Combustion Chamber Mold Making Instructions

JE recommends using a rigid mold compound such as Auto Body Dent Filler or equivalent. Do not use flexible materials such as latex or modeling clay. Do not use chalky or easily damaged materials such as plaster. Different resin based materials are available, but be careful when using these as they readily bond with metal surfaces and can be difficult to separate once cured. There are two common procedures for mold making:

Procedure 1:

- ✓ Combustion chamber and valves must be clean and free of carbon. Casting flash or tooling marks should be removed or reasonably smoothed.
- ✓ Apply a release agent such as WD-40 to all surfaces before pouring the molding compound.
- ✓ With the block fastened to an engine stand, bolt the head to the block and rotate it until the deck of the block is level with the floor, upside down.
- ✓ Make sure the dowel pins are installed in the block and the valves and spark plug are installed in the head. A rubber electrode cover on the spark plug will help the mold separate easier.
- ✓ Pour the molding compound from the underside (crankcase). The more "liquid" the molding compound, the better it will conform and allow bubbles to rise away from the chamber. Thicker compounds may need some pressure to ensure it conforms completely (an old piston works well for this).
- ✓ Allow the molding compound to extend into the bore ½" – 2". The mold must be flat and parallel to the deck on the bottom.
- ✓ Once the compound has cured, disassemble and scribe bore centerlines on the bottom of the mold, one parallel to the wrist pin centerline and one perpendicular.

Procedure 2:

- ✓ Combustion chamber and valves must be clean and free of carbon. Casting flash or tooling marks should be removed or reasonably smoothed.
- ✓ Apply a release agent such as WD-40 to the chamber and bore surfaces before pouring the molding compound.
- ✓ With the block fastened to an engine stand, bolt the head to the block and rotate it until the deck of the block is level with the floor, upside down.

- ✓ Make sure the dowel pins are installed in the block and the valves and spark plug are installed in the head.
- ✓ Pour the molding compound from the underside (crankcase). The more “liquid” the molding compound, the better it will conform and allow bubbles to rise away from the chamber.
- ✓ Drill three or four holes (1/8” – 3/8” dia) in the top of an old piston and assemble it on a connecting rod (rings and pin locks are not necessary).
- ✓ With main bearings in place, install the crankshaft and the piston/rod assembly (do not apply release agent to the piston). Rotate the crankshaft, pressing the piston into the molding compound and allowing the compound to squish through the holes.
- ✓ Once the compound has cured, remove the piston/mold from the connecting rod.

Plug reliefs and flame slots can either be put in place with clay beforehand or ground out of the finished mold.

Note: The position of the mold in relation to the bore and wrist pin centerline is critical!

Note: Allow molding compound to completely cure before disassembly!

Note: Do not send piston/rod assemblies, especially ones with press-fit pins as we cannot press them apart at our plant!