



Installation Instructions

## Flat Tappet Cam Run-In Procedure

**WARNING: NEW CRANE LIFTERS & CRANE SUPERLUBE #99003-1 MUST BE USED IN ORDER TO NOT VOID YOUR WARRANTY. PLEASE RETAIN YOUR RECEIPT, AS PROOF OF PURCHASE WILL BE REQUIRED IN THE EVENT OF ANY CLAIM.**

Proper flat tappet cam run-in procedure is now more critical than ever before, with emission requirements requiring the removal of zinc from most engine oils.

The most critical time in the life of a flat tappet cam is the first 20mins of run-in during which time the lifter faces bed into the cam lobes.

Run-in requires oil that still has zinc additives – e.g. Kendall mineral oil GT-1 20w-50 (.113%), GT-1 30 & GT-1 40 (.104%) , GT-1 50 (.111%)

Penrite Run in oil 20w-50 (.136%); HPR Classic 30/40/50 (.099%); HPR Gas 20w-60 (.101%).

Diesel oils also work great – Shell Rotella T and Mobil Delvac 1330/1340/1350.

**Crane Superlube #99003-1 (zinc alkyl dithiophosphate – an anti scuff extreme pressure supplement ) MUST be used. This should be poured over the lifters & camshaft prior to start up.**

**Caution : we do not recommend synthetic oil for run-in.**

**We strongly recommend mineral oils with flat tappet cams to ensure proper lifter rotation.** Flat tappet cams have the lobes ground on a slight taper and the lifter appears to sit offset from the lobe centerline. This induces a rotation of the lifter on the lobe and this rotation draws oil to the contact surface between the cam lobe and lifter. Synthetic oils are too slippery and do not promote proper lifter rotation.

**Lack of lifter rotation WILL cause camshaft failure.**

### **Cam and Lifter installation instructions;**

1. Prior to cam installation – change engine oil & filter.  
Wash the cam thoroughly in mineral spirits to remove the rust preventative coating.
2. **Do not “pump-up” hydraulic lifters before use.** This can cause the lifters to hold the valves slightly open during engine cranking which will cause compression loss and thus a delayed start-up and a possible “dry start” condition. This is very detrimental to proper cam run-in.
3. **Coat the cam lobes, distributor drive gear and the bottom face of the lifters with the supplied Crane Moly paste cam lube. (99002) Lube the sides of the lifters with engine oil.**
4. Install **Crane cam, new Crane lifters & timing set. Never use old lifters on a new cam. This can cause immediate cam failure.** Lube pushrod ends with oil before installing.
5. Put paint marks on the push rods to allow you to check for pushrod rotation on engine start-up. **Lack of lifter rotation will cause cam/lifter failure.** If a pushrod is not spinning – immediately stop the engine & find the cause.

6. Set your valve lash or lifter preload. Make sure cam is timed correctly. No1 cyl should have compression when the ignition is firing on No1.
7. If possible, drill prime your oiling system. Rotate the engine at least one complete revolution to assure oil gets to all valve train components. **Warning – do not crank engine to prime oil system.** This will deplete cam lube from the cam and lifters & cause a dry start condition which may lead to cam and lifter failure.
8. **It is important to start the engine with as little cranking as possible.** Cams rely on oil splash from the crank assembly for their lubrication supply. **There is insufficient oil supply to the cam and lifters until the engine fires up and attains at least 1500rpm.**
9. Lube distributor gear with supplied moly paste cam lube. Install distributor & preset ignition timing. Prime the fuel system. If the engine is carbied and has a mechanical fuel pump, bowls may be filled through the bowl vent tubes.
10. Fire up the engine and immediately **bring the revs to between 2000 to 3000 rpm.** **Warning – do not let the engine idle!** Do not worry about getting ignition timing set perfectly at this time, Lift rocker covers and **verify pushrod rotation.** Get the engine running fairly smoothly and **vary the engine speed between 2000 to 3000 rpm in a slow to moderate acceleration / deceleration cycle. Do not hold the engine at a constant rpm level!** During this time check for engine leaks or unusual noises. If something doesn't sound right – shut engine off and locate the source of the noise. Upon restart resume the high idle speed cycling. **Continue the varying run-in speed for 20 – 30 minutes. This is necessary to promote proper lifter rotation to properly mate the lifters to their lobes.**
11. Let engine cool and then change oil and filter.
12. At this point initial run-in is complete. Drive the car in a normal manner – but **avoid prolonged idling.** We recommend changing oil and filter again at 1000 kms. We strongly recommend mineral oils with flat tappet cams. If synthetic oil is your preference – run the engine for 8000 kms before changing.
13. **Valve springs – please note. For extended cam life, flat tappet cams should not be run with more than 330 lbs of open spring pressure.** Racing applications will often need to run more spring pressure at the expense of reduced cam life. **During run-in, open- spring loads must not exceed 330 lbs & should preferably be less than 300 lbs. On dual valve spring applications the inner springs must be removed during run-in so that the open break in load does not exceed 330 lbs.** Re-install inner springs after initial run-in period is complete.
14. **Please note: Big Block Chevs** have an oil priming idiosyncrasy and may need to be primed with a drill and priming tool for as much as 20 mins (while rotating the engine) to get oil to all of the lifters and rockers. Check to see that oil is coming out of all of the rocker arms before firing the engine.
15. **Please note: 253 – 308 Holden engines - oil priming.** Oil pumps on these engines can be lazy to pick up oil from the sump on initial fire-up. **The practice of filling the oil pump with grease in an attempt to rectify this is not recommended.** Fill oil pump and filter with oil. The oil system can be primed thru the oil pressure switch hole with an oil can or pressure primer.
16. **Caution – Small Block Chev timing sets** - do not add extra thrust washer behind cam gear. this will locate cam too far forward in the block and alter cam / lifter offset causing lack of lifter

rotation and cam failure.( note - timing sets supplied with brass or Torrington thrust washers have the cam gear machined to maintain correct lifter / cam relationship.)

- 17. If unsure of any of the above details –please contact either your parts supplier or Crane Technologies Tech Dept. Ph (08) 8363 5566 before attempting cam installation.**