



Forklift Operator Training Guide

DESIGNED TO MEET OSHA TRAINING REQUIREMENTS IN 29 CFR 1910.178

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Forklift Operator Training Guide

This study guide will help you prepare for the Forklift Operator Certification Training Course offered by Instructibly.com. This course is designed to meet the OSHA's Federal training requirements in 29 CFR 1910.178 which requires your employer to ensure you have completed this training before you operate a powered lift truck.

Once you have completed the course and successfully passed the quiz, you will receive a certificate of completion that is good for three years. Save this study guide as a reference and keep it around for your update in three years!

If you decide to take our course, we thank you and would appreciate your taking time to post a review on our website. Any suggestions for improvement or for other courses that would help you would be appreciated.

If you find our course and website helpful, please refer us to a friend, co-worker, or your employer.

Thanks and Good Luck!

Walter Henry

www.Instructibly.com

Introduction

Forklifts use the laws of physics to give one person power to move large loads with seemingly effortless precision. A well trained and experienced forklift operator is a marvel of skill and competence that can safely stack pallets or pick a single item from a trailer or pipe rack.

Yet, each year more than 100 people are killed and over 95,000 injured in accidents involving forklifts. Why? The same laws of physics that allow forklifts to make great lifts also make them subject to great mishaps. They tip over, drop loads, trap people, and fall off ramps or trucks.

Because of the large number of workplace accidents, OSHA has issued regulations containing safety requirements relating to fire protection, design, maintenance, and use of fork trucks, tractors, platform lift trucks, motorized hand trucks, and other specialized industrial trucks powered by electric motors or internal combustion engines. These regulations are found in the Code of Federal Regulations at 29 CFR 1910.178. A copy of the regulations can be found at Instructibly.com.

OSHA, believing that proper training can reduce the number of forklift-related injuries and fatalities, has issued a training standard in the regulations which require an employer to ensure that each powered industrial truck operator is competent to operate a powered industrial truck safely, as demonstrated by the successful completion of the training and evaluation requirements.

This guide will cover all of the information necessary to help an employer understand OSHA's requirements and provide a study guide for employees working towards their Forklift Operator Certification.

Training Requirements

OSHA's training requirements consist of a combination of (1) formal instruction (e.g., lecture, discussion, interactive computer learning, video tape, written material), (2) practical training (demonstrations performed by the trainer and practical exercises performed by the trainee), and (3) evaluation of the operator's performance in the workplace.

Prior to permitting an employee to operate a powered industrial truck (except for training purposes), the employer shall ensure that each potential operator has successfully completed all of the training requirements.

The training course offered by Instructibly.com meets the requirements of item (1) - formal instruction. The employer will need to provide items (2) and (3) before an employee is officially certified as competent to operate a powered industrial truck. A **Practical Training Plan** and an **Employee Evaluation Form** for use by the employer to address items (2) and (3) can be found at Instructibly.com.

As your employer is conducting the practical training and driver observation components of the training, keep in mind that trainees may operate a powered industrial truck only under the direct supervision of persons who have the knowledge, training, and experience to train operators and evaluate their competence; and where such operation does not endanger the trainee or other employees.

At the successful completion of this training, the employee should be provided a certificate that indicates that the employee has completed the training. The certification should include the name of the operator, the date of the training, the date of the evaluation, and the identity of the person(s) performing the training or evaluation.

Refresher training, including an evaluation of the effectiveness of that training, shall be conducted **at least once every three years**.

Additionally, refresher training in relevant topics shall be provided to the operator when:

- The operator has been observed to operate the vehicle in an unsafe manner;
- The operator has been involved in an accident or near-miss incident;
- The operator has received an evaluation that reveals that the operator is not operating the truck safely;
- The operator is assigned to drive a different type of truck; or

- A condition in the workplace changes in a manner that could affect safe operation of the truck.

Forklift Design

Forklifts come in a variety of sizes and designs and may operate on battery power, propane, gasoline, or diesel fuel. The picture at right shows the variety of design that you may encounter in the workplace. Each forklift is designed to perform specific tasks in set situations. Using it in any other way is not only unprofessional – it is dangerous.

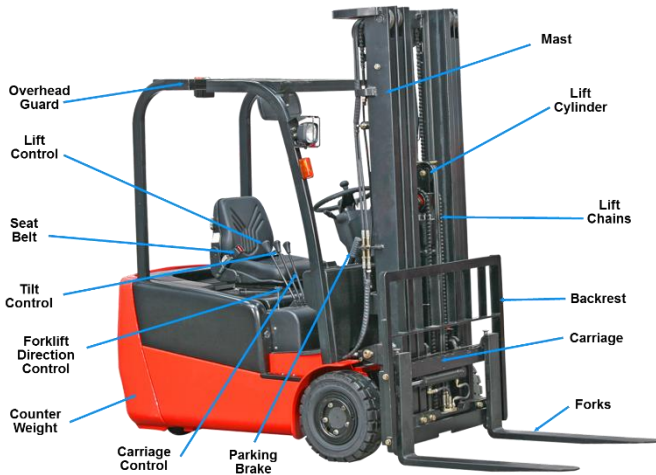
All forklifts have some things in common. They have forks that pick up the

load, hold it during transit

and put it in place at the new location. Forks tilt forward or backward. The operator can adjust the space between forks to lift loads of varying widths. Some forks on forklifts can be replaced with special attachments for carrying oddly shaped loads, such as drums, or long loads, such as pipe. Some can be used with a man-basket for elevating people.

The parts of a forklift include the mast, carriage, backrest, and overhead guard. Only the basic design is the same. In use, forklifts have different controls, weight capacities and restrictions on where they can be operated. That's why every forklift operator needs to learn all operating requirements for the particular forklift that they use. OSHA requires that you are

trained and certified for each type of forklift and each kind of work situation you encounter.



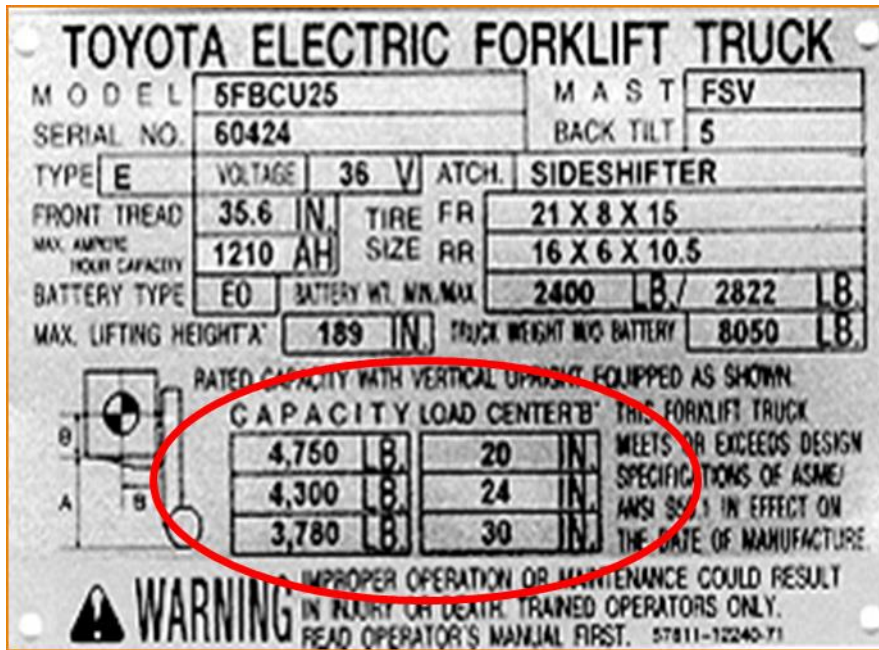
Is Driving a Forklift the Same as Driving a Car?

A forklift is not like a car. It steers in a very different way and has different controls. The forklift is less stable when turning because the front drive wheels support most of the load and a forklift has just three points of stability - the front wheels and the center of the rear axle; while a car has four points of stability (four tires). You have less steering control when turning especially when the forklift is loaded. The forklift's steering and drive mechanism also makes it difficult to stop quickly and dangerous to swerve. Remember that forklifts, even when unloaded, weigh two to three times more than an average car. Forklifts operate equally well in forward or reverse but steer differently in each direction. They also have blind spots, especially when loaded.

The Forklift Nameplate

OSHA requires a nameplate that is specific to the lift truck and any attachments that are used. The nameplate contains information including weight of the forklift, tire size and pressure, fuel type, etc. However, the most important information to the operator is the capacity and load center (circled in red below).

So what is capacity and load center? Capacity is the maximum weight that can safely be lifted to the forklift's maximum lifting height, assuming the center of gravity of the load is within the rated load center. The load center is the distance between the vertical face of the carriage and the center of gravity of the load. These two pieces of data will help you prevent a tip over. More on that later...



You should report and not operate any forklift that does not have the proper nameplate.

Hazardous Location and Forklift Designations

As mentioned in the section on forklift design, forklifts come in a variety of sizes and designs. One feature in the design is the extent of safeguards built into the exhaust, fuel, and electrical systems which determines whether or not a particular lift truck can operate in a hazardous environment/atmosphere. Keep in mind that the atmosphere or location where the forklift will be operating should be classified as to whether it is hazardous or nonhazardous prior to the consideration of the type of industrial trucks to be used. There are eleven different designations of industrial trucks or tractors based upon the power source and the extent of built-in safeguards. These designations are: D, DS, DY, E, ES, EE, EX, G, GS, LP, and LPS. The definitions for each designation is:

- D - diesel engine powered.
- DS - diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems.
- DY - diesel powered units that have all the safeguards of the DS units and in addition do not have any electrical equipment including the ignition and are equipped with temperature limitation features.
- E - electrically powered.
- ES - electrically powered provided with additional safeguards to the electrical system to prevent emission of hazardous sparks and to limit surface temperatures.
- EE - electrically powered that have all of the requirements for the E and ES units and the electric motors and all other electrical equipment completely enclosed.
- EX - electrically powered 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 - gasoline powered.
- GS gasoline powered that are provided with additional safeguards to the exhaust, fuel, and electrical systems.
- LP - liquefied petroleum gas (propane, butane) powered.

- LPS - liquefied petroleum gas powered that are provided with additional safeguards to the exhaust, fuel, and electrical systems.

Power-operated industrial trucks should not be used in atmospheres containing hazardous concentration of acetylene, butadiene, ethylene oxide, hydrogen (or gases or vapors equivalent in hazard to hydrogen, such as manufactured gas), propylene oxide, acetaldehyde, cyclopropane, diethyl ether, ethylene, isoprene, or unsymmetrical dimethyl hydrazine (UDMH).

Only approved power-operated industrial trucks designated as EX may be used in atmospheres containing hazardous concentrations of metal dust, including aluminum, magnesium, and their commercial alloys, other metals of similarly hazardous characteristics, or in atmospheres containing carbon black, coal or coke dust except used in such atmospheres.

In atmospheres where dust of magnesium, aluminum or aluminum bronze may be present, fuses, switches, motor controllers, and circuit breakers of trucks shall have enclosures specifically approved for such locations.

Only approved power-operated industrial trucks designated as EX may be used in atmospheres containing acetone, acrylonitrile, alcohol, ammonia, benzene, benzol, butane, ethylene dichloride, gasoline, hexane, lacquer solvent vapors, naphtha, natural gas, propane, propylene, styrene, vinyl acetate, vinyl chloride, or xylenes in quantities sufficient to produce explosive or ignitable mixtures and where such concentrations of these gases or vapors exist continuously, intermittently or periodically under normal operating conditions or may exist frequently because of repair, maintenance operations, leakage, breakdown or faulty operation of equipment.

Power-operated industrial trucks designated as DY, EE, or EX may be used in locations where volatile flammable liquids or flammable gases are handled, processed or used, but in which the hazardous liquids, vapors or gases will normally be confined within closed containers or closed systems from which they can escape only in case of accidental rupture or breakdown of such containers or systems, or in the case of abnormal operation of equipment; also in locations in which hazardous concentrations of gases or vapors are normally prevented by positive mechanical ventilation but which might become hazardous through failure or abnormal operation of the ventilating equipment; or in locations which are adjacent to Class I, Division 1 locations, and to which hazardous concentrations of gases or vapors might occasionally be communicated unless such communication is prevented by adequate positive-pressure ventilation from a source of clear air, and effective safeguards against ventilation failure are provided.

In locations used for the storage of hazardous liquids in sealed containers or liquified or compressed gases in containers, approved power-operated industrial trucks designated as DS, ES, GS, or LPS may be used. This classification includes locations where volatile flammable liquids or flammable gases or vapors are used, but which, would become hazardous only in case of an accident or of some unusual operating condition. The quantity of hazardous material that might escape

in case of accident, the adequacy of ventilating equipment, the total area involved, and the record of the industry or business with respect to explosions or fires are all factors that should receive consideration in determining whether or not the DS or DY, ES, EE, GS, LPS designated truck possesses sufficient safeguards for the location. Piping without valves, checks, meters and similar devices would not ordinarily be deemed to introduce a hazardous condition even though used for hazardous liquids or gases. Locations used for the storage of hazardous liquids or of liquified or compressed gases in sealed containers would not normally be considered hazardous unless subject to other hazardous conditions also.



Only approved power operated industrial trucks designated as EX shall be used in atmospheres in which combustible dust is or may be in suspension continuously, intermittently, or periodically under normal operating conditions, in quantities sufficient to produce explosive or ignitable mixtures, or where mechanical failure or abnormal operation of machinery or equipment might cause such mixtures to be produced.

The EX classification usually includes the working areas of grain handling and storage plants, room containing grinders or pulverizers, cleaners, graders, scalpers, open conveyors or spouts, open bins or hoppers, mixers, or blenders, automatic or hopper scales, packing machinery, elevator heads and boots, stock distributors, dust and stock collectors (except all-metal collectors vented to the outside), and all similar dust producing machinery and equipment in grain processing plants, starch plants, sugar pulverizing plants, malting plants, hay grinding plants, and other occupancies of similar nature; coal pulverizing plants (except where the pulverizing equipment is essentially dust tight); all working areas where metal dusts and powders are produced, processed, handled, packed, or stored (except in tight containers); and other similar locations where combustible dust may, under normal operating conditions, be present in the air in quantities sufficient to produce explosive or ignitable mixtures.

Only approved power-operated industrial trucks designated as DY, EE, or EX shall be used in atmospheres in which combustible dust will not normally be in suspension in the air or will not be likely to be thrown into suspension by the normal operation of equipment or apparatus in quantities sufficient to produce explosive or ignitable mixtures but where deposits or accumulations of such dust may be ignited by arcs or sparks originating in the truck.

Only approved power-operated industrial trucks designated as DY, EE, or EX shall be used in locations which are hazardous because of the presence of easily ignitable fibers or flyings but in which such fibers or flyings are not likely to be in suspension in the air in quantities sufficient to produce ignitable mixtures.

Only approved power-operated industrial trucks designated as DS, DY, ES, EE, EX, GS, or LPS shall be used in locations where easily ignitable fibers are stored or handled, including outside storage, but are not being processed or manufactured. Industrial trucks designated as E, which have been previously used in these locations may be continued in use.

On piers and wharves handling general cargo, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements for these types may be used.

If storage warehouses and outside storage locations are hazardous only the approved power-operated industrial truck specified for such locations in this paragraph (c) (2) shall be used. If not classified as hazardous, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements for these types may be used.

If general industrial or commercial properties are hazardous, only approved power-operated industrial trucks specified for such locations in this paragraph (c) (2) shall be used. If not classified as hazardous, any approved power-operated industrial truck designated as Type D, E, G, or LP may be used, or trucks which conform to the requirements of these types may be used.

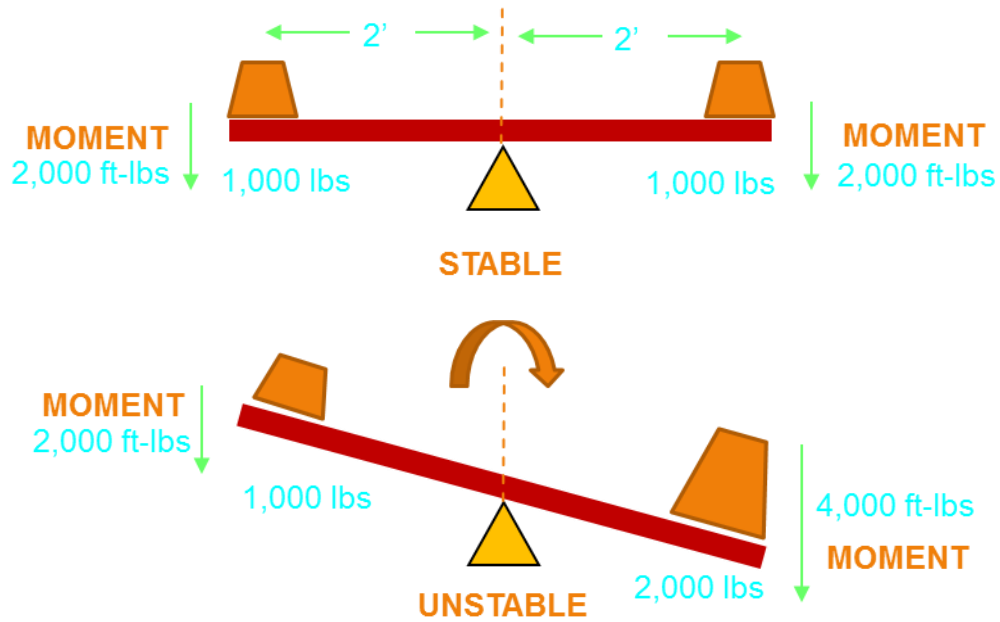
Converted industrial trucks. Power-operated industrial trucks that have been originally approved for the use of gasoline for fuel, when converted to the use of liquefied petroleum gas fuel in accordance with paragraph (q) of this section, may be used in those locations where G, GS or LP, and LPS designated trucks have been specified in the preceding paragraphs.

Forklift Stability

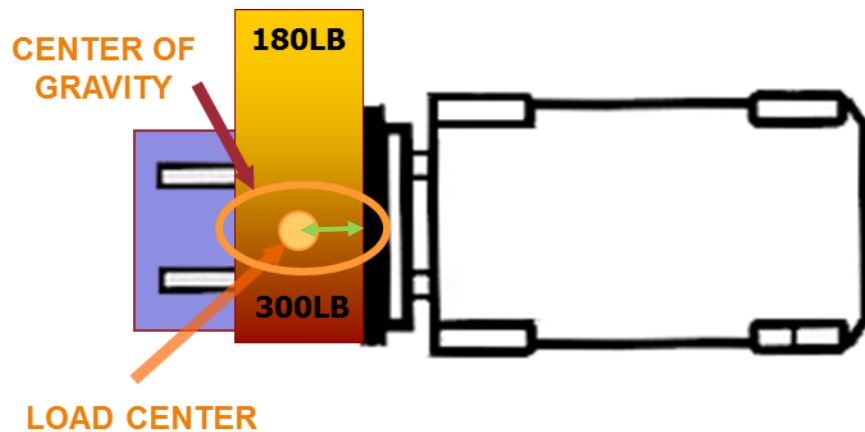
Knowledge of the forklift – things such as balance, stability, capacity and visibility - separates the good operator from the average operator. The professional knows that every load and every situation is different and that every lift and carry must be evaluated and planned.

Let's talk a little physics again. A moment of force is the product of a force and its distance from an axis, which causes rotation about that axis. Whether an object is stable depends on the object's moment at one end being greater than, equal to, or less than the object's moment at the other end. This principle can be seen in the way a teeter-totter works: that is, if the product of the load's downward force and its distance from the axis (moment) is equal to the moment at the device's other end, the

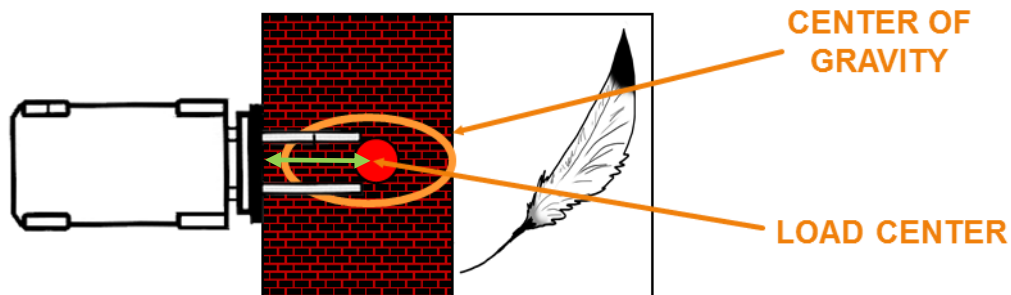
device is balanced. However, if there is a greater moment at one end of the device, the device will rotate downward at the end with the greater moment.



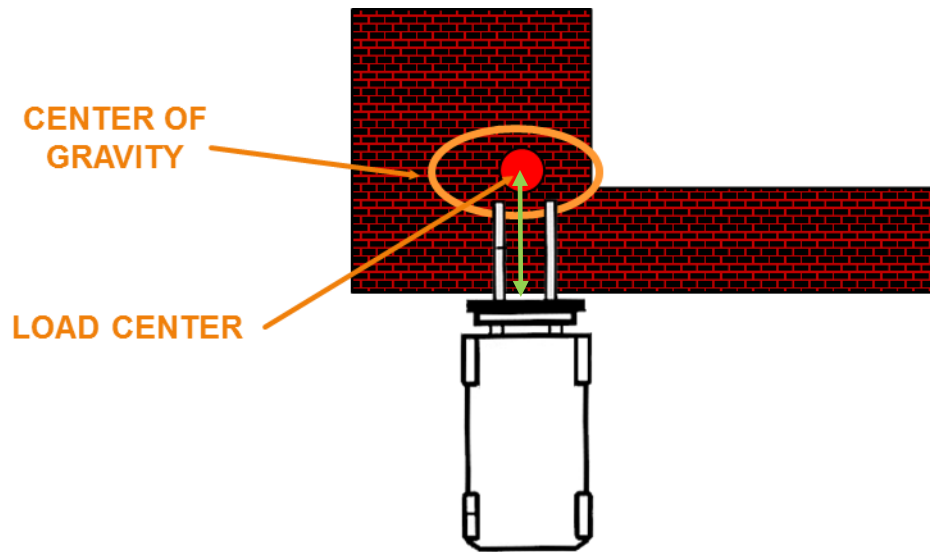
From that bit of knowledge, let's define a couple of more terms that will help us determine the stability of a forklift. Earlier we mentioned center of gravity and load center. The center of gravity is the average location of the weight of an object. The load center is the distance from the carriage, or vertical face of the forks, to the center of gravity of the load.



If a load contains materials with different weights or densities, the center of gravity will be on the side containing the heavy material. For example: If a pallet contains bricks on one side and feathers on the other, the center of gravity will be closer to the side of the pallet containing the bricks.



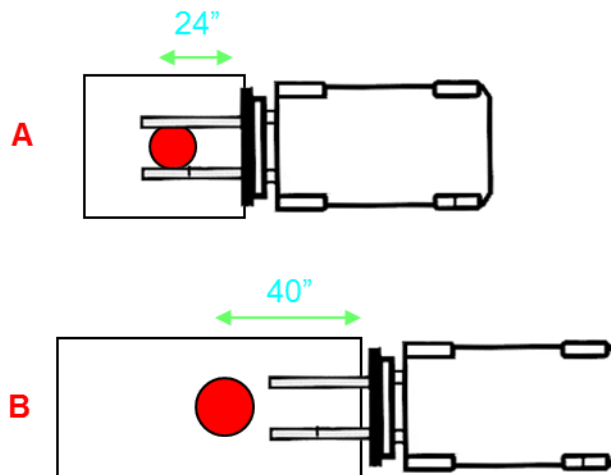
Similarly, the center of gravity for odd shaped loads of similar materials will be near the side with the most mass.



The load center is the distance from the carriage, or vertical face of the forks, to the center of gravity of the load. In the examples below the load centers are:

A: Load center = 24"

B: Load center = 40"



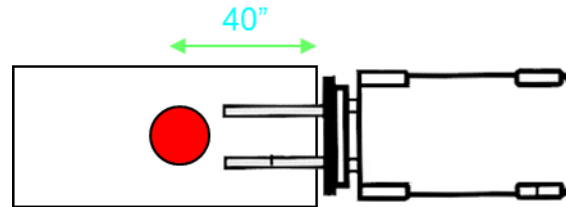
So understanding the center of gravity and load center help the operator to determine how to pick up a load and maintain stability (pick up the load on the side closest to the center of gravity). In example B above, the load should be picked up from the side, not the end as shown.

Load Center and Capacity

The load center is also related to the capacity of the forklift. Trucks with a capacity of 30,000 pounds or less are normally rated based upon a 24-inch load center. Trucks with a capacity greater than 30,000 pounds are normally rated based upon a 36- or 48-inch load center. The operator should always check the name plate to determine the maximum allowable weight at the rated load center.

If your forklift is rated for 5,000 pounds at 24 inches, it can safely lift a 5,000-pound load as long as the load center is 24 inches or less from the front face of the forks. If the load center is greater than 24 inches, it will reduce the lift truck's capacity. Each forklift is different; however, it is safe to assume that for every additional inch beyond 24 inches, the capacity will be reduced by 100 pounds.

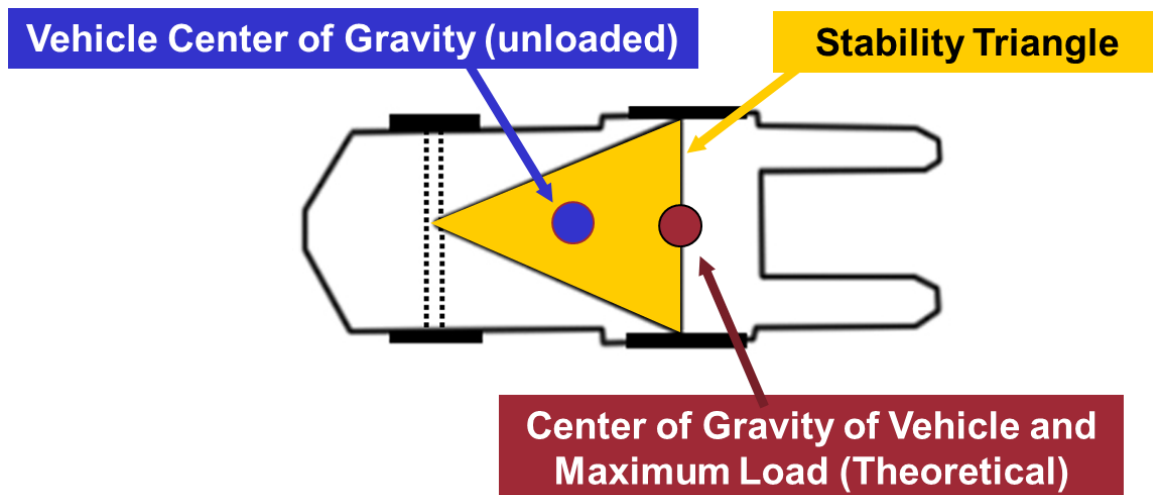
So in the example below you are going to try to lift a load that is 80 inches long with the forklift just described. The load center is 40 inches, or 16 inches greater than the rated load center of 24 inches. If 100 pounds capacity is lost per inch of extra load center, then the capacity of the lift truck is reduced by 1,600 pounds to 3,400 pounds.



Remember that the nameplate on the forklift identifies the capacity of the lift truck at various load centers.

The Stability Triangle

The design of the forklift is based on a stability triangle. The front axle, with its drive wheels, acts as the base of the triangle and supports the weight of the load. The sides of the stability triangle meet at the point where the forklift steers, in the middle of the steering axle.



Keeping the downward force of the load (center of gravity) within the stability triangle keeps the forklift stable and keeps the load from crashing to the ground. Allowing the load to move outside the stability triangle makes both the forklift and load less stable and subject to tipping, rolling, or dropping.

When Does the Load Become Less Stable?

- Whenever the load is raised
- When you are turning
- On slopes, either front to back or side-to-side
- On rough roads or uneven surfaces.

On every move, you need to decide if your stability will be affected by:

- The load – its weight and/or shape
- The route and its condition along the way
- The destination and maneuvers needed to set down the load

Know the rated load capacity of your forklift and never exceed it. The load capacity information should be located on a plate inside the forklift. This information and your understanding of stability help make you a safe forklift operator.

How Do Attachments Affect Forklift Capacity?

All attachments, such as carton clamps, drum clamps, paper roll clamps, rotators, and push-pull attachments, affect your lift truck's capacity in two ways:

- Adding an attachment is like permanently carrying a load. If the attachment weighs 1,000 pounds, your lift truck's capacity is automatically reduced by 1,000 pounds;
- Attachments typically move the load further away from the lift truck, which increases your load center. If the attachment moves the load 8 inches away, it will reduce the capacity by approximately 800 pounds (@100 pounds per inch).

What Should You Do If You Tip Over?

If the forklift operators drive safely and consider the combined actions that might cause them to tip over, they should never tip over in the first place. But, if there is a tip over, it is important that they know what to do and what NOT to do.

- Do not jump! You should be wearing the seat belt so that should not be an option. Many operators who thought they could jump clear of a tip over have been crushed by the overhead guard or the mast of the forklift.
- Seat belts must always be worn. Many fatalities have occurred when an un-seatbelted operator was thrown clear of the forklift and struck his or her head on a solid object.
- Brace yourself by holding firmly to the steering wheel and planting your feet.
- Lean away from the fall.

What Does the Pre-use Inspection Include?

According to OSHA studies, 6 percent of lift truck-related accidents are caused by improper maintenance. A thorough pre-operation inspection will catch almost any maintenance issue before it results in an accident. The pre-use inspection takes only a few minutes, and must be done at least daily or at the beginning of each tour. You may have a checklist to use – be sure to fill it out and turn it in every time. We have included a **Forklift Inspection Checklist** in the Appendix.

To begin a pre-operation inspection, you will need to do a “walk around.” Before you start be sure the forklift has been properly disengaged; the engine should be turned off, the parking brake set, the forks down, and the gear in neutral. Walk to either side of the forklift. Check the tires, be sure there is no debris around the axle or behind the mast, and make sure the overhead guard is solid. Next, look at the front of the truck; check that the forks and hoses are in good condition, fork pins are in place, the backrest is solid, and the mast and chains are greased. Last, walk to the rear. Check that the counterbalance bolt is tight and the radiator is clear of debris. Look for oil or water leaks on the floor.

Next lift the hood so that the engine can be inspected. Check the engine oil, transmission oil, coolant level, brake fluid, hydraulic fluid, make sure the fan belt is tight and the fan clear of debris, check to be sure that the radiator is also clear of debris.

- On LPG (propane) powered lift trucks inspect the propane tank and hose attachment for good condition. Does the propane tank clamp work effectively? Any signs of a propane leak?
- On electric lift trucks inspect the battery to ensure that it is in good condition.
- On diesel powered forklifts check for fuel tank damage or leaks and make sure that all valves and nozzles are secure.

Next hop into the seat of the forklift for some non-moving checks:

- Check the parking brake, be sure it is set;
- Put on the seat belt before starting the engine/turning the key to the “on” position;
- After starting the forklift, check all gauges, indicators, headlights and warning lights;
- Test the Horn;
- Operate the tilt & lift mechanism
 - When checking the tilt, listen for unusual sounds;
 - When checking the lift mechanism, inspect the hoses and chains and listen for unusual sounds, look for leaks;
- Put gear in reverse to test back-up alarm.

Finally, the moving checks:

- Check the parking brake by putting the forklift in gear (both forward and reverse) and stepping on the accelerator. The forklift should not move.
- Check the running brakes by moving forward and backward at speed and slamming on the brakes. The lift trucks should quickly stop.
- Inspect the steering by doing full turns to the right and left; listen for unusual sounds.

If anything is not right about the forklift, turn it off and secure it. Report the problem to your supervisor. You should never operator a forklift that has failed any of the pre-use checks.

Forklift Operation – Rules for Operators

To operate a forklift safely, operators should follow these rules:

- Only trained, authorized persons should operate a forklift
- Immediately report accidents
- Seat belts must always be worn
- Forklifts should never be driven up to anyone standing in front of a fixed object.
- Do not allow anyone to stand or pass under the elevated portion of any forklift, whether loaded or empty.
- Forklift controls should only be operated from driver’s seat
- Never block exits or emergency equipment
- Smoking is not permitted while driving, fueling, or charging
- Never eat or drink while driving
- No stunt driving or horseplay
- When a forklift is left unattended, the load shall be fully lowered, controls shall be neutralized, power shall be shut off, and parking brakes shall be set. A forklift is unattended when the operator is 25 ft. or more away from the vehicle, which remains in view or whenever the operator leaves the vehicle and it is not in view.

Forklift Operation – Rules for Equipment

The following rules should be followed relative to forklift equipment:

- Never place weight (sand bags, metal weights, etc.) on the back of a lift truck to prevent it from tipping over. Adding weight to the back of the lift truck does not increase the capacity of the mast, hydraulic system, chains, tilt cylinders, etc. and may cause a failure in these systems when lifting loads over the designed capacity of the lift truck.
- Towing should only be done from rear towing pin designed for such purpose.

- Never make modifications to your forklift (drill a hole in the forks, weld on hooks, etc.). This can degrade the integrity of the forklift. OSHA requires that only forklift manufacturers can make such modifications.
- Only use attachments designed for use with your forklift. Be sure to adjust the capacity and load center when using attachments.

What are Some of the Question that You Should Ask Yourself?

As a forklift operator, you should ask yourself the following questions to help you plan for lifting/moving a load:

- What is the rated load capacity of the forklift?
- Is this load well within the capacity limits?
- Will the shape of this load affect my stability?
- Will the load affect my visibility?
- Do I need to split up the load?
- Do I need to drive in reverse?
- Do I need a spotter?
- What hazards are along the route?
- What turns will I have to negotiate?
- Are there ramps, slopes, rough ground or obstacles?
- What about the destination?
- Can I get close enough?
- Can I pull in straight?
- Is the area free of overhead hazards like power lines, pipes, or beams?

Forklift Operation – Loading and Unloading

Before raising a load, you should know:

- The approximate (or better yet, the exact) weight of the load, and
- The location of the load's center of gravity (to determine load center and capacity)

Only loads within the rated capacity of the truck should be handled.

Inspect the load for stability, projections, damaged pallets before lifting.

Restack unstable loads.

The brakes of highway trucks shall be set and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks.

Fixed jacks may be necessary to support a semitrailer and prevent upending during the loading or unloading when the trailer is not coupled to a tractor.

Wheel stops or other recognized positive protection shall be provided to prevent railroad cars from moving during loading or unloading operations or while dockboards or bridge plates are in position.

Off-center loads should be cross-tied to the forks before lifting or traveling.

Some loads require securing (tying, banding or strapping down) before transport.

Compressed gas cylinders should be supported in an approved rack for transport by forklift. Laying the cylinders horizontally across the forks for transport should not be permitted.

When loading/unloading trailers using a dock with a lift truck, you should make a habit of these four practices:

- Check the dock plate for cracks or signs of wear, and be sure it is properly secured. Don't exceed the rated capacity of the dock board.
- Inspect the trailer floor before entering it with a lift truck. Look for holes or weak spots in the deck that the tire of a forklift could fall into, causing a tip over.
- Chock the trailer wheels to prevent trailer creep.
- Support the nose of the trailer with the tractor or a fixed jack.

Forklift Operation – Safe Driving Practices

- Always look in the direction of travel. If the load blocks your forward vision, you should drive in reverse.
- Remember to always look behind you before backing up.
- Keep body inside the cage of the forklift.
- When moving, the mast should be as low as possible.
- Avoid turning the truck when its load is raised more than a few inches (6" –12") above the ground.
- Sound the horn before moving and at corners, crossing aisles, near doorways, etc.
- All traffic regulations should be observed, including authorized speed limits.
- Operate at safe speeds - A safe speed is a speed at which you can quickly and easily stop if a pedestrian steps out in front of you. This isn't always the speed limit!
- Slow down on wet and slippery floors.
- Do not move the lift truck while raising or lowering a load. This can cause an unstable situation and a possible tip over.
- Remember, the forklift steers from the rear, so be careful when turning as the rear end swings wide.
- Watch for overhead obstructions when lifting your load.
- Avoid driving on loose objects or into holes.
- Never carry passengers.
- Always be aware of pedestrians in the area you are working.
- Pedestrians always have the right-of-way.
- Keep a safe distance from edge of ramps or docks.
- Keep a safe distance (approximately three forklift lengths) from the vehicle ahead.
- Keep the forklift under control at all times.
- Yield the right of way to ambulances, fire trucks, or other vehicles in emergency situations.
- Don't pass other forklifts traveling in the same direction at intersections, blind spots, or other dangerous locations.
- If your view is obstructed, you should not move the truck until you have a spotter (second person) working with you.
- There should be only one spotter per driver and only one driver per spotter.
- Ascended or descended grades slowly.

- Don't attempt to turn while ascending or descending grades.
- When ascending or descending grades in excess of 5 percent, loaded forklifts should be driven with the load up grade.
- Dock boards or bridge plates shall be driven over carefully and slowly.

Operating Hazards

It is important to be aware of all the potential hazards of the area in which you will be operating the lift truck. Hazards include:

- Workplace Conditions
- Moving Loads
- Pedestrians

Operating Hazards – Workplace Conditions

Some examples of workplace conditions/hazards include:

- Combustible fuel-operated forklift in poorly ventilated area
- Traveling on ramps
- Crossing railroad tracks
- Slippery floors
- Operating on dirt or gravel
- Poor lighting
- Congested/tight work spaces

Operating Hazards – Moving Loads

Some hazards associated with moving loads include:

- Working around loading docks
- Loads that block the forward vision
- Stacking and unstacking on racks
- Large or bulky loads
- Uneven weight distribution
- Broken pallets
- Poorly stacked loads, unwrapped loads

Operating Hazards – Pedestrians

In most workplaces, there is a lot of activity with other workers or visitors coming and going from the areas in which you may be operating a lift truck. You must always be aware of pedestrians, where they are or might be. You should always yield the right-of-way to pedestrians. You should also take charge of your work area by communicating with the pedestrians, letting

them know you are working in the area and directing them to safe areas before you resume operation. Some conditions that may cause accidents with pedestrians include:

- Obstructed views
- Turning
- Speeding
- Pedestrian unaware forklift is present
- Carrying passengers
- Horseplay

Forklift Maintenance – OSHA Requirements

Preventative maintenance should be completed on a routine basis per manufacture recommendations.

OSHA has specific requirement related to maintenance of lift trucks. These requirements include:

- All power-operated industrial trucks are to be examined before placing into service (at least daily, usually every shift). Any truck not in safe operating condition shall be removed from service and immediately reported. All repairs shall be made by authorized personnel.
- Modifications and additions which affect capacity and safe operation shall not be performed by the customer or user without manufacturers prior written approval. Capacity, operation, and maintenance instruction plates, tags, or decals shall be changed accordingly. Additional counterweighting of fork trucks (such as using sand bags, extra weights, etc.) shall not be done unless approved by the truck manufacturer.
- No repairs shall be made in Class I, II, and III locations.
- Those repairs to the fuel and ignition systems of industrial trucks which involve fire hazards shall be conducted only in locations designated for such repairs.
- Trucks in need of repairs to the electrical system shall have the battery disconnected prior to such repairs.
- All parts of any such industrial truck requiring replacement shall be replaced only by parts equivalent as to safety with those used in the original design.
- Water mufflers shall be filled daily or as frequently as is necessary to prevent depletion of the supply of water below 75 percent of the filled capacity. Vehicles with mufflers having screens or other parts that may become clogged shall not be operated while such screens or parts are clogged. Any vehicle that emits hazardous sparks or flames from the exhaust system shall immediately be removed from service, and not returned to service until the cause for the emission of such sparks and flames has been eliminated.
- When the temperature of any part of any truck is found to be in excess of its normal operating temperature, thus creating a hazardous condition, the vehicle shall be removed from service and not returned to service until the cause for such overheating has been eliminated.
- Industrial trucks shall be kept in a clean condition, free of lint, excess oil, and grease. Noncombustible agents should be used for cleaning trucks. Low flash point (below 100 deg. F.) solvents shall not be used. High flash point (at or above 100 deg. F.) solvents may be used. Precautions regarding toxicity, ventilation, and fire hazard shall be consonant with the agent or solvent used.
- Industrial trucks originally approved for the use of gasoline for fuel may be converted to liquefied petroleum gas fuel provided the complete conversion results in a truck which embodies the features specified for LP or LPS designated trucks.

Forklift Maintenance – Pre-Refueling Safety

Before refueling any forklift, the operator should observe and carry out the following safety precautions:

- Never refuel while the engine is running (the engine has the potential to ignite the fuel).
- Ensure you are following safe parking procedures.
- Open flame, smoke and any potential source of ignition are prohibited within 10 meters of any truck being refueled or recharged.

Forklift Maintenance – Propane Refueling

- Cylinders permanently mounted on trucks should be filled or exchanged only at locations designated for that purpose (well ventilated and isolated from all sources of ignition)
- Only trained and authorised personnel can recharge or exchange LP gas cylinders
- Ensure that the engine has stopped and the fuel-isolating valve is shut off before attempting to disconnect the cylinder
- Handle all cylinders and associated plumbing with extreme care. Damage from dropping or abuse could result in a serious fire
- Ensure that the cylinder is correctly positioned, so that the safety relief valve is facing upwards
- Chains should not be used to replace straps in the cylinder-clamping device
- It is advised that leather gloves be worn when changing cylinders to prevent potential injury
- Flexible hoses on LPG trucks should not protrude beyond the extremities of the truck and are to be protected from abrasion or sharp edges
- If the fuel system has a leak, report it immediately. Action should be taken to prevent the truck from being used until the leak has been corrected. Propane leaks are detected by distinct odor, hissing sound, frost on fittings
- Minimum PPE requirements for propane refueling are gloves and safety glasses. Additional PPE might be goggles or a face shield.

Forklift Maintenance – Gasoline or Diesel Refueling

- Smoking, naked lights or other sources of ignition are prohibited in the designated refueling area
- Care should be exercised to avoid spilling petrol or overflowing the tank during refueling.
- Replace the cap securely, flush down any spilled fuel and allow sufficient time for that fuel to completely evaporate, before restarting the truck.
- Minimum PPE requirements for diesel or gasoline refueling are gloves and safety glasses. Additional PPE might be goggles or a face shield.

Forklift Maintenance – Battery Charging

- Facilities shall be provided for charging batteries and should include equipment for handling batteries, flushing and neutralizing spilled electrolyte, for fire protection, for protecting charging apparatus from damage by trucks, and for adequate ventilation for dispersal of fumes from gassing batteries.
- Always wear PPE when working with batteries. PPE includes face mask, acid-resistant gloves, and an apron.

- Trucks shall be properly positioned and brake applied before attempting to change or charge batteries.
- Ensure that vent caps are functioning. The battery compartment cover shall be open to dissipate heat.
- Inspect battery connectors for damage.
- Hydrogen gas is released during the recharging process, so smoking in the charging area is prohibited.
- Never remove battery caps except to add water or take hydrometer readings.
- When charging batteries, acid shall be poured into water; water shall not be poured into acid.
- Immediately clean up electrolyte spills. Clean up electrolyte spills with baking soda (acid neutralizer) and water.
- Reinstalled batteries shall be properly positioned and secured in the truck.

Wrap Up

Well, that covers the information you or your employees need to prepare for the Forklift Operator Certification Training Course offered by instructibly.com. Hopefully you have a good understanding of the basic design and operation of a forklift, the important concepts associated with forklift stability, requirements for forklift inspections, operating hazards, and forklift maintenance requirements.

We've included a copy of the daily inspection checklist that can be used to help you with your required inspections and record keeping requirements.

Thank you!



Forklift Inspection Checklist

Date of inspection: _____ Location: _____

Forklift Serial #: _____ Inspector Name: _____ Signature: _____

1	Battery: Charge OK; Electrolyte / Water Full	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
2	Engine Oil: Full; Not Due for Change	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
3	Transmission Fluid: Full; Fluid Clean	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
4	Engine Belts: Operate Smoothly; No Pieces Missing	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
5	Radiator Level: Full	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
6	Markings, Warning Decals, Data Plate: Securely Attached & Readable	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
7	Overhead Guard: Securely Attached	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
8	Operator Restraint System: Fully Functional & Securely Attached	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
9	No Visible Leaks	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
10	Tires: In Good Condition & Fully Inflated	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
11	Brakes, Service: Function Smoothly; Do Not Fade	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
12	Brakes, Parking: Function Smoothly; Hold Securely	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
13	Accelerator Linkage: Functions Smoothly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
14	Light (Head, Tail, Operating, Warning): Work Properly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
15	Hydraulic Fluid: Full; Fluid Clean	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
16	Hydraulic Hoses; No Signs of Wear	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
17	Hydraulic System: Hydraulics Do Not Drift	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
18	Mast Chain and Stops: In Good Condition/Function Properly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
19	Fuel: Tanks Fastened Securely; Covers & Connections in Place	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
20	Steering: Operates Smoothly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
21	Drive Direction: Forward & Reverse Smoothly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
22	Tilt: Operates Smoothly in Both Directions	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
23	Hoist: Operates Smoothly in Both Directions	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
24	Forks: Attached Securely; Not Bent; Not Damaged	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
25	Ammeter: Functions Properly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
26	Engine Oil Pressure Gauge: Functions Properly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
27	Fuel Level Gauge: Functions Properly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
28	Temperature Gauge: Functions Properly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
29	Operating Hours Meter: Functions Properly	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
30	Horn: Operational	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>
31	Backup Alarm: Operational	Yes	<input type="checkbox"/>	No	<input type="checkbox"/>	N/A	<input type="checkbox"/>

Remarks: *An explanation of all "No" responses shall be listed below including corrective action taken.*
