

INSTALLATION AND BREAK-IN INSTRUCTIONS USING



TIGHT IS CORRECT - PLEASE READ THOUGH ENTIRE INSTRUCTIONS BEFORE FITTING

CALCULATING FINISHED BORE SIZE

There are two skirt clearance dimensions discussed in the instructions.

- The as machined un-coated piston skirt to cylinder wall.
- The coated skirt piston to cylinder wall.

Do not measure over the skirt coating and add clearance.

PRE-COATED OFF THE SELF PISTON SET:

- 1) Locate the as machined un-coated skirt diameter dimension stamped on the piston pin pad.
- 2) Refer to the standard instruction sheet supplied for the recommended skirt clearance on the back of the sheet. Using the stamped as machined un-coated skirt dimension add the amount of clearance required. **Example:** Skirt dimension of 4.0265" + Required clearance of .0035" = 4.030" finished bore.
- 3) Off the Shelf sets will be coated to a thickness of the minimum as machined un-coated skirt to cylinder dimension. **Example:** a piston with .0035" minimum as machined un-coated skirt clearance with have roughly .0035" total coating thickness.

CUSTOM COATED PISTON SETS:

- 1) Locate stamped as machined un-coated skirt diameter dimension on top or side of piston.
- 2) Add required wall clearance for finished bore size.
Refer to supplied standard instructions back page for recommended skirt clearance.
- 3) Total coating thickness will be to roughly the finished bore size that was calculated at time of order.

FITTING PISTON TO CYLINDER

- 1) Prepare piston with wrist pin but without rings and locks.
- 2) Holding the wrist pin, insert the piston upside down into a dry cylinder.
 - A) If the piston has little or no resistance no other action required. Go to "D".
 - B) If the piston sticks in the bore do not force it through. Remove and look for witness marks from the interference. Using Scotch-Brite, very lightly go over the witness mark area and try fitting again. Continue until a very slight interference fit .
 - C) Now, lightly oil the cylinder and check again. After a few strokes the piston will abrade in and become looser.
 - D) Clean piston and cylinder for final assembly. Re-oil both cylinder and coated skirt.

BREAK-IN Back Page →

UNITED ENGINE & MACHINE CO.
PISTONS

BREAK-IN PROCEDURE

The break-in procedures below are to produce progressive heat cycles to allow the coating to hone to the shape of the bore. Give the engine some light run time before going to full load.

Engine Dyno Break-in:

- 1) Warm up engine as normal with little to no load applied. Shut engine off and allow to cool to room temperature.
- 2) Restart and begin warm up procedure applying light load in a progression to about 50% load with a minute of idle time between loaded run time. This allows the piston to cool and collect more oil on the skirts. Run time about 10 minutes. Shut engine off and allow to cool. **Note: Flat tappet cam engines allow enough run time to break cam in.**
- 3) Restart and proceed with your normal break-in procedure to full load.

IN CAR BREAK-IN:

- 1) Start engine and check ignition timing. Allow engine to warm up to at least 160 degrees. Vary the RPM slightly with no load on the engine. **Note: Flat tappet cam engines allow enough run time to break cam in.** Shut engine off and allow to cool to room temperature.
- 2) Start engine and warm back up to operating temperature with little load applied and varying RPM.
- 3) Now apply some load for 15 minutes to bring up the piston temperature in progression starting with light to medium. Driving the vehicle to the best way to apply loads. Allow a minute of idle time between loads to allow the piston to cool and collect more oil on the skirts. Progress to heavier loads.

NOTE:

Many factors determine the number of progressive heat cycles. If the engine seems tight when advancing to the next power level, shut the engine down and allow it to cool allowing more oil to collect on the high spots. Restart engine and give more time at the previous power level.

INFORMATION VIDEOS FROM LINE2LINE

Engine Assembly with APC coating:
www.line2linecoatings.com/video4.html

Engine Break-in with APC coating:
www.line2linecoatings.com/video5.html

Questions on installation or break-in?

Please call United Engine & Machine Co.
Toll Free - 800-648-7970 Tech Dept.
Email - tech@uempistons.com

Limited Warranty

United Engine & Machine Co. warrants coating materials and workmanship to be free from defects on new unused pistons. If the coating is determined by United Engine & Machine Co. to be defective the coating will be re-applied free of charge. This warranty is limited and does not cover labor or incidental damage. For warranty inspection please call for a RMA number before sending product back, product without a RMA written on the outside of the box will be returned. Claims must be made within 60 days of invoice date.



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