

## Where coal and ores are extracted in open cast mining

Enormous quantities of coal, ores or graphite are conveyed in open cast mining. That is a harsh environment with a great deal of dust and dirt. The machines, fixtures and materials used here have to withstand very high stresses, for example ambient temperatures of -43 to +50 °C. So-called baffle flaps are used to guide these raw materials. These baffle flaps are moved and held in position **by large linear actuators**. However, the baffle plates are not rigid, but must be capable of being swivelled – in both the X and Y direction. This allows the baffle flaps to be adapted to the type and quantity of material being conveyed.

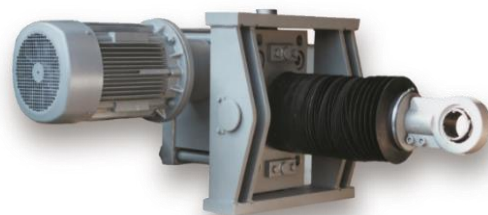


### A clever solution is called for – sturdy and durable

A sturdy and durable solution was sought for this demanding application. It was a tricky task for the Grob design engineers, who were able to present the right solution after just a short space of time: they simply developed a **linear actuator with a universal joint**. This allows the connected baffle plate to be swivelled in the X and Y direction. With this configuration the linear actuator can be swivelled in all directions and transverse forces can be avoided in all directions.

### This is the technology inside a powerful BJ linear actuator

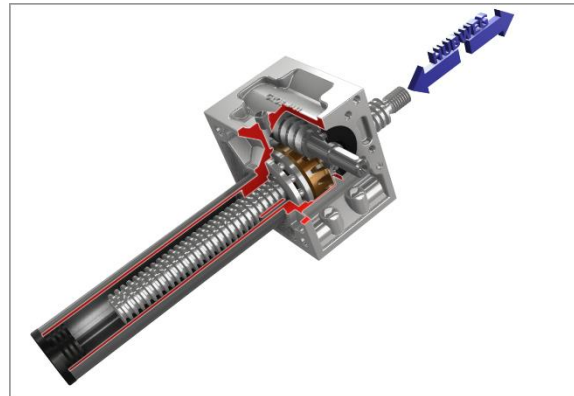
An actuator from the BJ cubic series was used here. A typical feature of this series is the cubic shape of the housing. This makes it easier to attach it to various constructions thanks to the surfaces, which are machined on all sides. In this case the load on the actuator is an impulse-type load of around 50,000 N.



Maximum loads of up to 350 kN can be realised with the linear actuator employed, a BJ4, while a maximum static load of 500 kN (BJ5) is possible with the BJ series. The complete universal joint is made of galvanized steel with a triple coat of lacquer. A basic version was supplied. The spindle is protected by a bellows so that no dust or dirt can penetrate into the actuator.

### How the basic version works

The worm shaft is driven by an electric motor. It causes the worm wheel to rotate. The worm wheel has a trapezoidal thread. The spindle head is connected to the baffle plate in such a way that it cannot rotate. If the worm shaft is now driven, a linear lifting movement is generated and the lifting spindle thereby travels through the linear actuator.



### The main advantage of the Grob linear actuators

1. **Simple and inexpensive** solutions in comparison with hydraulic and pneumatic systems.
2. A defined load can be lifted to a **pre-defined position** at a present speed.
3. **Several linear actuators can be synchronised** by means of connecting shafts and an electronic controller.
4. They can exert the **same forces** in both the pushing and pulling direction.
5. Many technically ideal and economically appealing solutions can be realised with our **mobile construction kit concept**.
6. Linear actuators are valued by design engineers as standard machine elements

### Do you have special requirements? These variants are possible

Linear actuators from Grob Antriebstechnik GmbH can also be supplied in ATEX versions for explosions-protected applications. Further options are:

- With a buttress thread for high static load
- With a ball screw for high-precision, low-backlash running.
- With additional oil lubrication for a higher duty cycle and input speed.