Perform Hydraulic Crane and Hook Block Operations
21J10C03 / Version ADT
01 Oct 2006

SECTION I. ADMINISTRATIVE DATA

All Courses Including This Lesson

Course Number	Version	Course Title
052-21J10 (R)	RCLS	General Construction Equipment Operators Course

Task(s) Taught(*) or Supported

Task Number	Task Title
	INDIVIDUAL
052-255-1038 (*)	Install Hook Block
052-255-1039 (*)	Move a Load With Crane and Hook Block

Reinforced Task(s)

Task Number	Task Title

Academic Hours

The academic hours required to teach this lesson are as follows:

	ADT Hours/Methods	
	4 hrs 40 mins	/ Conference / Discussion
	5 mins	/ Conference/Demonstration
	5 mins	/ Conference/Demonstration
	1 hr 30 mins	/ Demonstration
	32 hrs 10 mins	/ Practical Exercise (Performance)
Test	4 hrs 20 mins	
Test Review	15 mins	
Total Hours:	43 hrs 25 mins	

Test Lesson Number

	Hours	Lesson No.
Testing (to include test review)		N/A

Prerequisite Lesson(s)

Lesson Number	Lesson Title

Clearance Access

Security Level: Unclassified
Requirements: There are no clearance or access requirements for the lesson.

Foreign Disclosure Restrictions

FD5. This product/publication has been reviewed by the product developers in coordination with the Fort Leonard Wood, MO / Maneuver Support Center foreign disclosure authority. This product is releasable to students from all requesting foreign countries without restrictions.

References

Number	Title	Date	Additional Information
FM 5-434	Earthmoving Operations.	15 Jun 2000	
TM 5-3810-307-10	Capacity, Diesel Engine Driven, Grove Worldwide Contract Operator's Manual for (ATEC) All Terrain Crane AT422-T, 22 Ton Capacity, Diesel Engine Driven Grove Worldwide Contract DAAE07- 97-D-X001 Cage 12361 Part Number 1140000513.	01 Nov 1999	

Student Study Assignments

Read student guide

Instructor Requirements

Instructors must be ITC certified, course certified and licensed.

Additional Support Personnel Requirements

Name	Stu Ratio	Qty	Man Hours
Fuel Handler (Enlisted)		2	43 hrs 25 mins

Equipment Required for Instruction

Id Name	Stu Ratio	Instr Ratio	Spt	Qty	Exp
3810-01-448-2619 Crane, Truck, Mounted (ATEC)	1:2		No	0	No
4240-00-022-2946 Protector, Hearing	1:1	1:1	No	0	Yes
4240-00-052-3776 Goggles, Industrial	1:1	1:1	No	0	Yes
4930-00-253-2478 Lubricating Gun, Hand	1:2		No	0	Yes
4930-00-926-3581 Tank and Pump Unit, Fuel Dispensing			Yes	1	No
5120-00-189-7935 Socket, Socket Wrench, 15/16, 1/2" drive	1:2		No	0	Yes
5120-00-541-8444 Handle, Socket Wrench, 1/2" drive	1:2		No	0	No
7000-21-000-0115 Radio System, Trunk, Handheld, MACOM, UHF P170 Model 128	1:2	1:1	No	0	No
7920-00-205-1711 Rag, Wiping	1:12		No	0	Yes
8415-00-268-7868 Gloves, Work, Men's and Women's	1:1	1:1	No	0	No
8415-00-857-4915 Helmet, Safety, Construction Workers	1:1	1:1	No	0	Yes

* Before Id indicates a TADSS

Materials Required

Instructor Materials:
Gloves
Goggles
Hard hat
Safety boots
C03 Lesson plan
Hearing protection
Power point slides
TM 5-3810-307-10

Student Materials:
Gloves
Goggles
Safety boots
Pen or pencil
Student guide
Kevlar/Hard hats
Hearing protection
TM 5-3810-307-10
Equipment records folder

Classroom, Training Area, and Range Requirements

AUTO-AID INST, 1400 SF (Classroom XXI)
MED/HV EQUIP TR
RG SPT FAC

Ammunition Requirements

Id	Name	Exp	Stu Ratio	Instr Ratio	Spt Qty
None					

Instructional Guidance

NOTE: Before presenting this lesson, instructors must thoroughly prepare by studying this lesson and identified reference material.

1. Ensure classroom is set-up for training.
   a. One student guide per student.
   b. Ensure the computer interface is operational.
   c. Maintain a clean classroom.
2. Have inclement weather lesson plans on hand and ready for implementation.

Proponent Lesson Plan Approvals

Name	Rank	Position	Date
Blake, Timothy	GS-11	Training Specialist	02 Oct 2006
King, Ronnie	GS-12	Chief CE Branch	02 Oct 2006
Goff, Daniel	GS-14	Chief DOTLD	02 Oct 2006

SECTION II. INTRODUCTION

Method of Instruction: Conference/Demonstration
Instructor to Student Ratio is: 1:18
Time of Instruction: 5 mins
Media: Hands-on Instruction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

NOTE: Introduce yourself as the instructor

NOTE: Show Slide # 1

The purpose of hook block training is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

NOTE: Show Slide # 2

Terminal Learning Objective

NOTE: Inform the students of the following Terminal Learning Objective requirements.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

NOTE: Show Slide # 3

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment Level

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations	**NOTE:** It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.
Evaluation	Performance evaluation, refer to the student evaluation plan in the student guide.
Instructional Lead-In	The hydraulic crane is a very versatile piece of equipment. Not only can it excavate, it can also lift heavy objects and move or load them onto a haul unit. You must remember not to lift loads greater than its capability. While here at hydraulic crane phase, you will get a chance to experience its lifting capabilities.

SECTION III. PRESENTATION

NOTE: Inform the students of the Enabling Learning Objective requirements.

A. ENABLING LEARNING OBJECTIVE

ACTION:	Crane Set-up
CONDITIONS:	
STANDARDS:	

1. Learning Step / Activity 1. Introduce the LMI for crane set up operations.

Method of Instruction: Conference / Discussion
Instructor to Student Ratio: 1:6
Time of Instruction: 40 mins
Media: PowerPoint Presentation

NOTE: Show Slide # 4

A. LMI Setup

NOTE: The LMI must be reset after changing the crane configuration, or after the crane has been turned off for two or more hours.

1) LMI Set Up:

a) Press Select button.

b) Respond to the LMI by using keys F1-F4.

NOTE: Show Slide # 5

(1) To select hoist; choose 1 for auxiliary line, or 2 for main line.

NOTE: Show Slide # 6

(2) To select lift configuration; choose 1 for on rubber, or 2 for out riggers.

NOTE: Show Slide # 7

(3) To select reeving (parts of line); choose + to increase, or – to decrease.

NOTE: Show Slide # 8

(4) Press OK to confirm, otherwise repeat steps until LMI reads correct configuration.

NOTE: Show Slide # 9

2) Liquid crystal display (LCD) shows all symbols and numerical information.

a) Boom Pin Height

b) Boom Length

c) Boom Angle

d) Operating Radius

e) Reeving Information (parts of line)

f) Maximum Lift Weight

g) Actual Lift Weight

NOTE: Conduct a check on learning and summarize the learning activity.

2. Learning Step / Activity 2. Demonstrate Crane Set-Up Procedures.

Method of Instruction:	Demonstration
Instructor to Student Ratio:	1:6
Time of Instruction:	35 mins
Media:	Hands-on Instruction

NOTE: The demonstration will be conducted at the training site. Brief the students on equipment operations and personal safety equipment. Explain the set up procedures while the assistant demonstrates.

A. Setting up crane for operation

1) Perform a 360-degree walk-around and engage battery disconnect switch.

2) Start crane from carrier and wait for air pressure to reach 85 psi.

3) Turn engine off and engage the PTO.

4) Start crane from superstructure.

5) Engage function switch to the ON position ensuring that both armrests are completely down and secure seat belt.

6) Fully extend the extensions (verify that they are fully extended.)

7) Raise the boom out of the cradle 3 degrees or approximately 6 inches.

8) Attach float pads to the stabilizers, place the construction mats, and extend stabilizers 4 to 6 inches at a time until they are fully extended.

9) Level the crane by retracting the stabilizer(s) and verify that the tires are off the ground.

10) With the right joy stick, you must boom up and hoist down at the same time until you reach 35 degrees.

11) Remove the hook block from the tie down and hoist up to clear the cab.

12) Boom up to 40 degrees.

13) Disengage the superstructure swing pin lock. (Pull out and up.)

14) Release the swing brake located on the left arm rest.

15) With the left joy stick, swing to the right 180 degrees (blowing the horn three times before moving the superstructure to clear the area) and engage the swing pin lock again.

16) Telescope the boom out to 50 ft boom length and hoist down at the same time to hold the load at a steady position.

17) Retract the boom back to 27 feet and hoist up at the same time to hold the load at a steady position.

18) Disengage the positive swing pin and swing the superstructure to the left 180 degrees (blowing the horn three times before moving the superstructure to clear the area) to the stowage position.

19) Apply the swing lock pin and the swing brake switch.

20) Boom down to 35 degrees, hoist down until you able to connect the hook block to the tie down point on the front bumper.

21) Boom down and hoist up until the boom is about 6 inches from the cradle, make final adjustments and then lower the boom until it is down completely in the boom rest.

22) Retract the stabilizers, remove the float pads and install them in their stow position, and then fully retract the extensions.

23) Turn the function switch to the OFF position and turn the engine off in the superstructure.

24) Perform a 360 degree walk around, disengage the PTO in the carrier, continue the walk around and disengage the power switch.

NOTE: Conduct a check on learning and summarize the learning activity.

3. Learning Step / Activity 3. Perform Crane Set-up Procedures.

Method of Instruction: Practical Exercise (Performance)
Instructor to Student Ratio: 1:6
Time of Instruction: 9 hrs 15 mins
Media: Hands-on Instruction

NOTE: The students may be tested on this task at any time during this practical exercise. If the student tests out on this task early THEY ARE STILL REQUIRED TO COMPLETE THE ENTIRE BLOCK OF TRAINING.

Conduct a Practical Exercise on crane set-up procedures.

Refer to appendix C for practical exercise instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

4. Learning Step / Activity 4. Performance Evaluation

Method of Instruction: Test
Instructor to Student Ratio: 1:6
Time of Instruction: 1 hr 45 mins
Media: Hands-on Instruction

Conduct a performance evaluation on crane set-up procedures.

Refer to appendix C for performance evaluation instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

5. Learning Step / Activity 5. Performance Evaluation Review

Method of Instruction: Test Review
Instructor to Student Ratio: 1:6
Time of Instruction: 5 mins
Media: Small Group Instruction (SGI)

Conduct a performance evaluation review on crane set-up

Refer to appendix C for performance evaluation instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.

B. ENABLING LEARNING OBJECTIVE

ACTION:	Determine Lift Requirements
CONDITIONS:	Given a student guide, load calculating charts, lifting capacity charts, student workbook, and a guided discussion in a classroom environment.
STANDARDS:	Determined boom length, boom angle, boom pin height, maximum lifting capacity, parts of line, and rated load as a "GO" or "NO GO" in accordance with (IAW) appropriate lifting capacity charts.

1. Learning Step / Activity 1. Introduction to Determine Lift Requirements

Method of Instruction: Conference / Discussion
Instructor to Student Ratio: 1:6
Time of Instruction: 2 hrs
Media: PowerPoint Presentation

A. Basis for Safe Lifting

1) Hydraulic cranes are rated based on the strength of the material of the boom and other components.

2) Rated loads as shown on lift chart pertain only to the Grove 22-ton crane ton hydraulic crane.

a) Do not exceed rated loads at rated radius.

b) For Clamshell, Grapple, and Concrete Bucket operations, the weight of the load must not exceed 80% of rated lifting capacity.

3) The crane must be on a firm leveled surface.

NOTE: Lifting with outriggers and float pads is the preferred method.

NOTE: Show Slide # 10

a) For outrigger operation, tires must be off the ground.

NOTE: Show Slide # 11

b) For rubber lifts, the tires must be inflated to 110 psi.

NOTE: Show Slide # 12

B. Lifting Areas

1) Although lifting may be accomplished with the crane on its tires, the preferred method is with the crane properly stabilized using the outriggers.

2) Prohibited areas such as those with power lines and uneven ground must never be used.

3) Authorized areas, with proper operating radius and without height restrictions, are to be used at all times.

a) Lifting on rubber

b) Lifting on outriggers

C. Line Pull and Reeving Information.

NOTE: Show Slide # 13

NOTE: Refer students to TM 5-3810-307-10

1) Permissible line pulls

a) One part line is 8,074 pounds.

b) Multiple part receiving is 7,333 pounds for each part of line over one part of line, given a 6 part line.

2) Reeving

a) Cable (main and/or auxiliary)

b) Cable size (5/8" diameter)

c) Cable type (18x19 Class, or 35x7 Rotation Resistance)

d) Cable length (364')

e) Minimum one (1) part line

f) Maximum six (6) part line

NOTE: Show Slide # 14

D. Hoist (Main and Auxiliary)

1) Main hoist used for all lifting operations.

2) Auxiliary hoist used for special operations (i.e. pile driver).

NOTE: Show Slide # 15

E. Height Factors

1) Hook block height (main hook block is 4'6")

2) Sling height (measurement of the entire sling laying flat)

3) Load height (measured from bottom to the top of the load)

4) Lift height (highest point load will be lifted)

NOTE: Show Slide # 16

F. Weight Factors

1) Hook block weight is 498 pounds (use weight of actual hook block being used).

2) Sling weight (actual weight of sling after weighed on scales)

3) Load weight (actual weight of load per shipping instruction)

4) Additional weight (i.e. wind, ice, snow, mud/dirt, cargo or attachments):

   a) All load handling devices and boom attachments are considered part of the load being lifted.

   b) Attachments:

      i. Clamshell bucket (2900 lbs)

      ii. Grapple attachment (3200 lbs)

NOTE: Show Slide # 17

G. Review

NOTE: Show Slide # 18

H. Working Range Diagram

NOTE: Refer students to TM 5-3810-307-10

1) The working range diagram is used to find boom length only.

2) The working range diagram is located in the technical manual and it is located in the superstructure.

NOTE: Show Slide # 19

3) Two factors are needed to use the range diagram.

   a) Operating radius

   b) Boom pin height

NOTE: Show Slide # 20

4) Explain operating radius

   Operating radius is the measurement from the axis of rotation to the center line of the vertical hoist. Operating radius is rounded up to the next 5 feet.

NOTE: Show Slide # 21

5) Explain boom pin height (Total height from ground)

   a) To determine total height, add the load height, sling height, hook block height, and lift height.

b) Total all the height factors and round up to the next higher 5 foot increment (example 21' 4" would be 25 feet).

c) The total height will then become the boom pin height.

NOTE: Show Slide # 22

6) Identify, locate, and show how to use parts of the working range diagram.

a) Operating radius scale (located at the bottom of the range diagram)

b) Boom pin height scale (located along the left side of the range diagram)

c) Boom length scale (located where the operating radius and the boom pin height scale intersect)

d) Intersection point (the cross point of the boom pin height and operating radius)

e) Annotate boom length on the load chart form.

NOTE: Show Slide # 23

I. Rated Lifting Capacities Chart

NOTE: Refer students to TM 5-3810-307-10

1) The Rated Lifting Capacities Chart shows the maximum weight (in pounds) the crane can lift.

2) The crane has four lifting capacities ratings.

a) On outriggers fully extended

b) On rubber (360)

c) On rubber (defined arc over rear)

d) Pick & carry

NOTE: Show Slide # 24

3) Two factors are needed to use the Rated Lifting Capacities Chart.

a) Operating radius

b) Boom length

NOTE: Show Slide # 25

J. Load Chart Calculating

NOTE: Refer students to TM 5-3810-307-10

1) Parts and how to use the lifting capacities chart

a) Locate the operating radius (scale down left side)

b) Locate the boom length (scale across the top)

c) Find the block where the operating radius and boom length intersect.

d) Read maximum lifting capacity

e) Read boom angle (number in parenthesis)

f) Annotate the load chart form.

K. Review

NOTE: Show Slide # 26

NOTE: Transition into PE #1 for one hour.

NOTE: Conduct a check on learning and summarize the learning activity.

2. Learning Step / Activity 2. Perform Determining Lift Requirements

Method of Instruction: Practical Exercise (Performance)
Instructor to Student Ratio: 1:6
Time of Instruction: 4 hrs 25 mins
Media: Hands-on Instruction

NOTE: The students may be tested on this task at any time during this practical exercise. If the student tests out on this task early THEY ARE STILL REQUIRED TO COMPLETE THE ENTIRE BLOCK OF TRAINING.

Conduct a Practical Exercise on determining lift requirements.

Refer to appendix C for practical exercise instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.

C. ENABLING LEARNING OBJECTIVE

ACTION:	Install a Hook Block
CONDITIONS:	At a training site, given a hydraulic crane, a guided discussion on attaching a hook block, a hook block attachment, student guide, 15/16 socket, ratchet, and personal protective equipment (PPE).
STANDARDS:	Install a hook block using two to six parts of line without error utilizing TM 5-3810-307-10. Perform all operations without damage to equipment, the environment, and without injury to personnel.

1. Learning Step / Activity 1. Demonstrate Installation of a Hook Block

Method of Instruction: Conference / Discussion
Instructor to Student Ratio: 1:6
Time of Instruction: 1 hr
Media: Conference / Demonstration

A. Six Part Line Reeving

NOTE: Refer students to TM 5-3810-307-10.

1) With the crane positioned for over the rear operation, the boom down at –3 degrees, and centered over the hook block, follow the sequence below to reeve a one part of line.

a) With the aid of another operator and operating the hoist lever, slowly pull cable from the drum over the top of boom, then over the right idler sheave, down through the first sheave to the right of the boom point main sheave.

b) Pull out enough cable to reeve the one part of line. This avoids cable twisting. (approximately 20').

NOTE: With the crane positioned for over the rear operation, the boom down at -3 degrees, and centered over the hook block, follow the sequences to reeve six parts of line.

c) Reeve the cable around the first sheave to the right on the hook block.

d) Reeve the cable around the second sheave of the boom point main sheave.

e) Reeve the cable around the second sheave of the hook block.

f) Reeve the cable around the third sheave of the boom point main sheave.

g) Reeve the cable around the third sheave of the hook block.

B. Installing the Socket and Wedge

1) Pull dead end of cable through the top end of the socket.

2) Form a loop with the cable and put the dead end of the cable back through the socket, keeping the loop formed.

3) Insert the wedge into the loop and pull both ends of the cable tight.

4) Apply the cable clip and tighten.

5) Pull cable out enough to hook the wedge and socket to the left boom anchor.

6) Secure with anchor pin safety pin

C. Review

Determine if students have learned the material presented by:

(1) Soliciting student questions and explanations.

(2) Asking questions and receiving answers from the students.

(3) Correcting student misunderstandings.

NOTE: Conduct a check on learning and summarize the learning activity.

2. Learning Step / Activity 2. Perform Installing a Hook Block

Method of Instruction:	Practical Exercise (Performance)
Instructor to Student Ratio:	1:6
Time of Instruction:	2 hrs 20 mins
Media:	Hands-on Instruction

NOTE: The students may be tested on this task at any time during this practical exercise. If the student tests out on this task early THEY ARE STILL REQUIRED TO COMPLETE THE ENTIRE BLOCK OF TRAINING.

Conduct a Practical Exercise on installation of a hook block.

Refer to appendix C for practical exercise instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

3. Learning Step / Activity 3. Performance Evaluation

Method of Instruction:	Test
Instructor to Student Ratio:	1:6
Time of Instruction:	25 mins
Media:	Hands-on Instruction

Conduct a performance evaluation on installation of a hook block.

Refer to appendix C for performance evaluation instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

4. Learning Step / Activity 4. Performance Evaluation Review

Method of Instruction: Test Review
Instructor to Student Ratio: 1:4
Time of Instruction: 5 mins
Media: Small Group Instruction (SGI)

Conduct a performance evaluation review on installation of a hook block.

Refer to appendix C for performance evaluation review instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.

D. ENABLING LEARNING OBJECTIVE

ACTION:	Move a Load With a Hydraulic Crane and Hook Block
CONDITIONS:	Given a hydraulic crane at a training site, a guided discussion on moving a load with a hydraulic crane and hook block, hook block attached a prepared load, slings, lifting capacity charts, a ground guide, and personal protective equipment (PPE).
STANDARDS:	Move a load to the two predetermined locations, set up Load Moment Indicator (LMI) using all four lifting capacities, follow all hand and arm signals from signal person. Perform all operations without damage to equipment, the environment, and without injury to personnel.

1. Learning Step / Activity 1. Introduction to the Load Moment Indicator (LMI) System

Method of Instruction: Conference / Discussion
Instructor to Student Ratio: 1:6
Time of Instruction: 1 hr
Media: PowerPoint Presentation

NOTE: Show Slide # 27 & 28

A. Load Moment Indicator (LMI) System

1) Load moment indicator (maximum allowable weight)

a) Acts as a safety device by warning the operator of unsafe lifting conditions.

i. Gives both an audible and visual alarm.

ii. If unsafe lifting conditions persist, the LMI system will lock out the controls.

iii. Is not a substitute for sound operator judgment.

NOTE: Show Slide # 29

b) Liquid Crystal Display (LCD) shows all symbols and numerical information and provides the operator with the following continuous crane status information:

Boom Length
Boom Angle

iii. Working radius

iv. Boom tip height

v. Rated load (load weight)

vi. Net load being lifted by the crane

vii. Utilization bar graph

viii. LMI operation code number

2) Controls and indicators

a) Load moment limit light and audible warning.

i. Warns the operator that the rated limits have been reached.

ii. Will lock out the hoist up, telescope out, boom down functions.

b) The yellow Load Moment pre-warning Light will illuminate when the load reaches defined limits; use extreme caution while lifting near outer limits.

c) Alarm Light “Anti –2-Block”

i. Illuminates when contact is made with the boom tip switch.

ii. Hoist up, telescope out, and boom down functions are locked out.

d) Override Key Warning Light

i. Indicates when LMI lockout functions are disabled.

ii. Disabling the LMI system renders the crane not fully mission capable.

e) Alarm Stop button: When pushed the audible alarm will stop for approximately 15 seconds.

f) TARE Button

i. Indicates the “NET LOAD” (current load minus lifting tackle and hook block).

ii. Must be pushed prior to lift in order to zero the display. When lift is made, the system will display the “NET LOAD” weight.

iii. Changing the lifting radius (BOOM angle or length) causes the system to display the actual load weight: This includes everything suspended from the boom tip.

g) LIMITS Button: Allows limits to be programmed.

h) SELECT Button: Used to start the function;" set operating mode".

i) INFO Button: Information crane configurations.

j) CONTROL Button: Used for changing display contrast.

k) Audible Alarm: Sounds for the following conditions:

i. Overload condition

ii. Approaching two-block condition

iii. Preset limits reached

iv. Malfunction of LMI system

v. Operating error

l) Key Switch: Deactivates lockout functions of LMI.

m) Bypass A2B Button: Deactivates the Anti-two block alarm system.

n) Bypass LMI Button: Deactivates the LMI system.

o) Function Keys: Used for programming information into the system (F1-F4).

NOTE: Show Slide # 30

B. LMI Setup

NOTE: The LMI must be reset after changing the crane figuration, or after the crane has been turned off for two or more hours.

1) LMI Set Up:

a) Press Select button

b) Respond to the LMI by using keys F1-F4

NOTE: Show Slide # 31

i. To select hoist; choose 1 for auxiliary line, or 2 for main line.

NOTE: Show Slide # 32

ii. To select lift configuration; choose 1 for on rubber, or 2 for out riggers.

NOTE: Show Slide # 33

iii. If on rubber, choose 1 for static or 2 for pick and carry. If pick and carry, boom must be centered over the rear of the crane and swing pin lock applied.

NOTE: Show Slide # 34

iv. To select reeving (part of line); choose + to increase, or – to decrease.

NOTE: Show Slide # 35

v. Press OK to confirm, otherwise repeat steps until LMI reads correct configuration.

NOTE: If during operation you must change one of the previous configured functions, repeat the steps for LMI set up.

NOTE: Show Slide # 36

2) LMI Limit Settings:

a) The LMI system allows the operator to program limits to operating ranges, these limits include Boom Angle, Boom Pin Height, and Operating Radius. Also included in the limit settings is information and contrast control for the LMI display.

NOTE: Show Slide # 37

b) Radius Limitation:

i. Press Limit button.

ii. Press corresponding icon to select Radius limitation (using keys F1-F4).

iii. Press the arrow left key to set the radius limit (minimum).

iv. Press SET to assign minimum radius limit (press OK to accept the value).

NOTE: Show Slide # 38

c) To set Tip Heights limits:

i. Press LIMIT button.

ii. Press corresponding icon to select Tip Height (using keys F1-F4).

iii. Press the arrow up key to set the upper limit.

iv. Press SET to assign the upper limit (press OK to accept the value).

NOTE: Show Slide # 39

d) Boom Angle Limitation:

i. Press LIMIT button.

ii. Press corresponding icon to select Boom Angle limitation (using keys F1-F4).

iii. Press upper angle key to set upper limit.

iv. Press SET to assign the upper limit (press OK to accept the value).

v. Press lower angle key to set lower limit.

e) INFO Crane Configuration button: Press the INFO button to display the system configuration.

NOTE: Show Slide # 40

C. Review

NOTE: Show Slide # 41

NOTE: Conduct a check on learning and summarize the learning activity.

2. Learning Step / Activity 2. Demonstrate Moving a Load with a Crane and Hook Block

Method of Instruction:	Demonstration
Instructor to Student Ratio:	1:6
Time of Instruction:	45 mins
Media:	Hands-on Instruction

A. Prepare the Hydraulic Crane for Operation

NOTE: Refer students TM 5-3810-307-10.

NOTE: Perform starting procedures in accordance with (IAW) TM 5-3810-307-10.

1) Perform a 360 degree walk around to determine operational status of the crane and ground conditions and ensure that the outriggers are unlocked.

2) Engage the PTO.

3) Start the crane from the superstructure.

4) Set LMI system to crane configuration.

5) Engage Crane function Power switch

B. Setup crane on Outriggers

NOTE: Follow LMI setup procedures through step 11.

C. Move a load

1) Set the LMI System according to the load chart, place the mode selector to the actual boom configuration, and set the angle preset to the requested working boom angle.

NOTE: Remind students of the importance of the proper settings for safe operating conditions.

2) Raise the boom to the required boom angle and remove the hook block from the snubber line.

3) Release the swing brake and swing the boom to the load to be lifted, using the foot brake in conjunction with the control lever to stop over the load.

4) Lower the hook and extend/retract the boom as required and ensure that a sufficient amount of cable is pulled out so that when the boom is extended, the hook block is not drawn up into contact with the boom tip.

5) Once the load is hooked up, raise the boom and cable slowly until the desired height is reached.

6) Slowly swing the load to the rear of the carrier.

7) Lower the load to the pallet by extending and/or retracting the boom as required and slowly layout the cable.

8) Raise the load.

9) Swing the load to the right side of the carrier.

10) Lower the load to the pallet. Extend and/or retract the boom as required while either paying the cable in or out.

11) Return the load to the original pallet.

12) Unhook the cable and retract and raise the hook block while retracting the boom.

13) Swing the boom to the front of the carrier.

14) Lock the turntable and swing brake.

15) Lower the boom to the cradle and secure the hook block to the snubber line.

NOTE: Perform shut down procedures in accordance with (IAW) TM 5-3810-307-10.

D. Review

NOTE: Conduct a check on learning and summarize the learning activity.

3. Learning Step / Activity 3. Move a Load with a Crane and Hook Block

Method of Instruction: Practical Exercise (Performance)
Instructor to Student Ratio: 1:6
Time of Instruction: 16 hrs
Media: Hands-on Instruction

NOTE: The students may be tested on this task at any time during this practical exercise. If the student tests out on this task early THEY ARE STILL REQUIRED TO COMPLETE THE ENTIRE BLOCK OF TRAINING.

Conduct a practical exercise on moving a load with a hook block.

Refer to appendix C for practical exercise instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

4. Learning Step / Activity 4. Performance Evaluation

Method of Instruction: Test
Instructor to Student Ratio: 1:6
Time of Instruction: 2 hrs
Media: Hands-on Instruction

Conduct a performance evaluation on moving a load with a hook block.

Refer to appendix C for performance evaluation instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

5. Learning Step / Activity 5. Performance Evaluation Review

Method of Instruction: Test Review
Instructor to Student Ratio: 1:6
Time of Instruction: 5 mins
Media: Small Group Instruction (SGI)

Conduct a performance evaluation review on moving a load with a hook block.

Refer to appendix C for performance evaluation review instructions.

NOTE: Conduct a check on learning and summarize the learning activity.

CHECK ON LEARNING: Conduct a check on learning and summarize the ELO.

SECTION IV. SUMMARY

Method of Instruction: Conference/Demonstration
Instructor to Student Ratio is: 1:18
Time of Instruction: 5 mins
Media: Hands-on Instruction

Check on Learning	Determine if the students have learned the material presented by soliciting student questions and explanations. Ask the students questions and correct misunderstandings.
Review / Summarize Lesson	Restate the learning objectives and then check on learning.

SECTION V. STUDENT EVALUATION

Testing Requirements

NOTE: Describe how the student must demonstrate accomplishment of the TLO. Refer student to the Student Evaluation Plan.

1. Students' performance will be evaluated at the end of this module utilizing the performance measures provided in C03.

2. All students must receive a GO on all performance measures to receive a GO on the performance evaluation.

3. Refer to Appendix B for test administration.

Feedback Requirements

NOTE: Feedback is essential to effective learning. Schedule and provide feedback on the evaluation and any information to help answer students' questions about the test. Provide remedial training as needed.

Appendix A - Viewgraph Masters

VIEWGRAPHS FOR LESSON 1: 21J10C03 version ADT

Terminal Learning Objective

VGT's, Slides

Appendix B - Test(s) and Test Solution(s) (N/A)

Appendix C - Practical Exercises and Solutions

PRACTICAL EXERCISE(S)/SOLUTION(S) FOR LESSON 1: 21J10C03 version ADT

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #1)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original

	ecological condition.
Evaluation	Performance evaluation, refer to the student evaluation plan in the student guide.
Instructional Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #1: Determine the lift requirements for a 22-ton Hydraulic Crane using a hook block. The load height is 4' 10" and sling height is 2' 4". Your lift height is 17' 8". The sling weight is 175 pounds and your load weight is 4,867 pounds. You have an operating radius of 57'.You are to make the lift with the crane on outriggers fully extended. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1.	CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:
2.	OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK & CARRY
3.	BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY _____
4.	BOOM LENGTH	_____	PART OF LINE _____
5.	BOOM ANGLE	_____	GO/NO GO

*Indicates items given to student necessary to complete load chart.

Feedback Requirements

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #1)

Requirements: Determine lift requirements for a 22-ton Hydraulic Crane.

Scenario #1: Determine the lift requirements for a 22-ton Hydraulic Crane using a hook block. The load height is 4' 10" and sling height is 2' 4". Your lift height is 17' 8". The sling weight is 175 pounds and your load weight is 4,867 pounds. You have an operating radius of 57'.You are to make the lift with the crane on outriggers fully extended. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift

LOAD CHART

HOOK BLOCK HEIGHT	4' 6"	HOOK BLOCK WEIGHT	498
SLING HEIGHT	2' 4"	LOAD WEIGHT	4,867
LOAD HEIGHT	4' 10"	SLING WEIGHT	175
LIFT HEIGHT	17' 8"	ADDITIONAL WEIGHT	N/A
TOTAL HEIGHT	~~27" 28" 29' 4"~~ 30'	TOTAL WEIGHT	5,540

1.	CRANE SIZE	22 TON	CIRCLE WHICH LIFT CHART USED
2.	OPERATING RADIUS	~~57~~' 60'	***OUTRIGGERS*/RUBBER (360)**
			DEFINED ARC/PICK AND CARRY
3.	BOOM PIN HEIGHT	30'	**MAXIMUM LIFT CAPACITY 2,700**
4.	BOOM LENGTH	70'	PARTS OF LINE 2
5.	BOOM ANGLE	21.5	GO/**NO GO**

*Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #2)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation

Performance evaluation, refer to the student evaluation plan in the student guide.

Instructional Lead-In

Resource Requirements

Instructor Materials:

Gloves
Goggles
Hard hat
FM 5-434
Safety boots
PowerPoint Slides
C03 Lesson plan
Hearing protection

TM 5-3810-307-10

Student Materials:

Paper
Gloves
Goggles
FM 5-434
Safety boots
Pen or pencil
Student guide
Kevlar/hard hat
TM 5-3810-307-10

Hearing protection

Special Instructions

Procedures

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #2: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 13' and sling height is 4'. Your lift height is 21'. The sling weight is 400 pounds and your load weight is 14,200 pounds. You have an operating radius of 10'. Due to the narrow avenue for the crane to operate, you must make the lift without using the outriggers and pick up the load over the side of the crane. Complete the load chart form and determine the number of parts of line, and determine if it is a GO or NO GO for the lift. .

LOAD CHART

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1.	CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:
2.	OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK & CARRY
3.	BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY _____
4.	BOOM LENGTH	_____	PART OF LINE _____
5.	BOOM ANGLE	_____	GO/NO GO

*Indicates items given to student necessary to complete load chart.

Feedback Requirements

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #2)

Requirements: Determine lift requirements for a 22-ton Hydraulic Crane.

Scenario #2: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 13' and sling height is 4'. Your lift height is 21'. The sling weight is 400 pounds and your load weight is 14,000 pounds. You have an operating radius of 10'.Due to the narrow avenue for the crane to operate, you must make the lift without using the outriggers and pick up the load over the side of the crane. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT		4' 6"	HOOK BLOCK WEIGHT		498
SLING HEIGHT	*	4'	LOAD WEIGHT		14,200
LOAD HEIGHT	*	13'	SLING WEIGHT		400
LIFT HEIGHT	*	21'	ADDITIONAL WEIGHT		N/A
TOTAL HEIGHT		~~42'6"~~ ~~43'~~ 45'	TOTAL WEIGHT		15,098

1.	CRANE SIZE	22 TON	CIRCLE WHICH LIFT CHART USED
2.	OPERATING RADIUS	10'	***OUTRIGGERS*/RUBBER (360)**
			DEFINED ARC/PICK AND CARRY
3.	BOOM PIN HEIGHT	45'	**MAXIMUM LIFT CAPACITY 16,600**
4.	BOOM LENGTH	40'	PARTS OF LINE 3
5.	BOOM ANGLE	70	**GO**/NO GO

*Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #3)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation	Performance evaluation, refer to the student evaluation plan in the student guide.
Instructional Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

Procedures:

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #3: Determine the lift requirements for a 22-ton Hydraulic Crane using a weighted hook block. The load height is 22' 1" and sling height is 17'. Your lift height is 14'. The sling weight is 245 pounds and your load weight is 2,652 pounds. You have an operating radius of 31'7". Due to the narrow avenue for the crane to operate, you must back between two rows of containers and make the lift over the rear of the crane without engaging the outriggers (defined arc). Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1.	CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:
2.	OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK & CARRY
3.	BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY _____
4.	BOOM LENGTH	_____	PART OF LINE _____
5.	BOOM ANGLE	_____	GO/NO GO

*Indicates items given to student necessary to complete load chart.

Feedback Requirements

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #3)

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #3: Determine the lift requirements for a 22-ton Hydraulic Crane using a weighted hook block. The load height is 22' 1" and sling height is 17'. Your lift height is 14'. The sling weight is 245 pounds and your load weight is 2,652 pounds. You have an operating radius of 31'7". Due to the narrow operating area, you must back between two rows of containers and make the lift over the rear of the crane without engaging the outriggers (Defined arc). Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT		4' 6"	HOOK BLOCK WEIGHT		498
SLING HEIGHT	*	17'	LOAD WEIGHT		2,652
LOAD HEIGHT	*	22' 1"	SLING WEIGHT		245
LIFT HEIGHT	*	14'	ADDITIONAL WEIGHT		N/A
TOTAL HEIGHT		~~57' 7" 58'~~ 60'	TOTAL WEIGHT		3,395

1.	CRANE SIZE	22 TON	CIRCLE WHICH LIFT CHART USED
2.	OPERATING RADIUS	~~31~~'7" 35'	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK AND CARRY
3.	BOOM PIN HEIGHT	60'	**MAXIMUM LIFT CAPACITY 2,290**
4.	BOOM LENGTH	70'	PARTS OF LINE 2
5.	BOOM ANGLE	57.5	GO/**NO GO**

*Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #4)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation

Performance evaluation, refer to the student evaluation plan in the student guide.

Instructional Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

Procedures:

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #4: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 14' and sling height is 4'. Your lift height is 1'. The sling weight is 250 pounds and your load weight is 12,750 pounds. You have an operating radius of 20'. You must pick up the load at one end of a pier and carry it to the other end to be loaded onto a ship. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1. CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:	
2. OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)	
		DEFINED ARC/PICK & CARRY	
3. BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY	_____
4. BOOM LENGTH	_____	PART OF LINE	_____
5. BOOM ANGLE	_____	GO/NO GO	

***Indicates items given to student necessary to complete load chart.**

Feedback Requirements

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #4)

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #4: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 14' and sling height is 4'. Your lift height is 1'. The sling weight is 250 pounds and your load weight is 12,750 pounds. You have an operating radius of 20'.You must pick up the load at one end of a pier and carry it to the other end to be loaded onto the ship. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT		4' 6"	HOOK BLOCK WEIGHT		498
SLING HEIGHT	*	4'	LOAD WEIGHT		12,750
LOAD HEIGHT	*	14'	SLING WEIGHT		250
LIFT HEIGHT	*	1'	ADDITIONAL WEIGHT		N/A
TOTAL HEIGHT		~~23' 6" 24"~~ 25'	TOTAL WEIGHT		13,498

1.	CRANE SIZE	22 TON	CIRCLE WHICH LIFT CHART USED	
2.	OPERATING RADIUS	20'	OUTRIGGERS/RUBBER (360)	
			DEFINED ARC/**PICK AND CARRY**	
3.	BOOM PIN HEIGHT	25'	**MAXIMUM LIFT CAPACITY**	7,180
4.	BOOM LENGTH	40'	PARTS OF LINE	2
5.	BOOM ANGLE	52.5	GO/**NO GO**	

*Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #5)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation

Performance evaluation, refer to the student evaluation plan in the student guide.

Instructional Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

Procedures:

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #5: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 8' and sling height is 4' 6". Your lift height is 34'. The sling weight is 88 pounds and your load weight is 2,800 pounds. You have an operating radius of 30'. You must make the lift over the side of the crane without using the outriggers. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

*Indicates

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1.	CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:
2.	OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK & CARRY
3.	BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY _____
4.	BOOM LENGTH	_____	PART OF LINE _____
5.	BOOM ANGLE	_____	GO/NO GO

*Indicates items given to student necessary to complete load chart.

Feedback Requirements

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #5)

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #5: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 8' and sling height is 4' 6". Your lift height is 34'. The sling weight is 88 pounds and your load weight is 2,800 pounds. You have an operating radius of 30'.You must make the lift over the side of the crane without using the outriggers. Complete the load chart form, determine the number of parts of line and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT		4' 6"	HOOK BLOCK WEIGHT		498
SLING HEIGHT	*	4' 6"	LOAD WEIGHT	*	2,800
LOAD HEIGHT	*	8'	SLING WEIGHT	*	88
LIFT HEIGHT	*	34'	ADDITIONAL WEIGHT		N/A
TOTAL HEIGHT		~~50' 12" 51'~~ 55'	TOTAL WEIGHT		3,386

1.	CRANE SIZE *	22 TON	CIRCLE WHICH LIFT CHART USED
2.	OPERATING RADIUS *	30'	OUTRIGGERS/**RUBBER (360)**
			DEFINED ARC/PICK AND CARRY
3.	BOOM PIN HEIGHT	55'	**MAXIMUM LIFT CAPACITY** 1,680
4.	BOOM LENGTH	60'	PARTS OF LINE 2
5.	BOOM ANGLE	55.5	GO/**NO GO**

* Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #6)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation

Performance evaluation, refer to the student evaluation plan in the student guide.

Instructional Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

Procedures:

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane

Scenario #6: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 8' 7" and sling height is 4' 8". Your lift height is 28'. The sling weight is 545 pounds and your load weight is 15,042 pounds. You have an operating radius of 20'.You will make the lift with the outriggers fully extended. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for over the side or over the rear lift.

LOAD CHART

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1.	CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:
2.	OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK & CARRY
3.	BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY _____
4.	BOOM LENGTH	_____	PART OF LINE _____
5.	BOOM ANGLE	_____	GO/NO GO

*Indicates items given to student necessary to complete load chart.

Feedback Requirements _____

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #6)

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #6: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 8' 7" and sling height is 4' 8". Your lift height is 28'. The sling weight is 545 pounds and your load weight is 15,042 pounds. You have an operating radius of 20'. You will make the lift with the outriggers fully extended. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT		4' 6"	HOOK BLOCK WEIGHT		498
SLING HEIGHT	*	4'8"	LOAD WEIGHT	*	15,042
LOAD HEIGHT	*	8' 7"	SLING WEIGHT		545
LIFT HEIGHT	*	28'	ADDITIONAL WEIGHT		N/A
TOTAL HEIGHT		~~44' 21" 45' 9~~" 50'	TOTAL WEIGHT		16,085

1.	CRANE SIZE	* 22 TON	CIRCLE WHICH LIFT CHART USED	
2.	OPERATING RADIUS*	20'	**OUTRIGGERS**/RUBBER (360)	
			DEFINED ARC/PICK AND CARRY	
3.	BOOM PIN HEIGHT	50'	**MAXIMUM LIFT CAPACITY**	17,150
4.	BOOM LENGTH	50'	PARTS OF LINE	3
5.	BOOM ANGLE	61.5	**GO**/NO GO	

* Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #7)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation

Performance evaluation, refer to the student evaluation plan in the student guide.

Instructional Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

Procedures:

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #7: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 23' and sling height is 4' 3". Your lift height is 2' 3". The sling weight is 233 pounds and your load weight is 8,547 pounds. You have an operating radius of 30'.You must make the lift on outriggers fully extended. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1.	CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:
2.	OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK & CARRY
3.	BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY _____
4.	BOOM LENGTH	_____	PART OF LINE _____
5.	BOOM ANGLE	_____	GO/NO GO

* Indicates items given to student necessary to complete load chart.

Feedback Requirements _____

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #7)

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #7: Determine the lift requirements for a 22 ton Hydraulic Crane using a main hook block. The load height is 23' and the sling height is 4' 3". Your lift height is 2' 3". The sling weight is 233 pounds and your load weight is 8,547 pounds. You have an operating radius of 30'. You must make the lift on outriggers fully extended. Complete the load chart form, determine the number of parts of the line, and determine if it is a GO / NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT		4' 6"	HOOK BLOCK WEIGHT		498
SLING HEIGHT	*	4' 3"	LOAD WEIGHT	*	8,547
LOAD HEIGHT	*	23'	SLING WEIGHT	*	233
LIFT HEIGHT	*	2' 3"	ADDITIONAL WEIGHT		N/A
TOTAL HEIGHT		~~33' 12" 34'~~ 35'	TOTAL WEIGHT		9,278

1.	CRANE SIZE	* 22 TON	CIRCLE WHICH LIFT CHART USED	
2.	OPERATING RADIUS	* 30'	**0UTRIGGER**/RUBBER**(360)**	
			DEFINED ARC/PICK AND CARRY	
3.	BOOM PIN HEIGHT	35'	**MAXIMUM LIFT CAPACITY**	9,900
4.	BOOM LENGTH	50'	PARTS OF LINE	2
5.	BOOM ANGLE	46.5	**GO** / NO GO	

* Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE1 (SCENARIO #8)

Title

Determine Lift Requirements

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Explain the purpose of drip pans and their location under the equipment. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation

Performance evaluation, refer to the student evaluation plan in the student guide.

Instructional Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

Procedures:

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #8: Determine the lift requirements for a 22-ton Hydraulic Crane using a main hook block. The load height is 16' and sling height is 10' 5". Your lift height is 8' 3". The sling weight is 49 pounds and your load weight is 1,952 pounds. You have an operating radius of 53'4".You will make the lift with the outriggers fully extended. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT	*_____	HOOK BLOCK WEIGHT*	_____
SLING HEIGHT	*_____	LOAD WEIGHT	*_____
LOAD HEIGHT	_____	SLING WEIGHT	_____
LIFT HEIGHT	*_____	ADDITIONAL WEIGHT	_____
TOTAL HEIGHT	_____	TOTAL WEIGHT	_____

1.	CRANE SIZE	*_____	CIRCLE WHICH LIFT CHART USED:
2.	OPERATING RADIUS	*_____	OUTRIGGERS/RUBBER (360)
			DEFINED ARC/PICK & CARRY
3.	BOOM PIN HEIGHT	_____	MAXIMUM LIFT CAPACITY _____
4.	BOOM LENGTH	_____	PART OF LINE _____
5.	BOOM ANGLE	_____	GO/NO GO

* Indicates items given to student necessary to complete load chart.

Feedback Requirements

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE1 (SCENARIO #8)

Requirements: Determine lift requirements for a 22 ton Hydraulic Crane.

Scenario #8 Determine the lift requirements for the 22 ton hydraulic crane using a main hook block. The load height is 16' and sling height is 10' 5". Your lift height is 8' 3". The sling weight is 49 pounds and your load weight is 1,952 pounds. You have an operating radius of 53' 4". You will make the lift with the outriggers fully extended. Complete the load chart form, determine the number of parts of line, and determine if it is a GO or NO GO for the lift.

LOAD CHART

HOOK BLOCK HEIGHT		4'6"	HOOK BLOCK WEIGHT	498
SLING HEIGHT	*	10' 5"	LOAD WEIGHT	1,952
LOAD HEIGHT	*	16'	SLING WEIGHT	49
LIFT HEIGHT	*	8' 3"	ADDITIONAL WEIGHT	N/A
TOTAL HEIGHT		~~38'14" 39' 2~~" 40'	TOTAL WEIGHT	2,499

1.	CRANE SIZE	22 TON	CIRCLE WHICH LIFT CHART USED
2.	OPERATING RADIUS	~~53' 4~~" 55'	**OUTRIGGERS**/**RUBBER (360)**
			DEFINED ARC/PICK AND CARRY
3.	BOOM PIN HEIGHT	40'	**MAXIMUM LIFT CAPACITY 3,400**
4.	BOOM LENGTH	70'	PARTS OF LINE 2
5.	BOOM ANGLE	31.5 degrees	**GO**/NO GO

* Indicates items given to student necessary to complete load chart.

PRACTICAL EXERCISE SHEET PE2

Title

Perform Hydraulic Crane and Hook Block Operations

Lesson Number / Title

21J10C03 version ADT / Perform Hydraulic Crane and Hook Block Operations

Introduction

Motivator

NOTE: Allow one to two minutes for the lesson introduction. Explain the Contemporary Operational Environment (COE) to include lessons learned. Ensure the students are aware of how it will affect them during their future assignments.

The purpose of this lesson is to provide you with the skills and knowledge required to determine lift requirements, install a hook block, and move a load with a hydraulic crane and hook block. These are tasks that you, as a hydraulic crane operator, must perform effectively in a combat and peacetime environment.

Terminal Learning Objective

NOTE: The instructor should inform the students of the following Terminal Learning Objective covered by this practical exercise.

At the completion of this lesson, you [the student] will:

Action:	Perform Hydraulic Crane and Hook Block Operations
Conditions:	Given a hydraulic crane at a training site, a guided discussion on hook block operations, a prepared load, slings, lifting capacity charts, a ground guide, a student guide, and all personal protective equipment.
Standards:	Performs hydraulic crane and hook block operations by utilizing set up procedures, maneuvers a load to the predetermined positions, follows all hand and arm signals from a signal man utilizing FM 5-434, and TM 5-3810-307-10. Performs all hook block operations without error and with no damage to equipment or injury to personnel.

Safety Requirements

Review local training area SOP. Kevlar/Hard hats must be worn at all times. Hearing protection must be worn while equipment is running. Eye protection, gloves, and proper foot protection must be worn when operating equipment. Use three points of contact when mounting or dismounting equipment. Remove all jewelry. Use caution around moving parts.

Risk Assessment

Medium - Moderate A daily risk assessment is completed to constantly reevaluate those hazards currently identified.

Environmental Considerations

It is the responsibility of all Soldiers and DA civilians to protect the environment from damage. Avoid unnecessary stripping of vegetation and waterways. Control dust conditions and limit water erosion by dressing area at the end of each day. Avoid unnecessary equipment usage and follow established procedures for cleanup of fluid leaks. Restore site and surrounding areas as close as possible to the original ecological condition.

Evaluation

Performance evaluation, refer to the student evaluation plan in the student guide.

Instructional Lead-In

Lead-In	
Resource Requirements	**Instructor Materials:** Gloves Goggles Hard hat FM 5-434 Safety boots PowerPoint Slides C03 Lesson plan Hearing protection TM 5-3810-307-10 **Student Materials:** Paper Gloves Goggles FM 5-434 Safety boots Pen or pencil Student guide Kevlar/hard hat TM 5-3810-307-10 Hearing protection
Special Instructions	
Procedures	

NOTE: The students may be tested on this task at any time during this practical exercise. If the student tests out on this task early THEY ARE STILL REQUIRED TO COMPLETE THE ENTIRE BLOCK OF TRAINING.

A. Practical Exercise Instructions.

1) Ensure students have required materials and references.

2) Students will assist each other in performing PMCS (if required).

3) The primary operator will move the crane to the set up area.

4) The primary operator will perform the set up task while the second operator is observing and studying the student guide. When the first operator has completed the task, the operators will switch places. Continue this process for the allotted time.

5) Review

   a) Solicit student questions

   b) Ask questions.

   c) Correct student misunderstandings.

6) Actively observe students' progress and provide assistance as necessary throughout the exercise.

7) At the end of training the day, park and secure equipment.

Feedback Requirements

SOLUTION FOR
PRACTICAL EXERCISE SHEET PE2

Evaluation Guidance: Score the Soldier GO if all steps are passed (P). Score the Soldier NO-GO if any step is failed (F). If the Soldier fails any step, retrain and retest them. Retraining will be conducted outside of the training day.

PERFORMANCE MEASURES	DATE	GO	1st NO GO	2nd NO GO

SET-UP PROCEDURES

Did the student:

1. Perform pre-operation procedures.	_____	____	_____	_____
2. Engage the battery disconnect switch.	_____	____	_____	_____
3. Attach the float pads to the stabilizers.	_____	____	_____	_____
4. Start the crane from carrier and wait for the air pressure to reach 85 psi	_____	____	_____	_____
5. Turn the engine off and engage the hydraulic pump (PTO).	_____	____	_____	_____
6. Start crane from superstructure.	_____	____	_____	_____
7. Turn the function switch to the ON position.	_____	____	_____	_____
8. Position both arm rests in the down position.	_____	____	_____	_____
9. Extend the front and rear extensions fully.	_____	____	_____	_____
10. Position the construction mats under stabilizers (if required).	_____	____	_____	_____
11. Lower stabilizers 4 to 6 inches at a time until fully extended.	_____	____	_____	_____
12. Raise the boom out of the cradle 3° or approximately 6 inches **while holding the load.**	_____	____	_____	_____
13. Level the crane and verify that the tires are off the ground.	_____	____	_____	_____

14. Boom up and hold the load until boom reached 35°.	_____	____	_____	_____
15. Remove the hook block from tie down.	_____	____	_____	_____
16. Hoist hook block above carrier cab.	_____	____	_____	_____
17. Boom up to 40 degrees.	_____	____	_____	_____
18. Disengage the superstructure positive swing lock pin.	_____	____	_____	_____
19. Release the swing brake and sound the horn three times.	_____	____	_____	_____
20. Swing 180° to the right and engage the positive swing lock pin and swing brake.	_____	____	_____	_____
21. Extend the boom to 50' while holding the load.	_____	____	_____	_____
22. Retract the boom to 27' while holding the load.	_____	____	_____	_____
23. Disengage the superstructure positive swing lock pin.	_____	____	_____	_____
24. Release the swing brake and sound the horn three times.	_____	____	_____	_____
25. Swing 180° to the left and engage the positive swing lock pin.	_____	____	_____	_____
26. Boom down to 35º and hoist down to connect hook block to bumper.	_____	____	_____	_____
27. Boom down and hold the load until the boom was at 3º or approximately 6 inches from the cradle.	_____	____	_____	_____
28. Make final adjustments, lower the boom into cradle and engage swing brake.	_____	____	_____	_____
29. Fully retract the stabilizers and outrigger extensions.	_____	____	_____	_____
30. Turn the function switch to the off position and turn the engine off.	_____	____	_____	_____
31. Clear the suspension and disengage the hydraulic pump (PTO).	_____	____	_____	_____

32. Disengage the battery disconnect switch.	_____	____	_____	_____
33. Remove the float pads and stow them.	_____	____	_____	_____
34. Follow all hand and arm signals.	_____	____	_____	_____

MOVE A LOAD

Note: Throughout "Move A Load" the load will be maintained at 6 to 12 inches above the ground at all times, unless at a predetermined set down point.

Did the student:

1. Perform pre-operation procedures.	_____	____	_____	_____
2. Perform set-up procedures.	_____	____	_____	_____
3. Disengage swing lock pin and swing brake.	_____	____	_____	_____
4. Sound the horn three times.	_____	____	_____	_____
5. Swing right until boom was in line with load then telescope the boom until hook block is center over load.	_____	____	_____	_____
6. Engage the swing brake.	_____	____	_____	_____
7. Lower the hook block to connect to load.	_____	____	_____	_____
8. Raise the load approximately 6 to 12 inches off the ground.	_____	____	_____	_____
9. Disengage the swing brake and sound the horn three times.	_____	____	_____	_____
10. Swing to the right until boom was in line with first predetermined position.	_____	____	_____	_____
12. Extend the boom and lower the load at the first predetermined position.	_____	____	_____	_____
13. Raise the load approximately 6 to 12 inches off the ground.	_____	____	_____	_____
14. Sound the horn three times.	_____	____	_____	_____
15. Swing to the right until boom is in line with second predetermined position.	_____	____	_____	_____
16. Extend the boom and lower the load at the second predetermined position.	_____	____	_____	_____

17. Raise the load approximately 6 to 12 inches off the ground.	_____	____	_____	_____
18. Hold the load and retract the boom to 27 feet.	_____	____	_____	_____
19. Sound the horn three times.	_____	____	_____	_____
20. Swing to the left and return the load to its original start point.	_____	____	_____	_____
21. Lower the load and disconnect from hook block.	_____	____	_____	_____
22. Hoist the hook block up to boom tip.	_____	____	_____	_____
23. Sound the horn three times.	_____	____	_____	_____
24. Return the boom back to cradle.	_____	____	_____	_____
25. Perform after operation procedures.	_____	____	_____	_____

Evaluator's Comments:

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Evaluator's Signature:

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Evaluator's Signature:

_____

Appendix D - Student Handouts (N/A)