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Operational training · Metal working

Machine-based material processing

Part: Milling



Trainees

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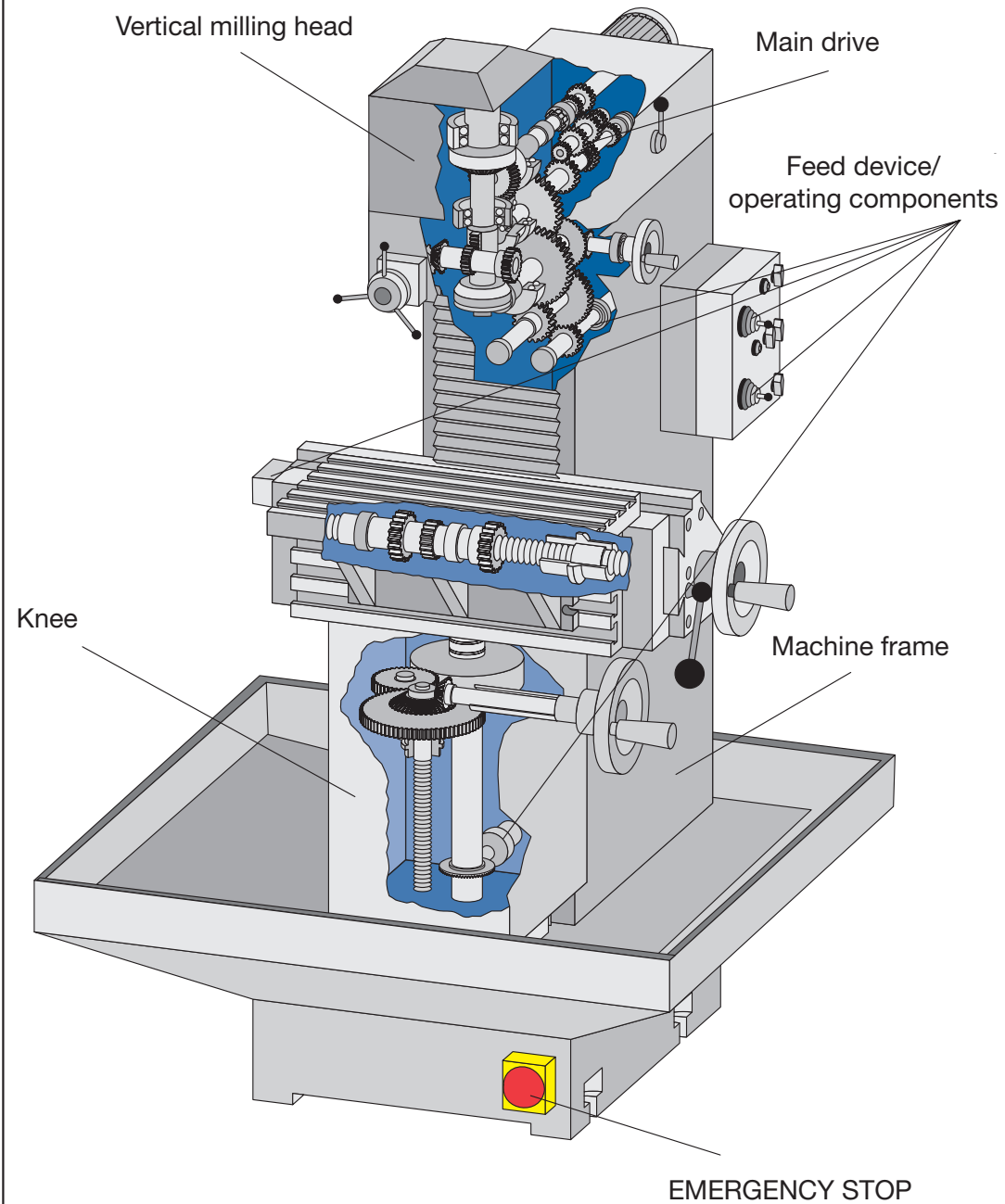
The content of the "Milling" course is based on the guidelines for the training scheme devised for training industrial mechanics.

The main course content is as follows:

- ▶ Milling
- ▶ Milling machines
- ▶ Milling processes
- ▶ Milling tools
- ▶ Clamping tools and workpieces
- ▶ Process parameters / materials
- ▶ Milling techniques
- ▶ Maintaining milling machines
- ▶ Reading and using technical documents
- ▶ Work planning and presenting work results
- ▶ Self-check
- ▶ Work safety, environmental protection and energy efficiency

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Design of a universal milling machine



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Equipping the work station

The milling work station must be equipped with the necessary tools, materials and personal protective equipment.

Tools and materials for the milling work station:

- ▶ Toolholders
- ▶ Milling tools
- ▶ Clamping devices
- ▶ Edge finder
- ▶ Parallel supports
- ▶ Measuring tools
- ▶ Files
- ▶ Bench hammer/mallet
- ▶ Open-ended wrench
- ▶ Valve-type oil can
- ▶ Hand broom
- ▶ Brush
- ▶ Safety goggles

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General guidance for work safety

In order to prevent accidents, the occupational health and safety regulations must be observed at all workplaces. The Accident Prevention Regulations (APR) issued by the German employers' liability insurance association are part of these regulations. The aim of these regulations is to draw attention to hazards and risks, and to prevent accidents.

Key points of the APR and other safety criteria in relation to milling are as follows:

- ▶ Complete training and orientation before working on milling machines for the first time
- ▶ Remove all jewellery
- ▶ Wear close-fitting clothing and do not wear gloves. Wear safety goggles and, if necessary, a hair net
- ▶ Only wear gloves when clamping milling tools
- ▶ Select suitable clamping tools; clamp tools and workpieces tightly and securely
- ▶ Test the machine before commencing work
- ▶ Set the process parameters correctly
- ▶ Do not take any measurements when the machine is running
- ▶ Clean and remove chips only when the milling machine is stopped
- ▶ Use a brush or hand broom to remove chips (do not use compressed air)
- ▶ Remove spilled or splashed cooling lubricant immediately
- ▶ If there is an accident risk, use the emergency stop button to switch off the milling machine immediately
- ▶ Report every accident to your immediate superior at once

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Environmental protection and energy efficiency

As with regulations for protecting personnel in the workplace, the legal regulations for protecting the environment do not of themselves cover every eventuality.

The most important thing is that each individual should act responsibly.

In order to protect the environment and save costs, materials and energy must be used efficiently.

Rational use of energy means organising the production process in such a way that the result is achieved with minimum use of energy and raw materials.

For milling work, this means:

- ▶ Determining the optimum blank size of each workpiece
- ▶ Selecting the optimum cutting speed, set the rotational speed, feed and advance rate correctly, as well as the start and overrun
- ▶ Paying attention to the correct machining sequence
- ▶ Only using suitable tools and materials
- ▶ Switching off all power-consuming devices when not in use
- ▶ Always using the proper cooling lubricant in the required quantities

Observe the following rules when disposing of waste:

- ▶ Steel chips go in the mixed scrap container
- ▶ Brass, aluminium and plastic chips go in the appropriately marked container
- ▶ Lubricating oil is to be poured into the waste oil container
- ▶ Used cleaning rags go in the container for oily solid waste
- ▶ Cooling lubricants go in the container marked "Used HFA liquids"

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