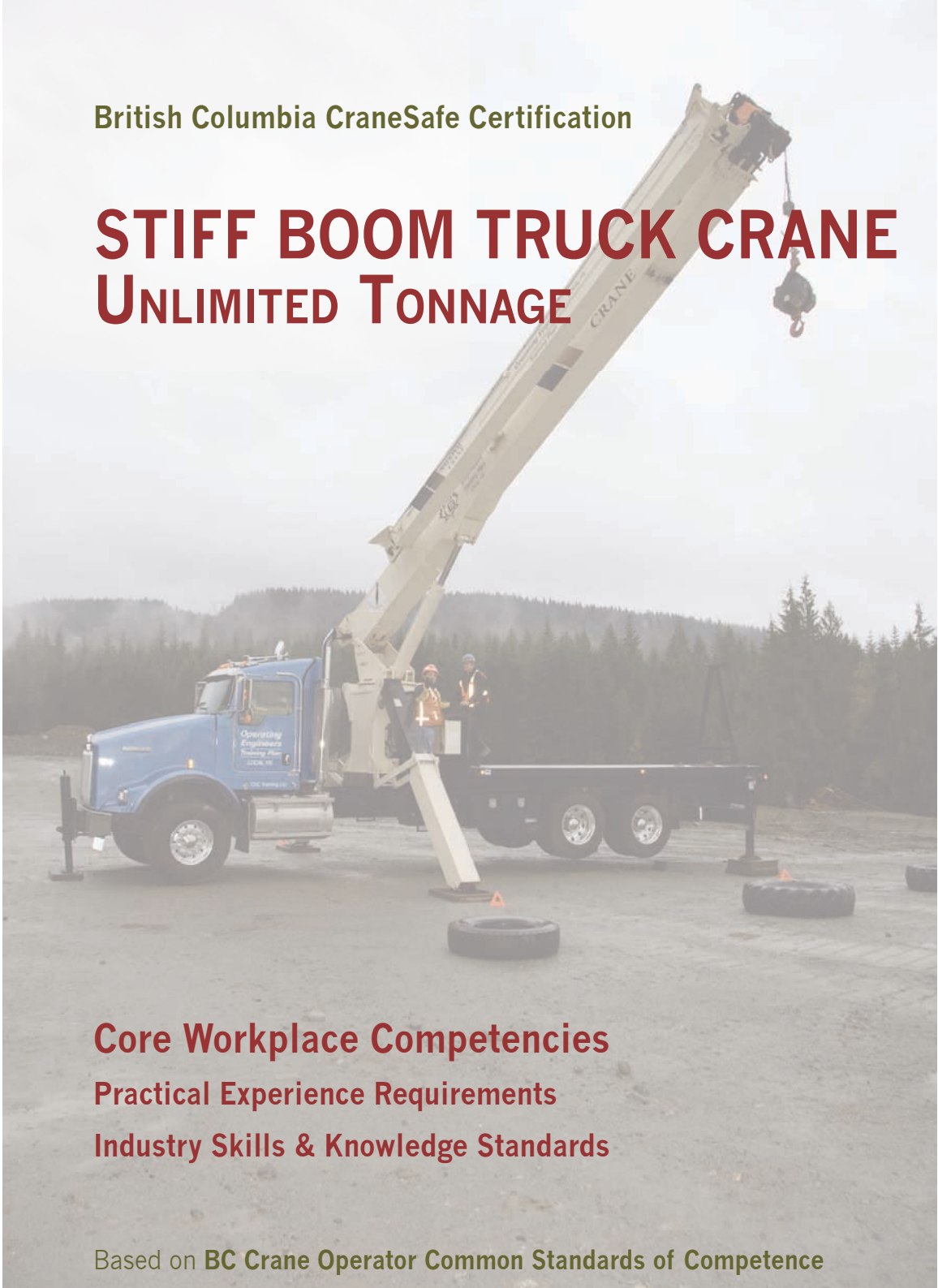




British Columbia CraneSafe Certification

# STIFF BOOM TRUCK CRANE UNLIMITED TONNAGE



**Core Workplace Competencies**

**Practical Experience Requirements**

**Industry Skills & Knowledge Standards**

Based on **BC Crane Operator Common Standards of Competence**

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#### SAFETY ADVISORY

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Be advised that references to the WorkSafe BC safety regulations contained within these materials do not/may not reflect the most recent Occupational Health and Safety Regulation (the current Standards and Regulation in BC can be obtained on the following website: <http://www.worksafebc.com>).

Please note that it is always the responsibility of any person using these materials to inform him/herself about the Occupational Health and Safety Regulation pertaining to his/her work.

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## Forward

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These core skills and abilities are the common foundation for all types of cranes.

1. Mobile Crane - 80 tonnes and under
2. Mobile Crane - Unlimited tonnage
3. Mobile Lattice Boom Friction Crane
4. Mobile Lattice Boom Hydraulic Crane
5. Folding Boom Truck Crane - 22 tonnes and under
6. Folding Boom Truck Crane - Unlimited tonnage
7. Stiff Boom Truck Crane - 40 tonnes and under
8. Stiff Boom Truck Crane - Unlimited tonnage

This is a guide to the skills, knowledge and ability identified by the crane industry in BC that you need to be a competent operator. This manual is designed to give you a brief overview of the crane standards and assessment process.

## Competency Profiles

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## PROFILE CHART: Crane Operator Core Knowledge & Workplace Competency

### CORE UNITS: Prerequisite for Stiff Boom Truck Crane Unlimited Tonnage

K = Knowledge Unit    W = Workplace Unit

#### 1. Safety (CS)

- 1.1 Demonstrate knowledge of safe working practices for crane operators (K)
- 1.2 Demonstrate knowledge of Workplace Hazardous Materials Information System (WHMIS) (K)
- 1.3 Manage first aid in emergency situations (K)
- 1.4 Demonstrate knowledge of power line hazards and high voltage equipment (K)
- 1.5 Comply with WorkSafe BC and OH&S regulations (W)
- 1.6 Respond to fire emergencies (W)

#### 2. Communications (CCOM)

- 2.1 Demonstrate knowledge of personnel involved in crane operations (K)
- 2.2 Demonstrate knowledge of hand signals (K)
- 2.3 Demonstrate knowledge of radio communications (K)
- 2.4 Demonstrate knowledge of workplace communications (K)
- 2.5 Use hand signals in the workplace (W)
- 2.6 Use radio communications in the workplace (W)
- 2.7 Communicate information clearly and check for understanding in the workplace (W)

#### 3. Cranes (CC)

- 3.1 Demonstrate knowledge of types of cranes and classifications (K)
- 3.3 Demonstrate knowledge of terminology related to craning and craning concepts (K)
- 3.6 Demonstrate knowledge of hoisting terminology, functions and systems (K)
- 3.7 Demonstrate knowledge of regulatory requirements pertaining to cranes (K)

#### **4. Rigging (CR)**

- 4.1 Demonstrate knowledge of lifting theory and forces (K)
- 4.2 Demonstrate knowledge of rigging hardware, materials, tools and manuals (K)
- 4.3 Demonstrate knowledge of types and function of wire rope and chains (K)
- 4.4 Demonstrate knowledge of installation, inspection and storage of wire rope (K)
- 4.5 Demonstrate knowledge of rigging techniques (K)
- 4.6 Use rigging hardware and tools in the workplace (W)

#### **5. Load Charts (CLC)**

- 5.1 Demonstrate knowledge of determining weight loads using fundamental math functions and calculations (K)
- 5.2 Demonstrate knowledge of loading and lifting (K)
- 5.3 Interpret load charts and load study drawings to configure crane for workplace operation (W)

#### **6. Transportation & Delivery (ATD)**

#### **7. Site Planning & Crane Positioning (ASPCP)**

#### **8. Crane Operations (CO)**

- 8.1 Demonstrate knowledge of pre-operational requirements in crane operations (K)
- 8.4 Demonstrate crane set-up per manufacturer's instructions (except Task 4 in Mobile) (W)

#### **9. Maintenance & Service (CMS)**

- 9.7 Maintain an equipment logbook to retain a permanent written record of maintenance and repairs (W)

## **PROFILE CHART:**

### **Mobile Crane Operator Knowledge Units & Workplace Competency**

### **Stiff Boom Truck Crane Unlimited Tonnage**

#### **ADVANCED UNITS**

Note: These are considered Advanced Units and build on the Crane Core Units

#### **3. Cranes (AC)**

- 3.14 Demonstrate knowledge of components and attachments for boom trucks with stiff booms unlimited tonnage (K)
- 3.15 Demonstrate knowledge of engines and ancillary systems on boom trucks with stiff booms unlimited tonnage (K)
- 3.5 Demonstrate knowledge of power transfer for boom trucks with stiff booms unlimited tonnage (K)

#### **6. Transportation & Delivery (ATD)**

- 6.11 Demonstrate knowledge to prepare a boom truck with stiff boom unlimited tonnage for highway / road travel

#### **7. Site Planning & Crane Positioning (ASPCP)**

- 7.8 Demonstrate knowledge to locate and safely position a boom truck with stiff boom unlimited tonnage using site assessment tools (K)
- 7.9 Conduct an accurate site assessment and safely position a boom truck with stiff boom unlimited tonnage in the workplace (W)

#### **8. Crane Operations (ACO)**

- 8.11 Demonstrate knowledge of operating a boom truck with stiff boom unlimited tonnage (K)
- 8.12 Operate a boom truck with stiff boom unlimited tonnage to safely lift and place loads in a workplace (W)

**9. Maintenance & Service (AMS)**

- 9.18 Demonstrate knowledge of inspecting engines, monitoring devices and hydraulic systems on boom trucks with stiff booms unlimited tonnage (K)
- 9.19 Demonstrate knowledge of servicing and maintenance procedures on boom truck with stiff booms unlimited tonnage (K)
- 9.20 Complete maintenance checklists (engine on / engine off) and maintain engines on a boom truck with stiff boom unlimited tonnage to manufacturer's specifications (W)
- 9.21 Perform routine inspections and maintenance of hydraulic systems on a boom truck with stiff boom unlimited tonnage (W)
- 9.22 Inspect monitoring devices and control mechanisms on a boom truck with stiff boom unlimited tonnage (W)

## **CraneSafe Certification Competencies: Knowledge, Skills & Abilities Identified by Industry**

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## Introduction to CraneSafe Certification Assessments

Trainees demonstrate the skills they have learned in class and on the job in a practical assessment conducted by a CraneSafe Assessor.



## Section 7 — Site Planning & Crane Positioning

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## Unit Standard ASPCP 7.9 W

### WORKPLACE ASSESSMENT

#### CONDUCT AN ACCURATE SITE ASSESSMENT & SAFELY POSITION A STIFF BOOM TRUCK CRANE UNLIMITED TONNAGE IN THE WORKPLACE

*Note:*

*This assessment may be able to be completed simultaneously with Advanced Workplace Unit ACO 8.12 W – Inspect and operate a boom truck with a stiff boom unlimited tonnage to safely pick up and carry loads in a workplace – it will depend entirely on the workplace and the opportunities you have to demonstrate the skills. Please ensure you read the assessment requirements for unit ACO 8.12 W to see if you can combine the activities and be assessed for them at the same time.*

#### PURPOSE

This unit allows a trainee to demonstrate his or her skills to conduct a site assessment and position a crane safely in the right location.

The emphasis of this unit assessment is site planning and crane positioning as outlined in Tasks 1 and 2.

It is important you record the activities in date order in your trainee logbook showing where and when you performed the tasks. These logbook entries are checked by the Mentor to see you have had sufficient practice in the task prior to assessment

#### TASK 1

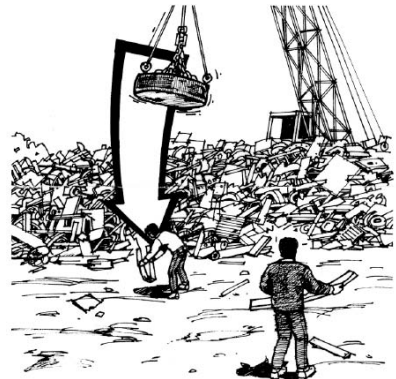
You must inspect a site and develop an accurate lift plan. In order to develop the lift plan correctly you must make an accurate site assessment.

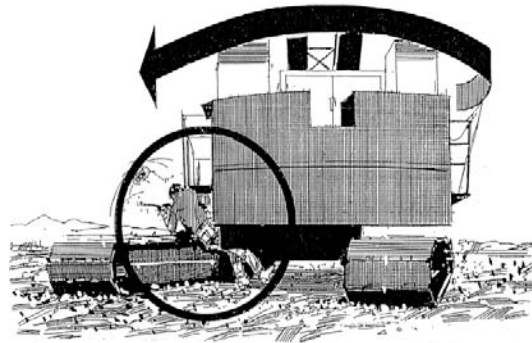
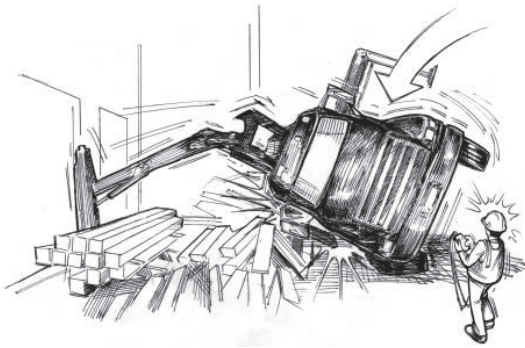
*Refer to Task #1  
Point 1.1*

When conducting a site plan there are a number of things that must be taken into consideration including:

##### **Assessment of area and soil condition**

The ground the crane will be on must be able to support a loaded crane. It needs to be reasonably level and reasonably compacted. As a rule of thumb side slopes, shoring locations, excavations and trenches should be avoided. Often the ground near to a building is made up of backfill and not as compacted as the rest of the site. This needs to be considered.





### Assessment of hazards and obstacles

Typical obstacles and hazards are overhead wires, trees, other structures or equipment. These are obvious and must be avoided. Less obvious are underground utilities or structures for which there may be no visible sign on the top surface. These may include cables, wires, pipes, sewers, tanks, parking garages, etc. As critical as it is to avoid above ground obstacles it is also necessary to check for underground utilities and structures to ensure safe crane operation. While the weight of the crane may not cause immediate damage the combination of the boom truck crane weight and vibration from hoisting, swinging, lowering etc., during operation can cause collapse and/or other damage.

Ground pressure points should be considered as they vary depending on the type of lift movement. For example, lifting a load over the corner of the boom truck produces the maximum ground bearing pressure and consideration must be made for this increased pressure.

Underground utilities or structures can usually be checked by the site supervisor or your supervisor who will have been in contact with local authorities. Task 2 addresses some of the actions to take to more safely and evenly distribute the weight of the crane and allow for ground bearing pressure points.

Once the ground surface has been checked for obstacles and hazards the boom truck must be positioned in the correct location. This often requires the use of additional equipment to distribute the load more evenly and ensure crane stability.

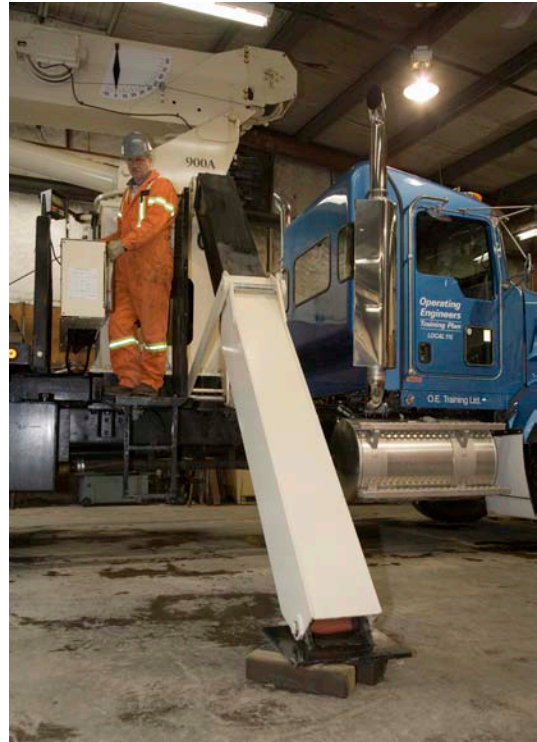


In this part of the assessment you must demonstrate the use of blocking and blocking mats prior to positioning. Then once positioned you must use the correct signalling and barrier signage. The crane will also need to have the correct grounding and bonding. This must all be in place and checked prior to the crane being used.

### **Blocking and blocking mats**

To be safe, blocking under the outrigger float should be three times larger in area than the float itself. The blocking must be firm and be capable of supporting the total weight of the crane and load. A pile of blocking may not create a firm and stable surface for support as it may move or topple under the weight or action of the crane. Blocking should not be placed under the outrigger beams.

Blocking mats, which are made of steel or wood, provide a much more stable platform over a larger surface of ground than blocks. If there is ever any doubt about the ground's stability on the worksite you should consult the site supervisor who may contact a soil professional. The risk of setting a boom truck up on an unstable or unknown surface is too great to take a chance!



## Signalling and Barrier Signage

While the boom truck is being positioned the operator and signaller must communicate effectively by using the correct hand and/or radio signals. Once the crane is in position the appropriate signage must be displayed to identify and hazard.

Signage is put in place to make sure that those working on the site or those new to the site know what areas should be avoided or where dangerous areas are located.

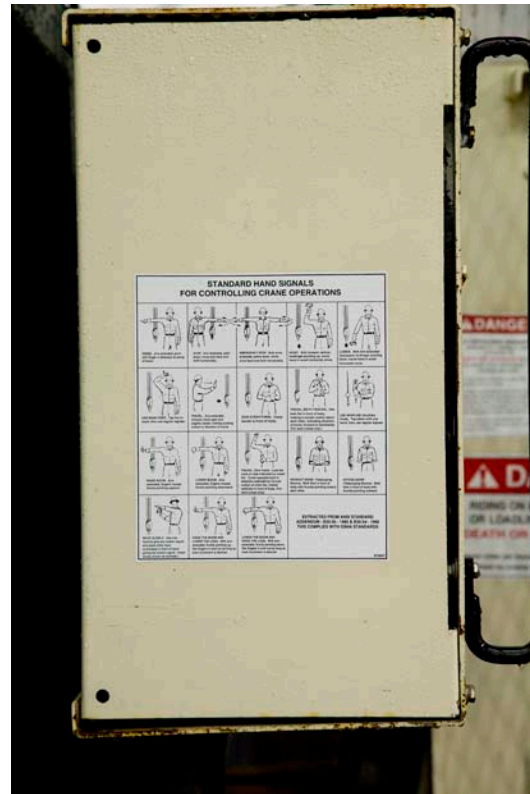
## Grounding and Bonding

Before the boom crane is used it must be properly grounded to make sure that in the event of an electrical contact (lightning strike, contact with power cables) the current will travel through the crane into the ground and not cause injury to the operator or others. Of equal importance is the bonding of the crane and its components as there must be continuity between all parts so that the current passes from one part to the next and then into the ground. Without this the purpose of grounding the equipment is futile.

A correctly bonded crane that has been properly grounded should avoid injuries to the crane operator or others.

*Note:*

*Your Mentor must verify he has seen you complete these tasks. After demonstrating these skills at work a minimum of three times you can be assessed. Your Mentor will advise if you are to do this as part of routine operations in the workplace or as a separate assessment task.*



## Section 8 — Crane Operations

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## Unit Standard ACO 8.11 W

### WORKPLACE ASSESSMENT

#### **OPERATE A BOOM TRUCK WITH STIFF BOOM CRANE UNLIMITED TONNAGE TO SAFELY LIFT UP & PLACE LOADS IN A WORKPLACE**

##### Purpose

This unit allows a trainee to demonstrate his or her skills to interpret load charts for stiff boom cranes and to demonstrate his or her skills to lift up and place a load with a boom truck with stiff boom crane unlimited tonnage.

The emphasis of this unit assessment is on the safe operation of the boom truck.

The unit assessment encompasses a variety of actions including operating a boom truck with a stiff boom crane unlimited tonnage, adjusting procedures as required for weather and conditions, performing hoists, monitoring the equipment, placing the load and then performing post operation procedures. A key requirement for the success of this assessment is for you to work through the tasks in the routine manner of a competent crane operator with a smooth transition between the responsibilities and an ability to be monitoring and sensing what is occurring during the process.

##### Note:

*This assessment may be able to be completed at the same worksite, on the same day as the assessments in Section 7 on Site Planning and Crane Positioning. (ASPCP 7.7 W). This will depend entirely on the workplace and the opportunities you have to demonstrate the skills. Please ensure you read the assessment requirements for previous units to see if you can combine the activities and be assessed for several of them at the same time.*

### TASK 1

You must correctly configure a stiff boom crane after accurately interpreting load charts and load study drawings. A number of requirements are needed in order for you to fulfil this assessment.

It is important you record the activities in date order in your trainee logbook showing where and when you performed the tasks. These logbook entries are checked by the Mentor to see you have had sufficient practice in the task prior to assessment.

*Your Mentor must verify that he has seen you complete these tasks. After demonstrating this skill at work a minimum of three times you can be assessed. Your Mentor will advise if you are to do this as part of routine operations in the workplace or as a separate assessment task.*

You will be required to complete the following as part of the assessment:

- |    |   |     |
|----|---|-----|
| 1. | Interpret load charts for stiff boom cranes accurately                      | 1.1 |
| 2. | Load dimensions are verified by crane operator (and supervisor as required) | 1.2 |
-

3. Calculate the centre of gravity 1.3
4. Follow any special lift instructions 1.4
5. Safe working loads (WLL/SWL) for wire rope (when winch equipped) and rigging are determined 1.5
6. Select the appropriate hardware and safety devices 1.6
7. Consider the load on the slings for equal and unequal lengths 1.7

Ideally you should have the opportunity to demonstrate this skill over a number of different operations prior to being assessed. The assessment should form part of normal daily work where possible.

## TASK 2

You must operate a boom truck first without a load and then with a load. The operations you must include in both scenarios are:

*Refer to Task # 2  
Points 2.1, 2.2*

- Booming up and booming down
- Slewing clockwise and counter clockwise
- Hoisting up and down



### TASK 3

In this portion of the assessment you must show that you are able to safely control the hook (and block when equipped with a hoist) during the lifts by making the necessary adjustments. In the assessment process you may not have, on that particular day, any of the weather conditions outlined in the assessment. In this case you must simulate how you would make adjustments to suit weather conditions that include:

- Ice *Refer to Task # 3  
Points 3.1, 3.2*
- Frozen to the ground
- High winds
- Lightning storm

The types of adjustments you must demonstrate are:

- Maintaining even control
- Using slower swing speeds
- Awareness of the effect of slewing speed on load and boom swing radius

### TASKS 4, 5, & 6

When you perform an equipped lift you must also be monitoring the equipment's performance and trouble shooting any problems that arise. At the same time all safety regulations must be adhered to and the manufacturer's recommendations for safe operation must be followed.

- When you demonstrate lift up and place procedures you must include:
- Simulating a lift near high voltage equipment
- Conducting a blind lift – including use of radio when signaller not visible

For the purposes of the assessment, you must show you are able to operate in the vicinity of high voltage equipment and for safety reasons, until you are a qualified crane operator, this must be simulated. As a trainee you must demonstrate that you know how to competently avoid touching high voltage equipment and it is not safe practice to have you learn and demonstrate this around live high voltage equipment – instead, to protect you and others, this is done through a mock situation.

The blind lift you perform is a way to measure your ability to complete a lift while not having the benefit of seeing the crane's operation. It is important you attempt this task only when you feel confident of your ability.

During any lift the crane operator has a variety of responsibilities. As well as ensuring the lift is safely carried out and completed he or she must monitor the equipment performance and trouble shoot any problems that arise as they occur. The essential parts of this include monitoring:

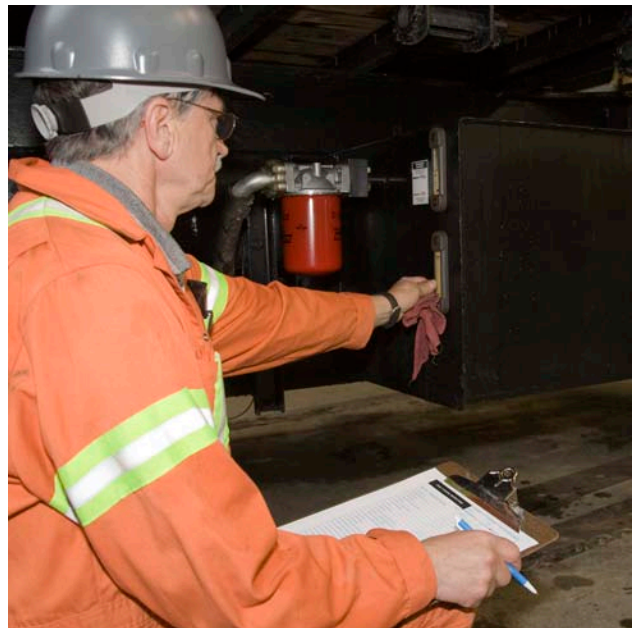
- Water levels
- Oil fluid levels
- Hydraulic levels
- Instrument gauges

Some things to watch for might include:

- A drop in pressure may indicate the levels may be low or there is a problem with the pump
- An increase in temperature may indicate that coolant or hydraulic fluid may be low, a fan belt may be broken, or the apparatus might be overloaded or overworked.

In these instances operation must be stopped and the levels, belts and equipment must be checked. Adjustments must be made prior to continuing with the lift.

A successful lift will include the load being safely placed at its intended destination, avoiding all obstacles and obeying the signal person. This must be demonstrated during the assessment process.



## TASK 7

On completion of the lifts you must perform the regular post operational procedures that include the following:

*Refer to Task #7  
Points 7.1, 7.2, 7.3, 7.4, 7.5, 7.6*

Post operation checks are made to check:

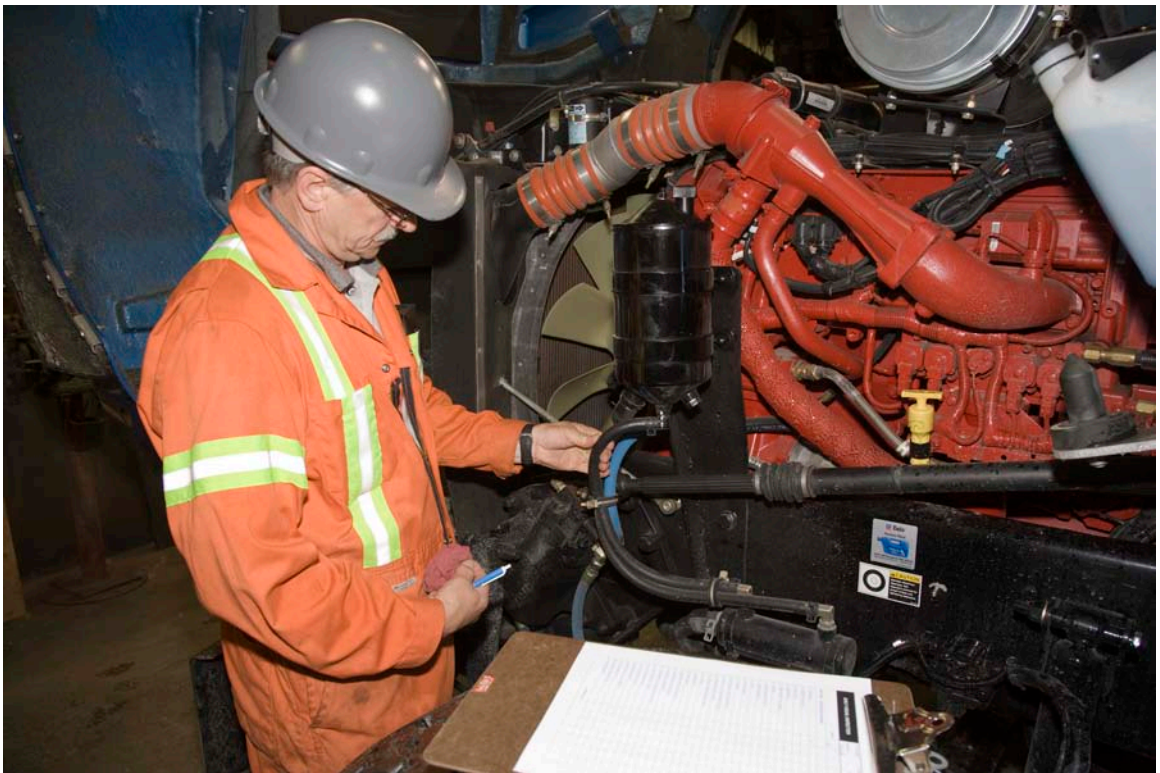
- fluid levels
- proper shut down of engine
- battery disconnect (switch)
- proper lockup
- wheels, deck, and cab are cleaned and all garbage or obstacles are removed from the cab
- leave in appropriate location

The assessment should take place in the workplace during normal operations and will take a number of days to complete.

*Your Mentor must verify he has seen you complete these tasks. After demonstrating these skills at work a minimum of three times you can be assessed. Your Mentor will advise if you are to do this as part of routine operations in the workplace or as a separate assessment task.*

## Section 9 — Maintenance & Service

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## Unit Standard AMS 9.20 W

### WORKPLACE ASSESSMENT

#### **COMPLETE MAINTENANCE CHECKLISTS (ENGINE ON/ENGINE OFF) & MAINTAIN ENGINES ON A STIFF BOOM TRUCK CRANE UNLIMITED TONNAGE TO MANUFACTURER'S SPECIFICATIONS**

##### Purpose

This unit allows a trainee to demonstrate his or her skills to perform engine maintenance.

The unit assessment covers routine engine inspections as well as basic maintenance and cleaning procedures. This assessment has many different components so it is unlikely that you would be able to complete all the tasks at the same worksite on the same day. By reading through the assessment you will see the different requirements. It may end up that you replace oil filters on a crane one day, clean the crane battery another day at another site, and maintain hydraulic tank breathers on another day on another crane. You should be aware of all the assessment components and where possible, demonstrate your ability to perform the requirements as they would naturally occur during the work processed.

##### Note:

*When conducting this assessment you must complete the work and make necessary entries in the crane maintenance logbook and other documents as required. This forms part of the assessment for Unit CMS 9.1 W – Maintaining an Equipment Logbook. Unit CMS 9.1 W is achieved naturally while completing the other units in Section 9 on Maintenance and Service.*

#### **TASKS 1 & 2**

You must complete maintenance checklists while the engine is off and then when the engine is on. Engine off checks are done to find any obvious problems and correct them before starting the engine and possibly endangering others. When conducting the maintenance checklists the following process must be followed:

*Refer to Tasks # 1 & 2  
Points 1.1, 1.2, 1.3, 1.4,  
2.1, 2.2, 2.3, 2.4*

- Properly check all things as outlined on the checklist and check it off accordingly
- Follow the company requirements as well as the manufacturers' manuals
- Accurately identify any problems and record them clearly in the maintenance logbook
- Report any problems to the crane superintendent/supervisor

### TASK 3

The requirements for Task 3 include using a variety of tools to perform a number of maintenance and service activities. It is unlikely you will be able to perform the range of jobs in one day so you may have to gradually work towards having each part signed off separately, or in segments.

It is important you record the activities in date order in your trainee logbook showing where and when you performed the tasks. These logbook entries are checked by the Mentor to see you have had sufficient practice in the task prior to assessment.

#### Basic Service and Maintenance

The basic boom truck service you are required to demonstrate must be performed according to the manufacturers' manuals and you should refer to those while completing the tasks which include:

- addition of required fluids
- adjustment of belts
- replacement of belts
- replacement or cleaning of air cleaners
- replacement of oil filters
- replacement of hoses

#### Tools

As a boom truck crane operator you are required to use a number of different tools and part of the assessment looks at your ability to use the following tools while performing the service and maintenance requirements:

- grease gun
- wrenches
- screwdrivers
- hammers
- vice grips
- pinch bar
- step ladder
- cloth or fibre glass tape measure



## Structural maintenance

During your course of time as a trainee you must be able to show that you are able to perform structural maintenance as required. The maintenance you perform may vary as different requirements will arise in different situations. For assessment purposes the structural maintenance should include maintenance to the following:

- bolts
- wedges
- cotter keys
- pins
- guard rails

*Refer to Task #3  
Point 3.4*



## Maintenance to boom truck crane accessories

The crane and accessory systems require maintenance from time to time. You must, over a period of time, demonstrate your ability to service and perform required maintenance on the following:

- gearbox
- hydraulic tank breathers
- outriggers and stabilizers
- booms
- steering systems
- air tanks
- filters

*Refer to Task #3  
Point 3.5*



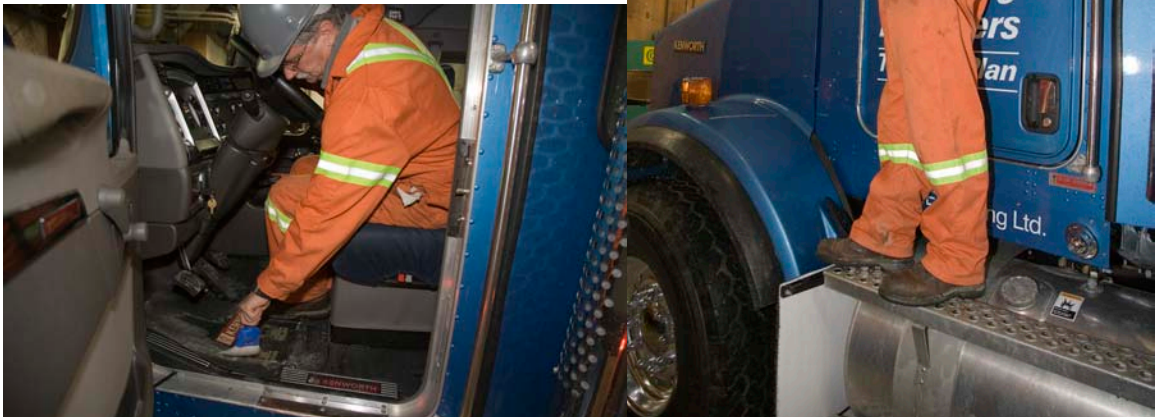
## Cleaning

Finally, the last step in any maintenance and service process is to clean the equipment. You may have demonstrated some of these skills in earlier assessments and you are able to cross reference those experiences to this task if you wish.

Refer to Task #3  
Point 3.6

You must clean the following boom truck components:

- batteries
- cab and windows
- wheels and tracks
- deck and car body



The assessment should take place in the workplace during normal operations and will take a number of days to complete.

*Your Mentor must verify he has seen you complete these tasks. After demonstrating these skills at work a minimum of three times you can be assessed. Your Mentor will advise if you are to do this as part of routine operations in the workplace or as a separate assessment task. Remember to record all of the experience doing these tasks in your trainee logbook.*

## Unit Standard AMS 9.21 W

### WORKPLACE ASSESSMENT

#### PERFORM ROUTINE INSPECTIONS & MAINTENANCE ON HYDRAULIC SYSTEMS ON A STIFF BOOM TRUCK CRANE UNLIMITED TONNAGE

##### Purpose

This unit allows a trainee to demonstrate his or her skills to perform routine inspections and maintenance on hydraulic systems on boom truck with stiff boom crane unlimited tonnage.

The unit assessment covers routine inspections as well as basic maintenance procedures. It will be easy to complete the inspections in a given day or time frame, however, performing the variety of maintenance specified in the assessment may have to occur over a period of time as the situations arise.

##### Note:

*When conducting this assessment you must complete the work and make necessary entries in the crane maintenance logbook and other documents as required. This forms part of the assessment for Unit CMS 9.1 W – Maintaining an equipment logbook. Unit CMS 9.1 W is achieved naturally while completing the other units in Section 9 on Maintenance and Service.*

### TASK 1

You must inspect the hydraulic systems and perform any necessary maintenance to ensure their safe and effective operation. The inspection and the maintenance must include each of the following:

*Refer to Task #1  
Point 1.2*

- pumps
- fluid levels
- hoses
- motors

The assessment should take place in the workplace during normal operations and will take a number of days to complete. Your Mentor must verify he has seen you complete these tasks. After demonstrating these skills at work a minimum of three times you can be assessed. Your Mentor will advise if you are to do this as part of routine operations in the workplace or as a separate assessment task. Remember to record all of the experience doing these tasks in your trainee logbook as this will be referred to by the Mentor.

## Unit Standard AMS 9.22 W

### WORKPLACE ASSESSMENT

#### INSPECT MONITORING DEVICES AND CONTROL MECHANISM ON STIFF BOOM TRUCK CRANE UNLIMITED TONNAGE

##### Purpose

This unit allows a trainee to demonstrate his or her skills to perform routine inspections of two important features of boom truck with stiff boom crane unlimited tonnage – the monitoring devices and the control mechanisms. After inspection, maintenance is to be performed on monitoring devices, as required, and adjustments are to be made to control mechanisms.

##### Note:

*It may be possible to include the work for this unit in conjunction with other assessment tasks in another unit or combination of units. Make sure you are familiar with the other unit's assessment requirements so you can obtain sign off on relevant tasks on the same day if practical.*

*When conducting this assessment you must complete the work and make necessary entries in the crane maintenance logbook and other documents as required. This forms part of the assessment for Unit CMS 9.1 W – Maintaining an Equipment Logbook. Unit CMS 9.1 W is achieved naturally while completing the other units in Section 9 on Maintenance and Service.*



#### TASK 1 - MONITORING DEVICES

You must inspect the following monitoring devices to ensure they operate properly. Maintenance must be performed on the devices according to the manufacturer's manual.

- Load moment indicator
- Boom angle indicator
- Boom length indicator
- Anti two block system



## TASK 2 – CONTROL MECHANISMS

You need to demonstrate an ability to inspect control mechanisms and perform the necessary adjustments. If the control mechanisms are not correctly adjusted accidents can occur. The variety of control mechanisms you must inspect and maintain may require you to complete different adjustments to different mechanisms on different days as it will depend on which mechanism needs adjustment. If this is the case, record all the work by date order in your trainee logbook and also seek sign off at different times if necessary.

*Refer to Task #2  
Points 2.1, 2.2*

Inspections and adjustments must be demonstrated for the following control mechanisms:

- cables
- brakes
- levers

This assessment should take place in the workplace during normal operations and will take a number of days to complete.

*Your Mentor must verify he has seen you complete these tasks. After demonstrating these skills at work a minimum of three times you can be assessed. Your Mentor will advise if you are to do this as part of routine operations in the workplace or as a separate assessment task. Remember to record all of the experience doing these tasks in your trainee logbook as this will be referred to by the Mentor.*

**This completes the Core Workplace Competencies:  
Stiff Boom Truck Crane - unlimited tonnage:**

The Assessment Tools against which you will be assessed as an Operator throughout, and at the end of your training period are included in the publication:

Crane Operator's Practical Assessment

This manual is available to guide you in reaching your goal as a competent Crane Operator and is also the manual your Mentor will use to guide his or her assessment of your developing competence.

You record your evidence of workplace activity in a third book:

The Work Record

This is the place where you get your daily work experience down. The mentor will use this book to cross reference with the Assessment Manual.

*Best wishes and Safe Craning!*

## Glossary

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<b>Assessor</b>	The Assessor is the BCACS Assessor who is responsible for the final assessment of the Trainee (student) against a knowledge or workplace unit standard
<b>Assessor – Third Party</b>	Third Party Assessor means a person recognized by the BCACS to perform practical assessments. This person must be dedicated to assessing only and not be a trainer of crane operators or otherwise be in any other potential conflict of interest.
<b>BCACS</b>	BC Association for Crane Safety
<b>Common Core of Competence Standards</b>	The Common Core of Competence Standards are the Knowledge and Workplace unit standards that must be completed by all students before they can undertake further specialised training for certification on either the four Mobile Cranes types or the four Boom Truck crane types.
<b>Certification</b>	Upon successful completion of the Mobile Crane Common Core and successful completion of one further advanced module, either: Mobile Cranes 80 tonnes and under, Mobile Cranes Unlimited Tonnage, Mobile Lattice Friction Cranes, Mobile Lattice Hydraulic Cranes, Boom Truck with Folding Boom 22 tonnes and under, Boom Truck with Folding Boom (unlimited tonnage), Boom Truck with Stiff Boom 40 tonnes and under, Boom Truck with Stiff Boom (unlimited tonnage), Tower Crane or Self Erect Tower Crane, the Trainee will receive a ‘Certificate of Qualification – Mobile Crane (Crane Type)’ or ‘Certificate of Qualification – Boom Truck Crane (Crane Type)’ or ‘Certificate of Qualification – Tower Crane (Crane Type)’
<b>Imperial Ton – short ton &amp; long ton</b>	<p>The standard ton in the U.S. measurement system is the “short ton”, equal to 2000 pounds (exactly 907.18474 kg). Both long and short tons are defined as 20 hundredweights, but a hundredweight is 112 pounds in the Imperial system (long or gross hundredweight) and 100 pounds in the US system (short or net hundredweight).</p> <p>The spelling “tonne” denotes the metric tonne of 1000 kilograms (approximately 2204.623 pounds).</p> <p>Long Ton (L/T sometimes known as a Gross Ton, Weight Ton, or Imperial Ton) is the name for the unit called the “Ton” in the Avoirdupois or Imperial system of measurements, as formerly used in the United Kingdom and several other Commonwealth countries. It has been replaced by the metric tonne. It is equal to 2240 pounds (exactly 1016.0469088 kilograms). A long ton-force is 2,240 pounds-force (9,964 newtons<sup>1</sup>).</p>

<sup>1</sup> <http://www.wikipedia.org>

<b>Incumbent/Existing Operator</b>	Incumbent / Existing Operator means an operator who is registered with the BCACS as of July 1, 2007 or an operator coming from outside of British Columbia after July 1, 2007 and who is in possession of an acceptable certificate. (Please contact the BCACS in writing or by email for more information regarding acceptable certificates.) Incumbent operator status will end on July 1, 2008. As of July 1, 2008 all operators will be required to possess their documented proof of competency as issued by BCACS.
<b>ITA</b>	Industry Training Authority
<b>Knowledge Unit Standards of Competence</b>	<p>The theoretical component of Mobile Crane Certification is made up of the Knowledge Units, which:</p> <ul style="list-style-type: none"> <li>• can be taught in a classroom setting by a qualified instructor, or</li> <li>• delivered on line, or</li> <li>• learned through self study on line or through printed materials</li> </ul>
<b>Level One Operator</b>	Level One Operator means a person new to crane operations who has not successfully challenged the core theory. This operator can operate only under direct hands-on supervision. A level one operator may only operate up to six months without successfully challenging the theory assessment. The Level One Certificate will be issued jointly to the employer and the operator and the Certificate may apply to any crane type.
<b>Level Two Operator</b>	Level Two Operator means a person who has passed the theory assessment and is certified to make routine lifts but will require hands-on supervision for all first time significant lifts and all high risk lifts. These routine lifts will be clearly documented by both the operator and the employer. Theory assessments for existing operators who choose to obtain Level 2 will be conducted by the employer. New operators will be required to pass a formal written assessment. A level two operator may choose to remain at this level for their working career or eventually they could challenge both the theory and the practical assessment to obtain a Level Three Certificate. A Level Two Certificate will specify what type of crane the operator may operate and their employer. The Level Two Certificate is only valid while working for the identified employer on the certificate.

<p><b>Level Three Operator and Interim Level Three Operator</b></p>	<p>Level Three Operator means a person who has passed both the theory and practical assessments conducted by a third party assessor for a specific crane type. A Level Three Certificate will specify what type of crane the operator may operate. This certificate means that the operator is competent to safely perform all crane lifts within the scope of the identified crane type and size. The employer is not identified on this certificate.</p> <p>Interim Level Three Operator means an incumbent operator who has registered before July 1, 2007 and has also signed a statement declaring that he or she is qualified to provide hands on supervision for Level One operators and to provide hands on supervision and has the ability to sign off for Level Two operators. This interim provision is necessary to phase in OHSR 14.34.1 (the new certification process) and will allow the Interim Level Three operator to sign off Level Two operators who have successfully performed first time significant lifts. This interim provision will expire on July 1, 2008 and only certified Level Three operators may provide hands on supervision or sign off after July 1, 2008.</p>
<p><b>Mentor</b></p>	<p>A mentor is a journey person who is the student/trainee's on-the-job coach, and is responsible for day-to-day assessment of the Trainee's work and for coaching, training and supervision on-the-job.</p>
<p><b>Metric tonne</b></p>	<p>A tonne (t) or metric ton (M/T), sometimes referred to as a metric tonne, is a measurement of mass equal to 1,000 kilograms. A tonne (t) or metric ton (M/T), sometimes referred to as a metric tonne, is a measurement of mass equal to 1,000 kilograms<sup>2</sup>.</p>

<sup>2</sup> <http://www.wikipedia.org>

<b>Practical Assessment</b>	Practical Assessment means an assessment conducted by a third party assessor, and supervised by the BCACS. The assessment involves spoken questions, as well as the operator using the crane to show that they have the basic knowledge, skills and ability to safely operate the crane. The operator is then considered to be competent (having the right skills and knowledge of the crane) and will receive written proof. If the operator is found not yet competent after performing the practical assessment they would be allowed to continue operating with a Level One or Two Certificate as decided by the third party assessor. An action plan and a follow-up date will be set following the completion of the assessment. The operator will be informed of this date both verbally and in writing.
<b>Theory Assessment</b>	Theory Assessment means an assessment administered by the BCACS, conducted on either paper, computer, verbal or other means. These assessments will be delivered through the ITA (Industry Training Authority) and administered by the BCACS.
<b>Work Experience Diary</b>	<p>The Work Experience Diary is a Work Record book (a journal) with pages in which the Trainee documents the dates and details of the practice tasks he has performed leading up to the assessment. The amount of time a Trainee must demonstrate the tasks prior to being assessed is stipulated in the Workplace Assessment Documents.</p> <p>It also contains an Evidence section – in which the Trainee inserts the pieces of evidence that are requested in the Workplace Assessment Document.</p>
<b>Workplace Units Standards of Competence</b>	<p>The practical component of Mobile Crane Certification is made up of the Workplace Units, which:</p> <ul style="list-style-type: none"> <li>• require hands on experience</li> <li>• are assessed on the job by a Registered Workplace Assessor</li> <li>• may be begun in a simulated setting such as a training yard, but are assessed for credit in the workplace</li> </ul>

## Metric Conversion Help

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For an online Metric Converters try:

<http://www.worldwidemetric.com/metcal.htm>

[http://www.sciencemadesimple.com/weight\\_conversion.php](http://www.sciencemadesimple.com/weight_conversion.php)

<b>Conversion Factors</b>	
<b>IMPERIAL TO METRIC</b>	
1 ounce =	28.375 grams
1 pound =	454 grams
1 short ton (2K) =	907 kilograms
1 metric tonne (2.2K) =	1,000 kilograms
1 inch =	2.54 centimetres
1 foot =	30.48 centimetres
1 yard =	91.44 centimetres
1 cubic foot =	28,316.846 cubic centimetres
1 Imperial gallon =	1.201 US gallons
1 Imperial gallon =	4.546 litres
1 Imperial pint =	0.568 litres
<b>METRIC TO IMPERIAL</b>	
1 gram =	0.0352 ounces
1 kilogram =	2.204 pounds (= 1000 grams)
1 metric tonne =	2,204 pounds
1 centimetre =	0.394 inches
1 metre =	39.37 inches
1 cubic metre =	1.308 cubic yards
1 litre =	61.024 cubic inches
1 litre =	0.220 Imperial gallons
1 litre =	0.264 US gallons
1 litre =	1.760 Imperial pints

## Recommended Reference Textbooks, Video/DVD Resources

**From the Construction Safety Association of Ontario <http://www.csao.org/>**

Mobile Crane Manual

by Donald E. Dickie, P. Eng., D. H. Campbell, P. Eng.  
Construction Safety Association of Ontario

ISBN 0-8273-6527-6

Rigging Manual

by Donald E. Dickie, P. Eng.  
Construction Safety Association of Ontario

ISBN 0-7726-1574-8

Hoisting and Rigging Safety Manual

Construction Safety Association of Ontario

ISBN 0-919465-70-6

Slings

Construction Safety Association of Ontario

ISBN 0-919465-76-5

**Safety in Rigging Video/DVD Series**

The complete set of 10 Safety in Rigging DVDs (FD001-FD010), complete with instructor's notes. Includes:

Cranes: Types, Components and Case Histories (FD001)

Hazard Awareness in Crane Operating Areas (FD002)

International Hand Signals (FD003)

Wire Rope (FD004)

Hardware (FD005)

Chain (FD006)

Slings (FD007)

Reeving (FD008)

Hoists, Winches and Related Devices (FD009)

Jacks, Rollers and Related Devices (FD010)

Cranes: Types, Components and Case Histories Video/DVD (set of 10)

**From the Operating Engineers Training Institute of Ontario <http://www.oetio.com>**

Mobile Craning Today

Operating Engineers Training Institute of Ontario

ISBN 0-8273-5460-6

### **Additional Resources**

IPT's Crane and Rigging Handbook  
by Ronald G. Garby

ISBN 0-920855-14-8

IPT's Crane and Rigging Training Manual  
By Ronald G. Garby

ISBN 0-920855-16-4

### **Reference Authority**

(to be developed when revised OSH regulations released in Summer 07)

1. WorkSafeBC Occupational Health and Safety (OHS) regulations
2. WorkSafe BC Occupational First Aid Requirements
3. CSA Standard Z150-1998 Safety Code for Mobile Cranes,
4. ANSI Standard ANSI/ASME B30.5-2004, Mobile and Locomotive Crane or ANSI/ASME B30.22-2005, Articulating Boom Crane,