**AUTOMOTIVE TECHINICAL SERVICE & REPAIR**

**Commercial Vehicle Service Technician**

**BIHAR SKILL DEVELOPMENT MISSION**

**(THREE MONTHS PROGRAM)**

It’s Objective, learning outcomes, Modules, assessments and material list

**RTD PROGRAM IN COMMERCIAL VEHICLE SERVICE TECHNICIAN**

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| Submitted to **:-** **BIHAR SKILL DEVELOPMENT MISSION,** **BIHAR GOVERNMENT**  | Submitted By **:- Maurya Motors Pvt Ltd.** |
| Session – 5th Aug’19 to 25th Oct’19 |

 **RTD PROGRAM IN COMMERCIAL VEHICLE SERVICE TECHNICIAN**

* Course Id- CVST
* Candidate Eligibility : **ITI Pass**
* Course Duration: 3 Months

**CONTACT DETAILS OF THE BODY SUBMITTING THE QUALIFICATION FILE**

**Name and address of submitting body:** Maurya Motors Pvt Ltd.

**NAME AND CONTACT DETAILS OF INDIVIUAL DEALING WITH THE SUBMISSION**

**Name :** Mr. Ramgopal Singh

**Position in the organization** : Principal

**Mobile Number :** 9304132699

**E-mail address :** ramgopal.singh@mauryamotors.in

**List of documents submitted in support of the Qualifications File**

1. **Curriculum Document**

**SUMMARY**

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| --- | --- |
| **Qualification Title**  | Maurya **-Commercial Vehicle Service Technician Level 1** |
| **Qualification Code**  | **CVST** |
| **Nature and purpose of the qualification**  | **Nature :** 3 months Course in Commercial Vehicle Service Technician**Purpose** : After completing this programme, participants will be able to: **•** Will be able to diagnose the fault for vehicle trouble• Able to repair post the root cause analysis of vehicle fault.**•** Able to organize his work to have maximum output.• Rightly identify the need of any repairs in the aggregates having any electrical or electronic Sub- System |
| **Body/bodies which will award the qualification** | **Driving & Technician Training Institute,** **A Division of Maurya Motors Pvt Ltd.,**  **Didarganj Check Post,Patna** **Didarganj Check Post,Patna** |
| **Occupation(s) to which the qualification gives access** | **Commercial Vehicle Service Technician** |
| **Entry requirements and / or recommendations** |  **Preferable ITI in Mechanical /Automobile Engineering** |

1. **OBJECTIVE OF THE COURSE :**

Technology is advancing every year. Soon in our market place BS VI vehicles will be available, so our technicians need to keep up with the technology. Thus we need to evaluate regular training needs of our technicians.

You will agree that your technicians of commercial vehicle service and repair need to have strong practical skills as well as being good at finding faults and problem solving. We at our training institute designed our training programs to support the complexities of today’s equipment and teach technicians to leverage all the tools available to efficiently diagnose issues correctly the first time. We believe that technician’s development content / services have a direct impact on shop operations and your profitability.

 At Our Driving & Technician Training Institute training courses are fully designed to give both theory and hands on experience to enhance their product knowledge and develop existing technical skills. Our mission is to develop a pool of trained & updated technicians ready as per our industry requirements. On completion of our two month course (378 Hours including practical 120 Hours) our endeavor will be to provide maximum placement to these technicians**.**

1. **LEARNING OUTCOMES :**

After completing this programme, participants will be able to:

1. Will be able to diagnose the fault for vehicle trouble .
2. Able to repair post the root cause analysis of vehicle fault.
3. Able to organize his work to have maximum output.
4. Rightly identify the need of any repairs in the aggregates having any electrical or electronic Sub- System.
5. **MODULE- THREE MONTHS (Commercial Vehicle Service Technician)**

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| --- | --- |
| **MODULE CODE & NAMES**  | **Code :- CVST****Module :-** BSDM (Commercial Vehicle Service Technician) |
| **MODULE COMPETENCE** | After completing this programme, participants will be able to diagnose the fault for vehicle trouble & will be able to repair post the root cause analysis of vehicle fault also able to organize his work to have maximum output. Further he can rightly identify the need of any repairs in the aggregates having any electrical or electronic Sub- System. |
| **MODE OF DELIVERY** | Practical and theoretical  |

| **Sr.No.** | **Module** | **Key Learning Outcome** | **Equipment’s required** |
| --- | --- | --- | --- |
| 1 | **Introduction , safety Procedures & Workshop Infrastructure** **Theory Duration(hh:mm) 24:00** | 1. Morning Prayer &Yoga-stretching exercises
2. Rules & discipline to be followed in the class room & residential premises
3. Brief outline about the course & about the Job opportunities for an Commercial Vehicle Technician
4. Safety Procedures in Workshop
5. 5 S & Kaizen in Workshop
6. Use of Fire Extinguisher effectively in case of Fire
7. Get familiarized with the Basic Workshop Layout
8. Understand the different Departments in Workshop & It’s Activities
9. Differentiate the work bays as per the work carried out
10. Calculate the Productivity, efficiency & Utilization of Technicians
 | 1. Personal Protection Equipment: Gloves, Safety Shoes, goggles, Ear plugs, Boiler suit, Workshop
2. Safety: Fire extinguishers, First Aid.
3. Safety signs ,SOP Charts on safety norms and drills., Charts of Do's and Don’ts in, Emergency Call No's
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| **Practical Duration (hh:mm) 06:00** | 1. Visit to our nearest workshop to make them understand the safety Procedures
2. How Kaizen is being implemented at workshop
3. How 5S is being implemented at our workshop
4. Test on the above topics
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| 2 | **Tools & Time management****Theory Duration (hh:mm) 13:00** **Practical Duration hh:mm) 05:00**  | 1. Identify the General Tools used in Workshop
2. Perform the General Maintenance & Upkeep of Workshop Tools & Equipment
3. Understand the normal functioning of Workshop
4. Observe Team Work Observe Time Management
 | 1. Basic Tool Box
2. Workshop tool, equipment :Drain pan, oil can, Jack hydraulic bench vice with Grinder, Two post lift, Ramp
3. Pneumatic tools, Air compressor.
4. Special maintenance tools: bins, racks, trolley, equipment stands, Wheel aligner, Head light aligner, Tyre changer, wheel balancer etc.
5. Precision Tools: Feeler gauges , Multi metre, Temp gauge, Dial gauge, Bore Dial Gauge, micrometre, Vernier Calliper, Torque Wrench, Steel Scale, Tyre pressure gauge etc.
6. Electrical and electronic testing equipment: Volt meter, Ammeters
7. Ohmmeters, Battery testing equipment, Computer based diagnostic equipment Neon timing light, oscilloscopes etc.
8. Special Tools: Pullers, Ball joint separators, Bearing pullers, Gear pullers, Slide hammers etc.
9. Specialty wrenches: Alignment wrenches, chain wrenches, locking wrenches, lug wrenches etc.
10. Trim or moulding tools: carbon scrapers, Gasket scrapers, scrapers, spoons etc.
11. Other tools: Hand tools, power tools, lifting and jacking equipment, tensioning equipment, brake roller teste, chassis dynamometer, suspension activation, security activator etc.
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| 3 | **Basics of Automobiles****Theory Duration(hh:mm) 49:00**  | 1. Understanding of different components used to build an automobile
2. Define & Describe the purpose & Working of Engine
3. Define & Describe the purpose & Working of Transmission (Clutch, Gear Box, Rear Axle)
4. Define & Describe the purpose & Working of Steering Systems used in Commercial vehicles
5. Distinguish various Suspension Systems
6. Define & Describe the working of different types of brake system
7. Define & Describe the purpose & Working of HVAC System
8. Understand the Basics of Tyre & Wheel Rims
9. Identify the Different Safety Systems Used in an Automobiles understand the various terms used in electricity and their co-relation
10. measure resistance, voltage and current using a multi-meter
11. define conductors, insulators, semiconductors and state their differences
12. recall, interpret and calculate the total resistance in a series and parallel circuits using ohm’s
13. understand and identify a grounded, shorted and open circuits
14. identify and understand the working of a fuses, relays, capacitors, diodes, transistors and their
15. usage in an electrical circuit
 | 1. Electrical wire harness, lighting, ignition, Electronic and air-conditioning systems etc.
2. Electronic systems including active and passive safety, Media, comfort and convenience, supplementary restraint systems (SRS), Networking and other systems, Electronic control unit , Hydraulic and pneumatic system various lubrication systems
 |
| **Practical****Duration(hh:mm) 11:00:00** | 1. Demonstrating the functioning of each system, component and aggregate (including both mechanical and electrical aggregates) of a vehicle.
2. Dismantle and reassemble aggregates of a vehicle (with help from other technicians and helper)
3. Test on the above topics
 |
| **4** | **Variants of Commercial Vehicle****Theory Duration(hh:mm) 06:00** | 1. Identify & Describe the SCV Models
2. Identify & Describe the LCV , ICV Models
3. Identify & Describe the M& HCV Models
 | 1. Stock yard visit
 |
| **Practical Duration(hh:mm) 06:00** | 1. Visit to our Stock yard to make them see & understand the models
 |
| 5 | **Engine****Theory Duration(hh:mm) 50:00** | 1. Understand the basic systems of Engine
2. Understand the basic function of engine
3. Identify the components of engine
4. Perform basic checks on engine
5. Perform the measurements of Engine component
6. Understand the Vehicle Starting System theory
7. Identify the Vehicle Starting System components
 | 1. Basic Tool Box,
2. Special Tools,
3. Precision Tools
4. General Equipment’s
5. Cut Section of BS-III & BS- IV engine,
 |
| **Practical Duration(hh:mm) 22:00** | 1. Dismantle and reassemble of Engine
2. Setting of clearance & use of correct Torque,
3. Cleaning of all Oil Galleries.
4. Engine Timing Setting
5. Common rail Pressure checking
6. Calibration of ECU.
7. Making understand about the correct sequence of Bolt Setting of Cylinder Head
8. Making understand the working of centrifugal filter in engine
9. Test on the above topics
 |
| 6 | **Electrical & Electronic Components** **Theory Duration(hh:mm) 19:00** | 1. Perform checks on Battery
2. Perform checks on Starter Motor
3. Perform checks on Charging System
4. Understand the Engine Management System
5. Identify the various body electrical components
6. Understand the function and working of various body electrical components
7. Perform basic checks and PMS on body electricals
8. Understand the various safety systems in a vehicle
9. Identify and understand the functioning of vehicle security systems
 | 1. Batteries and power storage system
2. Electrical wire harness, Lighting ignition Electronic and air-conditioning systems , electronic control unit Fuse Box assembly ,Relay Sensors , Multi meter , SAMTEK, TDS , INSITE
 |
| **Practical Duration(hh:mm) 11:00** | 1. Demonstration of Electrical wire harness, lighting, ignition, electronic and air-conditioning systems etc. electronic control unit - hydraulic and pneumatic system
2. Making understand the importance of various colours used for wires
3. How to check the resistance / voltage of different wires
4. How to check the Continuity of Wires
5. Repairing of all electrical and electronic faults including direct faults in: - input sensors - output actuators - wiring harnesses -
6. computer systems - calibration/adjustment specifications
7. Diagnosis of faults & their remedy by SAMTEK & INSIGHT.
8. Test on the above topics
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| 7 | **Suspension****Theory Duration (hh:mm) 10:00** | 1. Understand the various terminology used in suspension systems
2. Understand the functions of different types of suspension systems
3. Identify the components of different suspension systems
 | 1. Basic Tools
2. General tools
3. Suspension system of various models
 |
| **Practical Duration(hh:mm) 02:00** | 1. Demonstration of various types of Suspensions
 |
| 8 | **Steering****Theory Duration(hh:mm) 19:00** | 1. Understand the purpose and function of steering systems
2. Understand the different types of steering systems
3. Identify the components of different steering systems
4. Understand the functioning of different components in steering systems
5. Perform power steering oil change
6. Perform bleeding of power steering system
 | 1. Basic Tools.
2. General Equipment’s.
3. Steering Puller, Steering Box Assembly ,Power Steering Unit, Rocker Steering Box
 |
| **Practical Duration(hh:mm) 11:00** | 1. Dismantle and reassemble of Steering Box
2. Adjustment of Sector Shaft & rocker Shaft
3. Demonstrating the internal components of steering Box
4. Steering Wheel Preplay adjustment
5. Test on the above topics
 |
| 9 | **Brake & Clutch****Theory Duration(hh:mm) 19:00** | 1. Understand the various terminology used in brake systems
2. Understand the purpose and function of brake systems
3. Identify the different components of a brake systems
4. Understand the working of different systems used in a brake systems.
5. Understand the functioning of different brake system components
6. Perform brake bleeding and adjustment
7. Measure disc and pad run out
8. Understand the functioning of Anti-lock Braking System (ABS)
9. Understand the operation and function of a clutch
10. Identify the different parts of a clutch
11. Perform basic maintenance on a clutch system
 | 1. Basic Tools.
2. General Tools
3. Special tools
4. Brake System, Clutch Assembly, Clutch Operating System l Equipment’s.
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| **Practical Duration(hh:mm) 17:00** | 1. Dismantle and reassemble of Brake
2. Demonstration of Master Cylinder & wheel
3. Cylinder
4. How to do air bleeding,
5. Repairing of Brake Shoes,
6. Adjustment of Brake
7. Function of S Kam & air compressor
8. Adjustment of clutch fingers,
9. Adjustment of paddle free play of Clutch
10. Test on the above topics
 |
| 10 | **Transmission & Differential****Theory Duration (hh:mm) 12:00**  | 1. Understand the need for a transmission system
2. Understand the working of a transmission system
3. Identify the parts of a transmission system
4. Perform basic maintenance of a transmission system
5. Understand the principle of an automatic transmission system
6. Identify the parts of an automatic transmission system
7. Understand the concept of gear ratios
8. Define the purpose of Differential
9. Perform basic Service Operations on Driveline & Differential and Transfer Case
 | 1. Basic Tools
2. General Equipment’s
3. Dial Gauge with Stand Transmission Assembly, Differential assembly
 |
| **Practical Duration (hh:mm) 12:00** | 1. Making understand the sequence of correct pinion setting
2. Demonstrating different type of Gears
3. Backless checking of Transmission
4. Demonstrating the Concept of Gear Ratios
5. CCD Checking
6. All bearing free play setting.
7. Teeth Contact checking.
8. Runout Checking & Ovulating checking.
9. Test on the above topics
 |
| 11 | **Axle, Wheel, Wheel alignment & Tyres****Theory Duration(hh:mm) 19:00** | 1. Identify different types of Rear Axle
2. Identify the components of Rear Axle
3. Identify the components & state the types of Front Axle
4. Define the Purpose of Transfer Case
5. State the Concept of How Transfer Case Works
6. Identify the Different Types of Transfer Case
7. Understand the Wheels & Tyres – Nomenclature
8. Ratings & specifications related to vehicle attend
9. Understand & analyse the related Concerns of Tyre wear & co relate for trouble shooting
10. Understand Wheel Alignment Geometry & its co-relation with Alignment
11. Perform Wheel Alignment efficiently
 | 1. Basic Tools
2. General Equipment’s
3. Electronic Measuring Tools of wheel Alignment, Air Compressor, Dial Gauge, Axle Assembly ,Tyres with Hub
 |
| **Practical Duration(hh:mm) 11:00** | 1. Demonstrating Axle bearing Preloading
2. Hub Bearing Preloading.
3. Hub Greasing
4. Wheel alignment,
5. Blowing of Air pressure
6. Test on the above topics
 |
| 12 | **PDI****Theory Duration(hh:mm) 12:00** | 1. Understand the purpose and importance of PDI
2. Understand the general guideline and safety procedures to be followed while doing PDI
3. Perform PDI on vehicles one of each LOB.
4. Describe the necessity of Preventive management
5. Read & identify the steps to be carried out in PMS Charts
6. Provide the Estimate of expenses involved based on the PMS required
7. Understand the Tooling & Preparation required before conducting PMS
8. Perform Preventive Maintenance on all mode
 | 1. Visit to PDI workshop.
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| **Practical Duration(hh:mm): 06:00** | 1. Demonstration of PDI being done at our workshop in order to check all parameters before Delivery of Vehicle.
2. Test & Testimonials
 |
| 13 | **Organized & Effective Team working****Theory Duration(hh:mm) 06:00** | 1. Work as per the need of Organizational requirement
2. Work with Colleagues to integrate work timely & safely.
3. Maintain clear communication with Colleagues & seniors.
4. Try to evaluate & maintain timeline for the assigned Job.
5. Manage time, materials and cost effectively
6. Use resources in a responsible manner
7. Obtain guidance from appropriate people, where necessary
8. Work within the limits of job role
 | 1. Case Study : Audio & Video ,Role Play
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| 14 | **Total Duration(hh:mm) 378:00****Theory Duration(hh:mm) 258:00** | Model Curriculum of Commercial Vehicle Technician level-1 | Practical training at our selected organization workshop |
| **Practical Duration(hh:mm) 120:00** |