



**INSTRUCTIONS
BOOKLET
for
SUNNEN® SUPERABRASIVE
STONE ASSEMBLIES**



References – General

- Instructions Booklet for Sunnen Portable Stone Assemblies I-AB-101
- Instructions Booklet for Sunnen Honing Tools & Stone Sets I-AB-102

References – For Automotive Applications

- Sunnen Engine Rebuilding Equipment Catalog A-7100
- Sunnen Portable Hones and Accessories for Engine Rebuilding X-AN-5005

References – For Industrial Applications

- Sunnen Bore Sizing & Finishing Supplies Catalog X-SP-5500
- Sunnen Portable Hones and Accessories for Industrial Applications X-AN-5020

Doing production honing? Contact your local Sunnen Field Service Engineer or write Sunnen Products Company, 7910 Manchester Ave., St. Louis, Mo. 63143, U.S.A., for tips on honing rigs.

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SUNNEN® PRODUCTS COMPANY

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IMPORTANT INSTRUCTIONS

For Sunnen® Superabrasive Honing Stones

WARNING: Contains one or more of the following materials: CHROME OXIDE, COBALT, NICKEL, COPPER, SILVER and TIN. Abrading, cutting, grinding or processing this abrasive stone may produce potentially hazardous dust or fumes which can be inhaled, swallowed or come in contact with the skin or eyes. Dust or fumes can irritate eyes, skin, nose and respiratory tract. Inhalation of dust or fumes may cause temporary or permanent respiratory disease leading to disability or death. If processing the abrasive stone produces any dust or fumes, **ASSURE ADEQUATE VENTILATION** and use appropriate respiratory protection if necessary. Wash dust from exposed skin. **READ MATERIAL SAFETY DATA SHEET FOR ADDITIONAL HEALTH AND SAFETY INFORMATION.**

INTRODUCTION

PLEASE OBSERVE THE FOLLOWING HINTS AND PRECAUTIONS TO OBTAIN OPTIMUM LIFE AND PERFORMANCE FROM YOUR HONING STONE.

OPERATING HINTS

Hints for maximizing stone life and cutting action.

Use with AN-112, AN-600, AN-815, ANR-275, ANR-250 and GNR- Series Hones. Master Holders may be required.

Debur rough or out-of-round bores with a deburring stone set selected from table below.

	STONE SETS (2 STONES AND 2 GUIDES)			
BORE DIAMETERS MILLIMETERS	64-69	69-104	89-140	104-533
BORE DIAMETERS INCHES	2.5-2.7	2.7-4.1	3.5-5.5	4.1-21.0
DEBURRING In Rough Bores, All Materials	G25-A47	M27-A47	N37-A47	† W47-A47

† These stones require a Master Holder

Do not overfeed stones. Feed stones up just enough to produce good cutting action. Feeding up stones beyond this point will cause excessive stone wear with little corresponding increase in cutting action. Rate of stock removal will decrease as irregularities of bore are reduced. Corrective action should be taken only if stones stop cutting. See **Troubleshooting** for possible corrective actions.

Use a continuous and ample flow of full strength Sunnen Industrial Honing Oil. Avoid accidental dilution with solvents.

Soft or annealed tool steel should be honed with a different type stone set. For help in selecting right stone set, contact your local Sunnen Field Service Engineer or Sunnen Customer Service Department in St. Louis, Missouri.

POWER SOURCE

Use heavy duty electric or air drill motor or drill press. For best cutting action, select spindle speed (rpm) based on bore diameter, using spindle speed table posted on your machine or included in your machine's operating instructions.

To determine spindle speed (rpm) when table is not available, divide 1,200 by bore diameter stated in inches; for metric users divide 30,000 by bore diameter stated in millimeters.

Example for a 6 in. dia. hole: $1,200 \div 6 = 200$ (rpm)

Example for a 150 mm dia. hole: $30,000 \div 150 = 200$ (rpm)

Approx. Bore Size	Recommended Drill
2.5 - 5.0 in. (63 - 125 mm)	5/8 in.
5.0 - 15 in. (125 - 375 mm)	3/4 in.
15 in. & up (375 mm & up)	1 in.

IMPORTANT

Make sure hone rotates clockwise (as viewed from drive shank end of hone).

MATERIAL

CBN (cubic boron nitride or Borazon®) stones are recommended for honing all types of steel (hard, soft, high and low alloy, stainless, high speed, etc.) and heat resisting alloys.

Diamond stones are recommended for honing carbide, glass, ceramic, cast iron, and chrome plate.

COOLANT

For best cutting action and longest stone life, use ONLY Sunnen Industrial Honing Oil (such as: Sunnen MB-30® or MAN-863). Use a continuous and ample flow of oil to ensure accurate, fast honing and desired finish. DO NOT dilute or “cut” these oils with other fluids. Do not use lubricating oil, cutting oil, or water soluble oil; consistent results cannot be expected unless full strength recommended oil is used.

TRUING

For best results use Sunnen Metal Truing Sleeve and a paste made by combining honing oil and loose abrasive slurry from machine tray. It is also possible to use a workpiece for truing, but make certain that tool is producing desired hole geometry before honing to finished size.

DRESSING

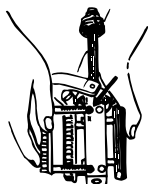
Dress a glazed stone by rubbing with a Sunnen LBN-700 Abrasive Dressing Stick, or by lightly grit blasting stone surface to remove some of the bond. DO NOT USE A SUNNEN MAN-700 DIAMOND DRESSER OR ANY OTHER DIAMOND STICK FOR SHARPENING SUPERABRASIVE STONES.

ASSEMBLY

Stone sets generally consist of an equal number of stones and guides. Stones and guides are inserted in alternate slots in hone body.

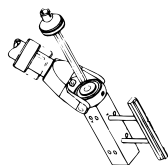
CAUTION

Replace both stones and both guides at same time. Differences in stone and guide height can cause chatter or poor cutting action.



HAND-FEED HONES

Remove pinion from hone body by pulling it straight out. Insert stones and guides as far as they will go in holes marked “X” on hone body, so rack teeth are toward pinion hole. Insert pinion while compressing stones and guides against hone body.



REMOTE-FEED HONES

Pull Release Ring back and tilt hone body as shown. Pull Pinion all the way out. Release Ring. Insert Stone and Guide Assemblies as far as they will go into their proper holes, with rack teeth toward pinion hole. Insert Pinion. Pull Release Ring back and engage Universal Ball with Pinion Socket.

SAFETY FEATURES

Drive shafts of Sunnen Hones are designed to shear when hone hits an obstruction. This safety feature is intended to protect other components of hone. Do not weld broken shafts or U-joints because the next time an obstruction is hit, a more expensive part of the hone may be damaged. If repeated breakage occurs as result of normal honing, call your Sunnen Field Service Engineer.

OPERATION

When hone is used in a lathe, drill press, or other rigid stroking device, two universal joints must be used to provide full floating action at honing head. Remote-Feed Hones are supplied with two universal joints as standard equipment; a second universal joint must be ordered separately when using Hand-Feed Hones in a rigid stroking device.

HAND-FEED HONES

Hand-Feed Hones are supplied with only one universal joint, which is sufficient if hone is being used in a portable electric drill motor. If a hand-feed hone is used in a drill press, lathe, or other machine with a fixed spindle, a second universal joint (specify AN-70) must be substituted in place of AN-26A Drive Shaft supplied with hone.

1. Place hone in workpiece bore.
2. Raise pinion about 6 mm (about .25 in.) and turn it counterclockwise to set stones roughly to bore diameter.
3. Push pinion back down, engaging its internal gear with gear on hone body.
4. Expand stones firmly against bore by turning wing wrench clockwise. During this adjustment, stones should not protrude more than 12 mm (about .50 in.) from bore.
5. Start hone rotating in work in a clockwise direction. When stones become loose as hole gets larger, stop hone and repeat Step 4.

REMOTE-FEED HONES

Remote-Feed Hones are designed for use in a drill press, lathe, or honing machine, where neither spindle nor workpiece can float. All remote-feed hones are equipped with two universal joints so that honing head can align itself to workpiece.

1. Place hone in workpiece bore.
2. Expand stones by turning handwheel in a counterclockwise direction (opposite to direction of hone rotation). When stones contact bore, back handwheel off one half turn.
3. Start hone rotating in work in a clockwise direction, and apply very light stopping pressure to handwheel as hone is stroked through length of bore.
4. As hole diameter gets larger and stones become loose, a light braking on handwheel will keep stones cutting.

STROKING

1. Hone should be stroked fast enough to produce a crosshatch in bore. If stroke is too slow, cutting action slows down and stones can even glaze and chatter.
2. When starting out, it is best to "short stroke" in tight spots of bore and gradually lengthen stroke as tight spots are honed out.
3. Overstroke each end of bore by 1/3 length of stone.

TROUBLESHOOTING – Chatter

- For diameters of 165 mm (6.50 in.) and larger, use proper Stone Support.
- Guide blocks may be too tight. To check, expand stones and guides out against cylinder wall. You should be able to wiggle guides with your fingers. If guides are tight, file or grind off about 1 mm (.03 in.) from wearing surface of each guide to relieve guide pressure and stop chatter. Guideless Stone Sets (GG, MM, NN, WW) also eliminate this problem.
- Increase stroking speed to break up chatter pattern.
- Make sure hone rotates clockwise (as viewed from drive shank end of hone).

Stones Do Not Cut

- Guide blocks may be too tight. To check, expand stones and guides out against cylinder wall. You should be able to wiggle guides with your fingers. If guides are tight, file or grind off about 1 mm (.03 in.) from wearing surface of each guide to relieve guide pressure and to speed up stock removal.
- Stroke may be too slow. Stroke faster.
- Stones may be glazed. Stones should be dressed with Sunnen LBN-700 Abrasive Dressing Stick. Increase stone pressure with wing wrench (or handwheel on remote-feed hone). Increase stroking speed to improve self-dressing.
- Make sure that a continuous and ample supply of Sunnen Industrial Honing Oil is being applied to bore.

Taper

- Not enough pressure is applied to stones. Increase pressure with wing wrench (or handwheel on remote feed hone). Adjust frequently to maintain stone pressure.
- Stroking is improper in a tapered cylinder. Localize honing in tight portion of bore and gradually lengthen stroke as bore becomes straighter.