Assembly Instructions

Hollow shafts with shrink discs for MGS gear units

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1. General information

Shaft-mounted gear units are mounted on the input shaft of the machine to be driven. Reaction torque must be taken up either by flange-mounting of the gear unit to the machine or by a torque arm. In the case of flange mounting, a deviation from a right angle to the axis of the shaft of 0.03/ 100 mm must not be exceeded, due to the danger of warping the bearings or placing unacceptable bending stress on the machine shaft.

2. Technical description of the shrink disc connection

The gear unit hollow shaft is connected to the smooth machine drive shaft by frictional engagement through elastic constriction of the hollow shaft by a shrink disc. This shaft-hub connection is totally free of backlash and hence also wear-free. Because of its self-centring property, it can transfer high torques and axial thrusts with at the same time high rotational accuracy. The hollow shaft is manufactured from heat-treated steel.

The connecting dimensions of thr machine driving shaft can be found in the dimension sheets "hollow shaft for shrink ring connection" from the STÖBER catalogue (valid for standard design, with special design query at the workshop necessary).

The hollow shafts have a different design depending on the gearbox sizes:

Hollow shafts with slots at the shrink fit:
Machine shaft must have **tolerance ISO h9!**

Hollow shafts without slots at the shrink fit:
Machine shaft must have **tolerance ISO h6!**

Caution! The hollow shaft may not be charged on the shrink disc side with a radial operation power.

3. Assembly, disassembly

3.1. General information

Where gear units are supplied with a shrink disc, this is already seated on the hollow shaft end and is thus ready to fit (tapered surfaces and screws of the shrink disc are greased at the factory).

N.B. The clamping bolts on the shrink disc must never be tightened before the machine shaft has been mounted, because otherwise the inner ring and hollow shaft hub will be deformed plastically.

3.2. Preparatory assembly work

a) De-grease the machine shaft in the pressure region of the shrink disc.
b) Remove closing and covering caps from hollow shaft and shrink disc.
c) Clean shrink fit and support fit of the hollow shaft hole to remove protective paint.

Important:
Hollow shaft hole and machine shaft must be free of grease in the region of the shrink fit!

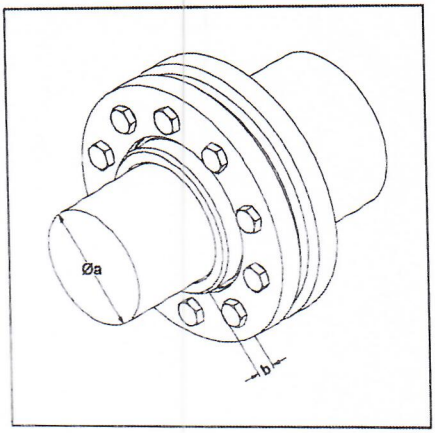
3.3. Assembly sequence

Slide the gear unit onto the machine shaft (do not use hammer!) and bring into position.

N.B. The following fitting instructions apply only to shrink discs supplied by us. For shrink discs from other manufacturers the instructions and safety notes in the respective documentation apply.

For slotted hollow shafts the dimension "b" must be taken into consideration!

Uniformly tighten the hexagon screws of the shrink disc subsequently (not in a diagonally opposite sequence) in several tightening operations (about 1/4 to 1/2 a turn each time) until all the screws have the necessary prestress by being tightened to the prescribed torque. It is essential to ensure that both shrink disks are absolutely plane-parallel (max. 0,2 mm) to one another (measure distance at various points).



øa	20	25	30	35	40	50
b	2	3	3	3	3	4

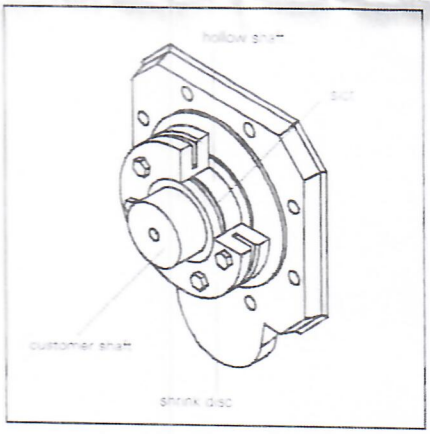
Screws	M5 8.8	M6 10.9/12.9	M8 10.9/12.9	M10 10.9/12.9	M12 10.9/12.9	M14 12.9
Spanner size [mm]	8	10	13	16	18	21
Tightening torque [Nm] (at μ total = 0,1	5	12/14	30/35	59/69	100/120	190

The tightening torque must correspond to the values in the table, and be checked with a torque spanner.

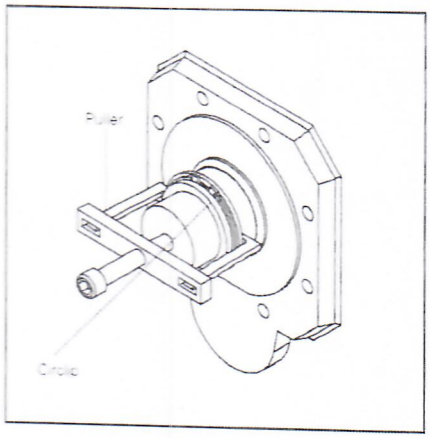
N.B. Covers or protective devices must be mounted correctly before commissioning the drive

3.4. Disassembly

Protect drive against unintentional power-up! Remove covers on the shrink disk. Loosen the screws of the shrink disc subsequently in several operations, initially only in (approx.) quarter turns (to avoid tilting the shrink disks).
N.B. Do not unscrew the screws completely from the tapped holes. The shrink disc could spring off (risk of injury).



Once the screws and shrink discs have been loosened, the frictional engagement between hollow shaft and machine shaft normally no longer exists. If necessary please remove the shrink disc and put the circlip into the key to pull the machine shaft off. If the shrink disc has to be cleaned, the screws and conical surface must be relubricated afterwards using a MoS2-based grease.



Assembly instructions

with backlash-free axially puggable shaft coupling for motors with shaft without keyway

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1. General information

Motor adapters with backlash-free, axially pluggable shaft coupling allow servo motors to be mounted to STÖBER MGS gear units and planetary gear units. The motors to be mounted have a smooth shaft without key, for the shaft end and the mounting flange normal rotational accuracy, axial run-out and concentricity values to DIN 42955-N suffice.

The centring diameter must be produced to tolerance ISO j6, the shaft end to tolerance ISO k6.

***Fig. 1** shows the three-part coupling with the clamping ring hub on the motor side, the plastic ring gear and the coupling hub on the gear unit side.*

***Important:** Make sure that the motor shaft shoulder and the motor flange face are in one plane. **Permissible misalignment ± 0.4 mm (Figure 2).** The plastic ring gear must not be axially displaced or strained!*
Make sure there are no screws or similar components projecting from the flange face in the motor flange area.

Provided these assembly instructions are complied with, the shaft coupling works backlash-free due to the interference fit of clamping ring hub and motor shaft and the elastic bracing of the plastic ring gear in the coupling claws. Maintenance of the coupling is not required.

Caution! Because of the elastomeric ring gear of the coupling, the working temperature of the fitted motor may only be 100° C max. at its flange and shaft. In the event of higher temperatures, please consult the manufacturer.

2. Assembly

- *Remove paper cover from adapter housing.*
- ***Check:** The tooth flanks of the plastic ring gear must be greased.*
- *Degrease motor shaft and bore hole of the coupling hub on the motor side.*

Straining ring design:

- *Fit coupling hub on motor shaft right up to the shaft shoulder, with unfavourable fit if neccesary warm up the coupling hub up to 70° C. **check axial position!***
- *Gradually tighten straining screws on coupling hub in a diagonally opposite sequence with a torque spanner to the tightening torques given in Table 1. (with heated coupling hub after cooling down to room temperature).*

Clamping ring design:

- *Measure the axial position of the coupling hub. Make sure there is a gap of 2 mm (see Figure 3).*
- *Gradually tighten clamping screw on coupling hub according to Table 3.*

- *Screw motor to adapter housing, tighten fixing screws to the tightening torques given in table 2.*

Note: When placing the motor on the adapter housing, make sure that the claws of the motor-side coupling hub join between the slightly bevelled teeth of the plastic ring gear.

3. Disassembly

- ***Make sure the motor is isolated from the supply and completely de-energized!***
- *Unscrew motor and take it off.*
  Caution in the case of hoisting or lifting operations!
  The gear unit is not self-locking.
  To prevent the load from falling down, it is absolutely mandatory that the applicable safety instructions (e.g. VBG) are strictly observed!
- *Undo clamping screws of coupling hub by several turns.*
- *Remove the screws next to the forcing screw threads, screw into forcing screw threads and force off clamping ring from the conical coupling hub by gradually tightening the screws in a diagonally opposite sequence.*

Table 1:

Straining screws of coupling hub	*Tightening torque [Nm]*
M4	***3***
M5	***5,9***
M6	***10***
M8	***36***

Table 2:

Motor fixing screws	*Tightening torque [Nm]*
M8	***25***
M10	***49***
M12	***85***

Table 3:

Clamping screws of coupling hub	*Tightening torque [Nm]*
M4	***2,9***
M6	***10***
M8	***25***

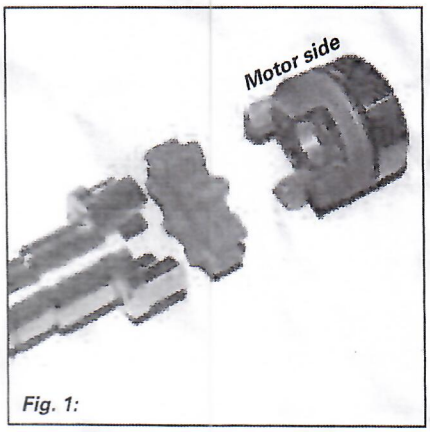

Fig. 1:

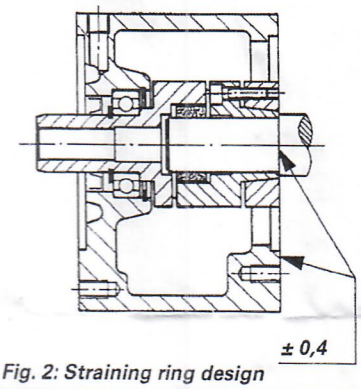

Fig. 2: Straining ring design

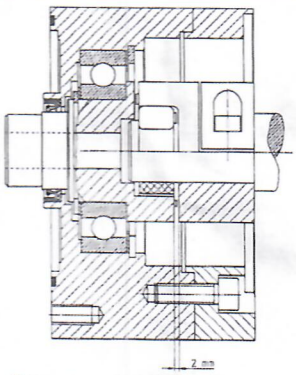

Fig. 3: Clamping ring design