

Stroker Kit

Installation instructions

Please read installation thoroughly before starting work. When they are completely understood proceed with installation

1. Clean and prepare the engine block

Please clean carefully the engine block and all components to ensure perfect bearing placement. By far the best way to remove all gallery plugs and all the dis-assembled engine to soak in a agitated chemical bath. This way all the sludge and dirt accumulations are removed. If chemical cleaning facilities are unavailable, you can use the less desirable method with a solvent such as Kerosene. It is imperative to ensure that the entire lubrication system is completely clean and free of obstructions.

2. Check NIP and back contact

It is necessary to check the NIP or crush fit of the new bearings in their housing and also the back contact if the old bearing backs have any bright, shiny areas. The procedure of this operation is:

- A. Apply a coating of the bearing "blue" to the cleaned tunnel seating and the joint faces of the case or cup
- B. Clean and try the bearings and apply the bearing "blue" to the joint faces on one bearing. Assembly the bearings in to the housings, tightening the holding bolt evenly to the correct tension. Threads should be oiled.
- C. Accurately measure and right down the assembled internal diameters of each pair of bearings, then release the bolt or bolts on one side only. This should allow the joint faces to separate on this side. A feeler guide of 0.10mm to 0.15mm should be accepted into the opening.
- D. Release the remaining bolts and dismantle the bearing unit completely. An examination of the housings and the bearings should reveal an even transference of "blue"
 - i. Tunnel bores to back of bearings
 - ii. One bearing joint face to the other
 - iii. The cap joint face to the case joint face or vice-versa

An uneven transference of blue indicates some "off standard" condition to be investigated and corrected.

3. Check oil clearance

With tunnel sizes correct to specification and shaft journal unworn or correctly ground undersize, ACL finished-to-size bearings will provide a correct operating clearance which can be quickly confirmed on assembly with the use of flexi gauge. Where doubt exists, or in special case, oil clearance should be checked by accurately measuring and writing down each journal diameter and then subtracting this from the corresponding internal bearing diameters that where noted when checking the amount of nip. *The difference between the two diameters represents the vertical oil clearance and this must fall within the specified tolerance shown against each part number in the alphabetical list.*

4. Check end float (Thrust clearance)

It is advisable to check the thrust clearance at both thrust faces to ensure an accurate measurement.

5. Main Bearings Alignment **IMPORTANT!**

After you have finished with the bearing installation you have achieved proper oil clearance. You have to check the main bearing alignment. This must be done in a machinery workshop.

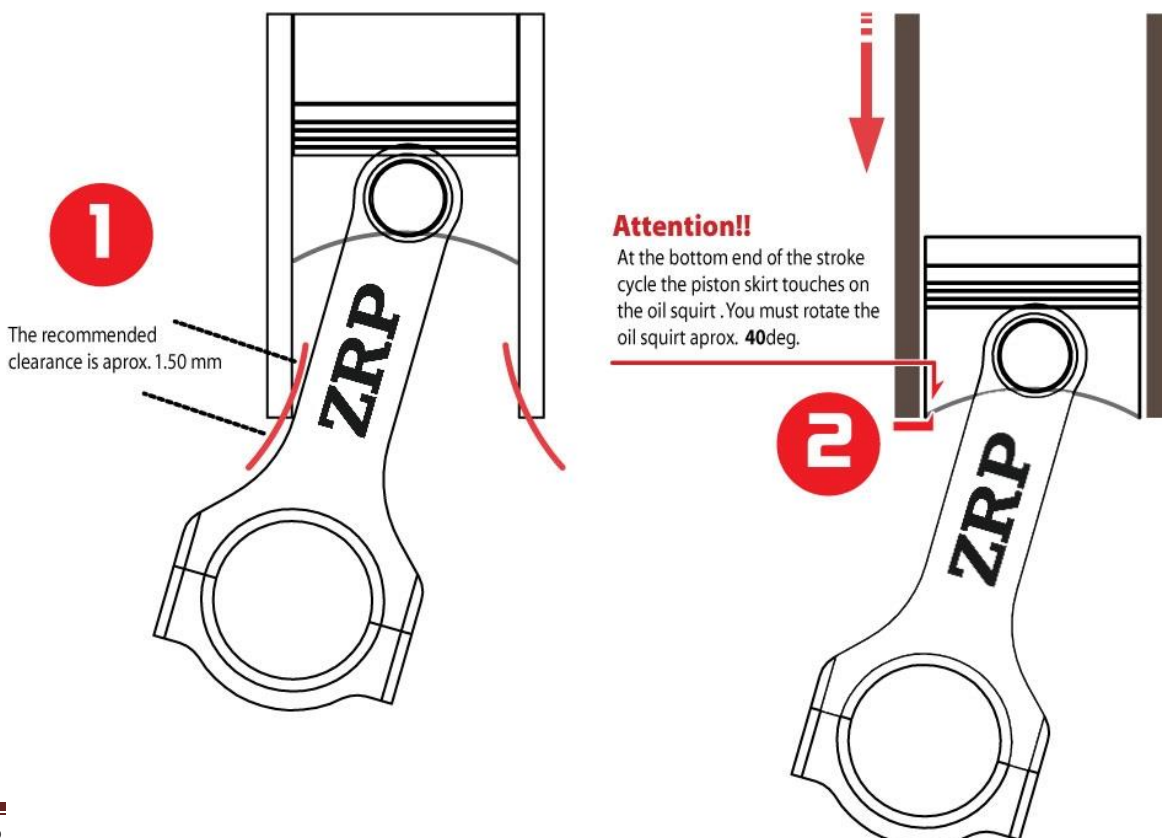
6. Crankshaft Installation

- A. Clean the Crankshaft very well, after that blow with dry air to clean oil holes thoroughly. **Make sure oil holes are flow free!**
- B. Inspect all journals to make sure the crank is free of nicks, scratches, and hairline cracks.
- C. Spread plenty of oil on all journals before assembly. Do not lubricate the thrust faces of the thrust bearing at this point.
- D. Check proper oil clearance and make sure the direction of rod and bearing are corrected. A 0.50mm-0.715mm side clearance is required
- E. Once you have measured all your journals and matched them to their specific bearings, you are ready to lay the crank in place. Before doing that, however, spread a coat of assembly grease on the bearings to protect the crank.
- F. Now position the crank on the block without installing any of the caps, just yet. Install a dial indicator on the nose of the crank to measure endplay. You should be able to move the crank back and forth by hand. The clearance must be as suggested by the engine's manufacturer.
- G. When you make sure you have the correct amount of endplay, go ahead and install the rear main seal before bolting on the main cap.
- H. The next step is to bolt up and torque all the main cap except for the cap containing the thrust bearing. Make sure you add oil on the thread of the bolts first. Check your endplay again. If you don't have enough play, one of the caps is out of alignment. You can adjust the cap location slightly by tapping it lightly with a dead-blow hammer and then tightening the bolts back down.
- I. Again, if the endplay is correct, you can install the last main cap-this one with the thrust bearing. Tap it into place but do not torque the cap bolts. Instead, knock the crank lightly, either forward or back, to align the thrust faces of the two bearing shells. Now tighten the bolts to the proper torque specs.
- J. Once you have reached this point, most probably the end play has tightened up a bit. You can use a screwdriver placed between one of the main caps and a counterweight to help you move the crank. Be careful and do not use excessive force.
If there isn't enough endplay, you may need to reduce the thickness of the thrust face of the thrust bearing slightly. This can usually get you a thousandth or so. Lightly rub both faces of both halves of the thrust bearing on super-fine sandpaper that is being lubricated by a constant stream of fluid in your cleaning tank. It's also a good idea to use a surface block (or even a pane of glass) underneath the sandpaper to make sure you are sanding on an even plane. If the endplay is too much, you must use oversized thrust washers.

- ★ We "strongly" recommend that you balance the crank and flywheel together.
- ★ All 4340 cranks are nitrited with plasma gas. DO NOT polish journal in any circumstances.

7. Rod Beam/Cylinder Bore Interference IMPORTANT !!! (not Required on all Engines)

1. Due to the fact that the shape of ZRP rods is much wider than OEM, to increase strength, some engines with small bore and long stroke, may require some milling of the cylinder to provide clearance for the rod to rotate full cycle. This should be done before the final piston and rod assembly. The recommended clearance is aprox. 1.50mm. Please check the drawing for guidance. (Required on some Toyota, Ford & Honda)
2. At the bottom end of the stroke cycle the piston skirt touches on the oil squirt. You must rotate the oil squirt approx. 40deg.



8. Rod Torque Specs – Installation Instructions

- The first thing you need to do when you get the bolts is to measure them so you are sure you have the correct size.
- Always apply ARP moly lube on the threads and under the head of the bolts when torquing.
- Please note that many bolts may look alike but have differences.
- After you have measured the bolts then you clean the threads of the rods and bolts thoroughly.
- Install rods by bringing cap and beam into alignment.
- Each rod is numbered and MUST be assembled with the same number on the cap and beam.
- Sequentially torque bolts to specified torque NOT to exceed maximum.

Material	Thread Size (in.)	UHL (in.)	Thread Length (in.)	Grip Length (in.)	Head Height (in.)	Wrench Size (in.)	Collar Diam. (in.)	Rec/ed Torque (ft/lb)
ARP2000	5/16	1.500	0.550	0.150	0.348	3/8	0.526	30
ARP2000	3/8	1.500	0.550	0.100	0.388	7/16	0.555	50
ARP2000	3/8	1.600	0.600	0.100	0.388	7/16	0.555	50
ARP 8740	7/16	1.600	0.600	0.200	0.388	7/16	0.644	75
ARPL19	3/8	1.500	0.550	0.100	0.388	7/16	0.555	55

9. Piston Installation Instructions

Important: Inspect all of your pistons, pins, rings before installation or modification. Parts that are altered, scratched, or damaged are non-returnable.

- Piston to Bore Clearance: Pistons already have the recommended clearance built in. Skirt diameter is smaller than the recommended bore size (see sizing on box). Some applications: Nitrous, supercharged, turbo, and cold water marine engines may need more than the recommended clearance.
- Pistons are measured 90 degrees from the pin axis at the widest point on the piston skirt.
- Clearances are set before coating. Coatings are 0.012mm (0.00047") thick and should be deducted when measuring for piston to bore clearance.
- Adding additional clearance then recommended may create extra engine noise (piston slap) upon start up and cold running. This can cause damage to the pistons and/or cylinder. Some piston noise is normal on engine start up and during cold running this will reduce when engine is at operating temperature. It is advisable to avoid high loads or high RPM during engine warm up.

	Application	Top Ring Gap (Min)	2nd Ring Gap (Min)	Oil Ring Rail
Ring End	N/A Street	.004" x Bore	.005" x Bore	Min .015"
	N/A Race	.0045" x Bore	.0055" x Bore	Min .015"
	Turbo/Supercharged	.006" x Bore	.006" x Bore	Min .015"
	Dirt/ATV/Snow	.004" x Bore	.005" x Bore	Min .015"
	Nitrous	.007" x Bore	.0065" x Bore	Min .015"
	Circle Track/Drag Race	.0055" x Bore	.006" x Bore	Min .015"

Ring end gap should be measured with the ring square in the bore on a fresh hone. Cylinder should be free of any taper.

- Wrist Pin Offset: Many pistons have an offset wrist pin. These pistons need to be installed with the offset to the thrust side of the engine. On pistons with centered wrist pins, the smaller valve pocket(s) to the exhaust side of the engine except some five valve engines.
- Piston to Valve Clearance: With the many cam profiles, gasket thicknesses, and deck clearances available it is important to make sure there is adequate clearance between the piston and the valve. Companies recommends a minimum of 1.5mm (.060") Intake and 2.0mm (.080") Exhaust. Using Clay is the most common method.
- Piston to Head Clearance (Squish): We recommend a minimum of 0.7-1.0mm (.027"-.040") for naturally aspirated engines and 1.0-1.5mm (.040"-.060") for Turbo, Supercharged, or Nitrous applications.
- Wrist Pin Clips: Most of pistons use a Round Wire type lock. Before installation check the lock groove for debris or burrs that will keep the lock from seating fully in the groove. Insert one end of the lock in the groove and spiral lock into groove. **DO NOT COMPRESS LOCK TOGETHER TO GET INTO THE GROOVE**, this will distort the lock and can cause lock failure. It is good practice to check over piston crown and valve pockets for and sharp edges. Sharp edges should be removed to avoid potential "Hot Spots" on the piston. Cleaning: Pistons should be cleaned with warm soapy water and dried before installation. We recommend a thin coating of oil on the piston skirt and cylinder wall. Avoid using Synthetic oil during engine break-in as this may keep the rings from properly seating. Lubricate wrist pins with oil or assembly lube before installation.