

APT Steel Billet Cams

Technical specifications for APT 'A' Series cams

1	Cam Part Number →	VP266	VP276
2	Duration @ 0.0158" cam lift	257/257 deg.	270/270 deg.
3	Duration @ 0.050" cam lift	214/214 deg.	224/224 deg.
4	Lobe center angle	106 deg.	106 deg.
5	Cam lobe lift	0.270"	0.280"
6	Valve Lift gross, 1.26 ratio	0.340"	0.353"
7	Cam timing #1 inlet lobe	102-103 ATDC	102-103 ATDC
8	Cam lobe lift @ TDC	0.064" (102 deg.)	0.076" (102 deg.)
9	Cam lobe lift +/- 2 degrees	0.058" (+2) 0.069" (-2)	0.071" (+2) 0.082" (-2)
10	Lash, engine warm, IN/EX	0.015"/0.017"	0.016"/0.018"
11	Spring pressure seat (closed)	72	72
12	Fully open spring pressure	135 (Rate 193 lbs/in)	139 (Rate 193 lbs/in)
13	APT spring part number	VPS-07	VPS-07
14	APT retainer part number <small>Factory double spring retainers fit VPS-07</small>	VSR-2 (948-1098) VSR-3 (1275)	VSR-2 (948-1098) VSR-3 (1275)
15	Spring installed height	1.38" + or - 0.020"	1.38" + or - 0.020"
16	Power band rating, RPM	1500 - 5500	1900 - 5800
17	Maximum safe redline RPM	6200	6500
18	Idle characteristics	Very Smooth	Smooth
19	Suggested compression ratio Min/Max 89/93 octane	8.8:1 / 9.4:1	8.9:1 / 9.5:1
20	Timing figures open/close @ 0.0158" cam lift	26.5 - 50.5 in. 58.5 - 18.5 ex.	33 - 57 in. 65 - 25 ex.
21	Suggested cam followers	CF-04	CF-04
22	Major intensity open/close	32.568 (16.284/16.284)	36 (18/18)
23	Suggested rocker ratio	Stock or 1.3 (see notes)	Stock or 1.3 (see notes)
24	Oil pump (slot drive A+ type)	(948—1098) OPA+SB (1275) OPA+	(948—1098) OPA+SB (1275) OPA+

If not sure ask! Cleaning the cam, installation, lubrication, break in are important.

Steel Billet Cams Notes

Thank you for considering one of our premium range of performance cams for the 'A' series engine.

Please study and read at least once everything on this page, and if you have questions on any confusing points please call an APT Tech. who can answer your concerns.

Most importantly, please realize that to get the best results from your purchase, and your final engine rebuild these cams have to be "dialed in" or "timed".

Therefore, just lining up the dots like it says in the factory workshop manual is not likely to give the expected results.

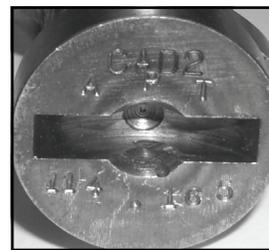
Included with this cam is a separate sheet, "*Installing & timing your cam*"

This covers three commonly used methods of adjusting the cam timing using offset keys, multi keyway sprockets and a vernier adjustable gear available from APT.

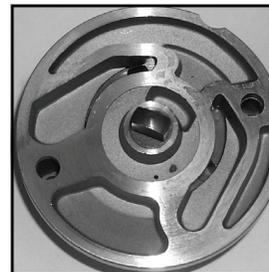
As you will notice these cams are unique in that each lobe has its own oil delivery hole as does the distributor drive gear.

These cams are induction hardened steel, with a finish ground hardness typically Rc 56-58

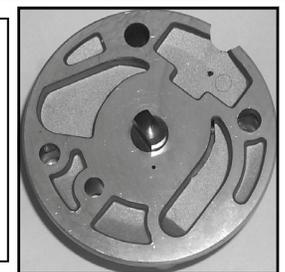
VERY IMPORTANT! The engine builder is responsible for cleaning out these "Gun Drilled" cams and installing the screw in plug.



This is the type of oil pump drive used on these cams, and is actually the design used by British Leyland on the Metro A+ engines. Please be sure to order the correct pump for your engine.



Left: OPA+
Use on all 1275 engines.
2 bolt, steel plate back.
Works very well.



Right: OPA+SB
Use on all 948 -1098 engines. Three bolt mounting

Info Chart Explanation

2./ The cam lift figure 0.0158" refers to the amount of lifter movement from the base circle that duration is measured from.

In other words when the lifter has moved 0.0158" that is where the duration is measured from, then the measuring is continued until the lifter is 0.0158" away from the base circle on the closing side of the cam.

Duration at this lift matches fairly well with most BMC factory duration numbers.

3./ The "duration at 50" is commonly used in the performance engine world as it gives a fairly good indication of the performance range the cam is going to fall into, and attention is mostly paid to the intake lobe.

A 1275 Sprite for example is 198 deg. @ 0.050" (intake) and in the later BL days intake duration got up to about 212 deg. @ 0.050" for GT spec.

For reference, duration @ 0.050" tops out at around 234 deg. for still 'street' drive-able engines. Of course bigger engines can stand slightly longer durations.

4./ Unless you are a cam designer any duration number connected with cams is in crank degrees, EXCEPT for Lobe Center Angle (LCA) which is in 'cam' degrees.

Most importantly, this figure affects valve overlap at TDC this affects idle and fuel economy and whatever you do it is always somewhat of a compromise. LCA range is 102—110 degrees for a normally aspirated engine.

5./ Stock factory cams generally have a gross lift figure 0.240" - 0.255"
As the duration gets longer it is possible to design more lift into the profile.

6./ Using the factory ratio figure of 1.26:1 these are the calculated lift figures before lash is taken out. For many reasons rocker ratios are often not what they are supposed to be!

7./ Cam Timing - this is very important.
To get the best results from your purchase correctly timing the cam is imperative. This is one of two methods we suggest. The "old" ways of cam setting often involved messing around close to the opening and closing ramp portion of the cam, this is not very accurate, and so not recommended.
Please follow the instructions on the APT "Installing & Timing Your Cam" sheet.

8./ Cam Timing - second method.
This method can be fast and accurate, especially if using the vernier style of adjustable cam gears. Anything you don't understand, please ask! Take your time

9./ These figures are just to give the installer some idea of where you are in terms of degrees when the numbers you are getting on your dial indicator are not exactly what you are looking for. (-2 = 100 deg. +2 = 104 deg.)

10./ Use the "9" method to adjust the lash, i.e. when #1 is fully open adjust #8
The lash on BMC engines does not vary much between hot and cold, but the best approach is to let the engine cool down enough you are not burning your fingers. If checking head nut torque do this prior to tappet adjustment.

11./ This is the pressure of the valve spring when the valve is closed and is holding the valve against the 'seat'.

It corresponds to the installed height in line # 15

A 10% tolerance against this suggested number is OK

12./ This is the valve spring pressure when the valve is fully opened based on a standard theoretical rocker ratio of 1.26

This number will go up to compensate for higher lift and greater valve velocity if you do something to increase the rocker ratio such as fitting offset bushes or higher ratio roller rockers which is fine.

15./ This is the measured height as seen by the outer spring when the valve is on the seat (closed) and can be measured with the depth measuring part of a vernier caliper without the outer spring fitted, and because the retainer moves up the keepers when some pressure is applied by the spring we suggest hold in the retainer up with your fingers while giving the valve stem a rap with a plastic mallet

20./ These figures are for reference only, NOT for timing your cam.
As you can see the lift at which these duration figures are given is specified, in this case 0.0158". These figures also are adjusted for the cam advance that is included in the timing specifications, which is not normally done.

22./ Some people like to see lots of technical details, if that is not you don't worry about these numbers! These figures deal with the very first part of the opening and the very last part of the closing ramps where they join the base circle (sometimes known as the 'heel' of the cam).

The number is calculated by subtracting the duration @ 0.050" from the duration @ 0.020" lift. The smaller the number the more aggressive the lift for a given duration. These numbers tend to be smaller on more modern cam designs. While the higher intensity (smaller numbers) produce more power as well as improving vacuum at idle and cruise the trade off is more valve train noise with added stress' of course, generally tighter lash with tighter tolerances on lash. Acceptable range for this measure for non race applications would be 30-40

For a lot more information on "intensities" and many other aspects of camshafts we recommend you go to the web site of the person who instigated the use of the "50 thou" duration convention as well how to measure the aggressiveness of the cam as mentioned above: www.harveycrane.com

Be sure to click these links: 'intensity', ramp secrets, aggressiveness, no-pulse

23./ 1.3 ratio requires offset bushes to be fitted to the 'pressed steel' rocker, or the use of custom 1.3 rockers, APT has the bushes or built up rocker sets.