

## ImPoRTanT noTice:

- If using Hypereutectic Pistons, follow piston manufacturers ring end gap specifications.
- **Quickseat®** is the recommended cylinder wall lubricant for ring installation. Piston skirts should be lightly lubricated with AL-4 or engine oil. Remember excessive or improper lubricating of the rings may prevent them from sealing.
- **During engine break-in, use petroleum based motor oils only.** Synthetic oils may be used after break-in cycle is complete.
- **Total Seal does not recommend** hard chromed compression or hard chromed oil rings be installed in chromed or nickel coated cylinders. For these applications call for recommendations.
- **Do not intermix gapless ring rails with oil ring rails or try to substitute rails from any other ring set.** Total Seal Gapless® rings and rails are carefully machined to fit together and are not interchangeable with other Total Seal rings or with any other rings not from this set.
- **excessive oil volume can lead to oil consumption.** This can be caused by high volume oil pumps, excessive bearing clearance, modified oil systems, etc. It is the end user's responsibility to make sure this system is functioning properly for the given application.

All cylinder heads (new, used or rebuilt) must have valve stem to guide clearance checked. Excessive clearances may lead to oil consumption. Valve to guide clearance must be fitted to the minimum end of manufacturers specification. All applications must use a positive type viton valve guide seal on intake and exhaust valves.

Total Seal Gapless® rings seal so well that increase manifold vacuum and decreased crankcase pressures may lead to excessive flow in the PCV system if the engine is so equipped. In some cases it may be necessary to reduce the amount of flow to prevent oil from being pulled through the PCV system. In most cases, a restrictor with a 1/16" orifice placed in the fresh air inlet breather hose is sufficient to remove all pressure from the crankcase without pulling oil into the induction system.

### Total Seal Piston Rings

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## Installation Sheet



*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.

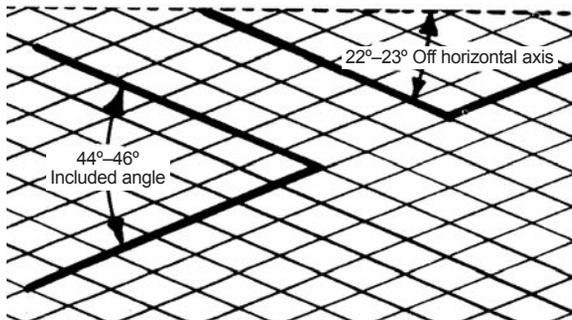
If you have questions, please call our technical service line for additional information at (623) 587-7400.

## 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



## Plateau Honing - call

## nikasil® or c coated cylinders - call

## Ring InStAl l aTion

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 (c onventional)

- 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°.

## n on gapless (c onventional) 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 c ontrol Ring

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

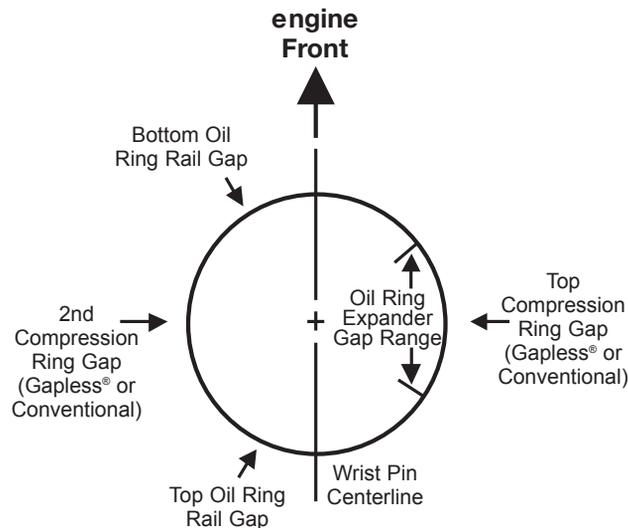


Fig. 1

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

## 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).

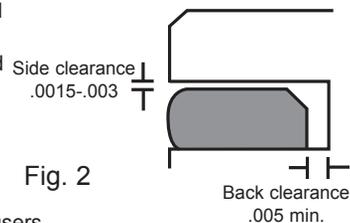


Fig. 2

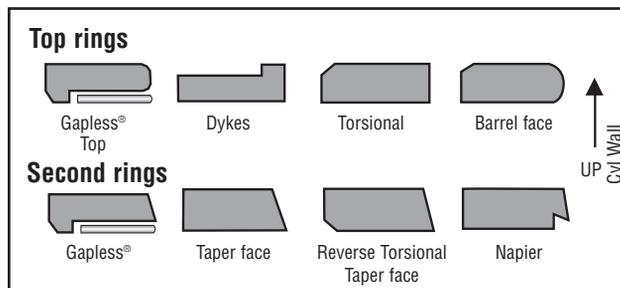


Fig. 3