



ghiringhelli

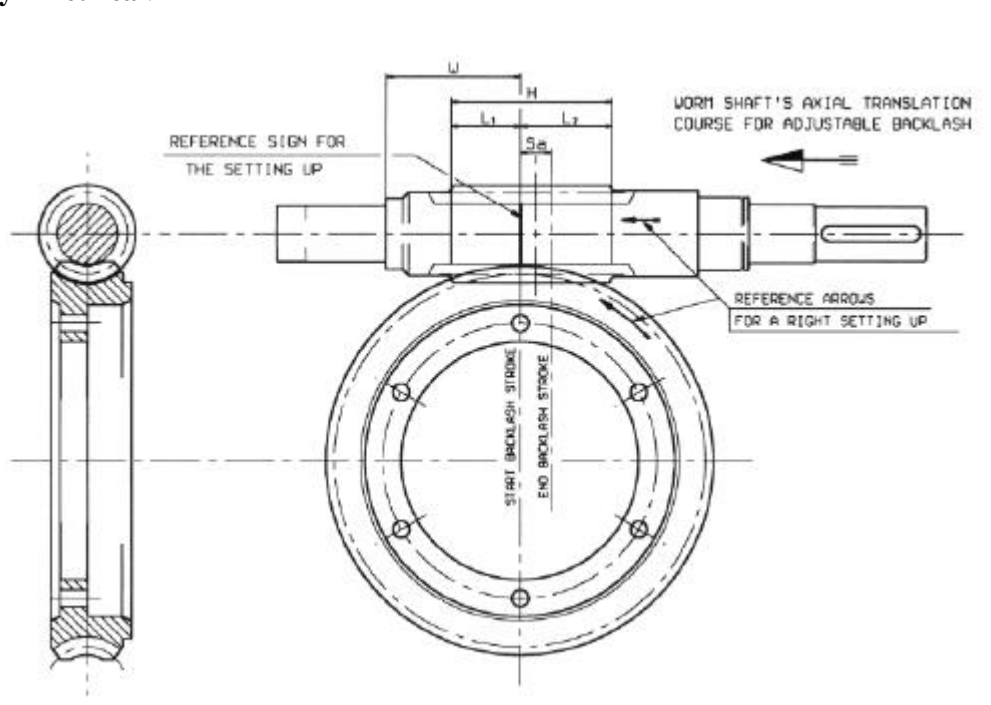
Worm Wheel set with Adjustable Backlash: Application's advices

The Project:

For plan a worm wheel set with adjustable backlash correctly, it's very important fix the measures and the worm wheel set's total drawing. The drawing must transfer the starting measure of the setting up (**W**) and the worm shaft's translation course for the adjustable backlash.

The backlash is recovered with the worm shaft's axial translation: foresee an axial translation of 1/10 of the size.

For avoid reversals of position during the setting up, the worm wheel made of Bronze **must be asymmetrical**.



- **The box:** all the adjacent elements must be worked with the right precision and the worm wheel set's setting up must be executed with the possibility of registration during the setting up. During the executive step we suggest: bore the boxes with a tolerance of 5 Js on the size.
- **The Worm Shaft:** with the first setting up, the thread will stick out respect to the worm wheel; then, with a right running in, the worm shaft will "go back" on the worm wheel and it will shift more and more with the following and necessary registrations for recover the backlash.

Ghiringhelli S.r.l.
I - 20091 Bresso (MI)
Via Vittorio Veneto 109

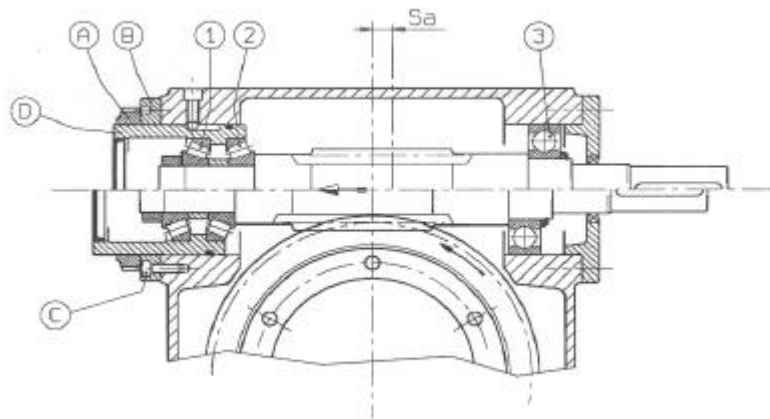
Tel. ++39-02-6108941
Fax. ++39-02-6104748
E-mail info@ghiringhelli-srl.com
Web Site: www.ghiringhelli-srl.com

C.F.-P.I.: 00840170153
C.C.I.A.A. Milano n. 175647
Tribunale di Milano n.
159718/3896/18



- **The Worm Wheel:** the worm wheel's setting up must be stiff. The coupling on the mounting wheel hub must be lightly forced (tolerances: shaft k, m and hole H). We suggest: foresee the setting up with a heating (70° C) of the worm wheel.
- **The Supports:** they must foresee the possibility of the axial translation thanks to thickness rings or registration lockrings (Example A – B). For the worm shaft's support, You can use normal ball bearings with a axial pre-load . Foresee the possibility of execute the axial registration also on the worm wheel, so you will avoid the disassembling of machine's complex elements.

Example A

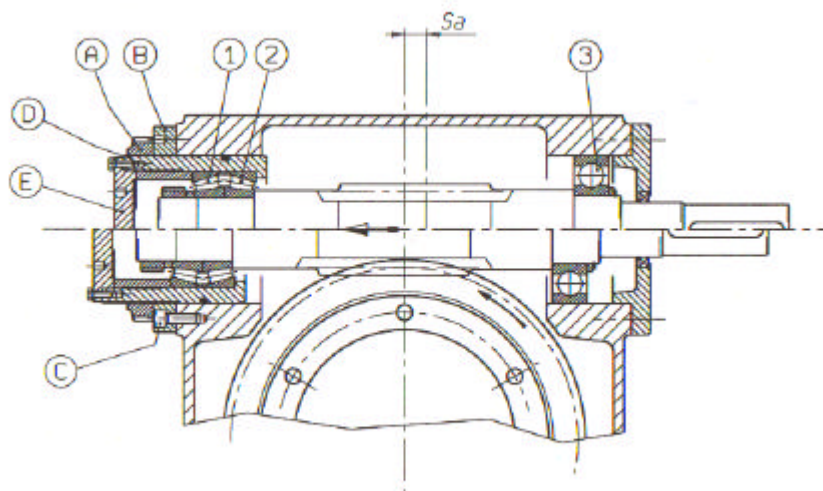


Notes:

- 1 – 2** : ball bearing with “O” arrangement and axial blocked.
- 3** : ball bearing axial free.
- A** : opposed lockring.
- B** : lockring.
- C** : screw.



Example B



Notes:

- 1 – 2 : ball bearings with “X” arrangement and axial blocked.
- 3 : ball bearing axial free.
- A : opposed lockring.
- B : lockring.
- C : Screws.
- D : bushing
- E : flange

For the setting up of the worm wheel set, we suggest: follow the instructions enclosed with the delivery of the set.

The Running in:

As for all the worm wheel set with adjustable backlash, a running in period is obligatory.

The Lubrication:

We don't suggest a grease lubrication because there isn't a “washing”, and so the breded heat is preserved in the coupling's area: risk of expansions and overheating.



With a oil lubrication, the peripheral speed must be $s_p < 8 - 9 \text{ m/1}''$. With a grease lubrication the peripheral speed must be $s_p < 1-1.5 \text{ m/1}''$

Suggested Viscosity for lubricant with mineral base:

Peripheral Speed (m/S)	< 3	3 - 6	> 6
ISO VG	680	460	320
Viscosity cSt (40° C)			

Using synthetic lubricant oil: please call us !!

Remember:

The backlash, between the worm and the wheel, can be checked and preserved with in limited values but **not completely erase**.

If the worm wheel set will be mounted and lubricated according these advices, it will preserve the requested backlash and, during its cycle of life, will be necessary 3 – 4 registrations.