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Weldable Stub Axle / Hub
Radial Roller
Axial Roller
Mating Steel Profile

Our standard Combined Roller bearing consists of a hub, a radial bearing and an axial roller

<table>
<thead>
<tr>
<th>BEARING REFERENCE</th>
<th>Dimensions (mm)</th>
<th>D</th>
<th>T</th>
<th>d</th>
<th>H</th>
<th>h</th>
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<th>A</th>
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<th>r</th>
<th>C</th>
<th>C0</th>
<th>Ca</th>
<th>Coa</th>
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$C$ = Dynamic Load Capacity for radial roller
$C_0$ = Static Load Capacity for radial roller
$C_a$ = Dynamic Load Capacity for axial (side) roller
$C_{oa}$ = Static Load Capacity for axial roller

See page 35 for information on how to select the correct size of bearing and mating steel channel.

Notes
4.053 and 4.054 bearings do not have grease holes.
All of our bearings are pre-greased.

www.euro-bearings.com
Our adjustable Combined Roller bearings have the side (axial) roller mounted on an eccentric shaft which allows for adjustment of their height (dimension ‘h’ on the chart below).

For guidance on how to adjust the height of the face roller of our eccentric CR bearings please see page 34.

www.euro-bearings.com
These combined bearings are adjustable by introducing shims between the hub and the axial roller carrier. This enables the overall height of the bearing to be altered.

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<tr>
<th>BEARING REFERENCE</th>
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C = Dynamic Load Capacity for radial roller
C₀ = Static Load Capacity for radial roller
Cₐ = Dynamic Load Capacity for axial (side) roller
Cₒa = Static Load Capacity for axial roller
### Mating Steel Profiles

#### STANDARD CHANNEL Overview

<table>
<thead>
<tr>
<th>Profile Reference</th>
<th>Web Height (mm)</th>
<th>Flange Width (mm)</th>
<th>Channel Height (mm)</th>
<th>Weight (kg/metre)</th>
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<td>PLATE 6</td>
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SEE THE FOLLOWING PAGES FOR DETAILED DRAWINGS OF ALL OUR PROFILES

**CAD files (dwg format) available for download from our website.**

www.euro-bearings.com
PROFILE REFERENCE: **EC053**

Weight: 5.2kg per metre

Moment of Area (Wx): 11.6cm³

Material: S355J0 (cold rolled)

Use with our:

4.053 Standard Combined Roller Bearing

Other suitable bearings:

**MRS 900** Channel Ball Bearing
Profiles Reference

<table>
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<tr>
<th>Profile Reference</th>
<th>Web Height mm</th>
<th>Flange Width mm</th>
<th>Channel Height mm</th>
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PROFILE REFERENCE: 2890

Weight: 10.5kg per metre

Moment of Area (Wx): 31.7cm³

Material: S450J2

Use with our:

4.054 Standard Combined Roller Bearing
4.454 Eccentric Adjustable CR Bearing

Other suitable bearings:

4.072 Shim Adjustable CR Bearing
2.2062 Radial Roller Bearing
MRS 948 Channel Ball Bearing

www.euro-bearings.com
PROFILE REFERENCE: **2867**

Weight: 14.8kg per metre

Moment of Area (Wx): 53.0cm³

Material: S450J2

Use with our:

- **4.055** Standard Combined Roller Bearing
- **4.455** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **4.073** Shim Adjustable CR Bearing
- **2.2070** Radial Roller Bearing
- **MRS 901** Channel Ball Bearing

[www.euro-bearings.com](http://www.euro-bearings.com)
PROFILE REFERENCE: **3018**

Weight: 19.4kg per metre

Moment of Area (Wx): 70.2cm³

Material: S450J2

Use with our:

- **4.055** Standard Combined Roller Bearing
- **4.455** Eccentric Adjustable CR Bearing

**Weight:** 19.4kg per metre

**Moment of Area (Wx):** 70.2cm³

**Material:** S450J2

**Use with our:**

- **4.055** Standard Combined Roller Bearing
- **4.455** Eccentric Adjustable CR Bearing
**PROFILE REFERENCE: 2810**

Weight: 20.9kg per metre

Moment of Area (Wx): 81.3cm³

Material: S450J2

Use with our:

- **4.056** Standard Combined Roller Bearing
- **4.456** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **4.074** Shim Adjustable CR Bearing
- **2.2077** Radial Roller Bearing
- **MRS 907** Channel Ball Bearing

www.euro-bearings.com
PROFILE REFERENCE: **3019**

Weight: 25.3kg per metre

Moment of Area (Wx): 101.7cm³

Material: S450J2

Use with our:

- **4.057** Standard Combined Roller Bearing
- **4.457** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **4.075** Shim Adjustable CR Bearing

**www.euro-bearings.com**
PROFILE REFERENCE: **2811**

Weight: 28.6kg per metre

Moment of Area (Wx): 127.8cm³

Material: S450J2

Use with our:

- **4.058** Standard Combined Roller Bearing
- **4.458** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **4.076** Shim Adjustable CR Bearing
- **2.2088** Radial Roller Bearing
PROFILE REFERENCE: **3020**

- Weight: 34.1kg per metre
- Moment of Area (Wx): 160cm³
- Material: S450J2

Use with our:

- **4.058** Standard Combined Roller Bearing
- **4.458** Eccentric Adjustable CR Bearing

![Diagram of Mating Steel Profiles: STANDARD CHANNEL 3020](image-url)
PROFILE REFERENCE: 2912

Weight: 31.2kg per metre

Moment of Area (Wx): 156cm³

Material: S450J2

Use with our:

4.059 Standard Combined Roller Bearing
4.459 Eccentric Adjustable CR Bearing

Other suitable bearings:

4.077 Shim Adjustable CR Bearing

www.euro Bearings.com
PROFILE REFERENCE: 3100

Weight: 40.6kg per metre

Moment of Area (Wx): 219.1cm³

Material: S450J2

Use with our:

4.060 Standard Combined Roller Bearing
4.460 Eccentric Adjustable CR Bearing

Other suitable bearings:

4.078 Shim Adjustable CR Bearing

www.euro Bearings.com
PROFILE REFERENCE: **2862**

Weight: 36.0kg per metre

Moment of Area (Wx): 190.1cm³

Material: S450J2

Use with our:

- **4.061** Standard Combined Roller Bearing
- **4.461** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **2.2107** Radial Roller Bearing
PROFILE REFERENCE: **2891**

Weight: 42.8kg per metre

Moment of Area (Wx): 249.7cm³

Material: S450J2

Use with our:

- **4.062** Standard Combined Roller Bearing
- **4.462** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **2.2123** Radial Roller Bearing
- **4.079** Shim Adjustable CR Bearing

**www.euro-bearings.com**
PROFILE REFERENCE: **3353**

Weight: 51.4kg per metre

Moment of Area (Wx): 322cm$^3$

Material: S450J2

Use with our:

- **4.062** Standard Combined Roller Bearing
- **4.462** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **4.079** Shim Adjustable CR Bearing
- **2.2123** Radial Roller Bearing

<table>
<thead>
<tr>
<th>Profile Reference</th>
<th>Web Height mm</th>
<th>Flange Width mm</th>
<th>Channel Height mm</th>
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<th>Bearing Reference</th>
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**STANDARD CHANNEL**

**2757**

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</table>

**PROFILE REFERENCE: 2757**

Weight: 52.3kg per metre

Moment of Area (Wx): 340cm³

Material: S450J2

Use with our:

- **4.063** Standard Combined Roller Bearing
- **4.463** Eccentric Adjustable CR Bearing

Other suitable bearings:

- **4.080** Shim Adjustable CR Bearing
- **2.2149** Radial Roller Bearing

www.euro-bearings.com
The side rollers on Jumbo bearings are eccentrically adjustable.

The side rollers on Jumbo bearings are eccentrically adjustable.

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<tr>
<td>4.093</td>
<td>D 280 T 188 d 150 H 119.5 - 93.5 h 72 7.5</td>
<td>S 90 r 5</td>
<td>489 1066 182 488</td>
<td>101 173</td>
<td>FC280 / FM280</td>
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<tr>
<td>4.094</td>
<td>D 320 T 218 d 140 H 135 - 110 - 114 h 85 10</td>
<td>S 90 r 8</td>
<td>642 1370 210 422</td>
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<tr>
<td>4.095</td>
<td>D 340 T 240 d 140 H 120 - 124 h 89 10</td>
<td>S 100 r 8</td>
<td>735 1600 232 463</td>
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<td>S 100 r 8</td>
<td>1050 2243 232 463</td>
<td>101 173</td>
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</tbody>
</table>

**FC = C Section**

**FM = I Section**

C = Dynamic Load Capacity

C0 = Static Load Capacity

www.euro-bearings.com
### Mating Steel Profiles

#### JUMBO CHANNEL

**Overview**

<table>
<thead>
<tr>
<th>Profile</th>
<th>Dimensions (mm)</th>
<th>Weight (kg / m)</th>
<th>Ex (mm)</th>
<th>Ey (mm)</th>
<th>Lx (cm4)</th>
<th>Ly (cm4)</th>
<th>Wx (cm3)</th>
<th>Wy (cm3)</th>
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For profiles FC320, FC340 and FC390 please refer to our website.

---

**C SECTION**

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<tr>
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<tr>
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**I SECTION**

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<th>Lx (cm4)</th>
<th>Ly (cm4)</th>
<th>Wx (cm3)</th>
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<tr>
<td>FM165</td>
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<tr>
<td>FM190</td>
<td>190.4 255 130 20 70 55 2 100.4 65 127.5 12003 1203 941 185</td>
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<tr>
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<td>220.4 295 150 20 90 65 2 126.3 75 147.5 20991 2119 1423 283</td>
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<td>FM250</td>
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**Material:** S355
See page 35 for information on how to select the correct size of bearing and mating steel channel.
CHANNEL BALL BEARINGS

The complete assembly includes the sealed ball bearing, a metal hub (ST52) and a polyamide rubbing block.

<table>
<thead>
<tr>
<th>Assembly Part No.</th>
<th>Bearing Part No.</th>
<th>Dimensions (mm)</th>
<th>Load Centre</th>
<th>Load PROFILE</th>
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<tbody>
<tr>
<td>10000 MRS 900</td>
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<td>d 25 D 52.4 B 17 S (Max - Min) 28-27</td>
<td>R 6 A 2 to 4</td>
<td>500mm EC053</td>
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<tr>
<td>10001 MRS 948</td>
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<td>d 25 D 62.4 B 20 S (Max - Min) 33-31</td>
<td>R 5 A 5 to 8</td>
<td>500mm 2890</td>
</tr>
<tr>
<td>10002 MRS 901</td>
<td></td>
<td>d 30 D 70 B 22 S (Max - Min) 38-36</td>
<td>R 5 A 10 to 15</td>
<td>500mm 2867/3018</td>
</tr>
<tr>
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<td></td>
<td>d 30 D 78 B 22 S (Max - Min) 38-36</td>
<td>R 5 A 15 to 20</td>
<td>500mm 2810/3019</td>
</tr>
</tbody>
</table>

The bearings can be purchased separately- please use this part number.

The complete assembly includes the sealed ball bearing, a metal hub (ST52) and a polyamide rubbing block.
The Vulkollan coated bearings are available in two sizes - 52.5mm ø and 62.5mm ø. They are designed to be used with the standard channels.

The complete assembly includes the bearing, the hub, an Oilamid rubbing block & the mounting plate. The Oilamid block helps the system run true and can be adjusted via a screw.

**V.053+PLV53 - for use with EC053 rail**

**V.054+PLV54 - for use with 2890 rail**

[Dimensions and diagrams of the bearings and assemblies are shown with measurements like 50, 35, 6.5, 35, 5, 18, 5, 55, 5, 62.5, 30.5, 40, 8.5, 40, 2.5, 32, etc.]
## MOUNTING PLATES

### Overview

<table>
<thead>
<tr>
<th>Plate Reference</th>
<th>Dimensions (mm)</th>
<th>For Bearing</th>
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<tbody>
<tr>
<td>PL00</td>
<td>X: 4.053</td>
<td>Y: 90</td>
</tr>
<tr>
<td>PL0</td>
<td>X: 4.054</td>
<td>Y: 100</td>
</tr>
<tr>
<td>PL1</td>
<td>X: 4.055</td>
<td>Y: 120</td>
</tr>
<tr>
<td>PL2</td>
<td>X: 4.056</td>
<td>Y: 120</td>
</tr>
<tr>
<td>PL3</td>
<td>X: 4.058</td>
<td>Y: 120</td>
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</tbody>
</table>

**PLATES CAN BE SUPPLIED INDIVIDUALLY OR WELDED TO A BEARING**

[www.euro-bearing.com](http://www.euro-bearing.com)
Standard Mounting Plates

NOTE: THIS DRAWING IS NOT TO SCALE

MOUNTING PLATE

PL00

THICKNESS: 10mm

PLATE REFERENCE: PL00

WELD TO BEARING: 4.053

USE WITH

STEEL CHANNEL: EC053

www.euro-bearings.com
Standard Mounting Plates

THICKNESS: 10mm

PLATE REFERENCE: **PL0**

WELD TO BEARING: 4.054 or 4.454 or 4.072 or 2.2062

USE WITH

STEEL CHANNEL: **2890**

www.euro-bearing.com
THICKNESS: 15mm

PLATE REFERENCE: PL1

WELD TO BEARING: 4.055 or 4.455 or 4.073 or 2.2070

USE WITH

STEEL CHANNEL: 2867

www.euro-bearing.com
THICKNESS: 15mm

PLATE REFERENCE: PL2

WELD TO BEARING: 4.056 or 4.456 or 4.074 or 2.2077

USE WITH

STEEL CHANNEL: 2810

www.euro-bearing.com
THICKNESS: 20mm

PLATE REFERENCE: PL3

WELD TO BEARING: 4.058 or 4.458 or 4.076 or 2.2088

USE WITH

STEEL CHANNEL: 2811
THICKNESS: 20mm

PLATE REFERENCE: PL4

WELD TO BEARING:
4.061 or 4.461 or 2.2107
4.062 or 4.462 or 2.2123

USE WITH
STEEL CHANNEL: 2862 or 2891
PLATE REFERENCE: **PL6**

WELD TO BEARING: **4.063** or **4.463** or **4.080** or **2.2149**

USE WITH

STEEL CHANNEL: **2757**
<table>
<thead>
<tr>
<th>CLAMP REFERENCE</th>
<th>FOR PROFILE REFERENCE</th>
<th>Dimensions (mm)</th>
<th>Weight (kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CF0</td>
<td>2890</td>
<td>121.3 x 60 x 130 x 10 88.5 44.5 41.0 10.8 100 40 6 11 18 20.5 M10x30</td>
<td>1.62</td>
</tr>
<tr>
<td>CF1</td>
<td>2867</td>
<td>135.4 x 60 x 130 x 10 105.0 38.5 53.0 12.7 100 40 6 11 18 26.5 M10x30</td>
<td>1.95</td>
</tr>
<tr>
<td>CF2</td>
<td>2810</td>
<td>157.2 x 80 x 160 x 15 123.0 49.5 61.2 14.0 130 60 6 13 18 30.6 M12x35</td>
<td>3.70</td>
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<tr>
<td>CF3</td>
<td>2811</td>
<td>175 x 80 x 160 x 15 137.5 46.9 66.2 16.2 130 60 6 13 18 33.1 M12x35</td>
<td>4.20</td>
</tr>
<tr>
<td>CF4</td>
<td>2862</td>
<td>201.5 x 80 x 160 x 15 159.0 44.4 71.2 19.4 130 60 6 13 18 35.6 M12x35</td>
<td>5.05</td>
</tr>
</tbody>
</table>
1. HOW DO WE MOUNT THE BEARINGS?

The stub axle of the bearing is made from ST52 which is a weldable steel. The best method is to drill a hole to locate the stub diameter marked ‘d’ in the drawings and to then weld from behind. The 45° chamfer (weld gusset) allows the weld to be kept flat, in case you need to use that area for rolling another bearing over. You do NOT have to disassemble the bearing to weld it into position- just keep the torch or arc away from the hardened steel radial roller and axial roller.

2. HOW DO YOU LUBRICATE THE BEARING?

All but the smallest sizes (4.053 and 4.054) of our standard range of Combined Roller Bearings have a threaded lube hole and hex-headed plug to allow the insertion of a grease nipple. Remove the plug to allow for the insertion of the grease nipple. If the nipple cannot be left in place for operational reasons, re-insert the plug. Use a good quality bearing grease (EP3 Lithium grease). Nipples are not supplied but the holes are standard metric threads.

The standard bearings are pre-lubricated and can be run without any further lubrication.

The adjustable types are also pre-lubricated but they are not re-lubricable.

3. ARE THE BEARINGS SEALED?

All ranges of the bearings are sealed with either metal or rubber shields. All our standard range of Combined Roller Bearings have composite rubber / metal shields. The adjustable (eccentric) types all have rubber seals. Both types of seals are very effective and these bearings are used in a variety of industrial environments.

Further information can be found on our website: www.euro-bearings.com
HOW TO ADJUST AN
ECCENTRIC CR BEARING

Adjusting the axial roller position:

STEP 1: Unscrew the four screws holding the front plate in position.

STEP 2: Rotate the axial bearing to the desired position.

STEP 3: Measure dimension ‘A’ (dimension ‘A’ on page 3).

STEP 4: Insert and tighten the four screws holding the front plate in position. Use a drop of adhesive (eg. Loctite threadlocker) on the screw thread to secure them permanently.

NB.
The series 4.454 through to 4.461 have splined eccentric shaft ends. 4.462 and 4.463 have hexagonal eccentric shaft ends. Both function in the same way.
SELECTING THE CORRECT SIZE OF BEARING & STEEL PROFILE

There are two important considerations when deciding which bearings to use:

a) Moments AND b) Hertzian Pressure

a) MOMENTS - the force on the bearing depends upon the distance between the load and the point of suspension and also the distance between the bearings and the point of suspension.

The location of the bearing with respect to the suspension point is critical in determining the force acting upon the bearing. The Hertzian static load capacity of the chosen bearing must not be exceeded and this therefore limits the maximum allowable load.

Using the moment-balance formula, the bearing distance can be calculated from:

\[ I = \frac{(P \cdot L)}{(2 \cdot C)} \]

where:

\( P \) = Weight of the load being moved in Newtons (N)
\( L \) = Distance between the load and \( P \), the suspension point (mm)
\( I \) = Distance of bearings from the suspension point (mm)
\( C \) = Maximum allowable static force per bearing, determined by Hertzian Pressure (see page 38)

This formula can be rearranged to calculate the static force generated:

\[ C = \frac{(P \cdot L)}{(2 \cdot I)} \]

And this value of \( C \) can then be compared with those given in the Hertzian Pressure data (provided by the table on page 38) to determine which bearing is best suited to the loading conditions. Please see the worked example on page 37.

This diagram shows the various dimensions required for calculating the moments and hertzian pressure.
b) HERTZIAN PRESSURE- the pressure on the profile should not exceed the tensile strength of the profile in order to prevent depressions in the steel channel. By ensuring that the maximum pressure is less than 750N/mm² (for S355 steel) and 900N/mm² (for S450J2 steel) such depressions should be prevented.

The table on the last page shows the approximate maximum static force on each bearing based on 0.31% of the bearing’s surface area being in contact with the channel at any moment in time.

HORIZONTAL TELESCOPIC ARRANGEMENTS

If your application involves a horizontal telescopic slide then you will need to use the following equations:

\[
C_A = \frac{P \times L}{2 \times I} \quad C_B = C_A + \frac{P}{2}
\]

Ususally $C_B$ will be the largest force.
A 2 tonne load is placed 600mm from the point of suspension (dimension \(L\)). The bearings are spaced 500mm apart (dimension \(I\)). Which size of bearing should be used?

Using the Moment-Balance formula (from the previous page):

\[
C = \frac{(P \cdot L)}{(2 \cdot I)}
\]

Assuming the bottom pair of bearings are level with the point of suspension then the value \(I = 500\)mm. The load is cantilevered out at 600mm and hence this is the value of \(L\). In this example \(P = 20,000\)N (the 2 tonne load on the forks).

Substituting these values into the equation gives \(C = 12,000\)N

Looking up this value of \(C\) (for the Radial Roller) on the Hertzian Pressure table (see page 38) shows that 4.058 is the required bearing size.

Please call if you need help with any of these calculations.

Telephone: 01908 511733

or email:

sales@euro-bearings.com
### Hertzian Pressure Table

<table>
<thead>
<tr>
<th>Bearing Reference</th>
<th>Diameter (mm)</th>
<th>Circumference (mm)</th>
<th>Contact Width (mm)</th>
<th>Approx. Contact Area (mm²)</th>
<th>Steel Grade</th>
<th>Maximum Static Force / Hertzian Pressure C (Newton)</th>
<th>Maximum Static Force / Hertzian Pressure Ca (Newton)</th>
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<tbody>
<tr>
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www.euro-bearings.com