth. For negative-earth system, connect the red lead to the coil and the black lead to the chassis. Turn the ignition on and crank the engine with the starter. This will give a reading on the meter. Then rotate the adjusting screw/knob until the needle is set in accordance with the meter manufacturer's instructions. At this stage, the dwell meter has not detected an interrupted, points opening and closing, current flow. The dwell meter is now ready for use.

It is important that the ignition coil's body makes sound contact with the chassis (earth).

Polarity Of The Electrical System

Some Jowetts may have been converted to negative-earth: Connect the black (negative) lead to earth and the red (positive) lead to the distributor or coil. Check the polarity of the electrical system!

Jowetts still with positive-earth system: Connect the red (positive) lead on the meter to earth and the black (negative) lead to the distributor or coil. Check the polarity of the electrical system!

Measuring The Dwell Angle

If new contact-breaker points have been fitted, set them to the correct gap with a feeler gauge. Make sure that there is no dirt or oil contamination at the contact faces of the points.

With the dwell meter connected, set the control switch to 'Dwell' position, start the engine and let it settle to a smooth low-idle. If it will not idle steadily, check the cause(s) and rectify any faults.

The meter reading should stay steady at a steady engine speed. If it does not, increase the idling speed slightly until it does.

Compare the steady reading on the appropriate scale with the desired dwell angle for Jowett Javelin or Jupiter. If it is too high, the contact-breaker gap is too small. If it is too low, the gap is too wide.

Before you switch off the engine to adjust the gap, make the following checks. First ask a helper to press the accelerator to increase the engine speed slowly to about 1,000 rpm, then let it drop back to idling speed while you note the reading.

The angle should remain about the same, with no more than two or three degrees deviation.

Secondly, increase the engine speed quickly to about 1,500 rpm, then let it drop back to idling speed while you again note the reading.

The angle should again remain the same, fluctuating by no more than two or three degrees.

Carry out these two tests several times so that you can take an average of any differences in the readings.

If the reading constantly fluctuates more than two or three degrees, the distributor-shaft bearing or advance-retard plate may be worn, or the cam itself damaged. Fit a new distributor.

Switch off the engine before making any adjustments necessary to the contact-breaker gap.

Adjusting The Gap

With the meter still connected, remove the distributor cap.

Using the starting handle in the crankshaft pulley dog, turn the engine by hand in its normal direction of rotation until the contact-breaker points are held fully open by one of the cam lobes .

Loosen the contact-breaker fixings slightly, it may be necessary to remove the rotor arm to do this, and, using a suitable screwdriver, adjust the gap as needed. Refer to the Maintenance Manual for correct setting procedure. Reduce the gap to increase the angle if the reading was too low; increase the gap to lower the angle if the reading was too high.

Replace the rotor arm if removed, and the distributor cap. Switch on the engine and check the dwell meter reading again. If the figure is still not correct, switch off and reset the gap.

Continue the procedure until the correct reading is obtained. This fine tuning compensates for wear in the distributor.

NOTE: The distributor should be in a well-maintained condition, as should the contact breaker set. The contact breaker points should only be dressed with fine sandpaper, not emery cloth or wet and dry paper. If in doubt about their condition, replace with a new set.

Above right: Figure 4. An analogue dwell meter available at Jaycar Electronics Ltd.

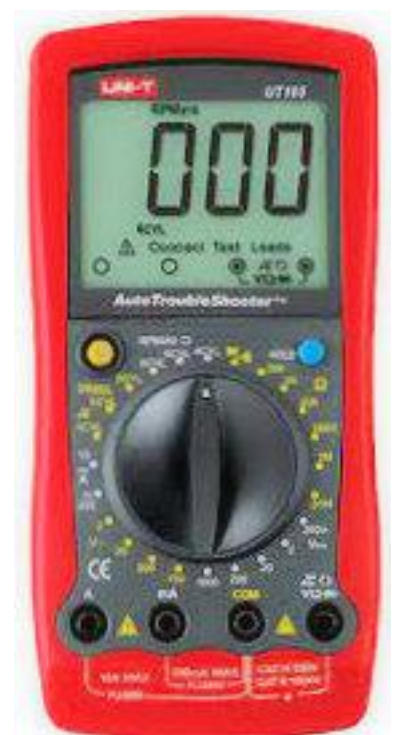


Dwell Meter – Version 2

One of the most important settings on a car is the contact breaker gap, because wrongly gapped points can result in difficult starting, a loss of power and an increase in fuel consumption. It is therefore desirable, to be as accurate as possible when checking this gap. The use of feeler gauges can have a major shortcoming in that they will measure the gap between the high points on the two contact faces, so any wear or pitting at the points will result in an inaccurate measurement. This problem can be overcome by using a dwell meter to measure the dwell angle.

The dwell angle is the number of degrees of cam rotation that occur while the points are closed; thus the wider the contact breaker gap, the longer it takes for the points to close and the lower value shown on the dwell scale. Similarly, a small gap means that the points will close more quickly and the dwell angle will, therefore, be of a higher reading. Refer to Figure 2. Using a dwell meter will give an accurate measurement of this angle so that the points gap can be adjusted until the angle corresponds exactly with the Jowett Cars Limited's recommendations.

Right: Figure 5. An example of a digital dwell capable meter.



There are a number of dwell meters on sale suitable for the home enthusiast mechanic. Any instructions provided with the meter must be followed, but the general principles will be the same. Most meters will provide a reading for four, six or eight-cylinder engines, whether they are negative or positive-earth, refer to *Figure 6*. The wiring instructions given in these notes are for the original positive-earth ignition system but if the car has been changed to a negative-earth system, all that has to be done is to simply reverse the two leads on the dwell meter.

Right: Figure 6. An example of an analogue read-out. The lower red scale being for four cylinder engines.

To carry out the dwell test, zero the meter reading as described on Page 5. Do not rely on the meter being at zero each time it is used.

Connect the meter leads as shown in *Figure 1*, with the black lead to the 'CB' low tension cable from the coil to the distributor. The red cable is connected to earth. Start the engine and run at low idle for a few seconds, take a reading on the dwell meter, and compare this with the dwell angle specified by Jowett. To reduce the dwell angle, the contact breaker gap should be increased, and to increase the dwell angle the points gap should be reduced. After any adjustment of the points, re-check the dwell angle until it matches the specification.

