**INSTALLATION SPECIFICATION SHEET**

**CP-CARRILLO RING RECOMMENDATIONS**

Failure to check ring end gap can result in severe engine failure. The following end gap recommendations are general guidelines. The best ring gap for any particular 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.

**RING GAP MEASURING PROCEDURES**

1. A torque plate should be installed on engine (if applicable) and torqued to same specifications as machine shop.
2. Piston ring should be below and square to the deck.
3. Measure ring end gap with a feeler gauge.

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**CP-CARRILLO CYLINDER HONING RECOMMENDATIONS**

*A torque plate must be utilized for boring and honing*

**GAS NITRIDED, CPN, CP2N AND R86NHP 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 a 525 (220 grit) stone, done until there is .001" left from final bore. The bore must be rounded to .0002", checked 360 degrees from the bottom to the top of the bore. Then switch to a 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.

**DUCTILE MOLY RINGS & PVD**

To identify a moly top ring look for a silver-grey plated finish with black phosphated 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 .020" to .022" crosshatch.

**CHROME RINGS**

To identify a chrome top ring the face will have chrome plating, the top and bottom of the ring will be a reddish-brown. Chrome on any of the rings is not advisable with nitrided 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 a 525 (220 grit) stone, honed until there is .001" left from final bore. The bore must be rounded to .0002", checked 360 degrees from the bottom to the top of the bore. Continue with a 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.

**DIESEL PISTON RINGS**

1. Minimum ring end gaps are as follows:
   - For wet cast iron block: Tops are Bore X 0.007" 2nds are 0.010" to 0.015" bigger then top ring end gap, oils should be 0.009" or more and do not file a 2pcs oil ring.
   - For filled or solid blocks: Tops are Bore X 0.008" 2nds are 0.015" to 0.020" bigger then top ring end gap, oils should be 0.009" or more and do not file a 2pcs oil ring.
   - Over 2000hp add 0.001" to the above formulas

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**ALL RINGS**

The honing must be done slow 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 should 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 could be material trapped in the honing grooves of the block that are not visible. Failure to clean the block could lead to premature ring wear and blow-by.

**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 or 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**

Due to the nature of high performance applications, CP-Carrillo/Panki products are sold without any warranty of merchantability or fitness or purpose, expressly understood and agreed between CP-Carrillo/Panki and purchasers that as part of the bargain between CP-Carrillo/Panki and purchasers, consideration of doing business with each other, all purchasers take, select and purchase said products and services from CP-Carrillo/Panki and CP-Carrillo/Panki shall provide purchaser with a full and complete opportunity to examine parts, inventory or services when purchasing from CP-Carrillo/Panki. CP-Carrillo/Panki shall not under any circumstances, be liable for any special, incidental, or consequential damages, including, but not limited to, damages or loss of other property of equipment, loss of profits or revenue, cost of purchased or replacement goods, or claims of customers of the purchaser which may arise and/or result from sales, installation or use of these parts.

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*These are our minimum recommendations. Your applications may require larger end gaps.*