<table>
<thead>
<tr>
<th>CONTENTS</th>
<th>PAGE</th>
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<td>Straight guide pillar P10</td>
<td>5</td>
</tr>
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<td>Demountable guide pillar with fixing clamps P21</td>
<td>6</td>
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<tr>
<td>Demountable guide pillar with central fixing P22</td>
<td>7</td>
</tr>
<tr>
<td>Demountable steel guide bush B10 - B12</td>
<td>8-9</td>
</tr>
<tr>
<td>Demountable bronze-plated guide bush B20 - B22</td>
<td>10-11</td>
</tr>
<tr>
<td>Straight sleeve ball bearing bush B30</td>
<td>12</td>
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<tr>
<td>Demountable ball bearing bush B40</td>
<td>13</td>
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<td>Stripper plate - demountable ball bearing bushes B42</td>
<td>14</td>
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<td>Type 3 ball bearing cage C13</td>
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<td>16-17</td>
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<td>Demountable steel block for pillar or bush R05 - R06 - R07 - R08</td>
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<td>Guide pillar selection - Type 1</td>
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<td>Guide pillar selection - Type 2</td>
<td>26-28</td>
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<tr>
<td>Guide pillar selection - Type 3</td>
<td>29</td>
</tr>
<tr>
<td>Accessories</td>
<td>30</td>
</tr>
</tbody>
</table>
Case-hardened and tempered to 60 - 64 HRC

Ordering example
Pillar D1=30 - L=160
P10.030.160

To be used with
Steel bush
Bronze-plated bush
Ball bearing cage
Flanged bearing bush
Demountable bush
Ball bearing cage

REFERENCES
MDL 10/2017
Case-hardened and tempered to 60-64 HRC

Supplied with mounting clamps and screws

Ordering example
Pillar D1=40 - F=100  
B10.040.100

D1 19 20 24 25 30 32 38 40 48 50 63 80
D2 28 38 45 56 65 81 100
D3 32.5 47 54 63 75 93 115
E 18 22 25 30 35 68 68
h 3.3 3 3 3 3 5 5

No. of clamps
2 3 3 4 4 4 4

Clamp ref.
B01.005.000  B01.006.000  B01.007.000  B01.008.000  B01.010.000  B01.012.000  B01.014.000  B01.016.000
Screw
M5x12  M6x16  M6x20  M8x20  M8x20  M8x20  M8x20  M8x20
M 19.5 27.5 31 37 43 52 63
N 25.5 35 38.2 44.3 52.3 61.3 72.3
Q1/R 24,932.5 24,937 30,375.5 30,375.5 37,043.5 43,953.5
Q2 36.6 37.1 46.6 49.2 57.7 67.7 77.3
T 14.5 14.7 17.5 17.5 17.5 17.5

Examples

Positions of bush mounting clamps

for Ø19 to 20
for Ø24 to 32
for Ø38 to 80
Case-hardened and tempered to 60-64 HRC
Supplied with mounting clamps and screws

Ordering example
Pillar D1=40 - L=100

B20.040.100

Examples

Positions of bush mounting clamps
for Ø19 to 20
for Ø24 to 32
for Ø38 to 80
ASSEMBLY INSTRUCTIONS

Straight sleeve ball bearing bushes are glued into the plate

1. Degrease with acetone or a similar solvent and thoroughly wipe clean the outer surface of the straight sleeve bush and the inside of the plate bore.

2. Apply a thin layer of Loctite 601 glue to both surfaces.

3. Insert the bush into the hole while turning.

4. Leave to set for the required amount of time (e.g. 4 hours at 22°C)

To select, please refer to pages 26-27
Case-hardened and tempered to 60 - 64 HRC

Supplied with clamps and screws.

To be used with

Examples

Made from heat-treated aluminium alloy

Type 3 ball bearing cage

Supplied with retaining clip

The choice of ball bearing cage for the stripper plate depends upon the guide diameter, the stroke of the stripper plate \( C_i \) in relation to the pillar support plate, and the depth \( L_c \) of the ball bearing cages required is determined by the following formula:

\[ L_c \geq C_i + E + 10 + X \]

Accessories

Straight pillar

Demountable pillar

Type 3 ball bearing cage

Straight sleeve bush

Demountable pillar

Bush of up to Ø50 for stripper plate

Operation facilitating the fitting of two type 3 ball bearing cages

Retaining clip for type 3 ball bearing cage C03.xxx.001

To be used with

Examples

Ordering example

Pillar D1=30 - E=32

B42.030.042

Ordering example

Pillar D1=30 - Lc=63

C13.030.063

The choice of ball bearing cage for the stripper plate depends upon the guide diameter, the stroke of the stripper plate \( C_i \) in relation to the pillar support plate, and the depth \( L_c \) of the ball bearing cages required is determined by the following formula:

\[ L_c \geq C_i + E + 10 + X \]
**BALL BEARING CAGE**

**C11 C12**

**TYPE 1 & 2**

- Case-hardened and tempered to 60 – 64 HRC
- Supplied with clamps and screws.

**Ordering example**

Pillar D1=30 - Lc=105

**C12.030.105**

**TYPE 1**

- Retaining accessories

C01.xxx.000

**TYPE 2**

- Retaining accessories

C02.xxx.000

**WORKING CONDITIONS**

**TYPE 1**

In this case, the end of the pillar and the retaining washer may come out of the ball bearing cage. All of the ball bearings remain precompressed in contact with the pillar and bushes.

The cage is supplied with a washer and screw.

To select, please refer to p 24-25

**TYPE 2**

In this case the ball bearing cage may come out of the bush completely. At the lower end, the end of the pillar cannot leave the cage because the washer is stopped by the retaining ring.

The cage is supplied with a washer, retaining ring and screw.

To select, please refer to p 26-28

---

**BALL BEARING CAGE**

**C11 C12**

**TYPE 1 & 2**

<table>
<thead>
<tr>
<th>D1</th>
<th>24</th>
<th>25</th>
<th>30</th>
<th>32</th>
<th>38</th>
</tr>
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<tbody>
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<td></td>
<td></td>
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<tr>
<td>34</td>
<td>17.5</td>
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**TYPE 2 BALL BEARING CAGE REFERENCE**

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<tbody>
<tr>
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**D1**

Lc

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**D1**

Lc

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<td>90</td>
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<td>105</td>
<td>61</td>
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<td>115</td>
<td>91</td>
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<td>125</td>
<td>115</td>
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</table>

**D1**

Lc

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<tr>
<td>63</td>
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</tr>
<tr>
<td>80</td>
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</tbody>
</table>

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**MDL 10/2017**

**MDL 10/2017**
### DEMOUNTABLE ROUND OR SQUARE STEEL BLOCK

#### Fitting the demountable steel blocks

- **To be used with**: Straight pillar
- **Examples**: Demountable pillar, Demountable bush

---

### MAIN ADVANTAGES AND OBSERVATIONS

1. The insertion method for the demountable steel blocks allows precise positioning in the bore without using pins and offers improved overall rigidity.

2. The demountable steel blocks are interchangeable within the same product reference, allowing them to be swapped during dismantling and reassembly operations without affecting the performance of the tool.

3. They are made from rolled carbon steel in round or square sections and are available in different standard thicknesses. Intermediate thicknesses are available upon request for a price supplement.

**Please note:**
- Diameter D1 corresponds to the nominal diameter of the pillar.
- The screw lengths must be determined according to the thickness of the plates to which the extensions will be fitted.
- The extensions may be used with the ball bearing guide system.

**Ordering example**
- **Round bush extensions; D1=40 mm; F=80 mm**: R06.040.080

---

### Dimensions

<table>
<thead>
<tr>
<th>Diameter (mm)</th>
<th>D1</th>
<th>D2</th>
<th>D3</th>
<th>D4</th>
<th>D5</th>
<th>D6</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
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<td>63</td>
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<tr>
<td><strong>40</strong></td>
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<td>63</td>
<td>80</td>
<td>100</td>
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<td>100</td>
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### Reference for Demountable Pillar Steel Block

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<th>50</th>
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### Reference for Demountable Bush Steel Block

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<td>R05.060.800</td>
<td>R05.060.100</td>
<td>R05.063.100</td>
</tr>
</tbody>
</table>

---

### Ordering example
- **Round bush extensions; D1=40 mm; F=80 mm**: R06.040.080
The choice of a Type 1 bushing and ball cage unit is based upon the required stroke and the nominal diameter of the pillar. When these two measurements are known, choose the components by referring to the table opposite.

- **Choose the required stroke from the “Stroke C” column.**
- **Follow this column down until you come to the coloured box situated in the row corresponding to the required pillar diameter.**
- **You will find the required length of bush on the same row, in column LB.**
- **Choose the required length of ball bearing cage from column LC. The longer the ball bearing cage, the longer its life span.**
- **Verify that the die closing height allows for this choice.**
- **See above to calculate the pillar lengths.**
TYPE 2: THE BALL BEARING CAGE IS NO LONGER PRELOADED

To choose bushes and ball bearing cages, refer Page 27
To calculate pillar lengths, Page 28
**GUIDE ELEMENT SELECTION**

**BALL BEARING • TYPE 2**

**CALCULATING THE PILLAR LENGTH**

Use of bush B30.xxx.xxx

L pillar type P10 = H - h2 - J2 - C2 + Ec

F pillar type P21 = H - h2 - J2 - C2

Use of bush B40.xxx.xxx

L pillar type P10 = H - h2 - J1 - C1 + E - C2 + Ec

F pillar type P21 = H - h2 - J1 - C1 + E - C2

If the correct length of guide pillar does not exist:

- For the P10 type: Choose a guide pillar of next length up and cut it down to length L,
- or
- Choose a guide pillar of the next shortest length and place it in the punch plate in such a way that you obtain length L

For the P21 type:

- Adjust the dimension C2 in order to obtain J2 and h2 at the lowest point.

For the P22 type:

- Position bush B30 in order to obtain J2 and h at the lowest point.

-H = Min. closing height
-h2 = Height of nut + washer at base of pillar
-J2 = Safety margin at end of stroke (B30 bush)
-C2 = Thickness of top plate
-Ec = Depth of insertion for straight pillar
-J1 = Safety margin at end of stroke (B40 flanged bearing bush)
-C1 = Thickness of bottom plate
-E = Depth of insertion for B40 bush

---

**ENSEMBLE BAGUE + CAGE À BILLES**

To choose a type 2 ball bearing bushing unit, you must first determine the required length of stroke C, and the diameter of the pillar. Next, determine the operating conditions (see Page 24-27). When these three factors are known, refer to the selection table on Page 27. Go to the column with the stroke C required. Follow this column down until you are level with the required diameter Dn and find the box corresponding to the desired operating conditions. The longest ball bearing bush allowed by the closing height will have the longest service life. When you have found the corresponding coloured box, follow the horizontal line towards the right-hand side to select the correct lengths of bush and ball bearing cage. See the previous page to calculate the pillar length. When you have determined all of these measurements, refer to the pages giving all of the dimensions and reference numbers for the different parts.

<table>
<thead>
<tr>
<th>Nominal pillar Ø Dn</th>
<th>a</th>
<th>h1</th>
<th>h2</th>
<th>J1+J2</th>
<th>E</th>
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<td>15,5</td>
<td>15</td>
<td>18,5</td>
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**GUIDE ELEMENT SELECTION**

**BALL BEARING • TYPE 3**

**Calculation of strokes S2 and S3 with type 3 ball bearing cage.**

\[
S2 = 2 (Lc - X - W - B) \\
S3 = (Lc - X - W + Lb) ou Lb - 4 (B)
\]

-H = Min. closing height
-La = Length of demountable bush (type B40.xxx.xxx) Values La, E and F: See pages 13-14
-Lb = Length of demountable bush (type B30.xxx.xxx)
-Lc = Length of ball bearing cage (type C13.xxx.xxx)
-Lb values: voir page 12
-p = Pitch of rows of ball bearings (Ball bearing cage type C13.xxx.xxx)
-m = Entry taper of pillar
-B = Safety height for bearings when preloaded

---

**Diagram:**

- Die fully open: The ball bearing cage is in position in the preload and safety zone (B).
- Die in low position: The stroke of the ball bearing cage is restricted by the retaining ring.
- Die in maximum position: Die with ball bearing cage without retaining ring and without stripper plate.

---

**Technical data:**

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# Accessories

**CLAMPS (WITHOUT SCREWS)**

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<th>Ref.</th>
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<td>18,3</td>
<td>24,6</td>
</tr>
<tr>
<td>B</td>
<td>12,7</td>
<td>15,9</td>
<td>15,9</td>
<td>14,5</td>
<td>18,8</td>
</tr>
<tr>
<td>C</td>
<td>3,2</td>
<td>4,9</td>
<td>4,9</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Ø screw</td>
<td>M5</td>
<td>M6</td>
<td>M8</td>
<td>M8</td>
<td>M6</td>
</tr>
</tbody>
</table>

**Retaining Washers**

For P22.XXX.XXX demountable pillars:

- **Nominal pillar Ø Dn**
  - 19: 5,6
  - 20: 6,8
  - 24: 8,8
  - 25: 10,8
  - 30: 12,8
  - 32: 14,2
  - 38: 17,2
  - 40: 19,2
  - 48: 25,5
  - 50: 31,5
  - 63: 35,1
  - 80: 39,1

**Mounting Screw**

- ISO 7380 for Ø 24 to 50

**Type 1 Retaining Rings**

- FOR 20, 25, 30, 32, 38, 40, 48, 50, 63, 80
- M6 x 20
- M8 x 20
- M10 x 25
- M12 x 30
- M16 x 35
- M20 x 40

**Type 2 Retaining Rings**

- ISO 7380 for Ø 24 to 50
- M8 x 15
- M10 x 18
- M12 x 20
- M16 x 25
- M20 x 35

**Type 3 Retaining Rings**

- ISO 7380 for Ø 24 to 50
- M8 x 10
- M10 x 13
- M12 x 15
- M16 x 20
- M20 x 25
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