

Engine Assembly Tips – In No Particular Order THE PREVENTIVE MAINTENANCE SERIES
Mike Dawson

1. When chasing threads, remember that head studs, non-turbo intake studs, rear mounting studs and exhaust manifold clamp studs have a special thread.
2. Clean all oil holes in crankcase and crankshaft; remove Allen plugs in the end of the lifter bore. Check the oiling grooves in the crankshaft main bearing areas for incomplete tooling.
3. Use spacers if boring cylinders .030 or greater; calculate thickness needed, and use sealer.
4. Check oil pressure regulator operation and install a new set of pump gears and spring. Clean, sand and epoxy seal the oil pump dummy shaft where it exits the aluminum casting.
5. Heat shrink a new cam gear; do not press the cold gear on the cam – better yet, get a “fail safe” gear.
6. Use blue Loctite on crankcase nuts and rod nuts, be sure piston arrows (or divots) point to front of car.
7. Offset ring gap on top half of piston; most ring instructions are not for flat engines.
8. Check TDC on #1 against keyways in cam and crank for double check of cam timing.
9. Torque heads before installing top cover in case you need an insert installed for a stud in an open hole.
10. You **must** use antisieze when installing crankcase studs; also remember they are special threads. Make sure that no head studs protrude into the crankcase where the holes are open.
11. Remember to install air deflectors under cylinders before installing pushrod tubes.
12. The short flange of the pushrod tube fits into the crankcase.
13. Oil hole in side of push rod installs to the rocker arm end; the U on the pushrod tube retainer faces out.
14. The flywheel end main bearing is different than the other two similar center bearings. Check numbers.
15. Flex plate is installed with the concave side towards engine; the opposite can damage the transmission.
16. Polish crankshaft and pulley/balancer hub where main seals run.
17. Use Coppercoat or RTV on paper gaskets other than the oil pan. Use RTV on paper gasket with 10 ft.lbs. on a “straightened” oil pan. No sealer on rubber valve cover gaskets; tighten until the spring reinforcement bends in and just touches the valve cover. Use new Grade 8 bolts.
18. Secure top cover with Grade 8 bolts ¼” longer than original and use blue loctite, flat and lock washer, torque to 15 ft.lbs. Special bolts are available as a kit from vendors.
19. Double check your valve adjustment by looking for the same number of threads showing beyond the nut for each stud on the same side.
20. Clean flashing from heads for proper cooling and straighten fins; use a keyhole saw and long 1/8 bit.
21. Chamfer the inside edge of bored cylinders to accept rings. (The original chamfer was lost)
22. Most important, always have the valve seats professionally “staked” or “peened”. Avoid used late model cast pistons since they have a history of cracking at the oil ring groove.

There could be lots more, but this is a page full of things to keep in mind when you invest money and your most valuable time.