MATERIAL HANDLING

MANUAL LIFTING TIPS

- ❑ Proper lifting techniques should be used
- ❑ Loads should be assessed before lifting
- ❑ Lift with the legs and not the back to prevent injuries
- ❑ Inspect around the load to ensure that there are no sharp edges, or protruding nails or screws that may cut someone
- ❑ Grip loads securely to avoid slipping and dropping
- ❑ The path should be cleared before lifting to ensure safe movement without obstacles
- ❑ Assistance should be sought for lifting heavy or awkward loads
- ❑ Keep loads close to the body to maintain balance & reduce strain
- ❑ Twisting should be avoided during lifting to protect the spine
- ❑ Take frequent breaks during repetitive lifting to prevent fatigue
- ❑ Warm-up exercises should be performed before lifting
- ❑ When in doubt about lifting an item, stop, get assistance, or contact a supervisor if necessary

FREIGHT ELEVATOR SAFETY TIPS

- ❑ Loads should be balanced & evenly distributed across floor
- ❑ The elevator's weight capacity should be checked and not exceeded to ensure safe operation
- ❑ Items should be properly secured to prevent shifting during transit
- ❑ Stack heights should not exceed the elevator cab height to avoid contact with the ceiling
- ❑ The path to and from the elevator should be clear of obstructions for safe loading and unloading
- ❑ Operators should ensure that elevator doors are fully open and clear before moving items in or out
- ❑ Protective barriers or guards should be used to secure loads
- ❑ Keep hands and feet clear of the elevator door while it is closing to avoid pinch and crush points
- ❑ Any unusual noises or movements should be reported immediately to maintenance personnel
- ❑ The elevator should be regularly inspected and maintained according to the manufacturer's guidelines

STACKING BRICKS AND BLOCKS

- ❑ Bricks and blocks should be stacked on a stable, level surface to prevent tipping
- ❑ Stacks should be limited to a safe height to prevent collapse and ensure stability
- ❑ Heavier items should be placed at the bottom of the stack to maintain balance
- ❑ Stacks should be built in an interlocking pattern to enhance stability
- ❑ Workers should avoid stacking bricks and blocks too close to edges or walkways
- ❑ Protective gloves should be worn to prevent hand injuries during stacking
- ❑ The work area should be kept clear of debris to prevent tripping hazards
- ❑ Bricks and blocks should be handled with care to avoid chipping or damage
- ❑ Tools and equipment should be inspected before use to ensure they are in good condition
- ❑ Stacks should be regularly checked for stability and re-stacked if necessary to maintain safety

HEIGHT OF STACKS

- ❑ Bricks should not be stacked higher than 7 feet. If stacks exceed 4 feet in height, they should be tapered back by 2 inches for every foot of height above the 4-foot level to maintain stability and prevent tipping
- ❑ Blocks should not be stacked higher than 6 feet. Similar to bricks, if block stacks exceed 6 feet, they should be tapered back by 1/2 block per tier above the 6-foot level to ensure stability and prevent collapse

RIGGING SAFETY PRACTICES

- ❑ Stay clear of the swing radius of the cab
- ❑ Never stand between the crane cab and the outriggers
- ❑ The greatest crush point is between the cab and the outriggers
- ❑ During high wind (25-30mph) shut down lifting operations and dog everything down if necessary
- ❑ Stay at least 50 feet from powerlines up to 50,000 (50Kv), and if power is unknown stay at least 25 feet away until voltage can be verified
- ❑ If the crane comes into contact with a powerline the operator must remain in the cab since it is the safest plane, unless there is a risk of the crane catching fire, then evacuate
- ❑ If lightning is within 10 miles, shut down operations
- ❑ Thunder can often be heard up to 6 or even 8 miles away so if you hear thunder lighting is most likely too close

LOAD STABILITY & SLING ANGLE

- ❑ The angle of the sling can affect stability and the stress on the sling. As the angle decreases, the stress on the sling increases.
- ❑ Always strive for a sling angle of 60 degrees or greater if possible. If lower angles are necessary, ensure the sling is rated for the increased load.
- ❑ For large or complex loads, consider using multiple hitches in combination (e.g., a basket hitch with additional chokers) to distribute the weight evenly and secure the load.
- ❑ Ensure the load has strong, secure attachment points for the hitch. Weak or improperly placed attachment points can lead to load instability or sling failure.
- ❑ Different materials (e.g., wire rope, chain, synthetic webbing) have varying strengths and flexibilities, affecting hitch selection.
- ❑ Consider environmental factors such as temperature, chemicals, or moisture, which could affect sling material and performance. Certain hitches might be more suitable in specific environments.
- ❑ Inspect all hitches and slings for wear, damage, or defects before use. Ensure all components are in good condition and appropriate for the selected hitch type.
- ❑ Ensure that the rigging crew is trained and knowledgeable about different hitch types and their appropriate applications. Proper training is essential for safe and effective hitch selection.

RIGGING SAFETY REMINDERS

- ❑ Before use, inspect all rigging equipment, including slings, shackles, hooks, and chains, for wear, damage, or defects. Replace any worn or damaged components immediately.
- ❑ Ensure the rigging equipment is suitable for the load's weight and type. Always check the load's weight and match it with the equipment's rated capacity.
- ❑ The load's center of gravity is crucial for balance. Make sure the load is stable and balanced before lifting.
- ❑ Select the correct type of sling (wire rope, chain, synthetic) and hitch (vertical, choker, basket) for the specific lifting task.
- ❑ Always lift straight up and avoid side loading, which can cause rigging to fail.
- ❑ Establish clear communication among the rigging team, including hand signals or radios, to ensure everyone is aware of the lifting plan.
- ❑ Ensure the load is properly secured with the appropriate number of slings and all connections are tight before lifting
- ❑ Use taglines to guide and control the load, especially in windy conditions or when the load is awkwardly shaped
- ❑ Ensure all personnel maintain a safe distance from the load while it's being lifted and moved. Never stand under a suspended load
- ❑ Always adhere to the manufacturer's guidelines and industry standards for rigging practices
- ❑ Ensure all rigging personnel are properly trained and certified for the tasks they are performing
- ❑ Store rigging equipment in a clean, dry area away from direct sunlight or chemicals that could damage the material
- ❑ Consider environmental factors such as wind, rain, or extreme temperatures that could affect rigging operations
- ❑ Have an emergency plan in place, including procedures for stopping work and securing the load if necessary
- ❑ When rigging and hoisting multiple items keep bundles with the same lengths together per lift

RIGGING SAFETY

SHAPE, SIZE & CAPACITY

- ❑ Consider the load's shape, size, and center of gravity when selecting a hitch
- ❑ Ensure the hitch can handle the full weight of the load without exceeding its rated capacity
- ❑ **Slings are synthetic, wire rope, chain or metal mesh**

HITCH TYPES

VERTICAL HITCH Used for lifting a load straight up, usually with a single leg. Simple but relies entirely on the sling's strength and is best for loads with a single attachment point.

CHOKER HITCH Suitable for cylindrical objects or loads without dedicated lifting points. It tightens around the load, which helps secure it but reduces the sling's effective lifting capacity.

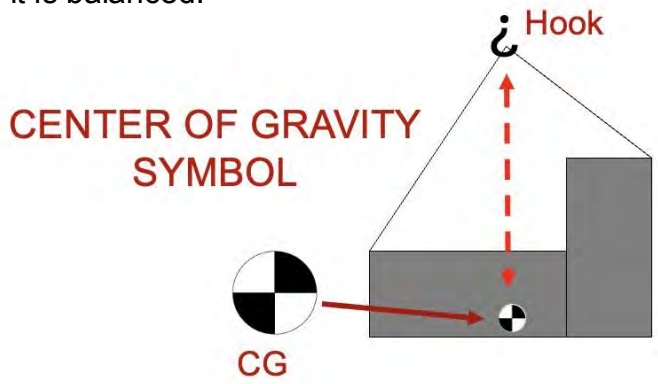
BASKET HITCH Distributes the load evenly between two legs of the sling, providing more stability. It's ideal for loads that can be balanced across two lifting points.

DOUBLE-WRAP BASKET HITCH offers even more security than a standard basket hitch, as the sling wraps around the load twice. It has a 360-degree choke on the load and helps compress it together.

BRIDLE HITCH, uses two or more vertical hitches to evenly distribute the load's weight.

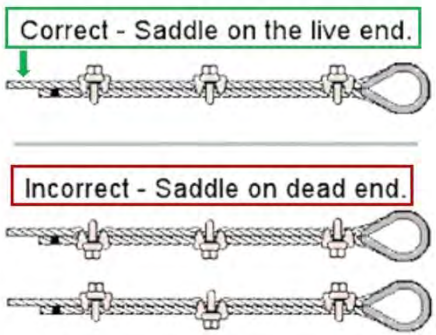
CENTER OF GRAVITY

- ❑ A load is stable when the hook is directly above the load's center of gravity
- ❑ Lift the load just enough to clear the ground and see if it is balanced.



REQUIRED MARKINGS ON SHACKLE

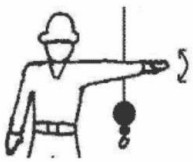
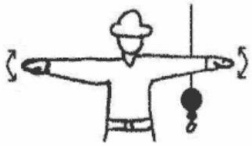
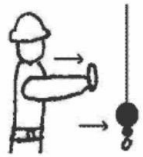
1. Manufacturer Name or Logo
2. WLL (Working Load Limit) aka Capacity
3. Size of the Shackle



SADDLE & U-BOLT FOR WIRE ROPE

CRANE HAND SIGNALS AS PER OSHA AND ASME (American Society of Mechanical Engineers)

The most critical hand signals are noted in red.

 **STOP** – With arm extended horizontally to the side, palm down, arm is swung back and forth.	 **EMERGENCY STOP** – With both arms extended horizontally to the side, palms down, arms are swung back and forth.	 **HOIST** – With upper arm extended to the side, forearm and index finger pointing straight up, hand and finger make small circles.
 **RAISE BOOM** – With arm extended horizontally to the side, thumb points up with other fingers closed.	 **SWING** – With arm extended horizontally, index finger points in direction that boom is to swing.	 **RETRACT TELESCOPING BOOM** – With hands to the front at waist level, thumbs point at each other with other fingers closed.
 **RAISE THE BOOM AND LOWER THE LOAD** – With arm extended horizontally to the side and thumb pointing up, fingers open and close while load movement is desired.	 **DOG EVERYTHING** – Hands held together at waist level.	 **LOWER** – With arm and index finger pointing down, hand and finger make small circles.
 **LOWER BOOM** – With arm extended horizontally to the side, thumb points down with other fingers closed.	 **EXTEND TELESCOPING BOOM** – With hands to the front at waist level, thumbs point outward with other fingers closed.	 **TRAVEL/TOWER TRAVEL** – With all fingers pointing up, arm is extended horizontally out and back to make a pushing motion in the direction of travel.

 **LOWER THE BOOM AND RAISE THE LOAD** – With arm extended horizontally to the side and thumb pointing down, fingers open and close while load movement is desired.	 **MOVE SLOWLY** – A hand is placed in front of the hand that is giving the action signal.	 **USE AUXILIARY HOIST** (whipline) – With arm bent at elbow and forearm vertical, elbow is tapped with other hand. Then regular signal is used to indicate desired action.
 **CRAWLER CRANE TRAVEL, BOTH TRACKS** – Rotate fists around each other in front of body; direction of rotation away from body indicates travel forward; rotation towards body indicates travel backward.	 **USE MAIN HOIST** – A hand taps on top of the head. Then regular signal is given to indicate desired action.	 **CRAWLER CRANE TRAVEL, ONE TRACK** – Indicate track to be locked by raising fist on that side. Rotate other fist in front of body in direction that other track is to travel.
 **TROLLEY TRAVEL** – With palm up, fingers closed and thumb pointing in direction of motion, hand is jerked horizontally in direction trolley is to travel.		

FORKLIFTS & HEAVY EQUIPMENT
aka PIT (Powered Industrial Trucks)

PRE-OPERATION INSPECTION
- ❑ Perform a pre-operation inspection before each shift
- ❑ Check for any mechanical issues, fluid levels, tire condition, and the functionality of safety features
- ❑ If the equipment fails inspection, tag it out of service and notify supervision that the equipment must be serviced and repaired

LOAD HANDLING
- ❑ Always check the load capacity of the forklift and never exceed it.
- ❑ Secure the load properly and ensure it is stable and balanced before moving.

SAFE DRIVING PRACTICES
- ❑ Human error is the great risk of incidents
- ❑ Drive at safe speeds and slow down when making turns
- ❑ Take the smoothest route, even if it is longer
- ❑ Keep a safe distance from other vehicles and pedestrians
- ❑ Use the horn at intersections and in areas with limited visibility
- ❑ Ensure clear visibility while operating the forklift
- ❑ Use spotters or mirrors when operating in areas with poor visibility
- ❑ Always look in the direction of travel
- ❑ Ensure clear visibility while operating the forklift
- ❑ Use spotters or mirrors when operating in areas with poor visibility

FORK POSITIONING
- ❑ Keep forks low to the ground as possible when traveling and preferably 6” or lower
- ❑ Tilt the mast back slightly to stabilize the load
- ❑ Use caution when raising or lowering loads, especially on inclines

WORK ENVIRONMENT
- ❑ Keep the work area well-lit and free of obstructions
- ❑ Mark forklift operating zones and pedestrian walkways clearly
- ❑ Ensure floors are dry and clean to prevent slipping

PARKING AND SHUTDOWN
- ❑ Always park the forklift on a flat surface and set the brake.
- ❑ Lower the forks to the ground when parking
- ❑ Turn off the engine and remove the key when not in use
- ❑ Never leave the forklift unattended (stay within 25 feet)

SAFETY EQUIPMENT & COMMUNICATION
- ❑ Wear appropriate personal protective equipment (PPE), such as safety shoes, hard hats, and high-visibility vests.
- ❑ Ensure the forklift is equipped with safety features like seat belts, mirrors, and alarms as use them.
- ❑ Establish clear communication protocols between operators and ground personnel.
- ❑ Use hand signals or two-way radios as needed.

FORKLIFTS & HEAVY EQUIPMENT aka PIT (Powered Industrial Trucks)

STEPS FOR COMPETENT & AUTHORIZED OPERATORS

	STEPS	DESCRIPTION
1	Knowledge Training	Workshops, PowerPoint, Videos & Round Table Discussions
2	Practical Training	Hands of Training
3	Evaluation	Be Evaluated on that type of equipment
4	Employer Certification must include	Knowledge and Practically Training date(s) and trainer name(s) Evaluation date(s) and evaluator's name(s) per type of equipment Statement Authorizing as a Competent and Authorized Operator per type of equipment

WHEN RETRAINING IS REQUIRED

- ❑ The employer must evaluate the operator on each type of equipment authorized at least once every 3 years.

WHEN RETRAINING IS REQUIRED

- ❑ Observed to operate the vehicle in an unsafe manner
- ❑ Involved in an accident or near-miss incident
- ❑ Receives an evaluation that reveals that the operator is not operating the truck safely
- ❑ Assigned to drive a different type of truck
- ❑ A condition in the workplace changes in a manner that could affect safe operation of the truck.


Class I: Electric Motor Rider Trucks


Class II: Electric Motor Narrow Aisle Trucks


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


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


Class V: Internal Combustion Engine Trucks (Pneumatic Tires)


Class VI: Electric and Internal Combustion Engine Tractors


Class VII: Rough Terrain Forklift Trucks

THERE ARE 7 TYPES OF FORKLIFTS

1. Electric Motor Ride Trucks
2. Electric Motor Narrow Aisle Trucks
3. Electric Motor Hand Truck/Rider Trucks
4. Internal Combustion Engine Trucks
5. Internal Combustion Engine Trucks (Pneumatic Tires)
6. Electric and Internal Combustion Engine
7. Rough Terrain Forklift Trucks

HEAVY EQUIPMENT TRAINING AND AUTHORIZATION FOLLOWS THE SAME REQUIREMENTS FOR FORKLIFT