

# **Boom Truck Operator “A” On-the-Job Training Guide**

**2018**



Online: [www.saskapprenticeship.ca](http://www.saskapprenticeship.ca)

*Recognition:*

*To promote transparency and consistency, portions of this document has been adapted from the 2013 Mobile Crane Operator National Occupational Analysis (Employment and Social Development Canada).*

*A complete version of the Occupational Analysis can be found at [www.red-seal.ca](http://www.red-seal.ca)*

# STRUCTURE OF THE ON-THE-JOB TRAINING GUIDE

To facilitate understanding of the occupation, this on-the-job training guide contains the following sections:

**Description of the Boom Truck Operator “A” trade:** an overview of the trade’s duties and training requirements.

**Essential Skills Summary:** an overview of how each of the nine essential skills is applied in this trade.

**On-the-Job and In-school Training Content for the Boom Truck Operator “A” Trade:** a chart which outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for topics of technical training.

# DESCRIPTION OF THE BOOM TRUCK OPERATOR “A” TRADE

*Boom Truck “A” Operator apprentices or tradespeople operate many types of Boom Truck cranes over 15.5 tons. Boom Truck Operator “A” proficiency certificate holders are certified to operate Boom Truck “B”. Boom Truck Operator “A” is considered a sub-trade of the Mobile Crane Operator trade.*

**Training Requirements:** 3000 hours (2 years) including in-school technical training sessions. An apprentice must successfully complete the required technical training and compile enough on-the-job experience to total at least 1500 hours each year.

Journeyman to apprentice ratio for this trade is: 1:2

The information contained within this document serves as a guide for employers and apprentices. Apprenticeship training is mutually beneficial to both employer and apprentice. The employer’s investment in training apprentices results in skilled and certified workers. The document summarizes the tasks to be covered by the apprentice during the on-the-job portion of apprenticeship training. An apprentice spends approximately 85% of the apprenticeship term training on-the-job.

**It is the employer’s or journeyman’s training responsibility to supervise an apprentice’s practical skills development until a satisfactory level of proficiency has been reached.**

## **EMPLOYER TRAINING RESPONSIBILITY**

- promote a safety-conscious workplace
- provide mentored, hands-on practice in the use of rigging equipment
- demonstrate calculations of the load weights, rigging capacities and crane capacities
- demonstrate set-up of cranes
- provide the opportunity for apprentices to perform minor maintenance on cranes
- further the apprentice’s ability to complete pre-operational inspections, checks and regular inspections
- ensure that the apprentice can perform craning operations

Employers should make every effort to expose their apprentices to work experience in as many areas of the trade as possible.

Below, in-school instruction is listed first; suggestions to help employers assist the apprentice to prepare for in-school training are listed next.

The content of the training components is subject to change without notice.

## **Entrance Requirements for Apprenticeship Training**

Your grade twelve transcript (with no modified classes) or GED 12 is your guarantee that you meet the educational entrance requirements for apprenticeship in Saskatchewan. In fact, employers prefer and recommend apprentices who have completed high school. This ensures the individual has all of the necessary skills required to successfully complete the apprenticeship program, and receive journeyman certification.

Individuals with “modified” or “general” classes in math or science do not meet our entry requirements. These individuals are required to take an entrance assessment prescribed by the SATCC.

English is the language of instruction in all apprenticeship programs and is the common language for business in Saskatchewan. Before admission, all apprentices and/or “upgraders” must be able to understand and communicate in the English language. Applicants whose first language is not English must have a minimum Canadian Language Benchmark Assessment of six (CLB6).

Note: A CLB assessment is valid for a one-year period from date of issue.

Designated Trade Name	<b>Math Credit</b> at the Indicated Grade Level❶	<b>Science Credit</b> at Grade Level
Boom Truck Operator “A”	Grade 10	Grade 10
<p>❶ - (One of the following) WA – Workplace and Apprenticeship; or F – Foundations; or P – Pre-calculus, or a Math at the indicated grade level (Modified and General Math credits are not acceptable.).</p> <p>*Applicants who have graduated in advance of 2015-2016, or who do not have access to the revised Science curricula will require a Science at the minimum grade level indicated by trade.</p> <p>For information about high school curriculum, including Math and Science course names, please see:  <a href="http://www.curriculum.gov.sk.ca/#">http://www.curriculum.gov.sk.ca/#</a></p> <p style="text-align: center;"><b>Individuals not meeting the entrance requirements will be subject to an assessment and any required training</b></p>		

# ESSENTIAL SKILLS SUMMARY

Essential skills are needed for work, learning and life. They provide the foundation for learning all other skills and enable people to evolve with their jobs and adapt to workplace change.

Through extensive research, the Government of Canada and other national and international agencies have identified and validated nine essential skills. These skills are used in nearly every occupation and throughout daily life in different ways.

A series of CCDA-endorsed tools have been developed to support apprentices in their training and to be better prepared for a career in the trades. The tools can be used independently or with the assistance of a tradesperson, trainer, employer, teacher or mentor to:

- understand how essential skills are used in the trades;
- learn about individual essential skills strengths and areas for improvement; and
- improve essential skills and increase success in an apprenticeship program.

The tools are available online or for order at: [www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml](http://www.esdc.gc.ca/eng/jobs/les/profiles/index.shtml)

The application of these skills may be described throughout this document within the skills and knowledge which support each sub-task of the trade. The most important essential skills for each sub-task have also been identified. The following are summaries of the requirements in each of the essential skills, taken from the essential skills profile. A link to the complete essential skills profile can be found at [www.red-seal.ca](http://www.red-seal.ca).

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## READING

In their daily work, Boom Truck Operators read and comprehend several types of texts. These include safety and work procedures as well as more complex hoisting regulations and manufacturers' operating manuals.

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## DOCUMENT USE

Boom Truck Operators use workplace documents such as logbooks, load charts, hazard assessments and workplace policies and procedures to carry out their job. They must be familiar with regulations relating to hoisting, rigging and safe work environments. They must have the ability to read and interpret manufacturers' specifications and load charts for the model of crane they are using. Depending on site-specific requirements, they may obtain information from engineered and construction drawings and plans.

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## WRITING

Boom Truck Operators use writing skills to record comments or notes in logbooks or work records. They write messages to colleagues or management to give work details or reply to requests for technical information. They may also write longer descriptions and explanations for various reporting and data collection forms

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## ORAL COMMUNICATION

Boom Truck Operators use oral communication skills to coordinate work with site crews. Clear communication of technical and complex information is very important to avoid injuries and promote efficiency. Boom Truck Operators also use communication skills when instructing apprentices, co-workers and on-site work crews. Good listening and visual skills are also required to communicate with riggers, signallers and other operators during lifts. Operators use verbal communication and hand signals to communicate the speed of lift movements and precise positioning of loads.

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## NUMERACY

Boom Truck Operators use a range of math skills in their daily work. These include mathematical and physics concepts such as conversions, geometry, algebraic calculations, measurement and calculation of load and lift requirements. They use code books, load charts and manufacturers' specifications to further determine procedures, limits and the necessary equipment for rigging and hoisting

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## THINKING

Boom Truck Operators must use decision-making skills to perform work planning and prioritizing. The decisions they make about the sequence of work have implications for everyone on site. Boom Truck Operators require strong analytical skills to effectively use their equipment.

Boom Truck Operators use problem solving skills to choose setup locations and crane configurations for specific jobs. During lifts, Boom Truck Operators make operational decisions to start, stop and vary the speed and direction of lifts to ensure safe movement and placement of a load. They evaluate the safety of lifts before and during lifts, and stop work if necessary

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## WORKING WITH OTHERS

To be effective, Boom Truck Operators must establish close and ongoing job-task coordination with other workers on the job site. They work closely with clients to plan lifts and ensure that their activities are coordinated with those of on-site crews. They are in close communication with riggers, signallers and supervisors to coordinate lifts and load placements. Boom Truck Operators work in close coordination with other operators when performing multiple crane lifts and when in close proximity with other cranes and heavy equipment.

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## DIGITAL TECHNOLOGY

Boom Truck Operators are increasingly required to interpret electronic data transmitted from LMI, anemometers and electronic scales to a display located in the cab of the crane. Controls for the mobile crane may also involve computerized applications.

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## CONTINUOUS LEARNING

As construction methods and crane technology are advancing, Boom Truck Operators must keep abreast of these developments. There are requirements for site or crane specific training and regulatory changes that may require additional certification and ongoing learning to ensure compliance and safe working conditions.

# ON-THE-JOB AND IN-SCHOOL TRAINING

## CONTENT FOR THE BOOM TRUCK OPERATOR

### “A” TRADE

This chart outlines on-the-job examples for apprentices to achieve relevant work experience to prepare for the topics of technical training. Topics of technical training are provided with the associated learning outcomes.

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#### Level One

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##### Safety/Tools and Equipment

- safety
- communications for hoisting
- high voltage electrical fundamentals
- trade related documents
- tools and equipment
- fasteners and retaining devices

##### Mentors can assist the apprentice to prepare for this section of technical training by:

- *ensuring the apprentice follows safe work practices and has knowledge of CSA standards, OH&S regulations and company safety policies*
- *demonstrating the use of safety equipment such as PPE, first aid kits, fire extinguishers and spill kits*
- *allowing apprentice to attend company safety meetings*
- *demonstrating crane safety and possible hazards*
- *demonstrating, then supervising the apprentice using hand signalling procedures during actual lifts of materials and equipment*
- *explaining safety procedures as it relates to high voltage electrical equipment*
- *explaining limits of approach when working near high voltage equipment*
- *ensuring the apprentice knows the safety procedures associated with electrical contact*
- *reviewing and explaining technical information from manufacturer’s manuals*
- *explaining the personal responsibility for crane operators to maintain log books*
- *demonstrating the use of the crane log book*
- *allowing the apprentice to use written communication, such as log book time sheets and accident reports*
- *ensuring the apprentice has knowledge of various hand and power tools*
- *ensuring the apprentice is exposed to various types of crane hardware/fasteners and their usages*

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##### Rigging

- wire rope
- rigging hardware
- introduction to rigging and hoisting
- sling configurations

##### Mentors can assist the apprentice to prepare for this section of technical training by:

- *demonstrating inspection procedures and identify damage to wire rope*
- *allowing the apprentice to choose the appropriate hardware for various lifts*
- *identifying various block classifications and their applications*
- *discussing the effects of sling angles*

- *exposing the apprentice to lifts requiring different sling configurations*
  - *allowing the apprentice to choose the rigging configuration for a basic lift such as sling type, size, use of hardware and quantity*
  - *discussing the effects of different types of sling configurations such as vertical, choker, basket hitch and two leg bridle*
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### **Load Weight Calculations**

- load weight calculations I

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *allowing the apprentice to calculate load weights for basic shaped loads*
  - *allowing the apprentice to determine and calculate center of gravity*
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### **Load Charts**

- load charts I

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *ensuring apprentice is aware of factors reducing capacities such as wind, weather and ground conditions*
  - *allowing the apprentice to use basic load charts*
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### **Boom Truck Operations**

- lifting theory and forces
- introduction to crane operations
- introduction to computerized operational aids
- job planning
- introduction to boom trucks

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *discussing the components of leverage and their applications*
  - *having the apprentice look through manufacturer's manuals*
  - *allowing the apprentice to interpret technical information gathered from multiple sources*
  - *demonstrate the quadrants of operation and the effects of lifting over the different quadrants*
  - *demonstrating operating procedures such as swing, hoist up/down and using multiple functions at the same time*
  - *ensuring the apprentice has basic crane operations such as programming range limiting devices and use of LMI*
  - *explaining job site layouts and hazards to consider*
  - *allowing the apprentice to attend a site meeting*
  - *exposing the apprentice to boom truck operations*
  - *supervising the apprentice during the completion of a walk around inspection prior to operation*
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## **Level Two**

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### **Rigging**

- wire rope
- rigging hardware
- rigging and hoisting
- sling configurations
- multi-crane lifts

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *installing a wire rope on a hoist drum*

- *supervising the apprentice during inspection and maintenance procedures for rigging equipment*
  - *discussing proper storage methods of rigging hardware*
  - *allowing the apprentice to select the rigging configuration for intermediate load configurations*
  - *ensuring the apprentice can calculate angular loading for various sling configurations*
  - *giving the apprentice exposure to lifts using various accessories such as equalizer beams and spreader bars*
  - *supervising the apprentice during the preparation and setup of a multi-crane lift*
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### **Load Weight Calculations**

- load weight calculations II

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *ensuring the apprentice can calculate load weights using formulas such as cylinder, cube and pyramid*
  - *allowing the apprentice to calculate load weights requiring multi step calculations such as tanks with fluid, H-beams and pipes*
  - *discussing the effect of load weight estimating when adding rigging accessories required for lift*
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### **Load Charts**

- load charts II

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *ensuring the apprentice can gather information from multiple locations within a load chart*
  - *discussing the factors reducing rated capacities such as wind, weather, ground conditions and personnel experience*
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### **Pre-operational Checks, Inspections and Maintenance**

- engines and drive systems
- mechanical systems
- hydraulic systems
- continual checks

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *having the apprentice view the crane manufacturer's requirements for inspections/maintenance*
  - *exposing the apprentice to maintenance procedures and checklists for rigging, pre-lift planning, crane setup and crane maintenance*
  - *supervising the apprentice conducting crane preventative maintenance tasks*
  - *demonstrating daily interval checks such as ground conditions, outriggers remain set and crane condition*
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### **Boom Truck Set-up**

- crane setup
- assembly and disassembly
- transportation
- pre-lift planning
- worksite preparation

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *supervising the apprentice while positioning the crane, making sure the apprentice takes into account radii, voltage/obstacle clearances, crane dimensions and load dimension/weight*
- *discussing the various methods of transporting a crane*
- *having the apprentice visit the job site to determine if it is favourable for crane mobility and setup*
- *allowing the apprentice to attend pre-lift planning meetings and completing a lift plan form*

- *describing the importance of site meetings*
  - *discussing potential site hazards such as overhead and underground obstructions and ground conditions*
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### **Boom Truck Operations**

- *lifting theory and forces*
- *introduction to crane operations*
- *introduction to computerized operational aids*
- *job planning*
- *introduction to boom trucks*
- *boom truck operation*
- *specialty crane operations*

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *allowing the apprentice to calculate working capacities for various crane configurations such as outrigger position, on rubber and boom length*
  - *having the apprentice verify the LMI is set properly, gauges are displaying appropriate readings and anti-two block device is functioning properly*
  - *identifying warning systems on cranes and importance of these systems*
  - *allowing the apprentice to select which crane is used for a specific job taking into consideration location, load size and quantity*
  - *ensuring the apprentice understands the legal responsibilities of the workers involved in crane operation*
  - *giving the apprentice exposure to various styles of hoisting equipment*
  - *allowing the apprentice to participate in specialty lifts such as blind lifts and tandem lifts*
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### **Safety/Tools and Equipment**

- *safety*
- *communications for hoisting high voltage electrical fundamentals*
- *trade related documents*
- *tools and equipment*

#### **Mentors can assist the apprentice to prepare for this section of technical training by:**

- *reviewing safety equipment and PPE requirements*
- *ensuring the apprentice can recognize site hazards*
- *allowing the apprentice to participate in shop safety meetings*
- *ensuring the apprentice has reviewed the CSA Z150, Saskatchewan OH&S manuals and company safety policy*
- *allowing the apprentice to direct rigging duties and demonstrate good knowledge of crane hand signals*
- *reviewing the importance of limits of approach*
- *demonstrating safety procedures associated with electrical contact*
- *discussing the process when requesting power to be de-energized when limits of approach cannot be used*
- *ensuring the apprentice records the information required in the crane log book*
- *allowing the apprentice to fill in log books*
- *ensuring the apprentice is able to use written communication such as incident reports and critical lift plan*
- *allowing the apprentice to use the different types of hand and power tools*

**Consider apprenticeship training as an investment in the future of your company and in the future of your workforce. Ultimately, skilled and certified workers increase your bottom line.**

**Get involved in the apprenticeship training system. Your commitment to training helps to maintain the integrity of the trade.**

**Do you have employees who have been working in the trade for a number of years but don't have trade certification? Contact your local apprenticeship office for details on how they might obtain the certification they need.**

**Saskatchewan Apprenticeship & Trade Certification Commission**

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