



2618 INSTRUCTIONS



FOR PISTON, PIN, LOCK AND RING INSTALLATION PLEASE READ TO ENSURE CORRECT OPERATION AND MAXIMUM PERFORMANCE FOR YOUR APPLICATION. BEFORE BALANCING, installing pins, rods, or locks, please check part number and description on box label to be sure you have the correct components. Shelf pistons that are altered, scratched or dinged are non-returnable. Custom Pistons are returnable only for manufacturing defects.

Piston to cylinder wall clearance

1. Piston diameter must be measured at gauge point, which, in most cases is .500" up from the bottom of skirt. (See fig. 1). Dimensions listed are gauged at a temperature of 72 degrees fahrenheit. Note: aluminum expands and contracts with temperature variations.
2. Your pistons are manufactured from 2618 non-silicon aluminum alloy.
3. Clearance is built into piston based upon finished bore for normal operating conditions. (See Table. 1).
4. Clearances listed below are minimum. Some applications such as supercharged, turbo, nitrous and endurance applications may require additional clearance (.001-.003"). Coldwater pickup marine applications may require an additional .002-.004".

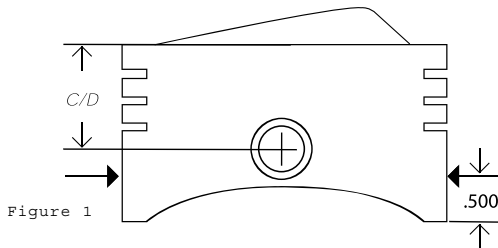


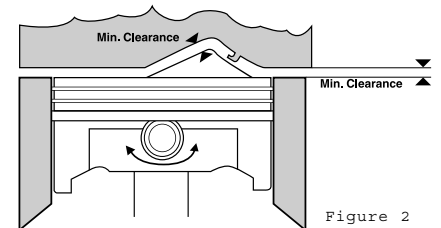
Table 1	bore range	min clearance.
Sport compact	2.500 to 3.625"	.0030 to .0036"
Sport compact	3.626 to 3.999"	.0035 to .0045"
SB applications	4.000 to 4.200"	.0035 to .0045"
BB applications	4.200 to 4.600"	.0040 to .0050"

Piston to valve clearance

Piston to valve clearance is determined by cam lift, lobe separation, duration, valve margin, head design, and aftermarket milling of cylinder head. Minimum recommended clearance for intake & exhaust valve would be 0.100" in all directions. Check using clay or follow cam manufacturers recommendations for checking clearance, making sure the cam is degreed exactly as it will be during operation.

Piston/dome to head and spark plug clearance

Due to the selection of aftermarket heads available, or modifications to combustion chambers, you should always check to assure proper clearance (See fig.2). Minimum clearance for steel rod =.040", aluminum =.060" min. Check using clay. With piston installed on rod at TDC, rock piston to get minimum clearance.

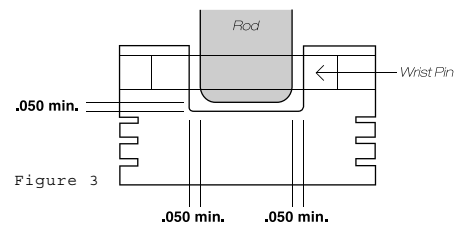


Crank counterweight to piston clearance

Always check counterweight to piston clearance. Recommended minimum is .060"

Connecting rod to piston clearance

Due to the large variation in rod widths and thickness above pin, always check for proper clearance on OEM, AFTERMARKET STEEL RODS AND ALUMINUM RODS. The large pads on top of factory rods can be removed prior to balancing. Recommended clearance is .050" per side and .050" from top of rod to piston (See fig. 3). With the piston installed on the rod, rock side to side and rotate forward and backward to ensure proper clearance.



Spiro locks

To install spiro locks, grip each end of lock and pull apart (approximately 1/8-1/4"). The lock will resemble a small coil spring (fig. 4). The lock can then be spiraled into place almost as if you were screwing them into a groove (fig. 5). You should not be able to spin the lock by hand after they are installed. **Most** JE Pistons that require spiro locks will need four locks per piston, two at each end of the pin.

Most sport compact applications require two per piston, one at each end.

WARNING: It is important that the correct number of locks are installed in each piston, or severe engine damage may occur!

Do not over-stretch spiro locks and do not re-use spiro locks!

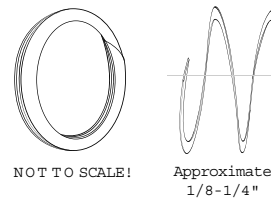


Figure 4
WARNING: Do not over-stretch spiro locks.

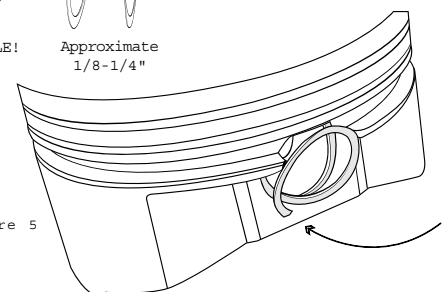


Figure 5

Wire locks

Insert one end of the lock into groove. Continue spiral feeding into groove until lock is fully seated.

DO NOT TRY TO SQUEEZE LOCK TOGETHER TO INSTALL. This will cause permanent deformation of the lock, thus not giving the appropriate radial preload.

Cleaning

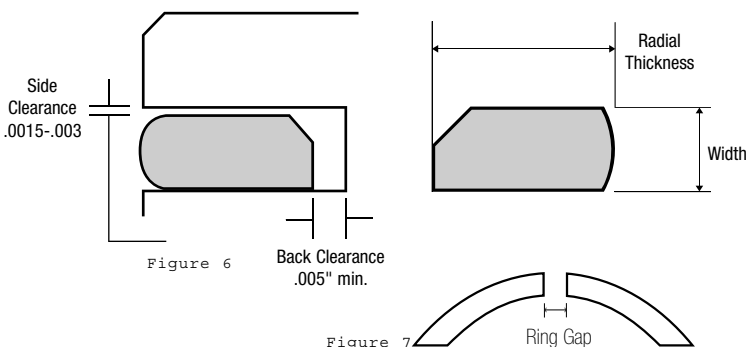
Scrub pistons and cylinder walls with hot water and soap before installing. We recommend a light coat of non-detergent oil on the piston's skirt and cylinder walls for initial installation. DO NOT USE DETERGENT OIL, SYNTHETIC OIL, OR AN ADDITIVE until the rings have seated. Be sure to lubricate pins with lubriplate, or an assembly oil to prevent galling on initial fire-up. Check forced pin oilers for foreign matter. Check to make sure the dome and valve pockets match the combustion chamber and valves. As a general rule, four-valve piston exhaust pockets are located above the JE logo on the underside of the piston. Also, in most cases, the intake is larger than the exhaust. Many JE/SRP piston designs have offset domes and/or specific valve pocket "left" or "right" hand positions. Check to be certain the pistons are installed accordingly.

RING INSTALLATION GUIDELINES

IMPORTANT: BEFORE FILING RINGS – Check each individual ring in its corresponding piston ring groove to ensure proper ring groove depth (radial back clearance) and side clearance (thickness)(fig. 6). Proper cylinder finish (honing), ring end-gap, and lubrication are critical to achieving optimum ring seal.

Ring End Gap Table (Use as a guideline only.)

	Top Ring	2nd Ring	Oil Ring Rail
Application	Min. Gap Per Inch of Bore		Minimum Gap
High-Perf. Street-Strip	Bore x .0045"	Bore x .0050"	min .015"
Street Moderate Turbo/Nitrous	Bore x .0050"	Bore x .0055"	min .015"
Late Model Stock	Bore x .0050"	Bore x .0053"	min .015"
Circle Track / Drag Race	Bore x .0055"	Bore x .0057"	min .015"
Nitrous Race Only	Bore x .0070"	Bore x .0065"	min .015"
Blown Race Only	Bore x .0060"	Bore x .0060"	min .015"



End Gap

End gap is the clearance between the two ends of a piston ring as it is installed in a cylinder (fig. 7). Most high performance and racing engine builders purchase piston rings slightly oversized in order to file fit them to very precise end gaps. Testing has shown measurable increases in horsepower and decreases in blow-by as a result of properly fitting the ring end gap to the operating conditions. Factors such as supercharging, turbocharging, nitrous oxide, endurance racing and different fuels determine proper ring end gap. Proper ring end gap can be more than double from one engine to the next depending upon the above factors.

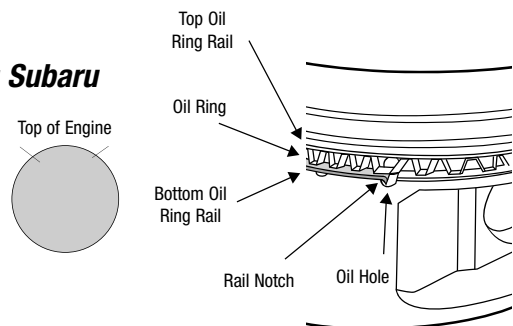
At operating temperature, the top ring end gap should be as small as possible. Precise machining of the cylinder bores is critical, and is the reason why rings should be fitted to the cylinder in which they are to be installed. A diameter variance from one cylinder to the next changes the end gap of the rings in that cylinder by a factor of pi (3.1416). For example, a cylinder .001" larger in diameter will increase the ring end gap by $.001 \times 3.1416 = .003$ ", rounding off, which could increase cylinder leakage in that cylinder and decrease performance.

Sets Containing Rail with a Tab

For sets containing one regular rail and one tab rail per cylinder. Tab rail can be installed above or below oil ring expander with tab pointing toward expander (fig. 8). If installed in horizontally opposed engine, rail gaps should be installed as shown at below.

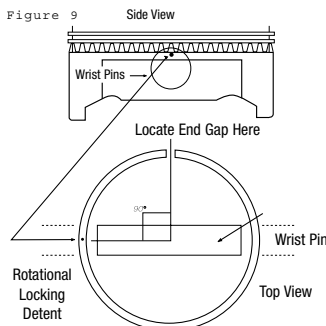
Figure 8

Example: Subaru

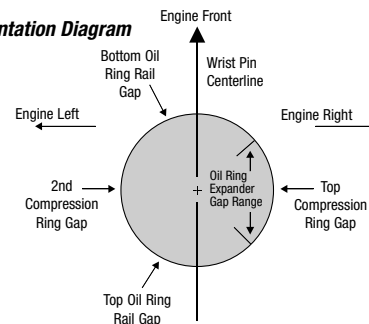


Oil Ring Support Rails Installation

1. Install oil ring support rails on the bottom of the oil ring groove with the antirotational locking detent facing downward.
2. Rotate the oil ring support rail until antirotational locking detent falls between opening at intersection of ring groove and wrist pin hole. (fig. 9)
3. Install oil ring assembly as usual.



Ring Orientation Diagram



NOT FOR SALE OR USE IN POLLUTION CONTROLLED VEHICLES.