



# TECH AND INSTALLATION TIPS



## CALCULATING COMPRESSION RATIO

$$CR = \frac{\text{SWEPT VOL.} + \text{TDC VOL.}}{\text{TDC VOL.}}$$

**Swept Volume** = 3.1416 x Bore x Bore x Stroke ÷ 4

**TDC Volume** = Cylinder Head Volume + Gasket Volume + Deck Volume + Piston Dish (-Dome) Volume

**Gasket Volume** = 3.1416 x Gasket Bore x Gasket Bore x Compressed Gasket Thickness ÷ 4

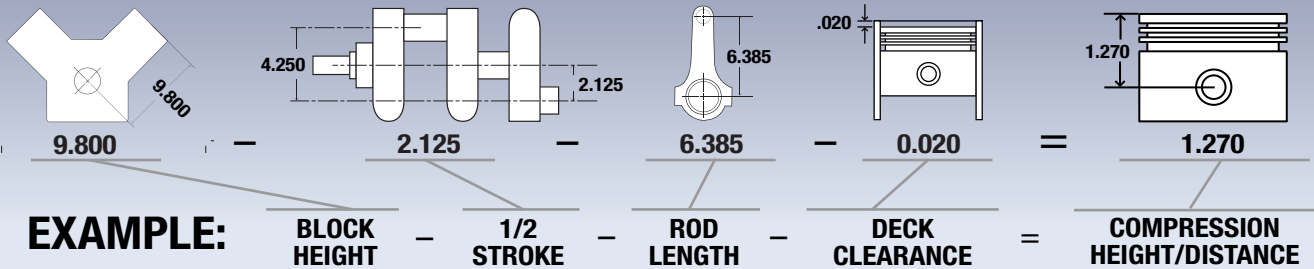
**Deck Volume** = 3.1416 x Bore x Bore x Deck Clearance ÷ 4

**Piston volume** = as published in JE catalog x -.061

**Head volume** = as published in cc's x .061

Always use cc's or ci's, do not mix the two. To convert cc's to ci's multiply cc's by .061

## CALCULATING COMPRESSION HEIGHT/DISTANCE



## PISTON/DOME TO HEAD AND SPARK PLUG CLEARANCE

Always check piston/dome to head and spark plug clearance to assure proper clearance (See fig.1). Minimum clearance for steel rod = .040", aluminum = .060". Check using clay with piston installed on rod at TDC, be sure to rock the piston back and forth in the bore to get total minimum running clearance.

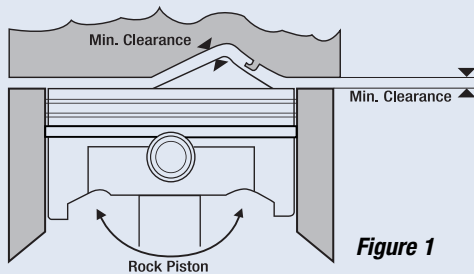


Figure 1

## 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 is .100" in depth and .050" radially. Check by using clay or follow cam manufacturers recommendations for checking clearance, making sure the cam is degreed exactly as it will be during operation.

## CRANK COUNTERWEIGHT TO PISTON CLEARANCE

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

## CONNECTING ROD TO PISTON CLEARANCE

Due to the large variation in rod widths and material thickness above pin, always check for proper piston to rod clearance on OEM, aftermarket steel rods and aluminum rods. Recommended clearance is .050" min per side and .050" min from top of rod to piston. With the piston installed on the rod, rock the piston side to side and rotate forward and backward to ensure proper clearance. See figure 2.

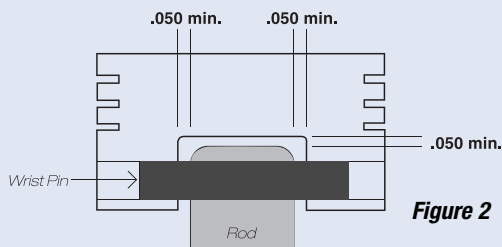


Figure 2



## HOW TO

### Convert from Cubic Centimeters to Cubic Inches

Multiply by **.0610237**

Example **1835cc x .0610237= 111.98**

### Convert from Cubic Inches to Cubic Centimeters

Multiply by **16.387064**

Example **350ch x 16.387064= 5735.47**

### Convert from Inches to Millimeters

Multiply by **25.4**

Example **3.189 x 25.4= 81.00mm**

### Convert from Millimeters to Inches

Multiply by **.0393701**

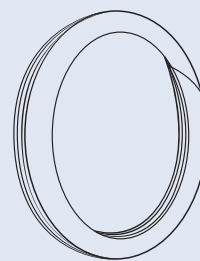
Example **81mm x .0393701= 3.1889**

## INSTALLING WIRE LOCKS

Install the end of one lock at 90 degrees from the pick lock groove. Carefully rotate the lock into the groove without kinking or deforming the lock. Firm pressure will be needed to install wire locks into piston wire lock groove. After the first lock is in place, seat the lock by solidly hitting the wrist pin with a brass drift pin into the wire lock. Now install the wrist pin and connecting rod into the piston, install the second wire lock the same as the first. Just as a precaution, after final assembly of both locks we recommend hitting each side of the wrist pin with the brass drift pin back and forth an additional time. Perform these functions on a cloth towel or soft rubber pad to prevent damage to the piston occurs.

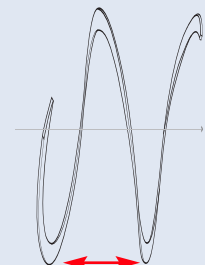
## INSTALLING SPIRO LOCKS

For installing Spiro locks, grip each end of the lock and pull apart (approx. 3/8"-7/16"). The lock will resemble a small coil (fig. 5). The lock can then be spiraled into place almost as if you were screwing them into a groove (fig. 6). When the locks are properly seated, only half of the lock will be visible above the groove. Most JE Pistons that require spiral locks will need 4 locks per piston, two at each end of the pin. **WARNING:** It is important that the correct numbers of locks are installed in each piston or severe engine damage may occur. **WARNING:** Do not over stretch spiro locks and do not reuse spiro locks!



Not to Scale!

Figure 5



Approximate:  
3/8" - 7/16"

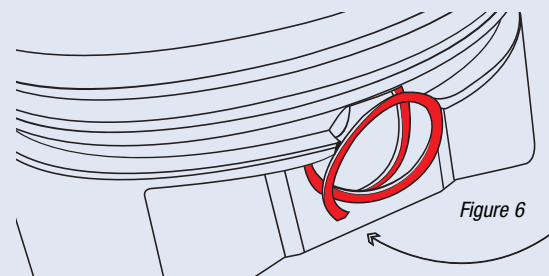


Figure 6