

TDI

Safety @ Work
Division of Workers' Compensation

Powered Industrial Trucks (Forklifts)



**Workplace
Program**

Texas Department of Insurance, Division of Workers' Compensation
www.txsafetyatwork.com
HS02-004C (07-24)



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INTRODUCTION



Forklifts and other powered industrial trucks are essential tools in many workplaces but come with significant risks. According to the [National Safety Council](#), forklifts were the source of 73 work-related deaths in 2022 and 15,480 injuries that required time away from work.

The [Occupational Safety and Health Administration](#) (OSHA) has categorized powered industrial trucks into seven classes:

Class 1



Electric motor rider trucks:

These are forklifts powered by electric batteries. The operator sits or stands on the truck to drive it. They are used mostly indoors on smooth floors in warehouses and factories. They produce no emissions, making them great for indoor use.

- **Height (Mast Lowered):** 85-90 inches.
- **Maximum Lift Height:** 125-130 inches.
- **Length (Standard Forks):** 120-125 inches.
- **Weight Capacity:** 3,000-6,500 lbs.
- **Turning Radius:** 60-80 inches.

Class 2



Electric motor narrow aisle trucks:

These electric trucks are designed to work in tight spaces. They can operate in very narrow aisles, usually less than 10 feet wide. They are perfect for warehouses that need to maximize storage space.

- **Height (Mast Lowered):** 90-95 inches.
- **Maximum Lift Height:** 200-210 inches.
- **Length (Standard Forks):** 40-45 inches.
- **Weight Capacity:** 3,000-4,500 lbs.
- **Turning Radius:** 70-75 inches.

Class 3



Electric motor hand trucks or hand/rider trucks:

These are smaller electric trucks that an operator can walk behind or ride on. They are used for moving pallets over short distances. You will often see them in retail stores, warehouses, and loading docks.

- **Height (Extended Handle):** 45-50 inches.
- **Width:** 25-30 inches.
- **Length:** 50-80 inches.
- **Turning Radius:** 45-55 inches.

Class 4



Internal combustion engine trucks (solid/cushion tires):

These forklifts have engines that run on gas, propane, or diesel. They use solid rubber tires, which work best on smooth, indoor surfaces. They can lift heavier loads than most electric trucks.

- **Height (Mast Lowered):** 110-115 inches.
- **Maximum Lift Height:** 100-105 inches.
- **Width:** 65-70 inches.
- **Length (Standard Forks):** 200-215 inches.
- **Weight Capacity:** 50,000-100,000 lbs.
- **Turning Radius:** 135-145 inches.

Class 5



Internal combustion engine trucks (pneumatic tires):

Similar to Class IV, but with air-filled tires, these trucks can be used both indoors and outdoors. The pneumatic tires help them handle rougher surfaces like gravel or uneven pavement.

- **Height (Mast Lowered):** 80-100 inches.
- **Maximum Lift Height:** 225-525 inches.
- **Width:** 70-100 inches.
- **Length (Standard Forks):** 185-285 inches.
- **Weight Capacity:** 50,000-100,000 lbs.
- **Turning Radius:** 130-220 inches.

Class 6



Electric and internal combustion engine tractors (tuggers):

These are designed for pulling rather than lifting. They are often used in airports or factories to tow heavy loads or multiple trailers. They can be powered by either electric batteries or combustion engines.

- **Height (Mast Lowered):** 50-55 inches.
- **Width:** 30-40 inches.
- **Length:** 60-75 inches.
- **Weight Capacity:** 8,800-13,200 lbs.
- **Turning Radius:** 45-70 inches.

Class 7



Rough terrain forklift trucks:

These are heavy-duty forklifts built for outdoor use on uneven or muddy ground. They usually have large, rugged tires and powerful engines. You will see them at construction sites, lumber yards, or other outdoor workplaces.

- **Height (Mast Lowered):** 90-100 inches.
- **Maximum Lift Height:** 170-180 inches.
- **Width:** 85-90 inches.
- **Length (Standard Forks):** 180-185 inches.
- **Weight Capacity:** 6,000-8,000 lbs.
- **Turning Radius:** 150-180 inches.

For simplicity, this Workplace Program uses the term "forklift" to refer to all seven classes of powered industrial trucks. We will cover the OSHA standards and practical safety tips to ensure the safe operations, design, and maintenance of these trucks.

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OSHA Standards for Forklifts



OSHA 29 CFR 1910.178

Operator Training and Certification

- Employers must provide training before or at the time of an employee's initial assignment to using a forklift.
- Only trained and certified workers may operate a forklift.
- Employers must ensure that each operator is competent, as demonstrated by the successful completion of training and evaluation.
- Training must be specific to the types of trucks used in the workplace.
- Refresher training is required:
 - Every three years at a minimum.
 - When unsafe operation is observed.
 - After a near-miss or accident.
 - When evaluation reveals unsafe operation.

- When assigned to a new type of truck.
- When site conditions change.

Equipment Requirements

- All new forklifts must meet the design and construction requirements established in the [American National Standard for Powered Industrial Trucks](#).
- Trucks must have a label indicating approval by a testing laboratory.
- Modifications affecting capacity and safe operation require manufacturer approval.

Safety Measures

- Unauthorized personnel are not permitted to ride on forklifts.
- Forklifts must not be operated if they are found to be in an unsafe condition.

General Safety Tips

Before Operation

- **Inspect equipment daily:**
Check brakes, lights, horn, steering, mast, overhead guard, tires, and fluid levels before each shift.
- **Wear proper clothing:**
Ensure operators wear appropriate clothing, including safety shoes and a hard hat.
- **Load limit:**
Ensure the load is within the forklift's rated capacity.

During Operation

- **Seatbelt use:**
Always wear a seatbelt when operating a sit-down rider forklift.

- **No horseplay:**
Avoid any form of horseplay or misuse of the forklift.
- **Sound the horn:**
Use the horn at blind intersections and corners to alert others.
- **Maintain visibility:**
Keep forks low to the ground for clear visibility, and use rear-view mirrors and headlights as needed.
- **Observe speed limits:**
Always follow the speed limits and be cautious in congested areas.
- **No riders:**
Do not allow passengers unless the forklift is designed for multiple riders
- **Load handling:**
Do not raise or lower loads while traveling. Ensure loads are stable and within the forklift's capacity.

Load Placement and Forklift Capacities

A forklift can lift less weight as the lifting height increases and the farther the load is from the center of its rated position.



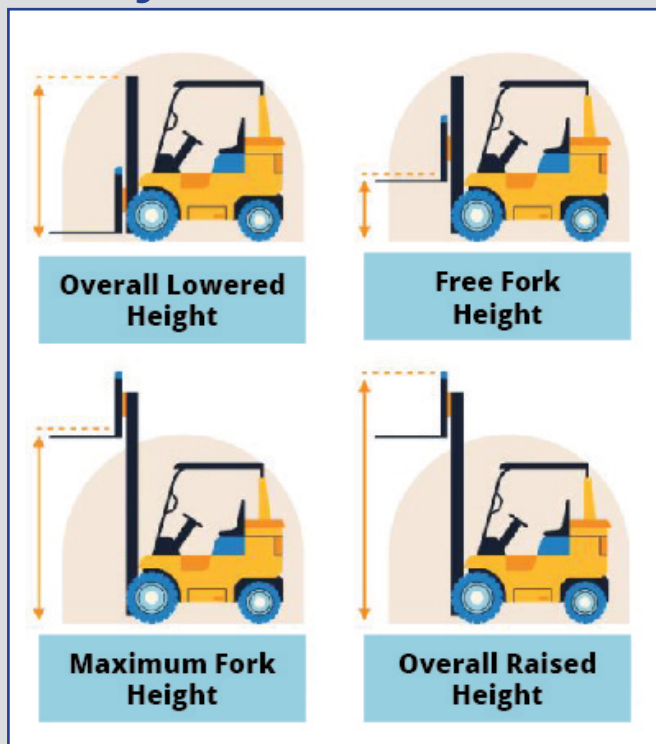
Note: Illustration above based on a standard 5,000 lb. forklift with a rated load center of 24 inches.

- **Stay inside the forklift.**
Keep arms, legs, head, and feet inside the forklift when driving.
- **Keep the forks low.**
Never drive with the forks up.
- **Avoid using forklifts to push machinery.**
Never use the forklift to push other vehicles.
- **Avoid wet surfaces.**
Slow down on wet or slippery surfaces
- **Use caution when driving on an incline:**
When driving on an incline:
 - Travel with the load pointing uphill.
 - Travel with no load with the forks pointing downhill.
 - Cross railroad tracks diagonally.
 - Use wall and ceiling mirrors to help see around corners.

Load Handling

- Ensure loads are stable and within the forklift's capacity.
- Spread the forks as wide as possible for even distribution and load stability.
- Approach the load squarely, inserting the forks fully.
- Tilt the forks back to shift the weight and increase stability.
- Keep the load low while traveling.
- Use a spotter if visibility is limited.

Forklift Dimensions to Know



Overall Lowered Height:

This is the height of the forklift with the forks lowered. Knowing this number is important for driving around the warehouse, stowing lifts, or driving onto trailers. Sometimes ceiling fixtures like lights or sprinklers can be lower than you think.

Overall Raised Height:

This is the measurement from the floor to the top of the mast when it's fully extended. Again, this measurement is important to know to avoid crashing into ceiling fixtures.

Free Fork Height:

This is the distance between the floor and the forks at their top height before the mast starts to extend. This measurement is important to know when space is limited, like when transporting pallets from the ground when there is overhead storage.

Maximum Fork Height:

This is the measurement from the floor to the forks at their highest position. Knowing this distance is important to make sure the forklift has the necessary reach to lift loads stored on higher racks. Remember, this distance needs to be at least eight inches higher than your highest load to account for lifting space.

Using the Correct Forklift

(See Appendix G or OSHA's *Forklift eTool* for types of forklifts under each class.)

Type	Recommended Aisle Size
Sit Down (Counterbalanced)/(Class 4 or 5)	10-12 feet
Stand-Up (Single Reach)/(Class 2)	8-9 feet
Stand-Up (Deep Reach)/(Class 2)	9-10 feet
Turret Truck/(Class 2)	4-6 feet
Narrow Aisle/(Class 2)	4-5 feet

If you need a more precise measurement, calculate the minimum aisle width requirement for a forklift using the following steps:

1. Take the right angle stacking width (the minimum space it takes for a forklift to make a 90-degree turn as listed in the manufacturer's specifications).
2. Add the load length.
3. Add 12 inches of clearance.

After Operation

- Lower the forks to the ground.
- Neutralize controls.
- Set brakes and shut off power.
- Remove the key.
- Block wheels if parked on an incline.

Working in Hazardous Environments

- Monitor carbon monoxide levels in enclosed areas.
- Provide adequate lighting and ventilation.

- Use appropriate forklifts for hazardous locations.
- Take precautions when handling hazardous materials.

Refueling and Recharging

- **Designated areas:**
Set up specific spots for battery charging and refueling.
- **Spill management:**
Have facilities ready to clean and neutralize any spilled electrolyte.
- **Safety measures:**
Ensure proper fire protection, good ventilation to disperse fumes, and protection for charging equipment from damage by trucks.
- **Handling equipment:**
Use a conveyor, overhead hoist, or similar equipment to handle batteries. Provide a carboy tilter or siphon for handling electrolytes.
- **Battery positioning:**
Make sure reinstalled batteries are properly positioned and secured in the truck. Position trucks correctly and apply the brake before changing or charging batteries.

When Charging Batteries

- **Open covers:**
Always open the battery compartment covers to let out heat and gases.
- **Mixing acid and water:**
Always pour acid into water, not the other way around.

- **Tool safety:**
Keep tools and metallic objects away from uncovered batteries.
- **Vent caps:**
Ensure vent caps are functioning properly.
- **No smoking:**
Do not allow smoking in charging and refueling areas. Post "No Smoking" signs and take precautions to prevent open flames, sparks, or electric arcs in these areas.

Working with Trailers and Vehicles

- Set vehicle brakes and chock wheels.
- Use fixed jacks to support semi-trailers not coupled to a tractor.
- Check floor strength and entrance clearance.
- Inspect vehicle interior for hazards.
- Use dock plates and ensure they are clear of obstructions.

Pedestrian Safety

- Give pedestrians the right of way.
- Do not allow anyone to walk or stand under raised forks.
- Maintain clear visibility to avoid obstacles and pedestrians.
- Use the horn, mirrors, and lights to alert others.
- Make eye contact with pedestrians when possible.

Maintenance and Inspection

- Remove unsafe forklifts from service immediately.
- Keep forklifts clean and free of excess oil and grease.
- Use only manufacturer-approved replacement parts.



- Do not alter forklifts without manufacturer approval.
- Conduct thorough inspections before each shift.

(See Appendix F and DWC's [Powered Industrial Truck Inspection Checklists](#) for more information on lift and stand-up/stand-on truck maintenance and inspections.)

Safety Tips for Loading & Unloading

Loading

- Fasten your seat belt.
- Ensure the load is within the forklift's rated capacity.
- Use the proper lift fixture for the type of load.
- Make sure the load is stable and centered; stack or tie uneven or loose loads.
- Spread the forks as wide as possible for even distribution and load stability.
- Approach the load squarely, positioning and inserting the forks far enough to ensure the pallet is completely on the forks.
- Tilt the forks back to shift the weight of the load and make it more stable.

Carrying the Load

- Keep the forks 6 to 10 inches above the ground to avoid potential hazards.
- Travel in reverse if the load blocks your vision.
- Always look in the direction of travel.
- Keep your arms and legs inside the forklift.
- Do not raise or lower the load while moving.

- Use a spotter if you don't have a clear view.

Unloading

- Turn the forklift slowly into position, squaring it up to the drop-off location.
- If unloading onto a stack, check for overhead clearance before raising the load.
- Raise and position the load to the correct height, then lower it slowly.
- Tilt the load forward, then lower it.
- Level the forks so they are no longer tilted and pull the forks back slowly.

Conclusion

By following these OSHA standards and other safety tips, you can create a safer workplace for everyone involved in forklift operations.

The following appendices provide more tips on forklift training, proper equipment maintenance, and safety rules, which are key to preventing accidents and injuries. A forklift inspection checklist is available in Appendix F of this publication and more are available by downloading DWC's [Powered Industrial Truck Inspection Checklists](#) publication.

For more occupational safety and health resources, training programs, and consultation services, visit www.txsafetyatwork.com, call 800-252-7031,

APPENDIX A:

Sample Training Quiz

Trainee Name:		Date:
Test Score:	Instructor:	Date Tested:

Circle the letter that best completes the statement.

- Repairs to your forklift should be made:
 - Before you use the forklift for work.
 - Whenever you get a break from the work you are presently doing.
 - When your company has a scheduled maintenance time.
 - By someone who has time to look it over.
- Who can operate forklifts?
 - Supervisors.
 - Trained and certified workers.
 - Friends.
 - Anybody.
- Operators are required to inspect their forklifts:
 - Monthly.
 - Daily.
 - Weekly.
 - Before each shift.
- If your vision is obstructed when traveling with a load:
 - Raise the load so you can see under it.
 - Lower and tilt the load forward so you can see over it.
 - Travel forward.
 - Travel in reverse.
- Who has the right-of-way?
 - Your forklift.
 - Someone else's forklift.
 - Things approaching from the left.
 - Pedestrians.
- Riders are allowed on a forklift:
 - If they are strapped in.
 - On the forks, within a safety platform.
 - Never.
 - Towed behind the unit.
- During the pre-operational inspection, you should check the:
 - Hydraulic system.
 - Brakes.
 - Tires.
 - All of the above.
- When traveling down a ramp:
 - Avoid this, if possible.
 - Travel with the load upgrade.
 - Forward.
 - Only without loads.
- How far should forks enter the pallet?
 - Half way.
 - Three quarters.
 - One fourth.
 - All the way.

- 10.** It is permissible to push one forklift with another forklift:
- a. If it is broken down.
 - b. If it is in your way.
 - c. If the forklift truck in front is driving too slowly.
 - d. Never.
- 11.** The maximum allowable load should be clearly marked on the nameplate of the forklift truck.
- a. True.
 - b. False.
- 12.** It is permissible to overload the truck by 25% if additional counterweights are used.
- a. True.
 - b. False.
- 13.** It is good practice to keep the load back against the truck mast as much as possible.
- a. True.
 - b. False.
- 14.** Maintenance personnel may be lifted on the forks to reach their work.
- a. True.
 - b. False.
- 15.** Smoking is permissible in refueling and recharging areas provided you see no leaking fuel.
- a. True.
 - b. False.
- 16.** Parking trucks is ok for a few minutes in front of fire extinguishers or exit doors.
- a. True.
 - b. False.
- 17.** It is permissible to let someone else operate your truck if he says he knows how.
- a. True.
 - b. False.
- 18.** When traveling with a load, the mast should be tilted back.
- a. True.
 - b. False.
- 19.** A professional operator checks each load for stability before moving it.
- a. True.
 - b. False.
- 20.** When loading a highway truck or trailer, its wheels should be chocked or blocked even though the driver says he set the brakes.
- a. True.
 - b. False.

Quiz Key

1.a; 2.b; 3.d; 4.d; 5.d; 6.b; 7.d; 8.b; 9.d; 10.d; 11.a; 12.b; 13.a; 14.b; 15.b; 16.b; 17.b; 18.a; 19.a; 20.a

APPENDIX B:

Driving Test Card

Operator's Name: _____

Date: _____

Each operator must be able to thoroughly explain the following:

YES	NO	General Explanation
<input type="checkbox"/>	<input type="checkbox"/>	Truck nameplate and related information.
<input type="checkbox"/>	<input type="checkbox"/>	Load center distance and related load capacity.
<input type="checkbox"/>	<input type="checkbox"/>	Three-point suspension and stability triangle.
<input type="checkbox"/>	<input type="checkbox"/>	Rear wheel steering.
<input type="checkbox"/>	<input type="checkbox"/>	All instruments, controls, and body components.
<input type="checkbox"/>	<input type="checkbox"/>	Pre-operation check.

Under a qualified instructor's supervision, each operator must complete the following, demonstrating smoothness and positive control when operating the truck.

YES	NO	Driving Test:
<input type="checkbox"/>	<input type="checkbox"/>	Adjustment of forks.
<input type="checkbox"/>	<input type="checkbox"/>	Pick up load.
<input type="checkbox"/>	<input type="checkbox"/>	Start and stop with load.
<input type="checkbox"/>	<input type="checkbox"/>	Drive with load straight and around the corner (forward and reverse).
<input type="checkbox"/>	<input type="checkbox"/>	Deposit the load in a designated area.
<input type="checkbox"/>	<input type="checkbox"/>	Stack load in a rack and un-stack.
<input type="checkbox"/>	<input type="checkbox"/>	Double stack a load.
<input type="checkbox"/>	<input type="checkbox"/>	Maneuver Load in a narrow aisle.

APPENDIX C:

Forklift Driver's Obstacle Course

INSTRUCTIONS: This is an example of how a driver's test course may be constructed. The test course shape, length, and difficulty are at the discretion of the trainer. The course should offer real life and site-specific material handling situations. ***The driver's performance will be recorded on the driving test card.***

The following is an explanation of the symbols that are used in the sample test course:



This is a pallet that is turned on its side and is being used as a barrier/ cone.



This is a test load that is on a pallet. This test load will be manipulated by the PIT operator as he or she negotiates the test course.



This is a powered industrial truck that will be operated by the driver.

Suggested obstacle activities

1. At Station #1:
 - a. Perform all "General Explanations" section on the driving test card.
 - b. Board the forklift and start it.
 - c. Proceed, driving forward to Station #2.
2. At Station #2:
 - a. Pick up the test load.
 - b. Proceed, driving forward through the obstacle course.
3. At station #3:
 - a. Place the test load on the stack.
 - b. Proceed driving forward to Station #4
4. At Station #4, park the forklift, but do not turn off the engine.
5. At station #4, put the forklift in reverse and drive in reverse to Station #3.
6. At Station #3:
 - a. Pick up the test load.
 - b. Proceed, driving in reverse, through the obstacle course.
7. At Station #2:
 - a. Place the test load on stack
 - b. Proceed, driving in reverse, to station #1.
8. At Station #1, park the forklift and turn off the engine.

APPENDIX D:

Sample Forklift Driver's Certificate and Driver's Card

Certified Forklift Driver

This is to certify that

has successfully completed
Forklift Driver Training.



Company Name: _____

Trucks Authorized to Operate: _____

Certifying Agent's Signature

Date Issued: _____

Date Expires: _____

Forklift Driver's Card

Operator's Name: _____

Company Name: _____

Date issued: _____ Date Expires: _____

Trucks Authorized to Operate: _____

Certifying Agent's Signature: _____

APPENDIX E:

Clarification on Seatbelts

Standard Number: [1910.178](#)

October 9, 1996

MEMORANDUM TO:	Regional Administrators
FROM:	John B. Miles, Jr. Directorate of Compliance Programs
SUBJECT:	Enforcement of the Use of Seat Belts on Powered Industrial Trucks in General Industry

It has come to my attention that clarification is needed to ensure that a uniform approach is taken by all OSHA offices with respect to the enforcement of the use of seat belts on powered industrial trucks in general industry.

American National Standards Institute (ANSI) B56.1-1969 Safety Standard for Powered Industrial Trucks, was adopted by OSHA under the procedures described in Section 6(a) of the Occupational Safety and Health Act (OSH Act). ANSI B56.1-1969 does not have provisions for the use of seat belts. Therefore, 29 CFR 1910.178 does not contain requirements for the use of seat belts. However, Section 5(a)(1) of the OSH Act requires employers to protect employees from serious and recognized hazards. Recognition of the hazard of powered industrial truck tip-over and the need for the use of an operator restraint system is evidenced by certain requirements in the more current versions of ANSI B56.1 consensus standard for powered industrial trucks; ASME/ANSI B56.1a-1989 Addenda to ASME/ANSI B56.1-1988; and ASME B56.1-1993 Safety Standard for Low Lift and High Lift Trucks. In addition, seat belts have been supplied by many manufacturers of counterbalanced, center control, high lift trucks which have a sit-down non-elevating operator position. Also, some manufacturers have instituted retrofit programs for the installation of operator restraint systems to older powered industrial trucks.

OSHA's enforcement policy relative to the use of seat belts on powered industrial trucks is that employers are obligated to require operators of powered industrial trucks which are equipped with operator restraint devices or seat belts to use the devices. OSHA should enforce the use of such devices under Section 5(a)(1) of the OSH Act.

After consultation with the Regional Solicitor, OSHA may also cite Section 5(a)(1) of the OSH Act, if an employer has not taken advantage of a manufacturer operator restraint system or seat belt retrofit program.

If you have any questions or concerns, please contact [the Office of General Industry Enforcement at (202) 693-1850].

[Corrected 10/22/2007]

APPENDIX F:

Forklift Inspection Checklist

Forklift Inspection Checklist								
Forklift Number:							Week of:	
Inspector's Name:								
Date:								
Shift:								
Day:	SUN	MON	TUE	WED	THU	FRI	SAT	
Proper oil level?								
Proper coolant level?								
Proper hydraulic fluid level?								
Proper battery water level?								
Battery connections clean and tight?								
Fuel system free of visible leaks or odors?								
Fuel level 10% or less? If so, change tank.								
Foot break hold?								
Hand brake hold?								
Fire extinguisher in place and charged?								
Horn and back up alarm works properly?								
Steering works properly?								
Lights work properly?								
Forks raise and lower properly?								
Forks tilt and side-shift properly?								
Lift chains greased and tight?								
Lifting cylinder seals intact?								
Safety hooks, mast, fork locks and forks intact?								
Tires inflated to correct pressure?								
Tires in good condition?								
Nameplate legible?								
Seat belts are in good condition?								
Forklift is free of excess dirt, oil, and grease?								
Comments:								

APPENDIX G:

Forklift Classifications and Lift Codes

OSHA refer to the following Industrial Truck Association's truck classifications for the definition of various types of powered industrial trucks.

CLASS 1 ELECTRIC MOTOR TRUCKS

- **Lift Code 1** – Counterbalanced Rider Type, Stand Up
- **Lift Code 4** – Three Wheel Electric Trucks, Sit-down
- **Lift Code 5** – Counterbalanced Rider Type, Cushion Tire, Sit-down
- **Lift Code 6** – Counterbalanced Rider, Pneumatic Or Either Type Tire, Sit-down

CLASS 2 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, Turret Trucks, Swing Mast, and Convertible Turret/Stock Pickers
- **Lift Code 6** – Low Lift Pallet And Platform (Rider)

CLASS 3 ELECTRIC MOTOR HAND TRUCKS

- **Lift Code 1** – Low Lift Platform
- **Lift Code 2** – Low Lift Walkie Pallet
- **Lift Code 3** – Tractors (Draw Bar, Pull Under 999lb)
- **Lift Code 4** – Low Lift Walkie/Center Control
- **Lift Code 5** – Reach Type Outrigger
- **Lift Code 6** – High lift Straddle
- **Lift Code 7** – High Lift Counterbalanced
- **Lift Code 8** – Low Lift Walkie/Rider Pallet

CLASS 4 INTERNAL COMBUSTION ENGINE TRUCKS-CUSHION TIRES ONLY

- **Lift Code 3** – Fork, Counterbalanced (Cushion Tire)

CLASS 5 INTERNAL COMBUSTION ENGINE TRUCKS-PNEUMATIC TIRES ONLY

- **Lift Code 4** – Fork, Counterbalanced (Pneumatic Tire)

CLASS 6 ELECTRIC AND INTERNAL COMBUSTION ENGINE TRACTORS

- **Lift Code 1** – Sit-down Rider (Draw Bar, Pull Over 999 lbs.)

CLASS 7 ROUGH TERRAIN FORKLIFT TRUCKS

- **Lift Code 1** – All Rough Terrain Forklift Trucks

APPENDIX H:

Designations of Forklifts

For the purpose of this OSHA standard (29 CFR 1910.178) there are eleven different designations of industrial trucks or tractors as follows: **D, DS, DY, E, ES, EE, EX, G, GS, LP, and LPS.**

- **D designated units:**
These are units similar to the G units except that they are diesel engine powered instead of gasoline engine powered.
- **DS designated units:**
These are diesel powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where a D unit may not be considered suitable.
- **DY designated units:**
These are diesel powered units that have all the safeguards of the DS units and in addition do not have any electrical equipment including the ignition. They are equipped with temperature limitation features.
- **E designated units:**
These are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.
- **ES designated units:**
These are electrically powered units that, in addition to all of the requirements for the E units, are provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures. They may be used in some locations where the use of an E unit may not be considered suitable.
- **EE designated units:**
These are electrically powered units that have, in addition to all of the requirements for the E and ES units, the electric motors and all other electrical equipment completely enclosed. In certain locations the EE unit may be used where the use of an E and ES unit may not be considered suitable.
- **EX designated units:**
These are electrically powered units that differ from the E, ES, or EE units in that the electrical fittings and equipment are so designed, constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.
- **G designated units:**
These are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.
- **GS designated units:**
These are gasoline powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of a G unit may not be considered suitable.
- **LP designated units:**
These are similar to the G unit except that liquefied petroleum gas is used for fuel instead of gasoline.
- **LPS designated units:**
These are liquefied petroleum gas powered units that are provided with additional safeguards to the exhaust, fuel, and electrical systems. They may be used in some locations where the use of an LP unit may not be considered suitable.

The atmosphere or location shall have been classified as to whether it is hazardous or nonhazardous before the consideration of industrial trucks being used therein and the type of industrial truck required shall be as provided in this section for such location.



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1-800-252-7031, Option 2

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