



INSTALLATION SPECIFICATION SHEET

Failure to check ring gap can result in severe engine failure. The following end gap recommendations are general guidelines. The best ring gap for any engine and application varies. Increased clearance is generally needed for forced induction, nitrous, filled blocks, endurance racing and other extreme applications. The final end gap suitable for the engine is the full responsibility of the engine builder. If you have any questions, please call 949-567-9000 for technical support.

DETERMINING RING END GAP:

To determine the ring end gap, look for your application in the proceeding table.

ALL BORES MUST BE CONVERTED TO INCHES.

Example: Bore size is 81mm- to find top ring end gap for a street application:

$$81\text{mm}/25.4 = 3.189 \text{ inches}$$

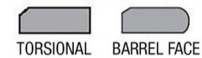
$$(3.189 \times .005) = .016$$

.016" is the minimum allowable clearance

NOTE:

1. If the ring gap is less than the minimum specified for your bore size, it will be necessary to file fit the rings to achieve proper end gap.
2. These are minimums, going a little over is ok (safer)
3. If you over file the second ring a bit, it's ok.
Remember the second ring's main job is just to control oil.
4. These are generalized recommendations, and not specific to your engine, your oiling system, your tune, your fuel, etc. When in doubt, seek an engine builder's guidance for further assistance.
5. CP is not liable for these recommendations if they do not work for your application.

Top Rings

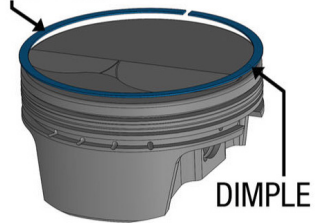


Second Rings



UP
CYL WALL

OIL SUPPORT RAIL



RING FILING PROCEDURES:

1. A torque plate should be installed on the engine (if applicable) and torqued to specifications.
2. The piston ring should be below and square to the deck.
3. Measure ring gap with a feeler gauge or equivalent measuring device.

Important: Ring sets are manufactured to fit specific bores. For every .001" over the intended bore size, ring gap will increase by .00314"

DIESEL PISTON RINGS

Minimum ring end gaps are as follows:

1. For wet Cast Iron block: Tops are Bore X min 0.007" 2nds are 0.010" to 0.015" bigger than top ring end gap, oils should be min 0.009" or more and do not file a 2pcs oil ring.
2. For filled or solid blocks: Tops are Bore X min 0.008" 2nds are 0.015" to 0.020" bigger than top ring end gap, oils should be min 0.009" or more and do not file a 2pcs oil ring.
3. Over 2000hp add 0.001" to the above formulas.

RING GAP CHART

APPLICATION	TOP RING	SECOND RING	OIL RING RAILS
Street Car, Low/Mid compression, Naturally Aspirated	Bore in inches X min .0045	Min .004"-.008" larger than top ring	Min. .015"
Hi-Performance Street, Motorcycle, ATV, Mid/High compression, Drag Racing, Naturally Aspirated	Bore in inches X min .0050	Min .005"-.008" larger than top ring	Min. .015"
Circle Track, Naturally Aspirated	Bore in inches X min .006	Min .006"-.008" larger than top ring	Min. .015"
Nitrous, Blown, Turbo, Low Boost	Bore in inches X min .006	Min .005"-.008" larger than top ring	Min. .015"
Nitrous, Blown, Turbo, Mid-high Boost	Bore in inches X min .0065	Min .006"-.008" larger than top ring	Min. .015"
Nitrous, Blown, Turbo, High Boost	Bore in inches X min .007 or more	Min .008"-.010" larger than top ring	Min. .015"

CYLINDER HONING RECOMMENDATIONS:

GAS NITRIDED, CPN and CPN2 PISTON RINGS

For use with gas nitrided, CPN and CPN2 piston rings. To identify a gas nitrided top ring the entire ring will be a light gray. These instructions must be followed for maximum ring seal. A torque plate must be used unless the bolt holes are not part of the cylinder. The first stone is 525 (220 grit) stone done until there is .001" left from the bottom to the top of the bore. Then switch to 625 (280 grit) stone, 50% load until .0002" is left from final bore. Then use the 625 stone at 20% load to final bore size.

CHROME RINGS

To identify a chrome top ring the face will have chrome plating, the top and the bottom of the ring will be reddish-brown. Chrome on any of the rings is not compatible with Nikasil bores. These instructions must be followed for maximum ring seal. A torque plate must be used unless the bolt holes are not part of the cylinder. The first stone is 525 (220 grit) stone, done until there is .001" left from final bore. The bore must be round to .0002", checked 360 degrees from the bottom to the top of the bore. Continue with 525 (220 grit) stone, 50% load until .0002" is left from final bore. Then use the 525 stone at 20% load to final bore size.

ALL RINGS

The honing must be done slowly to minimize heat build up. No hand honing. Final bore needs to be less than plus or minus .0002" out of round, checked 360 degrees around the bore from the bottom to the top of the cylinder. This can only be checked with a dial bore gauge. The expertise of your machine shop is critical to the proper finish on your block bore. When you receive the block back from the machine shop it will appear clean, the block still needs to be cleaned. There will be material trapped in the honing grooves of the block that are not visible. Failure to clean the block will lead to premature ring wear and blow by.

DUCTILE MOLY RINGS & PVD

To identify a moly top ring look for a silver-grey plated finish with black phosphate top and bottom surfaces. If there is a dot on the flat side of the ring, make sure it faces up. Rough hone cylinders to within .003", intermediate hone to within .0005" with 220 grit and final hone with a 400 grit and a 10 to 12 RA finish with a 20° to 22° crosshatch.

TOP RING INSTALLATION:

If the ring has a dot or laser marking, then this side will face up. If there is no dot look for an inner bevel and install this facing up. If there is neither a bevel nor any other marking the ring can be installed either way. (Non-directional).

SECOND RING INSTALLATION:

If the ring has a dot or laser marking this side will face up. If there is no dot look for an inner bevel and install this facing down. If you do not see either refer to the diagram. It is very important not to install the 2nd ring upside down, otherwise, it will pump oil into the combustion chamber.

OIL RING INSTALLATION:

Install the expander into the ring groove followed by the rails. The rails should be offset about 180°.

OIL SUPPORT RAIL INSTALLATION:

In applications where the pin bore protrudes into the oil ring groove, a rail support needs to be used. Install the rail support at the bottom of the oil ring groove with the dimple in the pin bore facing down.

DISCLAIMER / WARRANTY

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