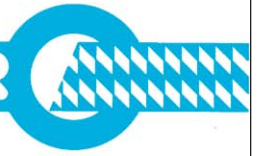


**HUNGER**



## Catalog R24

# Adjustable Reamers



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## Experience

## Performance

## Quality

**HUNGER** - a company with experience - specializing in manufacturing precision tools for over 100 years - and offering the most comprehensive range of adjustable reamers.

Years ago, **HUNGER** pioneered precision adjustable reamers - which have been further developed and refined into today's high performance tools.

The qualities of **HUNGER** tools are derived from close control of the materials and the manufacturing processes and the experience **HUNGER** has gained from over 100 years of precision tool manufacturing.

**HUNGER** adjustable reamers have been tested and approved by leading companies and are used worldwide for high performance work.







Today's demanding tolerances and finishes require **HUNGER** tools.

You can rely on **HUNGER**.



**HUNGER** also manufactures an extensive range of valve and valve seat refacing tools and machines for servicing the valves and valve seats of automotive engines and large marine and stationary diesel engines.

Please contact us for more information.

|   |   |                                 |
|---|---|---------------------------------|
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## Type D

**Application Range**

The standard reamer for repair and assembly jobs.

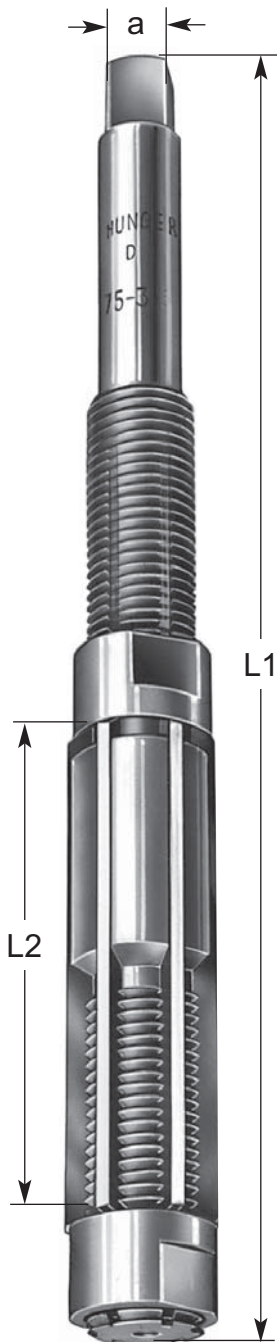
**Description**

Right-hand cutting reamer with expanding blades.

Due to the unique Hunger relief grinding process the blades have a progressively increasing clearance angle giving a softer cutting action.

From size D 12 the front adjusting nut is marked with a circumferential scale.

One graduation of the scale corresponds to a 0,01 mm change in cutting diameter.



| Size          | Range       |                   | Length Overall<br>L1 mm | Length Blades<br>L2 mm | WAF<br>a mm | No. of<br>Blades | Weight<br>kg |
|---------------|-------------|-------------------|-------------------------|------------------------|-------------|------------------|--------------|
|               | mm          | Inches            |                         |                        |             |                  |              |
| <b>D 6,4</b>  | 6,4 - 7,2   | 1/4 - 9/32        | 111                     | 32                     | 3           | 4                | 0,015        |
| <b>D 7,2</b>  | 7,2 - 8     | 9/32 - 5/16       | 111                     | 32                     | 3,5         | 4                | 0,015        |
| <b>D 8</b>    | 8 - 9       | 5/16 - 23/64      | 111                     | 32                     | 4,3         | 5                | 0,025        |
| <b>D 9</b>    | 9 - 10      | 23/64 - 25/64     | 115                     | 32                     | 4,3         | 5                | 0,035        |
| <b>D 10</b>   | 10 - 11     | 25/64 - 7/16      | 120                     | 35                     | 4,9         | 5                | 0,040        |
| <b>D 11</b>   | 11 - 12     | 7/16 - 15/32      | 125                     | 35                     | 6,2         | 5                | 0,045        |
| <b>D 12</b>   | 12 - 13,5   | 15/32 - 17/32     | 130                     | 42                     | 6,2         | 5                | 0,075        |
| <b>D 13,5</b> | 13,5 - 15,5 | 17/32 - 39/64     | 145                     | 50                     | 7           | 5                | 0,100        |
| <b>D 15,5</b> | 15,5 - 18   | 39/64 - 45/64     | 165                     | 60                     | 8           | 5                | 0,155        |
| <b>D 18</b>   | 18 - 21     | 45/64 - 53/64     | 180                     | 65                     | 9           | 5                | 0,225        |
| <b>D 21</b>   | 21 - 24     | 53/64 - 15/16     | 190                     | 70                     | 10          | 5                | 0,320        |
| <b>D 24</b>   | 24 - 27,5   | 15/16 - 1 5/64    | 205                     | 75                     | 11          | 5                | 0,430        |
| <b>D 27,5</b> | 27,5 - 31,5 | 1 5/64 - 1 15/64  | 225                     | 80                     | 12          | 6                | 0,600        |
| <b>D 31,5</b> | 31,5 - 37   | 1 15/64 - 1 29/64 | 240                     | 90                     | 14,5        | 6                | 0,870        |
| <b>D 37</b>   | 37 - 45     | 1 29/64 - 1 49/64 | 285                     | 100                    | 16          | 6                | 1,410        |
| <b>D 45</b>   | 45 - 55     | 1 49/64 - 2 5/32  | 320                     | 109                    | 20          | 6                | 2,320        |
| <b>D 55</b>   | 55 - 65     | 2 5/32 - 2 9/16   | 350                     | 120                    | 24          | 8                | 3,830        |
| <b>D 65</b>   | 65 - 80     | 2 9/16 - 3 5/32   | 460                     | 145                    | 29          | 10               | 6,800        |
| <b>D 80</b>   | 80 - 95     | 3 5/32 - 3 47/64  | 490                     | 150                    | 32          | 10               | 10,250       |
| <b>D 95</b>   | 95 - 110    | 3 47/64 - 4 21/64 | 490                     | 150                    | 36          | 10               | 13,700       |

Packing of the reamers:

From size D 6,4 to D 45 individually in clear plastic tubes.

Size D 55 in a plastic net.

From size D 65 to D 95 individually in wooden boxes.

**Sets of Reamers Type D in Wooden Cases**

| Symbol     | Range    |                 | No. of<br>Reamers | Weight<br>kg |
|------------|----------|-----------------|-------------------|--------------|
|            | mm       | Inches          |                   |              |
| <b>DAN</b> | 8 - 31,5 | 21/64 - 1 15/64 | 11                | 3,100        |
| <b>DEN</b> | 8 - 45   | 21/64 - 1 49/64 | 13                | 5,700        |

**Ordering Information**

The production of reamers with hard chrome coated blades and of hard chrome coated replacement blades has been discontinued.

Remaining stocks of almost all reamer sizes are still available while stocks last.

| Size          | Range<br>mm | Reamers                   |                         | Replacement Blades*       |                         | Nuts<br>Part No. |
|---------------|-------------|---------------------------|-------------------------|---------------------------|-------------------------|------------------|
|               |             | Special Steel<br>Part No. | Hard Chrome<br>Part No. | Special Steel<br>Part No. | Hard Chrome<br>Part No. |                  |
| <b>D 6,4</b>  | 6,4 - 7,2   | 100 06 000                | 101 06 000              | 100 06 400                | 101 06 400              | 140 02 510       |
| <b>D 7,2</b>  | 7,2 - 8     | 100 07 000                | 101 07 000              | 100 06 400                | 101 06 400              | 140 04 510       |
| <b>D 8</b>    | 8 - 9       | 100 08 000                | 101 08 000              | 100 08 400                | 101 08 400              | 100 08 510       |
| <b>D 9</b>    | 9 - 10      | 100 09 000                | 101 09 000              | 100 09 400                | 101 09 400              | 100 09 510       |
| <b>D 10</b>   | 10 - 11     | 100 10 000                | 101 10 000              | 100 10 400                | 101 10 400              | 100 10 510       |
| <b>D 11</b>   | 11 - 12     | 100 11 000                | 101 11 000              | 100 11 400                | 101 11 400              | 100 11 510       |
| <b>D 12</b>   | 12 - 13,5   | 100 12 000                | 101 12 000              | 100 12 400                | 101 12 400              | 100 12 520       |
| <b>D 13,5</b> | 13,5 - 15,5 | 100 13 000                | 101 13 000              | 100 13 400                | 101 13 400              | 100 13 520       |
| <b>D 15,5</b> | 15,5 - 18   | 100 15 000                | 101 15 000              | 100 15 400                | 101 15 400              | 100 15 520       |
| <b>D 18</b>   | 18 - 21     | 100 18 000                | 101 18 000              | 100 18 400                | 101 18 400              | 100 18 520       |
| <b>D 21</b>   | 21 - 24     | 100 21 000                | 101 21 000              | 100 21 400                | 101 21 400              | 100 21 520       |
| <b>D 24</b>   | 24 - 27,5   | 100 24 000                | 101 24 000              | 100 24 400                | 101 24 400              | 100 24 520       |
| <b>D 27,5</b> | 27,5 - 31,5 | 100 27 000                | 101 27 000              | 100 27 400                | 101 27 400              | 100 27 520       |
| <b>D 31,5</b> | 31,5 - 37   | 100 31 000                | 101 31 000              | 100 31 400                | 101 31 400              | 100 31 520       |
| <b>D 37</b>   | 37 - 45     | 100 37 000                | 101 37 000              | 100 37 400                | 101 37 400              | 100 37 520       |
| <b>D 45</b>   | 45 - 55     | 100 45 000                | 101 45 000              | 100 45 400                | 101 45 400              | 100 45 520       |
| <b>D 55</b>   | 55 - 65     | 100 55 000                | 101 55 000              | 100 55 400                | 101 55 400              | 100 55 520       |
| <b>D 65</b>   | 65 - 80     | 100 65 000                | 101 65 000              | 100 65 400                | 101 65 400              | 100 65 520       |
| <b>D 80</b>   | 80 - 95     | 100 80 000                | 101 80 000              | 100 80 400                | 101 80 400              | 100 80 520       |
| <b>D 95</b>   | 95 - 110    | 100 95 000                | 101 95 000              | 100 95 400                | 101 95 400              | 100 95 520       |

\*Replacement blades are supplied in matched sets.  
The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.

**Sets of Reamers Type D in Wooden Cases**

| Symbol     | Range<br>mm | Special Steel<br>Part No. | Hard Chrome<br>Part No. |
|------------|-------------|---------------------------|-------------------------|
| <b>DAN</b> | 8 - 31,5    | 100 00 100                | 101 00 100              |
| <b>DEN</b> | 8 - 45      | 100 00 200                | 101 00 200              |



## Type E

**Application Range**

The reamer for reaming longer holes and adjacent inline holes.

**Description**

Right-hand cutting hand reamer with expanding blades.

Extra long blades!

The blades are approximately 2/3 longer than the blades of reamer type D.

Due to the unique Hunger relief grinding process the blades have a progressively increasing clearance angle giving a softer cutting action.

| Size          | Range       |                     | Length Overall<br>L1 mm | Length Blades<br>L2 mm | WAF<br>a mm | No. of<br>Blades | Weight<br>kg |
|---------------|-------------|---------------------|-------------------------|------------------------|-------------|------------------|--------------|
|               | mm          | Inches              |                         |                        |             |                  |              |
| <b>E 10,5</b> | 10,5 - 12   | $27/64 - 15/32$     | 160                     | 65                     | 5,5         | 5                | 0,070        |
| <b>E 12</b>   | 12 - 13,5   | $15/32 - 17/32$     | 170                     | 70                     | 6,2         | 5                | 0,100        |
| <b>E 13,5</b> | 13,5 - 15,5 | $17/32 - 39/64$     | 195                     | 80                     | 7           | 5                | 0,140        |
| <b>E 15,5</b> | 15,5 - 17,5 | $39/64 - 11/16$     | 215                     | 90                     | 8           | 5                | 0,210        |
| <b>E 17,5</b> | 17,5 - 19,5 | $11/16 - 49/64$     | 230                     | 100                    | 9           | 5                | 0,280        |
| <b>E 19,5</b> | 19,5 - 21,5 | $49/64 - 27/32$     | 240                     | 110                    | 10          | 5                | 0,370        |
| <b>E 21,5</b> | 21,5 - 24,5 | $27/32 - 31/32$     | 260                     | 120                    | 10          | 5                | 0,470        |
| <b>E 24,5</b> | 24,5 - 27,5 | $31/32 - 1 5/64$    | 280                     | 130                    | 11          | 5                | 0,640        |
| <b>E 27,5</b> | 27,5 - 31,5 | $1 5/64 - 1 15/64$  | 310                     | 140                    | 12          | 6                | 0,880        |
| <b>E 31,5</b> | 31,5 - 37   | $1 15/64 - 1 29/64$ | 320                     | 150                    | 14,5        | 6                | 1,240        |
| <b>E 37</b>   | 37 - 45     | $1 29/64 - 1 49/64$ | 370                     | 165                    | 16          | 6                | 1,970        |
| <b>E 45</b>   | 45 - 55     | $1 49/64 - 2 5/32$  | 425                     | 180                    | 20          | 6                | 3,240        |

Packing of the reamers:

Individually in clear plastic tubes.

**Sets of Reamers Type E in Wooden Cases**

| Symbol     | Range       |                   | No. of<br>Reamers | Weight<br>kg |
|------------|-------------|-------------------|-------------------|--------------|
|            | mm          | Inches            |                   |              |
| <b>EA</b>  | 10,5 - 31,5 | $27/64 - 1 15/64$ | 9                 | 3,100        |
| <b>ESO</b> | 10,5 - 45   | $27/64 - 1 49/64$ | 11                | 5,700        |

**Ordering Information**

The production of reamers with hard chrome coated blades and of hard chrome coated replacement blades has been discontinued.  
Remaining stocks of almost all reamer sizes are still available while stocks last.

| Size          | Range       | Reamers                   |                         | Replacement Blades*       |                         | Nuts<br>Part No. |
|---------------|-------------|---------------------------|-------------------------|---------------------------|-------------------------|------------------|
|               |             | Special Steel<br>Part No. | Hard Chrome<br>Part No. | Special Steel<br>Part No. | Hard Chrome<br>Part No. |                  |
| <b>E 10,5</b> | 10,5 - 12   | 110 10 000                | 111 10 000              | 110 10 400                | 111 10 400              | 140 10 510       |
| <b>E 12</b>   | 12 - 13,5   | 110 12 000                | 111 12 000              | 110 12 400                | 111 12 400              | 100 12 510       |
| <b>E 13,5</b> | 13,5 - 15,5 | 110 13 000                | 111 13 000              | 110 13 400                | 111 13 400              | 100 13 510       |
| <b>E 15,5</b> | 15,5 - 17,5 | 110 15 000                | 111 15 000              | 110 15 400                | 111 15 400              | 100 15 510       |
| <b>E 17,5</b> | 17,5 - 19,5 | 110 17 000                | 111 17 000              | 110 17 400                | 111 17 400              | 110 17 510       |
| <b>E 19,5</b> | 19,5 - 21,5 | 110 19 000                | 111 19 000              | 110 19 400                | 111 19 400              | 110 19 510       |
| <b>E 21,5</b> | 21,5 - 24,5 | 110 21 000                | 111 21 000              | 110 21 400                | 111 21 400              | 100 21 510       |
| <b>E 24,5</b> | 24,5 - 27,5 | 110 24 000                | 111 24 000              | 110 24 400                | 111 24 400              | 100 24 510       |
| <b>E 27,5</b> | 27,5 - 31,5 | 110 27 000                | 111 27 000              | 110 27 400                | 111 27 400              | 100 27 510       |
| <b>E 31,5</b> | 31,5 - 37   | 110 31 000                | 111 31 000              | 110 31 400                | 111 31 400              | 100 31 510       |
| <b>E 37</b>   | 37 - 45     | 110 37 000                | 111 37 000              | 110 37 400                | 111 37 400              | 100 37 510       |
| <b>E 45</b>   | 45 - 55     | 110 45 000                | 111 45 000              | 110 45 400                | 111 45 400              | 100 45 510       |

\* Replacement blades are supplied in matched sets.

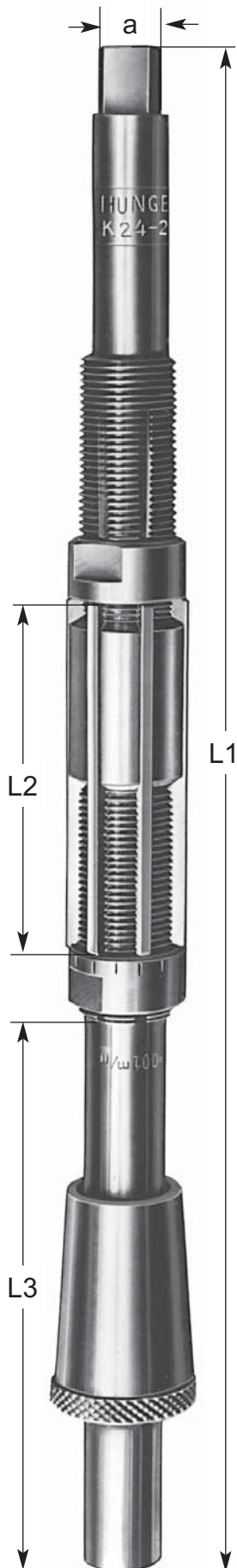
The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.

**Sets of Reamers Type E in Wooden Cases**

| Symbol     | Range<br>mm | Special Steel<br>Part No. | Hard Chrome<br>Part No. |
|------------|-------------|---------------------------|-------------------------|
| <b>EA</b>  | 10,5 - 31,5 | 110 00 100                | 111 00 100              |
| <b>ESO</b> | 10,5 - 45   | 110 00 200                | 111 00 200              |



## Type K

**Application Range**

The precision reamer for reaming of holes in line with each other. .  
The tapered guide sleeve holds the reamer in precise alignment with the holes.

**Description**

Right-hand cutting reamer with expanding blades.

Parallel shank with square at the rear and integral pilot with tapered guide sleeve at the front of the reamer.

Due to the unique Hunger relief grinding process the blades have a progressively increasing clearance angle giving a softer cutting action.

From size K 12 the front adjusting nut is marked with a circumferential scale.

One graduation of the scale corresponds to a 0,01 mm change in cutting diameter.

| Size   | Range       |                   | Length Overall<br>L1 mm | Length Blades<br>L2 mm | Length Pilot<br>L3 mm | WAF<br>a mm | No. of Blades | Weight<br>kg |
|--------|-------------|-------------------|-------------------------|------------------------|-----------------------|-------------|---------------|--------------|
|        | mm          | Inches            |                         |                        |                       |             |               |              |
| K 7    | 7 - 8       | 9/32 - 5/16       | 175                     | 32                     | 65                    | 3,5         | 4             | 0,030        |
| K 8    | 8 - 9       | 5/16 - 23/64      | 175                     | 32                     | 65                    | 4,3         | 5             | 0,055        |
| K 9    | 9 - 10      | 23/64 - 25/64     | 175                     | 32                     | 65                    | 4,3         | 5             | 0,065        |
| K 10   | 10 - 11     | 25/64 - 7/16      | 185                     | 35                     | 68                    | 4,9         | 5             | 0,085        |
| K 11   | 11 - 12     | 7/16 - 15/32      | 195                     | 35                     | 72                    | 6,2         | 5             | 0,100        |
| K 12   | 12 - 13,5   | 15/32 - 17/32     | 215                     | 42                     | 84                    | 6,2         | 5             | 0,130        |
| K 13,5 | 13,5 - 15,5 | 17/32 - 39/64     | 235                     | 50                     | 89                    | 7           | 5             | 0,180        |
| K 15,5 | 15,5 - 18   | 39/64 - 45/64     | 265                     | 60                     | 98                    | 8           | 5             | 0,280        |
| K 18   | 18 - 21     | 45/64 - 53/64     | 290                     | 65                     | 109                   | 9           | 5             | 0,410        |
| K 21   | 21 - 24     | 53/64 - 15/16     | 310                     | 70                     | 119                   | 10          | 5             | 0,570        |
| K 24   | 24 - 27,5   | 15/16 - 1 5/64    | 335                     | 75                     | 129                   | 11          | 5             | 0,770        |
| K 27,5 | 27,5 - 31,5 | 1 5/64 - 1 15/64  | 365                     | 80                     | 137                   | 12          | 6             | 1,040        |
| K 31,5 | 31,5 - 37   | 1 15/64 - 1 29/64 | 400                     | 90                     | 159                   | 14,5        | 6             | 1,550        |
| K 37   | 37 - 45     | 1 29/64 - 1 49/64 | 465                     | 100                    | 180                   | 16          | 6             | 2,550        |
| K 45   | 45 - 55     | 1 49/64 - 2 5/32  | 530                     | 109                    | 198                   | 20          | 6             | 5,000        |
| K 55   | 55 - 65     | 2 5/32 - 2 9/16   | 570                     | 120                    | 213                   | 24          | 8             | 6,450        |
| K 65   | 65 - 80     | 2 9/16 - 3 5/32   | 670                     | 145                    | 250                   | 29          | 10            | 11,900       |
| K 80   | 80 - 95     | 3 5/32 - 3 47/64  | 700                     | 150                    | 250                   | 32          | 10            | 13,700       |
| K 95   | 95 - 110    | 3 47/64 - 4 21/64 | 700                     | 150                    | 250                   | 36          | 10            | 23,900       |

Packing of the reamers:

From size K 7 to K 37 individually in clear plastic tubes.

From size K 45 to K 55 individually in plastic nets.

From size K 65 to K 95 individually in wooden boxes.

**Sets of Reamers Type K in Wooden Cases**

| Symbol | Range    |                 | No. of Reamers | Weight<br>kg |
|--------|----------|-----------------|----------------|--------------|
|        | mm       | Inches          |                |              |
| KAN    | 8 - 31,5 | 21/64 - 1 15/64 | 11             | 5,200        |
| KEN    | 8 - 45   | 21/64 - 1 49/64 | 13             | 10,700       |



**Ordering Information**

The production of reamers with hard chrome coated blades and of hard chrome coated replacement blades has been discontinued.  
 Remaining stocks of almost all reamer sizes are still available while stocks last.

| Size          | Range<br>mm | Reamers                   |                         | Replacement Blades*       |                         | Nuts<br>Part No. | Cone Bushes<br>Part No. |
|---------------|-------------|---------------------------|-------------------------|---------------------------|-------------------------|------------------|-------------------------|
|               |             | Special Steel<br>Part No. | Hard Chrome<br>Part No. | Special Steel<br>Part No. | Hard Chrome<br>Part No. |                  |                         |
| <b>K 7</b>    | 7 - 8       | 120 07 000                | 121 07 000              | 100 06 400                | 101 06 400              | 140 04 510       | 120 07 600              |
| <b>K 8</b>    | 8 - 9       | 120 08 000                | 121 08 000              | 120 08 400                | 121 08 400              | 100 08 510       | 120 08 600              |
| <b>K 9</b>    | 9 - 10      | 120 09 000                | 121 09 000              | 120 09 400                | 121 09 400              | 100 09 510       | 120 09 600              |
| <b>K 10</b>   | 10 - 11     | 120 10 000                | 121 10 000              | 120 10 400                | 121 10 400              | 100 10 510       | 120 10 600              |
| <b>K 11</b>   | 11 - 12     | 120 11 000                | 121 11 000              | 120 11 400                | 121 11 400              | 100 11 510       | 120 11 600              |
| <b>K 12</b>   | 12 - 13,5   | 120 12 000                | 121 12 000              | 120 12 400                | 121 12 400              | 100 12 520       | 120 12 600              |
| <b>K 13,5</b> | 13,5 - 15,5 | 120 13 000                | 121 13 000              | 120 13 400                | 121 13 400              | 100 13 520       | 120 13 600              |
| <b>K 15,5</b> | 15,5 - 18   | 120 15 000                | 121 15 000              | 120 15 400                | 121 15 400              | 100 15 520       | 120 15 600              |
| <b>K 18</b>   | 18 - 21     | 120 18 000                | 121 18 000              | 120 18 400                | 121 18 400              | 100 18 520       | 120 18 600              |
| <b>K 21</b>   | 21 - 24     | 120 21 000                | 121 21 000              | 120 21 400                | 121 21 400              | 100 21 520       | 120 21 600              |
| <b>K 24</b>   | 24 - 27,5   | 120 24 000                | 121 24 000              | 120 24 400                | 121 24 400              | 100 24 520       | 120 24 600              |
| <b>K 27,5</b> | 27,5 - 31,5 | 120 27 000                | 121 27 000              | 120 27 400                | 121 27 400              | 100 27 520       | 120 27 600              |
| <b>K 31,5</b> | 31,5 - 37   | 120 31 000                | 121 31 000              | 120 31 400                | 121 31 400              | 100 31 520       | 120 31 600              |
| <b>K 37</b>   | 37 - 45     | 120 37 000                | 121 37 000              | 120 37 400                | 121 37 400              | 100 37 520       | 120 37 600              |
| <b>K 45</b>   | 45 - 55     | 120 45 000                | 121 45 000              | 120 45 400                | 121 45 400              | 100 45 520       | 120 45 600              |
| <b>K 55</b>   | 55 - 65     | 120 55 000                | 121 55 000              | 120 55 400                | 121 55 400              | 100 55 520       | 120 55 600              |
| <b>K 65</b>   | 65 - 80     | 120 65 000                | 121 65 000              | 100 65 400                | 101 65 400              | 100 65 520       | 120 65 600              |
| <b>K 80</b>   | 80 - 95     | 120 80 000                | 121 80 000              | 100 80 400                | 101 80 400              | 100 80 520       | 120 80 600              |
| <b>K 95</b>   | 95 - 110    | 120 95 000                | 121 95 000              | 100 95 400                | 101 95 400              | 100 95 520       | 120 95 600              |

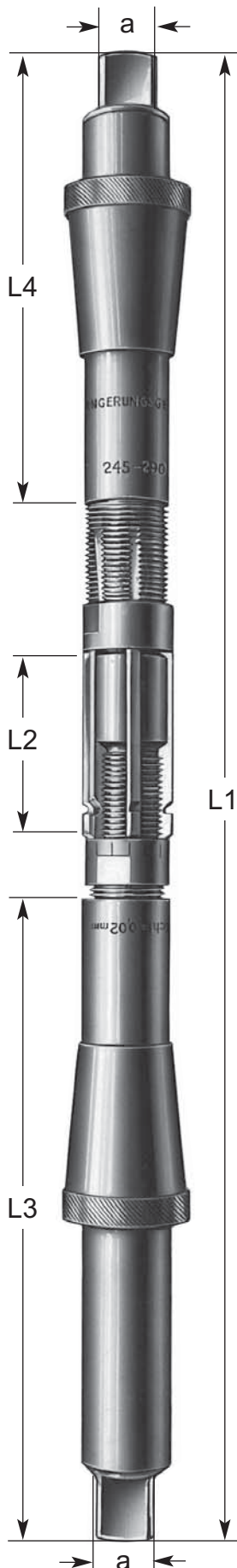
\*Replacement blades are supplied in matched sets.  
 The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.

**Sets of Reamers Type K in Wooden Cases**

| Symbol     | Range<br>mm | Special Steel<br>Part No. | Hard Chrome<br>Part No. |
|------------|-------------|---------------------------|-------------------------|
| <b>KAN</b> | 8 - 31,5    | 120 00 100                | 121 00 100              |
| <b>KEN</b> | 8 - 45      | 120 00 200                | 121 00 200              |



## Type U

**Application Range**

The universal reamer for all types of holes, especially for inline reaming of two or more aligned holes.

Two tapered guide sleeves provide for precise alignment between the hole being reamed and the other mating hole.

**Description**

Right-hand cutting reamer with expanding blades.

Interchangeable pilots on both the front and back of the reamer.

Each pilot has a square and a taper bush. A special bayonet coupling with mating cones between each pilot and the reamer body ensures proper alignment.

The blades are ground to provide a rough cut followed by finish reaming.

Due to the unique Hunger relief grinding process, the blades have a progressively increasing clearance angle, resulting in a softer cutting action.

The front adjusting nut is marked with a circumferential scale.

One graduation on the scale corresponds to a 0.01 mm change in cutting diameter.

| Size          | Range<br>mm | Length<br>Overall<br>L1 mm | Length<br>Blades<br>L2 mm | Length<br>Pilot<br>L 3 mm | Length<br>Pilot<br>L 4 mm | WAF<br>a mm | No. of<br>Blades | Weight<br>kg |
|---------------|-------------|----------------------------|---------------------------|---------------------------|---------------------------|-------------|------------------|--------------|
| <b>U 12</b>   | 12 - 13,5   | 250                        | 30                        | 110                       | 82                        | 8           | 5                | 0,170        |
| <b>U 13,5</b> | 13,5 - 15,5 | 270                        | 33                        | 116                       | 84                        | 9           | 5                | 0,245        |
| <b>U 15,5</b> | 15,5 - 18   | 295                        | 36                        | 127                       | 88                        | 10          | 5                | 0,360        |
| <b>U 18</b>   | 18 - 21     | 330                        | 40                        | 140                       | 100                       | 12          | 5                | 0,545        |
| <b>U 19,5</b> | 19,5 - 22,5 | 352                        | 44                        | 150                       | 110                       | 13          | 5                | 0,700        |
| <b>U 21</b>   | 21 - 24,5   | 352                        | 44                        | 150                       | 110                       | 13          | 5                | 0,800        |
| <b>U 24,5</b> | 24,5 - 29   | 385                        | 48                        | 157                       | 118                       | 13          | 6                | 1,140        |
| <b>U 29</b>   | 29 - 34     | 418                        | 52                        | 170                       | 130                       | 16          | 6                | 1,670        |
| <b>U 34</b>   | 34 - 39     | 440                        | 54                        | 180                       | 140                       | 18          | 6                | 2,430        |
| <b>U 39</b>   | 39 - 45     | 475                        | 60                        | 190                       | 150                       | 18          | 6                | 3,310        |
| <b>U 45</b>   | 45 - 52     | 500                        | 60                        | 200                       | 162                       | 18          | 6                | 4,700        |
| <b>U 52</b>   | 52 - 59     | 500                        | 60                        | 200                       | 162                       | 18          | 6                | 5,700        |
| <b>U 59</b>   | 59 - 66     | 500                        | 60                        | 200                       | 162                       | 18          | 6                | 6,700        |

Packing of the reamers:

From Size U 12 to U 39 individually in clear plastic tubes.

From Size U 45 to U 59 individually in plastic nets.

**Sets of Reamers Type U in Wooden Cases**

| Symbol     | Range   |                           | No. of<br>Reamers | Weight<br>kg |
|------------|---------|---------------------------|-------------------|--------------|
|            | mm      | Inches                    |                   |              |
| <b>USI</b> | 12 - 34 | $15/32 - 1 \frac{11}{32}$ | 7                 | 6,700        |
| <b>USE</b> | 12 - 45 | $15/32 - 1 \frac{49}{64}$ | 9                 | 13,100       |

**Type U**
**Ordering Information**

The production of reamers with hard chrome coated blades and of hard chrome coated replacement blades has been discontinued.  
 Remaining stocks of almost all reamer sizes are still available while stocks last.

| Size                      | Reamers                   |                         | Replacement Blades*       |                         | Front Nut<br>with Scale<br>Part No. | Back Nut<br>Part No. | Cone Bush<br>Part No. |
|---------------------------|---------------------------|-------------------------|---------------------------|-------------------------|-------------------------------------|----------------------|-----------------------|
|                           | Special Steel<br>Part No. | Hard Chrome<br>Part No. | Special Steel<br>Part No. | Hard Chrome<br>Part No. |                                     |                      |                       |
| <b>U 12</b>               | 130 12 000                | 131 12 000              | 130 12 400                | 131 12 400              | 130 12 520                          | 100 12 510           | 130 12 600            |
| <b>U 13,5</b>             | 130 13 000                | 131 13 000              | 130 13 400                | 131 13 400              | 100 12 520                          | 100 13 510           | 130 13 600            |
| <b>U 15,5</b>             | 130 15 000                | 131 15 000              | 130 15 400                | 131 15 400              | 130 15 520                          | 100 15 510           | 130 15 600            |
| <b>U 18</b>               | 130 18 000                | 131 18 000              | 130 18 400                | 131 18 400              | 130 18 520                          | 100 18 510           | 130 18 600            |
| <b>U 19,5<sup>+</sup></b> | 130 19 000                | 131 19 000              | 130 19 400                | 131 19 400              | 100 18 520                          | 130 19 510           | 130 18 600            |
| <b>U 21</b>               | 130 21 000                | 131 21 000              | 130 21 400                | 131 21 400              | 130 21 520                          | 100 21 510           | 130 21 600            |
| <b>U 24,5</b>             | 130 24 000                | 131 24 000              | 130 24 400                | 131 29 400              | 130 24 520                          | 130 24 510           | 130 24 600            |
| <b>U 29</b>               | 130 29 000                | 131 29 000              | 130 29 400                | 131 27 400              | 130 29 520                          | 130 29 510           | 130 29 600            |
| <b>U 34</b>               | 130 34 000                | 131 34 000              | 130 34 400                | 131 34 400              | 130 34 520                          | 130 34 510           | 130 31 600            |
| <b>U 39</b>               | 130 39 000                | 131 39 000              | 130 39 400                | 131 39 400              | 130 39 520                          | 130 39 510           | 130 37 600            |
| <b>U 45</b>               | 130 45 000                | 131 45 000              | 130 45 400                | 131 45 400              | 130 45 520                          | 100 45 510           | 130 45 600            |
| <b>U 52</b>               | 130 52 000                | 131 52 000              | 130 45 400                | 131 45 400              | 130 52 520                          | 130 52 510           | 130 52 600            |
| <b>U 59</b>               | 130 59 000                | 131 59 000              | 130 45 400                | 131 45 400              | 130 52 520                          | 130 52 510           | 130 65 600            |

\*Replacement blades are supplied in matched sets.

The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.

**Sets of Reamers Type U in Wooden Cases**

| Symbol     | Size Range<br>mm | Special Steel<br>Part No. | Hard Chrome<br>Part No. |
|------------|------------------|---------------------------|-------------------------|
| <b>USI</b> | 12 - 34          | 130 00 100                | 131 00 100              |
| <b>USE</b> | 12 - 45          | 130 00 200                | 131 00 200              |

<sup>+</sup>The intermediate size U 19,5 is not included in the sets.



## Type U Pilots

**Description**

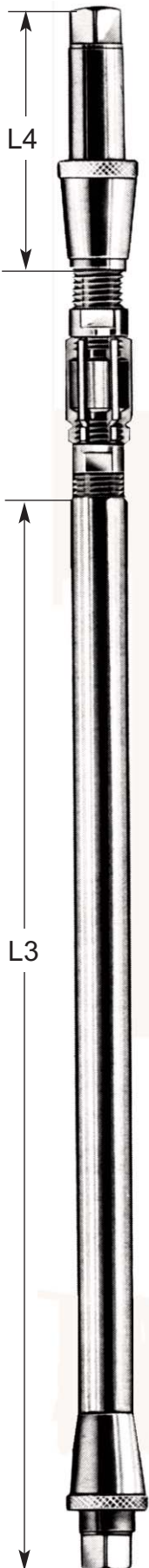
Each pilot has a square on one end and a female taper on the other end. The female taper in the pilot is designed to receive the mating male taper on the reamer body.

The pilot and reamer body are interlocked by a bayonet type coupling.

Since the mating tapers are usually tightly bonded, it is recommended that a plastic hammer be used to loosen the tight contact before removing the pilot from the reamer body.

Gently tap the pilot around the female cone.

With the contact loosened, rotate the pilot clockwise with respect to the reamer body until the triangular projection on the taper is centered in the recess in the female taper so that the pilot can be removed from the reamer body.

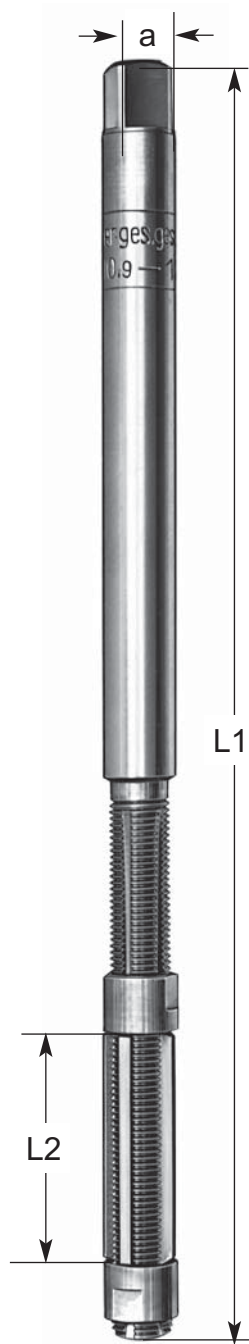


| Size of Reamer | Standard Front Pilots |            | Standard Back Pilots |            | Extension Pilots Size I |            |
|----------------|-----------------------|------------|----------------------|------------|-------------------------|------------|
|                | Length L3 mm          | Part No.   | Length L4 mm         | Part No.   | Length mm               | Part No.   |
| <b>U 12</b>    | 110                   | 130 12 701 | 82                   | 130 12 702 | 210                     | 132 12 711 |
| <b>U 13,5</b>  | 116                   | 130 13 701 | 84                   | 130 13 702 | 220                     | 132 13 712 |
| <b>U 15,5</b>  | 127                   | 130 15 701 | 88                   | 130 15 702 | 230                     | 132 15 713 |
| <b>U 18</b>    | 140                   | 130 18 701 | 100                  | 130 18 702 | 240                     | 132 18 714 |
| <b>U 19,5</b>  | 150                   | 130 19 701 | 110                  | 130 19 702 | 250                     | 132 19 715 |
| <b>U 21</b>    | 150                   | 130 21 701 | 110                  | 130 21 702 | 250                     | 132 21 715 |
| <b>U 24,5</b>  | 157                   | 130 24 701 | 118                  | 130 24 702 | 260                     | 132 24 716 |
| <b>U 29</b>    | 170                   | 130 29 701 | 130                  | 130 29 702 | 270                     | 132 29 717 |
| <b>U 34</b>    | 180                   | 130 34 701 | 140                  | 130 34 702 | 280                     | 132 34 718 |
| <b>U 39</b>    | 190                   | 130 39 701 | 150                  | 130 39 702 | 290                     | 132 39 719 |
| <b>U 45</b>    | 200                   | 130 45 701 | 162                  | 130 45702  | 400                     | 132 45 730 |
| <b>U 52</b>    | 200                   | 130 52 701 | 162                  | 130 52 702 | 400                     | 132 52 730 |
| <b>U 59</b>    | 200                   | 130 52 701 | 162                  | 130 59 702 | 400                     | 132 52 730 |

| Size of Reamer | Extension Pilots Size II |            | Extension Pilots Size III |            | Extension Pilots Size IV |            |
|----------------|--------------------------|------------|---------------------------|------------|--------------------------|------------|
|                | Length mm                | Part No.   | Length mm                 | Part No.   | Length mm                | Part No.   |
| <b>U 12</b>    | 410                      | 132 12 731 | 610                       | 132 12 751 | 810                      | 132 12 771 |
| <b>U 13,5</b>  | 420                      | 132 13 732 | 620                       | 132 13 752 | 820                      | 132 13 772 |
| <b>U 15,5</b>  | 430                      | 132 15 733 | 630                       | 132 15 753 | 830                      | 132 15 773 |
| <b>U 18</b>    | 440                      | 132 18 734 | 640                       | 132 18 754 | 840                      | 132 18 774 |
| <b>U 19,5</b>  | 450                      | 132 19 735 | 650                       | 132 19 755 | -                        | -          |
| <b>U 21</b>    | 450                      | 132 21 735 | 650                       | 132 21 755 | 850                      | 132 21 775 |
| <b>U 24,5</b>  | 460                      | 132 24 736 | 660                       | 132 24 756 | 860                      | 132 24 776 |
| <b>U 29</b>    | 470                      | 132 29 737 | 670                       | 132 29 757 | 870                      | 132 29 777 |
| <b>U 34</b>    | 480                      | 132 34 738 | 680                       | 132 34 758 | 880                      | 132 34 778 |
| <b>U 39</b>    | 490                      | 132 39 739 | 690                       | 132 39 759 | 890                      | 132 39 779 |
| <b>U 45</b>    | 600                      | 132 45 750 | 800                       | 132 45 770 | 900                      | 132 45 780 |
| <b>U 52</b>    | 600                      | 132 52 750 | 800                       | 132 52 770 | 900                      | 132 52 780 |
| <b>U 59</b>    | 600                      | 132 52 750 | 800                       | 132 52 770 | 900                      | 132 52 780 |

Customized extension pilots are available in any length.

## Type V



### Application Range

The special reamer for reaming the valve guide of engines.  
The optional centering bush fits in the valve seat so that the reamer aligns perfectly in the valve guide.

### Description

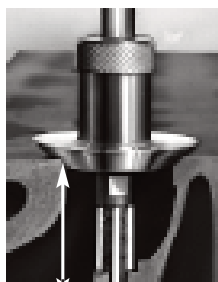
Right-hand cutting reamer with extra long shank and an optional centering bush. Due to the unique Hunger relief grinding operation the blades have a progressively increasing clearance angle giving a softer cutting action.

| Size  | Range     |               | Length Overall<br>L1 mm | Length Blades<br>L 2 mm | WAF<br>a mm | No. of Blades | Weight<br>kg | Centering Bush |       |
|-------|-----------|---------------|-------------------------|-------------------------|-------------|---------------|--------------|----------------|-------|
|       | mm        | Inches        |                         |                         |             |               |              | mm             | kg    |
| V 5,4 | 5,4 - 6   | 7/32 - 15/64  | 160                     | 28                      | 4           | 3             | 0,025        | 14-21          | 0,030 |
| V 5,9 | 5,9 - 6,5 | 15/64 - 1/4   | 160                     | 28                      | 4,3         | 3             | 0,030        | 17-28          | 0,050 |
| V 6,4 | 6,4 - 7   | 1/4 - 17/64   | 160                     | 28                      | 4,9         | 3             | 0,035        | 16-28          | 0,050 |
| V 6,9 | 6,9 - 7,5 | 17/64 - 19/64 | 160                     | 28                      | 5,5         | 3             | 0,040        | 21-38          | 0,070 |
| V 7,4 | 7,4 - 8   | 19/64 - 5/16  | 165                     | 28                      | 5,5         | 3             | 0,045        | 22-36          | 0,065 |
| V 7,9 | 7,9 - 8,5 | 5/16 - 21/64  | 170                     | 28                      | 6,2         | 3             | 0,055        | 23-47          | 0,150 |
| V 8,4 | 8,4 - 9   | 21/64 - 23/64 | 175                     | 28                      | 6,2         | 3             | 0,065        | 28-44          | 0,155 |
| V 8,9 | 8,9 - 9,5 | 23/64 - 3/8   | 180                     | 32                      | 7           | 4             | 0,075        | 25-53          | 0,190 |
| V 9,4 | 9,4 - 10  | 3/8 - 25/64   | 190                     | 32                      | 7           | 4             | 0,085        | 26-52          | 0,180 |
| V 9,9 | 9,9 - 11  | 25/64 - 7/16  | 200                     | 36                      | 8           | 5             | 0,100        | 25-53          | 0,190 |
| V10,9 | 10,9 - 12 | 7/16 - 15/32  | 220                     | 36                      | 8           | 5             | 0,130        | 33-61          | 0,270 |

### Ordering Information

The production of reamers with hard chrome coated blades and of hard chrome coated replacement blades has been discontinued.  
Remaining stocks of almost all reamer sizes are still available while stocks last.

| Size  | Reamers                   |                         | Centering Bushes<br>Part No. | Replacement Blades        |                         | Nuts<br>Part No. |
|-------|---------------------------|-------------------------|------------------------------|---------------------------|-------------------------|------------------|
|       | Special Steel<br>Part No. | Hard Chrome<br>Part No. |                              | Special Steel<br>Part No. | Hard Chrome<br>Part No. |                  |
| V 5,4 | 140 01 000                | 141 01 000              | 140 01 600                   | 140 01 400                | 141 01 400              | 140 01 510       |
| V 5,9 | 140 02 000                | 141 02 000              | 140 02 600                   | 140 02 400                | 141 02 400              | 140 02 510       |
| V 6,4 | 140 03 000                | 141 03 000              | 140 03 600                   | 140 03 400                | 141 03 400              | 140 03 510       |
| V 6,9 | 140 04 000                | 141 04 000              | 140 04 600                   | 140 04 400                | 141 04 400              | 140 04 510       |
| V 7,4 | 140 05 000                | 141 05 000              | 140 05 600                   | 140 05 400                | 141 05 400              | 140 05 510       |
| V 7,9 | 140 06 000                | 141 06 000              | 140 06 600                   | 140 06 400                | 141 06 400              | 100 08 510       |
| V 8,4 | 140 07 000                | 141 07 000              | 140 07 600                   | 140 07 400                | 141 07 400              | 140 07 510       |
| V 8,9 | 140 08 000                | 141 08 000              | 140 08 600                   | 140 08 400                | 141 08 400              | 140 08 510       |
| V 9,4 | 140 09 000                | 141 09 000              | 140 09 600                   | 140 09 400                | 141 09 400              | 140 09 510       |
| V 9,9 | 140 10 000                | 141 10 000              | 140 10 600                   | 140 10 400                | 141 10 400              | 140 10 510       |
| V10,9 | 140 11 000                | 141 11 000              | 140 11 600                   | 140 11 400                | 141 11 400              | 140 11 510       |



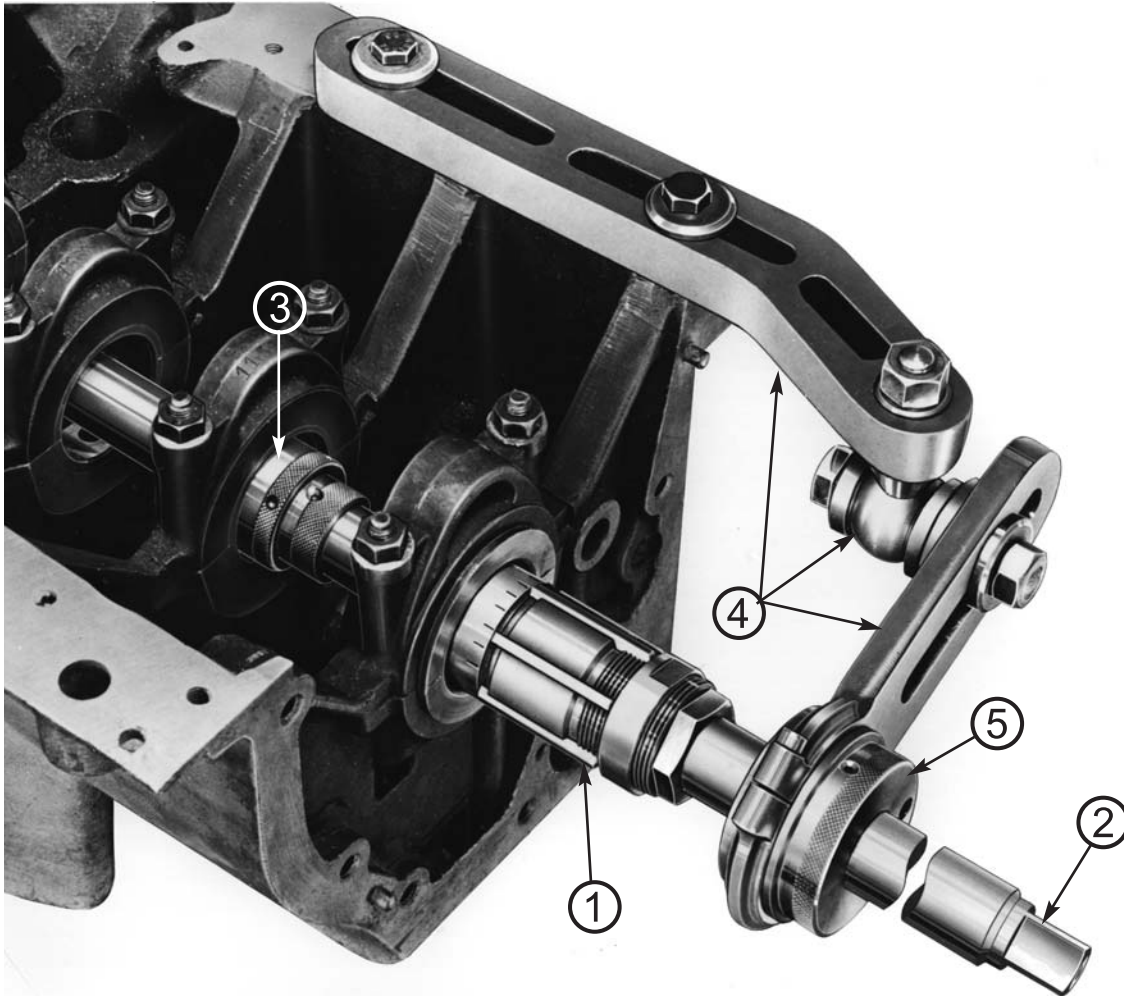
Centering Bush

Packing of the reamers: Individually in clear plastic tube containers.

### Sets of Reamers Type V in Wooden Cases

| Symbol | Range    |               | No. of Reamers | No. of Bushes | Special Steel<br>Part No. | Hard Chrome<br>Part No. | Weight<br>kg |
|--------|----------|---------------|----------------|---------------|---------------------------|-------------------------|--------------|
|        | mm       | Inches        |                |               |                           |                         |              |
| VR     | 5,9 - 12 | 15/64 - 15/32 | 10             | -             | 140 00 100                | 141 00 100              | 1,140        |
| VRB    | 5,9 - 12 | 15/64 - 15/32 | 10             | 10            | 140 00 200                | 141 00 200              | 3,500        |

**Example of Application:**  
**Inline Reaming of a Bearing Tunnel**



**Components**

- ① Adjustable Shell Reamer Type H
- ② Tool Bar
- ③ Expanding Tool Bar Guide
- ④ External Bearing Support
- ⑤ Plain Bearing Bush

**Type H**
**Application Range**

The reamer for reaming aligned holes, especially widely spaced holes

**Description**

Right-hand cutting shell reamer with adjustable blades and a through-hole for installing a tool bar for guiding and moving the reamer.

Adjustment is easily done with two round nuts which raise or lower the cutting blades by moving them along tapered seatings. The front nut is provided with a scale for ease of adjusting of the desired cutting diameter.

One graduation mark on the scale corresponds to a change in the cutting diameter of 0.02 mm.

A clamping spring screwed into the through-hole of the reamer ensures that the reamer is taken along when the tool bar is advanced and turned.

To place the reamer on the tool bar, slide the reamer onto and along the tool bar while at the same time rotating the reamer in direction of cut.

In case that a very rigid connection of the reamer to the tool bar is required, the clamping spring can be replaced by a clamping shell that locks the reamer to the tool bar.

Expandable guide bushes are available for insertion into the bores to align the tool bar in centerline with the bores.

See page 18 for more details.

An external bearing support is available for guiding the tool bar in front of a bore.

See page 19 for more details.

**Technical Details**


| Size  | Range<br>Ø<br>mm | Bore<br>Ø<br>d mm | Length<br>Reamer<br>L1 mm | Length<br>Blades<br>L2 mm | Nuts<br>WAF<br>mm | Blades<br>Qty | Reamer<br>Weight<br>kg |
|-------|------------------|-------------------|---------------------------|---------------------------|-------------------|---------------|------------------------|
| H 36  | 36 - 38          | 20                | 96                        | 44                        | 32                | 6             | 0,370                  |
| H 38  | 38 - 41          | 20                | 99                        | 44                        | 34                | 6             | 0,450                  |
| H 41  | 41 - 44          | 20                | 104                       | 48                        | 38                | 6             | 0,590                  |
| H 44  | 44 - 47          | 25                | 104                       | 48                        | 40                | 6             | 0,590                  |
| H 47  | 47 - 51          | 25                | 108                       | 48                        | 43                | 6             | 0,760                  |
| H 51  | 51 - 54          | 30                | 108                       | 52                        | 47                | 5             | 0,830                  |
| H 54  | 54 - 58          | 30                | 113                       | 52                        | 47                | 6             | 0,930                  |
| H 58  | 58 - 62          | 30                | 113                       | 52                        | 53                | 6             | 1,180                  |
| H 62  | 62 - 65          | 35                | 114                       | 52                        | 58                | 8             | 1,290                  |
| H 65  | 65 - 69          | 35                | 118                       | 57                        | 58                | 8             | 1,490                  |
| H 69  | 69 - 73          | 40                | 118                       | 57                        | 64                | 8             | 1,790                  |
| H 73  | 73 - 78          | 40                | 123                       | 57                        | 68                | 8             | 1,970                  |
| H 78  | 78 - 83          | 45                | 124                       | 57                        | 70                | 8             | 2,110                  |
| H 83  | 83 - 88          | 45                | 124                       | 60                        | 78                | 8             | 2,750                  |
| H 88  | 88 - 93          | 50                | 124                       | 60                        | 83                | 8             | 3,000                  |
| H 93  | 93 - 99          | 50                | 127                       | 60                        | 83                | 10            | 3,490                  |
| H 99  | 99 - 105         | 50                | 127                       | 60                        | *                 | 10            | 4,200                  |
| H 105 | 105 - 111        | 50                | 127                       | 60                        | *                 | 10            | 5,040                  |

\* Adjustment of the nuts with hook wrench..

## Description

The blades of the standard reamers type H are made of a special steel with excellent cutting properties.

In addition to the standard "special steel" version with uncoated blades, Hunger has also a "hard chrome" version, in which the blades are coated with hard chrome.

The hard chrome coating has a low coefficient of friction.

Reamers in the "hard chrome" version are therefore particularly suitable for reaming materials with a high wear tendency and materials that tend to stick and form built-up edges.

The production of reamers with hard chrome coated blades and hard chrome coated spare blades has been discontinued.

Remaining stocks of almost all reamer sizes are still available while stocks last.

The "hard chrome" version is replaced by the advanced "DLC" version, in which the blades are coated with diamond-like carbon (DLC).

See page 17 for details.

## Ordering Information

| Size         | Reamer                    |                         | Replacement Blades*  |                         | Spare Nut<br>with Scale<br>Part No. | Spare Clamping     |                   |
|--------------|---------------------------|-------------------------|----------------------|-------------------------|-------------------------------------|--------------------|-------------------|
|              | Special Steel<br>Part No. | Hard Chrome<br>Part No. | Special Steel<br>P/N | Hard Chrome<br>Part No. |                                     | Spring<br>Part No. | Shell<br>Part No. |
| <b>H 36</b>  | 150 36 000                | 151 36 000              | 150 36 400           | 151 36 400              | 150 36 520                          | 150 20 600         | 150 20 650        |
| <b>H 38</b>  | 150 38 000                | 151 38 000              | 150 38 400           | 151 38 400              | 150 38 520                          | 150 20 600         | 150 20 650        |
| <b>H 41</b>  | 150 41 000                | 151 41 000              | 150 41 400           | 151 41 400              | 150 41 520                          | 150 20 600         | 150 20 650        |
| <b>H 44</b>  | 150 44 000                | 151 44 000              | 150 44 400           | 151 44 400              | 150 44 520                          | 150 25 600         | 150 25 650        |
| <b>H 47</b>  | 150 47 000                | 151 47 000              | 150 47 400           | 151 47 400              | 150 47 520                          | 150 25 600         | 150 25 650        |
| <b>H 51</b>  | 150 51 000                | 151 51 000              | 150 51 400           | 151 51 400              | 150 51 520                          | 150 30 600         | 150 30 650        |
| <b>H 54</b>  | 150 54 000                | 151 54 000              | 150 54 400           | 151 54 400              | 150 54 520                          | 150 30 600         | 150 30 650        |
| <b>H 58</b>  | 150 58 000                | 151 58 000              | 150 58 400           | 151 58 400              | 150 58 520                          | 150 30 600         | 150 30 650        |
| <b>H 62</b>  | 150 62 000                | 151 62 000              | 150 62 400           | 151 62 400              | 150 62 520                          | 150 35 600         | 150 35 650        |
| <b>H 65</b>  | 150 65 000                | 151 65 000              | 150 65 400           | 151 65 400              | 150 65 520                          | 150 35 600         | 150 35 650        |
| <b>H 69</b>  | 150 69 000                | 151 69 000              | 150 69 400           | 151 69 400              | 150 69 520                          | 150 40 600         | 150 40 650        |
| <b>H 73</b>  | 150 73 000                | 151 73 000              | 150 73 400           | 151 73 400              | 150 73 520                          | 150 40 600         | 150 40 650        |
| <b>H 78</b>  | 150 78 000                | 151 78 000              | 150 78 400           | 151 78 400              | 150 78 520                          | 150 45 600         | 150 45 650        |
| <b>H 83</b>  | 150 81 000                | 151 81 000              | 150 81 400           | 151 81 400              | 150 81 520                          | 150 45 600         | 150 45 650        |
| <b>H 88</b>  | 150 82 000                | 151 82 000              | 150 82 400           | 151 82 400              | 150 82 520                          | 150 50 600         | 150 50 650        |
| <b>H 93</b>  | 150 83 000                | 151 83 000              | 150 83 400           | 151 83 400              | 150 83 520                          | 150 50 600         | 150 50 650        |
| <b>H 99</b>  | 150 84 000                | 151 84 000              | 150 84 400           | 151 83 400              | 150 84 520                          | 150 50 600         | 150 50 650        |
| <b>H 105</b> | 150 85 000                | 151 85 000              | 150 85 400           | 151 83 400              | 150 85 520                          | 150 50 600         | 150 50 650        |

\*Replacement blades are supplied in matched sets.

The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.



**DLC Coated**
**Description**

The blades of the reamers type H version DLC are coated with a diamond-like hard material layer, which is applied in a complex PVD process.

The DLC coating is characterized by extreme hardness, wear resistance and smoothness (very low friction).

At the same time, the sharpness of the cutting edges is preserved because the DLC coating is extremely thin.

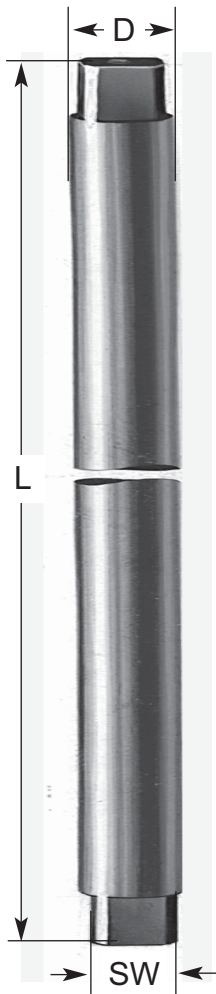
The DLC version of the reamers type H reamers is therefore ideal for reaming aluminum alloys, copper alloys (bronze and brass) as well as materials with a high wear effect and materials that tend to stick and form built-up edges

**Ordering Information**

| Size         | Reamer<br>DLC<br>Part No. | Replacement Blades<br>DLC<br>Part No. | Spare Nut<br>with scale<br>Part No. | Spare Clamping     |                   |
|--------------|---------------------------|---------------------------------------|-------------------------------------|--------------------|-------------------|
|              |                           |                                       |                                     | Spring<br>Part No. | Shell<br>Part No. |
| <b>H 36</b>  | 158 36 000                | 158 36 400                            | 150 36 520                          | 150 20 600         | 150 20 650        |
| <b>H 38</b>  | 158 38 000                | 150 38 400                            | 150 38 520                          | 150 20 600         | 150 20 650        |
| <b>H 41</b>  | 158 41 000                | 158 41 400                            | 150 41 520                          | 150 20 600         | 150 20 650        |
| <b>H 44</b>  | 158 44 000                | 158 44 400                            | 150 44 520                          | 150 25 600         | 150 25 650        |
| <b>H 47</b>  | 158 47 000                | 158 47 400                            | 150 47 520                          | 150 25 600         | 150 25 650        |
| <b>H 51</b>  | 158 51 000                | 158 51 400                            | 150 51 520                          | 150 30 600         | 150 30 650        |
| <b>H 54</b>  | 158 54 000                | 158 54 400                            | 150 54 520                          | 150 30 600         | 150 30 650        |
| <b>H 58</b>  | 158 58 000                | 158 58 400                            | 150 58 520                          | 150 30 600         | 150 30 650        |
| <b>H 62</b>  | 158 62 000                | 158 62 400                            | 150 62 520                          | 150 35 600         | 150 35 650        |
| <b>H 65</b>  | 158 65 000                | 158 65 40                             | 150 65 520                          | 150 35 600         | 150 35 650        |
| <b>H 69</b>  | 158 69 000                | 158 69 400                            | 150 69 520                          | 150 40 600         | 150 40 650        |
| <b>H 73</b>  | 158 73 000                | 158 73 400                            | 150 73 520                          | 150 40 600         | 150 40 650        |
| <b>H 78</b>  | 158 78 000                | 158 78 400                            | 150 78 520                          | 150 45 600         | 150 45 650        |
| <b>H 83</b>  | 158 81 000                | 158 81 400                            | 150 81 520                          | 150 45 600         | 150 45 650        |
| <b>H 88</b>  | 158 82 000                | 158 82 40                             | 150 82 520                          | 150 50 600         | 150 50 650        |
| <b>H 93</b>  | 158 83 000                | 158 83 400                            | 150 83 520                          | 150 50 600         | 150 50 650        |
| <b>H 99</b>  | 158 84 000                | 158 84 400                            | 150 84 520                          | 150 50 600         | 150 50 650        |
| <b>H 105</b> | 158 85 000                | 158 85 400                            | 151 83 400                          | 150 50 600         | 150 50 650        |

\* Replacement blades are supplied in matched sets.

The blades are finish ground, so no grinding is required after the blades are inserted into the reamer body.



## Tool Bars

### Application

A tool bar is required to guide the reamer

### Description

The tool bar has a square at each end to which a tap wrench can be attached to rotate and advance the reamer that is placed on the tool bar.

The tool bars are precision ground so that the reamer is guided precisely in every position along the tool bar.

### Ordering Information

| Tool Bar   |                    | Diameter<br>D mm | Length<br>L mm | WAF<br>SW mm | Weight<br>kg |
|------------|--------------------|------------------|----------------|--------------|--------------|
| Part No.   | for<br>Reamer Size |                  |                |              |              |
| 152 20 101 | H 36 - H 41        | 20               | 1000           | 13           | 2,420        |
| 152 25 101 | H 44 - H 47        | 25               | 1000           | 13           | 3,740        |
| 152 30 121 | H 51 - H 58        | 30               | 1200           | 16           | 6,540        |
| 152 30 151 | H 51 - H 58        | 30               | 1500           | 16           | 12,000       |
| 152 35 121 | H 62 - H 65        | 35               | 1200           | 18           | 8,750        |
| 152 40 151 | H 69 - H 73        | 40               | 1500           | 18           | 14,400       |
| 152 45 151 | H 78 - H 83        | 45               | 1500           | 22           | 18,110       |
| 152 50 171 | H 88 - H 105       | 50               | 1700           | 22           | 25,200       |

\* Customized tool bars are available in any desired length.

## Expandable Guide Bushes for the Tool Bars

### Application

The guide bush is clamped into one of the holes to keep the toolbar centered and aligned with the hole.

### Description

The guide bushes are equipped with clamping wedges that can be adjusted radially outward by means of an adjusting ring to clamp the guide bush in the bore.

### Order Information:



| Tool Bar Guides |            |                              | Bore<br>d mm | Expansion Range<br>D mm | Weight<br>kg |
|-----------------|------------|------------------------------|--------------|-------------------------|--------------|
| Size            | Part No.   | Suitable for<br>Reamer Sizes |              |                         |              |
| EL20            | 153 20 000 | H 36 - H 41                  | 20           | 35,5 - 54               | 0,200        |
| EL25            | 153 25 000 | H 44 - H 47                  | 25           | 43,5 - 62               | 0,300        |
| EL30            | 153 30 000 | H 51 - H 58                  | 30           | 49,5 - 74               | 0,410        |
| EL35            | 153 35 000 | H 62 - H 65                  | 35           | 61,5 - 83               | 0,620        |
| EL40            | 153 40 000 | H 69 - H 73                  | 40           | 68,5 - 93               | 0,800        |
| EL45            | 153 45 000 | H 78 - H 83                  | 45           | 77,5 - 105              | 1,100        |
| EL50            | 153 50 000 | H 88 - H 105                 | 50           | 87,5 - 127              | 1,550        |

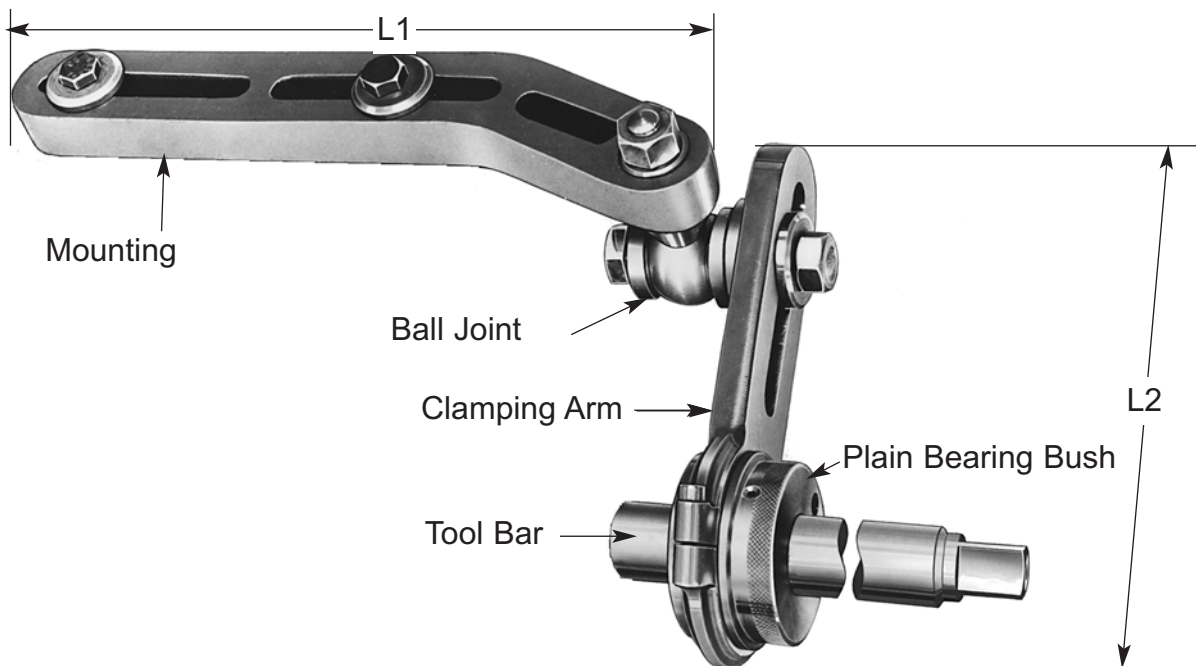
**Application**

The universal bearing support is designed to place a plain bearing bush in front of a hole for perfect alignment of the tool bar

**Description**

The plain bearing bush is locked into a clamp arm that is connected by a ball joint to a mounting base that is attached to the workpiece.

Both the clamp arm and ball joint are adjustable to ensure proper alignment.


**Ordering Information**

| Bearing Support |            |           | Components    |            |       |              |            |       |            |
|-----------------|------------|-----------|---------------|------------|-------|--------------|------------|-------|------------|
| Size            | P/N        | Weight kg | Mounting Base |            |       | Clamping Arm |            |       | Ball Joint |
|                 |            |           | Size          | P/N        | L1 mm | Size         | P/N        | L2 mm | P/N        |
| IA              | 156 11 100 | 3,140     | IA            | 156 11 110 | 330   | IA           | 156 11 120 | 210   | 156 11 130 |
| IIA1            | 156 12 102 | 5,100     | IIA           | 156 12 110 | 400   | IA           | 156 11 120 | 210   | 156 11 130 |

| Plain Bearing Bushes for Clamping Arm |            |                           |           |
|---------------------------------------|------------|---------------------------|-----------|
| Size                                  | P/N        | Suitable for Bar Diameter | Weight kg |
| IA/20                                 | 156 21 200 | 20 mm                     | 0,920     |
| IA/25                                 | 156 21 250 | 25 mm                     | 0,880     |
| IA/30                                 | 156 21 300 | 30 mm                     | 0,820     |
| IA/35                                 | 156 21 350 | 35 mm                     | 0,750     |
| IA/40                                 | 156 21 400 | 40 mm                     | 0,650     |
| IA/45                                 | 156 21 450 | 45 mm                     | 0,600     |
| IA/50                                 | 156 21 500 | 50 mm                     | 0,550     |

**Application.**

Adjustable reamers are designed to finish holes to an precise size or a precise fit where size is determined during assembly.

The blades cut away small amounts of material leaving a perfectly round, precisely finished hole. The amount of material to be removed by the reamers depends on the size of the hole and the material being reamed..

A common cutting allowance is 0,03 to 0,1mm per cut. For reamers type U the cutting allowance can be up to 0,3mm per cut.

In general, the more difficult the material being reamed the smaller the cutting allowance.

However, if too little material is removed, the blades will dull because they will push the hole open rather than cut.

A rough cut followed by finish reaming will produce a better surfacea better surface finish than reaming the holes in a single pass.

**Size Adjustment.**

The precision-ground reamer blades are held in tapered slots by nuts.

Adjustment is a simple operation performed by loosening one nut while tightening the other, allowing the blades to move along the tapered bottom slots, increasing or decreasing the reamer diameter depending on the direction of adjustment.

Reamers with an even number of blades can be checked for size with a micrometer.

Reamers with an odd number of blades can be set to size by first adjusting the reamer to a known size bush or ring and then adjusting the reamer to final size by turning of then leading nut by the required increments.

**Using Reamers.**

To set up for reaming, select the correct size reamer and adjust the blades to the required diameter.

Place the reamer in the hole to be reamed and apply moderate axial pressure so that the blades are in cutting contact with the hole from the start. Attach the tap holder to the square shank.

The tap holder must fit snugly onto the square to ensure that the reamer shank is held securely.

Check the alignment of the reamer.

Alignment should be 90° to the surface.

Verify alignment with a square.

Using the tap holder, rotate the reamer clockwise (cutting direction) while applying even pressure to advance the reamer through the hole.

**Important.**

**Always turn reamer clockwise (cutting direction), even when removing it from the hole.**

**Never turn a reamer counter-clockwise!**

Turning the reamer counterclockwise in the hole dulls the blades.

When reaming deep holes withdraw the reamer from time to time to remove chips.

When retracting the reamer, always rotate the reamer clockwise.

When reaming the back end of the hole, reduce the pressure to ensure that the reamer is not pushed through the hole, but that the back end of the hole is reamed at the same feed and speed as the main part.

When removing the reamer from the hole, rotate the reamer clockwise to avoid damaging the reamed hole and blunting the reamer blades.

**Lubrication.**

The use of a cutting fluid will improve the finish and extend the life of the reamer in many cases. Always lubricate with cutting oil or emulsion when reaming iron and steel.

Use kerosene when reaming brass, bronze, aluminum and other soft metals.

Cast iron and malleable iron can be completely dry reamed.

**Using Reamers with Guide Sleeves.**

The tapered guide sleeve sits in one hole and guides the reamer as it reams the other hole.

The guide sleeve provides precise alignment between the hole being reamed and its mating hole.

As the blades ream the hole, the guide sleeve, placed in the other hole or in the back end of a deep hole, holds the reamer in precise alignment.

**Maintenance of the Reamers.**

Clean reamers thoroughly after use.

Store reamers in the clear plastic tube containers or in the wooden cases.

A light coat of oil will prevent corrosion and prolong life.

If necessary, clean the blade slots from time to time to ensure proper setting of the cutting diameter.

Remove each blade and slide the corner of the blade along the bottom of the slot to remove chips and dirt.

**Make sure each blade is inserted in the same slot as before!**