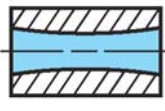
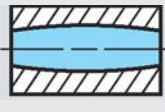
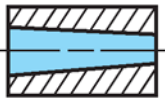
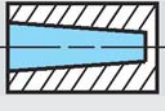

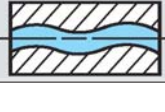
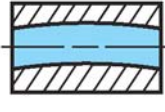


CONDITION TO BE CORRECTED		STEP 1	STEP 2	STEP 3	STEP 4	STEP 5
Standard Sunnen Tooling and Procedures will satisfy all ordinary honing requirements. If problems are encountered, they can usually be solved by following procedure suggested below. For detailed information on difficult or unusual honing problems contact your local Sunnen Field Engineer or Sunnen Customer Service Department in St. Louis, Missouri, USA.						
STONE NOT CUTTING	STONE GLAZED* Stone surface looks clean but cutting grains are dulled	Sharpen A or J stone with MAN-700 diamond dresser; use LBN-700 dressing stick on all other stones	Increase cutting pressure	Increase stroking speed	Use a softer stone (one with a lower hardness number)	Check oil to be sure you are using Sunnen Industrial Honing Oil*
(Honing dial needle moves too slowly)	STONE LOADED* Stone surface looks smeared and clogged with chips	Clean stone with LBN-700 dressing stick	Increase stroking pressure	Use a softer stone (one with a lower hardness number)	Use a coarser grit stone (one with a lower grit number)	Check oil to be sure you are using Sunnen Industrial Honing Oil*
SLOW STOCK REMOVAL* (Honing dial needle moves too slowly)		Increase spindle speed	Increase cutting pressure	Check oil to be sure you are using Sunnen Industrial Honing Oil*	Use a softer stone (one with a Lower hardness number)	Use a coarser grit stone (one with a lower grit number)
POOR STONE LIFE* (Honing dial needle moves too fast)		Decrease cutting pressure	Use faster spindle speed	Use harder stone (higher hardness number)	Use coarser grit stone (lower grit number)	Using Sunnen Industrial Honing Oil/Coolant*
BELLMOUTH		True stone and shoes with truing sleeve If part is short or unbalanced, shorten stroke length	Use softer stone (OK with lower hardness number)	If Bore is LONGER than 2/3 stone length: { Shorten STONE only (or row of stones) slightly on both ends If Bore is SHORTER than 2/3 stone length: { Shorten STONES and SHOES equally to 1-1/2 times bore length		If bellmouth persists shorten stones still more but do not shorten shoes any further CAUTION: Overcorrection of bellmouth will lead to barrel condition
BARREL		True stone and shoes with truing sleeve	Use finer grit stone (one with higher grit number)	Use longer stone or shorten guide shoes on both ends	Use mandrel with longer stone and shoe	CAUTION: Overcorrection of barrel will lead to bellmouth condition
TAPER IN OPEN HOLE		True stone and shoes with truing sleeve	Change stroke so tight end of bore is stroked over stone further	Reverse work on mandrel more often	If power stroking, make sure spindle and stroker are in alignment	
TAPER IN BLIND HOLE		Shorten stone and shoes to about 3/4 shorten stone more if taper persists	True stone and shoes frequently with truing sleeve	If hole has insufficient or no relief at bottom, use hard tip stone	Provide sufficient relief at bottom of hole	Provide adequate oil flow at bottom of hole to wash cutting out
OUT-OF-ROUND		Make sure honing tool is recommended size for diameter to be honed	Thoroughly true stone and shoes to exact hole diameter	If thin wall part, decrease cutting pressure	If stone stops cutting at decreased pressure use stone with lower hardness number	If power stroking make sure spindle and stroker are in alignment
WAVINESS		Use honing tool with sufficient stone length to bridge waviness (or lands and ports in bore)				
RAINBOW		Use L, BL, or multi-stone mandrel. Stone length should be at least 1-1/2 times the length of bore for best bow correction		Use shorter stroke length (less overstroke)	Use stone with lower hardness number to avoid part flexing	
FINISH TOO ROUGH*		Decrease cutting pressure	Use finer grit stone (one with higher grit number)	Check oil to be sure you are using Sunnen Industrial Honing Oil*	Thoroughly true shoes to exact hole diameter	For extremely fine finishes in soft or exotic material, use bronze mandrel or bronze shoes
RANDOM SCRATCHES		Decrease cutting pressure	Use finer grit stone (one with higher grit number)	Use softer stone (one with lower hardness number)	If hard steel mandrel is being used, change to soft steel mandrel. If soft steel mandrel or shoes are being used, change to bronze mandrel or shoes	Check oil to be sure you are using Sunnen Industrial Honing Oil*

\*Many honing problems, such as poor cutting action, poor stone life, and rough finish are caused by wrong honing oil, insufficient honing oil, dirty honing oil, or contaminated honing oil. Use only clean, full-strength Sunnen Industrial Honing Oil. Make sure that honing oil is neither diluted or "cut" with other oils. Keep solvents and cleaning fluids away from honing machine.

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