ROVER

T SERIES 2.0 16v

Valve lifts quoted assume a rocker ratio of 1:1

CAM CODE CAM KIT CODE	APPLICATION	POWER BAND	POWER INCREASE	DURATION INLET/EXHAUST	VALVE LIFT INLET/EXHAUST	TIMING	FULL LIFT INL ATDC EXH BTDC	LIFT AT TDC with clearance INLET/EXHAUST	VALVE CLEARANCE INLET/EXHAUST
ARTBP270H	Fast Road	-	10BHP	248° 248°	.348" .348" 8.84mm 8.84mm	14 - 54 54 - 14	110° 110°	.045" .045" 1.14mm 1.14mm	HYDRAULIC
ARTBP285M	Ultimate Road	-	15BHP	260° 260°	.384" .384" 9.75mm 9.75mm	22 - 58 58 - 22	108° 108°	.059" .057" 1.50mm 1.45mm	.008" .010" .20mm .25mm
ARTBP270HT	Fast Road Turbo	-	16BHP	240° 240°	.346" .346" 8.79mm 8.79mm	10 - 50 50 - 10	110° 110°	.017" .017" 0.49mm 0.43mm	HYDRAULIC
ARTBP285MT	Ultimate Road Turbo	-	20BHP+	260° 260°	.384" .384" 9.75mm 9.75mm	20 - 60 60 - 20	110° 110°	.049" .047" 1.24mm 1.19mm	.008" .010" .20mm .25mm

K SERIES 16v

Valve lifts quoted assume a rocker ratio of 1:1

ARKBP255H KBARKBP255H	Fast Road	2000-7000	10BHP	248° 248°	.348" .348" 8.84mm 8.84mm	14 - 54 54 - 14	110° 110°	.045" .045" 1.14mm 1.14mm	HYDRAULIC
ARKBP270H KBARKBP270H	Fast Road	2000-7000	16BHP	260° 260°	.380" .380" 9.65mm 9.65mm	20 - 60 64 - 16	110° 114°	.035" .016" 0.89mm 0.41mm	HYDRAULIC
VVCBP270	Fast Road	2000-7000	-	N/A 264°	N/A .388" N/A 9.86mm	62-22	N/A 110°	N/A .050" N/A 1.27mm	HYDRAULIC
ARKBP285H KBARKBP285H	Ultimate Road	2500-7500	20BHP+	274° 274°	.433" .433" 11.00mm 11.00mm	29 - 65 67 - 27	108° 110°	.088" .078" 2.23mm 1.98mm	HYDRAULIC
ARKBP285M	Ultimate Road	2800-7800	20BHP+	276° 276°	.440" .438" 11.18mm 11.13mm	34 - 62 64 - 32	104° 106°	.110" .098" 2.80mm 2.48mm	.008" .010" .20mm .25mm
ARKBP300H KBARKBP300H	Sprint/Hill Climb	2800-7500	-	288° 288°	.445" .445" 11.30mm 11.30mm	40 - 68 70 - 38	104° 106°	.133" .122" 3.38mm 3.10mm	HYDRAULIC
ARKBP300M	Sprint/Hill Climb	3200-8000	-	280° 280°	.442" .440" 11.23mm 11.18mm	34 - 66 70 - 30	104° 106°	.121" .108" 3.08mm 2.75mm	.008" .010" .20mm .25mm
ARKBP320M	Race/Sprint	4500-8500	-	290° 280°	.460" .440" 11.68mm 11.18mm	39 - 71 71 - 39	106° 106°	.141" .108" 3.58mm 2.75mm	.010" .012" .25mm .30mm
ARK1227	SLR 500	4500-8500	-	280° 280°	.462" .460" 11.73mm 11.68mm	36 - 64 68 - 32	104° 108°	.140" .117" 3.55mm 2.97mm	.008" .010" .20mm .25mm
ARK1444	Race/Sprint	4500-8500	-	276° 276°	.481" .479" 12.22mm 12.17mm	34 - 62 66 - 30	104° 108°	.143" .120" 3.63mm 3.05mm	.010" .012" .25mm .30mm
KK1	VVC conversion kit - hydraulic	All above profiles available, and more!							
KK2	VVC conversion kit - mechanical	All above profiles available, and more!							

Please note:
VVC inlet camshafts are to suit aftermarket engine mangement only.

As the VVC cylinder head utilises substantially larger valves than the standard K series head, it is more economincal to use this casting rather than have larger valves fitted to a standard head. For this reason we have developed a kit to convert the VVC mechanism back to two conventional camshafts. A 1600 engine fitted with this conversion is capable of producing in excess of 210bhp and 1800's are now nudging 250bhp.

The rules of successful camshaft installation.

Research shows the majority of camshafts that fail; do so during the first few moments of operation. Many camshafts are irreparably damaged even before the engine is started, because the basic rules of camshaft break-in are not followed.

The cause of premature cam and tappet failure is metal to metal contact between the tappet and camshaft lobe. Should this contact occur due to lack of proper lubrication or excessively high pressure due to valve train interference shearing the oil film, then 'galling' will take place. When this happens, metal is transferred from the tappet to the lobe or vice versa in a process comparable to welding. Microscopic high spots, which are present on all machined parts, become overheated due to friction and pressure and bond together, tearing sections loose from the tappet or lobe. These pieces of metal remain attached and create further local overheating during following revolutions of the camshaft and lead to ultimate failure of the affected components.

1. *New Piper followers and springs are recommended. Piper springs must be used when stated.*

2. *Coat camshaft(s) & followers in Piper cam lube or a high grade engine oil.*

3. *Camshaft retaining cap bolts typically have a low torque wrench setting, therefore when fitting camshaft retaining caps it is important to observe the following rules. 1. Never use any power tools to tighten retaining cap bolts. This includes pneumatic or cordless impact wrenches, cordless impact drivers and drills, pneumatic or cordless ratchets. 2. Torque bolts to the manufacturers torque wrench settings. 3. Follow manufacturers recommended tightening sequences and stages. Camshafts are prone to snap when these rules are ignored and may render your warranty void. If you are unsure of the correct torque wrench settings, tightening sequences and stages for your engine; consult an official workshop manual or ask the workshop of your local dealer for advice. Do not rely on online forums.*

4. *Check entire valve train for interference before starting the engine, i.e. valve to piston contact, for twin-cam engines, valve to valve possible contact and spring boxing. Valve springs should show .0.30" clearance between centre coils. Valve should have minimum .060" clearance from piston/block. Engines that utilise hydraulic tappets should have at least one inlet and one exhaust tappet temporarily replaced with mechanical tappets set with zero clearance. This allows accurate figures to be obtained from the above checks. When all checks are complete, ensure original hydraulic tappets are refitted.*

5. *It is essential you check your new Piper camshaft is identical to the camshaft you are replacing, (except for lobe forms). In the unlikely event you notice any manufacturing defects, stop installation and contact Piper after sales for advice.*

6. *Ensure coolant level is correct. The engine must start instantly and must not be subjected to a long grind on the starter motor.*

7. *When installing cams in classic cars, before attempting to start the engine for the first time, fill the carburettor with petrol, prime oil system by manually turning the oil pump and ensure the ignition timing is correct).*

8. *Do not idle the engine during the first 20 minutes of operation. RPM should be kept at 2500 or above. In pushrod engines oil throw-off from the crank may not be sufficient to lubricate the followers. Also contact stresses at the nose of the cam are very high at low speed. If adjustments are needed during the 20 minute run-in period, shut the engine off completely.* ***DO NOT IDLE.***

9. *In some overhead cam engines where re-profiled camshafts are being used, you may require larger than standard shims.*

10. *When modifying engines which utilise finger followers such as the Ford 'Pinto' engine, it is imperative that you ensure the followers sit in the horizontal position. Failure to do so will alter the rocker geometry.*

11. *If the lobes of your Piper camshaft(s) are coated with a black phosphorus coating, this must not be removed. All camshafts are coated with a protective oil coating which must be removed with a suitable solvent prior to installation, please see separate documentation.*

12. *If your new Piper camshaft came supplied with any of the following, please ensure to fit these after the protective oil coating has been removed. 1. Grub Screw. 2. Core Plug. 3. Ball Bearing (See note below). 4. Woodruff Key. 5 Bissell Pin / Dowel. Piper strongly recommends using a retaining compound when fitting core plugs, and a thread locking compound when fitting grub screws.*

    Note: With the following Vauxhall camshafts, only fit the supplied ball bearing if the camshaft being replaced has a ball fitted. Astra / Nova 1.3 / 1.4 / 1.6 GTE. Astra 1.8 J Series. Astra C20XE 16v exhaust camshaft.

A guide to correct camshaft timing

To check your camshaft timing you will need a 360° protractor (Piper Timing Disc or Pro Disc) and a dial gauge. The engine must be set at TDC and the protractor bolted to the crank pulley. Attach the dial gauge so that the foot is resting on the valve spring cap (or follower in OHC engines). Attach the pointer to the engine and zero the protractor. Engine is now at TDC with the protractor reading zero. Turn the engine until full lift is first shown on the dial gauge. Note number of degrees (e.g. 106° ATDC). Continue to turn the engine and note when lift starts to reduce (e.g. 110° ATDC). True lift position in this case, will be 108°. Your figures will differ but full lift is at midway point. Correct full lift position for your camshaft is shown in the Piper timing sheet for your engine.