Thank you for choosing Total Seal® Piston Rings—the longest lasting piston rings available for your engine.

We are confident you will enjoy the Total Seal benefits of:

- low blowby
- increased horsepower
- improved fuel economy
- cooler and cleaner oil
- longer engine life

Please spend a few minutes and read through this entire instruction sheet before you begin installation.

Proper installation will assure that you receive all the benefits of this fine ring set.

If you have questions, please call our technical service line for additional information at (623) 587-7400.
**engine Preparation - Iron cylinders**

Finish hone cylinder walls with torque plates installed if available. Recommended hone grit specification: moly-face or cast iron top ring 280-320 grit. Chrome face top ring: 220-280 grit. Finished hone with a 22 to 24 degree cross-hatch pattern off horizontal axis.

If this crosshatch angle pattern differs from the O.E. makers’ recommendations please follow the O.E. specifications.

**Cylinder Deck Surface**

22°–23° Off horizontal axis

44°–46° Included angle

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**Plateau Honing - call**

**nikasil® or coated cylinders - call**

**Ring Installation**

See gapping chart for recommended ring end gap and procedures.

**Total Seal Gapless® Top Ring**

1) Install machined ring first with groove side down and gap 180° from 2nd ring end gap (see fig. 1).
2) Install rail into groove machined in ring with gaps opposed 180°.

**Top Rings (conventional)**

1) If ring has a dot or laser mark, install that side up.
2) Unmarked rings with inner bevel are installed bevel side up.
3) Rings without dot or inner bevel install either side up (see fig 3).

**Total Seal Gapless® 2nd Ring**

1) Install machined ring first with groove side down and gap 180° from top ring end gap (see fig 1).
2) Install rail into groove machined in ring with gaps oppose 180°.

**Non gapless (conventional) 2nd and 3rd Rings**

1) If ring has a dot or laser mark, install that side up.
2) Unmarked rings with an inner bevel install bevel side down.
3) Rings without a dot or inner bevel install either side up (see fig. 3).

**Oil control Ring**

1) Three piece type - install as shown in figure 1.
2) Do not attempt to modify expander in any way.

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**Helpful Tips for Ring Fitting and Seating**

All pistons (including new ones) should be checked for proper ring to groove clearances.

Ring to piston groove back clearance should be a MINIMUM of .005" deeper than radial wall dimension of piston ring.

When rings are installed and bottomed out in the ring groove they should not protrude past the edge of the ring land. Due to variations in piston manufacturing it is the end users responsibility to check for proper fitment prior to final assembly.

Ring to groove side clearance should be a minimum of .0015 to a maximum of .003" (see fig. 2).

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**Fig. 1**

* If piston has more than 2 compression grooves, subsequent rings should be positioned 180° apart in descending order.

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**Fig. 2**

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**Fig. 3**