

Forklift Trucks – 12 Top Tips

Forklift trucks are used by many businesses and organisations to move goods and materials.

This Loss Prevention Standard provides 12 top tips to help prevent fires and other property loss events.

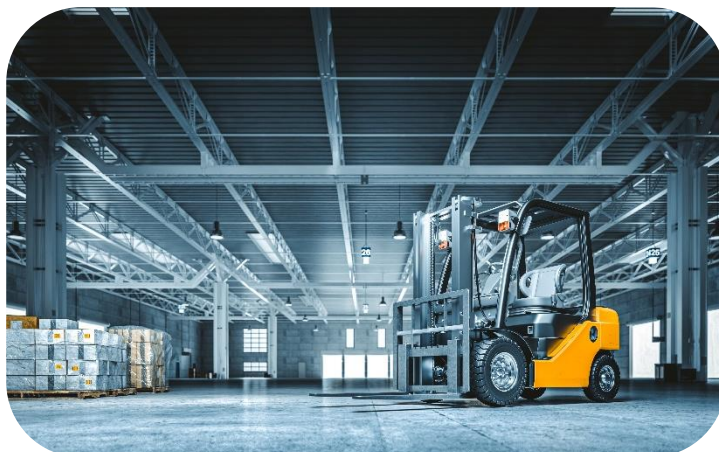
Forklift Trucks – 12 Top Tips

Introduction

Forklift trucks are used by many businesses and organisations. The most common types are vehicles powered by:

- Lead-acid batteries.
- Lithium-ion batteries.
- Liquified petroleum gas (LPG).
- Diesel.

Forklift trucks present a number of risk concerns requiring careful management. This Loss Prevention Standard is aimed at businesses using no more than two forklift trucks and the guidance can help reduce the potential for loss events, e.g. fire, impact, etc.



More detailed guidance can be found in Aviva Loss Prevention Standards **Battery Powered Forklift Trucks - Property** and **Lithium-ion Batteries - Storage and Transit**.

Note: This document relates to the use of forklift trucks and is focussed on property loss prevention and related risk management guidance. It is not intended to address liability exposures. The presumption is that all regulatory requirements, such as fire risk assessments, health and safety legislation and compliance with local building regulations, codes, or standards, have or will be met.

Understanding the Risks

Risk exposures associated with battery powered forklift trucks include, but are not limited to:

- **Overcharging.** Overcharging can lead to batteries overheating and release of combustible gases and ignition. The charging process can also produce a small amount of hydrogen gas, which is highly flammable.
- **Ventilation.** Inadequate or faulty ventilation can result in flammable gas accumulation in and around the charging area.
- **Sparking.** Damaged charging leads and terminals can cause sparking.
- **Electrical Fault.** Charging equipment can be damaged or become faulty, leading to overheating and ignition.
- **Battery Fault.** All batteries can develop faults and go in to thermal runaway, a condition that results in overheating of battery cells and ignition.

LPG and diesel powered vehicles can leak, potentially creating flammable atmospheres, and can create similar risks through the filling process. In addition, LPG powered vehicles can release flammable gas through repeated starting attempts.

The potential for fire damage can be increased by the presence of combustible materials, e.g., packaging, other goods/stock, pallets, etc., and/or any combustible construction materials which would support fire growth. In addition, forklift trucks can cause impact related damage to buildings, equipment, stock, etc.

Managing the Risks

1. Battery Charging Location

- Where possible, relocate battery charging to a detached shed building, or a dedicated charging room or hall within the building with at least 60 minutes fire resistance (insulation and integrity) from the rest of the building.
- Where this is not possible a dedicated charging area should be established.
 - ✓ This area should be maintained at least 2 metres clear of other forklift charging areas and combustible materials, such as some building linings, or stock, etc.
- **Important:** This area should be increased to 5 metres where lithium-ion battery powered equipment is utilised, given the wide flame dispersal associated with fires involving lithium-ion vehicle batteries.
- ✓ Use floor markings/hatching to demark the area and train operatives to ensure the area is kept clear.
- Do not place charging equipment on pallets or other combustible items.
- Do not install charging equipment within storage racking under any circumstances.
- Locate charging equipment least 0.5 metres from the ground.
 - ✓ This reduces the risks of electrical fire during a leak, water ingress event, etc.
- Use fixed metal barriers to help protect the chargers from accidental damage.

2. Charging

- Use proprietary forklift and charging equipment, supplied by a reputable vendor.
 - ✓ Do not use second-hand or refurbished equipment unless fully overhauled and certificated as safe for use.
- Aim to charge during occupied periods, as far as achievable.
- Ensure an isolation switch is installed away from the charging equipment.
- Do not use extension leads with charging equipment.
 - ✓ These can be easily damaged, leading to arcing and ignition.
 - ✓ These can also overheat and ignite.
- Ensure the vehicle ignition is turned off and forklift keys/fobs removed.
- Make sure battery chargers are always turned off before connecting the battery to the charger.

3. Ventilation

Charging locations should be adequately ventilated to assist with cooling and help dissipate any flammable vapours.

- A risk assessment should be carried out to assess ventilation needs.
- When relying on manual ventilation only, choose a location with good air movement, such as near a roller shutter, door or window.
- Ensure the charging is uncongested and cooling vents unobstructed.
- Mechanical ventilation is recommended where the vehicle is located in an internal area.
 - ✓ Ensure the ventilation system is suitable for use in the location via a risk assessment.
 - ✓ The exhaust point of such a ventilation system should be to a safe area in the open.

4. Damaged or Faulty Batteries

Forklift trucks with damaged or faulty batteries should be repaired as soon as possible.

- Pending repair, any such vehicle should not be charged and segregated/quarantined. Ideally this will be in a fire resisting compartment or dedicated charging building, however where such facilities are unavailable, a segregated area at least 5 metres from combustible building linings, other contents, or stock should be provided.
- Ensure keys are removed and secured, and adequate fault warning notices displayed.

5. Automatic Fire Detection and Automatic Fixed Fire Protection

Automatic fire detection systems should be extended to the forklift charging area, and connected to a reliable monitored and constantly attended location.

- Charging equipment should be interlocked to the fire detection/alarm system to ensure safe isolation of charging equipment upon activation.
- A manual means of raising a fire alarm should also be provided.
- Automatic sprinkler protection is a very reliable means of detecting and suppressing fire. Refer to your property insurer and broker for specific guidance on such systems.

6. Impact Protection

Help reduce the potential for impact related incidents involving forklift trucks by installing impact protection to vulnerable areas such as vehicle openings in compartment walls, storage racking, electrical or other plant, charging equipment, etc.

7. LPG Forklifts

- Only allow appropriately trained workers to change LPG cylinders.
- Ensure hoses and connectors are checked for damage when changing cylinders.
- Starting problems should be treated as an emergency event and the vehicle immediately taken out of use and segregated in a well-ventilated area, pending repair. The LPG cylinder should be isolated/shut off.
 - ✓ Deposits accumulating in vaporiser units, regulators and shut off valves can result in sticking valves and a fuel mixture that is too rich to ignite. Repeated starting attempts can release unburned LPG into the workplace, creating a very significant fire risk.
- Store LPG cylinders in a well-ventilated secured cage in the open, at least 10 metres from buildings and other valuable assets.
 - ✓ Cage to also be sited clear of areas containing combustible materials and vegetation.
 - ✓ Ensure appropriate warning signage is displayed, including no smoking signs.
 - ✓ The cage should be roofed with a solid material to prevent direct sunlight exposure.
 - ✓ Store empty and full cylinders separately.

8. Diesel Forklifts

- Locate diesel fuel tanks in well-ventilated areas at least 10 metres from buildings and other valuable assets.
- Ensure the hose and pumps are adequately secured to help prevent fuel theft and contamination incidents.
- Clean up fuel spillages immediately. Use non-combustible agents to soak up fuel spillages and dispose of within non-combustible, dedicated waste bins, located at least 10 metres from buildings and assets.
 - ✓ The use of sawdust for soaking up fuel spillages should be prohibited. Instead use proprietary, non-combustible absorbent granules.
- Do not park vehicles in areas where combustible materials may be present on flooring surfaces, e.g. grain, feedstock, etc.
 - ✓ Hot exhausts can ignite such materials.
- Ensure spark arrestors are installed to exhaust systems where diesel forklift trucks are operating in areas where potentially flammable atmospheres or combustible materials may be present.

9. End-of-Life Battery Management

All battery types have a recommended lifecycle rating, and this information will be available from the supplier/maintenance company.

- Ensure battery replacement is formally scheduled and battery health monitored closely during the final 12 months of the scheduled lifespan for signs of performance decline.
- Do not exceed recommended lifecycle charging unless approved by your supplier.
- Removed batteries should be removed immediately by the maintenance company or stored in a segregated area, at least 10 metres from buildings and valuable assets and collected by a reputable waste recycling company.

10. Self-Inspection

Ensure self-inspection programmes include areas where forklift trucks are used or stored, and ensure:

- Site rules and policies on use, storage and charging are being followed, and any arising issues are appropriately actioned.
- Equipment is in good working order including hoses, fuel lines, exhausts, etc.
- Damaged or faulty charging equipment including cables are removed from use immediately.
- Fire detection and any protection equipment are functioning normally.
- Thermographic cameras are used to check equipment when under charge for unusual heat patterns, etc.
- Any Impact protection devices are in good repair.

Refer to Aviva Loss Prevention Standards **Self-Inspections** and **Use of Thermographic Cameras - General Considerations** and **Checklist** for further guidance.

11. Maintenance, Inspection and Testing.

Ensure forklift trucks and charging equipment are subject to a formal maintenance arrangement as per Original Equipment Manufacturer (OEM) guidelines.

Refer to Aviva Loss Prevention Standards **Maintenance Regimes** for further guidance.

12. Emergency Response

Ensure an emergency response plan is in place, confirming key responsibilities and actions in an emergency event involving forklift trucks. Workers should be adequately trained in emergency response arrangements.

Refer to Aviva Loss Prevention Standard **Emergency Response Teams** for further guidance.

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Aviva Risk Management Solutions can offer access to a wide range of risk management products and services at preferential rates via our network of Specialist Partners.

For more information please visit: [Aviva Risk Management Solutions – Specialist Partners](#)

Sources and Useful Links

- [The Dangerous Substances and Explosive Atmospheres Regulations 2002.](#)
- [The Regulatory Reform \(Fire Safety\) Order 2005.](#)
- [The Fire Safety \(Scotland\) Regulations 2006.](#)
- [The Fire \(Scotland\) Act 2005.](#)
- [The Fire and Rescue Services \(Northern Ireland\) Order 2006.](#)
- [LPS 1271: Issue 2.3 Requirements for the LPCB Approval and Listing of Companies Installing Fire or Security Doors, Door-sets, Shutters and Active Smoke/Fire Barriers.](#)
- [LPS 1197: Issue 4.2 Requirements for the LPCB approval and listing of companies inspecting, repairing, and maintaining fire and security doors, door-sets, shutters, and active smoke/fire barriers.](#)
- [HSE document INDG139 Using electric storage batteries safely.](#)
- [Redbooklive.](#)

Note: Whilst UK standards and legislation are referenced in this document, other international standards and legislation should be referenced where applicable.

Additional Information

Relevant Aviva Loss Prevention Standards include:

- **Battery Powered Forklift Trucks – Property**
- **Business Continuity**
- **Contamination Following a Fire**
- **External Building Areas – Usage and Safety**
- **Fire Compartmentation**
- **Fire Doors, Fire Shutters & Fire Dampers**
- **Fire Safety Inspections**
- **Fire Safety Legislation**
- **Heat and Smoke Venting Systems**
- **Managing Change – Property**
- **Smoke Contamination**
- **Use of Thermographic Cameras – General Considerations**
- **Use of Thermographic Cameras – Checklist**
- **Lithium-ion Batteries – Storage and Transit**
- **Environmental, Social and Governance Overview**

To find out more, please visit [Aviva Risk Management Solutions](#) or **speak to one of our advisors.**

Email us at riskadvice@aviva.com or call 0345 366 6666.*

*The cost of calls to 03 prefixed numbers are charged at national call rates (charges may vary dependent on your network provider) and are usually included in inclusive minute plans from landlines and mobiles. For our joint protection telephone calls may be recorded and/or monitored.

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19th September 2025

Version 1.0

ARMSGI3382025

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