



# 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

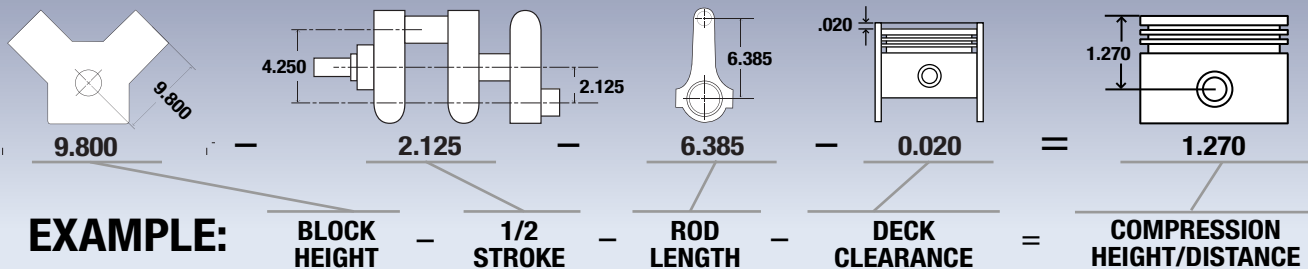
**Deck Volume** = 3.1416 x Bore x Bore x Deck Clearance ÷ 4

**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.

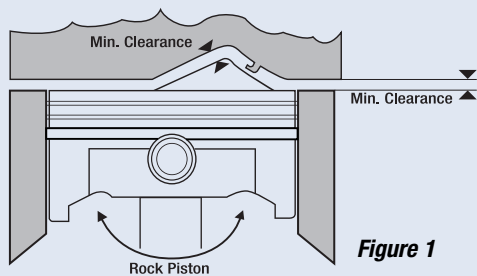


Figure 1

## 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.

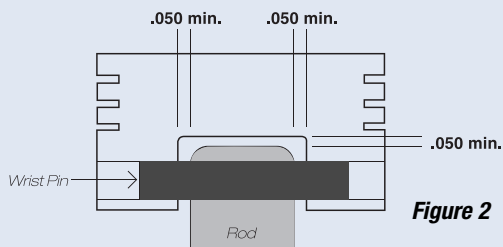


Figure 2



SMALL BLOCK  
CHEVY

BIG BLOCK  
CHEVY

FORD

MOPAR

BUICK/HRV

SPORT COMPACT

RINGS

## 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**

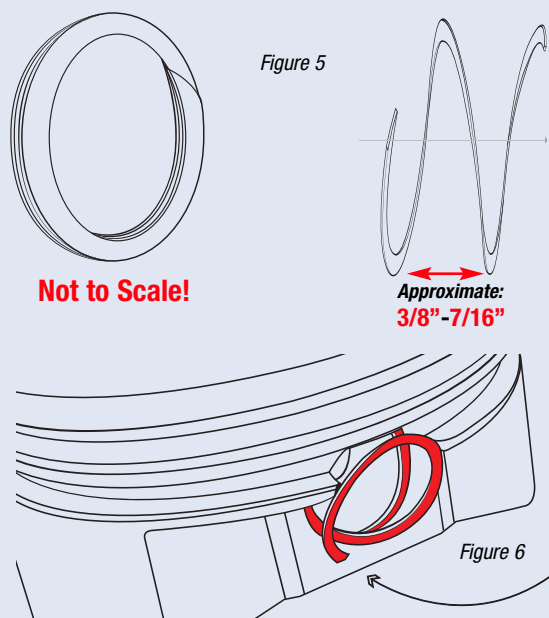
Example **81mm x .0393701= 3.1889**

## 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!**



Attn: (JE Sales Associate)



# Custom Piston Order Form

15312 Connector Lane, Huntington Beach, CA 92649, USA • TEL (714) 898-9763 • FAX (714) 893-8297 • www.jepistons.com

Engine Make: \_\_\_\_\_ Model: \_\_\_\_\_ Year: \_\_\_\_\_

Number of Cylinders: \_\_\_\_\_ Order Quantity of Pistons: \_\_\_\_\_

Cubic Inch Displacement: \_\_\_\_\_ Max RPM: \_\_\_\_\_ Approx. HP: \_\_\_\_\_

Bore Size: \_\_\_\_\_ Stroke: \_\_\_\_\_

Rod Length: \_\_\_\_\_

Steel  Aluminum  Titanium

Brand: \_\_\_\_\_

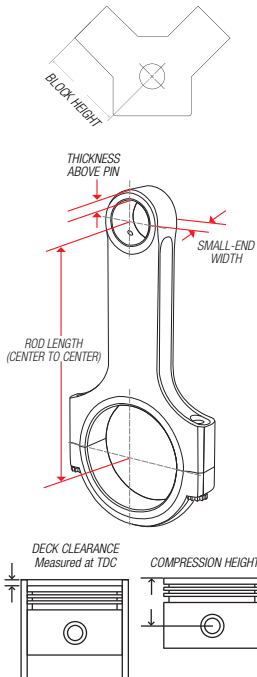
Rod Small-End Width: \_\_\_\_\_

Thickness Above Pin: \_\_\_\_\_

Piston Guided Rod  Yes  No

### Compression Height Calculation Table

Block Height: _____
-1/2 of Stroke: _____
Rod Length: _____
Deck Clearance +/-: _____
Compression Height: _____



Head Gasket Thickness: \_\_\_\_\_

Compression Ratio: \_\_\_\_\_

**CAMSHAFT SPECS:**  Hydraulic  Solid  Roller

Gross Valve Lift: In: \_\_\_\_\_ Ex: \_\_\_\_\_

Lobe Separation (°): \_\_\_\_\_ Duration @.050: In: \_\_\_\_\_ Ex: \_\_\_\_\_

Degreed in Std. °: + \_\_\_\_\_ ° - \_\_\_\_\_ °

Valve Lift @ TDC: In: \_\_\_\_\_ Ex: \_\_\_\_\_

**CYLINDER HEAD** Type: \_\_\_\_\_ Pt#: \_\_\_\_\_

Combustion Chamber Size: \_\_\_\_\_ cc's

Valve Diameter: In: \_\_\_\_\_ Ex: \_\_\_\_\_

Free Drop (If Known): \_\_\_\_\_

Was Cylinder Head Milled?:  Yes  No

If Cylinder Head Was Milled, How Much?: Flat: \_\_\_\_\_ Angled: \_\_\_\_\_

Piston Type (Circle One If Known):

- Dome  Flat Top  Dish  Inverted Dome
- Conical  Spherical  Round  3D

Pistons Designed For:  Circle Track  Asphalt  Dirt

Drag Race  Road Race  Marine  Street/Strip

Other (Please Specify): \_\_\_\_\_

Is Your Motor:  Carbureted  Injected

Turbo Charged: Lbs. Boost: \_\_\_\_\_  Blown: Lbs. Boost: \_\_\_\_\_

Nitrous - How Much HP:  100  250  350  400+

Other (Please Specify): \_\_\_\_\_

Fuel Type:  Pump Gas  Race Gas  Alcohol  Nitro

Purchasing Rings with Order:  Yes  No Cylinder Qty: \_\_\_\_\_

If **NOT** Purchasing Rings, Please Provide Ring Set Brand

And Part Number: \_\_\_\_\_

Axial Ring Height: **AXIAL RING HEIGHT**

Top: \_\_\_\_\_ 2nd: \_\_\_\_\_ Oil: \_\_\_\_\_

Radial Ring Widths: **RADIAL RING WIDTH**

Top: \_\_\_\_\_ 2nd: \_\_\_\_\_ Oil: \_\_\_\_\_

### OPTIONAL FEATURES

\*For details on custom piston features and terminology refer to catalog pages VIII and IX

Gas Ports; Vertical: \_\_\_\_\_ Spin Boss: \_\_\_\_\_

Gas Ports; Lateral: \_\_\_\_\_ Window Mill: \_\_\_\_\_

Accumulator Grooves: \_\_\_\_\_ Skirt Coating: \_\_\_\_\_

Contact Reduction: \_\_\_\_\_ DBL Pin Oilers: \_\_\_\_\_

Oil Rail Supports: \_\_\_\_\_ Pin Fit: \_\_\_\_\_

### PIN SPECS

Pin Diameter: \_\_\_\_\_ Length: \_\_\_\_\_ Wall Thickness: \_\_\_\_\_ Qty: \_\_\_\_\_

Pins With Order:  Yes  No Pin Fit:  Yes  No

Pin Series:  51  52  72  93  94  95  44

Locks:  Double Spiro Lock  Wire Lock  Tru Arc  HookWire

Single Spiro Lock  Single Tru Arc  Buttons

**JE Pistons reserves the right to choose the appropriate pin length if supplying pins per each piston design.**

### Expedite Service

7 day + 25%  5 day + 40%  3 day + 50%

### BILLING INFORMATION

Bill To: \_\_\_\_\_ Acct #: \_\_\_\_\_

Address: \_\_\_\_\_

Ship To: \_\_\_\_\_ Acct #: \_\_\_\_\_

Address: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Ship Method: \_\_\_\_\_ P.O. #: \_\_\_\_\_

CC#: \_\_\_\_\_ CVC#: \_\_\_\_\_

Name On Card: \_\_\_\_\_ Exp: \_\_\_\_\_

Deposit Amount (50% required): \_\_\_\_\_ Billing Zip Code: \_\_\_\_\_

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Customer's Email address: \_\_\_\_\_

**RETURN POLICY:** Custom pistons are returnable only for defects in workmanship or materials in the as received condition. Under no circumstances will parts be returnable after 90 days. Please check packaging for complete details regarding return policy. All returns require "Return Materials Authorization" (RMA) number, available from the JE sales department.