



**400-F Commerce Circle  
Yorktown, VA 23693  
Phone: 757-898-5645  
Fax: 757-597-7737  
[www.ezbore.net](http://www.ezbore.net)**

## ***Filing Piston Ring Ends for Tightest Tolerance***

One of the toughest jobs to do consistently during an engine overhaul is to set the piston ring end gap. Old-school builders just used a small hand file to remove the material by hand.



In kart racing, engines are so competitive that it is critical to obtain the best possible ring seal. One method frequently used to help seal a ring to the finished bore size is to install an oversize ring and file the end gap to a final fit - usually much tighter than the original OEM tolerance.

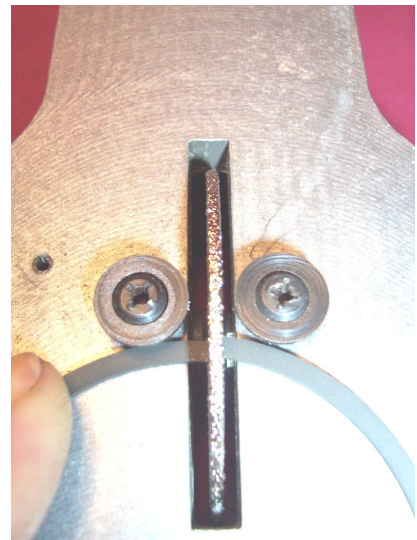
For racing applications, the top ring end gap is usually set at .003 to .005 clearance. Below is a picture of the stock end gap. Although the two ring ends are parallel to each other, the gap is excessive compared to race setting (stock gap is .020).

The ring ends are the key problem that most builders have, but with a little experience and the correct tooling you can set ring end gaps like a pro. Keep in mind that we are trying to get a very tight clearance yet keep the ends square.

See the photo with the ring seated to the cutting wheel. This is the standard method for gapping rings. There are two problems experienced with this method on the small race motor applications.

(1) We use a softer material - A cast iron ring in many applications, so the ring tends to get 2 nicks on the face where it contacts the cylinder wall if pushed all the way forward to the retaining contact buttons. This nick problem will not be an issue if working with chrome rings.

(2) The other problem that occurs is if you close both ends of the rings against the cutting wheel, the ring ends will not be parallel once installed in the bore, leaving a large triangular gap. This is due in part to the thickness of the cutting wheel and the smaller bore sizes associated with the kart race engine. Running .003 clearance doesn't allow for any taper at the point the ring ends meet. That type of gap can cause cylinder wall/ring damage when the engine is first started.





We recommend using one side of the wheel and hold the end parallel to wheel face. This will allow a controlled cut and adjustment of end angle to achieve a parallel finish once installed in the bore. This method is really the same cutting procedure currently used with more expensive power ring gap filers.

Remember to use light pressure and install the ring in the bore to check frequently, to prevent cutting too much material and finishing with a larger gap than desired.

After filing we recommend removing burrs by lightly touching ends with a small dressing stone. Check end gap in the cylinder. Use the piston to push ring down square, near the top of cylinder (Approximately  $\frac{1}{2}$ " down) and then move ring further down bore and check end gap. A small amount of cylinder bore run out can drastically change the ring end gap.

**Note: Ring must have end gap all the way through cylinder, and we do not recommend running a gap any tighter than .003.**

One last thing to consider during piston installation: run the top ring near the intake side of cylinder to allow for fuel to help cool the ring during initial start-up.

Please feel free to contact us regarding any questions that you may have. You may reach us by sending an eBay message to e-zbore\_motorsports, by email at sales@ezbore.net, or by telephone at 757-898-5645.

Hope this helps and

**Remember: "The real speed is in the details".**