Curriculum

For

Rickshaw Mechanic – Three Wheeler Mechanic

(Six Month Duration Course)

Code: VJ92S007

Table of Contents

Introduction Template

Overall objective of course

The objective of this course is to produce skilled Rickshaw Mechanic having ability to use tools and equipment properly.

Competencies gained after completion of course

Successful candidate get conversant with all types of Repair, Maintenance and overhauling of Rickshaw – Three Wheelers

Job opportunities available immediately and in the future

Work as assembler /fabricator in automobile/mechanical parts or equipment industry; auto mechanic ; self-employed for repair and maintenance auto rickshaw /petrol engine mechanic

Trainee entry level

8^{th} to 10^{th} grade

Age Limit

18 years and above.

Minimum qualification of trainer

Diploma of Associate Engineer in Auto

Medium of Instruction i.e. language of instruction

English (preferably) / **Urdu** (general) / Local (Provincial) Language in Pakistan

Sequence of the modules

All independent (except 6 and 7 may split into all learning outcomes)

- diesel / mechanical / Power **OR** 10^{th} grade with five years' experience specially in Overhauling Rickshaw
- Timeframe of assessment (recommendation)Preferably after each module, However Overall Assessment is made **After completion of Course**

Overview about the program

Module Title and Aim	Learning Units	Theory[1] Days/hours	Workplace[2] Days/hours	Timeframe of modules
Module 1 **Perform Diagnosis** **Aim**: Trainee will be able to understand diagnosing and rectifying minor faults for smooth operation.	1.1 Takes complaint from customer 1.2 Checks wheels 1.3 Inspects electrical system 1.4 Checks fly wheel and its system 1.5 Checks emission 1.6 Checks sound/noise of engine 1.7 Inspects fuel transmission 1.8 Checks oil level 1.9 1check steering and suspension system	/1	/7	One week
Module 2 **Performs tuning of engine** **Aim**: the trainee(s) will be able to acquire the skills and knowledge to tune up engine.	2. 1 Checks tappet 2. 2 Replaces air-filter 2. 3 Cleans radiator 2. 4 Services plug 2. 5 Replaces oil-filter 2. 6 Fuel system and Services carburetor 2. 7 Check and Cleans silencer 2. 8 Check and Adjusts CB-point 2. 9 Adjusts and clean gas regulator			Four weeks
Module 3 **Repairs brake system** **Aim**: Trainee will be able to diagnosed faults and repair the brake system as per specification/ease of use.	3. 1 Jacks up the rickshaw 3. 2 Dismantles wheel 3. 3 Dismantles brake parts 3. 4 Cleans brake parts 3. 5 Replaces worn-out parts 3. 6 Assembles brake parts 3. 7 Fills brake oil 3. 8 Performs air-bleeding 3. 9 Performs brake test 3. 10 Jacks down the rickshaw			Two weeks

[1] Learning hours in training provider premises
[2] Training workshop, laboratory and on-the-job workplace

Module 4 **Repairs steering system** **Aim** : Trainee will be able to diagnosed faults and repair the steering system as per specification/ease of use.	4.1 Jacks up the rickshaw 4.2 Dismantles front wheel 4.3 Dismantles steering mechanism 4.4 Cleans steering parts 4.5 Replaces worn-out parts 4.6 Applies greasing to bearings 4.7 Assembles steering mechanism 4.8 Fits steering mechanism 4.9 Adjust play in steering 4.10 Jacks down the rickshaw			Two weeks
Module 5 **Performs engine overhauling** **Aim**: the trainee(s) will be able to acquire the skills and knowledge to overhaul engine	5.1 Remove engine cover 5.2 Disconnects fuel supply 5.3 Disconnects battery connection 5.4 Removes silencer 5.5 Removes engine from foundation 5.6 Drains water from radiator 5.7 Drains oil from engine 5.8 Removes auxiliaries accessories 5.9 Dismantles engine 5.10 Cleans engine parts 5.11 Replaces engine parts 5.12 Repairs engine parts 5.13 Assembles the engine 5.14 Refits auxiliaries accessories 5.15 Fits engine on foundation 5.16 Fills oil in engine 5.17 Fills water in radiator 5.18 Connects battery terminal 5.19 Connect fuel supply			Five weeks
Module 6 **Follows safety rules** **Aim**: aim, the trainee(s) will be able to observe workplace safety rules, regulations and practices, and to maintain a safe, Healthy, hygienic and environmental friendly workplace.	6.1 Wears proper clothing 6.2 Cleans hands and body 6.3 Maintains workplace cleaning 6.4 Ensures ventilation and light 6.5 Maintains safety of colleagues 6.6 Uses fire-extinguishers 6.7 Cleans tools and equipment			One weeks
Module 7 **Performs Communication** **Aim**:	7.1 Communicates with client/owner 7.2 Communicates with supervisor 7.3 Communicates with juniors 7.4 Communicates with machinist			one weeks

Aim: the trainee(s) will be able communicate verbal and written in society	7.5 Communicates with electrician 7.6 Communicates with peers 7.7 Communicates with auto-parts sellers/vendors			
Module 8 **Transmission System** **Aim**: The trainee will be able to acquire the transmission system	8.1 Clutch Assembly 8.2 Gear Assembly Mechanism 8.3 Universal Cross Joint & Propeller Shaft 8.4 Differential 8.5 Axels and hubs			Four weeks

Curriculum Contents (Teaching and Learning Guide)

Module 1: Perform Diagnosis

Objective of the Module: .Diagnosing and rectifying minor faults for smooth running

Duration: 40 hours Theory: 08hours Practice 32 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
1.1 Takes complaint from customer	To ensure customer his/her arguments are in consideration Satisfy customer against complains	Know the effect of carefully listening, Ability to: rectify problems and keep customer in pleasant mood	6	simulating videos Role play seniors for problem solving activity	Classroom/workshop/
1.2 Checks wheels	To maintain wheels in sound condition	Knowledge of reading pressure gauges, pressure in wheels as per specification; notify ply in moving parts. Wheel balancing Ability to: check and maintain pressure ;fit and tight wheel properly ;rectify problems	4	Mechanics tool kit Jacks and stands	workshop
1.3 Inspects electrical system	To maintain electrical system in working condition	Knowledge of: electric circuits, switch, fuse ,connections to components, ampere/volt rating Ability to put fuse properly, isolate/insulate damaged wiring or components	8	General mechanic tool kit Multi meter Test lamp	workshop
1.4 Checks fly wheel and its system	To ensure the production of electric current	Knowledge of current forming, magnet strength ,coils for ignition and lighting Ability to maintain proper sparking current, test and replace current coil/ignition coil/CDI etc.	6	Test lamp Engine analyzer tacho meter Condenser Tester Spark plug deep socket set	workshop

				Insulation tester General mechanic tool kit Timing light Plug cleaner	
1.5 Checks emission	To keep vehicle engine in good condition	Knowledge of abnormal emission, causes of excessive emission, inspect silencer Ability to clean silencer, rectify emission problems	4	General mechanic tool kit smoke analyser	worksho p
1.6 Checks sound/noise of engine	To keep vehicle engine in good condition	Knowledge of abnormality of engine sound, noises due to loosen/worn out parts Ability to rectify problems	4	General mechanic tool kit	worksho p
1.7 Inspects fuel transmission	To ensure fuel supply continue and there be no leakage	Knowledge of type components for fuel supply, air fuel ratio, filters and its types Ability to clean/change fuel pump/filter	4	General mechanic tool kit	worksho p
1.8 Checks oil level	To keep oil level as per specification To keep oil in good condition	Knowledge of types of oils used in vehicle, required oil level, time and condition to change oil. Ability to maintain proper condition and level of oil	2	General mechanic tool kit	worksho p
1.9 Inspect steering and suspension system	To ensure system in normal condition	Knowledge of the parts use in steering system. And suspension system Ability to maintain proper condition of suspension system.	2	General mechanic tool kit	worksho p

Module: 2 Performs tuning of engine

Objective of the Module: .Tuning engine for smooth running

Duration: 160 hours Theory: 32 hours Practice: 128 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
2. 1 Checks tappet	To keep good vehicle performance	Knowledge of: valves, tappets and its clearance Ability to: set tappet accordingly	15	General mechanic tool kit Feeler gauge	workshop
2. 2 Replaces air-filter	To keep filter free from dust and chocking To keep filter in good condition	Knowledge of; types of filter material, advantage/reasons of using filter; disadvantage of using chocked/damaged filter Ability to: clean filter and replace filter	05	General mechanic tool kit	workshop
2. 3 Cleans radiator	To keep radiator free from dust /rust and chocking To keep radiator in good condition	Knowledge of: size of radiator, advantage/reasons of using radiator ;disadvantage of using chocked/damaged radiator, advantage of using coolants Ability to: check for leakage / chocking radiator .clean and replace radiator.	30	General mechanic tool kit	workshop
2. 4 Services plug	To prevent plug by carburization and keep it in good condition	Knowledge of; spark plug purpose, its gap. Cleaning methods penning and sand blasting Ability to clean / reconditioned sparks plugs.	30	Sand blasting machining Wire brush	workshop

2. 5 Replaces oil-filter	To keep filter free from dust / foreign particles and chocking To keep filter in good condition	Knowledge of; types of oil filter's material, advantage/reasons of using oil filter; disadvantage of using chocked/damaged oil filter Ability to: clean oil filter and replace it.	05	General mechanic tool kit	workshop
2. 6 Fuel system and Services carburetor	To keep carburetor clean, free from dust and oil To ensure air fuel ratio as per desire load and speed Keep it in good condition	Knowledge of : parts and function of carburetor :air fuel ratio. Function of butterfly uses of jets: meaning of throttling. Explain carburetor circuits Ability to reassemble and refit carburetor.: adjust set screws for smooth running and throttling	30	General mechanic tool kit Watchman's screw driver gear	workshop
2. 7 Check and clean Cleans silencer	To keep silencer free from carbon, oil and chocking Keep it in good condition	Knowledge of noise pollution/smoke pollution, construction and reason for using silencer, methods of cleaning silencer. Ability to clean. refit/replace silencer	15	Solvent solution Pipe rod Wire brush	workshop
2. 8 Check and Adjusts CB-point	To ensure the supply of electric current As per desired rate	Knowledge of contact and breakup methods/components used in vehicle. Gap required between points Ability to clean set	15	General mechanic tool kit Screw driver Filler gauge	workshop

		and refit CB point.			
2. 9 Check and Adjusts gas regulator	To ensure air fuel ratio as per desire load and speed Keep it in good condition	Knowledge of gases use in vehicle with pressure and storing conditions. Leak detection methods.Check regulator solenoid connections. Universal and fixed joints of gas circuit lines. diaphragm pump and gas regulator parts Ability to refit and adjust gas regulator.	15	General mechanic tool kit	workshop

Module 3: Repairs brake system

Objective of the Module: .To diagnose and rectify faults also service, adjust and repair break system as per specification / ease of use

Duration: 80 hours Theory:16hours Practice64 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
3. 1 Jacks up the rickshaw	To lift / tilt rickshaw and keep its position for work in safe way	Knowledge of: Lifting/tilting methods. Know the use of leverage mechanisms foolproof supporting of lifted vehicle Ability to: lift vehicle set support for safe rest.	2	**General mechanic tool kit** ,Jack, rest stopper	workshop
3. 2 Removes wheel	To remove wheel properly	Knowledge of: tools, their proper selection with safe use. methods or liquid use to pull out jam/rusted bolts. Ability to: dismantle wheel: pull out the worn stud/bolt.: form threads by taps	2	General mechanic tool kit Jack Wheel spanner	workshop
3. 3 Dismantles brake parts	To dismantle parts in sequential order	Knowledge of: part of break system. Reason of Ply in break system Ability to: dismantle break parts:	18	General mechanic tool kit Spanner set	workshop
3. 4 Cleans brake parts	To adopt correct methods of cleaning parts	Know methods of cleaning, tool/solvent used for cleaning Ability to clean/repair worn parts	2	**General mechanic tool kit** ,Solvent solution Brush, wire brush, scrapers	workshop
3. 5 Replaces worn-out parts	To decide whether parts replace or repair	Knows equivalent interchangeable parts, fits tolerances allowances Ability to replace the worn out part of same make and model.	2	**General mechanic tool kit**	workshop
3. 6 Assembles brake	To assemble	Knowledge of: tools,	15	General	workshop

parts	parts in sequential order	their proper selection with safe use. Knows reason for using torque wrenches Ability to assemble brake parts accordingly		mechanic tool kit	
3. 7 Fills brake oil	To dispense and judge the level of oil	Know the characteristics of brake oil. Know the qualities of different brands Ability to fill oil in system	2	Funnel , dispensing unit	workshop
3. 8 Performs air-bleeding	To ensure that there be no air bubble in line	Know the causes and disadvantage of air locking, methods of removing airlock Ability to perform air bleeding for efficient brake system.	20	Air bleeding Unit Brake oil	workshop
3. 9 Performs brake test	Ensure the brakes are working properly	Knowledge of ply set during braking procedure, Apply road test on road with smooth and sudden brake; adjust the ply as per need.	15	----	workshop
3. 10 Jacks down the rickshaw	To lift / tilt down rickshaw and keep it in level position for test drive	Knowledge of: Know the use of leverage mechanisms foolproof removal of supporting placed for lifting Ability to: turn down vehicle un support safely	2	Jack, rest stopper	workshop

Module 4: Repairs steering system

Objective of the Module: .To diagnose and rectify faults and service the steering systems

Duration: 80 hours Theory: 16hours Practice :64 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
4.1 Jacks up the rickshaw	To lift / tilt rickshaw and keep its position for work in safe way	Knowledge of: Lifting/ tilting methods. Know the use of leverage mechanisms foolproof supporting of lifted vehicle Ability to: lift vehicle set support for safe rest.	4	Jack, rest stopper	workshop
4.2 Removes front wheel	To remove wheel properly	Knowledge of: tools, their proper selection with safe use. Methods or liquid use to pull out jam/rusted bolts. Ability to: dismantle wheel: pull out the worn stud/bolt.: form threads by taps	10	General mechanic tool kit Jack Wheel spanner	workshop
4.3 Removesteering mechanism	To remove linkage mechanisms/steering box	Know the steering linkage types of steering systems ability to remove steering box	8	General mechanic tool kit	workshop
4.4Dismantles steering mechanism	To dismantles steering box/ linkage mechanisms	Know the steering linkage types of steering systems Ability to dismantle linkage /steering box	18	General mechanic tool kitt	workshop
4.5 Cleans steering parts	To keep parts free from dust/rust/grease	Know methods of cleaning, tool/solvent used for cleaning Ability to clean/repair worn parts	8	Solvent solution Brush, wire brush, scrapers	workshop

4.6Replaces worn-out parts	To decide whether parts replace or repair	Knows equivalent interchangeable parts, fits tolerances allowances Ability to replace the worn out part of same make and model.	4	**General mechanic tool kit**	worksho p
4.7 Applies greasing to bearings	To Apply grease gently	Know the purpose of lubrication Apply grease gently	4	Grease and grease gun	worksho p
4.8 Assembles steering mechanism	To assemble parts in sequential order	Know the steering linkage types of steering systems Ability to assemble linkage mechanisms/steering box	22	General mechanic tool kit	worksho p
4.9 Refits steering mechanism	To refit linkage mechanism s/steering box	Know the steering linkage types of steering systems Ability to refit linkage mechanisms/steering box	8	General mechanic tool kit	worksho p
4.10 Jacks down the rickshaw	To lift / tilt down rickshaw and keep it in level position for test drive	Know the use of leverage mechanisms foolproof removal of supporting placed for lifting Ability to: turn down vehicle un support safely	4	Jack, rest stopper	worksho p

Module 5: Performs engine overhauling

Objective of the Module: .Diagnosing and rectifying minor faults for smooth running

Duration: 200: hours Theory: 40hours Practice:160 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
5.1 Removes engine cover	To remove engine cover properly	Know the quick detachment mechanisms, Ability to remove engine cover with safe manner	4	General mechanic tool kit	workshop
5.2 Disconnects fuel supply	To remove fuel supply line from engine ensuring there be no leakage	Know methods to stop running out fuel, effect of air lock in fuel line, function of pump Ability to remove fuel supply line from engine side	8	General mechanic tool kit	workshop
5.3 Disconnects battery connection	To disconnect battery connection ensure identifying positive and negative terminals	Know the positive and negative terminal, Ability to disconnect the terminal with safe manner	8	**General mechanic tool kit**	workshop
5.4 Removes silencer	To remove silencer from engine with manifold	Know ways of damaging manifold seal can extract the seal in safe manner. Ability to open rusted bolts/nuts, detached silencer from vehicle.	8	**General mechanic tool kit**	workshop
5.5 Removes engine from foundation	To remove engine from foundation and pull out at working place safely	Know methods of lifting heavy weights and tools /guard supports use in displacing engine Ability to make proper support and balancing , during removal of engine from foundation, remove engine safely	12	General mechanic tool kit	workshop
5.6 Drains water from radiator and separate out it by engine	To remove radiator, after draining water ensuring there be no leakage	Knows the method of draining water from radiator Ability to drain out water from radiator without messing and separate out engine by radiator/its	8	**General mechanic tool kit** container	workshop

			connection			
5.7	Drains oil from engine	To drain oil from engine ensuring there be no leakage	Knows handling oil and keep it in safe place, the method of draining oil from engine. Ability to drain out oil in proper and safe manner from engine	8	**General mechanic tool kit**	worksho p
5.8	Removes auxiliaries accessories	To remove auxiliaries / accessories from engine and keep them in safe place	Know auxiliaries mount on engine Ability to remove auxiliaries from engine.	12	General mechanic tool kit	worksho p
5.9	Dismantles engine	To dismantle engine and its parts in sequential order with proper tools	Knows the parts of engine, tools used. Gaskets type effectiveness ,marking before removing parts Ability to use correct tools maintain proper sequencing in dismantle engine.	26	General mechanic tool kit	worksho p
5.10	Cleans engine parts	To keep Clean engine parts free from carbon, oil and clean them in good condition	Knows cleaning methods, solvents and tools Ability to clean parts, remove gasket without scratches the surfaces	8	Solvent solution Brush, wire brush, scrapers	worksho p
5.11	Replaces engine parts	To decide whether parts replace or repair	Know the working condition, clearances between mating parts Ability to replace un repair / unserviceable parts	8	**General mechanic tool kit**	worksho p
5.12	Repairs engine parts	To adopt proper repairing operation/met hod	Know the methods of repairing part Ability to repair or supervise the machining/repair work	8		worksho p
5.13	Assembles the engine	To assemble parts in sequential order	Knows the parts of engine, tools used. Gaskets type, solutions, effectiveness ,marking parts Ability to use correct tools maintain proper	30	General mechanic tool kit	worksho p

			placing of parts in proper manner, set gasket apply solution, tight bolts in sequential manner with torque wrench			
5.14	Refits auxiliaries accessories	To refits auxiliaries accessories in proper manner	Know auxiliaries mount on engine Ability to refit auxiliaries on engine.	8	General mechanic tool kit	worksho p
5.15	Fits engine on foundation	To refit engine on foundation in proper manner	Know methods of lifting down heavy weights and tools methods of removing guard / supports use in refitting engine Ability to make proper support and balancing , during refitting of engine on foundation, fits engine properly	8	General mechanic tool kit	worksho p
5.16	Fills oil in engine	To dispense , judge and maintain the level of oil as per specification	Knows type of engine oil for better performance method of filling oil in engine. Ability to fill oil in engine with proper and safe manner up to required level.	8	Funnel , dispensing unit	worksho p
5.17	Fit radiator/radiator connections and Fills water in radiator	To refit radiator/radi ator connections and Fills water in radiator	Knows the effectiveness of coolant ,type of coolants method of filling coolant in radiator Ability to Refit radiator / radiator connections and Fills out coolant/water in radiator up to required level checks and rectify leakage problems	8	General mechanic tool kit	worksho p
5.18	Connects battery connections	To connect battery connection ensure positive and negative terminals	Know the positive and negative terminal Ability to connect the terminal properly with safe manner	4	General mechanic tool kit	worksho p

5.19 Connect fuel supply	To refit fuel supply line to engine ensuring there be no leakage	Know the types of hose pipe fasteners Ability to connect the fuel supply with proper manner	4	General mechanic tool kit	worksho p

Module 6: Follows safety rules

Objective of the Module: .Diagnosing and rectifying minor faults for smooth running
Duration: 40 hours Theory: 8hours Practice:32 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
6.1 Wears proper clothing	To keep himself healthy and smart To perform work efficiently	Knows the effect of loose clothing, justify personal protective clothing and safety equipments Ability to demonstrate the use of personal protective clothing and equipment demonstrate work in safe sound manner	5	simulating videos Cloths Apron	Class room and Institute workshop
6.2 Cleans hands and body	To keep himself neat and clean	Knows the effect of dirtiness at work. Ability to demonstrate work with neat and clean healthy manner.	5	simulating videos Soap Solvent/ solution cloth	Class room and Institute workshop
6.3 Maintains workplace cleaning	To keep the work place / area neat and clean To avoid hazards due to messing dirtiness	Observe workshop safety, rules and regulations. Identify the common workplace hazards. Explain the different workplace security, emergency and evacuation procedures.	5	simulating videos Cotton waste Solvent/ solution cloth	Class room and Institute workshop
6.4 Ensures ventilation and light	To keep area / workplace ventilated and illuminated	Know the effect of deem light and suffocation Ability to maintain well ventilated and illuminated place for work	5	simulating videos Illuminating articles / fan exhaust fan	Class room and Institute workshop

6.5 Maintains safety of colleagues	To ensure safety of college during working at place	Explain the different basic first Aid procedures. Explain the different workplace security, emergency and evacuation procedures. Ability to demonstrate basic first aid on an annihilated toxic material victim. Demonstrate basic first aid on a victim with burns and other body injuries. Demonstrate basic first aid on an electric shock victim.	6	equipped first Aid box simulating videos	Class room and Institute worksho p
6.6 Uses fire-extinguishers	To demonstrat e fire prevention and fighting procedure	State the different methods of preventing and fighting fire. Describe the operating principle of different firefighting equipment including the fire extinguisher ability to demonstrate basic fire fighting and prevention	8	simulating videos extinguishe r	Class room and Institute worksho p
6.7 Cleans tools and equipment	To keep tools and equipment clean To keep tools and equipment in ready working condition	Describe the importance and procedure for the proper handling, storage, use and Disposal of different tools, equipment and materials. Demonstrate the safe handling, storage, and use of personal protective clothing and equipment	6	simulating videos General mechanic tool kit	Class room and Institute worksho p

Module 7: Performs Communication

Objective of the Module: .Diagnosing and rectifying minor faults for smooth running

Duration: 40hours Theory: 8hours Practice: 32 hours

Learning Unit	Learning Outcomes	Learning Elements	Duration	Materials Required	Learning Place
7.1Communicates with client/owner	Communicate Effectively With Customers	Knowledge of important and principles of good client service and good communication skills. Ability to communicate with clients with well manners	6	simulating videos Role play seniors for problem solving activity	Class room
7.2Communicates with supervisor	Handle and communicate with supervisor	Knowledge of different approaches and strategies and communication skills. Ability to be effective and co-operative team members.	6	simulating videos Role play seniors for problem solving activity	Class room
7.3Communicates with juniors	Communicate effectively and give instructions properly.	Knowledge of giving clear, concise instruction formulation of instruction ,non-verbal communication Ability to communicate effectively and handle problems.	6	simulating videos Role play seniors for problem solving activity	Class room
7.4Communicates with machinist	Communicate effectively and give instructions properly.	Knowledge of giving clear, concise instruction formulation of instruction ,non-verbal communication Ability to communicate effectively and handle problems.	5	simulating videos Role play seniors for problem solving activity	Class room
7.5Communicates with electrician	Communicate effectively and give instructions properly.	Knowledge of giving clear, concise instruction formulation of instruction ,non-verbal communication Ability to communicate effectively and handle problems.	5	simulating videos Role play seniors for problem solving activity	Class room

7.6 Communicates with peers	Communicate effectively and give instructions properly.	Knowledge of giving clear, concise instruction formulation of instruction, non-verbal communication. Ability to communicate effectively and handle problems	6	simulating videos Role play seniors for problem solving activity	Class room
7.7 Communicates with auto-parts sellers/vendors	Communicate Effectively With Customers	Knowledge of important and principles of good client service and good communication skills. Ability to communicate with clients with well manners	6	simulating videos Role play seniors for problem solving activity	Class room

Module 8: Transmission System

Objective of the Module: .Diagnosing and rectifying transmission system for smooth running

Duration: 160: hours Theory:32 hours Practice: 128 hours

Learning Unit	Learning Outcome	Learning Elements	Duration	Materials Required	Learning Place
8.1 Clutch Assembly	To re-assemble the clutch Assembly	Knowledge of types of clutches used in vehicles. Knowledge about the parts of clutch assembly. Ability to reassemble the clutch for proper working.	30	General mechanic tool kit	Institute workshop
8.2 Gear Assembly Mechanism	To re-assemble the gear mechanism	Knowledge of gear trains and types of gears. Ability to reassemble the gear assembly for proper working condition.	40	General mechanic tool kit	Institute workshop
8.3 Universal Cross Joint & Propeller Shaft	To re-assemble the universal cross joints and Propeller shaft.	Knowledge of joints and propeller shaft. Ability to reassemble the joints and propeller shaft.	30	General mechanic tool kit	Institute workshop
8.4 Differential	To re-assemble differential system	Knowledge of differential system (sun gears and star gears) Ability to reassemble differential and adjust backlash.	40	General mechanic tool kit	Institute workshop
8.5 Axels and hubs	To re-assemble axel shafts and hubs	Knowledge of axel, hubs and wheel bearings. Ability to change and replace the oil seals	20	General mechanic tool kit	Institute workshop

Assessment Template

Module 1: Perform Diagnosis

Learning Units	Theory Days/hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
1.1 Takes complaint from customer		6	**Describe** the effects of listening carefully, **Ability to**: rectify problems and keep customer in pleasant mood	Self-paced learning Discussion Question / Answer Direct Observation	
1.2 Checks wheels	1	3	**Understand** and read pressure gauges, pressure in wheels as per specification; notify play in moving parts. Wheel balancing **Ability to**: check and maintain pressure ;fit and tight wheel properly ;rectify problems	Discussion Individual practice Direct Observation	
1.3 Inspects electrical system	2	6	**Describe** :electric circuits, switch, fuse ,connections to components, ampere/volt rating **Ability to** put fuse properly, isolate/insulate damaged wiring or	Individual practice Question / Answer Direct Observation	

			components		
1.4 Checks flywheel and its system		6	**Describe** .how current forms, magnet strength ,coils for ignition and lighting **Ability to** maintain proper sparking current, test and replace current coil/ignition coil/CDI etc.	Individual practice Question / Answer Direct Observation	
1.5 Checks emission	1	3	**Understand,** abnormality of emission, causes of excessive emission, inspect silencer **Ability to** clean silencer, rectify emission problems	Demonstration Question / Answer Direct Observation	
1.6 Checks sound/noise of engine	1	3	**Describe** about the abnormality of engine sound, noises due to loosen/worn out parts **Ability to** rectify problems	Discussion Individual practice Question / Answer	
1.7 Inspects fuel transmission	1	3	**Identify** the types of components for fuel supply, understand air fuel ratio, filters and its types **Ability to** clean/change fuel pump/filter	Demonstration Direct Observation	
1.8 Checks oil gauge			**Describe** the type of oils used in vehicle,	Individual practice	

	2		required oil level, time and condition to change oil. **Ability to** maintain proper condition and level of oil		

Module 2: Performs tuning of engine

Learning Units	Theory Days / hours	Workplace Days / hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
2. 1 Checks tappet	3	12	**Describe** working of: valves, tappets and its clearance **Ability to**: set tappet accordingly	Demonstration Individual practice Question / Answer	
2. 2 Replaces air-filter	2	3	**Describe** types of filter material, advantage/reasons of using filter; disadvantage of using chocked/damaged filter **Ability to**: clean filter and replace filter	Individual practice	
2. 3 Cleans radiator	6	24	**Describe** the size of radiator, advantage/reasons of using radiator ;disadvantage of using chocked/damaged radiator, advantage of using coolants **Ability to**: check for leakage / chocking radiator .clean and	Discussion Question / Answer Direct Observation	

			replace radiator.		
2. 4 Services plug	6	24	**Understand** purpose of spark plug, its gap. Cleaning methods penning and sand blasting **Ability to** clean / reconditioned sparks plugs.	Individual practice Question / Answer	
2. 5 Replaces oil-filter	2	3	**Describe** types of oil filter's material, advantage/reasons of using oil filter; disadvantage of using chocked/damaged oil filter **Ability to**: clean oil filter and replace it.	Individual practice	
2. 6 Fuel system and Services carburetor	6	24	**Describe** the parts and function of carburetor: air fuel ratio. Function of butterfly uses of jets: meaning of throttling. **Ability to** reassemble and refit carburetor.: adjust set screws for smooth running and	Demonstration Individual practice Question/ Answer	

			throttling		
2. 7 Cleans silencer	3	12	**Describe** noises pollution / smoke pollution, construction and reason for using silencer, methods of cleaning silencer. **Ability to** clean. refit/replace silencer	Demonstration Individual practice Question / Answer	
2. 8 Adjusts CB-point	3	12	**Describe the** contact and breakup methods/components used in vehicle. Gap required between points **Ability to** clean set and refit CB point.	Discussion Individual practice Question / Answer	
2. 9 Adjusts gas regulator	3	12	**Describe** the uses of gases in vehicle with pressure and storing conditions. Leak detection methods. Universal and fixed joints of gas circuit lines. diaphragm pump and gas regulator parts **Ability to** refit and adjust gas regulator.	Discussion Individual practice Question / Answer	

Module 3: Repairs brake system

Learning Units	Theory Days/hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
3. 1 Jacks up the rickshaw	2		**Describe** Lifting/tilting methods. understand the use of leverage mechanisms foolproof supporting of lifted vehicle **Ability to**: lift vehicle set support for safe rest.	Individual practice Direct Observation	
3. 2 Dismantles wheel	2		**List** the tools, their proper selection with safe use. methods or liquid use to pull out jam/rusted bolts. **Ability to**: dismantle wheel: pull out the worn stud/bolt.: form threads by taps	Individual practice	
3. 3 Dismantles brake parts	3	15	**List** the part of break system. Reason of Play in break system **Ability to**: dismantle break parts:	Discussion Individual practice Question Answer	
3. 4 Cleans brake parts			**Describe** the methods of	Individual	

	2		cleaning, tool/solvent used for cleaning **Ability** to clean/repair worn parts	practice	
3. 5 Replaces worn-out parts	2		**Describe** equivalent / interchangeable parts, fits tolerances allowances **Ability to** replace the worn out part of same make and model.	Discussion Question Answer Direct Observation	
3. 6 Assembles brake parts	3	12	**List** the tools, their proper selection with safe use. Knows reason for using torque wrenches **Ability to** assemble brake parts accordingly	Discussion Individual practice Direct Observation	
3. 7 Fills brake oil	2		**Describe** the characteristics of brake oil. Know the qualities of different brands **Ability to** fill oil in system	Individual practice	
3. 8 Performs air-bleeding	2	18	**Describe** the causes and disadvantage of air locking, methods of removing airlock	Discussion Demonstration Question	

			Ability to perform air bleeding for efficient brake system.	Answer	
3. 9 Performs brake test	3	12	**Describe** play set during braking procedure, **Apply** road test on road with smooth and sudden brake; **adjust** the play as per need.	Individual practice Direct Observation	
3. 10Jacks down the rickshaw	2		**Describe** the use of leverage mechanisms foolproof removal of supporting placed for lifting **Ability to**: turn down vehicle un support safely	Individual practice	

Module 4: Repairs steering system

Learning Units	Theory Days/hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
4.1 Jacks up the rickshaw	1	3	**Describe** regarding the Lifting/ tilting methods. Know the use of leverage mechanisms foolproof supporting of lifted vehicle **Ability to**: lift vehicle set support for safe rest.	Individual practice	
4.2 Dismantles front wheel	1	9	**List of** tools, their proper selection with safe use. Methods or liquid use to pull out jam/rusted bolts. **Ability to**: dismantle wheel: pull out the worn stud/bolt.: form threads by taps	Individual practice	
4.3Dismantles steering mechanism	2	6	**Describe** the steering linkage types of steering mechanisms **ability to** remove steering box	Individual practice Question Answer Direct Observation	
4.4 Cleans steering parts			**Describe** the steering linkage	Individual	

	3	15	types of steering systems **Ability to** dismantle linkage /steering box	practice	
4.5Replaces worn-out parts	2	6	**Describe** methods of cleaning, tool/solvent used for cleaning **Ability** to clean/repair worn parts	Discussion	
4.6 Applies greasing to bearings	1	3	**Describe** equivalent interchangeable parts, fits tolerances allowances **Ability to** replace the worn out part of same make and model.	Demonstration Individual practice	
4.7 Assembles steering box	1	3	**Describe** the purpose of lubrication **Apply** grease gently	Demonstration Individual practice Direct Observation	
4.8 Fits steering box	4	18	**Describe** the steering linkage types of steering systems **Ability to** assemble linkage mechanisms/steering box	Demonstration Individual practice	

4.9 Adjust play in steering	2	6	**Describe**the steering linkage types of steering systems **Ability to** refit linkage mechanisms/steering box	Discussion Direct Observation	
4.10 Jacks down the rickshaw	1	3	**Describe** the use of leverage mechanisms foolproof removal of supporting placed for lifting **Ability to**: turn down vehicle un support safely	Individual practice	

Module 5: Performs engine overhauling

Learning Units	Theory Days/hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
5.1 Replaces engine cover	1	3	**Describe** the quick detachment mechanisms, **Ability to** remove seat with safe manner	Individual practice	
5.2 Disconnects fuel supply	2	6	**Describe**methods to stop running out fuel, effect of air lock in fuel line, function of pump **Ability to** remove fuel supply line from engine side	Individual practice	

5.3 Disconnects battery connection	2	6	**Knowledge** regarding the positive and negative terminal, **Ability to** disconnect the terminal with safe manner	Individual practice	
5.4 Removes silencer	2	6	**Describe** ways of damaging manifold seal **Can** extract the seal in safe manner. Ability to open rusted bolts/nuts, detached silencer from vehicle.	Individual practice	
5.5 Removes engine from foundation	3	9	**Describe** methods of lifting heavy weights and tools /guard supports use in displacing engine **Ability to** make proper support and balancing , during removal of engine from foundation, remove engine safely	Demonstration Individual practice Direct Observation	
5.6 Drains water from radiator			**Describe** the method of draining water	Individual practice	

	2	6	from radiator **Ability to** drain out water from radiator without messing and separate out engine by radiator/its connection		
5.7 Drains oil from engine	2	6	**Describe** the method of handling oil and keep it in safe place, the method of draining oil from engine. **Ability to** drain out oil in proper and safe manner from engine	Individual practice	
5.8 Removes auxiliaries accessories	3	9	**Describe** auxiliaries mount on engine **Ability to** remove auxiliaries from engine.	Demonstration Direct Observation	
5.9 Dismantles engine	5	21	**Describe** the parts of engine, tools used. Gaskets type effectiveness ,marking before removing parts **Ability to** use	Demonstration Direct Observation	

			correct tools maintain proper sequencing in dismantle engine.		
5.10 Cleans engine parts	2	6	**Describe** cleaning methods, solvents and tools **Ability to** clean parts, remove gasket without scratches the surfaces	Individual practice	
5.11 Replaces engine parts	1	9	**Describe** the working condition, clearances between mating parts **Ability to** replace un repair / unserviceable parts	Discussion Question Answer	
5.12 Repairs engine parts	1	9	**Describe** the methods of repairing part **Ability to** repair or supervise the machining/repair work	Demonstration Direct Observation	
5.13 Assembles the engine			**List** the parts of engine, tools used. Gaskets type, solutions, effectiveness	Discussion Demonstration Individual	

	7	33	,marking parts **Ability to** use correct tools maintain proper placing of parts in proper manner, set gasket apply solution, tight bolts in sequential manner with torque wrench	practice	
5.14 Refits auxiliaries accessories	7	33	**Describe** auxiliaries mount on engine **Ability to** refit auxiliaries on engine.	Individual practice	
5.15 Fits engine on foundation	1	9	**Describe** methods of lifting down heavy weights and tools methods of removing guard / supports use in refitting engine **Ability to** make proper support and balancing , during refitting of engine on foundation, fits engine properly	Individual practice	
5.16 Fills oil in engine			**Define** type of engine oil for	Individual	

	1	9	better performance method of filling oil in engine. **Ability to** fill oil in engine with proper and safe manner up to required level.	practice	
5.17 Fills water in radiator	1	9	**Describe** the effectiveness of coolant ,type of coolants method of filling coolant in radiator **Ability to** Refit radiator / radiator connections and Fills out coolant/water in radiator up to required level checks and rectify leakage problems	Individual practice	
5.18 Connects battery and fuel	1	9	**Identification** the positive and negative terminal **Ability to** connect the terminal properly with safe manner	Individual practice	

Module 6: Follows safety rules

Learning Units	Theory Days/hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
6.1 Wears proper clothing	2	3	**Determine** the effect of loose clothing, justify personal protective clothing. **Ability to** demonstrate the use of personal protective clothing and equipment demonstrate work in safe sound manner	Question Answer	
6.2 Cleans hands and body	2	3	**Describe** the effect of dirtiness at work. **Ability to** demonstrate work with neat and clean healthy manner.	Question Answer	
6.3 Maintains workplace cleaning	2	3	**Define** workshop safety, rules and regulations. Identify the common workplace hazards. **Demonstrate** different workplace security, emergency and evacuation procedures.	Question Answer	

6.4 Ensures ventilation and light	2	3	**Define** the effect of deem light and suffocation **Ability to** maintain well ventilated and illuminated place for work	Question Answer	
6.5 Maintains safety of colleagues	6		**Explain** the different basic first Aid procedures. Explain the different workplace security, emergency and evacuation procedures. **Ability to** demonstrate basic first aid on an annihilated toxic material victim. Demonstrate basic first aid on a victim with burns and other body injuries. Demonstrate basic first aid on an electric shock victim.	Question Answer	
6.6 Uses fire-extinguishers	2	6	**State** the different methods of preventing and fighting fire. Describe the operating principle of different firefighting	Question Answer	

			equipment including the fire extinguisher **ability to** demonstrate basic fire fighting and prevention		
6.7 Cleans tools and equipment		6	**Describe** the importance and procedure for the proper handling, storage, use and Disposal of different tools, equipment and materials. **Demonstrate** the safe handling, storage, and use of personal protective clothing and equipment	Question Answer	

Module 7: Performs Communication

Learning Units	Theory Days/hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
7.1 Communicates with client/owner		6	**Describe** the importance and principles of good client service and good communication skills. **Ability to** communicate with clients with well manners	Discussion Demonstration	
7.2 Communicates with supervisor	3	3	**understand** different approaches and strategies and communication skills. **Ability to** be effective and co-operative team members.	Discussion Demonstration	
7.3 Communicates with juniors	3	3	Instruct give clear, concise instruction formulation of instruction ,non-verbal communication **Ability to** communicate effectively and handle problems.	Discussion Demonstration	
7.4 Communicates with machinist	2	3	**Presenting** clear, concise instruction formulation of instruction ,non-verbal communication **Ability to** communicate effectively and handle problems.	Discussion Demonstration	
7.5 Communicates with electrician	2	3	**Describe** how to give clear, concise instruction formulation of instruction ,non-verbal communication **Ability to** communicate effectively and handle problems.	Discussion Demonstration	
7.6 Communicates with peers			**Presenting** clear, concise instruction formulation of instruction ,non-verbal	Discussion Demonstration	

	3	3	communication **Ability to** communicate effectively and handle problems		
7.7 Communicates with auto-parts sellers/vendors	3	3	**Justify** the importance and principles of good client service and good communication skills. **Ability to** communicate with clients with well manners	Discussion Demonstration	

Module 8: Transmission System

Learning Units	Theory Days/hours	Workplace Days/hours	Recommended formative assessment	Recommended Methodology	Scheduled Dates
8.1 Clutch Assembly	**6**	**24**	Describe the types of clutches used in vehicles. Knowledge about the parts of clutch assembly. Ability to reassemble the clutch for proper working.	Question Answer Demonstration Individual practice Direct Observation	
8.2 Gear Assembly Mechanism	**7**	**33**	Understand gear trains and types of gears. Ability to reassemble the gear assembly for proper working condition.	Question Answer Demonstration Individual practice Direct Observation	
8.3 Universal Cross Joint & Propeller Shaft	**6**	**24**	Describe the function of joints and propeller shaft. Ability to reassemble the joints and propeller shaft.	Question Answer Demonstration Individual practice Direct Observation	
8.4 Differential	**7**	**33**	understand differential system (sun gears and star gears) Ability to reassemble differential and adjust backlash.	Question Answer Demonstration Individual practice	

				Direct Observation	
8.5 Axels and hubs	**2**	**18**	Understand use axel, hubs and wheel bearings. Ability to change and replace the oil seals	Question Answer Demonstration Individual practice Direct Observation	

Supportive Notes

Assessment Context

- These learning units may be assessed on the job, off the job or a combination of on and off the job demonstrated by an individual working alone. In some areas continuous assessment may be required to gauge the competency.
- Assessment of the practical skills must take place only after a period of supervised practice and repetitive experience. If work place conditions are not available, assessment is simulated and that the work place conditions are acceptable.
- The prescribed outcome must be achieved without direct supervision.
- Competency should be assessed within the context of the qualification being sought.

Critical Aspects

Assessment must confirm that the candidate is able to:

- Apply the health and safety precautions during working.
- Use fire extinguishers.
- Read measurements with measuring tools.
- Identify and use the automotive fasteners.
- Select, handle and use hand tools, workshop tools safely and properly.
- Check the compression pressure of engine and diagnose the faults.
- Diagnose problems in different fuel systems and make the necessary adjustment.
- Set the valve and ignition timing.
- Diagnose and service the lubricating, cooling, ignition systems.
- Service the clutch and adjust the free play.
- Remove, dismantle, check, assemble and refit the transmission.
- Adjust the back lash of differential.
- Replace the axle bearing.
- Accuracy of adjustments.
- Replace the suspension systems components.
- Carry out the wheel balancing.
- Carry out the wheel alignment.
- Service of various mechanical steering gear boxes.
- Service of power steering.

Assessment Condition

The candidate will have access to:

- All tools, equipment, materials and documentation required.
- The candidates will be permitted to refer the following documents.
- Relevant workplace procedures.
- Relevant product and manufacturing specifications.
- Relevant drawings, manuals, codes, standards and reference material.

The Candidate will be required to:

- Orally or by other methods of communication, answer, questions put forward by the assessor.
- Identify superiors who can be approached for the collection of competency evidence where appropriate.
- Present evidence of credit for any off job training related course.

Resources required

Materials, tools, equipment and machines are listed within the learning units.

List of Tools, Machinery & Equipment

Name of Trade	(Auto Rickshaw mechanic)
Duration	Six months

Sr. No.	Name of Item/ Equipment / Tools	Qty.
1.	Set of socket set	1
2.	Set of pliers	2
3.	Set of screw driver	2
4.	Wire strippers	5
5.	Set of mechanic's hammer	2
6.	Torque wrench	2
7.	Tire wrench	2
8.	Trouble light	2
9.	Pressure gauge	2
10.	Hydraulic jack/lift	2
11.	Multi-meter	2
12.	Test light	2
13.	Lock nose pliers (Internal and external)	1
14.	Side cutter	1
15.	Impact screw driver	1
16.	Valve lapping tool	1
17.	Compressor	1 unit only
18.	Air tank	1 unit only
19.	Pressure washer	1 unit only
20.	Vacuum pump	1 unit only
21.	Vacuum cleaner	1 unit only

List of Consumable Supplies

Name of Trade	(Auto Rickshaw mechanic)
Duration	Six months

Sr. No.	Name of Consumable Supplies
1.	Cleaning materials
2.	Engine oils
3.	Grease
4.	Distilled water
5.	Fuse
6.	Sealant /adhesive
7.	Hydraulic oils/gear oil
8.	Brake fluid
9.	Carocine oil
10.	Cotton waste
11.	Cotton rage
12.	Petrol
13.	Brake fluid
14.	Mobile oil
15.	Emery paper
16.	Emery paste
17.	Kerosene
18.	Petrol
19.	Battery

SCHEME OF STUDIES

Rickshaw Mechanic (Three Wheeler)

Sr #	Modules	Theory Hours	Practical Hours	Total Hours
1	Module 01	8	32	40
2	Module 02	32	128	160
3	Module 03	16	64	80
4	Module 04	16	64	80
5	Module 05	40	160	200
6	Module 06	8	32	40
7	Module 07	8	32	40
8	Module 08	32	128	160
TOTAL HOURS		**160**	**640**	**800**