Electric Vehicle (EV) High-Voltage Safety & Maintenance

Course Overview

This training program is designed to equip automotive technicians and maintenance personnel with essential knowledge and practical skills in Electric Vehicle (EV) high-voltage safety and maintenance.

As EV technology continues to expand rapidly, technicians must understand high-voltage system architecture, safety procedures, battery maintenance, and diagnostic techniques. This course focuses on safe handling practices, lock-out/tag-out (LOTO) procedures, workshop safety management, and real-world troubleshooting using diagnostic tools.

The program combines theoretical understanding with hands-on practical sessions using real EV components and case studies.

Course Objectives

Upon completion of this training, participants will be able to:

- Understand EV high-voltage system architecture (battery, inverter, motor)
- Identify high-voltage components and safety zones
- Apply proper lock-out/tag-out (LOTO) procedures
- Perform safe handling and testing of high-voltage systems
- Conduct EV battery health checks and preventive maintenance
- Diagnose common EV system faults using diagnostic tools
- Implement EV workshop safety and emergency response procedures

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Training Benefits

Organizations and participants will benefit from:

- Improved high-voltage safety awareness
- Reduced risk of electrical accidents
- Enhanced compliance with safety standards
- Increased technician confidence when handling EV systems
- Improved diagnostic accuracy

- Reduced downtime and maintenance errors
- Strengthened workshop safety culture

Target Audience

- Automotive Technicians
- EV Maintenance Technicians
- Workshop Supervisors
- Fleet Maintenance Personnel
- Service Engineers
- Technical Trainers
- Safety Officers in automotive workshops

Training Methods

- Interactive lectures
- Real EV components demonstration
- Hands-on practical sessions
- Lock-out/tag-out practice
- Diagnostic tool application
- Case studies and troubleshooting exercises
- Group discussions
- Knowledge assessment

Course Modules

Module 1: Introduction to EV Technology

- EV system overview
- High-voltage architecture
- Battery, inverter, and motor functions

Module 2: High-Voltage Safety & PPE

- Electrical hazards and risk zones
- Safety classifications
- Personal Protective Equipment (PPE) requirements
- Workshop safety protocols

Module 3: Lock-Out / Tag-Out (LOTO) Procedures

- Isolation procedures
- Verification of zero energy
- Safe reactivation procedures

Module 4: EV Battery System

- Battery structure and chemistry
- Battery Management System (BMS)
- Battery health monitoring
- Preventive maintenance practices

Module 5: Diagnostic & Troubleshooting

- Diagnostic scanner usage
- Reading fault codes
- Real-time data monitoring
- Common EV fault identification

Module 6: Emergency Response & Incident Management

- Electrical shock response
- Fire risk management
- EV emergency handling procedures

Training Timeline (2 Days | 9:00 AM – 5:00 PM)

Day 1 – EV Fundamentals & High-Voltage Safety

9:00 – 9:15 Registration & Introduction

9:15 – 10:30 EV System Architecture

10:30 – 10:45 Break

10:45 – 12:00 High-Voltage Safety & PPE

12:00 – 1:00 Lunch

1:00 – 2:15 Lock-Out / Tag-Out (LOTO) Procedures

2:15 – 2:30 Break

2:30 – 3:45 EV Battery System & BMS

3:45 – 5:00 Practical Safety Demonstration & Workshop

Day 2 – Diagnostics, Maintenance & Emergency Management

9:00 – 9:15 Recap

9:15 – 10:30 Diagnostic Tools & Fault Codes

10:30 – 10:45 Break

10:45 – 12:00 Battery Health Check & Preventive Maintenance

12:00 – 1:00 Lunch

1:00 – 2:30 Practical Troubleshooting Session

2:30 – 2:45 Break

2:45 – 4:15 Emergency Response & Workshop Safety Management

4:15 – 4:45 Assessment / Knowledge Review

4:45 – 5:00 Closing & Certificate Briefing