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Solutions for a world in motion

Operation and Maintenance Manual GK10.1 and ABG 10.2-16.2 Bevel Gears



GK10.1



ABG10.2

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1. Safety instructions

Range of application

AUMA bevel gearboxes GK 10.1, ABG 10.2 – ABG16.2 operate valves (e.g. gate valves and globe valves).

These gearboxes are designed for manual operation. For other applications, please consult AUMA. The manufacturer is not liable for any possible damage resulting from use in other than the designated applications. Such risk lies entirely with the user. Observance of these operation instructions is considered as part of the designated use.

Maintenance

The maintenance instructions (refer to page 5) must be observed, otherwise a safe operation of the bevel gearbox is no longer guaranteed.

Warnings and notes

Failure to observe the warnings and notes may lead to serious injuries or damage. Qualified personnel must be thoroughly familiar with all warnings and notes in these operation instructions. Correct transport, proper storage, mounting and installation, as well as careful commissioning are essential to ensure a trouble-free and safe operation.

The following references draw special attention to safety-relevant procedures in these operation instructions. Each is marked by the appropriate pictograph.



This pictograph means: Note!

“Note” marks activities or procedures which have major influence on the correct operation. Non-observance of these notes may lead to consequential damage.



This pictograph means: Warning!

“Warning” marks activities or procedures which, if not carried out correctly can affect the safety of persons or material.

2. Transport, storage and packaging

Transport

- Transport to place of installation in sturdy packing.

Storage

- Store in well-ventilated, dry room.
- Protect against floor dampness by storage on a shelf or on a wooden pallet.
- Cover to protect against dust and dirt.
- Apply suitable corrosion protection agent to bare surfaces.

In case gearboxes are to be stored for a long period (more than 6 months), the following points must be observed:

- Prior to storage: Protect bare surfaces, in particular the output drive parts and mounting surface, with long-term corrosion protection agent. .
- Check for corrosion approximately every 6 months. If first signs of corrosion show, apply new corrosion protection.

Packaging

Our products are protected by special packaging for the transport ex works. The packaging consists of environmentally friendly materials which can easily be separated and recycled. For the disposal of the packaging material, we recommend recycling and collection centers. We use the following packaging materials: Wooden material boards (OSB)/cardboard/paper/PE film

3. Fitting the hand wheel

For gearboxes designed for manual operation, the hand wheel is supplied separately. Fitting is done on site according to figure 1.

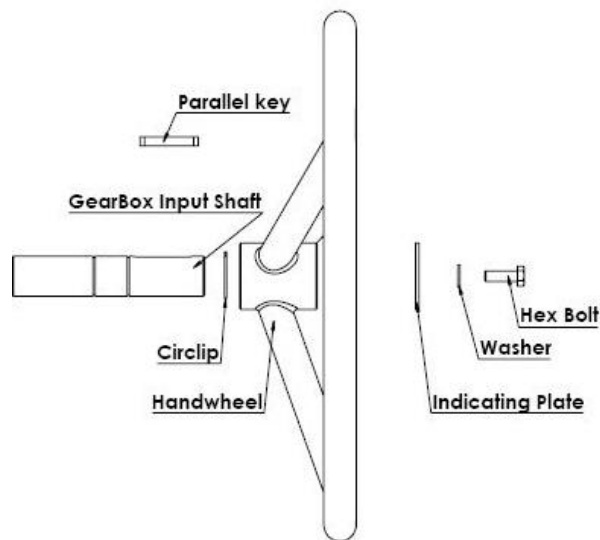


Figure 1

4. Mounting to valve



The gearboxes can be operated in any mounting position.

- Prior to mounting, the gearbox must be checked for damage. Damaged parts must be replaced by original spare parts.
- After mounting to valve, touch up any possible damage to paint finish.
- Check if mounting flange fits the gearbox.
- Spigot at flanges should be loose fit!

For output drive type A (figure 2 or 3), the internal thread of the stem nut must match the thread of the valve stem. If not ordered explicitly with thread, the stem nut is un-bored or with pilot bore when delivered. For finish machining of stem nut, refer below.

- Check whether bore and keyway match the input shaft of valve.
- Thoroughly degrease mounting faces of gearbox and valve.
- Apply a small quantity of grease to input shaft of valve.
- Place gearbox on valve and fasten. Fasten bolts (quality min. 8.8, refer to table 1) evenly crosswise.

Table: 1 Suggested fastener torques for bolts				
Fastener thread size		Fastener torques ft-lb [Nm]		
UNC	Metric	Strength class		
		8.8	A2-80	
1/4"	M6	8 [11]	7 [10]	
5/16"	M8	18 [25]	18 [24]	
3/8"	M10	38 [51]	35 [48]	
1/2"	M12	64 [87]	60 [82]	
5/8"	M16	158 [214]	148 [200]	
	3/4"	M20	318 [431]	289 [392]



Finish machining of stem nut (output drive type A):

4.1 GK10.1-The output drive flange must be removed from the gearbox

Refer to figure 2

- Using a 10 mm wrench or similar tool, remove the four fasteners (01) from the output drive type A of the GK10.1.
- Remove the A drive assembly from the bevel gearbox and place on a suitable clean surface.
- Loosen the setscrew (02) using a 3 mm Allen wrench.
- Rotate the locking ring (3) counter clockwise to unthread it from the A drive housing.

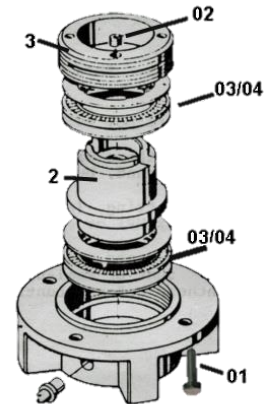


Figure 2

- Lift stem nut (2) out of the A drive housing and remove upper and lower thrust races and bearings (03/04)
- Machine the A drive stem nut according to valve stem requirements.
 - Drill and bore stem nut and cut thread. When fixing in the chuck, make sure stem nut runs true!
- Clean the machined stem nut.
- After machining, re-install the A drive stem nut and bearings/races in the following order from the housing up:
 - Race-bearing-race
 - Stem nut *Note: dog slots facing up!*
 - Race-bearing-race
- Reinstall the threaded locking ring and tighten clockwise until stem nut is difficult to turn.
- Rotate the locking ring approximately ¼ turn counterclockwise and tighten the set screw.

Note: the stem nut should rotate freely!
- Re-install the A drive assembly onto the GK by aligning the dogs of the GK with the stem nut and install the four fasteners. Tighten the fasteners in a crosswise fashion to the correct torque

Press a good quality Lithium soap EP multi-purpose grease into the grease nipple with a grease gun. Approximate capacity 1.5 oz.

4.2 ABG.2 -The output drive is removed through the top of the ABG bevel gearbox

Refer to figure 3

- Remove the stem cover cap (1) or the stem protection tube if installed.
- Loosen and remove the two threaded locking rings (2/3) installed above the stem nut in the hollow shaft of the bevel gearbox.
- Lift the stem nut (4) up or push from the bottom until the stem nut is out of the hollow shaft area of the ABG bevel gearbox.
- Machine the ABG stem nut according to valve stem requirements.
 - Note: Do not damage the external splines on the stem nut.
 - Drill and bore stem nut and cut thread. When fixing in the chuck, make sure the stem nut runs true!
- Clean the machined stem nut.
- After machining, re-install the ABG stem nut (4) through the top of the gearbox while aligning splines, push stem nut completely down into hollow shaft area.
- Install and tighten the first threaded locking ring (2), notch up.
- Install and tighten the second threaded locking ring (3), notch up.
- Reinstall the stem cover cap (1). If installing a stem protection please refer to the next section.

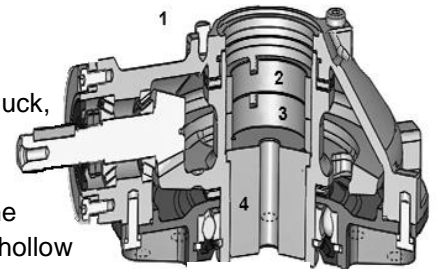


Figure 3



Figure 4



Protection tube for rising valve stem

- For metal tubes, seal the thread of the stem protection tube with Teflon tape, or thread sealing material.
- Screw protection tube (2) into gearbox thread and tighten it firmly.
- Push down the sealing (3) to the housing.
- Check whether cap (1) is available and without damage.

Note: Thread adapters may be involved when using stem tubes made of metal or plastic depending on scope of supply.

5. Operation of Valves

The maximum output torque (refer to name plate on gearbox) refers to the peak values and should not be applied over the whole travel.

Clockwise rotation at input shaft results in clockwise rotation at output drive

Enclosure protection IP67

Inspection

AUMA gearboxes in enclosure protection IP 67 undergo 100% testing for tightness in the factory.

- The enclosure protection IP 67 refers to the interior of the gearbox.
- Use suitable sealing material between valve flange and gearbox.

6. Maintenance

General references

- After commissioning, check gearbox for damage to paint finish.
- Do a thorough touch-up to prevent corrosion.
- Original touch up paint in small quantities can be purchased from AUMA.

AUMA gearboxes require very little maintenance.

- Approximately six months after commissioning and then every year check bolts between gearbox and valve for tightness. If required, tighten applying the torques given in table 1.
- Perform a test run as well as a visual inspection for grease leakage every six months. Carry out a detailed functional test for each gearbox every 5 years. Record the results for future reference.
- For gearboxes permanently exposed to ambient temperatures above 40 °C, maintenance must be performed at shorter intervals.
- For GK gearboxes with output drive type A: At intervals of approx. six months from commissioning, press in Lithium soap EP multi-purpose grease on mineral oil base at the grease nipple with a grease gun. Capacity approximately 1.5oz).

Seals:

- The seals must be changed when changing the grease.
- Seal kits may be purchased from AUMA.

Grease:

Grease and seal change is recommended after the following operation times:

- If operated seldom, after 10 – 12 years
- If operated frequently, after 6 – 8 years
- Original AUMA grease must be used.
- For the grease type, refer to name plate on gearbox
- Lubricants should not be mixed

Gearbox	GK10.1	ABG10.2	ABG14.2	ABG16.2
Weight	28 oz.	7.0 oz.	17.6 oz.	35.3
	0.8 kg	0.2 kg	0.5 kg	1 kg

The removed lubricant and the cleaning agent used must be disposed of according to the relevant regulations.



Change of grease

- Remove gearbox from valve:

During this time, the valve/pipeline must not be under pressure!

- Mark position of the gearbox on the valve, loosen connecting bolts to the valve and remove the gearbox.

Remove old grease:

Grease type, see name plate; grease quantities see table 2. The numbers used in the following text refer to the spare parts list(s) of these operation instructions.

Part numbers in bold type refer to GK type bevel gear

- Remove bolts at bearing flange (**2/3.1**).
- Remove bearing flange with bevel wheel (**4/2.2**) from housing.
- Remove old grease completely from the gear housing and the individual parts and clean bevel gear. For this purpose, kerosene or a similar cleaning agent may be used.
- Remove and replace the seals and O-rings (**07**, **08**, and **016/** 001,004 and 003) with new ones. Available as **S2/S1** seal kit.
- Clean mounting faces at bevel housing (**1/1.0**) and bearing flange (**2/3.1**) with bevel wheel.
- For the GK10.1, install grease into the housing (**1**) before going to the next step.
- Mount bearing flange (**2/3.1**) with bevel wheel into housing, while paying attention to the O-ring (**09/003**) at bearing flange and quad-ring (**016/001**) in the housing.
- Screw in 4 bolts with lock washers and fasten them evenly crosswise to the appropriate torque according to table 1.

ABG gearbox:

- Remove screw plug (539.0) at the ABG housing.
- Fill with new grease.
- Clean mounting faces at housing and insert screw plug (539.0) with new sealing S1 (014) and fasten them to the appropriate torque according to table 1.

After maintenance:

- Fasten gearbox to valve again.
- Perform test run to ensure proper function.
- Check the gearbox for damage to paint finish. Do a thorough touch-up to prevent corrosion. Original paint in small quantities can be supplied by AUMA.

7. Disposal and recycling

AUMA gearboxes have an extremely long lifetime. However, they have to be replaced at one point in time. AUMA recommends the following disposal methods:

Our gearboxes have a modular design and may therefore easily be disassembled, separated and sorted according to materials, i.e.:

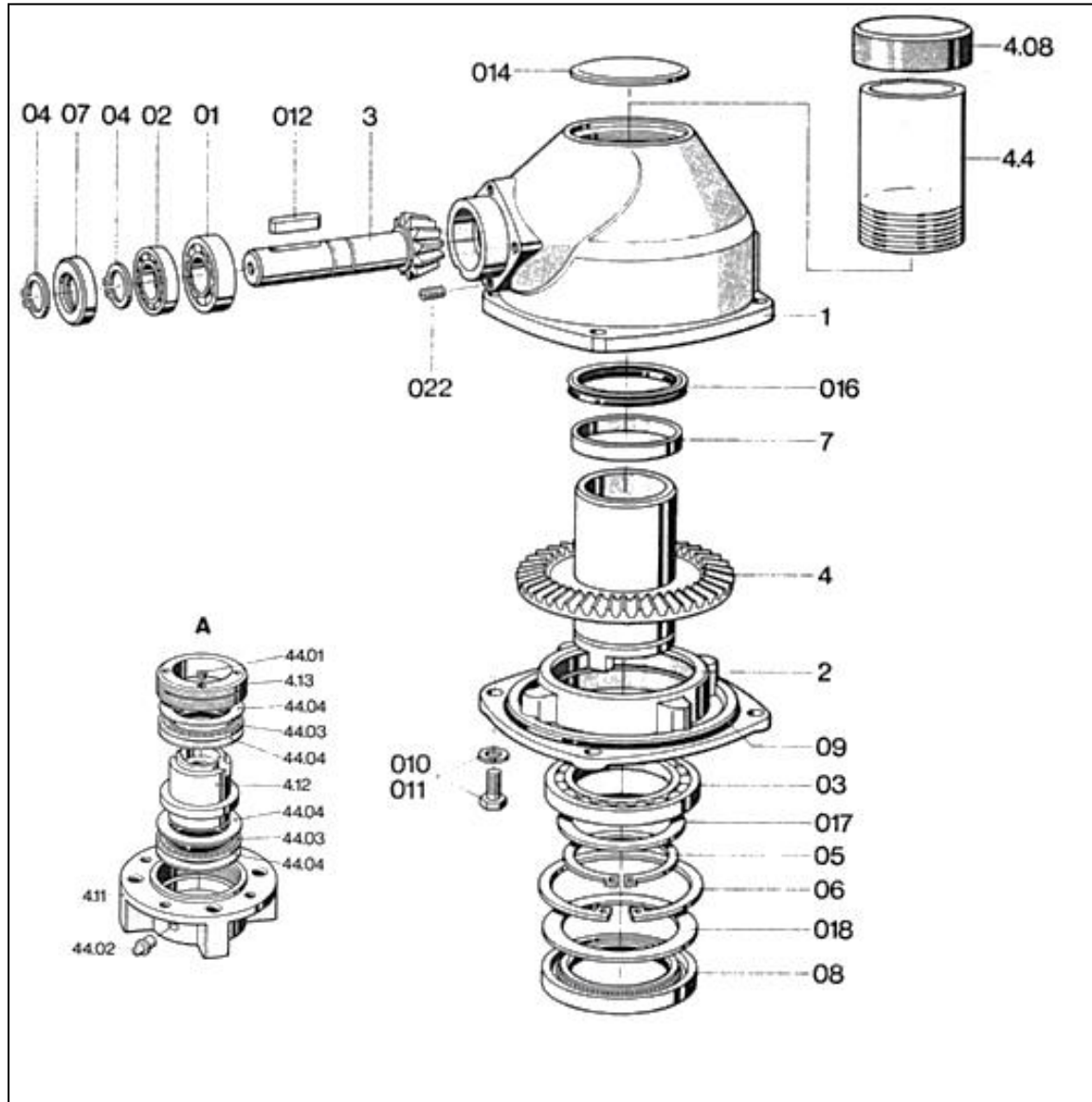
- Various metals
- Plastics
- Greases and oils

The following generally applies:

- Collect greases and oils during disassembly. As a rule, these substances are hazardous to water and must not be released into the environment.
- Arrange for controlled waste disposal of the disassembled material or for separate recycling according to materials.
- Observe the national regulations for waste disposal.

8. Spare parts

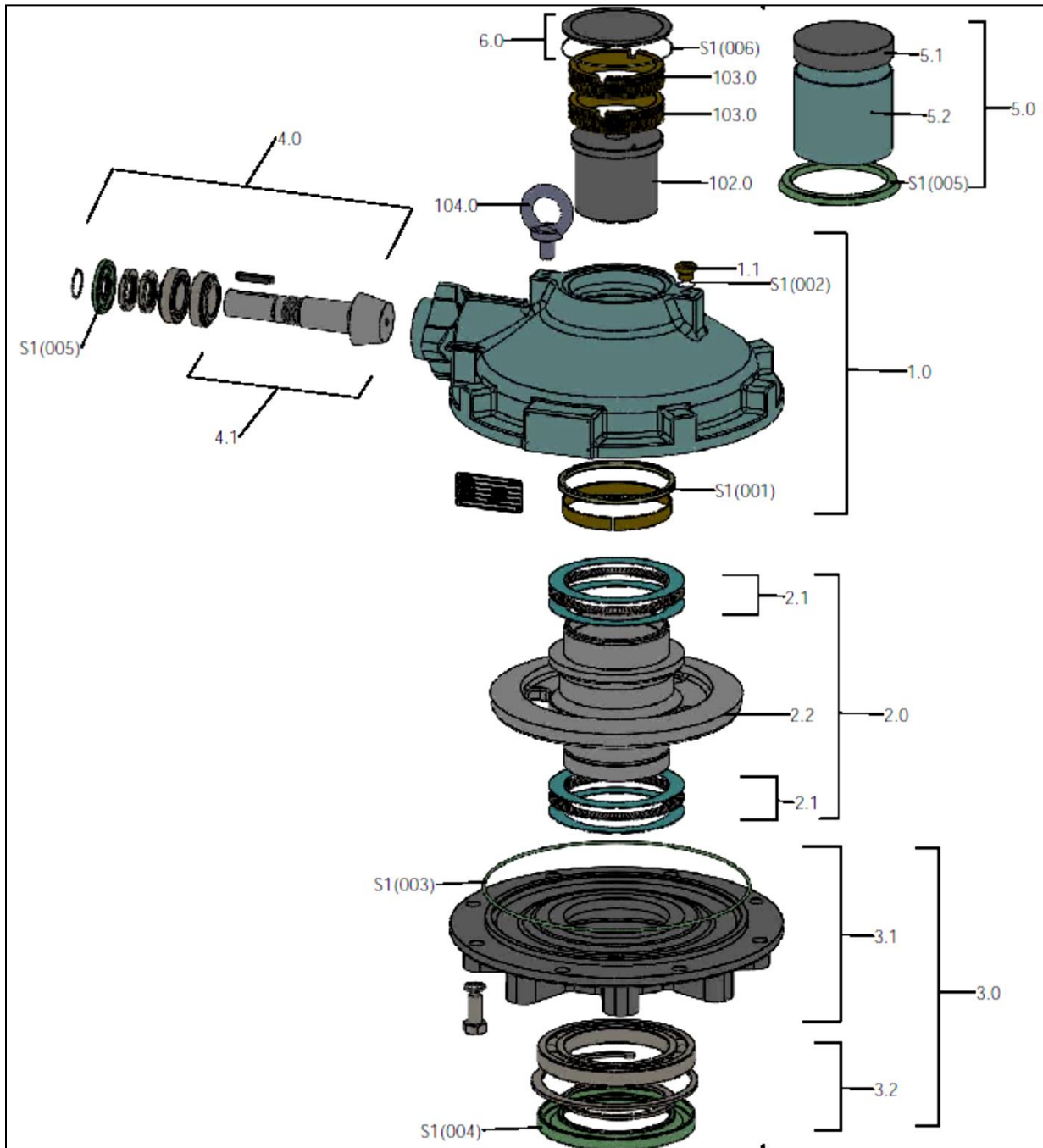
8.1 GK10.1 Parts list



Part No.	Description	Part No.	Description	Part No.	Description
1	Housing	06	Circlip	4.12	Stem nut
2	Bearing flange	07	Radial seal	4.13	Bearing lock nut
3	Bevel pinion shaft	08	Radial seal	44.01	Set screw
4	Bevel wheel	09	O-Ring	44.02	Grease nipple
7	Bushing	012	Parallel key	44.03	Thrust bearing
01	Ball bearing	014	Lid	44.04	Thrust washer
02	Ball Bearing	016	Quad ring	4.4	Stem tube
03	Ball bearing	017	Shim ring	4.08	Stem tube cap
04	Circlip	018	Shim ring	Not shown	Stem tube seal
05	Circlip	4.11	Mounting flange		

GK10.1 Parts list

8.2 ABG Parts list



Part No.	Description	Part No.	Description
1.0	Housing	5.2	Stem protection tube
2.0	Bevel assembly	5.3	V seal
2.1	Axial Needle Roller Bearing	6.0	Lid with O ring
2.2	Bevel sleeve	7.0	Not used
3.0	Output drive	102.0	Stem nut
3.1	Mounting flange	103.0	Ring nut
3.2	Bearing with circlip	104.0	Eye bolt (except ABG10.2)
4.0	Input shaft	S1	Seal kit
5.0	Stem Protection tube	018	Shim ring
5.1	Cap for stem protection tube	4.11	Mounting flange

ABG parts list