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Shop Solutions

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The Importance of Timing Sprocket Alignment

When assembling an engine, one of the most overlooked items is the timing chain sprocket alignment. The upper and lower gears should be installed and alignment checked with a straight edge. I have seen them as far as .020″ off. I allow the upper sprocket to be "proud" by half the thrust clearance when checking with the crank pushed toward the rear. As the crank floats from the oil pressure, it will be centered.

To adjust this, simply remove material from the sprocket that needs adjusting. I do it on a rotary table in the milling machine, spinning the sprocket on the table and using an end mill. On some, the top sprocket can be machined for a Torrington bearing or thrust washer at this time, while simultaneously correcting misalignment. Proper timing chain alignment will give a longer service life.

Ron Flood, Cedar Machine Service, North Branch, MN

Connecting Rod Pin Bore Repair

Ever need to repair a Ford, Chrysler or any other full-floating connecting rod where the pin bore is now larger than the O.D. of your new bushings? I use acid-core solder as a filler and bonding agent.

Heat your connecting rod's small end in your rod heater. Use the acid-core solder and coat the pin bore of the rod. Now, while it is hot, start to press your bushing into the hole. Use additional solder at the leading edge of the pin bushing and coat the outside of the bushing some as you press it in. Then let the rod cool down to room temp. As it cools it will shrink down in size and firmly grip the bushing. DO NOT QUENCH or the bushing may fall out. Use a wire brush to clean up the outside of your rod and hone the bushing to size.

Darrin Anderson, Sterling Bearing Inc., Kansas City, MO

Save The Piston, Remove The Pins

Before removing press-fit pistons that we plan on reusing, we immerse the piston in a coffee can of motor oil. You only need enough oil to submerge the piston. We use synthetic oil for the EP and high temperature qualities. We then heat it to about 250 degrees. This expands the piston away from the pin to minimize scratching of the pin bore and lubricates the pin in its travel through the rod end.

Our hotplate is an industrial type with a thermostat, so we set the temp and don't have to worry about overheating the oil and having it burst into flames.

By using this method, we seldom have to pin hone the pistons, and have never distorted one, but polishing the pins is still required. Many of the engines that need to be balanced use inexpensive pistons with broached slots in the pin bores, which makes pin honing difficult.

Timm Jurincie, Tuff-Enuf Auto & Marine Performance, Avondale, AZ

Ohio Makes a 'Max' Investment in Our Future

If you're looking for a new shop employee, Cleveland, OH may just be the city with the answer for you. Up until now it may have seemed that all the good employees either had jobs or had retired. Here is what Cleveland did to solve the problem of "lots of job openings and no qualified machinists or tradesmen."

August 19th of this year marked the opening of the first of three new high school/trade schools in our area since the Max Hayes trade school opened in 1957. The old Max Hayes School was no longer technologically up to date, was in disrepair and was located in a small residential area.

Rather than just refurbishing Max Hayes, a completely new facility was built on an old abandoned industrial site. At a cost of $48M, paid for by government grants and a voter-approved bond issue, the new facility is smaller than the original and built to handle 800 students. The original Max Hayes could handle 1,475.

It is a two-story building with classrooms on the second floor and 11 large workshop bays on the first floor. The school has separate labs/bays for trades such as auto collision repair, automotive technology, engineering, welding, manufacturing design, precision machining, and software development.

Students have equipment at their disposal that isn't available at some high tech companies. They will come out of there with state-of-the-art training and be able to "hit the ground running."

The public had a chance to view the new school in late summer and it was a huge success. For more information contact the Max Hayes school principal, Ms. Kelly Wittman, at the Cleveland School District. For more information, visit www.clevelandmetroschools.org/maxshayes.

Jim Kovach, Kovach & Associates, Performance Engine Building, Parma, OH

What's the Best Penetrant?

A recent online article provided some information on various penetrating oils. A subjective test of all the popular penetrates with the control being the torque required to remove the nut from a "scientifically rusted" environment resulted in the following numbers.

Penetrating oils …….Average torque load to loosen

No Oil used..... 516 pounds
WD-40 ..... 238 pounds
PB Blaster..... 214 pounds
Liquid Wrench..... 127 pounds
Kano Kroil ..... 106 pounds
ATF*-Acetone mix..... 53 pounds

The ATF*-Acetone mix was a "home brew" mix of 50% – 50% by volume automatic transmission fluid and acetone. It has been said that lacquer thinner may be used as a substitute for acetone.

Engine Pro Technical Committee,
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