

RING INSTALLATION

| RING DIAMETER | PART # |
|---------------|--------|
| mm | |

Most Powroll piston rings are oversize to enable re-ringing of cylinders which have worn within acceptable limits. Ring ends may need to be filed before installation.

Excess gap is not critical. Insufficient gap can cause damage.

New rings will not 'fix' a worn piston or cylinder

| Ring Diameter Inches | Ring Diameter Millimeters | Minimum End Gap |
|----------------------|---------------------------|-----------------|
| 1.731" - 1.968" | 44mm - 50mm | .004" |
| 1.969" - 2.675" | 50.25mm - 68mm | .007" |
| 2.676" - 3.120" | 68.10mm - 79.25mm | .010" |
| 3.121" - 4.016" | 79.35mm - 102mm | .013" |
| 4.017" - 4.173" | 102.25mm - 106mm | .016" |

CHECK CYLINDER CLEARANCE AND WEAR

Inspect cylinder wall for wear or scoring. Boring to an oversize is advisable with any ridge of .005" or more.

Measure cylinder in six places (front-to-back top, middle, bottom and side-to-side top, middle, bottom) using quality measuring tools. Variations of more than .003" require boring to larger size.

Check piston clearance against Powroll recommendations. More than .0025" over original recommended clearance requires boring to larger size.

Lightly hone cylinder to remove glaze (with 320 to 360 grit).

CHECK PISTON WEAR

Don't re-use siezed pistons. Seizure causes partial collapse of the piston skirt and results in poor ring seal and smoking.

Gently remove carbon (use acetone). Inspect for:

Skirt: Scoring, wear spots, cracks (replace piston).

Valve Pockets: Valve damage, cracks (replace piston).

Ring Lands: Cracking, pieces missing (replace piston).

Ring Grooves: Check clearance with a new ring in the groove, if a .005" feeler gauge fits between the top ring groove and the new ring, replace piston.

Pin and Clips: Wear on pin, piston clip grooves pushed out or worn (replace piston, pin and clips).

RING END GAP

Be certain you have the correct ring set. Ring thickness must be the same as the piston ring groove. Ring width must not be more than ring groove depth.

If end gap is not listed, gap using this formula: $.0035" \times \text{Bore Size (in inches)}$

Compression & Scraper Rings, One Piece Oil Rings: Position each ring squarely in the cylinder from bottom (use the piston to push the rings into the cylinder). Using a feeler gauge, measure the gap. File rings to the end gap listed.

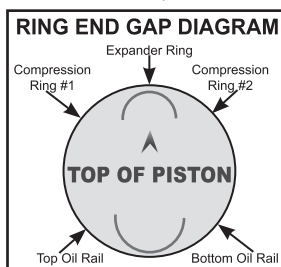
Three Piece Oil Rings: Center (corrugated) piece will not need to be gapped. Check and file rails in the same manner as the compression and scraper rings.

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Many modern ring sets contain a high performance oil control ring. We recommend using a quality ring compressor to avoid damage to the piston, ring, or cylinder during installation.

Install ring end gaps according to diagram.

1. Place Oil Ring Expander (wavy shaped ring segment) into the oil ring groove. Be sure tips of the expander are visible and properly butted (see below). Overlap of Oil Ring Expander tips will cause severe smoking and possible engine damage.



2. Thin Rail Rings can be installed with either side up. One rail ring below oil expander ring and one above.

3. Once rails are installed, be sure the expander tips are still butted and not overlapped.

4. Middle (scraper) ring: Middle ring can be either silver or black. Markings face up.

5. Top (Compression) ring. Usually silver faced. Markings face up. If no markings are evident, ring can be installed with either side facing up.

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