

CRANES • DERRICKS • HOISTS • ELEVATORS • CONVEYORS

Lifting and moving materials safely

Joy Glad, CSP

Construction equipment awareness • OSHA 29 CFR 1926 reference

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

CLASS OBJECTIVES

By the end, you can recognize the equipment and control its hazard zone

01 **DISTINGUISH**

what cranes, derricks, hoists, elevators, and conveyors are built to do.

02 **RECOGNIZE**

the primary struck-by, caught-in, fall-zone, and electrical hazards.

03 **APPLY**

a practical pre-use control sequence before equipment or loads move.

04 **LOCATE**

the OSHA 1926 references that anchor equipment-specific training.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

OSHA 1926 separates the equipment into two main reference paths

SUBPART CC

Cranes + derricks

Power-operated equipment used in construction to hoist, lower, and horizontally move a suspended load.

FOCUS

ground support • assembly/disassembly • power lines • inspection • operation • signals • fall zones

§§ 1926.1400–1442

SUBPART N

Hoists + elevators + conveyors

Equipment that lifts on a fixed path or moves material continuously through a defined system.

FOCUS

capacity • guarding • landing protection • warnings • stopping means • lockout

§§ 1926.552–555

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 29 CFR 1926, Subparts CC and N.

Cranes combine vertical lift with horizontal reach

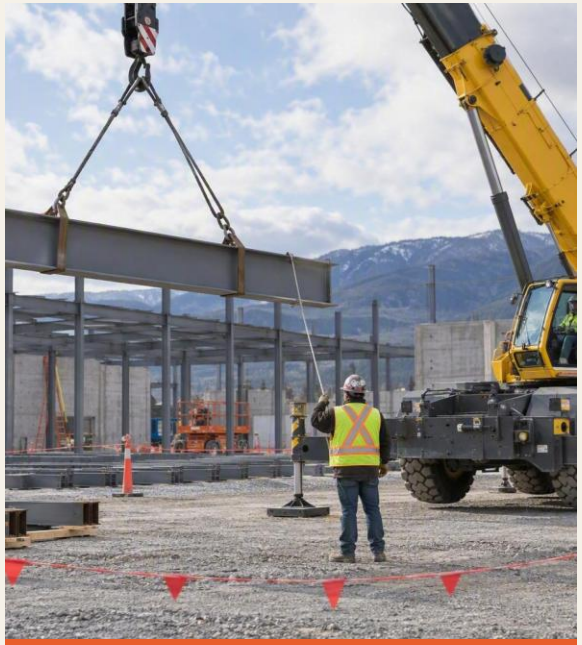
A crane hoists or lowers a suspended load and can move it horizontally through a work area.

COMMON

mobile • tower • crawler • articulating • overhead/gantry

WATCH FOR

unstable support, overload, power lines, swing radius, falling loads



MOBILE CRANE



TOWER CRANE

1 The equipment name describes motion and support—not permission to improvise. 2

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.1400–1402, 1408, 1424–1425.

A stable crane lift starts before the hook moves

01

SUPPORT

Confirm firm, drained, graded support; use mats/cribbing as required.

02

CAPACITY

Match configuration, radius, load weight, rigging, and load chart.

03

CLEARANCE

Define the work zone; assess power lines and swing/crush areas.

04

CONTROL

Use qualified roles, clear signals, and a protected fall zone.

STOP THE LIFT when support, capacity, clearance, communication, or equipment condition is uncertain.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.1402, 1408, 1412, 1417, 1424–1425, 1427–1430.

Derricks use a fixed mast and rigging to control a lift

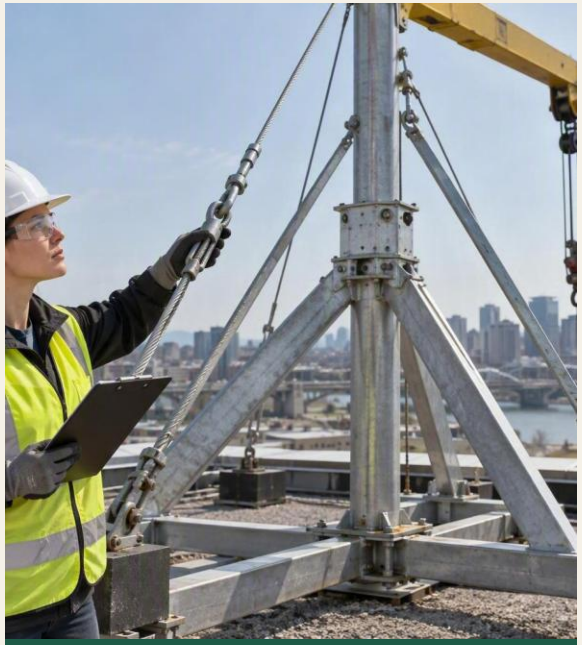
A derrick uses a mast or equivalent member, an angled boom, and a hoisting mechanism; guys or structural members stabilize the system.

COMMON

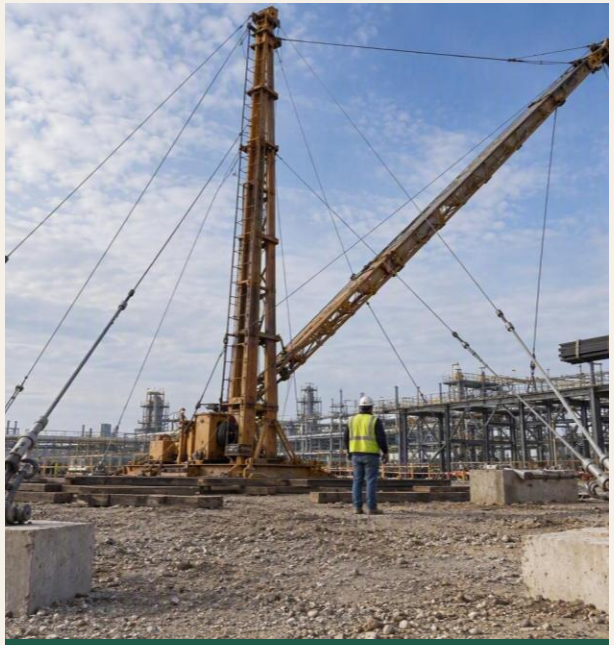
guy • stiff-leg • gin pole • Chicago boom • A-frame

WATCH FOR

anchors, guy tension, boom/mast alignment, wire rope, load path, fall zone



STIFF-LEG DERRICK



GUY DERRICK

1 The equipment name describes motion and support—not permission to improvise.

2

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926 Subpart CC, including 1926.1436.

Derrick stability lives in the support system

READ THE LOAD PATH

Every component must transfer force safely into the supporting structure or ground.

01	**MAST / FRAME**	plumb, sound, correctly supported
02	**GUYS / STIFF LEGS**	correct geometry, tension, and connections
03	**ANCHORS / BASE**	rated, verified, and protected from movement
04	**BOOM + HOIST**	configured and operated within procedures
05	**FALL ZONE**	controlled; only essential workers enter

If the support system changes, reassess the lift.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.1404, 1412–1417, 1424–1425, and 1436.

Hoists move a suspended load on a mostly fixed vertical path

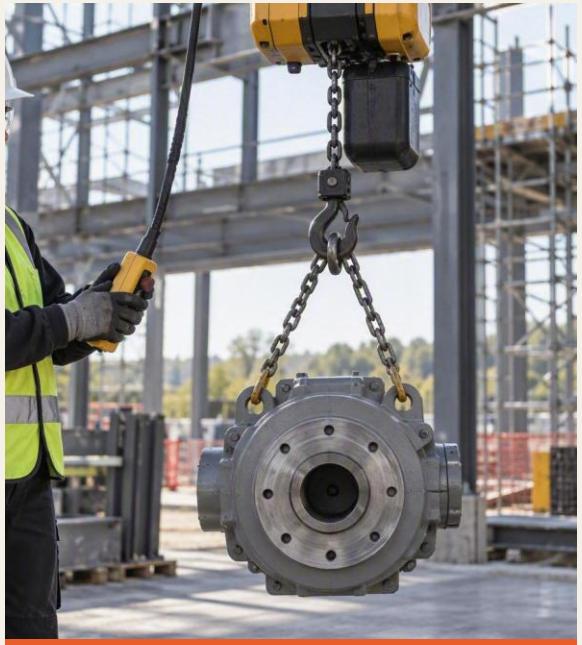
A hoist raises and lowers a load using chain or wire rope. It may be manual, electric, air-powered, overhead, drum-mounted, or part of a construction hoist tower.

COMMON

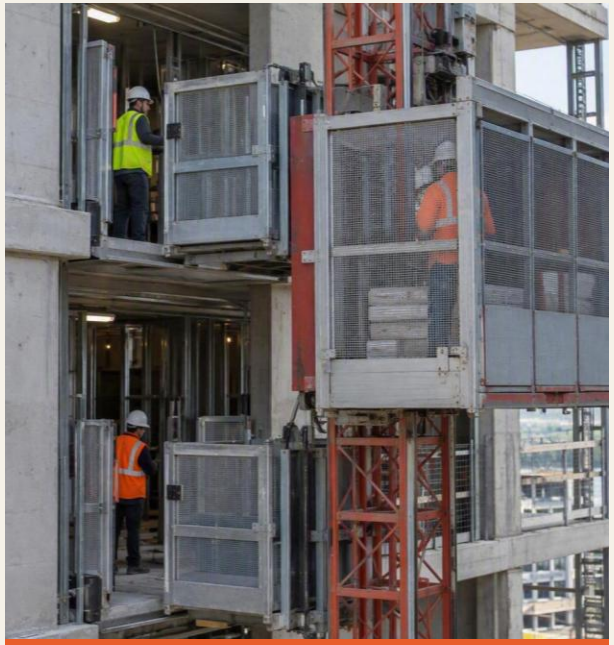
chain • lever • electric • air • drum • material hoist

WATCH FOR

overload, side pull, damaged hook/rope/chain, moving parts, workers below



CHAIN HOIST



MATERIAL HOIST

1 The equipment name describes motion and support—not permission to improvise.

2

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.552–554.

Safe hoisting is straight, rated, inspected, and clear

1	**INSPECT**	Hook and latch • chain/rope • brake • controls • support
2	**ALIGN**	Hoist, hook, and load share one vertical line—no side pull
3	**TEST**	Take slack; raise a few inches; verify balance and brake
4	**LIFT**	Move smoothly; keep hands, body, and coworkers clear

NEVER EXCEED RATED LOAD

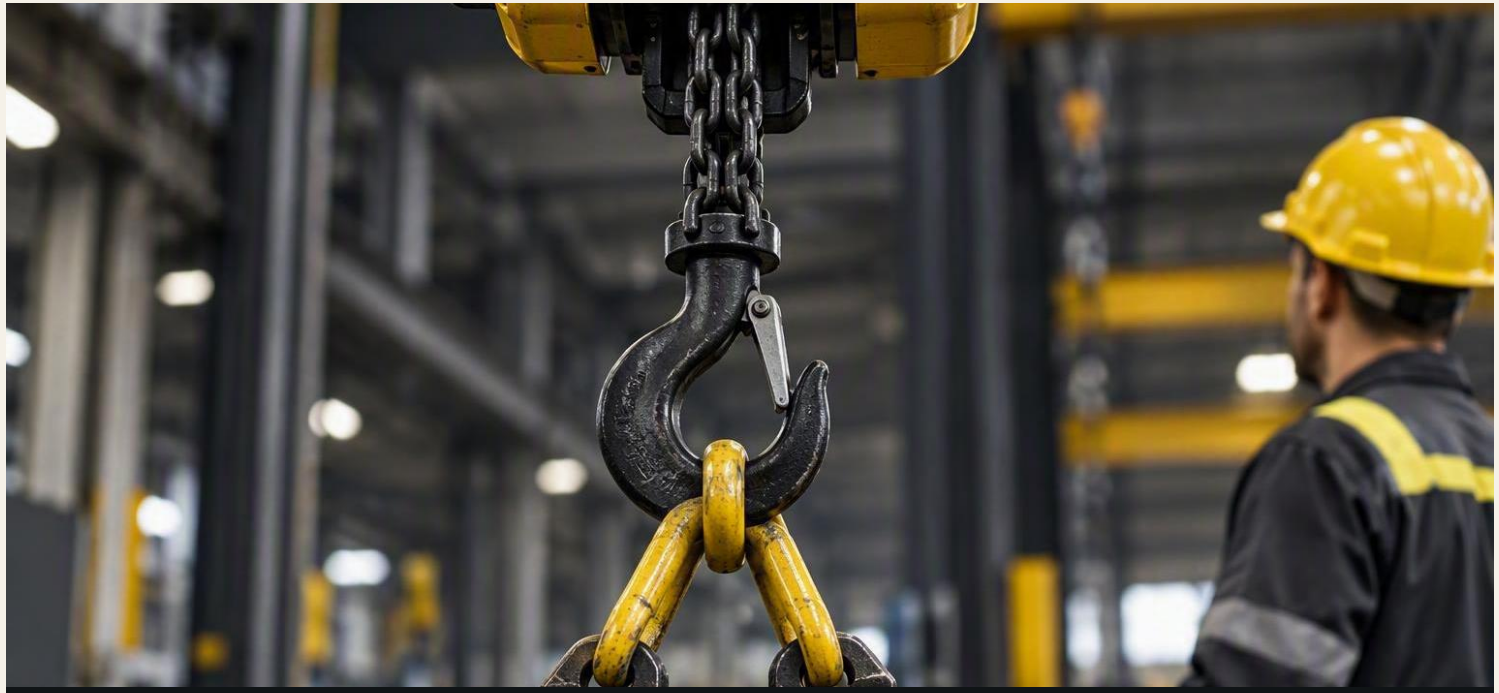
Never lift people unless the system is designed and approved for that purpose.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.552(a), 1926.553, and 1926.554.

VIDEO • HOISTS

Watch the hook, the load line, and the operator’s position



▶ WATCH PROPER CHAIN-HOIST USE ↗

WATCH FOR

01 How the load is centered before tension is applied.

02 What gets checked before the lift begins.

03 Where the operator stands—and where no one stands.

Linked video • 12:44 • Opens YouTube

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Video: Columbus McKinnon, “Proper Usage of Chain Hoists” (2025).

Construction elevators move people or materials on a guided path

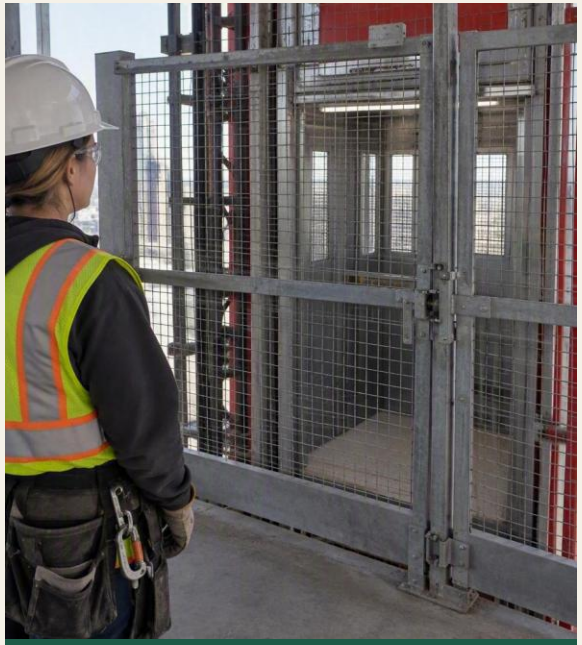
A temporary construction elevator or personnel hoist uses a guided car or platform to serve defined landings. Material hoists are restricted to material unless designed and approved otherwise.

COMMON

personnel hoist • material hoist • temporary construction elevator

WATCH FOR

open landings, overloading, gate bypass, rope condition, falling objects



PROTECTED LANDING



PERSONNEL HOIST

1 The equipment name describes motion and support—not permission to improvise.

2

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.552.

Posted limits and protected landings are the first line of defense

CAPACITY

Rated load, speed, and special warnings are posted on cars and platforms.

LANDINGS

Gates, enclosures, and access controls separate people from the moving car and hoistway.

01	**VERIFY**	car/platform and landing gates
02	**RESPECT**	posted load and rider limits
03	**INSPECT**	wire rope and safety devices
04	**CONTROL**	access, loading, and falling-object exposure

Do not defeat gates, interlocks, or landing protection.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.552(a)–(c).

Conveyors move material continuously through fixed zones

A conveyor carries material along a fixed path. The load path is predictable—but moving belts, rollers, pulleys, chains, and screws create continuous caught-in hazards.

COMMON

belt • roller • screw • bucket • drag/chain

WATCH FOR

nip points, unguarded drives, unexpected start, falling material, maintenance energy



BELT CONVEYOR



SCREW CONVEYOR

1 The equipment name describes motion and support—not permission to improvise.

2

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.555.

Guard the interface, warn before start, and isolate before entry

NIP + SHEAR POINTS	Guard belts, pulleys, rollers, chains, drives, and screw flights.
START-UP	Sound the audible warning before the conveyor starts.
STOPPING	Provide stopping means at the operator station and remote motor location where required.
MAINTENANCE	Lock out or otherwise render inoperable and tag out during repair or hazardous work.

A stopped belt is not an isolated belt. Verify energy control before reaching in.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Source: OSHA 1926.555(a)(1)–(8).

VIDEO • CONVEYORS

Watch how guarding and block-out change access to the hazard



▶ WATCH CONVEYOR SAFETY BASICS ↗

WATCH FOR

01 Which moving interfaces are reachable during normal work.

02 How guards prevent access—not just signal danger.

03 Why block-out and verification matter before cleanup.

Linked video • Opens YouTube

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Video: Martin Engineering, “Back to Basics: Conveyor Safety” (2024).

Choose the system by the movement the job requires

Equipment	Primary movement	Typical construction use	Main hazard zone
Crane	Vertical + horizontal reach	Place steel, forms, equipment	fall zone + swing radius
Derrick	Lift around a fixed mast/boom	Rooftop or constrained lifts	support system + fall zone
Hoist	Vertical along load line/path	Raise components or materials	suspended load + moving parts
Elevator	Guided vertical travel	Move people/materials by landings	hoistway + landings
Conveyor	Continuous fixed path	Move aggregate or bulk material	nip points + drives

Selection never replaces a lift plan, competent/qualified roles, or manufacturer procedures.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Reference map: OSHA 1926 Subparts CC and N.

SHARED CONTROLS

Five controls travel across every material-moving system

01

PLAN

Know the load, route, equipment limits, ground/support, clearances, and roles.

02

INSPECT

Check condition, guards, ropes/chains, controls, safety devices, and supports.

03

COMMUNICATE

Use one understood signal system; warn before motion; stop on uncertainty.

04

ISOLATE

Secure against movement and control hazardous energy before service or entry.

05

STAY CLEAR

Protect swing, crush, fall, hoistway, and caught-in zones.

If any control is missing, pause the task—the safest lift or movement is the one not started yet.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Sources: OSHA 1926.1402, 1408, 1412, 1417, 1424–1425, 1926.552–555.

KNOWLEDGE CHECK

Choose the best answer for each question

01 **Which crane condition must be confirmed before assembly or use?**

A Firm, graded support

B A faster line speed

C A larger hook

02 **What should happen before reaching into a conveyor for repair or hazardous maintenance?**

A Sound the horn only

B Isolate and tag the conveyor

C Stand beside the start control

03 **What is the safest position while a suspended load is moving?**

A Under the load

B Inside the fall zone

C Clear of the load and fall zone

PRESS SPACE TO REVEAL ANSWERS →

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Answer from the controls covered in this class.

KNOWLEDGE CHECK

Answers revealed

01 **Which crane condition must be confirmed before assembly or use?**

A Firm, graded support B A faster line speed C A larger hook

Correct: ground/support must meet manufacturer requirements for support and level.

02 **What should happen before reaching into a conveyor for repair or hazardous maintenance?**

A Sound the horn only **B Isolate and tag the conveyor** C Stand beside the start control

Correct: stop, lock out or otherwise render inoperable, tag, and verify energy control.

03 **What is the safest position while a suspended load is moving?**

A Under the load B Inside the fall zone **C Clear of the load and fall zone**

Correct: minimize exposure and keep nonessential employees outside the fall zone.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission

Sources: OSHA 1926.1402, 1425, and 1926.555(a)(7).

TAKE IT TO THE FIELD

The hazard zone moves when the equipment or load moves.

- ✓ **Right equipment + configuration**
- ✓ **Known load + rated capacity**
- ✓ **Sound support + protected route**
- ✓ **Inspected controls + safeguards**
- ✓ **Clear communication + exclusion zones**
- ✓ **Energy isolated before service**

KEY REFERENCES OSHA 29 CFR 1926 Subpart CC • §§ 1926.552–555 • equipment manufacturer procedures • site-specific plan

This overview supports awareness; it does not replace required qualification, certification, or hands-on training.

Property of Dynamics Safety and Environmental LLC. Do Not Copy or Share Without Written Permission