

3. It is vital to use a total of three (3) flywheel shims to achieve proper endplay. To ensure you have enough room to use three flywheel shims, please note the following:

- A. The width of most thrust bearings is 28.9mm +/- .05mm, however we have found some that measure 29.00mm.
- B. Flywheel depth is 3.18mm - 3.22mm.
- C. The paper gasket is .20mm, and will compress to .15mm. Please note that only one (1) gasket is used. We provide a spare gasket with the crankshaft. The paper gasket has a top and a bottom; it can be installed only one way.

4. You will need to run spacers under the cylinders to compensate for the increased stroke. How much depends on the compression ratio you wish to achieve. We have shims/spacers in the following thousands of an inch: .010", .020", .040" and .060".

5. In order to achieve proper pushrod length, we have provided 2.75mm spacers, one for each pushrod. These spacers are to be placed within the lifter end, and therefore the rod portion of the pushrod assembly must be removed. Below are some simple instructions for installation.

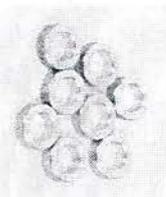
**Tools needed:**

- Bench top vice
- Set of soft jaws, preferably the style with "V" cuts in the faces.
- Soft faced hammer or hammer and block of wood.

We constructed this simple tool by welding a thick head washer onto the surface of an old gland nut. The lifter slides into the internal needle-bearing surface perfectly. Some lifters are more stubborn than others, so this tool will definitely come in handy.



Tool made from old gland nut



Clamp the rod portion of the pushrod assembly into the vise using your soft jaws, and extend the head of the lifter away from the vise to allow for sufficient leverage. A pair of screwdrivers or small pry bars is perfect for removing the lifter from the rod. Using equal force, pop the lifter away from the rod. As you can see below, this tool provides a fairly large surface to pry from.



Prying lifter off using tool.

Apply a touch of grease onto the outside surface of the spacer. This will hold the spacer steady prior to installation onto the rod. Install the spacer inside of the lifter making sure it slides to the bottom. Install the lifter onto the rod.



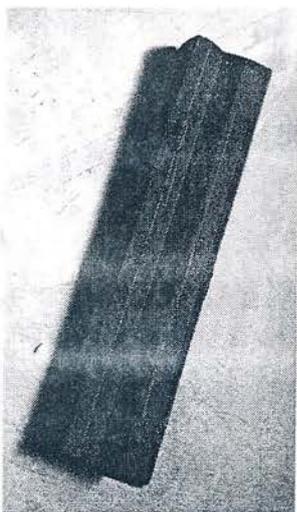
Installing spacer into lifter.

Using a soft faced hammer, and with the rod still clamped into the soft jaws, gently tap the lifter onto the rod until fully seated. Verify the lifter is fully seated by comparing with one of the other seven stock pushrods. The new pushrod will be 2.75mm greater length compared to stock.

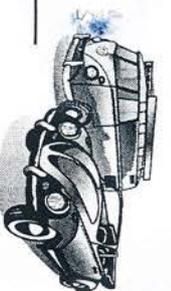
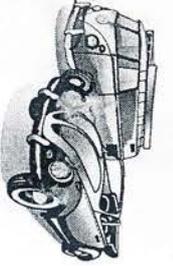


Tapping the lifter back into place.

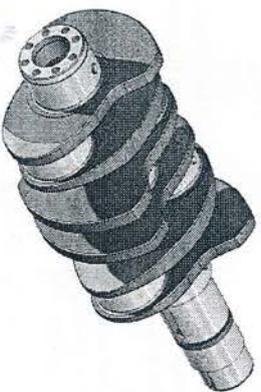
Always check the valve adjustment after the first driving test around the block.



Soft jaws with "V" groove down the center.



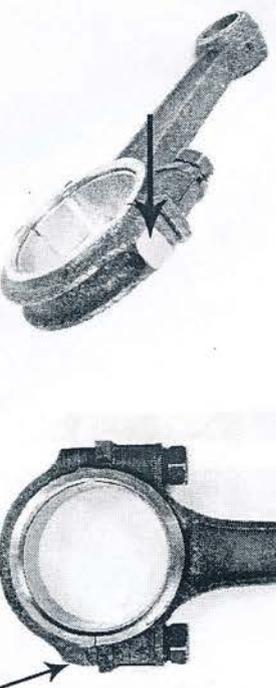
## 69.5 Crankshaft Installation Tips and Notes Part number 111 105 101OK



It goes without saying: to install this crankshaft a reasonable amount of VW air-cooled engine rebuilding experience is necessary. Thus the reason for naming this guide "Tips", and not "Instructions".

Aside from the basic installation procedures that should be followed when installing a crankshaft, there are five additional areas that need to be addressed.

1. You will need to have the additional 4 dowel pin holes added to your flywheel using the SPG pattern. The choice of lightening the stock flywheel weight is a subject of debate. We have been running a lightened version on our test motors without any ill effects.
2. Due to the additional 5.5mm of travel it is necessary to remove material from the bottom side of the connecting rod caps # 2 and # 4 to eliminate contact with the camshaft. It's best that enough material is removed to allow for roughly 2 millimeters clearance. Clearancing of the pistons, that we supply or most original German units, should not need to be performed. You can check any areas of concern by applying normal weather sealing caulk to the suspected area and look at the depression left after assembly.



Arrows point to area that will need to be removed to allow for clearance of the rod to cam.