

Basics of cams and how they work

Three things to look at when buying a cam(s):

Duration, Lift, and Overlap.

Duration- is the number of degrees of the crank rotation that the valve is held open by a cam (don't forget that the cam spins at half the speed that the crank spins at). A general rule of thumb is that the more duration the cam has, the more top-end power it will create, and this does cause you to lose low-end power. The more duration the cam has the more the valve will stay open during the crank's rotation. The longer the valve stays open the longer the time the cylinder can be filled. This is important at high rpm, since there is less and less time for the cylinder to fill.

Lift- is the height that the valve is lifted of the valve seat. Usually the more lift (with in reason) as the higher the valve is lifted the more flow that can go by. Look at it this way, if you have your window open half way you let in less air then if the window is open $\frac{3}{4}$ of the way. The draw back to having more lift is that the valve opening and closing speeds becomes higher increasing the chance of valve float. This is why you should upgrade to stiffer valve springs if the cams lift is moderately aggressive.

Overlap- is the point at which both intake valves and exhaust valves are open at the same time (at the end of the exhaust stroke and the beginning of the intake stroke). Overlap is important, because having both intake and exhaust valves open at the same time creates better scavenging of stale exhaust to occur. This is because the flow from the head into the cylinder (from the intake valves) creates a good push to get rid of stale exhaust out of the cylinder. Just like anything though, too much of a good thing is bad. If you get to much overlap the flow from the intake valves will push gas out of the cylinder before it has been used, thus wasting fuel, which equates to power. One more draw back of to much overlap is reversion into the intake ports. Reversion is when fuel/air is pushed back into the intake ports. This reversion causes intake charge dilution at low rpm as the backflow in the intake port gets in the way of cylinder filling. Two things will occur because of this, cylinder pressure becomes poor at low speeds because of the incomplete filling and the fuel/air intake charge becomes diluted because of air rushing back into the intake ports which causes low speed misfire. This is why aggressive cams that have big overlapping, create a ruff loopy idle. This misfiring causes the motor to skip a beat in rhythmic fashion at idle and low rpm. Usually firing once every four revolutions when the cylinder gets enough fuel to touch off. This occurrence is called 8-storking, because of the misfiring and the car skipping a beat it fires every other stroke of the 4-stroke cycle.

I hope this helps everybody understand how and what the cam does in the motor.