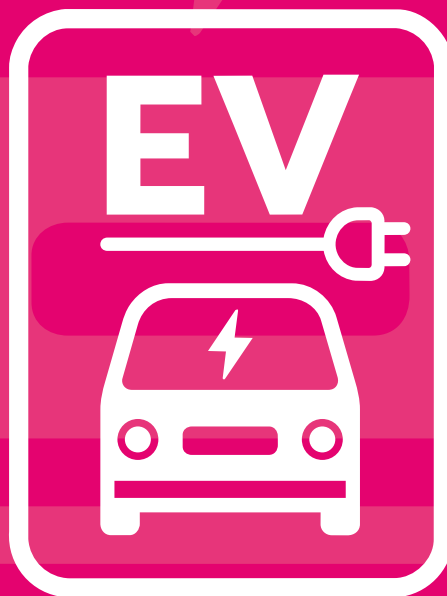




The communications union

***EV
SAFE DRIVER
GUIDANCE
FOR CWU REGIONAL LEADS***



MAIN EV DRIVER SAFETY ISSUES – CWU GUIDANCE

1. THERMAL RUNAWAY AND BATTERY FIRE

- Caused when battery heat generation exceeds heat dissipation.
- Can escalate rapidly from one cell to neighbouring cells.
- May result in smoke, flame, explosion, or toxic/flammable gas release.

2. MECHANICAL DAMAGE

- Battery damage from impact, crash, puncture, underbody strike, dropping, crushing, or deformation.
- Damage may create internal short circuits even if the vehicle initially appears normal.

3. ELECTRICAL ABUSE

- Overcharging, over-discharging, short circuits, faulty chargers, high-rate charging, or damaged cables.
- These can accelerate internal reactions and raise battery temperature.

4. THERMAL ABUSE

- Exposure to extreme heat, poor cooling, blocked ventilation, repeated rapid charging in hot conditions, or operating with a cooling-system fault.
- Heat build-up is a key pathway to failure.

5. BATTERY AGEING AND DEGRADATION

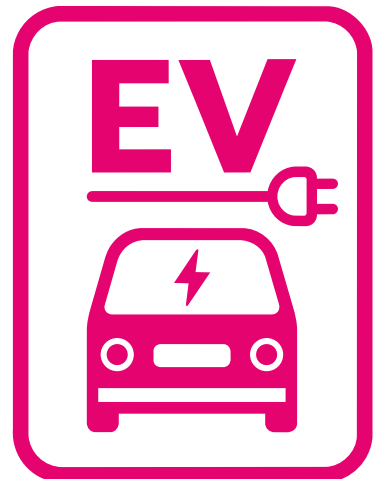
- Older or heavily cycled batteries may show increased internal resistance, imbalance, capacity loss, swelling, or abnormal heat generation.
- Ageing can reduce the margin before failure.

6. GAS RELEASE AND TOXIC EXPOSURE

- Failing lithium-ion batteries may release flammable and toxic gases such as carbon monoxide, hydrogen, carbon dioxide and volatile organic compounds.
- Drivers should treat smoke, hissing, chemical smells, or vapour as serious warning signs.

7. DELAYED WARNING OR SENSOR LIMITATIONS

- Voltage and temperature warnings may appear late.
- Best protection comes from multiple indicators: temperature, voltage, pressure, gas, mechanical swelling and BMS alerts.



SUGGESTED DRIVER SAFETY PROTOCOL GUIDANCE

1. PRE-DRIVE CHECKS

- Check for dashboard battery, charging, thermal-management, or high-voltage warnings.
- Do not drive if there is a persistent battery warning, unusual smell, visible smoke, fluid leak, swelling, impact damage, or abnormal heat.
- After any underbody impact, pothole strike, collision, or water ingress, arrange inspection before continued use.

2. SAFE CHARGING PROTOCOL

- **Only use approved chargers** and manufacturer-recommended charging equipment.
- Avoid using visibly damaged cables, connectors, adapters, or extension leads.
- Stop charging immediately if there is excessive heat, burning smell, arcing, smoke, repeated charger faults, or unusual noises.
- Do not repeatedly rapid charge if the vehicle reports overheating, reduced charging speed due to temperature, or thermal warnings.
- Where practical, avoid charging to 100% unnecessarily and avoid leaving the vehicle at very high state of charge in extreme heat unless required for a journey

3. OVERHEATING OR WARNING PROTOCOL

If the vehicle gives a battery-temperature, charging, or high-voltage warning:

1. Reduce load: slow down, avoid hard acceleration, and switch off unnecessary electrical loads if safe.
2. Stop in a safe open area away from buildings, fuel sources, vegetation, and other vehicles.
3. Turn off the vehicle and exit.
4. Keep people away from the vehicle.
5. Contact roadside assistance or emergency services depending on severity.
6. Do not restart or recharge until the vehicle has been inspected.

4. SMOKE, FIRE, HISSING, VAPOUR, OR CHEMICAL SMELL PROTOCOL

If smoke, hissing, flames, popping sounds, vapour, or strong chemical smells are present:

1. **Pull over safely and stop immediately.**
2. Switch off the vehicle if it is safe to do so.
3. Evacuate all occupants and move well away from the vehicle.
4. Warn others to keep clear.
5. Call emergency services and state clearly that it is an **electric vehicle battery incident**.
6. Do not attempt to open the battery compartment.
7. Do not inhale fumes.
8. Do not attempt to drive or charge the vehicle afterwards.

5. COLLISION OR IMPACT PROTOCOL

After a crash, underbody strike, flood exposure, or suspected battery impact:

- Treat the battery as potentially damaged even if the car still drives.
- Park outside and away from buildings or other vehicles where possible.
- Do not charge the vehicle until it has been inspected.
- Monitor for delayed smoke, heat, odour, warning lights, or noises.
- Report the incident to recovery personnel and insurers as a possible high-voltage battery concern.

6. STORAGE AND PARKING PROTOCOL

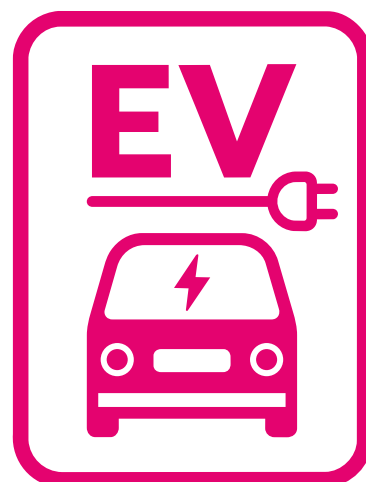
- Avoid parking a damaged or suspect EV inside a garage or close to buildings.
- If the vehicle has battery warnings, heat symptoms, or post-collision concerns, park in an open, isolated area.
- Keep charging areas clear of combustible materials.
- Ensure charging points are maintained and protected from water ingress or physical damage.

7. MAINTENANCE AND INSPECTION PROTOCOL

- Follow manufacturer service intervals for battery, cooling system, software updates and charging system.
- Investigate recurring range loss, slow charging, unusual fan noise, repeated warning lights, swelling, or abnormal heat.
- Ensure battery-management software updates are applied, as these may improve early warning and protective responses.

SIMPLE DRIVER RULE

If an EV shows battery warnings, unusual heat, smoke, hissing, chemical smell, fluid leak, or has suffered impact damage: stop using it, move away, do not charge it, and get professional help.



CWU SAFETY KNOWLEDGE & FAMILIARITY GUIDANCE

1. WHERE THE EV BATTERY IS LOCATED

For almost all everyday EVs (Royal Mail, BT/Openreach, fleet vans, pool cars):

A. MAIN TRACTION BATTERY (HIGH-VOLTAGE)

- It is a **large flat pack** mounted **under the floor** of the vehicle.
- Runs from **front to back**, between the wheels.
- Protected by a **metal tray** or **shielding panels**.
- You will NOT see the battery cells – only the casing.

B. 12-VOLT BATTERY (SMALL AUXILIARY BATTERY)

- Usually under the **bonnet**, like a normal car battery.
- Sometimes in the **boot** (e.g., some BMW, Mercedes EVs).
- This battery powers lights, locks, screens, etc.

2. WHAT A NON-TRAINED DRIVER CAN VISUALLY CHECK

These checks are **safe, external**, and require **no technical knowledge**.

A. UNDER-VEHICLE CHECK (10 SECONDS)

Look underneath from the side – **do not crawl under**.

Check for:

- **Fresh puddles** or **wet patches** under the centre of the vehicle
- **Oily, greasy**, or **bright-coloured** fluids
- **Burn marks, scorching**, or **discoloured metal**
- **Loose panels, hanging shields**, or **broken clips**
- **Debris stuck** under the battery tray (branches, plastic, packaging)

B. SIDE SILL & FLOOR AREA

Look along the lower edges of the vehicle:

Check for:

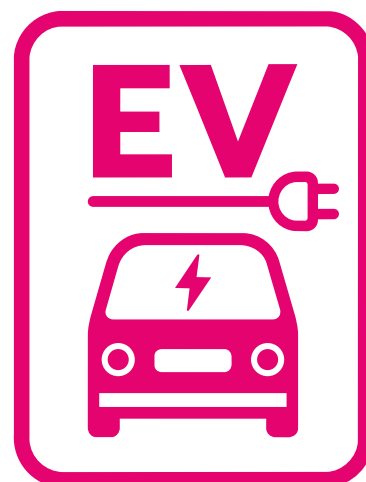
- **Dents** or **impact damage** to the lower body
- **Crushed areas** near the battery tray
- **Visible cracks** in plastic shielding

C. CHARGING PORT AREA

Check the charging flap and socket:

Look for:

- **Burn marks**
- **Melted plastic**
- **Discolouration**
- **Loose or bent pins**
- **Moisture** inside the port



D. CABIN FLOOR & REAR SEAT AREA

A visual and touch-free check:

Look for:

- **Bulging floor sections**
- **Warped plastic trim**
- **Discolouration**
- **Smoke residue**
- **Unusual heat** (without touching – hover your hand)

E. 12-VOLT BATTERY (IF VISIBLE)

Look only – **do not touch**.

Check for:

- **Corrosion** on terminals
- **Loose brackets**
- **Cracked casing**
- **Burn marks**

3. SIGNS THAT REQUIRE IMMEDIATE STOP & REPORT

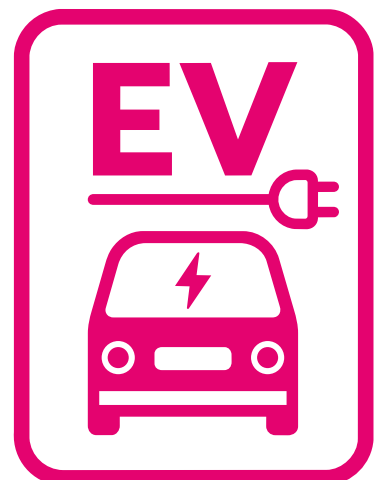
If a driver sees **any** of the following:

- Fresh fluid leaking from under the centre of the vehicle
- Burn marks around the charging port
- Smoke or vapour from under the floor
- Melted plastic anywhere near the battery tray
- A strong chemical or burning smell
- Cabin Floor visibly warped or bulging
- Under-tray hanging loose or dragging

DO NOT DRIVE THE VEHICLE. REPORT IMMEDIATELY TO YOUR MANAGER AND CWU REP.

4. WHAT A DRIVER MUST NOT DO

- **Do not open battery covers**
- **Do not touch high-voltage cables (orange cables)**
- **Do not poke or prod under-floor panels**
- **Do not attempt to “check the battery” internally**
- **Do not drive if any warning signs are present**



CWU SAFETY COMMITTEE BRIEFING

Identifying Thermal Runaway in Everyday EVs

A4 – Committee-Ready Safety Guidance (2026 Edition)

1. PURPOSE OF THIS BRIEFING

This briefing provides CWU reps, safety leads and operational managers with clear, practical guidance on **how to identify early signs of thermal runaway in electric vehicles (EVs)** used across Royal Mail, BT/Openreach, Parcelforce, and other CWU-represented fleets. Thermal runaway is a rapid, self-accelerating battery failure that can lead to fire, explosion, or toxic gas release. Early identification is critical to protecting members.

2. SUMMARY OF THE RISK

Lithium-ion batteries can enter thermal runaway following internal faults, physical damage, overheating, or charging issues. Once initiated, escalation can occur in **seconds**, producing flammable gases, smoke, and intense heat. EVs are generally safe, but early warning signs are detectable by drivers and can prevent serious harm.

Key risk characteristics:

- Rapid temperature rise inside the battery pack
- Gas venting before visible smoke
- Sudden electrical system instability
- Potential ignition of vented gases

3. EARLY WARNING SIGNS DRIVERS CAN IDENTIFY

Thermal runaway typically presents in six **observable stages**. Any **two signs together** should be treated as a serious hazard.

3.1 UNUSUAL SMELLS

- Sweet, solvent-like odour (electrolyte decomposition)
- Sharp chemical smell similar to nail-polish remover
- Burning plastic or electrical smell

3.2 UNEXPECTED HEAT

- Localised hot spots under rear seats, boot floor or centre tunnel
- Cabin warming despite HVAC being off
- Cabin Floor feeling unusually warm

3.3 DASHBOARD ALERTS

Common alerts across Tesla, Nissan, VW, Hyundai, Kia, BMW, Mercedes, Polestar and other fleet EVs:

- “Reduced power”
- “Electrical system fault”
- “Battery cooling limited”
- “Service vehicle soon”
- “Pull over safely”

3.4 AUDIBLE SIGNS

- Popping or crackling
- Hissing (gas venting)
- Repeated clicking from high-voltage contactors

3.5 SMOKE OR VAPOUR

- White or grey mist from under the vehicle
- Light smoke entering cabin vents
- Smoke accompanied by chemical odour

3.6 VEHICLE BEHAVIOUR CHANGES

- Sudden loss of power
- Jerky acceleration
- 12-volt system flickering
- Doors/windows behaving erratically

4. IMMEDIATE ACTIONS FOR DRIVERS

If any two warning signs occur together:

1. **Pull over immediately** in a safe location
2. **Shut down the vehicle**
3. **Exit the vehicle**
4. **Move 15–20 metres away**
5. **Call 999** and state: “**Electric vehicle – possible battery thermal runaway.**”
6. **Do not** open the bonnet or investigate the smell
7. **Do not** attempt to move or restart the vehicle

5. EMPLOYER RESPONSIBILITIES

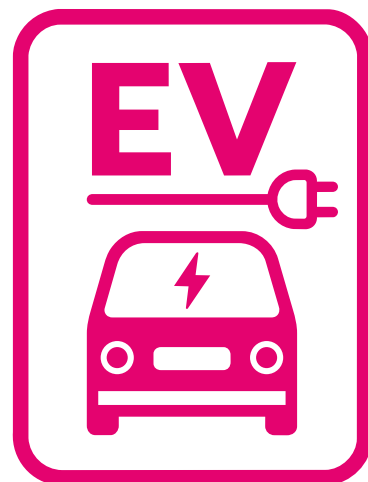
Under the **Health and Safety at Work Act 1974**, **Management of Health and Safety at Work Regulations 1999**, and **PUWER**, employers must:

- Provide safe vehicles, safe systems of work, and adequate training
- Ensure EVs undergo appropriate inspection, maintenance and battery-health monitoring
- Provide clear emergency procedures for EV incidents
- Ensure drivers can recognise early warning signs
- Maintain charging infrastructure to prevent overheating or electrical faults

6. CWU REP ACTIONS

Reps should:

- Ensure members receive clear EV safety briefings
- Report any EV battery-related incidents, smells, smoke or dashboard faults
- Request inspection records for vehicles showing repeated electrical warnings
- Escalate concerns where EVs show recurring battery-cooling or electrical-system alerts
- Ensure employers provide suitable training for EV operation and emergency response
- Record all incidents in branch safety logs and request follow-up investigations



7. EVIDENCE NOTES FOR REPS

When collecting evidence after an EV incident, record:

- Smells detected (type, strength, duration)
- Dashboard warnings displayed
- Any noises heard (popping, hissing, crackling)
- Vehicle behaviour changes
- Time between first sign and smoke
- Weather, charging status, recent impacts or faults
- Photographs of smoke, vehicle position, and dashboard alerts (if safe)

This information supports investigations, RIDDOR assessments, and employer accountability.

LEGALLY BINDING REQUIREMENTS FOR COMMERCIAL EV SAFETY & TRAINING (UK)

Audience: Fleet managers, CWU reps, safety committees **Scope:** Commercial electric vehicles (cars & vans) used for work purposes **Purpose:** Summarise only the statutory duties that apply to EV safety, training, charging, and electrical competence.

1. HEALTH AND SAFETY AT WORK ETC. ACT 1974 (HSWA)

Legal status: Primary legislation **Binding duties:**

- Employers must provide **information, instruction, training and supervision** to ensure employee safety.
- EV-specific hazards (high-voltage systems, battery thermal runaway, charging risks) fall under the employer's duty to manage **foreseeable risks**.
- Employers must maintain **safe systems of work** for vehicle use, charging, inspection, and defect reporting.

What this means for EV fleets:

- Mandatory training on EV hazards, safe charging, emergency actions, and defect escalation.
- Mandatory risk assessments covering EV battery risks, home-charging risks, and electrical hazards.

2. ELECTRICITY AT WORK REGULATIONS 1989 (EAWR)

Legal status: Statutory instrument **Binding duties:**

- Anyone working on or near electrical systems must be **competent** and **properly trained**.
- Employers must prevent **danger** from electrical systems, including high-voltage EV components and charge-points.

What this means for EV fleets:

- Only trained/competent persons may install, inspect, or maintain EV charge-points.
- Drivers must be trained not to interfere with electrical equipment or damaged cables.
- EV battery damage must be treated as an electrical hazard requiring competent inspection.

3. PROVISION AND USE OF WORK EQUIPMENT REGULATIONS 1998 (PUWER)

Legal status: Statutory instrument **Binding duties:**

- Employers must ensure work equipment (including vehicles) is **safe, maintained**, and used only by **trained and competent** workers.
- Daily checks, defect reporting, and safe-use training are mandatory.

What this means for EV fleets:

- EVs must be included in daily safety checks.
- Drivers must be trained in safe operation, charging, and emergency shutdown procedures.
- EV-specific defects (battery warnings, cooling faults, charging errors) must be escalated immediately.

4. ROAD TRAFFIC & DRIVING LICENCE REGULATIONS (COMMERCIAL EV WEIGHT RULES)

Legal status: Statutory instrument **Binding duties:**

- Category B licence holders may drive EVs up to **4,250 kg MAM**.
- Earlier mandatory training for heavier alternatively-fuelled vehicles was **removed** in the 2025 amendment.

What this means for EV fleets:

- No EV-specific driver licence training requirement exists.
- Employers must still ensure drivers are competent under HSWA/PUWER.

5. DVSA OPERATOR LICENSING & COMMERCIAL VEHICLE SAFETY REQUIREMENTS

Legal status: Statutory guidance with legal force through operator licensing **Binding duties:**

- Operators must ensure drivers are **trained** to conduct daily safety checks.
- Applies equally to EV vans and ICE vans.

What this means for EV fleets:

- EV-specific daily checks (battery status, charging port condition, cable integrity) must be included.
- Drivers must be trained to recognise EV-specific warning indicators.

6. AUTOMATED AND ELECTRIC VEHICLES ACT 2018

Legal status: Primary legislation **Binding duties:**

- Regulates public charging infrastructure safety and insurer liability.
- Does **not** mandate EV-specific driver training.

What this means for EV fleets:

- Employers must ensure charging infrastructure used for work is compliant and safe.

7. HOME-CHARGING (LEGAL DUTIES DERIVED FROM HSWA + EAWR)

Legal status: No EV-specific statute – obligations arise from HSWA & EAWR **Binding duties:**

- Employers must ensure home charging used for work purposes is **safe, competent**, and **risk-assessed**.
- Electrical work (installing charge-points) must be carried out by **competent persons**.
- Drivers must notify **home insurers** of EV charge-point installation (insurance contract requirement).

What this means for EV fleets:

- Mandatory home-charging safety guidance for drivers.
- Mandatory insurer notification for home charge-points.
- Employers must assess risks of charging in enclosed garages.

SUMMARY OF WHAT IS **NOT** REQUIRED BY LAW

To avoid misinformation:

- No EV-specific driver qualification
- No EV-specific CPC module
- No legally mandated EV charging course for drivers
- No EV-specific operator licence category
- No statutory EV battery-handling licence for drivers

All training obligations come from **general safety law**, not EV-specific statutes.

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