

Flat Tappet Camshaft Break-in Procedure

WARNING: New lifters must be installed with your new camshaft.

Prior to Installation:

- Check the compatibility of the camshaft with the remainder of the valve train components (valve springs, rockers, etc.) for Coil bind and mechanical interference.
- On race or high spring load applications, use lighter load springs or remove the inner spring (dual spring application) just for break-in. Open Pressures should be under 300lb for Break-in.
- Read thoroughly the “Reasons and causes for cam failure” document.

Due to the EPA’s mandate for zinc removal from most motor oils, proper flat tappet camshaft break-in procedure is more critical than ever before. This is true for both hydraulic and mechanical flat tappet camshafts. As a point of interest, **the most critical time in the life of a flat tappet camshaft is the first 20 minutes** of break-in during which the bottoms of the lifters “mate-in” with the cam lobes.

There are some oils with additive packages that are better for camshaft break-in. These include, but are not limited to: **Brad Penn or Joe Gibbs racing or a “race only” petroleum-based oil.** Do not use API rated SL, SM, or SN oil.

CAUTION: We do not recommend the use of synthetic oils for break-in. Prior to installing the camshaft and lifters, it is recommended that the crankcase be drained and filled with new, clean oil, and include **Crane Cams Part #99003-1 Super Lube**™ additive. The oil filter should also be changed at this time. Please note that warranty is void if **#99003 Super Lube** is not used. Proper flat tappet camshaft break-in starts with the cam installation and includes the following steps:

1. Before installing the camshaft and lifters, wash them thoroughly in clean mineral spirits to remove the rust preventative that is placed on the cam before shipping.
2. DO NOT “pump-up” hydraulic lifters before use. This can cause the lifters to hold a valve open during engine cranking, which will cause low compression. The low compression will delay engine start-up and is very detrimental to proper camshaft break-in.



#99003-1



3. With the supplied Moly paste lube Part **#99002-1**, coat the bottom of the lifters (NOT the sides). Liberally coat the cam lobes and distributor gear.



#99002-1

4. Use Crane Cams assembly lube Part **#99008-1** on all other surfaces and components.
5. Set your valve lash or lifter preload. Try to minimize the number of times that you rotate the engine, as this can displace the moly paste from the lobes and lifters.
6. If possible, prime the oiling system. When priming, rotate the engine at least two complete revolutions to assure oil gets to all valve train components. **Valve covers should be off to assure that all rockers are oiling.**
7. Preset the ignition timing to start the engine at a fast idle. **It is important that the static ignition timing is set as close as possible and if the engine has a carburetor, it should be filled with fuel. The engine needs to start quickly without excessive cranking to insure immediate lubrication to the cam lobes.**



#99008-1

8. Start the engine and immediately bring to 3,000 rpm. Timing should be adjusted, as quickly as possible, to reduce excessive heat or load during break-in. Get the engine running fairly smooth and vary the engine speed from 1500–3000 RPM in a slow, to moderate, acceleration/deceleration cycle. During this time, be sure to check for any leaks and check out any unusual noises. If something doesn’t sound right, shut the engine off and check out the source of the noise.

(cont.) Upon restart, resume the high idle speed cycling. Continue the varying break-in speed for 20–30 minutes. This is necessary to provide proper lifter rotation to properly mate each lifter to its lobe. Should the engine need to be shut down for any reason, upon re-start it should be immediately brought back to 3000 rpm and the break-in continued for a total run time of 20–30 minutes.

9. During this break-in time, verify that the pushrods are rotating, as this will show that the lifters are also rotating. If the lifters do not rotate, the cam lobe and lifter will fail! Sometimes you may need to help spin the pushrod to start the rotation process driving this break-in procedure.
10. **Let the engine cool, and then drain the crankcase and properly dispose of the oil and oil filter. Refill the crankcase with a premium petroleum-based oil that contains the proper flat tappet compatible additives, not a synthetic oil. At this point the initial break-in is complete. You can drive the vehicle in your normal manner. We recommend changing the oil and filter after 500 miles. You might want to put another 5000 miles on the cam before switching to a synthetic, if that is your preference.**

Additional Information:

Spring Pressures: For extended camshaft life, flat-tappet cams should not be run with more than the recommended open valve spring pressure. Racing applications will often need to run more spring pressure at the expense of reduced camshaft life. In order to break-in a camshaft with high open pressures, the inner springs should be removed to reduce break-in load. The inner springs can then be reinstalled after initial break-in is complete.

Lifter Rotation: Flat tappet cams (both hydraulic and mechanical) have the lobes ground on a slight taper and the lifters appear to sit offset from the lobe centerline. This will induce a rotation of the lifter on the lobe. This rotation draws oil to the mating surface between the lifter and the lobe. If it is possible to view the pushrods during break-in, they should be spinning as an indication that the lifter is spinning. If you don't see a pushrod spinning, immediately stop the engine and find the cause.

Never use old flat tappet lifters on a new cam. On flat tappet cams, the lobes and lifter bottoms mate together. If the lifters are removed from the engine, they must go back on the same lobe from which they were removed. **Crane Cams recommends the use of high quality lifters to prevent premature cam or lifter wear.**

Big Block Chevrolets have an oil-priming idiosyncrasy. When priming a Big Block Chevy with a drill motor and priming tool, it is often necessary to prime for as long as 20 minutes (while rotating the engine) to get oil to all of the lifters and rockers. It is advisable to prime these engines with the valve covers removed so you can check to see oil coming out of all of the rocker arms before firing the engine. This last step is advisable on all engines, but particularly on Big Block Chevrolets.