



Safety Training Course C

FORKLIFT SAFETY

Presented by

Contract Services Administration Training Trust Fund

As part of the

Safety Pass Training Program for the Motion Picture and Television Industry

C



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Second Edition

August 2018

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Safety Pass Training Program

The Entertainment Industry is committed to maintaining a safe and healthful working environment. To that end, all major studios have a safety representative on staff. In addition, all employers have a safety program in force. This Safety Pass Program has been designed to further promote safety and health and to prevent injuries, illnesses, and accidents on all productions, both on-lot and off-lot.

Studios and production companies may have more restrictive safety requirements than those mandated by local, state, or federal laws or regulations. They also may assign different duties or responsibilities to employees. Therefore, in addition to this Safety Pass training course, employees should refer to the safety manual and materials provided by their employers.

Employees must adhere to all safety rules and regulations. Failure of any employee to follow safety rules and regulations can lead to disciplinary action, up to and including discharge. However, no employee shall be discharged or otherwise disciplined for refusing to perform work that the individual reasonably believes is unsafe.

No safety training can comprehensively cover all possible unsafe work practices. Each production and its employees, therefore, should fully promote each employee's personal obligation to work safely in order to prevent accidents involving, and injuries to, the employee and to his/her fellow employees.

The Safety Pass Program derives from Federal and California Occupational Safety and Health Administration (OSHA) safety regulations. However, the material included in this workbook and its accompanying presentation should be used only as a general guideline. It is not intended as a legal interpretation of any federal, state, or local safety standard.

During the course of your employment, you may be acting as a supervisor or manager. In California, individuals with management authority and actual authority for the safety of a business practice could be convicted of a crime if they have actual knowledge of a serious concealed danger and fail to warn the affected employees and report the hazard. If a hazard exists, immediately notify the employer or studio safety department of the hazard and insure that potentially affected employees are informed of the danger and that steps are taken immediately to mitigate it.

Although the information contained in this training program has been compiled from sources believed to be reliable, the Alliance of Motion Picture and Television Producers, Contract Services Administration Trust Fund, Contract Services Administration Training Trust Fund, and the instructor make no guarantee nor warranty as to, and assume no responsibility for, the accuracy, sufficiency, or completeness of such information.

The Entertainment Industry is committed to maintaining a safe and healthful working environment.

Injury and Illness Prevention Program



This class is part of the employer's safety program.

Employers must provide workers a place of employment free from recognized hazards and must have a safety training program in place.

In the State of California, this program is known as an Injury and Illness Prevention Program (IIPP). One requirement of an IIPP is that every employee must be properly trained in safety.

The IIPP and Safety Pass training courses are part of the employer's safety program.



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Introduction

Purpose

Forklifts are valuable to the motion picture and television industry, in both versatility and strength. At the same time, forklifts can be hazardous if proper operational practices and safety precautions are not followed.

The goal of this course is to increase awareness and understanding of forklift regulations and reduce workplace accidents and injuries. Forklift drivers and those working in proximity of forklifts will learn about:

- Common hazards
- Components and controls
- The principles of load capacity and stability
- Inspection procedures
- Basic operation
- Attachments
- Refueling and recharging

With the proper training, knowledge, and safety practices, forklift operators and crew can do their part in maintaining a safe work environment.



Training

Only drivers authorized by the employer and trained in the safe operation of forklifts are permitted to operate such vehicles.

Refresher Training

OSHA requires refresher training if the operator has been observed using the forklift in an unsafe manner, involved in an accident or near-miss incident, evaluated as not using the forklift safely, assigned to drive a different type of forklift, or there is a change in workplace conditions that could affect safe operation of the forklift.

OSHA also requires an evaluation of an operator's performance at least once every three years.

In addition, forklift operators are required to take Safety Pass refresher training once every three years. This refresher training includes the evaluation required by OSHA.

Operating Rules

Employers using forklifts (and other industrial trucks and tow tractors) must post and enforce the thirty-three rules listed in Cal/OSHA's *Operating Rules for Industrial Trucks*. See appendix D for the full list.

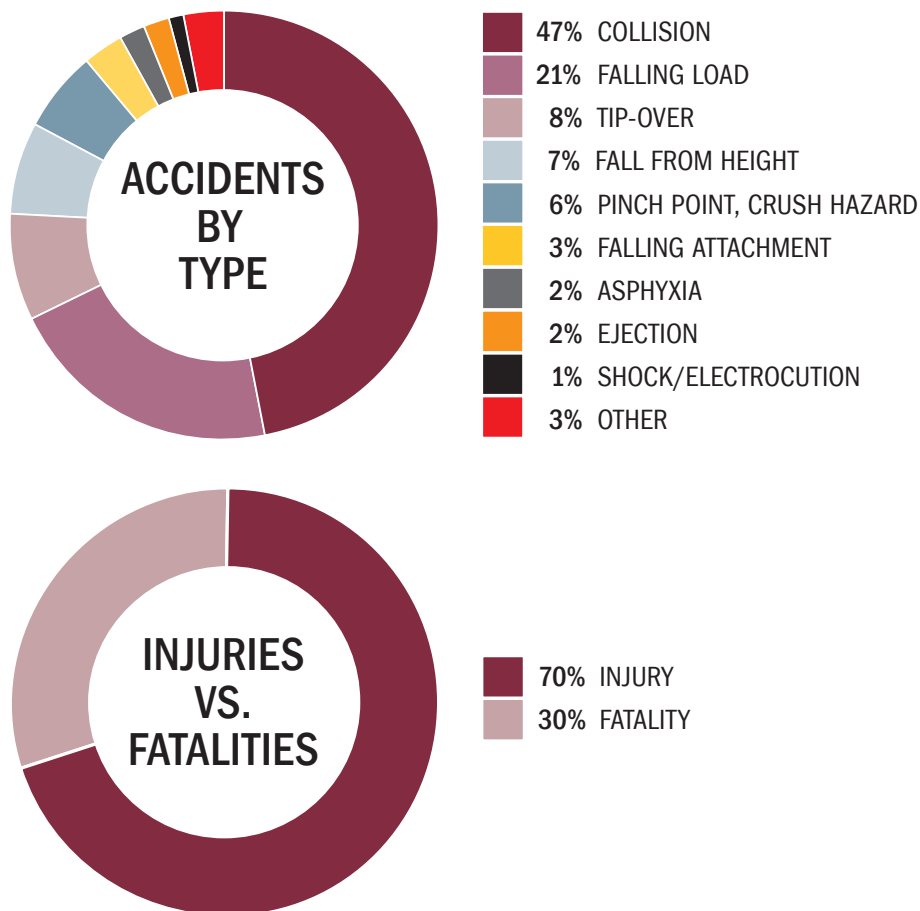
Scene 1

Hazards

Forklifts can be dangerous when not used properly. Failure to observe inspection and operational rules can have significant consequences. Even the slightest error can contribute to accidents. Operators must remain cautious and aware in order to prevent injuries and fatalities.

This scene describes the most common forklift hazards and their potential causes.



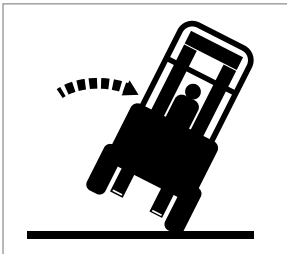

OSHA Accident Statistics




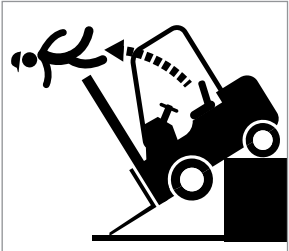


Source: US Dept. of Labor, Occupational Health and Safety Administration (OSHA). Based on 458 incidents, 2011-2013.

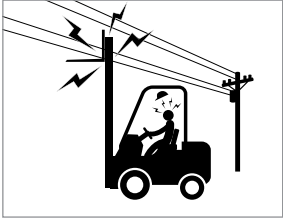



Common Forklift Hazards and Possible Causes

Hazard	Description	Possible Causes
Collision 	Impact between a forklift and a pedestrian, another vehicle, or an object	<ul style="list-style-type: none"> • Inattention to pedestrian traffic • Obstructed view, driving path • Not looking in the direction of travel • Others walking/standing too close to vehicle
Falling Load 	A load that unintentionally falls from forks, an attachment, a stack, or a trailer	<ul style="list-style-type: none"> • Improperly secured load • Inadequate load clearance • Uneven or unstable surface • Unsafe driving
Tip-Over 	The vehicle falls to one side, forward, or backward	<ul style="list-style-type: none"> • Exceeding capacity • Improper load handling • Unsafe driving on an incline, uneven surface, or loading dock • Turning too quickly • Horseplay
Fall from Height 	Falling from forks, a pallet, or an attachment	<ul style="list-style-type: none"> • Using an unapproved attachment • Improperly secured attachment • Not wearing required personal fall protection equipment (PFPE)

Hazard	Description	Possible Causes
<p>Pinch Point, Crush Hazard</p> 	<p>Anywhere it is possible for a body part to be caught between moving parts of the vehicle, or between the vehicle and another object</p>	<ul style="list-style-type: none"> • Reaching through mast • Putting hands on or near moving parts • Putting body outside running lines
<p>Falling Attachment</p> 	<p>The attachment falls from elevated forks</p>	<ul style="list-style-type: none"> • Unsecured or improperly secured attachment • Using an unapproved attachment
<p>Asphyxia</p> 	<p>Oxygen deprivation</p>	<ul style="list-style-type: none"> • Operating a vehicle with an internal combustion engine in an enclosed space • Contact with hazardous materials
<p>Ejection</p> 	<p>Being thrown from the vehicle</p>	<ul style="list-style-type: none"> • Not wearing seat belt • Collision



Hazard	Description	Possible Causes
<p>Electrical Hazard</p>  <p>Other</p> 	<p>Shock or electrocution through contact with energized wires, equipment, or the vehicle itself</p> <p>Fuel fire, battery burn, tire explosion, struck by maintenance equipment</p>	<ul style="list-style-type: none"> • Not following minimum safe approach distance (MSAD) requirements • Not checking overhead clearance • Unsafe work, refueling, or maintenance practices

Electrical Hazards

To avoid electrical hazards, forklift operators must maintain the proper minimum safe approach distance (MSAD) from energized overhead lines.

When determining a safe distance, consider the maximum height of the mast and the load being carried, as well as electrical line sway. For more details on safe distance requirements, refer to the operator's manual for the forklift being used and *Safety Bulletin #22A, Power Line Distance Requirements*. See appendix A of this course book for a link to industry safety bulletins.

Keep in mind that an energized line does not need to be touched to cause damage or injury. Electricity can arc, or jump, from a line to another object. When in doubt, stay the maximum distance away from power lines.

California Boom-type Lifting or Hoisting Equipment Clearances Required from Energized Overhead High-Voltage Lines

Nominal Voltage (Phase to Phase)	Minimum Required Clearance (Feet)
600 50,000	10
over 50,000 75,000	11
over 75,000 125,000	13
over 125,000 175,000	15
over 175,000 250,000	17
over 250,000 370,000	21
over 370,000 550,000	27
over 550,000 1,000,000	42

Source: 8 CCR §2946 (2)

Federal Clearances Required When Working On or Near Exposed Energized Parts

Nominal Voltage (Phase to Phase)	Minimum Required Clearance (Feet)
50,000 or below	10
over 50,000	10 feet plus 4 inches for every 10,000 volts over 50,000 volts

Source: 29 CFR §1910.333



Your employer may set MSAD requirements greater than those shown here.



Notes

Scene 2

Forklift Basics

Classifications

There are seven classifications of powered industrial trucks (PITs) based on engine type, tire type, work environment, purpose, and equipment characteristics (Figure 2.1). Within each classification are one or more types, or subcategories, of forklifts. For the full list of forklift classes and types, see appendix B.



Figure 2.1. Seven classifications of PITs.

g

pneumatic tire.

A tire filled with air.

solid/cushion tire.

A tire of solid rubber.

Figure 2.1. Key

- 1** Class I—Electric Motor Rider Trucks
- 2** Class II—Electric Motor Narrow Aisle Trucks
- 3** Class III—Electric Motor Hand Trucks or Hand/Rider Trucks
- 4** Class IV—Internal Combustion Engine Forklift Trucks (Solid/Cushion Tires)
- 5** Class V—Internal Combustion Engine Forklift Trucks (Pneumatic Tires)
- 6** Class VI—Electric and Internal Combustion Engine Tractors
- 7** Class VII—Rough Terrain Forklift Trucks

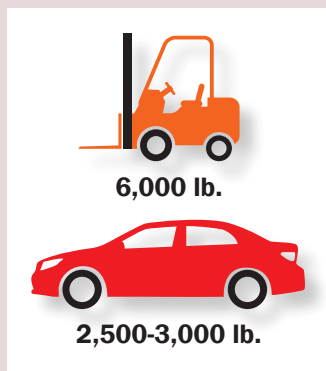


Figure 2.2.
Forklift weight vs. car weight.

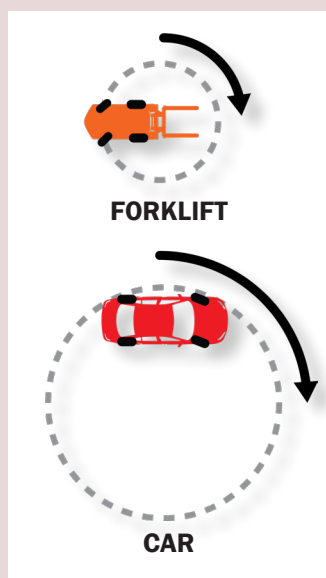


Figure 2.3.
A forklift has a smaller turning radius than a car.

Forklifts vs. Cars

While both a forklift and a car can be driven, the similarity ends there. Weight, steering, braking, stability, and visibility make operation of these two vehicles drastically different.

Weight

The forklift's compact size can be misleading. For example, a smaller Class V forklift weighs approximately 6,000 lb., making it twice as heavy as a car (Figure 2.2).

Steering

While passenger vehicles have front-wheel steering, most forklifts use rear-wheel steering (Figure 2.3) which reduces the turning radius and allows for greater maneuverability in small spaces. However, rear-wheel steering causes the rear end to swing out, which can be hazardous, especially when working near an obstruction or an edge.

(Some forklifts are all-wheel steering or, occasionally, front-wheel steering.)

Braking

Cars have brakes on the front and rear tires, while forklifts have them only on the front. Stopping too quickly while carrying a heavy load can cause load instability or a tip-over.

Stability

A forklift's narrow width, short wheelbase, and lack of shock absorbers make it less stable than a car. Taking corners too quickly or driving on uneven surfaces can cause a tip-over.

Visibility

From inside a car, a driver can generally see in all directions, with limited blind spots. When operating a forklift, however, the load and mast can greatly decrease visibility. Operators must look in the direction of travel and watch out for objects and personnel.

Operator's Manual

Each make and model of forklift will vary in design, operation, and safety and emergency procedures. For this reason, each forklift has its own operator's manual which must stay with the vehicle. **Do not operate a forklift that does not have an operator's manual on board.**

Data Plate and Decals

All forklifts have a data plate and decals (Figure 2.4). The data plate, also called a nameplate, provides specific vehicle information such as the type of attachment being used, serial number, forklift weight, and capacity. Decals provide warning and instructional safety information. The data plate and decals should be clearly visible to the operator. Check the operator's manual to see where each is located.

FORKLIFT TRUCK


MODEL	6GHDV14		SERIAL NO.	86736	
MAST TYPE	FSU	BACK TILT	5	ATTACH	FORKS
FRONT TREAD	35	TIRE FR SIZE	21x7x15/SOLID		
	885	TIRE RR SIZE	16x5x10-1/2/SOLID		
TRUCK WT.	8370	lb			
ACCURACY±5%	3800	kg			

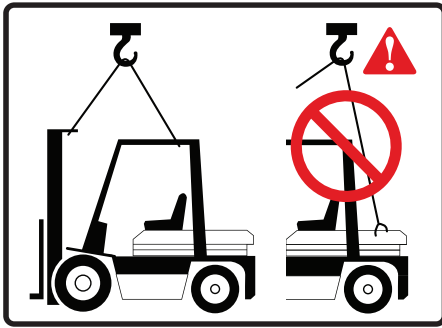
RATED CAPACITY WITH VERTICAL MAST EQUIPPED AT MAX. LIFT HEIGHT "A" AS SHOWN

	A	B	C	CAPACITY
in 189	24	0		5000 lb
mm 4800	600	0		2200 kg
in 189	30	0		4350 lb
mm 4800	760	0		1900 kg

THIS FORKLIFT TRUCK MEETS OR EXCEEDS DESIGN SPECIFICATIONS OF ASME/ANSI B56.1 IN EFFECT ON THE DATE OF MANUFACTURE.

WARNING IMPROPER OPERATION OR MAINTENANCE COULD RESULT IN INJURY OR DEATH. TRAINED OPERATORS ONLY. READ OPERATOR'S MANUAL FIRST.






WARNING


Notes on Side-shifting Operation


- (1) When a load on the forks is shifted to one side, shift the forks sideways so that the load is properly positioned between the forks
- (2) When the height of the forks is more than 150cm (60in), special care is required. Careless shifting may cause the machine to tip over. Shift the forks gently. Don't shift the forks more than required.




WARNING


Seat belts help reduce tip over injury if you follow these instructions.









DANGER




Don't jump!



Hold on tight



Brace feet



Lean away

Do not operate a forklift if the data plate or decals are illegible or missing.

Figure 2.4. Read and understand the data plate (top left) and all decals.

Components

Knowing the names and locations of forklift components (Figure 2.5) is important in navigating the operator's manual, understanding operator instructions, describing problems, and reporting improper function.

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load-engaging means.

The general term for any device attached to the forklift's carriage or mast that carries or pulls the load.

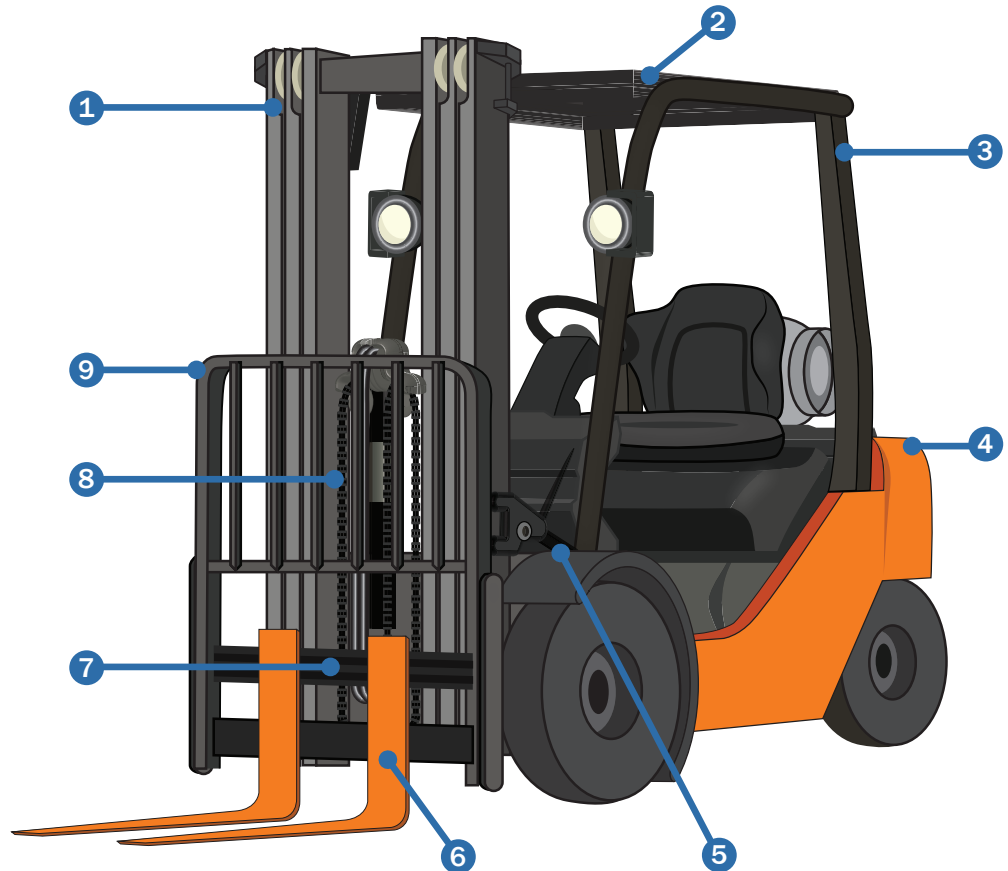


Figure 2.5. Forklift components.

- 1 Mast.** The vertical assembly, made up of interlocking rails, that raises and lowers the load.
- 2 Canopy guard (overhead guard).** An overhead shield that protects the vehicle operator from falling objects.
- 3 Rollover protective structure (ROPS).** A metal structure that protects operators from injuries caused by tip-overs.
- 4 Counterweight.** The weight built into a forklift's basic structure that provides stability to the machine and enables it to lift heavy objects by acting as a counter balance.
- 5 Tilt cylinder.** Mounted to the mast and frame, the means by which the mast is pivoted back and forth.
- 6 Forks.** The standard load-engaging means.
- 7 Carriage.** The component on which the forks, or other attachments, are mounted.
- 8 Lift cylinder and lift chains.** The means by which the mast, carriage, and forks are lifted.
- 9 Load backrest.** A rack-like extension attached to the carriage which prevents the load from shifting backward off the forks.

Controls

The controls of a forklift (Figure 2.6) can vary between classes, types, and models. Operators must check the operator's manual and familiarize themselves with the control levers of the particular model being used. However, operators can generally expect to see the following basic controls.

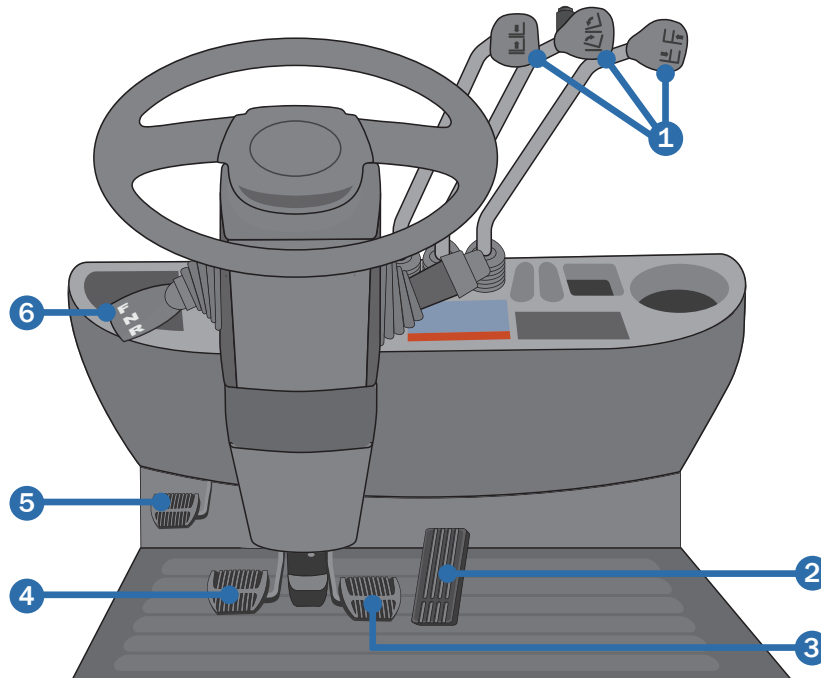


Figure 2.6. Forklift controls.

- | | |
|--|--|
| <p>1 Hydraulic lift controls. Most forklifts have three lift controls that:</p> <ul style="list-style-type: none"> • Raise and lower the load • Tilt the load • Shift the forks to the right or left | <p>4 Inching pedal. Acts as a brake and disengages the transmission, allowing the engine speed to increase thereby giving more power to the hydraulic lift.</p> |
| <p>2 Accelerator pedal. Controls forward and reverse speed.</p> | <p>5 Parking brake. Can be the fourth pedal or a hand brake. Set the parking brake when exiting a forklift.</p> |
| <p>3 Brake pedal. Slows and stops the forklift.</p> | <p>6 Directional lever. Controls forward, neutral, and reverse movement. It is usually attached to the left side of the steering column.</p> |



Notes



Scene 3

Forklift Physics

A forklift is able to lift and move heavy loads while remaining upright by employing the principles of leverage and stability. This scene explains these principles and how they are used to determine a forklift's capacity and maintain its stability.

Leverage

A **lever** is a rigid beam that pivots at a fixed point (**fulcrum**). Levers are used to lift heavy loads at one end of a beam by applying force to the other end.

A seesaw is a lever. It is a beam balanced by a fulcrum. By applying force at one end of the beam, the load at the other end of the beam is lifted. When the forces are equal, the beam is balanced. A forklift is also a lever. The front wheels are the fulcrum, and the **counterweight** balances the load. If the load is heavier than the counterweight—that is, if capacity is exceeded—the machine can lose its balance and tip forward (Figure 3.1).

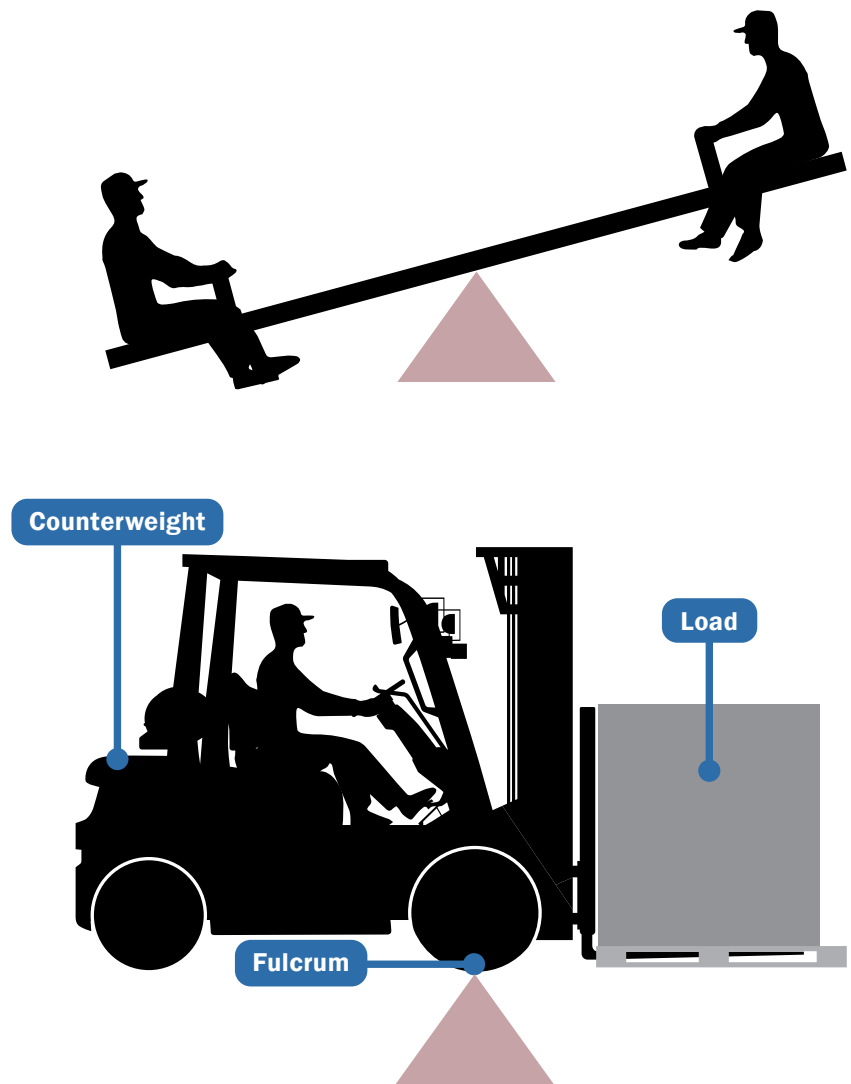


Figure 3.1. A seesaw (top) and a forklift (bottom) are both levers.

Capacity

One way forklift operators maintain stability is by making sure the load does not exceed the forklift's capacity.

Capacity is the maximum weight a forklift can safely carry at a specified load center and mast height. To better understand how capacity works, it's important to know the parts of a load. The load's **center of gravity**, or **load CG**, is the point where weight is evenly distributed on all sides. The **load center** is the distance from the face of the forks to the line of action. The **line of action** is the imaginary vertical line through the load's center of gravity (Figure 3.2).

When capacity is exceeded, the forklift can tip over.

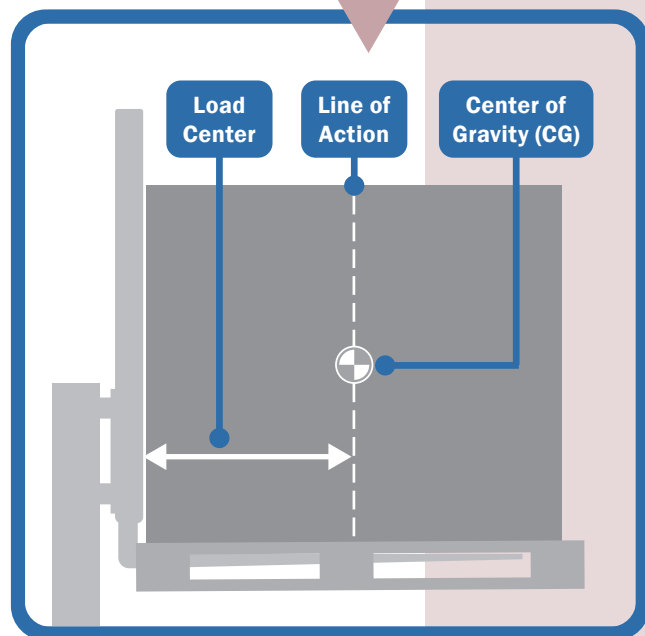


Figure 3.2. A forklift at maximum capacity with a magnified view of the load's load center, line of action, and center of gravity (CG).



The manufacturer determines the maximum capacity for each make and model, called the rated capacity. The rated capacity is shown on the data plate (Figure 3.3), as well as in the operator's manual. More than one rated capacity may be provided.

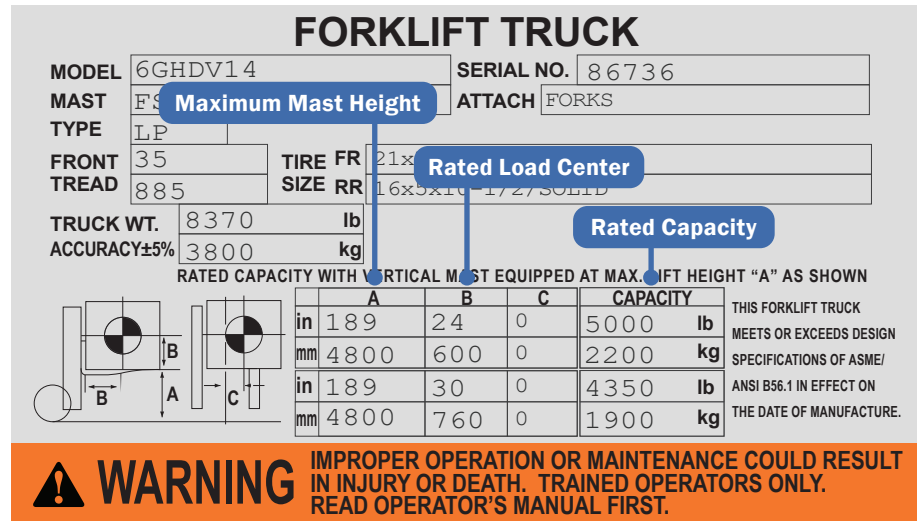


Figure 3.3. Data plate for standard forks, showing rated capacities for a load with a 24 in. load center, and a load with a 30 in. load center.

Before attempting to lift a load, operators must ensure it does not exceed the rated capacity of the vehicle:

- If the load weight is greater than the rated capacity, the load cannot be lifted.
- If the value of the actual load center (Figure 3.4) is greater than the rated load center, calculate an adjusted capacity to determine if the load can be lifted.

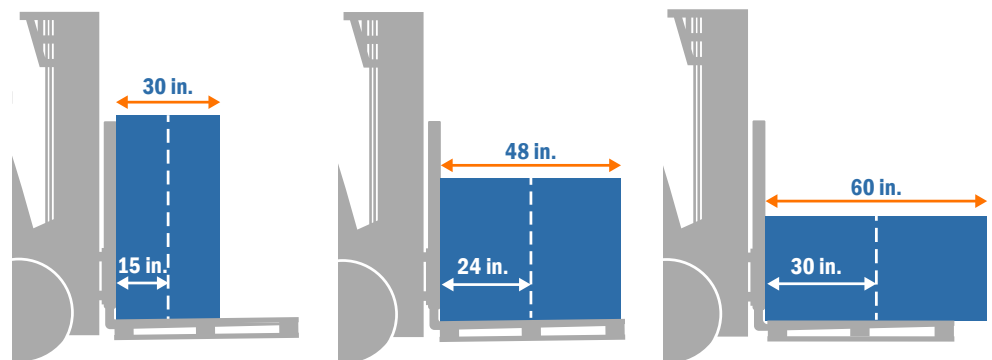


Figure 3.4. The load center can vary due to the load's size, shape, or weight distribution.

When the load center increases, capacity decreases.

Calculate a load's adjusted capacity using OSHA's field calculation formula:

$$\frac{\text{Rated load center (in.)}}{\text{Actual load center (in.)}} \times \text{Rated capacity (lb.)} = \text{Adjusted capacity (lb.)}$$

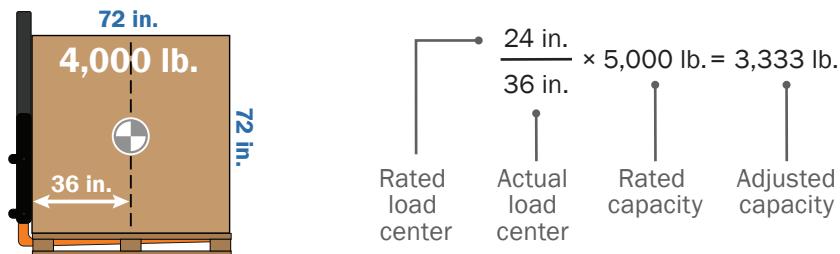
After performing this calculation, verify that the load weight is less than or equal to the adjusted capacity before lifting the load.



Exceeding a forklift's capacity is a serious hazard. The load center and load weight must be evaluated for every unique load.

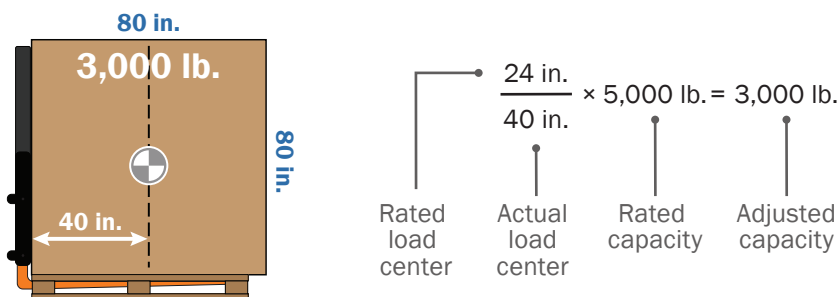
Examples:

- 1 Calculate the adjusted capacity for a 4,000 lb. load with a 36 in. load center by using a rated capacity of 5,000 lb. and a rated load center of 24 in.



The load weight (4,000 lb.) is greater than the adjusted capacity (3,333 lb.), making the load unsafe to lift.

- 2 Calculate the adjusted capacity for a 3,000 lb. load with a 40 in. load center using the same rated measures as the previous example—a 5,000 lb. rated capacity and a 24 in. rated load center.



The load weight (3,000 lb.) is equal to the adjusted capacity (3,000 lb.). The load is safe to lift.

Stability

Maintaining stability is crucial to forklift safety and is dependent upon the combined center of gravity (CCG) staying within the boundaries of the stability triangle and stability pyramid.

The **CCG** is the center of gravity of a loaded forklift (Figure 3.5). The **stability triangle** is the area between the three points that make up the suspension system of counterbalanced forklifts (Figure 3.6). Point one is the pivot pin in the middle of the rear axle. Points two and three are the front wheels (fulcrum). The **stability pyramid** is the area formed by the stability triangle and the highest point of the forklift or load (Figure 3.7).

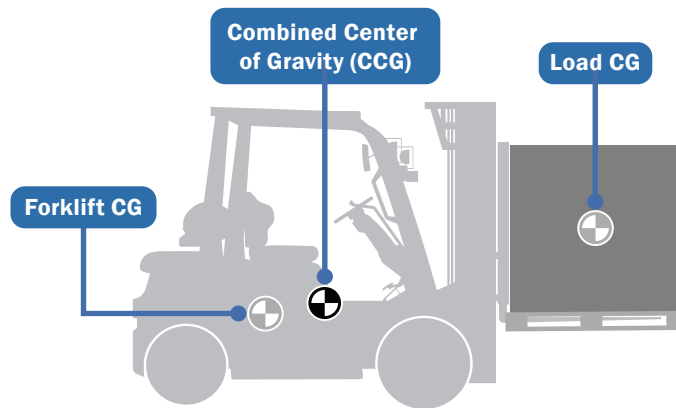


Figure 3.5. The CCG is the center of gravity of a loaded forklift.

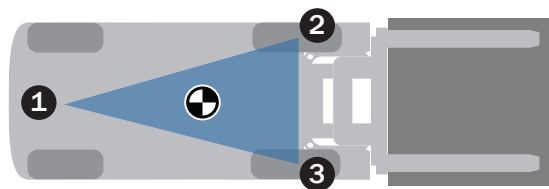


Figure 3.6. The stability triangle is formed by the pivot point of the rear axle and the front tires.

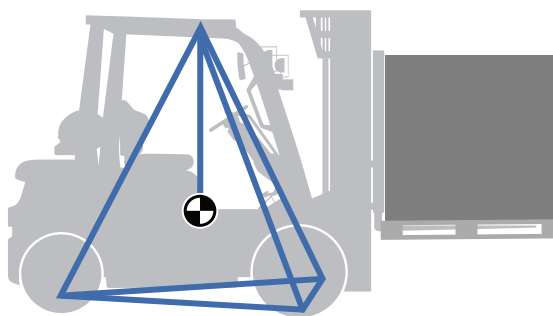


Figure 3.7. The stability pyramid is the area formed by the stability triangle and the highest point of the forklift or load.

Note: From this point, this course will use the term stability triangle to refer to both the stability triangle and the stability pyramid.

If the CCG goes outside of the stability triangle, the vehicle can tip.

Several factors affect forklift stability:

- Load weight
- Load balance
- Mast height
- Mast tilt
- Vehicle maneuvering
- Environmental conditions

Load Weight

As the load weight increases, the CCG moves forward, toward the load (Figure 3.8). If the load weight exceeds the forklift's capacity, the CCG will move outside the stability triangle and the forklift can tip forward.

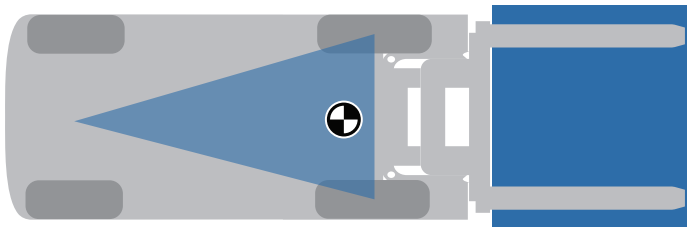


Figure 3.8. The CCG of a forklift loaded to maximum capacity is at the front of the stability triangle.

Load Balance

Load balance refers to how a load is arranged on the forks—side-to-side and front-to-back—for optimal stability. A properly balanced load puts the load CG between the forks (Figure 3.9) and as close to the mast as possible (Figure 3.10). An unbalanced load makes a tip-over more likely.

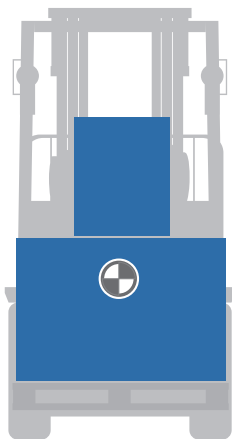


Figure 3.9. Position the load CG between the forks.

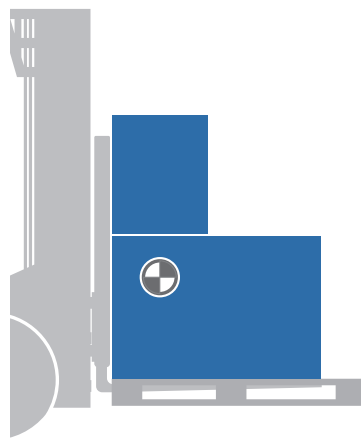


Figure 3.10. Position the load with the CG as close to the mast as possible.

Mast Height

As the mast is raised, the area of safe operation is reduced because the CCG moves upward where the stability triangle narrows (Figure 3.11). With the mast raised, it would take little force to push the CCG outside the stability triangle's boundaries. The higher the load is lifted, the less stable the machine becomes.

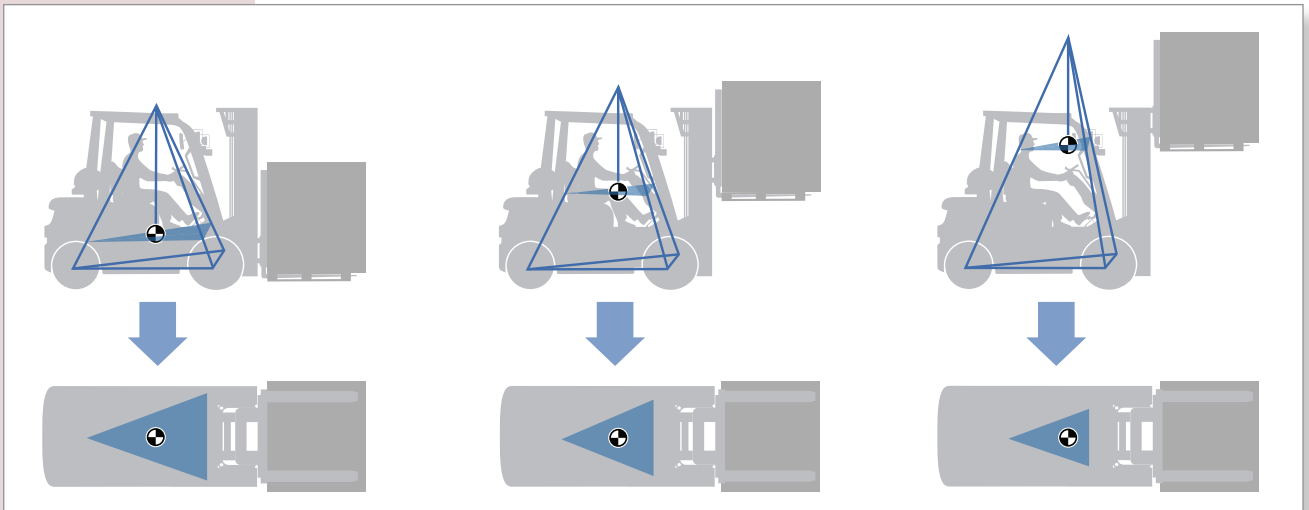


Figure 3.11. The stability triangle gets smaller as the mast is raised.

Mast Tilt

Depending on the weight and height of the load, mast tilt could be the difference between stability and instability (Figure 3.12). Move the mast backward for increased stability.

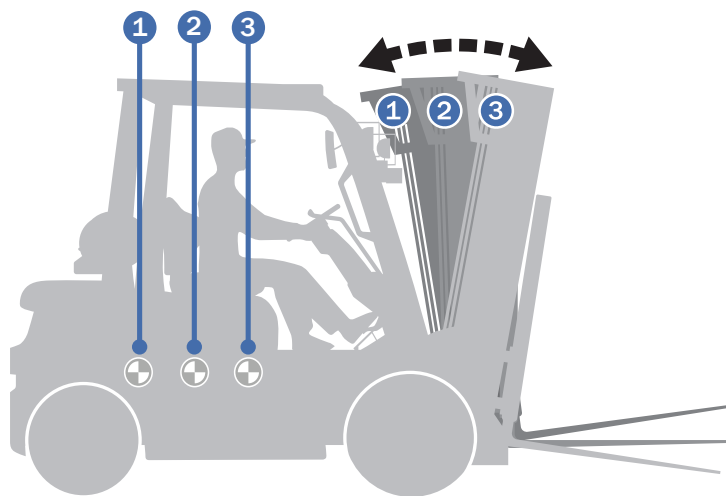


Figure 3.12. A mast tilted backward (1) moves the CG toward the rear of the stability triangle, a vertical mast (2) puts the CG in the middle of the stability triangle, and a mast tilted forward (3) moves the CG to the front of the stability triangle.

Maneuvering and Environmental Conditions

When a forklift is in motion, basic maneuvering and environmental conditions (such as a ground obstruction or an uneven driving surface) will apply a force that can shift the CCG. If the force is strong enough, the CCG can be pushed outside the boundaries of the stability triangle (Figure 3.13), resulting in a tip-over, falling load, or a collision.

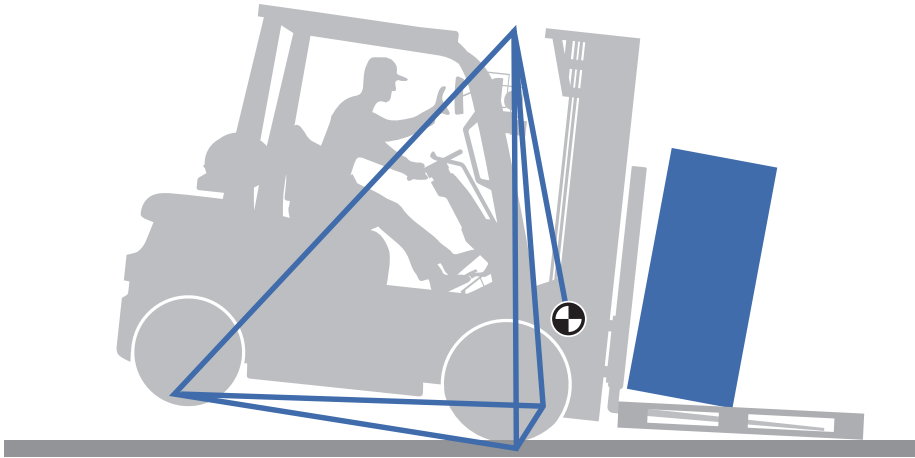


Figure 3.13. Stopping too quickly can force the CCG outside the stability triangle.



**DO NOT JUMP FROM
THE FORKLIFT!**

Tip-Over Procedure

In case of a tip-over, the general procedure (Figure 3.14) is to stay seated, brace your feet, and lean forward and in the opposite direction of the tip-over. Always wear your seat belt.



Figure 3.14. The tip-over procedure will vary depending on the type of forklift. Check the operator's manual for specific procedures.



Scene 4

Pre-Use Inspections

Before a forklift is used each day, or when there is a change in operators, three types of pre-use inspections must occur:

- 1 A **work zone inspection** identifies hazards in the immediate work area.
- 2 A **walk-around inspection** is a visual assessment of the physical condition of the forklift.
- 3 A **function test** is a check of the machine's power sources, controls, and operation.

This scene discusses the general procedures for each type of inspection. Follow the specific inspection procedures, detailed in the operator's manual, for the forklift model you are using.

If any deficiency is noticed during the visual or operational inspections, or while driving, the operator must stop and park the vehicle, report the deficiency, and get assistance. All repairs must be made by authorized personnel.

Never operate a defective machine.



1. Work Zone Inspection

The work zone inspection identifies specific hazards in the work zone to help determine if the area should be avoided or if other precautions or actions should be taken. (The work zone inspection can also dictate driving practices, which will be covered in the next scene.)

When evaluating the work zone, include the following:

- Vehicle and pedestrian traffic
- Power lines
- Overhead obstructions (Figure 4.1)
- Ground surface debris
- Ground obstructions
- Slippery work surfaces
- Uneven and sloped surfaces (Figure 4.2)
- Loading docks and elevated driving platforms
- Non-load-bearing work surfaces (Figure 4.3)
- Stages, set pieces, and props
- Stage pits and tanks (Figure 4.4)
- Production equipment
- Enclosed spaces when using an internal combustion engine
- Changing light conditions

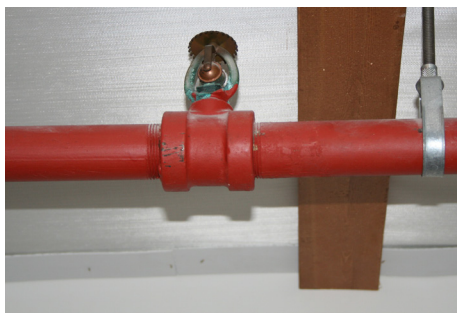


Figure 4.1. Be aware of the height of overhead obstructions such as lights, sprinklers, pipes, heating ducts, and door frames.



Figure 4.2. Check the route for uneven (gravel, potholes, railroad tracks), and sloped surfaces.



Figure 4.3. Be sure the work surface can support the weight of a forklift and its load. When on location, consult a site representative for maximum weight limits. A forklift's weight and ground bearing pressure are listed in the specs in the operator's manual.



Figure 4.4. Many stages have pits and tanks located under the floor that may not be able to support the weight of a forklift and its load. Contact Backlot Operations or Studio Safety to get authorization to take a forklift onto a stage floor. Check posted signage and the stage itself for weight limits and markings indicating pits and tanks.

Check studio policy before bringing a forklift with an internal combustion engine onto a stage.



**See appendix C for
a sample checklist.**

2. Walk-Around Inspection

This visual inspection verifies that components are present and in safe operating condition. Below are general guidelines—follow the checklist provided by the manufacturer or the employer for the forklift in use.

Pre-Inspection

Before beginning the visual inspection, be sure that:

- the operator's manual is with the forklift,
- the data plate and safety decals are in place and legible,
- the information on the data plate matches the model, serial number, and attachment, and
- the vehicle is powered off.

Performing the Inspection

Inspect all areas of the vehicle for tight connections, signs of damage, and overall good condition. Fuel and fluids should be filled to the proper levels and tires properly inflated.

Keep an eye out for:

- Fluid leaks
- Cracked or frayed cables and hoses
- Cracked or broken mast, cage, and finger guards
- Missing or loose bolts, pins, or other hardware
- Loose mast chains
- Damaged forks
- Unsecured attachment
- Debris that has collected in moving parts
- Tires with cuts or gouges
- Unauthorized modifications

When operating an electric forklift, inspect the following areas:

- Cables and connectors
- Battery restraints
- Electrolyte levels
- Hood latch

For an internal combustion forklift, check the:

- Engine oil and coolant
- Brake reservoir
- Air filter
- Belts and hoses
- Radiator
- Hood latch

For forklifts that use liquefied petroleum gas (LPG), also known as propane, confirm the following:

- The propane tank and fuel line are in good condition.
- The propane tank is properly positioned (Figure 4.5).
- The fuel line is securely connected to the tank.
- The tank valve is open $\frac{3}{4}$ to $1\frac{1}{2}$ turns to allow adequate propane to the engine and quick closure if a problem occurs.

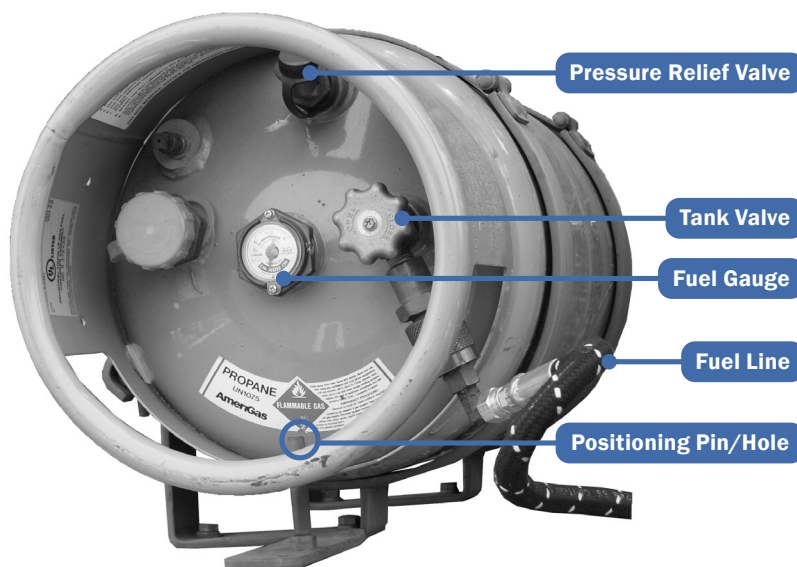


Figure 4.5. Propane tank properly positioned with pressure relief valve at the top of the tank and the positioning pin engaged.

If propane is seen, heard, or smelled, close the valve immediately. This is an indication that the tank, connection, or fuel line is leaking. To check for leaks, apply soapy water to the tank valve, the fuel line, and the fuel line's connection points. Turn the valve back on and look for bubbles. If the leak cannot be stopped, do not use the vehicle. Close the valve and report the problem to your supervisor.

3. Function Test

Once the work zone and walk-around inspections are complete, the operator must test the controls and components of the forklift.

Pre-Inspection

Before beginning the function test:

1. Mount the forklift using three points of contact (Figure 4.6).
2. Buckle the seat belt.
3. Familiarize yourself with the directional and hydraulic controls.
4. Start the engine.



Figure 4.6. Mount and dismount a forklift using three points of contact.

Performing the Inspection

Test the driving controls:

- Lights
- Brakes
- Steering
- Drive control: forward and reverse
- Horn and back-up alarm
- Inch control (if equipped)

Test the hydraulic controls:

- Hoist and lower
- Tilt forward and back
- Shift side to side

**FASTEN
SEAT
BELTS**



Scene 5

Operation

Forklift operators must follow safe operating rules at all times. Attention and adherence to these rules can significantly reduce accidents and injuries. This scene discusses requirements and best practices for safe forklift operation.

Before operating any forklift, you must be properly trained and authorized by the employer. In addition, all three pre-use inspections must be complete.

Refer to the operator's manual for manufacturer recommendations on procedures specific to the forklift make and model being used. Your employer may have additional guidelines specific to the work environment that must be followed.

When traveling in the same direction, a safe distance is considered three vehicle lengths or a time lapse of three seconds passing the same point.



Driving Safety

- Follow all traffic regulations.
- Do not exceed authorized safe speed.
- Keep the vehicle under control.
- Stunt driving and horseplay prohibited.
- Maintain a safe distance from other vehicles.
- Do not pass a forklift traveling in the same direction at intersections, blind spots, or other dangerous locations.
- Slow down and sound horn at intersections or where vision is obstructed.
- If a load obstructs the view, drive in reverse with the load trailing.
- Look in the direction of travel.
- Drive slowly over uneven or slippery surfaces.
- Cross railroad tracks at an angle.
- Do not allow others to ride on forklift.
- Do not smoke while driving a forklift.

Forks Safety

- Travel with the forks as low as possible.
- Do not allow others to ride on the forks.
- Do not stand, pass, or work under raised forks, loaded or empty.

Seat Belts

Always use the seat belt. During a tip-over, the driver's first impulse may be to try to jump from the vehicle. However, doing so puts the driver at risk of being trapped under the forklift and severely injured. Remember, forklifts are heavy. A fastened seat belt keeps the driver safe and secure in the forklift.

Pedestrians

Always yield to pedestrian traffic. Do not assume that pedestrians are aware of forklift activity. They may not hear back-up alarms or see back-up lights. Additionally, other personnel may not understand the danger of being too close to a forklift. The rear of the forklift swings out when turning, and stopping short to avoid a collision with someone could cause the load to fall.

Never drive a forklift up to anyone standing in front of a fixed object. A pedestrian can be trapped and injured if the forklift or load moves unexpectedly.

Pinch Points and Crush Hazards

Do not place any part of the body outside the running lines of the forklift, through the mast, or near moving parts. When driving in reverse, do not wrap your hand around the ROPS.

Loading Docks and Elevated Platforms

When operating on loading docks or elevated driving platforms, drivers must stay clear of edges and be careful of the rear swing of the vehicle when turning. The width of one tire on the forklift is the minimum distance allowed from the edge while the forklift is on any elevated dock, platform, freight car, or truck.



Before driving on an incline, make sure the driving surface is free from slippery substances like grease, sand, and gravel.

Inclines

Driving on an incline can be especially dangerous as the incline itself shifts the CCG, affecting the forklift's stability.

When traveling on an incline:

- Refrain from turning.
- Stay clear of edges.
- Slow down.
- Avoid grades that exceed the manufacturer's recommendations (located in the operator's manual).

When traveling on an incline without a load:

- Keep the forks on the downhill side of the vehicle.
- When traveling downhill, drive forward (Figure 5.1).
- When traveling uphill, drive in reverse and look in the direction of travel (Figure 5.2).

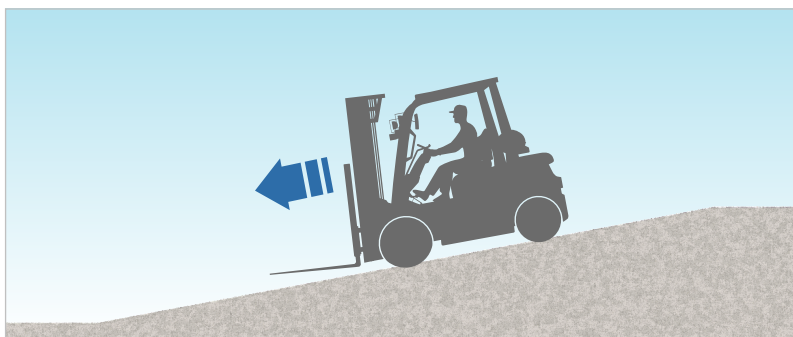


Figure 5.1. When traveling downhill without a load, drive forward.

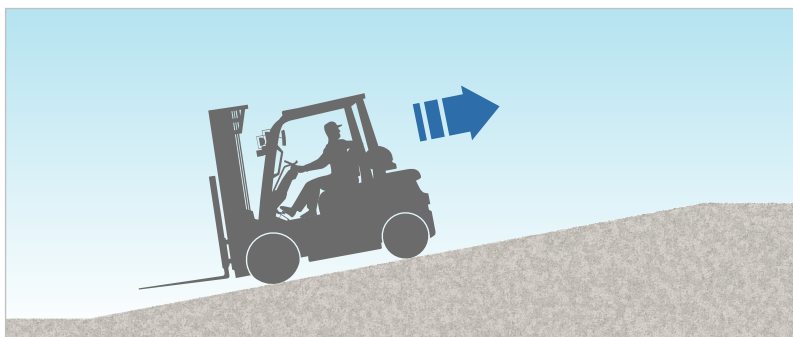


Figure 5.2. When traveling uphill without a load, drive in reverse and look in the direction of travel.

When traveling on an incline with a load:

- Keep the load on the uphill side of the vehicle.
- When traveling uphill, drive forward and use a spotter if the view is obstructed (Figure 5.3).
- When traveling downhill, drive in reverse and look in the direction of travel (Figure 5.4).
- Tilt the load back and raise the carriage only as much as is necessary to clear the grade.

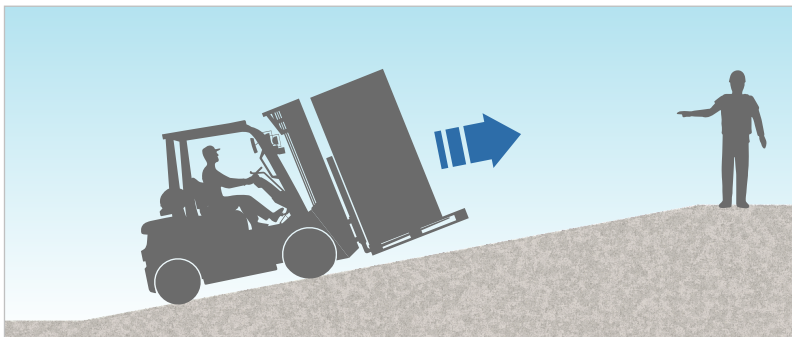


Figure 5.3. When traveling uphill with a load, drive forward and use a spotter if the view is obstructed.



Figure 5.4. When traveling downhill with a load, drive in reverse and look in the direction of travel.

When operating a motorized or hand pallet jack, forks are pointed downgrade.

Parking

A forklift parked in the wrong place could be hit by a person or another object. A forklift parked incorrectly could move unintentionally. To avoid serious bodily injury and property damage:

- Park only in designated areas and away from heat sources.
- Do not park closer than 8½ ft. from the centerline of railroad tracks.

Do not block:

- Electrical controls
- Exits (Figure 5.5)
- Fire lanes (Figure 5.6)
- Fire extinguishers or other emergency equipment



Figure 5.5. Exit.

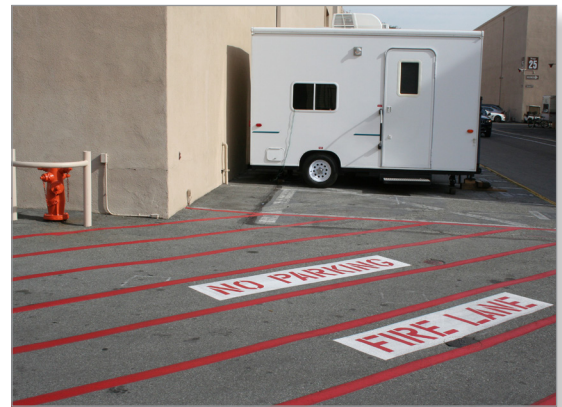


Figure 5.6 Fire lane.

g

attended.

The operator is within 25 ft. of the forklift, which remains in view.

unattended.

The operator is over 25 ft. from, or out of sight of, the forklift.

Additionally, parking rules differ depending on whether the forklift is attended or unattended. Park an **attended** vehicle with the forks, or other attachment, fully lowered, the directional control set to neutral, and the parking brake set to prevent unintended movement. When leaving a forklift **unattended**, park the vehicle with the mast in a vertical position, the forks, or other attachment, fully lowered, the parking brake set, the engine turned off, and the key removed from the ignition. If on a level surface, the engine can remain on providing the front and back wheels are blocked. However, if a forklift is left on an incline, operators must turn off the engine and block the wheels.

Load Handling

Load handling refers to how a load is secured, lifted, moved, and placed. Poor load handling can result in a tip-over, a collision, or a falling load. To avoid these hazards, forklift operators must follow load handling rules and best practices.

General Safety

- A forklift must not be loaded in excess of its rated capacity.
- A loaded forklift must not be moved until the load is safe and secure.
- There must be sufficient overhead clearance.
- The forks must be placed under the load as far as possible. (The forks must be at least $\frac{2}{3}$ the length of the load.)
- The mast must be tilted back to increase load stability.
- When stacking loads on top of one another or on shelving, use backward tilt only enough to stabilize the load.
- Do not use forward tilt when the forks, or other attachment, is elevated, except when picking up or placing a load.

Never adjust the load while traveling.

Load Configuration

Proper load configuration helps to maintain vehicle stability and stay within capacity by keeping the load's center of gravity as close to the mast as possible and positioned between the forks. Because loads come in all shapes and sizes, forklift operators must position each load based on its weight distribution and shape, as well as the weight distribution and shape of individual items in a multi-item load (Figure 5.7).

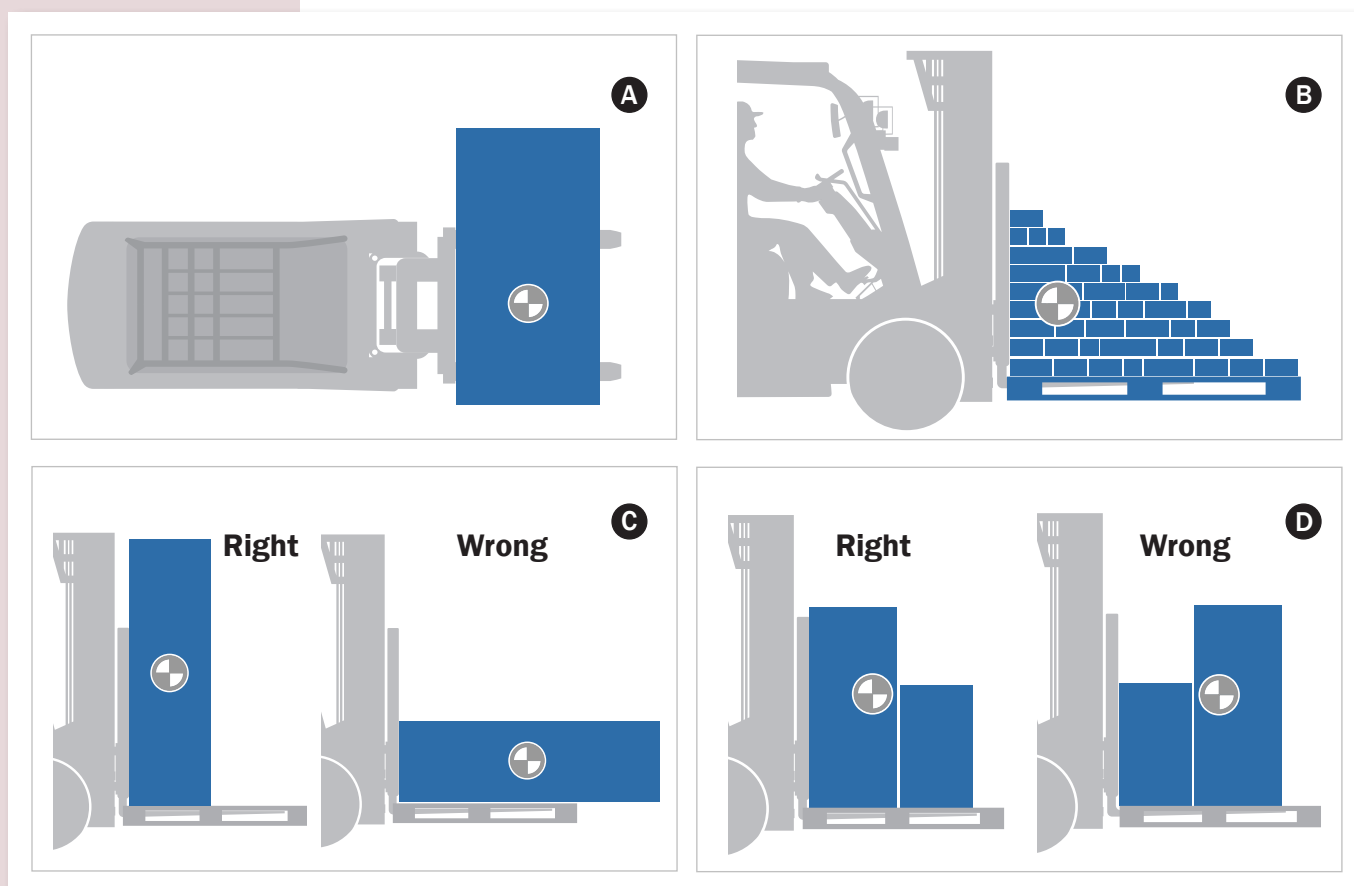


Figure 5.7. Place (A) the CG in the middle of the forks, (B) the heaviest part of the load closest to the mast, (C) the longest side of the load against the mast, and (D) the heaviest item closest to the mast.

Non-Standard Loads

In the motion picture and television industry, standard-sized pallet loads may not be the norm. Rather, operators may be moving set walls, decorations, cars, props, or other uncrated items (Figure 5.8).

When lifting and moving non-standard material, pay attention to:

- Load configuration: Position the load's CG between the forks and as close to the mast as possible.
- Load dimensions: Check vertical and lateral clearance along the route.
- Load stability: Secure the load so that it cannot be knocked off the forks.



Figure 5.8. A non-standard load.

Lifting and Lowering Guidelines

Following the proper guidelines for lifting and lowering loads will help prevent hazards such as collisions, falling loads, and tip-overs.

General Safety

- Do not lift or lower the forks unless the forklift is in neutral and the parking brake is set.
- Look in the direction of travel when backing up.
- Carry a load only as high as needed for safe travel.

The following guidelines may vary based on load weight, size, or the attachment being used. Also, the employer may have specific policies to follow.

Lifting a Load From the Ground

1. Approach the load slowly and carefully.
2. Square the forklift to the load.
3. Adjust the width of the forks to fit the load.
4. Level the forks (Figure 5.9).
5. Drive the forks fully under the load. (Be careful that the forks do not go through a wall or another load.)
6. Lift the load only as much as needed for safe travel.
7. Tilt the mast back to stabilize the load.



Figure 5.9. Mast is level when approaching a load to lift.

Lowering a Load to the Ground

1. Square the forklift to the placement area.
2. Inch forward slowly and carefully.
3. Level the mast.
4. Lower the forks until the load is on the ground.
5. Continue to lower the forks until the load is disengaged.
6. Back out slowly, looking in the direction of travel.
7. Raise the forks only enough as needed for safe travel.

Lifting a Load From a Stack

1. Square the forklift to the stack.
2. Lift the forks to be level with the pallet (Figure 5.10).
3. Inch forward slowly and carefully.
4. Drive the forks fully under the load.
5. Lift the load off the stack.
6. Slowly back away from the stack, looking in the direction of travel.
7. Lower the load to a few inches off the ground, or enough for safe travel.
8. Tilt the mast back for stability.

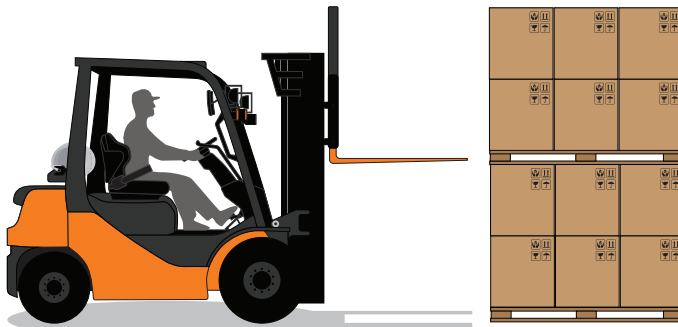


Figure 5.10. Lift the forks until they are level with the pallet.

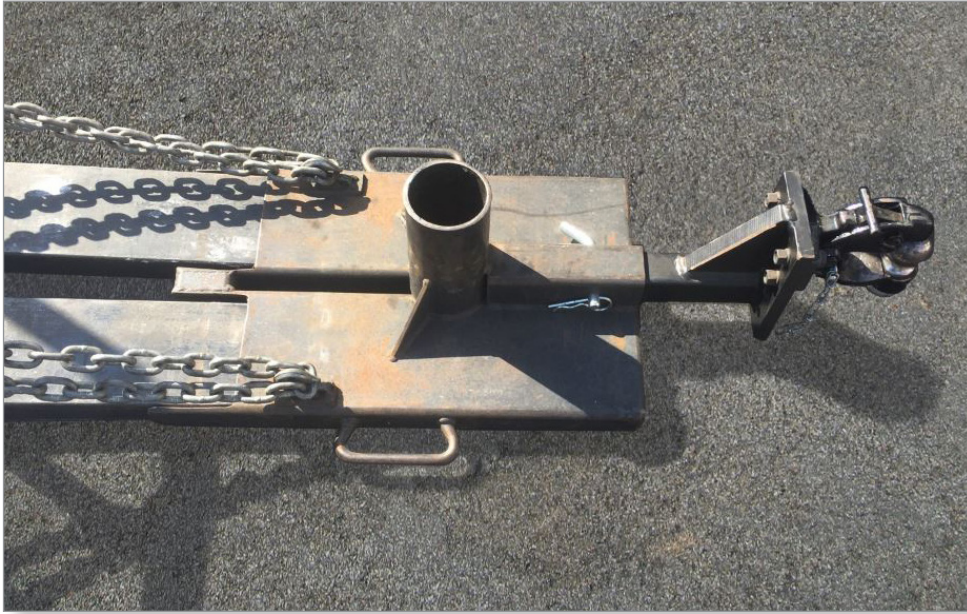
Lowering a Load Onto a Stack

1. Square the forklift to the stack.
2. Level the mast.
3. Raise the load to a height a few inches above where it will be placed.
4. Inch forward slowly until the load is in position.
5. Lower the forks until the load is disengaged.
6. Slowly back away from the stack, looking in the direction of travel.



End-of-Shift Procedure

1. Park in a safe and designated space.
2. Put the mast in a vertical position.
3. Lower the forks to the ground.
4. Place controls in neutral and set the parking brake.
5. Turn off the engine and lights.
6. Remove the key.
7. Exit facing in, maintaining three points of contact with the forklift.
8. Block the wheels if on an incline.
9. Shut off the propane tank.



Scene 6

Attachments

Forklifts are able to handle tasks beyond lifting loads on forks. Attachments are available that allow the forklift to tow other vehicles, lift personnel, act as a hoist, and more. Some attachments have fork pockets that standard forks slide through, while others replace the forks and carriage altogether. In the motion picture industry, the most commonly used attachments will have fork pockets.

In this scene we'll talk about general safety considerations and recommended practices for attachments.

General Usage

It is recommended that front-end attachments be factory installed. If they are not, the forklift must:

- be marked to identify the type of attachment;
- show the weight of the forklift and attachment combination; and
- show the capacity of the forklift and attachment combination at maximum mast height.

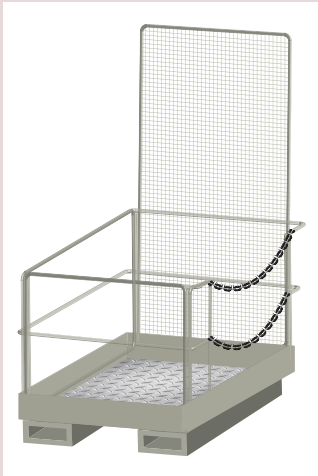


Figure 6.1.
California compliant
personnel platform.

Capacity and Stability

Operators must be trained on how to use each individual attachment, as forklift performance will be altered. The weight and type of attachment can move the CCG closer to the front of the forklift and higher off the ground than standard forks. The reduction in capacity and stability requires heightened attention to speed, cornering, stopping, inclines, and clearance. Even if there is no load, a forklift with an attachment must be operated as partially loaded.

Pre-Operation Inspection

The attachment should be inspected along with the vehicle during the regular walk-around inspection. Check that the attachment is secured so that it cannot be inadvertently dislodged and that the data plate, capacity charts, and decals have been updated accordingly.

Elevating Workers

A personnel platform (Figure 6.1) can be used to lift workers if a scissor lift or boom lift is not available, and if the operator's manual does not prohibit it.

When using this type of attachment, the forklift operator's first priority is to keep the employee being lifted safe. The operator must:

- Use a securely attached platform.
- Make sure that the mast is vertical—do not tilt the mast.
- Set the parking brake and shift into neutral.
- Lift and lower personnel smoothly and with caution.
- Stay seated at the controls while personnel are on the platform.
- Never travel with personnel on the platform other than to make minor movements for final positioning.

Towing

A commonly used attachment in the motion picture and television industry is the hitch-type attachment (Figure 6.2), used to move small trailers or generators into place. These towing attachments require the driver to drive in reverse (looking in the direction of travel). Check the operator's manual for towing instructions specific to the make and model being used.

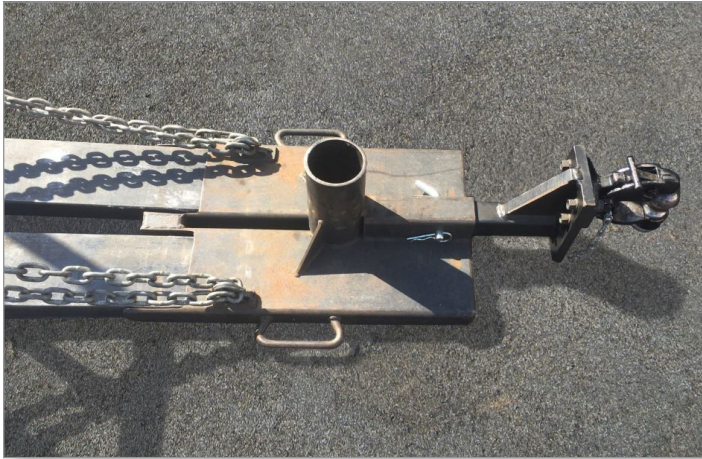


Figure 6.2. A ball hitch attachment slides onto the forks.

Modifications

Modifications and structural changes to attachments that affect capacity and safe handling are prohibited unless:

- approved in writing by the manufacturer; or
- designed, manufactured, and installed in accordance with recognized engineering and manufacturing principles.

All data plates, including capacity, operation, and maintenance instructions, shall be changed accordingly.



Notes



Scene 7

Refueling and Recharging

All seven classes of forklifts are powered by electric or internal combustion engines. Those powered by internal combustion engines run on fuels such as gasoline, diesel, and liquid petroleum gas (also known as LPG or propane). Depending on employer policy, forklift operators may be allowed to change propane tanks and refuel forklifts that use gasoline and diesel fuel. However, only qualified and authorized persons may refill propane tanks and change and charge batteries.

This scene reviews the hazards inherent in refueling and recharging forklifts and how to safely mitigate these risks through caution, attention, and planning. Contact your safety representative for specifics on the procedures you are allowed to perform.



Refueling with Gas or Diesel

When refueling forklifts that are powered by gasoline or diesel fuel, explosive vapors are the main hazard. Take the following precautions:

- Turn off the engine before refueling.
- Refuel in designated safe locations (with proper ventilation and away from heat sources and people).
- Do not allow the forklift to become low on fuel or run out of fuel.
- Do not fill the tank to the top.
- Do not smoke (including e-cigarettes).

Changing a Propane Tank

Propane is flammable and its vapor is heavy. If not adequately dissipated, it will collect in low-lying areas (pockets, pant cuffs) and possibly ignite when exposed to a heat source. It is also extremely cold. If propane comes in contact with skin, frostbite can result.

When changing a propane tank, operators must follow these safety practices:

- Wear the required personal protective equipment (PPE): safety goggles and insulated gloves made of leather or neoprene.
- Change cylinders in a well-ventilated area, away from sources of ignition.
- Do not drop, drag, or roll containers.
- Close the tank valve.
- Run the engine until it stops to ensure that the fuel line is empty.
- Carefully disconnect the fuel line and holding straps.
- Remove the empty cylinder and inspect it for damage.
- Inspect the replacement cylinder for damage. Remove any damaged cylinder from service.
- Replace with full cylinder, positioned properly so that the pressure relief valve is at the top of the tank and the positioning pin is in the positioning hole (Figure 7.1).
- Open the valve $\frac{3}{4}$ to $1\frac{1}{2}$ turns.



Figure 7.1. Positioning pin in positioning hole.

Recharging Batteries

Trained personnel are the only people allowed to charge and change batteries. However, all forklift operators should be aware of the safety practices required when changing and charging batteries:

- Recharge in designated safe locations.
- Take precautions to prevent flames, sparks, or electric arcs.
- Keep tools and other metallic objects away from uncovered batteries.
- Know where the emergency equipment (eye-washing station, neutralizing material) is located.



Notes



Appendix A

References and Resources

Related Industry Safety Bulletins

CSATF Safety Bulletins can be found online at: <https://www.csatf.org/bulletintro.shtml>

[Safety Bulletin #22A](#), *Power Line Distance Requirements*

Cal/OSHA Regulations (CCR Title 8)

For up to date Cal/OSHA standards use search term: **Title 8 Index – State of California**

Industrial Trucks, Tractors, Haulage Vehicles, and Earthmoving Equipment, CCR Title 8, §3649-3669.

Federal OSHA Regulations (CFR Title 29)

For up to date Federal OSHA standards use search term: **Regulations (Standards – 29 CFR) Occupational Safety**

Materials Handling and Storage, CFR Title 29, §1910.178. Powered industrial trucks.

Standards

Safety Standard for Low Lift and High Lift Trucks, ANSI/ITSDF B56.1-2016



Appendix B

PIT Classifications

Class I: Electric Motor Rider Trucks

- Lift Code 1: Counterbalanced Rider Type, Stand Up
- Lift Code 4: Three Wheel Electric Trucks, Sit Down
- Lift Code 5: Counterbalanced Rider, Cushion Tires, Sit Down
- Lift Code 6: Counterbalanced Rider, Pneumatic or Either Type Tire, Sit Down

Class II: Electric Motor Narrow Aisle Trucks

- Lift Code 1: High Lift Straddle
- Lift Code 2: Order Picker
- Lift Code 3: Reach Type Outrigger
- Lift Code 4: Side Loaders: Platforms
- Lift Code 4: Side Loaders: High Lift Pallet
- Lift Code 4: Turret Trucks
- Lift Code 6: Low Lift Platform
- Lift Code 6: Low Lift Pallet

Class III: Electric Motor Hand Trucks or Hand/Rider Trucks

- Lift Code 1: Low Lift Platform
- Lift Code 2: Low Lift Walkie Pallet
- Lift Code 3: Tractors
- Lift Code 4: Low Lift Walkie/Center Control
- Lift Code 5: Reach Type Outrigger
- Lift Code 6: High Lift Straddle
- Lift Code 6: Single Face Pallet
- Lift Code 6: High Lift Platform
- Lift Code 7: High Lift Counterbalanced
- Lift Code 8: Low Lift Walkie/Rider Pallet and End Control

Class IV: Internal Combustion Engine Forklift Trucks (Solid/Cushion Tires)

Lift Code 3: Fork, Counterbalanced (Cushion Tire)

Class V: Internal Combustion Engine Trucks (Pneumatic Tires)

Lift Code 4: Fork, Counterbalanced (Pneumatic Tire)

Class VI: Electric and Internal Combustion Engine Tractors

Lift Code 1: Sit-Down Rider (Draw Bar Pull Over 999 lbs.)

Class VII: Rough Terrain Forklift Trucks

Vertical mast type forklift trucks

Variable reach type forklift trucks

Truck/trailer mounted forklift trucks

Appendix C

Daily Inspection Checklist

Internal Combustion Engine Industrial Truck - Gas/LPG/Deisel Truck

Record of Fuel Added

Date		Operator		Fuel	
Truck#		Model#		Engine Oil	
Department		Serial#		Radiator Coolant	
Shift		Hour Meter		Hydraulic Oil	

Safety and Operational Checks (Prior to each shift)

Pre-Operation Check (Engine off)	✓	Explain any problems
Leaks - Fuel, Hydraulic Oil, Engine Oil or Radiator Coolant		
Tires - Condition and Pressure		
Forks, Top Clip Retaining Pin and Heel - Check Condition		
Load Backrest - Securely Attached		
Hydraulic Hoses, Mast Chains, Cables and Stops - Check Visually		
Overhead Guard - Attached		
Finger Guards - Attached		
Propane Tank (LP Gas Truck) - Rust Corrosion, Damage		
Safety Warnings - Attached (Refer to Parts Manual for Location)		
Battery - Check Water/Electrolyte Level and Charge		
All Engine Belts - Check Visually		
Hydraulic Fluid Level - Check Level		
Engine Oil Level - Dipstick		
Transmission Fluid Level - Dipstick		
Engine Air Cleaner - Squeeze Rubber Dirt Trap or Check the Restriction Alarm (if equipped)		
Fuel Sedimentor (Diesel)		
Radiator Coolant - Check Level		
Operator's Manual - In Container		
Nameplate - Attached and Information Matches Model, Serial Number and Attachments		
Seat Belt - Functioning Smoothly		
Hood Latch - Adjusted and Securely Fastened		
Brake Fluid - Check Level		
Operational Check (Engine on)	✓	Explain any problems
Accelerator or Direction Control Pedal - Functioning Smoothly		
Service Brake - Functioning Smoothly		
Parking Brake - Functioning Smoothly		
Steering Operation - Functioning Smoothly		
Drive Control - Forward/Reverse - Functioning Smoothly		
Tilt Control - Forward/Reverse - Functioning Smoothly		
Hoist and Lowering Control - Functioning Smoothly		
Attachment Control - Operation		
Horn and Lights - Functioning		
Cab (if equipped) - Heater, Defroster, Wipers - Functioning		
Gauges: Ammeter, Engine Oil Pressure, Hour Meter, Fuel Level, Temperature, Instrument Monitors - Functioning		

Electric Industrial Truck

Record of Fuel Added

Date		Operator		Battery Water	
Truck#		Model#		Hydraulic Oil	
Department		Serial#			
Shift		Drive Hour Meter Reading		Hoist Hour Meter Reading	

Safety and Operational Checks (Prior to each shift)

Pre-Operation Check (Motor off)	✓	Explain any problems
Leaks - Hydraulic Oil, Battery		
Tires - Condition and Pressure		
Forks, Top Clip Retaining Pin and Heel - Condition		
Load Backrest - Securely Attached		
Hydraulic Hoses, Mast Chains, Cables and Stops - Check Visually		
Overhead Guard - Attached		
Finger Guards - Attached		
Propane Tank (LP Gas Truck) - Rust Corrosion, Damage		
Safety Warnings - Attached (Refer to Parts Manual for Location)		
Battery - Water/Electrolyte Level and Charge		
All Engine Belts - Check Visually		
Hydraulic Fluid Level - Dipstick		
Transmission Fluid Level - Dipstick		
Operator's Manual - In Container		
Capacity Plate Attached - Information Matches Model, Serial Number and Attachments		
Battery Restraint System - Adjust and fasten		
Operator Protection		
Sit-down Truck - Seat Belt - Functioning Smoothly		
Man-up Truck - Fall protection/Restraining means - Functioning		
Brake Fluid - Check Level		

Operational Check (Motor on)	✓	Explain any problems
Accelerator Linkage - Functioning Smoothly		
Parking Brake - Functioning Smoothly		
Service Brake - Functioning Smoothly		
Steering Operation - Functioning Smoothly		
Drive Control - Forward/Reverse - Functioning Smoothly		
Tilt Control - Forward/Reverse - Functioning Smoothly		
Hoist and Lowering Control - Functioning Smoothly		
Attachment Control - Operation		
Horn - Functioning		
Lights & Alarms (where present) - Functioning		
Hour Meter - Functioning		
Battery Discharge Indicator - Functioning		
Instrument Monitors - Functioning		

Appendix D

Operating Rules for Industrial Trucks

General Industry Safety Order

§3650. Industrial Trucks. General.

(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 by the operator if the forks are raised no more than 42 inches above the same level on which the industrial truck is located, the power is shut off, controls placed in neutral and the brakes set. If on an incline, the wheels shall be securely blocked. Whenever the forks are raised, the operator will remain in the seat of the industrial truck except when the operator is actively loading or unloading materials.
- (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 stop signs, blue flags or blue lights displayed in accordance with Section 3333 of these Orders and Title 49, Code of Federal Regulations, Section 218.27 which is hereby incorporated by reference.
- (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 8½ 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.

(Continued)



- (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.
- (33) When provided by the industrial truck manufacturer, an operator restraint system such as a seat belt shall be used.

Glossary

adjusted capacity. The maximum weight a vehicle can safely carry at the load's load center and intended placement position (height/distance).

attachment. Any job-specific tool that is affixed to the front carriage of a forklift or to the forks themselves.

capacity. The capacity of a truck equipped with load carriage and forks, or with attachments, is the weight at a specific load center that a given truck can transport in a carry position and stack to the specified elevation of the load-engaging means.

center of gravity (CG). The point of an object where weight is evenly distributed on all sides and from where a single applied force could support it.

combined center of gravity (CCG). The center of gravity of a loaded forklift.

counterweight. The weight that is built into the truck's basic structure and is used to offset the load's weight and to maximize the vehicle's resistance to tipping over.

dynamic stability. The idea that 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 height. The height to the top of the mast or load guard when mast is fully extended.

fulcrum. The pivot point on which a lever rests or is supported.

lateral stability. A truck's resistance to overturning sideways.

lift height. The height to which the top of the fork is raised when the mast is fully extended.

line of action. The imaginary, vertical line that runs through an object's center of gravity.

load center. The distance from the face of the forks to the line of action.

load-engaging means. The general term for any device attached to the forklift's carriage or mast that carries or pulls the load.

longitudinal stability. The truck's resistance to tipping forward or backward.

minimum safe approach distance. The closest distance a worker is permitted to approach live electrical lines, equipment, or components.

powered industrial truck (PIT). A mobile, power-propelled truck used to carry, push, pull, lift, stack, or tier material.

pneumatic tire. A tire made of reinforced rubber and filled with compressed air. Designed for use on improved surfaces, and may be used outdoors or indoors.

rated capacity. The weight established by the manufacturer at a required load center that a given PIT can transport and stack to a height established by the manufacturer.

rollover protective structure (ROPS). A structure designed to protect vehicle operators from injuries caused by vehicle overturns.



solid / cushion tire. A tire made of smooth, solid rubber and fitted around a metal band. Designed for use indoors on smooth, dry surfaces.

stability triangle. The area formed by the three points of the suspension system (the pivot point of the rear axle and the front tires) where the center of gravity (CG) or combined center of gravity (CCG) can move about without causing a tip-over.

stability pyramid. The area formed by the stability triangle and the highest point of the forklift or load.

static stability. The stability of a truck when not in motion.



Industry Safety Resources

Safety Bulletins

Safety Bulletins are researched, written, and distributed by the Industry Wide Labor-Management Safety Committee for use by the motion picture and television industry. The Industry Wide Labor-Management Safety Committee is composed of Guild, Union, and Management representatives active in industry safety and health programs.

These Safety Bulletins are guidelines recommended by the Safety Committee. They are not binding laws or regulations. State, federal, and/or local regulations, where applicable, override these guidelines. Modifications in these guidelines should be made, as circumstances warrant, to ensure the safety of the cast and crew.

The Committee and these Safety Bulletins are representative of the commitment of both Labor and Management to safe practices in the motion picture and television industry. The members of the Committee and all those who contributed to its work have devoted a great deal of time and effort to these guidelines because of the importance of safety to our industry.

Current safety bulletins are available on the CSATF website:

<http://www.csatf.org/bulletintro.shtml>

24-Hour Industry Safety Hotline

The 24-hour industry safety hotline number directs callers to an automated system that will assist them in reaching the desired Studio Safety Hotline.

888-7-SAFELY

A list of the Studio Safety Hotlines can also be found on the CSATF website:

http://www.csatf.org/studio_safety_hotlines.pdf

**Safety is everyone's
responsibility.**

