

**National Vocational and Technical Training Commission
(NAVTTTC)**

Competency Standards

For

“Automotive Technician“

Table of Contents

S. No	Content	Page No.
1	Structural information	2
2	Competency Map	4
3	Module A: <i>Perform Preventive Maintenance</i>	9
4	Module B: <i>Maintain Vehicle Engine</i>	19
5	Module C: <i>Repair Body Electrical System</i>	27
6	Module D: <i>Maintain HVAC System</i>	38
7	Module E: <i>Maintain Suspension System</i>	43
8	Module F: <i>Maintain Transmission System</i>	49
9	Module G: <i>Maintain Brake System</i>	58
10	Module H: <i>Perform On-board Diagnostic</i>	64
11	Module I: <i>Perform Engine Overhauling</i>	68
12	Module J: <i>Maintain Vehicle Infotainment system</i>	75
13	Module K: <i>Perform Communication</i>	77
14	Module L: <i>Pursue Professional Development</i>	81
15	Module M: <i>Demonstrate safety</i>	85
16	List of tools and equipment	89
17	List of Consumables	97

Structure of the competency standard table

Competency Standards are performance specifications that identify the knowledge and competencies an individual needs to succeed in the workplace.

Unit of competency

A unit of competency is a statement which points to an outcome that employers will value and is observable and assessable during the work. The competency unit is derived during the process of Occupational Analysis and is called 'Task Statement' in the job analysis table called DACUM Chart or competency map.

Overview

An overview is a description of the competency standard. It briefly describes the purpose and linkage of the competency units with a job role.

Performance Criteria

Performance criteria statements sets the standard of performance of a task in a job role. It describes 'how well' a task or competency unit is to be performed. It should be observable and written in a measurable term. It is one of the basic criterions for conducting assessment of the performance of a tradesman

Knowledge and understanding

Supporting knowledge and understanding statements include the essential knowledge and understanding, covering facts, principles, procedures, processes and methods. These statements cover the basic knowledge and understanding that is required to master a competency unit in an occupation.

Tools and Equipment

All the related tools, equipment and machinery that are required to perform competency tasks are listed under this heading.

Consumable

The disposable goods that changes their shapes or become vanished while performance of certain task.

Boundaries

This competency standards of Automobile technician trade is limited to perform of repair and maintenance work on four wheeler automobile, equipped with petrol or diesel engine.

Competency Map

Duty and Task

A- Perform Preventive Maintenance

A-1 Follow vehicle specific OEM instructions	A-2 Conduct vehicle walk around inspection	A-3 Conduct under hood inspection	A-4 Conduct under vehicle inspection	A-5 Change engine oil	A-6 Replace oil filter	A-7 Clean air filter	A-8 Maintain spark plug
A-9 Service brake system	A-10 Replace drive belts	A-11 Top up Battery Electrolyte	A-12 Adjust Headlights	A-13 Adjust clutch pedal free play	A-14 Top up all fluids	A-15 Replace wheel bearings	A-16 Maintain tire
A-17 Re-torque fasteners	A-18 Perform lubrication?	A-19 Conduct road test					

B- Maintain Vehicle Engine

B-1 Inspect Engine cooling system	B-2 Repair engine cooling system	B-3 Inspect lubrication system	B-4 Repair lubrication system	B-5 Maintain fuel system	B-6 Repair fuel system	B-7 Inspect ignition system	B-8 Repair ignition system
B-9 Inspect starting system	B-10 Repair starting system	B-11 Inspect Charging system	B-12 Repair charging system				

C- Repair Body Electrical System

C-1 Diagnose affected electrical, electronic system	C-2 Repair Body Wiring	C-3 Replace wiper system parts	C-4 Maintain lighting system	C-5 Maintain horn system	C-6 Maintain central locking system	C-7 Maintain ignition Switch System	C-8 Service remote control
---	------------------------	--------------------------------	------------------------------	--------------------------	-------------------------------------	-------------------------------------	----------------------------

malfunction(s)							
C-9 Repair Power Window system	C-10 Repair Sunroof system	C-11 Service Supplementary Restraint System (SRS)					

D- Maintain Heat ventilation and Air Conditioning (HVAC) System

D-1 Test HVAC system performance	D-2 Diagnose fault in electrical circuit of HVAC system	D-3 Repair HVAC Electrical circuit	D-4 Diagnose fault in HVAC mechanical components	D-5 Repair HVAC Mechanical components	D-6 Perform refrigerant leak test	D-7 Recharge AC Refrigerant	D-8 Perform HVAC system test (road test)
----------------------------------	---	---	--	---------------------------------------	-----------------------------------	-----------------------------	--

E- Maintain Suspension System

E-1 Diagnose problems related to springs, struts, shocks, control arms, linkages	E-2 Maintain steering system	E-3 Replace suspension bushes	E-4 Replace suspension links	E-5 Replace shock Absorbers	E-6 Replace leaf springs	E-7 Perform Wheel Balancing	E-8 Perform Wheel Alignment, Road Test
--	------------------------------	-------------------------------	------------------------------	-----------------------------	--------------------------	-----------------------------	--

F- Maintain Transmission System

F-1 Verify transmission operation	F-2 Change A.T.F. (Automatic Transmission Fluid)	F-3 Replace Automatic Transmission Fluid Filter	F-4 Replace transmission mountings	F-5 Replace automatic transmission shift lever button	F-6 Perform Automatic transmission overhauling	F-7 Replace clutch system components (Manual Transmission)	F-8 Perform Manual transmission overhauling
-----------------------------------	--	---	------------------------------------	---	--	--	---

F-9 Replace shift lever bushes	F-10 Replace constant velocity Joints	F-11 Reinstall Propeller Shaft	F-12 Adjust differential backlash				

G- Maintain Brake System							
G-1 Verify brake specification	G-2 Perform brake inspection	G-3 Replace brake booster	G-4 Replace brake master cylinder	G-5 Replace wheel cylinders	G-6 Replace brake callipers	G-7 Replace brake Disks/drums	G-8 Service Brake Hoses, Pipes , Lines
G-9 Perform Brake system Air Bleeding	G-10 Adjust park brake cable	G-11 Perform Road Test to verify brake function					

H- Perform On-board Diagnostic							
H-1 Perform vehicle scanning	H-2 Detect faults in vehicle Electronic systems	H-3 Reset service intervals	H-4 Replace Electronic Control Unit (ECU)	H-5 Replace Sensors	H-6 Replace Actuators	H-7 Perform on-board manual diagnostic	

I- Perform Engine Overhauling

I-1 Perform Engine Compression Test	I-2 Perform engine oil pressure test	I-3 Remove engine from vehicle	I-4 Dismantle engine components	I-5 Perform necessary measurement	I-6 Repair engine parts	I-7 Re build engine	I-8 Reinstall engine on vehicle
I-9 Test performance after engine Overhauling							

J- Maintain Vehicle Infotainment system

J-1 Check Infotainment System	J-2 Replace audio Device	J-3 Replace video device	J-4 Replace Parking Camera	J-5 Install navigation equipment			
-------------------------------	--------------------------	--------------------------	----------------------------	----------------------------------	--	--	--

K- Perform Communication

K-1 Practice active listening	K-2 Ask appropriate questions	K-3 Demonstrate telephone etiquette	K-4 Instruct semi-skilled workers	K-5 Communicate with supervisor	K-6 Maintain relations with Parts dealers	K-7 Perform E-Mail correspondence	
-------------------------------	-------------------------------	-------------------------------------	-----------------------------------	---------------------------------	---	-----------------------------------	--

L- Pursue Professional Development

L-1 Obtain automotive technician certification	L-2 Maintain Driving licence	L-3 Attend Training programs	L-4 Consult experts colleagues	L-5 Visit trade exhibitions	L-6 Join trade associations	L-7 Interpret auto industry publications	L-8 Document work performed
L-9 Browse internet	L-10 Mentor new staff						

M- Demonstrate safety							
M-1 Follow company procedures, policies	M-2 Wear personal protective equipment as required	M-3 Use tools and equipment according to manufacturer's specifications	M-4 Handle hazardous materials according to guidelines	M-5 Maintain clean shop environment	M-6 Use fire extinguisher properly	M-7 Report safety violations	M-8 Lift vehicle using proper techniques; i.e., manufacturer's specifications

Module A: Perform Preventive Maintenance

Overview: This Module (A) of competency standard for Auto motive technician identifies the competencies required to perform preventive maintenance of vehicle according to Manufacturer Instructions including vehicle Inspections, Changing oil and oil filter, cleaning of air filter, maintaining of spark plugs, servicing of brake system, replacement of belts, maintaining the level of battery electrolyte, adjustment of Head lights, adjustment of clutch paddle , maintaining level of fluid, replacement of wheel bearings, maintaining wheels and re-torquing of fasteners

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
<p>A-1 Follow vehicle specific Original Equipment Manufacturer (OEM) instructions</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Verify vehicle maintenance Schedule according to OEM Manual,</p> <p>P-2 Transport vehicle to service station safely,</p> <p>P-3 Interpret stripe and decal on the vehicle correctly,</p> <p>P-4 Requisite necessary materials and equipment needed to perform maintenance,</p> <p>P-5 Ensure compliance of Federal /Provincial and local laws, codes and regulations.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted for Preventive maintenance in vehicle,</p> <p>K-2 Interpret automobile Repair orders,</p> <p>K-3 Enlist Tools & equipment required Preventive Maintenance,</p> <p>K-4 Differentiate types of Automotive maintenance,</p> <p>K5 Interpret maintenance schedules,</p> <p>K-6 Interpret service manuals according to specific model of vehicle,</p> <p>K-7 Describe maintenance of tools & equipment.</p>	<p>Tool trolley</p> <p>Repair Manuals</p> <p>Measuring Instruments</p> <p>Scanners</p> <p>Special Service Tools (SST)</p> <p>Vehicle protective kit</p> <p>Lift (two or Four post)</p>
<p>A-2 Conduct vehicle walk around inspection</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate exterior damages of vehicle correctly,</p> <p>P-2 Conduct vehicle tires/wheels inspection</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe necessity of vehicle walk around inspection,</p> <p>K-2 Enlist observations / faults and</p>	

	<p>for normal working condition according to auto workshop Standard operational procedures(SOP)</p> <p>P-3 Conduct windshield/wiper/glasses inspection for their condition according to auto workshop SOPs,</p> <p>P-4 Locate damage in side-view mirrors correctly,</p> <p>P-5 Locate physical damage in head and tail lights correctly,</p> <p>P-6 Locate damage in mouldings correctly.</p>	<p>damages,</p> <p>K-4 Describe visual inspection techniques,</p> <p>K-7 Select tools, equipment and consumables required for vehicle preventive maintenance.</p>	
A-3 Conduct under hood inspection	<p>A competent individual must be able to successfully:</p> <p>P-1 Verify vehicle under hood components for normal working condition according to Preventive maintenance check list,</p> <p>P-2 Verify vehicle fluids/liquid for normal condition & quantity according to Preventive maintenance check list,</p> <p>P-3 Verify vehicle wiring harness physical condition according to auto workshop SOPs,</p> <p>P-4 Verify condition of under hood fasteners for normal fastening , according to auto workshop SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe methods of under hood maintenance as per OEM standard / recommendations,</p> <p>K-2. Identify vehicle under hood components/parts,</p> <p>K-3 Define engine,</p> <p>K-4 Differentiate engines,</p> <p>K-5 Explain necessity of automotive coolant,</p> <p>K-6 Define engine oil grading,</p> <p>K-7 Enumerate under hood Belts,</p> <p>K-8 Define purpose of brake fluid.</p>	Toll Trolley
A-4	<p>A competent individual must be able to successfully:</p>	<p>A competent individual must be able to successfully:</p>	Tool Trolley

<p>Conduct under vehicle inspection</p>	<p>P-1 Station/place automobile for under vehicle inspection by applying auto workshop SOPs,</p> <p>P-2 Inspect following according to auto workshop SOPs:</p> <ul style="list-style-type: none"> ○ Suspension for normal working, ○ Fuel tank for physical damage or leakages, ○ Linkages for worn/damage/loose fitting, ○ Mounting worn/damage/loose fitting, ○ Drive shaft worn/damage/loose fitting, ○ Shields for worn/damage/loose fitting, ○ Silencer for clogging/ worn/damage/loose fitting. 	<p>K-1 Describe methods of under vehicle maintenance as per OEM standard / recommendation,</p> <p>K-2 Interpret Pictorial diagrams given in OEM manual,</p> <p>K-3 Identify parts of vehicle lifting jacks,</p> <p>K-4 Describe operation of car lifting machine.</p>	<p>Torque Wrench</p> <p>Personal safety equipment</p>
<p>A-5 Change engine oil</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Determine engine oil level by applying prescribed method,</p> <p>P-2 Locate oil drainage system correctly,</p> <p>P-2 Remove oil from engine without spoilage,</p> <p>P-3 Pour recommended quantity of oil into engine without spoilage,</p> <p>P-4 Dispose off dirty oil by applying auto workshop SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted for oil change in vehicle,</p> <p>K-2 Interpret Pictorial diagrams engine oil drainage in OEM manual,</p> <p>K-2 Enlist Tools, equipment and consumables used for oil change,</p> <p>K-3 Explain importance of following engine oil change schedule,</p> <p>K-4 Define necessity of different engine oil grading.</p>	<p>Toll trolley</p> <p>Oil suction machine</p> <p>Personal safety equipment's</p>
<p>A.6</p>	<p>A competent individual must be able to</p>	<p>A competent individual must be able to</p>	<p>Toll trolley</p>

<p>Replace oil filter</p>	<p>successfully:</p> <p>P-1 Locate oil filter on the vehicle correctly,</p> <p>P-2 Remove oil filter from vehicle applying correct method,</p> <p>P-3 Fix oil filter in the vehicle according to OEM Manual.</p>	<p>successfully:</p> <p>K-1 Define working of oil filter,</p> <p>K-2 Describe schedule of oil filter change as per OEM recommendation,</p> <p>K-3 Interpret OEM manual for oil filter location,</p> <p>K-4 Enlist Special Service Tools for oil filter replacement.</p>	<p>SST (special service tool)</p> <p>Personal protective equipment's (PPEs)</p>
<p>A-7 Clean air filter</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate air filter on the vehicle correctly,</p> <p>P-2 Remove air filter from Vehicle as per auto workshop SOPs,</p> <p>P-3 Service air filter for clog/dust removal as per auto workshop SOPs,</p> <p>P-4 Fix air filter into the vehicle for normal operation.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted during service of air filter of vehicle,</p> <p>K-2 Enlist Tools, equipment and consumables required to remove and replace air filter,</p> <p>K-3 Describe the purpose of air filter in an automobile,</p> <p>K-4 Interpret OEM manual for air filter location,</p> <p>K-5 Enumerate troubles accrued in vehicle due to clogged air filter.</p>	<p>Toll trolley</p> <p>Source of compressed air</p>

<p>A-8 Maintain spark plug</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove spark plug from the engine applying recommended method,</p> <p>P-2 Service spark plug as per method recommended in the OEM manual,</p> <p>P-3 Fix spark plug in the vehicle for normal operation applying recommended torque.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted during service of air filter of vehicle,</p> <p>K-2 Explain the necessity of spark plug for petrol engine,</p> <p>K-3 Describe spark plug removal procedure,</p> <p>K-4 Interpret OEM manual for spark plug specifications,</p> <p>K-5 Describe adjustment of spark plug gap by using feeler gauge as per manual,</p> <p>K-6 Enlist Tools , equipment and consumables needed to service spark plug.</p>	<p>Toll trolley Feeler gauge Sark Plug Cleaning Machine</p>
<p>A-9 Service brake system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Perform brake test for normal operation,</p> <p>P-2 Locate parts of conventional brake system,</p> <p>P-3 Adjust paddle brake for normal operation according to OEM manual,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Define importance of brake system in vehicle,</p> <p>K-2 Enlist types of vehicle brake systems,</p> <p>K-3 Enlist parts of conventional brake system,</p> <p>K-4 Interpret pectoral diagram of brake</p>	<p>Toll trolley Personal safety equipment's Lifts (Two or Four Post)</p>

	P-4 Adjust parking brake for normal operation according to OEM manual.	system in OEM, K-5 Enlist Tools, equipment & consumables needed to service brake system.	
A-10 Replace drive belts	A competent individual must be able to successfully: P-1 Inspect drive belt for correct tension, P-2 Remove Drive belt by applying correct procedure, P-3 Replace drive belt by applying correct procedure.	A competent individual must be able to successfully: K-1 Describe precautionary measures adopted while working with drive belts, K-2 Describe drive belt adjustment procedure, K-3 Describe drive belt replacement procedure, K-4 Interpret drive belt section of OEM manual, K-5 Enlist tools, equipment and consumables needed to replace drive belts.	Toll trolley Personal protective equipment (PPEs) SST
A-11 Top up battery electrolyte	A competent individual must be able to successfully: P-1 Perform visual Inspection of battery for physical damage as per auto workshop SOPs,	A competent individual must be able to successfully: K-1 Define typical voltage sources in automobile, K-2 Define construction of battery,	Toll trolley Personal protective equipment (PPEs) SST Hydrometer

	<p>P-2 Perform test for determination of specific gravity of the battery as per auto workshop SOPs,</p> <p>P-3 Maintain electrolyte level in the battery up to mark without spoilage,</p> <p>P-4 Determine battery off load /on load voltage correctly.</p>	<p>K-3 Enlist automobile battery parts,</p> <p>K-4 Enlist automobile battery faults,</p> <p>K-5 Describe battery maintenance procedure,</p> <p>K-6 Describe usage of hydrometer for electrolyte check-up,</p> <p>K-7 Describe usage of battery tester for voltage testing.</p>	
<p>A-12 Adjust Head light</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Inspect head light rays position by applying correct techniques,</p> <p>P-2 Adjust reflection/refraction on desired angle,</p> <p>P-3 Adjust head lights beams applying procedure prescribed in OEM Manual.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe Construction of electrical lamp,</p> <p>K-2 Enumerate types of lamps used in vehicles,</p> <p>K-3 Explain method for adjusting head lights,</p> <p>K-4 Interpret Pictorial diagram of OEM manual for headlights adjustment,</p> <p>K-5 State vehicle lighting norms/laws.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p>
<p>A-13 Adjust clutch pedal free play</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Verify clutch pedal play for normal working,</p> <p>P-2 Adjust clutch system as per OEM recommendation.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Define purpose of clutch,</p> <p>K-2 Enlist Parts of clutch system,</p> <p>K-3 Describe adjustment procedure,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Steel Rule</p> <p>Repair Manuals</p>

		K-5 Enlist tools, equipment and consumables needed to adjust clutch system.	
A-14 Top up of all fluids	<p>A competent individual must be able to successfully:</p> <p>P-1 Determine fluids level of Brake system per OEM recommendations,</p> <p>P-2 Replace contaminated brake fluid.</p> <p>P-3 Top up Brake fluid per OEM recommendations,</p> <p>P-4 Transmission system, antifreeze, washer and power steering,</p> <p>P-5 Change level of fluids as per auto workshop SOPs,</p> <p>P-6 Clean excess fluid as per auto workshop SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist fluids used in vehicle,</p> <p>K-2 Define purpose of typical automobile fluids,</p> <p>K-3 Explain the method of top up as per OEM standard,</p> <p>K-4 Interpret OEM manual to determine specifications of fluids used in specific vehicle.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p>
A-15 Replace wheel bearing	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove bearing from wheel using method Prescribed in OEM manual,</p> <p>P-2 Apply Lubricates on bearing according to its specification,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working with bearing,</p> <p>K-2 Define advantage of bearing,</p> <p>K-3 Identify bearing according to its number code,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Lift (Two or Four posts)</p> <p>Repair manual</p>

	<p>P-3 Fix bearing in the wheel for normal operation as per automobile workshop SOPs.</p>	<p>K-4 Select tools for bearing removal and fixing,</p> <p>K-5 Enlist bearing types,</p> <p>K-6 Describe bearing faults,</p> <p>K-4 Interpret OEM manual to determine specifications of wheel bearings used in specific vehicle,</p> <p>K-7 Describe the method of wheel bearing replacement.</p>	<p>Hydraulic Press</p>
<p>A-16 Maintain tire</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Determine tire condition for normal operation as per auto workshop SOPs,</p> <p>P-2 Remove tire from vehicle applying correct procedure,</p> <p>P-3 Service tire for normal operation as per auto workshop SOPs,</p> <p>P-4 Fix tire on vehicle applying correct procedure.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working with tire,</p> <p>K-2 Identify tires correctly for the size and ply,</p> <p>K-3 Enlist tire repairing tools and equipment and consumables,</p> <p>K-4 Describe the method of replacement as per OEM standard.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Tyre changing Machine</p> <p>Tyre pressure gauge</p> <p>Source of compressed air</p>
<p>A-17 Re-torque fasteners</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Adjust of captive threaded fasteners/nut & bolts for recommended torque,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Explain Fasteners threading,</p> <p>K-2 Explain fasteners and their types,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p>

	<p>P-2 Replace clips /clamps correctly,</p> <p>P-3 Adjust of cotter for recommended torque as per auto workshop SOPs,</p> <p>P-4 Redo non-metallic fasteners correctly.</p>	<p>K-3 Identify fasteners size,</p> <p>K-4 Enlist tools to operate fasteners,</p> <p>K-5 Describe method of tightening the fasteners as per the recommended torque.</p>	Torque wrench
<p>A-18 Perform Lubrication</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Select lubricants according to OEM recommendations,</p> <p>P-2 Locate greasing/lubrication points according to OEM manual,</p> <p>P-3 Perform Chassis lubrication as per auto workshop SOPs,</p> <p>P-4 Perform under hood lubrication as per auto workshop SOPs,</p> <p>P-5 Clean excess grease/lubricant from vehicle body applying SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while applying grease/lubrication on vehicle engine,</p> <p>K-2 Describe the necessity of lubrication,</p> <p>K-3 Differentiate between lube types,</p> <p>K-4 Enlist tools, equipment and consumables required for working on vehicle engine cooling system, "Lubrication"</p> <p>K-5 Explain types and use of grease,</p> <p>K-6 Describe contamination of grease,</p> <p>K-4 Interpret OEM manual to determine specifications of lubricants used in specific vehicle.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>Oil can</p> <p>Grease gun</p>
<p>A-19 Conduct road test</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Perform after service vehicle cleaning</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted before, during and after road</p>	<p>Valid Driving licence</p> <p>Seat cover</p> <p>Floor mats</p>

	<p>as per auto workshop SOPs,</p> <p>P-2 Bring out vehicle from service station safely,</p> <p>P-2 Perform road test applying correct procedure,</p> <p>P-3 Fill out road test check list correctly.</p>	<p>test,</p> <p>K-2 Enlist functions of vehicle which has to be determined during road test.</p>	
--	--	--	--

Module B: Maintain Vehicle Engine

Overview: This Module (B) of competency standard for Auto motive technician identifies the competencies required to perform vehicle engine maintenance including cooling system s repair & maintenance, lubrication system repair & maintenance, fuel system repair & maintenance, Ignition system repair & maintenance, starting system repair & maintenance and the repair & maintenance of charging system for normal engine performance.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
<p>B-1 Inspect engine cooling system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate components of vehicle cooling system correctly,</p> <p>P-2 Determine functioning of cooling system applying prescribed procedures,</p> <p>P-3 Determine leakage in vehicle cooling system applying prescribed procedures,</p> <p>P-4 Diagnose Physical damage in vehicle cooling system applying prescribed diagnostic techniques,</p> <p>P-5 Diagnose Faulty component / part in the cooling system of vehicle applying prescribed diagnostic techniques.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on cooling system of vehicle engine,</p> <p>K-2 Describe the necessity of engine cooling system,</p> <p>K-3 Enlist vehicle cooling system component/parts,</p> <p>K-4 Define coolant specifications,</p> <p>K-5 Enlist tools, equipment and consumables required for working on vehicle engine cooling system.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair manual</p>

<p>B-2 Repair engine cooling system.</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove Parts from cooling system of vehicle applying method prescribed in service manual,</p> <p>P-2 Test engine cooling system component for normal working applying prescribed method,</p> <p>P-3 Perform servicing of cooling system as per auto workshop SOPs,</p> <p>P-4 Fix engine cooling system component in vehicle for normal function as per auto workshop SOPs,</p> <p>P-5 Perform after service test on cooling system of vehicle applying prescribed method.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Explain operation of engine cooling system,</p> <p>K-2 Explain function of radiator, Thermostat, water pump & fan in vehicle cooling system,</p> <p>K-3 Enumerate steps to perform pressure test on cooling system.</p>	<p>Toll trolley Personal protective equipment (PPEs) SST</p>
<p>B-3 Inspect Lubrication system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate components of vehicle Lubricant system correctly,</p> <p>P-2 Determine functioning of lubrication system applying prescribed procedures,</p> <p>P-3 Determine leakage in vehicle system applying prescribed procedures,</p> <p>P-4 Determine oil pressure performance with oil pressure gauge as per auto workshop SOPs,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on lubrication system of vehicle engine,</p> <p>K-2 Describe the necessity of lubrication in engine,</p> <p>K-3 Enlist vehicle lubrication system component / parts,</p> <p>K-5 Enlist tools required for working on engine lubrication system.</p>	<p>Toll trolley Personal protective equipment (PPEs) SST Repair Manual</p>

	<p>P-5 Diagnose Physical damage in vehicle lubrication system applying prescribed diagnostic techniques,</p> <p>P-6 Diagnose Faulty component/part in the lubrication system of vehicle applying prescribed diagnostic techniques.</p>	<p>K-6 Enlist typical lubricant for city/common vehicle.</p> <p>K-7 Select tools, equipment and consumables required for working on vehicle Lubrication system.</p>	
<p>B-4 Repair Lubrication system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove Lubricant from vehicle applying method prescribed in service manual,</p> <p>P-1 Remove Parts from lubrication system of vehicle applying method prescribed in service manual,</p> <p>P-2 Test vehicle cooling system component for normal working applying prescribed method,</p> <p>P-3 Perform servicing of lubrication system parts as per auto workshop SOPs,</p> <p>P-4 Fix vehicle lubrication system component in vehicle for normal function as per auto workshop SOPs,</p> <p>P-5 Perform after service test on Lubrication system of vehicle applying prescribed method.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Explain operation of vehicle lubrication system,</p> <p>K-2 Explain function of oil pump,</p> <p>K-2 Give purpose of O-ring,</p> <p>K-3 Enumerate steps to perform servicing on lubrication system.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p>
<p>B-5 Inspect fuel</p>	<p>A competent individual must be able to successfully:</p>	<p>A competent individual must be able to successfully:</p>	<p>Toll trolley</p> <p>Personal protective</p>

<p>system</p>	<p>P-1 Locate components of vehicle fuel system correctly,</p> <p>P-2 Determine functioning of vehicle fuel system applying prescribed procedures,</p> <p>P-3 Determine the pressure of fuel pump applying prescribed procedures,</p> <p>P-4 Diagnose Physical damage in vehicle fuel system applying prescribed diagnostic techniques,</p> <p>P-5 Diagnose Faulty component/part in fuel system of vehicle applying prescribed diagnostic techniques,</p> <p>P-6 Diagnose fault in alternative Fuel (CNG / LPG) system as per auto workshop SOPs.</p>	<p>K-1 Describe precautionary measures adopted while working on lubrication system of vehicle engine,</p> <p>K-2 Describe Automobile fuels and types,</p> <p>K-3 Explain fuel system of petrol automobile,</p> <p>K-4 Explain fuel system of diesel automobile,</p> <p>K-5 Enumerate components of petrol vehicle fuel system,</p> <p>K-6 Enumerate components of diesel vehicle fuel system,</p> <p>K-6 Define electronic fuel injection system and its advantages,</p> <p>K-7 Explain working of Carburettor,</p> <p>K-8 Enlist parts of carburettor,</p> <p>K-9 Explain necessity & working of fuel filter,</p> <p>K-10 Define Fuel injector,</p> <p>K-11 Explain return pressure injector rail (EFI) System,</p> <p>K-12 Select tools, equipment and consumables required for working on vehicle fuel system.</p>	<p>equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p>
---------------	---	---	---

<p>B-6 Repair fuel system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove fuel from vehicle applying method prescribed in service manual,</p> <p>P-2 Remove Parts from fuel system of typical (conventional) petrol vehicle applying method prescribed in service manual,</p> <p>P-3 Remove Parts from fuel system of typical (conventional) diesel vehicle applying method prescribed in service manual,</p> <p>P-4 Remove Parts from fuel system of EFI vehicle applying method prescribed in service manual,</p> <p>P-5 Test vehicle fuel system component for normal working applying prescribed method,</p> <p>P-6 Perform servicing of fuel system parts,</p> <p>P-7 Fix vehicle fuel system component in vehicle for normal function,</p> <p>P-8 Pour fuel in to the vehicle applying prescribed method,</p> <p>P-9 Perform after service test on fuel system of vehicle applying prescribed method,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist symptoms of trouble in vehicle due to fuel system malfunctioning</p> <p>K-2 Enumerate carburettor parts,</p> <p>K-3 Describe carburettor servicing method,</p> <p>K-4 Describe fuel injector servicing method,</p> <p>K-5 Describe servicing method of EFI system.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p>
<p>B-7 Inspect Ignition system.</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Identify components of vehicle ignition system,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on ignition system of automobile,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p>

	<p>P-2 Determine functioning of ignition system applying prescribed procedures,</p> <p>P-3 Determine leakage in vehicle ignition system applying prescribed procedures,</p> <p>P-4 Determine ignition switch and ignition coil performance applying prescribed procedures,</p> <p>P-5 Determine ignition distributor condition applying prescribed procedures,</p> <p>P-6 Diagnose Physical damage in vehicle ignition system applying prescribed diagnostic techniques,</p> <p>P-7 Diagnose faulty component/part in ignition system of vehicle applying prescribed diagnostic techniques.</p>	<p>K-2 Describe necessity of ignition system in automobile,</p> <p>K-3 Enlist vehicle ignition system component / parts,</p> <p>K-4 Explain Contact breaker (CB) point function,</p> <p>K-5 Explain Distributor less Ignition (DLI),</p> <p>K-6 Enlist tools, equipment and consumables required for working on vehicle ignition system.</p>	<p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>
<p>B-8</p> <p>Repair ignition system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove Parts from ignition system of vehicle applying method prescribed in service manual,</p> <p>P-2 Test ignition system component of vehicle for normal functioning applying prescribed method,</p> <p>P-3 Perform servicing of ignition system parts,</p> <p>P-4 Fix vehicle ignition system component in vehicle for normal function as per auto</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist symptoms of trouble in vehicle due to fuel system malfunctioning,</p> <p>K-2 Enlist Parts of ignition system,</p> <p>K-3 Describe the Purpose of distributor assembly,</p> <p>K-4 Define characteristics of high tension lead,</p> <p>K-5 Describe working of ignition coil,</p> <p>K-6 Define Purpose of battery in the</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>

	<p>workshop SOPs,</p> <p>P-5 Perform after service test on ignition system of vehicle applying prescribed method.</p>	<p>ignition system of vehicle.</p>	
<p>B-9</p> <p>Inspect starting system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate components of vehicle starting system as per auto workshop SOPs,</p> <p>P-2 Determine functioning of starting system applying prescribed procedures,</p> <p>P-3 Diagnose Physical damage in vehicle starting system applying prescribed diagnostic techniques,</p> <p>P-4 Diagnose Faulty component/part in starting system of vehicle applying prescribed diagnostic techniques.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on starting system of automobile,</p> <p>K-2 Describe starting system of automobile,</p> <p>K-3 Enlist vehicle starting system component / parts,</p> <p>K-4 Enlist tools, equipment and consumables required for working on vehicle ignition system.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>
<p>B-10</p> <p>Repair engine starting system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove Parts from starting system of vehicle applying method prescribed in service manual,</p> <p>P-2 Test starting system component of vehicle for normal functioning applying prescribed method,</p> <p>P-3 Perform servicing of starting system parts,</p> <p>P-4 Fix vehicle ignition system component in</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist symptoms of trouble in vehicle due to starting system malfunctioning,</p> <p>K-2 Enlist Parts of starting system,</p> <p>K-3 Describe importance of battery characteristics in normal functioning of starting system,</p> <p>K-4 Describe the use of multi meter,</p> <p>K-5 Define characteristics of High</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p> <p>Soldering Iron</p>

	<p>vehicle for normal function as per auto workshop SOPs,</p> <p>P-5 Perform after service test on starting system of vehicle applying prescribed method.</p>	Tension lead/cable.	
<p>B-11</p> <p>Inspect charging system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate components of vehicle charging system correctly,</p> <p>P-2 Determine functioning of starting system applying prescribed procedures,</p> <p>P-3 Diagnose Physical damage in vehicle starting system applying prescribed diagnostic techniques,</p> <p>P-4 Diagnose Faulty component/part in starting system of vehicle applying prescribed diagnostic techniques.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on charging system of automobile</p> <p>K-2 Describe necessity of charging system in automobile,</p> <p>K-3 Identify vehicle charging system component / parts,</p> <p>K-4 Explain function of vehicle alternator,</p> <p>K-5 Enlist vehicle alternator parts,</p> <p>K-6 Explain function of vehicle charger,</p> <p>K-7 Draw free hand typical circuit/ electrical/ schematic/ block diagram of automobile charging circuit,</p> <p>K-8 Select tools, equipment and consumables required for working on vehicle ignition system.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>
<p>B-12</p> <p>Repair</p>	<p>A competent individual must be able to successfully:</p>	<p>A competent individual must be able to successfully:</p>	<p>Toll trolley</p> <p>Personal protective</p>

Charging system	<p>P-1 Remove Parts from starting system of vehicle by applying method prescribed in service manual,</p> <p>P-2 Test charging system component of vehicle for normal functioning by applying prescribed method,</p> <p>P-3 Repair vehicle alternator by applying prescribed techniques,</p> <p>P-4 Perform servicing of servicing system parts,</p> <p>P-4 Fix vehicle starting system component in vehicle for normal function as per auto workshop SOPs,</p> <p>P-5 Perform after service test on starting system of vehicle by applying prescribed method.</p>	<p>K-1 Enlist symptoms of trouble in vehicle due to starting system malfunctioning,</p> <p>K-2 Enlist parts of starting system,</p> <p>K-3 Enlist parts of alternator,</p> <p>K-4 Describe characteristics of automobile charger circuits.</p>	<p>equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p> <p>Soldering Iron</p>
-----------------	---	--	---

Module C: Repair Body Electrical System

Overview:. This Module (C) of competency standard for Auto motive technician identifies the competencies required to repair body electrical system including diagnose affected electrical / electronic system malfunctioning, repairing of body wiring, service and maintenance of wiper,

Maintenance of lighting system, Maintenance of horn system, maintenance of ignition circuit, servicing of remote control, repairing of power Window circuitry, repairing Sunroof circuitry and servicing of Supplemental Restraint System for normal performance of vehicle.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
<p>C-1 Diagnose affected electrical/electronic system malfunction(s)</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Demonstrate use of test and measuring instruments as per their operation manual,</p> <p>P-2 Determine functioning of vehicle electrical/electronic circuit applying prescribed procedures,</p> <p>P-3 Perform tests to diagnose fault in wiring/harness of vehicle as per prescribed procedure,</p> <p>P-4 Perform tests to determine faulty components of vehicle electrical/electronic circuit as per prescribed procedure,</p> <p>P-5 Diagnose Physical damage in vehicle electrical/electronic circuit applying prescribed diagnostic techniques,</p> <p>P-6 Perform earthing test for proper functioning as per SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working with test and measuring instruments,</p> <p>K-2 Describe precautionary measures adopted while working on vehicle electrical /electronic system,</p> <p>K-3 Define voltage and its types(A.C/D.C)</p> <p>K-4 Interpret Test and measuring instruments manual,</p> <p>K-5 Interpret Vehicle schematics,</p> <p>K-6 Identify electrical protection devices used in automotive,</p> <p>K-7 Describe Electrical protection devices used in automotive,</p> <p>K-8 Enlist relays used in automotive,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>

		<p>K-9 Describe relays used in automotive,</p> <p>K-10 Enlist sensing devices used in automotive,</p> <p>K-11 Describe sensing devices used in automotive,</p> <p>K-12 Enumerate operation of electrical/ electronic test and measuring instruments used for automotive electrical service,</p> <p>K-13 Select tools, equipment and consumables required for working on vehicle electrical / electronic system.</p>	
<p>C-2 Repair body wiring</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Maintain earth connection for normal functioning,</p> <p>P-2 Locate body wiring circuit components correctly,</p> <p>P-3 Remove Faulty component/wire /cable/ terminal from body wiring of vehicle applying method prescribed in service manual,</p> <p>P-4 Test component/wire/cable/ terminal of vehicle body wiring for determination of its condition applying prescribed testing methods,</p> <p>P-5 Repair vehicle wiring applying</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Calculate load on battery in power and ampere hour,</p> <p>K-2 Enlist symptoms of trouble in vehicle due to body wiring malfunctioning,</p> <p>K-3 Define characteristics of wires and cables used in automotive circuits,</p> <p>K-4 Identify ratings/values of component used in body wiring system of vehicle,</p> <p>K-5 Describe harness and their insulation,</p> <p>K-6 Describe testing procedure of</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Multi-meter</p>

	<p>prescribed techniques.</p> <p>P-6 Fix component/wire/cable/terminal related to body wiring circuit on proper place</p> <p>P-7 Connect component in vehicle body wiring circuit according to schematics</p> <p>P-8 Perform after service electrical test of vehicle for normal circuit operation</p> <p>P-9 Check connectivity wiring terminals for normal physical/electrical connections</p>	<p>protecting devices of automobile circuits,</p> <p>K-7 Describe testing procedure of relays of automobile circuits,</p> <p>K-8 Describe testing procedure of sensing devices of automobile circuits.</p>	
<p>C-3 Maintain wiper system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Diagnose physical/mechanical fault in wipers system of vehicle applying procedure recommended in service manual.</p> <p>P-2 Diagnose fault in wipers circuit of vehicle applying procedure recommended in service manual.</p> <p>P-3 Remove mechanical parts of wiper system from as per automotive workshop SOPs.</p> <p>P-4 Remove electrical components of wiper system from vehicle applying proper techniques.</p> <p>P-5 Service wiper motor applying prescribed techniques.</p> <p>P-6 Insert mechanical component in wiper</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe function of wipers in vehicles,</p> <p>K-2 Draw free hand wipers circuit / schematic diagram,</p> <p>K-3 K-1 Describe symptoms/causes of trouble in wiper system of the vehicle,</p> <p>K-4 Select tools, equipment and consumables required for working on vehicle circuit/system of vehicle.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>

	<p>system of vehicle as per SOPs,</p> <p>P-7 Connect electrical component in wiper system of vehicle by applying automotive workshop SOPs,</p> <p>P-8 Test after service wiper system performance for normal operations per automotive workshop SOPs.</p>		
<p>C-4</p> <p>Maintain lighting system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Diagnose Fault in Lighting System of the Vehicle by applying prescribed diagnostic techniques,</p> <p>P-2 Locate components of lighting circuit of the vehicle correctly,</p> <p>P-3 Remove component from lighting circuit of vehicle by applying automotive workshop SOPs,</p> <p>P-4 Test component for determination of its condition by applying automotive workshop SOPs,</p> <p>P-5 Perform mechanical/physical repair / maintenance of lighting system of vehicle applying prescribed techniques,</p> <p>P-6 Repair vehicle lighting circuit applying prescribed techniques,</p>	<p>A competent individual must be able to successfully :</p> <p>K-2 Describe precautionary measures adopted while working on vehicle lighting system,</p> <p>K-2 Describe function of Components in vehicle lighting system,</p> <p>K4 Describe techniques and procedures of diagnosing faults in lighting system,</p> <p>K3 Explain techniques for inspecting and verifying the repair of lighting system,</p> <p>K4 Interpret schematic diagram of lighting circuit of vehicle,</p> <p>K-5 Explain different lighting system of vehicle,</p> <p>K-3 Describe symptoms/causes of trouble in lighting system of the vehicle,</p> <p>K-4 Select tools, equipment and consumables required for working on</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>

	<p>P-7 Fix component/wire/cable/terminal related to lighting circuit on proper place,</p> <p>P-8 Connect component in vehicle lighting circuit according to schematics,</p> <p>P-9 Perform after service electrical test of vehicle for normal lighting circuit operation,</p> <p>P-10 Test lighting circuit connectors for proper connections using prescribed techniques.</p>	lighting circuit / system of vehicle.	
<p>C-5 Maintain horn system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate components of horn circuit of the vehicle correctly,</p> <p>P-2 Diagnose Fault in horn circuit of the Vehicle by applying automotive workshop SOPs,</p> <p>P-3 Remove component from horn circuit of vehicle by applying automotive workshop SOPs,</p> <p>P-4 Test component for determination of its condition by applying automotive workshop SOPs,</p> <p>P-5 Perform mechanical/physical repair/maintenance of horn system of vehicle applying prescribed techniques,</p> <p>P-6 Repair vehicle horn circuit applying</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on vehicle horn circuit,</p> <p>K-2 Describe function of Components in vehicle horn circuit,</p> <p>K-3 Describe techniques and procedures of diagnosing faults in horn circuit,</p> <p>K-4 Explain techniques for inspecting and verifying the repair of horn system,</p> <p>K-5 Read and interpret schematic diagram of horn circuit of vehicle,</p> <p>K-6 Describe symptoms/causes of trouble in horn circuit of the vehicle,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>

	<p>prescribed techniques,</p> <p>P-7 Fix component/wire/cable/terminal related to horn circuit on proper place,</p> <p>P-8 Connect component in vehicle horn circuit according to schematics,</p> <p>P-9 Perform after service test of vehicle for normal horn operation.</p>	<p>K-7 Select tools, equipment and consumables required for working on vehicle horn circuit/system of vehicle.</p>	
<p>C-6</p> <p>Maintain central locking system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate components of horn circuit of the vehicle correctly,</p> <p>P-2 Diagnose Fault in horn circuit of the Vehicle by applying automotive workshop SOPs,</p> <p>P-3 Remove component from horn circuit of vehicle by applying automotive workshop SOPs,</p> <p>P-4 Test component for determination of its condition by applying automotive workshop SOPs,</p> <p>P-5 Perform mechanical/physical repair / maintenance of horn system of vehicle applying prescribed techniques,</p> <p>P-6 Repair vehicle horn circuit by applying prescribed techniques,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on vehicle central locking system,</p> <p>K-2 Explain central locking system,</p> <p>K-3 Enlist components of central locking system,</p> <p>K-4 Identify components of central locking system,</p> <p>K-5 Describe function of Components in vehicle central locking system,</p> <p>K-6 Describe techniques and procedures of diagnosing faults in central locking system,</p> <p>K-7 Read and interpret schematic diagram of central locking circuit of</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>

	<p>P-7 Fix component/wire/cable/terminal related to horn circuit on proper place,</p> <p>P-8 Connect component in vehicle horn circuit according to related schematics,</p> <p>P-9 Perform after service test of vehicle for normal horn operation by applying prescribed techniques.</p>	<p>vehicle,</p> <p>K-8 Describe symptoms/causes of trouble in central locking system of the vehicle,</p> <p>K-9 Select tools, equipment & consumables required for working on vehicle central circuit/system of vehicle.</p>	
<p>C-7</p> <p>Maintain Ignition switch system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Test Ignition switch for proper function,</p> <p>P-2 Remove ignition switch from the steering by applying automotive workshop SOPs,</p> <p>P-3 Perform electrical/mechanical Servicing on ignition switch by applying automotive workshop SOPs,</p> <p>P-4 Fix ignition switch assembly on proper place by applying automotive workshop SOPs,</p> <p>P-5 Perform after service test of ignition for normal horn operation by applying automotive workshop SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on ignition switch,</p> <p>K-2 Define function of ignition switch,</p> <p>K-3 Enlist systems controlled with ignition switch in vehicle,</p> <p>K-4 Describe method of removing ignition switch from vehicle,</p> <p>K-5 Read and interpret schematic diagram of ignition switch of vehicle,</p> <p>K-6 Describe symptoms / causes of trouble in ignition switch of the vehicle,</p> <p>K-7 Select tools, equipment & consumables required for working on vehicle central circuit / system of vehicle.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>
<p>C-8</p> <p>Service</p>	<p>A competent individual must be able to successfully:</p>	<p>A competent individual must be able to successfully:</p>	<p>Toll trolley</p> <p>Personal protective</p>

Remote control	<p>P-1 Test remote control for proper performance by applying automotive workshop SOPs,</p> <p>P-2 Service remote control system by applying automotive workshop SOPs,</p> <p>P-3 Replace remote control battery by applying automotive workshop SOPs,</p> <p>P-5 Perform after service test of remote for normal horn operation by applying automotive workshop SOPs.</p>	<p>K-1 Describe precautionary measures adopted while working on remote control,</p> <p>K-2 Define function of remote control,</p> <p>K-3 Define working principle of remote control system,</p> <p>K-4 Describe method of removing battery from remote control unit,</p> <p>K-5 Define remote control battery characteristics,</p> <p>K-6 Describe symptoms/causes of trouble in remote control system,</p> <p>K-7 Select tools, equipment and consumables required for working on remote control.</p>	<p>equipment (PPEs)</p> <p>SST</p> <p>Multi-meter</p>
C-9 Maintain Power windows system	<p>A competent individual must be able to successfully :</p> <p>P-1 Locate components/parts of power windows system of the vehicle correctly,</p> <p>P-2 Diagnose Fault in power windows circuit of the Vehicle by applying automotive workshop SOPs,</p> <p>P-3 Remove component from Power windows system of vehicle by applying automotive workshop SOPs,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on vehicle Power windows system,</p> <p>K-2 Explain power windows system,</p> <p>K-3 Enlist components of power windows system,</p> <p>K-4 Identify components of power windows system,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>

	<p>P-4 Test power windows system component for determination of its condition by applying automotive workshop SOPs,</p> <p>P-5 Perform mechanical/physical repair/maintenance of Power windows system of vehicle applying prescribed techniques,</p> <p>P-6 Repair vehicle Power windows circuit applying prescribed techniques,</p> <p>P-7 Service power windows motor applying prescribed techniques,</p> <p>P-8 Fix mechanical/electrical component related to Power windows system on proper place,</p> <p>P-9 Connect component in vehicle power windows circuit according to related schematics,</p> <p>P-10 Perform after service test of vehicle for normal Power windows system operation by applying automotive workshop SOPs.</p>	<p>K-5 Describe function of power windows system Components in vehicle,</p> <p>K-6 Describe techniques and procedures of diagnosing faults in power windows system,</p> <p>K-7 Interpret schematic diagram of power windows system of vehicle,</p> <p>K-8 Describe symptoms/causes of trouble in power windows system of the vehicle,</p> <p>K-9 Select tools, equipment and consumables required for working on vehicle power windows circuit/system of vehicle.</p>	
	<p>A competent individual must be able to successfully :</p> <p>P-1 Locate components/parts of sunroof system of the vehicle correctly,</p> <p>P-2 Diagnose Fault in sunroof circuit of the</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on vehicle sunroof system,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p>

<p>C-10 Maintain sunroof system</p>	<p>by applying correct diagnostics techniques,</p> <p>P-3 Remove component from sunroof system of vehicle by applying automotive workshop SOPs,</p> <p>P-4 Test sunroof system component for determination of its condition by applying automotive workshop SOPs,</p> <p>P-5 Perform mechanical/physical repair/maintenance of sunroof system of vehicle applying prescribed techniques,</p> <p>P-6 Repair vehicle sunroof system circuit applying prescribed techniques,</p> <p>P-7 Service power sunroof by applying prescribed techniques,</p> <p>P-8 Fix mechanical/electrical component related to sunroof system on proper place,</p> <p>P-9 Connect component in vehicle sunroof circuit according to related schematics,</p> <p>P-10 Perform after service test of vehicle for normal sunroof system operation by applying automotive workshop SOPs.</p>	<p>K-2 Explain sunroof system,</p> <p>K-3 Enlist components of power windows system,</p> <p>K-4 Identify components of sunroof system,</p> <p>K-5 Describe function of sunroof system components in vehicle,</p> <p>K-6 Describe techniques and procedures of diagnosing faults in sunroof system,</p> <p>K-7 Interpret schematic diagram of sunroof system of vehicle,</p> <p>K-8 Describe symptoms/causes of trouble in sunroof system of the vehicle,</p> <p>K-9 Select tools, equipment and consumables required for working on vehicle sunroof circuit/system of vehicle,</p>	<p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>
	<p>A competent individual must be able to successfully :</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 State importance of SRS in</p>	<p>Toll trolley</p> <p>Personal protective</p>

<p>C-11 Service Supplemental Restraint System (SRS)</p>	<p>P-1 Diagnose Fault in SRS of the Vehicle, P-2 Locate components (e.g. air beg, sensors, control units) of SRS circuit of the vehicle correctly, P-3 Remove component from SRS circuit of vehicle applying SOPs, P-4 Test component for determination of its condition applying SOPs, P-5 Perform mechanical / physical repair/maintenance of SRS of vehicle applying prescribed techniques, P-6 Repair vehicle lighting circuit applying prescribed techniques, P-7 Fix component/wire/cable/terminal related to lighting circuit on proper place, P-8 Connect component in vehicle lighting circuit according to schematics, P-9 Perform after service electrical test of vehicle for normal lighting circuit operation, P-10 Test lighting circuit connectors for proper connections.</p>	<p>automobile, K-2 Describe precautionary measures adopted while working on vehicle SRS, K-3 Explain Supplemental Restraint System, K-4 Enlist components of SRS, K-4 Identify components of SRS, K-5 Describe function of SRS components in vehicle, K-6 Describe techniques and procedures of diagnosing faults in SRS, K-7 Interpret schematic diagram of SRS of vehicle, K-8 Describe symptoms/causes of trouble in sunroof system of the vehicle, K-9 Select tools, equipment and consumables required for working on vehicle SRS circuit of vehicle, K-10 Describe necessity of inflator in automobile.</p>	<p>equipment (PPEs) SST Repair Manual Scanner Multi-meter</p>
---	---	---	---

Module D: Maintain HVAC System

Overview:.. This Module (D) of competency standard for Auto motive technician identifies the competencies required to maintain Heating, Ventilation & Air-Conditioning System(HVAC) including Servicing, fault diagnosing and repairing of the system for normal performance on vehicle.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
D-1 Test HVAC System performance	<p>A competent individual must be able to successfully:</p> <p>P-1 Perform cooling test on HVAC system performance adopting OEM guidelines and procedures,</p> <p>P-2 Perform pressure test on HVAC System to determine refrigerant pressure adopting OEM guidelines and procedures,</p> <p>P-3 Perform Cleaning of vehicle HVAC system as per OEM guideline,</p> <p>P-4 Perform trim repairing in vehicle HVAC system as per OEM guideline,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Explain HVAC system,</p> <p>K-2 Describe precautionary measures adopted while performing tests on HVAC system of vehicle,</p> <p>K-3 State importance of necessity of HVAC system in automobile,</p> <p>K-4 Enlist components of HVAC system,</p> <p>K-5 Identify components of HVAC</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p> <p>Refrigerant Recycling Machine</p> <p>Vacuum pump</p>

	<p>P-5 Recycle Refrigerant in vehicle HVAC system as per OEM guideline,</p> <p>P-6 Perform after service electrical test of vehicle for normal HVAC operation.</p>	<p>system,</p> <p>K-6 Describe working of HVAC system, components, e.g. A.C compressor, condenser, heater core. evaporator, receiver drier,</p> <p>K-7 Explain techniques and procedures for servicing and repairing Vehicle HVAC system,</p> <p>K-8 Select tools, equipment and consumables required for working on vehicle HVAC system / circuit of vehicle,</p> <p>K-9 Explain function and operation of the climate control system.</p>	
<p>D-2</p> <p>Diagnose Fault in Electrical circuit of HVAC system</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Diagnose electrical fault in HVAC system of the Vehicle adopting OEM guidelines and procedures,</p> <p>P-2 Locate components of HVAC circuit of the vehicle correctly,</p> <p>P-3 Test electrical components for determination of their condition applying SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe function of components of HVAC system in vehicle,</p> <p>K-2 Describe techniques and procedures of diagnosing faults due to electrical malfunctioning in HVAC circuit of automobile,</p> <p>K-3 Interpret Electrical schematics of HVAC system of automobile,</p> <p>K-4 Describe symptoms/causes of trouble in HVAC system of the vehicle,</p> <p>K-5 Describe usage of gauges and probes,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p> <p>Refrigerant Recycling Machine</p> <p>Vacuum pump</p>

		K-6 Select tools, equipment & consumables required for working on HVAC system / circuit of vehicle.	
D-3 Repair HVAC Electrical circuit	<p>A competent individual must be able to successfully:</p> <p>P-1 Perform HVAC Circuit test to determine electrical fault adopting OEM guidelines and procedures,</p> <p>P-2 Verify electrical values of HVAC circuit with the OEM Schematics,</p> <p>P-3 Replace HVAC electrical components and parts using prescribed method in the repair manual,</p> <p>P-4 Repair HVAC electrical components and parts using prescribed method in the repair manual,</p> <p>P-4 Repair vehicle HVAC applying prescribed techniques,</p> <p>P-5 Fix component/wire/cable/terminal related to HVAC circuit on proper place,</p> <p>P-7 Perform after service electrical test of vehicle for normal HVAC circuit operation.</p>	<p>A competent individual must be able to successfully:</p> <p>K-2 Explain techniques and procedures of repairing vehicle HVAC electrical faults,</p> <p>K-6 Select tools, equipment And consumables required for working on HVAC system / circuit of vehicle.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>
D-4 Diagnose Fault(s) in HVAC Mechanical	<p>A competent individual must be able to successfully:</p> <p>P-1 Diagnose choking in vehicle HVAC system component e.g. AC condenser, Heater</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe the specific safety procedures as mentioned in the</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p>

Components	<p>core, Evaporator, Receiver drier,</p> <p>P-2 Diagnose damage(s) in vehicle HVAC system components e.g.AC condenser, Heater core evaporator, receiver drier, compressor,</p> <p>P-3 Diagnose mechanical/clogging fault in HVAC system of the Vehicle adopting OEM guidelines and procedures,</p> <p>P-4 Remove Parts from HVAC system of vehicle applying SOPs.</p>	<p>guidelines,</p> <p>K-2 Explain function of the components of HVAC system,</p> <p>K-3 Interpret the repair manual for carrying out diagnoses.</p>	Repair Manual
D-5 Repair HVAC Mechanical System	<p>A competent individual must be able to successfully:</p> <p>P-1 Remove mechanical fault / coggling from HVAC system of vehicle applying SOPs,</p> <p>P-2 Perform mechanical / physical repair / maintenance of HVAC of vehicle applying prescribed techniques,</p> <p>P-3 Perform refrigerant pressure test,</p> <p>P-4 Perform after service mechanical test of vehicle for normal HVAC operation.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe techniques and procedures of removing faults due to electrical malfunctioning in HVAC circuit of automobile,</p> <p>K-2 Interpret repair manual to carry out repair,</p> <p>K-3 Select tools, equipment And consumables required for working on HVAC system / circuit of vehicle.</p>	Toll trolley Personal protective equipment (PPEs) SST Repair Manual
D-6 Perform Refrigerant Leak Test	<p>A competent individual must be able to successfully:</p> <p>P-1 Connect HVAC Refrigerant recycle machine with vehicle as mentioned in by the OEM guideline,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while performing leakage test on vehicle HVAC system,</p>	Toll trolley Personal protective equipment (PPEs) SST

	<p>P-2 Perform leakage test to determine refrigerant/cooling leakage from HVAC system adopting OEM guidelines and procedures.</p>	<p>K-2 Describe usage of gauges and probes, K-3 Interpret repair manual to carry out Refrigerant Leak Test, K-4 Describe different types of Refrigerant Leak Detectors (RLD) K-5 Explain usage of tools and operation of equipment Describe specific safety procedures as mentioned in the OEM guideline.</p>	<p>Repair Manual Multi-meter Refrigerant Recycling Machine Vacuum pump</p>
<p>D-7 Recharge AC Refrigerant</p>	<p>A competent individual must be able to successfully: P-1 Recycle refrigerant of vehicle as per OEM guideline P-2 Select Refrigerant according to HVAC system installed in vehicle, P-3 Perform Flushing of AC System according SOPs, P-4 Recharge refrigerant in Vehicle HVAC system P-5 Retrofit vehicle HVAC System as per SOPs. P-6 Verify function of HVAC system after refrigerant re-charging by applying SOPs.</p>	<p>A competent individual must be able to successfully: K-1 Describe precautionary measures adopted while flushing / charging refrigerant, K-2 Describe HVAC Refrigerants, K-3 Enlist types of automobile refrigerants. K-4 Explain mixing of refrigerants, K-5 Define Recharging auto AC Systems, K-6 Adding Oil to the AC System, K-7 Enumerate operating steps of recirculation, K-8 Explain usage of tools and operation of equipment Describe specific</p>	<p>Toll trolley Personal protective equipment (PPEs) SST Repair Manual Refrigerant Recycling Machine Vacuum pump</p>

		safety procedures as mentioned in the OEM guideline.	
D-8 Perform HVAC System Road Test	A competent individual must be able to successfully: P-1 Adjust HVAC controls as per customer desire P-2 Perform Defogging correctly P-3 Drive vehicle for a distance to check compartment temperature for normal cooling P-4 Check vehicle engine temperature	A competent individual must be able to successfully: K-1 Describe precautionary measures adopted while performing road test for HVAC system, K-2 Interpret the repair manual to carry out the test and to verify the values, K-3 Prepare Check list for HVAC system performance test on road.	Valid Driving licence Seat cover Floor mats Digital AC cooling Tester

Module E: Maintain Suspension System

Overview:.. This Module (E) of competency standard for Automotive technician identifies the competencies required to maintain Suspension system including Servicing, fault diagnosing, Parts replacement, repairing of suspension system and performing wheel alignment for normal performance of vehicle.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
	A competent individual must be able to successfully: P-1 Perform road test to determine cause of noise and vibration due to steering & suspension system of the vehicle according	A competent individual must be able to successfully: K-1 Describe precautionary measures adopted while working on steering and suspension system of vehicle,	Toll trolley Personal protective equipment (PPEs) SST

<p>E-1 Diagnose problems related to Springs, Struts, shocks, control arms / linkages</p>	<p>SOPs, P-2 Identify type of steering system of specific vehicle applying SOPs, P-3 Identify type of suspension system of specific vehicle applying SOPs, P-4 Locate components of steering & suspension system according to OEM manual, P-5 Diagnose Physical damage /warn / fault/grinded /silted / damaged / broken part in steering & suspension system components (e.g. size loss, rusting, Tension loss, thread slip, etc.) applying prescribed diagnostic techniques, P-6 Measure spring specifications with respect to OEM manual, P-7 Measure shocks and struts specifications with respect to OEM manual, P-8 Remove Springs from steering & suspension system as per OEM instructions, P-9 Remove linkages from suspension system as per OEM instructions, P-10 Remove shocks and struts from suspension system as per OEM instructions, P-11 Test conventional steering parts for wear and damage. P-12 Test rack and pinion steering for wear</p>	<p>K-2 Describe importance of steering and suspension system, K-3 Explain the function of steering system K-4 Define working of standard mechanical (reciprocating ball) steering, K-5 Define working of rack and pinion steering, K-6 Enlist parts of steering box K-7 Interpret steering & suspension section of OEM manual, K-8 Interpret manual steering pictorial schematics, K-9 Interpret Power steering pictorial schematics, K-10 Interpret manual steering electrical schematics, K-11 Interpret suspension pictorial schematics K-12 Enumerate components of manual steering system, K-13 Enumerate components of power steering system, K-14 Enlist steering and suspension system fasteners e.g. Springs, Struts, shocks, control arms / linkages,</p>	<p>Repair Manual Scanner Multi-meter Lifting source</p>
--	---	---	---

	<p>and damage</p> <p>P-13 Test (inner and outer Tie rods) for normal working as per OEM instructions</p> <p>P-14 Determine steering fluid characteristics for normal performance applying SOPs</p> <p>P-15 Determine power steering pump belt for normal performance applying SOPs</p>	<p>K-15 Select tools, equipment and consumables required for working on vehicle wiper system,</p> <p>K-16 Interpret suspension section of repair manuals.</p> <p>K-17 Describe the operation of the suspension system.</p>	
E-2 Maintain steering system	<p>A competent individual must be able to successfully:</p> <p>P-1 Perform servicing on steering system by applying automotive workshop SOPs,</p> <p>P-2 Remove worn parts including: tie rods, idler arms, centre links, pitman arms, pitman shaft, seals, entire racks from steering system applying SOPs,</p> <p>P-3 Replace Steering system parts as per SOPs,</p> <p>P-4 Diagnose faulty/grinded/silted/damaged / broken part related with steering system applying SOPs,</p> <p>P-5 Perform after service test to determine normal working steering system applying prescribed methods of testing.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe Specific safety precautions and guidelines necessary to perform steering system,</p> <p>K-2 Interpret repair manuals to steering service and repair section,</p> <p>K-3 Identify tools and equipment's required to repair and replace parts of steering system.</p> <p>K-4 Identify Types of Steering systems</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting source</p> <p>Multi-meter scanner</p>
E-3 Replace	<p>A competent individual must be able to successfully:</p>	<p>A competent individual must be able to successfully:</p>	<p>Toll trolley</p> <p>Personal protective</p>

<p>Suspension Bushes</p>	<p>P-1 Identify bushes in suspension system of vehicle applying prescribed SOPs, P-2 Inspect suspension bushes for normal function applying SOPs, P-3 Remove suspension bushes using prescribed SOPs. P-4 Perform servicing on suspension system applying SOPs, P-5 Replace bushes from suspension systems as per SOPs, P-5 Perform after service test to determine normal working of bushes applying prescribed methods of testing.</p>	<p>K-1 Describe Specific safety precautions and guidelines necessary to replace suspension bushes, K-2 Interpret suspension section of repair manual, K-3 Identify suspension system, K-4 Define uses and necessity of suspension bushes, K-5 Select tools and equipment's required to diagnoses faults in suspension system.</p>	<p>equipment (PPEs) SST Repair Manual Lifting source Hydraulic Press</p>
<p>E-4 Replace Suspension Links</p>	<p>A competent individual must be able to successfully: P-1 Locate linkage in suspension system of vehicle applying prescribed SOPs, P-2 Inspect suspension bushes for normal function applying SOPs, P-3 Remove linkage from suspension using prescribed SOPs, P-4 Replace linkage of suspension systems as per SOPs, P-5 Perform after service test to determine normal working of linkage applying prescribed</p>	<p>A competent individual must be able to successfully: K-1 Describe Specific safety precautions and guidelines necessary to replace suspension bushes, K-2 Interpret repair manuals to suspension bush replacement section, K-3 Identify tools and equipment's required to replace suspension linkage, K-4 Define uses and necessity of suspension linkage, K-5 Identify tools and equipment</p>	<p>Toll trolley Personal protective equipment (PPEs) SST Repair Manual Lifting source Hydraulic Press</p>

	methods of testing.	required to remove from and fix in suspension system,	
E-5 Replace Shock Absorber	<p>A competent individual must be able to successfully:</p> <p>P-1 Identify shock absorber in suspension system of vehicle correctly,</p> <p>P-2 Inspect shock absorber normal function applying SOPs,</p> <p>P-3 Remove shock absorber using prescribed SOPs.</p> <p>P-4 Perform servicing on shock absorber applying SOPs,</p> <p>P-5 Install shock absorber in vehicle correctly,</p> <p>P-6 Perform after service test to determine normal working of shock absorbers applying prescribed methods of testing.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe Specific safety precautions and guidelines necessary to replace suspension bushes,</p> <p>K-2 Interpret schematics of shock absorbers repair manual,</p> <p>K-3 Identify tools and equipment required to work on shock absorber,</p> <p>K-4 Define uses and necessity of shock absorbers,</p> <p>K-5 Identify tools, equipment and consumables required to work on shock absorber.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting source</p>
E-6 Replace Leaf Spring	<p>A competent individual must be able to successfully:</p> <p>P-1 Identify leaf spring in suspension system of vehicle correctly,</p> <p>P-2 Inspect leaf spring normal function applying SOPs,</p> <p>P-3 Remove leaf spring using prescribed SOPs.</p> <p>P-4 Perform servicing on leaf spring</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe Specific safety precautions and guidelines necessary to replace leaf spring,</p> <p>K-2 Interpret schematics of repair manual,</p> <p>K-3 Identify tools and equipment required to work on leaf spring,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting source</p>

	<p>applying SOPs,</p> <p>P-5 Install leaf spring in vehicle correctly,</p> <p>P-6 Perform after service test to determine normal working of leaf spring applying prescribed methods of testing.</p>	<p>K-4 Define uses and necessity of leaf spring in vehicle,</p> <p>K-5 Identify tools, equipment and consumables required to work on leaf spring.</p>	
E-7 Perform Wheel Alignment	<p>A competent individual must be able to successfully:</p> <p>P-1 Drive vehicle to the identify wheel alignment applying prescribed methods of testing,</p> <p>P-2 Drive vehicle on to the plate form of wheel alignment machine (Turn Table) precisely,</p> <p>P-3 Calibrate the wheel alignment machine to the vehicle speciation correctly,</p> <p>P-4 Perform wheel alignment following OEM data sheet for the vehicle,</p> <p>P-5 Remove vehicle from wheel alignment machine safely,</p> <p>P-6 Perform after alignment test drive to determine correct wheel alignment.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while automobile wheel alignment,</p> <p>K-2 Describe necessity of wheel alignment,</p> <p>K-3 Enumerate procedure of wheel alignment,</p> <p>K-4 Identify parts of wheel alignment machine,</p> <p>K-5 State operation and controls of wheel alignment machine,</p> <p>K-6 Interpret wheel alignment machine operation manual.</p> <p>K-7 Interpret repair manuals to perform vehicle wheel alignment,</p> <p>K-8 Select tools equipment and consumable required to perform wheel alignment.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lift four post</p> <p>Wheel Alignment Machine</p>

<p>E-8 Perform Wheel Balancing</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Drive vehicle to the identify wheel balancing applying prescribed methods of testing,</p> <p>P-2 Remove the wheel from vehicle applying SOPs,</p> <p>P-3 Calibrate the wheel balancing machine to the wheel correctly,</p> <p>P-4 Perform wheel balancing following OEM data sheet for the vehicle,</p> <p>P-5 Fix balanced wheel on vehicle applying SOPs,</p> <p>P-6 Perform after wheel balancing test drive to determine correct wheel alignment.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while automobile wheel alignment,</p> <p>K-2 Describe necessity of wheel alignment,</p> <p>K-3 Enumerate procedure of wheel alignment,</p> <p>K-4 Identify parts of wheel alignment machine,</p> <p>K-5 State operation and controls of wheel alignment machine,</p> <p>K-6 Interpret wheel alignment machine operation manual,</p> <p>K-7 Interpret repair manuals to perform vehicle wheel alignment,</p> <p>K-8 Identify tools equipment & consumable required to perform wheel balancing.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Lifting Source –(Lift Two post)</p> <p>Wheel Balancing Machine</p>
--	--	--	---

Module F: Maintain Transmission System

Overview: Overview: This Module (F) of competency standard for Automotive technician identifies the competencies required to maintain transmission system including identification of transmission system operation, changing of transmission fluid, Replacement of transmission fluid filter, Replacement of transmission system mountings, Perform automatic transmission over hauling, replacement of clutch system components, repairing of gear box, replacement of automatic transmission shift lever bushes, replacement of CV joints, Re-installation of propeller shaft, and adjustment of differential backlash.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
F-1 Verify transmission operation	<p>A competent individual must be able to successfully:</p> <p>P-1 Check vehicle for identification of transmission type,</p> <p>P-2 Perform basic physical inspection of transmission system,</p> <p>P-3 Determine performance of vehicle transmission performance,</p> <p>P-4 Diagnose faults in Transmission system of the vehicle.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on transmission system of vehicle,</p> <p>K-2 Differentiate between manual and automatic transmission of automobile,</p> <p>K-3 Describe working principle of manual and automatic transmission of automobile,</p> <p>K-4 Enlist main components of manual transmission system,</p> <p>K-5 Identify components of automatic transmission system,</p> <p>K-6 Interpret schematics of manual and automatic transmission systems of automobile,</p> <p>K-7 Describe symptoms/causes of trouble in manual transmission system of the vehicle,</p> <p>K-8 Describe symptoms/causes of trouble in Automatic transmission system of the vehicle,</p> <p>K-9 Describe techniques and procedures of diagnosing faults due to</p>	<p>Lifting Source –(Lift Two post)</p> <p>Scanner</p>

		<p>electrical malfunctioning in transmission system of automobile,</p> <p>K-10 Select tools, equipment and consumables required for working on transmission system of vehicle.</p>	
<p>F-2</p> <p>Change automatic transmission fluid(ATF)</p>	<p>A competent individual must be able to successfully:</p> <p>Identify Transmission fluid drain mechanism / sump,</p> <p>P-1 Determine transmission fluid characteristics prescribed method,</p> <p>P-2 Remove transmission fluid from system without spoilage,</p> <p>P-3 Clean automatic transmission fluid strainer according to repair manual,</p> <p>P-3 Pour recommended quantity of fluid into transmission system without spoilage,</p> <p>P-4 Dispose of used transmission fluid applying SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted for ATF change in vehicle,</p> <p>K-2 Enlist Tools, equipment and consumables used for ATF change,</p> <p>K-3 Explain importance of following ATF change schedule,</p> <p>K-4 Explain techniques for dismantling automatic transmission oil sump.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Waste oil Container</p> <p>Lifting source (Two Post)</p>
<p>F-3</p> <p>Replace automatic transmission fluid filter</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate ATF filter on vehicle correctly,</p> <p>P-2 Remove ATF filter from vehicle correctly,</p> <p>P-3 Install ATF filter in the vehicle according to OEM Manual.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted for ATF change in vehicle,</p> <p>K-2 Differentiate between automatic transmission fluid filter & Steiner,</p> <p>K-3 Explain importance of following</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Waste oil Container</p>

	.	<p>ATF change schedule,</p> <p>K-4 Describe schedule of oil filter change as per OEM recommendation,</p> <p>K-5. Select SST for oil filter replacement,</p> <p>K-6 Explain techniques for dismantling automatic transmission oil sump,</p> <p>K-7 Explain techniques for replacement of automatic transmission fluid filter.</p>	Lifting source (Two Post)
<p>F-4</p> <p>Replace transmission mountings</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate transmission mounting on vehicle correctly,</p> <p>P-2 Remove mountings from transmission system of vehicle correctly,</p> <p>P-4 Diagnose faulty/grinded/silted/damaged/ broken mounting applying SOPs,</p> <p>P-5 Re-Install mountings in the transmission system vehicle according to OEM Manual,</p> <p>P-6 Perform test drive to determine functioning of transmission mounting correctly,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted for replacement of transmission mountings in automobile,</p> <p>K-2 Enlist Tools, equipment and consumables used for replacement of transmission mountings in automobile,</p> <p>K-3 Define problems accrued due to damage transmission mountings in automobile,</p> <p>K-4 Explain techniques for dismantling of transmission mountings in automobile,</p> <p>K-5 Explain techniques for removing transmission mounting.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Hydraulic Jack</p>

<p>F-5 Replace Automatic Transmissions Shift lever button</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate Shift lever button on vehicle correctly,</p> <p>P-2 Remove Shift lever button from transmission system of vehicle applying proper method,</p> <p>P-3 Install shift lever button in transmission system of vehicle according to OEM Manual,</p> <p>P-4 Test shift lever button for normal operation.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted for replacement of Shift lever button in automobile,</p> <p>K-2 Enlist Tools, equipment and consumables used for replacement of Shift lever button in automobile,</p> <p>K-3 Discuss about possible problems occurrence due to damaged Shift lever button in automobile,</p> <p>K-4 Explain techniques for dismantling of Shift lever button in automobile,</p> <p>K-5 Enumerate method of removing shift lever button.</p>	<p>Toll trolley Personal protective equipment (PPEs) SST Repair Manual</p>
<p>F-6 Perform automatic transmission overhauling</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Apart manual transmission system installation from vehicle,</p> <p>P-2 Dis-engage transmission system from vehicle,</p> <p>P-3 Dismantle transmission system part,</p> <p>P-4 Take measurements of automatic transmission components,</p> <p>P-5 Diagnose faulty / grinded/silted / damaged / broken part related with gear</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted to perform automatic transmission system overhauling in automobile,</p> <p>K-2 Explain mechanical measuring units,</p> <p>K-3 Demonstrate use of automobile shop measuring instrument,</p> <p>K-4 Explain measurement techniques</p>	<p>Toll trolley Personal protective equipment (PPEs) SST Repair Manual Waste oil Container Lifting source (Two Post) Multi-meter Hydraulic jack</p>

	<p>box applying SOPs</p> <p>P-6 Perform servicing on manual transmission system,</p> <p>P-7 Connect automatic transmission mechanical components,</p> <p>P-8 Connect automatic transmission electrical components,</p> <p>P-9 Re-Install automatic transmission system on vehicle,</p> <p>P-10 Perform test drive to determine functioning of transmission system correctly.</p>	<p>for automatic transmission system of automobile,</p> <p>K-5 Describe function of automatic transmission system mechanical parts,</p> <p>K-6 Describe function of automatic transmission system electrical parts,</p> <p>K-7 Enumerate automatic transmission installations removal steps,</p> <p>K-8 Explain techniques for overhauling automatic transmission,</p> <p>K-9 Select tools, equipment & consumable according to the repair manual,</p> <p>K-10 Adopt proper method for dismantling and assembling of automatic transmission according to repair manual.</p>	<p>Transmission overhauling Stand</p>
<p>F-7 Replace clutch system components (Manual Transmission)</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate clutch system components (e.g. Clutch, master cylinder, fly wheel, clutch plate, finger plate etc.) on vehicle correctly,</p> <p>P-2 Remove components from clutch system of vehicle applying proper method,</p> <p>P-3 Diagnose faulty/grinded/silted/damaged/ broken part</p>	<p>A competent individual must be able to successfully :</p> <p>K-1 Describe precautionary measures adopted for replacement of Shift lever button in automobile,</p> <p>K-2 Interpret schematics of clutch systems in automobile,</p> <p>K-3 Define possible problems occurrence due to faulty clutch system</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting Source</p> <p>Hydraulic jack</p>

	<p>related with clutch system applying SOPs,</p> <p>P-4 Take measurements of clutch system components,</p> <p>P-5 Perform servicing on clutch system,</p> <p>P-6 Re-Install clutch system in vehicle according to OEM Manual,</p> <p>P-7 Test clutch system for normal operation.</p>	<p>in automobile,</p> <p>K-4 Explain techniques for dismantling of clutch system components in automobile,</p> <p>K-5 Select tools, equipment and consumables used for replacement of clutch system components in automobile.</p>	
<p>F-8 Perform Manual transmission overhauling</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate gear components (e.g. input shaft, output shaft Shift levers, gears etc.) on vehicle correctly,</p> <p>P-2 Remove components from gear box of vehicle applying proper method,</p> <p>P-3 Take measurements of gearbox components correctly,</p> <p>P-4 Diagnose faulty/grinded/silted/damaged/ broken part related with gear box by applying SOPs,</p> <p>P-5 Repair gear box using prescribed techniques,</p> <p>P-6 Re-Install gear box in vehicle according to OEM Manual,</p> <p>P-7 Test gear system for normal operation by applying prescribed testing</p>	<p>A competent individual must be able to successfully :</p> <p>K-1 Interpret gearbox schematics of specific automobile,</p> <p>K-2 Define possible problems occurrence due to malfunctioning gearbox in automobile,</p> <p>K-3 Explain techniques for dismantling of gearbox and its components in automobile,</p> <p>K-4 Select tools, equipment and consumables used to perform repairing of automobile gearbox.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Hydraulic jack</p> <p>Transmission Overhaul stand</p>

	method.		
F-9 Replace shift lever bushes	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate Shift lever bushes on vehicle correctly,</p> <p>P-2 Remove Shift lever bushes from transmission system of vehicle applying proper method,</p> <p>P-3 Install shift lever bushes in transmission system of vehicle according to OEM Manual,</p> <p>P-4 Test shift lever bushes for normal operation,</p>	<p>A competent individual must be able to successfully :</p> <p>K-1 Describe precautionary measures adopted for replacement of Shift lever bushes in automobile,</p> <p>K-2 Interpret schematics of shift lever bushes in automobile,</p> <p>K-3 Enlist Tools, equipment and consumables used for replacement of Shift lever bushes in automobile,</p> <p>K-4 Define possible problems occurrence due to malfunctioning Shift lever bushes in automobile,</p> <p>K-5 Explain techniques for dismantling of Shift lever bushes in automobile,</p> <p>K-6 Enumerate method of removing Shift lever bushes.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting source</p>
F-10 Replace constant velocity (CV) joints	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate CV Joints on vehicle correctly,</p> <p>P-2 Remove CV Joints transmission system of vehicle applying proper method,</p> <p>P-3 Install CV Joints in transmission system of vehicle according to OEM</p>	<p>A competent individual must be able to successfully :</p> <p>K-1 Describe precautionary measures adopted for replacement of Shift lever bushes in automobile,</p> <p>K-2 Interpret schematics of CV Joints in automobile,</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting Source</p>

	<p>Manual, P-4 Test CV Joints for normal operation.</p>	<p>K-3 Select tools, equipment and consumables used for replacement of CV Joints in automobile, K-4 Define possible problems occurrence due to malfunctioning of CV Joints in automobile, K-5 Explain techniques for dismantling of CV Joints in automobile, K-6 Enumerate method of removing CV Joints.</p>	
<p>F-11 Reinstall propeller shaft</p>	<p>A competent individual must be able to successfully: P-1 Locate propeller shaft on vehicle correctly, P-2 Remove propeller shaft transmission system of vehicle applying proper method, P-3 Install propeller shaft in transmission system of vehicle according to OEM Manual, P-4 Test propeller shaft for normal operation,</p>	<p>A competent individual must be able to successfully : K-1 Describe precautionary measures adopted for propeller shaft installation in automobile, K-2 Interpret schematics of propeller shaft in automobile, K-3 Select tools, equipment and consumables used for installation of propeller shaft in automobile, K-4 Discuss possible problems occurrence due to malfunctioning of propeller shaft in automobile, K-5 Explain techniques for dismantling of propeller shaft in automobile, K-6 Enumerate method of removing</p>	<p>Toll trolley Personal protective equipment (PPEs) SST Repair Manual Lifting Source(Two post)</p>

		propeller shaft, K-7 Enumerate method of propeller shaft re-installation.	
F-12 Adjust differential backlash	A competent individual must be able to successfully: P-1 Locate differential backlash on vehicle correctly, P-2 Determine adjustment of differential backlash of vehicle for normal function applying proper method, P-3 Perform servicing of for normal function, P-4 Adjust for normal function of vehicle according to OEM Manual, P-5 Test normal after adjustment operation of differential backlash,	A competent individual must be able to successfully : K-1 Describe precautionary measures adopted for differential backlash of automobile, K-2 Identify differential backlash and related parts, K-3 Interpret schematics of differential backlash, K-4 Enlist common Tools, SSTs, equipment and consumables used for installation of differential backlash in automobile, K-5 Define possible problems occurrence due to malfunctioning of differential backlash in automobile, K-6 Explain techniques for dismantling of differential backlash in automobile, K-7 Enumerate method of removing differential backlash. K- 8 Enumerate method of differential backlash adjustment	Toll trolley Personal protective equipment (PPEs) SST Repair Manual Lifting Source (Two post) Differential stand Dial gauge

Module G: Maintain Brake System

Overview: This Module (G) of competency standards for Auto motive technician identifies the competencies required to perform maintenance of break system of vehicles according to Manufacturer Instructions including verification of brake specification , brake inspection, replacement of brake system parts (e.g. brake boosters, wheel cylinder, calipers, disks, drums etc.) This module also includes servicing , bleeding & adjustment of the vital safety system of a vehicle

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
G-1 Verify brake specification	A competent individual must be able to successfully: P-1 Locate main components of standard vehicle breaking system (e.g. Brake Pedal, Brake, booster, Master Cylinder, Brake Fluid, Hydraulic Line, Proportional Valve,	A competent individual must be able to successfully: K-1 Describe precautionary measures adopted for while working on brake system of automobile K-2 Enlist types brake systems in	

	<p>Hydraulic Callipers, Disc Brakes, Brake Pads, Rotor, Drum Brakes, Drum, Brake Shoes, Wheel Cylinder) correctly</p> <p>P-2 Locate components of vehicle Antilock Braking System (e.g. Electronic Wheel Sensors, Emergency Brake) correctly</p> <p>P-3 Determine pedestal braking for normal operation applying SOPs</p> <p>P-4 Determine parking brake for normal operation applying SOPs</p> <p>P-5 Examine brake fluid leakage by applying prescribed methods</p>	<p>automobile</p> <p>K-3 Differentiate braking systems according to technology applications</p> <p>K-4 Describe working of braking system</p> <p>K-5 Enlist component of pedestal (drum) Braking system</p>	
<p>G-2</p> <p>Perform brake inspection</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Inspect brake pads/ brake shoes wear tear as per manual.</p> <p>P-2 Inspect disc pads applying SOPs</p> <p>P-3 Inspect servo unit applying SOPs</p> <p>P-4 Inspect master cylinders applying SOPs</p> <p>P-5 Inspect wheel cylinder applying SOPs</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist component of pedestal (disk) Braking system</p> <p>K-2 Enlist component of hydraulic Braking system</p> <p>K-3 Enlist component of ABS</p> <p>K-4 Identify components of Parking brake system</p> <p>K-5 Explain the function of parking brakes</p> <p>K-6 Tabulate reaction and distance braking ratio</p> <p>K-7 Describe replacement brake</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting Source (Two post)</p> <p>Vernier Calliper, Micrometre, Dial gauge</p>

		pads / brake shoes as manual	
G-3 Replace brake booster	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate brake booster on vehicle correctly</p> <p>P-2 Remove brake booster of vehicle applying proper method</p> <p>P-3 re-assemble brake booster in transmission system of vehicle according to OEM Manual</p> <p>P-4 Test brake booster for normal operation</p>	<p>A competent individual must be able to successfully:</p> <p>K-2 Enlist Tools, equipment and consumables used for replacement of brake booster in automobile</p> <p>K-3 Define possible problems occurrence due to damaged brake booster in automobile</p> <p>K-6 Explain techniques for dismantling of brake booster in automobile</p> <p>K-2 Enumerate method of removing brake booster</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Brake bleeding unit</p>
G-4 Replace brake master cylinder	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate master cylinder on vehicle correctly</p> <p>P-2 Remove master cylinder of vehicle applying proper method</p> <p>P-3 Re-assemble master cylinder in vehicle according to OEM Manual</p> <p>P-4 Test master cylinder for normal operation by applying techniques prescribes in service manual.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1</p> <p>K-2 Enlist Tools, equipment and consumables used for replacement master cylinder in automobile</p> <p>K-3 Define possible problems occurrence due to damaged master cylinder in automobile</p> <p>K-6 Explain techniques for dismantling of master cylinder in automobile</p> <p>K-2 Enumerate method of removing master cylinder</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Brake bleeding unit</p>

<p>G-5 Replace wheel cylinder</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate on vehicle correctly</p> <p>P-2 Remove wheel cylinder of vehicle applying proper method</p> <p>P-3 Re-assemble wheel cylinder of vehicle according to OEM Manual</p> <p>P-4 Test wheel cylinder for normal operation</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist Tools, equipment and consumables used for replacement of wheel cylinder in automobile</p> <p>K-2 Define possible problems occurrence due to damaged wheel cylinder in automobile</p> <p>K-3 Explain techniques for dismantling of wheel cylinder in automobile</p> <p>K-4 Enumerate method of removing wheel cylinder</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Brake bleeding unit</p> <p>Lifting Source (Two Post)</p> <p>Washing tray</p>
<p>G-6 Replace brake callipers</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate brake callipers on vehicle correctly</p> <p>P-2 Remove brake callipers of vehicle applying proper method</p> <p>P-3 Install brake callipers of vehicle according to OEM Manual</p> <p>P-4 Test brake callipers for normal operation</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist Tools, equipment and consumables used for replacement of Shift lever button in automobile</p> <p>K-2 Define possible problems occurrence due to damaged brake callipers in automobile</p> <p>K-3 Explain techniques for dismantling of brake callipers in automobile</p> <p>K-4 Enumerate method of removing brake callipers</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Brake bleeding unit</p> <p>Lifting Source (Two Post)</p> <p>Washing tray</p>

<p>G-7 Replace brake Disks/drums</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate brake Disks/drum on vehicle correctly</p> <p>P-2 Remove brake Disks/drum of vehicle applying proper method</p> <p>P-3 Install brake Disks/drum of vehicle according to OEM Manual</p> <p>P-4 Test brake Disks/drum for normal operation</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist Tools, equipment and consumables used for replacement of brake Disks/drum in automobile</p> <p>K-2 Define possible problems occurrence due to damaged brake Disks/drum in automobile</p> <p>K-3 Explain techniques for dismantling of brake Disks/drum in automobile</p> <p>K-4 Enumerate method of removing brake Disks/drum</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting Source (Two Post)</p>
<p>G-8 Service Brake Hoses,Pipes ,</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate Brake line parts in vehicle correctly</p> <p>P-2 Re assemble brake fluid reservoir correctly.</p> <p>P-3 Detect brake fluid leakage by applying prescribed leakage detection procedures</p> <p>P-4 Examine connection/terminals of brake lines to the wheel assembly</p> <p>P-5 Remove brake lines as per SOPs</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Define possible problems occurrence due to damaged brake lines in automobile</p> <p>K-2 Enumerate method of removing brake lines</p> <p>K-3 Explain techniques for dismantling of brake lines in automobile</p> <p>K-4 Interpret brake section of OEM manual</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting Source (Two Post)</p> <p>Washing tray</p>

	<p>P-6 Re-Install brake lines as per SOPs</p> <p>P-7 Remove slack out of the brake lines safely</p> <p>P-8 Test brake lines for normal function by applying SOPs</p>	<p>K-4 Select Tools, equipment and consumables used for replacement of brake lines in automobile</p>	
<p>G-9</p> <p>Perform air bleeding</p>	<p>A competent individual must be able to successfully::</p> <p>P-1 Confirm need to bleed the brake lines as per automobile workshop SOPs</p> <p>P-2 Position vehicle on a flat surface safely</p> <p>P-3 Perform air bleeding as per SOPs</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted for while performing air bleeding on brake system of automobile</p> <p>K-2 Describe necessity of air bleeding in vehicle</p> <p>K-3 State steps of air bleeding</p> <p>K-4 Select Tools, equipment and consumables used to perform air bleeding on automobile</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting Source (Two Post)</p> <p>Washing tray</p> <p>Brake system Air Bleeding unit</p>
<p>G-10</p> <p>Adjust park brake cable</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Verify Parking brake performance for normal operation</p> <p>P-2 Locate both terminals of parking brake cable for normal physical connection/strength</p> <p>P-3 Perform servicing on parking brake cable as per SOPs</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist Tools, equipment and consumables used for adjustment of parking brake of automobile</p> <p>K-2 Define possible problems occurrence due to defective parking brake of automobile</p> <p>K-3 Explain techniques for dismantling</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Lifting Source (Two Post)</p>

	P-4 Perform adjustment of Parking brake cable on optimum position as per OEM manual prescriptions P-5 Test brake for normal operation	of parking brake cable of automobile K-4 Enumerate re-assembling of parking brake cable	
--	--	--	--

Module H: Perform On-board Diagnostic

Overview:.. This Module (H) of competency standard for Auto motive technician identifies the competencies required to perform vehicles on board diagnosis according to Manufacturer recommendations including vehicle scanning, fault detection in vehicle electronic system, resetting of service intervals, replacement of electronic control unit, sensors, actuators and performing on board manual diagnostic.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
H-1 Perform vehicle scanning	A competent individual must be able to successfully: P-1 Prepare vehicle for scanning using specific method mentioned in OEM manual P-2 Connect Data Link Cable with vehicle diagnostic connector. Using specified method mentioned in service manual. P-3 Set the scanning system according to the specific vehicle	A competent individual must be able to successfully: K-1 Describe precautionary measures adopted for while performing on board scanning K-2 Enlist parts of on board scanning system K-3 Enlist method of on board scanning K-4 Describe the function of the scanner. K-5 Describe the method of connecting	Seat Cover, Floor Mat Scanner Repair Manual

	P-4 Perform scanning of vehicle	data link cable K-8 Select tools, equipment and consumables required for vehicle scanning	
H-2 Detect faults in vehicle Electronic System	<p>A competent individual must be able to successfully:</p> <p>P-1 Interpret vehicle data for diagnosing</p> <p>P-2 Collect Engine electrical data of vehicle through OBD scanning applying techniques given in OEM & scanner manuals.</p> <p>P-3 Collect power train electrical data of vehicle through OBD scanning applying techniques given in OEM & scanner manuals</p> <p>P-4 Collect vehicle chassis electrical data through OBD scanning applying techniques given in OEM & scanner manuals.</p> <p>P-5 Collect vehicle body electrical data through OBD scanning applying techniques given in OEM & scanner manuals.</p> <p>P-6 Retrieve collected electrical data applying techniques given in scanner manual.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe the method of connecting data link cable</p> <p>K-2 Describe the method of connecting data link cable with diagnosis connector</p> <p>K-3 Define types of warning lights in instrument cluster</p> <p>K-4 Explain method of data retrieving for vehicle fault diagnosis</p> <p>K-5 Explain data retrieving procedure for diagnosing of vehicle.</p> <p>K-6 Interpret OBD program</p>	<p>Seat Cover, Floor Mat</p> <p>Scanner</p> <p>Repair Manual</p>
	A competent individual must be able to	A competent individual must be able to	Seat Cover, Floor Mat

<p>H-3 Reset Service Intervals</p>	<p>successfully:</p> <p>P-1 Select the vehicle data for resetting service interval</p> <p>P-2 Perform equipment setting for vehicle data resetting</p> <p>P-3 Back up vehicle service data on prescribed location</p> <p>P-4 Wipe/Delete previous data from vehicle on customer's demand, applying methods recommended in OEM manual</p> <p>P-5 Perform service intervals resetting applying methods recommended in OEM manual</p>	<p>successfully:</p> <p>K-1 Identify service interval as per maintenance manual</p> <p>K-2 Describe method of Backing up vehicle data</p> <p>K-3 Describe method of deleting vehicle service intervals data.</p> <p>K-4 Enlist steps for performing service intervals resetting</p>	<p>Scanner Repair Manual</p>
<p>H-4 Replace Electronic Control Unit (ECU)</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate ECU in the vehicle correctly</p> <p>P-2 Turn the ignition switch on</p> <p>P-3 Unplug electrical connector of electronic control unit correctly</p> <p>P-4 Remove electronic control unit from vehicle safely</p> <p>P-5 Install ECU in vehicle by applying SOPs</p> <p>P-6 Perform synchronization with the help of scanner according to repair manual</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe the method of connecting data link cable</p> <p>K-2 Interpret complete of possible errors.</p> <p>K-3 Explain the function description electronic control unit.</p> <p>K-4 Explain handling of electrical connectors of electronic control according to repair manual</p>	<p>Toll trolley Personal protective equipment (PPEs) SST Repair Manual Scanner</p>

<p>H-5 Replace Sensors</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate sensors (e.g. Crankshaft position sensor, Camshaft position sensor, Airflow sensor, Throttle position sensor etc.)</p> <p>P-2 Remove typical sensors from the vehicle safely</p> <p>P-3 Connect typical sensors from the vehicle applying SOPs</p> <p>P-4 Perform synchronization with the help of scanner according to OEM manual</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe the method of connecting data link cable</p> <p>K2 define types of sensors and their locations</p> <p>K3 Describe functioning of sensors</p> <p>K-4 Explain handling of electrical connectors of electronic control according to repair manual</p> <p>K-5 Interpret repair manual</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p>
<p>H-6 Replace vehicle Actuators</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate actuators (e.g. Idle speed control valve, variable valve timing intelligent, throttle motor, gear shifting solenoid etc.) in vehicle correctly</p> <p>P-2 Remove actuators safely</p> <p>P-3 Detect faulty actuator in vehicle applying SOPs</p> <p>P-4 Connect actuator in vehicle correctly applying SOPs</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe functioning of actuators</p> <p>K-3 Enlist typical actuators in vehicle</p> <p>K-4 Explain manually testing procedure of actuators</p> <p>K-4 Explain procedure of actuators testing with the help of scanner</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Scanner</p> <p>Multi-meter</p>
<p>H-7 Perform on board manual</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Locate manually diagnostic</p>	<p>A competent individual must be able to successfully:</p>	<p>SST</p> <p>Repair Manual</p>

diagnostic	connector/port of the vehicle correctly P-2 Diagnose trouble part of the vehicle with the help of on board manual diagnoses	K-1 Interpret diagnostic manual K-2 Interpret diagnostic codes K-3 Describe repairs as per service manual	
------------	--	---	--

Module I: Perform Engine Overhauling

Overview. This Module (I) of competency standard for Auto motive technician identifies the competencies required to perform vehicles on board diagnosis according to Manufacturer recommendations including vehicle scanning, fault detection in vehicle electronic system, resetting of service intervals, replacement of electronic control unit, sensors, actuators and performing on board manual diagnostic.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
I-1 Perform Engine Compression Test	A competent individual must be able to successfully: P-1 Perform under bonnet cleaning by applying prescribed cleaning methods P-2 Perform a visual inspection of engine to determine physical concerns/wear and tear P-3 Determine engine worn by visualising out coming smoke from muffler. P-4 Station vehicle for engine removal correctly. P-5 Determine engine performance by listen to the sounds/Noises coming out from engine	A competent individual must be able to successfully: K-1 Describe precautionary measures adopted for performing engine tests on vehicle engine K-2 Define working principle of different engines K-3 Identify parts of Petrol engine K-4 Identify parts of 4 stroke Petrol engine K-5 Identify parts of 2 stroke Petrol engine K-6 Identify parts of diesel engine K-7 Describe construction and function	Toll trolley Personal protective equipment (PPEs) SST Repair Manual Engine compression Tester

	<p>P-6 Determine engine performance by listen to the sounds/Noises coming out from muffler/silencer.</p> <p>P-7 Perform engine dry compression test (with the help of assistant) applying technique mentioned in service manual</p> <p>P-7 Perform engine wet compression test by applying technique mentioned in service manual</p>	<p>of Engine parts</p> <p>K-8 Explain in detailed usage of engine compression tester step by step.</p> <p>K-9 Enlist steps of performing dry compression test</p> <p>K-10 Enlist steps of performing wet compression test</p> <p>Interpret engine testing section of OEM service manual</p> <p>Interpret engine inside and outside pictorials</p>	
<p>I-2</p> <p>Perform engine oil pressure test</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Station vehicle for performing engine oil pressure test</p> <p>P-2 Make arrangements to perform oil pressure test</p> <p>P-3 Perform oil pressure test on engine by applying technique mentioned in service manual</p> <p>P-4 Document outcomes of oil pressure test correctly</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 State the reason of performing engine oil tests</p> <p>K-2 Describe installation method of oil pressure gauge</p> <p>K-3 Interpret oil pressure gauge</p> <p>K-4 Enlist steps to perform engine oil pressure test</p> <p>K-5 Enlist steps of performing wet compression test</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Engine oil pressure Tester</p> <p>RPM Meter</p>
<p>I-3</p> <p>Remove engine from vehicle</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Position hoist near vehicle as per</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p>

	<p>SOPs</p> <p>P-2 Remove electrical connectors without damage</p> <p>P-3 Remove peripheral /parts attached/connected with the engine</p> <p>P-4 Remove engine mountings as per SOPs.</p> <p>P-5 Lift engine from vehicle with the help of an assistant</p> <p>P-6 Station engine on over-hauling table/stand.</p>	<p>adopted for removing engine from vehicle</p> <p>K-2 Define engine removing procedure as per service manual.</p>	<p>SST</p> <p>Repair Manual</p> <p>Engine lifting jack</p>
<p>I-4</p> <p>Dismantle engine components</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Document engine information correctly</p> <p>P-2 Drain fluids from Engine as per SOPs</p> <p>P-3 Remove Following by applying correct techniques:</p> <ul style="list-style-type: none"> • Ignition system • Flywheel • Cylinder head • Valves • Crankcase cover • Oil pump • Camshaft and the valve lifters 	<p>A competent individual must be able to successfully:</p> <p>K-1 Enumerate engine dismantling engine procedure</p> <p>K-8 Define:</p> <ul style="list-style-type: none"> ○ Thermodynamics of IC Engine Cycles ○ cycle efficiency ○ Modified fuel-air cycle considering heat losses and valve timing ○ Engine dynamics and torque ○ Use of Combustion chart ○ Thermodynamic cycle with supercharging in engines ○ Limits of Supercharging, Methods of 	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Power Tool (Pneumatic)</p>

	<ul style="list-style-type: none"> • Piston • Connecting rod assembly • Crankshaft • Bearings or seals disassembling a Briggs & Stratton four stroke engine 	<p>Supercharging and Superchargers</p> <ul style="list-style-type: none"> ○ Fuels & combustion in SI engines ○ knocking and fuel rating ○ Energy balance ○ volumetric efficiency measurement of indicated and brake power ○ Exhaust emissions and its measurement and control 	
<p>I-5</p> <p>Perform necessary measurement</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Perform measurements on necessary engine components as per service specifications correctly</p> <p>P-2 Select components to be cleaned by applying SOPs.</p> <p>P-3 Select components to be machined by applying SOPs.</p> <p>P-4 Select components to be replaced by applying SOPs.</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while taking precision measurements.</p> <p>K-1 Give reason for engine inside components measurement.</p> <p>K-2 Enlist inside parts on which measurement is required while engine overhauling</p> <p>K-3 Enlist Tools and equipment used to perform engine physical measurements on engine parts</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Parts Washing tray</p> <p>Measuring Instruments</p> <p>Repair Manual</p>
<p>I-6</p> <p>Repair engine parts</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Perform cylinder block service as per SOPs,</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on engine</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p>

	<p>P-2 Perform machining on engine parts as per specifications</p> <p>P-3 Perform cylinder head and valve train service as per SOPs,</p> <p>P-3 Perform engine valve /valve train service as per SOPs,</p> <p>P-4 Perform engine cam shaft/drives service as per SOPs,</p> <p>P-5 Perform engine Piston service as per SOPs,</p> <p>P-6 Perform engine lubrication and cooling systems service as per SOPs,</p> <p>P-7 Perform engine exhaust system service as per SOPs,</p> <p>P-8 Perform mechanical timing as per SOPs,</p> <p>P-9 Perform front-end service as per SOPs,</p>	<p>components</p> <p>K-2 Explain trouble shooting method for 2 stroke engine</p> <p>K-3 Explain trouble shooting method for four stroke engine</p> <p>K-4 Explain trouble shooting method for diesel engine</p> <p>K-5 Define machining of engine parts</p> <p>K-6 Select Tools and equipment and consumables/adhesives used to perform engine re assembling</p>	<p>Repair Manual</p>
<p>I-7 Re build engine</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Verify Measurement of all dismantle parts as per specification given in OEM manual</p> <p>P-2 Re-assemble engine block</p> <p>P-3 Install crank shaft and its peripherals</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while Re-building engine</p> <p>K-2 Describe engine assembly method as per service manual.</p> <p>K-3 Give importance of gas kits</p> <p>K-4 Explain usage of torque wrench.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Torque Wrench</p>

	<p>P-4 Install the timing chain or belt to specification</p> <p>P-5 Install pistons, rings, gaskets, and seals</p> <p>P-2 Assemble cylinder head components as per service manual</p> <p>P-7 Install head gasket as per SOPs</p> <p>P-8 Install new valve heads and train</p> <p>P-8 inspect re-build engine for recommended fasteners tightness.</p>	<p>P-5 select gaskets</p> <p>K-6 Identify cylinder head components</p> <p>K-7 Enlist components of cylinder head</p> <p>K-8 Described method of cylinder head components.</p> <p>K-9 Select Tools, equipment and consumables/adhesives used to perform engine re assembling</p>	
<p>I-8 Reinstall engine on vehicle</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Place engine on vehicle by applying SOPs</p> <p>P-2 Fasten engine on the chassis as per OEM recommendations.</p> <p>P-2 Re-connect electrical engine fittings as per OEM recommendations.</p> <p>P-3 Re-connect fuel fittings with engine as per OEM recommendations..</p> <p>P-4 Re-connect transmission with</p>	<p>A competent individual must be able to successfully:</p> <p>-1 Describe precautionary measures adopted for engine installation</p> <p>K-1 Describe engine installation procedure</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Engine Lifting Jack</p>

	<p>engine as per OEM recommendations.</p> <p>P-5 Re-connect exhaust fitting with engine as per OEM recommendations.</p> <p>P-6 Perform engine tune up procedure by applying automobile workshop SOPs</p>		
I-9 Test performance after engine Overhauling	<p>A competent individual must be able to successfully:</p> <p>P-1 Go through a careful initial start-up</p> <p>P-2 Check engine performance as per service manual.</p> <p>P-3 Inspect engine leakage by applying automobile workshop SOPs</p> <p>P-4 Communicate after service precautions to the vehicle user clearly</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Explain engine test performance as per specification.</p> <p>K-2 Described engine leakage areas.</p>	<p>Seat cover, foot mat, Valid Driving Licence Scanner</p>

Module J: Maintain Vehicle Infotainment system

Overview:.. This competency standard (J) refers to the development of skills and competences to meet the ever changing market demands and challenges. The technician must evaluate his/her performance, attend capacity building programs and exhibit positive attitude towards attaining the organization's goals.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
-----------------	----------------------	-----------------------------	-------------------

<p>J-1 Check Infotainment System</p>	<p>A competent individual must be able to:</p> <p>P-1 Locate infotainment equipment on/in to vehicle</p> <p>P-2 Adjust audio equipment as per costumer's desire</p> <p>P-3 Adjust Radio channels as per costumer's desire</p> <p>P-4 Adjust video equipment as per costumer's desire</p> <p>P-5 Adjust navigation equipment as per costumer's desire</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe precautionary measures adopted while working on vehicle infotainment system</p> <p>K-2 Enlist typical automobile infotainment equipment</p> <p>Describe working of typical automobile infotainment equipment</p> <p>K-3 Interpret Service Manual of vehicle infotainment equipment</p> <p>K-4 Enlist Tools & equipment required to operate vehicle infotainment equipment</p>	<p>Repair Manual</p> <p>Seat cover, foot mat,</p> <p>Multi-meter</p>
<p>J-2 Replace audio Device</p>	<p>A competent individual must be able to successfully :</p> <p>P-1 Remove audio device from vehicle by applying SOPs</p> <p>P-2 Mount audio device in/on to vehicle by applying SOPs</p> <p>P-3 Perform wiring & cabling of audio device in/on to vehicle as per schematics</p> <p>P-4 Test performance of audio device in/on to vehicle by applying SOPs</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe installation procedure of audio equipment</p> <p>K-2 Interpret (wiring) manual audio equipment</p> <p>K-3 Select Tools, equipment and consumables required to perform automotive audio equipment installation</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Seat cover, foot mat,</p> <p>Multi-meter</p>

<p>J-3 Replace video device</p>	<p>A competent individual must be able to:</p> <p>P-1 Remove video device from vehicle by applying SOPs</p> <p>P-2 Mount video equipment in/on to vehicle by applying SOPs</p> <p>P-3 Perform wiring & cabling of video equipment in/on to vehicle as per schematics</p> <p>P-4 Test performance of video equipment in/on to vehicle by applying SOPs</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe installation procedure of video equipment</p> <p>K-2 Interpret (wiring) manual video equipment</p> <p>K-3 Select Tools, equipment and consumables required to perform automotive video equipment installation</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Seat cover, foot mat,</p> <p>Multi-meter</p>
<p>J-4 Replace Parking Camera</p>	<p>A competent individual must be able to:</p> <p>P-1 Test performance of parking camera for normal functioning</p> <p>P-2 Trace Parking camera wiring/caballing</p> <p>P- 3 Remove Parking camera from the vehicle by applying SOPs</p> <p>P-4 Re-install Parking camera on the vehicle as per OEM manual</p> <p>P-5 Adjust parking camera according to</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Explain operation of parking camera</p> <p>K- 2 Interpret:</p> <ul style="list-style-type: none"> ○ vehicle wiring diagram ○ Parking camera manual <p>K-3 Enlist Tools, equipment and consumables required to replace parking camera on vehicle.</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Seat cover, foot mat,</p> <p>Scanner</p>

	customer's desire.		
J-5 Install navigation equipment	<p>A competent individual must be able to:</p> <p>P-2 Mount navigation equipment in/on to vehicle by applying SOPs</p> <p>P-3 Perform wiring & cabling of navigation equipment in/on to vehicle as per schematics</p> <p>P-3 Connect communication device in vehicle according to schematics</p> <p>P-4 Test performance of navigation equipment in/on to vehicle by applying SOPs</p> <p>P-4 Adjust navigation device as per customer's desire</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Explain device connections</p> <p>K-2 Interpret safety precaution during installation of communication device</p> <p>K-3 Explain about installation procedures of interface cables</p> <p>K-4 Interpret safety precaution during installation of interface cables</p>	<p>Toll trolley</p> <p>Personal protective equipment (PPEs)</p> <p>SST</p> <p>Repair Manual</p> <p>Seat cover, foot mat, Scanner</p>

Module K: Perform Communication

Overview: This competency standard is about proper communication with external and internal customers through various modes of communication

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
K-1 Practice active listening	A competent individual must be able to: P-1 perform desired physical actions on verbal commands accordingly P-2 Determine communication styles elegantly	A competent individual must be able to successfully: K-1 Enlist types of customer behaviours K-2 State advantages of "Less speaking & more listening"	

	<p>P-3 Display body language while listening to a customer to show attention</p> <p>P-4 Demonstrate use of typical dictionary</p>	<p>K-3 Define verbal communication techniques</p> <p>K-4 State advantages of being humble during conversation</p>	
<p>K-2 Ask appropriate questions</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Investigate issue /problem through relevant questions</p> <p>P-2 Demonstrate courteous behaviour while listen to the people actively</p> <p>P-3 Record information about customer's enquiry or complaint as per company practice</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Develop vehicle history questionnaire</p> <p>K-2 Define the necessity of being polite while asking questions</p>	
<p>K-3 Demonstrate telephone etiquette</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Demonstrate courteous behaviour and listen actively to customer</p> <p>P-2 Greet at the beginning & ending of phone call</p> <p>P-3 Opt non- abusive and Jargons less words</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe telephonic communication ethics / norms</p> <p>K-2 Record information about enquiry or complaint as per company's practice</p>	

<p>K-4 Instruct semiskilled workers</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Opt professional & clear language for commending</p> <p>P-2 Use language which labour could understand elegantly</p> <p>P-3 Assign helper his/her job clearly</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe the methods overcome the sentiment</p>	
<p>K-5 Communicate with supervisor</p>	<p>A competent individual must be able to successfully:</p> <p>P-1 Convey ideas to the supervisor precisely</p> <p>P-2 Report safety hazards to supervisor urgently</p> <p>P-3 Maintain good working relation with supervisor elegantly</p> <p>P-4 Help supervisors with the purchasing auto parts, tools , equipment and consumables for economical prices and timely delivery</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe the Importance of accurate communication</p> <p>K-2 Write work reports</p> <p>K-3 Fill indent form</p> <p>K-4 Maintain work history</p>	
<p>K-6 Maintain relations with Parts dealers</p>	<p>A competent individual must be able to:</p> <p>P-1 Apply negotiation skills while dealing with shop owner / dealer elegantly</p> <p>P-2 Maintain telephone/address diary</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Enlist names and address of trade related shops/agencies/ traders / shops</p>	

	up-to-date.	/dealers	
K-7 Perform E-Mail correspondence	<p>A competent individual must be able to successfully:</p> <p>P1. Select appropriate medium and channels for communication and follow organization's strategy</p> <p>P2. Assign and define a clear task / goal with defined deadline for reply and completion</p> <p>P3. Maintain record of all communication (by phone, E-mail, Inter office memos etc.)</p>	<p>A competent individual must be able to successfully:</p> <p>K1. Types of communications, medium, and channels</p> <p>K2. Policy and communication strategy of the organization</p> <p>K3. Hierarchy of the organization and appropriate contacts</p> <p>K4. External stakeholders/customers of the organization</p>	

Module L: Pursue Professional Development

Overview:.. This competency standard refers to the development of skills and competences to meet the ever changing market demands and challenges are a key job role in the occupation of Sales and Customer Service Officer. He/she must evaluate his/her performance, attend capacity building programs and exhibit positive attitude towards attaining the organization’s goals.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
L-1 Obtain automotive technician certification	A competent candidate of certification must be able to successfully: P-1 Attend competency based automotive technician training program with at least 80% attendance and satisfaction of training providers P-2 Get admit card for competency testing test/examination from concerned authority/Board	A competent individual must be able to: K-1 Differentiate between certified and non-certified automotive technician K-2 Enlist duties of a competent technician automobile technician	
L-2 Maintain licensing	A competent individual must be able to: P-1 Exhibit self-learner (at least) Light Transport Vehicle License obtained from concerned/authorised government	A competent individual must be able to: K-1 Interpret traffic signs K-2 Interpret road signs/marks	

	department		
L-3 Attend skill up gradation Training	<p>A competent individual must be able to:</p> <p>P-1 Attend at plant training regularly</p> <p>P-2 Participate in scheduled working plan meeting courteously</p> <p>P-3 Attend skill up gradation training/ seminars regularly</p> <p>P-4 Visit assorted industrial units regularly</p> <p>P-5 Participate in skill competitions regularly</p> <p>P-6 Demonstrate to-do attitude in profession elegantly</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Recognise the importance of Mechatronics technician in process and manufacturing industry</p> <p>K-2 Define technical regulations for process plant</p> <p>K-3 State the importance of teamwork</p> <p>K-4 State the principles of solid, semi-solid and liquid processing</p> <p>K-5 State the importance and application of electro chemical process</p>	
L-4 Consult experts colleagues	<p>A competent individual must be able to:</p> <p>P-1 Get technical advice from pro workers properly</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Collect plant structural data</p>	
L-5 Visit trade exhibitions	<p>A competent individual must be able to:</p> <p>P-1 Report information collected from trade exhibition visit concisely</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Recognise the purpose of visit</p>	

<p>L-6 Join trade associations</p>	<p>A competent individual must be able to:</p> <p>P-1 Upgrade professionalism by joining electrical , electronics and other related associations</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Identify the objectives of trade association</p>	
<p>L-7 Interpret auto industry publications</p>	<p>A competent individual must be able to:</p> <p>P-1 Apply skills mentions in Technical bulletins correctly</p> <p>P-2 Adopt skill up gradation suggested in books and websites</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe the core information from publication</p>	
<p>L-8 Document work performed</p>	<p>A competent individual must be able to:</p> <p>P-1 Perform error free documentation using MS Excel</p> <p>P-2 Write work reports on MS office concisely</p> <p>P-3 Document activity log on prescribed forms</p> <p>P-4 produce hard copy of work done on computer in error free format</p> <p>P-5 Produce basic</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe Ms office short keys</p> <p>K-2 Interpret log books, Manufacturer reports and other relevant documents.</p> <p>K-3 Define short keys for MS Excel</p> <p>K-4 Record the Basic lab. Documentation and plant data</p>	

	<p>drawing using AutoCAD</p> <p>P-6 Complete various reports including work orders.</p> <p>P-7 Maintain work shop inventory.</p>		
L-9 Browse internet	<p>A competent individual must be able to:</p> <p>P-1 Use error free language in writing letters/emails concisely</p> <p>P-2 Ensure format or structure of the correspondence is according to company's practice</p> <p>P-3 Browse website as per desire</p> <p>P-4 Download related software as per desire</p> <p>P-5 Perform accurate communication via internet with in specified time limits</p>	<p>A competent individual must be able to successfully:</p> <p>K-1 Describe procedure of Creating E-mail account</p> <p>K-2 Describe procedure of sending E-mail</p> <p>K-3 Describe short keys for MS office</p>	
L-10 Mentor new staff	<p>A competent individual must be able to:</p> <p>P-1 Motivate newly inducted staff for hard working & more learning</p> <p>P-2 Be polite while giving instructions</p> <p>P-3 Demonstrate problem solving attitude</p>	<p>A competent individual must be able to:</p> <p>K-1 Define the necessity of being mentor for new staff</p>	

Module M: Demonstrate safety

Overview:.. The competency standard (M) is about demonstrating skill and knowledge of personal health, safety, Tools, equipment and consumables safety , firefighting, first aid procedures, quality and environment related regulations, reaction on accidents & safe placement of automobile on work station in automotive repairing workshop.

Competency Unit	Performance Criteria	Knowledge and Understanding	Tools & equipment
<p>M-1 Follow company procedures and policies</p>	<p>A competent individual must be able to:</p> <p>P-1 Review company safety SOP/Policy P-2 Demand safety equipment P-3 Check physical condition of safety equipment P-4 Wear safety equipment during operation as per requirement of SOP/policy P-5 Keep workplace environment clean P-6 Report safety risks and hazards P-7 Report accident P-8 Perform basic fire fighting</p>	<p>A competent individual must be able to:</p> <p>K-1 Company safety SOPs/policies K-2 ISO safety standards K-3 Safety risks & hazards K-4 First aid K-5 Safety equipment K-6 Reporting procedures K-7 Work permit K-8 Best safety practices K-9 Basic fire fighting</p>	

<p>M-2 Wear personal protective equipment as required</p>	<p>A competent individual must be able to:</p> <p>P-1 Select personal protective equipment in terms of type and quantity according to work orders.</p> <p>P-2 Use personal protective equipment to ensure correct fit and optimum protection in compliance with company procedures.</p> <p>P-3 Maintain personal protective equipment to ensure correct fit and optimum protection in compliance with company procedures.</p> <p>P-4 Ensure personal protective equipment is cleaned and stored in proper place.</p>	<p>A competent individual must be able to:</p> <p>K-1 Personal safety equipment</p> <p>K-2 Personal safety risk & hazards</p> <p>K-3 Personal health & hygiene</p> <p>K-4 Anger & stress management</p> <p>K-6 First aid</p> <p>K-7 Basic firefighting</p> <p>K-8 Injuries reporting procedures</p> <p>K-9 House keeping</p> <p>K-10 Safe work habits</p>	<p>helmets, goggle masks, Face Gloves(latex , cotton glove) Overall Combination Safety Shoes</p>
<p>M-3 Use tools and equipment according to manufacturer's specifications</p>	<p>A competent individual must be able to:</p> <p>P-1 Verify machine for normal earthing</p> <p>P-2 Keep tools & equipment secured as per SOPs</p> <p>P-3 Check oil leakage of machines</p> <p>P-4 Verify operation of emergency levers as per scheduled</p> <p>P-5 Follow operating instructions discussed in machines operating manuals</p> <p>P-6 Check unusual mechanical</p>	<p>A competent individual must be able to define:</p> <p>K-2 Fire fighting</p> <p>K-3 First aid</p> <p>K-4 Storage of tools & equipment</p> <p>K-5 Safety covers</p> <p>K-6 Emergency shutdown procedure</p> <p>K-7 Environmental hazards</p> <p>K-8 Electricity hazards</p>	

	<p>noise as per SOPs</p> <p>P-7 Stack selective tools in box/bin</p> <p>P-8 Place safety/dust covers on machines/ equipment when they are not in use</p>		
<p>M-4</p> <p>Handle hazardous materials according to guidelines</p>	<p>A competent individual must be able to:</p> <p>P-1 Store hazardous material at specified room/place according to SOPs</p> <p>P-2 Use hazardous materials as per instructions/ direction mentioned/printed on container/manual</p> <p>P-3 Report spoilage of hazardous materials immediately to the senior</p> <p>P-4 Dispose of hazardous material according to SOPs</p>	<p>A competent individual must be able to:</p> <p>K-1 Enlist typical hazardous materials in automobile workshop</p> <p>K-1 Interpret precaution mention on container of material used in automotive workshop e.g. acids, coolants, adhesives, flammable materials, grease etc.</p>	
<p>M-5</p> <p>Maintain clean shop environment</p>	<p>A competent individual must be able to:</p> <p>P-1 Implement the safety culture of the department;</p> <p>P-2 Ensure the adherence of safe work practices</p> <p>P-3 Demonstrate :</p> <ul style="list-style-type: none"> ○ Application of self-tidiness after work ○ Maintenance of workplace after work ○ Application of scheduled cleaning/dusting 	<p>A competent individual must be able to:</p> <p>K-1 Define advantages of personal Hygiene</p> <p>K-2 Define advantages of tidiness on work place</p>	

	<ul style="list-style-type: none"> ○ Placement of tools and equipment 		
M-6 Use firefighting equipment	<p>A competent individual must be able to:</p> <p>P-1 Inform safety violation/accident before attempting to extinguish</p> <p>P-2 Confirm self-safety before starting to extinguish a fire</p> <p>P-2 Demonstrate operation of :</p> <ul style="list-style-type: none"> ○ Firefighting Blankets ○ Fire buckets ○ Fire extinguisher ○ Fire hose ○ Fire alarm 	<p>A competent individual must be able to:</p> <p>K-1 Describe the operation of typical firefighting installations</p> <p>K-2 Enumerate fire extinguisher</p> <p>K-3 Describe stands for of P.A.S.S. (Pull, Aim, Squeeze, Sweep) related with fire extinguisher</p>	<p>Fire Extinguishers, A, B,C Type</p> <p>First Aid Box</p> <p>Sand Buckets</p> <p>Fire Fighting Blanket</p>
M-7 Report safety violations	<p>A competent individual must be able to:</p> <p>P-1 Communicate safety breach to the authority orally.</p> <p>P-2 Prepare safety violation/s report in writing</p> <p>P-3 Communicate safety breach to the authority orally.</p> <p>P-4 Prepare safety violation/s report in writing</p>	<p>A competent individual must be able to:</p> <p>K-1 Describe hazard reporting procedure.</p>	
M-8	A competent individual must be able to:	A competent individual must be able to:	Valid Driving Licence

Station vehicle on specified work place	P-1 Drive /Drag vehicle to workplace safely using SOPs P-2 Lift Vehicle up to desired height safely using SOPs P-3 Demonstrate operation of car lifter	K-1 Enlist car lifting machine K-2 Differentiate mechanical and hydraulic Jacks K-3 Explain working of workshop car lifter.	
--	--	--	--

List of tools and equipment

<i>Sr. No.</i>	<i>Description</i>	<i>Quantity (No.)</i>
1.	A/C Recycling machine	2
2.	Adequate fire extinguisher	10
3.	Air Compressor	2
4.	Air pressure gun	10
5.	Allen key/torx screw set	10
6.	Approved first aid kit	3
7.	Axle stands	5
8.	Battery (13.2 V , 64 AH)	5
9.	Battery tester / charger	5
10.	Bench drill machine I	10

11.	Bench grinder	10
12.	Bench vices	10
13.	Brake bleeding machine	10
14.	Brake calliper	10
15.	Caulking/sealing gun	10
16.	Centre punch	10
17.	Chisels	12
18.	Coil spring compression	12
19.	Combination spanners set	8
20.	Compression tester	8
21.	Computer	20
22.	Cooling system pressure testing equipment	10
23.	Creeper	10
24.	Creeper Boards	10
25.	Crimping tool	20
26.	Cushion or knee protectors	20
27.	Disc set	20
28.	Disc turning machine	20
29.	Drill set	10

30.	Engine analyser	2
31.	Engine overhauling stand Wheel alignment machine	2
32.	Feeler gauge	10
33.	File set	10
34.	Files	10
35.	Flaring tool	10
36.	Gap adjusting tool	10
37.	Garage jacks	10
38.	Gas analyser	2
39.	Gas leak detection equipment (electronic and snoop)	2
40.	Grease gun	2
41.	Hack saw	10
42.	Hammer set	10
43.	Hand drill machine	5
44.	Hand grinder	5
45.	Head light aligner	5
46.	Heat Gun	2
47.	Heat gun	2
48.	Hoist/ramp/pit (pit no AF)	2

49.	Hot glue gun	2
50.	Hydraulic jack	5
51.	Hydraulic press	5
52.	Hydrometer	5
53.	Infra-red emission tester	2
54.	Inspection lamp	5
55.	Knife	20
56.	Laptop computer and relevant software	10
57.	Lathe machine	5
58.	Lead light	5
59.	Lifts	2
60.	Locktite sealers	10
61.	Magnet Rod	10
62.	Rubber Mallet	10
63.	Metal hole saw	10
64.	Micro-meter (digital)	20
65.	Multi meter	20
66.	Oil can	20
67.	Oil drain Steiner	20

68.	Oil filter (strip) spanner	20
69.	Open end spanners set	10
70.	Overhead winch	10
71.	parts trolley	5
72.	Parts washing trolley	5
73.	Pipe wrench	10
74.	piston compression	2
75.	Piston ring Compression	2
76.	Piston Ring Expender	5
77.	Plastic Gauge	5
78.	Plastic trim tool/craft knife	10
79.	Players	10
80.	Pop riveting gun	10
81.	Portable gas proof inspection lamps	10
82.	Power lead	10
83.	Power set	10
84.	Printer	2
85.	Protective eyewear	2
86.	Puller	5

87.	Punch set	5
88.	Radiator leakage tester	2
89.	Relevant safety equipment	5
90.	Rigid Racks	5
91.	Ring spanners set	5
92.	RPM gauge	5
93.	Scan tool	5
94.	Scanner (Diagnostic)	2
95.	Scissor pain	5
96.	Scraper	5
97.	Screw driver set	20
98.	Screw extractor set	20
99.	Service Vehicle	20
100.	Slan Set	5
101.	Socket set	5
102.	Soldering equipment	10
103.	Soldering iron	10
104.	Soundo scope	5
105.	Service tool (SST)	5

106.	Spanners Set	2
107.	Spark Plug cleaner	10
108.	Spike guarded jumper leads	10
109.	Steam wash machine	5
110.	Tape measure	5
111.	Tappet set	10
112.	Taps and dies	10
113.	Thermometer	10
114.	Timing light	10
115.	Tire changer	10
116.	Tire pressure gauge	5
117.	Tongue wrench	5
118.	Tool box	20
119.	Tools trolley	20
120.	Torsion wrench	20
121.	Transmission jack	5
122.	Tube cutter	5
123.	Universal stereo removal set	10
124.	Vacuum and compression gauges	10

125.	Vacuum cleaner	2
126.	Vacuum tester	2
127.	Valve compressor	5
128.	Venires calliper	5
129.	Welding equipment	10
130.	Wheel balance	5
131.	Wheel chocks	5
132.	Wheel spanner cross type	5
133.	Wire brush	10
134.	Wire cutters	20
135.	Wire strippers	20
136.	Workshop car lifter machine	10

List of consumables

<i>Sr. No.</i>	<i>Description</i>	<i>Quantity</i>
1.		-
2.	Anti-freeze	20
3.	Battery electrolyte	20
4.	Brake oil/fluid (assorted)	20
5.	Contact cleaner	10
6.	Cotton waste	50

7.	Diesel	50
8.	Distilled water	50
9.	Emery paper	50
10.	Emery paste	50
11.	Engine oil	20
12.	fasteners and ties	100
13.	Gear oil/fluid	20
14.	Grease (assorted)	20
15.	Insulation tape	50
16.	Kerosene oil	50
17.	Knitted hand gloves	50
18.	Metal glue	20
19.	Paper and Pen	50
20.	Petrol	50
21.	Plastercine /bluetac	20
22.	Radiator liquid	20
23.	Rubber solution	20
24.	Rust cleaner	- 20
25.	Safety glasses	20

26.	Selection of nuts, bolts, washers, screws	100
27.	soap	20
28.	Solder	50
29.	Washing powder	50