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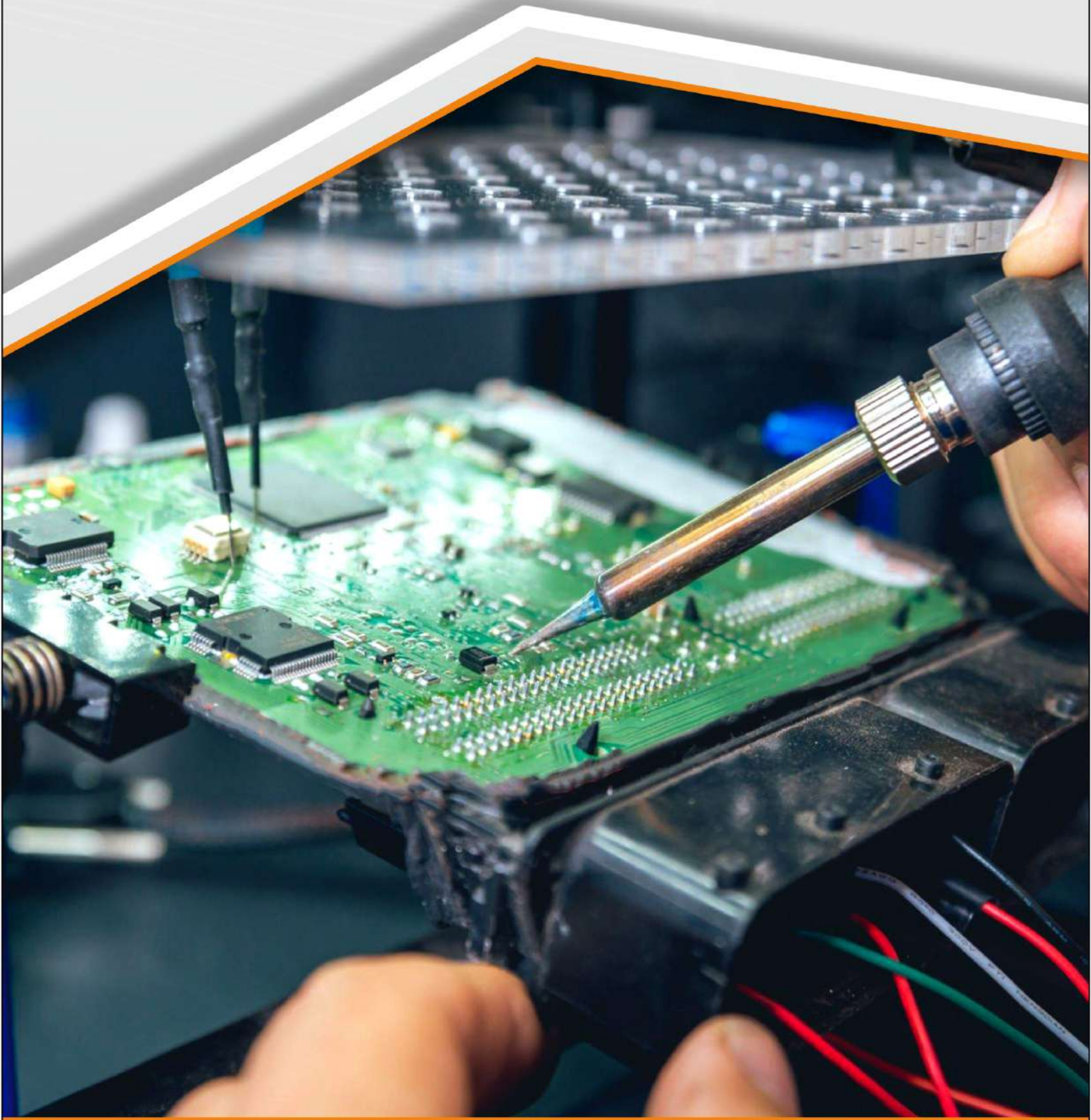
TECHNICAL TRAINING CENTER



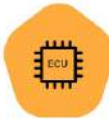
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COURSE TITLE

ECU REPAIRING



ECU REPAIRING



ECU

Understanding function of control modules, Module power supply, Module ground, Sensor reference power, Sensor reference ground, Sensor signals analogue and digital, Module output circuits, PWM signals, Frequency, Duty cycle, PWM signal switched to ground, PWM signal switching to power, MIL Malfunction Indicator Lamp, Understanding DTCs, DTC types and its description, ECU/ECM Memory chips like KAM (Keep Alive Memory), EEPROM, ROM, RAM.



ECU COMPONENTS IDENTIFICATION

ECU, Semi conductors(ICs), Diode, Transistor, Capacitor and Resistor types and its Functions. Resistor, Diode, Capacitor and Mosfet testing with multimeter and oscilloscope, NPN and PNP transistor testing, Different types of FETs (BFET, JFET and MOSFET), Soldering and Desoldering practice on circuit boards.



ECU INPUT AND OUTPUT CIRCUITS

Module power supply, Module ground, Sensor Reference power, Sensor Reference ground, Sensor signals analogue and digital, Module output circuits, PWM signals, Frequency, Duty cycle, PWM signal switched to ground, PWM signal switching to power, MIL Malfunction Indicator, DTC description, ECU/ECM Memory chips, KAM(Keep Alive Memory), EEPROM, ROM, RAM



ECU PROGRAMMING

Module programming with Scan tool, Immobilizer programming, Read and Write the Micro-processor, EEPROM and Cloning of ECU with KTM/KTAG tools.



ECU COMPONENT TESTING

ECU circuit board component testing with multi meter, simulator, ECU test bench with Oscilloscope.

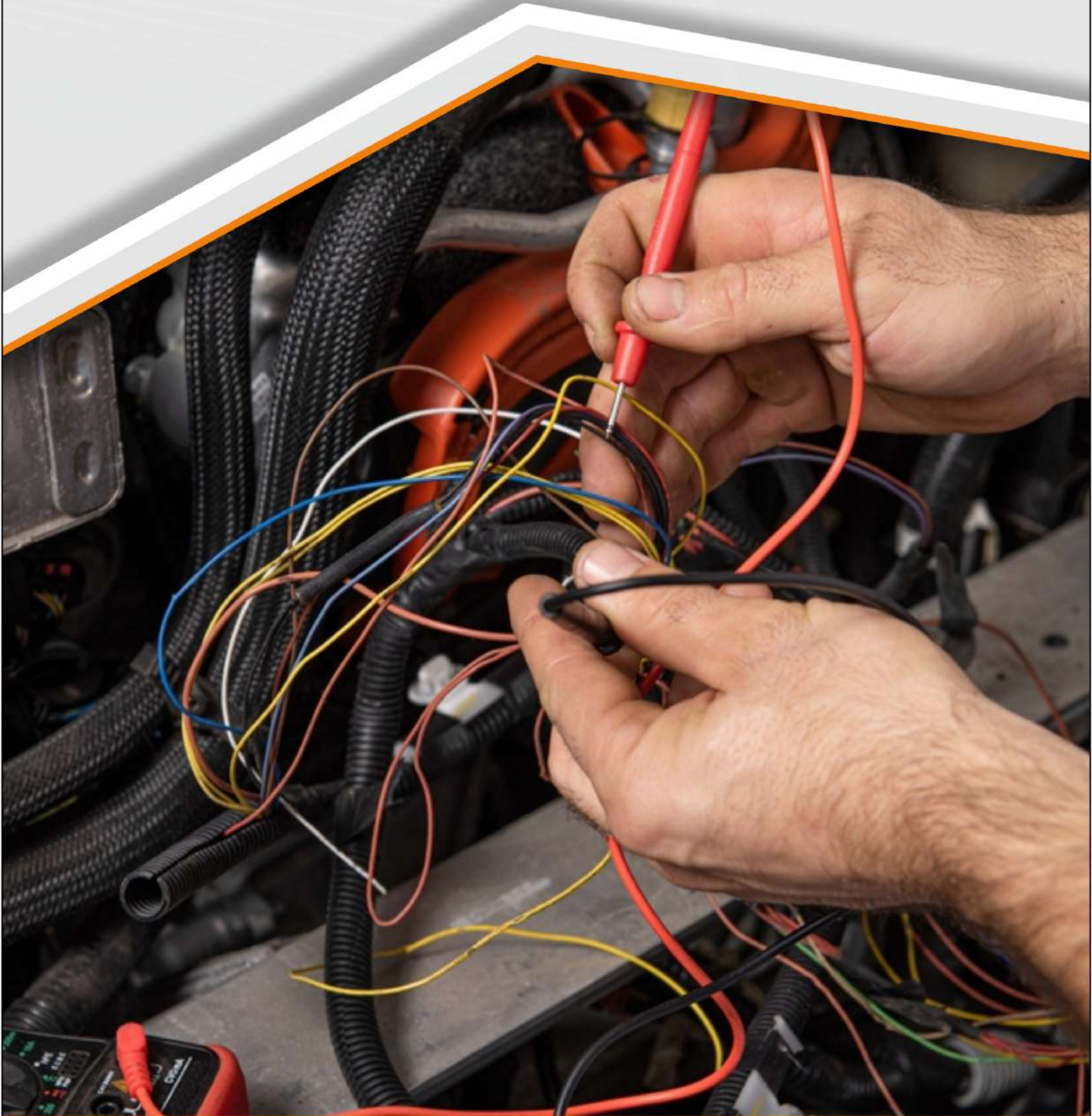


ECU TRACING

(ECU/ECM/PCM) Circuit board component circuit tracing for injector, ignition coil, sensors and Actuators.

COURSE TITLE

VEHICLE ELECTRICAL AND ELECTRONICS SYSTEM



VEHICLE ELECTRICAL AND ELECTRONICS SYSTEM



ELECTRICITY THEORY

Voltage, Current, Resistance, Ohm's Law, Watt's Law, Basic electrical circuit.



COMPONENTS OF ELECTRICAL CIRCUIT

Fuses, Bulbs, 4 Pin Relay, 5 Pin Relay, Electric motors, Circuit Breakers, Fusible link, switch NC, NO, MPMT switches, Momentary contact switch and How to check these components.



ELECTRICAL CIRCUITS

Series circuit, Parallel circuit, High or power side switching circuit, Power side switching with power side trigger, Power side switching with ground side trigger, Low or ground side switching, Groundside switching with power side trigger, Ground side switching with ground side trigger, Multi throw switching, Multi throw switching circuit with relay, Bidirectional switching circuit. Circuit faults (Open circuit, Short to ground, Short to power, High resistance). Pull up and Pull down circuits.



DIGITAL MULTIMETER

Multi meter Familiarization by measuring Voltage, Current, Resistance, Audible Continuity, Voltage drop test, Capacitance, Diode checking, Transistor checking.



SENSORS

APP sensor, AC pressure sensor, Inductive CKP, Hall effect CKP, CMP, ECT, CHT, Fuel pressure sensor, FRP (Fuel rail pressure sensor), HO₂S (Zirconia) Heated oxygen sensor, IAT, Knock sensor, MAP sensor, TP sensor, MAP-T sensor, MAFT sensor, Wastegate position sensor, OSS Output shaft speed sensor, AAT ambient air temperature sensor, WSS wheel speed sensor, VSS vehicle speed sensor, CPP clutch pedal position switch, BPP brake pedal position switch, Electronic intake manifold position sensor, EOP engine oil pressure switch, EGR position sensor, EGT exhaust gas temperature sensor, Exhaust pressure differential sensor, FRP fuel rail pressure sensor, Fuel temperature sensor, HO₂S sensor (nernst concentration cell type), Turbo charger position sensor(VCT). Oscilloscope usage for sensors with pattern.



COMMUNICATION NETWORK (CAN)

Communication networks (Types of CAN,LIN), Data transmission, Recessive and Dominant signal, Protocols, Priority determination, Sources of interference, Network termination, Gate way module, DLC, Terminating resistance measurement, Voltage measurement, Oscilloscope measurement with different CAN related Faults.

VEHICLE ELECTRICAL AND ELECTRONICS SYSTEM



INTRODUCTION TO STARTING SYSTEM AND CHARGING SYSTEM

Vehicle Battery, Battery OCV, Battery charging system check, Battery parasitic drain, Specific gravity checking, Container drain checking, Cranking test, Jump starting, Alternator /Generator working and testing(with load/without load), Positive side voltage drop, Negative Side voltage drop, Current measurement, Starting system and component working, Starter Testing.



INTRODUCTION TO ELECTRONICS

Module power supply, Module ground, Module switching input, Output circuits, Low current output circuit, High current output circuit, Testing Module power and ground circuits.



WIRING REPAIR TECHNIQUES

Wire Crimping, Wiring repair techniques, Terminal repair techniques, Checking wiring harness and Connector faults, Wiggle test, Intermittent wiring faults.



WIRING DIAGRAM

How to read wiring Schematics or Diagrams, Understanding of electrical symbols, Connector views, Component location views, Different circuit tracing in a car. (Engine cooling, Central door lock, Starting system, Charging(Alternator) System, HVAC system, Head lamp Circuit).

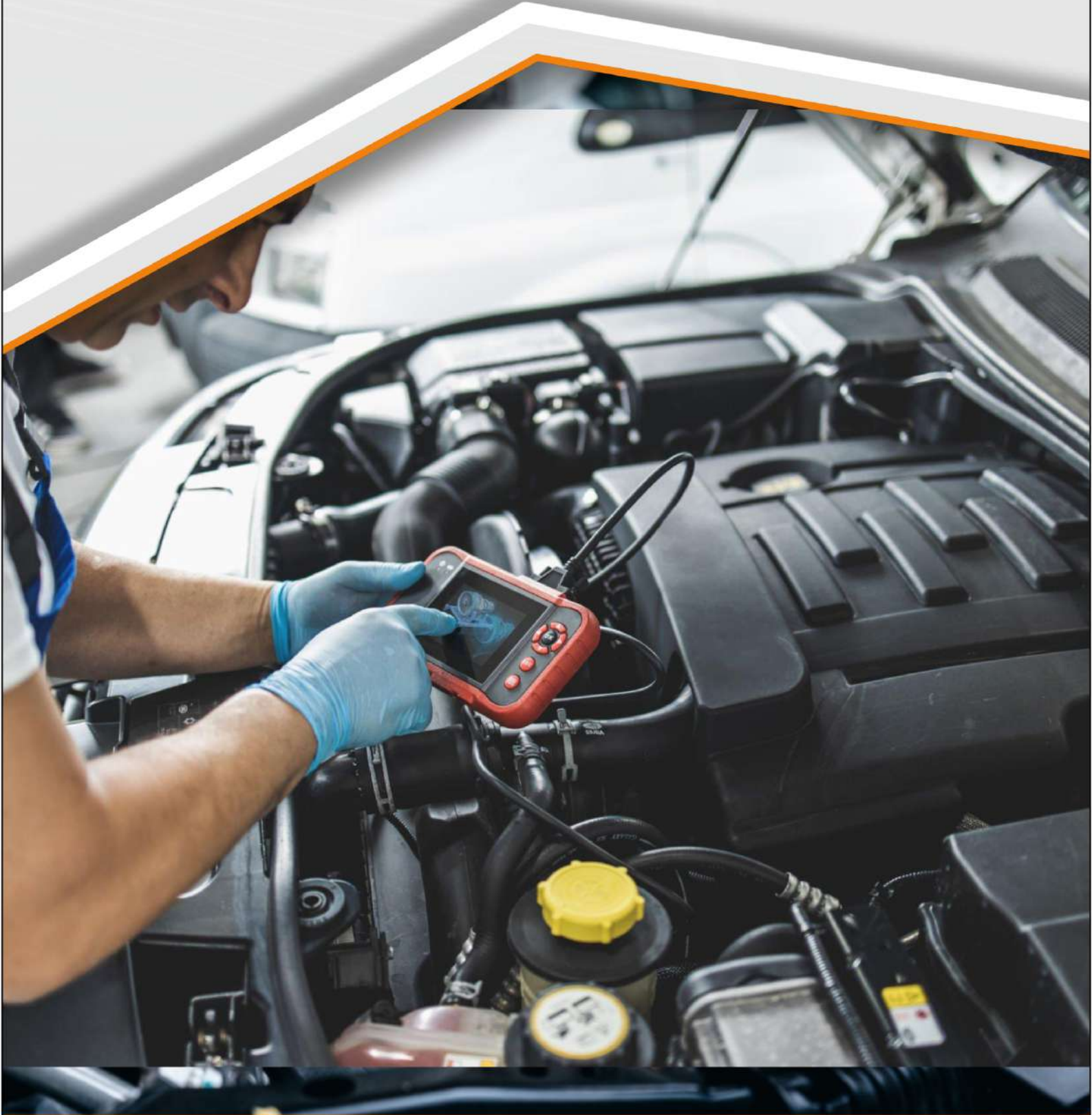


ACTUATORS

COP coil on plug with and without integrated driver, Electronic ignition coil, Electric fuel pump, Port fuel injection, Direct fuel injection, Electronic throttle control actuator (TCM), EVAP solenoid valve, Turbo charger wastegate actuator, Waste gate regulating solenoid valve, Pressure actuated TC wastegate, Vacuum actuated TC wastegate, VCT/VVT actuator, EGR Valve actuator, EGR cooler bypass valve actuator, Piezo fuel injector, Solenoid fuel injector, Fuel metering valve FMV, Glow plugs, Variable vane electrical actuator, Oil pressure solenoid valve with all Oscilloscope patterns of Actuators.

COURSE TITLE

VEHICLE DIAGNOSIS SYSTEM



VEHICLE DIAGNOSIS SYSTEM



DIAGNOSIS PROCESS

6 Step Diagnostic method to diagnose a fault, Types Of Faults, Reproducing concern, Road test, Intermittent fault data capture, Wiggle test, Mechanical and Electrical faults, Wiring faults-Ground supply Voltage drop test/ Resistance Check, Continuity check, Short to ground, Short to power, Shorted together and High resistance check with resistance mode, Root cause identification and analysis.



DTC DRIVEN DIAGNOSIS

Usage of Scan tool, Retrieve DTC, Erase DTC, Module checking, Network DTCs, Freeze frame data analysis.



SYMPTOM BASED DIAGNOSIS

Without DTC (Symptom Based Diagnosis) how to diagnose the faults in the vehicle.



SERVICE FUNCTIONS

Injector coding, SAS calibration, Oil reminder reset, Electronic throttle Body learning, Gear box learning etc.



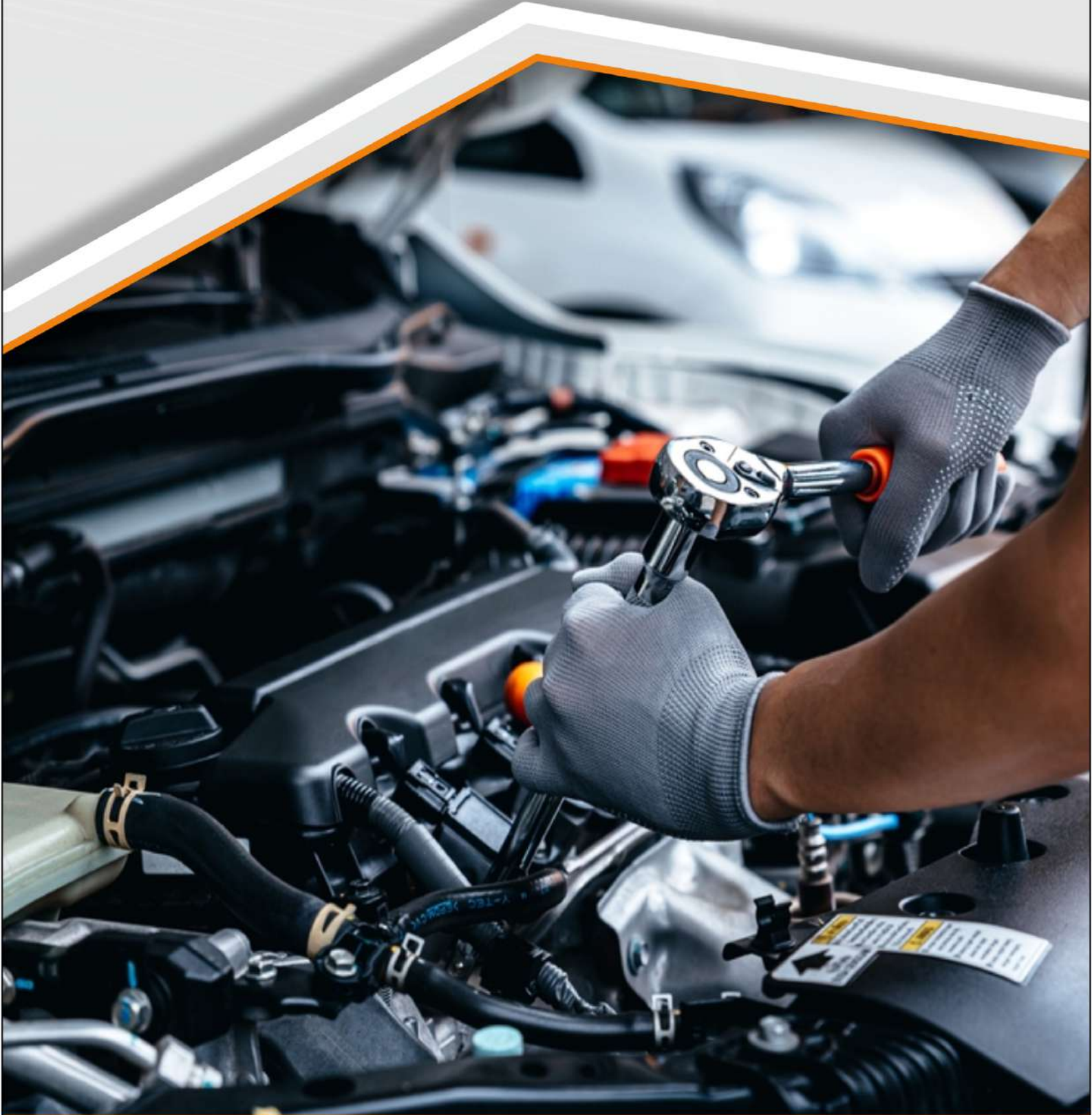
KEY CODING

Key coding, Remote learning, Key cutting.



COURSE TITLE

MASTER COURSE



MASTER COURSE



ECU REPAIRING:-

- ECU Components Identification
- ECU Component Testing
- ECU Tracing & Programming
- Key Coding
- ECU Input and Output Circuits



VEHICLE ELECTRICAL AND ELECTRONICS SYSTEM:-

- Electricity Theory
- Components of Electrical Circuits
- Digital Multimeter
- Wiring Diagram
- Introduction to Starting System and Charging System
- Sensors
- Communication Network (CAN)
- Actuators
- Introduction to Electronics
- Wiring Repair Techniques



VEHICLE DIAGNOSIS SYSTEM:-

- Diagnosis Process
- DTC Driven Diagnosis
- Symptom Based Diagnosis
- Service Functions
- Key Coding

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