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AUTOMOTIVE MECHATRONICS



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COMPETENCY STANDARDS

National Vocational Certificate Level 2-4

Version 1 - November, 2019



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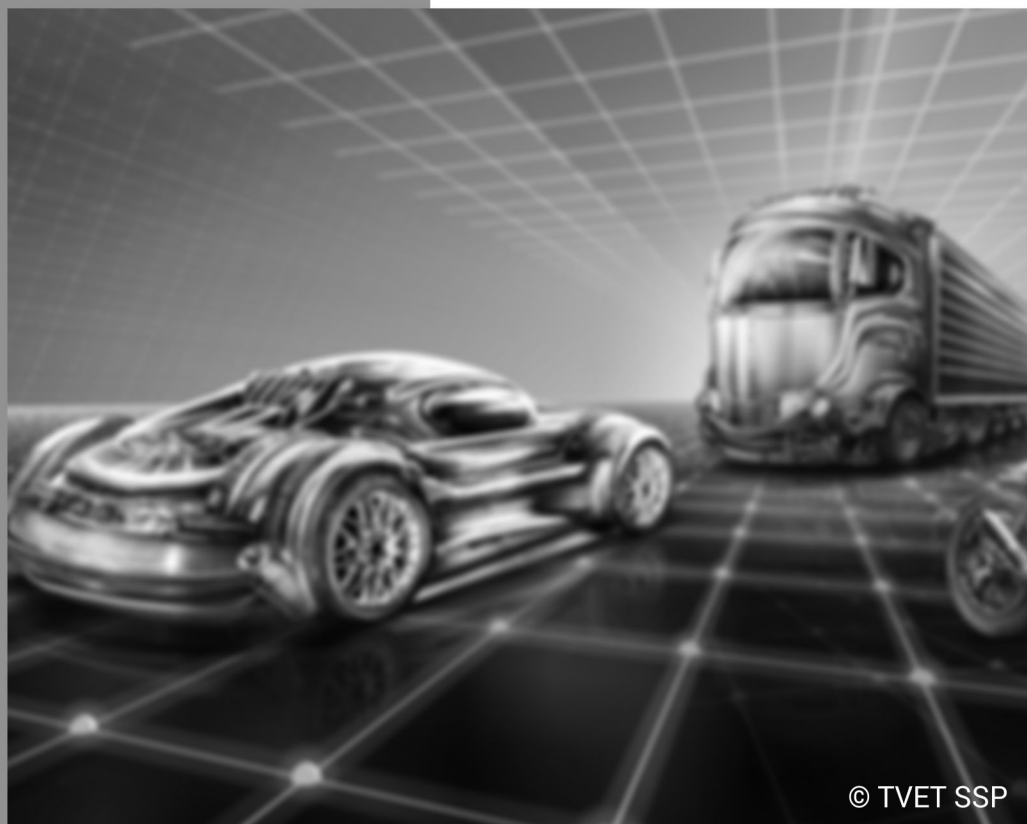
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Introduction

Automotive Mechatronics field is in demand across the country and abroad. Mechatronics combines principles of mechanics, electronics and computing to improve technical systems and to create new equipment with built-in 'artificial intelligence'. In this qualification, trainees will maintain engine assembly, fuel system engine cooling & lubrication system, brake and suspension system of vehicle. They also perform general inspection of vehicle, tuning system; maintain ignition system and fuel control system. Trainees will be learned to maintain controlled electrical & electronic system, network system and hybrid system.

This is a good career opportunity for a reliable and responsible individual with a strong work ethic. In order to build the capacity of technical and vocational training institutes in Pakistan through provision of demand driven competencies-based trainings, NAVTTC and TEVT Sector Support Program (TSSP) have joined hands together to develop qualifications. These qualifications will not only build the capacity of existing workers of this sector but also support the youth to acquire skills best fit for this sector. The benefits and impact of development of these qualifications will be on both demand and supply side.

Based upon this demand of industry these competency-based qualifications for Automotive Mechatronics are developed under National Vocational Qualification Framework (NVQF) (Level 2 to 4). The qualifications mainly cover competencies along with related knowledge and professional skills which are essential for getting a job or self-employed.

The National Vocational & Technical Training Commission (NAVTTTC) has approved the Qualification Development Committee (QDC). The QDC consists of experts from the relevant industries from different geographical locations across Pakistan and academicians who were consulted during the development process to ensure input and ownership of all the stakeholders. The National Competency Standards could be used as a referral document for the development of curricula to be used by training institutions.

Automotive Mechatronics curriculum will prepare students to maintain engine assembly, fuel system, engine cooling, tuning & lubrication system, brake, suspension, vehicle transmission and electrical system. They determine the necessary materials for a job, perform OBD scanner operations, and maintain network and hybrid system in a safe, effective manner. Graduates from this program may find jobs in dealership, service centres, businesses, and on workshops.



Detail of National Vocational Certificate Levels

The detail of the competency standards included in this qualification are given below:

National Vocational Certificate level 2, in “Automotive Mechatronics”

- Comply Personal Health and Safety Guidelines
- Communicate the Workplace Policy and Procedure
- Perform Basic Communication (Specific)
- Perform Basic Computer Application (Specific)
- Maintain Engine Assembly
- Maintain Fuel System
- Service Engine Cooling System
- Maintain Engine Lubrication System
- Maintain Brake System
- Maintain Suspension System
- Check Vehicle Transmission System
- Service Electrical System
- Perform On-Board Diagnostic (OBD-II) Scanner Operations

National Vocational Certificate level 3, in “Automotive Mechatronics”

- Apply Work Health and Safety Practices (WHS)
- Identify and Implement Workplace Policy and Procedures
- Communicate at Workplace
- Perform Computer Application Skills
- Manage Personal Finances
- Perform General Inspection
- Perform Engine Tuning
- Maintain Ignition System
- Maintain Fuel Control System-I
- Service Comfort & Safety System-I
- Maintain Controlled Brake System
- Conserve Power Transmission-I
- Perpetuate Controlled Electrical & Electronic System-I



National Vocational Certificate level 4, in “Automotive Mechatronics”

- Contribute to Work Related Health and Safety (WHS) Initiatives
- Analyze Workplace Policy and Procedures
- Perform Advanced Communication
- Develop Advance Computer Application Skills
- Manage Human Resource Services
- Develop Entrepreneurial skills
- Maintain Fuel Control System-II
- Maintain Emission Control System
- Conserve Power Transmission-II
- Service Comfort & Safety System-II
- Perpetuate Controlled Electrical & Electronic System-II
- Maintain Network System
- Maintain Hybrid System



Purpose of the Qualification

The purpose of the training is to provide skilled labor to improve the existing capacity of the automotive sector. This training will provide the requisite skills to the trainees to participate in Automotive Mechatronics field to meet the challenges in the field. Further, to improve the skill level of the trainees and prepare them for the market competition on national and international level.

The core purpose of this qualification is to produce employability in the field of Automobile according to national and international standards.



Main Objectives of the Qualification

The Automotive Mechatronics qualifications level 2-4 consists of theoretical and practical details.

The main objectives of the qualification are as follows:

1. Comply Personal Health and Safety Guidelines
2. Communicate the Workplace Policy and Procedure
3. Perform Basic Communication (Specific)
4. Perform Basic Computer Application (Specific)
5. Maintain Engine Assembly
6. Maintain Fuel System
7. Service Engine Cooling System
8. Maintain Engine Lubrication System
9. Maintain Brake System
10. Maintain Suspension System
11. Check Vehicle Transmission System
12. Service Electrical System
13. Perform On-Board Diagnostic (OBD-II) Scanner Operations
14. Apply Work Health and Safety Practices (WHS)
15. Identify and Implement Workplace Policy and Procedures
16. Communicate at Workplace
17. Perform Computer Application Skills
18. Manage Personal Finances
19. Perform General Inspection
20. Perform Engine Tuning
21. Maintain Ignition System
22. Maintain Fuel Control System-I
23. Service Comfort & Safety System-I
24. Maintain Controlled Brake System
25. Conserve Power Transmission-I
26. Perpetuate Controlled Electrical & Electronic System-I
27. Contribute to Work Related Health and Safety (WHS) Initiatives
28. Analyze Workplace Policy and Procedures
29. Perform Advanced Communication
30. Develop Advance Computer Application Skills
31. Manage Human Resource Services



- 32.** Develop Entrepreneurial skills
- 33.** Maintain Fuel Control System-II
- 34.** Maintain Emission Control System
- 35.** Conserve Power Transmission-II
- 36.** Service Comfort & Safety System-II
- 37.** Perpetuate Controlled Electrical & Electronic System-II
- 38.** Maintain Network System
- 39.** Maintain Hybrid System



Date of Validation

The level 2-4 of National vocational qualification on Automotive Mechatronics has been validated by the Qualifications Development Committee (QDC) members on June 15, 2019 and will remain in currency until December 2021.

Codes of Qualifications

The International Standard Classification of Education (ISCED) is a framework for assembling, compiling and analyzing cross-nationally comparable statistics on education and training. ISCED codes for these qualifications are assigned as follows:

ISCED Classification for Automotive Mechatronics level 2-4

Code	Description
0714 E&A 15	National Vocational Certificate level 2, in “Automotive Mechatronics”
0714 E&A 16	National Vocational Certificate level 3, in “Automotive Mechatronics”
0714 E&A 17	National Vocational Certificate level 4, in “Automotive Mechatronics”

**Members of Qualification Development Committee**

The following members participated in the Qualification development and validation process.

S #	Name	Designation	Organization	Role in QDC
1	Mr. Mehboob-ur-Rehman	Sr. Instructor Automotive	SOS Institute	Chairman QDC
2	Mr. Ahmed Ali	Automotive Instructor	Aman Tech	QDC+OP+CS+Validation
3	Mr. Usman Ali	Assistant Manager (Lining)	Orient Automotive Industry Pvt Ltd	QDC+OP+CS+Validation
4	Mr. Rana Imran Sattar	Instructor Automotive Trade	PTEVTA	QDC+OP+CS+Validation
5	Mr. Abdullah Shah	Lecturer GCT Peshawar	PK.TEVTA	QDC+OP+CS
6	Mr. Abdul waheed	CEO	Honda (Lahore)	QDC+CS Validation
7	Mr. Muhammad Atif	Sr. Instructor Automotive	Miti	QDC+OP+CS
8	Mr. Muhammad Adnan Khan	Sr. Instructor Automotive	Miti	QDC+OP+CS
9	Mr. Muhammad Jawwad	Assistant Manager (QA)	Orient Automotive Industry Pvt Ltd	QDC+OP+CS+Validation
10	Mr. Sheikh Qamar	Manager	Automotive Industry	QDC+OP+CS
11	Mr. Ahsan Iqbal	Assistant Manager	Bolan Casting Limited	QDC+OP+CS+Validation
12	Mr. Syed Muhammad Ahmed	Assistant Manager	Bolan Casting Limited	QDC+OP+CS
13	Ms. Sarwat Sabih	Civil Engineer	Freelance Expert	CS Facilitator
14	Mr. Sohaib	Freelancer	Private sector	Co-Facilitator



Entry Requirements

The entry requirements for achieving a National Vocational Certificate level 2-4, in “Automotive Mechatronics “are given below:

Title	Entry Requirements
National Vocational Certificate level 2, “Automotive Mechatronics”	Access to assessment against the Competency Standards making up this qualification is open. However, entry into formal training institutes, based on this qualification may require skills and knowledge equivalent to middle (Grade 8).
National Vocational Certificate level 3, “Automotive Mechatronics”	Access to assessment against the Competency Standards making up this qualification is open. However, entry into formal training institute for this qualification is person having National Vocational Certificate level 2, “Automotive Mechatronics” or Middle with hands on experience
National Vocational Certificate level 4, “Automotive Mechatronics”	Access to assessment against the Competency Standards making up this qualification is open. However, entry into formal training institute for this qualification is person having National Vocational Certificate level 3, “Automotive Mechatronics” or GIII or Middle with 1 year of work experience



Categorization and Levelling of the Competency Standards

Code	Name of Duty or (Module)	Level	Credit	Category
102200844	Comply Personal Health and Safety Guidelines	2	03	Generic
41700839	Communicate the Workplace Policy and Procedure	2	02	Generic
1100851	Perform Basic Communication (Specific)	2	03	Generic
61100856	Perform Basic Computer Application (Specific)	2	04	Generic
071400942	Maintain Engine Assembly	2	08	Technical
071400943	Maintain Fuel System	2	08	Technical
071400944	Service Engine Cooling System	2	05	Technical
071400945	Maintain Engine Lubrication System	2	05	Technical
071400946	Maintain Brake System	2	05	Technical
071400947	Maintain Suspension System	2	08	Technical
071400948	Check Vehicle Transmission System	2	05	Technical
071400949	Service Electrical System	2	08	Technical
071400950	Perform On-Board Diagnostic (OBD-II) Scanner Operations	2	06	Technical
102200846	Apply Work Health and Safety Practices (WHS)	3	03	Generic
41700840	Identify and Implement Workplace Policy and Procedures	3	02	Generic
41700840	Communicate at Workplace	3	03	Generic
1100852	Perform Computer Application Skills	3	04	Generic
61100858	Manage Personal Finances	3	03	Generic
41300867	Perform General Inspection	3	06	Technical
071400951	Perform Engine Tuning	3	06	Technical
071400952	Maintain Ignition System	3	05	Technical
071400953	Maintain Fuel Control System-I	3	05	Technical
071400954	Service Comfort & Safety System-I	3	08	Technical
071400955	Maintain Controlled Brake System	3	06	Technical
071400956	Conserve Power Transmission-I	3	06	Technical
071400957	Perpetuate Controlled Electrical & Electronic System-I	3	08	Technical
071400958	Contribute to Work Related Health and Safety (WHS) Initiatives	4	03	Generic
102200848	Analysis Workplace Policy and Procedures	4	03	Generic
41700841	Perform Advanced Communication	4	03	Generic
1100853	Develop Advance Computer Application Skills	4	04	Generic



61100858	Manage Human Resource Services	4	02	Generic
41300869	Develop Entrepreneurial skills	4	03	Generic
071400959	Maintain Fuel Control System-II	4	06	Technical
071400960	Maintain Emission Control System	4	06	Technical
071400961	Conserve Power Transmission-II	4	06	Technical
071400962	Service Comfort & Safety System-II	4	05	Technical
071400963	Perpetuate Controlled Electrical & Electronic System-II	4	06	Technical
071400964	Maintain Network System	4	06	Technical
071400965	Maintain Hybrid System	4	08	Technical



Packaging of Qualifications

The National Vocational Qualifications have been packaged as detailed below:

“Automotive Mechatronics”
National Vocational Certificate level 4,

Maintain Hybrid System

Maintain Network System

Perpetuate Controlled Electrical & Electronic System-II

Service Comfort & Safety System-II

Conserve Power Transmission-II

Maintain Emission Control System

Maintain Fuel Control System-II

Develop Entrepreneurial skills

Manage Human Resource Services

Develop Advance Computer Application Skills

Perform Advanced Communication

Analyze Workplace Policy and Procedures

Contribute to Work Related Health and Safety (WHS) Initiatives



Perpetuate Controlled Electrical & Electronic System-I

Conserve Power Transmission-I

Maintain Controlled Brake System



**“Automotive Mechatronics”
National Vocational Certificate level 3**

Service Comfort & Safety System-I

Maintain Fuel Control System-I

Maintain Ignition System

Perform Engine Tuning

Perform General Inspection

Manage Personal Finances

Perform Computer Application Skills

Communicate at Workplace

**Identify and Implement Workplace Policy and
Procedures**

Apply Work Health and Safety Practices (WHS)



**Perform On-Board Diagnostic (OBD-II) Scanner
Operations**

Service Electrical System

Check Vehicle Transmission System

Maintain Suspension System

Maintain Brake System

Maintain Engine Lubrication System

**Automotive Mechatronics”
National Vocational Certificate level 2,**



Service Engine Cooling System

Maintain Fuel System

Maintain Engine Assembly

Perform Basic Computer Application (Specific)

Perform Basic Communication (Specific)

Communicate the Workplace Policy and Procedure

Comply Personal Health and Safety Guidelines



Detail of Competency Standards

102200844 Comply Personal Health and Safety Guidelines

Overview: This Competency Standard identifies the competencies required to protect/apply occupational Safety, health and Environment at workplace according to the industry's approved guidelines, procedures and interpret environmental rules/regulations. Trainee will be expected to identify and use Personal Protective Equipment (PPE) according to the work place requirements. The underpinning knowledge regarding Observe Occupational Safety and Health (OSH) will be sufficient to provide the basis for the job at workplace.

Competency Units	Performance Criteria
CU1. Identify Personal Hazards at Workplace	P1: Identify risk to personal health P2: Identify hygiene and safety at work place P3: Identify processes P4: Identify tools, equipment and consumable materials that have the potential to cause harm P5: Report, identified risk to Health, hygiene and safety to concerned
CU2. Apply Personal Protective Safety Equipment (PPE) and Equipment	P1: List the Personal Protective equipment P2: Select personal protective equipment in terms of type and quantity according to work orders. P3: Wear personal protective equipment according to job requirements. P4: Clean personal protective equipment P5: Stored Personal Protective equipments in proper place after use.
CU3. Comply Occupational Safety and Health (OSH)	P1: Maintain cleanliness and hygiene as per organizational policy P2: Comply with Health, hygiene and safety precautions before starting work P3: Comply organizational Health, hygiene and safety guidelines during work P4: Deal with resolvable problems according to prescribed procedures P5: Report un resolvable problems to concerned P6: Place the tools equipment etc at their prescribed place after completion of work



CU4. Dispose of hazardous Waste/materials from the designated area.	P1: Identify hazardous waste materials which needs to be disposed off P2: Segregate hazardous or non-hazardous waste carefully from the designated area as per approved procedure P3: Use proper disposal hazardous containers for dispose-off hazardous waste as per procedure P4: Take necessary precautions like putting masks and gloves while disposing hazardous waste/ materials as per standard operating procedure
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Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Explain safety rules and regulations of organization
- K2:** List Personal protection and safety Equipment
- K3:** Describe meaning of Safety signs and symbols
- K4:** Demonstrate understanding of safety related Standard Operating Procedure/guidelines
- K5:** Describe waste disposal SOPs
- K6:** Explain best practices relating to clean and safe work environment

Critical Evidence(s) Required

The candidate needs to produce following critical evidence (s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of maintaining personal health and hygiene practices. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.



041700839 Communicate the Workplace Policy and Procedure

Overview: This unit describes the performance outcomes, skills and knowledge required to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision.

Competency Units	Performance Criteria
CU1. Identify workplace communication procedures	<p>P1. Identify organizational communication requirements and workplace procedures with assistance from relevant authority</p> <p>P2. Identify appropriate lines of communication with supervisors and colleagues.</p> <p>P3. Seek advice on the communication method/equipment most appropriate for the task</p>
CU2. Communicate at workplace	<p>P1. Use effective questioning, and active listening and speaking skills to gather and convey information</p> <p>P2. Use appropriate non-verbal behavior at all times</p> <p>P3. Encourage, acknowledge and act upon constructive feedback</p>
CU3. Draft Written Information	<p>P1. Identify and comply with required range of written materials in accordance with organizational policy and procedures</p> <p>P2. Draft and present assigned written information for approval, ensuring it is written clearly, concisely and within designated timeframes.</p> <p>P3. Ensure written information meets required standards of style, format and detail.</p> <p>P4. Seek assistance and/or feedback to aid communication skills development</p>
CU4. Review Documents	<p>P1. Check draft for suitability of tone for audience, purpose, format and communication style</p> <p>P2. Check draft for readability, grammar, spelling, sentence and paragraph construction and correct any inaccuracies or gaps in content.</p> <p>P3. Check draft for sequencing and structure</p> <p>P4. Check draft to ensure it meets organizational requirements</p> <p>P5. Ensure draft is proofread, where appropriate, by supervisor or colleague</p>



Knowledge and Understanding

- K1:** Key provisions of relevant regulations that may affect aspects of business operations, such as privacy laws
- K2:** Organizational policies, plans and procedures.
- K3:** Barriers to communication
- K4:** Communication model
- K5:** Verbal and written communication techniques

Critical Evidence(s) Required

A person who demonstrates competency in this unit must be able to provide evidence of the ability to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

**001100851 Perform Basic Communication (Specific)**

Overview: This unit describes the skills and knowledge required to assist in the development of communication competence by providing information regarding different forms of communication and their appropriate use.

By the end of this program, learners will be able, to communicate more effectively and efficiently by: working in a team, follow supervisor's instructions and develop generic communication work skills at workplace

Competency Units	Performance Criteria
CU1. Communicate in a team to achieve intended outcomes	<p>P1. Treat team members with respect</p> <p>P2. Maintain positive relationships to achieve common organizational goals</p> <p>P3. Get work related information from team</p> <p>P4. Identify interrelated work activities to avoid confusion</p> <p>P5. Adopt communication skills, which are designed in a team.</p> <p>P6. Identify problems in communication with a team</p> <p>P7. Resolve Communication barrier through discussion and mutual agreement</p>
CU2. Follow Supervisor's instructions as per organizational SOPs	<p>P1. Receive the instructions from Supervisor</p> <p>P2. Carry out the instructions of the supervisor</p> <p>P3. Report to the supervisor as per organizational SOPs</p>
CU3. Develop Generic communication skills at workplace	<p>P1. Develop basic reading skills</p> <p>P2. Develop Basic writing Skills</p> <p>P3. Develop basic listening skills</p>

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- K1:** Basic Learn and understand Types of communication
- K2:** Basic Reading Skills
- K3:** Basic Writing skills
- K4:** Basic Verbal communication skills
- K5:** Basic Problem solving skills



- K6:** Basic Self-Management Skills
- K7:** Basic Technology Skills
- K8:** Basic Interview Skills
- K9:** Basic Workplace dress code
- K10:** Basic The role of team members and functionality of the teams

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Make a list of appropriate communication skills with colleagues and supervisors



061100856 Perform Basic Computer Application (Specific)

Overview: This unit describes the skills and knowledge required to use spreadsheet to prepare a page of document, develops familiarity with Word, Excel, Access, PowerPoint, email, and computer graphics basics.

It applies to individuals who perform a range of routine tasks in the workplace using a fundamental knowledge of spreadsheets, Microsoft office and computer graphics in under direct supervision or with limited responsibility.

Competency Units	Performance Criteria
CU1. Create Word Documents	P1. Open word processing application P2. Create a word document P3. Customize page layout with relevant name setting P4. Set up page in a word document P5. Edit word document as required P6. Use simple formatting tools when creating the document P7. Save word document to directory P8. Insert table in a word document P9. Insert appropriate images into document as necessary P10. Insert header/footer in a word document P11. Insert section break in a word document P12. Set style in word document P13. Select basic Print settings P14. Print the document
CU2. Use internet for Browsing	P1. Use search engines to open website P2. Search data on different topics P3. Refine search to increase relevance of information or content P4. Navigate a website to access the information or content required



Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- K1:** Describing formatting styles and their effect on formatting, readability and appearance of documents
- K2:** Outline purpose, use and function of word-processing software.
- K3:** Editing in MS Word
- K4:** Formatting in MS word
- K5:** Use of different search engines
- K6:** Use of different web pages

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Identify the components of computer
- Follow organizational ergonomic work health and safety (WHS) requirements and practices
- Create, open and retrieve documents using customized basic settings
- Format documents by creating tables and adding text, objects and images
- Save and prints documents.
- Download data through web browser



071400942 Maintain Engine Assembly

Overview: This competency standard covers the skills and knowledge required to Engine Assembly's maintenance. These include removal / Refit of Cylinder head assembly and Cylinder block assembly. Setting of engine timing and coupling of engine assembly with transmission assembly are also included.

Competency Unit	Performance Criteria
CU1. Remove & Refit Engine Head Assembly	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Remove the inlet and exhaust manifold</p> <p>P4. Remove the cylinder head cover</p> <p>P5. Remove cylinder head bolts</p> <p>P6. Remove cam gear by using cam puller</p> <p>P7. Remove the camshaft and cam bearings</p> <p>P8. Remove valve and valve springs using valve spring compressor</p> <p>P9. Check a cylinder head for flatness or warped/twisted</p> <p>P10. Inspect and verify the faults</p> <p>P11. Refit Engine Head assembly as per the workshop manual</p> <p>P12. Ensure housekeeping after completion of task</p>
CU2. Remove & Refit Engine Block Assembly	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Remove the cylinder head cover</p> <p>P4. Remove the cylinder head</p> <p>P5. Remove oil sump/pan</p> <p>P6. Remove Crank shaft front and rear Main oil seal</p> <p>P7. Remove main Journal bearing caps.</p> <p>P8. Remove Big end Journal bearing caps</p> <p>P9. Refit Engine Block Assembly as per the workshop manual</p> <p>P10. Ensure housekeeping after completion of task</p>



CU3. Set Engine Timings	P1. Select the tool and equipment according to the job requirement P2. Ensure safety precautions P3. Set engine timing P4. Start engine for idle running speed as per workshop manual P5. Ensure housekeeping after completion of task
CU4. Couple Engine & Transmission	P1. Select the tool and equipment according to the job requirement P2. Ensure safety precautions P3. Hold the engine assembly and transmission at same level P4. Ensure transmission primary / input shaft centrally aligned with clutch plate drive hub. P5. Insert transmission primary shaft into the clutch plate drive hub. P6. Ensure Bell housing completely fix with engine rear side P7. Fit engine and transmission bolts P8. Apply torque as per workshop manual and fix the engine and transmission P9. Ensure housekeeping after completion of task

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain engine types and main parts of engine assembly
- K2:** Explain engine systems i.e. cooling system, Ignition system
- K3:** Describe function of intake and exhaust system
- K4:** Describe Valve timing and valve mechanism of an engine
- K5:** Know about Crank and cam shaft function and their location
- K6:** Explain variable valve timing with intelligence (VVTI) and variable valve timing & lift electronic control (VTEC).
- K7:** Explain cylinder head for warpage
- K8:** Know about Magnetic Particle Inspection



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Remove & refit engine head assembly
- Remove & refit engine block assembly
- Ensure Timing degree graduation setting by using ignition timing gun
- Ensure Bell housing completely fix with engine rear side
- Check the head assembly condition

Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Ear plug / Ear Muff
- Overall
- Compression Tester
- Valve Lifter
- Ring Compressor
- Ring Expander
- Stethoscope
- Plier set
- Engine Hoist
- Hydraulic Jack
- Combination Spanner Set
- Allen key Set
- Socket Set
- Wheel Spanner
- Oil filter spanner



- Torque Wrench
- Tool Trolley
- Engine mounts.
- Hammer
- Mallet
- Clutch plate alignment tool



071400943 Maintain Fuel System

Overview: This competence standard covers the skills and knowledge required to perform engine maintenance including Installation and Service of fuel injectors and rail, Fuel pumps, Carburetor and Throttle body.

Competency Unit	Performance Criteria
CU1. Service Fuel Injectors and Rail	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Observe Fuel Injector condition through engine operation</p> <p>P4. Check wire harness and connectors</p> <p>P5. Check input supply of fuel injectors.</p> <p>P6. Remove the air cleaner and accessories.</p> <p>P7. Remove and Service fuel injectors.</p> <p>P8. Assemble the air cleaner and accessories</p> <p>P9. Perform test drive.</p> <p>P10. Ensure housekeeping after completion of task</p>
CU2. Repair Fuel Pump	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Diagnose physical damage or faulty fuel pump in vehicle (Diesel / Petrol) by applying prescribed diagnostic techniques.</p> <p>P4. Check pressure of fuel pump</p> <p>P5. Check vacuum of fuel pump.</p> <p>P6. Repair/replace faulty fuel pump</p> <p>P7. Ensure function of fuel pump after service of vehicle fuel system.</p> <p>P8. Ensure housekeeping after completion of task</p>
CU3. Perform Carburetor	<p>P1. Select appropriate tools and equipment.</p>



Service	<p>P2. Ensure work safety all times.</p> <p>P3. Remove the engine air filter and accessories.</p> <p>P4. Identify and adjust air fuel mixture adjustment screw.</p> <p>P5. Test the engine carburetor at idle and while revving up.</p> <p>P6. Identify the idle mixture screw; adjust it until the engine is idling smoothly, with no misfires or shakes, and at the proper speed.</p> <p>P7. Assemble the air filter and accessories onto the carburetor</p> <p>P8. Perform test drive.</p> <p>P9. Ensure housekeeping after completion of task</p>
CU4. Perform Throttle Body Service	<p>P1. Select appropriate tools and equipment.</p> <p>P2. Ensure work safety at all times.</p> <p>P3. Observe idle speed of vehicle.</p> <p>P4. Disconnect all connectors from throttle body.</p> <p>P5. Remove the mounting bolts of throttle body and its accessories</p> <p>P6. Clean the throttle body with non-abrasive cleaner.</p> <p>P7. Assemble the throttle body and accessories</p> <p>P8. Perform test drive</p> <p>P9. Ensure housekeeping after completion of task</p>

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Describe function and working of fuel system
- K2:** Identify types and parts of fuel system
- K3:** Describe function of fuel injectors and rail
- K4:** Explain types of carburetor circuits
- K5:** Describe carburetor service method
- K6:** Describe types of fuel pump and service method
- K7:** Describe Throttle Body service method



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Remove and install fuel injectors
- Remove and install fuel pumps
- Remove and service carburetor with air cleaner.
- Remove and install throttle body

Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Overall
- Repair Manual.
- Carburetor cleaner
- Wrench Socket Set
- Screwdriver Set
- Needle nose pliers
- Impact screw driver
- Combination Spanner Set
- Pressure Gauge
- Vacuum Gauge
- Digital Multimeter
- Diagnostic Scanner



071400944 Service Engine Cooling System

Overview: This competency standard covers the skills and knowledge required to perform radiator service and radiator fan service. It also describes the performance of thermostat valve and water pump.

Competency Unit	Performance Criteria
CU1. Perform Radiator Service	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Disconnect all water, automatic transmission fluid (ATF) hoses and electric connections from radiator</p> <p>P3. Remove radiator from vehicle</p> <p>P4. Remove fan with shroud</p> <p>P5. Service/replace the radiator</p> <p>P6. Refit fan and shroud with radiator</p> <p>P7. Refit the radiator in the vehicle</p> <p>P8. Check leakages in cooling system</p> <p>P9. Ensure housekeeping after completion of task</p>
CU2. Perform Radiator Fan Service	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Disconnect all water, automatic transmission fluid ATF and electric connections from radiator</p> <p>P3. Remove radiator from vehicle</p> <p>P4. Remove fan from shroud</p> <p>P5. Service/replace the fan motor and fan</p> <p>P6. Replace the carbon brushes</p> <p>P7. Refit the fan with shroud.</p> <p>P8. Refit the radiator in the vehicle</p> <p>P9. Ensure housekeeping after completion of task</p>
CU3. Evaluate Thermostat Valve Performance	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Disconnect the water hose from thermostat valve hosing.</p> <p>P3. Remove the thermostat valve</p> <p>P4. Check the thermostat valve as per the workshop manual.</p> <p>P5. Replace thermostat if found faulty</p> <p>P6. Refit the valve into the housing</p>



	P7. Ensure housekeeping after completion of task
CU4. Evaluate Water Pump Performance	P1. Select the tool and equipment according to the job requirement P2. Disconnect the water and electric connections from water pump. P3. Remove Water pump from vehicle. P4. Check water pump, seals and bearings P5. Replace water pump P6. Ensure housekeeping after completion of task

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain purpose of coolant in cooling system
- K2:** Define heat exchanger
- K3:** Explain operating temperature of car engine.
- K4:** Define function of radiator pressure cap.
- K5:** Explain function of thermostat valve.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Remove & refit radiator.
- Remove & refit Thermostat
- Remove & refit Water Pump



Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Cotton Gloves
- Goggles
- Safety mask
- Safety Shoes
- Overall
- Wire Brush
- Combination Pliers
- Nose Plier
- Spanner set
- Oil drain tray
- Fiber brush
- Phillips Screw Driver Set
- Flat Screw Driver Set
- Pressure tester gauge



071400945 Maintain Engine Lubrication System

Overview: This competency standard covers the skills and knowledge required to test the performance of oil pressure switch, oil pump, and repair oil leakages.

Competency Unit	Performance Criteria
CU1. Test Performance of Oil Pressure Switch	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Switch on the ignition-switch/key and observe the oil lamp indicator on instrument panel P4. Start the engine and observe the oil lamp indicator P5. Ensure housekeeping after completion of task
CU2. Service Oil Pump	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Remove oil sump safely P4. Inspect oil strainer P5. Inspect oil pump P6. Inspect oil pressure relief valve P7. Ensure housekeeping after completion of task
CU3. Investigate & Repair Oil Leakages	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Locate the oil leakages P4. Replace tappet cover seal P5. Replace oil sump gasket/seal P6. Replace ignition distributor “O” ring (Seal) P7. Ensure housekeeping after completion of task

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:



- K1:** Describe main purpose of engine lubrication system
- K2:** Explain types of engine lubrication system
- K3:** Explain different types and function of oil pumps
- K4:** Describe main purpose of oil pressure switch
- K5:** Describe main purpose of oil pressure relief valve
- K6:** Explain function of oil cooler

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Service of Oil Pump.
- Inspect oil pressure relief valve.
- Inspect oil pressure switch

Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Coverall
- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set
- Socket Set
- Allen Key Set
- Oil Pressure Gauge



071400946 Maintain Brake System

Overview: This competency standard covers the skills and knowledge required to maintain mechanical brake, hydraulic brake and pneumatic brake systems.

Competency Unit	Performance Criteria
CU1. Perform Maintenance of Mechanical Brake System	<p>P1. Select appropriate tools and equipment</p> <p>P2. Remove, clean, inspect and measure drum/disc diameter</p> <p>P3. Repair brake drum/disc</p> <p>P4. Inspect wheel cylinders for leakage and proper operation</p> <p>P5. Adjust brake shoes and parking brake</p> <p>P6. Install brake drums or hub assembly</p> <p>P7. Install wheel bearing as per workshop manual</p> <p>P8. Perform road test</p> <p>P9. Ensure housekeeping after completion of task</p>
CU2. Perform Maintenance of Hydraulic Brake System	<p>P1. Select appropriate tools and equipment</p> <p>P2. Measure brake pedal height</p> <p>P3. Adjust brake pedal travel and free play</p> <p>P4. Check master cylinder for external leakages and proper operation</p> <p>P5. Inspect brake lines, hose pipes and fittings</p> <p>P6. Select and fill brake fluids to proper level</p> <p>P7. Perform brake bleeding</p> <p>P8. Perform road test</p> <p>P9. Ensure housekeeping after completion of task</p>
CU3. Perform Maintenance of Pneumatic Brake System	<p>P1. Select appropriate Tools and equipment</p> <p>P2. Measure brake pedal height</p> <p>P3. Adjust brake pedal travel and free play</p> <p>P4. Check master cylinder for external leakages and proper operation</p> <p>P5. Inspect brake lines, hose pipes and fittings</p> <p>P6. Inspect air reservoir, safety valve, water drain plugs</p> <p>P7. Start vehicle and check the air leakage</p> <p>P8. Perform road test</p> <p>P9. Ensure housekeeping after completion of task</p>



Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain inspection and servicing of brake systems
- K2:** Explain lifting and supporting vehicles procedure
- K3:** Describe brake system components.
- K4:** Describe types of braking systems
- K5:** Describe types and characteristics of brake fluids

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Replace brake drum and brake shoes
- Replace brake disc and brake pads
- Perform mechanical diagnosis of anti-lock brake problems.
- Perform brake bleeding
- Perform air leakage test of pneumatic brake system

Tools and Equipment required

The tools and equipment required for this competency standard are given below:

- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Overall
- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set



- Socket Set
- Brake Bleeding Equipment
- Brake Efficiency Tester
- Different Types of Brushes
- Cleaning Equipment with Detergent
- Jack Trolley Type with Weight Lifting Capacity 5 Tons
- Lifting Equipment (Service Pit)
- Wet towel
- Brake Drum Pullers
- Jack Hoist/ Stand
- Brake Fluid Tester
- Flaring Tool/Flare Tool for brake tubes repairing
- Flare-nut wrench
- Tube Bender
- Special suction pump or vacuum bleeder
- Compressed air to pressure Bleeder
- Special bleed valve tools (only for ABS use)
- Trolley Jack
- Axle stands
- Brake fluid collector/container



071400947 Maintain Suspension System

Overview: The Competency standard covers the skills and knowledge required to maintain various types of suspensions and their component parts, maintain coil, leaf, and torsion bar springs, independent suspension arms and linkages, maintain shock absorbers, McPherson Strut, tie rod performance. Test differential and axle and maintain wheel balancing and alignment.

Competency Unit	Performance Criteria
CU1. Check Performance of McPherson Strut	P1. Select the tool and equipment according to the job requirement P2. Ensure safety precaution P3. Check for damaged or sagging springs. P4. Check the steering mounts and linkages P5. Remove McPherson strut P6. Check the McPherson strut pivot bearing P7. Ensure housekeeping after completion of task
CU2. Check Tie rod Performance	P1. Select the tools and equipment according to the job requirement P2. Ensure safety precaution P3. Check play in ball joint P4. Replace ball joint P5. Inspect tie rod /rack-end play P6. Replace tie rod/rock end P7. Ensure housekeeping after completion of task
CU3. Check Performance of Coil Spring Sagging	P1. Select the tools and equipment according to the job requirement P2. Ensure safety precaution P3. Inspect coil spring height P4. Replace cracked/ damaged rubber cushion P5. Replace cracked/ damaged coil spring P6. Ensure housekeeping after completion of task
CU4. Test Performance of Stabilizer Bar	P1. Select the tool and equipment according to the job requirement P2. Ensure safety precaution P3. Inspect/replace the stabilizer bar mounting bush P4. Inspect/replace stabilizer bar links



	<p>P5. Inspect/replace stabilizer bar</p> <p>P6. Ensure housekeeping after completion of task</p>
<p>CU5. Test Knuckle Assembly Operations</p>	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Check performance of knuckle assembly</p> <p>P4. Replace wheel bearing</p> <p>P5. Replace wheel hub</p> <p>P6. Replace knuckle assembly</p> <p>P7. Ensure housekeeping after completion of task</p>
<p>CU6. Check Performance of Upper & Lower Suspension Arms</p>	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Replace mounting bush</p> <p>P4. Replace ball joint of upper arm & lower arm</p> <p>P5. Inspect upper & lower arms bush</p> <p>P6. Replace suspension arms</p> <p>P7. Ensure housekeeping after completion of task</p>
<p>CU7. Test Differential System</p>	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Check oil level</p> <p>P4. Replace differential oil with specified grade oil</p> <p>P5. Clean/ replace axle case breather</p> <p>P6. Replace axle seals</p> <p>P7. Over Haul/replace differential if found faulty</p> <p>P8. Ensure housekeeping after completion of task</p>
<p>CU8. Test Axle Assembly</p>	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Replace inner/outer CV (constant velocity) joint</p> <p>P4. Replace inner/outer axle boots</p> <p>P5. Inspect/ replace axle nut and lock</p> <p>P6. Ensure housekeeping after completion of task</p>
<p>CU9. Maintain Wheel Alignment</p>	<p>P1. Select the tool and equipment according to the job requirement</p>



	<p>P2. Ensure safety precaution</p> <p>P3. Perform pre-alignment inspection,</p> <p>P4. Inspect wheel alignment</p> <p>P5. Adjust camber, caster and toe in/toe out</p> <p>P6. Perform road test</p> <p>P7. Ensure housekeeping after completion of task</p>
<p>CU10. Maintain Wheel Balancing</p>	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Inspect tyre conditions and specifications</p> <p>P4. Balance wheel assembly on wheel balancing machine</p> <p>P5. Ensure housekeeping after completion of task</p>

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Describe sprung weight and un-sprung weight
- K2:** Define types of suspension system
- K3:** Explain the types of springs
- K4:** Identify ball joint, tie rod and steering linkages and their location
- K5:** Describe purpose and function of ball joint
- K6:** Explain purpose and function of shock absorber
- K7:** Define wheel alignment and steering geometry
- K8:** Explain the wheel balancing and their benefits for the tyres and vehicle performance
- K9:** Define transverse (or side-to-side) wheel support.
- K10:** Define longitudinal (front-to-back) wheel support
- K11:** Define alignment angles (camber, caster and toe)

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Remove and refit McPherson Strut



- Adjust alignment angles (camber, caster and toe)
- Replace wheel hub
- Remove and refit suspension system

Tools and Equipment required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Overall
- Pipe Wrench
- Wheel skids wooden
- Jack/ trolley jack
- Jack stands different size/height
- Wheel alignment machine
- Wheel balancing Machine
- Vernier caliper
- Wrenches (Set)
- Ratchet and Sockets (Set)
- Screwdrivers
- Pliers
- Hammer
- Jack
- Ramps
- Hex Wrench(Set)
- Ball joint puller
- Mechanic Gloves (Disposable and Non-disposable)
- Hand Cleaner



071400948 Check Vehicle Transmission System

Overview: This competency standard covers the skills and knowledge required to maintain Mechanical, Hydraulic Clutch systems and manual transmission

Competency Unit	Performance Criteria
CU1. Check Performance of Manual Transmission	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Check and replace gear oil P4. Check performance of manual transmission P5. Replace Transmission seals P6. Replace synchronizer ring gears P7. Ensure housekeeping after completion of task
CU2. Check Performance of Mechanical Clutch System	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Inspect clutch system components P4. Adjust clutch cable P5. Remove components from clutch system of vehicle P6. Remove gearbox assembly P7. Diagnose faulty/damaged/broken part related with clutch system P8. Replace faulty components P9. Refit gearbox assembly P10. Ensure housekeeping after completion of task
CU3. Check Performance of Hydraulic Clutch System	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Replace clutch master cylinder seal P4. Replace slave cylinder seal P5. Perform clutch bleeding P6. Ensure housekeeping after completion of task



Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Describe purpose of clutch system
- K2:** Explain difference between Mechanical and Hydraulic clutch system
- K3:** Identify parts of clutch system
- K4:** Explain purpose of bleeding in hydraulic clutch system
- K5:** Describe gear ratio used to maximize torque or speed in gearbox
- K6:** Describe components of manual gearbox

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Replace Transmission seals
- Replace clutch plate and pressure plate assembly
- Perform clutch bleeding
- Remove and refit gearbox assembly

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Coverall
- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set
- Socket Set



- Allen Key Set
- Bearing Puller
- Housing Puller
- Tyre Lever
- Hammer
- Clutch plate aligner (centering tool)



071400949 Service Electrical System

Overview: This Competency Standard identifies the competencies required to test the performance of electrical system in accordance with the approved guidelines and procedures. Candidate will also acquire skills and knowledge to perform inspection and testing of ignition system, fuse & relays, lighting system, Alternator and Self-Starting system.

Competency Unit	Performance Criteria
CU1. Check Performance of Ignition System	P1. Select appropriate tools and equipment. P2. Ensure work safely at all times. P3. Check performance of battery and Indication light. P4. Check operation of ignition switch P5. Check wire harness and connectors P6. Check spark plug and rectify faulty parts. P7. Check distributor and distributor cap P8. Check performance of CB (contact breaker) point P9. Check ignition system sensor P10. Ensure housekeeping after completion of task
CU2. Test Performance of Fuses & Relays	P1. Select appropriate tools and equipment. P2. Ensure work safely at all times. P3. Check performance of battery P4. Check fuses of Instrument panel P5. Check relays of Instrument panel P6. Check wire harness and connectors P7. Ensure housekeeping after completion of task
CU3. Service Lighting System	P1. Select appropriate Tools and equipment. P2. Ensure work safely at all times. P3. Check the headlights and tail lights and replace faulty parts P4. Check reverse lights and reverse gear switch and replace P5. Check fog lights and replace faulty parts P6. Check roof and reading lights and replace in case of any fault P7. Check brake switch and replace faulty parts P8. Check turn signals (indicators) and replace faulty parts



	<p>P9. Check parking/ instrument panel light bulbs and replace faulty parts</p> <p>P10. Check combination switch and replace damaged/faulty parts</p> <p>P11. Check all relays and fuses</p> <p>P12. Check wiring harness of lighting system</p> <p>P13. Ensure housekeeping after completion of task</p>
CU4. Test Performance of Alternator	<p>P1. Select appropriate tools and equipment.</p> <p>P2. Ensure work safely at all times.</p> <p>P3. Check charging warning light</p> <p>P4. Check alternator output voltage and ampere</p> <p>P5. Check wire harness and electrical connection</p> <p>P6. Check tension of belt.</p> <p>P7. Replace faulty components according to procedure.</p> <p>P8. Ensure housekeeping after completion of task</p>
CU5. Service Self Starting System	<p>P1. Select appropriate tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check performance of battery.</p> <p>P4. Check electrical wire harness, relays and connection of starter motor.</p> <p>P5. Check alignment of stater motor pinion with flywheel.</p> <p>P6. Ensure the fault is removed and starter motor is functioning properly.</p> <p>P7. Ensure housekeeping after completion of task</p>

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

K1: Interpret manufacturer’s repair manual

K2: Describe use of Scanners



- K3:** Explain the function of Alternator with Voltage Regulator
- K4:** Define the function of Starter Motor
- K5:** State about Wiring Harness and Wiring Circuit Diagram
- K6:** Describe function of Spark Plug
- K7:** Explain different Types of Batteries (including Hybrid Batteries)
- K8:** Explain different Types of Ignition System
- K9:** Describe types of sensors
- K10:** Explain Ignition timing light
- K11:** Describe uses of DMM (digital multi-meter)

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Check fuse and relays
- Install lights
- Maintain Lamp
- Install Starter Motor
- Install Alternator
- Install Battery
- Maintain spark plugs

Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Coverall
- Service Creeper
- Digital Multimeter
- Flat / Philips Screwdriver Set
- Combination Spanner Set



- Repair Manual
- Combination Plier
- Needle Nose Plier
- Test Lamp
- Scanners



071400950 Perform On-Board Diagnostic (OBD-II) Scanner Operations

Overview: This competency standard covers the skills and knowledge required to ensure the proper use of OBD-II scanner to diagnose various electronic system and rectify their faults.

Competency Unit	Performance Criteria
CU1. Perform Scanning & Diagnoses	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Connect the required connector with car of OBD-II</p> <p>P4. Switch on the ignition switch</p> <p>P5. Enter the Car's detail in OBD-II scanner</p> <p>P6. Diagnose Engine and Electronically Controlled Transmission</p> <p>P7. Ensure housekeeping after completion of task</p>
CU2. Investigate OBD-II for Fault Analysis	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Check the DTC (Diagnostic trouble code) with OBD-II scanner</p> <p>P4. Remove faults and ensure with OBD-II scanner</p> <p>P5. Ensure housekeeping after completion of task</p>
CU3. Check Vehicle's Mechanical Parameters of OBD-II Operations	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Set idle speed through adjustment screw on throttle body</p> <p>P4. Diagnose the adjusted RPM with OBD-II</p> <p>P5. Diagnose engine coolant temperature with OBD-II scanner</p> <p>P6. Check the mass air flow with OBD-II scanner at different engine speed</p> <p>P7. Ensure housekeeping after completion of task</p>
CU4. Maintain OBD-II Scanner	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Ensure availability of required connectors of OBD-II</p>



	scanner P4. Clean OBD-II scanner on regular basis P5. Replace battery of OBD-II scanner when required P6. Store OBD-II scanner safely P7. Ensure housekeeping after completion of task
Knowledge and Understanding	

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Describe main parts of an electronic system
- K2:** Define different types and functions of sensors
- K3:** Define the different types of actuators
- K4:** Explain OBD systems
- K5:** Explain the proper procedure of using an OBD-II

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Enter the Car's detail in OBD-II equipment
- Diagnose Engine and Electronically Controlled Transmission
- Diagnose the faults with OBD-II

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety Mask
- Helmet
- Safety Shoes
- Overall
- OBD-II scanner
- Tool kit
- Screw drivers (flat/Philips)



102200846 Apply Work Health and Safety Practices (WHS)

Overview: This unit describes the skills to work with safety and participate in hazard assessment activities, follow emergency procedures and participate OHS practices in process.

Competency Units	Performance Criteria
CU1. Implement safe work practices at work place	P1. Implement relevant rules and procedures of WHS at work place. P2. Comply with duty of care requirements P3. Use personal protective equipment according to safe work practices P4. Contribute to WHS consultative activities P5. Raise WHS issues with relevant personnel
CU2. Participate in hazard assessment activities a work place	P1. Identify hazards or WHS issues in the workplace to relevant personnel P2. Assess and control risks according to own level of responsibility, in line with workplace procedures P3. Report hazards or WHS issues in the workplace to relevant personnel P4. Document risk control actions as required
CU3. Follow emergency procedures at workplace	P1. Report emergencies or incidents promptly to relevant personnel P2. Deal with emergencies in line with own level of responsibility P3. Implement evacuation procedures as required
CU4. Participate in OHS consultative processes	P1. Contribute to workplace meetings, inspections or other consultative activities P2. Raise OHS (Occupational Health and Safety) issues with designated persons in accordance with organizational procedures P3. Take actions to eliminate workplace hazards or to reduce risks



Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Outline the WHS rights and responsibilities that apply to own role
- K2:** Explain the term duty of care
- K3:** Describe typical health and safety roles in the workplace
- K4:** List and describe common safety signs and symbols
- K5:** Explain procedures for reporting hazards, risks, incidents and accidents
- K6:** Identify and describe common hazards and major causes of accidents relevant to the workplace
- K7:** Explain what the term risk control means
- K8:** List and describe potential emergency situations and how to respond to them

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

Demonstrate evidences of the Health and safety Processes to avoid any incident.



041700840 Identify and Implement Workplace Policy and Procedures

Overview: This unit describes the skills and knowledge required to develop and implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.

Competency Units	Performance Criteria
CU1. Identify workplace policy & procedures	P1. Identify the workplace policy & procedures P2. Apply appropriate strategies that can be used to measure whether your workplace health and safety obligations are being met. P3. Assure the policies are realistic, resources and personnel to implement P4. Implement the policy & procedures that reflects the organizations commitments P5. Ensure the appropriate methods of implementation, outcomes and performance indicators
CU2. Implement workplace policy & procedures	P1. Apply and assign responsibility for recording systems to track continuous improvements in policy & procedures P2. Implement strategies for continuous improvement in effective and efficient information
CU3. Communicate workplace policy & procedures	P1. Communicate procedures to help implement workplace policy P2. Inform those involved in implementing the policy about expected outcomes, activities to be undertaken and assigned responsibilities
CU4. Review the implementation of workplace policy & procedures	P1. Identify the trends that may require remedial actions P2. Record the trends that may require remedial actions. P3. Ensure policy and procedures as required are made for continuous improvement of performance



Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Legislation, regulations and codes of practice applicable to the organization
- K2:** internal and external sources of information and organizational policy & procedures
- K3:** Typical barriers to implementing policies and procedures in an organization.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

Identify evidences of the ability to implement work place policy and procedures. briefly identify work place procedures to avoid incident.

**001100852 Communicate at Workplace**

Overview: This unit describes the performance outcomes, skills and knowledge required to develop communication skills in the workplace. It covers gathering, conveying and receiving information, along with completing assigned written information under direct supervision.

Competency Units	Performance Criteria
CU1. Communicate within the organization	<p>P1. Communicate within a department</p> <p>P2. Communicate with other departments.</p> <p>P3. Use various media to communicate effectively</p> <p>P4. Communicate orally and written</p>
CU2. Communicate outside the organization	<p>P1. Deal with vendors</p> <p>P2. Deal with clients/customers</p> <p>P3. Interact with other organisations</p> <p>P4. Use various media to communicate effectively</p> <p>P5. Work with people of different cultures / backgrounds</p>
CU3. Communicate effectively in workgroup	<p>P1. Assess the issues to provide relevant suggestion to group members</p> <p>P2. Resolve the issues/ problems /conflicts within the group</p> <p>P3. Arrange group working sessions to increase the level of participation in the group processes</p> <p>P4. Communicate messages to group members clearly to ensure interpretation is valid</p> <p>P5. Communicate style /manner to reflect professional standards/ awareness of appropriate cultural practices</p> <p>P6. Act upon constructive feedback</p>
CU4. Communicate in writing	<p>P1. Identify relevant procedures for written information</p> <p>P2. Use strategies to ensure correct communication in writing .i.e.</p> <ul style="list-style-type: none"> • correct composition • clarity • comprehensiveness • accuracy • appropriateness <p>P3. Draft assigned written information for approval, ensuring</p>



	<p>it is written within designated timeframes</p> <p>P4. Ensure written information meets required standards of style, format and detail</p> <p>P5. Seek assistance / feedback to aid communication skills development</p>
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Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- K1:** Importance of intra and inter organizational communication
- K2:** Basics of business communication
- K3:** Defining Modes of communication
- K4:** Effective communication in workgroup
- K5:** Communicating through writing
- K6:** The importance of teamwork

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

In your current position, what types of written communication do you use most often? (List them all).

**061100858 Perform Computer Application Skills**

Overview: This unit describes the skills and knowledge required to use spreadsheet applications, prepare in page documents, develops familiarity with Word, Excel, Access, PowerPoint, email, and computer graphics basics.

It applies to individuals who perform a range of routine tasks in the workplace using a fundamental knowledge of spreadsheets, Microsoft office and computer graphics in under direct supervision or with limited responsibility.

Competency Units	Performance Criteria
CU1. Prepare In-page documents as per required information	<p>P1. Set keyboard preferences according to information requirements</p> <p>P2. Layout Page according to information requirements</p> <p>P3. Toggle between Languages</p> <p>P4. Identify the usage of tool bar</p> <p>P5. Insert Columns as per requirement</p> <p>P6. Print the document</p>
CU2. Prepare Spreadsheets as per required information	<p>P1. Create workbook according to information requirements</p> <p>P2. Insert sheet according to information requirements</p> <p>P3. Enter basic formulae / functions using cell referencing when required</p> <p>P4. Correct formulas when error messages occur</p> <p>P5. Use a range of common tools during spreadsheet development</p> <p>P6. Edit columns and rows within the spreadsheet Filter data</p> <p>P7. Save the spreadsheet to a folder on a storage device</p> <p>P8. Format spreadsheet using formatting features as required</p> <p>P9. Incorporate object and chart in spreadsheet</p> <p>P10. Print spreadsheet</p>
CU3. Use MS Office as per required information	<p>P1. Use Microsoft Word for documentation</p> <p>P2. Use Microsoft Excel for documentation</p> <p>P3. Use Microsoft PowerPoint for presentation</p> <p>P4. Perform OneNote</p> <p>P5. Perform Outlook for emails</p> <p>P6. Perform Publisher applications</p>



CU4. Perform computer graphics in basic applications	P1. Perform graphic fundamentals in basic applications P2. Draw Points and lines to make images P3. Draw Dots in space to make images P4. Draw lightening blot Shapes to make images P5. Enlarge circles and rectangles to block in forms
CU5. Create Email account for communications	P1. Make email account for communications P2. . Compose text of an email message according to organizational guidelines as required P3. Create an automatic signature for the user P4. Attach files to email message where required P5. Send email message P6. Reply to / forward a received message using available features P7. Save an attachment to the relevant folder P8. Save email message using available settings P9. Adjust email accounts to restrict and quarantine possible email security problems <ul style="list-style-type: none">• Print email message as per requirements

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- K1:** List basic technical terminology related to reading help files and prompts
- K2:** Explain the effect of formatting and appearance on the readability and usability of spreadsheets
- K3:** Outline log-in procedures relating to accessing a personal computer (PC)
- K4:** Describe the purpose, use and function of spreadsheet applications.
- K5:** Understand **MS Word** to create documents, flyers, publications
- K6:** Understand **MS PowerPoint** to create presentations
- K7:** Understand **MS Excel** to store, organize, and manipulate data
- K8:** Understand **OneNote** to organize data you collect including handwritten notes, drawings, screen captures, audio clips, and more
- K9:** Understand of **Publisher** to create extensive publications, posters, flyers, menus



K10: Understand **Outlook** to manage email and calendars, to do lists, and contacts

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Create spreadsheets
- Customize basic settings
- Format spreadsheets
- Apply basic formulas
- Insert objects and charts in spreadsheets
- Save and print spreadsheets.



041300867 Manage Personal Finances

Overview: This unit of competency describes the outcomes required to manage develop, implement and monitor a personal budget in order to plan regular savings and manage debt effectively.

Competency Units	Performance Criteria
CU1. Develop a personal budget	P1. Calculate current living expenses using available information to prepare a personal budget. P2. Keep a record of all income and expenses for a short period of time to help estimate ongoing expenses. P3. Subtract total expenses from total income to determine a surplus or deficit budget for the specified period. P4. Find reasons for a deficit budget and ways to reduce expenditure identified. P5. Identify ways to increase income
CU2. Develop long term personal budget	P1. Analyze income and expenditure and set long term personal financial goals. P2. Develop a long-term budget based on the outcomes of short-term budgeting. P3. Identify obstacles that might affect the business P4. Formulate a regular savings plan based on budget
CU3. Identify ways to maximize future finances	P1. Determine sources to maximize personal income, P2. Get further education or training to maintain or improve future income. P3. Identify the need for debt to finance living and other expenses, P4. Determine the appropriate levels of debt and repayment. P5. Consolidate existing debt, where possible, to minimize interest costs and fees. P6. Seek professional money management services.



Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Explain the abilities to plan and organize to keep records and monitor a personal budget
- K2:** Describe abilities to set and review goals
- K3:** Explain basic financial management and record keeping to enable development and management of a personal budget
- K4:** Describe benefits of financial goal setting and personal budgeting to enable effective management of personal finances
- K5:** Outline numeracy skills to compare income and expenditure

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

Demonstrates competency to provide evidence of the ability to manage personal finances. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.



071400951 Perform General Inspection

Overview: This competency standard covers the skills and knowledge required to perform General Inspections and prepare job Card / Report

Competency Unit	Performance Criteria
CU1. Inspect Mechanical Failure	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Check fluid level of engine, brake, gear and power steering.</p> <p>P4. Check coolant level and its condition.</p> <p>P5. Check filters (air filter, fuel filter, oil filter and A/C filter)of vehicle</p> <p>P6. Check drive belts(alternator belt, power steering pump belt, A/C compressor belt)</p> <p>P7. Check tyre conditions and air pressure in all tyres including spare tyre</p> <p>P8. Check any abnormal noise in engine</p> <p>P9. Check any fluid leakages (brake fluid, power steering fluid,gear oil and engine oil)</p> <p>P10. Check parts of brake system, cooling system and lubrication system)</p> <p>P11. Ensure housekeeping after completion of task</p>
CU2. Inspect Electrical Failure	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Check the Battery function and level of its electrolyte</p> <p>P4. Check/clean the battery terminals</p> <p>P5. Check operation of all lights(head lights, back lights,brake light, indicator lights, reverse gear light and fog light)</p> <p>P6. Check horn of the vehicle</p> <p>P7. Check the ignition system</p> <p>P8. Check the working condition of alternator</p> <p>P9. Check the performance of self-starter</p> <p>P10. Check the A/C system</p>



	<p>P11. Check the wipers of the vehicle</p> <p>P12. Ensure housekeeping after completion of task</p>
CU3. Perform Road Test	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Perform road test applying correct procedure</p> <p>P4. Accelerate the engine to check engine noise</p> <p>P5. Apply brake to check loose parts and noisy suspension</p> <p>P6. Check the wheel alignment during driving</p> <p>P7. Ensure housekeeping after completion of task</p>
CU4. Prepare Job Card/Report	<p>P1. Note down the mechanical faults</p> <p>P2. Note down the electronic faults.</p> <p>P3. Note down the hydraulic faults</p> <p>P4. Ensure housekeeping after completion of task</p>

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- K1:** Describe methods to check fluid level of engine, brake, gear and power steering
- K2:** Describe importance to check filters of a vehicle and its types
- K3:** Explain different types of belts and methods to check them
- K4:** Explain methods to check tyre condition and importance of checking the spare tyre
- K5:** Describe to check the battery functions and level of its electrolyte
- K6:** Explain different types of electrical failure
- K7:** Explain how to perform road test
- K8:** State how to prepare Job Card / Report
- K9:** Define how to diagnose electronic faults with the help of OBD-II scanner



Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Check working condition of an alternator
- Analyze the self-starter performance
- Accelerate the engine to check engine noise
 - Check fluid leakage of brake.

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Overall
- OBD-II scanner
- Digital Multimeter
- Hydrometer
- Test lamp
- Special service tools
- Screw drivers(flat/Philips)
- Socket set



071400952 Perform Engine Tuning

Overview: This competency standard covers skills and knowledge required to perform Engine Tuning that is, Clean/Replace air filter, adjustment of engine idle speed, tappet clearance, spark plugs, Contact Breaker Point and air fuel ratio.

Competency Unit	Performance Criteria
CU1. Clean/Replace Air filter	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Locate air filter on the vehicle correctly</p> <p>P4. Remove the air filter</p> <p>P5. Service air filter for clog/dust removal</p> <p>P6. Clean out the canister</p> <p>P7. Fix air filter into the vehicle for normal operation</p> <p>P8. Ensure housekeeping after completion of task</p>
CU2. Adjust Engine Idle Speed	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Find the adjustment screws and start the engine</p> <p>P4. Adjust engine idle speed by adjusting throttle valve adjusting screw</p> <p>P5. Refit all parts to finish the job</p> <p>P6. Ensure housekeeping after completion of task</p>
CU3. Adjust Air Fuel Ratio	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Locate the air filter and remove it</p> <p>P4. Find the adjustment screws on the carburettor</p> <p>P5. Start the engine and warm-up to normal operating temperature</p> <p>P6. Adjust screw to find the right mixture</p> <p>P7. Refit the air filter assembly</p> <p>P8. Ensure housekeeping after completion of task</p>
CU4. Adjust Tappet Clearance	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p>



	<p>P3. Remove tappet cover and related parts</p> <p>P4. Turn the crankshaft to close the intake and exhaust valves</p> <p>P5. Use feeler gauge to adjust tappet clearance as per workshop manual</p> <p>P6. Refit all parts with defined procedure</p> <p>P7. Ensure housekeeping after completion of task</p>
CU5. Clean/Adjust/Replace Spark Plugs	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Disconnect and clean spark plug wire</p> <p>P4. Remove and clean spark plugs</p> <p>P5. Adjust plug gaps as per standard if required</p> <p>P6. Replace spark plugs with new if required</p> <p>P7. Ensure housekeeping after completion of task</p>
CU6. Clean/Adjust/Replace Contact Breaker Point	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Clean and adjust C B points</p> <p>P4. Replace C B points if required</p> <p>P5. Clean distributor cap segments</p> <p>P6. Ensure housekeeping after completion of task</p>

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- K1:** Describe the purpose of Engine tuning
- K2:** Identify types and parts of Carburetor
- K3:** Describe the purpose of throttle valve
- K4:** Describe types, working principle, and gap range of spark plugs
- K5:** Explain the main purpose of Ignition distributor
- K6:** Describe valve clearance procedure



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Adjust engine idle speed by adjusting throttle valve adjusting screw
- Adjust screw to find the right mixture of air fuel ratio
- Use feeler gauge to adjust tappet clearance as per workshop manual.
- Remove and clean spark plugs.
- Clean and adjust Contact Breaker (C.B.) point.

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Overall
- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set
- Socket Set
- Allen Key Set
- Wire Brush
- Feeler Gauge
- Spark plug cleaner



071400953 Maintain Ignition System

Overview: This competency standard covers the skills and knowledge required to maintain contact breaker (CB) ignition system, electronic ignition system and Coil-On-Plug (COP) System.

Competency Unit	Performance Criteria
CU1. Maintain Contact Breaker Ignition System	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Check battery voltage</p> <p>P4. Check ignition switch using multimeter.</p> <p>P5. Check ignition coil</p> <p>P6. Check/ replace and adjust CB point gap</p> <p>P7. Adjust firing order</p> <p>P8. Clean/adjust/replace spark plugs</p> <p>P9. Check ignition distributor components</p> <p>P10. Replace capacitor/condenser, if required</p> <p>P11. Ensure housekeeping after completion of task</p>
CU2. Maintain Electronic Ignition System	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Check battery voltage</p> <p>P4. Check ignition switch using multimeter.</p> <p>P5. Check ignition coil</p> <p>P6. Service distributor</p> <p>P7. Check induction coil for resistance</p> <p>P8. Replace ignition module, if required</p> <p>P9. Service spark plugs</p> <p>P10. Ensure housekeeping after completion of task</p>
CU3. Maintain Coil-On-Plug (COP) System	<p>P1. Select appropriate tools and equipment.</p> <p>P2. Check battery voltage with multimeter</p> <p>P3. Check ignition coil resistance</p> <p>P4. Connect OBD-II scanner for scanning engine & note down the code</p> <p>P5. Check performance of sensor</p>



	<p>P6. Replace the faulty parts</p> <p>P7. Reconnect the OBD-II scanner</p> <p>P8. Verify the maintenance of fault</p> <p>P9. Ensure housekeeping after completion of task</p>
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Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- K1:** Identify parts of CB point ignition system
- K2:** Identify parts of electronic ignition system
- K3:** Explain the types of ignition system
- K4:** Explain function of different parts/units of ignition system
- K5:** Describe the different codes of OBD-II scanner relevant to the ignition system

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Maintain CB point ignition system
- Use Multimeter in ignition system
- Maintain electronic ignition system

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Overall
- Battery
- Wires
- Test Lamps



- Digital Multimeter
- Electrical Tool Kit
- OBD-II scanner
- Plug Spanner
- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set
- Socket Set
- Feeler Gauge



071400954 Maintain Fuel Control System-I

Overview: This competence standard covers the skills and knowledge required to perform maintenance of Electronic Fuel Injection (EFI) System, Common Rail Direct Injection (CRDI) System and Motronic Control Unit for CNG System.

Competency Unit	Performance Criteria
CU1. Maintain Electronic Fuel Injection (EFI) System	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check performance of Engine Control Unit (ECU)</p> <p>P4. Check performance of fuel pump motor</p> <p>P5. Check the condition of fuel filter</p> <p>P6. Check the performance of fuel regulator and fuel dumper in EFI fuel vehicle</p> <p>P7. Check injector of the vehicle</p> <p>P8. Check the leakage of fuel line</p> <p>P9. Ensure housekeeping after completion of task</p>
CU2. Maintain Common Rail Direct Injection (CRDI) System	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Service and Cleaning of Diesel Injectors</p> <p>P4. Check fuel pressure at fuel rail inlet and outlet</p> <p>P5. Check Fuel Pressure Sensor</p> <p>P6. Ensure housekeeping after completion of task</p>
CU3. Maintain Motronic Control Unit for CNG System	<p>P1. Select appropriate tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check performance of solenoid valve for fuel selection (CNG / Gasoline)</p> <p>P4. Maintain solenoid valve at CNG kit.</p> <p>P5. Adjust the CNG regulating screw.</p> <p>P6. Maintain pressure setting of CNG</p>



	<p>P7. Check performance of oxygen Sensor</p> <p>P8. Check performance of throttle valve position sensor</p> <p>P9. Ensure housekeeping after completion of task</p>
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Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- K1:** Explain Electronic Fuel Injection (EFI) System
- K2:** Explain Common Rail Direct Injection (CRDI) System
- K3:** Explain Motronic Control Unit for CNG System
- K4:** Describe function of Electronic Control Unit (ECU)
- K5:** Explain working principle of fuel pressure sensor
- K6:** Describe function of fuel filter
- K7:** Describe function of solenoid valve

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Check pressure sensors and gauges
- Install fuel filter and service of rails
- Locate and replace position of sensors
- Check function of sensors
- Remove & Install sensor connectors
- Check function of solenoid valves



Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Fuel pressure guage
- Fuel filter opener
- Spanner
- Screw driver
- Allen key set



071400955 Service Comfort & Safety System-I

Overview:This competence standard covers the skills and knowledge required to perform maintenance of suspension system, inspection & service of Power Windows & Central Locking System and seat belts. Candidate will also acquire skills and knowledge to perform service of Heat Ventilating and Air-Conditioning (AC) System.

Competency Unit	Performance Criteria
CU1. Maintain Suspension System	<p>P1. Select appropriate tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Maintain tie rod</p> <p>P4. Maintain ball Joint</p> <p>P5. Maintain shock absorber coil spring</p> <p>P6. Maintain link rod</p> <p>P7. Maintain lower/upper arm bushing</p> <p>P8. Maintain hub bearing or stud</p> <p>P9. Maintain inner/outer CV joint</p> <p>P10. Ensure housekeeping after completion of task</p>
CU2. Maintain Power Window & Central Locking System	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Diagnose failure in power window system.</p> <p>P4. Diagnose failure in central locking system.</p> <p>P5. Service and re-assemble power window system.</p> <p>P6. Service and re-assemble central locking system.</p> <p>P7. Check fuse, relays, electrical wire harness and connector of power window and central locking system.</p> <p>P8. Check actuator assembly of central locking system.</p> <p>P9. Check motor of power window system.</p> <p>P10. Ensure housekeeping after completion of task</p>
CU3. Verify Seat Belt	<p>P1. Select appropriate Tools and equipment.</p>



	<p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check seat belt indication lamp.</p> <p>P4. Check fuse, relays, electrical wire harness and connectors.</p> <p>P5. Check operation of seat belts.</p> <p>P6. Check function of power seat switches.</p> <p>P7. Check function of power seat motor and rectify failures.</p> <p>P8. Ensure housekeeping after completion of task</p>
CU4. Service Heat Ventilating system	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check performance of radiator and rectify failures.</p> <p>P4. Check leakages of heater hoses and rectify failures.</p> <p>P5. Check blower fan and rectify failures.</p> <p>P6. Check electrical system of heat ventilation and rectify failures.</p> <p>P7. Check performance of thermostat and rectify failures.</p> <p>P8. Check leakages of heater core and rectify failures.</p> <p>P9. Check performance of heater control valve and rectify failures.</p> <p>P10. Ensure housekeeping after completion of task</p>
CU5. Service Air-Conditioning (AC) System	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check performance of AC compressor and rectify failures.</p> <p>P4. Check performance of AC condenser with fittings and rectify failures.</p> <p>P5. Check radiator fan and rectify failures.</p> <p>P6. Check performance receiver/dryer or accumulator and rectify failures.</p> <p>P7. Check blower fan and rectify failures.</p> <p>P8. Check performance of expansion valve and rectify failures.</p> <p>P9. Check leakages of evaporator and rectify failures.</p>



	<p>P10. Perform refrigerant leak test.</p> <p>P11. Re-charge AC refrigerant.</p> <p>P12. Check electrical system of air conditioning and rectify failures.</p> <p>P13. Ensure housekeeping after completion of task</p>
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Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- K1:** Explain Suspension System
- K2:** Explain Heat Ventilating System
- K3:** Explain Air-Conditioning (AC) System
- K4:** Describe function of Power Window & Central Locking System
- K5:** Explain safety functions of seat belts.
- K6:** Describe function of fuse and relays
- K7:** Describe keyless entry
- K8:** Explain immobilizer system

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Check and Install Thermostat Valve
- Install Radiator and Blower Fan
- Install Heater Core
- Check fuse and relays and wire harness
- Install Compressor and Condenser
- Perform Air-Conditioning Vacuum and Gas charging and check pressure of gas



Tools and Equipment required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Ear plug / Ear Muff
- Overall
- Scanner OBD-II
- Digital Multimeter
- Screwdriver Set
- Combination Spanner Set
- Repair Manual
- Combination Plier
- Needle Nose Plier
- AC Recycling Machine
- Air Compressor
- Air Pressure Gun
- Allen Key & Star Allen Key set
- Axle Stand
- Test Lamp
- AC Compressor Oil (ND-8 oil)
- AC Gas Cylinder
- Gas leak detector
- Torque Wrench
- Tool Trolley
- Teflon Tape
- Pressure pump

**071400956 Maintain Controlled Brake System**

Overview: This competency standard covers the skills and knowledge required to maintain Anti-lock Braking System (ABS), pressure modulator and ABS- Electronic Control Unit (ECU).

Competency Unit	Performance Criteria
CU1. Maintain Anti-lock Braking System (ABS)	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Follow safety rules regarding the job.</p> <p>P3. Apply OBD-II scanner to check faults in ABS.</p> <p>P4. Check wiring harness of ABS system.</p> <p>P5. Check ABS fuse and relay.</p> <p>P6. Inspect brake lining.</p> <p>P7. Check wheel speed sensors.</p> <p>P8. Check pressure of ABS.</p> <p>P9. Ensure housekeeping after completion of task</p>
CU2. Maintain pressure Modulator	<p>P1. Ensure safety precautions & adopt PPEs</p> <p>P2. Select tools/equipment/material as per requirement</p> <p>P3. Check the brake fluid inlet lines</p> <p>P4. Check the brake fluid outlet lines</p> <p>P5. Check the return motor connection</p> <p>P6. Ensure housekeeping after completion of task</p>
CU3. Maintain ABS- Electronic Control Unit (ECU)	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Follow safety rules regarding the job.</p> <p>P3. Maintain ECU of ABS system</p> <p>P4. Clean and refit the connector.</p> <p>P5. Ensure housekeeping after completion of task</p>

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- K1:** Describe inspection procedures of ABS
- K2:** Explain ESA (electronic stability assist)
- K3:** Explain ESC (electronic stability control)
- K4:** Explain EBD (electronic brake-force distribution)



K5: Identify braking components

K6: Explain working of ABS

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Check/replace wheel speed sensors
- Diagnose faults in ABS with OBD-II scanner
- Replace ABS brakes components

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Ear plug / Ear Muff
- Overall
- Impact screw driver
- Needle nose pliers
- Hydraulic Jack
- Shop towel
- Car Lift
- OBD-II scanner
- Multi meter
- Wheel Spanner
- Emery Paper
- Screwdriver set
- Small socket set
- Repair Manual
- Tool Trolley



071400957 Conserve Power Transmission-I

Overview: This competency standard covers the skills and knowledge required to maintain Automatic Transmission and Electronically Controlled Transmission, testing their oil pressure, testing/replacing sensors, replacing oil seals and maintaining oil level.

Competency Unit	Performance Criteria
CU1. Perform maintenance of Automatic Transmission	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Test automatic transmission P4. Replace vehicle speed sensor P5. Replace multi-plate clutches P6. Replace transmission fluid strainer P7. Check/replace valve body P8. Replace torque converter P9. Replace transmission oil seals P10. Maintain/replace automatic transmission fluid P11. Ensure housekeeping after completion of task
CU2. Perform maintenance of Electronic Control Transmission (ECT) System	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Test ECT fluid pressure P4. Replace vehicle speed sensor P5. Replace input shaft sensor P6. Replace output shaft sensor P7. Check/replace valve body P8. Replace multi-plate clutches P9. Replace transmission oil seals P10. Maintain/replace ECT fluid P11. Ensure housekeeping after completion of task
CU3. Perform Diagnosis of Electronically Controlled Transmission (ECT) System with OBDII Scanner	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Connect OBD-II Scanner P4. Monitor functions of all sensors. P5. Replace the faulty sensors



	P6. Ensure housekeeping after completion of task
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Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore he/she must be able to:

- K1:** Explain main components of Automatic Transmission
- K2:** Describe torque converter and its components
- K3:** Explain different types of clutches in automatic transmission
- K4:** Explain purpose of oil cooler
- K5:** Describe planetary gear set used for reverse gear
- K6:** Describe the procedure for testing transmission oil pressure
- K7:** Describe different sensors used in electronically controlled transmission

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Replace Torque converter
- Replace Transmission oil seals
- Replace multi-plate clutches

Tools and Equipment required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Ear plug / Ear Muff
- Overall



- Oil Pressure Gauge
- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set
- Socket Set
- Grip Plier
- Allen Key Set
- Bearing Puller
- Housing Puller
- Tyre Lever
- Hammer



071400958 Perpetuate Controlled Electrical & Electronics System-I

Overview: This competency standard covers the skill and knowledge required to maintain controlled electrical and electronic system of the vehicle which includes service of windshield washer, Wiper System. Candidate will also acquire skills and knowledge to perform maintenance of instrument panel, functionality of sensors and Electrical Motors.

Competency Unit	Performance Criteria
CU1. Service Windshield Wash System	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check function of rain sensor.</p> <p>P4. Check hoses of the system</p> <p>P5. Check wire harness and connector.</p> <p>P6. Check performance and service of shower nozzles.</p> <p>P7. Check function of pump motor.</p> <p>P8. Service faulty parts.</p> <p>P9. Ensure housekeeping after completion of task</p>
CU2. Service Wiper System	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check wire harness and connector.</p> <p>P4. Disconnect wiper motor and its connector.</p> <p>P5. Connect wiper motor with battery and check its functionality.</p> <p>P6. Service of wiper motor</p> <p>P7. Check wiper linkages</p> <p>P8. Ensure housekeeping after completion of task</p>
CU3. Check Performance of Instrument Panel	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check gauges of instrument panel cluster</p> <p>P4. Check performance of CD player, Radio and LCD.</p>



	<p>P5. Check function of switch buttons and knobs of instrument panel</p> <p>P6. Check performance of indicators and warning lights in instrument panel</p> <p>P7. Ensure housekeeping after completion of task</p>
CU4. Demonstrate Function of Sensors	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Connect OBD-II Scanner</p> <p>P4. Monitor functions of all Sensors.</p> <p>P5. Replace the faulty sensor.</p> <p>P6. Ensure housekeeping after completion of task</p>
CU5. Maintain Electrical Motors	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check wire harness and connectors of all motors.</p> <p>P4. Monitor function of different motors.</p> <p>P5. Disconnect and remove the faulty motors</p> <p>P6. Connect with the battery and check for its function.</p> <p>P7. Service and maintain/replace the motors.</p> <p>P8. Ensure housekeeping after completion of task</p>

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Define Motor and explain its types
- K2:** Explain Sensors and their types.
- K3:** Explain function of different sensors used in cars.
- K4:** Explain identification of different indicator and warning lights
- K5:** Explain different types of gauges and meter in instrument panel



K6: Explain working of windshield wash & wiper system.

Critical Evidence(s)

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Remove and install windshield wash system.
- Remove and install wiper blades/wiper motor
- Diagnosis and repair through OBD-II Scanner

Tools and Equipment required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Coverall
- Digital Multimeter
- OBD-II scanner
- Electrical tool kit
- Combination spanner set
- Socket set
- Flat / Philips Screwdriver set
- Cleaner
- Cotton waste
- Repair Manual



102200848 Contribute to Work Related Health and Safety (WHS) Initiatives

Overview: This unit describes the skills and knowledge required to manage the identification, review, development, implementation and evaluation of effective participation and consultation processes as an integral part of managing work health and safety (WHS).

Competency Units	Performance Criteria
<p>CU1. Contribute to initiate work-related health and safety measures</p>	<p>P1. compile database on work-related health and safety</p> <p>P2. Identify measures that address legal obligations.</p> <p>P3. Consult with individuals/ parties to formulate measures and initiatives</p> <p>P4. Consult with individuals/parties to identify factors impacting on work-related health and safety</p> <p>P5. Participate in consultative meetings.</p>
<p>CU2. Contribute to establish work-related health and safety measures</p>	<p>P1. Assist in planning of work-related health and safety measures</p> <p>P2. Contribute to the development of work-related health and safety measures</p> <p>P3. Identify to implement work-related health and safety measures i.e.</p> <ul style="list-style-type: none"> • resourcing requirements, • timelines • responsibilities <p>P4. Assist to implement work-related health and safety measures and initiatives i.e.</p> <ul style="list-style-type: none"> • scheduling • liaison • administering resources • communication
<p>CU3. Contribute to ensure legal requirements of WHS measures</p>	<p>P1. Identify WHS legal requirements</p> <p>P2. Apply knowledge of all aspects of WHS measures to</p> <ul style="list-style-type: none"> • Consultation • workplace policies • participation processes <p>P3. Ensure, WHS measures are in accordance with legal requirements</p>



CU4. Contribute to review WHS measures	P1. Develop effective practices to review work-related health and safety measures P2. Assist individuals and parties related to WHS measures in following activities <ul style="list-style-type: none">• preparing reports• communicating review• evaluating outcomes
CU5. Evaluate the organization's WHS system	P1. Assess ongoing compliance with OHS (Occupational Health and safety) P2. Take feedback from concerned persons regarding WHS measures. P3. Assess the overall effectiveness of WHS management practices P4. Assist the development process of WHS measures in following ways <ul style="list-style-type: none">• Suggest amendments• Document amendments• Implement amendments P5. Take feedback from concerned persons regarding WHS measures. P6. Communicate improvements in WHS Measures

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Explain the application of relevant mandatory health monitoring, including biological monitoring, to help secure work health and safety
- K2:** Explain the difference between work-related health and safety measures and initiatives designed to meet specific legislative requirements and obligations, and those designed to support non-statutory health promotion programs, and give examples of each
- K3:** List factors that impact on work-related health and safety and their potential effects
- K4:** Identify internal and external sources of WHS information and data, and how to access them
- K5:** Outline organizational WHS and other relevant policies, procedures, processes and systems, including human resources



- K6:** Summarize relevant WHS legislation, other legislation (such as privacy and workers compensation) and common law rights and duties specific to work-related health and safety measures and initiatives
- K7:** Describe work-related health and safety measures and initiatives that either address specific legislative requirements and obligations, or support non-statutory health prevention programs, including:
- The factors impacting on worker health and safety that they address
 - Effectiveness
 - Costs and benefits
 - Criteria for decisions regarding their implementation in a specific workplace
 - How they should be implemented.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to contribute work-related health and safety measures and initiatives. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.



041700841 Comply with Workplace Policy and Procedures

Overview: This unit describes the skills and knowledge required to implement a workplace policy & procedures and to modify the policy to suit changed circumstances. It applies to individuals with managerial responsibilities who undertake work developing approaches to create, monitor and improve strategies and policies within workplaces and engage with a range of relevant stakeholders and specialists.

Competency Units	Performance Criteria
CU1. Manage work timeframes	P1. Complete work tasks within deadlines in according to order of priority P2. Supervisors are informed of any delays in work times or projects
CU2. Manage to convene meeting	P1. Develop agenda in line with meeting purpose P2. Select participants and notify them accordingly P3. Carryout meeting arrangements according to the time P4. Record the minutes of the meeting
CU3. Decision making at workplace	P1. Identify the problem, challenge or opportunity P2. Generate an array of possible solutions or responses P3. Evaluate the costs and benefits associated with each option P4. Assess the impact of the decision and modify the course of action as needed
CU4. Set and meet own work priorities at instent	P1. Take initiative to prioritize and facilitate competing demands to achieve organizational goals and objectives P2. Use technology efficiently and effectively to manage work priorities and commitments P3. Maintain appropriate work-life balance
CU5. Develop and maintain professional competence	P1. Assess personal knowledge and skills against competency P2. Participate in networks to enhance personal knowledge, skills and work relationships P3. Seek feedback from employees, clients and colleagues to develop and improve competence



CU6. Follow and implement work safety requirements	P1. Identify and report emergency incidents P2. Practice organizational policy and procedures for responding to emergency incidents P3. Identify and implement workplace procedures and work instructions for controlling risks
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Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Healthy work life balance
- K2:** Meeting terminologies, structures and arrangements
- K3:** Relevant organizational procedures and policies regarding meetings, chairing and minutes.
- K4:** Barriers to implement policies and procedures in an organization and possible strategies to address them.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to understand workplace policy and procedures. The evidence should integrate employability skills with workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.



001100853 Perform Advanced Communication

Overview: This unit describes the performance outcomes, skills and knowledge required to develop communication skills used professionally. It covers plan and organise work and conduct trainings at workplace, along with demonstrating professional skills independently.

Competency Units	Performance Criteria
CU1. Demonstrate professional skills	P1. Use different modes of communication to communicate <ul style="list-style-type: none">• Speaking• Reading• Writing• Listening• Presentation• visual representation etc P2. Develop CV Skills according requirements P3. Upgrade professional skills by attending trainings, webinars, conferences etc. P4. Perform Continuous professional development as required at workplace P5. Develop interview skills
CU2. Plan and Organize work	P1. Identify task requirements. P2. Plan steps to complete tasks. P3. Review planning and organizing process. P4. Organize work.
CU3. Provide trainings at workplace	P1. Assess the need for training P2. Prepare trainees for the learning experience P3. Present training session P4. Support trainees in managing their own learning P5. Facilitate group learning P6. Provide opportunity for practice P7. Provide feedback on progress on trainees P8. Review delivery experience



Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

- K1:** Explaining the training skills
- K2:** Identification of the professional skills
- K3:** Describing the advanced language skills
- K4:** Understanding of the assessment and trainees feedback methods
- K5:** Direct and indirect communication methods
- K6:** Explaining the need of the training type at the work place

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Job sheet
- Office emails and coordination reports
- Feedback proforma



061100858 Develop Advance Computer Application Skills

Overview: This unit provides an overview of Microsoft Office programs to create personal, academic and business documents following current professional and/or industry standards, i.e. Data Entry, Power Point Presentation and managing data base and graphics for Design
It applies to individuals employed in a range of work environments who need to be able to present a set range of data in a simple and direct forms

Competency Units	Performance Criteria
CU1. Manage Information System to complete a task	P1. Perform Data Entry in MS office P2. Manage File/folder in MS office P3. Perform Scanning of document P4. Maintain Office Record in drives P5. Perform Printing of document P6. Search required Files/Folders P7. Convert Files in required format. P8. Manage sizes of Files/Folders <ul style="list-style-type: none">• Compress• Zip /unzip
CU2. Prepare Presentation using computers	P1. Prepare presentation as per requirements, i.e. <ul style="list-style-type: none">• Open blank presentation and add text / graphics• Create a simple design for a presentation• Apply existing styles within a presentation• Use presentation template and slides to create a presentation• Use various tools to improve the look of the presentation• Save presentation to the appropriate storage device and folder with required name P2. Customize basic settings to meet user requirements P3. Format presentation as require <ul style="list-style-type: none">• Develop organizational charts• Add objects and manipulate to meet presentation purposes• Modify slide layout, including text and colours, to meet presentation requirements• Save presentation in another format



	<ul style="list-style-type: none">• Save to storage device and close presentation <p>P4. Add slide show effect into presentation as required to enhance the presentation</p> <ul style="list-style-type: none">• Incorporate pre-set Animation• Apply Multimedia effects• Record Narration• Apply hyperlink• Apply video• Rehearse Timings• Test presentation for overall effect <p>P5. Print the presentation</p> <ul style="list-style-type: none">• Select appropriate print format for presentation• Select preferred slide orientation• Add notes and slide numbers• Preview slides and run spell check before presentation• Print selected slides and submit presentation to appropriate person for feedback <p>P6. Practice verbal presentation</p> <p>P7. Practice presentation through AV Aids</p>
<p>CU3. Use Microsoft Access to manage database</p>	<p>P1. Collect the data using a standard data base package.</p> <p>P2. Start access to manage database .i.e.</p> <ul style="list-style-type: none">• identify problem statement of Data• Develop a table with fields /attributes according to database usage/ user requirements• Create a primary key and establish an index for each table• Modify table layout and field attributes as required• Create a relationship between the two tables• Add data in a table according to information requirements• Add records as required• delete records as required• Save database to storage area• close down database to storage area• Apply criteria in the following Query



	<ul style="list-style-type: none"> • SQL view of Query • Wildcards of query • Query Criteria <p>P3. Customize basic settings:</p> <ul style="list-style-type: none"> • Adjust page layout to meet user requirements • Open and view different toolbars • Format font as appropriate for the purpose of the database entries • Create reports • Design reports to present data in a logical sequence • Modify reports to include or exclude additional requirements • Distribute reports to appropriate person in a suitable format <p>P4. Create forms</p> <ul style="list-style-type: none"> • Use a wizard to create a simple form • Open existing database and modify records through a simple form • Rearrange objects within the form to accommodate information requirements
<p>CU4. Develop graphics for Design</p>	<p>P1. Develop graphic design concepts based on a thorough understanding of the communication need</p> <p>P2. Use design techniques confidently to produce designs</p> <p>P3. Integrate design tools skillfully to produce designs</p> <p>P4. Evaluate the success of completed designs to meet objectives</p> <p>P5. evaluate feedback from client / peers</p>

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out the tasks covered in this competency standard. This includes the knowledge of:

K1: List basic technical terminology to read help files and prompts

K2: Outline the different types of formal and informal presentations



- K3:** Explain Power point presentation
- K4:** Segregation of Data
- K5:** Define the relation among data
- K6:** Define criteria in the query
- K7:** Creates and modify reports and forms.
- K8:** Outline basic database design principles
- K9:** Current graphic design software
- K10:** Discuss features of current and emerging technologies used in graphic design practice and the options they present for effective graphic design solution

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Design and develop a simple database using a standard database package
- Create, format and prepare presentations for distribution and display
- Customize basic settings
- Add slide show effects.
- Generate employment report from given data by using Microsoft Access.



041300869 Manage Human Resource Services

Overview: This unit describes the skills and knowledge required to plan, manage and evaluate delivery of human resource services, integrating business ethics. It applies to individuals with responsibility for coordinating a range of human resource services across an organization. They may have staff reporting to them.

Competency Units	Performance Criteria
<p>CU1. Determine strategies for delivery of human resource services</p>	<p>P1. Analyze business strategy and operational plans to determine human resource requirements</p> <p>P2. Review external business environment that likely impact on organization’s human resource requirements</p> <p>P3. Consult line and senior managers to identify human resource needs in their areas</p> <p>P4. Review organization’s requirements for diversity in the workforce</p> <p>P5. Deliver human resource services that comply with business goals</p> <p>P6. Develop strategic action plan for delivery of human resource services</p> <p>P7. Develop roles and responsibilities of human resource team</p> <p>P8. Develop quality assurance policy</p>
<p>CU2. Manage the delivery of human resource services</p>	<p>P1. Communicate human resource strategies and services to internal and external stakeholders</p> <p>P2. Develop and negotiate service agreements between</p> <ul style="list-style-type: none"> • The human resource team, • Service providers • Client groups <p>P3. Document service specifications, performance standards and timeframes</p> <p>P4. Document /communicate service</p> <ul style="list-style-type: none"> • Specifications, • Performance standards • Timeframes <p>P5. Monitor Quality assurance processes</p> <p>P6. Ensure that services are delivered by appropriate providers, according to service agreements and operational plans</p>



	P7. Identify underperformance of human resource team or service providers
CU3. Evaluate human resource service delivery	P1. Establish Management information system for human resource services P2. Conduct survey to determine level of satisfaction P3. Analyze feedback of survey P4. Recommend changes to service delivery P5. Support agreed change processes across the organization
CU4. Manage integration of business ethics in human resource practices	P1. Ensure ethics in personal behavior P2. Ensure code of conduct is observed across the organization, P3. Observe confidentiality requirements in dealing with all human resource information P4. Deal promptly with unethical behavior P5. Ensure all persons responsible for human resource functions understand requirements regarding their ethical behavior

Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Identify the key provisions of legal and compliance requirements that apply to managing human resources
- K2:** Summarize the organization's code of conduct
- K3:** Explain human resource strategies and planning processes and their relationship to business and operational plans
- K4:** Describe performance and contract management
- K5:** Explain how feedback is used to modify the delivery of human resources.

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to manage human resource services. The evidence should integrate employability skills with



workplace tasks and job roles and verify competency is able to be transferred to other circumstances and environments.

Performance requirements

This competency is to be assessed using standard and authorized work practices, safety requirements and environmental constraints. Demonstrated evidence is required of the ability to:

- Plan and manage human resource delivery within legislative, organizational and business ethics frameworks
- Communicate effectively with a range of senior personnel
- Identify and arrange training support where appropriate
- Calculate human resource return on investment within the organization.



041300860 Develop Entrepreneurial Skills

Overview: This Competency Standard identifies the competencies required to develop entrepreneurial skills, in accordance with the organization's approved guidelines and procedures. You will be expected to develop a business plan, collect information regarding funding sources, develop a marketing plan and develop basic business communication skills. Your underpinning knowledge regarding entrepreneurial skills will be sufficient to provide you the basis for your work.

Competency Units	Performance Criteria
CU1. Develop a business plan	P1. Conduct a market survey to collect following information <ul style="list-style-type: none">• Customer /demand• Tools, equipment, machinery and furniture with rates• Raw material• Supplier• Credit / funding sources• Marketing strategy• Market trends• Overall expenses• Profit margin P2. Select the best option in terms of cost, service, quality, sales, profit margin, overall expenses P3. Compile the information collected through the market survey, in the business plan format
CU2. Collect information regarding funding sources	P1. Identify the available funding sources based on their terms and conditions, maximum loan limit, payback time, interest rate P2. Choose the best available option according to investment requirement P3. Prepare documents according to the loan agreement requirement P4. Include the information of funding sources in the business plan
CU3. Develop a marketing plan	P1. Make a marketing plan for the business including product, price, placement, promotion, people, packaging and positioning P2. Include the information of marketing plan in the business plan



CU4. Develop basic business communication skills	P1. Communicate with internal customers e.g.: labor, partners and external customers e.g.: suppliers, customers etc., using effective communication skills P2. Use different modes of communication to communicate internally and externally e.g.: presentation, speaking, writing, listening, visual representation, reading etc. P3. Use specific business terms used in the market
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Knowledge and Understanding

The candidate must be able to demonstrate underpinning knowledge and understanding required to carry out tasks covered in this competency standard. This includes the knowledge of:

- K1:** Explain the 7ps of marketing including product, price, placement, promotion, people, packaging and positioning
- K2:** Describe 7Cs of business communication
- K3:** Define different modes of communication and their application in the industry
- K4:** Enlist specific business terms used in the industry
- K5:** Enlist the available funding sources
- K6:** Explain how to get loan to start a new business
- K7:** Explain market survey and its tools e.g: questionnaire, interview, observation etc
- K8:** Describe the market trends for specific product offering
- K9:** State the main elements of business plan
- K10:** Explain how to fill the business plan format

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) to be competent in this competency standard:

A person who demonstrates competency in this unit must be able to provide evidence of the ability to develop Entrepreneurial Skills.

Performance requirements

- Conduct market survey and formulate business plans in terms of feasibility, investment potential, risk, and completeness.
- Demonstrate the use of both verbal and non-verbal business communication.
- Effectively present business ideas and profile



071400959 Maintain Fuel Control System-II

Overview: The competency standard is about demonstrating skill and knowledge to observe and maintain fuel control parameters of Gasoline Direct Injection system and Common Rail Direct Injection system with the help of Scanner. Candidate will also be familiarized with the functionality and parameters of Eco-Idle System.

Competency Unit	Performance Criteria
CU1. Maintain Gasoline Direct Injection (GDI)	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Connect the Scanner and select engine parameters.</p> <p>P4. Monitor fuel pressure sensor during Key on Engine Off (KOEO) position</p> <p>P5. Monitor desired & actual fuel Pressure with engine parameters during Key On Engine Running (KOER) position.</p> <p>P6. Monitor low-pressure pump or high-pressure pump control circuit.</p> <p>P7. Ensure housekeeping after completion of task</p>
CU2. Maintain Common Rail Direct Injection (CRDI)	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check low pressure pump and test ports using pressure gauge</p> <p>P4. Check high pressure pump and test ports using pressure gauge</p> <p>P5. Check pressure control valve</p> <p>P6. Ensure housekeeping after completion of task</p>
CU3. Maintain Eco-idle System	<p>P1. Select appropriate Tools and equipment.</p> <p>P2. Ensure work safety at all times, complying with health and safety precautions, regulations and other relevant guidelines.</p> <p>P3. Check Start/Stop function and ensure ECO symbol display.</p>



	<p>P4. Ensure all given parameters (Battery, Temperature, Starter Motor , Coolant, etc.) are correct before operating Start/Stop ECO system</p> <p>P5. Check performance of all running modes of ECO system (Start/Stop, Crossing, Slope Assist, Traffic Jam, and Parking System).</p> <p>P6. Ensure housekeeping after completion of task</p>
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Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain Gasoline Direct Injection (GDI)
- K2:** Explain Working Principle of Pressure Controlled Circuit
- K3:** Explain Common Rail Direct Injection (CRDI)
- K4:** Explain Working Principle of Pressure Control Valve
- K5:** Explain Eco-Idle System

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform Low & High Pressure Pump Controlled Circuit Test
- Check Pressure Control Valve
- Ensure function of Eco-Idle System

Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask



- Helmet
- Safety Shoes
- Overall
- Scanner OBD-II
- Repair Manual
- Socket Set
- Screwdriver Set
- Combination Spanner Set
- Pressure Gauge
- Digital Multimeter
- Spanner Set



071400960 Maintain Emission Control System

Overview: The Competency standard covers the skills and knowledge required to maintain the vehicle emission control systems which is mostly related to a series of chemical reactions, sensors and vacuum control solenoids function. Passage of time, the device loses its effectiveness and creates effects on engine performance.

Competency Unit	Performance Criteria
CU1. Analyze Exhaust Gas Operation	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Test vehicle for exhaust gas analysis</p> <p>P4. Inspect Catalytic convertor for damages</p> <p>P5. Inspect Charcoal canister & Purge valve for secure connections</p> <p>P6. Check Positive crankcase ventilation (PCV) valve</p> <p>P7. Check Fuel tank & cap gasket for proper sealing</p> <p>P8. Check Exhaust gas recirculation (EGR) valve</p> <p>P9. Check Heated oxygen sensors (O₂ Sensor)</p> <p>P10. Ensure housekeeping after completion of task</p>
CU2. Adjust Exhaust Gas Recirculation (EGR) System	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Check vacuum-controlled EGR valves on gasoline engines</p> <p>P4. Check EGR valves with a potentiometer</p> <p>P5. Check mechanical pressure transducers</p> <p>P6. Check electro-pneumatic pressure transducers</p> <p>P7. Check electrical pressure transducers</p> <p>P8. Check electric change-over valves</p> <p>P9. Check thermo valves</p> <p>P10. Check the EGR system with OBD-II Scanner</p> <p>P11. Ensure housekeeping after completion of task</p>
CU3. Perform Re-generation Process for Diesel System	<p>P1. Select the tool and equipment according to the job requirement</p> <p>P2. Ensure safety precaution</p> <p>P3. Prepare vehicle/engine for regeneration process</p> <p>P4. Connect OBD-II Scanner</p>



	<p>P5. Perform Regeneration process in Diesel EFI System</p> <p>P6. Ensure housekeeping after completion of task</p>
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Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Describe how to reduce nitrogen oxide, soot particles, and noise in diesel exhaust system.
- K2:** Describe how to reduce nitrogen oxide and fuel consumption in gasoline engine/ GDI
- K3:** Explain how to use tools and equipment for servicing emission control system
- K4:** Describe main components of emission control system
- K5:** Describe the function of catalytic convertor
- K6:** Describe the function of exhaust gases recirculation valve (EGR)
- K7:** Explain types of EGR valve
- K8:** Describe checking of exhaust gas recirculation system
- K9:** Describe “Ad Blue” and Diesel Particulate Filter (DPF)

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Inspect Catalytic convertor for damage
- Perform Regeneration process in Diesel EFI System
- Perform emission analysis

Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Overall
- OBD-II Scanner



- Multimeter
- Wheel skids wooden
- Jack/ trolley jack
- Jack stands different size/height
- Spanner Set
- Ratchet and Sockets Set
- Screwdrivers
- Pliers
- Hammer
- Ramps
- Hand Cleaner
- Exhaust Gas Analyzer
- Potentiometer



071400961 Conserve Power Transmission-II

Overview: This competency standard covers the skills and knowledge required to perform diagnosis of CVT, Maintain Continuous Variable Transmission (CVT) system and Perform Road Test to check performance of CVT.

Competency Unit	Performance Criteria
CU1. Perform Diagnosis of CVT with OBD-II	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Connect OBD-II Scanner P4. Monitor function of all sensors. P5. Monitor function of actuators. P6. Ensure housekeeping after completion of task
CU2. Maintain Continuous Variable Transmission (CVT) system	P1. Select tools and equipment according to job requirement P2. Observe occupational health and safety precautions at all times P3. Test CVT oil pressure P4. Check & Replace vehicle speed sensor P5. Check & Replace Input shaft sensor P6. Check & Replace Output shaft sensor P7. Check & Replace actuator(solenoid valves) P8. Check & Replace CVT oil P9. Check & Replace CVT belt P10. Check & Replace Transmission oil seal P11. Check primary, secondary and manual valve body P12. Check & Replace multi-plate clutches P13. Replace shaft bearings, if required P14. Ensure housekeeping after completion of task
CU3. Perform Road Test to check performance of CVT	P1. Perform final road test P2. Accelerate the engine to check noise P3. Check the performance of CVT during driving P4. Ensure housekeeping after completion of task



Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain Continuous Variable Transmission (CVT)
- K2:** Describe different types of valve bodies used in CVT
- K3:** Describe different types of clutches in CVT
- K4:** Explain how variable pulleys works
- K5:** Explain different sensors used in CVT
- K6:** Explain different solenoid valves used in CVT
- K7:** Explain the function of Planetary Gear set in Reverse Gear

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Test CVT oil pressure
- Replace CVT oil
- Replace CVT belt
- Replace Transmission oil seal

Tools and Equipment

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Overall



- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set
- Socket Set
- Grip Plier
- Allen Key Set
- Bearing Puller
- Housing Puller
- Tyre Lever
- Hammer
- Oil Pressure Gauge
- OBD-II Scanner



071400962 Service Comfort & Safety System-II

Overview: This competence standard covers the skills and knowledge required to understand the parameters of cruise control system and supplemental restraint system (SRS)

Competency Unit	Performance Criteria
CU1. Check Cruise Control System	P1. Select appropriate tools and equipment. P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines. P3. Check supply in ECU. P4. Check wiring harness, fuses and relays P5. Inspect Cruise Control Main Switch Assembly. P6. Inspect Cruise Control Actuator Assembly. P7. Check Vacuum leakage in line at servo unit P8. Adjust throttle linkage to maintain engine speed. P9. Ensure housekeeping after completion of task
CU2. Maintain Supplementary Restraint System (SRS)	P1. Select appropriate tools and equipment. P2. Ensure work safely at all times, complying with health and safety precautions, regulations and other relevant guidelines. P3. Check supply in ECU. P4. Check wiring harness, fuses and relays. P5. Maintain Supplementary Restraint System (SRS) P6. Ensure housekeeping after completion of task

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain Cruise Control System
- K2:** Explain Supplementary Restraint System (SRS)
- K3:** Explain function of crash sensor



Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Diagnose Cruise Control System using OBD-II Scanner
- Diagnose Supplemental Restraint System (SRS) using OBD-II Scanner
- Install seat belts
- Install Air Bag Module assembly

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Coverall
- OBD-II Scanner
- Digital Multimeter
- Screwdriver Set
- Socket Spanner Set
- Repair Manual
- Combination Plier
- Allen Keys set
- Star Keys set



071400963 Perpetuate Controlled Electrical & Electronics System-II

Overview: This competence standard covers the skills and knowledge required to Service Controlled Wiper & Washer System, Repair Electronic Power Steering (EPS) System and Test Function of Sensors

Competency Unit	Performance Criteria
CU1. Service Controlled Wiper & Washer System	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Test function of rain sensor.</p> <p>P4. Check operation of wiper motors and wiper arms.</p> <p>P5. Check wiper motor connector and fuse.</p> <p>P6. Check washer tank and washer motor.</p> <p>P7. Inspect washer lines and nozzles.</p> <p>P8. Remove, Service and refit of wiper motor.</p> <p>P9. Check and replace combination switch/wiper switch.</p> <p>P10. Ensure housekeeping after completion of task</p>
CU2. Repair Electronic Power Steering (EPS) System	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Find faults in electronic power steering system using OBD-II scanner</p> <p>P4. Check Fuse, relays of electronic power steering system.</p> <p>P5. Check wiring harness and connectors of electronic power steering system.</p> <p>P6. Remove, Service and Refit electronic power steering system motor.</p> <p>P7. Ensure housekeeping after completion of task</p>
CU3. Test Function of Sensors	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Check/replace oxygen sensor.</p> <p>P4. Check/replace crank position sensor.</p> <p>P5. Check/replace cam sensor.</p> <p>P6. Check/replace Throttle position sensor.</p> <p>P7. Check/replace Intake air temperature sensor.</p>



	<p>P8. Check/replace Intake air flow sensor</p> <p>P9. Check/replace of knock sensor.</p> <p>P10. Ensure housekeeping after completion of task</p>
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Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain wiper system
- K2:** Explain wind screen washer system
- K3:** Define rain sensor
- K4:** Explain function of combination switch
- K5:** Define electrical power steering system(EPS)
- K6:** Explain function of oxygen sensor
- K7:** Explain function of crank positioning sensor
- K8:** Explain function of cam sensor
- K9:** Explain function of throttle position sensor
- K10:** Explain function of mass air flow sensor
- K11:** Explain function of mass air pressure sensor
- K12:** Explain function of intake air temperature sensor

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Check, Remove, and refit of wiper motor.
- Check, Remove, and refit of combination switch.
- Scan the vehicle by OBD-II scanner.
- Check, Remove, and refit of oxygen sensor.
- Remove and refit of electrical power steering system.



Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Safety Helmet
- Safety Shoes
- Overall
- OBD-II Scanner
- Multi meter
- Repair Manual
- Wire cutter
- Combination plier
- Combination Spanner Set
- Small socket set
- Screwdriver set
- Shop towel
- Needle nose pliers
- Car lifting equipment
- Car jack
- Wheel Spanner
- Service creeper



071400964 Maintain Network System

Overview: This competency standard covers the skills and knowledge required to locate navigation CAN device, remove & refit LCD, usage of multi meter, usage of soldering iron.

Competency Unit	Performance Criteria
CU1. Verify Navigation System	P1. Arrange Tools & equipment P2. Ensure HSE requirements are fulfilled for the given task P3. Locate navigation device P4. Check electric connection of device P5. Check connection of Antenna P6. Remove LCD from Vehicle dashboard P7. Check Navigation card P8. Ensure housekeeping after completion of task
CU2. Maintain Control Area Network (CAN) System	P1. Select appropriate tools/ material as per SOP P2. Follow safety rules P3. Locate CAN connector P4. Remove and service of connector P5. Refit the CAN connector at its location P6. Ensure housekeeping after completion of task
CU3. Verify Electronic Parking System	P1. Select appropriate tools/ material as per SOP P2. Check Diagnostic Trouble Codes P3. Check/ replace parking switch P4. Check wiring harness and fuses P5. Check function of electric parking motors P6. Check Hill Assist system P7. Check ABS Modulator P8. Ensure housekeeping after completion of task

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

K1: Define navigation system



- K2:** Define global positioning system (GPS)
- K3:** Define navigation programming
- K4:** Explain Control Area Network (CAN)
- K5:** Explain Hill Assist System
- K6:** Explain ABS Modulator system
- K7:** Explain DTC for ABS System

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Locate navigation device
- Check navigation device & antenna with the help of Multimeter
- Remove & refit navigation LCD
- Locate, remove, service of CAN connector & refit it
- Locate ABS Modulator
- Check location of Electric Parking Motor

Tools and Equipment Required

The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Overall
- Combination Pliers
- Nose plier
- Wire cutter
- Multimeter
- OBD-II Scanner
- Allen Keys set



- Star keys set
- Spanner Set
- Socket Set
- Phillips Screw Driver Set
- Flat Screw Driver Set



071400965 Maintain Hybrid System

Overview: This competency standard covers the skills and knowledge required to maintain Series, Parallel, and Series-Parallel Hybrid vehicles including their sensors, power control module, generator motors, batteries and power-split units.

Competency Unit	Performance Criteria
CU1. Maintain Series Hybrid	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Check Function of engine</p> <p>P4. Check Function of Generator/Alternator in Series Hybrid system</p> <p>P5. Check Function of inverter in Series Hybrid system</p> <p>P6. Check Function of battery in Series Hybrid system</p> <p>P7. Check Function of drive motor in Series Hybrid system</p> <p>P8. Check Function of Powertrain Control Module (PCM) in Series Hybrid system</p> <p>P9. Check Function of Sensors in Series Hybrid system</p> <p>P10. Check Function of hybrid breaker in Series Hybrid system</p> <p>P11. Ensure housekeeping after completion of task</p>
CU2. Maintain Parallel Hybrid	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all times</p> <p>P3. Maintain engine in Parallel Hybrid system</p> <p>P4. Maintain transmission in Parallel Hybrid system</p> <p>P5. Maintain hybrid motor in Parallel Hybrid system</p> <p>P6. Maintain battery in Parallel Hybrid system</p> <p>P7. Maintain Powertrain Control Module (PCM) in Parallel Hybrid system</p> <p>P8. Perform sensors maintenance in Parallel Hybrid system</p> <p>P9. Perform hybrid breaker maintenance in Parallel Hybrid system</p> <p>P10. Ensure housekeeping after completion of task</p>
CU3. Maintain Combined Hybrid System	<p>P1. Select tools and equipment according to job requirement</p> <p>P2. Observe occupational health and safety precautions at all</p>



	times
	P3. Check engine performance
	P4. Check Generator/Alternator performance
	P5. Check inverter performance
	P6. Check battery performance
	P7. Check hybrid motor performance
	P8. Check power split device performance
	P9. Check PCM performance
	P10. Check sensor performance
	P11. Perform hybrid breaker performance
	P12. Ensure housekeeping after completion of task

Knowledge and Understanding

The candidate must possess underpinning knowledge and understanding required to carry out tasks covered in this competency standard. Therefore, he/she must be able to:

- K1:** Explain different types of Hybrid System
- K2:** Describe types of batteries in Hybrid vehicle
- K3:** Describe the functions of high tension cables
- K4:** Describe the function of Inverters
- K5:** Describe the function of Power Split Unit
- K6:** Describe various sensors used in Hybrid vehicles
- K7:** Describe the function of PCM
- K8:** Describe the function DC-DC Convertor

Critical Evidence(s) Required

The candidate needs to produce following critical evidence(s) in order to be competent in this competency standard:

- Perform battery maintenance
- Perform PCM maintenance
- Perform sensor maintenance

Tools and Equipment required



The tools and equipment required for this competency standard are given below:

- Leather Gloves
- Cotton Gloves
- Goggles
- Safety mask
- Helmet
- Safety Shoes
- Coverall
- OBD-II Scanner
- Combination spanner Set
- Philips Screw Driver Set
- Flat Screw Driver Set
- Plier Set
- Socket Set
- Grip Plier
- Allen Key Set
- Bearing Puller
- Housing Puller
- Tyre Lever
- Hammer
- Multi Meter
- OBD-II scanner



Complete List of Tools and Equipment

- Cotton Gloves
- Ear plug / Ear Muff
- Goggles
- Leather Gloves
- Mechanic Gloves (Disposable and Non-disposable)
- Overall
- Safety Helmet
- Safety mask
- Safety Shoes
- AC Gas Cylinder
- AC Recycling Machine
- Air Compressor
- Air Pressure Gun
- Allen Key & Star Allen Key set
- Allen key Set
- Axle stands
- Ball joint puller
- Battery
- Bearing Puller
- Brake Bleeding Equipment
- Brake Drum Pullers
- Brake Efficiency Tester
- Brake fluid collector/container
- Brake Fluid Tester
- Car jack
- Car Lift
- Car lifting equipment
- Carburetor cleaner (sensor safe)
- Cleaner
- Cleaning Equipment with Detergent
- Clutch plate aligner (centering tool)
- Clutch plate alignment tool



- Combination Plier
- Combination Spanner Set
- Compressed air to pressure Bleeder
- Compression Tester
- Compressor Oil
- Coolant drain tray
- Cotton waste
- Diagnostic Scanner
- Different Types of Brushes
- Digital Multimeter
- Ducting Tape
- Electrical tool kit
- Emery Paper
- Engine Hoist
- Engine mounts
- Exhaust Gas Analyzer
- Feeler Gauge
- Fiber brush
- Flare-nut wrench
- Flaring Tool/Flare Tool for brake tubes repairing
- Flat Screw Driver Set
- Formats of reports
- Gas leak detector
- Grip Plier
- Hammer
- Hand Cleaner
- Hex Wrench(Set)
- Housing Puller
- Hydraulic Jack
- Hydrometer
- Impact screw driver
- Jack Hoist/ Stand
- Jack stands different size/height
- Jack Trolley Type with Weight Lifting Capacity 5 Tons
- Lifting Equipment (Service Pit)



- Mallet
- Micrometer
- Multi meter
- Needle nose pliers
- Nose Plier
- OBD-II Scanner
- Oil filter spanner
- Oil Pressure Gauge
- Phillips Screw Driver Set
- Pipe Wrench
- Plier set
- Plug Spanner
- Pressure Cap Tester
- Pressure Gauge
- Pressure pump
- Ramps
- Ratchet and Sockets Set
- Ring Compressor
- Ring Expander
- Screwdriver Set
- Service creeper
- Shop towel
- Small socket set
- Spanner set
- Spark plug cleaner
- Special bleed valve tools (only for ABS use)
- Special service tools
- Special suction pump or vacuum bleeder
- Star Keys set
- Stethoscope
- Test lamp
- Thermometer
- Tool kit
- Tool Trolley
- Torque Wrench



- Tube Bender
- Tyre changer
- Tyre Lever
- Vacuum Gauge
- Valve Lifter
- Vernier caliper
- Wet towel
- Wheel alignment machine
- Wheel balancing Machine
- Wheel skids wooden
- Wheel Spanner
- Wire Brush
- Wire cutter
- Wires
- Wrench Socket Set
- Computer system
- Internet facility



List of Stationary

- Available material on methods of transformation of biodegradable waste into compost and into biogas
- Available material on processes used to produce steel from ferrous metal
- Available material on processes used to recycle plastics with a low energy input.
- Local laws and regulations on Health, hygiene and safety
- Manual of available local green resources, products, and services
- Manual of indenting/Ordering procedures
- Manual of air emissions and control technologies
- Manual of local Standards of environmental quality
- Manual of Methods of Erosion control
- Manual of organizational Safety rules and regulations
- Manual of Pollution reduction and prevention methods/ solutions
- Manual of Procedures for biological remediation
- Manual of Procedures for chemical remediation
- Manual of Procedures for containment remediation
- Manual of Procedures for landscaping
- Manual of Procedures for thermal remediation
- Manual of Procedures for tree-planting
- Manual of Safety signs and symbols
- Manual of techniques of energy conservation
- Manual of water conservation fixtures
- Operation manual of bio digester
- Repair Manual.
- Standard operating procedures for Health, hygiene and safety
- Waste disposal SOPs
- Equipment Maintenance Manuals
- Log Book
- Handbooks
- Design Books/ Sheets
- Pencils
- Erasers
- Pencil Sharpeners
- Paper Cutter



- Scissors
- Color Pencils
- White chart paper
- Brown Sheets
- White Board Markers (red, blue, green, black)
- Permanent markers(black)
- File covers

