

The timing mechanism in the ignition system causes the sparkplug to fire in each cylinder just before the piston reaches top dead centre (TDC) on its compression stroke. That gives time for the mixture to start burning steadily as the piston passes through TDC, which in turn ensures that the resulting expansion of burning gases will be most effectively used throughout the power stroke.

The timing of the spark is measured as the number of degrees by which the crankshaft is short of bringing the piston in the timing cylinder to TDC.

The number of degrees varies from car to car but should be advanced by one degree for every 500-600m that the vehicle operates above sea level (again consult the handbook or the technical department of the AA).

'Static timing' means setting the timing with the engine stopped. Here you set the crankshaft at the correct number of degrees before TDC, then adjust the distributor by turning it until the contact-breaker points are just beginning to open.

However, this method of setting the timing takes no account of wear and backlash in the distributor drive. As a result, the timing can be slightly out, even at idling speed; the spark will occur later than it should and the engine will not develop full power.

Stroboscopic timing (see overleaf), by which the timing is checked and set with the engine running, is more accurate.

Some manufacturers disapprove of their cars being statically timed and give only a stroboscopic figure in their handbooks.

But static timing is simpler, and can be done with either a circuit-tester or a test lamp. It is adequate for the initial setting of the timing mechanism before fine tuning is done.

Setting the static timing

Find the timing marks — they may be on the crankcase just behind the crankshaft pulley, with a corresponding pointer on the pulley, or they may be on the crankcase, with a pointer on the crankcase.

If there are no numbers but only a notched scale, TDC is shown by a large notch. The scale of other notches varies from car to car; some cars have only one other notch, which is the specified number of degrees before TDC.

With the ignition switched off, turn the engine in its normal direction of rotation.

You can turn the engine by engaging the top gear and pushing the car forward, or you can do so by turning the crankshaft pulley with a spanner or socket on the nut.

The second method is made easier by removing the sparkplugs to release cylinder compression.

Turn the pulley until the pointer is in line with the appropriate timing mark when

the piston in the timing cylinder is rising on its compression stroke. Remember that the crankshaft turns twice for each rotation of the timing gear.

To identify the compression stroke, remove the sparkplug on the timing cylinder. Get a helper to place a finger or thumb over the hole to feel the pressure rise as you turn the engine.

An alternative way is to remove the rocker or camshaft cover and note when both valves on the timing cylinder are closed. To adjust the distributor,

remove the cap by undoing its clips or screws.

With the timing mark correctly aligned, the rotor arms should be opposite the contact for the timing cylinder — check this by tracing back the ignition lead — and the points should be about to open. You can confirm this by noting that the heel on the contact-breaker arm is just at the bottom of one of the cam lobes.

Depending on whether the camshaft is chain or gear driven, the distributor shaft may turn clockwise or anti-clockwise.

Slacken the pinch bolt at the base of the distributor body.

Connect one clip of the test lamp to the live terminal of the points (the low-tension terminal) and earth the other lead to the engine. Switch on the ignition. Turn the distributor to a point where the test-lamp light flickers between on and off. Tighten the pinch bolt and recheck with the lamp by flicking the rotor arm.

Some distributors have a vernier control — a graduated scale set by a knurled knob — for final adjustment after locking.

Adjusting the distributor



Align the timing notch on the crankshaft pulley with the marks on the engine block, which may be numbered.

Compression check



Remove the sparkplug from the timing cylinder and check with a thumb for rising air pressure as the piston comes up to TDC.

Setting top dead centre

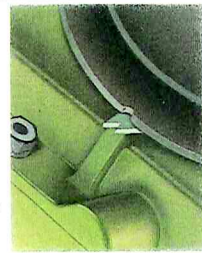


Contact-breaker points

Rotor arm

When the timing is correct, the rotor arm is opposite the distributor cap contact for the timing cylinder.

Other marks



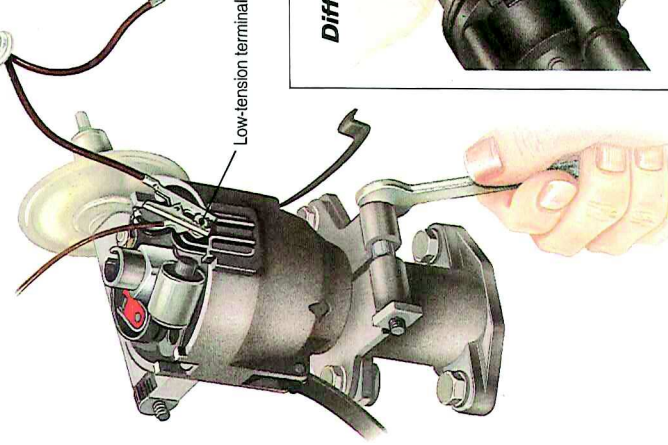
If there are no numbers, the largest notch means top dead centre.

Different mounting



A distributor mounted on the end of the camshaft (in an overhead-camshaft design) is held by two or three bolts or studs in a slotted flange.

Test lamp



Low-tension terminal

To earth

Slacken the pinch bolt on the clamp at the base of the distributor body so that you can just rotate the distributor.

Tools and equipment

SPANNERS OR SOCKETS • PLUS SPANNER • CIRCUIT-TESTER OR TEST LAMP • SCREWDRIVERS