

MODULE OVERVIEW

This module discusses the importance of load charts and charts that apply to different configurations. It includes on-rubber, on-outrigger, jib, and deduction charts, as well as range diagrams and operational notes. In addition, parts of line and capacity calculations are covered.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*; *Mobile Crane Operations Level One*; and *Mobile Crane Operations Level Two*.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Define the concepts of center of gravity and leverage.
2. Define the importance of using a load/capacity chart for lifting operations.
3. Define the terms on a load/capacity chart to indicate boom angle, load radius, and boom length.
4. Calculate crane capacity using a load/capacity chart.
5. Calculate parts of line.
6. Identify the differences between on-rubber and on-outrigger charts.
7. Identify the difference between lattice boom, hydraulic boom, and boom truck, and boom attachment charts.
8. Describe different crane counterweight configurations.
9. Explain the importance of reviewing setup and operational procedures.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Identify boom angle, boom length, and load radius on a load/capacity chart.
2. Identify the requirements of the on-rubber load/capacity chart.
3. Identify the requirements of the on-outrigger load/capacity chart.
4. Properly identify load/capacity charts that are used in different configurations.
5. Identify parts of line and counterweight considerations in load/capacity chart information.
6. Calculate parts of a line.
7. Calculate crane capacities using load/capacity charts.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	<i>ANSI/SAE J987</i>
Transparencies	Load/capacity charts for different machines
Blank acetate sheets	Copies of site safety manual or procedures
Transparency pens	Videotape: <i>Lift Calculations</i>
Whiteboard/chalkboard	TV and VCR
Markers/chalk	Load moment indicator
Pencils and scratch paper	Copies of the Quick Quiz*
Manufacturer's literature on different types of cranes	Module Examinations**
<i>ASME B30.5</i>	Performance Profile Sheets**
<i>ANSI/SAE J765</i>	Performance Profile Examination Worksheets**

*Located in the back of this module.

**Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Brief trainees on site safety procedures.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 25 hours are suggested to cover *Load Charts*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Leverage, Load Charts, and Types of Cranes	
A. Introduction	_____
B. Center of Gravity and Leverage	_____
C. Load/Capacity Charts and Manufacturers	_____
D. Types of Cranes	_____
E. Importance of Load/Capacity Charts for Lifting Operations	_____
Sessions III and IV. Crane Configuration I	
A. Boom Length, Boom Angle, and Load Radius	_____
B. Laboratory – Trainees practice identifying boom angle, boom length, and load radius on a load/capacity chart. This laboratory corresponds to Performance Task 1.	_____
C. Quadrants of Operation	_____
D. Configuration of the Crane Base	_____
E. Laboratory – Trainees practice identifying requirements of the on-rubber load/capacity chart and the on-outrigger load/capacity chart. This laboratory corresponds to Performance Tasks 2 and 3.	_____
F. Tower and Ring Attachments	_____
Sessions V and VI. Crane Configuration II	
A. Counterweight Configurations	_____
B. Laboratory – Trainees practice identifying load/capacity charts that are used in different configurations. This laboratory corresponds to Performance Task 4.	_____
C. Deduction Charts	_____
D. Laboratory – Trainees practice identifying parts of line and counterweight considerations in load/capacity chart information. This laboratory corresponds to Performance Task 5.	_____
E. Laboratory – Trainees practice calculating parts of line. This laboratory corresponds to Performance Task 6.	_____
Sessions VII–IX. Calculating Crane Capacity	
A. Calculating Crane Capacity	_____
B. Range Diagram	_____
C. Laboratory – Trainees practice calculating crane capacities using load/capacity charts. This laboratory corresponds to Performance Task 7.	_____

Session X. Review, Module Examination, and Performance Testing

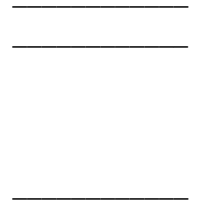
A. Review

B. Module Examination

1. Trainees must score 70 percent or higher to receive recognition from NCCER.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

C. Performance Testing

1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.



MODULE OVERVIEW

This module discusses the stowing and erection of the swing-away extension, A-frame jib, and auxiliary single-sheave boom head, as well as the assembly and removal of intermediate boom sections.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Mobile Crane Operations Level One; Mobile Crane Operations Level Two; and Mobile Crane Operations Level Three, Module 21301-05.*

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Determine if there is adequate space and resources for crane assembly and disassembly.
2. Define the relationship of the counterweight to the assembly and disassembly of the boom.
3. Assemble and disassemble various crane attachments and components.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Analyze the site for assembly/disassembly room.
2. Analyze and determine counterweight requirements needed for boom assembly.
3. Determine the ground stability and possible ground support needed for assembly and disassembly.
4. Assemble and disassemble crane attachments and components.
5. Install and remove an auxiliary single-sheave boom head.
6. Properly install wire rope and all lifting attachments.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

Copies of site safety manual or procedures

Copies of mobile crane operator's manuals

Mobile crane

Swing-away lattice extension

A-frame jib

Intermediate boom sections

Power-pinned fly

Manufacturer's assembly and disassembly instructions for crane and components

Auxiliary single-sheave boom head

Wire rope

Blocking

Tools and accessories to attach and stow crane components

Copies of the Quick Quiz*

Module Examinations**

Performance Profile Sheets**

*Located in the back of this module.

**Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to assemble and disassemble cranes. Review site safety procedures and site evacuation procedures. Ensure that all trainees are familiar with hand signals and other site communication procedures. Brief trainees on pinching and crushing hazards attendant with assembling and disassembling cranes.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Telescopic Boom Attachment Assembly and Disassembly*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Pre- and Post-Assembly Considerations	
A. Introduction	_____
B. Pre- and Post-Assembly Considerations	_____
C. Counterweight Considerations	_____
D. Laboratory – Trainees practice analyzing the site for assembly/disassembly room, and determining the ground stability and possible ground support needed for assembly and disassembly. Trainees also practice analyzing and determining counterweight requirements needed for boom assembly. This laboratory corresponds to Performance Tasks 1, 2, and 3.	_____
Session III. Swing-Away Lattice Extension	
A. Installing a Swing-Away Lattice Extension	_____
B. Stowing a Swing-Away Lattice Extension	_____
C. Laboratory – Trainees practice installing and stowing a swing away lattice extension. This laboratory corresponds to Performance Task 4.	_____
Session IV. A-Frame Jib	
A. Installing an A-Frame Jib	_____
B. Stowing an A-Frame Jib	_____
C. Laboratory – Trainees practice installing and stowing an A-frame jib. This laboratory corresponds to Performance Task 4.	_____
Sessions V. Intermediate Boom Sections	
A. Installing Intermediate Boom Sections	_____
B. Removing Intermediate Boom Sections	_____
C. Laboratory – Trainees practice installing and removing intermediate boom sections. This laboratory corresponds to Performance Task 4.	_____
Sessions VI. Power-Pinned Fly	
A. Extending a Power-Pinned Fly	_____
B. Retracting a Power-Pinned Fly	_____
C. Laboratory – Trainees practice extending and retracting a power-pinned fly. This laboratory corresponds to Performance Task 4.	_____

Sessions VII. Auxiliary Single-Sheave Boom Head and Wire Rope

- A. Auxiliary Single-Sheave Boom Head _____
- B. Laboratory – Trainees practice installing and removing an auxiliary single-sheave boom head. This laboratory corresponds to Performance Task 5. _____
- C. Wire Rope _____
- D. Laboratory – Trainees practice properly installing wire rope and all lifting attachments. This laboratory corresponds to Performance Task 6. _____

Session VIII. Review, Module Examination, and Performance Testing

- A. Review _____
- B. Module Examination _____
 - 1. Trainees must score 70 percent or higher to receive recognition from NCCER.
 - 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.
- C. Performance Testing _____
 - 1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.
 - 2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.

MODULE OVERVIEW

This module addresses operational techniques beyond simple lifts. These include more advanced lifting operations, such as multiple-crane lifts, critical lifts, blind lifts, and demolition. This module also includes sections on how to use magnet and vacuum lifting devices, and how to operate a mobile crane in extreme weather conditions.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Mobile Crane Operations Level One; Mobile Crane Operations Level Two; and Mobile Crane Operations Level Three*, Module 21301-05 and 21302-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Recognize the crane, communication, and personnel requirements for multiple-crane lifts, and identify requirements for personnel lifts.
2. Perform a blind lift under the direction of one or more signal people.
3. Identify the crane requirements and environmental guidelines for critical lifts.
4. Identify safety practices when operating in the path of transmitter energy.
5. Define the regulations for demolition procedures.
6. Describe the guidelines for safely operating a vacuum lifting device for lifting purposes.
7. Define the requirements for operating a magnet for lifting purposes.
8. Define the guidelines for operating a crane in extreme weather conditions.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Perform a blind lift.
2. Identify the components of a crane that should be observed closely before cold weather operation.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

OSHA 1926.550(g)

Copies of a critical lift plan

Copies of site safety procedures

Mobile crane with rigging and lifting equipment

Crane manufacturer's operator's manual

Signal flags or communications equipment

ANSI A10.6-1983 Safety Requirements for Demolition Operations

Demolition videocassette or DVD

TV and VCR/DVD

Copies of the Quick Quiz*

Module Examinations**

Performance Profile Sheets**

*Located in the back of this module.

**Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to operate a crane. Review site safety procedures and site evacuation procedures. Ensure that all trainees are familiar with hand signals and other site communication procedures. Brief trainees on pinching and crushing hazards attendant with crane operations. This module may require trainees to visit construction sites. Brief trainees on site safety procedures.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Advanced Operational Techniques*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Session I. Introduction, Personnel Lifts, and Multiple-Crane Lifts	
A. Introduction	_____
B. Personnel Lifts	_____
C. Multiple-Crane Lifts	_____
Sessions II and III. Blind Lifts	
A. Blind Lifts	_____
B. Laboratory – Trainees practice making blind lifts. This laboratory corresponds to Performance Task 1.	_____
Session VI. Critical Lifts and Working Near Transmitters	
A. Critical Lifts	_____
B. Working Near Transmitters	_____
Sessions V and VI. Demolition, Vacuum Lifting, and Electromagnet Lifting	
A. Demolition	_____
B. Vacuum Lifting	_____
C. Electromagnet Lifting	_____
Sessions VII. Cold Weather Operation	
A. Cold Weather Operation	_____
B. Laboratory – Trainees practice identifying the components of a crane that should be observed closely before cold weather operation. This laboratory corresponds to Performance Task 2.	_____
Session VIII. Review, Module Examination, and Performance Testing	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module provides an in-depth discussion of lift plan implementation. The topics covered include reference information, calculations, single- and multiple-crane lifting, critical lifts, and engineering.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum*; *Mobile Crane Operations Level One*; *Mobile Crane Operations Level Two*; and *Mobile Crane Operations Level Three*, Modules 21301-05 through 21303-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Provide the necessary information requested on a lift plan.
2. Reference available material that will assist in a safe lifting operation.
3. Calculate additions and deductions involved in lifting operations.
4. Identify existing operations that need special approval.
5. Identify engineering considerations in a lift plan.
6. Identify the various types of lift plans and their differences.
7. Identify the importance of lift plan implementation.
8. Describe the importance of following and adhering to a lift plan.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Fill out a lift plan based on a given scenario.
2. Perform single-crane lifting calculations.
3. Perform multiple-crane lifting calculations.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

OSHA 29 CFR 1910.180

OSHA 29 CFR 1926.550

ASME B30.5

Crane(s) and operator's manuals available for performing lifts

Copies of site emergency procedures

Copies of sample pre-lift worksheets and lift plans

Module Examinations*

Performance Profile Sheets*

Performance Profile Examination Worksheets*

*Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module may require trainees to visit construction sites. Brief trainees on site safety procedures.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Lift Planning*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I through III. Introduction and Lift Plan	
A. Introduction	_____
B. Lift Plan	_____
C. Laboratory – Trainees practice filling out a lift plan based on a given scenario. This laboratory corresponds to Performance Task 1.	_____
Sessions II and III. Calculations I	
A. Calculations for Single-Crane Lifts	_____
B. Laboratory – Trainees practice performing the calculations for single-crane lifts. This laboratory corresponds to Performance Task 2.	_____
Sessions IV through VI. Calculations II	
A. Calculations for Multiple-Crane Lifts	_____
B. Laboratory – Trainees practice performing the calculations for multiple-crane lifts. This laboratory corresponds to Performance Task 3.	_____
Session VII. Critical Lifts, Engineering Considerations, and Lift Plan Implementation	
A. Critical Lifts	_____
B. Engineering Considerations	_____
C. Lift Plan Implementation	_____
Session VIII. Review, Module Examination, and Performance Testing	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module provides an in-depth discussion of the *ASME B30.23* and *29 CFR 1926.550(g)* requirements while presenting advanced operating techniques for hoisting personnel.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Mobile Crane Operations Level One; Mobile Crane Operations Level Two; and Mobile Crane Operations Level Three*, Modules 21301-05 through 21304-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Identify which federal regulations apply to hoisting personnel.
2. Identify which consensus standards apply to hoisting personnel.
3. Visually inspect the platform, suspension system, and attachment points.
4. Perform a test lift following appropriate safety procedures and regulations, including the use of fall protection.
5. Define operation techniques for hoisting personnel near power lines.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Visually inspect the platform, suspension system, and attachment points.
2. Perform a test lift following appropriate safety procedures and regulations, including the use of fall protection.
3. Perform operations for hoisting personnel.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

OSHA 29 CFR 1926.104 1926.106, 1926.550(g), and 1926.753

ASME B30.23

Fall protection equipment

Fall protection safety video or DVD

TV and VCR or DVD player

OSHA document: *Crane or Derrick Suspended Personnel Platforms*

Personnel platform

Personnel Platform Pre-lift Inspection Form

Crane and rigging hardware for personnel platform

Copies of the Quick Quiz*

Module Examinations**

Performance Profile Sheets**

*Located in the back of this module.

**Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to operate a crane. Review site safety procedures and site evacuation procedures. Ensure that all trainees are familiar with hand signals and other site communication procedures. Brief trainees on pinching and crushing hazards attendant with crane operations. This module may require trainees to visit construction sites. Brief trainees on site safety procedures. This module may require trainees to be hoisted on a platform by a crane. Ensure that personnel have fall protection equipment and know how to use it properly.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 20 hours are suggested to cover *Hoisting Personnel*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I through III. Introduction, Fall Protection, and Requirements	
A. Introduction	_____
B. Fall Protection	_____
C. Platform Requirements	_____
D. Boom-Attached Platform Requirements	_____
E. Crane and Operational Requirements	_____
Sessions II and III. Personnel Platform Inspection	
A. ASME-Prescribed Personnel Platform Inspection	_____
B. Laboratory – Trainees practice inspecting the platform, suspension system, and attachment points. This laboratory corresponds to Performance Task 1.	_____
Sessions IV and V. Trial Lift	
A. Proof Testing	_____
B. Laboratory – Trainees practice performing a test lift. This laboratory corresponds to Performance Task 2.	_____
Sessions VI and VII. Advanced Operations Techniques	
A. Advanced Operations Techniques for Hoisting Personnel	_____
B. Laboratory – Trainees practice hoisting personnel. This laboratory corresponds to Performance Task 3.	_____
Session VIII. Review, Module Examination, and Performance Testing	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module provides a step-by-step look at short and long lattice boom assembly and disassembly.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Mobile Crane Operations Level One; Mobile Crane Operations Level Two; and Mobile Crane Operations Level Three*, Modules 21301-05 through 21305-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Determine if there is adequate space and resources for crane assembly and disassembly.
2. Identify lattice boom components.
3. Define the relationship of the counterweight to the assembly and disassembly of the boom.
4. Assemble and disassemble a short lattice boom.
5. Assemble and disassemble a long lattice boom.
6. Assemble and disassemble a jib at a lattice boom top.
7. Define and evaluate foundation requirements unique to long lattice boom erection.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Determine the amount of counterweight required for lattice boom erection.
2. Identify lattice boom components.
3. Assemble and disassemble a short lattice boom.
4. Assemble and disassemble a long lattice boom.
5. Assemble a jib at the lattice boom top.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Manufacturer's assembly instructions for a long lattice boom
Transparencies	Lattice boom crane and counterweights
Blank acetate sheets	Short and long lattice boom sections
Transparency pens	Jib and rigging hardware
Whiteboard/chalkboard	Blocking
Markers/chalk	Tools and rigging hardware for attachment of boom sections
Pencils and scratch paper	Copies of the Quick Quiz*
Lattice boom crane manufacturer's assembly and disassembly instructions	Module Examinations**
Jib manufacturer's assembly instructions	Performance Profile Sheets**
Manufacturer's assembly instructions for a short lattice boom	

*Located in the back of this module.

**Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to assemble and disassemble cranes. Review site safety procedures and site evacuation procedures. Ensure that all trainees are familiar with hand signals and other site communication procedures. Brief trainees on pinching and crushing hazards attendant with assembling and disassembling cranes.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 25 hours are suggested to cover *Lattice Boom Assembly and Disassembly*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Assembly and Counterweights Considerations, and Boom Parts	
A. Introduction	_____
B. Pre- and Post-Assembly Considerations	_____
C. Counterweight Considerations	_____
D. Laboratory – Trainees practice determining the amount of counterweight required for lattice boom erection. This laboratory corresponds to Performance Task 1.	_____
E. Boom Parts	_____
F. Laboratory – Trainees practice identifying lattice boom components. This laboratory corresponds to Performance Task 2.	_____
Sessions III through VII. Lattice Boom Assembly and Disassembly	
A. Assembling Short Lattice Booms	_____
B. Laboratory – Trainees practice assembling and disassembling a short lattice boom. This laboratory corresponds to Performance Task 3.	_____
C. Assembling Long Lattice Booms	_____
D. Laboratory – Trainees practice assembling and disassembling a long lattice boom. This laboratory corresponds to Performance Task 4.	_____
Sessions VIII and IX. Jib Assembly	
A. Jib Assembly	_____
B. Laboratory – Trainees practice assembling a jib at the lattice boom top. This laboratory corresponds to Performance Task 5.	_____
Session X. Review, Module Examination, and Performance Testing	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module covers accident prevention and investigation, the hazards of power line contact, and various failures that may occur during lifting operations.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Mobile Crane Operations Level One; Mobile Crane Operations Level Two; and Mobile Crane Operations Level Three*, Modules 21301-05 through 21306-05.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Explain legal responsibilities associated with crane operations, including accident prevention and investigation guidelines.
2. Describe the fire prevention standard for mobile crane operations.
3. Describe operational guidelines for lifting around power lines.
4. Recognize various failures in lifting and how to avoid them.

PERFORMANCE TASKS

There are no performance tasks for this module.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen

Transparencies

Blank acetate sheets

Transparency pens

Whiteboard/chalkboard

Markers/chalk

Pencils and scratch paper

ASME B30.5

Copies of sample accident investigation

Proximity warning device

Crane safety DVD or video

TV and VCR or DVD player

Copies of site safety procedures

Mobile crane with rigging and lifting equipment

Crane manufacturer's operator's manual

Copies of the Quick Quiz*

Module Examinations**

*Located in the back of this module

**Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. Review site safety procedures and site evacuation procedures. Ensure that all trainees are familiar with hand signals and other site communication procedures. Brief trainees on pinching and crushing hazards attendant with crane operations. This module may require trainees to visit construction sites. Brief trainees on site safety procedures.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 15 hours are suggested to cover *Emergency Procedures*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources.

Topic	Planned Time
Session I. Introduction and Accident Prevention and Investigation	
A. Introduction	_____
B. Accident Prevention and Investigation	_____
Session II. Fire	
A. Fire Prevention	_____
B. Extinguishing Fires	_____
Sessions III and IV. Power Lines	
A. De-energized and Grounded Electric Power Lines	_____
B. Prohibited Zone	_____
C. Avoidance Zone	_____
D. Operations in Transit	_____
E. Power Line Contact	_____
Session V. Various Failures in Lifting	
A. Striking the Boom	_____
B. Backward Collapse of a Boom	_____
Session VI. Review and Module Examination	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	

MODULE OVERVIEW

This module discusses the proper handling, loading, unloading, and securing procedures of mobile cranes and their components. Information is also presented on driver requirements and requirements for securing mobile cranes for transport.

PREREQUISITES

Prior to training with this module, it is recommended that the trainee shall have successfully completed *Core Curriculum; Mobile Crane Operations Level One; Mobile Crane Operations Level Two; and Mobile Crane Operations Level Three*, Modules 21301-05 through 21307-05. This is an elective module.

OBJECTIVES

Upon completion of this module, the trainee will be able to do the following:

1. Describe the proper handling of crane components.
2. Describe the proper procedures for securing the crane and its components for transport.
3. Describe the proper procedures for loading and unloading mobile crane components.
4. Properly load a crane and its components onto a flatbed trailer.
5. Properly secure a load on a flatbed trailer.
6. Recognize applicable local, state, and federal requirements.

PERFORMANCE TASKS

Under the supervision of the instructor, the trainee should be able to do the following:

1. Properly load a crane and its components onto a flatbed trailer.
2. Properly secure a load on a flatbed trailer.

MATERIALS AND EQUIPMENT LIST

Overhead projector and screen	Blocking
Transparencies	Tie downs, binders, or other strapping
Blank acetate sheets	Tools and equipment to load, secure, and unload a crane
Transparency pens	<i>ASME B30.5</i>
Whiteboard/chalkboard	<i>49 CFR Subpart I</i>
Markers/chalk	<i>23 CFR Sections 127 and 658</i>
Pencils and scratch paper	<i>Federal Motor Carrier Safety Regulations Sections 390.21 and 393</i>
Manufacturer's literature on loading, unloading, and securing cranes	Copies of site safety manual or procedures
Mobile crane	Module Examinations*
Flatbed trailer and ramp	Performance Profile Sheets*

*Located in the Test Booklet.

SAFETY CONSIDERATIONS

Ensure that the trainees are equipped with appropriate personal protective equipment and know how to use it properly. This module requires trainees to operate a crane. Review site safety procedures and site evacuation procedures. Ensure that all trainees are familiar with hand signals and other site communication procedures. Brief trainees on pinching and crushing hazards attendant with crane operations. This module may require trainees to visit construction sites. Brief trainees on site safety procedures.

TEACHING TIME FOR THIS MODULE

An outline for use in developing your lesson plan is presented below. Note that each Roman numeral in the outline equates to one session of instruction. Each session has a suggested time period of 2½ hours. This includes 10 minutes at the beginning of each session for administrative tasks and one 10-minute break during the session. Approximately 10 hours are suggested to cover *Load Charts*. You will need to adjust the time required for hands-on activity and testing based on your class size and resources. Because laboratories often correspond to Performance Tasks, the proficiency of the trainees may be noted during these exercises for Performance Testing purposes.

Topic	Planned Time
Sessions I and II. Introduction, Loading and Unloading Cranes	
A. Introduction	_____
B. Loading	_____
C. Unloading	_____
D. Securing the Load	_____
E. Laboratory – Trainees practice properly loading a crane and its components onto a flatbed trailer. This laboratory corresponds to Performance Task 1.	_____
F. Laboratory – Trainees practice securing the load on a flatbed trailer. This laboratory corresponds to Performance Task 2.	_____
Session III. Transporting Cranes	
A. Transporting Cranes	_____
B. Transport Regulations	_____
Session IV. Review, Module Examination, and Performance Testing	
A. Review	_____
B. Module Examination	_____
1. Trainees must score 70 percent or higher to receive recognition from NCCER.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	
C. Performance Testing	_____
1. Trainees must perform each task to the satisfaction of the instructor to receive recognition from NCCER. If applicable, proficiency noted during laboratory exercises can be used to satisfy the Performance Testing requirements.	
2. Record the testing results on Craft Training Report Form 200, and submit the results to the Training Program Sponsor.	