2. *Why a Honing Plate?*

   At the beginning of the race season when you're rebuilding your tried-and-true race engine or building a new engine for the upcoming season, the block should be honed using a honing plate. This is the only way to make the bores straight and round with the throttle wide open. If the bores aren't straight and round at W.O.T. (wide open throttle), then the engine won't make any horsepower. If you're building several engines, or plan to do so over the next few years, it will pay you to get your own honing plate. The real problem is that most people/engine builders and machine shops don't have honing plates for Chrysler engines, especially non-Hemis. Honing plates don't wear out. Cast iron plates are less expensive but can break if mishandled or dropped. Billet-steel plates are much stronger and more durable. All the Mopar Performance honing plates are made of billet-steel.

3. *Honing Plate Thread Engagement*

   The honing plate should be held onto the block with the same thread length as the head. This sounds easy enough, but how do you get the two to be the same? Since cylinder head distortion is what you're trying to match, the first step starts with the head after machining. The head bolts with washers, if they are to be used with the head on final assembly, are inserted into the head and the length of bolt protruding out the bottom of the head is measured. We'll assume that this measurement is .895". The bolts that are going to be used with the honing plate are inserted into the plate. The amount that sticks out of the bottom of the plate has to be adjusted to .895". If the first pass yielded 1.200" length, then hardened washers can be installed under the bolt head. The hardened washers run around .100". So, in this example, three hardened washers would be used to get the correct length. (Refer to 'Block-to-Head Distortion,' Cylinder Head section for more information.)

Engine Block Honing Plate

For new engine build-up or rebuilds, honing plates provide extreme accuracy for precision work to allow maximum horsepower output at wide open throttle. Special steel torque plate tools are designed to allow the bores to be honed straight and round as required for high output, high rpm engines. Made of billet steel rather than cast iron for greater durability and accuracy.

P4452193 'A' engine honing plate.

Boring and Milling Specifications

The stock 'A' engine block is a thin wall casting design. Because of this, the maximum allowable overbore is .040". (The "X-Block" and "R-Block" have extra heavy cylinder walls which will accept up to 0.150" overbore.)

The intake manifold surface on the head should be milled .0095" for each .010" milled off the gasket surface of the block or heads. Since the intake manifold also seals the top of the block, the front and rear block rails will have to be milled .0144" for each .010" milled from the head and/or block deck surface. Any previous information on milling specifications is not up-to-date and should be disregarded.

1. When machining cylinder head and deck, be sure they're perfectly flat.
2. When milling head and deck, don't make them too smooth. A typical production surface (100 micro-inches) should be your guide.

Most of the engines can be overbored .060", but the 1977 and newer thin wall, lightweight castings should be limited to .030" maximum and .020" preferred. This does not apply to the race block. If the head surface is milled, the intake manifold surface and the front and rear rail of the block should also be milled. The early 360 (1971-1976) blocks are a special case. They used a 4.00" bore (340 was 4.04") but the block was made with the 340 water-jacket core. This means that these blocks can be bored to the same actual bore size as any 340 and have the same borewall thickness. The same is NOT true of the newer 360 blocks.

Blocking Off Oil to the Tappet Galley

Required when roller camshafts are used, because the roller lifter uncovers the oil galley, resulting in very low oil pressure.

To install a roller camshaft in an 'A' engine, there are several things that are absolutely required. One is an aluminum bronze distributor drive gear and hardened shaft (P3690874). The other requirement is that the oil to the tappet bores should be blocked. One way is to "bush" the tappet bores. See Figure 3-8. This is an expensive machine shop operation. Another easier and cheaper way to accomplish this is outlined as follows. If this is not done, the engine will have inadequate oil pressure.

1. Remove both front oil galley plugs and the right galley plug at the rear of the block.

   Note: The right oil galley is next to cylinders #2, 4, 6, 8.

2. Drill or ream along the centerline of the existing hole in the right oil galley to 5/8" diameter. Start at the front and go past four tappet bores. Repeat this procedure from the rear of the block and go past the other four tappet bores of the right bank.

   The depth of the drill or ream is approximately 10" from either end.

3. Install a copper or aluminum thin wall tube (above 5/8" O.D., 1/2" I.D.) into the drilled-out right oil galley. Press the tube into the galley from each end of the block. (Two pieces of the tube required.) The recommended Mopar Performance package is P4120603.

4. Use "Peening" tool from kit and drive this tool through each lifter bore in order to peen the tube.

   Note: Above right oil galley refers to the passenger side of the block as installed in the car.

5. Drill through the tube all of the oil passages that intersect the tube.

   Drill the oil passages from the main bearing bulkhead to the oil galleys on #1, 2, 3 and 4 to a diameter of approximately .283". Drill the passages from the main bearing bulkheads to the camshaft bearing bores on #2 and #4 to a diameter of .283". Drill the passage from the camshaft bearing bores to the deck of the cylinder block on journals #2 and #4 to a diameter of approximately .283". Be sure to clean drillings and burrs from the block.

6. Rethread each end of the right galley to 1/2" pipe size. Seal the galley with two 1/2" pipe plugs (one at each end). Make sure that the plug does not block the main bearing feed holes.

7. Block the oil to the left galley at the front of the block. This is best done by drilling and tapping (straight thread) the front part of the oil galley. It must be threaded at least 1/4" past the oil feed that is coming up from the No. 1 main bearing. Install a low Allen head set screw with Loctite such that it blocks (1/4" past) the hole from the No. 1 main bearing. The Allen head set screw design allows the screw head to be flush or slightly recessed to the edge of the block.

Race Oil Restriction Packages

Blocks off oil to the right side tappet bores. Required for race engines with high lift roller camshafts.

P5249508	Drill and ream package.
P4120603	Tube and peen tool package.

O-Ringing

There is no need to O-ring 6 cyl., 'B,' 'RB' or Hemi blocks, but the 'A' engines with high compression ratios (over 12.0:1) will need to have the block "O-ringed." This is a precision operation and should be done very carefully.

When O-ringing, use a groove diameter no less than 4.325" inside diameter. (It can be larger if necessary to prevent O-ring from riding on the gasket bead. This is to be avoided at all costs, since it guarantees a leak.) Lab tests and track reports both indicate a groove .032" wide x .016" deep works well, although larger grooves (.055" x .038", for example) are proving successful, too. See Figure 3-9. In any case, the metal O-ring should not protrude more than .016" (use safety wire or hard stainless steel of .032" dia., depending on groove width).

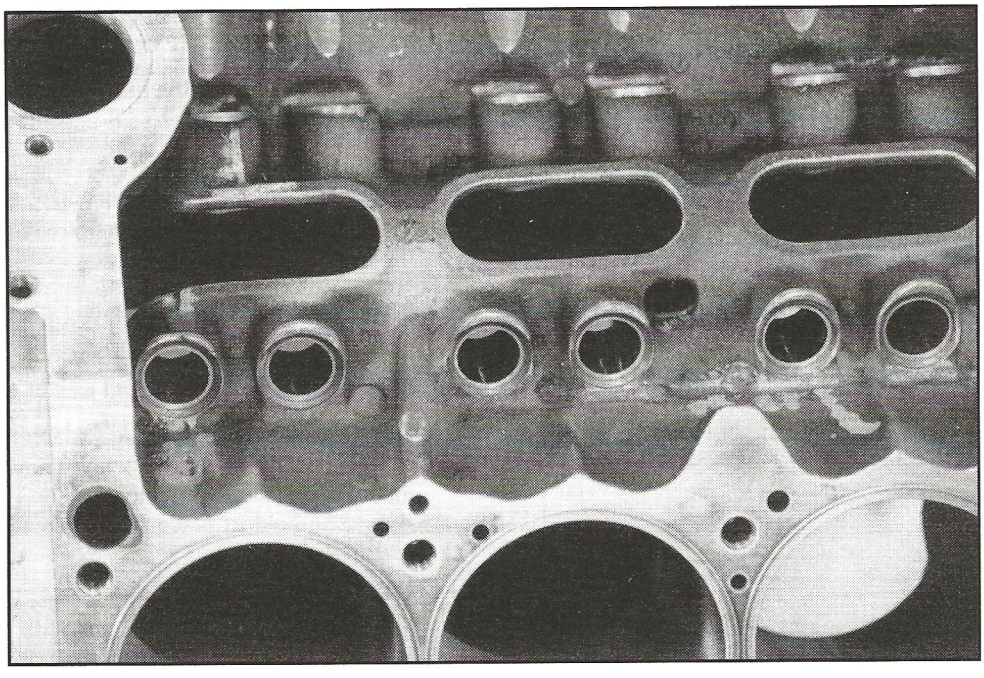

Figure 3 - 8