



Shop Solutions

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TALKIN' BOUT THOSE GOOD VIBRATIONS

We get a lot of broken bolt, broken tap, and broken easy out work in our shop, mostly because we are good at it! We are usually the last guys called because we are not known as the cheapest, but the guys that always can do the job. When we are trying to remove a broken tap without an EDM, we spray it first with PB Blaster, our favorite penetrant, then use a small brass punch and small hammer to gently work the tap free in all directions. Often times you can then use a slender needle nose plier, forceps, or 4 pronged tap remover between the flutes and turn and remove the broken tap. When the tap wants to move, but sometimes just won't, we vibrate the tap and/or pliers with a vibratory etching pen. Don't bother with a cheap etching pen! In some applications they will work, but not as well as a higher power unit. This many times will allow the tap to back out freely. If not, then we just start to break the flutes with a small punch, again vibrating the larger parts with the pen, while blowing air to the bottom of the hole with a fine tipped blow gun. We also have a blowgun and regulator attached to a small CO2 tank for blowing out the broken chips, in this case the freezing action of the CO2 will contract the chips and tap and allow easier removal. Definitely wear a face shield and gloves for that operation! Continue until removed. The pen and CO2 deal also works when removing stubborn small carburetor parts too.

Timm Jurincie
TUF-ENUF Auto & Marine Performance
Avondale, AZ.

NO BUGS

I put an aquarium bubbler in the coolant tank on my crankshaft grinder to keep the coolant moving. This keeps the algae from blooming and keeps the coolant better to work with. I used a pair of old main caps wired to the base to form a stand. When I don't grind for a week or more it really helps keep the coolant clear.

Randy Torvinen
Torvinen's Machine
Menahga, MN

VACUUM CHECKING PORTS WITH EGR HOLES

It's difficult to vacuum test the exhaust valves on the 5 valve per cylinder VW cylinder head and many other heads due to the EGR hole in each port. I've found an easy solution. Save the dried silicone from the tip of the tube of silicone. With the exhaust valves out of the head, slip the silicone into the EGR hole. A little oil will help it to seal the EGR hole. Reinstall the valves. Now you can vacuum test each port by itself without having to block off all the ports.

Ronnie Myers
MAR Automotive, Inc
Philadelphia, PA

SQUARE RINGS IN A ROUND HOLE

We have a quick trick to use while checking ring gaps on odd engines that you may not have a ring squaring tool for, and/or the pistons are not of a flat top design. Set your digital-dial calipers for the depth you want to check the rings, lock the set screw, and carefully use the butt end of the calipers to square the rings in the bore. Check them a few times around the circumference as they will move around a bit until they are nice and square. This will get Gilligan off the island if you don't have a ring squaring tool that will fit the bore.

Also be sure to deburr your rings when finished grinding gaps. We also go a step further on the oil scraper rings as these are steel. We lightly grind a small chamfer with the belt sander on the outside corner of the steel oil rails as these will scratch the bores after some run time. We then lightly deburr the chamfered edge with a scotchbrite wheel on the pedestal grinder, and then finish with a light lap on the top and bottom surface of all the rings to ensure no hang ups on the ring lands. (I can't take full credit for this procedure. We adopted it from the "Blueprint it and build it right" article written for Engine Builder by the late Joe Mondello.)

Jake Sampson
Sampson Racing Engines
Inver Grove Heights, MN

CHECK IT OUT AND CHECK IT OFF

Checking your parts before starting the job is very important. Many years ago I worked in a machine shop assembling and installing engines after hours. It was very important to have all the correct parts before we close the doors at night, there were no second chances. The first thing to do is make sure all the parts are there. Next match all the part numbers to the invoice, and last check all the sizes to make sure they are what the block and crankshaft are finished to. Getting the job done with as few problems as possible is what we all want. If you check everything ahead of time, the job will go together much easier and faster.

Ken Marlar
Sterling Engine Parts
Minneapolis, MN

LINER SEAL LUBRICATION

Using Vaseline, grease, white lead or dense lubricants such as engine oil, vegetable oil, antifreeze, brake fluid, castor oil, vegetable shortening and silicon spray IS NOT RECOMMENDED for a liner seal lubricant.. Currently aftermarket suppliers recommend using a soapy water solution.

Due to changes in liner seal materials, recommendations for seal lubricants have also changed over the past few years. If you check an old service manual and compare it to a new manual or tech bulletin, you will usually find a different recommendation. Some products can cause premature swelling of the seal rings, creating installation difficulties and seal damage. Others can corrode the liners or other engine parts during assembly. Used in excess, others can physically damage the seals during installation.

The heavy consistency of these products could reduce the expansion volume needed when the seal is compressed into the confines of the block bore. This "hydraulic lock" condition will often shear off a section of the seal or can cut an entire strip from the seal resembling a rubber band. Not only could this distort the cylinder liner resulting in piston scoring, but can also cause coolant leakage past the seal into the lube oil. This type of failure is very common with the International 300 & 400 Series diesels when correct procedures are not followed.

Engine Pro Technical Committee with thanks to Advantage Engine Parts