WHITEPAPER --- FACTORS IN FORKLIFT ACCIDENTS

## What *factors* contribute to forklift accidents?
- Lack of proper training for lift truck drivers
- Lack of training for particular types of forklifts
- Lack of training for particular forklift applications within a plant
- Incomplete or incompetent completing of daily checklist
- Poor or improper maintenance of the forklift
- Various reasons operator may be under stress.
- Lift truck not equipped with the proper attachments and accessories.
- Excessive age or excessive usage of the forklift
- Not taking advantage of modern electronic safety devices to improve safety, awareness + accountability

## What driver *operational* factors contribute to forklift accidents?
- Driving the forklift at unsafe high speeds---speed limits or zones implemented?
- Allowing youths 18 or younger to operate forklifts (OSHA 29 CFR 570.58)
- Failure to complete required refresher training and 3 year performance evaluation (OSHA 29 CFR 1910.178(l)
- Using the forklift forks to open or close freight doors of buildings, trailers or railcars.
- Failure to keep arms or legs from between mast uprights or within confines of the forklift
- Improper wheels chocking of semi-trailers or railway cars---or forklifts on inclines.
- A safe distance of at least 3 truck lengths should be maintained for reaction time
- Improper warnings to pedestrians and forklift drivers about forklift traffic areas
- Poor communication between operators and vehicles in close confines.
- Incomplete or incompetent completing of daily checklist
- Improper acceleration or turning or breaking of the forklift
- Riding other people anywhere on the forklift or on the load.
- Leaving key in ignition allows access by untrained driver
- Ascending-descending *incorrectly* with **load** facing DOWNGRADE
- Jerky---erratic movement of the forklift or lifting
- Inadequate servicing or improper repair of the forklift.
- Crossing railroad tracks straight on and not diagonally
- Improper parking or exiting of the forklift procedures
- Driver racing, horseplay or "stunt driving" on forklifts
- Driving with elevated load on the forks
- Improper reversing procedures and techniques
- Allowing passing in intersections or blind spots
- If an operator has been observed operating in unsafe manner—he should get refresher training
- Using forklifts in high traffic pedestrian areas

Correct ramp procedures
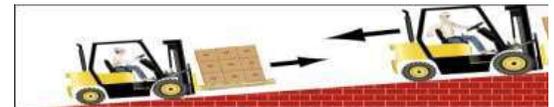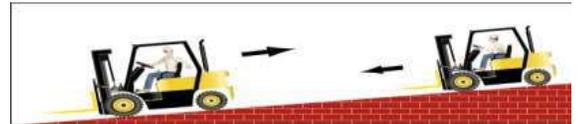
What *mechanical* factors increase risk of forklift accidents?
- Hydraulic or transmission oil leaks or roof leaks---create slippery floor---effect stopping distance.
- Operating forklift without usage of a seatbelt---keeps operator inside cage in the event of tipover
- Problem in directional shift linkage or transmission creates unsafe operation of forklift.
- Brake malfunction resulting in reduces slowing or stopping of the forklift.
- Steering malfunction resulting in inability to properly control forklift direction
- Malfunction of mast lifting assembly---hang ups or blockages are unsafe
- Excessive and noxious CO_2 emissions from lift truck engine or battery.
- Confusing layout of the lift truck hydraulic controls and displays.
- Safety accessory devices **not attached** or are malfunctioning.
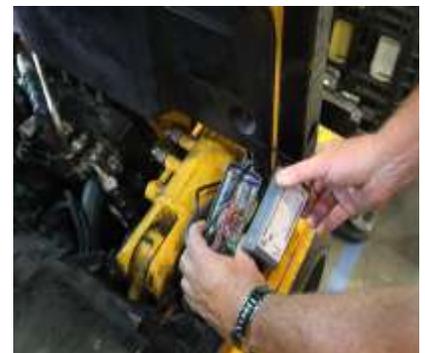
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What *plant layout + design* factors contribute to forklift accidents?

- Excessive lift truck traffic in warehouse or production areas
- Excessive pedestrian or personel carrier traffic in warehouse or production areas
- Crowded, cluttered confusing aisle layouts
- Inadequate ventilation---especially in winter
- Operating on ramps with no side rails or picking pallet loads on ramps and inclines
- Obstructions at intersecting aisles, walkways and doors.
- TOO narrow aisles----no room for error when turning—operating forklift
- Areas subject to wet or slippery floors---require forklifts to slow down
- ALL grades or inclines should be ascended or descended slowly
- Different loading ramp styles, angles or surfaces.
- Blind spots or obstruction in the facility that is blocking driver's view.
- Poor condition of loading dock ramps, plates or doors
- Do not allow parking within 8' of a railroad track
- Walking and working in forklift traffic areas instead of designated pedestrian walkways
- Annoying conditions such as poor lighting, foul odors, excessive noise, toxic gases, noxious dust
- Place heaviest loads on the bottom rack----lighter loads on the top
- Don't enter box car or semi-trailer without first inspecting its floor, dockplate, chock and load limits
- Potholes should be repaired---drivers attempting to divert around them can be dangerous
- No control over SPEED ZONES (high speed and low speed)

Can an *improper load* factors contribute to forklift accidents?

- Excessive load height or width which blocks driver's forward vision.
- Load too heavy---exceeds the lifting capacity of the forklift.
- Extreme caution when handling unstable or off-centered pallet loads
- Load improperly or poorly stacked on a pallet.
- Bad pallets design or those in poor repair
- Excessively long--high loads effect forklift's lifting capacity
- Removal or damage to load backrest
- Loads not tilted back to the backrest will be less stable
- Elevated loads tilted forward become less stable at high lift heights
- If load carried obstructs forward view, driver shall be required to travel with load trailing.

How can *accidents with pedestrians* be reduced or avoided?

- Keep untrained and unauthorized operators OFF of equipment
- Separate the pedestrian and forklift traffic by creating designated walkways or travel ways.
- Prevent pedestrians from entering forklift operating areas---marked walkways or barriers.
- Be sure pedestrian areas are very well lit and there are no obstructions to limit forklift driver vision.
- Prevent or avoid driving forklifts near areas of high pedestrian traffic (like: time clocks, lunch rooms, entrances/exits, office doors etc).
- Pedestrians should always let the driver know they are in the area for extended periods.
- Forklifts ALWAYS yield "right of way" to pedestrians
- Do NOT leave keys in the ignition
- NEVER walk near or under raised forks OR lifted loads.
- Keep safe distances from the forklift whenever possible.
- Make eye contact with the driver to ensure your presence is known.
- Consider making it a policy to sound the horn at intersections.
- Limit lower forklift travel speeds in high pedestrian zones
- Design loads that do not restrict the driver's viewing area.
- Do not move the forklift if you do not have a clear view of travel
- Drive or walk extra cautiously near blind corners, doorways, narrow aisles
- Install convex mirrors at blind aisle intersections---helping both driver + walker
- Pedestrians should be aware that forklifts have a wide rear end swing radius
- Pedestrians should be aware that forklifts can not stop suddenly—due to vehicle and load stability
- Consider using blue forklift focused spotlights---warning pedestrians via visible blue beam on floor
- Consider using wireless warning alarms whenever a forklift enters a high traffic area

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Preparing for an Accident
Preparing for an accident requires having four things in place: planning, attitude, supplies, and communications.

Planning Ahead
The entity will never know in advance what accidents will occur or when, but it can plan ahead to know what the most likely risks are in a given situation to prepare for and, hopefully, avoid them. Having specific plans in place for various types of accidents and regularly training employees to work within those plans is one of the most effective means of ensuring that accidents will be avoided when possible and handled appropriately when they do occur. Your public entity should assign a safety committee to regularly monitor and update the entity's accident plans, recommend training for employees, and walk through the entity's work sites to check for potentially unsafe conditions.

Attitude of Safety
In addition to planning for accidents and responding to them, instilling an attitude of safety among employees reduces the risk of having accidents occur. Workplace safety training instructs workers on best practices and helps avoid common mishaps. Policies and procedures should also reflect that safety is a priority within the public entity. If employees are encouraged to cut corners to reduce costs or get a job done more quickly, the attitude of safety is undermined and an accident is more likely to occur. Have safety committee in place that has authority to make changes where unsafe conditions or practices are found shows the entity is dedicated to providing a safe environment.

The Right Supplies
An important part of preparing for an accident is having the right supplies available if an accident does occur. Minor accidents can become major ones if the entity does not keep basic emergency first aid kits and other job-specific emergency medical supplies on hand at all times. A member of the safety committee should be designated as a "Safety Officer" to regularly monitor and maintain the first aid kits, emergency car kits, and job-specific emergency supplies as needed. Accident preparation and response training for public employees should include training on the proper use of emergency equipment. Depending on the nature of the entity, the work done, and the proximity to medical facilities, the entity may need to provide first aid and CPR training for some or all employees.

Emergency Contacts and Communications
Another essential component of preparing for an accident is having emergency contact information and communication plans in place. During training, employees should be told who to contact and how to contact the person in case of an accident. In the case of an auto or other offsite accident, the employee may need to call 911 or other emergency response professionals first and then contact the entity designee regarding the accident. Employees on work sites may require wireless communications devices or other emergency communications equipment and should be trained in their safe and appropriate use.

Responding to an Accident
Depending on the situation, the entity may or may not need all the steps listed below, but this outline works in nearly all situations:

- ***Get to a safe place***
Regardless of the situation, getting to a safe place after an accident will help prevent any additional accidents of injuries from occurring. This will allow senior management to assess the situation and proceed.
- ***Assess the situation***
Is anyone injured? Do you need to call 911? Has any property been damaged? Answering these basic questions will determine the next steps.
- ***Call for help***
In any case of injury, getting professional help immediately will minimize the risks of the situation and prevent injuries from getting worse. Know the limits of what can and cannot be handled internally. If anything beyond very simple first aid is required, always get EMS or other professionals involved right away.
- ***Assist the injured***
Provide first aid where possible; stabilize those with major injuries.
- ***Get information***
Record the details of the accident while they are fresh in the minds of those involved and who witness the event. Time can change the way the incident is viewed and people's memories of it, so write down all information immediately. Get contact information from others involved whenever possible, and get insurance information where necessary.
- ***Keep the evidence***
Never destroy potential evidence in an attempt to prevent further accidents. Always keep people away from potentially hazardous equipment, but do not discard or destroy it.
- ***Prevent further accidents***
Following an accident, the safety officer and/or the Safety Committee should quickly take action to assess the situation to prevent any further injuries. The Safety Committee may recommend long-term changes, but the entity management should always do what they can to keep others safe in the short term, as well.

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• *Follow up*

File the appropriate paperwork as required by federal or state OSHA and the entity's insurance company, and provide any assistance necessary as requested by the Safety Committee or human resources department.

Checklist for Creating a "Culture of Safety" *Answer "Yes" or "No."*

- "Safety" is part of the language of your company?
- Safety is part of your company's value structure?
- Are checklists completed at beginning of every shift and turned in and stored properly?
- Is preventive maintenance completed on a pre-scheduled basis?
- Safety is considered something that is **everyone's** job----top to bottom?
- Employees are rewarded in a tangible, visible way for promoting safety?
- Safe practices are part of the unwritten rules of the company?
- Safety concerns are evident in the interaction among staff and in their interaction with members of the public?
- New employees are briefed and trained on safety procedures?.
- New employees know there are consequences for ignoring safety practices or engaging in unsafe behavior?
- Consequences for ignoring safety practices or engaging in unsafe behavior are enforced?
- Practices in place for scheduling and planning recurrent driver training on your equipment?
- Utilizing technology and electronic devices for improving safety?
- Utilizing technology and electronic devices for improving productivity?
- Utilizing technology and electronic devices for improving accountability?

What can KEYTROLLER forklift safety devices do for my fleet?

KEYTROLLER- LCD Wireless Access Monitoring System for Forklifts

- Keyless code/RFID ignition-----trained and authorized operators only!
- Checklist automation---be sure forklift is safe to drive!
- Impact abuse sensing----accountability for abusive drivers
- Speed sensing----Warn, alarm, log speeding events
- Speedometer----shows operator his actual speed in .1 MPH/KPH
- Maintenance scheduling----insures preventive maintenance is performed
- Training scheduling----insures recurrent operator training is completed
- Text messaging----send text messages with responses to forklift drivers
- Email Generation---*Automatic* emails generated on specific events
- Report generation---*Automatic* usage and event reports generated and emailed
- Productivity evaluation---Monitor time forklift was loaded/unloaded or moving/idle
- Pedestrian warning---Transmitter in LCD device enables wall alarm when within 50'
- Video---When equipped with SMARTI camera---auto email of impact or speeding video
- Wireless communication---Event log data automatically transmitted and logged

KEYTROLLER ELECTRONIC SAFETY DEVICES FOR FORKLIFTS + EQUIPMENT

- KEYTROLLER-LCD - Access monitoring device with checklist, impact, speeding + more!
- KEYTROLLER-IOS --- Access monitoring device with impact, speeding for small fleets.
- START – SMART ---- Economy keypad code/RFID ignition device
- SPEED-SAVER-EL --- Speed sensing and control for electronic throttles
- SPEED-SAVER --- Speed sensing and control for cable type throttles
- KEYCHECK --- Wireless Android rugged tablet with custom checklist app
- HUSHHH --- "Noiseless" broadband back up alarms
- FOREWARNER --- Proximity "blue or red" floor LED spotlight---9 lens
- FOREWARNER -mini --- Proximity "blue or red" floor LED spotlight---2 lens
- FOREWARNER -MAXI --- Overhead crane "blue or red" floor LED spotlight---28 lens
- SPEEDTROLLER --- Digital speedometers with warning and alarm
- SMARTIE --- DVR and Rear view camera system
- SMARTI --- Wireless DVR camera emails video of impact and speeding events
- KEYWARNER --- Wireless forklift proximity warning system for pedestrians
- ZONETROLLER --- IR transmitter/receiver zone speed or alarm control system
- SEETROLLER --- Wireless camera fork vision system (Battery powered fork cameras)
- Lift-N-Weigh --- Economy hydraulic forklift scale
- WEIGH-ALERT --- Hydraulic overload warning device for forklifts
- WEIGHTROLLER --- Conventional hydraulic scale (2% accuracy)
- PRECISE --- High accuracy hydraulic scale (.2% accuracy)
- CYBERWATCH - SMS --- Cellular hour meter and phone app
- CYBERWATCH - LAN --- WiFi hour meter
- AISLETROLLER --- Intersecting aisle radar warning device

www. KEYTROLLER.com