



8.2 Litre Performance Parts
Albuquerque, New Mexico

ENGINE BUILDING BASICS

⊕ Torque Specs

- ⇒ Rods : 40 Lb/Ft (50 w/ chromoly bolts) Mains : 90 Lb/Ft
- ⇒ Heads : 115 Lb/Ft Stock Rockers : 55 Lb/Ft
- ⇒ Intake : 30 Lb/Ft Shaft Rockers: 35-40 Lb/Ft
- ⇒ Valve Covers (steel) : 10 Lb/Ft Exhaust : 35 Lb/Ft
- ⇒ F/P to Crank : 50 Lb/Ft Cam Bolts : 25 Lb/Ft
- ⇒ Anything threaded into an aluminum intake : <25 Lb/Ft
- ⇒ Firing Order 15634278 #1 is Pass. Front, #2 is Driver's Front

⊕ Clearances

- ⇒ Ring End Gap : .017"- .020" (or as specified by piston sheet, i.e KB)
- ⇒ Rod Side Clearance : .015" - .035" (OE .008"- .016")
- ⇒ Lifter Preload : .020"- .060"
- ⇒ Bearings : .002"- .004" street, .003"- .004" race (OE .0005"- .0028")
- ⇒ Cam Endplay : .015" min
- ⇒ Crank Endplay : .002"- .012" (OE) (we aim for .006")
- ⇒ Valve/Piston : .120" recommended
- ⇒ Piston/Wall : Varies (see piston instructions)

⊕ Clearances (Clunks, Thunks, Knocks, and scrapes)

- ⇒ Rods/ bolts / Block
- ⇒ Rod / Cam
- ⇒ Pushrods / pushrod holes in head
- ⇒ Rocker / Valve Cover
- ⇒ Cam Gear Bolts / Block
- ⇒ Fuel Pump Eccentric / Timing Cover
- ⇒ Dipstick/Tube / Crank/Rods
- ⇒ Dipstick / Oilpan
- ⇒ Oilpan / Ground ☺



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- ⊕ Remove ALL plugs (including dipstick bearing) before vating engine.
- ⊕ We like to clean up the casting flash inside and out on the block for better oil return flow (plus it looks better).
- ⊕ Drill 9/16" hole center rear of lifter valley for additional oil drain back if you feel it is appropriate for your application.
- ⊕ Drill out pushrod holes in heads (9/16" +) for clearance with shaft rockers. It is a good idea otherwise, for the future addition of shaft rockers.
- ⊕ Remove remainder of old intake end seals in holes at either side of block, front and rear. Use 3/16 drill bit if necessary.
- ⊕ Remove pressed in oil galley plugs (2) from lifter valley (the ones you missed in step 1 above)
- ⊕ Clean all parts, blow out all oil passages. Assembly lube should only be applied to parts as they are installed - lubed parts sitting around the shop pick up shop dust and grit.
- ⊕ Install cam bearings, freeze plugs, and oil galley plugs. Don't forget to stake the oil galley plugs
- ⊕ Install the camshaft (lube well).
- ⊕ Install main bearings - *be sure that holes in bearings line up with holes in block. Note: #1 bearing is wider than 2 and 4.*
- ⊕ Install rear main seal (lip facing front of engine).



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- ⊕ Lay in crank and plastigauge™ bearings. If clearance is good (.002-.003), lube and torque main nuts/bolts to 90 Lbs. The crank should turn easily by hand. You should also check the end play at this point (.006")
- ⊕ Check Piston Clearance. This should have been done at the machine shop, but it doesn't hurt to check. Measurement depends on piston make and usage. Typically, cast are .002-.003 and forged run .006-.010.
- ⊕ Check ring end gap - min .018, more for the KB series pistons.
- ⊕ Assemble rod and piston, install piston rings.
- ⊕ Install rod bearings. *Do not mix rods and rod caps!*
- ⊕ Install Pistons with notch, -, or 'f' facing the front of the engine.
- ⊕ The rods may have the bearing offset and/or chamfered on one side. This side with the extra clearance will face the radius on the outside edge of the crank journal. The tabs of the rod bearings both go on the same side of the rod. Torque rod bolts to 50 Ft/Lbs unless they are billet or aluminum, in which case they'll have their own spec. (Stock rod bolts 40 Lb/Ft)
- ⊕ Turn the engine after you install each piston/rod. This will help you make sure that nothing is binding, such as a backwards cap. You should plastigauge the rod bearing clearance as well - min is .0015 for stock, preferably .002-.0025.

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- ⊕ You can check your rod side clearance, though this is not as critical as bearing clearance. .015-.035 is good. Aluminum rods or steel rods in full race engines need more.
- ⊕ Check your deck height before you install the heads. This again depends on pistons and use. 0-.030 works fine. This measurement is rarely equal on all cylinders due to variances in blocks, cranks, and pistons. This is a good time to check the TDC mark on your crank pulley - there are several different pointers and TDC mark locations - if they do not match, you should mark the correct TDC location on the pulley for later reference (i.e. setting timing).
- ⊕ You may choose to do this in another order, which is fine. The important thing is that it all gets checked.
- ⊕ Those of you building a race engine, or blueprinting one, will most likely mock it up a few times to get measurements and have the block and crank machined to your needs.
- ⊕ **Double Check: before cranking:**
 - ⇒ Oil Slinger installed (in front of crank gear)
 - ⇒ Fuel Pump eccentric or cam thrust limiter installed
 - ⇒ O-ring on pickup tube?
 - ⇒ Cam gear bolts don't hit block.
 - ⇒ Oil drain plug tightened, oil filled, system primed.
 - ⇒ Sensor or plug in oil sensor hole behind intake
 - ⇒ 3/8 oil galley plug R/F installed and tight
 - ⇒ Turn engine over by hand at least 2 times after all pans, covers, etc are in place and tightened (including distributor, fuel pump, etc)
- ⊕ Thank you for choosing Cad Company's Best Engineered Parts for the Cadillac 472", 500, and 425" engines. Feel free to call with any questions or suggestions _____ 😊