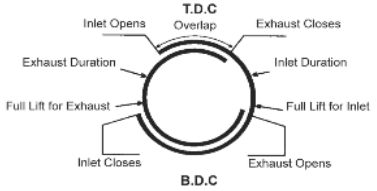
BIKES

CAM TIMING - The easiest way of timing camshafts is by using the lobe centre angle (L.C.A.) method. This involves setting the engine on true T.D.C. which makes the full lift position for No. 1 inlet, the L.C.A. after T.D.C. and on No. 1 exhaust the L.C.A., before T.D.C. there will be a dwell on full lift. The true position is in the centre of this dwell.



DURATION - The duration quoted is checked with zero valve clearance and 0.040" of lift.

VALVE CLEARANCE ADJUSTMENT - Reprofiling of the camshaft could cause it to come out of the standard shim/adjuster range and oversize shim/adjusters would need to be manufactured.

VALVE - PISTON CLEARANCE - We recommend this should be checked.
On 4 cyl. engines the inlet should have .050" clearance @ 10º after T.D.C. and the exhaust .065" clearance @ 10º before T.D.C. On single cylinder engines the inlet should have .080" clearance @ 12º after T.D.C. and the exhaust .080" clearance @ 12º before T.D.C.

VALVE SPRING & GUIDE CLEARANCE - Valve spring clearance should be a minimum of .040" before coil bind. Valve cap to valve guide clearance should also be a minimum of .040".

ROCKER ARM & CAM FOLLOWERS - It is absolutely essential to use NEW cam followers or rocker arms when installing a new or reconditioned camshaft.

RUNNING IN - After installing the new camshaft ensure that it rotates freely and there is no interference with the cam and followers, on initial start up. Do not allow your engine to idle below 2500 rpm for the first 20 minutes. This should ensure adequate lubrication of cam and followers.

CARS

The installation and first few moments of running are critical factors in the life of the camshaft and the following instructions have been devised in order to obtain maximum performance from the engine and to ensure a long and trouble free life from both the cam and associated components.

1.Before fitting the camshaft check that it is identical in every respect (EXCEPT FOR LOBE PROFILES) to the one being replaced. Special attention should be given to the oil feed details and journal diameters as variations may occur during the manufacture of the engine.

2.On the Vauxhall front wheel drive camshafts - a ball bearing is supplied loose with the camshaft. Please check the original camshaft to see if the ball is fitted into the distributor end main oil gallery. If so fit supplied ball as original Vauxhall cam.

3.Liberally coat both the camshaft and cam followers with cam lube before installation. Failure to do so can cause scuffing between the surface of the cam and the cam followers which will cause premature wear.

4.It is essential that NEW Kent Cam followers are fitted.

5.Upon installation valve springs must be checked to ensure that coil binding does not exist at full lift. There must be a minimum clearance of .040" (1mm) between the centre coils. (Fig 1)

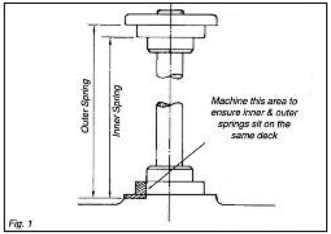


Fig. 1

6.When using KENT valve springs ensure that they are fitted as per instructions with the correct installed height. In some instances the cylinder head will need machining. (Fig 1)

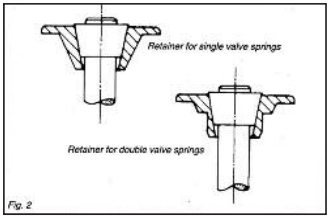


Fig. 2

7.When Double springs are being installed in place of singles, the valve spring retainer cap must be machined to accept the inner spring (See Fig 2). Alternatively in most instances we are able to supply modified caps in steel or lightweight alloy.

8.Once the valve springs have been installed check both inner and outer springs for coil binding and ensure that the bottom face of the spring retaining cap does not contact the top of the valve guide or valve stem oil seal. Minimum clearance on full lift is .060" (1.5mm). If this clearance cannot be achieved the top of the guides must be machined.
Special stem seals are also available.

9.Certain engines are designed with hydraulic pedestals to pivot the cam followers. The pedestals must be bled of oil and inspected before refitting. If the condition of the pedestals is in any doubt they must be replaced.

10.Having timed in the camshaft check that there is no valve to piston contact - minimum clearance .060" (1.5mm). In twin cam applications ensure there is no valve to valve contact.

11.When modifying engines that utilize finger followers i.e. Ford Pinto SOHC, it is imperative that you ensure the followers remain in the original attitude relative to the cylinder head (See Fig 3). Failure to do so will alter the rocker geometry, increasing or decreasing valve lift and can result in failure of both cam and followers.

12.When replacing the camshaft ensure only high quality engine oil is used (check that it is the correct grade) and the oil filter is replaced.

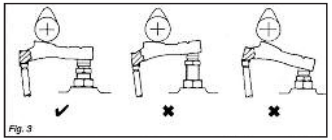


Fig. 3

13.Before starting the engine, turn over the engine by hand to ensure that it rotates freely, prime the oil system, and check that everything is set to ensure the engine starts straight away. Do not turn over for any length of time on the starter.

14. Once the engine is running do not allow it to idle for the first twenty minutes, and keep the revs to a minimum of 2500 in order to ensure adequate lubrication of cam and followers.

15.**IMPORTANT - TECHNICAL INFORMATION FORD CVH ENGINES - OVERSIZE CAMSHAFTS & FOLLOWERS**
Although the vast majority of Ford CVH Engines are fitted with standard size Camshafts & Cam Followers, there are some engines in service which are fitted with Oversizes on these components. Extreme care should be taken to ensure that the correct parts are fitted. Should a Standard Camshaft or Cam Follower be fitted to an Oversize Housing the result will be a very noisy engine. To identify cylinder heads fitted with Oversize Components, Ford stamp the Rocker cover Rail above No. 1 exhaust port with one of the following codes:

T25 = 0.25mm Oversize Follower - Standard size Camshaft
C38 = Standard Size Follower - 0.38mm Oversize Camshaft
C38/T25 = 0.25mm Oversize Follower - Standard size Camshaft

Camshaft timing instructions

There are a number of different methods of cam timing procedure. We at Kent Cams use and recommend either of the following two methods:

A

B

C

D

CAM TIMING USING LIFT AT TOP DEAD CENTRE METHOD:

In recent years with the proliferation of multi valve and multi cam engines this method has proved extremely popular. The process involves setting your camshafts at a specified lift at TDC.
This Method has been in use by Kent Cams and many top engine builders for many years. The relative simplicity has the benefit of setting individual cams at the same position without resorting to excessive crankshaft rotation:

Refer to the Kent Cams catalogue or web site for the TDC lift figure of your particular camshaft.

1. Set your engine to TDC number 1 cylinder (fig a) it is important to ensure you are in the middle of the dwell which occurs a TDC.
2. Position a clock gauge on the inlet follower and turn the cam to achieve the specified lift (e.g. 2.72mm fig b).
3. If your engine has separate inlet and exhaust cams then position clock gauge on the exhaust follower and set this to its specified lift (e.g. 2.41mm fig c).

With your cams set to their specific Top dead centre lifts it is now time to fit your cam belt or chain, inevitably there will be some movement from the ideal TDC lift figure hence the necessity to check your figures a second time with the belt/chain installed and tensioned. Fine adjustments can then be carried out with the aid of a vernier cam gear / cam pulley.

It is imperative that the engine should be checked to ensure there is no piston to valve contact prior to initial starting.

CAM TIMING USING FULL LIFT BEFORE/AFTER TOP DEAD CENTRE METHOD:

For many years the most commonly used method has involved establishing top dead center (TDC) as a datum (zero degrees) and positioning your camshaft with the inlet or exhaust valve at maximum lift at a given position relative to this datum:

For example take our Ford 2Ltr SOHC camshaft number RL30 which has a quoted figure of inlet timing @ full lift = 105 degrees. This means that the inlet valve should be set to be fully open at 105 degrees after top dead center. Therefore using a protractor or timing disc you can establish 105 degrees after TDC and it is at this point that your inlet valve should be at maximum lift. Minor adjustments from the standard timing point can be made with the aid of an adjustable timing gear.

1. Zero a timing disc on your crankshaft with the engine set at top dead centre (fig a)
2. Rotate crankshaft in direction of normal rotation (after TDC) to the specified Full lift position as quoted in the Kent Cams catalogue or web site. (fig d. 105 degrees).
3. Establish, with the aid of a clock gauge, that the inlet valve has achieved maximum lift and is in the middle of its dwell period.
4. Adjustments on the cam pulley can then be made to achieve this.
5. If your engine has a separate exhaust camshaft then return to top dead centre and rotate the crankshaft to the quoted full lift position before top dead centre (opposite direction of rotation. fig e.). It is at this point your exhaust valve should have reached maximum lift. Once again fine adjustments can be made on the cam pulley

It is imperative that the engine should be checked to ensure there is no piston to valve contact prior to initial starting.

E