THE NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING

OCCUPATIONAL STANDARDS

OCCUPATION: CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN

LEVEL: NTA LEVEL 4

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ABBREVIATIONS

CBET	Competency Based Education and Training
NACTVET	National Council for Technical and Vocational Education and Training
NOS	National Occupational Standards
OS	Occupational Standards
TET	Technical Education and Training
TVET	Technical and Vocational Education and Training

GLOSSARY OF TERMS

Circumstantial Knowledge:	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
Competence:	The ability to use knowledge, understanding, practical, and thinking skills to perform effectively to the workplace standards required in employment.
Competency:	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
Competency-based Education:	An instructional programme that derives its content from validated tasks and bases assessment on the learner's performance.
Curriculum:	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".
Educational/Training Programme:	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.
Occupation:	A specific position requiring the performance of specific tasks – essentially the same tasks are performed by all employees having the same title. (Example: baker)
Occupational Area:	This is a broad grouping of related jobs. (Example: food service)
Occupational Competence:	The application of knowledge and skills that consistently meet the standards required by the work context.
Occupational Standards:	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.
Occupational/Job Analysis:	A process used to identify the tasks that are important to employees in any given occupation**.**
Performance Criteria:	Indicate expected end results or outcomes in the form of evaluative statements.
Skills:	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.

Standards:	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, with a high level of human development. 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 (NACTVET) has begun the job of drafting Occupational Standards (OS) that will eventually be adopted as National Occupational Standards (NOS) for use in the delivery of TET that meets the needs of the labour market and the country's economic agenda.

Occupational Standards (OS) are performance criteria that are matched with labour market demands. Each of them describes the functions, performance standards, and understanding or knowledge underpinning a given occupation. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruitment, supervision, and appraisal, as well as TET Standards. They are also helpful for benchmarking and harmonizing job 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 application across all public and private institutions.

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

For the purpose of TET delivery, Tanzania has 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. Therefore, it is quite pertinent

for TET institutions to use the relevant occupational standards as a benchmark for formulating their curricula.

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.

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 process of developing these Occupational Standards involved both local and international expertise. The process began with an examination of major documents that guide Tanzanian skills development including the *10-year National Skills Development Strategy (2016-2026)*. NACTVET 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 team of experts in consultation with practitioners developed draft occupational standards. The draft document was used to develop an occupational profile for each occupation (DACUM Chart), which is attached as an **Appendix** to every Occupational Standard.

The occupational standards were validated during the stakeholders' forum held on 22nd and 23rd February 2024 at Morogoro. The information from the stakeholders' forum provides insight from the workplace, professional bodies, regulatory bodies and sector ministries regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation.

3.0 THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIANS

The standards cover a broad range of duties and tasks that can be performed by a Civil Aviation Ground Equipment Maintenance 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 Civil Aviation Ground Equipment Maintenance 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 Civil Aviation Ground Equipment Maintenance Technician shall inspect, repair and maintain civil aviation ground equipment under the supervision of engineers. In the workshop, technicians perform all kinds of maintenance work, from simple maintenance of ground equipment to disassembly, repair and reconstruction of equipment and maintenance of various control systems of

ground equipment. Generally, the Civil Aviation Ground Equipment Maintenance Technician performs the following responsibilities:

a) Maintenance of civil aviation special vehicles

b) Mechanical maintenance of civil aviation special vehicle engines

c) Maintenance of electronic control systems of civil aviation special vehicle engines

d) Maintenance of electrical system of civil aviation special vehicles

e) Maintenance of chassis systems of electrical systems of civil aviation special vehicles

f) Diagnosis and maintenance of the transmission system of civil aviation special vehicles

g) Maintenance of hydraulic systems of civil aviation special vehicles

h) Maintenance of electric drive systems of civil aviation special vehicles

i) The organization and guidance of workshop maintenance

j) The workshop technical training and management

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

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 CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN – NTA LEVEL 4

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRYOUT MAINTENANCE OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	401
TASK TITLE	CARRYOUT MAINTENANCE OF THE ENGINE	**TASK NO.**	4011
PERFORMANCE CRITERIA	The person performing this task must be able to maintain the engine in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Diagnostic instruments of vehicles; 3. Oil recovery devices; 4. Full set of vehicle toolboxes; 5. Lifting machines and maintenance tunnels; 6. Personal protective equipment; 7. Fire safety equipment. 8. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Apply preventive measures for health and safety when carryingout engine maintenance; 2. Select appropriate tools and equipment; 3. Check and change engine oil; 4. Check and change the engine coolant; 5. Replace the fuel filter of the engine; 6. Replace the air filter of the engine; 7. Check and replace the engine accessory items, such as belt;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the operation of each engine system; 1.2 Maintain the engine air intake system; 1.3 Maintain the engine lubrication system; 1.4 Maintain the engine fuel system; 1.5 Maintain the engine accessory system. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 The process and organization of engine maintenance;

8. Check and dispose the sealing condition of each contact surface of the engine; 9. Check and dispose the sealing condition of cooling line of the engine; 10. Check and dispose the sealing condition of the fuel system of the engine; 11. Read the fault code of engine systems. 12. Observe health, occupational and environmental safety, rules and regulations	2.2 Safety requirements for implementing engine inspection and maintenance; 2.3 The performance and selective pairing of lubricating oil; 2.4 The performance and selective pairing of coolant; 2.5 Waste disposal; 2.6 The confirmation of engine maintenance time. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition of engine functions; 3.2 The function and composition of lubricating oil; 3.3 The function and composition of coolants; 3.4 The function and composition of fuel systems. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Civil aviation special vehicles are maintained in accordance with technical requirements and manufacturer's specifications
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operation of operating tools; 2. Safety operation of measuring instruments; 3. Occupational health and safety; 4. Detecting operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRYOUT MAINTENANCE OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	401
TASK TITLE	CARRYOUT MAINTENANCE OF THE CHASSIS OF CIVIL AVIATION SPECIAL VEHICLES	**TASK NO.**	4012
PERFORMANCE CRITERIA	The person performing this task must be able to maintain the chassis of civil aviation special vehicles in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Gas-pressure meters; 3. Brake fluid discharge devices; 4. Lubricating grease refilling devices; 5. High pressure air supply devices; 6. Pneumatic power tools; 7. Full set of vehicle toolboxes; 8. Lifting machines and maintenance tunnels; 9. Personal protective equipment; 10. Fire safety equipment. 11. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Apply preventive measures for health and safety when carryingout maintenance of vehicle chasis ; 2. Select appropriate tools and equipment; 3. Check and adjust the clutch operating mechanism; 4. Check and adjust the transmission operating mechanism; 5. Check and adjust the brake operating mechanism; 6. Check and adjust the steering gear operating mechanism; 7. Check and replace drive axle gear oil;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Maintain the transmission system of the vehicle chassis; 1.2 Maintain the steering system of the vehicle chassis; 1.3 Maintain the braking system of the vehicle chassis; 1.4 Maintain the traveling system of the vehicle chassis. **2.0 Principles** The person performing this task must be able to explain the following principles:

8. Check and lubricate universal gearing devices; 9. Check and lubricate the steering transmission linkage; 10. Check connections of pneumatic and braking systems; 11. Check the tire pressure and tire wear; 12. Check the condition of suspension system and shock absorber; 13. Adjust or replace parts in accordance with check results; 14. Clean the workplaces; 15. Arrange and store the tools and equipment. 16. Observe health, occupational and environmental safety, rules and regulations	2.1 Principles of clutch power transmission; 2.2 Driving principles of vehicles; 2.3 Principles of vehicle braking; 2.4 Requirements and standards of checking vehicle chassis; 2.5 Organizations of the workflow of maintaining vehicle chassis; 2.6 The performance and selection of lubricating oil. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and operation of clutch; 3.2 The composition and operation of the transmission system; 3.3 The composition and operation of the suspension; 3.4 The composition and operation of the steering system; 3.5 The composition and operation of the braking system. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills;
DESCRIPTION OF THE END PRODUCT / SERVICE	Chassis of civil aviation special vehicles are maintained in accordance with technical requirements and manufacturer's specifications
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Detecting operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRYOUT MAINTENANCE OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	401
TASK TITLE	CARRYOUT MAINTENANCE OF THE ELECTRICAL SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**TASK NO.**	4013
PERFORMANCE CRITERIA	The person performing this task must be able to check the functioning of the vehicle electritical system and carry out repair in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Multimeters; 3. Battery capacity testers; 4. Density tests; 5. Battery charging equipment; 6. Full set of vehicle toolboxes; 7. Lifting machines and maintenance tunnels; 8. Personal protective equipment; 9. Fire safety equipment. 10. Safety gear		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Apply preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check the battery installation; 4. Check the battery voltage and capacity; 5. Check the generator drive belt; 6. Check the functions of the starters; 7. Check the functions of the headlamps; 8. Adjust the illumination position of the headlamps; 9. Check the signal system; 10. Check the wiper action and water spray position; 11. Check the driver's portable systems;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Maintain the power supply systems of vehicles; 1.2 Maintain the start-up systems of vehicles; 1.3 Maintain the driver portable systems of vehicles; 1.4 Maintain the lighting systems of vehicles; 1.5 Maintain the air-conditioning systems of vehicles. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Check the power supply battery standards of vehicles;

12. Check the air conditioning; 13. Clean the workplaces; 14. Arrange and store the tools and equipment. 15. Observe health, occupational and environmental safety, rules and regulations	2.2 Check the function standards of starters; 2.3 Check the standards of the function of lighting and signal systems; 2.4 Standards for checking the wiper action and water spray position; 2.5 Check the standards of air conditioning functions. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and functions of the power supply systems; 3.2 The composition and functions of the starter systems; 3.3 The composition and functions of lighting and signal systems; 3.4 The composition and functions of wipers and water-spraying systems; 3.5 The composition and functions of driver portable systems; 3.6 The composition and functions of air conditioning systems. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills; 4.5 Diagnosing equipment using skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Electrical systems of civil aviation special vehicles are maintained in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Detecting operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRYOUT MAINTENANCE OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	401
TASK TITLE	CARRY OUT MAINTENANCE OF THE HYDRAULIC SYSTEMS OF CIVIL AVIATION SPECIAL VEHICLES	**TASK NO.**	4014
PERFORMANCE CRITERIA	The person performing this task must be able to check the function of the hydraulic components and connections and perform repairs in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Multimeters; 3. Diagnostic instruments of vehicles; 4. Recycling and refueling devices of hydraulic oil; 5. Hydraulic pressure gauges; 6. Full set of vehicle toolboxes; 7. Lifting machines and maintenance tunnels; 8. Personal protective equipment; 9. Fire safety equipment 10. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Apply preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check the fastening and sealing conditions of components in hydraulic systems; 4. Check the functioning of hydraulic motors; 5. Check the functioning of the valves; 6. Check the functioning of hydraulic cylinders; 7. Check and replace hydraulic oil and hydraulic oil filters; 8. Clean the workplaces;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Maintain the hydraulic systems of vehicles 1.2 Check the pressurization devices and pipelines of hydraulic systems; 1.3 Check the operating devices and pipelines of hydraulic systems; 1.4 Check the executive devices and pipelines of hydraulic systems. **2.0 Principles** The person performing this task must be able to explain the following principles:

9. Arrange and store the tools and equipment. 10. Observe health, occupational and environmental safety, rules and regulations	2.1 Check the fastening and sealing standards of hydraulic components; 2.2 Check the standards of the functions of hydraulic motors; 2.3 Check the standards of the functions of hydraulic control valves; 2.4 Check the standards of the functions of hydraulic cylinders; 2.5 Check and replace process organization of hydraulic oil and hydraulic oil filters; 2.6 Conduct the selective pairing of hydraulic oils. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition of vehicle hydraulic equipment; 3.2 The structure and functions of hydraulic pumps; 3.3 The structure and functions of hydraulic control valves; 3.4 The structure and functions of hydraulic motors; 3.5 The structure and functions of hydraulic oil; 3.6 The structure and functions of hydraulic cylinders. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Hydraulic systems are checked and maintained in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Detecting operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT MECHANICAL MAINTENANCE OF CIVIL AVIATION SPECIAL VEHICLE ENGINE	**DUTY NO.**	402
TASK TITLE	REPLACE FAULTY PARTS OF ENGINE	**TASK NO.**	4021
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and replacement of the parts of engines in accordance with civil aviation ground vehicle maintenance manuals, road safety rules and regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or Vehicle Engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. High pressure air supply devices; 3. Cylinder philometers; 4. Dial indicators; 5. Clearance gauges; 6. Micrometers; 7. Vernier calipers; 8. Engine oil recycling and refueling devices; 9. Coolant recycling and refueling devices; 10. Tilting devices of engine maintenance; 11. Full set of vehicle toolboxes; 12. Personal protective equipment 13. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Appy preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment; 3. Disassemble and install engine block groups; 4. Disassemble and install cylinder heads; 5. Disassemble and install piston connecting rod groups; 6. Disassemble and install crankshafts;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Maintain the engine block groups; 1.2 Maintain the crank-link mechanism of engines; 1.3 Disassemble and install the whole parts of engines; 1.4 Measure the deformation and abrasion of the crank-link mechanism of engines; 1.5 Maintain the proper fit clearance among the parts of engines;

7. Disassemble and install flywheel groups; 8. Disassemble and install engine bearers; 9. Clean the workplaces; 10. Arrange and store the tools and equipment. 11. Observe health, occupational and environmental safety, rules and regulations	**2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 The working principles of four-stroke engines; 2.2 The standards of disassembly and installation of engine block groups; 2.3 The standards of disassembly and installation of crank-link mechanism; 2.4 The standards of deformation and abrasion of crank-link mechanism; 2.5 The standards of the fit clearance of engine parts. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The functions and structure of block groups; 3.2 The functions and structure of piston connecting rods; 3.3 The functions and structure of crankshaft flywheel groups; 3.4 The installation positions and connection of engines; **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The parts functions of engines are detected and assembled in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Detecting operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRYOUT MAINTENACE OF MECHANICAL SYSTEMS OF CIVIL AVIATION SPECIAL VEHICLE ENGINE	**DUTY NO.**	402
TASK TITLE	REPLACE PARTS OF ENGINE VALVES MECHANISM	**TASK NO.**	4022
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and replacement of the parts of engines in accordance with civil aviation ground vehicle maintenance manuals, road safety rules and regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. High pressure air supply devices; 3. Spring pressure gauges; 4. Straightedges; 5. Dial indicators; 6. Clearance gauges; 7. Micrometers; 8. Vernier calipers; 9. Tilting devices of engine maintenance; 10. Full set of vehicle toolboxes; 11. Personal protective equipment 12. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Disassemble, inspect and assemble the valve transmission groups; 4. Disassemble, inspect and assemble the valve groups; 5. Inspect the air impermeability of valves; 6. Clean the workplaces; 7. Arrange and store the tools and equipment.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Maintain valve transmission groups; 1.2 Maintain valve groups; 1.3 Check air impermeability of valves; 1.4 Measure valve timing. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Working principles of engine valve systems; 2.2 The standards of disassembly and installation of valve groups;

8. Observe health, occupational and environmental safety, rules and regulations	2.3 The standards of air impermeability of valves; 2.4 Valve timing measurements; 2.5 Assembly standards of valve mechanism transmission systems. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The functions and structure of valve transmission groups; 3.2 The functions and structure of valve groups. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Inspection and assembly of the functions of vehicle engine valve mechanism parts are conducted in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT MAINTENACE OF MECHANICAL SYSTEMS OF CIVIL AVIATION SPECIAL VEHICLE ENGINES	**DUTY NO.**	402
TASK TITLE	REPLACE THE PARTS OF ENGINE COOLING SYSTEMS	**TASK NO.**	4023
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and replacement of the parts of engine cooling systems in accordance with civil aviation ground vehicle maintenance manuals, road safety rules and regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of Senior Technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. High pressure air supply devices; 3. Lubrication system pressure gauges; 4. Coolant recycling and refueling devices; 5. Densimeters; 6. Tilting devices of engine maintenance; 7. Full set of vehicle toolboxes; 8. Personal protective equipment. 9. Safety gear		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Inspect and replace cooling antifreeze; 4. Inspect and replace water temperature sensors; 5. Inspect and replace the thermostats; 6. Inspect and replace the radiators; 7. Inspect and replace water pumps 8. Inspect and replace cooling fans; 9. Comply with safety regulations when performing tasks; 10. Clean the workplaces;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Inspect the pressure of cooling systems; 1.2 Maintain the faults of cooling systems; 1.3 Change the parts of cooling systems; 1.4 Replace coolant. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Working principles of cooling systems; 2.2 Working principles of thermostats; 2.3 Working principles of radiators; 2.4 Working principles of a water pumps; 2.5 Selective pairing of cooling liquid; 2.6 Management of discarded coolant.

11. Arrange and store the tools and equipment. 12. Observe health, occupational and environmental safety, rules and regulations	**3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and functions of cooling systems; 3.2 The type and structure of electronic control type of cooling systems. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Parts of the engine cooling system are detected in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Inspect operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT MAINTENACE OF MECHANICAL SYSTEMS OF CIVIL AVIATION SPECIAL VEHICLE ENGINE	**DUTY NO.**	402
TASK TITLE	REPLACE THE PARTS OF ENGINE LUBRICATING SYSTEMS	**TASK NO.**	4024
PERFORMANCE CRITERIA	The person performing this task must be able to check and replace engine lubricating system parts in accordance with the maintenance manuals of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle maintenance workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. High pressure air supply devices; 3. Lubricating system pressure gauges; 4. Recycling and refueling devices of lubricating oil; 5. Tilting devices of engine maintenance; 6. Full set of vehicle toolboxes; 7. Personal protective equipment. 8. Safety gear		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate operation tools and equipment for this task; 3. Check and replace the lubricating oil filter; 4. Check and replace the sump strainer; 5. Check and replace the engine oil pressure sensor; 6. Check and replace the engine oil temperature sensor; 7. Check and replace the engine oil pressure regulating valve; 8. Check and replace the engine oil pump; 9. Clean the workplaces;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the pressure of lubricating systems; 1.2 Maintain the faults of lubricating systems; 1.3 Replace the parts of lubricating systems; 1.4 Replace the lubricating oil. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Working principles of the lubricating system; 2.2 Working principles of the oil pressure sensor; 2.3 Working principle of the engine oil temperature sensor; 2.4 Working principle of the engine oil pressure regulating valve; 2.5 Working principle of the engine oil pump oil;

10. Arrange and store the tools and equipment. 11. Observe health, occupational and environmental safety, rules and regulations	2.6 The selection of lubricating oil; 2.7 The waste disposal of lubricating oil. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Functions and structures of lubricating system; 3.2 Functions and structures of lubricating oil filter; 3.2 Functions and structures of engine oil pump; 3.3 Types of lubricating oil. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills; 4.5 Tool skills; 4.6 Skills of assembling and disassembling parts by using general tools.
DESCRIPTION OF THE END PRODUCT / SERVICE	Parts of the engine lubricating system are detected in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT MAINTENACE OF ELECTRICAL SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	403
TASK TITLE	CHECK AND REPLACE VEHICLE POWER SUPPLY AND STARTER SYSTEM PARTS	**TASK NO.**	4031
PERFORMANCE CRITERIA	The person performing this task must be able to check the function of the vehicle power supply systems in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle maintenance workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Multimeters; 2. Diode test lights; 3. Battery capacity testers; 4. Diagnostic instruments of vehicles; 5. Oscilloscopes; 6. Current detectors; 7. Battery charging equipment; 8. Full set of vehicle toolboxes; 9. Lifting machines and maintenance tunnels; 10. Personal protective equipment. 11. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check the generator belt; 4. Check the appearance of the battery; 5. Check the battery capacity; 6. Check the wire connection; 7. Check the charging performance of vehicles; 8. Check the functions of the starters;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the battery performance; 1.2 Check the performance of charging systems; 1.3 Check the performance of start-up systems; 1.4 Replace the parts of power supply systems; 1.5 Replace the parts of start-up systems. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 The charging and discharging of batteries; 2.2 The operation of starters; 2.3 The operation of AC generators;

9. Read system data and fault codes by using diagnostic devices; 10. Adjust or replace parts in accordance with check results; 11. Clean the workplaces; 12. Arrange and store the tools and equipment. 13. Observe health, occupational and environmental safety, rules and regulations	2.4 The inspection standards of the start-up system; 2.5 The inspection standards of the charging system. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and operation of the power supply systems; 3.2 The composition and operation of the start-up systems; 3.3 Functions and structures of batteries; 3.4 Functions and structures of generators; **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills; 4.5 Circuit detecting skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Parts of the power supply and the starter system of vehicles are detected and replaced in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT ELECTRICAL SYSTEM MAINTENANCE OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	403
TASK TITLE	CHECK AND MAINTAIN LIGHTING AND SIGNAL SYSTEMS	**TASK NO.**	4032
PERFORMANCE CRITERIA	The person performing this task must be able to check the function of the vehicle power supply systems in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle maintenance workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Multimeters; 2. Diode test lights; 3. Light detectors; 4. Diagnostic instruments of vehicles; 5. Oscilloscopes; 6. Current detectors; 7. Battery charging equipment; 8. Full set of vehicle toolboxes; 9. Lifting machines and maintenance tunnels; 10. Personal protective equipment. 11. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check the vehicle clearance lamps; 4. Check the vehicle headlamps; 5. Check the turning lights and warning lights; 6. Check the reversing lamps; 7. Check the brake lamps; 8. Check the horns; 9. Adjust the positions of the lights; 10. Adjust or replace parts in accordance with check results;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the headlamps and signal systems; 1.2 Adjust the positions of the lights; 1.3 Replace the parts of illuminating and signal systems. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Working principles of headlamps; 2.2 Working principles of the signal system; 2.3 Data requirements of traffic rules for illuminating and signal lights.

11. Read system data and fault codes by using diagnostic devices; 12. Clean the workplaces; 13. Arrange and store the tools and equipment. 14. Observe health, occupational and environmental safety, rules and regulations	**3.0 Theories** The person performing this task must be able to explain the following: 3.1 Types and structures of headlamps; 3.2 Types and structures of clearance lamps; 3.3 Types and structures of turning lights and warning lights; 3.4 Types and structures of horns. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills; 4.5 Circuit inspection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The lighting and signal systems of vehicles are inspected and maintained in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operation of operating tools; 2. Safety operation specifications for measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT MAINTENANCE OF CHASSIS SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	404
TASK TITLE	INSPECT AND REPLACE PARTS OF THE VEHICLE DRIVING SYSTEM	**TASK NO.**	4041
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and replacement of the parts of vehicle driving systems in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements		
RANGE STATEMENT	The task can be performed in the vehicle maintenance workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Gas-pressure meters; 3. Pneumatic power tools; 4. Lubricating grease refilling devices; 5. Damper compressors; 6. Air compressors; 7. Pneumatic power tools; 8. Wheel lifting devices; 9. Full sets of vehicle toolboxes; 10. Lifting machines and maintenance tunnels; 11. Safe supporting devices for vehicles; 12. Personal protective equipment. 13. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check and replace dampers; 4. Check and replace damper springs; 5. Check and replace wheels and tires; 6. Repair tyre punctures; 7. Clean the workplaces;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the parts of driving systems; 1.2 Replace the parts of driving systems. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 The working principle of dampers; 2.2 The properties of coil spring dampers; 2.3 The properties of coil spring dampers for steel plate; 2.4 The requirements of tires for safety driving;

8. Arrange and store the tools and equipment. 9. Observe health, occupational and environmental safety, rules and regulations	2.5 The requirements for selection of tires. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 Functions and structures of the driving systems; 3.2 Structures of dampers; 3.3 Structures of wheels; 3.4 Structures of tires. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills; 4.5 Diagnostic skills for instruments.
DESCRIPTION OF THE END PRODUCT / SERVICE	The vehicle driving systems are detected and assembled in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT MAINTENANCE OF CHASSIS SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	404
TASK TITLE	INSPECT AND REPLACE PARTS OF THE VEHICLE STEERING SYSTEM	**TASK NO.**	4042
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and replacement of the parts of vehicle steering systems in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements		
RANGE STATEMENT	The task can be performed in the vehicle maintenance workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Lighting devices; 2. Steering wheel inclinometers; 3. Air compressors; 4. Pneumatic power tools; 5. Lubricating grease refilling devices; 6. Full set of vehicle toolboxes; 7. Lifting machines and maintenance tunnels; 8. Supporting devices for the maintenance safety of vehicles; 9. Personal protective equipment. 10. Safety gear		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check, refill, and replace the power steering fluids; 4. Check and replace the dustproof covers of steering tie rods; 5. Check and replace the joints of steering tie rods; 6. Check the steering servomechanisms; 7. Check and adjust the steering wheel free play; 8. Clean the workplaces;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the steering performance of vehicles; 1.2 Check the parts of vehicle steering systems; 1.3 Check the steering servomechanisms; 1.4 Replace the parts of vehicle steering systems; 1.5 Replace the power steering hydraulic oil. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Principles of the vehicle steering; 2.2 Principles of the hydraulic servo; 2.3 Inspection standards of steering system parts; 2.4 Assembly requirements of steering system parts; 2.5 Selection of hydraulic oil;

9. Arrange and store the tools and equipment. 10. Observe health, occupational and environmental safety, rules and regulations	2.6 The waste disposal of hydraulic oil. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and structure of vehicle steering systems; 3.2 The structure and type of steering machine; 3.3 The structure and type of steering servomechanism. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The steering systems of vehicles are checked and assembled in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT MAINTENANCE OF CHASSIS SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	404
TASK TITLE	CHECK AND REPLACE VEHICLE BRAKING SYSTEM PARTS	**TASK NO.**	4043
PERFORMANCE CRITERIA	The person performing this task must be able to check the functions of vehicle braking systems in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle maintenance workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Air compressors; 3. Pneumatic power tools; 4. Brake fluid recovery devices; 5. Full set of vehicle toolboxes; 6. Lifting machines and maintenance tunnels; 7. Safe supporting devices for vehicles; 8. Personal protective equipment. 9. Safety gear		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check the air impermeability of braking pipes and air tanks; 4. Check the level and color of brake fluid; 5. Replace the brake fluid; 6. Check the braking servomechanism; 7. Check the function of the driving brake; 8. Check the function of the parking brake; 9. Clean the workplaces;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the braking performance of vehicles; 1.2 Check the performance of brake booster devices of vehicles; 1.3 Replace the parts of braking systems; 1.4 Replace the brake hydraulic oil; 1.5 Replace the parts of braking pressure devices. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Working principles of the vehicle braking; 2.2 Working principles of compressors; 2.3 Working principles of the braking servomechanism; 2.4 Checking requirements and standards of the braking performance;

10. Arrange and store the tools and equipment. 11. Observe health, occupational and environmental safety, rules and regulations	2.5 Assembly requirements of braking system parts; 2.6 The selection of brake fluid; 2.7 The waste disposal of brake fluid. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and function of braking systems; 3.2 The structure of brakes; 3.3 The structure of braking servomechanisms; 3.4 The composition and function of braking pressure systems. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The braking systems of vehicles are detected and assembled in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking the operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT DIAGNOSIS AND MAINTENANCE OF TRANSMISSION SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	405
TASK TITLE	CHECK AND REPLACE TRANSMISSION SHAFT	**TASK NO.**	4051
PERFORMANCE CRITERIA	The person performing this task must be able to check and replace the transmission shafts in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle maintenance workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Air gauges; 3. Full set of vehicle toolboxes; 4. Pneumatic power tools; 5. Lubricating grease refilling devices; 6. Damper compressors; 7. Air compressors; 8. Lifting machines and maintenance tunnels; 9. Safe supporting devices for vehicles; 10. Personal protective equipment. 11. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate operation tools and equipment for this task; 3. Check the performance of transmission shafts; 4. Check the performance of half shafts; 5. Replace the bearing of transmission shafts and cross axles; 6. Disassemble and install transmission shafts; 7. Disassemble and install half shafts; 8. Clean the workplaces;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the performance of vehicle transmission mechanisms; 1.2 Check the parts of vehicle transmission mechanism; 1.3 Change the parts of vehicle transmission mechanism; 1.4 Lubricate the parts of transmission mechanism. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 Constant speed principle of cross-shaped universal joints;

9. Arrange and store the tools and equipment. 10. Observe health, occupational and environmental safety, rules and regulations	2.2 Constant speed principles of birfield universal joints; 2.3 Standards and requirements of checking and installing transmission shafts; 2.4 Standards and requirements of checking transmission mechanism parts; 2.5 Standards and requirements of changing transmission mechanism parts; 2.6 Selection of lubricating grease; 2.7 The processing of wasted lubricating grease. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and types of transmission shafts; 3.2 The structure of cross-shaped universal joint; 3.3 The structure of birfield universal joints. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills; 4.6 Skills of assembling and disassembling parts by using general tools; 4.7 Driving skills; 4.8 Skills of leading vehicles into workplaces.
DESCRIPTION OF THE END PRODUCT / SERVICE	The transmission shafts are inspected, assembled, checked and changed in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking policies and procedures; 5. Waste disposal methods.

<table>
<tr><td>OCCUPATION</td><td>CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>CARRY OUT DIAGNOSIS AND MAINTENANCE OF TRANSMISSION SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES</td><td>DUTY NO.</td><td>405</td></tr>
<tr><td>TASK TITLE</td><td>DISASSEMBLE AND INSTALL CLUTCH</td><td>TASK NO.</td><td>4052</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to maintain the clutch in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers.
The tools and equipment to be used include:
1. Illuminating devices;
2. Air gauges;
3. Air compressors;
4. Pneumatic power tools;
5. Transmission supports;
6. The installation guide tools of clutches;
7. Full set of vehicle toolboxes;
8. Lifting machines and maintenance tunnels;
9. Safe supporting devices for vehicles;
10. Personal protective equipment.
11. Safety gear</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Abide by the preventive measures for health and safety when performing this task;
2. Select appropriate tools and equipment for this task;
3. Check the assembly performance of the clutches;
4. Dissemble and install the control mechanism of clutches;
5. Dissemble and install the clutch assembly;
6. Comply with safety regulations when performing tasks;
7. Clean the workplaces;
8. Arrange and store the tools and equipment.</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Check the assembly performance of the clutches;
1.2 Dissemble and install the control mechanism of clutches;
1.3 Dissemble and install the clutch assembly.

2.0 Principles
The person performing this task must be able to explain the following principles:
2.1 The properties of release springs;
2.2 The principles of hydraulic and pneumatic transmission;
2.3 The standards of checking the assembly performance of the clutches;</td></tr>
</table>

9. Observe health, occupational and environmental safety, rules and regulations	2.4 The requirements of assembling and installing the control mechanism of clutches; 2.5 The requirements of assembling and installing the clutch assembly. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and structure of the control mechanism of clutches; 3.2 The structure of clutch assembly. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Clutches are dissembled and installed in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT DIAGNOSIS AND MAINTENANCE OF TRANSMISSION SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	405
TASK TITLE	INSPECT AND MAINTAIN TRANSMISSION ASSEMBLY	**TASK NO.**	4053
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and maintenance of transmission assembly of special vehicles in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Air gauges; 3. Air compressors; 4. Pneumatic power tools; 5. Transmission supports; 6. The installation guide tools of clutches; 7. Full set of vehicle toolboxes; 8. Lifting machines and maintenance tunnels; 9. Safe supporting devices for vehicles; 10. Personal protective equipment. 11. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Check and maintain the control mechanism of manual transmissions; 4. Check and maintain the mechanism of self-locking and inter-locking; 5. Check and maintain the transmission mechanism of manual transmissions;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the driveability of manual transmissions; 1.2 Check the transmission performance of manual transmissions; 1.3 Change the control mechanism parts of manual transmissions; 1.4 Install the gearbox assembly onto the vehicles; 1.5 Replace the gear oil in the gearbox. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 The speed shifting principles of gears;

6. Check and maintain the synchronizers; 7. Install the gearbox assembly onto the vehicles; 8. Clean the workplaces; 9. Store tools and equipment. 10. Observe health, occupational and environmental safety, rules and regulations	2.2 The synchronization principles of transmissions; 2.3 The principles of hydraulic and pneumatic transmission; 2.4 The standards of checking the driveability of manual transmissions; 2.5 The standards of checking transmission mechanism of manual transmissions; 2.6 The requirements of changing the control mechanism parts of manual transmissions; 2.7 The selection of gear oil; 2.8 The processing of wasted gear oil. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and structure of the control mechanism of transmissions; 3.2 The transfer structure of transmissions; 3.3 The transmission principles of transmissions; 3.4 The structure of synchronizers. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills; 4.5 Skills of assembling and disassembling parts by using general tools; 4.6 Driving skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The transmission assembly is detected and maintained in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT DIAGNOSIS AND MAINTENANCE OF TRANSMISSION SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	405
TASK TITLE	INSPECT AND MAINTAIN VEHICLE WHEEL HUBS	**TASK NO.**	4054
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and maintenance of special vehicles, including wheel hubs of vehicles, in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Lighting devices; 2. Air compressors; 3. Pneumatic power tools; 4. Lubricating grease refilling devices; 5. Lift devices of wheels; 6. Full set of vehicle toolboxes; 7. Lifting machines and maintenance tunnels; 8. Supporting devices for the maintenance safety of vehicles; 9. Personal protective equipment. 10. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Dissemble and install the steering wheel hubs; 4. Adjust the preload intensity of steering wheel hubs; 5. Dissemble and install the driving wheel hubs; 6. Adjust the preload intensity of driving wheel hubs; 7. Dissemble and install the driving half shafts of the rear wheels;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the performance of steering wheel hubs; 1.2 Check the performance of driving wheel hubs; 1.3 Change the wheel hubs of driving wheels; 1.4 Lubricate wheel hubs of steering and driving wheels. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 The bearing working principles of tapered rollers; 2.2 The requirements of installing and adjusting the steering wheel hubs; 2.3 The requirements of adjusting the preload intensity of steering wheel hubs;

8. Inspect and replace the sealing rings of wheel hubs; 9. Clean the workplaces; 10. Store the tools and equipment. 11. Observe health, occupational and environmental safety, rules and regulations	2.4 The requirements of installing and adjusting the driving wheel hubs; 2.5 The requirements of installing the driving half shafts of rear wheels; 2.6 The selection of lubricating grease; 2.7 The processing of wasted lubricating grease. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The structure of steering wheel hubs; 3.2 The structure of driving wheel hubs. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork skills; 4.4 Report writing skills; 4.5 Skills of assembling and disassembling parts by using general tools; 4.6 Driving skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The wheel hubs are inspected and maintained in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

OCCUPATION	CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	CARRY OUT DIAGNOSIS AND MAINTENANCE OF TRANSMISSION SYSTEM OF CIVIL AVIATION SPECIAL VEHICLES	**DUTY NO.**	405
TASK TITLE	INSPECT AND MAINTAIN DECELERATORS AND DIFFERENTIALS	**TASK NO.**	4055
PERFORMANCE CRITERIA	The person performing this task must be able to conduct the inspection and maintenance of decelerators and differentials of special vehicles in accordance with the maintenance manual of civil aviation ground vehicles, road safety regulations and technical requirements.		
RANGE STATEMENT	The task can be performed in the vehicle repair workshop under the supervision of senior technicians or vehicle engineers. The tools and equipment to be used include: 1. Illuminating devices; 2. Air compressors; 3. Pneumatic power tools; 4. Lubricating grease refilling devices; 5. Lift devices of wheels; 6. Full set of vehicle toolboxes; 7. Lifting machines and maintenance tunnels; 8. Safe supporting devices for vehicles; 9. Personal protective equipment 10. Safety gear		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Abide by the preventive measures for health and safety when performing this task; 2. Select appropriate tools and equipment for this task; 3. Dissemble and install the main decelerators from rear axles of vehicles; 4. Check and maintain transmission gears on the main decelerators; 5. Adjust the transmission gear clearance and meshing mark of main decelerators;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Check the performance of main decelerators; 1.2 Change the parts of main decelerators; 1.3 Change the gear oil of main decelerators; 1.4 Dissemble and install the main decelerators from rear axles of vehicles. **2.0 Principles** The person performing this task must be able to explain the following principles: 2.1 The working principles of the transmission of hypoid gears;

6. Adjust the preload intensity of the transmission gears of main decelerators; 7. Check and maintain differentials; 8. Adjust the planetary gear and half shaft gear on differentials; 9. Clean the workplaces; 10. Arrange and store the tools and equipment. 11. Observe health, occupational and environmental safety, rules and regulations	2.2 The working principle of decelerators; 2.3 The standards and requirements of adjusting the transmission gear clearance and meshing mark of main decelerators; 2.4 The standards and requirements of adjusting the preload intensity of transmission gears of main decelerators; 2.5 The selection of gear oil; 2.6 The processing of wasted gear oil. **3.0 Theories** The person performing this task must be able to explain the following: 3.1 The composition and structure of main decelerators; 3.2 The composition and structure of decelerators. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Customer service skills; 4.3 Teamwork and coordination skills; 4.4 Report writing skills; 4.5 Skills of assembling and disassembling parts by using general tools; 4.6 Driving skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The decelerators and differentials are inspected and maintained in accordance with technical requirements and manufacturer's specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Safety operations of operating machines and tools; 2. Safety operations of measuring instruments; 3. Occupational health and safety; 4. Checking operating policies and procedures; 5. Waste disposal methods.

APPENDIX: DACUM CHART FOR CIVIL AVIATION GROUND EQUIPMENT MAINTENANCE TECHNICIAN - NTA LEVEL 4

DUTIES	TASKS	ENABLERS
1.0 Carry out maintenance of civil aviation special vehicles	1.1 Carry out maintenance of the engine. 1.2 Carry out maintenance of the chassis of civil aviation special vehicles. 1.3 Carry out maintenance of the electrical system of civil aviation special vehicles. 1.4 Carry out maintenance of the hydraulic systems of civil aviation special vehicles.	**General skills and knowledge** · Cooperation with others using communication skills and reporting to the superiors · Use of the manufacturer's manual · The skills and knowledge of vehicle maintenance and operation · Interpretation of the technical drawing of machine components · Basic materials science **Tools and equipment** · Personal protective equipment, such as safety shoes, goggles, gloves and safety helmets · Full set of vehicle toolboxes · Special tools and equipment for vehicle maintenance conformed to technical requirements **Materials** · Diesel oil · Lubricating oil · Hydraulic oil · Filters · The attachment belt · Bulbs · Coolant **Requirements for employees** · Teamwork · Honesty and trustworthiness · Punctuality and high efficiency · Emphasis on commitment
2.0 Carry out mechanical maintenance of civil aviation	2.1 Replace faulty parts of engine. 2.2 Repalce parts of engine valves mechanism 2.3 Replace the parts of engine cooling systems.	**General skills and knowledge** · Cooperation with others using communication skills and reporting to the superiors · Use of the manufacturer's manual

DUTIES	TASKS	ENABLERS
special vehicle engine	2.4 Replace the parts of engine lubricating systems.	· The skills and knowledge of engine testing and assembly · Interpretation of the technical drawing of machine components · Basic materials science **Tools and equipment** · Personal protective equipment, such as safety shoes, goggles, gloves and safety helmets · Full set of vehicle toolboxes · Special tools and equipment for engine maintenance conformed to technical requirements · Engine maintenance and measuring tools **Materials** · New spare parts conformed to the engine technical requirements · Diesel oil · Lubricating oil · Coolant **Requirements for employees** · Teamwork · Honesty and trustworthiness · Punctuality and high efficiency · Emphasis on commitment
3.0 Carry out maintenance of electrical system of civil aviation special vehicles	3.1 Check and replace vehicle power supply and starter system parts. 3.2 Check and maintain lighting and signal systems.	**General skills and knowledge** · Cooperation with others using communication skills and report to the superiors · Use of the manufacturer's manual · The skills and knowledge of maintaining and operating electrical systems · Machine components · Interpretation of technical drawings · Basic materials science **Tools and equipment**

DUTIES	TASKS	ENABLERS
		· Safety shoes, goggles, gloves and so on · Protective equipment · Complete set of universal maintenance tools · Special tools for electrical circuit maintenance conformed to the technical requirements · Electrical measuring tools **Materials** · Battery · Bulbs · Switch assembly · Generators · Starters · The attachment belt · Harnesses and fuses **Requirements for employees** · Teamwork · Honesty and trustworthiness · Punctuality and high efficiency · Emphasis on commitment
4.0 Carry our maintainance of chassis system of civil aviation special vehicle	4.1 Inspect and replace parts of the vehicle driving system. 4.2 Inspect and replace parts of the vehicle steering system. 4.3 Inspect and replace vehicle braking system parts.	**General skills and knowledge** · Cooperation with others using communication skills and report to the superiors · Use of the manufacturer's manual · Skills and knowledge of inspection and maintenance for chassis systems · Interpretation of the technical drawing of machine components · Basic materials science **Tools and equipment** · Personal protective equipment, such as safety shoes, goggles, gloves and safety helmets · Full set of vehicle toolboxes

DUTIES	TASKS	ENABLERS
		· Special tools and equipment for chassis systems conformed to technical requirements · Tools for measuring chassis systems **Materials** · New spare parts conformed to the vehicle chassis system technical requirements · Gear oil · Hydraulic oil **Requirements for employees** · Teamwork · Honesty and trustworthiness · Punctuality and high efficiency · Emphasis on commitment
5.0 Carry out diagnosis and maintenance of transmission system of civil aviation special vehicles	5.1 Check and replace transmission shaft. 5.2 Disassembsle and install clutche. 5.3 Inspect and maintain transmission assembly. 5.4 Inspect and maintain wheel hubs. 5.5 Inspect and maintain decelerators and differentials.	**General skills and knowledge** · Cooperation with others using communication skills and reporting to the superiors · Use of the manufacturer's manual · Skills and knowledge of inspection and maintenance for detecting transmission systems · Interpretation of the technical drawing of machine components · Basic materials science **Tools and equipment** · Personal protective equipment, such as safety shoes, goggles, gloves and safety helmets · Full set of vehicle toolboxes · Special tools and equipment for drive maintenance conformed to technical requirements · Tools for measuring transmission systems **Materials**

DUTIES	TASKS	ENABLERS
		· New spare parts conformed to the vehicle transmission system technical requirements · Gear oil · Hydraulic oil **Requirements for employees** · Teamwork · Honesty and trustworthiness · Punctuality and high efficiency · Emphasis on commitment