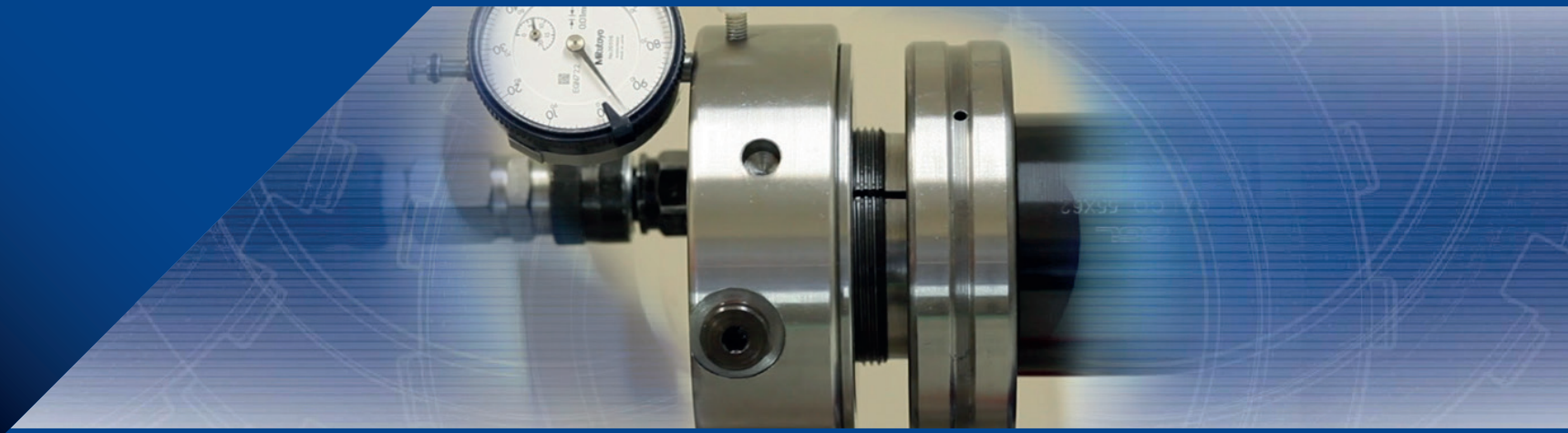
BERTOLOTO & GROTTA

Sleeve for Bearings

Instructions for Assembling and Disassembling Sleeves under Self-aligning Bearings with Tapered Bore



Video 09: ASSEMBLING of WITHDRAWAL SLEEVE under self-aligning ROLLER BEARING with HYDRAULIC NUT

See the step-by-step procedure at **www.bgl.com.br/en/treinamento.htm**
Technical Videos - **Video 09**

BGL Application Engineering

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Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

INITIAL ARRANGEMENTS

01

Keep the workplace dry and dust-free.

02

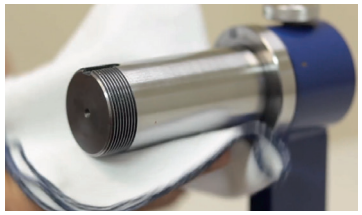
Select the adequate tools.

03

It is important that, before unpacking the parts, you compare the designation of the package with your needs.

04

The shaft may show contact corrosion or abrasion and it must be carefully cleaned.

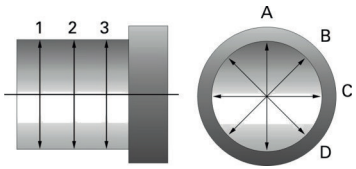


05

Next, check the dimensional precision and the shape of the shaft that will be in contact with the Sleeve.
The shaft dimension must be within the tolerance of maximum h10 and cilindricity IT5/2 or—at low rotations—IT7/2.

⚠ ATTENTION

The shaft diameter must be checked using a micrometer in four positions in two or three planes.



Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

Assembling Procedures

06

Remove the package from the bearing, remove the protective oil from the bore and also from the external diameter.

Note: The shaft needs to be scaled.

07

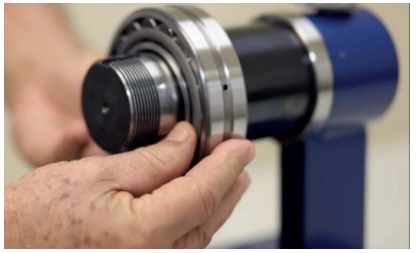
With a feeler gauge, measure the initial clearance between the external ring and the bearing roller which shows to be the most free and write it down for usage with the clearance reduction table.

Nominal measure of the internal diameter d (bore bearing)		Bearing Radial Clearance Before Assembly							
		Clearence Group							
		C2		Normal		C3		C4	
Greater than	Up to including	max.	min.	max.	min.	max.	min.	max.	min.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
24	30	0,020	0,030	0,030	0,040	0,040	0,055	0,055	0,075
30	40	0,025	0,035	0,035	0,050	0,050	0,065	0,065	0,085
40	50	0,030	0,045	0,045	0,060	0,060	0,080	0,080	0,100
50	65	0,040	0,055	0,055	0,075	0,075	0,095	0,095	0,120
65	80	0,050	0,070	0,070	0,095	0,095	0,120	0,120	0,150
80	100	0,055	0,080	0,080	0,110	0,110	0,140	0,140	0,180
100	120	0,065	0,100	0,100	0,135	0,135	0,170	0,170	0,220

Radial Clearance Reduction Calculation Example:
Bearing: **22212 K/C3 with 60 mm bore**
Initial Clearance: **0.08 mm**

08

And put it on the shaft.



Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

09

Unpack and clean the Sleeve.

10

Put a thin film of oil on the internal and external surfaces of the Sleeve. This procedure will help in the assembling process.

11

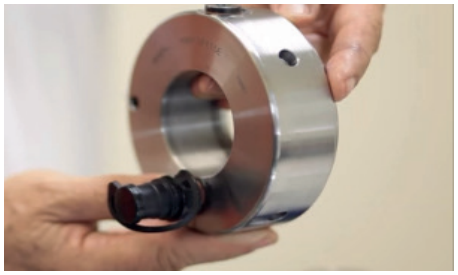
Put the Sleeve on the shaft. If necessary, enlarge it inserting a screwdriver in the slot and then move it under the bearing until you get a firm contact.

Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

ATTENTION

The assembling of the Withdrawal Sleeve under the self-aligning bearing with internal diameter above 50 mm gets extremely easier when you use the Hydraulic Nut and the comparator dial.

Note: In this example a Withdrawal Sleeve AHX 312 was used with the Hydraulic Nut HMV 11E.



12

Insert the Hydraulic Nut in the shaft thread, with the plunger turned to the Withdrawal Sleeve.

13

Use a straight pin spanner (chave de pino reta -CPR), to get a proper contact between the bearing, the Sleeve and the shaft.

Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

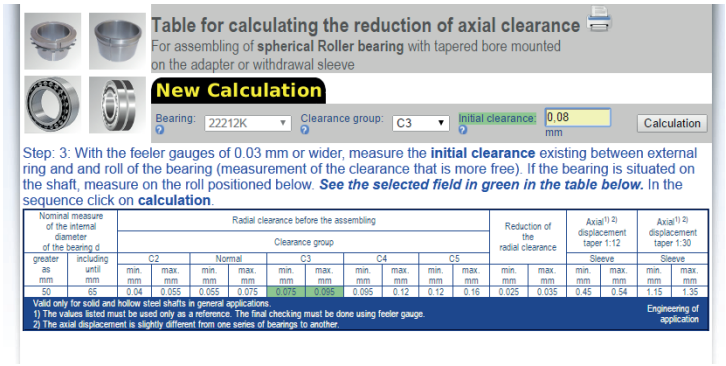
14

Perform the online calculation of clearance reduction accessing:

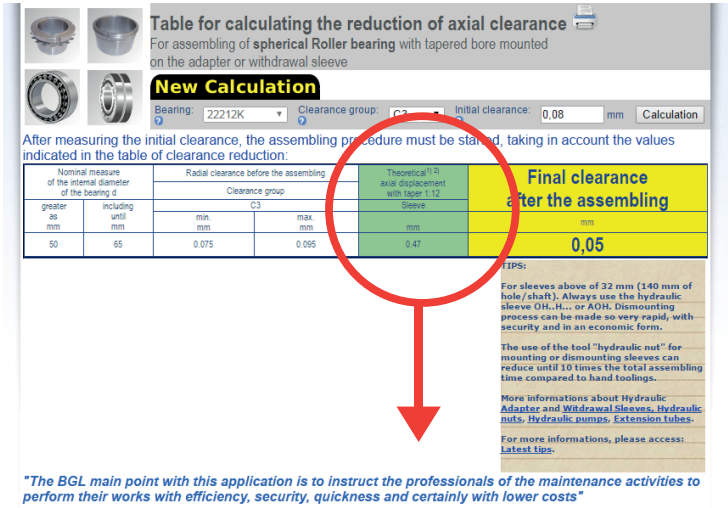
www.bgl.com.br/en/catalogo

Step 1

Step 2



Step 3



"The BGL main point with this application is to instruct the professionals of the maintenance activities to perform their works with efficiency, security, quickness and certainly with lower costs"

In this example, we are using the axial displacement value (0.47 mm) related to the use of Hydraulic Nut for assembling.

Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

15

You can also consult the Printed **Table of Radial Clearance Reduction** to assemble Self-Aligning **Roller Bearings** with Tapered Bore. Order yours from BGL.

Radial Clearance Reduction Calculation Example:

Bearing: **22212 K/C3 with 60 mm bore**

Initial Clearance: **0.08 mm**

Reduction: **0.03 mm**

Final Clearance: **0.05 mm**

Axial Displacement: **0.47 mm**

Nominal measure of the internal diameter d (bore bearing)		Bearing Radial Clearance Before Assembly										Reduction of Bearing Radial Clearance		Axial Taper "S" 1)2)			
		Clearence Group												Axial Displacement Taper 1:12		Axial Displacement Taper 1:30	
		C2		Normal		C3		C4		C5							
Greater than	Up to including	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.
mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
24	30	0,020	0,030	0,030	0,040	0,040	0,055	0,055	0,075	-	-	0,010	0,015	0,250	0,290	-	-
30	40	0,025	0,035	0,035	0,050	0,050	0,065	0,065	0,085	0,085	0,105	0,015	0,020	0,300	0,350	–	–
40	50	0,030	0,045	0,045	0,060	0,060	0,080	0,080	0,100	0,100	0,130	0,020	0,025	0,370	0,440	–	–
50	65	0,040	0,055	0,055	0,075	0,075	0,095	0,095	0,120	0,120	0,160	0,025	0,035	0,450	0,540	1,150	1,350
65	80	0,050	0,070	0,070	0,095	0,095	0,120	0,120	0,150	0,150	0,200	0,035	0,040	0,550	0,650	1,4	1,65
80	100	0,055	0,080	0,080	0,110	0,110	0,140	0,140	0,180	0,180	0,230	0,040	0,050	0,660	0,790	1,650	2,000
100	120	0,065	0,100	0,100	0,135	0,135	0,170	0,170	0,220	0,220	0,280	0,050	0,060	0,790	0,950	2	2,35
120	140	0,080	0,120	0,120	0,160	0,160	0,200	0,200	0,260	0,260	0,330	0,060	0,075	0,930	1,100	2,300	2,800
140	160	0,090	0,130	0,130	0,180	0,180	0,230	0,230	0,300	0,300	0,380	0,070	0,085	1,050	1,300	2,65	3,2
160	180	0,100	0,140	0,140	0,200	0,200	0,260	0,260	0,340	0,340	0,430	0,080	0,095	1,200	1,450	3,000	3,600
180	200	0,110	0,160	0,160	0,220	0,220	0,290	0,290	0,370	0,370	0,470	0,090	0,105	1,300	1,600	3,3	4
200	225	0,120	0,180	0,180	0,250	0,250	0,320	0,320	0,410	0,410	0,520	0,100	0,120	1,450	1,800	3,700	4,450
225	250	0,140	0,200	0,200	0,270	0,270	0,350	0,350	0,450	0,450	0,570	0,110	0,130	1,600	1,950	4	4,85
250	280	0,150	0,220	0,220	0,300	0,300	0,390	0,390	0,490	0,490	0,620	0,120	0,150	1,800	2,150	4,500	5,400
280	315	0,170	0,240	0,240	0,330	0,330	0,430	0,430	0,540	0,540	0,680	0,135	0,165	2,000	2,400	4,95	6
315	355	0,190	0,270	0,270	0,360	0,360	0,470	0,470	0,590	0,590	0,740	0,150	0,180	2,150	2,650	5,400	6,600
355	400	0,210	0,300	0,300	0,400	0,400	0,520	0,520	0,650	0,650	0,820	0,170	0,210	2,500	3,000	6,2	7,6
400	450	0,230	0,330	0,330	0,440	0,440	0,570	0,570	0,720	0,720	0,910	0,195	0,235	2,800	3,400	7,000	8,500
450	500	0,260	0,370	0,370	0,490	0,490	0,630	0,630	0,790	0,790	1,000	0,215	0,265	3,100	3,800	7,8	9,5
500	560	0,290	0,410	0,410	0,540	0,540	0,680	0,680	0,870	0,870	1,100	0,245	0,300	3,400	4,100	8,400	10,300
560	630	0,320	0,460	0,460	0,600	0,600	0,760	0,760	0,980	0,980	1,230	0,275	0,340	3,800	4,650	9,5	11,6
630	710	0,350	0,510	0,510	0,670	0,670	0,850	0,850	1,090	1,090	1,360	0,310	0,380	4,250	5,200	10,600	13,000
710	800	0,390	0,570	0,570	0,750	0,750	0,960	0,960	1,220	1,220	1,500	0,350	0,425	4,750	5,800	11,9	14,5
800	900	0,440	0,640	0,640	0,840	0,840	1,070	1,070	1,370	1,370	1,690	0,395	0,480	5,400	6,600	13,500	16,400
900	1000	0,490	0,710	0,710	0,930	0,930	1,190	1,190	1,520	1,520	1,860	0,440	0,535	6,000	7,300	15	18,3
1.000	1.120	0,530	0,770	0,770	1,030	1,030	1,300	1,300	1,670	1,670	2,050	0,490	0,600	6,400	7,800	16,000	19,500
1.120	1.250	0,570	0,830	0,830	1,120	1,120	1,420	1,420	1,830	1,830	2,250	0,550	0,670	7,100	8,700	17,8	21,7
1.250	1.400	0,620	0,910	0,910	1,230	1,230	1,560	1,560	2,000	2,000	2,450	0,610	0,750	8,000	9,700	19,900	24,300
1.400	1.600	0,680	1,000	1,000	1,350	1,350	1,720	1,720	2,200	2,200	2,700	0,700	0,850	9,100	11,100	22,7	27,7
1.600	1.800	0,750	1,110	1,110	1,500	1,500	1,920	1,920	2,400	2,400	2,950	0,790	0,960	10,200	12,500	25,600	31,200

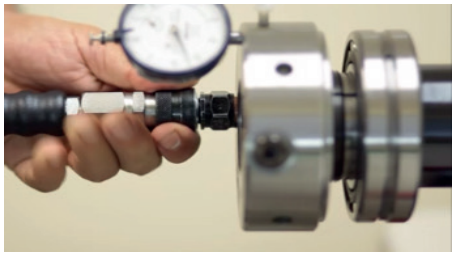
Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

16

Next, insert the comparator dial into the Hydraulic Nut and tie it with the nylon screw.

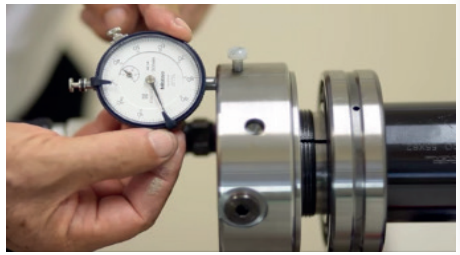
17

Tie the Pump hose to the quick coupling of the Hydraulic Nut.



18

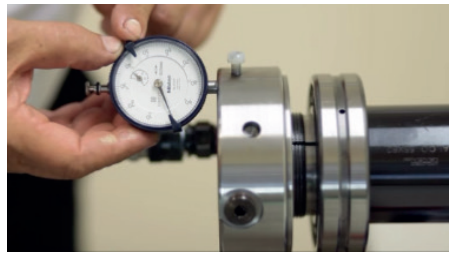
Set the comparator dial indicator to zero (0).



19

After that, consult the Axial Displacement Table to know the amount to be displaced and set the second marker to the figure in the table.

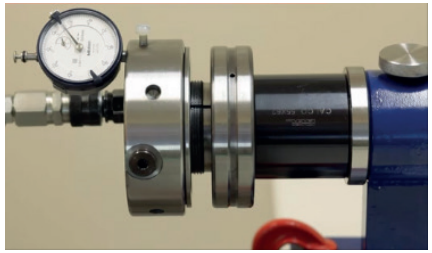
Axial Displacement: 0.47 mm



Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

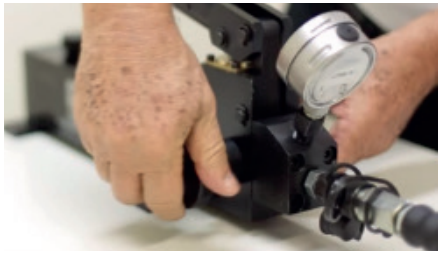
20

Pump the oil to the Hydraulic Nut, displacing the plunger, observing on the comparator dial the clearance reduction by axial displacement.



21

Upon reaching the desired axial displacement, relieve the Pump pressure and remove the comparator dial.



22

With the pin spanner, tighten the Hydraulic Nut moving back the plunger for the oil to return to the Pump.

Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

23

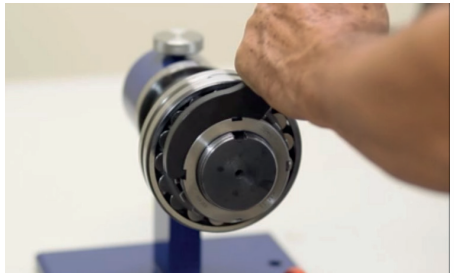
Disconnect the Pump, remove the Hydraulic Nut and check the final radial clearance with the feeler gauge.

24

Put the MB Lockwasher.

25

Firmly tighten the Locknut using an HN Hook Spanner.



Video 09: **ASSEMBLING** of **WITHDRAWAL SLEEVE** under self-aligning **ROLLER BEARING** with **HYDRAULIC NUT**

26

Align the nearest notch of the Nut with the external jut of the Washer and, with the help of a pricker, bend it.

27

To finish, make sure the bearing can be turned easily with your hands.

To disassemble, see **Video 15** at **www.bgl.com.br/en/treinamento.htm**

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Catalog Download:
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Reference Technical Standards:
ABNT NBR 16535-1: SLEEVES FOR BEARINGS
ABNT NBR 16535-2: LOCKNUTS AND LOCKWASHERS

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