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## CYLINDER SLEEVE INSTALLATION PROCEDURE 4-STROKE

### General Rules for Sleeve Installation

These tips are intended to be a guide for installing sleeves into cylinders. There are always exceptions to the rule and care must be taken on special applications.

**Step 1.** Determine which type of cylinder is to be sleeved.

- A. Original cylinder is alloy-chrome plated, Nikasil, or electrofused. The cylinder must be bored to accept the new cylinder sleeve.
- B. Original cylinder or block has a cast-in liner. Do not try to push out the cast-in liner. Cylinder damage will be the result. The cylinder must be bored to accept the new cylinder sleeve.
- C. Original barrel is cast iron. The cast iron cylinder will be bored out to accept the new sleeve.
- D. Original cylinder or block has a replacement sleeve. Heat the cylinder to remove the sleeve. Check the new sleeve outside diameter for proper fit, re-heat the cylinder to install the new cylinder sleeve.

**Step 2.** The cylinder is bored out to accept the sleeve.

When the sleeve is installed into an all aluminum cylinder, the interference fit is .004”.

When the sleeve is being installed into a cast iron cylinder bore, the interference fit is .002” to .003”.

The interference fit is determined by measuring the outside diameter of the sleeve, then boring the cylinder diameter smaller than the sleeve.

The interference fit is a critical aspect of sleeve installation because this step insures that the sleeve does not move when in the cylinder. Also, proper interference fit is important for cylinder cooling purposes.

**Step 3** Installation of flanged type sleeves follow the same procedures, but the top of the cylinder must have a countersink to the correct depth to accept the flanged sleeve. An interference fit of .001” to .000” on the flange diameter is recommended.

**Step 4.** The cylinder is then heated in an oven between 400 degrees, up to 450’ for an hour or more. Do not use a torch or hot plate for this procedure. It is important that the cylinder heats uniformly.

**Step 5.** The cylinder is then removed from the oven and the sleeve will drop easily into the cylinder.

Turning the sleeve by hand to line up the bottom skirt cut-out (when required) is a common practice.

You will have between five and ten seconds before the sleeve and cylinder lock up.

**Step 6.** The cylinder must then be put under a hydraulic press to keep the sleeve from rising while the cylinder is cooling.

**Step 7.** The cylinder (sleeve) must be bored out and honed to insure proper piston clearance. Measure your piston at the skirt to properly bore the sleeved cylinder to the correct bore size.

Next, hone your cylinder to the correct piston clearance. Finish hone with a 280 grit.

Properly sleeved cylinders can use the O.E.M. recommended piston clearance.

When using aftermarket pistons, size the clearance using the manufacturer recommended specs.

If you have a doubt, add a half thousandth (.0005”) to the clearance.

**Step 8.** As an added finishing touch, surface decking the top of the cylinder is recommended in order to make sure that the head gasket will sit flat on the cylinder to create a good sealing surface. Make sure you only take the minimum cut off the top of the cylinder.