

## *Valve Seal Installation by Joe Fisher*

### **Valve Stem Seals**

**The valve seal allows a controlled amount of oil to pass so the valve stem to guide is lubricated and prevents premature wear while keeping the majority of the oil off of the stem. When the seal hardens or wears too much oil is allowed down the stem which can turn into carbon and collect on the backside of the valve and eventually prevent the valve from closing fully, if enough oil passes then it will wind up in the combustion chamber and burn causing blue smoke out the exhaust and high oil consumption.**

**One of the signs of worn seals is after a cold start. You will see blue smoke out the exhaust for a while until the engine is run for a period of time.**

**It will also be noticed when accelerating after long periods of idling and when coasting down a hill.**

**This procedure was done on my wife's 82 Vette. It has a positive valve seal and the common O-ring seal.**

**Most older small blocks used only the o-ring seal, but I recommend using, in conjunction with the o-ring, FelPro SS5112, and FelPro SS10058 umbrella seals. They will fit inside the inner damper spring.**

**If you only have the O-ring and are going to use the umbrellas then substitute the umbrella seal for the blue positive seals in the photos. All other steps still pertain.**

**Note: When using the O-ring seal the oil deflector must be used.**

**The valve spring compressor I use in this article is just one type, there are others. I had to use this style because of the crowded engine compartment and large CrossFire manifold.**

**I normal use this one which is inexpensive and easy to use:**



**Some things to remember before starting:**

- Disconnect the battery.**
- Make sure transmission is in neutral, the emergency brake is on and the wheels are chocked.**
- When air is put in the cylinder the engine will turn, so keep fingers and items away from fan.**
- Once the spring is removed, do not push down on valve stem, it will relieve the air pressure and the valve will drop into the cylinder.**
- Count the valve seals and O-rings before starting.**

**Many years ago I did a set of heads and had one O-ring left over. I disassembled the heads to find out there were 17 in the package!**

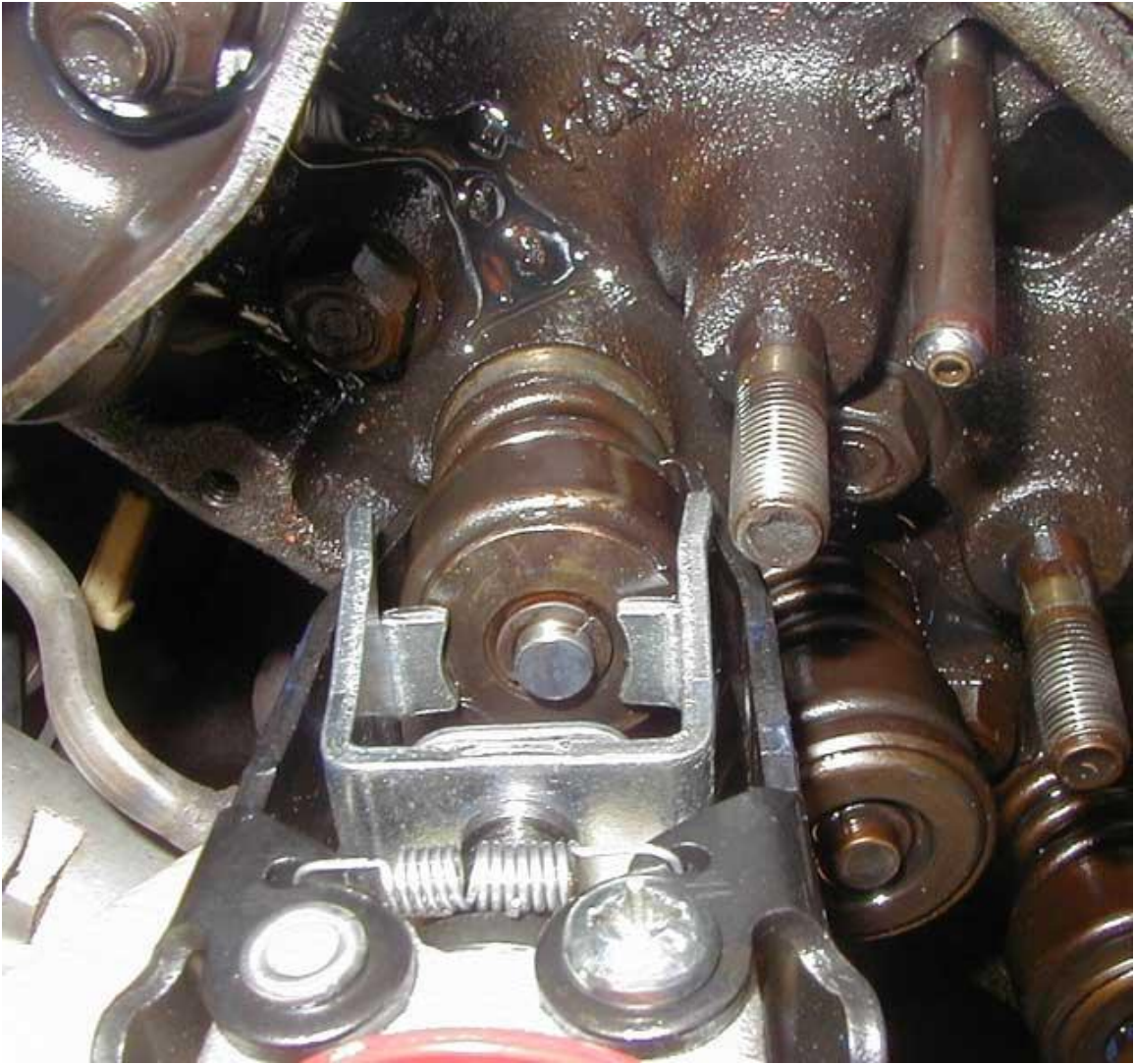


**This is the tool to put air into the cylinders**

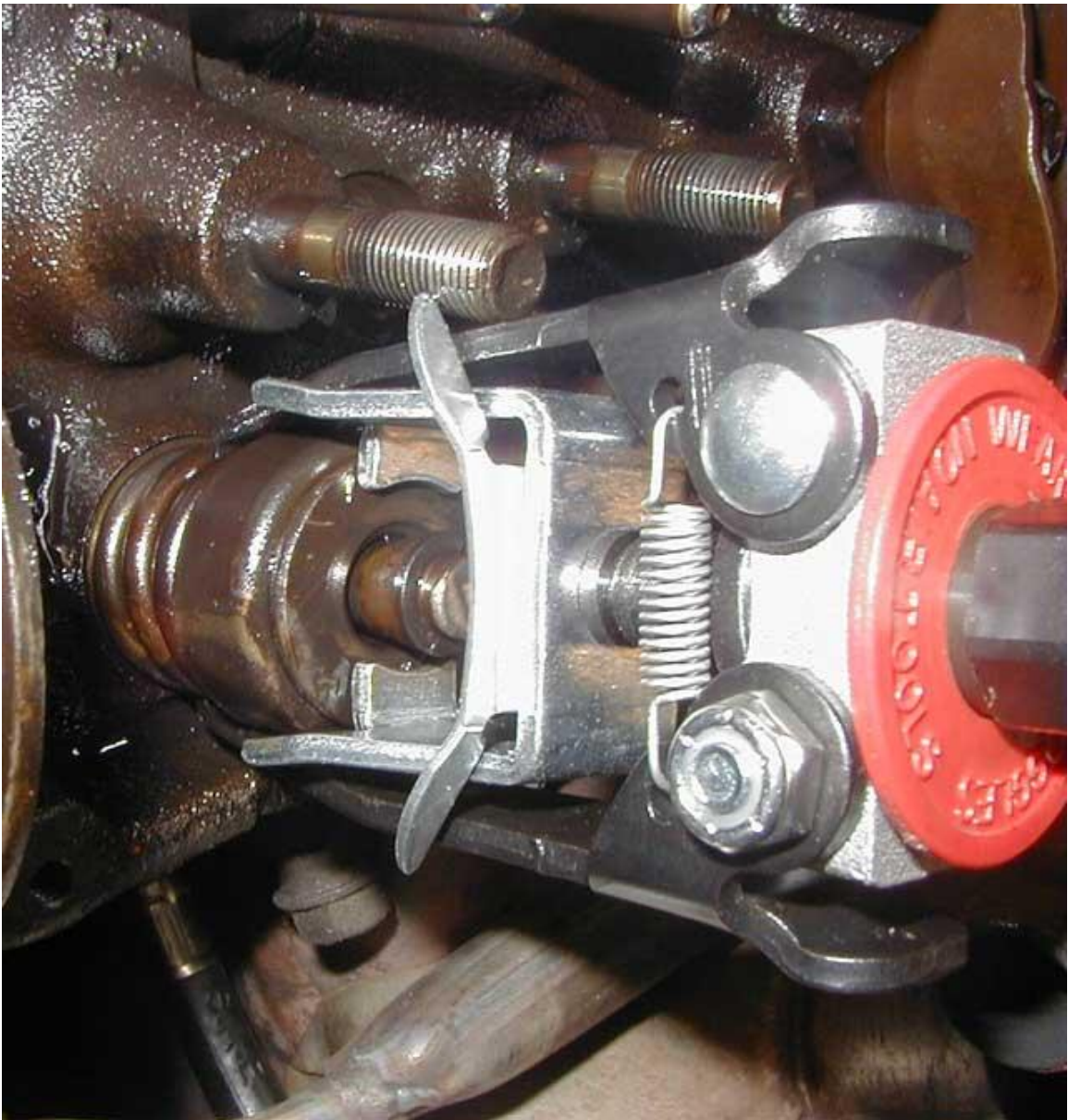
**Do only one cylinder at a time. Remove the rocker arms and be sure to keep them in the order they came off so they go back on the same valve. The exhaust and intake are identified by the port they are nearest to. Remove the spark plug, screw in the air adapter and connect the air source. Do not disconnect or interrupt the air source until both springs are back on the valves.**



**Give the side of the retainer a hit with a soft hammer.  
This will help to unseat the keeper to retainer bond.**



**Spring compressor installed and ready to go.**



**Compress the spring just enough to expose the keepers.**



**Put a magnet near the keepers and use a small awl or pick to separate them from the valve stem. Sometimes the valve spring will not come up. This is usually because the O-ring has hardened in the groove. Use a pick and break the O-ring up until the spring will come off.**



**The valve spring compressed.**

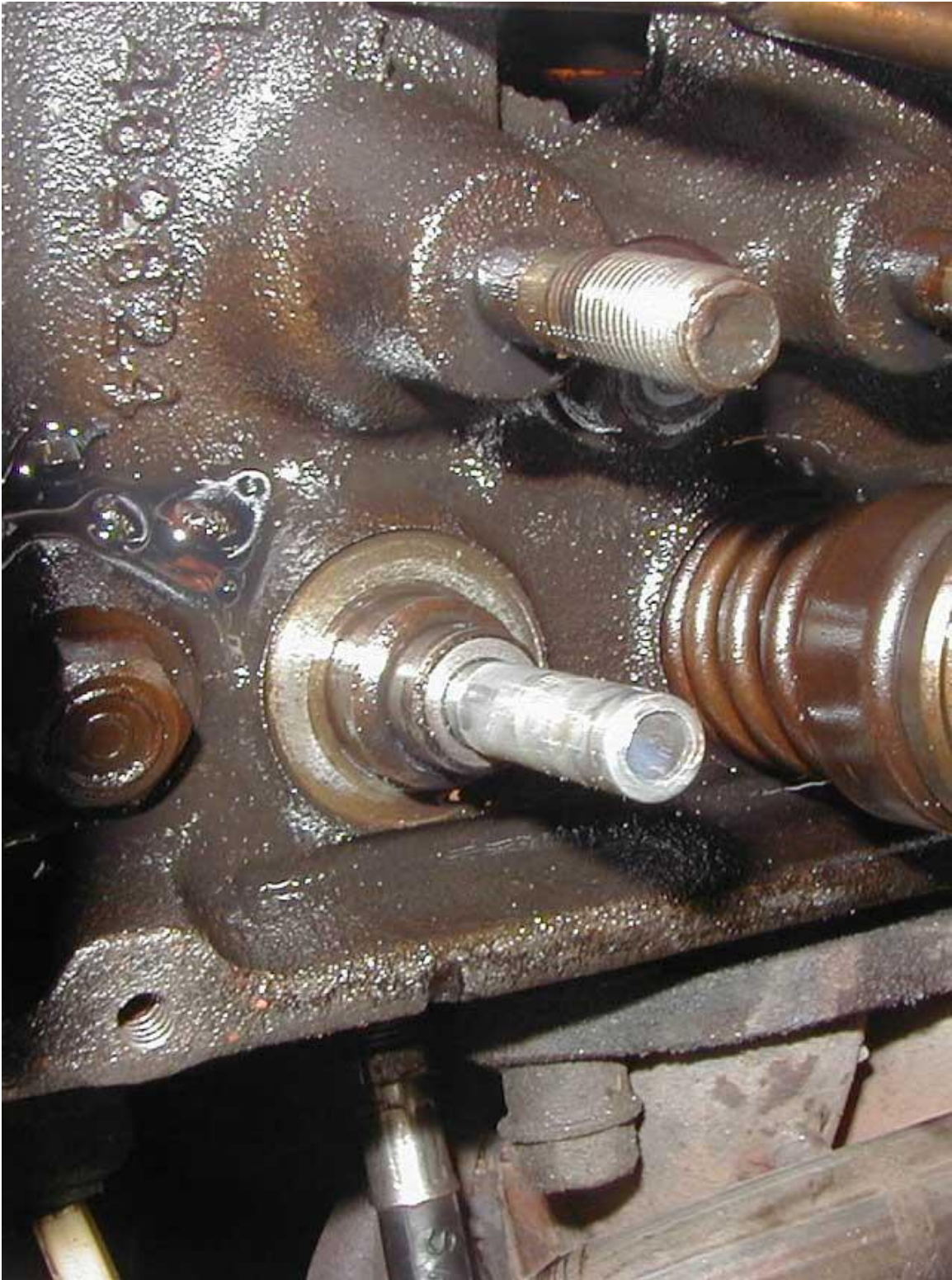




**This is an intake that I am doing. Note the two grooves on the valve stem. Now is a good time to inspect the rocker arm studs for any damage.**



**Work organized and neat. It makes things go smoothly. I already did one cylinder so I have three to go on this side.**



**Put the plastic protector sleeve over the stem so the grooves don't nick the new seal. Put some oil on the top of the stem to lube the seal.**



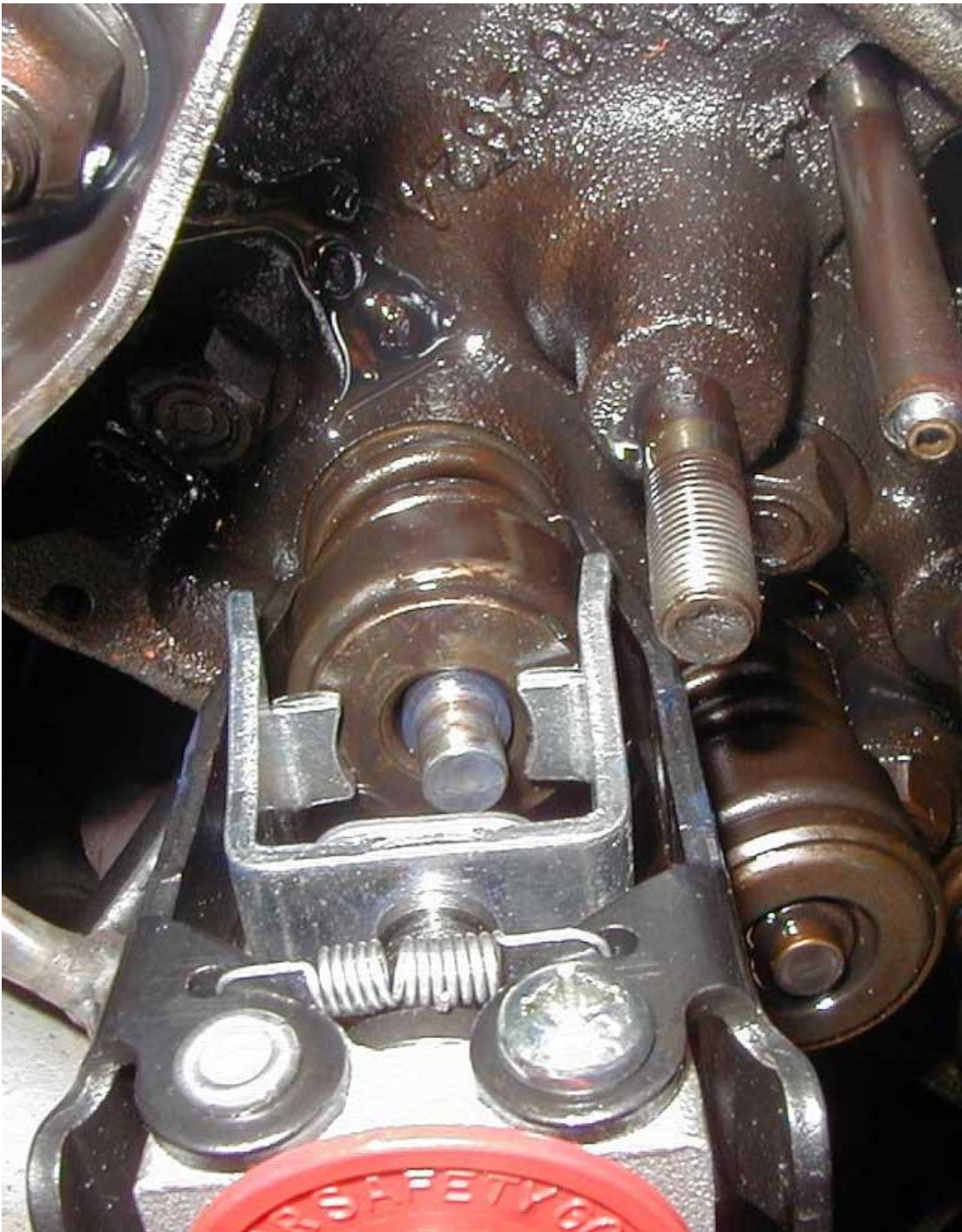
**I apply sideways pressure to the valve stem as I gently push the seal onto the stem. I do this so I don't unseat the valve.**



**Make sure the seal is down on the machined boss of the valve guide completely**



**Before installing the keepers, clean and inspect them. Look for sharp edges, not rounded ones, on the raised lip that sits in the groove of the stem. The one on the left is new.**



**Put the spring over the valve, compress the spring, lube the O-ring and slip it onto the stem. It is now in the first groove.**

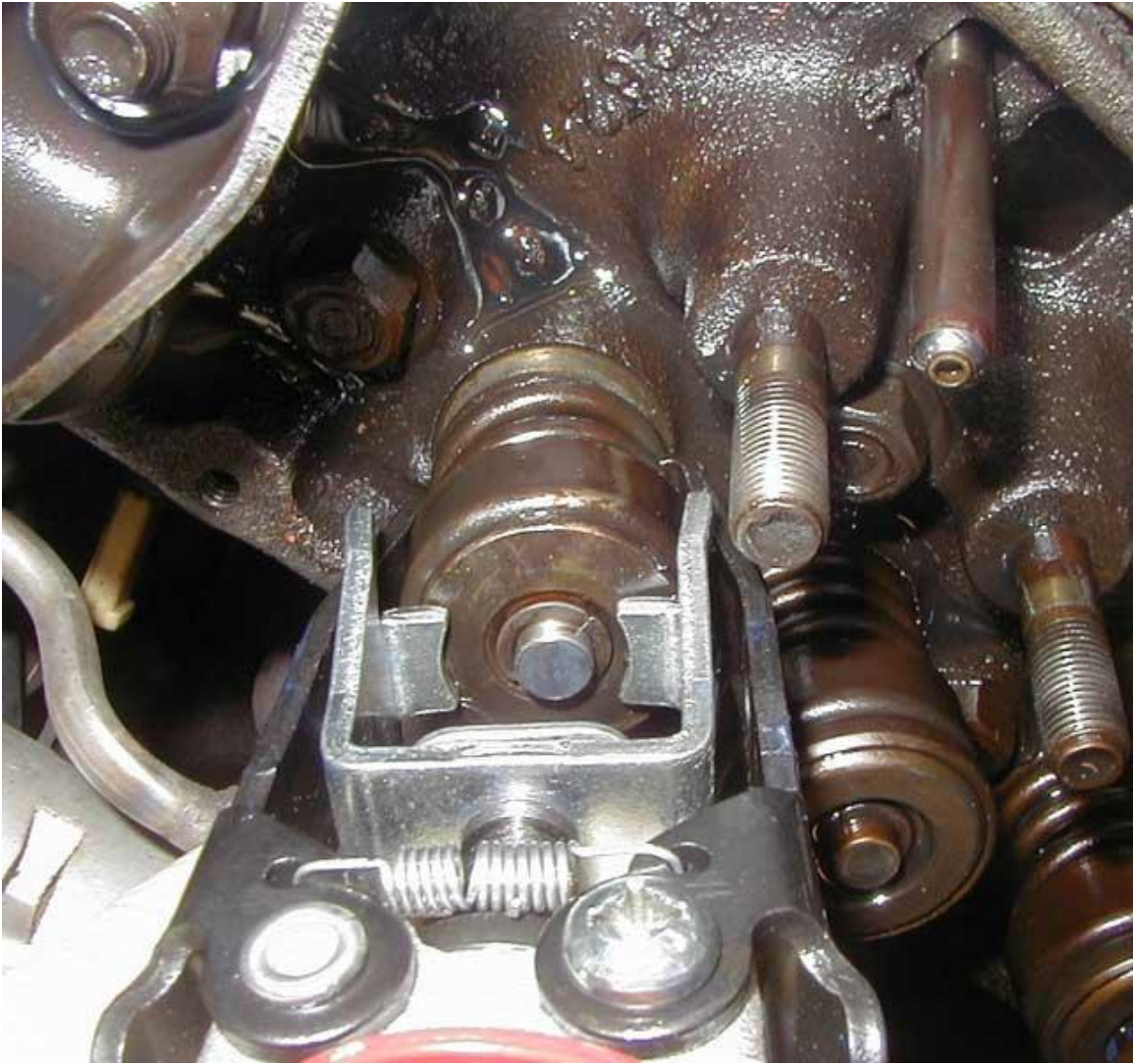


**Continue to move it down until it sits in the second groove. Do Not push any further.**

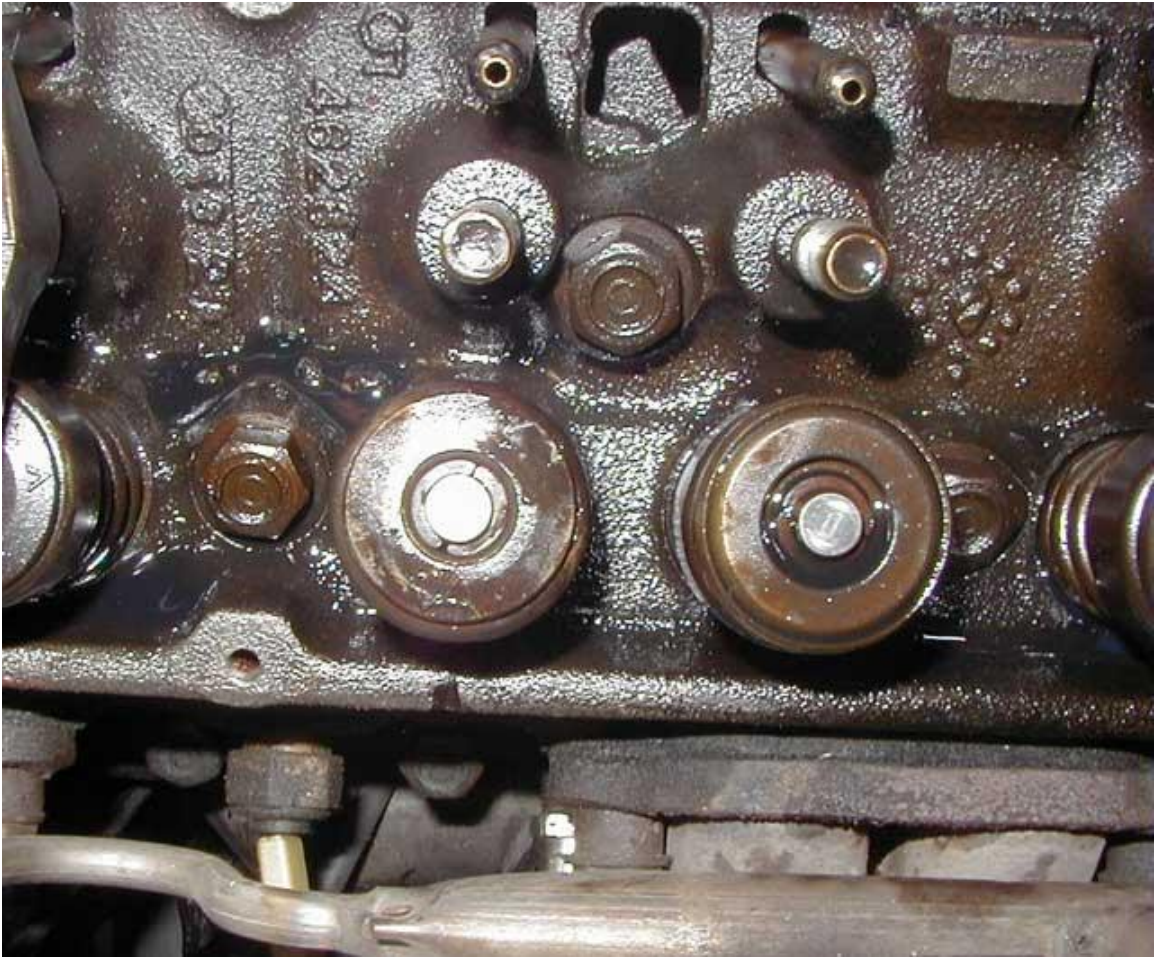




**Install the keepers.**



**Pull up on the compressor/spring and remove the tension from the compressor.**



**Give the retainer a couple of light taps with the dead blow hammer to seat the keepers. Now go to the next valve. Make sure to clean any pieces of O-ring that fell onto the head before putting the covers on.**



**Adjusting the valves:**

**Everyone has their own method for doing this; some do it with the engine running, others with the engine off. I have used the following method for many years and it has never failed me. I even use this method while the engine is still on the engine stand.**

**This will not work with solid lifters, high overlap cams or the 30-30 cam.**

**With the piston at TDC and both valves closed back off the retaining nuts until the rocker arms have play between it and the valve tip.**

**Now slowly turn one of the nuts down while spinning the pushrod between two fingers. When you feel resistance to you spinning the push rod you have achieved zero clearance.**

**Make sure your socket is not contacting the rocker arm causing a false feel.**

**Now turn the nut an additional 1/2 - 3/4 turn and then go to the other rocker. Continue in the firing order and adjust the rest in the same manner.**

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