



Powered Industrial Truck/Forklift Safety Program

October 2016

San Bernardino Valley College
701 South Mount Vernon Avenue
San Bernardino, California 92410

&

Crafton Hills College
11711 Sand Canyon Road
Yucaipa, California 92399

CONTENTS

POLICY STATEMENT	3
PURPOSE	3
SCOPE AND APPLICATION	3
RESPONSIBILITIES	3
DEFINITIONS	5
PROGRAM ELEMENTS	6
COMPLIANCE	10
PROGRAM EVALUATION.....	13
DOCUMENTATION AND RECORDKEEPING	13
APPENDIX A: SBVC SITE SPECIFIC INFORMATION	14
APPENDIX B: CHC SITE SPECIFIC INFORMATION	15
APPENDIX C: FORKLIFT OPERATOR’S DAILY CHECKLIST	16
APPENDIX D: COMPONENTS.....	17

Policy Statement

It is the policy of the San Bernardino Community College District (SBCCD) that all employees operating a Powered Industrial Truck (PIT) will be qualified and knowledgeable of safe operating procedures in furtherance of protecting the safety and health of those on campus.

Purpose

SBCCD has determined that certain employees may operate PITs, inducing the potential exposure to the associated hazards during routine operations. These hazards include tipping over the PIT, pedestrian traffic, blind spots, poor truck maintenance, narrow aisles and other hazardous conditions. The purpose of this program is to ensure that all SBCCD PIT operators are adequately trained and qualified to operate a PIT to ensure a safe campus for employees and students. SBCCD will maintain compliance with the Cal/OSHA standard for PITs.

Scope and Application

This program applies to all San Bernardino Community College District employees and contractors who operate or anticipate operating a PIT/forklift during their employment. They must complete an initial training, operator evaluation and retraining every three years.

Responsibilities

Program Administrator

The College President is the program administrator, the Vice President of Administration is the designee, and both have the authority and responsibility for implementing and maintaining this PIT Safety Program for their respective campuses. Assigned campus designees are as follows:

Vice President of Administrative Services/SBVC, Site Safety Officer
San Bernardino Valley College
Tel: (909) 384-8958
&
Vice President of Administrative Services/CHC, Site Safety Officer
Crafton Hills College
Tel: (909) 389-3210

The PIT/Forklift Program Administrators and designees may be assisted in their duties by District Safety & Risk Management. District Safety & Risk Management can be reached at (909) 382-4040 during regular business hours.

The Program Administrator is responsible for administering the PIT/Forklift Safety Program. Duties of the program administrator including:

- Identifying work areas, processes or tasks that require workers to operate PIT/Forklifts and evaluating hazards.
- Monitoring PIT/Forklift use to ensure that they are being used in a safe operating condition
- Arranging for and/or conducting training.
- Ensuring proper storage and maintenance of PIT/Forklifts
- Maintaining records required by the program.
- Evaluating the program.
- Updating written program, as needed.

Supervisors

Supervisors are responsible for ensuring that the PIT/Forklift Safety Program is implemented in their particular areas. In addition to being knowledgeable about the program requirements for their own protection, supervisors must also ensure that the program is understood and followed by the employees under their charge. Duties of the supervisor include:

- Ensuring that PIT/Forklift operating employees under their supervision (including new hires) have received appropriate training and certification
- Ensuring that employees who are not certified will not operate a PIT/Forklift
- Ensuring that PIT/Forklifts are maintained and in safe operating conditions
- Ensuring pedestrian walkways are established
- Continually monitoring work areas and operations to identify potential hazards
- Coordinating with the Program Administrator on how to address hazards or other concerns regarding the program

Employees

PIT/Forklift Operators shall:

- Participate in PIT/Forklift training, as required
- Comply with all safe operating procedures presented in this program
- Maintain active certifications for operation of PIT/Forklifts
- Report all accidents and near miss incidents (Near Miss: unplanned event that did not result in injury, illness, or damage – but had the potential to do so)
- Conduct daily forklift inspections and walk-arounds prior to operation
- Report any deficiency found during inspection that might affect the safe operation of the PIT/Forklift

Definitions

- **Backrest:** A vertical steel grid of the carriage above the forks to prevent the load from falling toward the driver
- **Carriage:** A support structure that consist of the backrest and flat metal plates (pair of forks) that move along the mast by chains or are directly attached to the hydraulic cylinder that support the load. There are four sizes of hook type fork carriages rated by lifting capacity of the fork carriage:
 - Class I carriages are rated for loads up to 2000 lbs. The carriage bar spacing is 13 inches
 - Class II carriages are rated for loads up to 5,550 lbs. The carriage bar spacing is 16 inches
 - Class III carriages are rated for loads up to 10,000 lbs. The carriage bar spacing is 20 inches
 - Class IV carriages are rated for loads up to 15,500 lbs. The carriage bar spacing is 25 inches
- **Hydraulic Lift Cylinder-**The power supply to lift the load
- **Center of Gravity (COG) of the Forklift:** The balance point of the forklift between the counterweight at the back of the vehicle and the forks. Unloaded, the COG is in the center of the forklift under the driver and partially up the body of the forklift. The COG is shifted as a load is added or moved. This is a key component of preventing a tip-over type accident
- **Center of Gravity (COG) of the Load:** The balance point of the load that is usually in the center, if the weight of objects on a pallet is equally distributed. If not, the COG can affect the load-moment and therefore the lift capacity
- **Combined Center of Gravity:** The balance point of the truck in combination with the load, which is affected by the height of the load, tilt of the forks, making turns, and inclines. The leading cause of tip over accidents involves the movement of the combined center of gravity outside the stability triangle
- **Center of gravity-**The point on an object at which all of the object's weight is concentrated and all of the parts balance each other. All objects have a center of gravity
- **Counterweight:** The weight built into the forklift rear structure usually made from lead or steel that is used to offset the load's weight and to maximize the resistance to tipping over including driving down an incline with the load in front or backing up an incline with a full load
- **Dynamic Stability:** An unloaded forklift's center of gravity and a loaded forklift's combined center of gravity can shift outside of the stability triangle as a result of certain movements, such as sudden stops and starts, turns, or operating on grades
- **Extended Load-Center Rule:** The capacity of a forklift drops by the ratio of the load center distance (LCD) times the rating
 - Example 1: If the load center distance is 28" the ratio is 24/28. Multiply this by 5,000 lbs. = 4,285.7 lbs.
 - Example 2: Similar to the above, if the LCD is 30" the ratio is 24/30 x 5,000 lbs. = 4,000 lbs. capacity.
- **Forks:** The horizontal portion of the carriage consisting of two components, the tip and heel to engage the load. Forks come in two styles, hook type and pin type. Hook type are generally found on trucks up to 14,000 lbs. capacity. Pin, or shaft mounted, type forks are found on the larger capacity lift trucks
- **Free lift:** The amount of vertical fork movement possible before the mast telescoping section begins to extend out the top of the mast
- **Fulcrum:** The axis of rotation when the forklift tips over. This can occur in two directions perpendicular to each other: Lateral and Longitudinal stability
- **Lateral Stability (See Figure 4):** The resistance of a truck to over tip sideways
- **Lift Cylinder:** Controls the amount by which the mast structure, forks and carriage of a forklift may be raised or lowered in the vertical position
- **Line of Action:** An imaginary vertical line through an object's center of gravity
- **Load Capacity:** The maximum weight (materials) a forklift can carry at a given "load center", with the mast held in a vertical position
- **Load Center:** The horizontal distance from the fork's (or other attachment's) vertical face to the line of action through the load's center of gravity

- **Load-moment:** The product of the object's weight multiplied by the object's distance from the fulcrum, which is a fixed point that acts as the pivot point. On a sit-down counterbalanced forklift, the fulcrum or pivot point is the axle of the front wheels. It is this product, or Load Moment, which determines how much overturning force, is being applied to the forklift. **Load Moment = Weight X Distance**
- **Longitudinal Stability:** The tendency of the forklift to tip forward or rearward
- **Mast:** The vertical arms of the forklift that allow the load to travel a given distance for raising or lowering. The mast may also be tilted forward or backward with operator controls
- **Mast Extended Height:** The height to the top of the mast or load guard on a forklift when the mast is fully extended
- **Mast Free Lift:** The height that forks on a forklift can be raised before the mast extends (without increasing mast height)
- **Mast Lift Height:** The distance from the floor to the top of the upper fork surface when the mast is fully extended
- **Mast Lowered Height:** The height of the top of the mast from the floor when the mast is fully lowered
- **Maximum Fork Height:** Measured from the fork tips to the floor
- **Operating Area (Circle of Safety):** An imaginary area around the forklift that the operator should take control of. If a pedestrian enters this space cushion, stop the forklift until the pedestrian exits
- **Overall Extended Height:** Measured from the highest point of the mast or load to the floor
- **Overhead Guard:** A framework/roof on a forklift that provides overhead protection for the operator from falling objects
- **Power Plant:** Power source of the forklift, which can include gasoline, LPG, diesel or electricity
- **Rating Plate:** Manufacturer data plate on the forklift that lists the lifting capacity based upon listed conditions. Manufacturer's data plate must be legible per Cal/OSHA requirements.
- **Stability Triangle:** Looking down on the forklift from above, it is a triangle formed by 2 points at the center of each front tire and one point at the center of the steering axle. As long as the Center of Gravity (COG) remains within the stability triangle, the forklift will not tip over (See Appendix D, Figure 2).
- **Tilting Angle:** The tilting angle is the maximum angle in which a mast can tilt forward and backward. The tilting angle varies when dealing with different forklifts, masts and attachments and is also limited at high mast to maintain truck stability. This is useful to know as depending on what materials you are carrying, you may require a higher tilt angle to ensure stable manoeuvrability and avoid any loss of loads.
- **Tilt Cylinder:** Controls the amount by which the mast structure, forks and carriage may be tilted beyond the vertical position, forward or backward
- **Track:** The distance between the wheels of one axle of the forklift

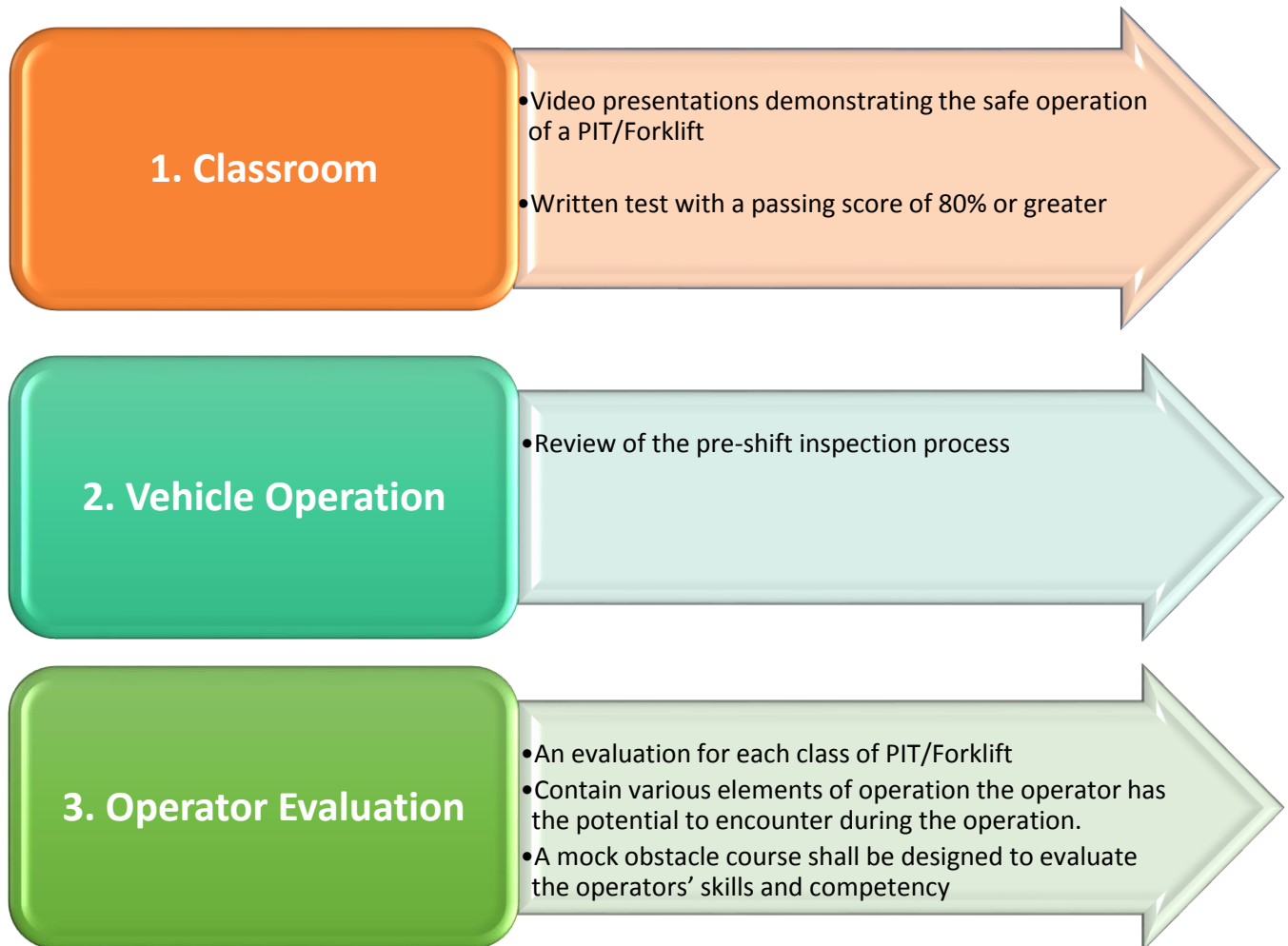
Program Elements

Training Program

Only certified and properly trained employees are authorized to operate any PIT/Forklift that is under the ownership of San Bernardino Community College District.

A PIT/Forklift operator must successfully complete all portions of the training program to become qualified to operate a PIT/Forklift at SBCDD. Training and driver certification is valid for a maximum of three years.

The training program has three components:



Additional training may be needed for the following:

- The purchase of new equipment including a new truck, accessories or attachments
- Change of workplace conditions that might affect safe truck operation
- Minor accident or near miss incident occurs
- Operator is observed operating a PIT/Forklift improperly or unsafely

If the operator is involved in an accident or is observed using the PIT/Forklift in an unsafe manner, driving privileges may be reevaluated by SBCCD

Inspections

Inspections are an essential constituent of the safe operation of a PIT/Forklift, providing the identification of potential mechanical or operational hazards that may be present on the equipment prior to operation. Any identified hazard must be remedied immediately or the vehicle should be taken out of operation and the hazards reported to

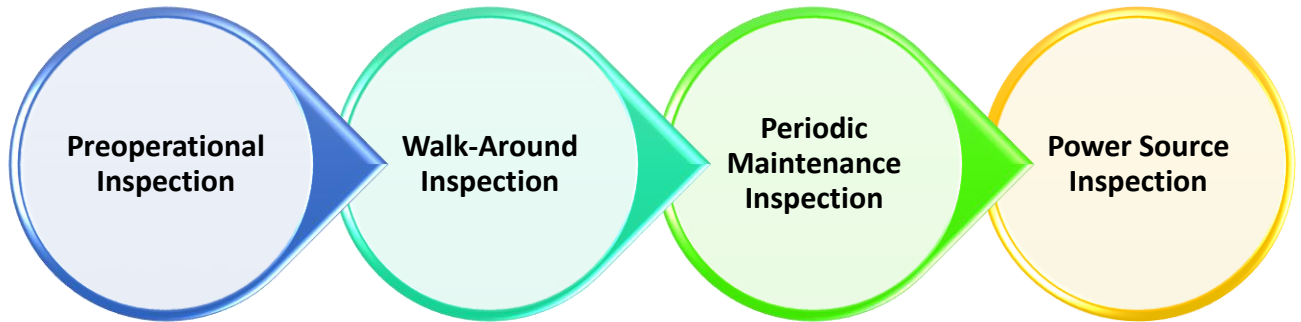
the supervisor. Once repairs of the equipment are complete, another inspection should be completed prior to operation of the PIT/Forklift.

1. Operators

- Conduct and document daily forklift inspections
- Performed at the beginning of the shift prior to the operation of any powered industrial truck/forklift
- All operators shall be familiar with pre-shift inspection procedure
- Report any identified hazards immediately to supervisor
- Any PIT/Forklift that does not pass inspection should be taken out of service and tagged
- Conduct a walk-around inspection prior to operation
- Document all inspections on the appropriate inspection form.

2. Mechanics

- Follow the Periodic Maintenance Table and Periodic Replacement Table in the Operator's and Owner's Manual for the particular powered industrial truck/forklift
- Perform timely repairs as necessary to keep the equipment in safe operation condition
- Do not return any out of service equipment back into operation until all repairs are complete.
- Internal mechanics shall arrange for outside vendor maintenance if necessary



Preoperational Inspection

The purpose of the preoperational inspection is to verify that the equipment is in safe operating condition, ensure equipment reliability and provide early detection of potential hazards. The preoperational inspection should be conducted at least once daily or before every shift. The preoperational inspection should include the Operator's Daily Checklist (Form in Appendix 1) and the Pre-use Inspection form.

Walk-Around Inspection

The purpose of the walk-around inspection is to ensure no obstructions are in the path of the vehicle by checking any blind spots and observing any potential operational hazards. The walk-around inspection is a visual inspection that does not require documentation but needs to be conducted before operating any PIT/Forklift.

Periodic Maintenance Inspection

The purpose of this inspection is to ensure that the PIT/Forklift is maintained in a safe operating condition. Authorized personnel shall only conduct this inspection. Mechanics shall follow the guidelines of the forklift manufacturer. Only authorized mechanics or personnel shall perform battery maintenance.

Power Source Inspection

The power source for the PIT/Forklifts is Propane, a liquid petroleum gas (LPG) pressurized in a container. The purpose of this inspection is for the vehicle operator prior to identify any hazards including:

- Dents, scrapes or gouges
- Damage to liquid level gauge
- Relief valve damage or debris
- Any leakage at valves or threaded connections
- Ensure tanks have not exceeded the regulatory life cycle of 10 years

Compliance

The California Safety and Health Association (Cal/OSHA) Title 8 Article 25 provides regulatory guidelines that must be adhered to by all SBCCD PIT/Forklift operators.

PIT/Forklift Operations

- Only certified and trained employees can operate the forklift and must be in good Authorized Driver status.
 - PIT/Forklifts shall not be operated by any non-SBCCD employees including delivery truck drivers or contractors even if they have forklift experience
 - Seat belts shall be used in PIT/Forklifts that have them
 - PIT/Forklifts with identified mechanical or operational hazards shall not be operated
 - PIT/Forklifts that are out for serviced shall be tagged with an “Out of Service” tag
 - Passengers are prohibited on any portion of the forklift.
 - Standing on the forks and passing under elevated forks is prohibited
 - Do not put arms or legs between the uprights of the mast or outside the running lines
 - When getting on and off the forklift always use the 3 points of contact rule:
 - Always face the vehicle
 - Have both hands and one foot or both feet and one hand in contact with the forklift
 - Do not jump off the vehicle
 - Start the engine only when the direction control is in neutral and the parking brake is on
 - Before shifting into gear put your foot on the brake
 - When lifting a load, do not lean out of the operator compartment or stand on the ground
 - At all times when using the forklift maintain an operating area or space cushion around the truck. Take control of this area. If a pedestrian enters, stop until they leave
 - Pedestrians always have the right-of-way
 - Avoid parking in exit pathways, traffic lanes, or blocking access to emergency equipment
 - Horseplay and operating skills competitions are not permitted
 - PIT/Forklift shall not be operated in low lighting areas
 - When reversing direction, come to a complete stop first
 - Always be careful of overhead hazards when working in or around buildings
 - Maintain a space cushion around the truck
 - OSHA defines a forklift as unattended if the operator is ≥ 25 ft. from the vehicle and it remains in the operator's view, or whenever the operator leaves the vehicle and is not in their view
 - When a forklift is going to be unattended:
 - Lower the forks/load to the ground and tip forward so with no load the tips will not be a trip hazard.
 - Put shift control in neutral.
 - Apply the parking brake.
 - Stop the engine.
-

Loading and Unloading

- **Before lifting a load:**
 - Make sure the forks are able to go at least 2/3 of the way under a load.
 - Forks should be spread as far as possible to promote the best lateral stability when lifting, and lock them to the carriage.
-

- Loose or unstable loads should be restacked or plastic wrapped prior to moving.
- **Hazards of Overloading:**
 - Reduced steering control as the weight shifts off the back wheels.
 - Reduced braking control as stopping distances increase.
 - Potential truck damage, an accumulative effect.
 - Increase chance of severe accident.
- **Indicators of Overloading:**
 - Rear wheels lift off the ground.
 - Mechanical strain when trying to lift a load. Potential damage can occur to the forklift, an accumulative effect.
 - Steering gets sloppy. "Sudden power steering" syndrome as weight shifts off the back wheels of a rear wheel steering vehicle.
 - Reduced braking control – stopping distance increases.
- **When approaching a load to be lifted, align with the center:**
 - Approach the load straight with forks in traveling position.
 - Stop when about a foot from the load.
 - Level the forks and slowly proceed forward until the load is up against the backrest.
 - Lift the load just enough to clear the floor/ground and tip it back to help move the center of gravity toward the rear of the vehicle thus improving stability.
 - Always check pathway of travel for pedestrians and obstructions prior to moving.
 - If reversing direction, apply the brake prior to shifting direction.
 - Travel height should be about 4-6" at the fork tips and 2" at the fork heels on level surfaces.
- **Putting down a load:**
 - Line up with the drop off location and stop about a foot away.
 - Always check the load capacity of the load drop off point.
 - Level the forks and drive in the rest of the way.
 - Lower the load.
 - Tilt forks slightly forward to completely release the load.
 - Before backing up look in the direction of travel on both sides for pedestrians and obstructions.
- **When stacking a loaded pallet on another align with the center of the load on approach:**
 - Pull up to within a foot of the other pallet and come to a complete stop.
 - Raise the load 6-10" above it.
 - Inch forklift forward stopping 3-4" in front.
 - Carefully tilt the mast forward until it is level.
 - If necessary inch forward more until front to back alignment is correct,
 - Lower the load.
 - Tilt the forks slightly forward and lower to disengage the pallet.
 - Prior to backing up look in the direction of travel on both sides for pedestrians and obstructions.
 - Once clear of the load lower the forks to travel position.
 - Do not turn with elevated forks.

Traveling with a Load

- Avoid potholes or running over objects in the roadway.
- Give pedestrians the right-of-way. Do not let people stand anywhere near the forklift while moving. Remember how the vehicle moves with rear wheel steering.
- Use the horn to alert people of your movement, especially near building entrances or at corners.
- Keep pedestrians and helpers out of the potential fall zone of the load should it fall, or forklift should it tip over.
- Leave enough room for the load and forklift to clear other objects prior to making turns.

- The best position to make a 90 right-hand degree turn from one aisle to another is from the far right-hand side of the aisle in which you are driving.
 - Maintain smooth movement of the vehicle with appropriate speed. Sharp acceleration, deceleration or sharp, fast turns can mean loss of load or stability. (See Dynamic Stability, Center of Gravity, Stability Triangle).
 - Never turn the forklift with the load lifted higher than traveling height.
 - If vision is blocked by the load, travel in reverse. However, do not drive backward up a hill with a load. You could lose steering control because your center of gravity will shift forward.
 - Always obey road signs and traffic rules.
 - Look in the direction of travel.
 - Do not lift or lower the load when the forklift is in motion. (See Dynamic Stability, COG, Stability Triangle).
 - Carry long, high or wide loads slowly because of increased stability problems.
-

Inclines, Ramps, Loading Docks and Elevated Work Areas

- **Inclines and Ramps**
 - Slow down on grades because stability is decreased and stopping distance is increased
 - Travel straight up or down
 - Never attempt to turn on a grade. Tip over is inevitable.
 - Travel in the center of the ramp.
 - Keep the load uphill so the load will not slip off or upset the stability and cause the forklift to tip forward.
 - Keep the forks downhill on an unloaded forklift.
 - **Loading Docks and Elevated Work Areas:**
 - Slow down.
 - Always be aware of edge and clearance.
 - Always stay at least 1 tire width from edges.
 - Be careful about rear end swing.
 - Watch for slippery conditions caused by weather and spills.
 - Allow for vision adjustment time for changing light conditions when moving in and out of a warehouse or truck trailer.
-

Working in Highway Trailers

- Trailer or truck wheels must be chocked or restrained and brakes set.
 - Trailers must be backed up to and square with the dock.
 - Check height of trailer for proper clearance.
 - Check condition of trailer floor. Accidents have occurred where the floor failed under the forklift.
 - Always check the floor capacity before entering a trailer with the powered industrial truck/forklift.
 - Dock plate must be adequate for weight and secured against movement.
 - Jack stands may be necessary to support un-coupled trailers to prevent tipping if the load is very heavy or if the forklift can travel 3 ft past the landing gear.
-

Parking

- **When parking:**
 - Pull up and stop.
 - Level and lower the forks so they rest flush on the ground and do not present a trip/fall hazard to pedestrians.
-

- Put the truck in neutral and apply the parking break.
 - Pull the key out of the ignition and return it to the appropriate person.
 - Never turn, park or stack loads on slopes.
 - Never park with a load up in the air. It could lower on its own if there is a hydraulic leak.
 - Maintain clearance around heaters lights, heated ducts and pipes. Never block access to electrical panels, controls, emergency equipment or emergency exits.
 - At the end of the day for the LP engine turn off the tank valve, run the engine out of fuel, and then turn off the key.
-

Unexpected Emergencies

- **Unexpected Emergencies**
 - Engine stops while traveling: Stop the truck as soon as possible. Steering and braking will be difficult.
 - Load shifts or starts to fall while raised: If possible lower the load. The overhead guard will usually protect the operator. Honk the horn to warn people.
 - Tipping of the truck: Stay with the truck. Lean away from the direction of the tip. Brace arms and legs inside the guard to protect them.
 - Forks or mast hangs up: If the chain goes slack or the mast sections lower unevenly, stop lowering and raise the forks immediately to find the cause.
-

Power Source

- **Changing LP Tanks:**
 - Tanks should only be changed out in well-ventilated areas.
 - Switch the ignition and lights off.
 - Ensure there are no fire, flames, smoking or other ignition sources nearby.
 - Check for any damage or leaks of the propane tank.
 - Do not restart the vehicle until all LP gas smell has dissipated.
 - If the forklift fails to restart, contact the appropriate personal for assistance.
-

Program Evaluation

The SBCCD PIT/Forklift Safety Program will be reviewed and revised as necessary whenever changes at SBCCD sites render any section of this program obsolete, incidences related to work in/around PIT/Forklifts result in an injury or near miss, and on an annual basis by the Program Administrator.

Documentation and Recordkeeping

A written copy of this program and the related OSHA standard is maintained electronically and can be accessed online at <https://sbccd.org/safetyrisk>. The program is readily available to all employees who wish to review it.

Appendix A: SBVC Site Specific Information

VP Administrative Services

- (909) 384-8958

SBCCD Safety & Risk Management

- (909) 382-4040

Web Links

- <https://sbccd.org/safetyrisk>

*

Appendix B: CHC Site Specific Information

VP Administrative Services

- (909) 389-3210

SBCCD Safety & Risk Management

- (909) 382-4040

Web Links

- <https://sbccd.org/safetyrisk>

Appendix C: Forklift Operator's Daily Checklist

Instructions: Complete this form at the beginning of each shift

Model #	Date:	Inspector's Name:
Hour Meter Reading @ Start of the Day:	Signature:	

Visual Checks

OK	Needs Attention or Repair	Not Applicable		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Exterior damage, oil/water leakage on floor, loose parts	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Engine oil level	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Hydraulic oil level. Also, contamination/consistency.	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Radiator	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Fuel level / Charge	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wheels/Tire condition	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Head and Tail lamps	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Warning lights. Use test button.	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Load handling system: forks, mast, backrest (for any bends or cracks), chains, lift/tilt cylinders	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Overhead Guard for any bends or cracks	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other:	

Operational Checks

OK	Needs Attention or Repair	Not Applicable		
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Horn	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Steering. Looseness, vibration, and pulling.	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Brakes. Pedal play and braking effect.	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Parking Brake	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Lift, tilt, side shift controls	Action - Report
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other:	

Comments (Explain any items that need repair, maintenance or adjustment)

Appendix D: Components

FORKLIFT COMPONENTS

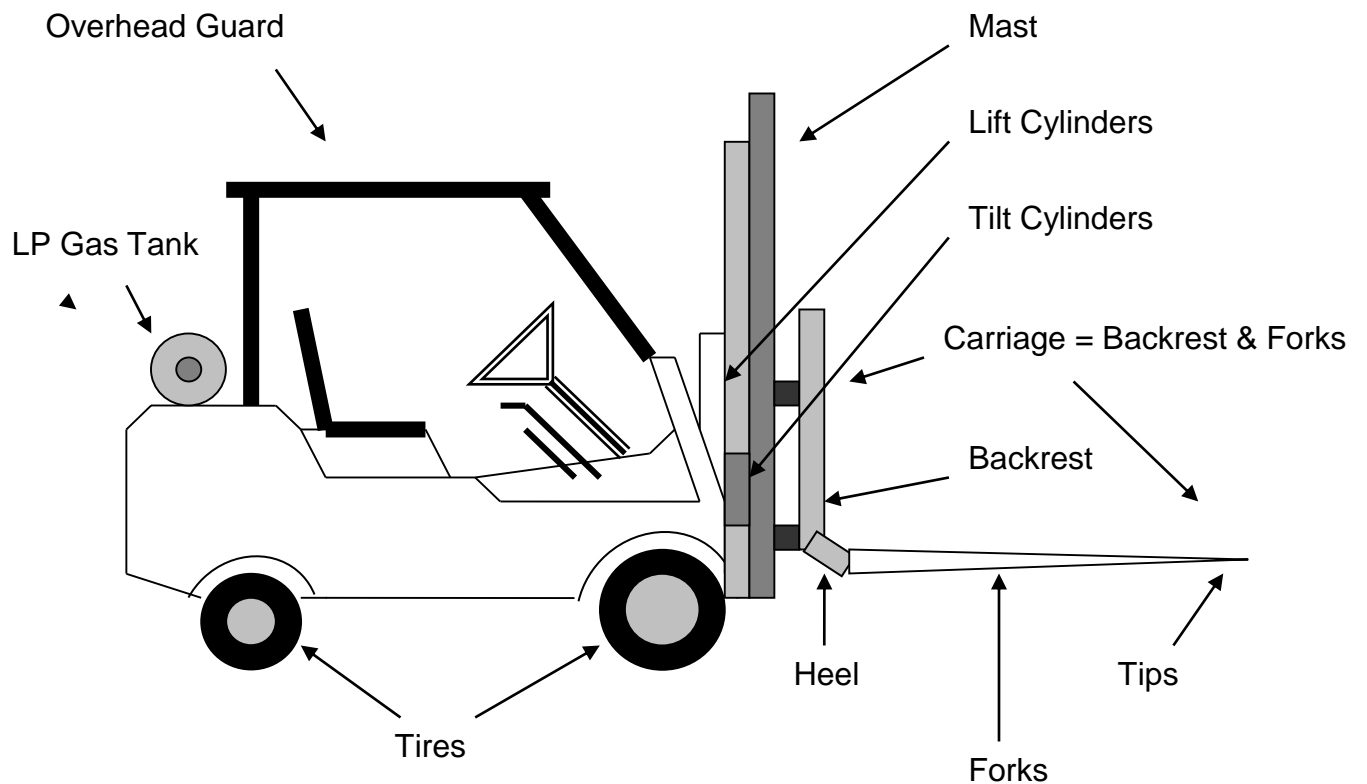


Figure 1A.

STABILITY TRIANGLE

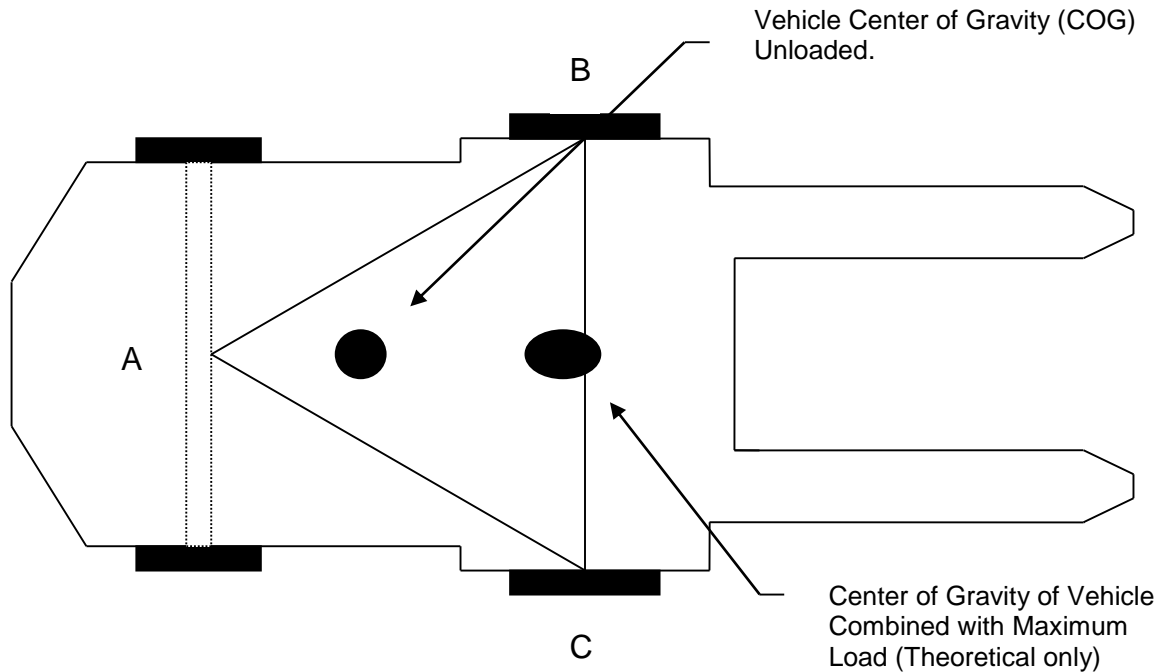


Figure 2.

FULCRUM PRINCIPLE LONGITUDINAL STABILITY

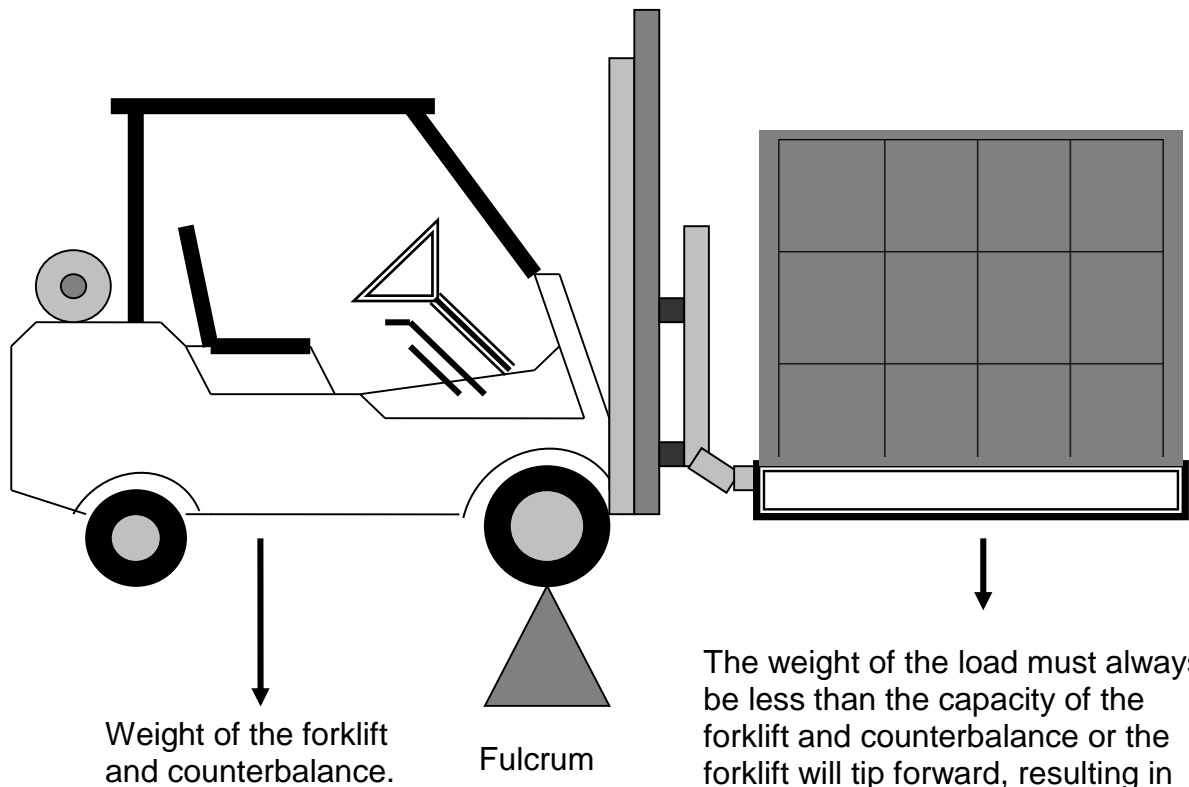
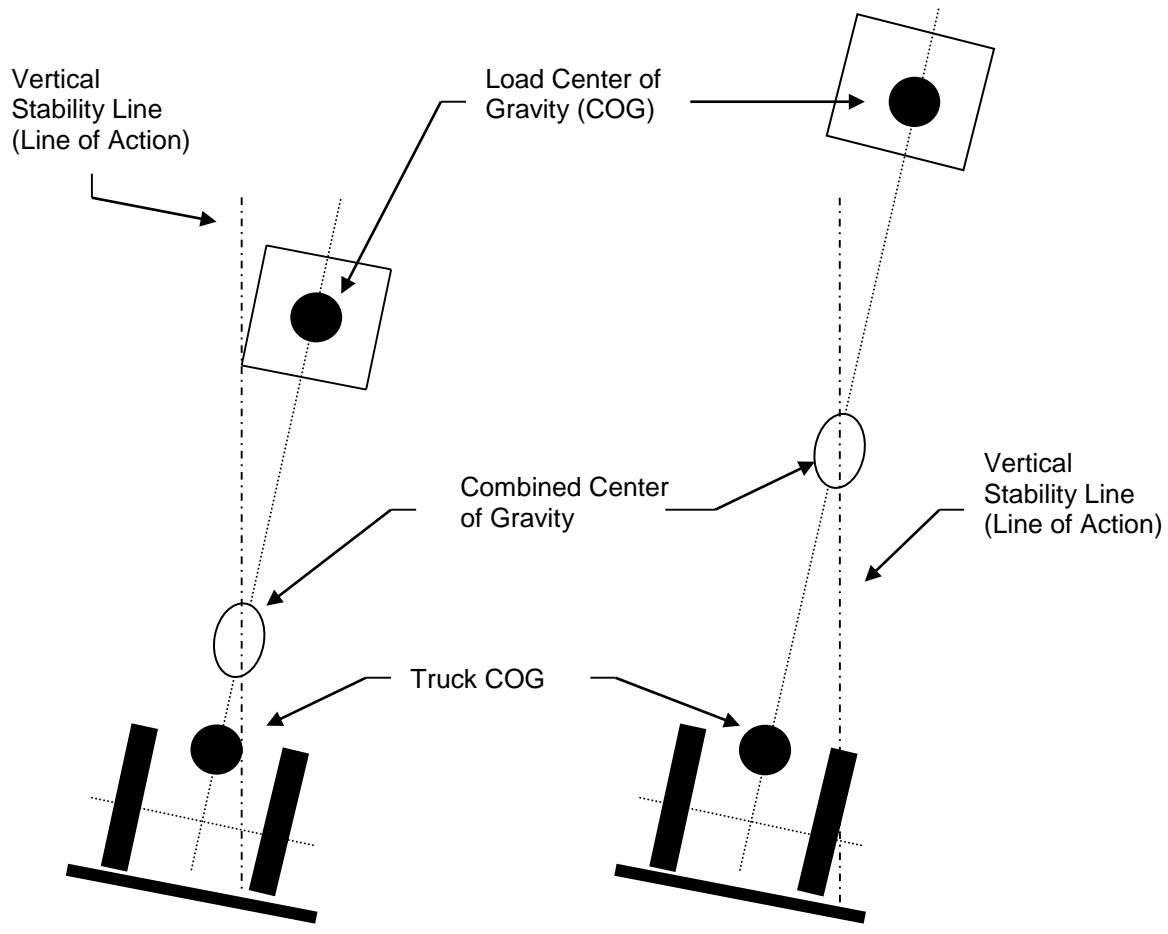


Figure 3.

LATERAL STABILITY

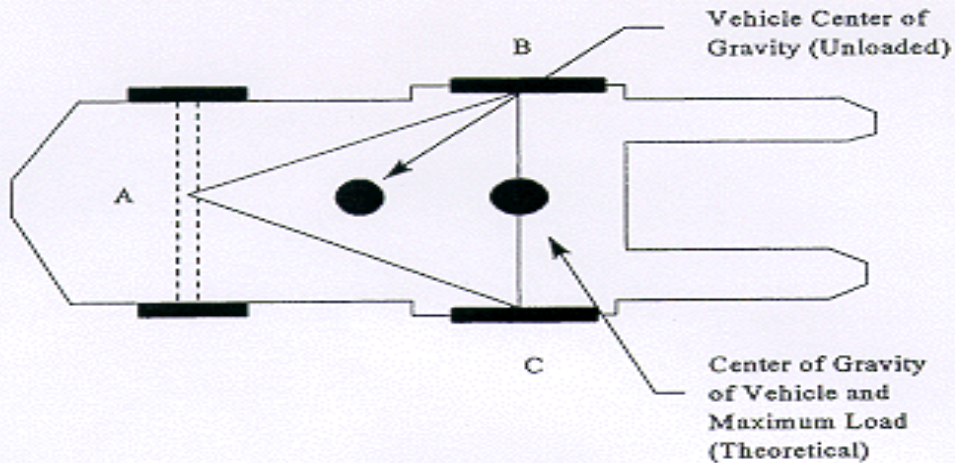


1. Vehicle is Stable

2. Vehicle is Unstable. The line of action is outside the stability triangle, and the vehicle will tip over. This type of accident can be fatal and is easily avoided by proper planning of a lift.

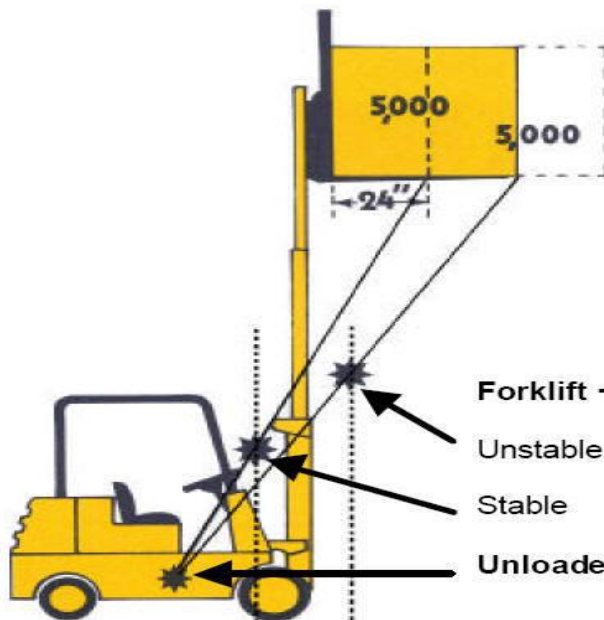
Figure 4.

Figure 1.



Notes:

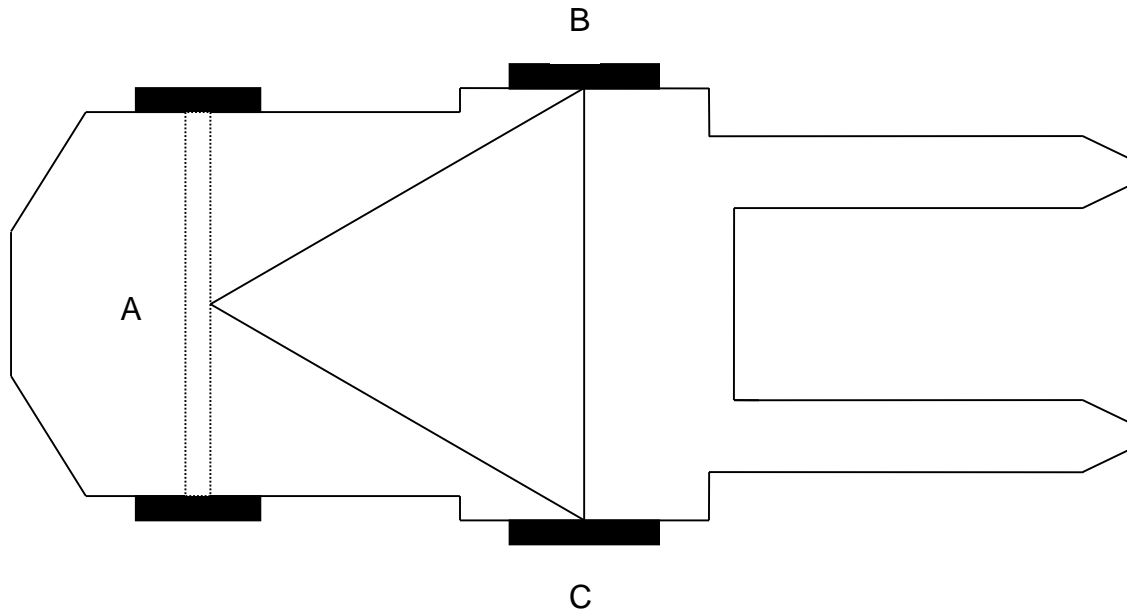
1. When the vehicle is loaded, the combined center of gravity (CG) shifts toward line B-C. Theoretically the maximum load will result in the CG at the line B-C. In actual practice, the combined CG should never be at line B-C.
2. The addition of additional counterweight will cause the truck CG to shift toward point A and result in a truck that is less stable laterally.



The center of gravity of the forklift-load combination can move outside the stability triangle if:

- the load is picked up on the tip of the forks,
- the load is tilted forward,
- the load is tilted too far back when raised
- the load is wide, or
- forklift movement causes the center of gravity to shift

STABILITY TRIANGLE - EXERCISE



Based upon the information in the “Mechanics of a Forklift” section, use your pen/pencil or finger to demonstrate how the Center of Gravity (COG) moves during the following forklift conditions:

1. Show the normal Center of Gravity (COG) position without a load.
2. Show the COG position with a load that is close to the maximum.
3. Show where the COG moves when a heavy load is tilted back.
4. Show where the COG moves when a raised mast is tilted forward with a load.
5. Show where the COG moves if the load COG is greater than 24” out on the forks because of unequal weight on a standard 48” pallet. How could you better lift this load?
6. Show where the COG moves when the forklift is loaded traveling forward on a slope that goes up to the left of the driver.
7. Show where the COG moves when the forklift carrying a load makes a left-hand turn.
8. Show where the COG moves when the forklift is stationary on a slope rising up to the drivers right when a heavy load is lifted to the top of the mast height. What can potentially happen? (See lateral stability).
9. Show where the COG moves when the forklift is driven forward down a slope with a load. Why is this a problem? What symptoms would you expect to experience to indicate a problem? (See longitudinal stability). Always keep the load uphill when driving on slopes.
10. Generate your own question(s) regarding the load, forklift position and motion until you feel comfortable with the concept of the stability triangle.

Figure 5.

Appendix E: Operating Rules For Industrial Trucks

General Industry Safety Order 3664 Operating Rules (Part (a)).

(a) Every employer using industrial trucks or industrial tow tractors shall post and enforce a set of operating rules including the appropriate rules listed in Section 3650.

General Industry Safety Order 3650 Industrial Trucks. General (Part(s)).

(t) Industrial trucks and tow tractors shall be operated in a safe manner in accordance with the following operating rules:

- (1) Only drivers authorized by the employer and trained in the safe operations of industrial trucks or industrial tow tractors pursuant to Section 3668 shall be permitted to operate such vehicles.
- (2) Stunt driving and horseplay are prohibited.
- (3) No riders shall be permitted on vehicles unless provided with adequate riding facilities.
- (4) Employees shall not ride on the forks of lift trucks.
- (5) Employees shall not place any part of their bodies outside the running lines of an industrial truck or between mast uprights or other parts of the truck where shear or crushing hazards exist.
- (6) Employees shall not be allowed to stand, pass, or work under the elevated portion of any industrial truck, loaded or empty, unless it is effectively blocked to prevent it from falling.
- (7) Drivers shall check the vehicle at the beginning of each shift, and if it is found to be unsafe, the matter shall be reported immediately to a foreman or mechanic, and the vehicle shall not be put in service again until it has been made safe. Attention shall be given to the proper functioning of tires, horn, lights, battery, controller, brakes, steering mechanism, cooling system, and the lift system for fork lifts (forks, chains, cable, and limit switches).
- (8) No truck shall be operated with a leak in the fuel system.

(9) Vehicles shall not exceed the authorized or safe speed, always maintaining a safe distance from other vehicles, keeping the truck under positive control at all times and all established traffic regulations shall be observed. For trucks traveling in the same direction, a safe distance may be considered to be approximately 3 truck lengths or preferably a time lapse — 3 seconds — passing the same point.

(10) Trucks traveling in the same direction shall not be passed at intersections, blind spots, or dangerous locations.

(11) The driver shall slow down and sound the horn at cross aisles and other locations where vision is obstructed. If the load being carried obstructs forward view, the driver shall be required to travel with the load trailing.

(12) Operators shall look in the direction of travel and shall not move a vehicle until certain that all persons are in the clear.

(13) Trucks shall not be driven up to anyone standing in front of a bench or other fixed object of such size that the person could be caught between the truck and object.

(14) Grades shall be ascended or descended slowly.

(A) When ascending or descending grades in excess of 10 percent, loaded trucks shall be driven with the load upgrade.

(B) On all grades the load and load engaging means shall be tilted back if applicable, and raised only as far as necessary to clear the road surface.

(C) Motorized hand and hand/rider trucks shall be operated on all grades with the load-engaging means downgrade.

(15) The forks shall always be carried as low as possible, consistent with safe operations.

(16) When leaving a vehicle unattended (the operator is over 25 feet (7.6 meters) from or out of sight of the industrial truck), the brakes are set, the mast is brought to the vertical position, and forks are left in the down position, either:

(A) The power shall be shut off and, when left on an incline, the wheels shall be blocked; or

(B) The power may remain on provided the wheels are blocked, front and rear.

(17) When the operator of an industrial truck is dismounted and within 25 feet (7.6 meters) of the truck which remains in the operator's view, the load engaging means shall be fully lowered, controls placed in neutral, and the brakes set to prevent movement.

Exception: Forks on fork-equipped industrial trucks may be in the raised position for loading and unloading if the forks are raised no more than 42 inches above the level where the operator/loaders are standing, and the power is shut off, controls placed in neutral and the brakes set. If on an incline, the wheels shall be blocked.

(18) Vehicles shall not be run onto any elevator unless the driver is specifically authorized to do so. Before entering an elevator, the driver shall determine that the capacity of the elevator will not be exceeded. Once on an elevator, the industrial truck's power shall be shut off and the brakes set.

(19) Motorized hand trucks shall enter elevators or other confined areas with the load end forward.

(20) Vehicles shall not be operated on floors, sidewalk doors, or platforms that will not safely support the loaded vehicle.

(21) Prior to driving onto trucks, trailers and railroad cars, their flooring shall be checked for breaks and other structural weaknesses.

(22) Vehicles shall not be driven in and out of highway trucks and trailers at loading docks until such trucks or trailers are securely blocked or restrained and the brakes set.

(23) To prevent railroad cars from moving during loading or unloading operations, the car brakes shall be set, wheel chocks or other recognized positive stops used, and blue flags or lights displayed in accordance with applicable regulations promulgated by the Public Utilities Commission.

(24) The width of one tire on the powered industrial truck shall be the minimum distance maintained from the edge by the truck while it is on any elevated dock, platform, freight car or truck.

(25) Railroad tracks shall be crossed diagonally, wherever possible. Parking closer than 8 1/2 feet from the centerline of railroad tracks is prohibited.

(26) Trucks shall not be loaded in excess of their rated capacity.

(27) A loaded vehicle shall not be moved until the load is safe and secure.

(28) Extreme care shall be taken when tilting loads. Tilting forward with the load engaging means elevated shall be prohibited except when picking up a load. Elevated loads shall not be tilted forward except when the load is being deposited onto a storage rack or equivalent. When stacking or tiering, backward tilt shall be limited to that necessary to stabilize the load.

(29) The load engaging device shall be placed in such a manner that the load will be securely held or supported.

(30) Special precautions shall be taken in the securing and handling of loads by trucks equipped with attachments, and during the operation of these trucks after the loads have been removed.

(31) When powered industrial trucks are used to open and close doors, the following provisions shall be complied with:

(A) A device specifically designed for opening or closing doors shall be attached to the truck.

(B) The force applied by the device to the door shall be applied parallel to the direction of travel of the door.

(C) The entire door opening operation shall be in full view of the operator.

(D) The truck operator and other employees shall be clear of the area where the door might fall while being opened.

(32) If loads are lifted by two or more trucks working in unison, the total weight of the load shall not exceed the combined rated lifting capacity of all trucks involved.

Operating rules for industrial trucks contained on this poster are current through Register 2002, No. 22 California Code of Regulations (operative 6-27-2002). Other rules may also apply.
S-503-04/07

Appendix F: Title 8 Section 3668

(a) Safe Operation.

(1) The employer shall ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the training and evaluation specified in this section.

(2) Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each operator has successfully completed the training required by this section, except as permitted in subsection (e).

(b) Training program implementation. Trainees may operate a powered industrial truck only:

(1) Under the direct supervision of persons who have the knowledge, training and experience to train operators and evaluate their competence; and

(2) Where such operation does not endanger the trainee or other employees.

(3) Training shall consist of a combination of formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), practical training (demonstrations performed by the trainer and practical exercises performed by the trainee) and evaluation of the operator's performance in the workplace.

(4) All operator training and evaluation shall be conducted by persons who have the knowledge, training and experience to train powered industrial truck operators and evaluate their competence.

(c) Training program content. Powered industrial truck operators shall receive initial training in the following topics, except in topics which the employer can demonstrate are not applicable to the safe operation of the truck in the employer's workplace.

(1) Truck-related topics:

(A) Operating instructions, warnings, and precautions for the types of truck the operator will be authorized to operate;

(B) Differences between the truck and the automobile;

(C) Truck controls and instrumentation: where they are located, what they do, and how they work;

(D) Engine or motor operation;

(E) Steering and maneuvering;

(F) Visibility (including restrictions due to loading);

(G) Fork and attachment adaptation, operation, and use limitations;

(H) Vehicle capacity;

(I) Vehicle stability;

(J) Any vehicle inspection and maintenance that the operator will be required to perform;

(K) Refueling and/or charging and recharging of batteries;

(L) Operating limitations;

(M) Any other operating instructions, warnings, or precautions listed in the operator's manual for the types of vehicle that the employee is being trained to operate.

(2) Workplace-related topics:

(A) Surface conditions where the vehicle will be operated;

(B) Composition of loads to be carried and load stability;

(C) Load manipulation, stacking, and unstacking;

(D) Pedestrian traffic in areas where the vehicle will be operated;

(E) Narrow aisles and other restricted places where the vehicle will be operated;

(F) Hazardous (classified) locations where the vehicle will be operated;

(G) Ramps and other sloped surfaces that could affect the vehicle's stability;

(H) Closed environments and other areas where insufficient ventilation or poor vehicle maintenance could cause a build-up of carbon monoxide or diesel exhaust;

(I) Other unique or potentially hazardous conditions in the workplace that could affect safe operation.

(d) Refresher training and evaluation. Refresher training, including an evaluation of the effectiveness of that training, shall be conducted as required by subsection (d)(1) to ensure that the operator has the knowledge and skills needed to operate the powered industrial truck safely.

(1) Refresher training in relevant topics shall be provided to the operator when:

(A) The operator has been observed to operate the vehicle in an unsafe manner;

(B) The operator has been involved in an accident or near-miss incident;

(C) The operator has received an evaluation that reveals that the operator is not operating the truck safely;

- (D)** The operator is assigned to drive a different type of truck; or
- (E)** A condition in the workplace changes in a manner that could affect safe operation of the truck.
- (2)** An evaluation of each powered industrial truck operator's performance shall be conducted at least once every three years.
- (e)** Avoidance of duplicative training. If an operator has previously received training in a topic specified in subsection (c) of this section, and such training is appropriate to the truck and working conditions encountered, additional training in that topic is not required if the operator has been evaluated and found competent to operate the truck safely.
- (f)** Certification. The employer shall certify that each operator has been trained and evaluated as required by this section. The certification shall include the name of the operator, the date of the training, the

date of the evaluation, and the identity of the person(s) performing the training or evaluation.

(g) Dates. The employer shall ensure that operators of powered industrial trucks are trained, as appropriate, in accordance with the following dates:

(1) If the employee was hired before July 15, 2000, the initial training and evaluation of that employee must be completed by July 15, 2000;

(2) If the employee was hired after July 15, 2000, the initial training and evaluation of that employee must be completed before the employee is assigned to operate a powered industrial truck.

Exception: Agricultural operations as defined in Section 3437 of the General Industry Safety Orders are exempt from the requirements of Section 3668.

Note: Authority cited: Section 142.3, Labor Code.

Reference: Section 142.3, Labor Code.



Safety Program Approval Form

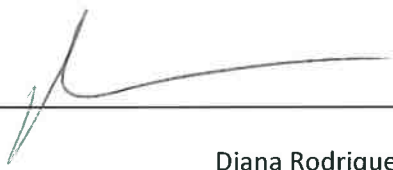
Safety Program: **Powered Industrial Truck/Forklift Consolidated Safety Program – San Bernardino Valley College – September 2016**

Reviewed by:  Date 09/19/16
Whitney J. Fields

SBCCD Director, Safety & Risk Management

Approved by:  Date 9.21.16
Scott Stark

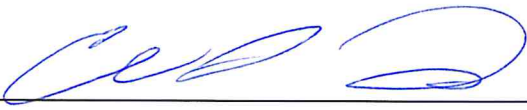
SBVC/Vice President Administrative Services/Business Services

Approved by:  Date 9.21.16
Diana Rodriguez
SBVC President

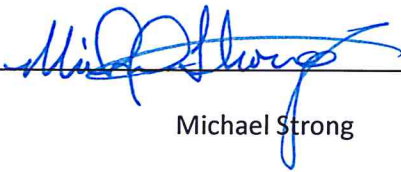


Safety Program Approval Form

Safety Program: **Powered Industrial Truck/Forklift Consolidated Safety Program – Crafton Hills College**
– September 2016

Reviewed by:  Date 09/19/16
Whitney J. Fields

SBCCD Director, Safety & Risk Management

Approved by:  Date 9/23/16
Michael Strong

CHC/Vice President Administrative Services/Business Services

Approved by:  Date 9/27/16

Dr. Wei Zhou

CHC President