



ghiringhelli

Worm Gears - Helical Wheel with Adjustable Backlash: Fitting Instructions

Foreword

We remind you that our worm and wheel sets are **not without backlash but with adjustable backlash** and therefore don't work with zero backlash.

Avoid, during assembly, shocks and distortions and follow carefully the operations as listed.

Fitting:

- Operation n. 1:** Before starting you must have on hand.
- Fitting drawing
 - Certificate of the marks as supplied with the gear
 - Marking compound
 - Very fluid hydraulic oil
 - Comparator (with hundreds of a mm)
 - Equipment for heating the bronze wheel
- Operation n. 2.0:** The bronze wheel has a precise position with respect to the worm and must be fit **exactly with the same direction as specified in the drawing.**
- Operation n. 2.1:** The wheel must be forced with interference on its hub. Before you do this, heat the wheel up to 60-70 C
- Operation n. 3:** Place exactly the median portion of the helical wheel with respect to the hub of the worm.
- Operation n. 4:** Put marking compound on the worm and insert it carefully till it touches the wheel. Check that the bearings of the screw remain in their seat.
- Operation n. 5:** On the certificate of mating the mark obtained on our test bench is marked. Before running in, verify that the mark on the worm wheel is similar. If not, move the wheel along its hub till the mark is the correct one.

Should a problem arise, verify operations 2 and 3.



Operation n. 6: By moving the worm by hand you detect that the mating becomes harder. Move the worm on its hub till the minimum backlash is obtained.

Remember that a few thousands of a mm of total eccentricity may produce points where backlash becomes zero.

Block the screw on its hub when the harder position is reached.

The adjustment after running in (operation 8) will settle everything.

Operation n. 7: **Backlash must be measured on the wheel only. Before checking backlash, verify that the worm is blocked on its hub.**

Operation n. 8: **Avoid to change the profile of the flanks of the wheel or of the worm. In this case the guarantee is no more valid.**

If there are problems in mating, carefully verify the drawings, the dimensions and the procedure followed in the fitting.

Operation n. 9: For better results and minimum backlash, running in **must be done** while the machine operates normally. Have the worm gear operate at low speed for some hours in an oil bath using highly fluid hydraulic oil.

Stop running in to adjust backlash. Continue for 2-3 hours increasing speed and changing sense of rotation. If necessary repeat the operation.

Control the temperature during running in and avoid overheating.

The temperature should not be more than 20 C higher than the room temperature.

Operation n. 10: At the end of running in discharge the exhaust oil and, if possible, wash the oil pan with a solution. Don't worry if at this stage you notice small pieces of bronze, this is normal. Fill in the oil pan with dense oil, as indicated in the specifications.

ADVICE. DON'T DISPOSE OF OIL IN THE ENVIRONMENT