You educate apprentice tradesmen in technical schools and factories... we offer you practice-oriented teaching and training systems for your education relating to Assembly Projects – Maintenance... and much more.

Ask for the Mechatronics catalogue.

Have a look at our complete product range relating to Assembly Projects – Maintenance... and much more.

Ask for the Mechatronics catalogue.

GUN-CATALOGUE No. 2, “MECHATRONICS”, COVERS THE FOLLOWING PROGRAM GROUPS

- Engineering Drawing
- Cutaway Models
- Dimensional Metrology
- Fasteners and Machine Parts
- Manufacturing Engineering
- Assembly Projects
- Maintenance
- Machinery Diagnosis
- Automation

INDUSTRIAL TRAINING AND VOCATIONAL QUALIFICATION

ASSEMBLY PROJECTS – MAINTENANCE

You educate apprentice tradesmen in technical schools and factories... we offer you practice-oriented teaching and training systems for your education relating to Assembly Projects – Maintenance... and much more.

Ask for the Mechatronics catalogue.

Have a look at our complete product range relating to Assembly Projects – Maintenance... and much more.

Ask for the Mechatronics catalogue.

GUNT-CATALOGUE No. 2, “MECHATRONICS”, COVERS THE FOLLOWING PROGRAM GROUPS

- Engineering Drawing
- Cutaway Models
- Dimensional Metrology
- Fasteners and Machine Parts
- Manufacturing Engineering
- Assembly Projects
- Maintenance
- Machinery Diagnosis
- Automation

INDUSTRIAL TRAINING AND VOCATIONAL QUALIFICATION

ASSEMBLY PROJECTS – MAINTENANCE

You educate apprentice tradesmen in technical schools and factories... we offer you practice-oriented teaching and training systems for your education relating to Assembly Projects – Maintenance... and much more.
Maintenance is a Key Area in Apprentice Training

Plant and machinery should be operational... therefore, maintenance is an essential part of production and machine management. 

...not sitting idle

You must have:

- Strategies and methods in place
- Qualified and trained staff

GUNT supports you with our proven teaching systems regarding Assembly Projects and Maintenance. Our service will help you to make the education of your staff much more practice-oriented. This is hands-on tuition in practice.

A Selection of Assembly Exercises

MT 152
MT 154
GL 430

MT 156
MT 157
MT 158

MT 140.02
MT 140.01
MT 110.02

MT 180
MT 181
MT 182

MT 183
MT 184
MT 185

...there is much more at GUNT. On the following pages we show you some detailed examples.
Learning Concepts Relating to Industrial Maintenance

The maintenance of industrial plant and machinery is a key field of activity for technicians and skilled tradesmen working in mechanical and electrical engineering.

Key area in technical training
The level of attention devoted to the subject of maintenance by the curricula is therefore high.

TEACHING AND LEARNING SYSTEMS RELATING TO MAINTENANCE

GUNT-Geratebau GmbH offers you a wide range of wholly practice-oriented teaching and training systems relating to technical maintenance with which you can cover essential learning content:

- Use of specific manufacturer’s documentation for maintenance, inspection and repair
- Planning and assessing maintenance sequences and steps
- Reading and understanding engineering drawings
- Practical execution and documentation of maintenance operations
- Familiarisation with machine and system components
- Testing and commissioning of repaired systems
- Understanding maintenance as the interaction between inspection, maintenance and repair
- Assessment of malfunctions, detection of faults

The GUNT training systems are ideally suitable for students’ group working, and of course for project-oriented working methods.

What is maintenance?
'Maintenance' as defined by German industry standard DIN 31051 is a complex field, so the range of teaching and training systems we offer in this area is very diverse.

This theme should be read in close conjunction with the GUNT catalogue no. 2

This chapter deals with the process of familiarisation with component and their functions, reading and understanding engineering drawings or operating instructions, and familiarisation with technical terminology and language. The assembly exercises can be conducted in relatively short periods of time (within lesson units) and do not as yet require any particular technical experience. Fault diagnosis and maintenance measures are not yet central to the training systems.

...So the theory is easy!
Learning Objectives / Experiments
- Introduction to technical drawing:
  - reading and understanding technical drawings
  - three-plane views
  - sectional views
  - drawing types
  - 3D views
  - parts lists
  - dimensioning
  - surface finish and tolerance specifications
  - differentiation between standard and production parts
  - material specifications
- Planning and execution of simple assembly operations:
  - planning and describing work sequences
  - assessing results
- Measurement exercises:
  - length measurements
  - angle measurements
- Manufacturing methods:
  - operational examples of handmade production and production on machine tools

Coverage of the fundamentals: An Assembly Kit for Introducing a Course

Function group | Partial function | Movement
--- | --- | ---
Main body | Carries, supports and guides all other parts | None
Stop | Sets the length to be cut off | None
Shear body | Transmits the shearing force to the workpiece | Rotary & linear motion

Lever shears function groups

Assembly step 1 (Main body) – Parts required for assembly

<table>
<thead>
<tr>
<th>Pos.</th>
<th>Name</th>
<th>Pos.</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Main body</td>
<td>17</td>
<td>Cheese head screw</td>
</tr>
<tr>
<td>3</td>
<td>Bearing flange</td>
<td>18</td>
<td>Cheese head screw</td>
</tr>
<tr>
<td>8</td>
<td>Lower blade</td>
<td>23</td>
<td>Parallel pin</td>
</tr>
<tr>
<td>11</td>
<td>Base plate</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MT 158 Assembly Exercise: Ball Valve and Shut-off Valve

Two different valves and fittings in one assembly kit. Parts are clearly and perfectly arranged.

Exercises can be conducted in a classroom – no workshop environment necessary.
- Assembly exercises can be conducted in relatively short periods of time (within lesson units).
- Comprehensive and well-structured instructional material will impress you.

Learning Objectives / Experiments
- Design and function of a ball valve
- Design and function of a valve
- Assembly and disassembly, including for the purposes of maintenance and repair
- Replacing components (e.g. seal)
- Comparison of 2 different valves and fittings
- Reading and understanding engineering drawings and operating instructions
- Leak testing (together with hydraulic valves and fittings test stand MT 162)

Grinding of the seat of a flat seat valve

Replacement parts available according to part lists and drawings
ASSEMBLY PROJECTS – MAINTENANCE

MT 186 Assembly & Maintenance Exercise: Gear Pump

- Installing the driven shaft
- Mounting the wearing discs

Learning Objectives / Experiments
- Design and function of a gear pump and its components
- Assembly and disassembly for maintenance and repair purposes
- Replacing components (e.g. seals)
- Troubleshooting, fault assessment
- Planning and assessment of maintenance and repair operations
- Reading and understanding engineering drawings and operating instructions

Components included in the assembly kit

MT 140.02 Assembly Exercise: Piston Compressor

- Students studying the assembly
- Crankcase, crankshaft, oil distribution ring

Learning Objectives / Experiments
- Design and function of a compressor
- Reading and understanding engineering drawings
- Familiarisation with components and assemblies, their design features and functions
- Dimensioning exercises, gauging of parts
- Work planning, particularly planning and presentation of the assembly process
- Familiarisation with assembly aids and jigs
- Assembly exercises: component and complete unit assembly
- Analysis of faults and damage, in conjunction with maintenance and repair steps
- Material selection criteria

In conjunction with MT 140.01:
- Functional testing of the assembled compressor
ASSEMBLY PROJECTS – MAINTENANCE

MT 110.02 Assembly Exercise: Spur Wheel/Worm Gear Mechanism

- Practical exercise assembling a modern industrial gear unit using simple tools and jigs
- Broad scope of learning presenting interdisciplinary problems
- Comprehensive and well-structured instructional material

An example of assembly section

Learning Objectives / Experiments
- Design and function of a multistage gear combination
- Reading and understanding engineering drawings
- Familiarisation with component and assemblies, their design features and functions
- Dimensioning exercises, gauging of parts
- Work planning, particularly planning and presentation of the assembly process
- Familiarisation with assembly aids and jigs
- Assembly exercises: component and complete unit assembly
- Analysis of faults and damage, in conjunction with maintenance and repair steps
- Material selection criteria

In conjunction with MT 172:
- Functional testing of the assembled gear unit

Left hand: single parts of the gear
Right hand: fully assembled multistage gear

MT 190 Assembly Project: Materials Tester

- Build your own materials tester

This is the assembly kit...

...and this is the result

Learning Objectives / Experiments
- Reading and understanding technical documentation
- Planning and execution of assembly operations and sequences
- Familiarisation with machine elements and components
- Commissioning and checking of a materials tester following assembly
- Planning, execution and assessment of maintenance operations
- Fault analysis: Troubleshooting, fault assessment and repair

After assembly:
- Tensile test of metallic specimens
- Recording of stress-elongation diagrams
- Brinell hardness test
MT 210 Assembly & Maintenance Exercise: Refrigeration

Learning Objectives / Experiments

- Reading and understanding technical documentation
- Planning and execution of assembly operations and sequences
- Making piping connections as per system diagram
- Electrical installation as per circuit diagram
- Commissioning and checking of a refrigeration unit following assembly (in conjunction with ET 150.01)
- Familiarisation with the function of the components of a refrigeration system and of the complete system
- Fault analysis: troubleshooting, fault assessment and repair
- Planning, execution and assessment of maintenance operations

In conjunction with ET 150.01:

- Evacuation and filling of refrigeration units

HL 960 Assembly Station: Pipes and Valves and Fittings

Maintenance, repair, troubleshooting of a refrigeration system...totally practice-oriented

Practically oriented assembly of piping and system installations

Maintenance, repair

...it is difficult to imagine a more hands-on training system

Learning Objectives / Experiments

- Design and function of valves and fittings, piping elements and system components
- Planning of piping and system installations according to specification, e.g. a process schematic
- Selection of components and drafting of requirement lists
- Technically correct preparation and execution of system assembly
- Reading and understanding engineering drawings and technical documentation
- Operational testing of the constructed systems (in conjunction with suitable water supply and disposal)
ASSEMBLY AND MAINTENANCE EXERCISE: PISTON PUMP

1

Mul

head

an

7 Solutions

All Rights Reserved G.U.N.T. Gerätebau GmbH, Barsbüttel, Germany 06/2007

ASSEMBLY PROJECTS – MAINTENANCE

Note:

HL 960

parts: 25 - x

Items:

- piping system (with flange connections), we also need the following additional

48

piping system:

1 and 48 - x 2.

E

elements are required to assemble the sections into

35 33

D

d

32

7 Solutions

All rights reserved, G.U.N. Gerätebau, Barsbüttel, Germany 11/2008

11/2008

MT 10/2008

Procedure for assembling the screw pump

Safety washer

(11)

Seal

Valve cover

(15)

Valve piston and valve spring

O-ring

Set screw

(7)

(6)

e4

136

graphics and drawings. That way you can

Additionally you receive the complete

arranged folder.

The complete material on CD (PDF)

The complete instructional material is delivered in hardcopy form in a clearly

arranged folder.

Additionally you receive the complete material as PDF-files. It includes all texts,

graphics and drawings. That way you can conveniently print or present.

Fundamental principles presented in detail

The basic principles and technical descriptions are professionally illustrated with lots

of graphics, photos and clear text.

The pages are suitable for printing out or using with a video projector.

Worksheet 4, Page 4 - Solution to task 4.5

In the standard designation of

the following control

on type code 02

the number of designs accordingly.

The pump industry has made use of these properties and developed a

multi-flow

multi-flow

number of designs accordingly.

The complete material on CD (PDF)

The complete instructional material is delivered in hardcopy form in a clearly

arranged folder.

Additionally you receive the complete material as PDF-files. It includes all texts,

graphics and drawings. That way you can conveniently print or present.

The core of the teaching material is a complete set of drawings conforming to

standards. In addition to the assembly drawing with

parts list, you will find all manufacturing drawings of

the individual parts.

So you are able to produce your own parts, or have them manufactured for you.

Tasks and solutions

Complete set of drawings

- Prepared exercises and worksheets help to focus on the learning task so the

students work efficiently.

- Of course there is a recommended solution for every exercise.

- The core of the teaching material is a complete set of drawings conforming to

standards. In addition to the assembly drawing with

parts list, you will find all manufacturing drawings of

the individual parts.

So you are able to produce your own parts, or have them manufactured for you.

Fundamental principles presented in detail

The basic principles and technical descriptions are professionally illustrated with lots

of graphics, photos and clear text.

The pages are suitable for printing out or using with a video projector.