

**NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND  
TRAINING**



**APRIL 2023**

**PROPOSED OCCUPATIONAL STANDARDS**

**OCCUPATION: MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN**

**LEVEL: NTA 6**

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## **ABBREVIATIONS**

<b>CAD</b>	Computer-aided Design
<b>CBE</b>	Competency Based Education and Training
<b>MOP</b>	Maintenance Operational Procedures
<b>NACTVET</b>	National Council for Technical and Vocational Education and Training
<b>NOS</b>	National Occupational Standards
<b>OS</b>	Occupational Standards
<b>PLC</b>	Programmable Logic Controller
<b>PPT</b>	PowerPoint
<b>QC</b>	Quality Control
<b>TET</b>	Technical Education and Training
<b>TVET</b>	Technical and Vocational Education and Training

## GLOSSARY OF TERMS

<b>Circumstantial Knowledge:</b>	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
<b>Competence:</b>	The ability to use knowledge, understanding, practical, and thinking skills to perform effectively to the workplace standards required in employment.
<b>Competency:</b>	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
<b>Competency-based Education:</b>	An instructional programme that derives its content from validated tasks and bases assessment on the learner's performance.
<b>Curriculum:</b>	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
<b>Educational/Training Programme:</b>	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
<b>Occupation:</b>	A specific position requiring the performance of specific tasks – essentially the same tasks are performed by all employees having the same title. (Example: baker)
<b>Occupational Area:</b>	This is a broad grouping of related jobs. (Example: food service)
<b>Occupational Competence:</b>	The application of knowledge and skills that consistently meet the standards required by the work context.
<b>Occupational Standards:</b>	Specific requirements of competences people are expected to demonstrate in a particular occupational area, including knowledge and relevant attitudes. They also act as a performance tool of assessment of the prescribed outcomes.
<b>Occupational/Job Analysis:</b>	A process used to identify the tasks that are important to employees in any given occupation.
<b>Performance Criteria:</b>	Indicate expected end results or outcomes in the form of evaluative statements.
<b>Skills:</b>	The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.
<b>Standards:</b>	A set of statements, which if proved true under working conditions,

means that an individual is meeting an expected level and type of performance.

**Task Analysis:** The process of analysing each task to determine the steps, circumstantial knowledge, attitudes, performance standards, tools and materials needed, as well as safety concerns required for the employees performing it.

**Task:** A work activity that has a definite beginning and ending, is observable or measurable, and consists of two or more definite steps that leads to a product, service, or decision.

**Underpinning Knowledge:** Crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.

**Verification Process:** The process of having experts review and confirm the importance of the task (competency) statements identified through occupational analysis. Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.

## 1.0. INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. Tanzania's *Development Vision 2025* intends to raise the country's economy to a middle-income status. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical and Vocational Education and Training of Tanzania has begun the job of drafting Occupational Standards that will eventually be adopted as National Occupational Standards for TET in order to ensure that it meets the needs of the labour market and the country's economic agenda.

National Occupational Standards (NOS) are performance criteria that are matched with labour market demands. Each National Occupational Standard describes functions, performance standards, and knowledge/understanding for one important function or task. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruiting, supervision, and appraisal, as well as TET standards. They're also helpful for benchmarking and harmonizing qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current and consistent in delivery across all public and private institutions.

However, it must be noted that, Occupational Standards and Training standards/qualifications standards are different. Occupational Standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical wiring circuits, performs troubleshooting in electrical wiring, etc.) and they are usually defined by employers following procedures agreed upon by all stakeholders. Education and training standards are developed from the activities defined in occupational standards, and they include learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable him or her to function at an agreed level in an occupation. Education and Training standards are used to define curricula in training institutions. It is however critical that there must be a direct link between the Occupational Standards and the training standards to respond to demands of the labour market.

In TET delivery, Tanzania adopted the Competence Based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the Occupational Standards. Occupational Standards are thus the starting point for developing competency-based training (CBET) programmes. TET institutions will be required to benchmark their curricula with relevant Occupational Standards.

Occupational Standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training (TET).

The Mechanical Equipment Installation Technician Occupation has its own set of occupational standards. The document explains how the Occupational Standards were developed, as well as the scope, the occupational profile in the form of DACUM charts, and the Occupational Standards.

## **2.0. OCCUPATIONAL STANDARD DEVELOPMENT PROCESS**

The Occupational Standards development process began with an examination of major documents that guide Tanzanian skill development. The *10-year National Skills Development Strategy (2016-2026)* was one of the documents reviewed, and it outlined six (6) economic sectors that should be prioritized when developing skills development programmes.

These sectors include: Transport and Logistics, Tourism and Hospitality, Agribusiness, Construction, Energy and ICT. NACTE labour market reports were also used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a workshop comprised of experts and educators with substantial knowledge and experience in the occupation conducted an occupational analysis utilizing the DACUM approach to produce the occupational profile. The analysis resulted in DACUM Charts, which are attached as **Appendix 1** to this document.

The Occupational Standards were then developed. Experts in Occupational Analysis and the Development of Occupational Standards facilitated the workshop. Interviews, online surveys, and a stakeholder forum were used to validate the Occupational Standards. Engineers, Supervisory Technicians on the job, and experienced Mechanical Equipment Installation Technicians were key informants in the survey to discover occupational trends. The information was used to gain insight from the workplaces regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation. At least 3 online surveys were completed by experts from the labour market across the country. Apart from the survey aiding in defining the scope for the occupational analysis, they also served to engage a wide cross-section of experts in the occupation. Apart from this, the stakeholders' forum was attended by 28 participants from different parts of the country representing various companies.

## **3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR MECHANICAL EQUIPMENT INSTALLATION TECHNICIANS**

The standards cover a broad range of duties and tasks that can be performed by a Mechanical Equipment Installation Technician. However, the occupational standards are not meant to replace

individual job descriptions. Instead, they are to be used for guidance in defining skill levels and knowledge for the technician in specific settings or positions. The Mechanical Equipment Installation Technician may perform tasks in a number of key areas of the Occupational Standards, but not necessarily in all areas. For example, in large operations, other individuals may be employed or designated to perform specific tasks.

The Mechanical Equipment Installation Technician uses machines and tools to complete the installation and debugging of mechanical equipment under the supervision of engineers. Generally, the Mechanical Equipment Installation Technician performs the following responsibilities:

- a) Preparations before operation
- b) Assembly of typical components
- c) Production and installation of typical mechanical components
- d) Installation of auxiliary pipeline
- e) General equipment installation
- f) Special equipment installation
- g) General equipment debugging
- h) Special equipment debugging
- i) Assembly and debugging of typical equipment
- j) Maintenance and upkeep of general equipment
- k) Maintenance and upkeep of special equipment
- l) Maintenance and upkeep of typical equipment
- m) Organization and management of mechanical equipment installation

The Occupational Standards have been clustered into NTA qualification levels, i.e. NTA 4, 5 and 6.

#### **4.0. VALIDITY PERIOD**

Due to the rapid development of technology, the validity period of occupational standards is 3-5 years. The review will proceed in the same manner as the one before it, with new occupational standards being developed based on current trends of the labour market.

#### **5.0. OCCUPATIONAL STANDARDS**

## 5.1 OCCUPATIONAL STANDARDS FOR MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN - NTA 6

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	PREPARATIONS BEFORE OPERATION	<b>DUTY NO.</b>	601
<b>TASK TITLE</b>	READING OF TECHNICAL DOCUMENTS AND KEY POINT SUMMARY REPORTS	<b>TASK NO.</b>	6011
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to read the relevant technical documents for the installation of mechanical equipment and key point summary reports.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Assembly process specification;</li> <li>2. General assembly drawings, component assembly drawings and part drawings;</li> <li>3. Assembly process and operation flow card;</li> <li>4. Relevant technical documents such as user and manufacturing manuals, and equipment operation skills and knowledge;</li> <li>5. Safety precautions.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Read the assembly process specifications, determine the mutual assembly relationship between product parts and components, and determine the assembly sequence and method;</li> <li>2. Read the general assembly drawings, component assembly drawings and part drawings, and determine the mechanical structure;</li> <li>3. Read the process and operation flow card, and determine the fitting dimensions and accuracy requirements of each part and component;</li> <li>4. Understand the assembly process, and determine the assembly technical requirements, quality inspection methods and inspection tools for each process;</li> <li>5. Understand the assembly process, and determine the tools, fixtures and special-</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Determine the assembly sequence;</li> <li>1.2 Read the assembly dimensions and accuracy;</li> <li>1.3 Read the assembly technical requirements;</li> <li>1.4 Determine the transportation method for assembly parts;</li> <li>1.5 Determine the tools and equipment required during the assembly process;</li> <li>1.6 Determine safety precautions for assembly.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Assembly principles of the mechanical structure of the equipment;</li> <li>2.2 Principles of assembly sequence arrangement;</li> </ol>	

<p>purpose equipment required during the assembly process;</p> <p>6. Read the user manual and understand the equipment operation skills and knowledge;</p> <p>7. Read the safety precautions.</p>	<p>2.3 Dimensional accuracy and technical requirements;</p> <p>2.4 Principles of parts transportation methods;</p> <p>2.5 Principles of the tools and equipment required in assembly.</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <p>3.1 Circumstantial knowledge of mechanical drawing;</p> <p>3.2 Circumstantial knowledge of mechanical assembly technology;</p> <p>3.3 Circumstantial knowledge of tolerance fit and technical measurement;</p> <p>3.4 Circumstantial knowledge of mechanical design and principles.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Computer skills;</p> <p>4.3 Drawing skills;</p> <p>4.4 Learning skills;</p> <p>4.5 Teamwork skills;</p> <p>4.6 Report writing skills.</p>
<p><b>DESCRIPTION OF THE END PRODUCT / SERVICE</b></p>	<p>The report is issued in accordance with the relevant technical documents of the assembly process specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	OCCUPATION CODE	
<b>DUTY TITLE</b>	PREPARATIONS BEFORE OPERATION	DUTY NO.	601
<b>TASK TITLE</b>	PREPARATION OF INSTALLATION MACHINES AND TOOLS, AND CONFIRMATION OF INSTALLATION CONDITIONS	TASK NO.	6012
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to prepare supporting equipment and tools for installation according to the assembly process specifications of the mechanical equipment to be assembled, confirm installation conditions, and prepare well before installation.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Technical documents for the installation of mechanical equipment;</li> <li>2. Commonly-used installation tools, such as: jaw tools, cutting tools, fastening tools and welding tools;</li> <li>3. Commonly-used testing tools, such as: various measuring tools, instruments and apparatus;</li> <li>4. Installation equipment required, such as: drilling machine and grinding machine;</li> <li>5. Various fasteners and accessories, such as: screws, nuts, washers, bolts, studs, pressure plates, rivets, sealing rings;</li> <li>6. Various types of engine oil, hydraulic oil, fuel, etc.;</li> <li>7. Forklifts, cranes, auxiliary handling machines, and other tools;</li> <li>8. Personal protective equipment, such as safety helmet, safety shoes, goggles and protective gloves.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Determine the installation type and conditions based on the installation drawings of mechanical equipment;</li> <li>2. Reasonably prepare relevant tools based on the installation characteristics of the components;</li> <li>3. Reasonably choose testing tools based on the installation characteristics of the components;</li> <li>4. Reasonably choose special-purpose equipment based on the installation characteristics of the components;</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Determine the installation type and conditions of mechanical equipment;</li> <li>1.2 Select and use installation tools;</li> <li>1.3 Select and use testing tools;</li> <li>1.4 Select and use special-purpose equipment;</li> <li>1.5 Select installation accessories;</li> <li>1.6 Inspect installation auxiliary facilities such as forklifts and cranes.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain</p>	

<p>5. Prepare standard parts (screws, nuts, washers, sealing rings, etc.) according to the assembly drawing;</p> <p>6. Inspect special-purpose equipment such as drilling machine and grinding machine;</p> <p>7. Inspect basic auxiliary facilities such as forklifts and cranes.</p>	<p>the following principles:</p> <p>2.1 Installation characteristics of various parts of mechanical equipment;</p> <p>2.2 Functions and selection principles of various installation tools;</p> <p>2.3 Functions and selection principles of various testing tools;</p> <p>2.4 Functions and selection principles of various installation equipment;</p> <p>2.5 Functions and principles of relevant installation accessories.</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <p>3.1 The structure and assembly characteristics of mechanical equipment;</p> <p>3.2 Assembly drawings and technical requirements;</p> <p>3.3 The characteristics of the installation tools and special-purpose equipment;</p> <p>3.4 The type and scope of application of testing tools.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Entrepreneurial skills;</p> <p>4.4 Learning skills;</p> <p>4.5 Teamwork skills;</p> <p>4.6 Report writing skills;</p> <p>4.7 Tool and instrument operation skills.</p>
<p><b>DESCRIPTION OF THE END PRODUCT / SERVICE</b></p>	<p>Installation tools and equipment are prepared, installation conditions are confirmed, and preparations are made for subsequent installation according to the technical documents for mechanical equipment installation.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety guarantee;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Report writing.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	PREPARATIONS BEFORE OPERATION	<b>DUTY NO.</b>	601
<b>TASK TITLE</b>	PREPARATION OF EQUIPMENT ASSEMBLY PLANS AND TECHNICAL MEASURES	<b>TASK NO.</b>	6013
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to prepare assembly plans and technical measures based on the technical documents for mechanical equipment installation, installation tools and equipment.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Technical documents for the installation of mechanical equipment;</li> <li>2. Computer and software related to Word;</li> <li>3. Commonly-used installation tools, such as: jaw tools, cutting tools, fastening tools and welding tools;</li> <li>4. Commonly-used testing tools, such as: various measuring tools, instruments and apparatus;</li> <li>5. Installation equipment required, such as: drilling machine and grinding machine;</li> <li>6. Various fasteners and accessories, such as: screws, nuts, washers, bolts, studs, pressure plates, rivets, sealing rings;</li> <li>7. Various types of engine oil, hydraulic oil, fuel, etc.;</li> <li>8. Forklifts, cranes, auxiliary handling machines, and other tools;</li> <li>9. Personal protective equipment, such as safety helmet, safety shoes, goggles and protective gloves.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Read the technical documents for the installation of mechanical equipment;</li> <li>2. Determine the installation conditions;</li> <li>3. Disassembly, cleaning and lubrication of various parts;</li> <li>4. Determine the tools and equipment required for installation;</li> <li>5. Determine the installation sequence and methods;</li> <li>6. Determine the inspection method after installation;</li> <li>7. Prepare an assembly plan based on the above content;</li> <li>8. Propose effective technical measures for</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Read the technical documents for the installation of mechanical equipment;</li> <li>1.2 Determine the installation content;</li> <li>1.3 Determine the installation sequence;</li> <li>1.4 Determine the installation machines and tools;</li> <li>1.5 Determine the detection method;</li> <li>1.6 Prepare the assembly plan;</li> <li>1.7 Propose technical measures.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p>	

<p>the installation of equipment component.</p>	<p>2.1 Installation characteristics of mechanical equipment;</p> <p>2.2 The principle of determining the installation sequence;</p> <p>2.3 The principle of selecting installation machines and tools, and equipment;</p> <p>2.4 The principle of formulating assembly plans.</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <p>3.1 Circumstantial knowledge of mechanical equipment installation technology;</p> <p>3.2 Technical documents for the installation of mechanical equipment;</p> <p>3.3 Operation specifications for tools and equipment used for installation;</p> <p>3.4 Operation specifications for inspection instrument used for installation.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Necessary communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Tool and instrument operation skills.</p>
<p><b>DESCRIPTION OF THE END PRODUCT / SERVICE</b></p>	<p>The assembly plan and technical measures of the equipment are prepared, and the plan report is issued in accordance with the technical documents for mechanical equipment installation and related installation tools and equipment.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Report writing.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	ASSEMBLY OF TYPICAL COMPONENTS	<b>DUTY NO.</b>	602
<b>TASK TITLE</b>	ASSEMBLY OF MACHINE TOOL SPINDLE, GEAR PUMP, GEARBOX, WORKBENCH AND OTHER COMPONENTS	<b>TASK NO.</b>	6021
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to complete the assembly of machine tool spindle, gear pump, gearbox, workbench and other components according to the requirements of the equipment installation.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Mechanical installation tool kit;</li> <li>2. Mechanical accuracy inspection tools;</li> <li>3. Power source;</li> <li>4. Safety technical regulations and rules;</li> <li>5. Personal protective equipment: safety belts, safety helmets, work clothes, safety shoes, goggles, protective gloves, etc.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Adhere to safety precautions when performing tasks;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Complete the equipment acceptance inspection;</li> <li>4. Read the assembly drawings of each component;</li> <li>5. Using various positional accuracy detection methods;</li> <li>6. Use adjustment methods for bearing fit, gear fit, and faying surface fit errors.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Develop safety rules and regulations;</li> <li>1.2 Prepare labor protective equipment;</li> <li>1.3 Ensure the implementation of safety standards for production equipment.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Labor protection;</li> <li>2.2 Safety standard;</li> <li>2.3 Mechanical transmission principle.</li> </ol> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <ol style="list-style-type: none"> <li>3.1 Assembly process of mechanical parts.</li> </ol> <p><b>4.0 Essential Skills</b></p>	

	<p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Tool and equipment operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The assembly of machine tool spindle, gear pump, gearbox, workbench and other components is completed.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p>Detailed knowledge about:</p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Assembly operation process and procedures;</li> <li>3. Disposal methods of waste.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	ASSEMBLY OF TYPICAL COMPONENTS	<b>DUTY NO.</b>	602
<b>TASK TITLE</b>	ASSEMBLY OF COMPRESSOR COMPONENTS SUCH AS PISTON COMPONENTS AND CYLINDER HEAD COMPONENTS	<b>TASK NO.</b>	6022
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to complete the assembly of compressor components such as piston components and cylinder head components according to the requirements of the equipment installation.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Mechanical installation tool kit;</li> <li>2. Mechanical accuracy inspection tools;</li> <li>3. Power source;</li> <li>4. Safety technical regulations and rules;</li> <li>5. Personal protective equipment: safety belts, safety helmets, work clothes, safety shoes, goggles, protective gloves, etc.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Adhere to safety precautions when performing tasks;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Complete the equipment acceptance inspection;</li> <li>4. Read the assembly drawings of each compressor component;</li> <li>5. Using various positional accuracy detection methods;</li> <li>6. Use the method of adjusting the faying surface fit errors.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Develop safety rules and regulations;</li> <li>1.2 Prepare labor protective equipment;</li> <li>1.3 Ensure the implementation of safety standards for production equipment.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Labor protection;</li> <li>2.2 Safety standards;</li> <li>2.3 Sealing requirements for piston assembly.</li> </ol> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <ol style="list-style-type: none"> <li>3.1 Assembly process of mechanical parts.</li> </ol> <p><b>4.0 Essential Skills</b></p>	

	<p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The assembly of compressor components such as piston components and cylinder head components is completed.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Assembly operation process and procedures;</li> <li>3. Disposal methods of waste.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	ASSEMBLY OF TYPICAL COMPONENTS	<b>DUTY NO.</b>	602
<b>TASK TITLE</b>	ASSEMBLY OF THE PNEUMATIC OR HYDRAULIC SYSTEM	<b>TASK NO.</b>	6023
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to complete the assembly of the pneumatic or hydraulic system according to the requirements of the equipment installation.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Mechanical installation tool kit;</li> <li>2. Power source;</li> <li>3. Safety technical regulations and rules;</li> <li>4. Personal protective equipment: safety belts, safety helmets, work clothes, safety shoes, goggles, protective gloves, etc.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Adhere to safety precautions when performing tasks;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Complete the equipment acceptance inspection;</li> <li>4. Identify gas circuit diagrams and hydraulic schematic diagrams;</li> <li>5. Select various suitable components.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Develop safety rules and regulations;</li> <li>1.2 Prepare labor protective equipment;</li> <li>1.3 Ensure the implementation of safety standards for production equipment.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Labor protection;</li> <li>2.2 Safety standard;</li> <li>2.3 Requirements for pneumatic and hydraulic system pressure, flow rate, etc.</li> </ol> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <ol style="list-style-type: none"> <li>3.1 Principles of pneumatic and hydraulic transmission;</li> <li>3.2 Assembly process and procedures for pneumatic and hydraulic systems.</li> </ol>	

	<p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The assembly of the pneumatic or hydraulic system is completed.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Disposal methods of waste.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	INSTALLATION AND DEBUGGING OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	603
<b>TASK TITLE</b>	INSTALLATION AND DEBUGGING OF DOUBLE HOUSING PLANER	<b>TASK NO.</b>	6031
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to master the installation process of the double housing planer bed and complete the operation and accuracy inspection of the double housing planer.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Complete set of testing tools;</li> <li>2. Complete set of electrical tools;</li> <li>3. Installation engineering construction drawings;</li> <li>4. Technical documents for test run;</li> <li>5. General specifications and quality standards for the installation of mechanical equipment;</li> <li>6. Personal protective equipment, such as safety helmet, safety shoes, goggles and protective gloves;</li> <li>7. Mechanical installation tool kit.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Master the structure of the double housing planer;</li> <li>2. Complete the installation according to the installation process of the double housing planer bed;</li> <li>3. Master the installation process of other main components of the double housing planer and complete the installation;</li> <li>4. Complete the trial run and accuracy inspection of the double housing planer.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Understand the design intent;</li> <li>1.2 Read technical documents;</li> <li>1.3 Install foundation: The surface of the foundation should be flat, and the installation of the planer must be carried out after the complete drying of concrete;</li> <li>1.4 Install the double housing planer bed;</li> <li>1.5 Install columns and connecting beams;</li> <li>1.6 Install the crossbeam lifting box, side tool box device and crossbeam;</li> <li>1.7 Install electrical equipment and wiring;</li> <li>1.8 Carry out test run of machine tool;</li> <li>1.9 Detect the geometric accuracy of the machine tool.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p>	

	<p>2.1 Construction principles of foundation;</p> <p>2.2 Installation principles of mechanical structure;</p> <p>2.3 Geometric accuracy inspection of machine tools (use tools to complete accuracy tests such as levelness, parallelism and verticality);</p> <p>2.4 Machine assembly;</p> <p>2.5 Electrical assembly.</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <p>3.1 Knowledge of foundation construction;</p> <p>3.2 Knowledge of measuring geometric accuracy through the use of commonly-used measuring tools;</p> <p>3.3 Knowledge of structural installation of various types of machinery;</p> <p>3.4 Installation knowledge of various electrical components;</p> <p>3.5 Knowledge of circuit wiring debugging;</p> <p>3.6 Knowledge of double housing planer operation.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Mechanical installation and debugging skills;</p> <p>4.3 Electrical installation and debugging skills;</p> <p>4.4 Customer service skills;</p> <p>4.5 Teamwork skills;</p> <p>4.6 Report writing skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The assembly preparation is inspected in accordance with the typical installation and debugging manual.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <p>1. Basic knowledge of national standard drawing;</p> <p>2. Knowledge of the use and maintenance of drawing instruments and tools;</p> <p>3. Basic knowledge of general specifications and quality standards for the installation of mechanical equipment;</p> <p>4. Knowledge of machine tool test run and operation.</p>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	INSTALLATION AND DEBUGGING OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	603
<b>TASK TITLE</b>	INSTALLATION AND DEBUGGING OF LARGE VERTICAL LATHES	<b>TASK NO.</b>	6032
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to master the installation process of large vertical lathes, and complete the operation and accuracy inspection of large vertical lathes.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Complete set of testing tools;</li> <li>2. Complete set of electrical tools;</li> <li>3. Installation engineering construction drawings;</li> <li>4. Technical documents for test run;</li> <li>5. General specifications and quality standards for the installation of mechanical equipment;</li> <li>6. Personal protective equipment, such as safety helmet, safety shoes, goggles and protective gloves;</li> <li>7. Mechanical installation tool kit.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Read the general assembly drawing of the machine tool;</li> <li>2. Draw assembly drawings of connectors;</li> <li>3. Master the assembly process of vertical lathes;</li> <li>4. Select tools and measuring tools according to process requirements for tooling (bed, spindle box, feed system, auxiliary system);</li> <li>5. Read the electrical schematic diagram and wiring diagram of the machine tool;</li> <li>6. Complete electrical system installation and wiring;</li> <li>7. Carry out test run of the machine tool (for example, idle running).</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Understand the design intent;</li> <li>1.2 Read technical documents (machine tool general assembly drawing, electrical schematic diagram, electrical wiring diagram);</li> <li>1.3 Install foundation;</li> <li>1.4 Install the lathe bed;</li> <li>1.5 Install the spindle box (the bearings are correctly installed, the spindle runs smoothly, and the spindle runout and parallelism meet the requirements);</li> <li>1.6 Install the feed system (the parallelism between the lead screw and the guide rail meets the requirements);</li> <li>1.7 Install the workbench and tool holder (the workbench runs smoothly without jamming);</li> <li>1.8 Complete electrical system wiring according to the drawings;</li> </ol>	

	<p>1.9 Carry out test run and inspect the accuracy to start the machine tool.</p> <p><b>2.0 Principles</b> The person performing this task must be able to explain the following principles:</p> <p>2.1 Installation principles in engineering construction drawings;</p> <p>2.2 Technical documents;</p> <p>2.3 Principles for geometric accuracy inspection of machine tools;</p> <p>2.4 Machine assembly;</p> <p>2.5 Electrical assembly;</p> <p>2.6 Operation principles for machine tool trial operation.</p> <p><b>3.0 Theories</b> The person performing this task must be able to explain the following:</p> <p>3.1 Knowledge of foundation construction;</p> <p>3.2 Knowledge of measuring geometric accuracy through the use of commonly-used measuring tools;</p> <p>3.3 Knowledge of structural installation of various types of machinery;</p> <p>3.4 Installation knowledge of various electrical components;</p> <p>3.5 Knowledge of circuit wiring debugging;</p> <p>3.6 Knowledge of large-scale lathe operation.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Mechanical installation and debugging skills;</p> <p>4.3 Electrical installation and debugging skills;</p> <p>4.4 Customer service skills;</p> <p>4.5 Teamwork skills;</p> <p>4.6 Report writing skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The assembly preparation is inspected in accordance with the typical installation and debugging manual.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Basic knowledge of national standard drawing;</li> <li>2. Knowledge of the use and maintenance of drawing instruments and tools;</li> <li>3. Basic knowledge of general specifications and quality standards for the installation of mechanical equipment;</li> </ol>

	4. Knowledge of machine tool test run and operation.
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<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	INSTALLATION AND DEBUGGING OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	603
<b>TASK TITLE</b>	INSTALLATION AND DEBUGGING OF HEAVY-TYPE BRIDGE CRANE	<b>TASK NO.</b>	6033
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to install the heavy-type bridge crane in accordance with technical requirements and manufacturer's instruction manual, and debug to a normal operation state.		
<b>RANGE STATEMENT</b>	<p>The task can be performed under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. The machine (machinery) body and parts to be installed;</li> <li>2. Vernier calipers, micrometers, measuring tapes and steel rulers;</li> <li>3. Straight rules, angle rulers, level gauges;</li> <li>4. Commonly-used tools such as electric hand drills, screw taps, threading dies, files, wrenches, oilstones, scrapers, copper rods, hammers, rubber hammers;</li> <li>5. Auxiliary tools such as vices, detergent, gauze, etc.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Abide by the preventive measures for health and safety when performing this task;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Install tracks and buffer stops;</li> <li>4. Install the mechanism of heavy-type bridge cranes;</li> <li>5. Install the slide wire of heavy-type bridge cranes;</li> <li>6. Install the electrical equipment of heavy-type bridge cranes;</li> <li>7. Carry out debugging and operation of heavy-type bridge cranes;</li> <li>8. Clean the tools, equipment and workplaces.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Determine the installation datum line of the track, and adjust the track using a level gauge and steel ruler;</li> <li>1.2 When installing the buffer stop, ensure that its web centerline is in the same plane as the centerline of the track beam;</li> <li>1.3 Before installation, check for defects in rotating parts, mechanical parts and previously enclosed assembly components, and assemble and adjust the parts and components according to the manufacturer's instructions;</li> <li>1.4 Install the slide wire according to the design drawings;</li> <li>1.5 Install electrical equipment according to the manufacturer's drawings and relevant regulations.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <p><b>3.0 Theories</b></p>	

	<p>The person performing this task must be able to explain the following:</p> <p>3.1 Parts assembly drawings and technical requirements;</p> <p>3.2 Operating characteristics of heavy-type bridge cranes;</p> <p>3.3 Basic fitter operation theories such as filing, drilling and calibration;</p> <p>3.4 The installation theory of tracks, buffer stops, slide wires, mechanisms and electrical equipment.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Skills to read engineering technical drawings;</p> <p>4.2 Basic operational skills of fitters;</p> <p>4.3 Communication skills;</p> <p>4.4 Teamwork skills;</p> <p>4.5 Customer service skills;</p> <p>4.6 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	<p>Assembly, debugging and operation are carried out according to the installation instructions of the heavy-type bridge crane.</p>
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	INSTALLATION AND DEBUGGING OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	603
<b>TASK TITLE</b>	INSTALLATION AND DEBUGGING OF PISTON COMPRESSORS	<b>TASK NO.</b>	6034
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to install the piston compressor in accordance with technical requirements and manufacturer's instruction manual, and debug to a normal operation state.		
<b>RANGE STATEMENT</b>	The task can be performed under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include: <ol style="list-style-type: none"> <li>1. The machine (machinery) body and parts to be installed;</li> <li>2. Vernier calipers, micrometers, measuring tapes and steel rulers;</li> <li>3. Straight rules, angle rulers, level gauges and jacks;</li> <li>4. Commonly-used tools such as electric hand drills, screw taps, threading dies, files, wrenches, oilstones, scrapers, copper rods, hammers, rubber hammers;</li> <li>5. Auxiliary tools such as vices, detergent, gauze, etc.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Abide by the preventive measures for health and safety when performing this task;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Install the front bearing seat;</li> <li>4. Install the crankshaft;</li> <li>5. Install the rear bearing seat;</li> <li>6. Install shaft seal;</li> <li>7. Install the coupler;</li> <li>8. Install the oil pump;</li> <li>9. Install the oil three-way valve;</li> <li>10. Install the unloading device;</li> <li>11. Install the cylinder liner;</li> <li>12. Install the piston connecting rod assembly;</li> <li>13. Install the gas valve group and cylinder head;</li> <li>14. Clean the tools, equipment and workplaces.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Select the corresponding tools and equipment;</li> <li>1.2 Assemble structural parts;</li> <li>1.3 Connect with threaded fasteners;</li> <li>1.4 Lubricate and seal parts.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <ol style="list-style-type: none"> <li>3.1 Parts assembly drawings and technical requirements;</li> <li>3.2 The effect of deburring, polishing and lubrication on assembly;</li> <li>3.3 Basic fitter operations such as filing, drilling and calibration;</li> </ol>	

	<p>3.4 Installation of the front bearing seat, crankshaft, rear bearing seat, shaft seal, coupler, oil pump, oil three-way valve, unloading device, cylinder liner, piston connecting rod assembly, gas valve group and cylinder head.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Skills to read engineering technical drawings;</p> <p>4.2 Basic operational skills of fitters;</p> <p>4.3 Communication skills;</p> <p>4.4 Teamwork skills;</p> <p>4.5 Customer service skills;</p> <p>4.6 Tool and instrument operation skills.</p>
<p><b>DESCRIPTION OF THE END PRODUCT / SERVICE</b></p>	<p>Assembly, debugging and operation are carried out according to the installation instructions of the piston compressor.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT	<b>OCCUPATION</b>	
<b>DUTY TITLE</b>	INSTALLATION AND DEBUGGING OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	603
<b>TASK TITLE</b>	INSTALLATION AND DEBUGGING OF HYDRAULIC PRESSES	<b>TASK NO.</b>	6035
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to complete the installation and debugging of the hydraulic press in accordance with		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the machine shop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Complete mechanical installation tool kit;</li> <li>2. Level gauge;</li> <li>3. Theodolite;</li> <li>4. Level gauge;</li> <li>5. Measuring tape;</li> <li>6. Steel ruler;</li> <li>7. Sling (steel wire rope);</li> <li>8. Personal protective equipment, such as safety shoes, goggles, gloves and work clothes;</li> <li>9. Vernier caliper;</li> <li>10. Torque wrench;</li> <li>11. Electric drill.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Abide by the preventive measures for health and safety when performing this task;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Install the hydraulic press base;</li> <li>4. Install the ejection mechanism;</li> <li>5. Install the moving workbench;</li> <li>6. Install columns and hot assembly;</li> <li>7. Install the moved crossbeam;</li> <li>8. Install the plunger;</li> <li>9. Install the upper crossbeam and hydraulic cylinder block;</li> <li>10. Carry out trial run;</li> <li>11. Clean the tools, equipment and workplaces;</li> <li>12. Arrange and store the tools and equipment.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Install the moving workbench of the hydraulic press;</li> <li>1.2 Install the hydraulic press column;</li> <li>1.3 Install the upper crossbeam and hydraulic cylinder block of the hydraulic press.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Principles for testing the levelness of the moving workbench of the installation hydraulic press;</li> <li>2.2 Principles for hot assembly of installation hydraulic press columns and nuts;</li> </ol>	

	<p>2.3 The trial run workflow of the installation hydraulic press.</p> <p><b>3.0 Theories</b> The person performing this task must be able to explain the following:</p> <p>3.1 Theory of installation and use of tools and equipment for hydraulic presses;</p> <p>3.2 Calculation method for hot assembly of hydraulic press columns and nuts.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Entrepreneurial skills;</p> <p>4.6 Learning skills;</p> <p>4.7 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The hydraulic press is installed in accordance with technical requirements and manufacturer's specifications.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	INSTALLATION AND DEBUGGING OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	603
<b>TASK TITLE</b>	INSTALLATION AND DEBUGGING OF THE AUTOMATIC PRODUCTION LINE OF MODULAR MACHINE TOOL	<b>TASK NO.</b>	6036
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to complete the installation and debugging of the automatic production line of modular machine tool in accordance with technical requirements and manufacturer's specifications.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the machine shop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Complete mechanical installation tool kit;</li> <li>2. Level gauge;</li> <li>3. Theodolite;</li> <li>4. Level gauge;</li> <li>5. Measuring tape;</li> <li>6. Steel ruler;</li> <li>7. Sling (steel wire rope);</li> <li>8. Personal protective equipment, such as safety shoes, goggles, gloves and work clothes;</li> <li>9. Vernier caliper;</li> <li>10. Torque wrench;</li> <li>11. Electric drill;</li> <li>12. Concrete mixing plant.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Abide by the preventive measures for health and safety when performing this task;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Pour the concrete foundation;</li> <li>4. Install the middle base of the machine tool (along with the fixture);</li> <li>5. Install and adjust the conveyor belt transmission device;</li> <li>6. Install the side bases and columns of each machine tool;</li> <li>7. Install hydraulic stations and lay hydraulic pipelines;</li> <li>8. Install the foundation bolts and pour them, and after they are firmly fixed,</li> </ol>	<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Install the middle base device of the machine tool;</li> <li>1.2 Install the hydraulic pipeline of the modular machine tool;</li> <li>1.3 Install the electrical cabinet and electrical equipment of the modular machine tool.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Leveling method for installing the base of the modular machine tool;</li> <li>2.2 The control logic for installing the hydraulic pipeline of the modular machine tool;</li> </ol>		

<p>tighten the foundation bolts of the side base, middle base and conveyor belt transmission device of each machine tool to check the accuracy of the machine tool;</p> <p>9. Install the middle bearing plate and side limit plate, and install the workpiece conveyor belt;</p> <p>10. Install the electrical cabinet and electrical equipment;</p> <p>11. Carry out trial run;</p> <p>12. Clean the tools, equipment and workplaces;</p> <p>13. Arrange and store the tools and equipment.</p>	<p>2.3 The electrical control logic for installing the modular machine tool.</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <p>3.1 Theory of installation and use of tools and equipment for modular machine tools;</p> <p>3.2 The installation theory of hydraulic pipeline components in modular machine tools;</p> <p>3.3 The installation theory of electrical control components in modular machine tools.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Entrepreneurial skills;</p> <p>4.6 Learning skills;</p> <p>4.7 Tool and instrument operation skills.</p>
<p><b>DESCRIPTION OF THE END PRODUCT / SERVICE</b></p>	<p>The automatic production line of modular machine tool is installed in accordance with technical requirements and manufacturer's specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE</b></p>	<p><b>Detailed knowledge about:</b></p> <p>1. Occupational health and safety;</p> <p>2. Maintenance operation processes and procedures (MOPP);</p> <p>3. Waste disposal methods.</p>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTENANCE OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	604
<b>TASK TITLE</b>	MAINTENANCE OF DOUBLE HOUSING PLANERS	<b>TASK NO.</b>	6041
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to be familiar with the performance, structure and transmission equipment of the machine tool, and care and maintain the double housing planer in accordance with product specifications, technical document requirements and manufacturer's maintenance manual.		
<b>RANGE STATEMENT</b>	The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include: <ol style="list-style-type: none"> <li>1. Safety work clothing and safety devices;</li> <li>2. Safety devices and warning signs;</li> <li>3. Maintenance tools and manuals;</li> <li>4. Auxiliary tools;</li> <li>5. Maintenance and repair consumables.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Prepare equipment management system;</li> <li>2. Manage spare parts;</li> <li>3. Determine the mechanical and electrical system faults of the double housing planer;</li> <li>4. Guide the repair and maintenance of mechanical parts;</li> <li>5. Guide the maintenance of electrical systems;</li> <li>6. Comply with safety regulations when performing tasks;</li> <li>7. Conduct debugging after machine tool maintenance.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Disassemble and reassemble important functional components;</li> <li>1.2 Check and adjust the fitting clearance of various parts;</li> <li>1.3 Detect and adjust the geometric accuracy and working accuracy of the machine tool;</li> <li>1.4 Determine the cause of faults caused by improper operation during processing;</li> <li>1.5 Check the wiring quality during electrical maintenance;</li> <li>1.6 Eliminate common electrical faults in NC machine tool debugging;</li> <li>1.7 Eliminate common mechanical faults in NC machine tool debugging;</li> <li>1.8 Carry out test run of the machine tool after maintenance.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p>	

	<p>2.1 Management principles for spare parts;  2.2 Management principles for mechanical equipment;  2.3 Maintenance of electrical systems;  2.4 Safe and civilized regulations.</p> <p><b>3.0 Theories</b>  The person performing this task must be able to explain the following:  3.1 Equipment maintenance methods;  3.2 The content of equipment management;  3.3 The composition of equipment management system;  3.4 The method of implementing rules and regulations.</p> <p><b>4.0 Essential Skills</b>  4.1 Communication skills;  4.2 Mechanical repair and maintenance skills;  4.3 Electrical repair and maintenance skills;  4.4 Customer service skills;  4.5 Teamwork skills;  4.6 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The fault repair and maintenance management of the double housing planer are carried out to improve the service life of the machine tool and maximize its effectiveness.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTENANCE OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	604
<b>TASK TITLE</b>	MAINTENANCE OF LARGE VERTICAL LATHES	<b>TASK NO.</b>	6042
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to be familiar with the performance, structure and transmission equipment of the machine tool, and care and maintain the large vertical lathe in accordance with product specifications, technical document requirements and manufacturer's maintenance manual.		
<b>RANGE STATEMENT</b>	The task can be performed in the mechanical equipment installation workshop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include: <ul style="list-style-type: none"> <li>1. Safety work clothing and safety devices;</li> <li>2. Safety devices and warning signs;</li> <li>3. Maintenance tools and manuals;</li> <li>4. Auxiliary tools;</li> <li>5. Maintenance and repair consumables.</li> </ul>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Prepare equipment management system;</li> <li>2. Classify and manage equipment;</li> <li>3. Manage spare parts;</li> <li>4. Determine the fault of mechanical equipment;</li> <li>5. Guide the maintenance of mechanical parts;</li> <li>6. Guide the maintenance of mechanical parts;</li> <li>7. Guide the maintenance of electrical systems;</li> <li>8. Be familiar with the precautions during the repair and maintenance process of general mechanical equipment;</li> <li>9. Implement information management of equipment;</li> <li>10. Comply with safety regulations when performing tasks;</li> <li>11. Conduct debugging after machine tool maintenance.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Disassemble and reassemble important functional components (such as spindle box, feed system, tool holder, etc.);</li> <li>1.2 Check and adjust the fitting clearance of various parts;</li> <li>1.3 Detect and adjust the geometric accuracy and working accuracy of the machine tool;</li> <li>1.4 Determine the cause of faults caused by improper operation during processing;</li> <li>1.5 Program and modify the CNC system PMC ladder diagram;</li> <li>1.6 Identify the electrical wiring diagram and electrical schematic diagram of the machine tool;</li> <li>1.7 Check the wiring quality during electrical maintenance;</li> <li>1.8 Eliminate common electrical faults in NC machine tool debugging;</li> <li>1.9 Eliminate common mechanical faults in NC machine tool debugging;</li> </ol>	

	<p>1.10 Carry out test run of the machine tool after maintenance.</p> <p><b>2.0 Principles</b> The person performing this task must be able to explain the following principles:</p> <p>2.1 Management principles for spare parts; 2.2 Management principles for mechanical equipment; 2.3 Maintenance of electrical systems; 2.4 Safe and civilized regulations.</p> <p><b>3.0 Theories</b> The person performing this task must be able to explain the following:</p> <p>3.1 Equipment maintenance methods; 3.2 The content of equipment management; 3.3 The composition of equipment management system.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills; 4.2 Mechanical repair and maintenance skills; 4.3 Electrical repair and maintenance skills; 4.4 Customer service skills; 4.5 Teamwork skills; 4.6 Asset management skills; 4.7 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The fault repair and maintenance management of the vertical lathe are carried out to improve the service life of the machine tool and maximize its effectiveness.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTENANCE OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	604
<b>TASK TITLE</b>	MAINTENANCE AND DEBUGGING OF HEAVY-TYPE BRIDGE CRANE	<b>TASK NO.</b>	6043
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to maintain the heavy-type bridge crane in accordance with technical requirements and manufacturer's maintenance manual.		
<b>RANGE STATEMENT</b>	The task can be performed in the machine shop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include: 1. Safety work clothing and safety devices; 2. Safety devices and warning signs; 3. Maintenance tools and manuals; 4. Auxiliary tools; 5. Maintenance and repair consumables.		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Select operating tools;</li> <li>2. Perform periodic lubrication on parts;</li> <li>3. Regularly maintain vulnerable components;</li> <li>4. Analyze and repair mechanical faults;</li> <li>5. Analyze and repair electrical system faults;</li> <li>6. Maintain the mechanical parts;</li> <li>7. Maintain electrical equipment;</li> <li>8. Clean the workplaces;</li> <li>9. Arrange and store the tools and equipment.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b> The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Maintain the mechanism, slide wire and electrical equipment of the heavy-type bridge crane;</li> <li>1.2 Analyze the equipment fault and determine the type of fault;</li> <li>1.3 Dismantle equipment;</li> <li>1.4 Assemble equipment;</li> <li>1.5 Check the accessories.</li> </ol> <p><b>2.0 Principles</b> The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 The principle of placing equal emphasis on maintenance and repair, and prioritizing prevention;</li> <li>2.2 Standardization, technicalization and institutionalization of maintenance work.</li> </ol> <p><b>3.0 Theories</b> The person performing this task must be able to explain the following:</p> <ol style="list-style-type: none"> <li>3.1 Structural composition and operation theory of the heavy-type bridge crane;</li> </ol>	

	<p>3.2 Preventive maintenance plan; 3.3 Use of proper tools and equipment.</p> <p><b>4.0 Essential Skills</b> 4.1 Communication skills; 4.2 Computer skills; 4.3 Customer service skills; 4.4 Report writing skills; 4.5 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The mechanism, slide wire and electrical equipment of the heavy-type bridge crane are regularly inspected, repaired and maintained in accordance with the equipment maintenance manual.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP).</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTENANCE OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	604
<b>TASK TITLE</b>	MAINTENANCE OF PISTON COMPRESSORS	<b>TASK NO.</b>	6044
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to maintain the piston compressor in accordance with technical requirements and manufacturer's maintenance manual.		
<b>RANGE STATEMENT</b>	The task can be performed in the machine shop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include: <ol style="list-style-type: none"> <li>1. Safety work clothing and safety devices;</li> <li>2. Safety devices and warning signs;</li> <li>3. Maintenance tools and manuals;</li> <li>4. Auxiliary tools;</li> <li>5. Maintenance and repair consumables.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Select proper operating tools;</li> <li>2. Carry out daily maintenance of piston compressors;</li> <li>3. Carry out third-level maintenance of piston compressors;</li> <li>4. Perform periodic lubrication on parts;</li> <li>5. Perform external maintenance;</li> <li>6. Maintain air valves and cylinders;</li> <li>7. Check the oil circuit and quality;</li> <li>8. Maintain electrical equipment;</li> <li>9. Analyze and repair common faults of piston compressors, such as heating, oil leakage, cylinder burning, etc.;</li> <li>10. Clean the workplaces;</li> <li>11. Arrange and store the tools and equipment.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Perform periodic lubrication on parts;</li> <li>1.2 Analyze the piston compressor fault and determine the type of fault;</li> <li>1.3 Dismantle equipment;</li> <li>1.4 Assemble equipment;</li> <li>1.5 Check the accessories.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 The principle of placing equal emphasis on maintenance and repair, and prioritizing prevention;</li> <li>2.2 Standardization, technicalization and institutionalization of maintenance work.</li> </ol> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <ol style="list-style-type: none"> <li>3.1 Structural composition and operation theory of the piston compressor;</li> <li>3.2 Preventive maintenance plan.</li> </ol>	

	<p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Computer skills;</p> <p>4.3 Customer service skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The air valve, cylinder, oil circuit and electrical equipment of the piston compressor are regularly inspected, repaired and maintained in accordance with the equipment maintenance manual.
<b>CIRCUMSTANTIAL KNOWLEDGE</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP).</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTENANCE OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	604
<b>TASK TITLE</b>	HYDRAULIC PRESS MAINTENANCE	<b>TASK NO.</b>	6045
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to complete the maintenance of the hydraulic press in accordance with technical requirements and manufacturer's specifications.		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the machine shop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Complete mechanical maintenance tool kit;</li> <li>2. Level gauge;</li> <li>3. Theodolite;</li> <li>4. Level gauge;</li> <li>5. Measuring tape;</li> <li>6. Steel ruler;</li> <li>7. Machinery lubricating oil;</li> <li>8. Sling (steel wire rope);</li> <li>9. Personal protective equipment, such as safety shoes, goggles, gloves and work clothes;</li> <li>10. Vernier caliper;</li> <li>11. Torque wrench;</li> <li>12. Electric drill.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Abide by the preventive measures for health and safety when performing this task;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Maintain the hydraulic press base;</li> <li>4. Maintain the ejection mechanism;</li> <li>5. Maintain the moving workbench;</li> <li>6. Maintain the column and hot assembly;</li> <li>7. Maintain the moved crossbeam;</li> <li>8. Maintain the plunger;</li> <li>9. Maintain the the upper crossbeam and hydraulic cylinder block;</li> <li>10. Maintain the electrical cabinet and electrical equipment;</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Maintain the moving workbench of the hydraulic press;</li> <li>1.2 Maintain the hydraulic press columns;</li> <li>1.3 Maintain the upper crossbeam and hydraulic cylinder block of the hydraulic press.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Principles for testing the levelness of the moving workbench of the maintenance hydraulic press;</li> <li>2.2 Principles for hot assembly of maintenance hydraulic press columns and nuts;</li> </ol>	

<p>11. Clean the tools, equipment and workplaces;</p> <p>12. Arrange and store the tools and equipment.</p>	<p>2.3 The trial run workflow of the maintenance hydraulic press.</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <p>3.1 Theory of use of tools and equipment for maintenance hydraulic presses;</p> <p>3.2 Calculation method for hot assembly of maintenance hydraulic press columns and nuts.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Entrepreneurial skills;</p> <p>4.6 Learning skills;</p> <p>4.7 Tool and instrument operation skills.</p>
<p><b>DESCRIPTION OF THE END PRODUCT / SERVICE</b></p>	<p>The hydraulic press is maintained in accordance with technical requirements and manufacturer's specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE:</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	MAINTENANCE OF TYPICAL EQUIPMENT	<b>DUTY NO.</b>	604
<b>TASK TITLE</b>	MAINTENANCE OF THE AUTOMATIC PRODUCTION LINE OF MODULAR MACHINE TOOL	<b>TASK NO.</b>	6046
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to complete the maintenance of the automatic production line of modular machine tool		
<b>RANGE STATEMENT</b>	<p>The task can be performed in the machine shop under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. Complete mechanical maintenance tool kit;</li> <li>2. Level gauge;</li> <li>3. Theodolite;</li> <li>4. Level gauge;</li> <li>5. Measuring tape;</li> <li>6. Steel ruler;</li> <li>7. Machinery lubricating oil;</li> <li>8. Sling (steel wire rope);</li> <li>9. Personal protective equipment, such as safety shoes, goggles, gloves and work clothes;</li> <li>10. Vernier caliper;</li> <li>11. Torque wrench.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Abide by the preventive measures for health and safety when performing this task;</li> <li>2. Select appropriate operation tools and equipment for this task;</li> <li>3. Maintain the middle base of the machine tool (along with the fixture);</li> <li>4. Maintain and adjust the conveyor belt transmission device;</li> <li>5. Maintain the side bases and columns of each machine tool;</li> <li>6. Maintain hydraulic stations and lay hydraulic pipelines;</li> <li>7. Maintain the foundation bolts and pour them, and after they are firmly</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Maintain the middle base device of the machine tool;</li> <li>1.2 Maintain the hydraulic pipeline of the modular machine tool;</li> <li>1.3 Maintain the electrical cabinet and electrical equipment of the modular machine tool.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 Leveling method for maintaining the base of the modular machine tool;</li> </ol>	

<p>fixed, tighten the foundation bolts of the side base, middle base and conveyor belt transmission device of each machine tool to check the accuracy of the machine tool;</p> <p>8. Maintain the middle bearing plate and side limit plate, and maintain the workpiece conveyor belt;</p> <p>9. Maintain the electrical cabinet and electrical equipment;</p> <p>10. Clean the tools, equipment and workplaces;</p> <p>11. Arrange and store the tools and equipment.</p>	<p>2.2 The control logic for maintaining the hydraulic pipeline of the modular machine tool;</p> <p>2.3 The electrical control logic for maintaining the modular machine tool.</p> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <p>3.1 The theory of using maintenance modular machine tools and equipment;</p> <p>3.2 The working theory of hydraulic pipeline components in maintenance modular machine tools;</p> <p>3.3 The working theory of electrical control components in maintenance modular machine tools.</p> <p><b>4.0 Essential Skills</b></p> <p>4.1 Communication skills;</p> <p>4.2 Customer service skills;</p> <p>4.3 Teamwork skills;</p> <p>4.4 Report writing skills;</p> <p>4.5 Entrepreneurial skills;</p> <p>4.6 Learning skills;</p> <p>4.7 Tool and instrument operation skills.</p>
<p><b>PRACTICAL PERFORMANCE</b></p>	<p>The automatic production line of modular machine tool is maintained in accordance with technical requirements and manufacturer's specifications.</p>
<p><b>CIRCUMSTANTIAL KNOWLEDGE:</b></p>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety;</li> <li>2. Maintenance operation processes and procedures (MOPP);</li> <li>3. Waste disposal methods.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	ORGANIZATION AND MANAGEMENT	<b>DUTY NO.</b>	605
<b>TASK TITLE</b>	CLASS MANAGEMENT	<b>TASK NO.</b>	6051
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to organize team members to learn technical and operational skills, and impart higher and newer operational skills and installation processes in the profession.		
<b>RANGE STATEMENT</b>	<p>The task of organizing team members to learn can be performed under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include:</p> <ol style="list-style-type: none"> <li>1. The machine (machinery) body and parts to be installed;</li> <li>2. Vernier calipers, micrometers, measuring tapes and steel rulers;</li> <li>3. Straight rules, angle rulers, level gauges;</li> <li>4. Commonly-used tools such as electric hand drills, screw taps, threading dies, files, wrenches, oilstones, scrapers, copper rods, hammers, rubber hammers;</li> <li>5. Auxiliary tools such as vices, detergent, gauze, etc.;</li> <li>6. Office software.</li> </ol>		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
<p>The person performing this task must be able to do the following:</p> <ol style="list-style-type: none"> <li>1. Train employees;</li> <li>2. Abide by the preventive measures for health and safety when performing this task;</li> <li>3. Select appropriate operation tools and equipment for this task;</li> <li>4. Clean the tools, equipment and workplaces.</li> </ol>		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b></p> <p>The person performing this task must be able to explain how to:</p> <ol style="list-style-type: none"> <li>1.1 Execute the details and technical requirements of the components;</li> <li>1.2 Execute the structural part assembly;</li> <li>1.3 Use measuring tools.</li> </ol> <p><b>2.0 Principles</b></p> <p>The person performing this task must be able to explain the following principles:</p> <ol style="list-style-type: none"> <li>2.1 The working principle of measuring tools;</li> <li>2.2 Technical conditions and specifications;</li> <li>2.3 The principle of safety prevention;</li> <li>2.4 The use principle of office software.</li> </ol> <p><b>3.0 Theories</b></p> <p>The person performing this task must be able to explain the following:</p> <ol style="list-style-type: none"> <li>3.1 Parts assembly drawings and technical requirements;</li> <li>3.2 Equipment operation theory;</li> <li>3.3 Installation process.</li> </ol>	

	<p><b>4.0 Essential Skills</b></p> <p>4.1 Skills to read engineering technical drawings;</p> <p>4.2 Basic equipment operation skills;</p> <p>4.3 Organization and communication skills;</p> <p>4.4 Teamwork skills;</p> <p>4.5 Customer service skills;</p> <p>4.6 Report writing skills;</p> <p>4.7 Tool and instrument operation skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	The higher and newer operational skills and installation processes in the profession are explained, and everyone is organized to discuss and learn together.
<b>CIRCUMSTANTIAL KNOWLEDGE:</b>	<p><b>Detailed knowledge about:</b></p> <ol style="list-style-type: none"> <li>1. Occupational health and safety.</li> </ol>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	ORGANIZATION AND MANAGEMENT	<b>DUTY NO.</b>	605
<b>TASK TITLE</b>	SAFETY MANAGEMENT	<b>TASK NO.</b>	6052
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to propose safety precautions and special safety measures in conjunction with the safety requirements of the construction design and plan.		
<b>RANGE STATEMENT</b>	The task can be performed in the office under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include: 1. Safety work clothing and safety devices; 2. Safety devices and warning signs; 3. Maintenance tools and manuals; 4. Auxiliary tools; 5. Maintenance and repair consumables; 6. Office software.		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>		<b>UNDERPINNING KNOWLEDGE</b>	
The person performing this task must be able to do the following: 1. Train employees; 2. Overhaul handheld electrical equipment; 3. Transport and install the equipment; 4. Observe the fire protection measures; 5. Use temporary electricity; 6. Use the WORD and PPT office software.		<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b> The person performing this task must be able to explain how to: 1.1 Set up work safety operation procedures; 1.2 Set up precautions for special operation personnel; 1.3 Set up general regulations; 1.4 Inspect handheld electric tools in advance; 1.5 Set up precautions for equipment handling and installation.</p> <p><b>2.0 Principles</b> The person performing this task must be able to explain the following principles:</p> <p><b>3.0 Theories</b> The person performing this task must be able to explain the following: 3.1 The development theory of safety precautions; 3.2 The development theory of the content of safety activities; 3.3 The development theory of the content of safety measures.</p> <p><b>4.0 Essential Skills</b></p>	

	<p>4.1 Skills to read engineering technical drawings;</p> <p>4.2 Equipment installation skills;</p> <p>4.3 Communication skills;</p> <p>4.4 Teamwork skills;</p> <p>4.5 Customer service skills;</p> <p>4.6 Text writing skills.</p>
<b>DESCRIPTION OF THE END PRODUCT / SERVICE</b>	Safety precautions and special safety measures are proposed in conjunction with the safety requirements of the construction design and plan.
<b>CIRCUMSTANTIAL KNOWLEDGE:</b>	<p><b>Detailed knowledge about:</b></p> <p>1. Occupational health and safety.</p>

<b>OCCUPATION</b>	MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN	<b>OCCUPATION CODE</b>	
<b>DUTY TITLE</b>	ORGANIZATION AND MANAGEMENT	<b>DUTY NO.</b>	605
<b>TASK TITLE</b>	QUALITY CONTROL	<b>TASK NO.</b>	6053
<b>PERFORMANCE CRITERIA</b>	The person performing this task must be able to guide team members in improving and enhancing operational methods and processes.		
<b>RANGE STATEMENT</b>	The task can be performed in the office under the supervision of senior mechanical equipment installation technicians or mechanical engineers. The tools and equipment to be used include: 1. Office software; 2. Printer, fax machine, paper and pen.		
<b>EVIDENCE REQUIREMENT</b>			
<b>PRACTICAL PERFORMANCE</b>	<b>UNDERPINNING KNOWLEDGE</b>		
The person performing this task must be able to do the following: 1. Train employees; 2. Determine the basic operation of the equipment; 3. Determine the installation technology; 4. Determine the quality standard; 5. Use the WORD and PPT office software.	<p><b>Detailed knowledge about:</b></p> <p><b>1.0 Methods</b> The person performing this task must be able to explain how to: 1.1 Determine the importance of quality; 1.2 Determine the knowledge of quality standards; 1.3 Determine the knowledge of quality control and QC team activities; 1.4 Determine the quality self inspection and mutual inspection methods; 1.5 Determine the operation method and process knowledge.</p> <p><b>2.0 Principles</b> The person performing this task must be able to explain the following principles:</p> <p><b>3.0 Theories</b> The person performing this task must be able to explain the following: 3.1 The theory of formulating quality standard items; 3.2 The theory of formulating the content of process improvement; 3.3 The theory of formulating the QC content.</p> <p><b>4.0 Essential Skills</b> 4.1 Equipment installation skills; 4.2 Communication skills; 4.3 Teamwork skills; 4.4 Customer service skills.</p>		
<b>DESCRIPTION OF THE END</b>	Team members are guided to improve operational methods		

<b>PRODUCT / SERVICE</b>	and processes.
<b>CIRCUMSTANTIAL KNOWLEDGE:</b>	<b>Detailed knowledge about:</b> <ol style="list-style-type: none"><li>1. Process improvement and enhancement;</li><li>2. Occupational health and safety.</li></ol>

**TABLE 1: DACUM CHARTS FOR MECHANICAL EQUIPMENT INSTALLATION TECHNICIAN - NTA 6**

DUTIES	TASKS	ENABLERS
<p>1.0 Preparations before operation</p>	<p>1.1 Understanding of technical documents, including the key points and parts.</p>	<p><b>General skills and knowledge</b></p> <ul style="list-style-type: none"> <li>• Cooperation with others using communication skills and report to the superiors</li> <li>• Use of the manufacturer's manual</li> <li>• Operating skills and knowledge of lifting equipment and cranes, and the use of auxiliary tools</li> <li>• The structure of the mechanical parts</li> <li>• Interpretation of technical drawings</li> <li>• Assembly process</li> <li>• Use of measuring instruments</li> </ul> <p><b>Tools and equipment</b></p> <ul style="list-style-type: none"> <li>• Personal protective equipment, such as safety shoes, goggles, gloves, labor protection clothing and safety helmets</li> <li>• Equipment maintenance tool kit</li> <li>• Travelling crane, crane, hook and steel rope, pad iron, foundation bolt, electric welding machine, vise, electric soldering iron</li> <li>• Level gauge, dial indicator, vernier caliper, (inner) outside micrometer, measuring tape, steel ruler</li> <li>• Rubber hammer, file, brush, circlip pliers, socket, internal and external hexagon wrench, cross screwdriver, slotted screwdriver, vice, needle-nose pliers</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• Fuse, battery, relay</li> <li>• Lubricating grease (oil)</li> <li>• Insulating tape, loose tape, sandcloth, duster cloth</li> <li>• Marker pen, recording paper</li> </ul> <p><b>Requirements for employees</b></p> <ul style="list-style-type: none"> <li>• Teamwork spirit, integrity, time management, organization and coordination</li> </ul>
	<p>1.2 Preparation of installation machines and tools, and confirmation of installation conditions.</p>	
	<p>1.3 Preparation of equipment assembly plans and technical measures.</p>	

<b>DUTIES</b>	<b>TASKS</b>	<b>ENABLERS</b>
2.0 Assembly of typical components	2.1 Assembly of machine tool spindle, gear pump, gearbox, workbench and other components.	<p><b>General skills and knowledge</b></p> <ul style="list-style-type: none"> <li>• Cooperation with others using communication skills and report to the superiors</li> <li>• Use of the manufacturer's manual</li> <li>• Operating skills and knowledge of lifting equipment and cranes, and the use of auxiliary tools</li> <li>• The structure of the mechanical parts</li> <li>• Interpretation of technical drawings</li> <li>• Assembly process</li> <li>• Use of measuring instruments</li> </ul> <p><b>Tools and equipment</b></p> <ul style="list-style-type: none"> <li>• Personal protective equipment, such as safety shoes, goggles, gloves, labor protection clothing and safety helmets</li> <li>• Equipment maintenance tool kit</li> <li>• Travelling crane, crane, hook and steel rope, pad iron, foundation bolt, electric welding machine, vise, electric soldering iron</li> <li>• Level gauge, dial indicator, vernier caliper, (inner) outside micrometer, measuring tape, steel ruler</li> <li>• Rubber hammer, file, brush, circlip pliers, socket, internal and external hexagon wrench, cross screwdriver, slotted screwdriver, vice, needle-nose pliers</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• Fuse, battery, relay</li> <li>• Lubricating grease (oil)</li> <li>• Insulating tape, loose tape, sandcloth, duster cloth</li> <li>• Marker pen, recording paper</li> </ul> <p><b>Requirements for employees</b></p> <ul style="list-style-type: none"> <li>• Teamwork spirit, integrity, time management, organization and coordination</li> </ul>
	2.2 Assembly of compressor components such as piston components and cylinder head components, and repair of AC generator.	
	2.3 Assembly of the pneumatic or hydraulic system.	
3.0 Installation and debugging of	3.1 Installation and debugging of double	<b>General skills and knowledge</b>

DUTIES	TASKS	ENABLERS
typical equipment	housing planer.	<ul style="list-style-type: none"> <li>• Cooperation with others using communication skills and report to the superiors</li> <li>• Use of the manufacturer's manual</li> <li>• Operating skills and knowledge of lifting equipment and cranes, and the use of auxiliary tools</li> <li>• The structure of the mechanical parts</li> <li>• Interpretation of technical drawings</li> <li>• Assembly process</li> <li>• Use of measuring instruments</li> <li>• Equipment debugging</li> </ul> <p><b>Tools and equipment</b></p> <ul style="list-style-type: none"> <li>• Personal protective equipment, such as safety shoes, goggles, gloves, labor protection clothing and safety helmets</li> <li>• Equipment maintenance tool kit</li> <li>• Travelling crane, crane, hook and steel rope, pad iron, foundation bolt, electric welding machine, vise, electric soldering iron</li> <li>• Level gauge, dial indicator, vernier caliper, (inner) outside micrometer, measuring tape, steel ruler</li> <li>• Rubber hammer, file, brush, circlip pliers, socket, internal and external hexagon wrench, cross screwdriver, slotted screwdriver, vice, needle-nose pliers</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• Fuse, battery, relay</li> <li>• Lubricating grease (oil)</li> <li>• Insulating tape, loose tape, sandcloth, duster cloth</li> <li>• Marker pen, recording paper</li> </ul> <p><b>Requirements for employees</b></p> <ul style="list-style-type: none"> <li>• Teamwork spirit, integrity, time management, organization and coordination</li> </ul>
	3.2 Installation and debugging of large vertical lathes.	
	3.3 Installation and debugging of heavy-type bridge crane.	
	3.4 Installation and debugging of piston compressors.	
	3.5 Installation and debugging of hydraulic presses.	
	3.6 Installation and debugging of the automatic production line of modular machine tool.	
	4.1 Maintenance of double housing planer.	<b>General skills and knowledge</b>

DUTIES	TASKS	ENABLERS
4.0 Maintenance of typical equipment	4.2 Maintenance of large vertical lathe.	<ul style="list-style-type: none"> <li>• Cooperation with others using communication skills and report to the superiors</li> <li>• Use of the manufacturer's manual</li> <li>• Operating skills and knowledge of lifting equipment and cranes, and the use of auxiliary tools</li> <li>• The structure of the mechanical parts</li> <li>• Fault diagnosis knowledge</li> <li>• Equipment disassembly, reassembly and debugging</li> <li>• Use of measuring instruments</li> </ul> <p><b>Tools and equipment</b></p> <ul style="list-style-type: none"> <li>• Personal protective equipment, such as safety shoes, goggles, gloves, labor protection clothing and safety helmets</li> <li>• Equipment maintenance tool kit</li> <li>• Travelling crane, crane, hook and steel rope, pad iron, foundation bolt, electric welding machine, vise, electric soldering iron</li> <li>• Level gauge, dial indicator, vernier caliper, (inner) outside micrometer, measuring tape, steel ruler</li> <li>• Rubber hammer, file, brush, circlip pliers, socket, internal and external hexagon wrench, cross screwdriver, slotted screwdriver, vice, needle-nose pliers</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• Fuse, battery, relay</li> <li>• Lubricating grease (oil)</li> <li>• Insulating tape, loose tape, sandcloth, duster cloth</li> <li>• Marker pen, recording paper</li> </ul> <p><b>Requirements for employees</b></p> <ul style="list-style-type: none"> <li>• Teamwork spirit, integrity, time management, organization and coordination</li> </ul>
	4.3 Maintenance of heavy-type bridge crane.	
	4.4 Maintenance of piston compressor.	
	4.5 Maintenance of hydraulic press.	
	4.6 Maintenance of automatic production line of modular machine tool.	
	5.1 Class management.	<b>General skills and knowledge</b>
	5.2 Safety management.	

<b>DUTIES</b>	<b>TASKS</b>	<b>ENABLERS</b>
5.0 Organization and management	5.3 Quality control.	<ul style="list-style-type: none"> <li>• Cooperation with others using communication skills and report to the superiors</li> <li>• Management psychology knowledge</li> <li>• Work safety management knowledge</li> <li>• Quality management and quality control knowledge</li> <li>• Assembly process</li> <li>• Knowledge of equipment detection and debugging</li> </ul> <p><b>Tools and equipment</b></p> <ul style="list-style-type: none"> <li>• Personal protective equipment, such as safety shoes, goggles, gloves, labor protection clothing and safety helmets</li> <li>• Equipment maintenance tool kit</li> <li>• Travelling crane, crane, hook and steel rope, pad iron, foundation bolt, electric welding machine, vise, electric soldering iron</li> <li>• Level gauge, dial indicator, vernier caliper, (inner) outside micrometer, measuring tape, steel ruler</li> <li>• Rubber hammer, file, brush, circlip pliers, socket, internal and external hexagon wrench, cross screwdriver, slotted screwdriver, vice, needle-nose pliers</li> </ul> <p><b>Materials</b></p> <ul style="list-style-type: none"> <li>• Fuse, battery, relay</li> <li>• Lubricating grease (oil)</li> <li>• Insulating tape, loose tape, sandcloth, duster cloth</li> <li>• Marker pen, recording paper</li> </ul> <p><b>Requirements for employees</b></p> <ul style="list-style-type: none"> <li>• Task allocation, personnel management, time management, organization and coordination, safety management, quality control</li> </ul>