Auto – Working Safely with EV Meeting Kit

WHAT'S AT STAKE

Electric vehicles (EVs) are changing the automotive industry – but they're also changing the risks. These high-voltage machines aren't like traditional gas-powered cars. One wrong move around an energized system can result in instant electrocution, arc flash burns, or even fire. And the scary part? Many of the hazards are silent and invisible. Whether you're a mechanic, first responder, or tow truck operator, you can't treat an EV like just another car. Your safety – and the safety of those around you – depends on knowing what you're dealing with before you ever touch the hood.

WHAT'S THE DANGER

Electric vehicles (EVs) carry serious hazards that traditional gas-powered vehicles don't. High-voltage batteries, silent operation, and complex electronic systems can catch you off guard if you're not properly trained. Let's break down the main dangers:

1. **High-Voltage Shock – Deadly in Seconds**

EV batteries operate at 300–800 volts – more than enough to kill. If you contact an energized component, the electric shock can stop your heart, cause internal burns, or trigger fatal arrhythmias.

- Even touching a damaged cable or connector without proper PPE can be deadly
- Shocks often happen when workers assume the system is powered off when it isn't

1. **Arc Flash – Instant Burn Risk**

If you short a high-voltage system (like crossing battery terminals), you could trigger an arc flash – a sudden explosion of heat and light hotter than the surface of the sun.

- Arc flashes can cause severe burns, eye damage, or set clothing on fire
- They occur in a fraction of a second and leave little room to react

1. **Battery Fires – Toxic, Fast, and Hard to Stop**

Damaged or overheated lithium-ion batteries can ignite violently. Once a thermal runaway begins, the fire spreads rapidly and can be difficult to extinguish.

- EV battery fires release toxic gases and may re-ignite even after being "put out"
- Fire risk is highest during charging, after collisions, or when working on damaged battery packs

1. **Delayed Discharge – Energy Can Linger**

Even after an EV is turned off, its capacitors and components can retain high voltage for several minutes, sometimes even longer.

- Touching these energized parts too soon can still cause a shock
- Proper shutdown procedures must be followed, including waiting periods

HOW TO PROTECT YOURSELF

Working safely around electric vehicles means understanding their systems and using strict procedures every time – no shortcuts. Here's how to protect yourself from the hidden dangers EVs present:

De-Energize Before You Touch Anything – Always assume the vehicle is live until you've fully powered it down following the manufacturer's shut-off process.

- Disconnect the 12V system and follow proper lockout/tagout (LOTO) procedures
- Wait the required time (often 10+ minutes) for capacitors to discharge before starting work

Wear the Right PPE – Not Your Everyday Gear – For high-voltage systems, you'll need more than gloves and safety glasses.

- Use rubber-insulated gloves rated for at least 1,000V and test them before each use
- Wear arc-rated clothing (AR) to reduce burn risk from potential arc flash
- Use insulated tools with non-conductive handles when working near energized components

Follow Lockout/Tagout (LOTO) Protocols Every Time – Treat EVs like industrial machines – they need proper energy isolation.

- Place warning tags and locks on the vehicle once it's powered down
- Never trust a visual indicator alone – verify voltage with a tester
- Make sure all techs and coworkers know the car is being serviced

Prevent Vehicle Movement – Chock It, Disable It – EVs can move silently and suddenly.

- Chock the wheels and engage the parking brake
- Put the car in service mode or neutral (if safe), and verify it can't roll
- Keep key fobs away from the vehicle and outside the work zone

Have an Emergency Plan and Fire Extinguisher Ready – EV fires escalate quickly and can't always be extinguished with standard ABC extinguishers.

- Use a Class D or lithium battery-rated fire extinguisher where EV work is performed
- Know your shop's evacuation plan and emergency shutdown procedures

Stay Trained and Up to Date – EV systems vary between manufacturers and change fast.

- Complete EV-specific training from OEMs or certified

programs

- Don’t guess — check the service manual before every job

FINAL WORD

Electric vehicles demand respect. With the right training, tools, and steps, you can work confidently and safely on EVs — and avoid the silent, deadly risks hidden under the hood.
