

Reconditioning High-Silicon Aluminum Alloy Engine Blocks with Sunnen AN-Series Hones Instructions

GOODSON

Tools and Supplies for Engine Builders

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AN-30

**Please read instructions
before using.**



A. INTRODUCTION

One of the most significant features of these aluminum die-cast engine blocks is that they do not require steel or cast iron liners in the cylinder bores. Pure particles of silicon, averaging about .001" in diameter (0.03mm), are dispersed in the aluminum alloy throughout the engine block. Because silicon is very hard, there will be very little wear in the cylinder bores. In fact; as far as the pistons and rings are concerned, the cylinder wall is silicon, and the aluminum's function is merely to hold the silicon particles.

B. RECONDITIONING HINTS

If the cylinder bores become excessively scored or worn, they can be honed to accept oversize pistons. However, the usual sizing and finishing operation leaves a cylinder wall of silicon and aluminum; the silicon particles do not protrude from the aluminum.

To achieve the proper surface for compatibility of the rings and pistons, the cylinders should be prepared in such a manner that the silicon particles protrude from the aluminum, so the pistons and rings contact only silicon. Therefore, a special conditioning operation is needed to remove the aluminum from between the silicon particles.

C. PROCEDURES

When reconditioning using a Sunnen AN-110, AN-111 or AN-112 Portable Cylinder Hone the following items are required:

Electric Drill: 1/2" OR 5/8" 350 RPM

Quick-Coupler: AN-80

Hone Stop: HS-150-1/2 or HS-150-5/8

Stone Sets: MM33-J63, MM33-J85, and MM33-C05

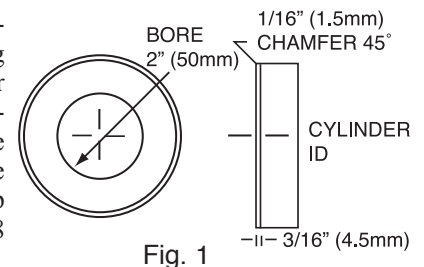
Felt Set: MM33-F05

Silicon Compound: AN-30

Dial Bore Gage: Model GA-2125

Honing Oil: RHO-10 or RHO-50

1. To avoid hitting main bearing webs and damaging stones, place a soft steel or aluminum washer in the bottom of each cylinder before honing (see Fig. 1) or use the Goodson Hone Stop (HS-150-1/2 or HS-150-5/8 attached to the hone drive.



2. Use a continuous flow of Honing Oil while honing the cylinders. DO NOT use Honing Oil on the final conditioning operation.
3. Roughing Operation: Hone to within 0,08 nun (.003 in) of finish diameter, using a M33-J63 Stone Set.

Remove 1" (25mm) from the top of the stones as illustrated (see Fig. 2). Cut through abrasive with an old hacksaw blade and break off unwanted section of stone. Remove abrasive only, DO NOT cut into stone holder.

4. Finishing Operation: Hone to within .001" (0,03mm) of finish diameter, using a MM33-J85 Stone Set.
Remove 1" (25 mm) of the top of the stone (see. Fig.2).
Stock Removal Rate: .002 in/min.
(0,05 mm/min.)
Stone Wear/Stock Removal Ratio: 2/1.

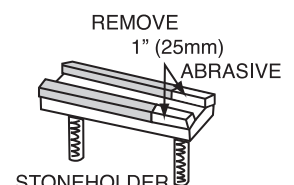


Fig. 2

Surface Finish: 15-20 Ra μ m (0,4-0,5 Ra μ m).

Reconditioning High-Silicon Aluminum Alloy Engine Blocks with Sunnen AN-Series Hones Instructions (continued)

5. Polishing Operation: Wipe cylinder clean and hone to finish diameter, using a MM33-C05 Stone Set. Tighten Feed Pinion, as required.

Remove 1" (25mm) from the top of the stone as illustrated (see Fig. 2).

Stock Removal Rate: .0007 in/min. (0,02 mm/min.).

Stone Wear/Stock Removal Ratio: 2/1.

Surface Finish: 4-6 Ra μ in (0,1-0,2 Ra μ m).

6. Conditioning Operation: **DO NOT** use a continuous flow of Honing Oil during this operation. Saturate MM33-F05 Felt Set with Honing Oil.

Wipe Cylinder clean.

Thoroughly mix Silicon Compound; then coat Felt Set and entire polished surface of Cylinder wall with a heavy coating of compound.

IMPORTANT: To avoid contamination keep lid tightly closed on Compound; use only clean brushes when applying Compound; and **DO NOT** reuse Compound.

Tighten Feed Pinion, as tightly as you can with your fingers. **DO NOT** use pliers or over tighten.

Turn ON power and hone cylinder for 1-1/2 minutes.

Use-a steady, even stroking motion; overstroke end of cylinder by 1/8" (3 mm).

Periodically tighten Feed Pinion to compensate for Felt Set wear.

Cylinder surface will have a dull matte finish. Repeat for each cylinder.

NOTE: As Felt Set becomes worn, replace to avoid scoring cylinder with stone holders.

7. Carefully wipe cylinders clean.

NOTE: To avoid contamination: Store felt set(s) separately in a clean storage box.

WARNING: THE USED OIL SATURATED FELT SETS CONTAIN MINERAL OIL WHICH IS A HAZARDOUS WASTE. DISPOSE OF FOLLOWING APPLICABLE GOVERNMENT REGULATIONS.

Be sure to download the MSDS for the this product and keep it on file.

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