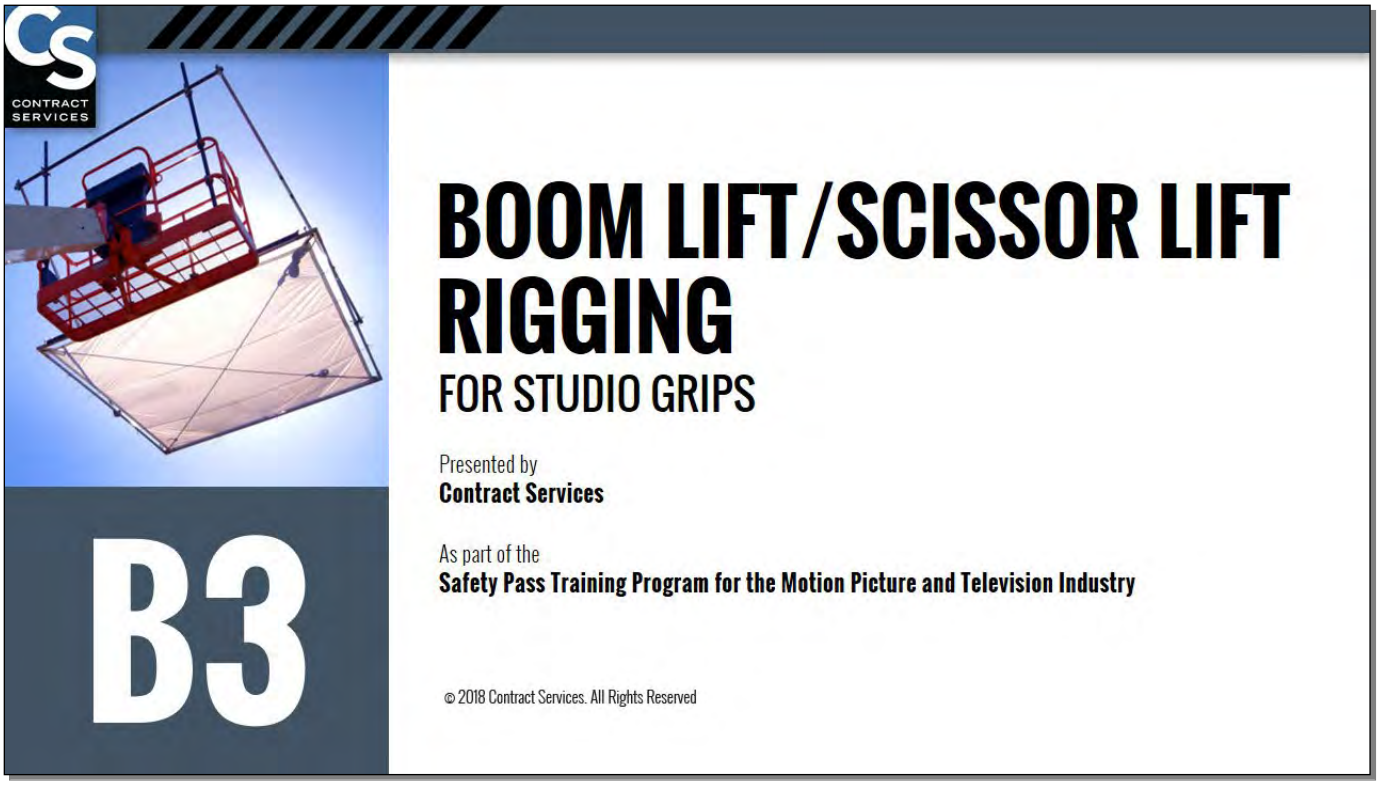
NOTE: Reading this PDF course book is not a substitute for completing the Self-Paced Online training portion of this course. This PDF course book is a resource that accompanies the online training.



English:
If you do not comprehend English, and you require Safety Pass training in a language other than English, please send notification in writing to 2710 Winona Avenue, Burbank, CA 91504. Please provide your name, along with contact information, and specify the language you comprehend. Thank you.

Spanish:
Si usted no comprende inglés y requiere la capacitación Safety Pass en un idioma diferente al inglés, por favor envíe una notificación por escrito a 2710 Winona Avenue, Burbank, CA 91504. Por favor provea su nombre, junto con la información de contacto, y especifique el idioma que usted comprende. Gracias.

Korean:
영어를 이해하지 못하시고 영어가 아닌 다른 언어로 **Safety Pass** 훈련을 받으셔야 한다면, 서면 통지를 **2710 Winona Avenue, Burbank, CA 91504** 로 보내주시기 바랍니다. 귀하의 성함과 연락처를 기재하시고 이해하실 수 있는 언어를 명시해주십시오. 감사합니다.

Armenian:
Եթե դուք անգլերեն չեք հասկանում և ձեզ հարկավոր է **Safety Pass**-ի մարզում անգլերենից տարբեր լեզվով, խնդրում ենք գրավոր ծանուցագիր ուղարկել հետևյալ հասցեով՝ **2710 Winona Avenue, Burbank, CA 91504**: Խնդրում ենք ներկայացնել ձեր անունը, ինչպես նաև կապի տեղեկությունը, հատկապես նշելով ձեր հասկացած լեզուն: Շնորհակալություն:

Contract Services Administration Training Trust Fund
2710 Winona Avenue
Burbank, CA 91504

Safety Pass Training Program

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

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

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

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

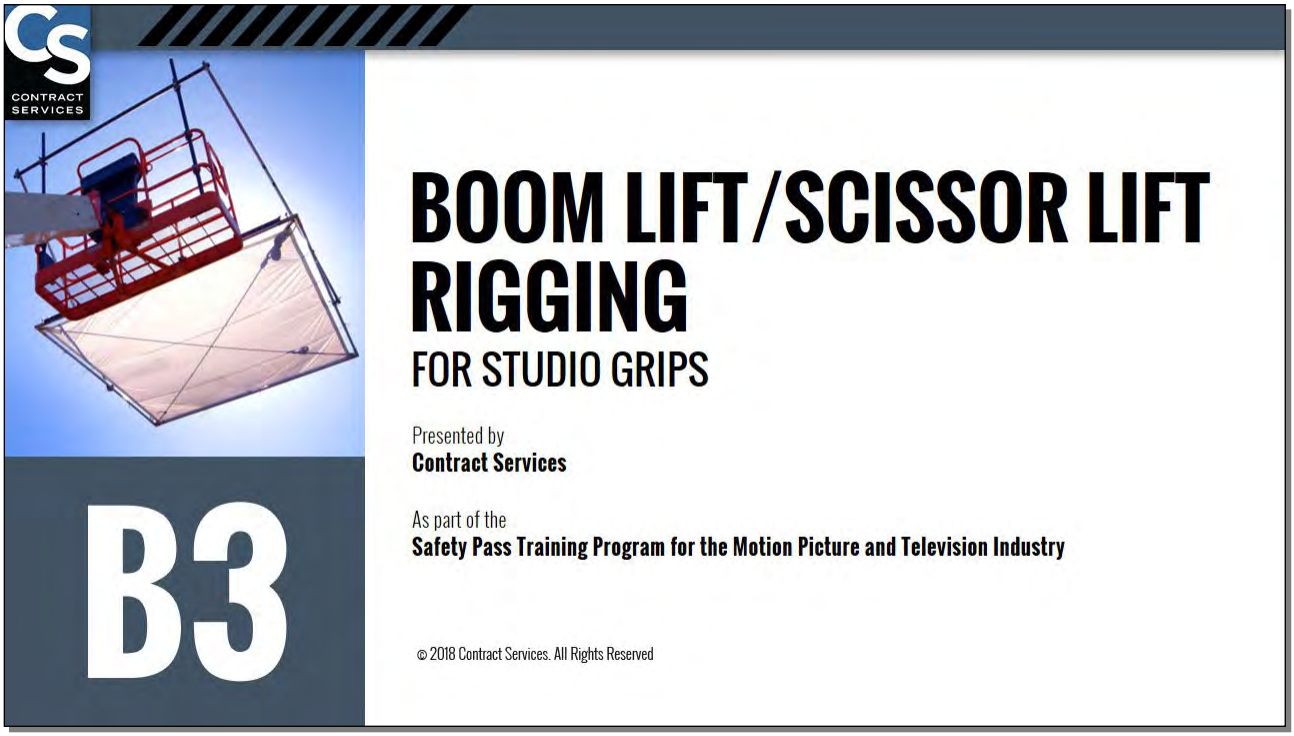
The Safety Pass Program derives from Federal and California Occupational Safety and Health Administration (OSHA) safety regulations. However, the material included in this workbook and its accompanying presentation should be used only as a general guideline. It is not intended as a legal interpretation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

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

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

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

Slide 1 - Welcome 1.1+1.2



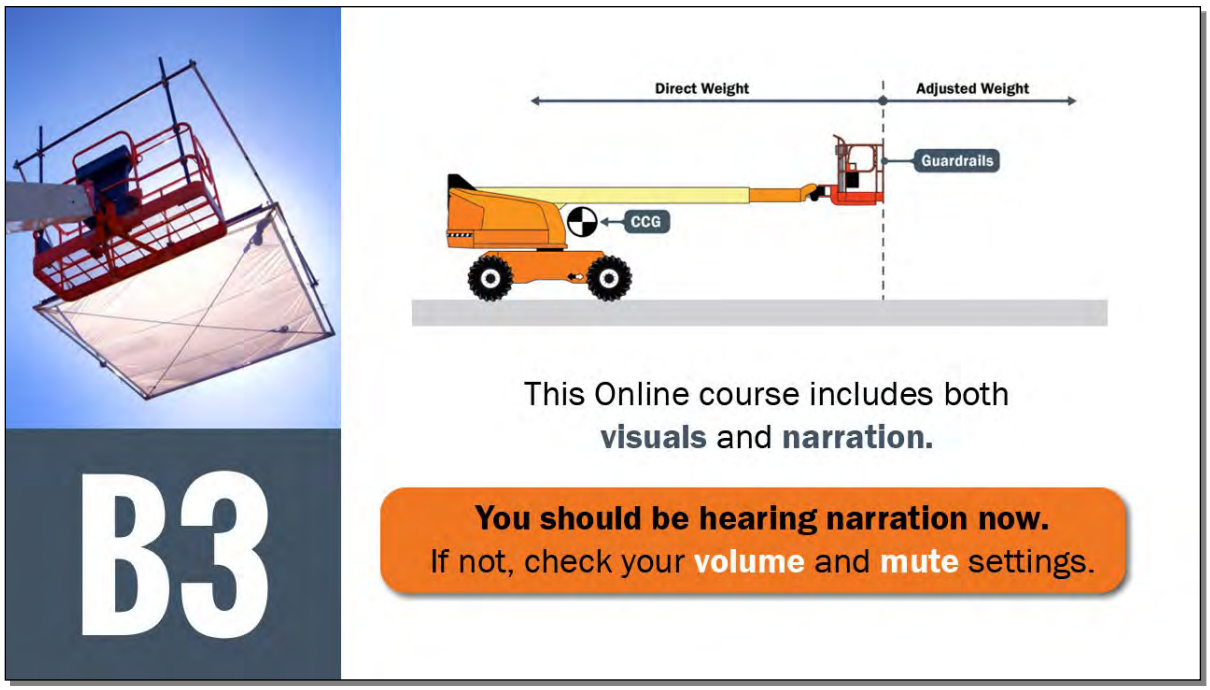
Hello, and welcome to the Online portion of course B3, *Boom Lift/Scissor Lift Rigging for Studio Grips.* The Online portion takes 120 minutes to complete.

This course is part of the Safety Pass training program for the motion picture and television industry; it is presented to you by Contract Services.

After you complete the Online portion, you will need to return the *Registration* page to enroll for the In-Person portion of the course. In order to receive credit for this course, you must successfully complete both the Online and In-Person portions.

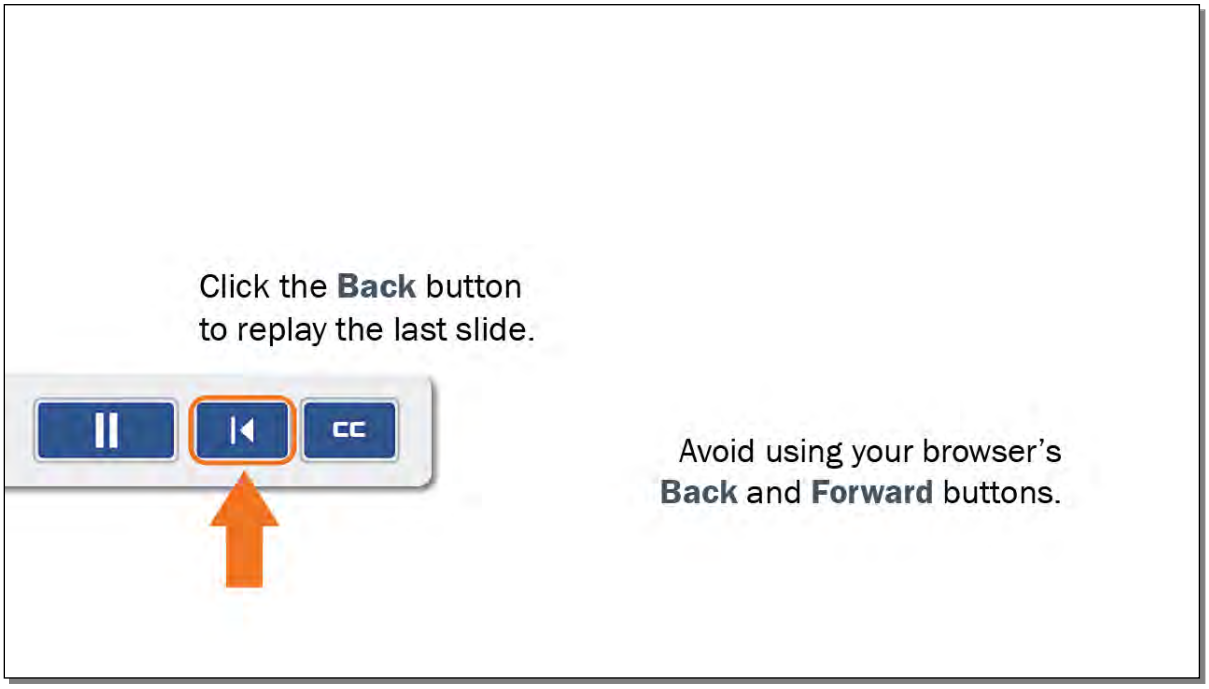
You must complete the In-Person portion of this course by the date indicated on the *Registration* page; otherwise, you will need to complete the Online portion again.

Slide 2 - Welcome 1.3



This Online portion of the course includes both visuals and narration. Please ensure you can read the on-screen text and hear the narration at a comfortable volume. This course is divided into scenes of related information. Along the way, you'll encounter Knowledge Check questions to help you retain the information.

Slide 3 - Welcome 1.4



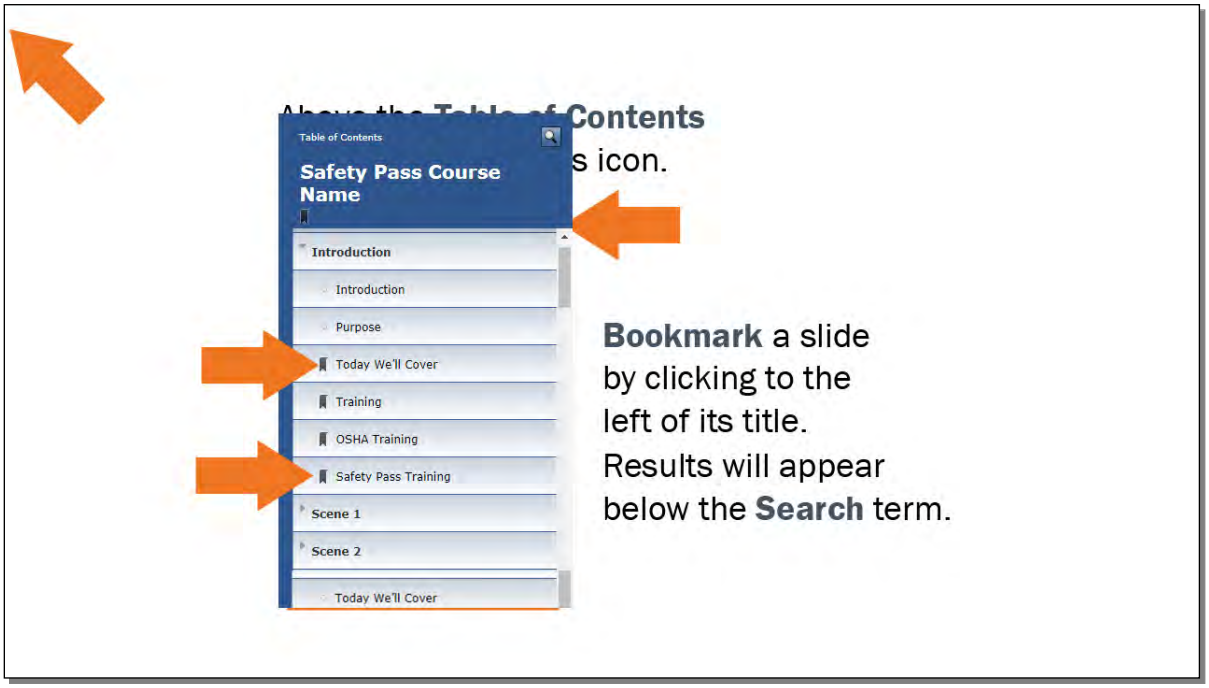
Closed captions are available by clicking the *CC* button on the bottom left of the player window. To the left of the *Closed Caption* button is a *Pause* button should you need to stop playback; a second click will resume the presentation.

Periodically the course will pause to give you a chance to absorb important information. When you are ready to move on, just click the *NEXT* button to continue.

Avoid using your browser's *Back* and *Forward* functions during the course. If you need to replay the last slide, click the *Back* button (between the *Pause* and *Closed Caption* buttons). To go back further, you can select a slide from the *Table of Contents* on the left. Only slides you've previously viewed will be available.

If you need to continue the course at a later time, click *Log Out* (in the top right corner) to ensure your progress is saved. When you log back in, the presentation will resume where you left off.

Slide 4 - Welcome 1.5



You can bookmark an important slide by clicking on the left of its title in the *Table of Contents*. Above the *Table of Contents* is a magnifying glass icon that reveals a search field to quickly locate key terms throughout the presentation. Search results will appear below the search term. Click the *Search* icon again to clear the results.

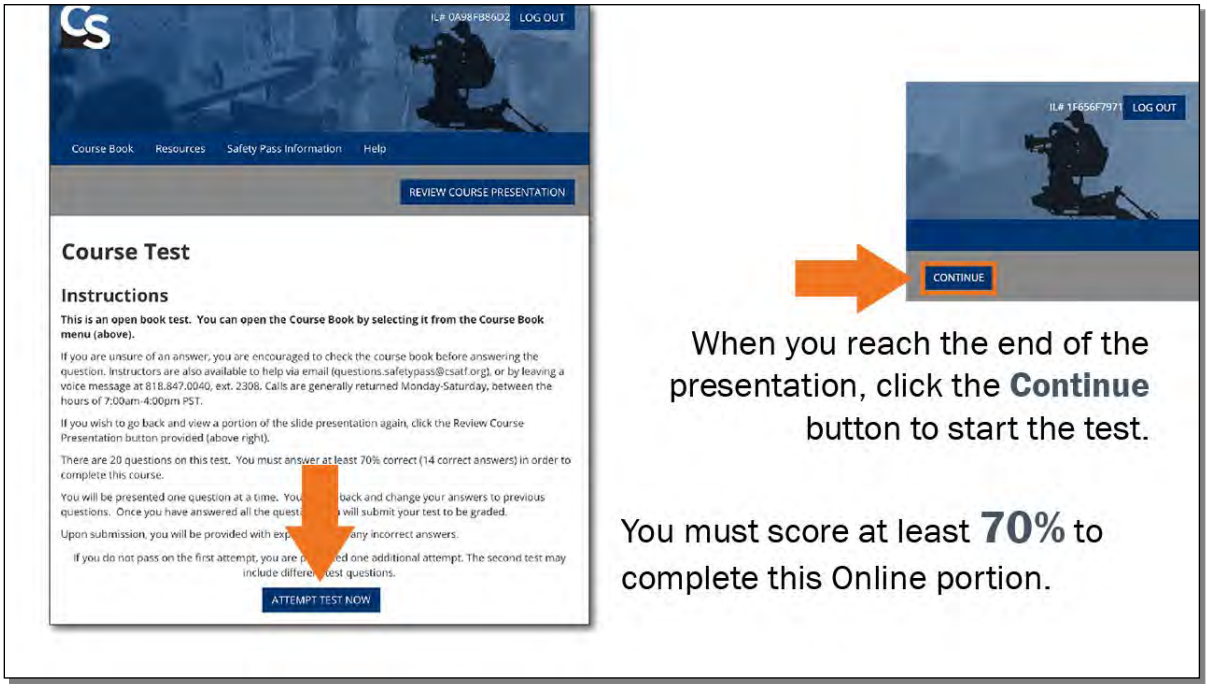
Above the player window, you'll find the *Resources* tab; hovering over the tab will display links to course-related resources like guidelines, regulations, and appendices.

The *Safety Pass Information* tab provides a link to current safety bulletins.

Under the *Course Book* tab you'll find a link to a PDF version of a supplementary course book. You may use the course book for reference while you are viewing the presentation.

Throughout the presentation you'll notice small book icons in the lower right corner of the slides; the numbers in these icons reference course book pages where you can find supplementary information about the topic being covered.

Slide 5 - Welcome 1.6+1.7



When you reach the end of the presentation, you will be directed to the test for the Online portion of the course. You must score at least 70% to successfully complete this Online portion. During the test, you are free to refer to the course book and provided resources. If you have a question about course content--you don't fully understand a topic, want more information regarding a regulation, or need clarification on a test question--first check the course book. If you need additional support, you can find subject-matter expert contact information by clicking on the *Instructor Help* link under the *Help* tab.

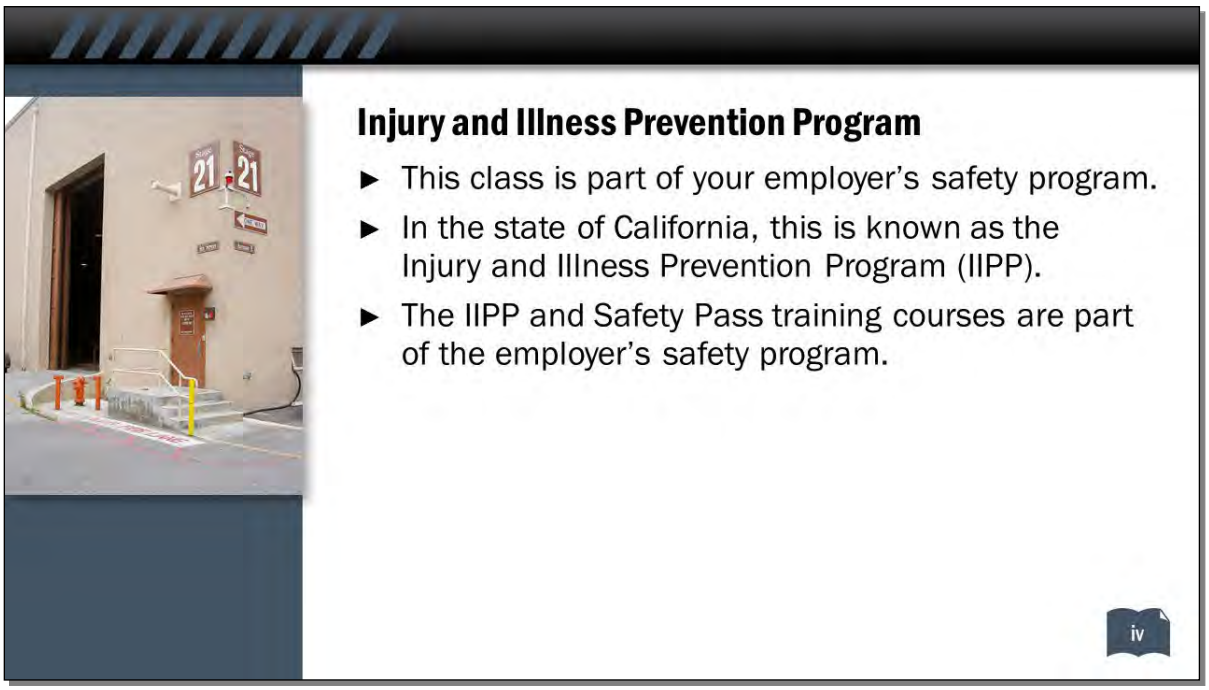
For issues affecting use of the course--like audio, video, or navigational problems--you can find technical support contact information by clicking on the *Technical Assistance* link under the *Help* tab.

Once you have passed the test you will need to return to the *Registration* page to enroll for the In-Person portion of the course.

As a reminder, in order to receive credit for this course, you must successfully complete both the Online and In-Person portions. You must complete the In-Person portion of this course by the date indicated on the *Registration* page or you will need to complete the Online portion again.

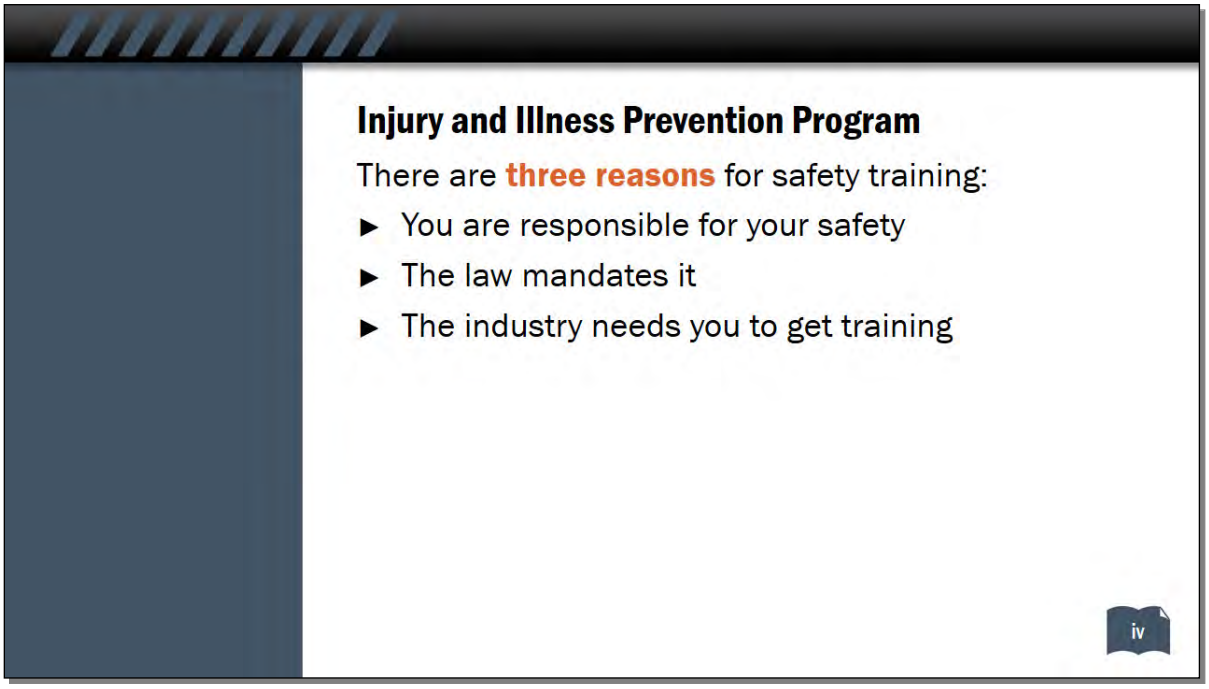
If you're ready to begin, click the *NEXT* button to get started.

Slide 6 - IIPP



This course is part of your employer's safety program. In the state of California, this is known as an Injury and Illness Prevention Program (or IIPP). The IIPP and the Safety Pass training courses are part of your employer's safety program.

Slide 7 - Three Reasons



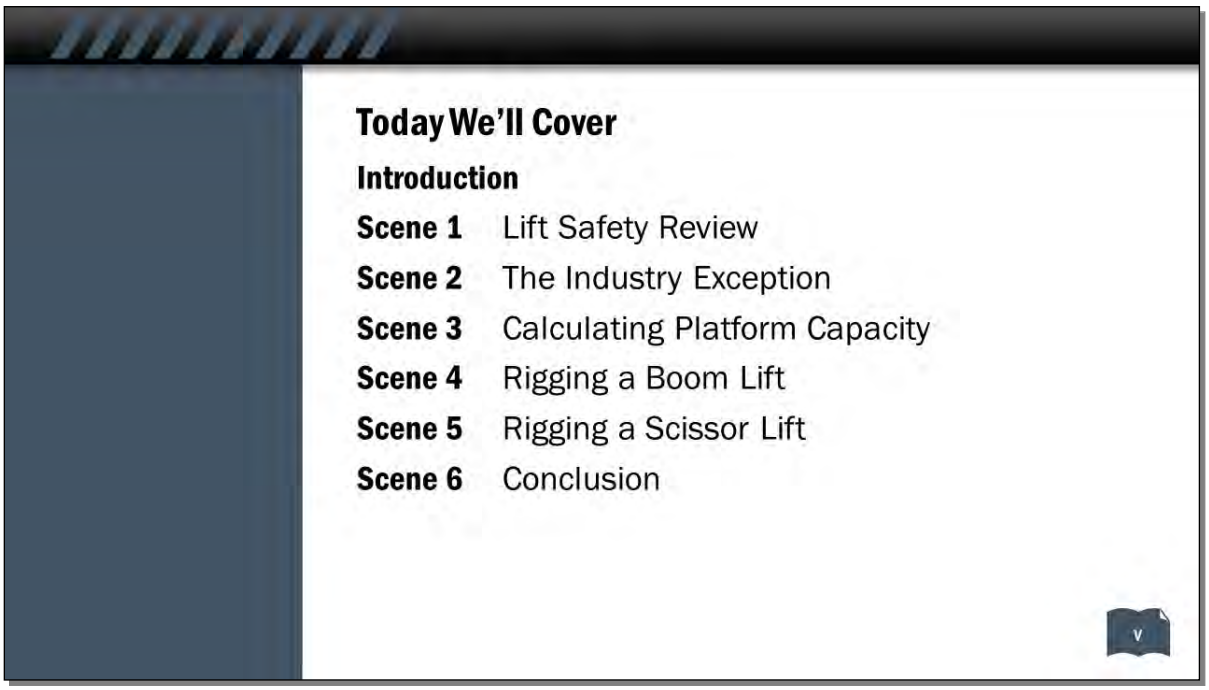
There are three reasons to get safety training.

First, you are personally responsible for your safety. You owe it to yourself and your coworkers to avoid accidents and injuries. The way you make a living and your quality of life depend on it.

Second, it is the law. Occupational safety and health standards guarantee the right to a safe workplace and require employers to train their employees in safety.

And third, the industry requires it. This course is part of a cooperative commitment between major motion picture and television studios and industry labor unions to deliver safety training.

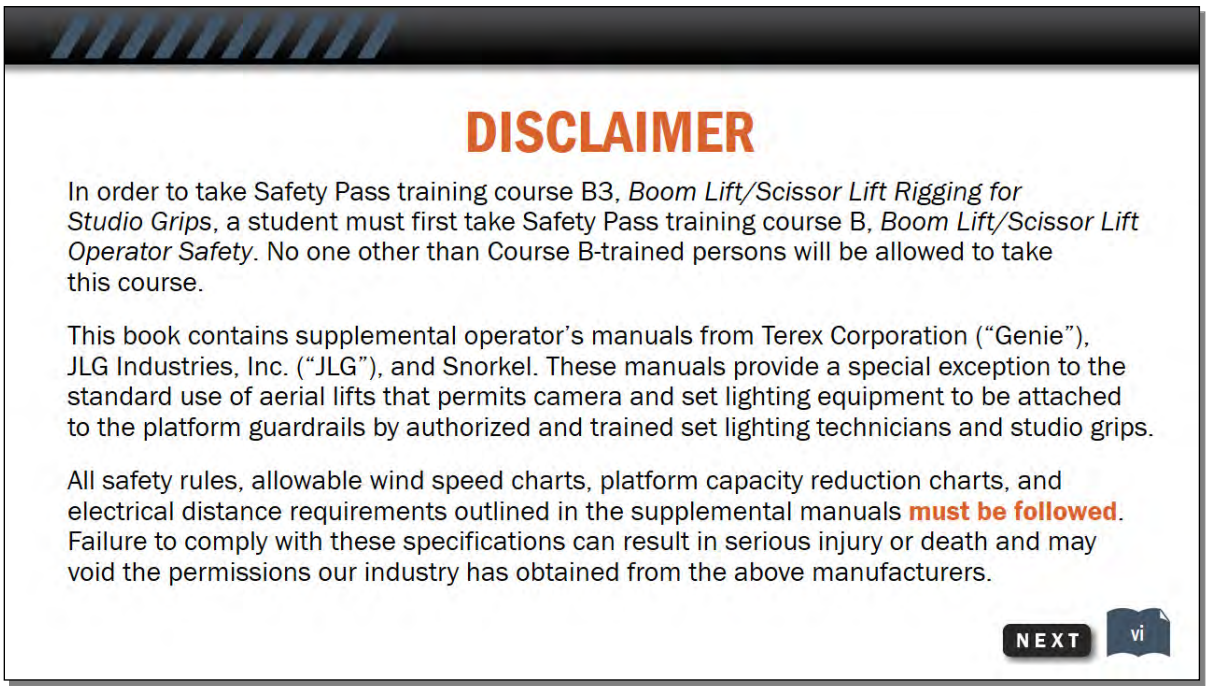
Slide 8 - Today We'll Cover



Today, we'll begin with a review of basic lift safety and then cover procedures for rigging boom lifts and scissor lifts for the motion picture industry.

Let's get started.

Slide 9 - DISCLAIMER



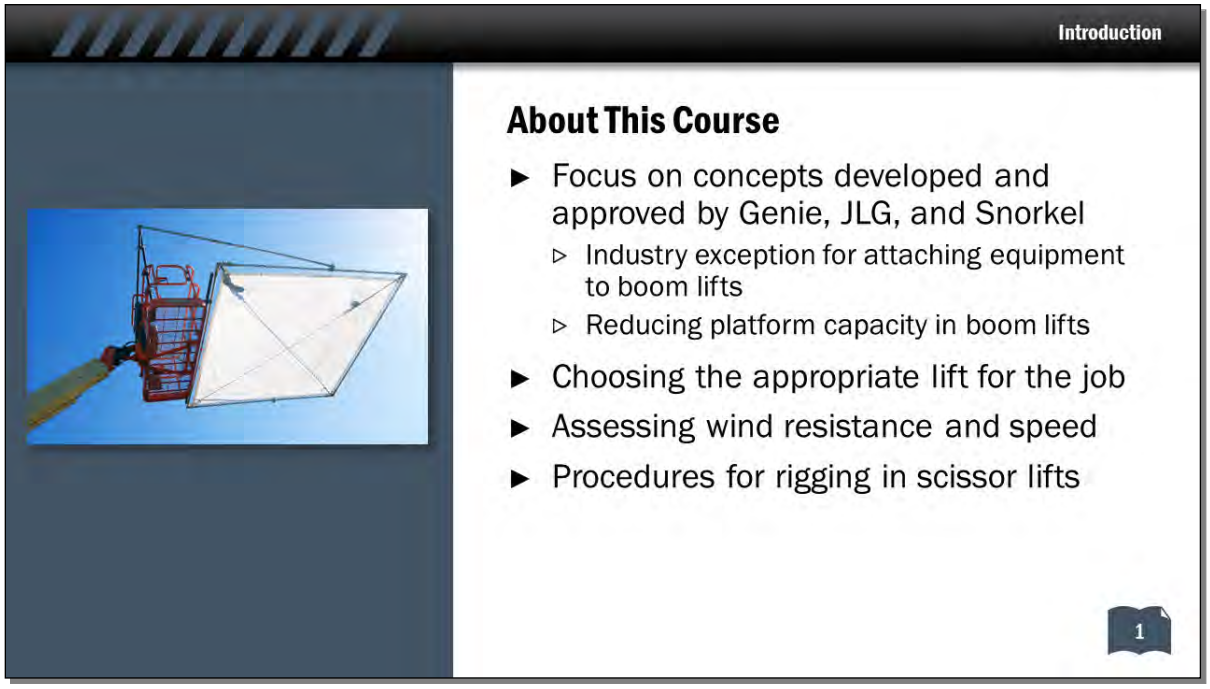
In order to take Safety Pass training course B3, *Boom Lift/Scissor Lift Rigging for Studio Grips*, a student must first take Safety Pass training Course B, *Boom Lift/Scissor Lift Operator Safety*. No one other than course B-trained persons will be allowed to take this course.

This book contains supplemental operator's manuals from Terex Corporation, JLG Industries, Inc., and Snorkel. These manuals provide a special exception to the standard use of aerial lifts that permits camera and set lighting equipment to be attached to the platform guardrails by authorized and trained set lighting technicians and studio grips. All safety rules, allowable wind speed charts, platform capacity reduction charts, and electrical distance requirements outlined in the supplemental manuals must be followed. Failure to comply with these specifications can result in serious injury or death and may void the permissions our industry has obtained from the above manufacturers.

Slide 10 - Introduction

Introduction.

Slide 11 - About This Course



This course focuses on concepts that have been developed and approved for studio grips by Genie, JLG, and Snorkel, specifically the exception given by the manufacturers to the motion picture industry for attaching equipment to boom lifts and determining and reducing platform capacity in boom lifts. We'll also talk about choosing the appropriate lift for the job, assessing wind resistance and speed, and procedures for rigging in scissor lifts, which are not covered by the industry exception.

Slide 12 - Terminology

The lifts discussed in this course go by a number of names. In general, they can be called *mobile elevating work platforms* or *aerial lifts*. In OSHA regulations, a scissor lift is called an *elevating work platform*, and a boom lift is referred to as an *aerial device* or an *extensible boom platform*.

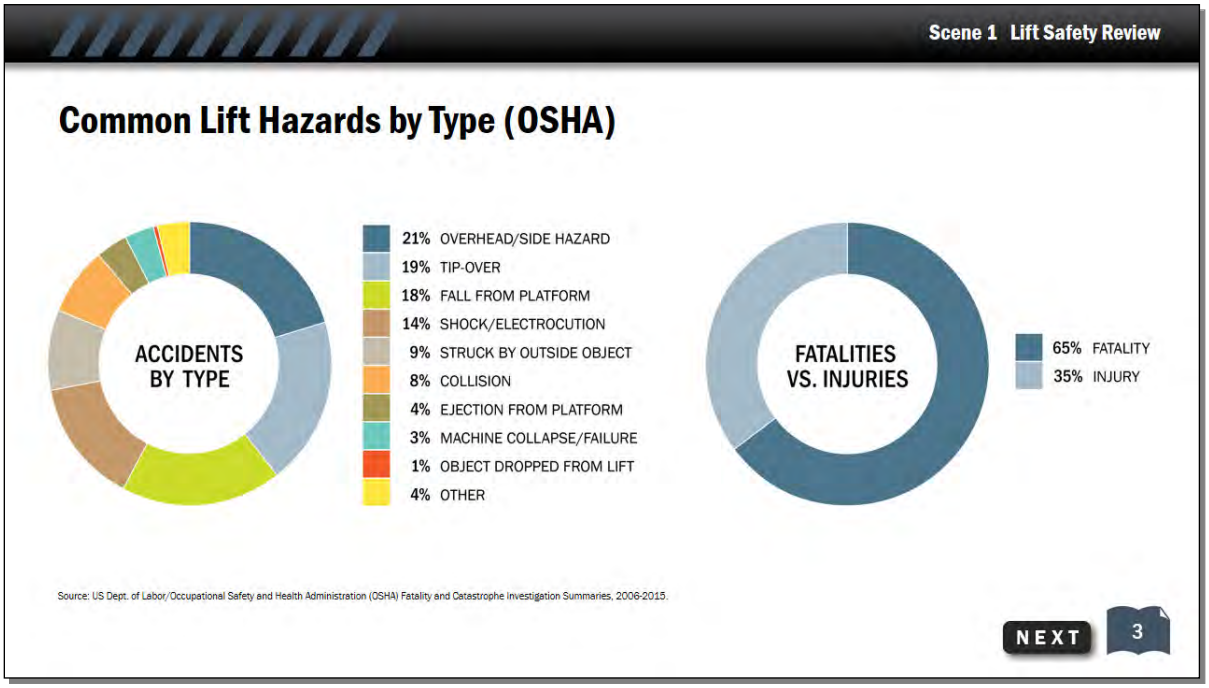
Boom lifts also have nicknames such *as Condor, stick boom, knuckle boom, cherry picker*, or *Z-boom*. In the interest of simplicity, this course will use *scissor lift* and *boom lift* to refer to the individual machines.

The terms *platform*, *machine*, *lift*, and *device* will apply to both types unless otherwise indicated. *Boom* and *basket* will apply only to boom lifts.

Slide 13 - Lift Safety Review

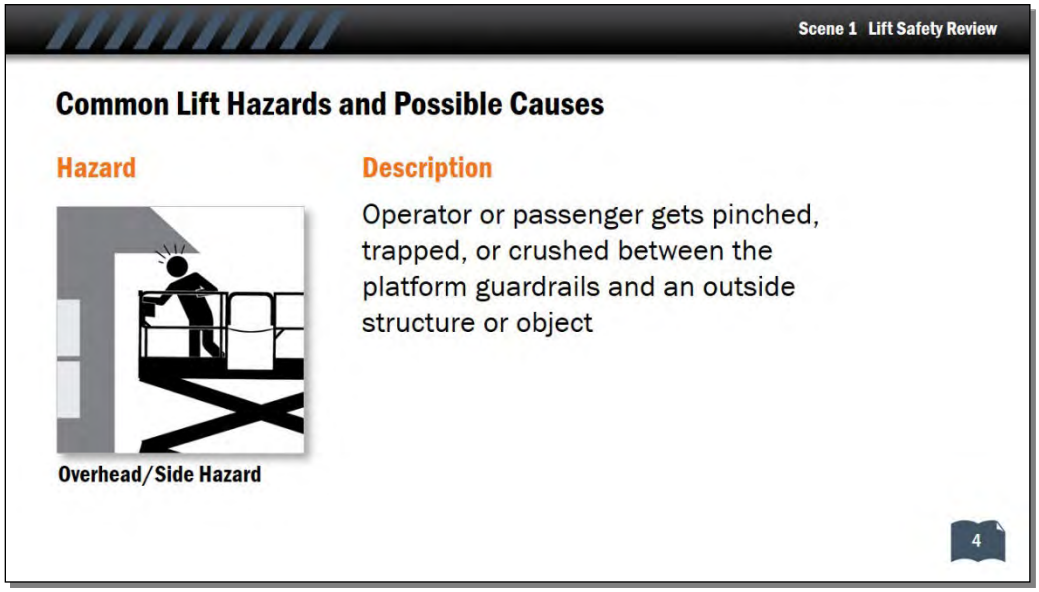
In this scene, we'll revisit the basic concepts of lift safety and operation that were presented in our B course, *Boom Lift/Scissor Lift Operator Safety*.

Slide 14 - OSHA Accident Statistics



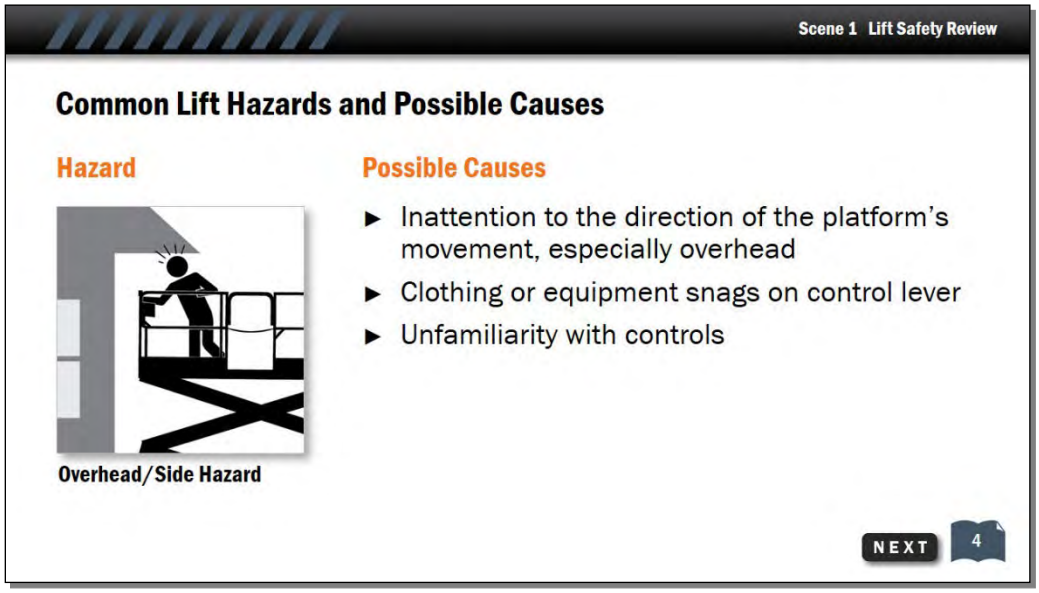
These 10-year figures from the Occupational Safety and Health Administration, or OSHA, show that the top three causes of injuries involving boom lifts and scissor lifts were: contact with an overhead or side hazard, a machine tip-over, or a fall from the platform. They also show that 65%, or well over half, of all of the injuries were fatalities.

Slide 15 - Overhead/Side



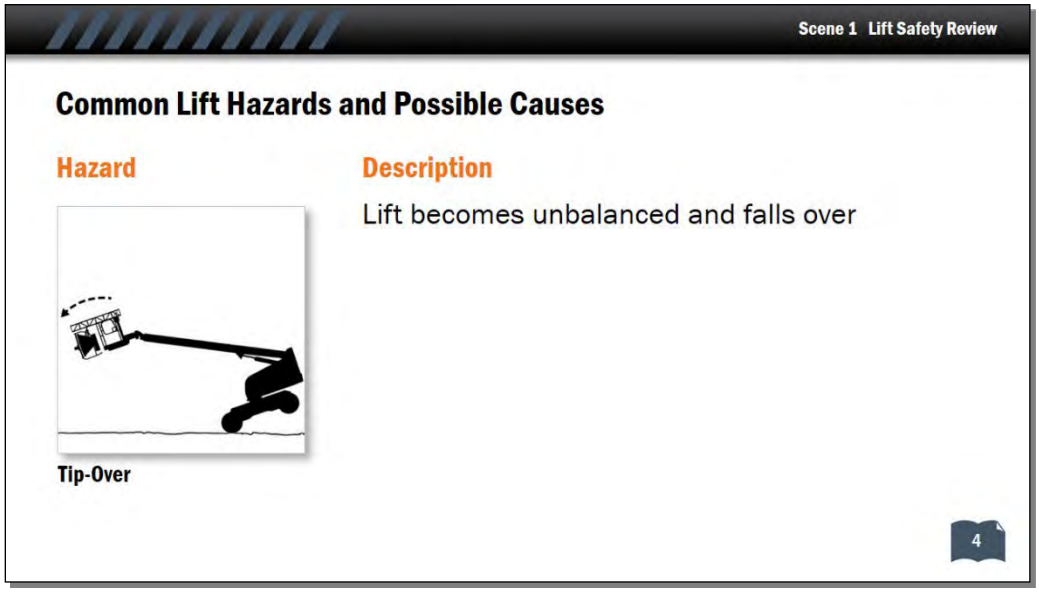
The top injury, involving overhead or side hazards, occurs when the lift operator gets pinched, trapped, or crushed between the platform guardrails and an outside structure and is not able to reverse the controls to get free.

Slide 16 - Overhead/Side 2



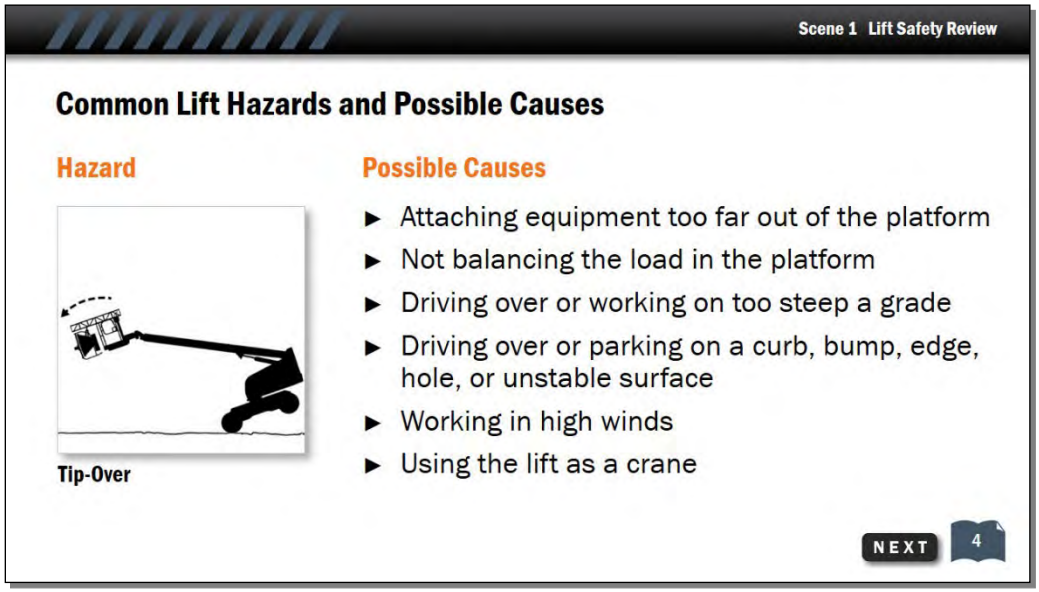
It's most likely to be caused by not looking in the direction of the platform's movement, especially overhead It could also happen if the operator's clothing or equipment catches the control lever and inadvertently moves the platform. Or, the operator could be unfamiliar with the controls.

Slide 17 - Tip-Over



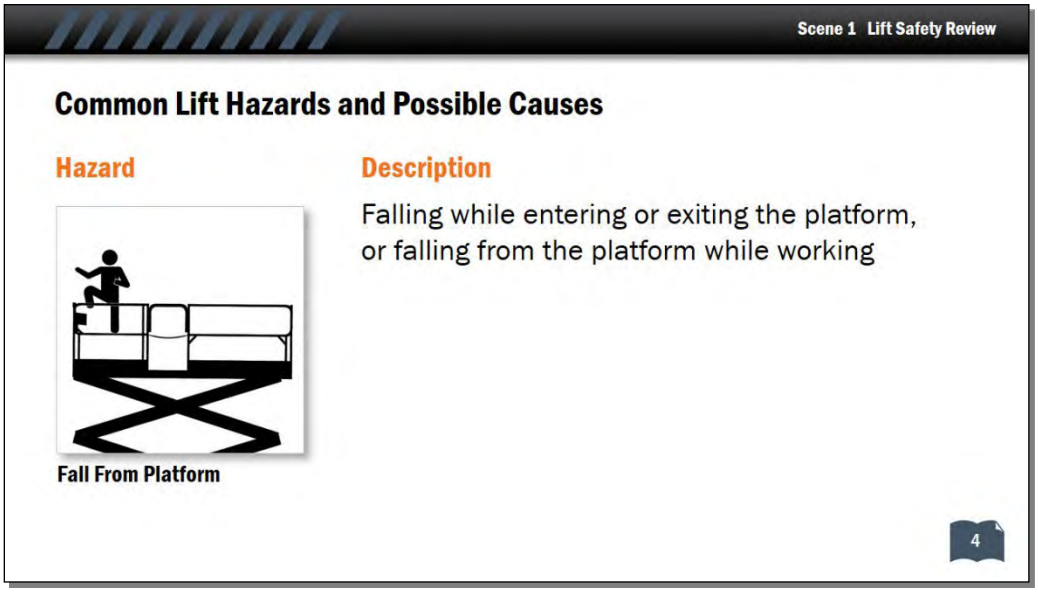
A tip-over is just what it sounds like--the lift becomes unbalanced and tips over, and the operator is injured by being thrown out of the platform or by being crushed by the falling machine.

Slide 18 - Tip-Over



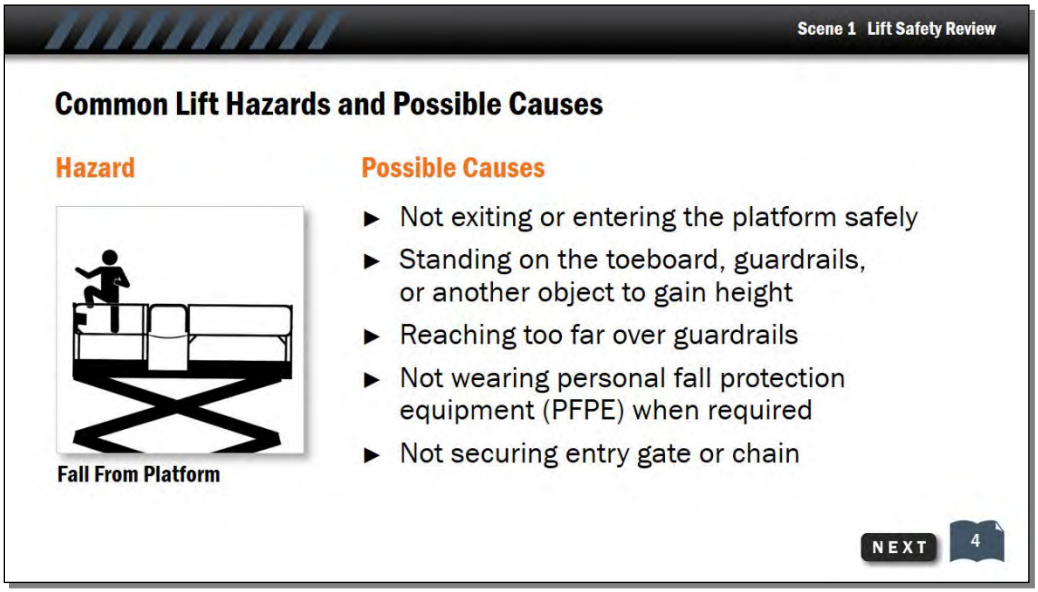
This may be due to attaching equipment too far out of the platform, not balancing the load in the platform, driving or working on too steep a grade for the machine, driving over or parking on a curb, bump, edge, hole, or unstable surface, working in high winds, or using the lift as a crane.

Slide 19 - Fall From Platform



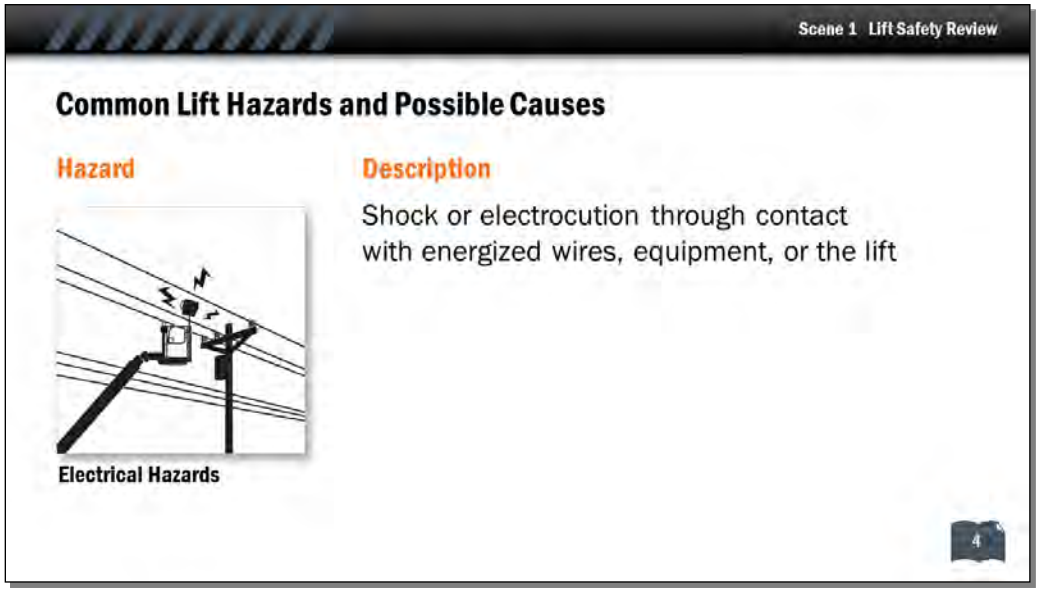
To avoid falling while entering or exiting the platform, face the platform and use three points of contact when getting on or off.

Slide 20 - Fall From Platform 2



To prevent a fall while working on an elevated platform, don't stand on the toeboard or guardrails, or place an object such as an apple box in the platform to gain height. Always keep both feet on the platform floor--reaching too far over the guardrail can cause you to lose balance. Wear personal fall protection equipment (or PFPE) when it's required and remember to close and secure the entry gate or chain.

Slide 21 - Electricity

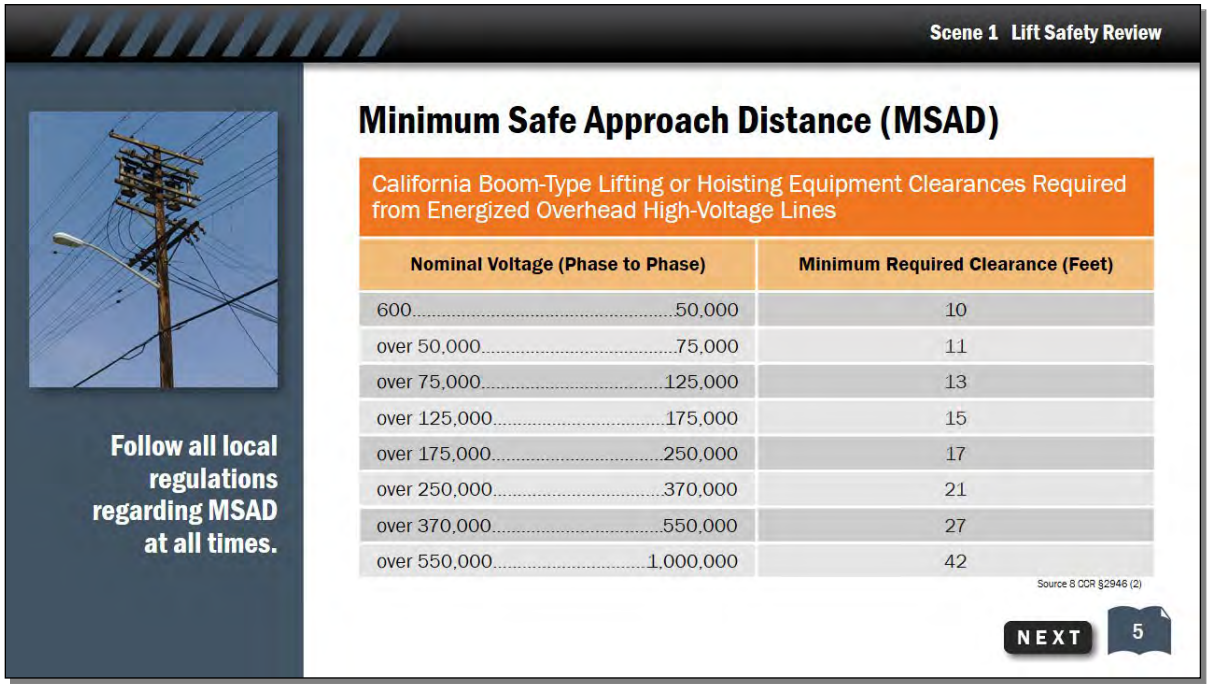


Injuries from electrical hazards occur when a lift operator is shocked or electrocuted through proximity to, or contact with, energized wires or machinery.

Slide 22 - Electricity 2

Causes for this include improperly using or dressing power cables, using the lift as a ground for welding, or not following MSAD, or minimum safe approach distance, requirements.

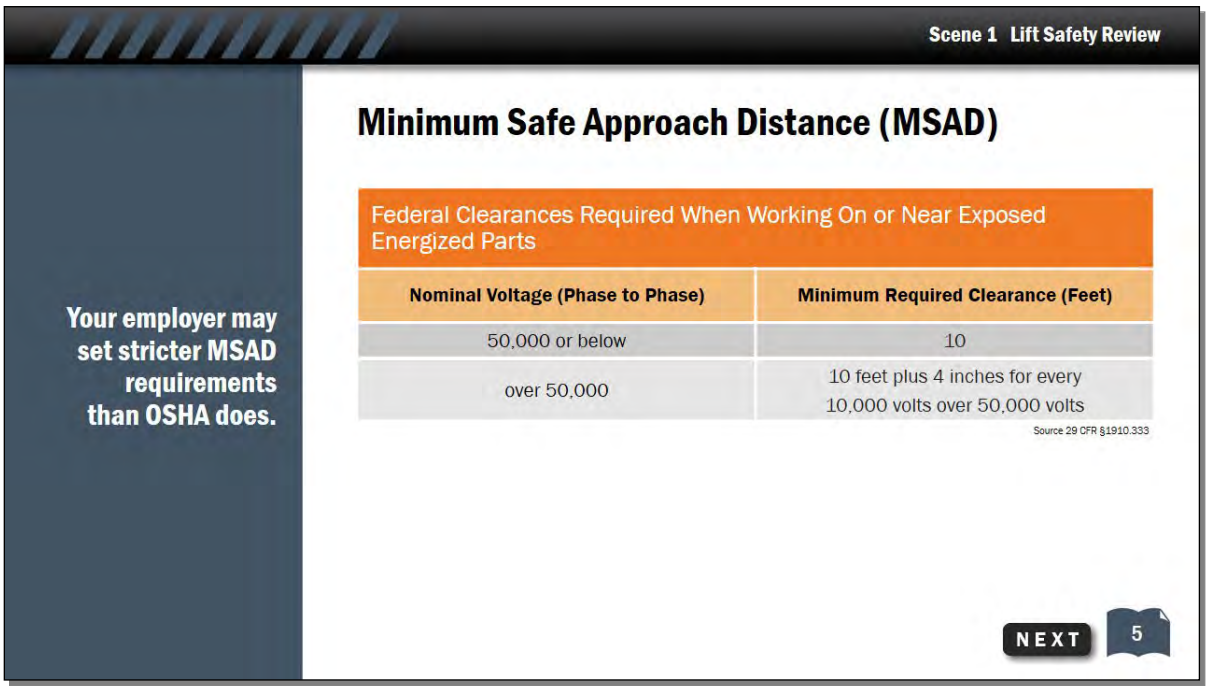
Slide 23 - MSAD - California



This table shows the MSAD requirements for lift work in California. If the voltage of a power line is between 600 and 50,000 Volts, all parts of the lift must be at least 10 feet away. The clearance distance increases as the voltage does.

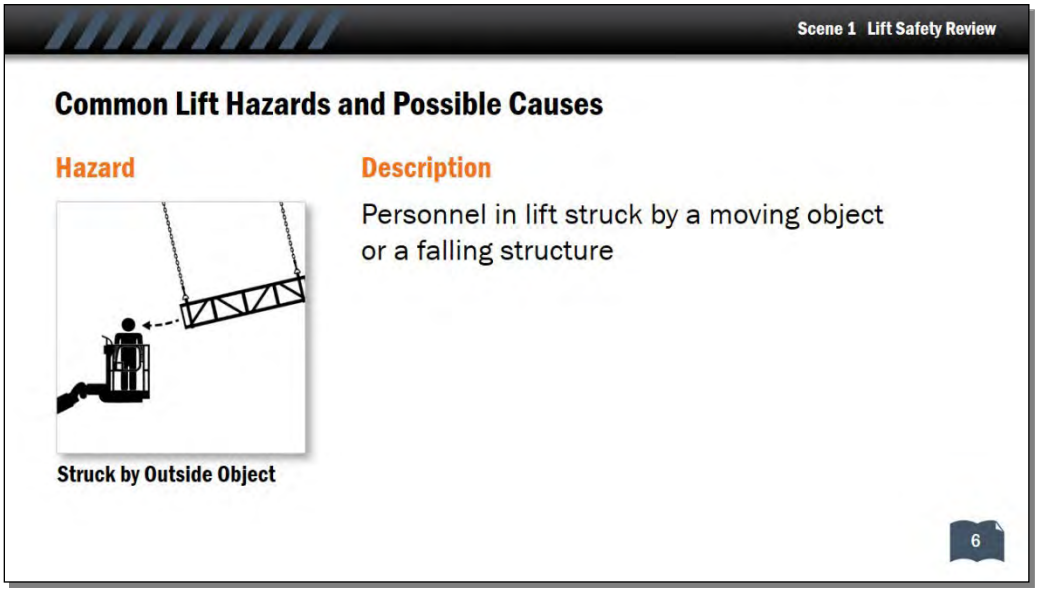
What if you're not sure of the voltage of a power line? Note the number on the power line's pole, call the local power company, and ask for a "pole spotter" for information. In the meantime, and in general, follow the rule of thumb that when in doubt, always assume a line is energized and stay the maximum distance away.

Slide 24 - MSAD - Federal



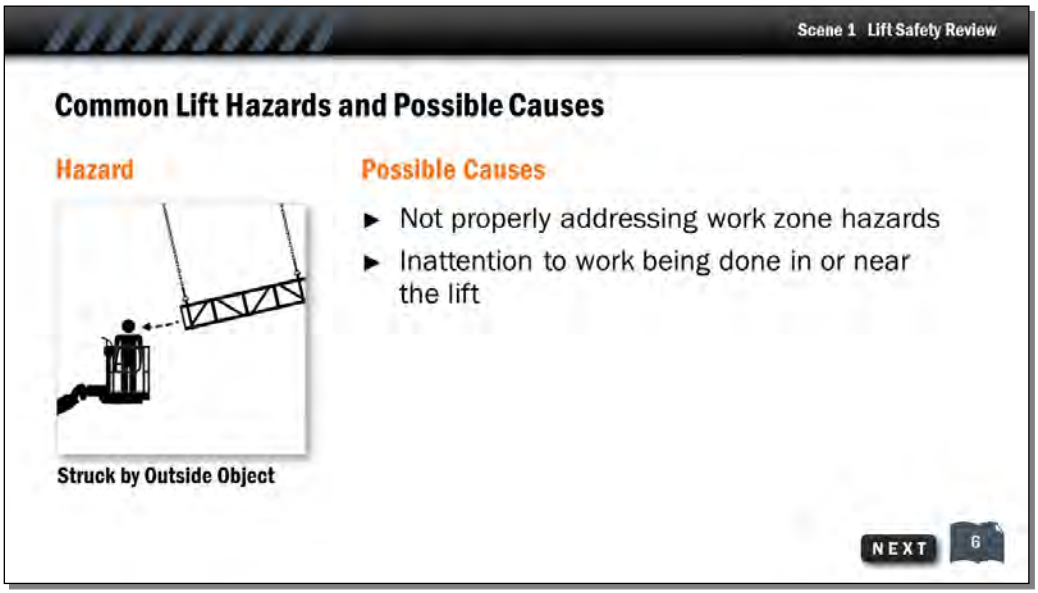
This table shows the MSAD requirements set by federal OSHA, if you're not working in California. You can find both tables in Safety Bulletin #22A under the *Safety Pass Information* tab. Be aware that your employer may set greater MSAD requirements than either California or federal OSHA.

Slide 25 - Struck by Object



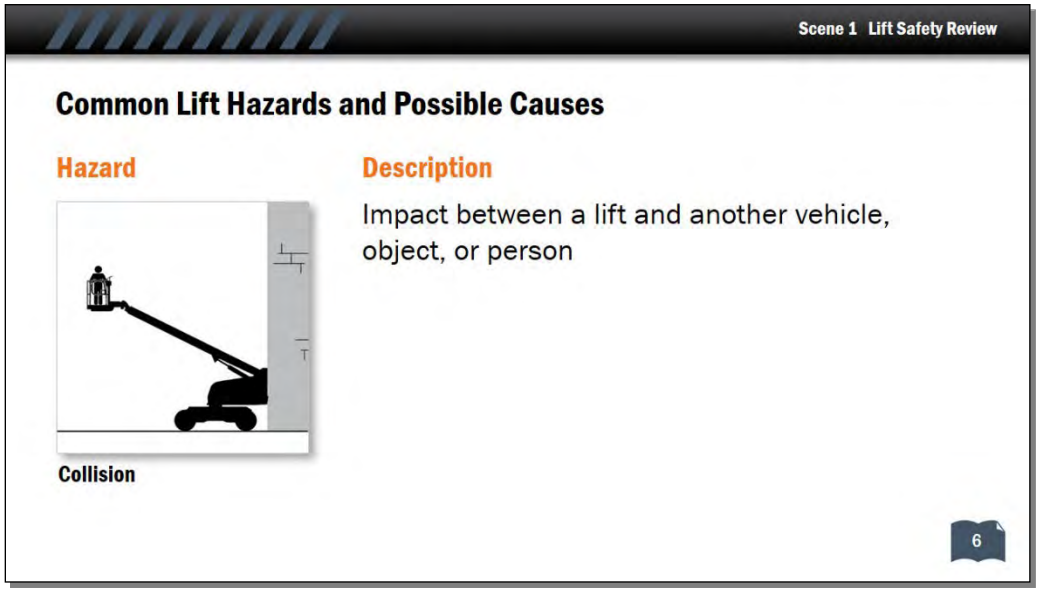
Let's get back to our list of lift hazards. The next one is, being struck by an outside object while in a lift.

Slide 26 - Struck by Object



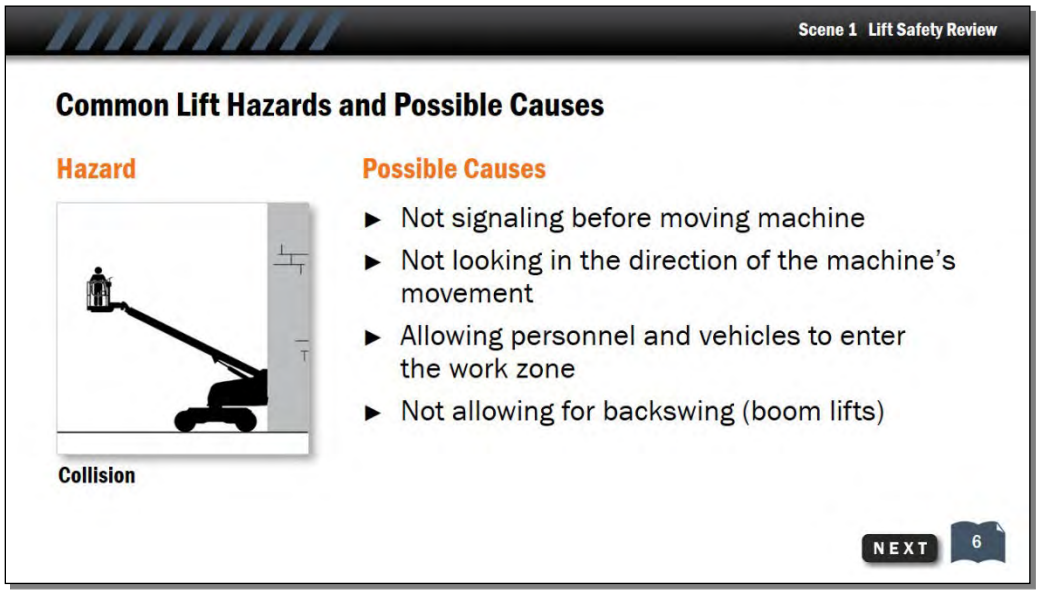
Possible causes of this may be not addressing overhead work zone hazards, or inattention to work being done in or near the lift.

Slide 27 - Collision



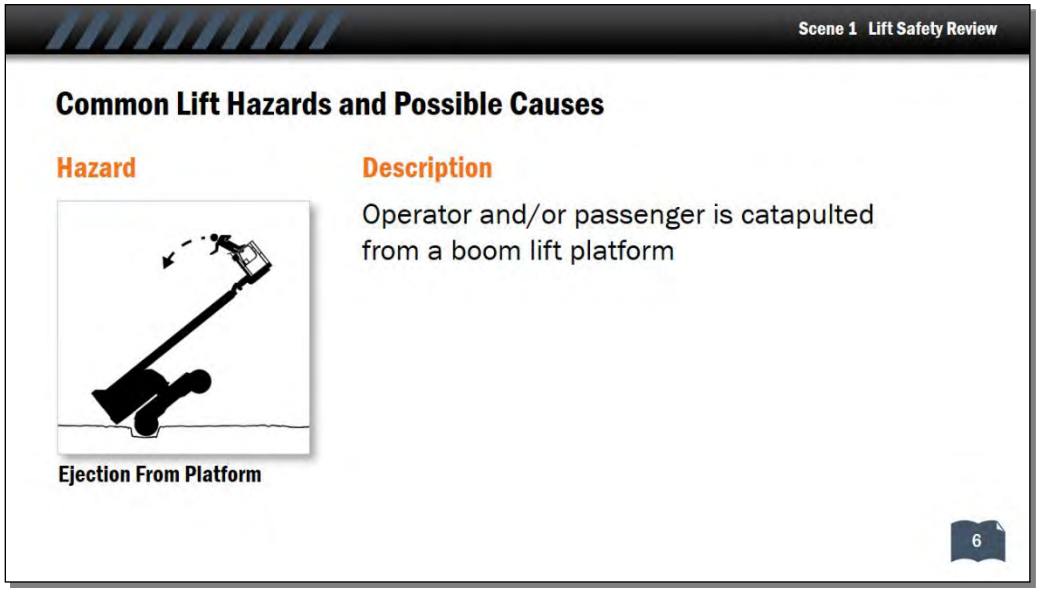
A collision can cause injuries when a lift strikes a person, a structure, or another vehicle.

Slide 28 - Collision 2



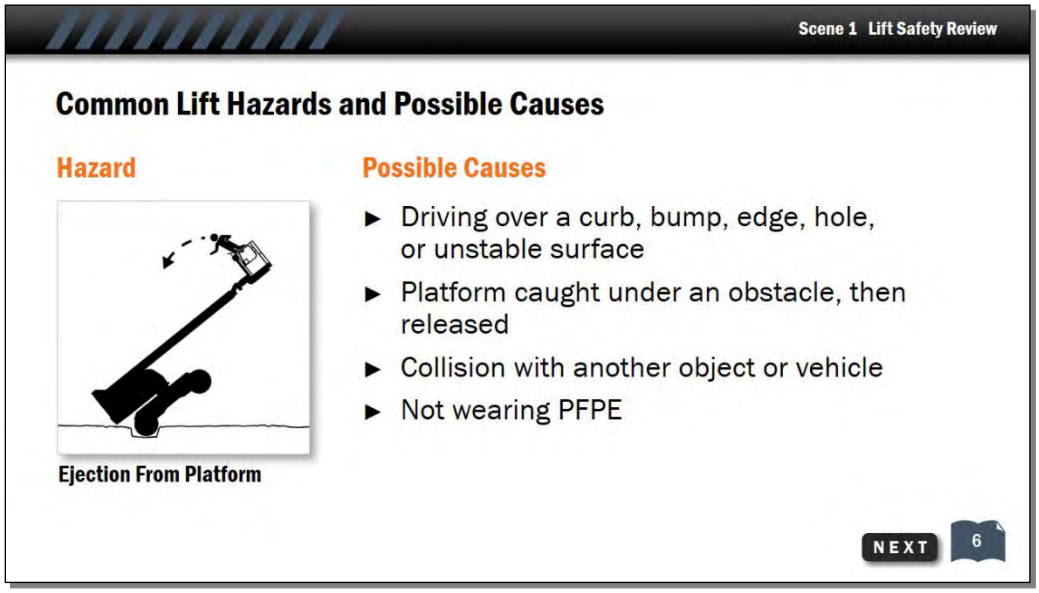
This could happen if the operator doesn't signal before moving the machine, isn't looking in the direction of the machine's movement while driving, allows personnel or vehicles to enter the work zone, or doesn't allow for the backswing of a boom lift.

Slide 29 - Ejection



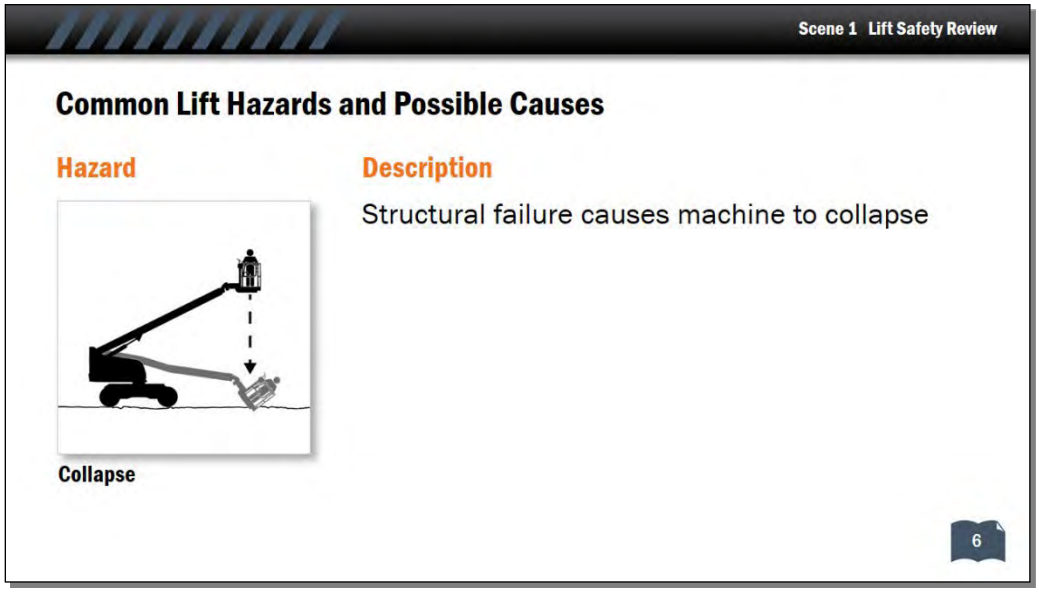
The long arm of a boom lift contains a certain amount of “give,” and under certain circumstances, it can sway so much that occupants of the platform could be catapulted out.

Slide 30 - Ejection



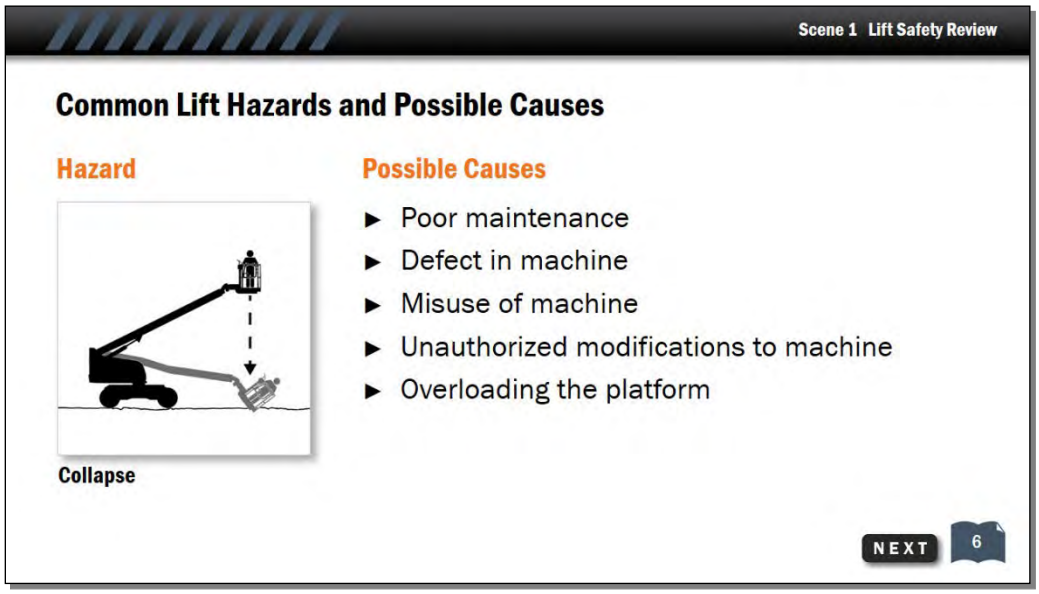
This includes driving over a curb, bump, edge, hole, or unstable surface, the platform catching under an obstacle and then being released, a collision with a structure or a vehicle, and not wearing PFPE.

Slide 31 - Collapse



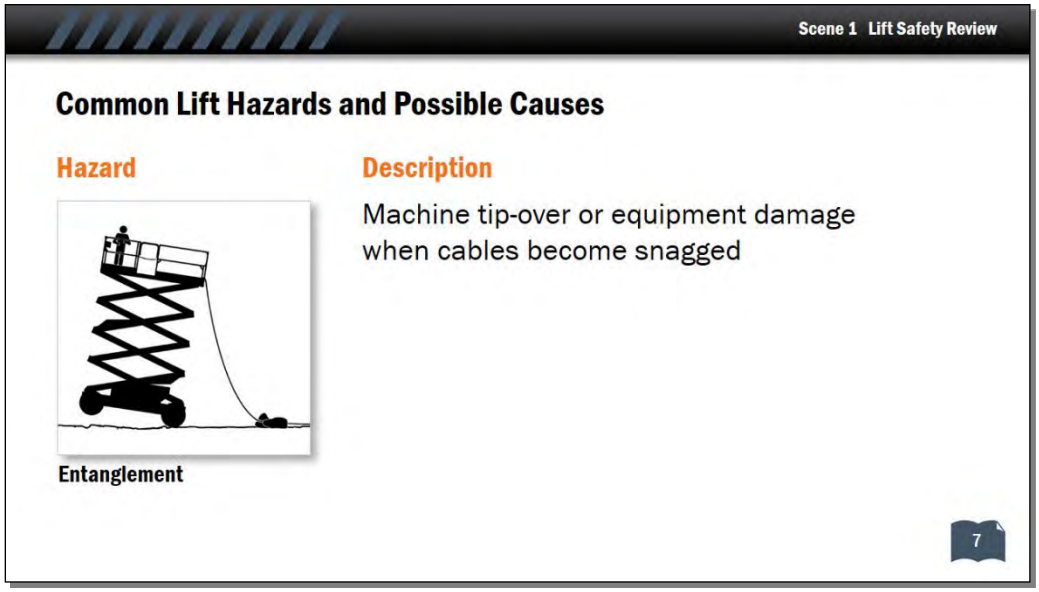
In extreme cases, a boom lift or scissor lift may collapse, causing the platform to suddenly drop.

Slide 32 - Collapse 2



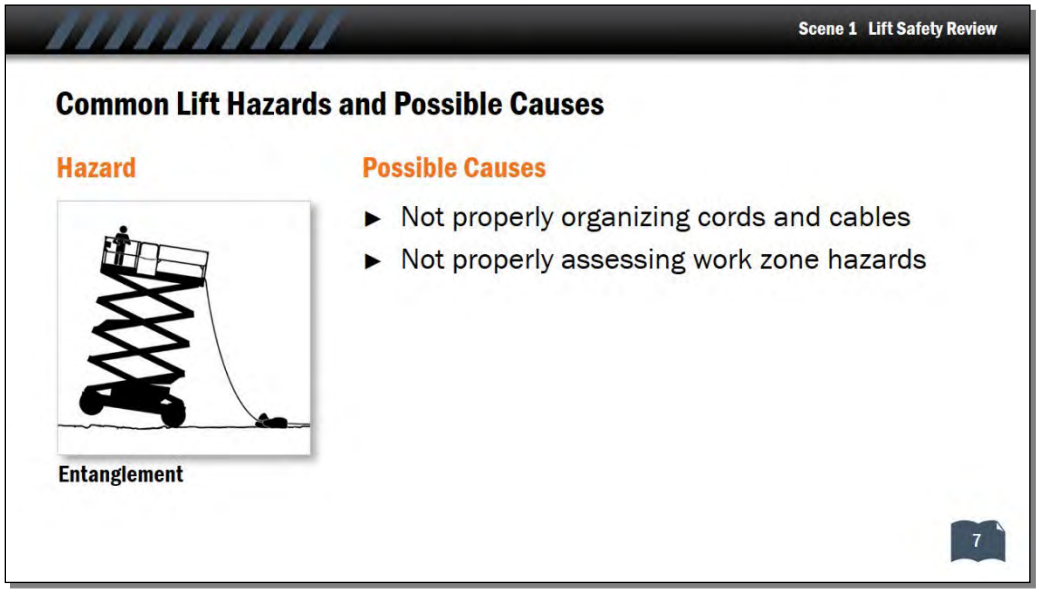
This could be due to poor maintenance, a defect in the machine, misuse of the lift, unauthorized modifications to the lift, or overloading the platform.

Slide 33 - Entanglement



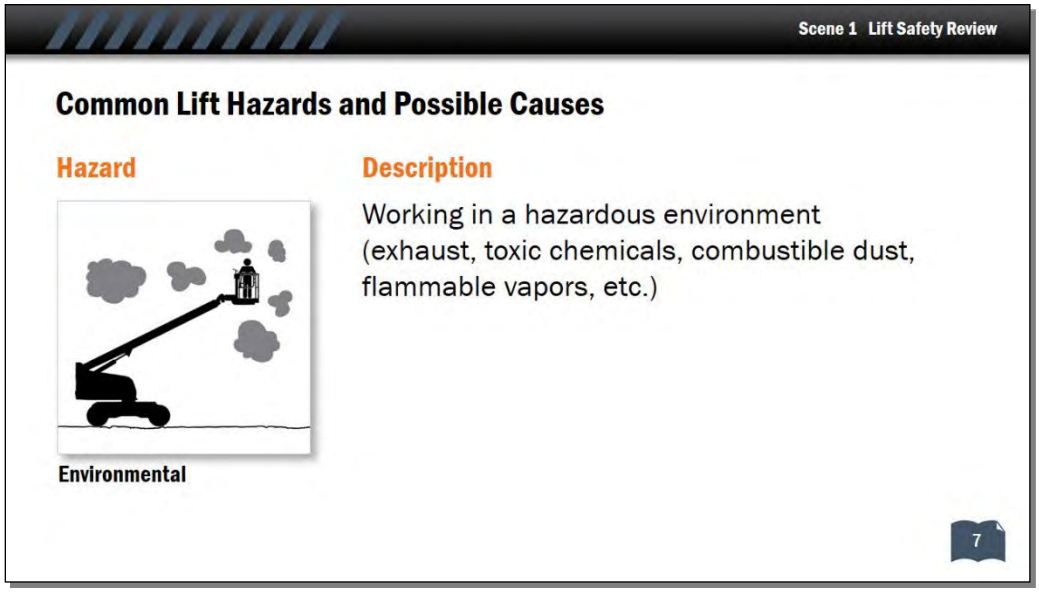
When cables are run from a lift platform to the ground, care must be taken to ensure that they don't get snagged on objects on the ground or driven over by the lift itself. Either situation can pull the lift over, or damage equipment in the lift or on the ground.

Slide 34 - Entanglement 2



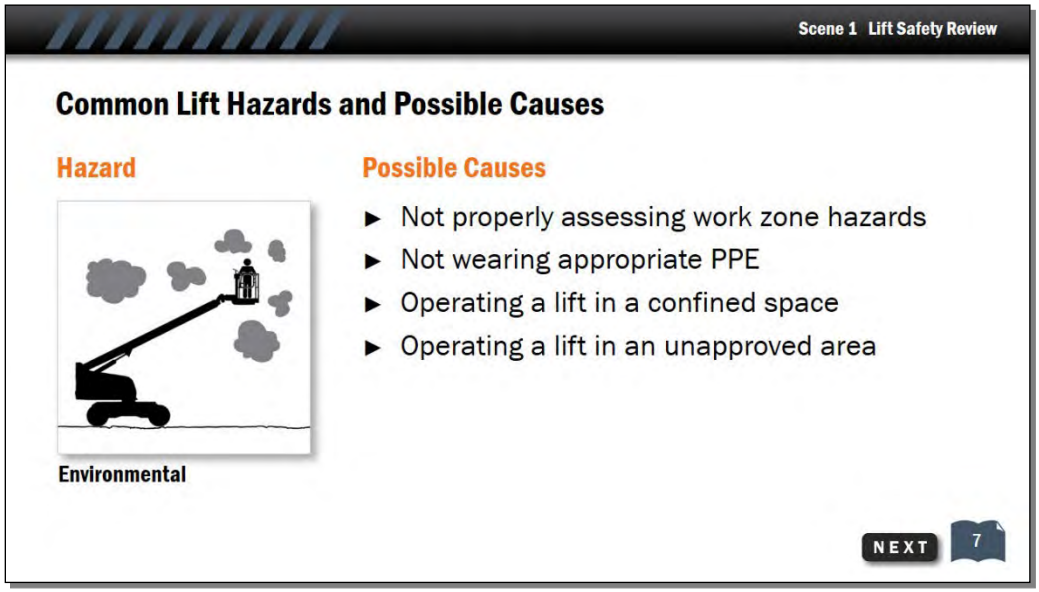
To avoid entanglement hazards, keep cords and cables organized, and be aware of obstacles in the work zone.

Slide 35 - Environmental



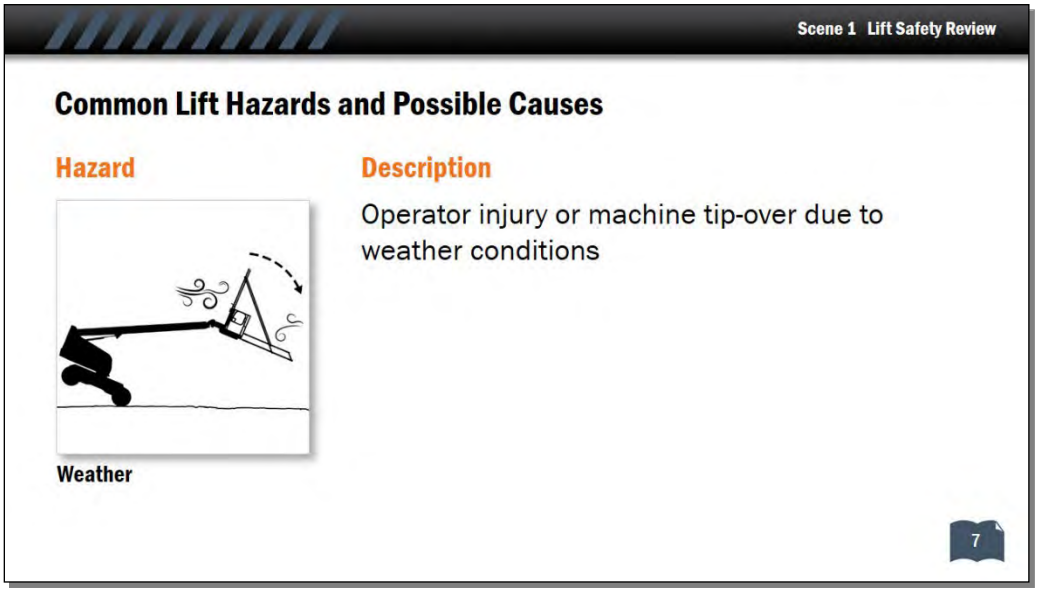
Let's talk about hazards in the lift's environment. The area around a lift could expose workers to hazards such as machine and equipment exhaust, toxic chemicals, combustible dust, or flammable vapors.

Slide 36 - Environmental 2



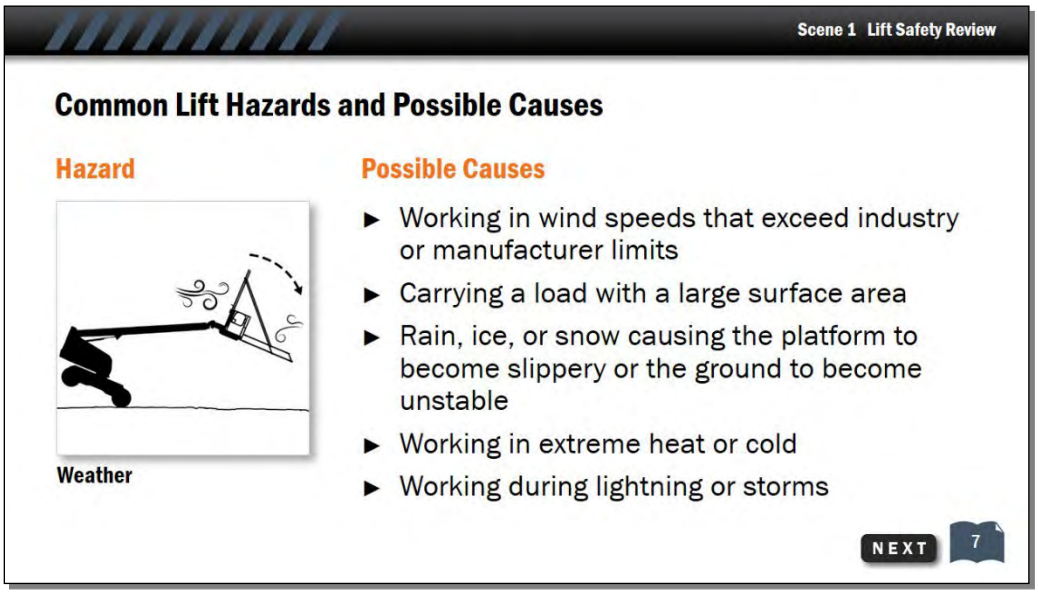
These conditions could arise due to not properly assessing work zone hazards, not wearing appropriate PPE, or operating the lift in a confined space or an unapproved area.

Slide 37 - Weather



The weather can be another type of environmental hazard when working on a lift.

Slide 38 - Weather 2



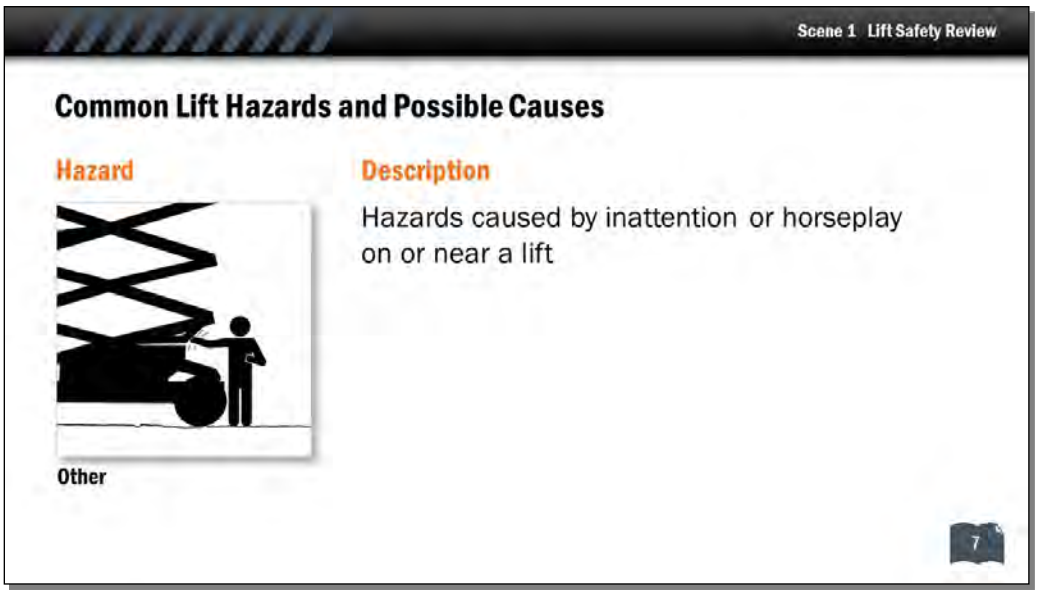
For example, high wind speeds can tip a lift over. Carrying a load with a large surface area can create wind resistance beyond the lift's wind speed ratings.

Rain, ice, or snow can cause the platform or the ground surface to be slippery or unstable.

Fog can affect visibility, and extreme temperatures can cause heat illness or hypothermia.

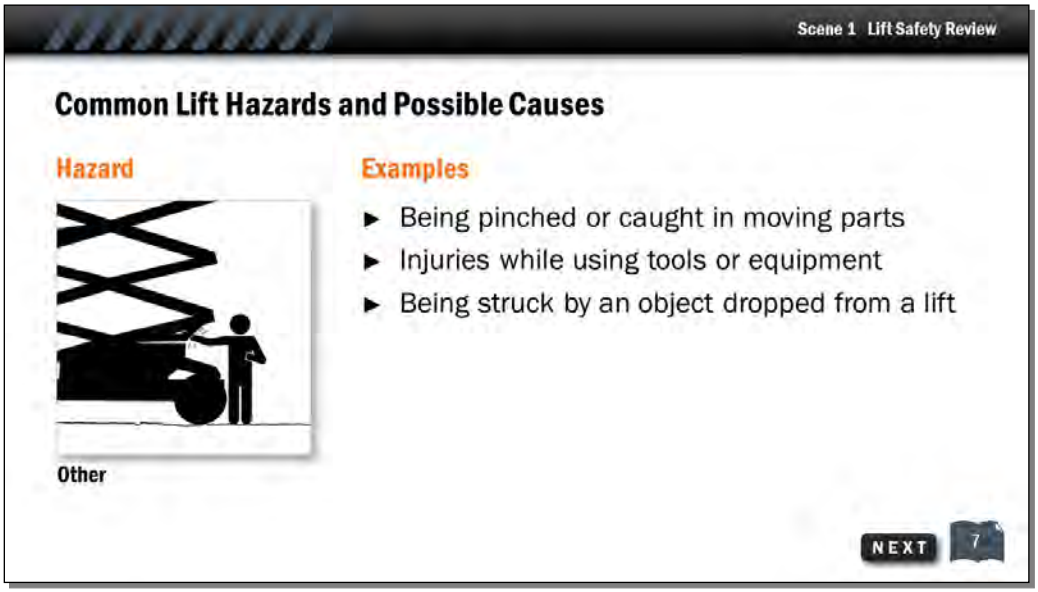
Never use a lift during a storm or when there is lightning.

Slide 39 - Other



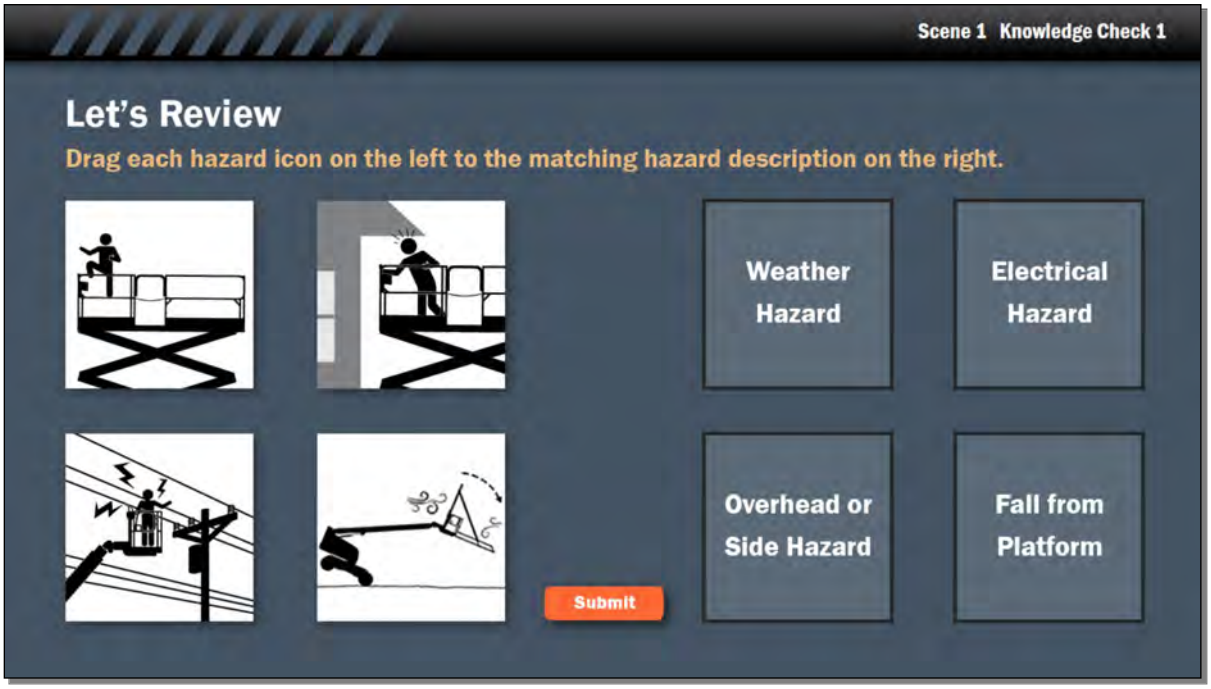
A few other types of hazards that we haven't mentioned yet are a result of inattention or horseplay while working on the platform or near a moving lift.

Slide 40 - Other 2



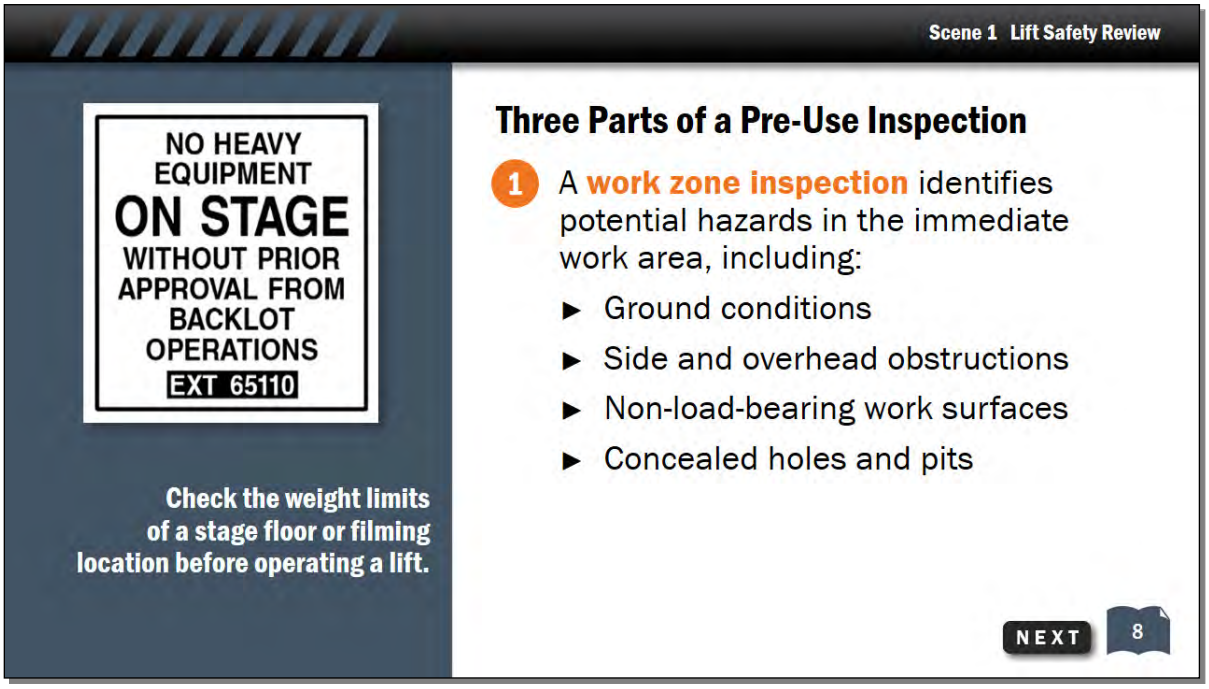
These include being pinched or caught in moving lift parts, being injured by tools or other equipment on the platform or being struck by an object dropped from a lift.

Slide 41 - Knowledge Check 1



Let's review. Drag each icon on the left to the matching hazard description on the right. Then click *Submit*.

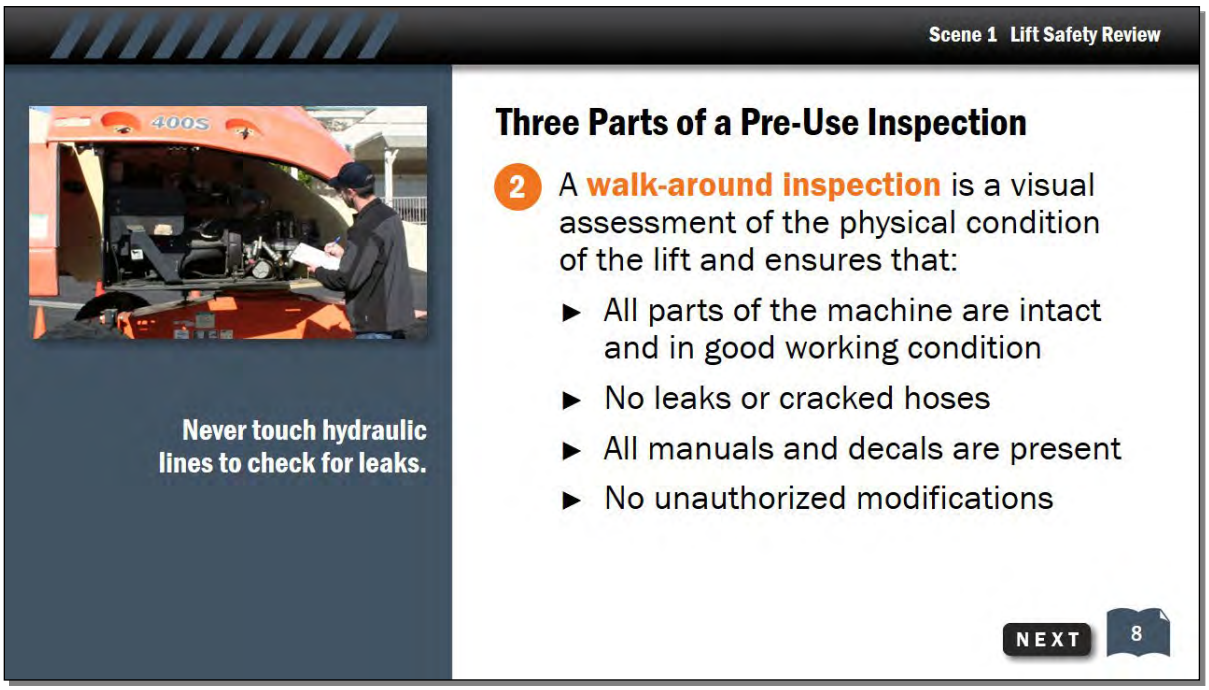
Slide 42 - Pre-Use Inspection 1



A three-part inspection must be performed at the beginning of each workday or shift. The first part, the work zone inspection, identifies potential hazards in the immediate work area, including ground conditions, side and overhead obstructions, non-load-bearing work surfaces, and concealed holes and pits.

Always check weight limits of a stage floor or location before operating a lift.

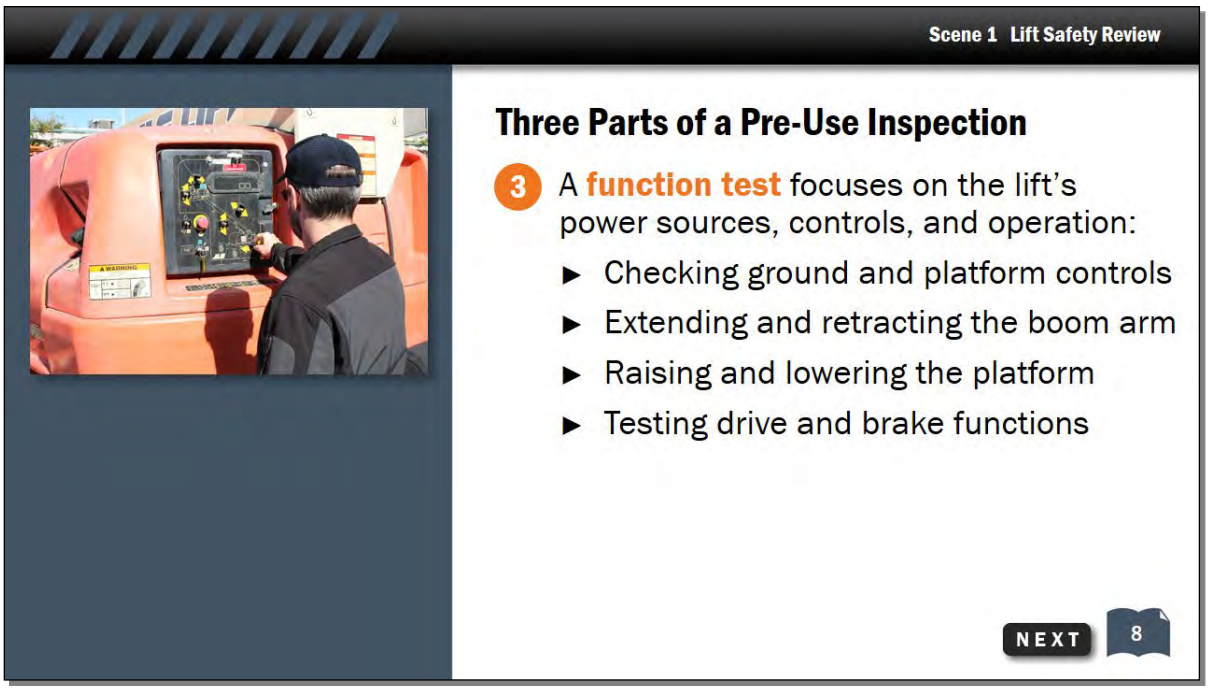
Slide 43 - Pre-Use Inspection 2



The second part of the pre-use inspection, the walk-around inspection, is a visual assessment of the physical condition of the lift. It ensures that all of the parts of the machine are intact and in good working condition, that there are no leaks or cracked hoses, that all of the manuals and decals are present, and that there have been no unauthorized modifications to the machine.

Never touch hydraulic lines when checking for leaks. Hydraulic fluid is highly pressurized and can cause serious injection injuries.

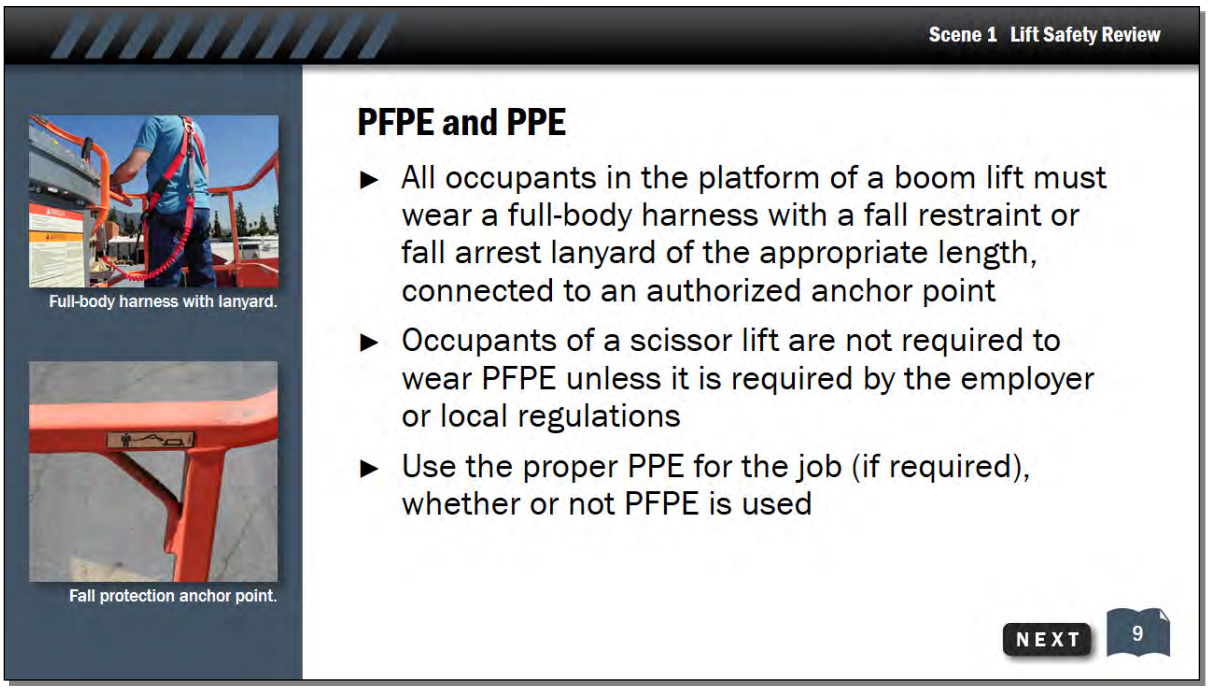
Slide 44 - Pre-Use Inspection 3



The last part of the inspection is the function test, which focuses on the lift's power sources, controls, and operation. It includes checking the ground and platform controls, extending and retracting the boom arm, raising and lowering the platform, and testing the drive and brake functions.

If any part of the machine fails an inspection, safely shut down the machine and contact a supervisor. Never operate a defective machine.

Slide 45 - PFPE and PPE



All occupants in the platform of a boom lift must wear a full-body harness with a fall restraint or fall arrest lanyard of the appropriate length, connected to an authorized anchor point. Our industry does not allow the use of body belts for fall protection. Attach only one harness per anchor point. If the platform doesn't have dedicated fall protection anchor points, ask your employer or safety rep how to proceed. Occupants of a scissor lift are not required to wear PFPE unless it is specified by the employer or local regulations.

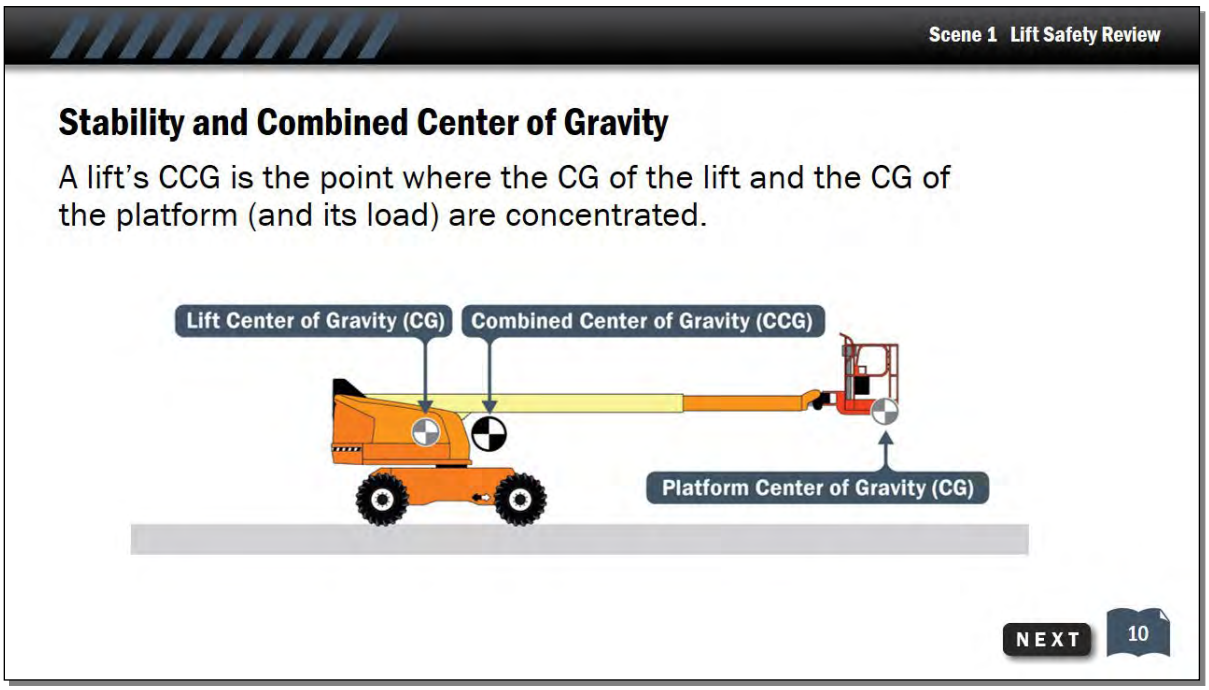
Whether PFPE is required or not, be sure you are using the proper PPE for the job at hand.

Slide 46 - Driving While Elevated

Lifts should be driven with the platform in the lowest recommended driving position. Driving with the platform elevated, as shown here, is allowed only if the following conditions are met: the driving surface is firm, smooth, and level, without any holes or debris, the operator has a clear view of the travel path, the lift is operated at a speed determined by the manufacturer, and, the operator has the employer's approval to do so. Some employers may not allow a boom lift or scissor lift to be driven while it is elevated.

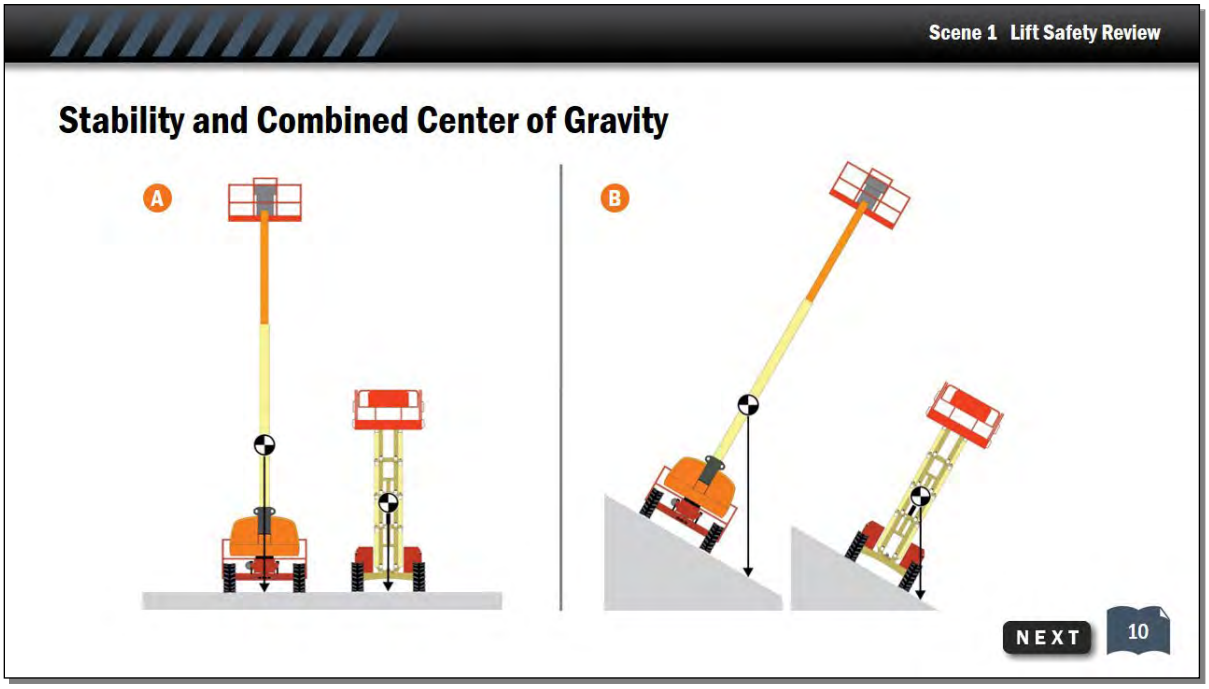
There are additional procedures that must be followed when driving a lift with equipment rigged in the platform. We'll talk more about that in Scenes 4 and 5.

Slide 47 - Stability and CCG 1



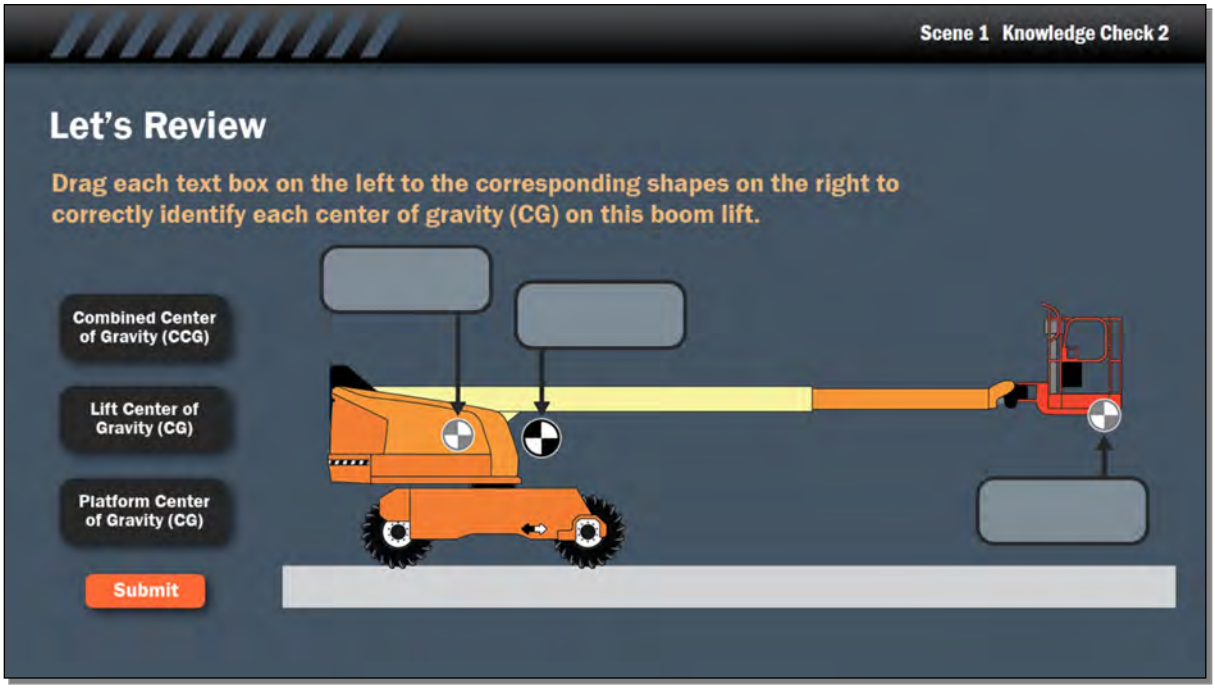
Every lift has a specific combined center of gravity, or CCG, which is the point at which the center of gravity of the lift and the center of gravity of the platform are concentrated. Any action that changes the configuration or angle of the machine, such as raising the platform, extending the boom, driving on an incline, or increasing the load weight will affect the CCG.

Slide 48 - Stability and Combined Center of Gravity



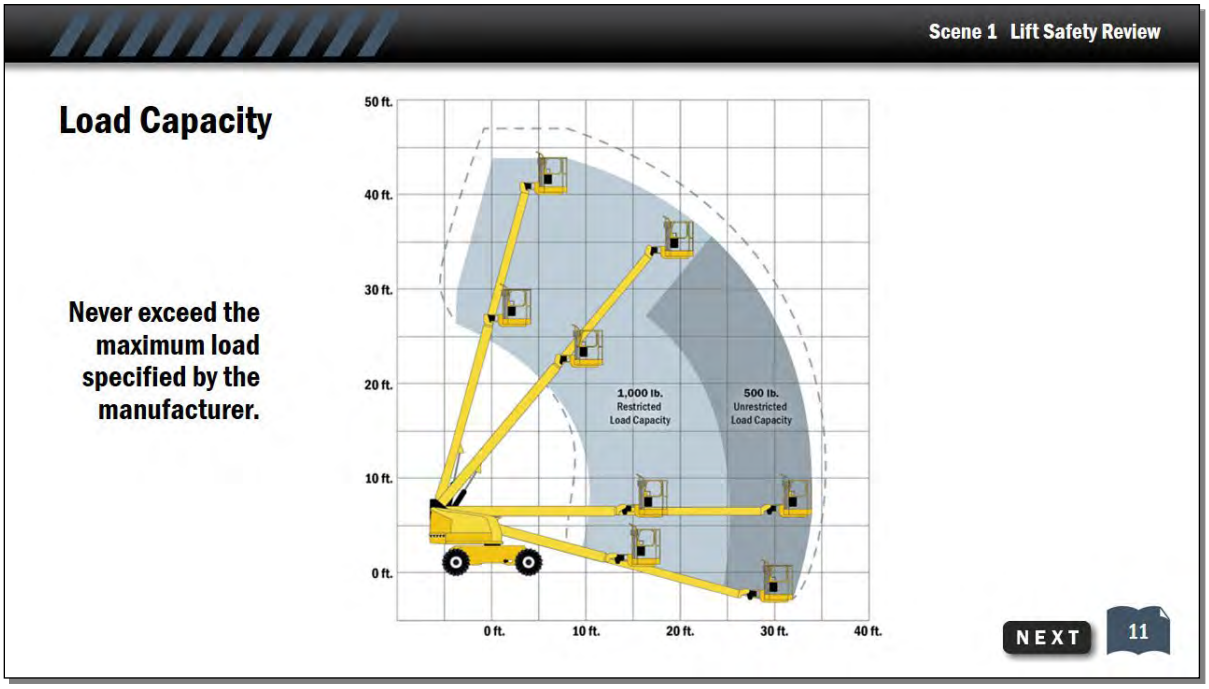
A lift rests on four wheels, which creates two tipping axes: front-to-back, or side-to-side. Within the wheelbase is an area of stability that supports the machine in its normal work positions. As long as the CCG remains within the lift's area of stability, as shown in Diagram A, the lift is designed to remain stable. If the CCG of a lift extends past the area of stability, shown in Diagram B, the machine is likely to tip, most commonly to one side. This could occur due to driving over a bump or a hole, working in high winds, traveling while elevated, side loading, or working on too steep of an incline.

Slide 49 - Knowledge Check 2



Let's review. Drag each text box on the left to the corresponding shapes on the right, to correctly identify each center of gravity (CG) on this boom lift. Then click *Submit*.

Slide 50 - Load Capacity

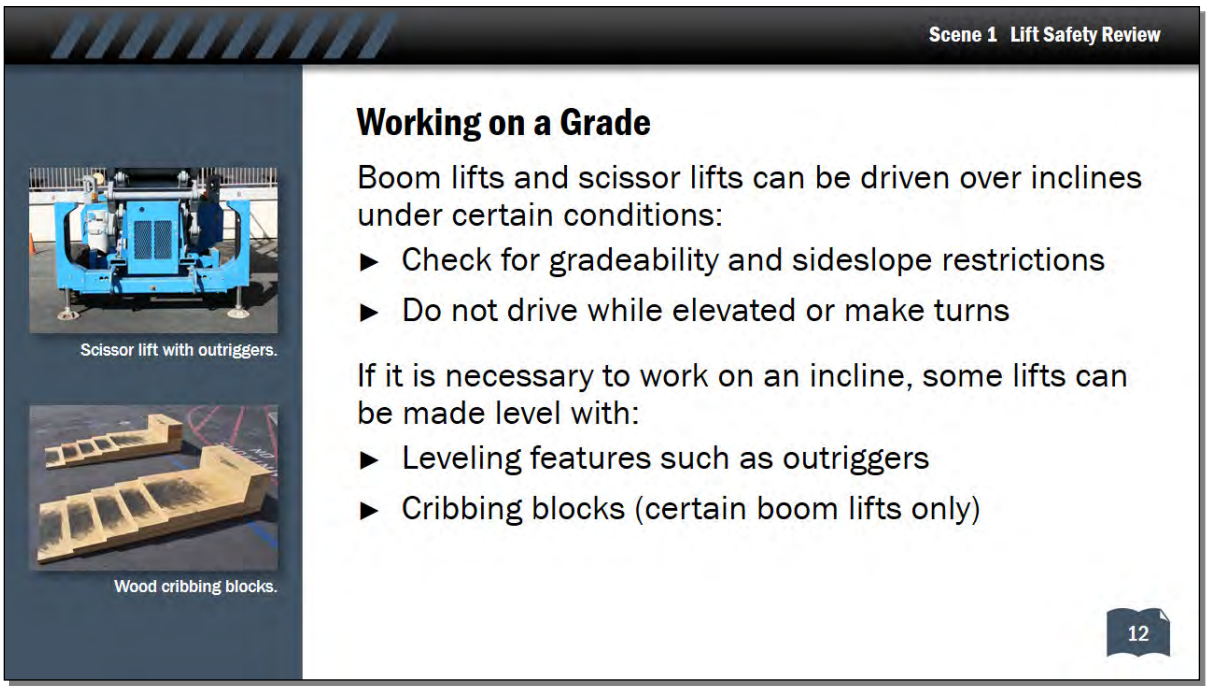


In order to maintain stability while working at height, lift manufacturers have limitations on the maximum load a platform can support. Often, a manufacturer will specify different maximum allowable loads based on the position of the platform and the weight of the load, known as **unrestricted capacity** and **restricted capacity.**

For example, this lift has an unrestricted load capacity of 500 pounds, and a restricted load capacity of 1,000 pounds. When the load is 500 pounds or less, the platform can be positioned anywhere in the shaded areas. When the load is between 500 and 1000 pounds, the platform is restricted to the lighter shaded area. A lift's allowable capacities will be affected if equipment is attached to the guardrails or extends past the platform. Scene 3, Calculating Platform Capacity, covers this in more detail.

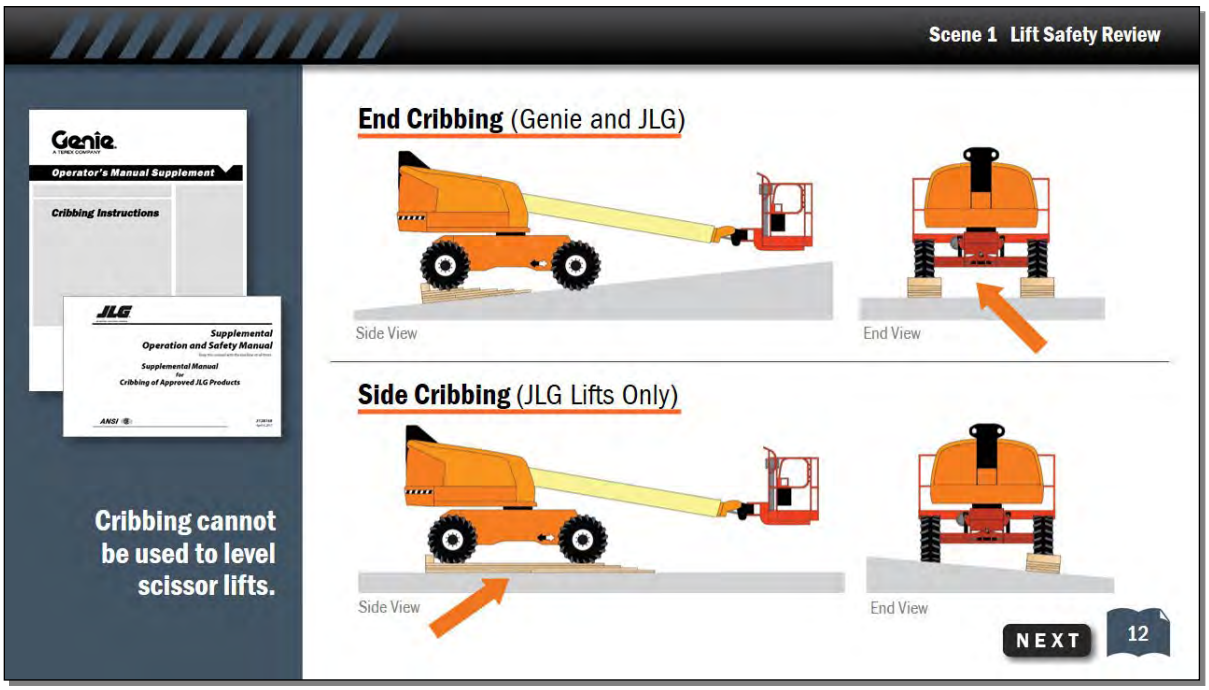
Check the decals on the machine or the operator's manuals for capacity charts for the lift you are using. Never exceed the maximum load specified by the manufacturer.

Slide 51 - Working on a Grade



Boom lifts and scissor lifts are designed to be operated on level surfaces. However, they can be driven over low inclines under certain conditions. Check the lift's decals or operator's manual for gradeability and side slope ratings to make sure that the incline doesn't exceed manufacturer limits. Don't drive on an incline while elevated or turn on an incline. If it is necessary to work on an incline, the lift itself must be made level. Depending on the lift type and model, this can be achieved with leveling features such as outriggers, or, for some boom lift models, cribbing blocks.

Slide 52 - Cribbing: Types



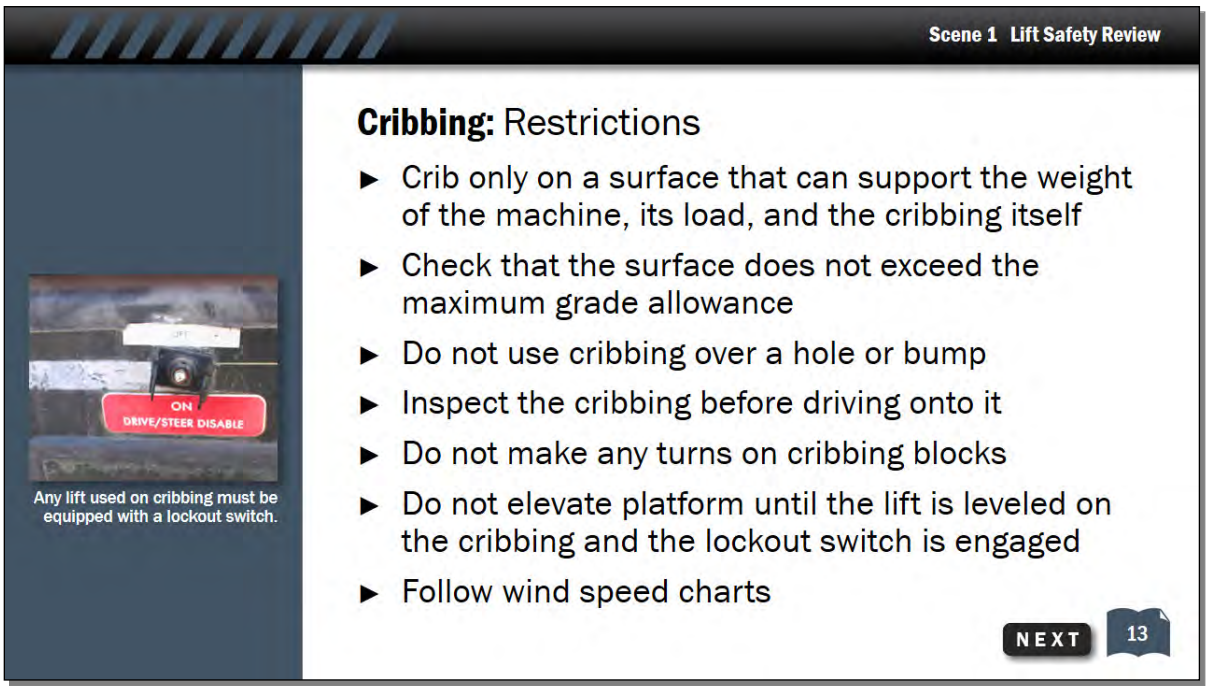
Two manufacturers--Genie and JLG--have given boom lift operators permission to use wood cribbing to level a lift that is on a grade. JLG also allows cribbing to be used to level a boom lift on a side slope. Snorkel does not allow its lifts to be leveled with cribbing blocks. Cribbing is allowed for boom lifts only. It is not approved for leveling scissor lifts.

These diagrams show end cribbing, in which two end tires are supported on two blocks, and side cribbing, in which two side tires are supported on one long block. End cribbing blocks cannot be used for side cribbing. In both situations, two tires must be driven onto the cribbing blocks--do not crib one tire alone.

Supplemental manuals for cribbing procedures can be found in your course book appendices, or they can be requested from Genie or JLG. Note that the supplemental manuals for cribbing are not the same as the supplemental manuals for rigging. Some boom lift models may be approved for cribbing, but not for rigging, and vice-versa.

A comparison chart of approved models for cribbing and rigging can be found in Appendix B in your course book, or under the *Resources* tab.

Slide 53 - Cribbing: Restrictions



When you use cribbing, keep the following in mind:

Crib only on a surface that is firm enough to support the weight of the machine, its load, and the cribbing itself.

Check that the surface does not exceed the maximum grade allowance specified in the manual. Do not use cribbing over a hole or a bump.

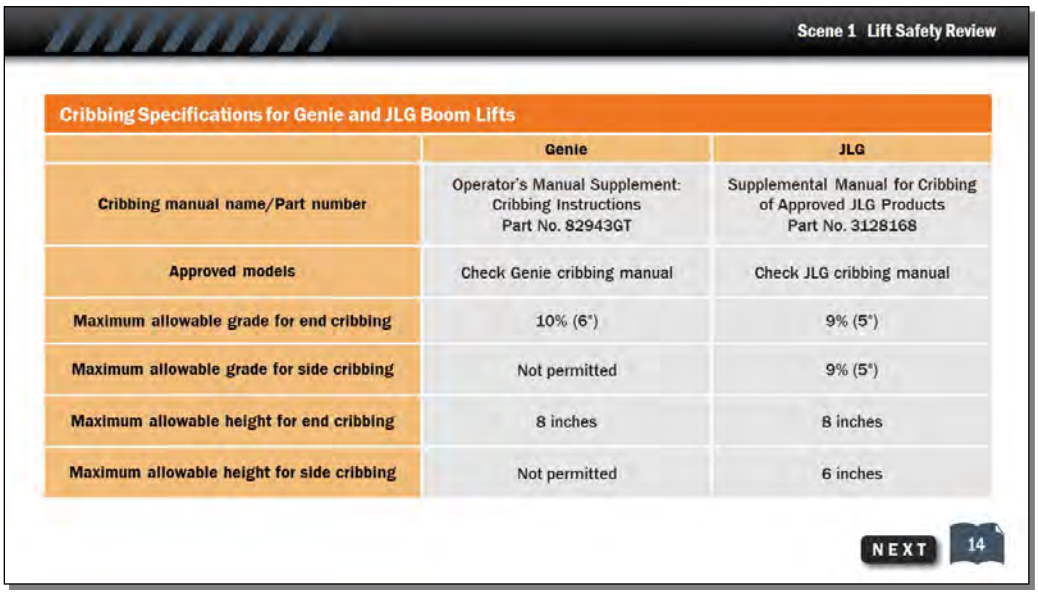
Inspect the cribbing before driving onto it. Drive onto the cribbing blocks slowly with the platform in the lowered position.

Do not make any turns on cribbing blocks. Both manufacturers require that any lift that is used on cribbing be equipped with a lockout switch, which disables the drive and steer functions while the machine is on the cribbing, and which must be engaged before raising the platform. If a machine does not have a lockout switch, one must be installed by an approved vendor.

Do not raise the platform until the machine is leveled on the cribbing blocks and the lockout switch is engaged.

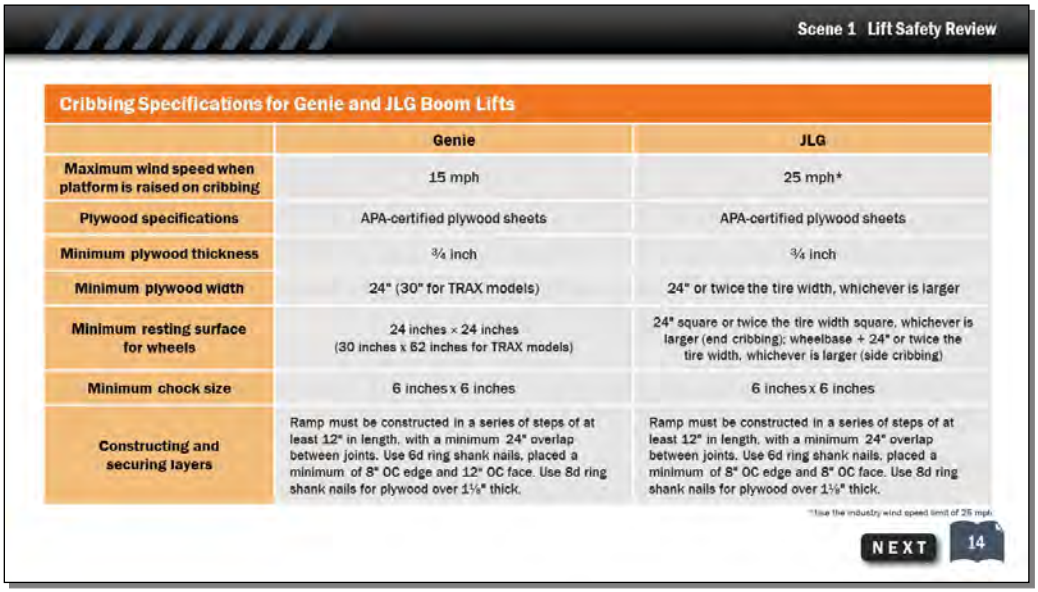
And, pay attention to wind speed.

Slide 54 - Cribbing Specifications 1



These tables give an overview of the construction requirements for Genie and JLG cribbing. Always follow the manufacturer's specifications and the list of approved models when building or using cribbing.

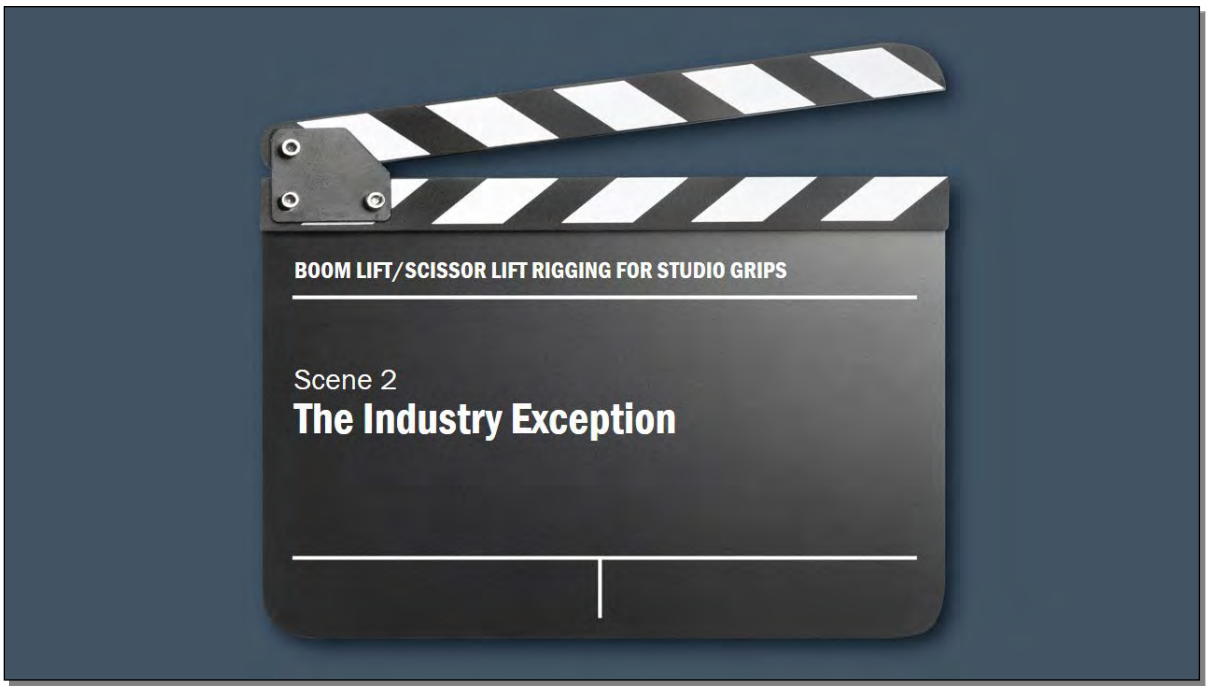
Slide 55 - Cribbing Specifications 2



Note that Genie allows a maximum wind speed of 15 miles per hour for lifts on cribbing. Do not exceed this limit when using Genie lifts.

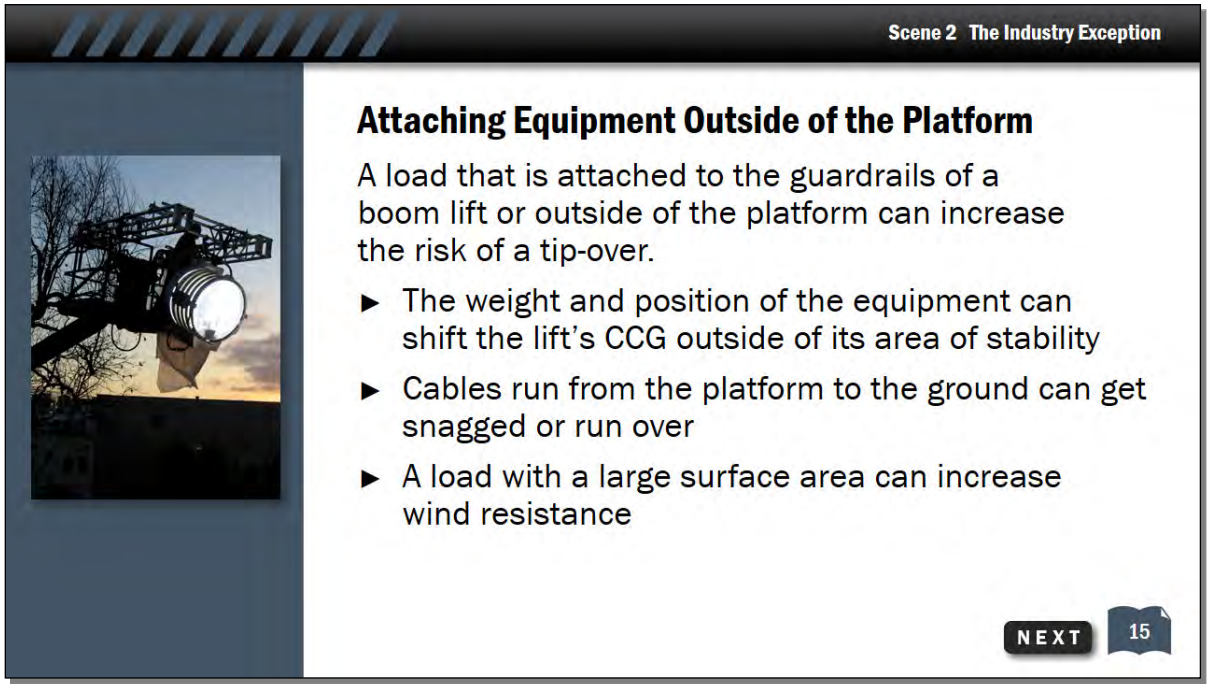
JLG allows a maximum wind speed of 28 miles per hour when using cribbing; however, this exceeds our industry wind speed limit of 25 miles per hour for all lift work. Follow the industry standard when using JLG lifts.

Slide 56 - The Industry Exception



Now that you're caught up on some of the basics of lift safety, let's talk about the motion picture industry exception for rigging to boom lifts.

Slide 57 - Attaching Equipment



The maximum capacity of a boom lift is based on a load that is evenly distributed in the platform. In our industry, however, there are situations where lighting or camera equipment may need to be attached to the guardrails or outside of the platform.

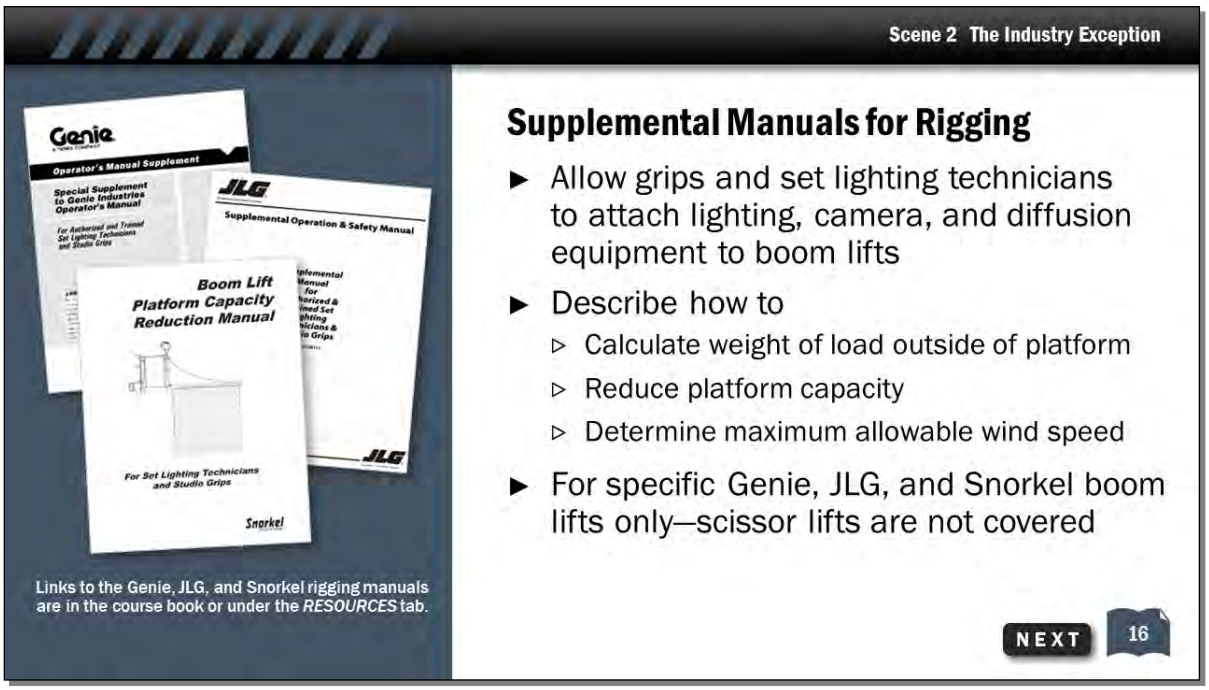
This practice may increase the risk of a tip-over for three main reasons.

First, the weight and position of the equipment may shift the lift's CCG too far outside of its area of stability.

Next, cables run from the platform to the ground could get snagged on an outside object or get run over by the lift.

Last, a load with a large surface area, such as a diffusion screen, can create wind resistance beyond the lift's wind speed ratings.

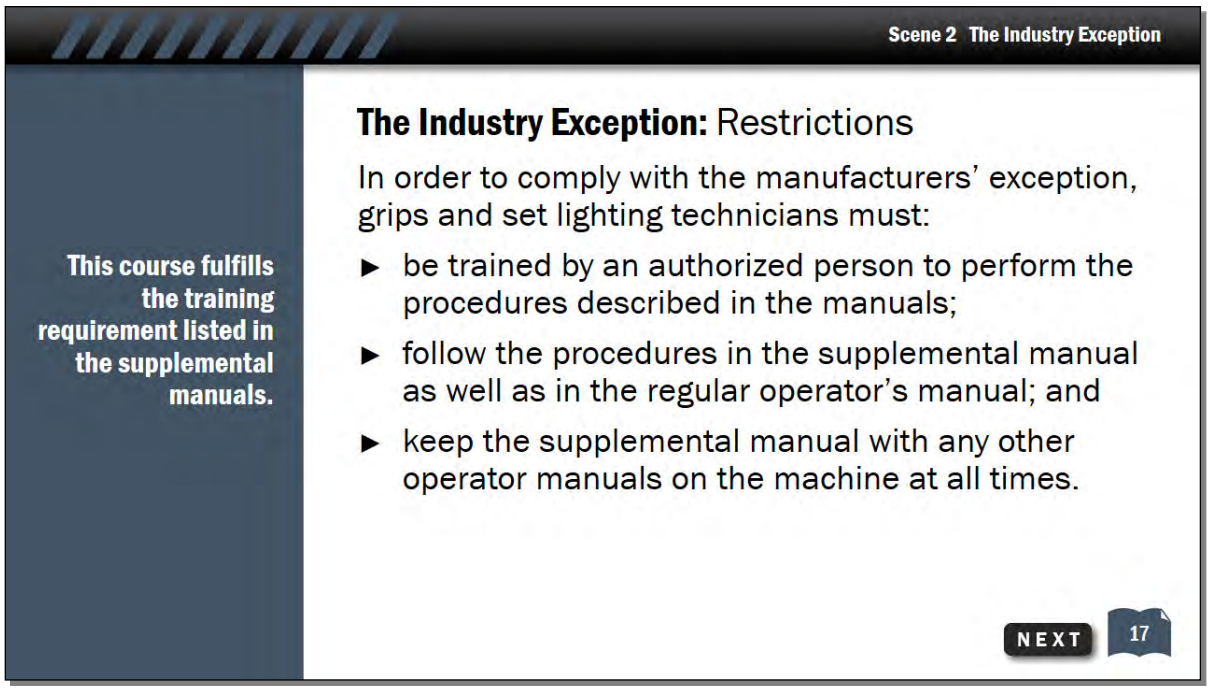
Slide 58 - Manuals for Rigging



At the request of our industry to address these issues, three manufacturers--Genie, JLG, and Snorkel--have produced special manuals that supplement their regular operator's manuals. These supplemental manuals allow an exception for trained grips and set lighting technicians to safely attach lighting equipment, camera equipment, and light diffusion screens onto and outside of the guardrails of some of their boom lift models. They include procedures for calculating the weight of a load when it's outside of the platform, reducing the platform's capacity to account for a shifted load's center of gravity, and determining the maximum allowable wind speed based on the surface area of the load. The supplemental manuals cover specific boom lift models only. The exception does not cover scissor lifts, manlifts, forklifts, or any other type of lift. We'll talk about rigging scissor lifts in Scene 5.

Links to these manuals are available in the course book, under the *RESOURCES* tab, or from the manufacturer.

Slide 59 - Restrictions



In order to comply with the exception provided by the manufacturers in their supplemental manuals, grips and set lighting technicians must:

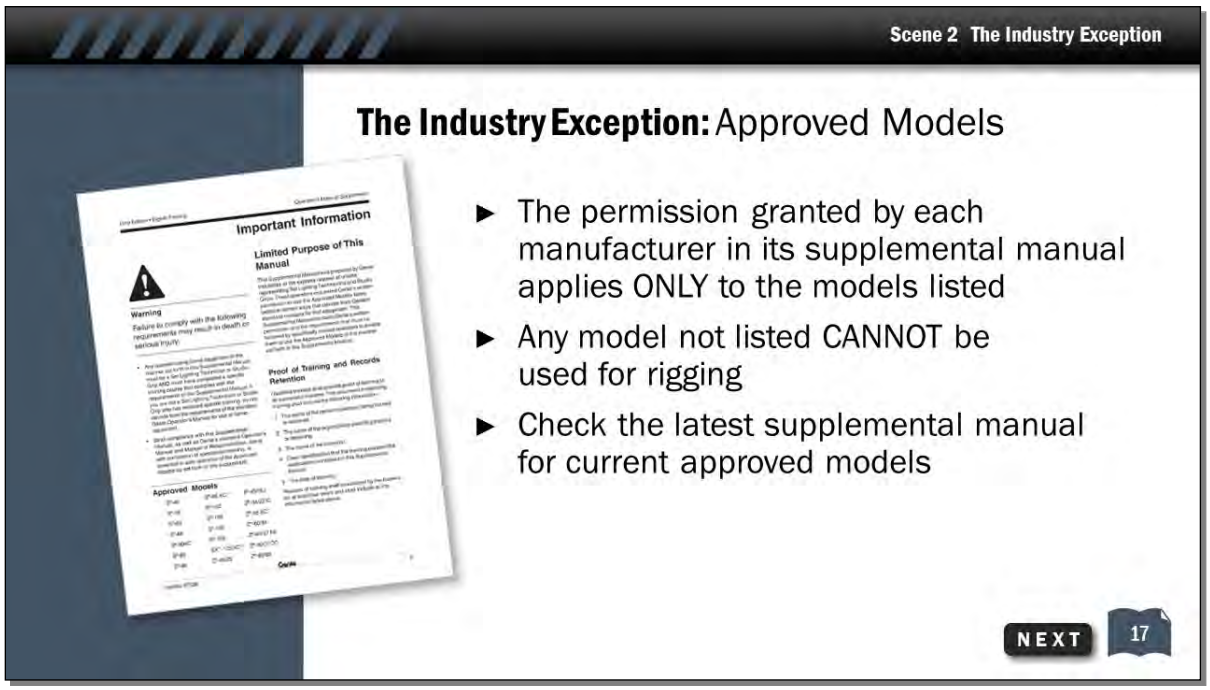
be trained by an authorized person to perform the procedures described in the manuals;

follow the procedures in the supplemental manual as well as in the regular operator's manual;

and keep the supplemental manual with any other operator manuals on the machine at all times.

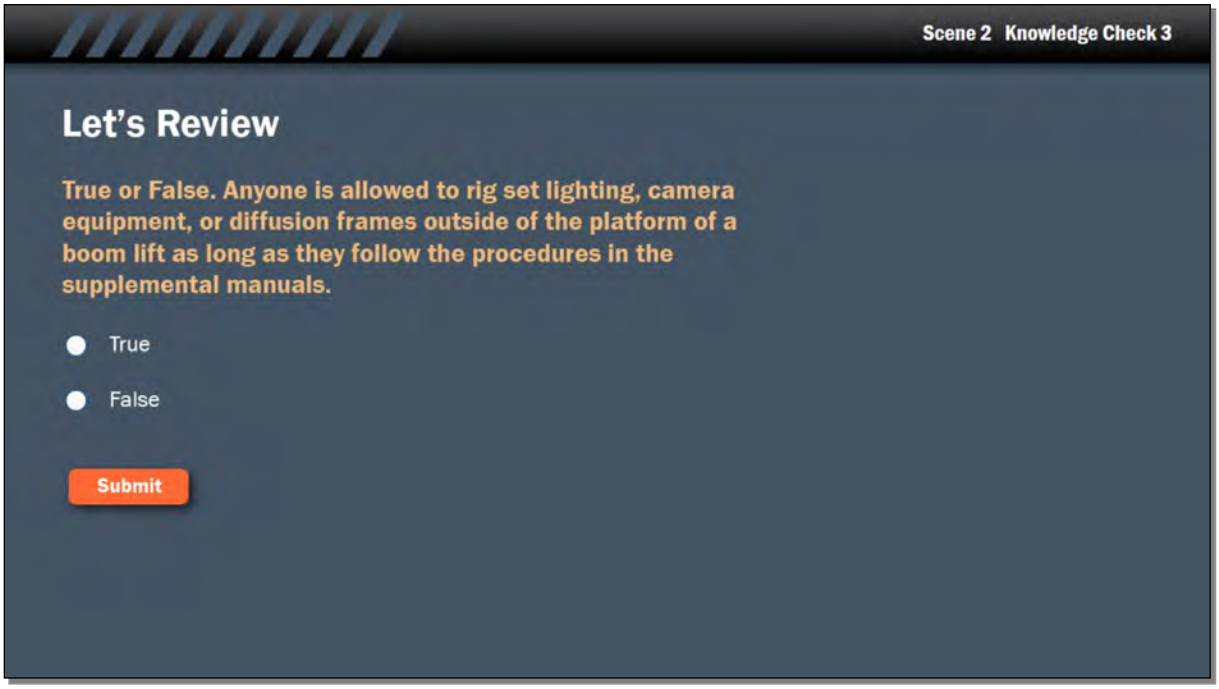
This course fulfills the training requirement outlined by the manufacturers.

Slide 60 - Approved Lift Models



The permission given by each manufacturer in its supplemental manual applies ONLY to the lift models listed. Refer to the latest manual for the current approved models. Any model not listed CANNOT be used for rigging any equipment in any manner that falls outside of the procedures described in its regular operator's manual.

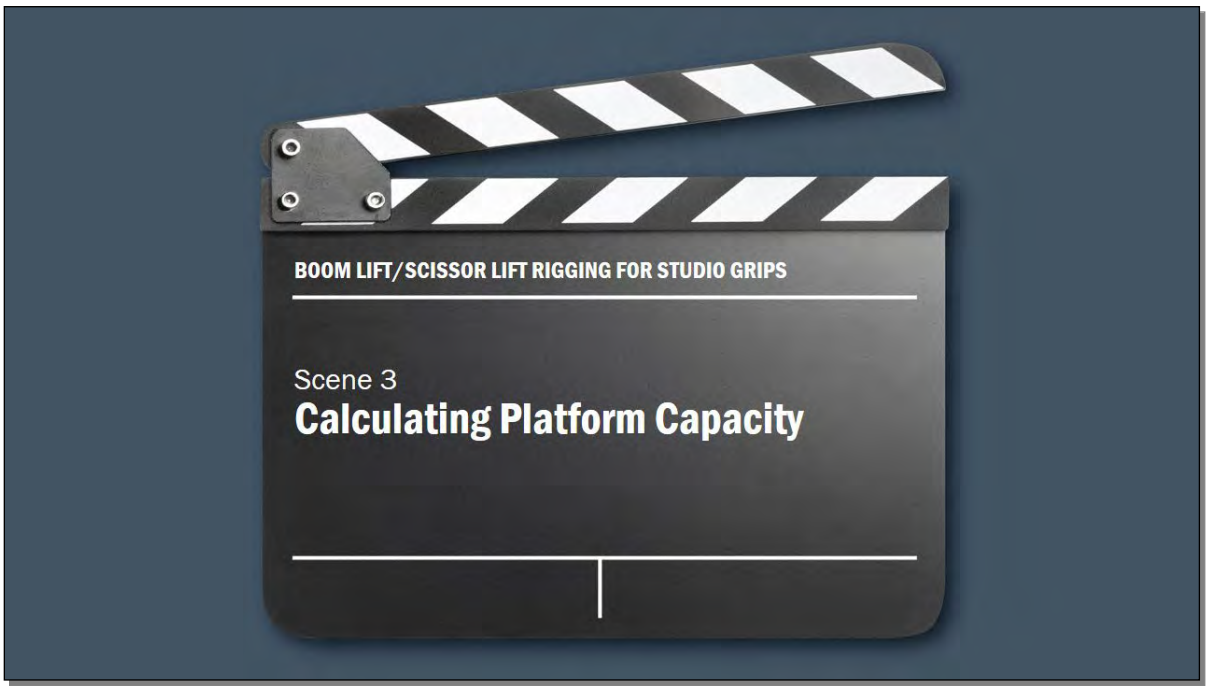
Slide 61 - Knowledge Check 3



Let's review.

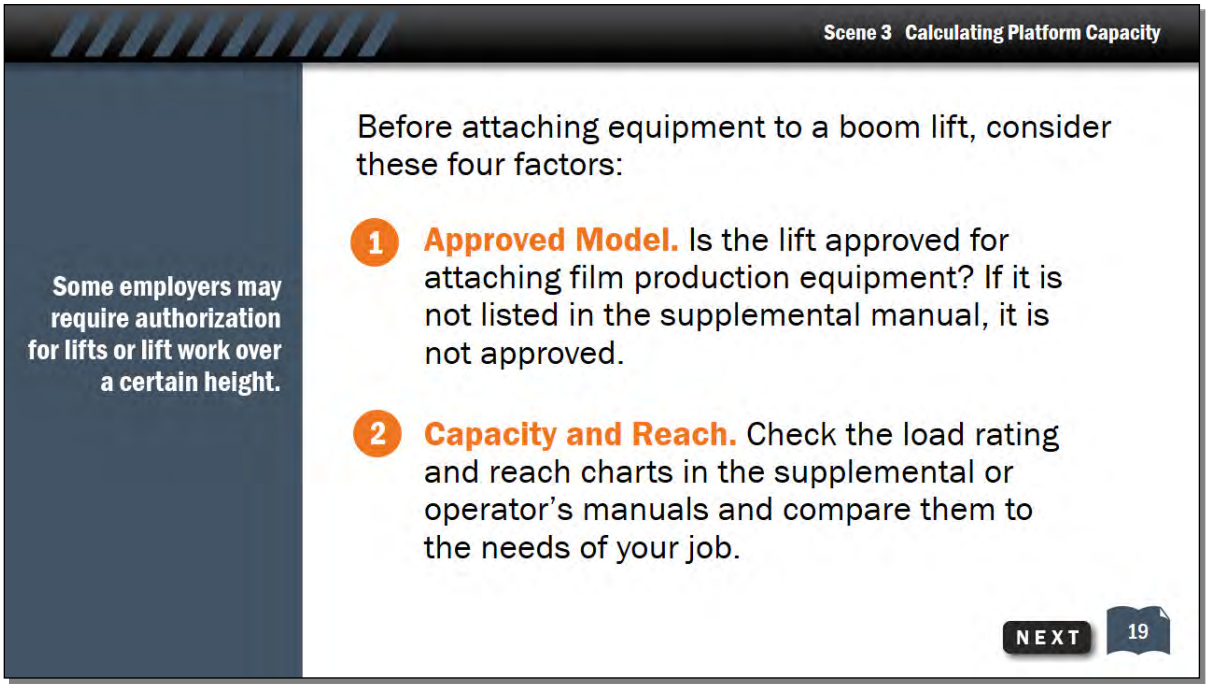
True or false. Anyone is allowed to rig set lighting, camera equipment, or diffusion frames outside of the platform of a boom lift as long as they follow the procedures in the supplemental manuals.

Slide 62 - Calculating Capacity



This scene details the procedures for calculating platform capacity when rigging motion picture equipment to a boom lift.

Slide 63 - Four Factors: 1-2

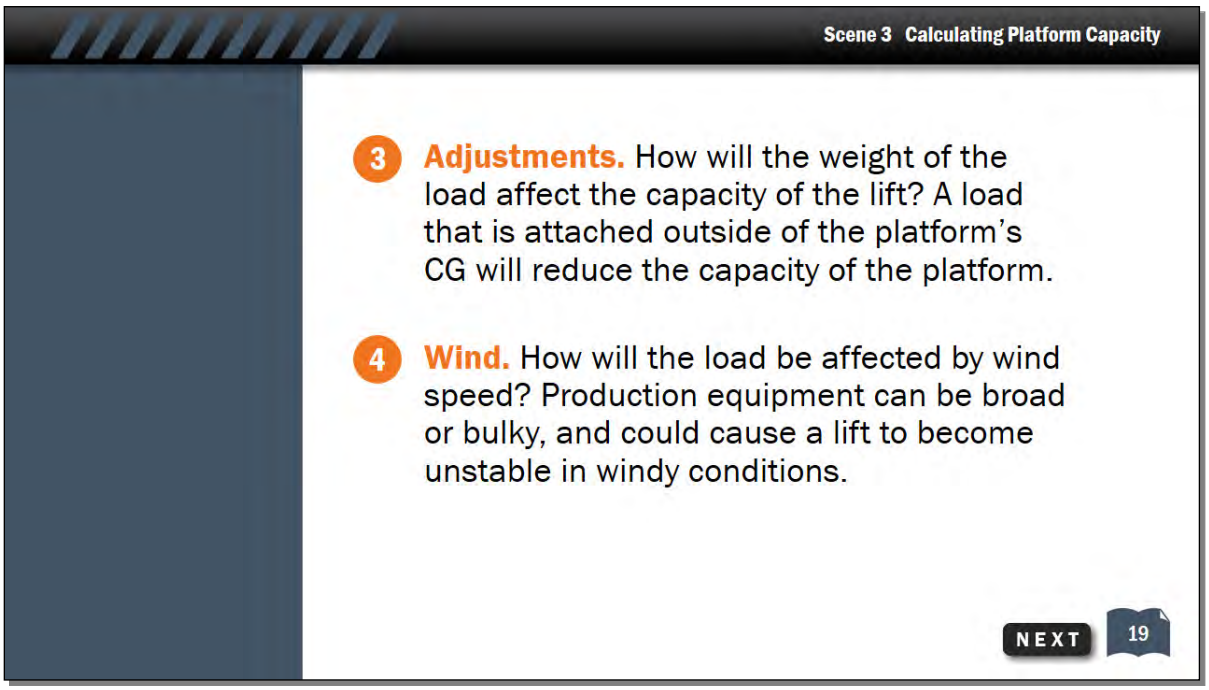


Before attaching any equipment to a boom lift, consider these four factors:

One: Is the lift model approved for attaching film production equipment? If it is not listed in the supplemental manual, it is not approved.

Two: What is the lift's capacity and reach? Check the load rating and reach charts in the supplemental or operator's manuals and compare them to the needs of your job. Note that some employers may require authorization for lifts or lift work over a certain height.

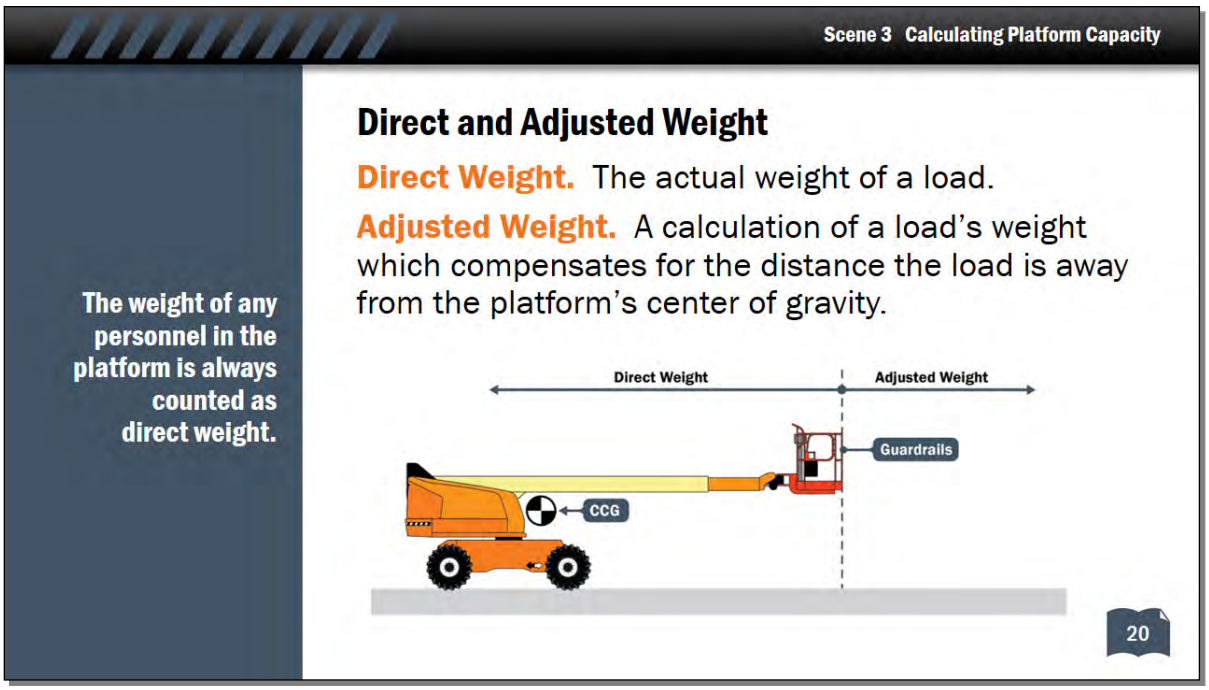
Slide 64 - Four Factors: 3-4



Three: Adjustments. How will the weight of the load affect the capacity of the lift? A load that is attached outside of the platform's CG will reduce the capacity of the platform and will need to be adjusted. We'll talk about adjusted weight in a moment.

Four: How will the load be affected by wind speed? Production equipment can be broad or bulky and could cause a lift to become unstable in windy conditions. Always follow the wind speed charts in the supplemental manuals.

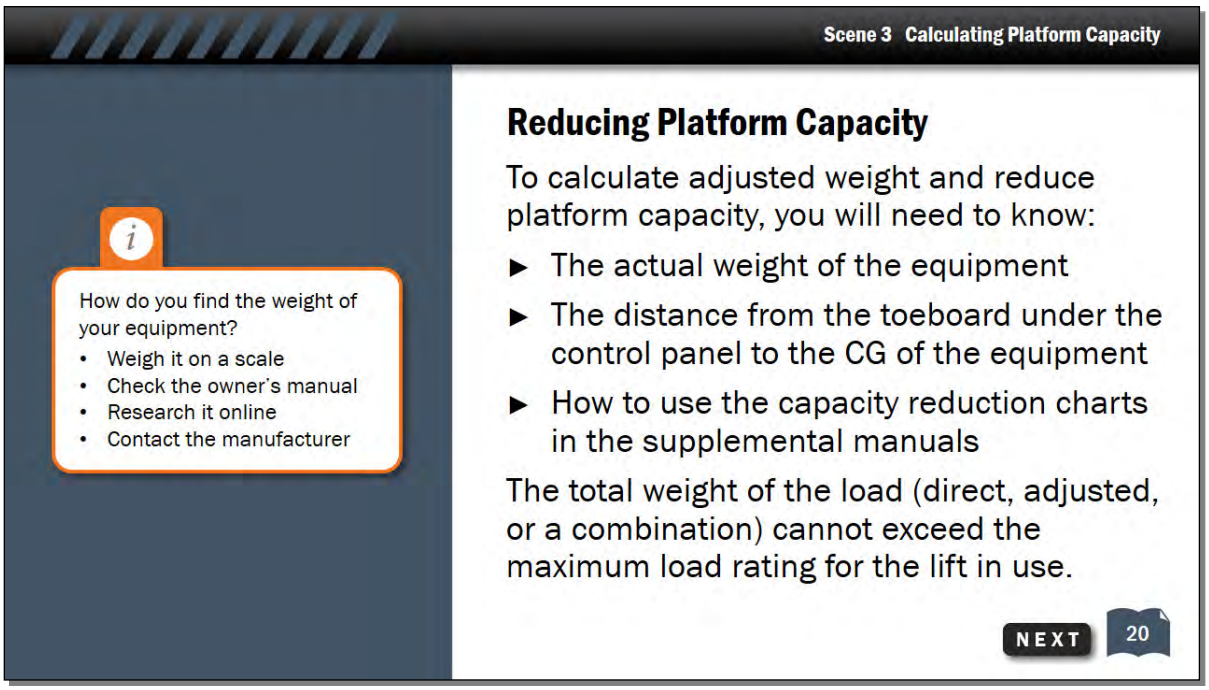
Slide 65 - Direct and Adjusted Weight



As discussed in Scene 1, every boom lift has maximum load capacities based on the combined center of gravity of the lift. These capacities apply to the DIRECT weight, or actual weight, of a load inside the platform, personnel operating or working in the lift, or cables extending down the boom arm. However, when equipment is attached to the guardrails of a boom lift or extends past the platform, the load is positioned outside of the lift's normal CCG, creating an increase in force that affects the lift's normal capacities. This type of load must be calculated as ADJUSTED weight, which compensates for the distance the center of gravity of the load is away from the center of gravity of the platform. The farther the load is outside of the platform, the greater the adjusted weight.

Adjusted weight will always be more than the actual weight of the equipment and will also reduce the capacity of the platform. Adjusted weight is calculated by using tables provided in the supplemental manuals. The weight of any personnel in the platform is never adjusted. It is always counted as direct weight.

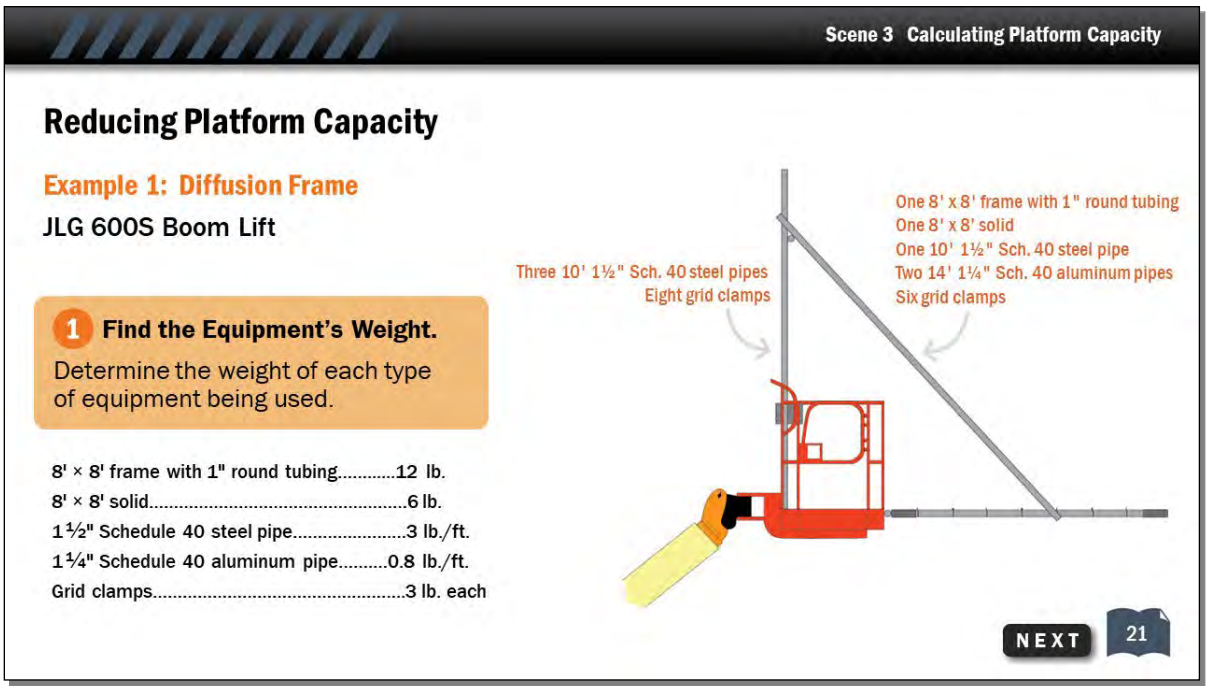
Slide 66 - Platform Capacity



To calculate adjusted weight and reduce platform capacity, you will need to know the actual weight of the equipment, the distance from the toeboard under the control panel to the center of gravity of the equipment, and how to use the capacity reduction charts in the supplemental manuals. The total weight of the load, whether direct, adjusted, or a combination of the two, cannot exceed the maximum load rating for the lift in use.

How do you find the weight of your equipment? If it's small enough, you can weigh it on a scale. Or, you can check the owner's manual, research the weight online, or contact the manufacturer.

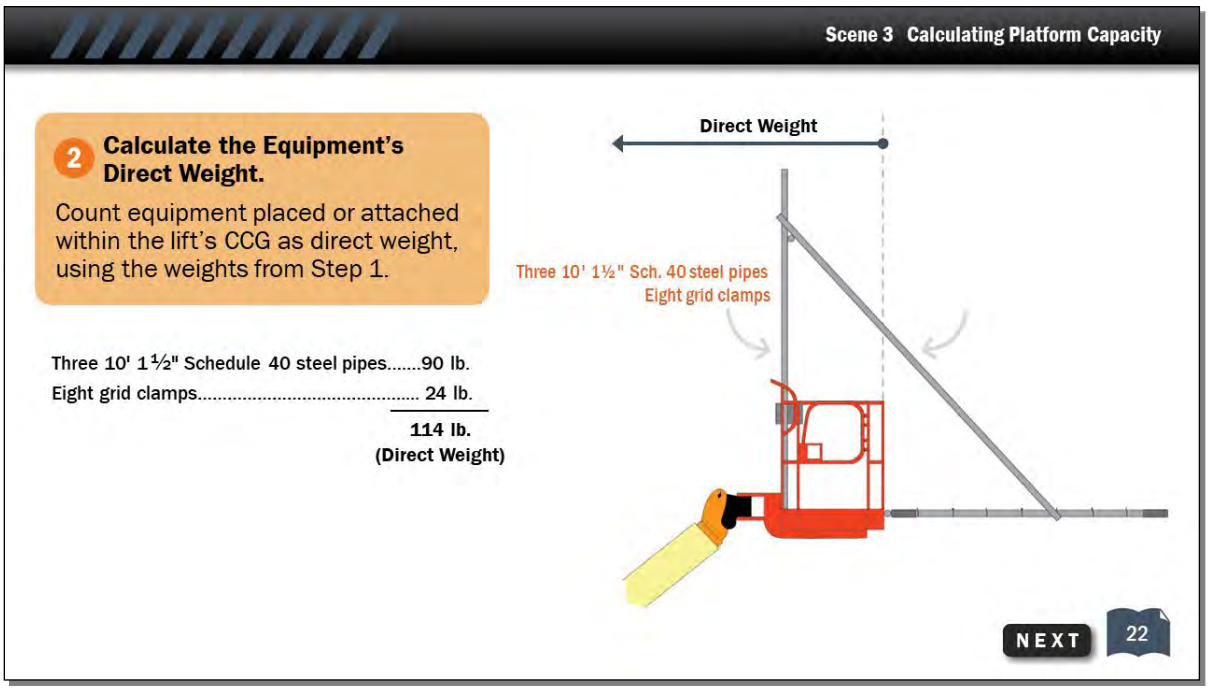
Slide 67 - Example 1.1



Let's go through the process of adjusting the weight of a load.

Here we have an 8-by-8-foot diffusion frame, attached to both the front and the rear of the platform of a JLG 600S boom lift. We'll start by finding the weight of the equipment in use. The weight of the frame is 12 pounds, the solid fabric weighs 6 pounds, the Schedule 40 steel pipe is 3 pounds a foot, the Schedule 40 aluminum pipe weighs 0.8 pounds a foot, and each grid clamp is 3 pounds.

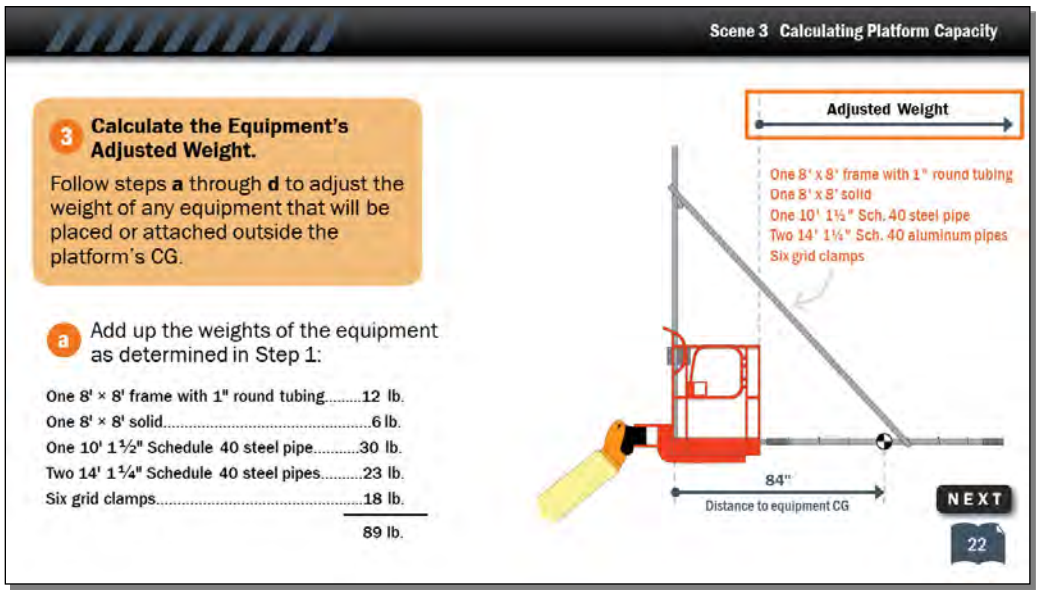
Slide 68 - Example 1.2



Now we'll take a look at where the equipment is positioned.

The equipment that is in the platform or within the lift's normal CCG will be counted as direct weight. Three 10 foot, 1-1/2 inch Schedule 40 steel pipes and eight grid clamps will count as 114 pounds of direct weight. Although the diagonal aluminum pipes that hold up the frame are attached to points both inside and outside of the platform, we'll count them as adjusted weight because they extend beyond the guardrails.

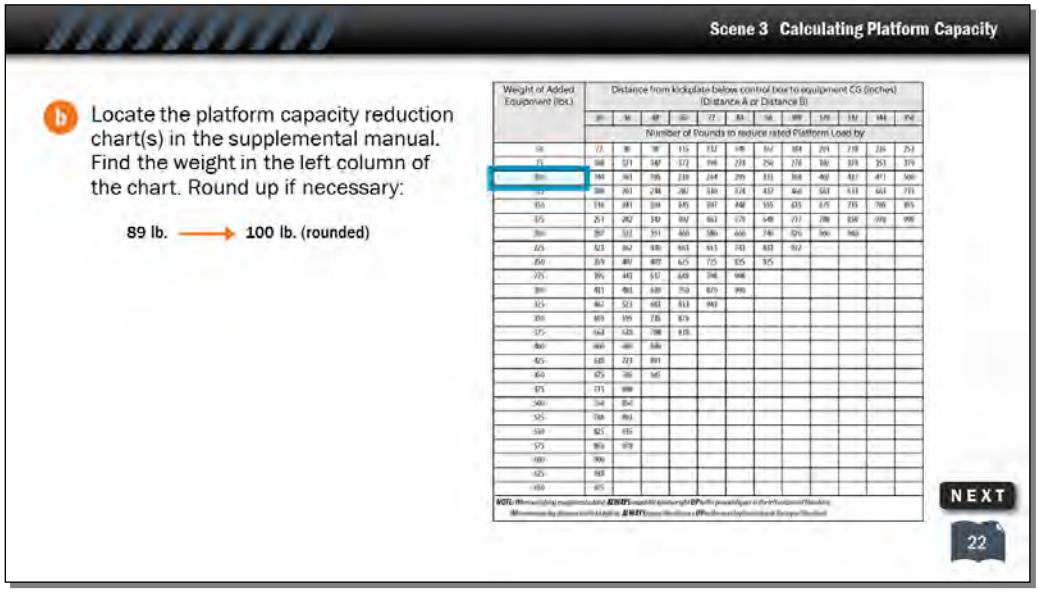
Slide 69 - Example 1.3a



Next, we'll start to figure the adjusted weight.

We have the 8-foot frame, one 8-foot solid, one 10-foot 1-1/2 inch Schedule 40 steel pipe, two 14-foot, 1-1/4 inch Schedule 40 aluminum pipes, and six grid clamps, totaling 89 pounds.

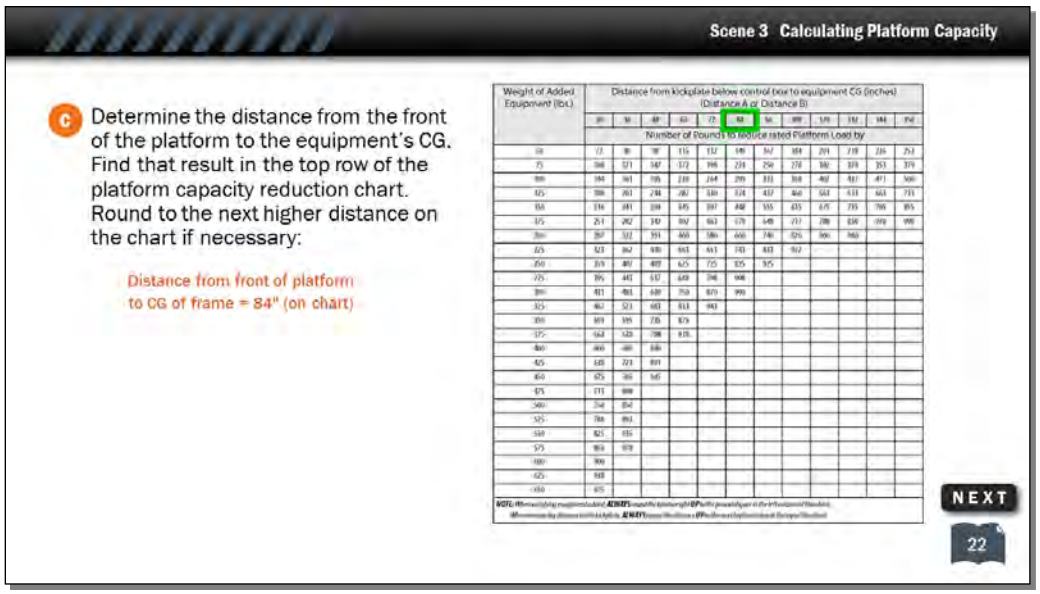
Slide 70 - Example 1.3b



To begin to adjust the weight, we'll locate the correct platform capacity reduction chart for the lift we're using.

For this example, we'll use JLG's platform capacity reduction chart to adjust the weight. Looking at the left column, our weight of 89 pounds will round up to 100 pounds.

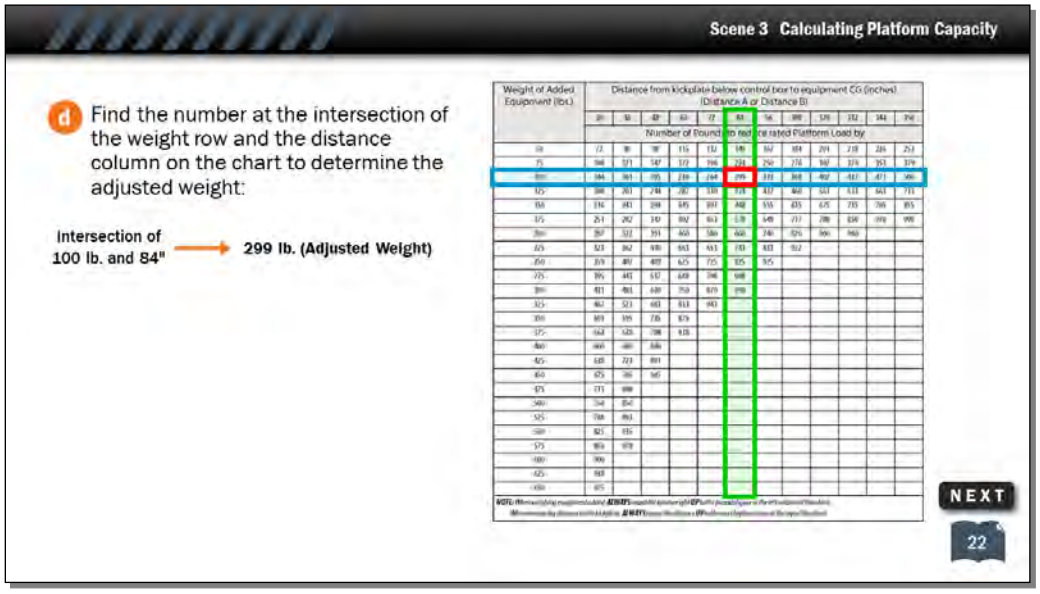
Slide 71 - Example 1.3c



The distance from the toeboard under the control panel to our equipment's center of gravity is 84 inches. That's on the chart, so we don't need to round it up.

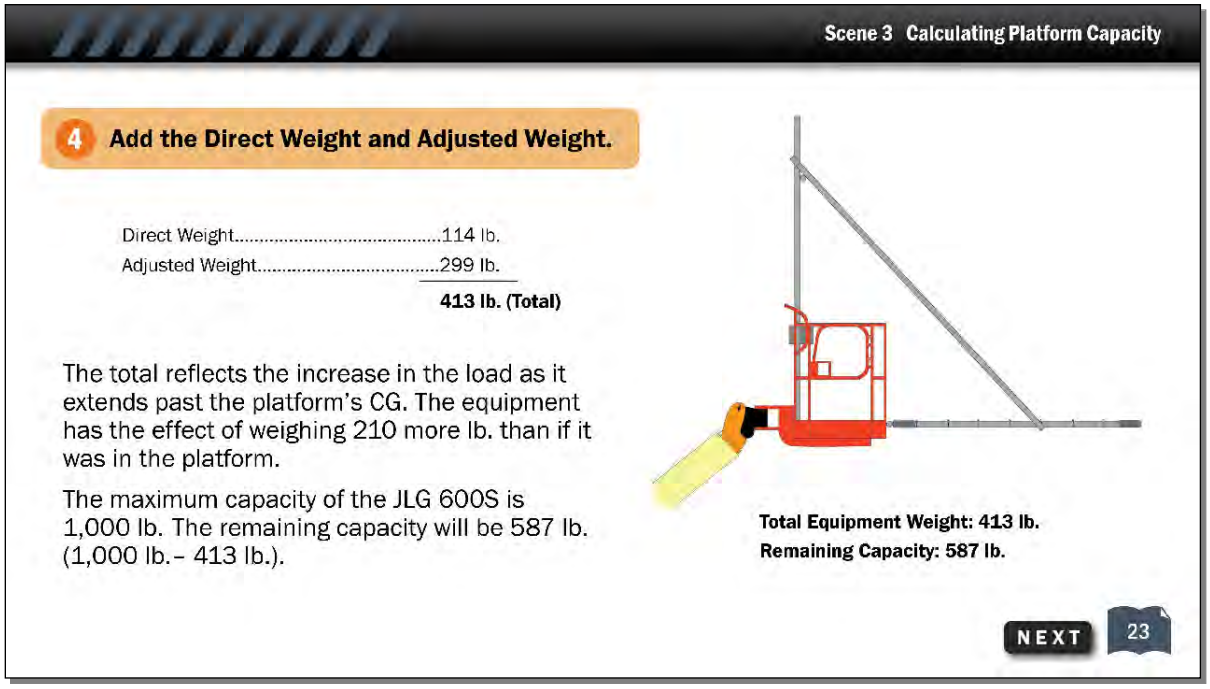
Note that JLG refers to the toeboard as a "kickplate" on their chart.

Slide 72 - Example 1.3d



The intersection of 100 pounds and 84 inches on the chart is 299 pounds of adjusted weight.

Slide 73 - Example 1.4

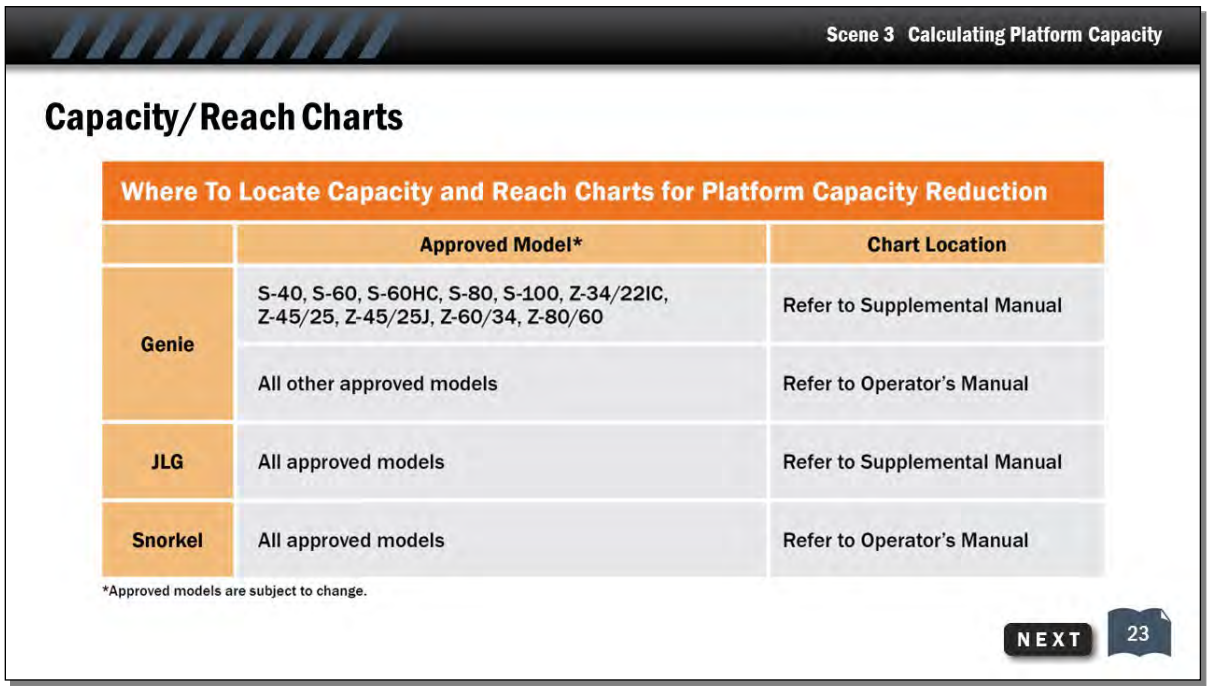


We're not quite finished.

To find the total weight of our equipment, we'll need to combine our direct weight of 114 pounds, with our adjusted weight of 299 pounds. The total, 413 pounds. The increase that the load places on the lift, when it's attached beyond the platform, has the effect of weighing 210 more pounds than if it was carried within the platform, and did not need to be adjusted.

The maximum capacity of the JLG 600S is 1,000 pounds. Subtracting the total weight of 413 pounds, for the diffusion frame, leaves 587 pounds of remaining capacity for the lift.

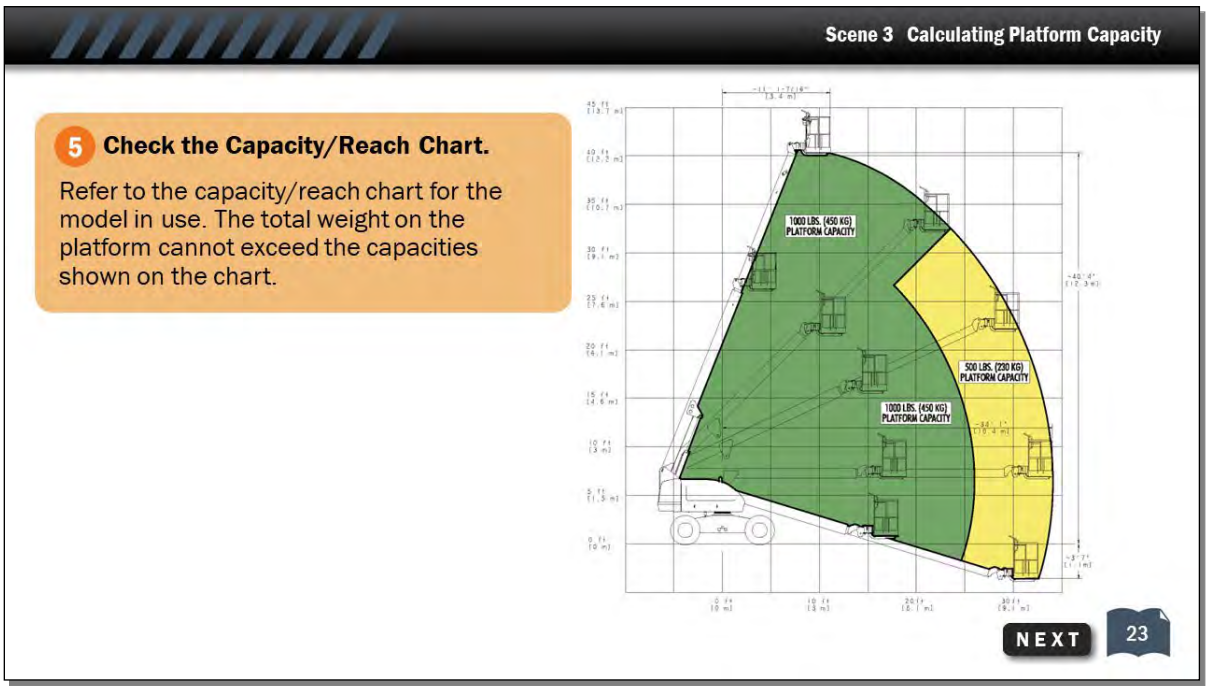
Slide 74 - Example 1.5a



Once you've found the total weight of your load and the lift's remaining capacity, check the capacity and reach chart for the model you're using. This table shows where they are located.

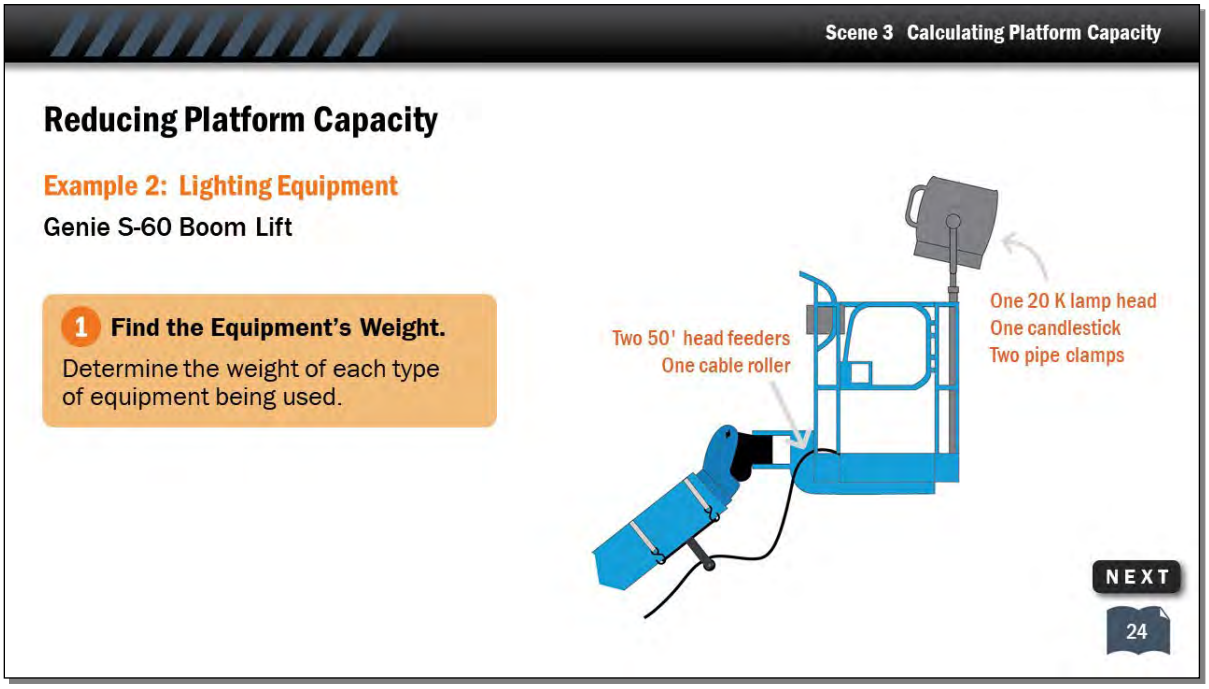
Note that for some lifts, the charts may be in the regular operator's manual for the lift, and not in the supplemental manual.

Slide 75 - Example 1.5b



Here is JLG's capacity and reach chart for this lift's model and serial number. The chart shows that if you don't add any more weight to the platform, your load of 413 pounds would be able to be positioned anywhere the platform will reach. If you add more weight, the increase may affect where you can position the platform. The maximum load weight that can be carried in this lift is 1,000 pounds.

Slide 76 - Example 2.1

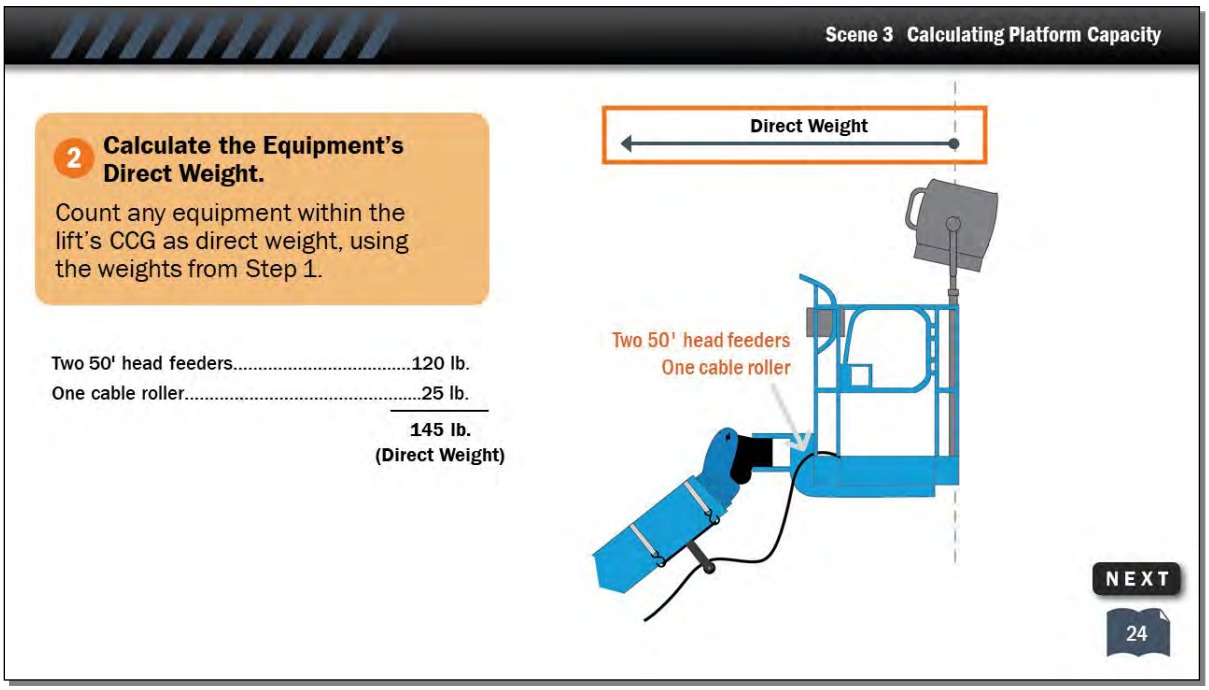


Let's go through another example, lighting equipment attached to a Genie S-60 boom lift.

A 20K lamp head is 125 pounds. A candlestick support is 10 pounds. The clamps holding it to the guardrails are 3 pounds each, head feeder cables are 60 pounds each, and cable rollers are 25 pounds each.

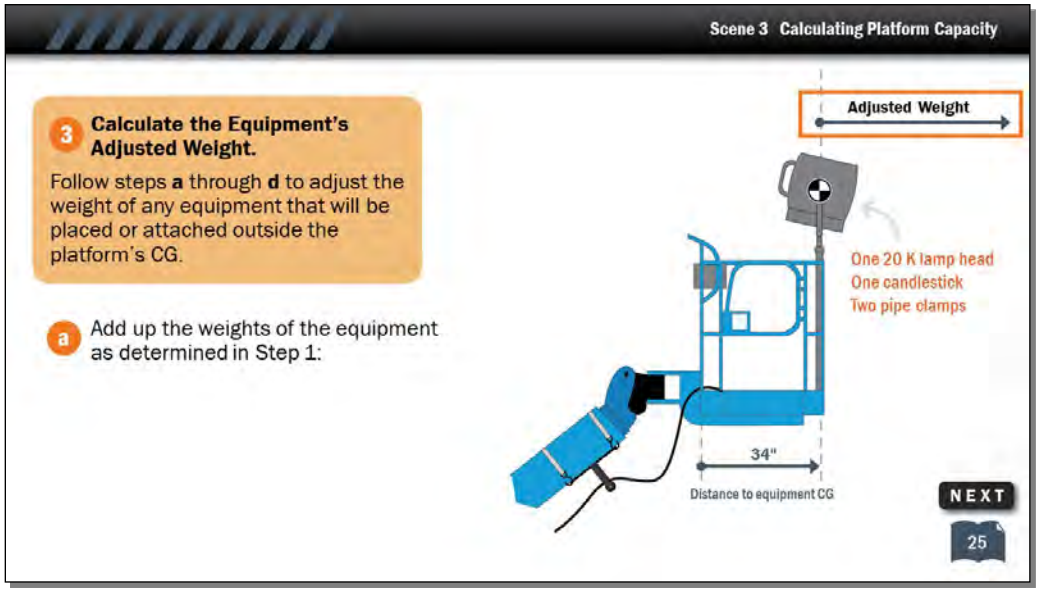
The weights in our examples are approximations only. Always find the actual weight of your equipment each time you make your calculations.

Slide 77 - Example 2.2



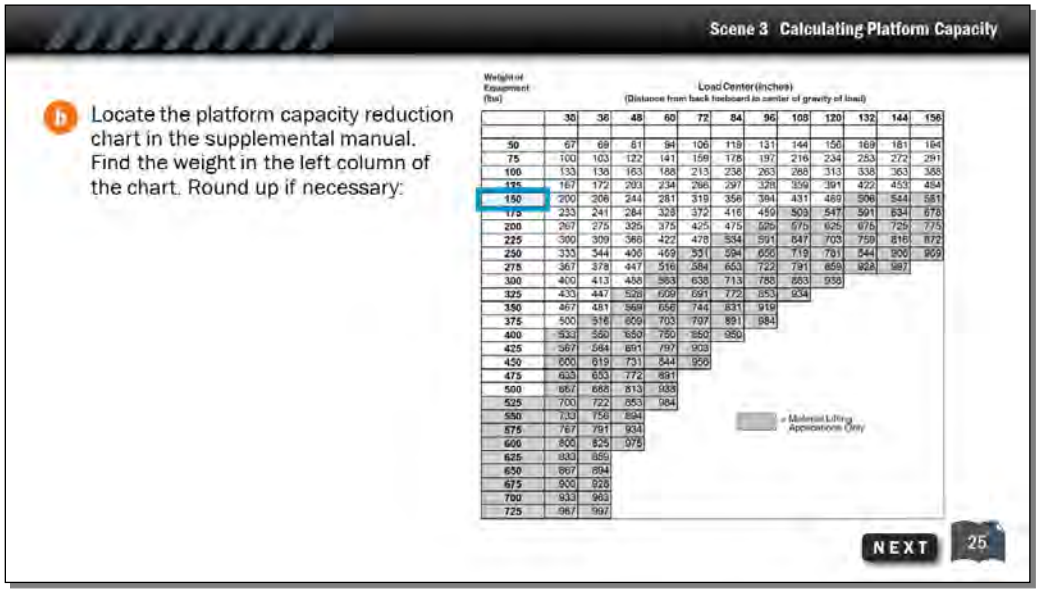
Again, we'll start by finding the direct weight of any equipment inside the guardrails of the platform. In this case, the two head feeders and single cable roller total 145 pounds of direct weight.

Slide 78 - Example 2.3a



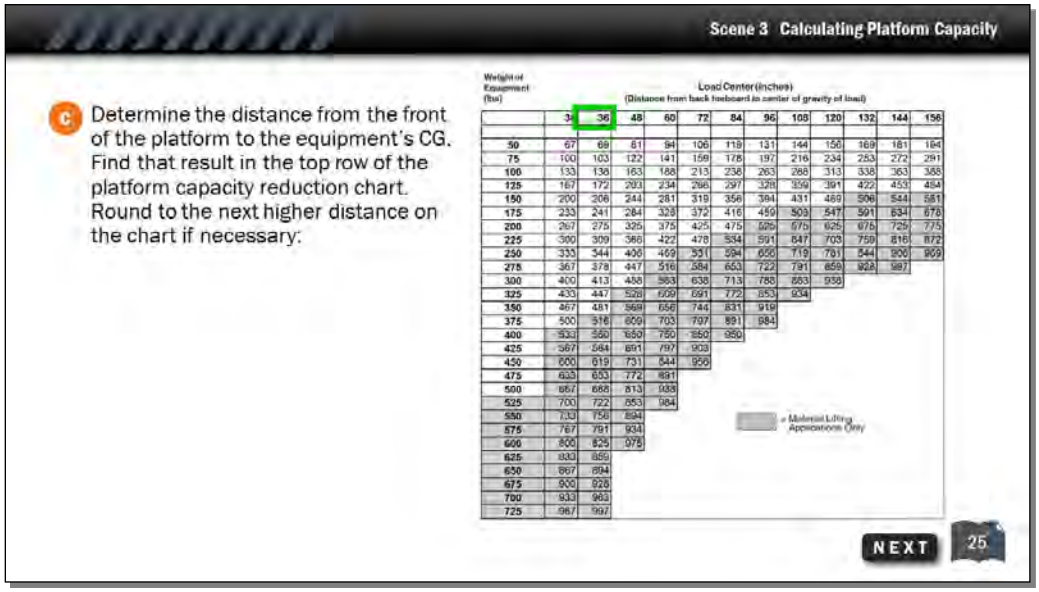
Moving on to the equipment that will count as adjusted weight, we have the 20K lamp head, one candlestick, and two pipe clamps. Using the weights given previously, those items total 141 pounds.

Slide 79 - Example 2.3b



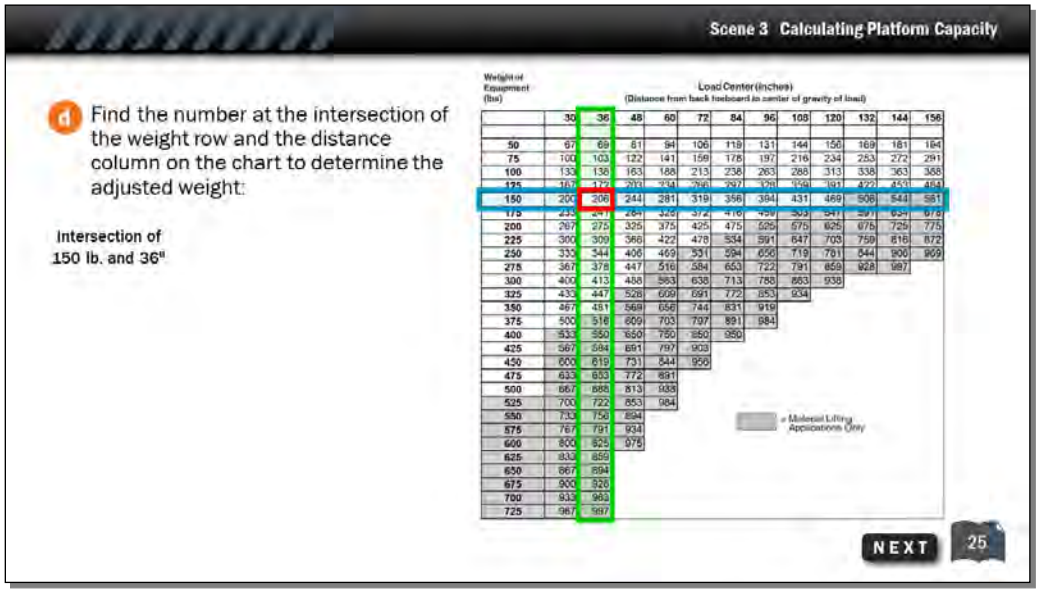
We'll use Genie's platform capacity reduction chart to reduce the weight. Looking at the left side of the chart, we can see that the weight of our equipment, 141 pounds, falls between two numbers on the chart. Always round weights UP. So, we'll round our equipment weight of 141 pounds to 150 pounds.

Slide 80 - Example 2.3c



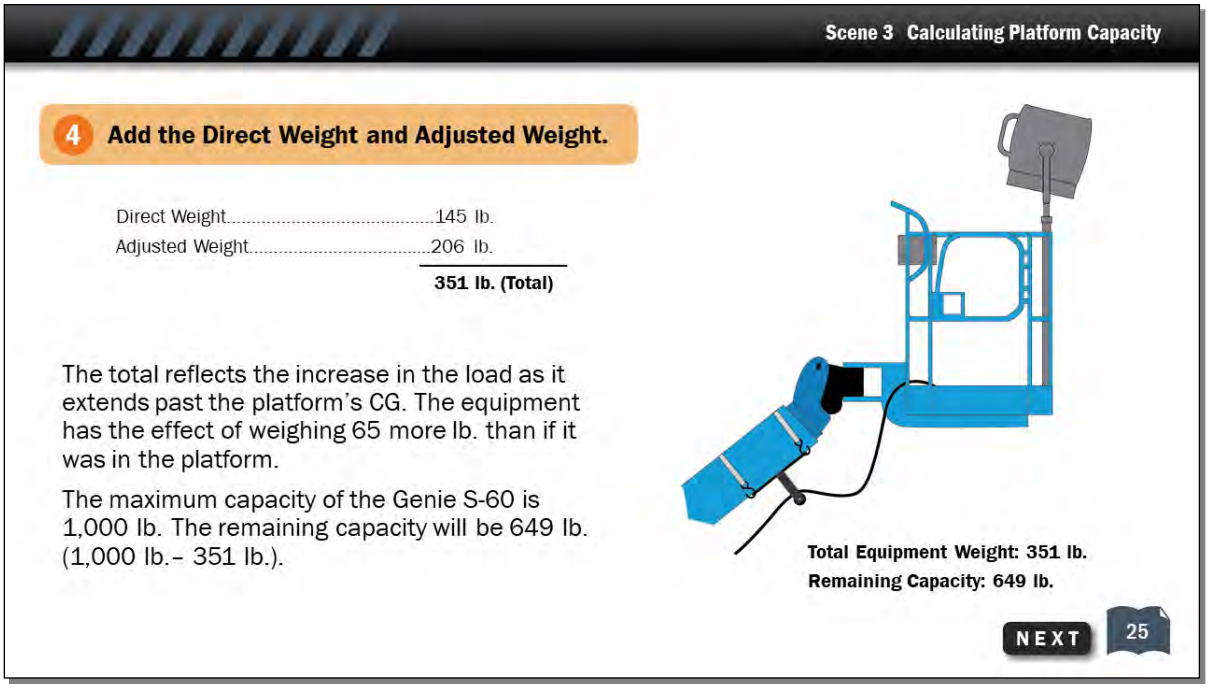
Now we'll factor in the distance that our load's center of gravity is from the toeboard under the control panel. In our example, it's 34 inches. Looking at the top row of the chart, and rounding up again, we'll count that distance as 36 inches.

Slide 81 - Example 2.3d



The intersection of our two numbers on the chart will give us the adjusted weight. The intersection of 150 pounds and 36 inches is 206 pounds of adjusted weight.

Slide 82 - Example 2.4

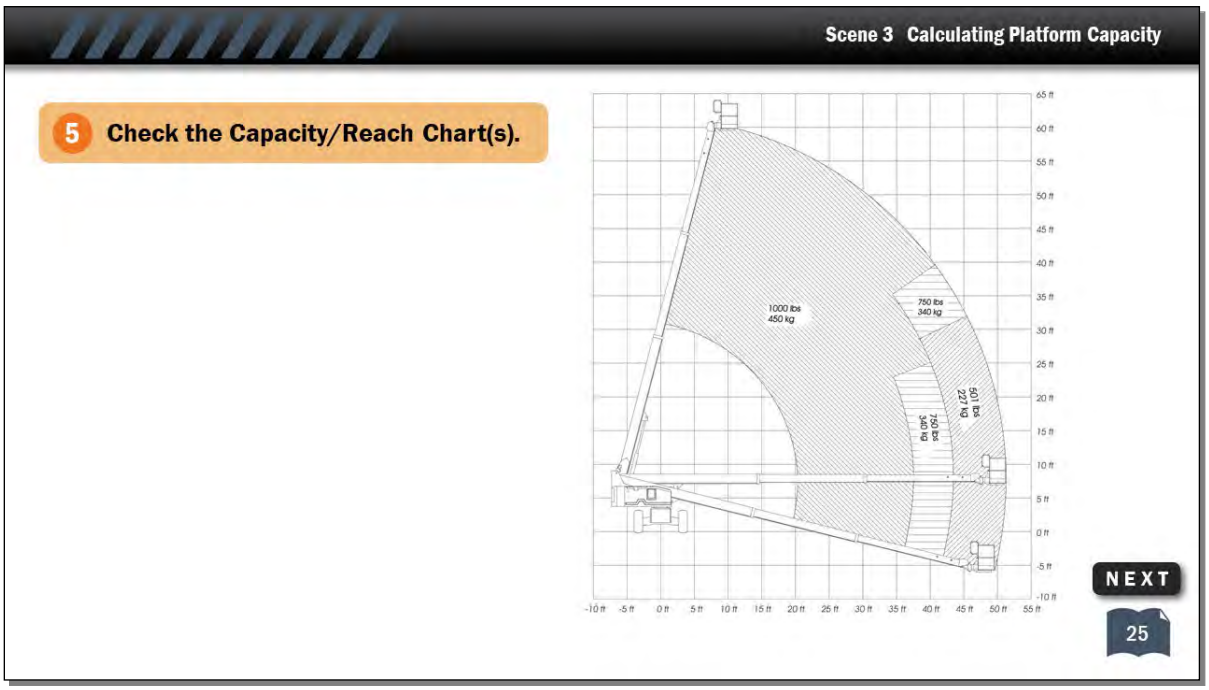


We're not quite finished.

To find the total weight of our equipment we'll need to combine our direct weight of 145 pounds, with our adjusted weight of 206 pounds, the total, 351 pounds, reflects the increase that the load places on the lift when it's attached beyond the platform, and has the effect of weighing 65 more pounds than if it was carried within the platform, and did not need to be adjusted. This total is also the amount by which the platform's capacity must be reduced.

The maximum capacity of the Genie S-60 is 1,000 pounds. Subtracting the total weight of 351 pounds, for the lamp and cables, leaves 649 pounds of remaining capacity for the lift.

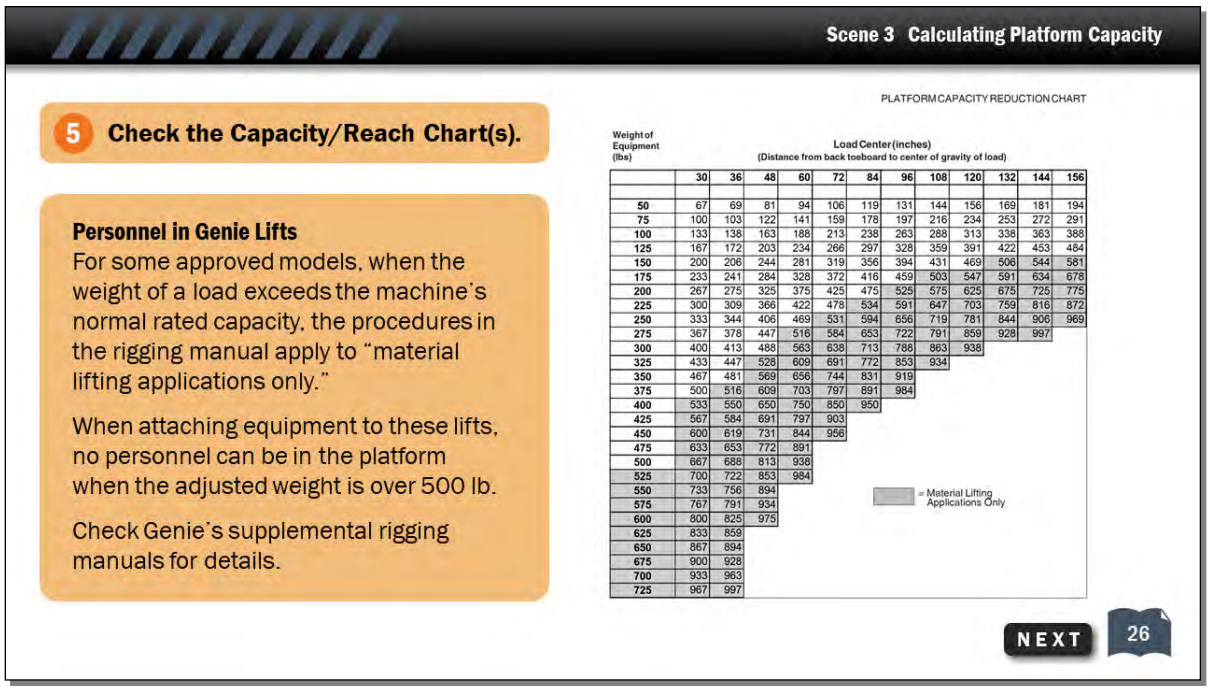
Slide 83 - Example 2.5a



Here is Genie's capacity and reach chart for this lift's model and serial number. The chart shows that if you don't add any more equipment to the platform, your load of 351 pounds would be able to be positioned anywhere the platform will reach. If you add more equipment, the increase in weight may affect where you can position the platform.

The maximum load weight that can be carried in this lift is 1,000 pounds.

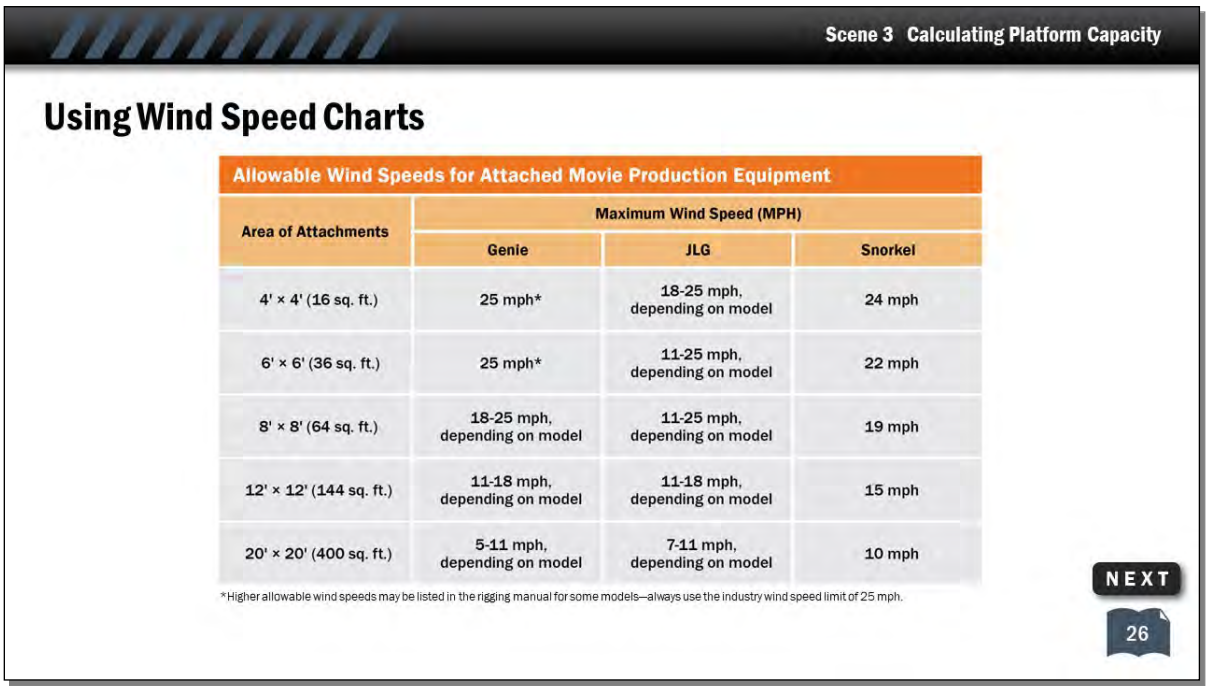
Slide 84 - Example 2.5b



Something to note about personnel in Genie lifts: Genie specifies that, for some approved models, when the weight of a load exceeds the machine's normal rated capacity, the procedures in the rigging manual apply to "material lifting applications only." In general, this means that when attaching equipment to these lifts, no personnel can be in the platform when the adjusted weight is over 500 pounds.

Check the supplemental manuals for details.

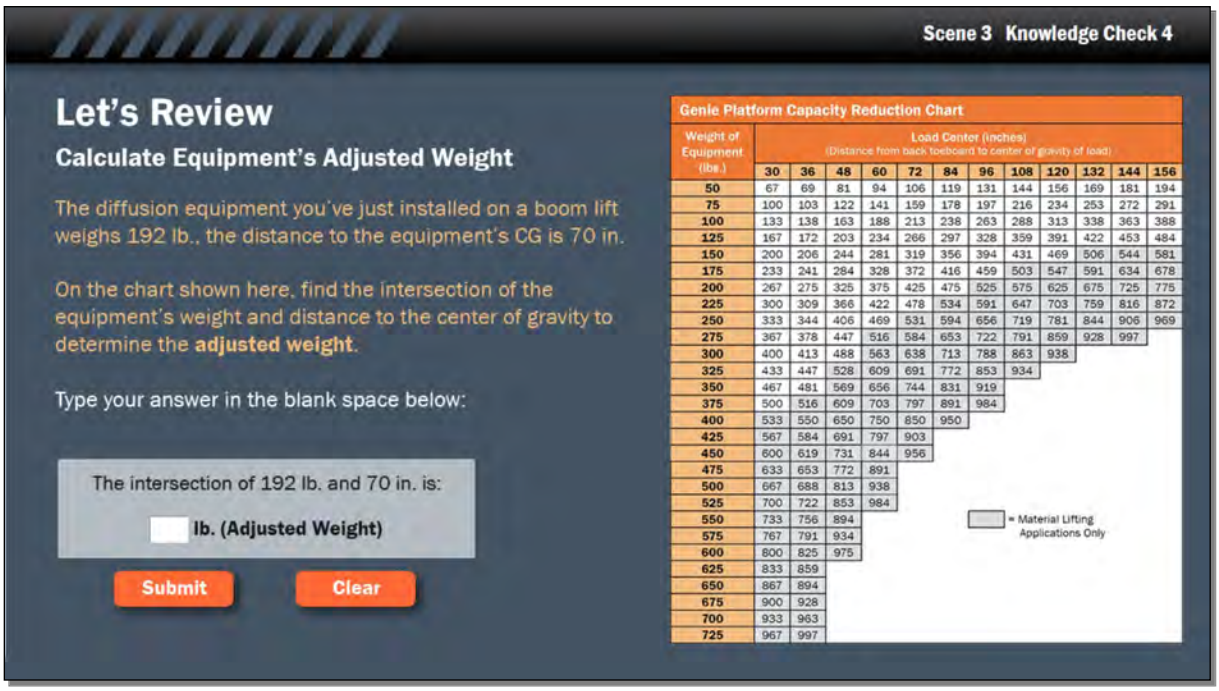
Slide 85 - Using Wind Speed Charts



The large surface area of production equipment such as diffusion frames can increase wind resistance, creating a tip-over hazard. Refer to each manufacturer's supplemental rigging manual for the maximum allowable wind speed by size of attachment. If the lift is also approved for cribbing, refer also to the wind speed charts in the cribbing manual and follow the lowest wind speed indicated for that model.

Note that Safety Bulletin #22 does not allow lifts to be raised--with or without attached equipment--in winds exceeding 25 miles per hour.

Slide 86 - Knowledge Check 4



Let's review.

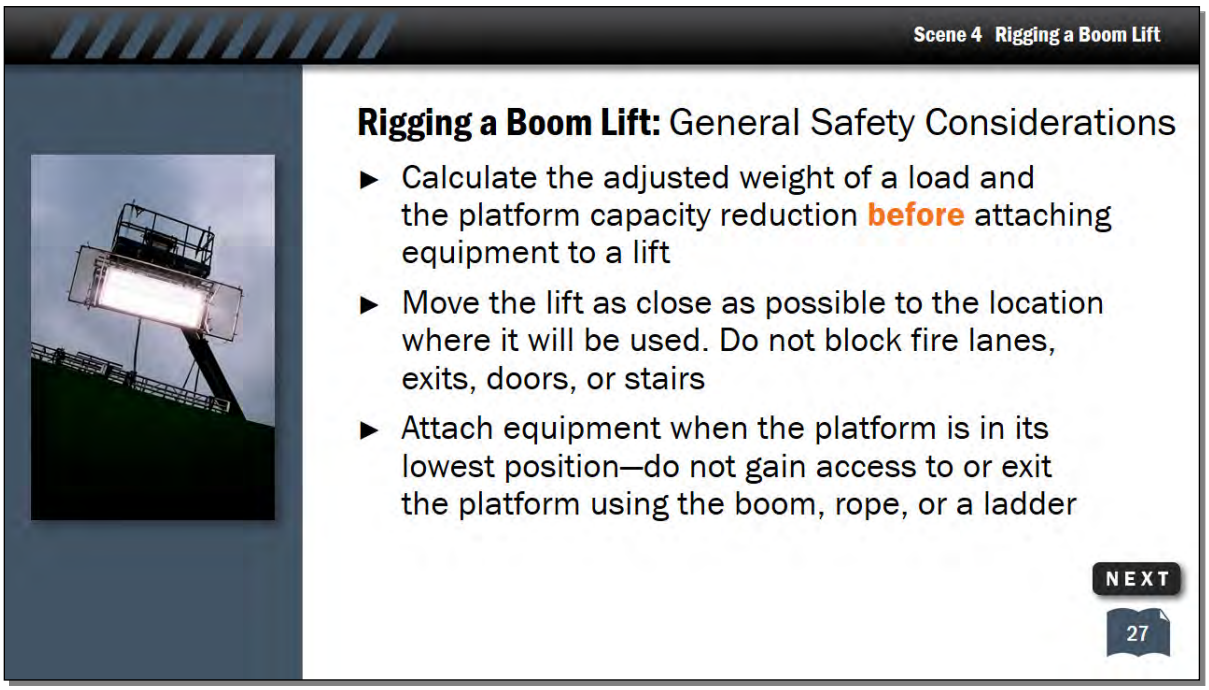
Calculate equipment's adjusted weight. The diffusion equipment you've just installed on a boom lift weighs 192 pounds, and the distance to the equipment's center of gravity is 70 inches. On the chart shown here, find the intersection of the equipment's weight and distance to the center of gravity to determine the adjusted weight.

Slide 87 - Rigging a Boom Lift

This scene presents some general safety tips for rigging boom lifts.

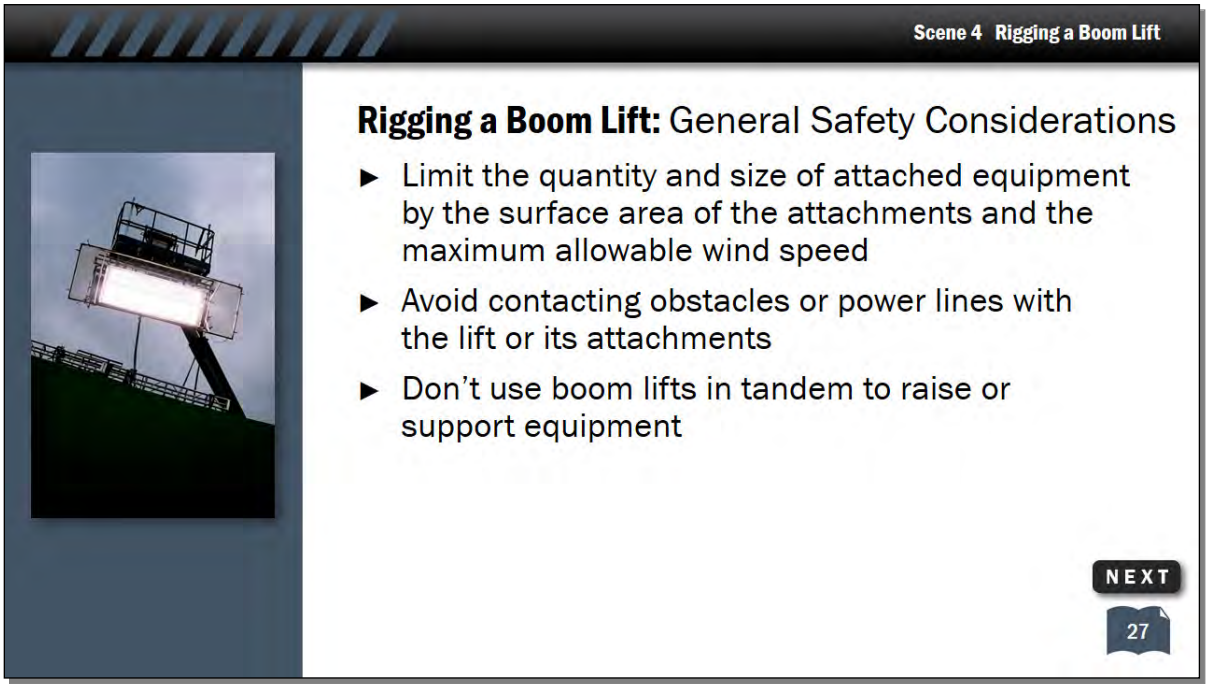
There is no one way to properly rig equipment--for questions about specific procedures, check with a supervisor or your safety rep.

Slide 88 - General Safety 1



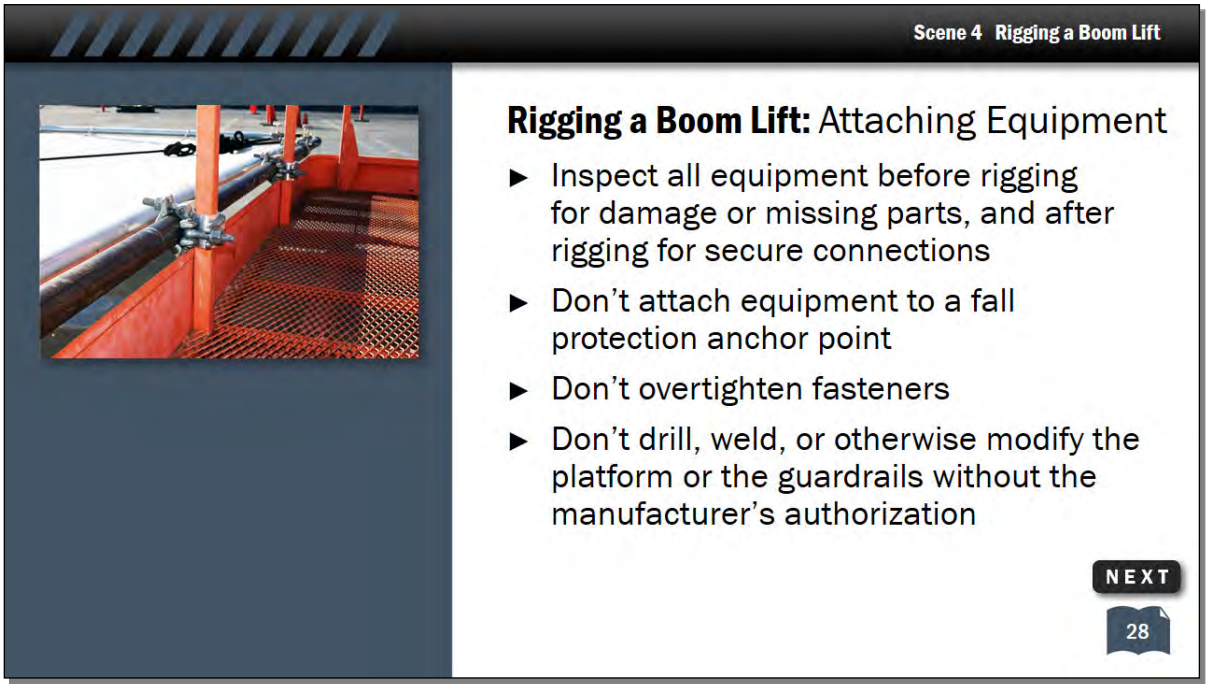
Calculate the adjusted weight of a load and the platform capacity reduction, as described in Scene 3, BEFORE attaching equipment to a lift. Move the lift as close as possible to the location where it will be used. Do not block fire lanes, exits, doors, or stairs. Attach and adjust equipment when the platform is in its lowest position--do not gain access to or exit the platform using the boom, rope, or a ladder.

Slide 89 - General Safety 2



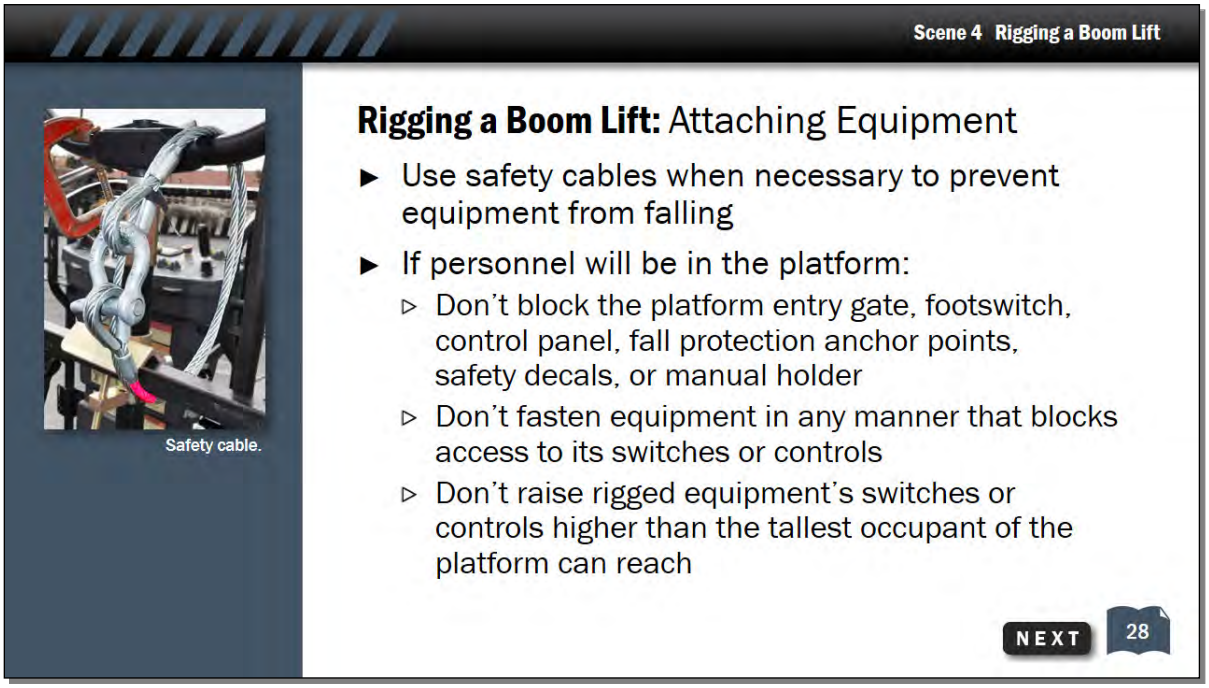
Even if meets the weight criteria for the lift, you may need to limit the quantity and size of equipment attached to the platform based on the surface area of the attachments and the maximum allowable wind speed. Avoid contacting outside obstacles or power lines with the lift or its attachments. Don't use boom lifts in tandem to raise or support equipment.

Slide 90 - Attaching Equipment 1



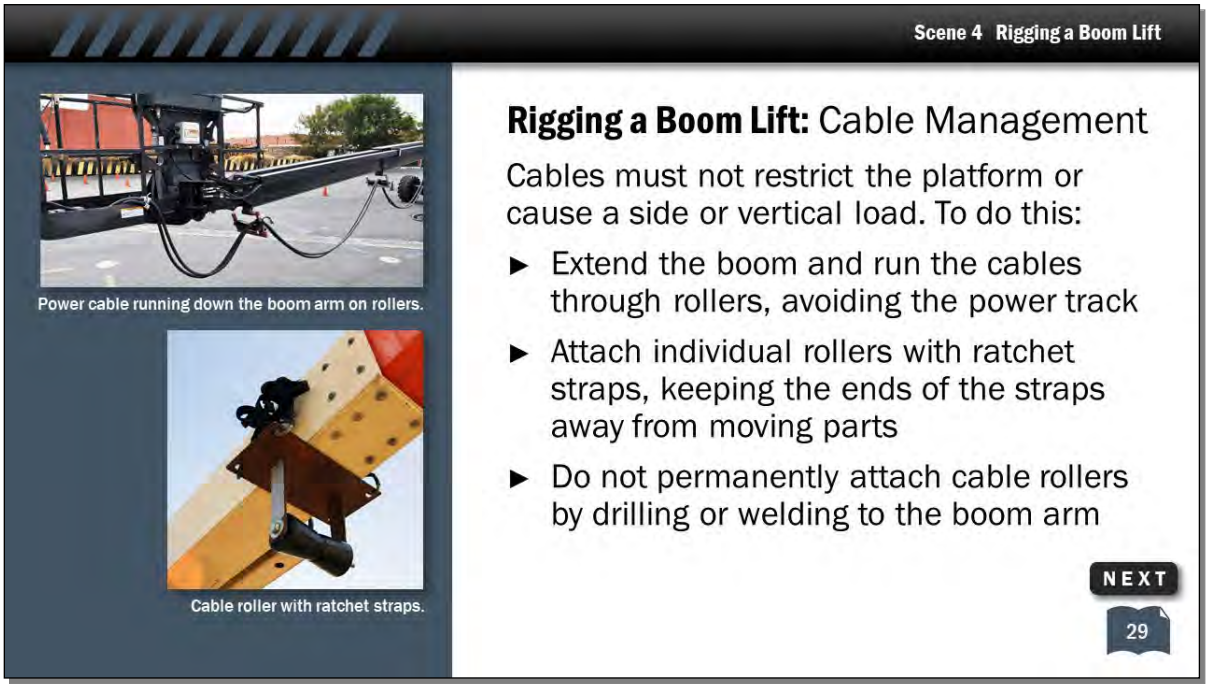
When rigging equipment, inspect all equipment before rigging for damage or missing parts, and after rigging for secure connections. Don't attach equipment to a fall protection anchor point. Don't overtighten fasteners, which may dent or damage guardrails. And, don't drill, weld, or otherwise modify the platform or the guardrails without the manufacturer's authorization.

Slide 91 - Attaching Equipment 2



Use safety cables when necessary to prevent equipment from falling off of the platform. If personnel will be working in the platform, don't block the platform entry gate, footswitch, control panel, fall protection anchor points, safety decals, or manual holder with equipment. Don't fasten equipment in any manner that blocks access to its switches or controls. And, don't raise equipment switches or controls higher than the tallest occupant in the platform can safely reach.

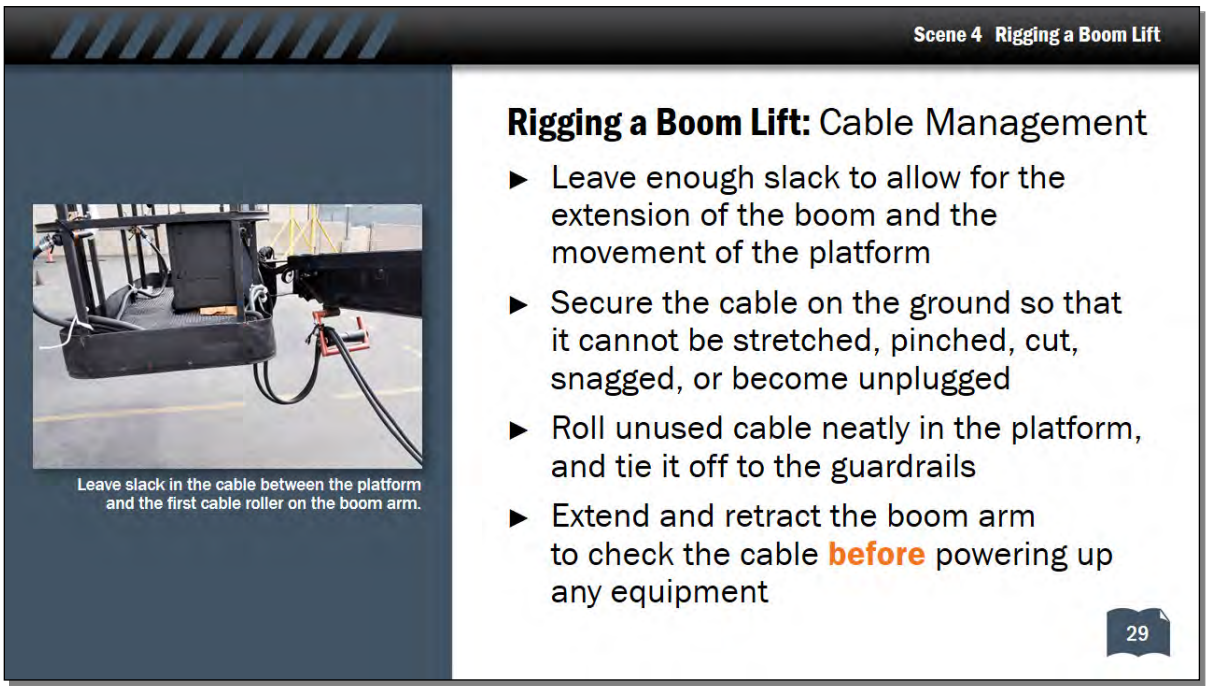
Slide 92 - Cable Management 1



When rigging equipment that requires power, the cables must not restrict the platform or cause a side or vertical load. This can be done by securing the cables to the boom arm. To do this, extend the boom horizontally and run the cables through rollers, avoiding the power track.

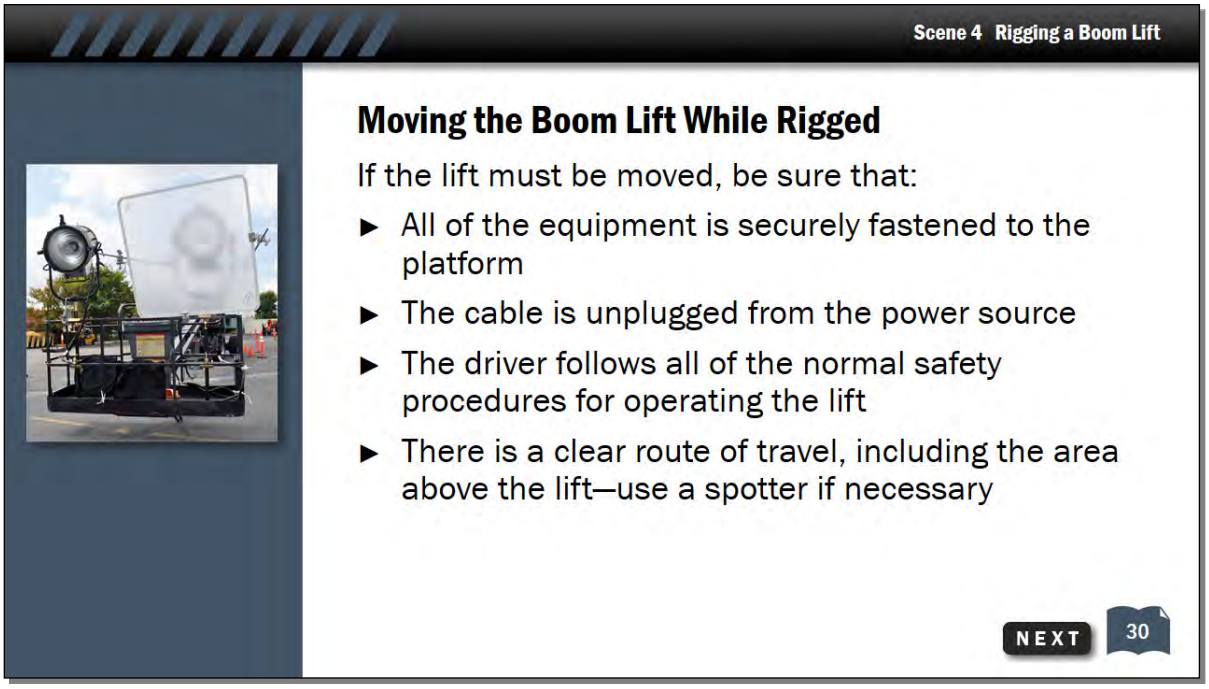
If the lift does not have pre-installed rollers, as shown in the top photo, attach individual rollers, such as those in the bottom photo, with ratchet straps, keeping the ends of the straps away from moving parts. Do not permanently attach cable rollers by drilling or welding to the boom arm.

Slide 93 - Cable Management 2



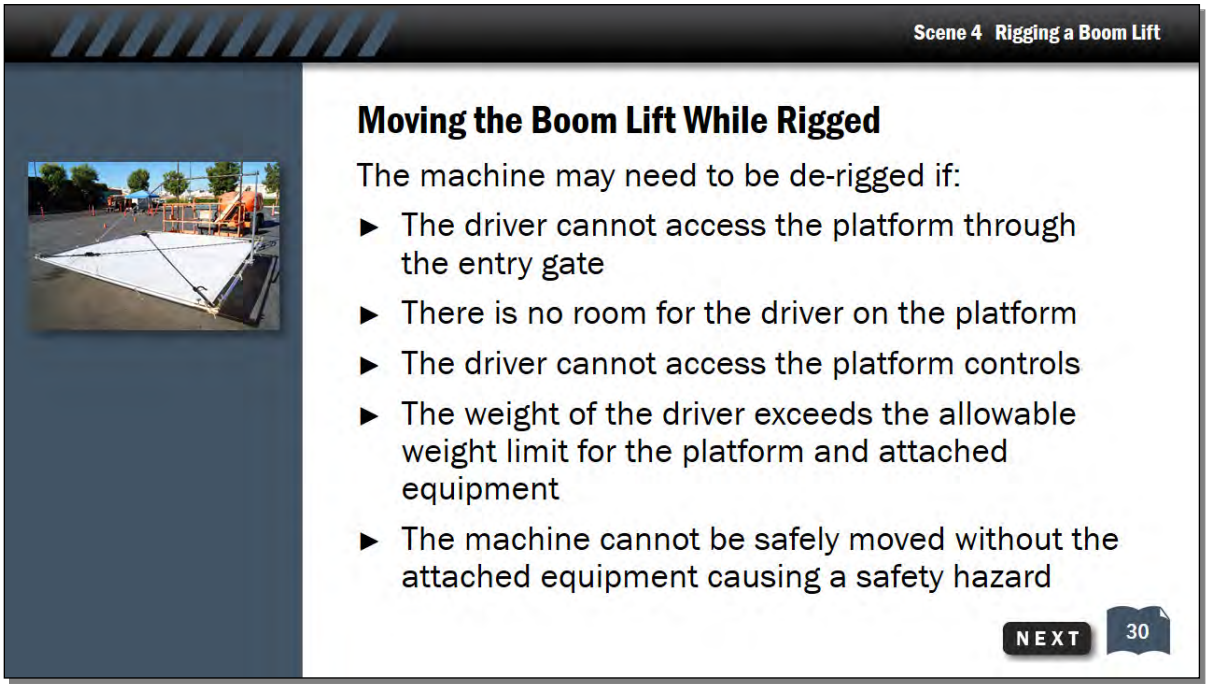
Leave enough slack in the cable between rollers and between the platform and the first cable roller to allow for the extension of the boom and the movement of the platform. Secure the cable on the ground so that it cannot be stretched, pinched, cut, snagged, or become unplugged. Roll unused cable neatly in the platform, and tie it off to the guardrails, away from the operator. Extend and retract the boom arm to check the cable BEFORE powering equipment.

Slide 94 - Moving While Rigged 1



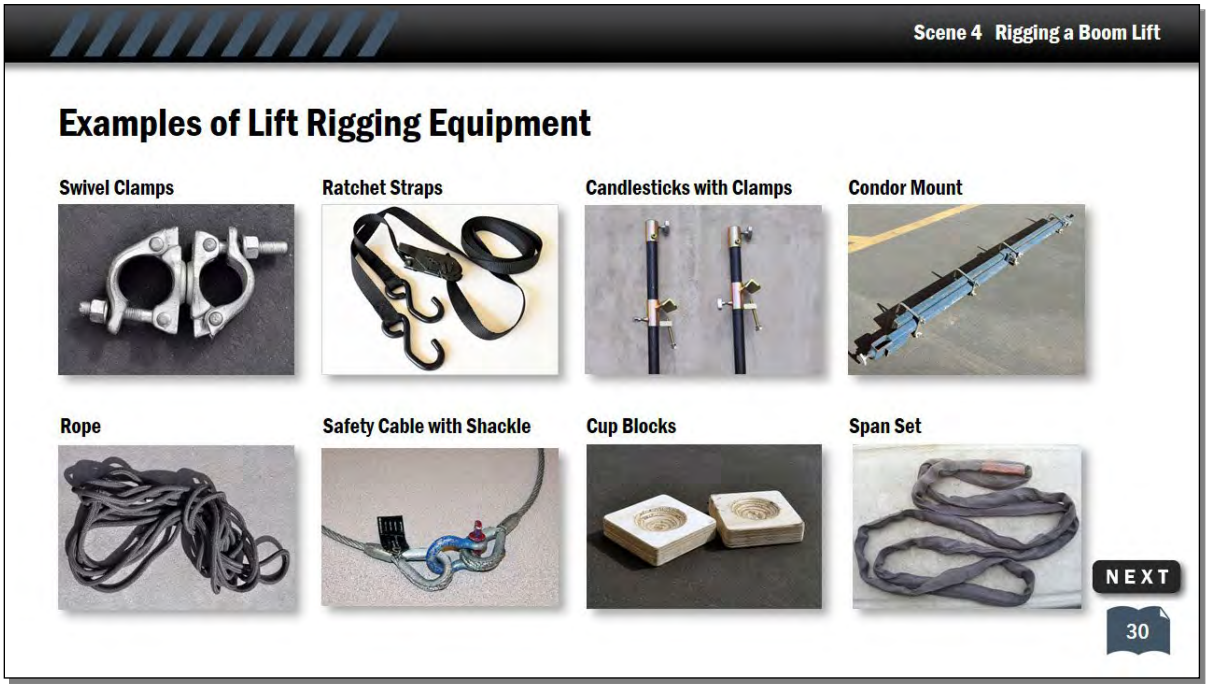
Once equipment has been attached to a boom lift, it's preferable not to move the machine. However, if the lift must be moved, be sure that: all of the equipment is securely fastened to the platform, the cable is unplugged from the power source, the driver follows all of the normal safety procedures for operating the lift, and, there is a clear route of travel, including the area above the lift--use a spotter if necessary.

Slide 95 - Moving While Rigged 2



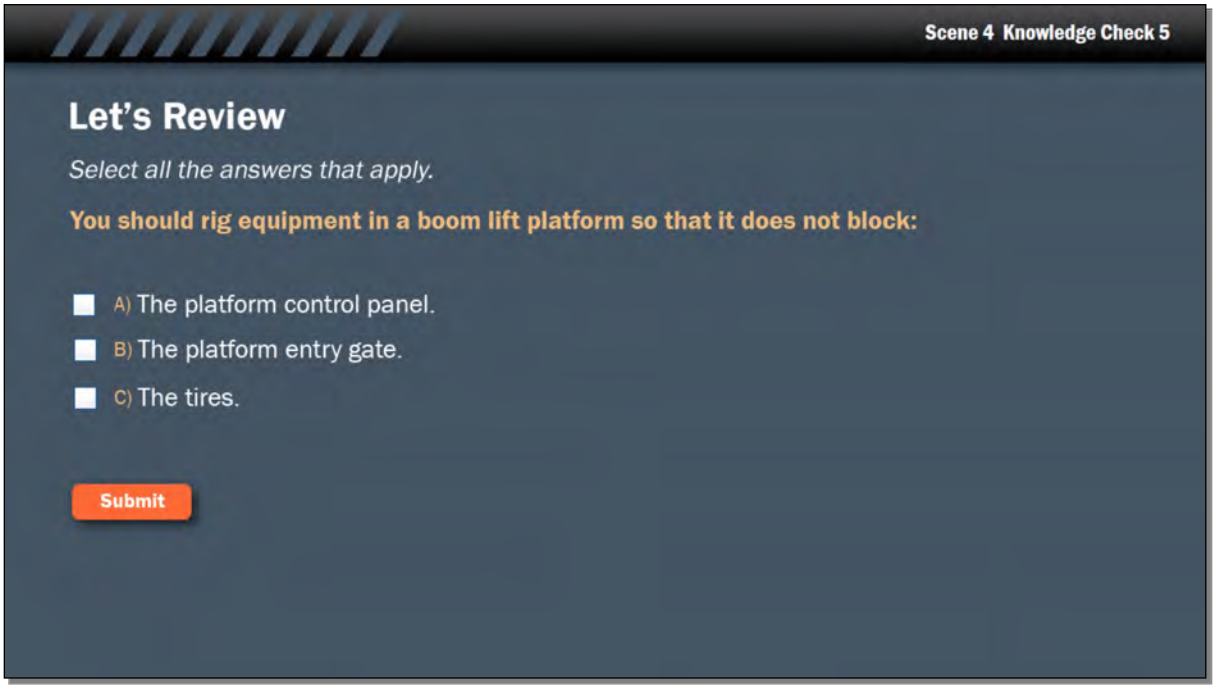
The machine may need to have some of its equipment de-rigged if: the driver cannot access the platform through the entry gate, there is no room for the driver on the platform, the driver cannot access the platform controls, the weight of the driver exceeds the allowable weight limit for the platform and the attached equipment, or, if the machine cannot be moved without the attached equipment causing a safety hazard.

Slide 96 - Equipment Examples



Here are some common examples of equipment used to attach motion picture equipment to boom lifts.

Slide 97 - Knowledge Check 5



Let's review. Select all the answers that apply.

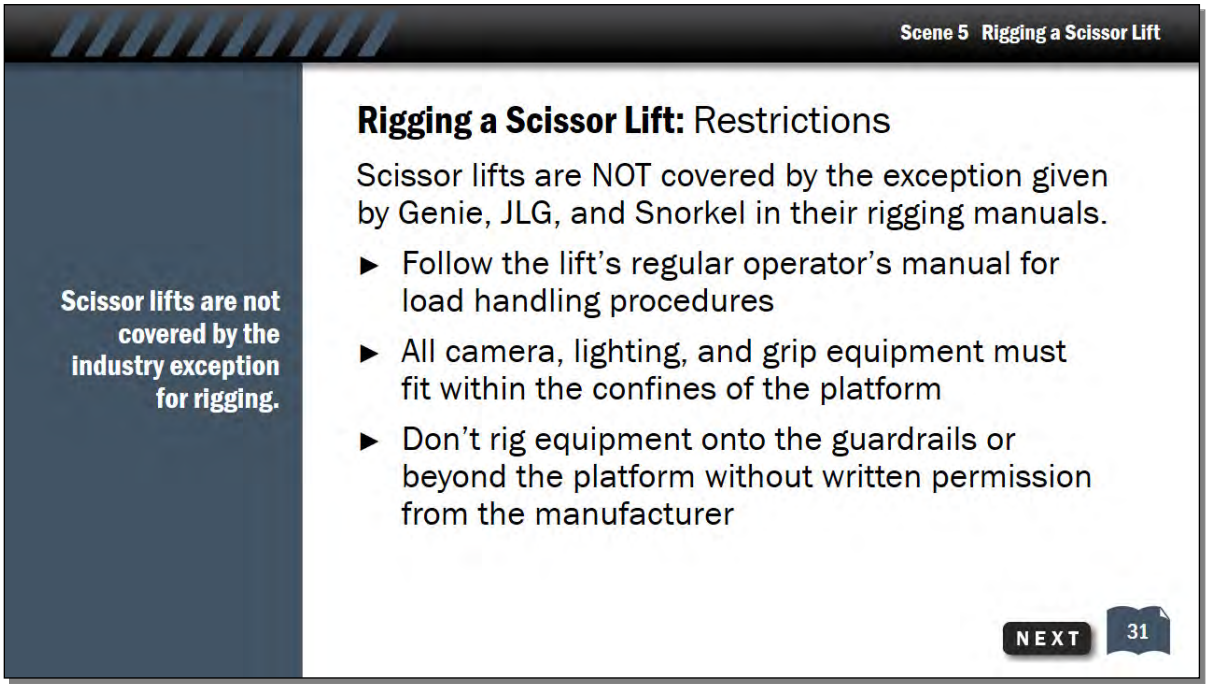
You should rig equipment in a boom lift platform so that it does not block:

(A) the platform control panel,
(B) the platform entry gate, or
(C) the tires.

Slide 98 - Rigging a Scissor Lift

This scene covers general rigging procedures for scissor lifts.

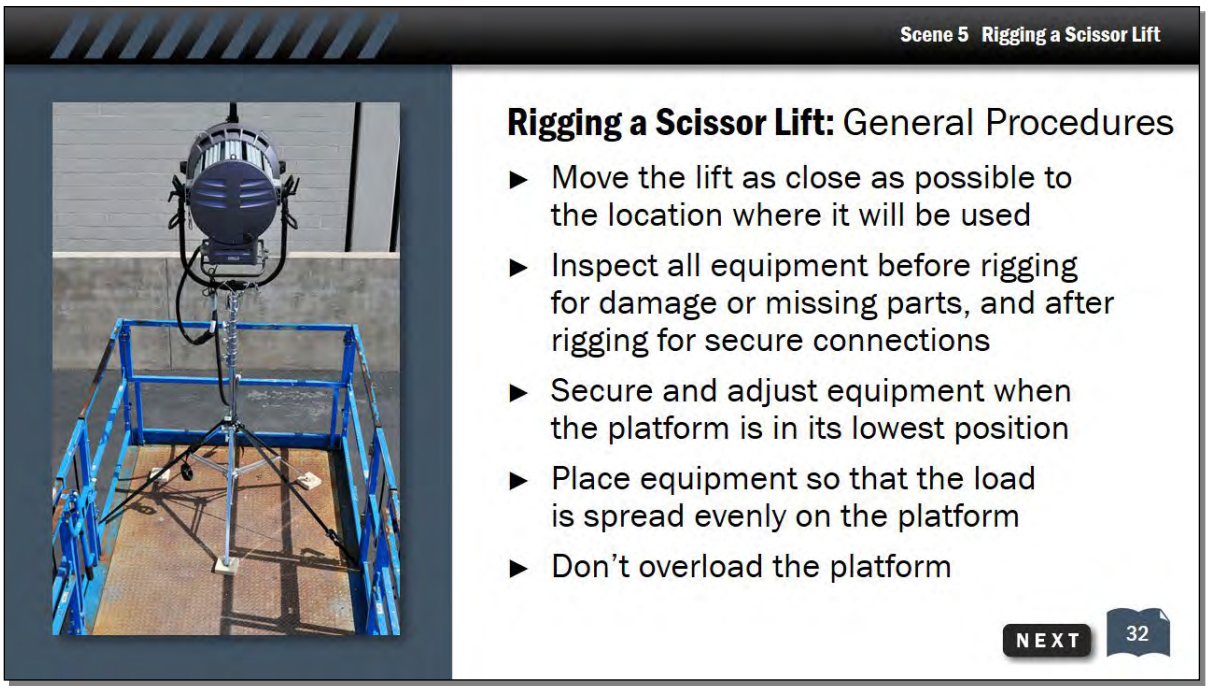
Slide 99 - Restrictions



It is very important to know that scissor lifts are NOT covered by the industry exception for rigging given by Genie, JLG, and Snorkel in their supplemental rigging manuals. Instead, follow the lift's regular operator's manual for load handling procedures. All camera, lighting, and grip equipment must fit within the confines of the platform.

We'll talk about cables in a moment. Don't rig equipment onto the guardrails or beyond the platform without written permission from the manufacturer.

Slide 100 - General Procedures 1



Move the lift as close as possible to the location where it will be used.

Do not block fire lanes, exits, doors, or stairs at any time.

Inspect all equipment before rigging for damage or missing parts, and after rigging for secure connections.

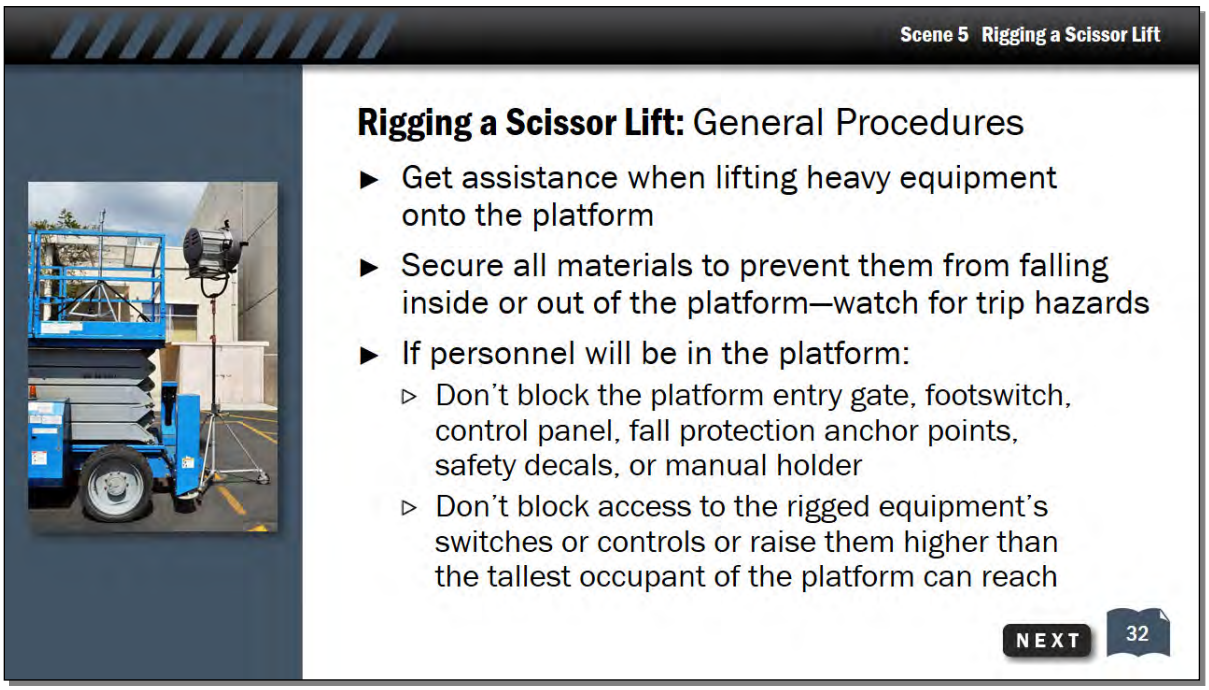
Secure and adjust equipment when the platform is in its lowest position.

Do not gain access to or exit the platform using the scissor arms.

If possible, place equipment so that the load is spread evenly on the platform.

Don't overload the platform--check the operator's manual or machine decals for maximum load limits and remember to account for personnel weight.

Slide 101 - General Procedures 2



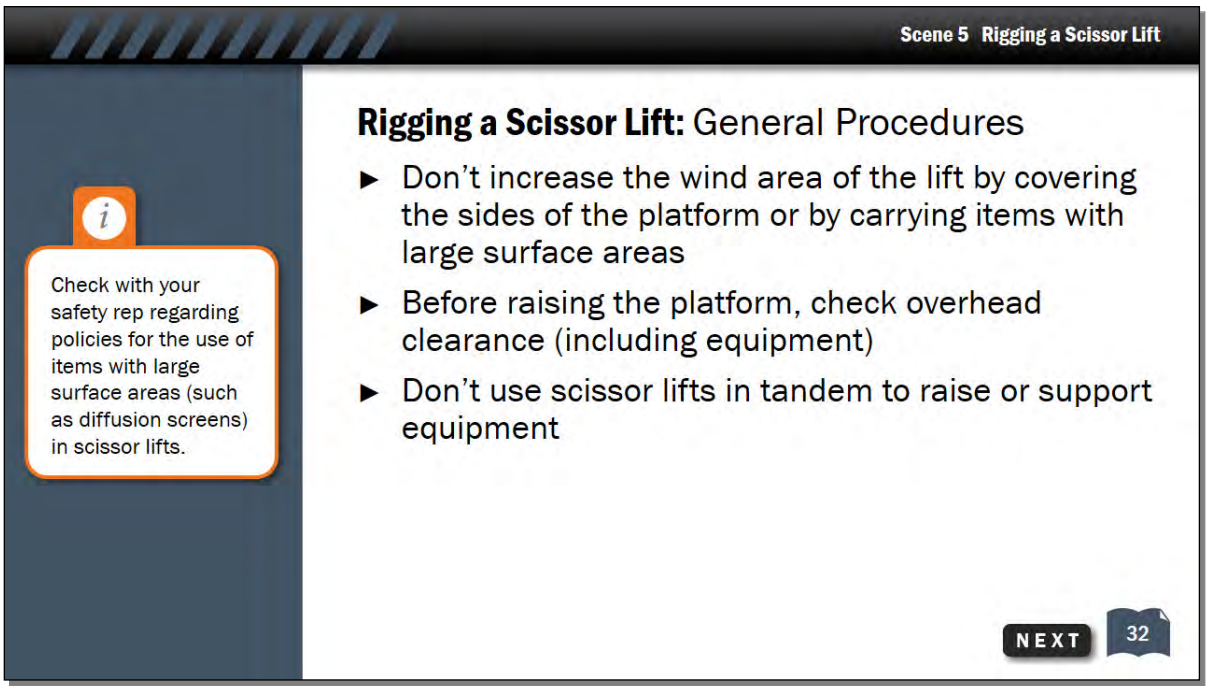
Get assistance or use mechanical means, such as a crank stand, when lifting heavy equipment onto the platform.

Secure all materials to prevent them from falling inside or out of the platform and watch for trip hazards when using straps to secure equipment to the platform.

If personnel will be working in the platform, don't block the platform entry gate, footswitch, control panel, fall protection anchor points, safety decals, or manual holder with equipment.

And, don't fasten equipment in any manner that blocks access to its switches or controls or that raises the switches or controls higher than the tallest occupant in the platform can safely reach.

Slide 102 - General Procedures 3

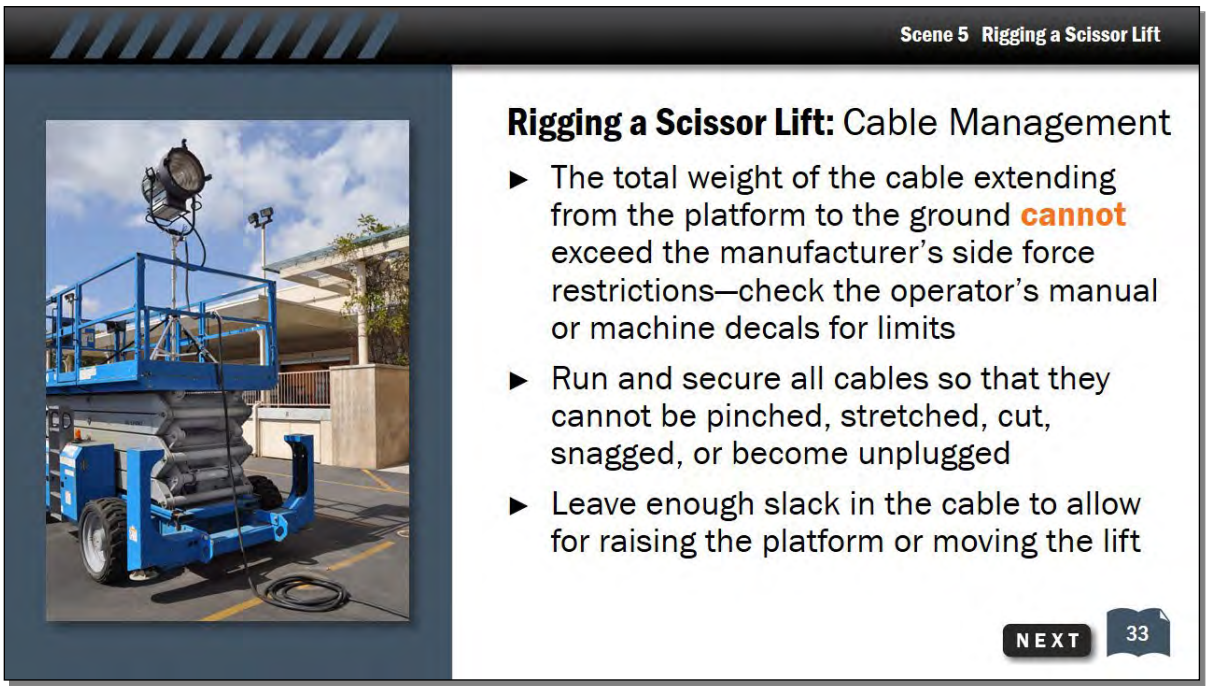


Don't increase the wind area of the lift by covering the sides of the platform or by carrying items with large surface areas. Check with your safety rep regarding policies for the use of items with large surface areas (such as diffusion screens) in scissor lifts.

Before raising the platform, check your overhead clearance, including the height of your equipment.

And, don't use scissor lifts in tandem to raise or support equipment.

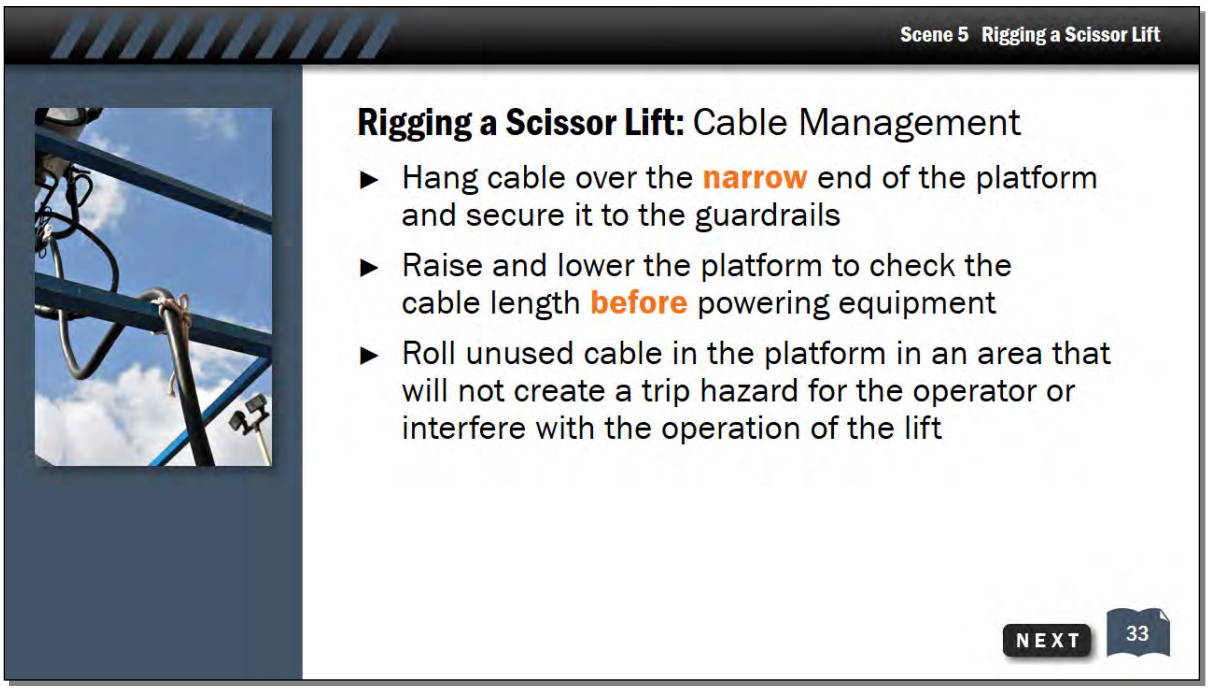
Slide 103 - Cable Management 1



Power cables may extend over the platform of a scissor lift, if these procedures are followed. Most importantly, the total weight of the cable that extends from the platform to the ground CANNOT exceed the manufacturer's side force restrictions, or it could cause a tip-over from a side load. Check the operator's manual for these limits.

Second, all cables should be run and secured in a way that they cannot be pinched, stretched, cut, snagged, run over, or become unplugged. This will include leaving enough slack in the cable to allow for raising the platform or moving the lift if necessary.

Slide 104 - Cable Management 2

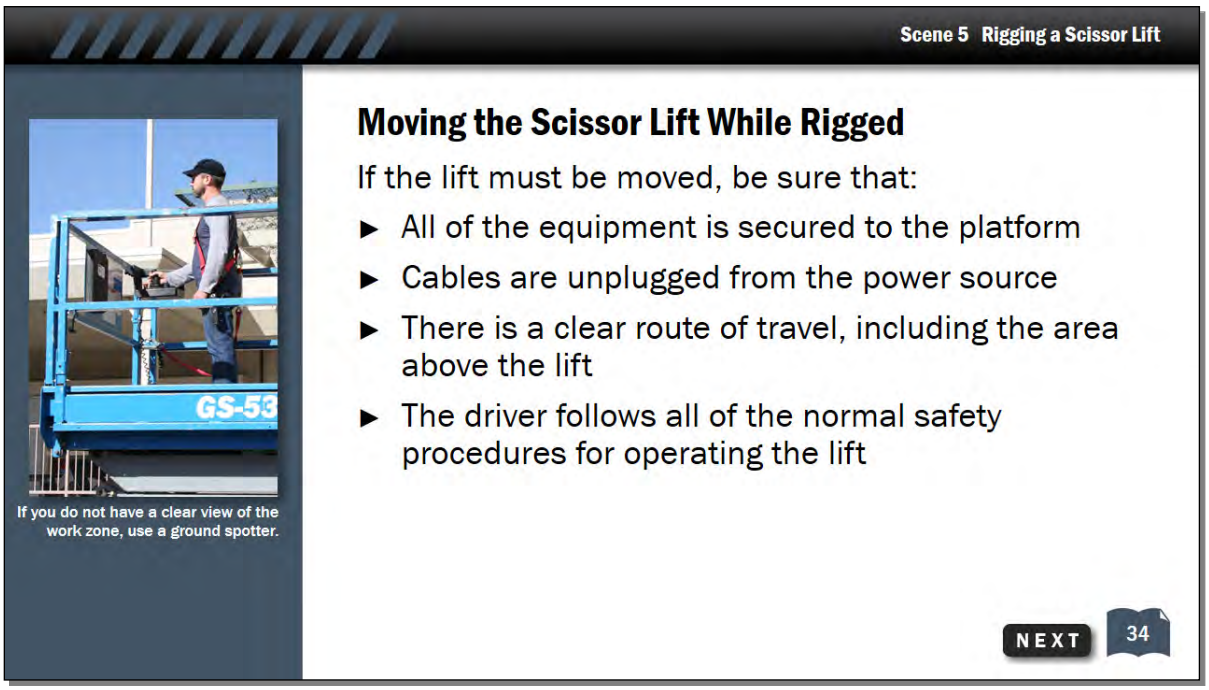


Hang cable over the NARROW end of the platform and secure it to the guardrails.

Raise and lower the platform slowly to check the length of the cable BEFORE you power the equipment.

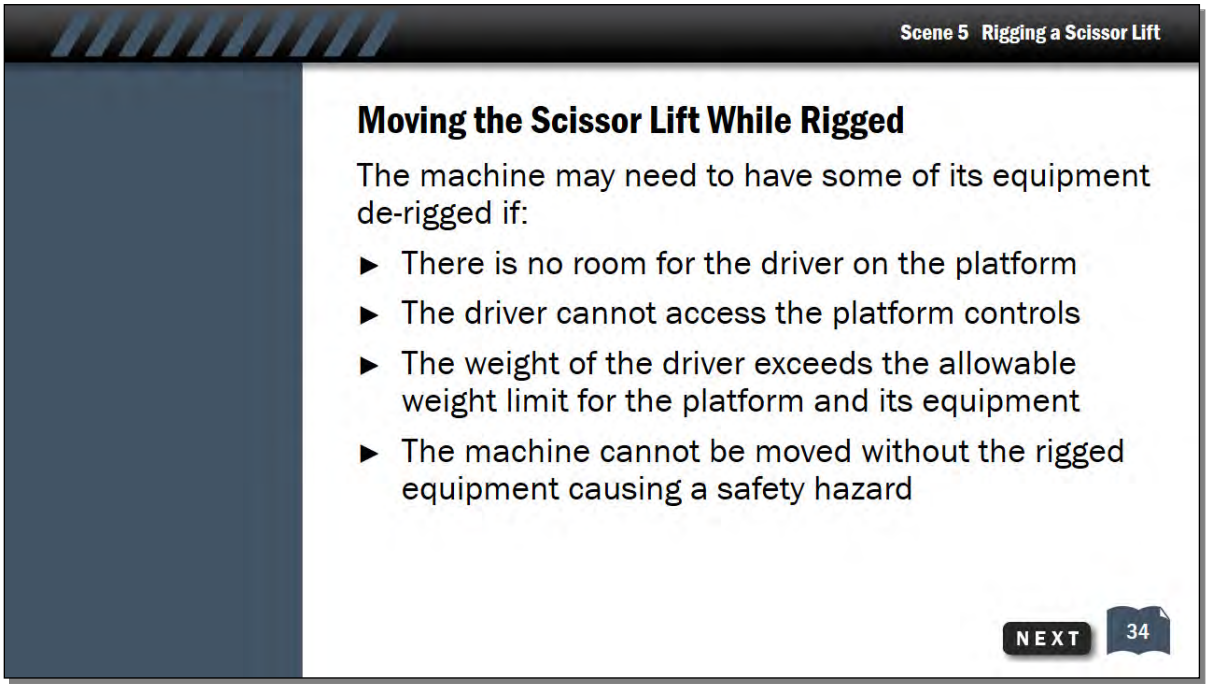
Roll any unused cable neatly in an area of the platform that will not create a trip hazard for the operator or interfere with the operation of the lift.

Slide 105 - Moving While Rigged 1



Once a scissor lift has been rigged with equipment and cables, it is preferable not to move the machine. If the lift must be moved, be sure that all of the equipment is securely fastened to the platform, that power cables are unplugged from the power source, that there is a clear route of travel, including the area above the lift, and that the driver follows all of the normal safety procedures for operating the lift.

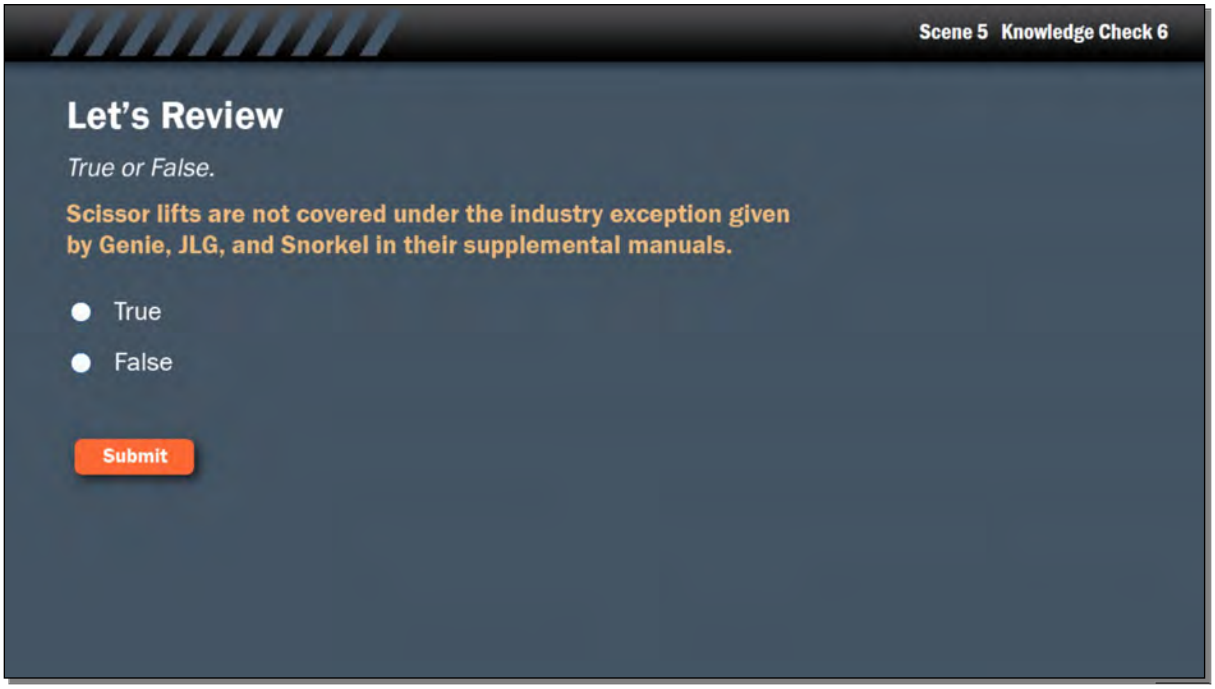
Slide 106 - Moving While Rigged 2



The machine may need to have some of its equipment de-rigged if:

the lift needs to be moved, but there is no room for the driver on the platform;
the driver cannot access the platform controls;
the weight of the driver exceeds the allowable weight limit for the platform and attached equipment; or
the machine cannot be moved without the rigged equipment causing a safety hazard.

Slide 107 - Knowledge Check 6



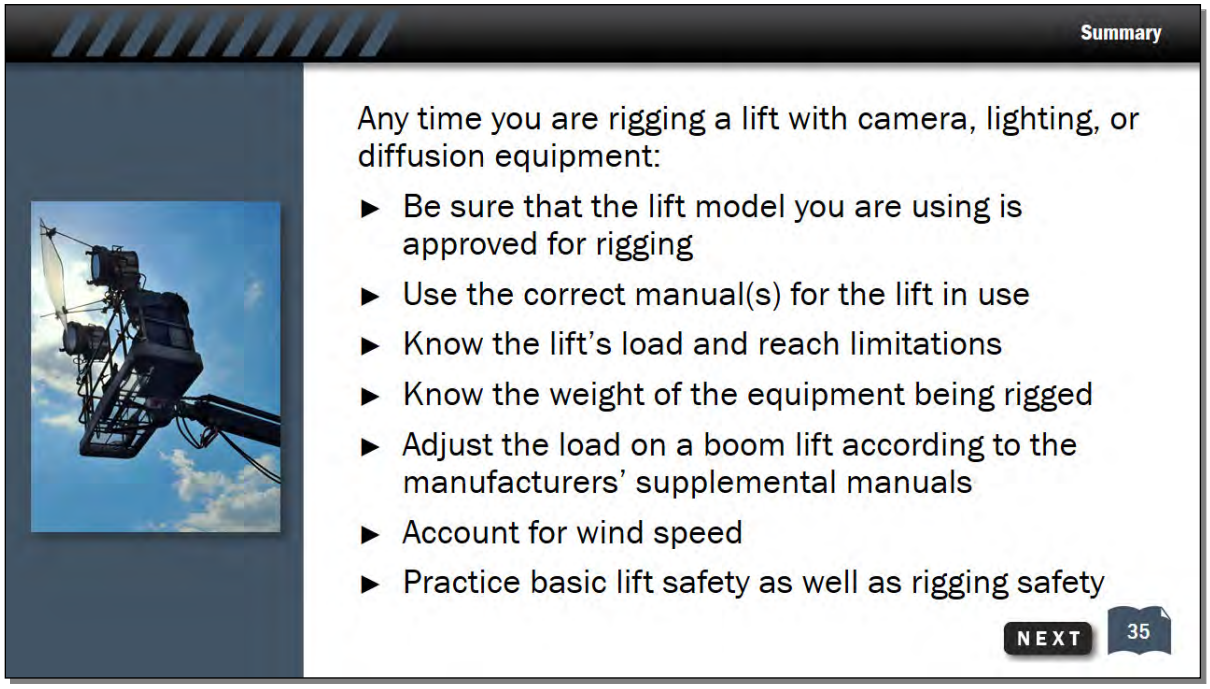
Let's review.

True or false. Scissor lifts are not covered under the industry exception given by Genie, JLG, and Snorkel in their supplemental manuals.

Slide 114 - Conclusion

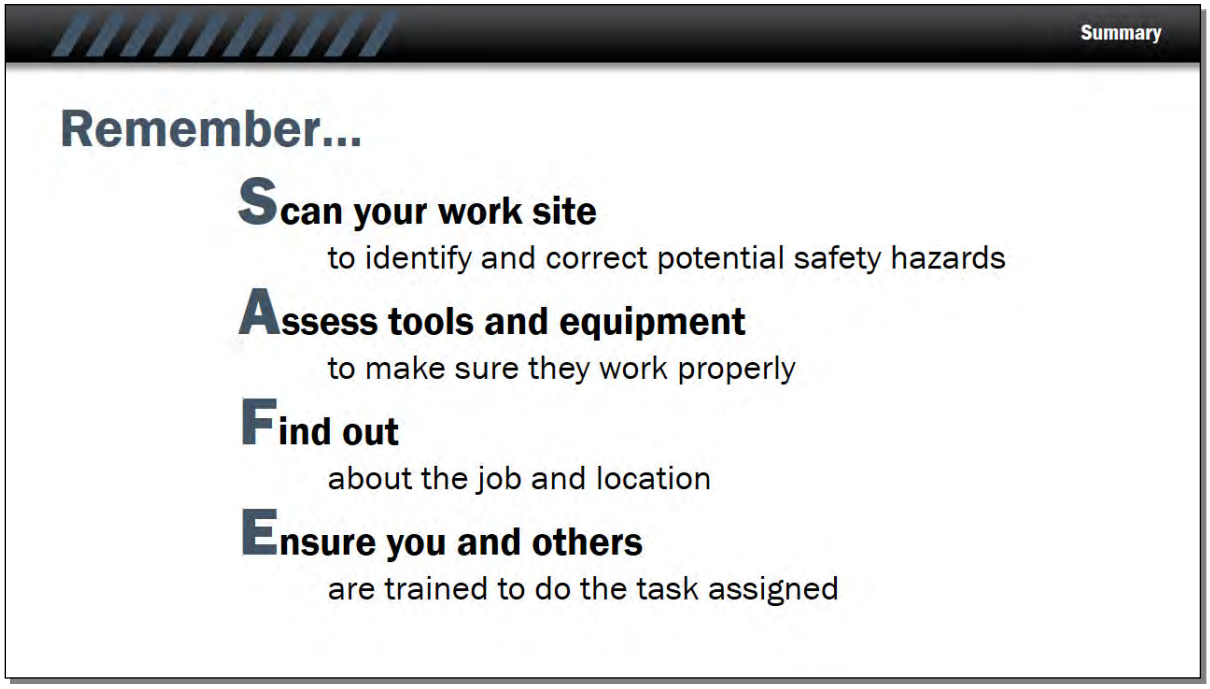
Let’s wrap up what we’ve learned about rigging boom lifts and scissor lifts today.

Slide 115 - When Rigging...



Any time you are rigging a lift with camera, lighting, or diffusion equipment: be sure that the lift model you are using is approved for rigging, use the correct manual--or manuals--for the lift in use, know the lift's load and reach limitations. Know the weight of the equipment being rigged, and if using a boom lift, adjust the load according to the instructions in the manufacturers' supplemental manuals. Be sure you account for wind speed, and always practice basic lift safety as well as rigging safety.

Slide 116 - S.A.F.E.



Remember...

Scan your work site to identify and correct potential safety hazards.

Assess tools and equipment to make sure they work properly.

Find out more about the job and the location.

And, **ensure** you and others are trained to do the task assigned.

Industry Safety Resources

Safety Bulletins

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

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

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

Current safety bulletins are available on the CSATF website:

https://www.csatf.org/production-affairs-safety/safety-bulletins/

24-Hour Industry Safety Hotline

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

888-7-SAFELY

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

https://www.csatf.org/production-affairs-safety/studio-safety-hotlines/

Safety is everyone's responsibility.