Lifter Installation and Valve Adjustment for Hydraulic and Mechanical Lifter Camshafts

You MUST check lifter pre-load on any hydraulic cam installation! Failure to do so can result in SEVERE CAM, LIFTER, AND VALVE TRAIN DAMAGE, and can void your warranty.

Thank you for purchasing genuine Lunati brand products for your performance engine! We know you have a choice when it comes to performance parts, and we are proud to offer the highest quality products available today.

We’d like for you to take just a moment to review our recommended installation procedure before beginning. Following these simple steps should provide you with a successful camshaft and lifter installation.

When installing your new Lunati flat tappet (NON-roller) camshaft, we require a new set of Lunati brand lifters be installed as well. (Failure to do so will void any and all expressed or implied warranties!)

Use a liberal amount of Lunati Assembly Lube P/N 99010 (supplied) on all cam lobes and lifter surfaces of non-roller cams to facilitate smooth operational movement during initial engine start up. We also recommend applying a small amount of motor oil to the pushrod seat area of the lifter.

For “roller” cams, coat the cam surface and lifters with a quality (NON synthetic) motor oil. Be sure to properly tighten cam sprocket bolts, etc. (Use Lunati Cam Bolt Locking Plate Kit P/N 90283 on all Chevy V-8 and V-6 applications.)

All “pre start up” lifter adjustments should be made with the intake manifold removed, to better see all valve train motion. Engines with separately adjustable rocker arms, such as the small block and big block Chevy V-8 require adjustment one cylinder at a time! On engines with shaft-mounted adjustable rocker arms, we recommend fully backing off all adjusters prior to installing the rocker shaft assembly. Be sure the pushrods are properly “seated” in the lifters and rocker arms before starting your adjustment procedure. NOTE: Improper adjustment of the rocker arms can cause the valve to hit the piston upon engine rotation!

On hydraulic lifter cams, rotate the engine in the normal direction of rotation until the exhaust valve begins to open. At this point, adjust the intake valve to ZERO LASH with no pre-load at the lifter, then tighten 1/2 more turn. Rotate the engine again until the intake valve has fully opened. Now you can adjust the exhaust valve to ZERO LASH, then 1/2 more turn. Repeat this procedure until each cylinder is completed.

On engines with non-adjustable rocker arms, you must have a lifter pre-load of .020” to .060”. (See “Setting Lifter Pre-Load” in this instruction sheet.) Use the same sequence as above.

Pushrods for each cylinder are usually the same length (except for big block Chevrolets) unless valve stem heights are not properly matched. Be sure that the valve you check for lifter pre-load isn’t open. Allow a few minutes for lifter bleed down if this occurs.

NOTE: Some installations require changing pushrod length, using adjustable pushrods, shimming the rocker stands or shafts, installing straight screw-in studs instead of stock bottle neck type studs, using Allen set adjusting nuts, or machining the heads for adjustable rocker arms, studs, and guide plates.
If you run into problems, we suggest you give our tech help line a call **BEFORE ATTEMPTING ANY FURTHER ADJUSTMENTS!** Lunati Technical Service—(662) 892-1500.

Hydraulic lifter cams usually do not require additional adjustment after initial engine start-up.

To adjust **VALVE LASH ON MECHANICAL (solid) LIFTER CAMS**, follow the same basic procedure as above. Instead of lifter pre-load and zero lash, use the valve lash specs printed on your Lunati cam spec card. After engine start-up and break-in, change the oil and filter, and verify the valve lash settings. You'll need to check this periodically based on vehicle usage. **(The valve lash settings noted on the spec card are “HOT” settings, and will need to be verified with the engine at operating temperature.)**

If you **DO NOT KNOW THE VALVE LASH SPECS** for your Lunati cam, call our tech help line at (662) 892-1500 and give them the Lunati grind number (or part number) stamped on the end of the cam.

**Setting lifter pre-load in hydraulic lifters on engines with NON-Adjustable rocker arms:**

Lifter pre-load (the distance the lifter plunger is depressed by the pushrod) should be between .020” and .060”. Too little pre-load or no pre-load will result in very noisy operation while the engine is running. Too much pre-load may cause the engine to idle rough, have very low manifold vacuum, and/or poor low-RPM throttle response.

With all adjusters fully backed off, torque all bolts for rockers, shafts or stands to proper specs. As always, **NEW LIFTERS MUST BE INSTALLED ON ANY NEW (non roller) CAMSHAFT!**

Using the valve cover gasket surface of the head as a guide, lay a metal scribe, etc., flat on this surface, and make two marks to be sure your reference point is flat and stable. Scribe a line on the pushrod. Unbolt the rocker assembly and remove from the cylinder head, but do NOT remove the pushrods. At this time, the pushrods will “rise” relative to their position prior to removing the rocker assembly due to the oil pressure in the hydraulic cavity of the lifter. Now, scribe another mark on the pushrod. The difference between the two marks is the amount of lifter preload. You should achieve this same distance when reassembling your engine. You can measure this pre-load amount with a machinist’s pocket scale or dial calipers. A distance of .020” to .060” is recommended.

If the pre-load is less than the minimum .020”, we recommend measuring the amount of free-play (lash) between the rocker arm and pushrod with a dial indicator or feeler gauge. Add .030” to this figure. Call Lunati’s tech line with this measurement and we’ll be happy to assist you with the appropriate length pushrod part number to achieve your appropriate lifter preload.

We suggest checking the valve stem heights on both cylinder heads. If your valve stem heights are uneven (check them by laying a straight edge across the top of the valves) or different from factory specs (see the factory shop manual), then you’ll have to check lifter pre-load on **each valve** independently.

On engines with pedestal or shoulder bolt mounted rockers, shims can be used to reduce the lifter pre-load. If pre-load is too little, you’ll need to use longer than stock pushrods. **(Use same measuring procedure as above.)**

Finally, if you’re confused or don’t understand how this all works, **STOP, DON’T GO ANY FURTHER!** Call our tech line and ask for assistance **BEFORE** you damage your cam, components, or engine.
CAM AND LIFTER WEAR—
PREVENT IT BEFORE IT BEGINS

Like any mechanical component where constant friction occurs, flat tappet (hydraulic or solid lift) camshafts and lifters
are subject to wear. The degree of stress and friction these components are subjected to will spell the difference
between a cam and lifter installation that lasts as it should and one that wears prematurely.

There are two main different types of flat tappet cams. **Hydraulics**, the most common and popular type for street use, act like
small hydraulic pumps, smoothing valve action and providing quiet, nearly maintenance-free operation that can last over
100,000 miles. **Solid**, or **Mechanical** types tend to offer a higher level of performance, but require more maintenance than the
hydraulic style and are substantially noisier. This type of cam requires a “lash” setting at the valve as well.

Today’s flat tappet cam designs are the most aggressive and powerful we’ve ever produced. This level of performance requires
a certain amount of attention on behalf of the end user and/or engine builder during assembly and
initial start up. When properly installed and maintained, a Lunati hydraulic cam and lifters can be
expected to provide reliable performance for thousands of miles. Our mechanical flat tappet cams
(commonly called “solids”) are exactly as their name implies—they have no hydraulic lifter action
and are known for their distinctive mechanical “clattering” sound while the engine is running.
Powerful but noisy, flat tappet cams allow the camshaft designer to engineer more valve action
into the profile for added power and torque.

Regardless of your particular choice of lifter design—hydraulic or solid—be absolutely positive
that the camshaft you’re installing in your engine is combined with the correct type of lifters! NEVER ATTEMPT TO USE HYDRAULIC LIFTERS ON A SOLID CAM - OR SOLID LIFTERS ON A HYDRAULIC CAM! Doing so will VOID ANY AND ALL WARRANTIES! If you’ve obtained a
camshaft or set of lifters and you cannot be sure of the type design, contact the manufacturer prior
to installation. You can contact Lunati’s Certified Valve Train Professionals at 662-892-1500 for
assistance.

Without a doubt, the vast majority of all cam and lifter failures occur when the new cam and lifters are installed and the engine is
fired up and run for the first time. The first 10 minutes of initial cam break-in is the most crucial! If the appropriate instructions
and installation procedures aren’t followed - with the correct components - failure is likely imminent.

One of the most common problems we find with cam and lifter wear results when a new cam is installed with USED LIFTERS! Even lifters that have only a few minutes of running time on them cannot be used with another cam. **NEW LIFTERS MUST ALWAYS BE USED WITH A NEW CAM**
due to the immediate wear pattern that begins the instant the engine is fired up and run. Although appearing to be flat across
the bottom, lifters are actually convex shaped with a crown of approximately .002". This
crown shape and the taper ground into the cam’s lobes promote the lifter’s rotation
while the engine is operating.

Before you install the new cam, properly coat each and every lobe, including the fuel
pump lobe, with cam and lifter assembly lube. A number of these compounds are
available. Be sure that the lube you use is one designed specifically for cam and lifter
assembly, and has a high concentration of moly in its formula. Lunati also offers this
lube, available by ordering Lunati P/N 99010.

Apply cam lube liberally to both the lifter faces and lobe areas of your flat tappet cam
and lifters.

Lunati recommends “pre-oiling” your engine prior to start up. Failure to do so will result
in premature parts wear and possible cam failure (see photo). Dry cam lobes and
lifters will wear out immediately upon start up. Lunati will not warranty cams that have
failed due to improper break-in, lack of lubrication, or dry start ups. Oil pump primer
tools are available through most major auto parts suppliers and speed shops.

We have found that utilizing straight 30 weight, non-detergent motor oil works best for initial start up and cam break in. Switching
to a multi-grade, premium quality oil for your climate conditions is acceptable after the first 500 miles of engine operation. DO NOT use synthetic or synthetic blend oils prior to the first 5000 miles of engine operation.

Lunati recommends filling the oil filter with fresh oil in addition to the crankcase prior to initial start up.

Filling the carburetor float bowls, or priming the injection pump will facilitate quick engine start up. This prevents cam and lifter
wear during the initial engine firing. Once the engine fires, Lunati recommends setting the throttle RPM at 2000-2500 for the first
20 minutes of run time. After the first 20 minutes, we suggest increasing the engine RPM in increments of 500 RPM for 1 minute
at a time up to 3500. After reaching 3500 RPM and maintaining for one minute, begin to decrease RPM in increments of 500
RPM for 1 minute at a time until the engine is back down to 1000 RPM. Once this is accomplished, your Lunati cam and lifters have successfully completed their initial break in run cycle.

In the event your engine develops a problem (overheating, fuel leak, etc.) shut the engine off immediately, let it cool down, repair the problem and resume your break in procedure.

After you’ve completed the break-in procedure, let the engine cool and then drain the oil. Discard the oil and oil filter and replace both, using clean, fresh oil of the correct weight.

Once you’ve completed all of the steps we’ve outlined, your new Lunati cam and lifters should perform flawlessly for a long time to come.

If you have any problems or questions, consult one of Lunati’s technical service advisors at 662-892-1500.

Lunati Sales & Service
11126 Willow Ridge Drive
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Phone: 662-892-1500
Fax: 662-890-6309

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**Lunati Limited Warranty**

All Lunati Limited Warranties are extended to the original consumer only. This Limited Warranty is not assignable or otherwise transferable. There are no warranties that extend beyond those stated herein. Lunati offers no other warranties expressed or implied beyond this Limited Warranty.

In the event of an alleged defect in material or workmanship, Lunati’s responsibility is strictly limited to repair or replacement of the defective product. Lunati has no other obligation expressed or implied. Final warranty determination will be in the sole discretion of Lunati. Lunati shall not be responsible for: (a) actual or alleged labor, transportation, or other incidental charges, or (b) actual or alleged consequential or other damages incurred by use of any Lunati product.

To initiate the warranty process, the consumer must return the alleged defective product to the original place of purchase with a dated receipt and Lunati-issued Return Materials Authorization (RMA) #. Warranty claims will be rejected if the date of purchase cannot be established by the consumer or if the return is not accompanied by a valid Lunati RMA#. Lunati assumes no responsibility for products sent without an authorized RMA#.

This Limited Warranty sets forth specific legal rights. The consumer may have other rights as a result of variations in state laws or provincial laws. This Limited Warranty supersedes all prior warranty statements.

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**Lunati – New Product**

Lunati warrants its new products to be free from defects in material and workmanship for a period of 90 days from date of purchase.

Lunati’s Limited Warranty specifically does not apply to products, which have been: (a) modified or altered in any way, (b) subjected to adverse conditions, such as misuse, neglect, accident, improper installation or adjustment, dirt or other contaminants, water, corrosion, or faulty repair, or (c) used in other than those applications recommended by Lunati. Lunati also does not warrant, and disclaims all liability for products used in racing activities and/or applications other than those specifically recommended in the current brand catalog.