

**SPECIAL INSTRUCTIONS**

for

**SUNNEN HONALL P-180 HEAD & DRIVER SET**

**GENERAL**

Sunnen P-180 Head & Driver Set is designed for sizing and finishing holes in work too bulky or heavy to take to your honing machine. It uses the same mandrels and stones used in Sunnen Honing Machines. The Adapters listed in Table 1 must be used as they are different from the adapters used in Sunnen Honing Machines.

**ASSEMBLE UNIT**

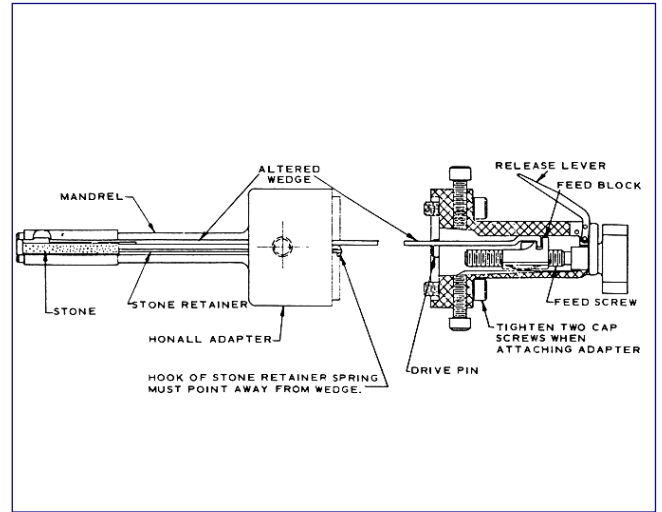
To assemble, proceed as follows:

**NOTE:** Automotive Division Customers please refer to separate Assembly Instructions, I-P-190.

1. Select correct Mandrel, Sleeve, Stone, Adapter, and Wedge and assemble to P-180.
2. Mandrels used with P-180 Head & Driver Set are supplied with a standard Wedge for use in Sunnen Honing Machine. To use wedges not supplied, alter it as shown (see Figure 1).

**NOTE:** PBL8-W, PBL10-W, and PBL12-W Wedges (included in P-180 Kit) have already been altered.

3. Snap altered Wedge into Feed Block as shown (see Figure 2).

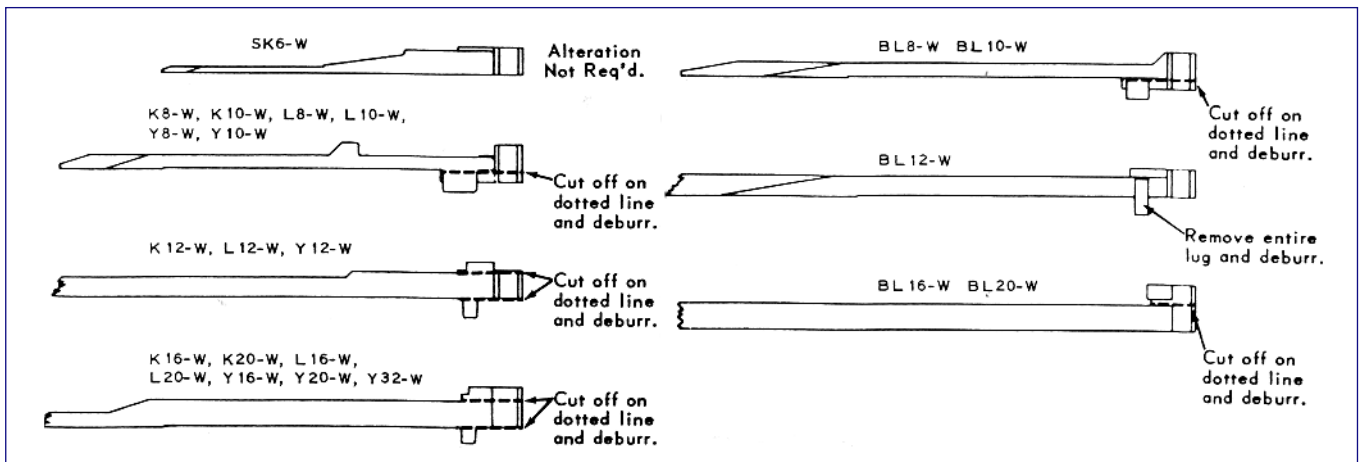


**FIGURE 3, Assembly**

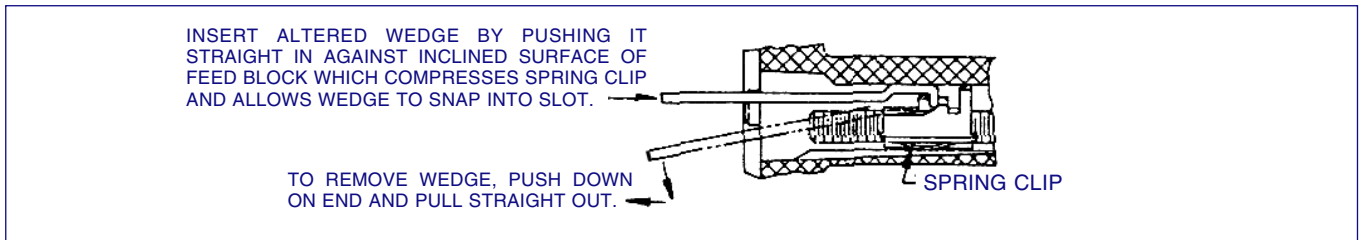
4. Attach Adapter to P-180 with 2 capscrews as shown (see Figure 3).

**NOTE:** When using Y32 Mandrel, remove Stone Retainer from PAK20-A Adapter.

5. Insert Mandrel into Adapter with Wedge and Stone Retainer side by side and tighten setscrew (refer to Figure 3).
6. Place Stone in Mandrel (refer to Figure 3).



**FIGURE 1, Wedges**



**FIGURE 2, Insert Wedge**

**NOTE:** If Wedge sticks out too far, retract it by turning Stone Feed-Up Knob counterclockwise (see Figure 4).

## DRIVING SOURCE

1. P-180 should be driven by a portable drill (electric or air) with a speed of 150 to 400 rpm. It may also be driven by a drill press or other rigid driving source providing the 3/8" Universal Drive Shank is used (see Figure 5).

2. In general, the larger mandrels should be driven at lower speeds and the smaller mandrels at higher speeds, but very small mandrels may have to be driven at slow speeds to reduce the possibility of breakage.

## HOW TO HONE

1. True in mandrel, shoes, and stone.
2. Clamp workpiece to a table or in a vise.
3. Place mandrel into workpiece, and turn Stone Feed-up Knob clockwise until stone touches workpiece; then turn one more complete turn. This holds stone firmly against workpiece as stone automatically expands while honing.
4. Release lever will allow operator to retract stones and permit withdrawing and re-entry without adjusting Feed-up Knob.

5. To increase pressure, turn Cutting Pressure Control clockwise (refer to Figure 4). Too much pressure results in excessive stone wear. Too little pressure will allow stone to glaze and cease cutting, and cause mandrel to lose stability, resulting in loss of accuracy.

6. Use a continuous and ample flow of Sunnen Honing Oil to ensure accurate, fast honing and desired finish. *Do not dilute oil. Do not use lubricating oil, cutting oil or water soluble oil; they reduce cutting speed, impair accuracy, and cannot be relied on to give the expected finish.*

7. Turn driving source on and stroke at rate of about 60 strokes (complete cycles) per minute. For a long stroke, a slower stroking speed may be used. Stroke full length of workpiece, allowing stone to extend through hole by 1/4-1/2 the stone length.

### CAUTION

Turn driving source off before removing mandrel from workpiece to prevent whipping and possible damage to workpiece.

8. Honing Procedure:

- Hone until mandrel becomes loose in bore; stop honing and take mandrel out of bore.

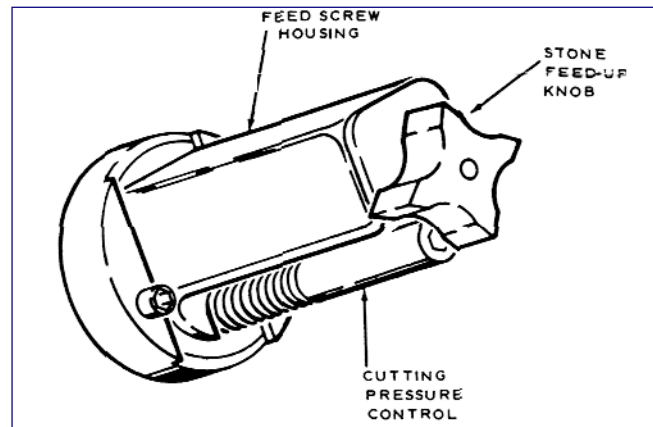


FIGURE 4, Stone Feed-Up Knob

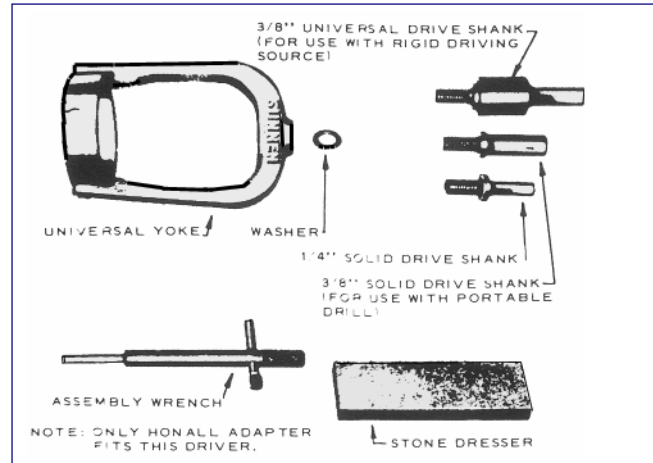


FIGURE 5, Head & Driver Set

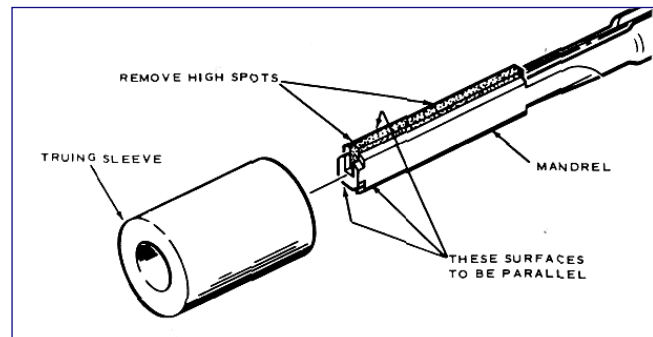


FIGURE 6, Truing

- Measure bore.
- Put mandrel back into bore and turn Stone Feed-up Knob clockwise as much as bore is undersize.

**NOTE:** One turn of Knob will raise a K or Y stone .016" (0.4mm), or an L stone .009" (0.2mm).

- Repeat step 8 as required, until bore is to size.

**NOTE:** With practice, operator will learn how much Stone Feed-up Knob should be overfed to allow for stone wear. This will reduce the number of measurements necessary to hone to finish size.

## TRUING SHOES & STONE

True shoes and stone as follows (*see Figure 6*):

1. Stone and shoes of mandrel must be parallel to one another so that unit can generate a straight, round hole. Therefore, mandrel must be trued-in each time a new stone, mandrel, or shoe is used.
2. Clamp proper truing sleeve to a table or vise as described for workpiece above.
3. Proceed to hone as outlined above, except eliminate flow of Honing Oil. Use only a light coating of Honing Oil on stone and shoes.
4. Inspect stone and shoes after several strokes. Entire length of shoes and stone should show contact with sleeve.
5. Dress down any high spots on shoes, using a file. Dress down carefully high spots on stone, using an LBN-700 abrasive stick or MAN-700 diamond dresser. Repeat truing and inspect again.
6. Once mandrel shoes and stone have been trued-in, proper stroking of hone in workpiece will maintain stone and shoes parallel. However, it is good practice to reverse workpiece regularly. This makes honing operation serve as a truing operation as well.

## TROUBLESHOOTING

1. If STONE WEARS TOO FAST, reduce cutting pressure, use more honing oil, or use a harder stone,
2. If STONE DOES NOT CUT stone is probably glazed. Increase cutting pressure. Shut off honing oil for a few seconds. To sharpen stone, stroke lightly with LBN-700 abrasive dressing stick supplied, or with Sunnen MAN-700 diamond stone dresser.
3. If OPEN HOLE IS TAPERED, stone is stroked too far out of large end of hole. If very close tolerances are desired, hone work from other end occasionally. This will keep stone and mandrel true.

4. If BLIND HOLE IS TAPERED, grind tip off mandrel if necessary shorten stone and shoe to about 2/3 depth of blind hole. Write for Data File No. 103 for Honing Techniques in Blind Holes.

### 5. If HOLE IS BELLMOUTHED:

- Increase cutting pressure to get stability.
- If rigid driving source is used, be sure to use 3/8" Universal Drive Shank (*refer to Figure 5*).
- If bellmouth is only .0001" or .0002" worse than allowed, shorten stone slightly on both ends.
- If bellmouth is much worse than allowed, shorten stone and shoes to 1-1/2 times bore length.
- If bellmouth persists, shorten stone still more but do not shorten shoes any further.

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**NOTE:** Overcorrecting of bellmouth will lead to barrel shape.

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### 6. If HOLE IS BARREL SHAPED:

- Increase stroke length.
- Use a longer stone (if previously shortened) or shorten shoes slightly on both ends.
- Use mandrel with longer stone and shoe.

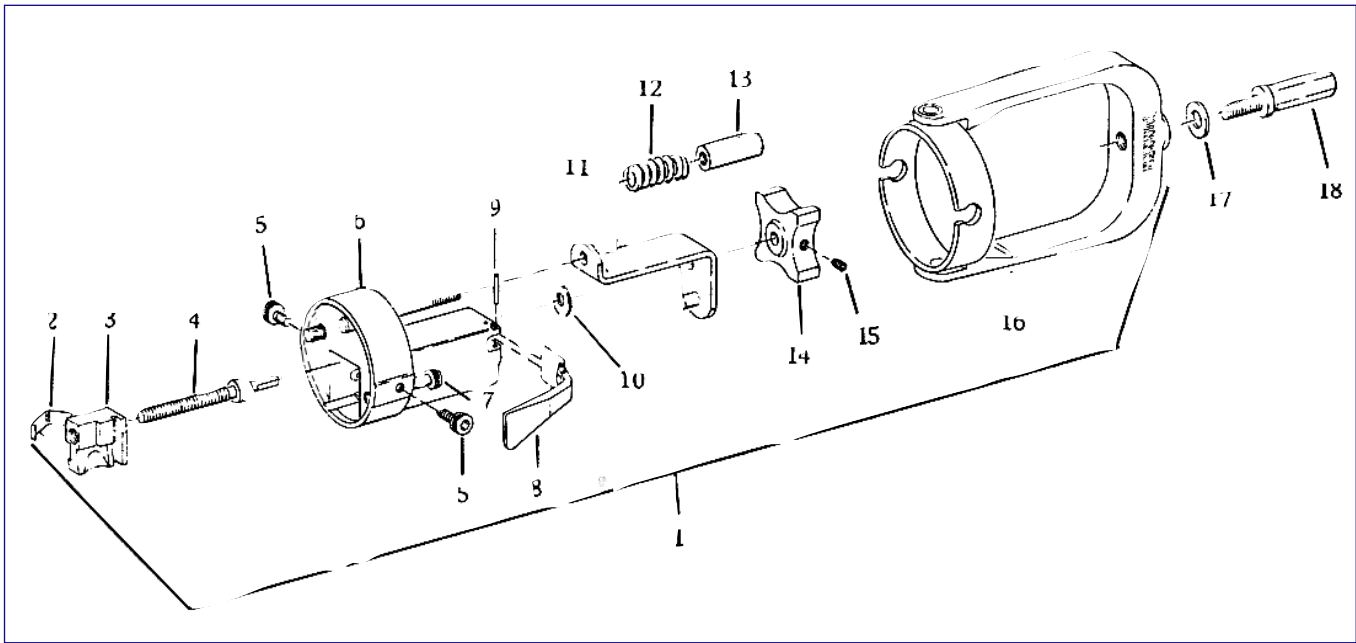
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**NOTE:** Overcorrecting of barrel shape will lead to bellmouth.

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### 7. If HOLE IS OUT-OF-ROUND

- Workpiece is clamped too tight. Use care when clamping thin-walled sections. Do not use high cutting pressure on thin-walled parts.
- If rigid driving source is used, be sure to use 3/8" Universal Shank (*refer to Figure 5*).



ITEM No.	PART No.	QTY	DESCRIPTION
1	<b>P-159A</b>	1	.... <b>Feed Housing Assembly</b> <i>includes</i> items 2 thru 16
2	P-115A	1	.....Spring Clip
3	P-145A	1	.....Feed Block
4	P-154A	1	.....Feed Screw
5	P-144A	2	.....Screws (10-32 x 1/2 SHCS)(Pkg. of 4)
6	P-158A	1	.....Housing <i>includes</i> items 7, 8 and 9
7	P-124A	2	.....Screws (10-32 x 3/4 SHCS swaged in place)(Pkg. of 2)
8	P-1 10A	1	.....Lever and Roller Assembly <i>with</i>
9	---	1	.....Pin
10	---	1	.....Washer (3/16 Flat)
11	P-152A	1	.....Strap and Pin Assembly
12	P-147A	1	.....Spring
13	P-134A	1	.....Cap and Screw Assembly
14	P-148A	1	.....Knob <i>with</i>
15	---	1	.....Setscrew (10-32 x 1/4 CPSS)
16	P-169A	1	.....Yoke Assembly
17	---	3	.... <b>Flatwasher</b> (5/16)
18	<b>P-162</b>	1	.... <b>Universal Drive Shank</b> (3/8) For use with rigid driving source
18	<b>P-163</b>	1	.... <b>Drive Shank</b> (3/8) For use with portable drill
18	<b>P-164</b>	1	.... <b>Drive Shank</b> (1/4)
N/S	<b>P-119A</b>	1	.... <b>Assembly Wrench</b>
N/S	<b>LBN-700</b>	1	.... <b>Stone Dresser</b>

N/S - Not Shown

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