



**FLOYD**

THE TOOLING SPECIALISTS FOR PRECISION COMPONENT MACHINING

## Service Instructions

# Habegger MOJ Knurling Head



**FLOYD**

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## 40 GENERAL REMARKS

**40.1** These knurling heads are used for straight or crossed knurling (30° or 45°) in the midst of a work piece or behind a turned shoulder. No radial pressure will be exerted on the work piece during the knurling operation.

**40.2** The MOJ head engages onto the work piece in open position, closing is effected by an action on the lever. We use therefore a slide of the machine. This cutting-in motion on the lever should not exceed **1 second**.

**40.3** The knurled diameter is in direct relation with the position of the lever of the MOJ head, i.e. of the slide.

### **40.4 Main advantages :**

- Does not fear any obstacle on the machined work pieces
- No radial effort exerted on the work piece
- Reduced assembly space
- Possibility to knurl diameters smaller than 1 mm
- No flange or support before the knurls: Knurling is effected up to the shoulders on work pieces

## 41 KNURLING CONDITIONS

### **41.1 Diameter before knurling**

Knurling is obtained by material deforming. Therefore, the diameter before knurling increases by 25 to 35 % of the pitch value, according to the machined material. These values are in direct relation with the material resistance.

Indicative values are:

Tough materials:	25 %
Smooth materials:	35 %





Example: stainless steel  
 $\emptyset$  before knurling: 3.875 mm  
Pitch: 0.5 mm

Result: 25 % of 0.5 = 0.125  
 $\emptyset$  before knurling + 0.125 =  $\emptyset$  after knurling  
 $3.875 + 0.125 = \underline{\emptyset 4.000 \text{ mm}}$

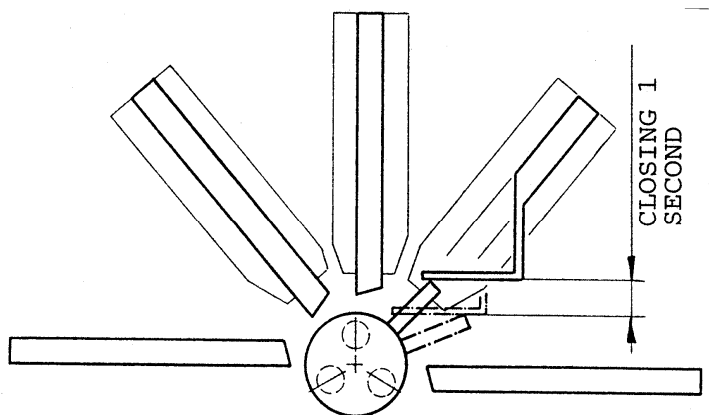
The user must affect tests by himself in order to determine the diameter before knurling. He may use the following formula:

d = diameter before knurling  
D = diameter after knurling  
P = pitch

$$d = \underline{D - (P/2)}$$

**41.2** The peripheral speed of the work piece must be about 20 m/min. This speed decreases when the material is very hard.

**41.3** The advance on the lever should not exceed 1 second. This forces the knurls to form a unique profile. It avoids knurling in flakes.



**41.4** We also recommend a lot of lubricating. Never stop machining during or towards the end of the knurling operation.





**41.5** Pitches of more than 0.7 mm should be avoided, as the effort on the setting lever is too high.

**41.6** The following information is absolutely needed when orders or enquiries are submitted:

- a) The diameter after knurling.
  - b) The required pitch. The user must determine this.
  - c) The diameter and length of the shoulder after which the Knurling operation will be affected.
  - d) The kind of material used.
- 41.7** The three knurls must always have the same pitch. For crossed knurling, use two knurls type BL and one knurl BR.

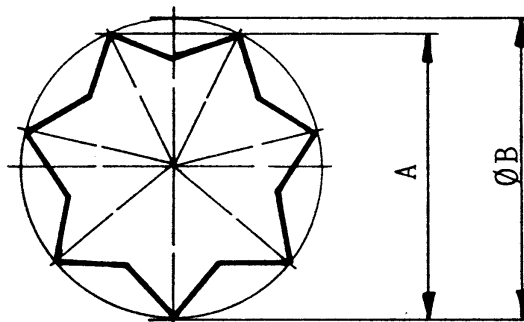




## 42 KNURLING WITH AN ODD NUMBER OF TEETH

**Note :**

Measuring the outside diameter of a knurled part with an odd number of teeth must be done by other means than the micrometer (for example by ring-gauges).



Number of teeth on the diameter	$\text{ØB} \times \dots = A$	$A \times \dots = \text{ØB}$
5	0.90451	1.10557
7	0.95066	1.05190
9	0.96980	1.03114
11	0.97970	1.02072
13	0.98550	1.01471
15	0.98910	1.01102
17	0.99150	1.00857
19	0.99320	1.00684
21	0.99440	1.00563
23	0.99540	1.00462
25	0.99610	1.00391
27	0.99660	1.00341
29	0.99710	1.00290
31	0.99740	1.00260
33	0.99770	1.00230
35	0.99800	1.00200
37	0.99820	1.00180





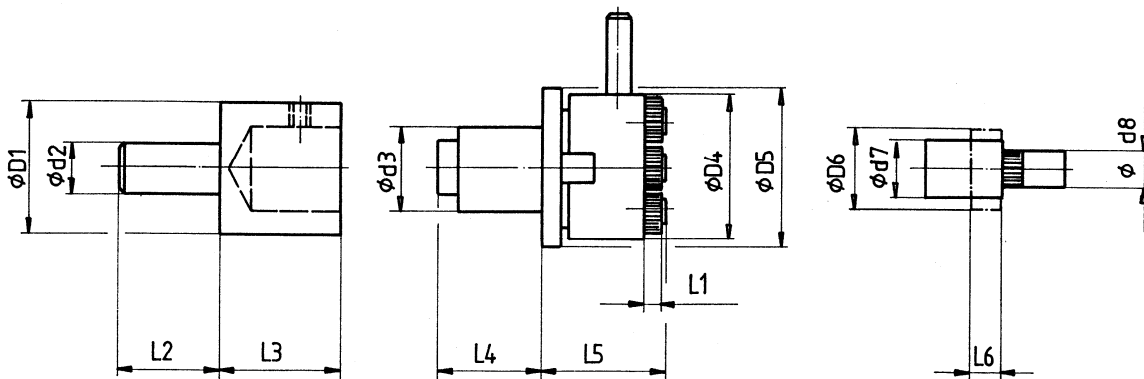
## 43 SPARE PARTS

We supply spare parts for the knurling head MOJ.

The following points must be stated in your order:

### Example:

Type of head:	MOJ2 A head
Wanted parts as per assembly drawing:	Knurls no 103
Number:	1 set of 3 pcs
Pitch and type of knurling operation:	0.20 AA (straight)





## 44 ASSEMBLY DRAWING

Designation	No
Cam	101
Spring lock washer	102
Knurls	103
Knurl-holder	104
Knurl-holder spring	106
Setting lever	114
Body	305
Compression spring	307
Cam pin	309
Sleeve	310
Body pin	315
Sleeve pin	316
Stop washer	317
Ring	319 (MOJ4)

