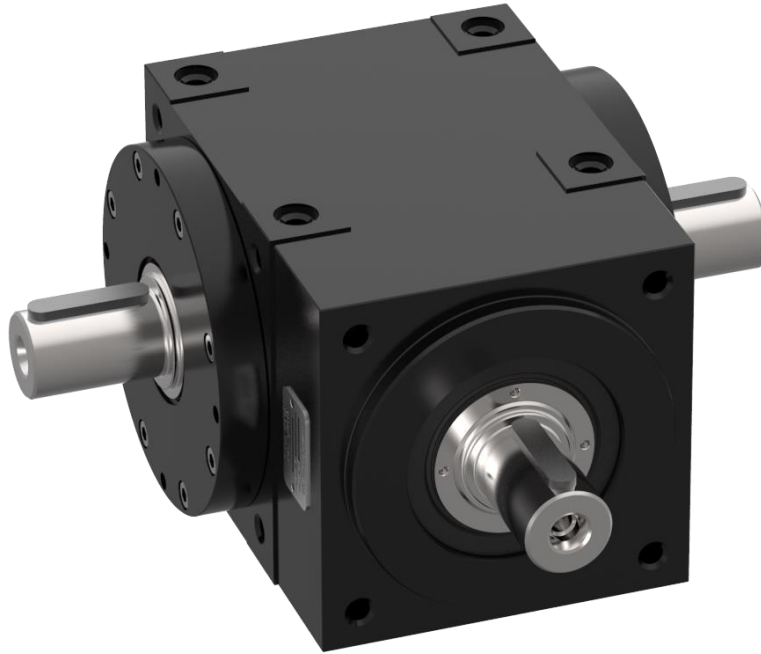
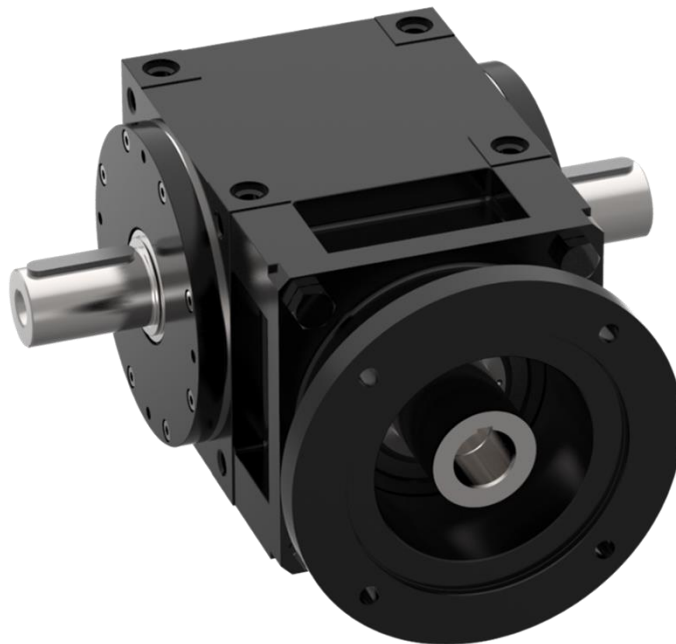


Assembly instructions

BT / BM / BF Gearboxes



BT / BM



BF

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1 Safety instructions

A distinction is made between different levels of safety instructions. Table 1 below shows the definitions of symbols and signal words.


Symbol	Signal word	Definition
	DANGER!	Immediately imminent danger. Death or extremely serious injury, crippling.
	WARNING!	Possibly dangerous situation. Death or extremely serious injuries may result.
	CAUTION!	Less dangerous situation. Minor or moderate injuries may result.
	NOTICE	Potentially damaging situation. Possible damage to product and/or machine.
	INFO	Tips and other useful or important information and advice. No dangerous or harmful consequences for persons or property.

Table 1: Classification of notices


Symbol	Signal word	Definition
	Environmental hazard	Pollution risk for the environment

Table 2: Other symbols

2 General

2.1 Information on the documentation

These assembly instructions have to be read carefully before assembling, commissioning and maintaining the product. The document must be kept in a suitable place for future reference and must be available for any assembly, maintenance or dismantling work.

2.2 Target group

This documentation is intended for qualified trained personnel who are familiar with mechanical assembly work. Assembly, commissioning and maintenance may only be carried out by accordingly qualified personnel. Technical training or safety instruction is required.

2.3 Scope

The scope of these instructions covers the following products of the company ESA Eppinger GmbH:

- BT Bevel gearboxes
- BM Bevel gearboxes
- BF Bevel gearboxes with motor flange

All mounting parts necessary for the assembly, installation, operation and maintenance, which are included in the scope of supply of these gearboxes, are also within the scope of this document.

2.4 Intended use

Eppinger gearboxes are machine elements for converting or diverting torques and rotational speeds within the respectively specified performance range. Any operation outside the specified performance characteristics or other than the specified use is not permitted. The permissible torques and rotational speeds of the gearboxes must not be exceeded. The forces affecting on the gearbox shafts have to be limited to the maximum permissible values.

Unauthorised modifications or alterations to the product are not permitted.

According to the EC Machinery Directive 2006/42/EC, gearboxes are referred to as machine components and are therefore assemblies that do not fall within the scope of the Machinery Directive 2006/42/EC. Therefore, gearboxes are

components to be installed in machines. The commissioning is forbidden until by or after the integration into the end product, the requirements of the machine directives are met.

2.5 Contact

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73770 Denkendorf/Germany

+49 (0) 711 / 934 934-626

vertrieb@eppinger-gears.com

<https://www.eppinger.de>

3 Handling and Transport

During handling and transport, suitable lifting equipment must be used depending on the weight of the gearbox. The permissible lifting capacities and other specifications of the hoist manufacturer must be observed.

Suitable suspension points have to be gathered from Figure 1. All BT, BM and BF series gearboxes are equipped with metric threads in the housing at these points. The thread sizes can be gathered from the respective data sheets. If ring bolts are used, a suitable spreader beam may have to be used.

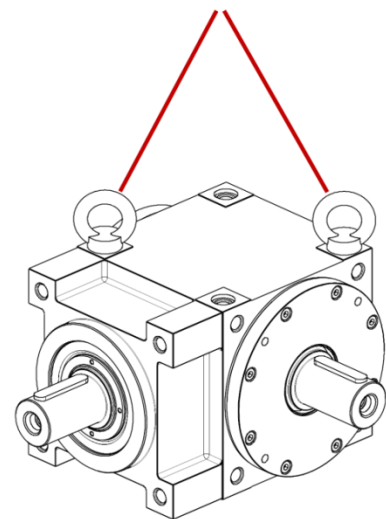


Figure 1: Suspension points



DANGER!

Death or extremely serious injury / crippling caused by falling loads. During transport, never stay under suspended loads.

The weights given in Table 3 apply to gearboxes with solid output shafts on both sides.

Gearbox	Weight about	Gearbox	Weight about	Gearbox	Weight about
BT50	1.5 kg	-	-	BF50	2.0 kg
BT75	5.2 kg	BM75	5.5 kg	BF75	6.0 kg
BT90	8.5 kg	BM90	9 kg	BF90	10 kg
BT110	14 kg	BM110	16 kg	BF110	16 kg
BT140	26 kg	BM140	32 kg	BF140	32 kg
BT170	42 kg	BM170	48 kg	BF170	47 kg
BT210	72 kg	-	-	-	-
BT240	105 kg	-	-	-	-
BT280	160 kg	-	-	-	-

Table 3: Weights

4 Storage

The gearboxes have to be stored protected from dust, dirt and moisture. The temperature has to be between -5°C and +40°C and the humidity should not exceed 60%. The maximum storage period is 24 months and the corrosion protection has to be checked regularly to ensure that it is intact.

5 Assembly



CAUTION!

Assembly work may only be carried out by accordingly qualified trained personnel. First of all, check the gearbox for external damage.



CAUTION!

A damaged gearbox must not be operated.

Before installing the gearbox, always switch off the machine and secure it against a restart. In addition it has to be ensured that the machine cannot move.



DANGER!

Death or extremely serious injury / crippling caused by moving machine elements when accidentally switched on or by accidentally releasing stressed components during assembly.

Before installation, check the direction of rotation of the gearbox. The direction of rotation of the gearbox can be gathered from the data sheet.

5.1 Mounting of the gearbox

The gearbox has to be securely screwed to the application. Special attention has to be paid to a flat support.

All existing mounting holes must always be used on the selected screw-on side. At this, the screw tightening torque depends on the strength class of the screw as well as the material of the bearing face respectively the internal thread.

5.2 Assembly of the shafts

The torque transmission takes place via a key. The shaft is suitable for mounting couplings or for a direct mounting of transmission elements such as gearwheels or belt wheels onto the shaft.

The gear shaft must be clean and free of grease or oil.

For the chosen transmission principle, the existing specification of the manufacturer of the coupling or the clamping device must be observed.

NOTICE

Damages of the gearbox caused by large axial loads during the assembly. When pressing components onto the shaft, do not support the force via the gearbox housing.

The supporting length of the key must be suitable for the torque to be transmitted.

5.3 Assembly of the motor for the BF series

The torque transmission of the motor also takes place via a key. The hollow input shaft of the gearbox as well as the solid shaft of the motor must be clean and free of grease or oil.

After the motor has been inserted until the motor plate is in contact with the gearbox flange, screw the motor to the gearbox flange. Take care of the thread reach of the bolts. The thread reach of the bolt shall be twice the length of the nominal diameter of the bolt. (Figure 2)

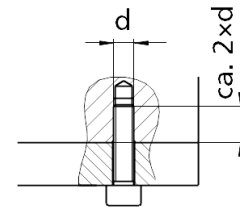


Figure 2: Length of the bolt

6 Commissioning



CAUTION!

The commissioning may only be carried out by accordingly qualified trained personnel.

Before commissioning, all mechanical mounting parts and their fastening must be checked. Check the screw tightening torques. Commissioning may only take place if the machine complies with the provisions of the EC Machinery Directive. The monitoring and protective devices of the machine must not be put out of operation. In addition to EMERGENCY STOP buttons, EMERGENCY STOP command devices, covers and hoods, this also includes other protective devices such as sensors, light barriers and acoustic or optical emergency signals. The security of the gearbox can only be assured by the end product. Therefore, any commissioning with overridden protection equipment of the machine is not permitted.



DANGER!

Death or extremely serious injury / crippling caused by equipment in operation without suitable safety or protective devices by the surrounding end product.

7 Operation



CAUTION!

The gearbox may only be operated by accordingly qualified trained personnel.

The gearbox may only be operated with active protective and monitoring equipment of the machine.



DANGER!

Death or extremely serious injury / crippling caused by equipment in operation without suitable safety or protective devices by the surrounding end product.



WARNING!

Burns at hot surfaces.

During operation, the surface of the gearbox can reach high temperatures. It must be ensured that there is no unintentional contact with the surface of the gearbox.

During the operation, the gearbox should be observed.

Leakage, unusual temperature rises or an increase in the noise respectively vibration indicate a fault which has to be repaired. If one of these criteria should occur, the plant has to be shut down immediately. If the fault cannot be eliminated, contact ESA Eppinger (chapter 2.5).

8 Maintenance



CAUTION!

Maintenance may only be carried out by accordingly qualified trained personnel.

Gearboxes from size 140 are equipped with screw plugs to allow an oil change. Smaller gearboxes are lubricated for life and they are therefore designed without any screw plugs.

The quantities of oil and the intervals of the oil changes can be gathered from Table 4. The recommended intervals for a change have to be observed.

For special gearboxes and gearboxes with operating conditions outside the specification, any separately communicated maintenance intervals and specifications apply.

Gearbox	Oil quantity	Change interval
BT/BM/BF 140	0.35 L	15 000 h
BT/BM/BF 170	0.8 L	15 000 h
BT210	1.5 L	15 000 h
BT240	2.0 L	15 000 h
BT280	2.8 L	15 000 h

Table 4: Oil quantities and maintenance intervals

Fully synthetic oil Mobil SHC Gear 150 is used as the standard lubricant. During the oil change, choose either the same lubricant or a lubricant acc. to the following specification:

- Fully synthetic lubricant
- Viscosity class ISO VG150
- Minimum requirements according to DIN 51517-3:2018-09 respectively ANSI/AGMA 9005-F16

NOTICE

Damages to the gearbox by a reduced lubricity.

Different lubricants must not be mixed. This may result in a reduced lubrication effect and a damaging of the gearbox.

To change the oil, open the screw plugs on one side of the gearbox and empty the gearbox completely. For a complete draining, it might be necessary to move the gearbox.



DANGER!

Risk of burns during the oil change by hot gearbox oil.



CAUTION!

Skin irritation by intensive contact with synthetic oil.

After the complete draining all but the topmost of screw plugs can be closed again. The required quantity of oil according to Table 4 can be filled via this opening.

The required quantity of oil must not be exceeded or undercut.

NOTICE

Damages to the gearbox due to the wrong quantity of lubricant.

Insufficient lubricant can result in a damaging of the gearbox.

Too much lubricant can result in an excessive heating.

Fill in each time the specified quantity of lubricant.

After the filling of the lubricant, close the screw plug again.

The drained oil has to be disposed of acc. to chapter 9.2.

9 Decommissioning



CAUTION!

Dismantling and disposal may only be carried out by accordingly qualified trained personnel.

9.1 Dismantling

Before dismantling the gearbox, always switch off the machine and secure it against a restart. In addition it has to be ensured that the machine cannot move.



DANGER!

Death or extremely serious injury / crippling caused by moving machine elements when accidentally switched on or by accidentally releasing stressed components during dismantling.

9.2 Disposal



ENVIRONMENTAL HAZARD!

Environmental compatibility, health risks, disposal regulations and the local possibilities of proper disposal must be observed.

Any and all operating materials, in particular oils, fats and lubricants are to be disposed of according to the national and regional applicable regulations.



CAUTION!

Skin irritation by intensive contact with synthetic oil.

10 Changes to these assembly instructions

Changes in version 3:

- Adaption to the corporate design

Changes in version 2:

- Complete revision