Picking The Right Cam

We often hear the question “What cam do I need for my bike?” and while there are no hard and fast rules for picking a cam for a specific application, some basic guidelines are worth considering. Keep in mind that performance camshafts are usually chosen for the basic purpose of producing more power from your engine. The three questions to answer before choosing a new cam are:

1. **Primary Application** Is the bike going to be used for all around street riding or is the goal to have an engine which is running at maximum torque and horsepower for track or drag racing?

2. **Type of Riding** Do you spend a lot of your time riding two-up on highway trips, or is it more important to have the most power? In other words is your riding style conservative or more aggressive?

3. **Engine/Bike Combination** This question relates to displacement (cubic inches), compression ratio, bike weight, and what kind of cylinder head modifications have been done. Have the intake and exhaust ports been changed to result in better flow efficiency? Does the engine have a higher than stock compression ratio to take advantage of a longer duration cam? Is the bike lighter like a Dyna or a heavy bagger?

To get the best cam for your bike, all of these factors have to be taken into account. Almost every type of engine modification imaginable has been performed on H/D type engines. Here is a short summary of modifications listed in order of increasing cost and installation complexity.

- Relieved air cleaners
- Higher output ignitions
- Free flow exhaust system
- Performance camshafts
- Modified fuel injections (or)
- Larger carburetors
- High compression pistons
- Big bore cylinders and pistons
- Long stroke flywheels

It is important to note that too much cam sometimes results in poor low RPM response and power. Street bikes will often perform better with a mild cam than a more radical cam. While bigger cams may have a higher peak horsepower, a more conservative cam may feel stronger to street riders because maximum torque occurs at a lower RPM. Changing cams is the easy way to get more torque in the 2000–4000 RPM range. A cam with a longer intake duration will reduce static compression pressure at low speeds, which in turn tends to reduce low RPM torque. But with a longer-duration cam and a higher compression ratio, power at middle and high speeds will be increased, which is what you wanted all along. This is the main benefit of a good performance camshaft and a properly tuned engine.

For an engine with a cam properly matched to the displacement and compression ratio, the net result will be more power at middle and higher engine speeds. In general, higher compression ratios need longer duration cams. Bolt-in type cams are intended for stock compression ratios.

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Camshafts and Hydraulic Lifters

There has always been a great amount of interest regarding the application of hydraulic lifters with performance camshafts. On H/D engines, this attention relates to Twin 88s, EV80 Big Twins, and Sportsters (1991 and later) since all of these engines now use hydraulic lifters as stock components.

Because we hear many questions about whether to use “solids” or “hydraulics” we felt that some discussion might help in deciding which type of lifter would be the best for specific applications. Each type of lifter design has distinct advantages.

First, all Andrews Products H/D camshafts will operate properly with hydraulic lifters if the engine and heads are set up correctly. If hydraulic lifters are installed and correctly adjusted, they have some definite advantages:

- Quiet operation
- Long time service intervals
- No loss of lift and duration from heat expansion

For hydraulic lifters to operate properly in your engine, the most important point at the time of installation is to make sure that the oil feed holes in the lifter blocks are in position to feed oil to the lifters when the cam is positioned at the lowest lift point. For this to occur with high lift cams, it may be necessary to modify the lifter blocks or lifters so oil can flow into the lifter feed hole from the tappet body.

The real advantage of solid lifters relates to all out racing. For anything else, including most street riding, we recommend that hydraulic lifters be used.

For dragsters, a properly designed cam with solid lifters will be the best choice. But for most street bikes, the idea of low-maintenance hydraulic lifters is pretty attractive. New H/D hydraulic lifters work so well that unless you really need 6500+ RPM, don’t bother with solid lifters on a street bike. Hydraulic lifters are a little harder to install and adjust, but you will end up with a quieter engine that needs less servicing.