



PERSONAL RECORD BOOK

Industrial Electrician



This is your Record Book!

DO NOT SUBMIT TO THE ITA

This is not required to achieve certification

- **It is a record of your progress towards achieving certification in the trade**
- **It provides a record of your experience**
- **It is your responsibility to keep it up-to-date**
- **Take it with you if you change employers**

Note: Employers and supervisors are not responsible for keeping your Record Book up-to-date. They are responsible for sign-off of hours and sign-off of competencies once you have achieved the required level of skills and knowledge.

APPRENTICE IDENTIFICATION

Trade: INDUSTRIAL ELECTRICIAN

Legal First Name:		Legal Last Name:	
Suite Number:	Street Number and Name:		
City:		Province:	Postal Code:
Telephone Number:		Email Address:	

Work Safely!

A safe work attitude contributes to an accident free environment. Accident prevention and safe working conditions are the responsibility of both employers and employees.

Wear the required personal protective equipment, follow safe work practices and follow all safety regulations applicable to specific job activities.

Employer's responsibilities:

- Provide and maintain safety equipment and protective devices
- Ensure proper safe work clothing is worn
- Enforce safe work procedures
- Provide safeguards for machinery, equipment and tools
- Observe all accident prevention regulations
- Train employees in safe use and operation of equipment

Employee's responsibilities:

- Work in accordance with the safety regulations pertaining to job environment
- Work in such a way as not to endanger themselves or fellow workers.

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EMPLOYER INFORMATION

Originating Employer

Start Date:	End Date:
Employer:	
Contact Person:	
Address:	Phone:
	Email:
	Fax:
Supervisor/Journeyman 1:	*TWID #:
	Phone:
	Email:
Supervisor/Journeyman 2:	TWID #:
	Phone:
	Email:

*TWID # – Trade Worker Identification Number

If you have more than one employer during your apprenticeship, record the information for subsequent employers on the following page(s).

If your job ends or you change employers...

Before leaving your place of employment:

- Update Workplace Hours through a [Work-Based Training Hours form](#) for the current reporting period and get signoff by your employer.
- Update Record of Competencies with your supervisor.
- Confirm with your employer that your workplace hours have been reported to ITA, and if possible get a copy of all Work-Based Training Hours reports submitted.
- Notify the ITA of the change in your employment by submitting an [Apprentice and Sponsor Registration form](#) with your new employer.

When re-employed...

You must be registered with your new employer before submitting any work-based training hours to the ITA.

Subsequent Employers

Start Date:	End Date:
Employer:	
Contact Person:	
Address:	Phone:
	Email:
	Fax:
Supervisor/Journeyperson 1:	TWID #:
	Phone:
	Email:
Supervisor/Journeyperson 2:	TWID #:
	Phone:
	Email:

Subsequent Employers

Start Date:	End Date:
Employer:	
Contact Person:	
Address:	Phone:
	Email:
	Fax:
Supervisor/Journeyperson 1:	TWID #:
	Phone:
	Email:
Supervisor/Journeyperson 2:	TWID #:
	Phone:
	Email:

WORKPLACE HOURS

Instructions

Make an entry in this section each time your hours are reported to the ITA.

1. Get a copy of the *Workplace Hours Report* from your employer.
2. Fill in the dates of the reporting period and the hours reported.
3. Enter your employer name, address and phone number.
4. Keep your Record Book in a safe place.

Workplace Hours

Workplace hours must be submitted to the ITA by your employer on a regular basis. Your hours should be reported at least every six months; however, every three months is preferred.

At the beginning of your apprenticeship discuss the frequency of reporting with your employer.

Keeping Workplace hours up-to-date in your Record Book gives you the tools to better manage your apprenticeship. It provides you with the opportunity to:

- Follow up with your employer each reporting period to ensure your hours are reported on a regular basis.
- Discuss your progress with your direct supervisor/journeyperson on a regular basis.

RECORD OF COMPETENCIES

Instructions

The Record of Competencies is filled out and signed-off by the journeyperson supervising your work.

1. Know what skills are expected at each level of the program.
2. Ask the journeyperson to sign off on the competency when you have acquired the skills and are able to perform the task without supervision.
3. If the journeyperson agrees that you have the required skills, he/she will:
 - Record the date that the competency was achieved
 - Sign off on the competency
 - Enter his/her Trades Worker Identification Number (TWID #)

What is a Record of Competencies?

The Record of Competencies lists all competencies you should be knowledgeable in prior to receiving your certification. Keeping this section up to date will allow you to track your progress towards certification and demonstrate proficiency in the skills within the scope of your trade. Completion of the entire program should result in you becoming a skilled and knowledgeable journeyperson.

- Refer to this section periodically to ensure you are getting the work experience you need.
- Use the competencies as a guide to ensure work tasks are assigned so that you acquire the skills and knowledge required to be successful in the trade.

Review the Record of Competencies on a regular basis with your direct supervisor/journeyperson to ensure they have been completed.

Program Outline

The Program Outline provides detailed information on the scope of knowledge and skills expected at each level of the program, further defining the competencies listed in the Record Book. The Program Outline is a great resource for developing a training plan.

Download from: <https://www.itabc.ca/program/electrician-industrial>

Apprenticeship Toolkit

For general information on apprenticeship and tips for navigating the apprenticeship system in BC visit ITA's website to learn about the [apprenticeship basics](#).

LEVEL 1

IMPORTANT!

Download the Program Outline!

<https://www.itabc.ca/program/electrician-industrial>

Read the competency tables

Some competencies are taught in many levels

For detailed information about that competency, go to the Program Outline

THEORY

LINE A: APPLY CIRCUIT CONCEPTS

- DESCRIBE THE PRINCIPLES OF ALTERNATING CURRENT
- DESCRIBE THE OPERATING PRINCIPLES OF SERIES CIRCUITS
- ANALYZE SERIES CIRCUITS
- DESCRIBE THE OPERATING PRINCIPLES OF PARALLEL CIRCUITS
- ANALYZE PARALLEL CIRCUITS
- DESCRIBE THE OPERATING PRINCIPLES OF COMBINATION CIRCUITS
- ANALYZE COMBINATION CIRCUITS
- DESCRIBE THE OPERATING PRINCIPLES OF VOLTAGE DIVIDERS
- ANALYZE VOLTAGE DIVIDERS
- DESCRIBE THE OPERATING PRINCIPLES OF BRIDGE CIRCUITS
- ANALYZE BRIDGE CIRCUITS
- DESCRIBE THE OPERATING PRINCIPLES OF THREE-WIRE CIRCUITS
- ANALYZE THREE-WIRE CIRCUITS
- DESCRIBE THE PRINCIPLES OF ELECTROMAGNETISM
- DESCRIBE THE OPERATING PRINCIPLES OF DIODES IN DC CIRCUITS
- DESCRIBE OPERATING PRINCIPLES OF BJTS IN DC CIRCUITS

LINE B: PERFORM SAFETY-RELATED FUNCTIONS

- DESCRIBE SAFETY EQUIPMENT AND PPE
- IDENTIFY AND CONTROL WORKPLACE HAZARDS

- DESCRIBE LOCKOUT REQUIREMENTS

LINE C: USE TOOLS AND EQUIPMENT

- INTERPRET DIGITAL METER READINGS

LINE D: ORGANIZE WORK

- INTERPRET CODES, REGULATIONS AND STANDARDS

LINE G: USE COMMUNICATION AND MENTORING TECHNIQUES

- DESCRIBE THE SHARED RESPONSIBILITIES FOR WORKPLACE LEARNING

LINE H: INSTALL AND MAINTAIN CONSUMER/SUPPLY SERVICES AND METERING EQUIPMENT

- DETERMINE SINGLE-PHASE SERVICE EQUIPMENT REQUIREMENTS WHEN CTS AND PTS ARE NOT REQUIRED
- DESCRIBE MAINTENANCE PROCEDURES FOR SINGLE-PHASE SERVICES AND METERING EQUIPMENT

LINE I: INSTALL AND MAINTAIN PROTECTION DEVICES

- IDENTIFY PROTECTIVE DEVICES
- DETERMINE PROTECTIVE DEVICE REQUIREMENTS

LINE J: INSTALL AND MAINTAIN LOW VOLTAGE DISTRIBUTION SYSTEMS

- DETERMINE SINGLE-PHASE DISTRIBUTION CENTRE REQUIREMENTS

LINE L: INSTALL AND MAINTAIN BONDING, GROUNDING AND GROUND FAULT DETECTION SYSTEMS

- DIFFERENTIATE BETWEEN GROUNDING AND BONDING

- DETERMINE GROUNDING AND BONDING REQUIREMENTS FOR DC AND SINGLE-PHASE SYSTEMS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF GROUNDING AND BONDING SYSTEMS ACCORDING TO THE CEC

LINE Q: INSTALL AND MAINTAIN RACEWAYS, CABLES AND ENCLOSURES

- IDENTIFY CONDUCTORS AND CABLES FOR RESIDENTIAL CIRCUITS
- DETERMINE CONDUCTOR AND CABLE REQUIREMENTS IN RESIDENTIAL CIRCUITS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF CONDUCTORS AND CABLES ACCORDING TO THE CEC
- DETERMINE REQUIREMENTS FOR COMMON RACEWAYS, BOXES AND FITTINGS

LINE R: INSTALL AND MAINTAIN BRANCH CIRCUITRY

- DESCRIBE THE CHARACTERISTICS OF LIGHT
- DESCRIBE THE OPERATION OF LED AND INCANDESCENT LIGHTING
- DESCRIBE RECEPTACLES AND SWITCHES AND THEIR REQUIREMENTS
- DESCRIBE TESTING OF RECEPTACLES AND SWITCHES
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF LIGHTING CONTROLS ACCORDING TO THE CEC
- DESCRIBE TYPES OF LIGHTING STANDARDS
- DESCRIBE THE INSTALLATION OF LIGHTING STANDARDS

LINE V: INSTALL AND MAINTAIN MOTOR STARTERS AND CONTROLS

- DESCRIBE THE OPERATING PRINCIPLES OF MANUAL MOTOR STARTERS
- DESCRIBE THE OPERATING PRINCIPLES OF MAGNETIC MOTOR STARTERS

- DESCRIBE THE OPERATING PRINCIPLES OF MAGNETIC MOTOR CONTROL CIRCUITS
- DESCRIBE TROUBLESHOOTING PROCEDURES FOR MOTOR STARTERS AND MOTOR CONTROLS
- DESCRIBE MAINTENANCE PROCEDURES FOR MOTOR STARTERS AND MOTOR CONTROLS

LINE AA: INSTALL AND MAINTAIN COMMUNICATION SYSTEMS

- DESCRIBE PROCEDURES TO INSTALL A STRUCTURED CABLE SYSTEM

PRACTICAL

LINE A: APPLY CIRCUIT CONCEPTS

- APPLY ELECTRICAL CIRCUIT CONCEPTS
- PERFORM ELECTRICAL CIRCUIT CALCULATIONS
- PERFORM METER READINGS TO VERIFY CIRCUIT CONCEPTS
- SOLVE PROBLEMS INVOLVING MAGNETIC CIRCUITS
- CONNECT AND TEST DIODES IN DC CIRCUITS
- CONNECT AND TEST BJTS IN DC ELECTRONIC CIRCUITS

LINE B: PERFORM SAFETY-RELATED FUNCTIONS

- APPLY PERSONAL SAFETY PRECAUTIONS AND PROCEDURES
- APPLY PERSONAL SAFETY MEASURES
- PREVENT AND IDENTIFY VARIOUS CLASSES OF FIRES
- PERFORM LOCK-OUT AND TAG-OUT PROCEDURES FOR VARIOUS SITUATIONS

LINE C: USE TOOLS AND EQUIPMENT

- USE DIGITAL METERS

LINE D: ORGANIZE WORK

- USE RESIDENTIAL PRINTS, DRAWINGS, MANUALS AND SPECIFICATIONS TO LOCATE INFORMATION
- USE CONSTRUCTION DRAWINGS TO DEVELOP A MATERIAL TAKEOFF

LINE R: INSTALL AND MAINTAIN BRANCH CIRCUITRY

- CONNECT AND TEST LIGHTING CONTROLS FOR LED AND INCANDESCENT

LINE V: INSTALL AND MAINTAIN MOTOR STARTERS AND CONTROLS

- CONNECT MANUAL MOTOR STARTERS
- CONNECT MAGNETIC MOTOR STARTERS.
- CONNECT MAGNETIC MOTOR CONTROL CIRCUITS
- DRAW WIRING AND SCHEMATIC DIAGRAMS FOR AC MOTOR CONTROLS

LINE AA: INSTALL AND MAINTAIN COMMUNICATION SYSTEMS

- PERFORM TERMINATION OF DATA CABLE

Supervisor Signature

NOTES FROM LEVEL 1

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LEVEL 2

IMPORTANT!

Download the Program Outline!

<https://www.itabc.ca/program/electrician-industrial>

Read the competency tables

Some competencies are taught in many levels

For detailed information about that competency, go to the Program Outline

THEORY

LINE A: APPLY CIRCUIT CONCEPTS

- DESCRIBE THE PRINCIPLES OF INDUCTANCE AND INDUCTIVE REACTANCE
- DESCRIBE THE PRINCIPLES OF CAPACITANCE AND CAPACITIVE REACTANCE
- DESCRIBE THE OPERATING PRINCIPLES OF SINGLE-PHASE AC SERIES CIRCUITS
- ANALYZE SINGLE-PHASE AC SERIES CIRCUITS
- DESCRIBE THE OPERATING PRINCIPLES OF SINGLE-PHASE AC PARALLEL CIRCUITS
- ANALYZE SINGLE-PHASE AC PARALLEL CIRCUITS
- DESCRIBE THE PRINCIPLES OF POWER FACTOR CORRECTION
- DESCRIBE THE APPLICATION OF DIODES IN RECTIFIERS
- ANALYZE SINGLE-PHASE RECTIFIER CIRCUITS
- ANALYZE AC ELECTRONIC CIRCUITS THAT UTILIZE BIPOLAR-JUNCTION TRANSISTORS (BJTS)

LINE H: INSTALL AND MAINTAIN CONSUMER/SUPPLY SERVICES AND METERING EQUIPMENT

- DETERMINE SINGLE-PHASE SERVICE EQUIPMENT REQUIREMENTS WHEN CTS ARE REQUIRED

LINE I: INSTALL AND MAINTAIN PROTECTION DEVICES

- DETERMINE PROTECTIVE DEVICE REQUIREMENTS
- DESCRIBE PROCEDURES TO TEST PROTECTIVE DEVICES
- DESCRIBE SURGE PROTECTION DEVICE RATINGS AND INSTALLATION PRACTICES

LINE L: INSTALL AND MAINTAIN BONDING, GROUNDING AND GROUND FAULT DETECTION SYSTEMS

- DETERMINE GROUNDING REQUIREMENTS FOR SINGLE-PHASE AC SYSTEMS
- DETERMINE BONDING REQUIREMENTS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF GROUNDING AND BONDING SYSTEMS ACCORDING TO THE CEC

LINE N: INSTALL AND MAINTAIN RENEWABLE ENERGY GENERATING AND STORAGE SYSTEMS

- DESCRIBE RENEWABLE ENERGY SYSTEMS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF RENEWABLE ENERGY GENERATING AND STORAGE SYSTEMS ACCORDING TO THE CEC

LINE P: INSTALL AND MAINTAIN TRANSFORMERS

- DESCRIBE CONNECTION AND OPERATION OF TRANSFORMERS IN PARALLEL
- DESCRIBE THE EFFECTS OF LOADS ON VOLTAGE-REGULATION
- DESCRIBE TAP-CHANGER EQUIPMENT

LINE Q: INSTALL AND MAINTAIN RACEWAYS, CABLES AND ENCLOSURES

- IDENTIFY CONDUCTORS AND CABLES FOR COMMERCIAL, INSTITUTIONAL AND INDUSTRIAL CIRCUITS

- DETERMINE CONDUCTOR AND CABLE REQUIREMENTS FOR COMMERCIAL, INSTITUTIONAL AND INDUSTRIAL CIRCUITS
- DETERMINE REQUIREMENTS FOR SPECIALTY RACEWAYS, BOXES AND FITTINGS
- DESCRIBE THE REMOVAL OF UNUSED CONDUCTORS AND

LINE R: INSTALL AND MAINTAIN BRANCH CIRCUITRY

- DESCRIBE THE OPERATION OF DISCHARGE LIGHTING
- DESCRIBE SINGLE-PHASE WIRING DEVICES AND THEIR REQUIREMENTS
- DESCRIBE LIGHTING CONTROLS FOR DISCHARGE LIGHTING
- DESCRIBE TROUBLESHOOTING PROCEDURES FOR DISCHARGE LIGHTING
- DESCRIBE MAINTENANCE FOR DISCHARGE LIGHTING

LINE S: INSTALL AND MAINTAIN HEATING, VENTILATING AND AIR-CONDITIONING (HVAC) SYSTEMS

- DESCRIBE THE COMPONENTS OF HVAC SYSTEMS
- DESCRIBE THE APPLICATION OF ENERGY MANAGEMENT DEVICES
- DESCRIBE CONTROLS FOR HEATING, VENTILATING AND AIR CONDITIONING
- DETERMINE THE INSTALLATION REQUIREMENTS FOR HEATING SYSTEMS ACCORDING TO THE CEC
- DESCRIBE MAINTENANCE PROCEDURES FOR HVAC SYSTEMS AND CONTROLS

LINE T: INSTALL AND MAINTAIN EXIT AND EMERGENCY LIGHTING SYSTEMS

- DESCRIBE EXIT AND EMERGENCY LIGHTING SYSTEMS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF EXIT AND EMERGENCY LIGHTING SYSTEMS ACCORDING TO THE CEC

- DESCRIBE PROCEDURES TO TEST EXIT AND EMERGENCY LIGHTING SYSTEMS
- DESCRIBE PROCEDURES TO MAINTAIN EXIT AND EMERGENCY LIGHTING SYSTEMS

LINE U: INSTALL AND MAINTAIN CATHODIC PROTECTION SYSTEMS

- DESCRIBE CATHODIC PROTECTION SYSTEMS
- DETERMINE THE REQUIREMENTS FOR CATHODIC PROTECTION ACCORDING TO THE CEC
- DESCRIBE MAINTENANCE OF CATHODIC PROTECTION SYSTEMS

LINE V: INSTALL AND MAINTAIN MOTOR STARTERS AND CONTROLS

- DESCRIBE THE OPERATING PRINCIPLES OF COMMON CONTROL DEVICES
- DESCRIBE THE OPERATING PRINCIPLES OF MAGNETIC MOTOR STARTERS
- DESCRIBE THE OPERATING PRINCIPLES OF MAGNETIC MOTOR CONTROL CIRCUITS
- DESCRIBE TROUBLESHOOTING PROCEDURES FOR MOTOR STARTERS AND MOTOR CONTROLS
- DESCRIBE MAINTENANCE PROCEDURES FOR MOTOR STARTERS AND MOTOR CONTROLS

PRACTICAL

LINE A: APPLY CIRCUIT CONCEPTS

- SOLVE PROBLEMS USING APPLIED MATHEMATICS
- SOLVE PROBLEMS INVOLVING RESISTORS, INDUCTORS, AND CAPACITIVE REACTANCE
- SOLVE PROBLEMS INVOLVING POWER FACTOR CORRECTION
- INSERT CAPACITORS FOR POWER FACTOR CORRECTION

LINE D: ORGANIZE WORK

- USE COMMERCIAL PRINTS, DRAWINGS, MANUALS AND SPECIFICATIONS TO LOCATE INFORMATION

LINE P: INSTALL AND MAINTAIN TRANSFORMERS

- CONNECT SINGLE-PHASE TRANSFORMERS
- CONNECT AUTO TRANSFORMERS
- CONNECT MULTI-TAP AND TAP CHANGER TRANSFORMERS
- CONNECT INSTRUMENT TRANSFORMERS

LINE V: INSTALL AND MAINTAIN MOTOR STARTERS AND CONTROLS

- CONNECT MAGNETIC MOTOR STARTERS
- CONNECT MAGNETIC MOTOR CONTROL CIRCUITS
- DRAW WIRING AND SCHEMATIC DIAGRAMS FOR AC MOTOR CONTROLS

Supervisor Signature

NOTES FROM LEVEL 2

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LEVEL 3

IMPORTANT!

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Read the competency tables

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THEORY

LINE A: APPLY CIRCUIT CONCEPTS

- DESCRIBE THE CHARACTERISTICS OF THREE-PHASE AC CIRCUITS
- DESCRIBE OPERATING PRINCIPLES OF FIELD EFFECT TRANSISTORS (FETS) AND INSULATED GATE BIPOLAR TRANSISTORS (IGBTS)
- ANALYZE ELECTRONIC CIRCUITS THAT UTILIZE FETS AND IGBTS
- DESCRIBE THYRISTOR CIRCUITS
- DESCRIBE RECTIFICATION CIRCUITS
- DESCRIBE LOGIC GATES
- DESCRIBE NUMBER SYSTEMS

LINE C: USE TOOLS AND EQUIPMENT

- IDENTIFY CAUSES OF POOR POWER QUALITY
- DESCRIBE THE USE OF POWER QUALITY ANALYZERS

LINE H: INSTALL AND MAINTAIN CONSUMER/SUPPLY SERVICES AND METERING EQUIPMENT

- DETERMINE THREE-PHASE SERVICE EQUIPMENT REQUIREMENTS
- DESCRIBE MAINTENANCE PROCEDURES FOR THREE-PHASE SERVICES AND METERING EQUIPMENT

- DETERMINE THE REQUIREMENTS FOR THE MAINTENANCE OF THREE-PHASE SERVICES AND METERING EQUIPMENT ACCORDING TO THE CEC

LINE J: INSTALL AND MAINTAIN LOW VOLTAGE DISTRIBUTION SYSTEMS

- DETERMINE THREE-PHASE DISTRIBUTION CENTRE REQUIREMENTS

LINE L: INSTALL AND MAINTAIN BONDING, GROUNDING AND GROUND FAULT DETECTION SYSTEMS

- DETERMINE GROUNDING REQUIREMENTS FOR THREE-PHASE AC SYSTEMS
- DESCRIBE GROUND FAULT DETECTION SYSTEMS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF GROUNDING AND BONDING SYSTEMS ACCORDING TO THE CEC

LINE M: INSTALL AND MAINTAIN POWER GENERATION SYSTEMS

- DESCRIBE OPERATING PRINCIPLES OF THREE-PHASE ALTERNATORS
- DESCRIBE MAINTENANCE AND TROUBLESHOOTING FOR ALTERNATORS
- DESCRIBE THE CHARACTERISTICS OF DC GENERATORS
- DESCRIBE OPERATING PRINCIPLES OF DC GENERATORS
- DESCRIBE THE MAINTENANCE OF DC GENERATORS

LINE P: INSTALL AND MAINTAIN TRANSFORMERS

- DESCRIBE APPLICATIONS OF THREE-PHASE AUTO TRANSFORMERS
- DESCRIBE THREE-PHASE APPLICATIONS OF INSTRUMENT TRANSFORMERS

- DETERMINE THE REQUIREMENTS FOR LOW-VOLTAGE THREE-PHASE TRANSFORMERS ACCORDING TO THE CEC
- DESCRIBE HIGH-VOLTAGE TRANSFORMER CIRCUITS
- DESCRIBE THE INSTALLATION OF HIGH-VOLTAGE INSTRUMENT TRANSFORMERS
- DETERMINE THE REQUIREMENTS FOR HIGH-VOLTAGE THREE-PHASE TRANSFORMERS ACCORDING TO THE CEC

LINE R: INSTALL AND MAINTAIN BRANCH CIRCUITRY

- DESCRIBE THREE-PHASE WIRING DEVICES
- DETERMINE THE REQUIREMENTS FOR THREE-PHASE CAPACITORS ACCORDING TO THE CEC

LINE V: INSTALL AND MAINTAIN MOTOR STARTERS AND CONTROLS

- DESCRIBE THREE-PHASE MOTOR STARTERS AND CONTROLS
- DESCRIBE MAINTENANCE OF THREE-PHASE MOTOR STARTERS
- DESCRIBE THE OPERATION OF MAGNETIC DC MOTOR CONTROLLERS
- DETERMINE THE REQUIREMENTS FOR REDUCE VOLTAGE STARTERS ACCORDING TO THE CEC

LINE W: INSTALL AND MAINTAIN DRIVES

- DESCRIBE THE OPERATION OF ELECTRONIC MOTOR CONTROLS

LINE Y: INSTALL AND MAINTAIN MOTORS

- DESCRIBE THE OPERATING PRINCIPLES OF AC MOTORS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF AC MOTORS ACCORDING TO THE CEC
- DESCRIBE BASIC MAINTENANCE AND TROUBLESHOOTING FOR AC MOTORS
- DESCRIBE THE OPERATING PRINCIPLES OF DC MOTORS

- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF DC MOTORS ACCORDING TO THE CEC
- DESCRIBE MAINTENANCE AND TROUBLESHOOTING FOR DC MOTORS

PRACTICAL

LINE A: APPLY CIRCUIT CONCEPTS

- CALCULATE VOLTAGE, CURRENT, IMPEDANCE, POWER AND POWER FACTOR IN THREE-PHASE AC CIRCUITS
- CALCULATE POWER FACTOR CORRECTION OF THREE-PHASE AC CIRCUITS
- CONNECT AND TEST THYRISTOR CIRCUITS
- CONNECT AND TEST RECTIFIER CIRCUITS
- CALCULATE VALUES FOR RECTIFIED POWER SUPPLIES

LINE D: ORGANIZE WORK

- USE INSTITUTIONAL PRINTS, DRAWINGS, MANUALS AND SPECIFICATIONS TO LOCATE INFORMATION

LINE M: INSTALL AND MAINTAIN POWER GENERATION SYSTEMS

- CONNECT THREE-PHASE ALTERNATORS

LINE P: INSTALL AND MAINTAIN TRANSFORMERS

- CALCULATE VOLTAGE, CURRENT AND KVA VALUES FOR THREE-PHASE TRANSFORMER BANKS
- CALCULATE VOLTAGE, CURRENT AND KVA VALUES FOR THREE-PHASE AUTOTRANSFORMER CIRCUITS
- CALCULATE INSTRUMENT TRANSFORMER RATINGS AND METER READINGS IN THREE-PHASE CIRCUITS
- CONNECT THREE SINGLE-PHASE TRANSFORMERS AS A THREE-PHASE BANK
- CONNECT THREE-PHASE AUTOTRANSFORMERS
- CONNECT INSTRUMENT TRANSFORMERS IN THREE-PHASE CIRCUITS
- CALCULATE VOLTAGE, CURRENT AND KVA VALUES FOR HIGH-VOLTAGE TRANSFORMER BANKS

- CALCULATE INSTRUMENT TRANSFORMER RATINGS AND METER READINGS IN HIGH-VOLTAGE CIRCUITS

LINE V: INSTALL AND MAINTAIN MOTOR STARTERS AND CONTROLS

- CONNECT REDUCED VOLTAGE STARTERS
- CONNECT WOUND-ROTOR MOTOR CONTROLLERS
- CONNECT SYNCHRONOUS MOTOR STARTERS
- CONNECT MOTOR BRAKING AND DECELERATION CONTROLS

LINE W: INSTALL AND MAINTAIN DRIVES

- CONNECT AC DRIVES
- CONNECT DC DRIVES
- CONFIGURE AC DRIVES
- CONFIGURE DC DRIVES

LINE Y: INSTALL AND MAINTAIN MOTORS

- CONNECT AC MACHINES
- CONNECT DC MOTORS

Supervisor Signature

NOTES FROM LEVEL 3

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LEVEL 4

IMPORTANT!

Download the Program Outline!

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Read the competency tables

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For detailed information about that competency, go to the Program Outline

THEORY

LINE D: ORGANIZE WORK

- DESCRIBE HAZARDOUS LOCATIONS
- DESCRIBE WIRING METHODS FOR HAZARDOUS LOCATIONS
- DETERMINE REQUIREMENTS FOR HAZARDOUS LOCATIONS ACCORDING TO THE CEC

LINE I: INSTALL AND MAINTAIN PROTECTION DEVICES

- DESCRIBE THE OPERATING PRINCIPLES OF VOLTAGE PROTECTION DEVICES

LINE K: INSTALL AND MAINTAIN POWER CONDITIONING, UNINTERRUPTIBLE POWER SUPPLY (UPS) AND SURGE SUPPRESSION SYSTEMS

- IDENTIFY TYPES OF EMERGENCY POWER SYSTEMS
- DETERMINE EMERGENCY POWER SYSTEM REQUIREMENTS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF EMERGENCY POWER SYSTEMS ACCORDING TO THE CEC
- DESCRIBE MAINTENANCE PROCEDURES FOR EMERGENCY POWER SYSTEM BATTERIES
- DESCRIBE PROCEDURES TO TEST EMERGENCY POWER SYSTEMS

LINE N: INSTALL AND MAINTAIN RENEWABLE ENERGY GENERATING AND STORAGE SYSTEMS

- DESCRIBE ALTERNATIVE POWER SYSTEMS

LINE O: INSTALL AND MAINTAIN HIGH VOLTAGE SYSTEMS

- DESCRIBE THE PURPOSE OF HIGH VOLTAGE SAFETY EQUIPMENT
- DESCRIBE HIGH VOLTAGE SAFETY PROCEDURES
- DESCRIBE THE CONSTRUCTION AND OPERATING PRINCIPLES OF HIGH VOLTAGE CABLES
- DESCRIBE PROCEDURES TO INSTALL AND TERMINATE HIGH VOLTAGE CABLE
- DESCRIBE THE OPERATING PRINCIPLES OF HIGH VOLTAGE SWITCH GEAR AND PROTECTIVE DEVICES
- DESCRIBE PROCEDURES TO INSTALL HIGH VOLTAGE SWITCH GEAR AND PROTECTIVE DEVICES
- DESCRIBE THE USE OF TEST EQUIPMENT FOR HIGH VOLTAGE CIRCUITS
- DESCRIBE FIELD TESTING METHODS FOR HIGH VOLTAGE CABLES

LINE X: INSTALL AND MAINTAIN NON-ROTATING EQUIPMENT AND ASSOCIATED CONTROLS

- DESCRIBE THE INSTALLATION OF WELDING EQUIPMENT
- DESCRIBE THE INSTALLATION OF HEATING SYSTEMS (NON-HVAC)
- DESCRIBE THE INSTALLATION OF ELECTROSTATIC PRECIPITATORS
- DESCRIBE THE OPERATING PRINCIPLES OF ELECTRO-MAGNETS
- DETERMINE THE REQUIREMENTS FOR INSTALLING NON-ROTATING EQUIPMENT AND ASSOCIATED CONTROLS ACCORDING TO THE CEC
- DESCRIBE THE MAINTENANCE OF ELECTROSTATIC PRECIPITATORS

LINE Z: INSTALL AND MAINTAIN SIGNALING SYSTEMS

- DESCRIBE THE OPERATION OF FIRE ALARM AND SUPPRESSION SYSTEMS

- DESCRIBE PROCEDURES TO INSTALL FIRE ALARM AND SUPPRESSION SYSTEMS
- DESCRIBE PROCEDURES TO TEST FIRE ALARM AND SUPPRESSION SYSTEMS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF FIRE ALARM SYSTEMS ACCORDING TO THE CEC
- DESCRIBE THE OPERATING PRINCIPLES OF SECURITY ALARM SYSTEMS
- DESCRIBE PROCEDURES TO INSTALL SECURITY ALARM SYSTEMS
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF SECURITY AND SURVEILLANCE SYSTEMS ACCORDING TO THE CEC

LINE AA: INSTALL AND MAINTAIN COMMUNICATION SYSTEMS

- DESCRIBE THE INSTALLATION OF FIBRE OPTIC CABLE
- DESCRIBE COMMUNICATION PROTOCOLS
- DESCRIBE METHODS OF CERTIFICATION FOR A STRUCTURED CABLE SYSTEM
- DETERMINE THE REQUIREMENTS FOR THE INSTALLATION OF FIBRE OPTIC CABLE ACCORDING TO THE CEC

LINE AB: INSTALL AND MAINTAIN BUILDING AUTOMATION SYSTEMS

- DESCRIBE THE OPERATING PRINCIPLES OF BUILDING AUTOMATION SYSTEMS
- DESCRIBE PROCEDURES TO INSTALL BUILDING AUTOMATION SYSTEMS

LINE AC: INSTALL, PROGRAM AND MAINTAIN AUTOMATED CONTROL SYSTEMS

- DESCRIBE THE OPERATING PRINCIPLES OF PROGRAMMABLE LOGIC CONTROLLERS (PLCS)
- DESCRIBE THE INSTALLATION PROCEDURES OF PLCS

- DESCRIBE THE OPERATING PRINCIPLES OF AUTOMATED CONTROL SYSTEMS
- DESCRIBE INPUT AND OUTPUT (I/O) TYPES
- DESCRIBE SENSORS AND ACTUATORS FOR AUTOMATED CONTROL SYSTEMS
- DESCRIBE THE MODES OF CONTROL FOR AUTOMATED SYSTEMS
- DESCRIBE CNC SYSTEMS
- DESCRIBE SCADA, DDC, AND DCS MONITORING SYSTEMS
- DESCRIBE THE INSTALLATION AND MAINTENANCE OF PROCESS HEATING AND COOLING EQUIPMENT
- DESCRIBE PROCEDURES TO UPDATE FIRMWARE

LINE AD: INSTALL AND MAINTAIN PNEUMATIC, HYDRAULIC CONTROL AND PUMPING SYSTEMS

- DESCRIBE PNEUMATIC CONTROL SYSTEMS
- DESCRIBE HYDRAULIC CONTROL SYSTEMS
- DESCRIBE PUMPING SYSTEMS
- DESCRIBE PUMP INSTALLATION
- DESCRIBE PUMP MAINTENANCE

PRACTICAL

LINE D: ORGANIZE WORK

- USE INDUSTRIAL PRINTS, DRAWINGS, MANUALS AND SPECIFICATIONS TO LOCATE INFORMATION

LINE N: INSTALL AND MAINTAIN RENEWABLE ENERGY GENERATING AND STORAGE SYSTEMS

- INSTALL ALTERNATIVE POWER SYSTEMS
- TEST ALTERNATIVE POWER SYSTEMS

LINE Z: INSTALL AND MAINTAIN SIGNALING SYSTEMS

- CONNECT AN INITIATING AND SIGNALING CIRCUIT

LINE AA: INSTALL AND MAINTAIN COMMUNICATION SYSTEMS

- SET UP AND MAINTAIN A SIMPLE COMPUTER NETWORK

LINE AC: INSTALL, PROGRAM AND MAINTAIN AUTOMATED CONTROL SYSTEMS

- CONNECT PLCs
- CONNECT AUTOMATED CONTROL SYSTEMS
- WRITE BASIC PLC PROGRAMS
- USE A PROGRAMMING TERMINAL TO UPLOAD AND DOWNLOAD PLC PROGRAMS

LINE AD: INSTALL AND MAINTAIN PNEUMATIC, HYDRAULIC CONTROL AND PUMPING SYSTEMS

- PERFORM PNEUMATIC RELATED CALCULATIONS
- PERFORM HYDRAULIC RELATED CALCULATIONS

Supervisor Signature

NOTES FROM LEVEL 4

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WORKPLACE COMPETENCIES

Competencies for which knowledge or skills are primarily acquired in the workplace.

Download the Program Outline!

<https://www.itabc.ca/program/electrician-industrial>

Workplace Competencies appear in the Occupational Analysis Chart (OAC)

- C1: USE COMMON AND SPECIALTY TOOLS AND EQUIPMENT**
- C2: USE ACCESS EQUIPMENT**
- C3: USE RIGGING, HOISTING AND LIFTING EQUIPMENT**

- D3: ORGANIZE MATERIALS AND SUPPLIES**
- D4: PLAN PROJECT TASKS AND PROCEDURES**
- D5: PREPARE WORKSITE**
- D6: FINALIZE REQUIRED DOCUMENTATION**

- E1: FABRICATE SUPPORT STRUCTURES**
- E2: INSTALL BRACKETS, HANGERS AND FASTENERS**
- E3: INSTALL SEISMIC RESTRAINT SYSTEMS**

- F1: COMMISSION SYSTEMS**
- F2: PERFORM STARTUP AND SHUTDOWN PROCEDURES**
- F3: DECOMMISSION SYSTEMS**

- G1: USE COMMUNICATION TECHNIQUES**

- I4: MAINTAIN PROTECTION DEVICES**

- J2: MAINTAIN LOW VOLTAGE DISTRIBUTION EQUIPMENT**

- L2: MAINTAIN GROUNDING AND BONDING SYSTEMS**
- L4: MAINTAIN GROUND FAULT DETECTION SYSTEMS**

- N2: MAINTAIN RENEWABLE ENERGY GENERATING AND STORAGE SYSTEMS**
- P2: MAINTAIN EXTRA-LOW AND LOW-VOLTAGE SINGLE-PHASE TRANSFORMERS**
- P4: MAINTAIN LOW-VOLTAGE THREE-PHASE TRANSFORMERS**
- P6: MAINTAIN HIGH-VOLTAGE TRANSFORMERS**
- W2: MAINTAIN DRIVES**
- Z2: MAINTAIN FIRE ALARM SYSTEMS**
- Z4: MAINTAIN SECURITY AND SURVEILLANCE SYSTEMS**
- AA4: MAINTAIN COMMUNICATION SYSTEMS**
- AB2: MAINTAIN BUILDING AUTOMATION SYSTEMS**
- AC2: MAINTAIN AUTOMATED CONTROL SYSTEMS**
- AD2: MAINTAIN PNEUMATIC CONTROL SYSTEMS**
- AD4: MAINTAIN HYDRAULIC CONTROL SYSTEMS**

MISSING COMPETENCIES?

To develop the best journeyperson possible employers should attempt to provide training in all competencies for the trade. This is not always possible.

If your employer is unable to provide training in any competency required for your trade, note that competency below.

Competencies listed here will remain unsigned until your employer can provide training in that area or until you find an alternate way to gain the experience needed.

Competency:	Date:
Reason:	
Alternate plan:	

Competency:	Date:
Reason:	
Alternate plan:	

TECHNICAL TRAINING

Instructions

Keep a record of each level of technical training completed.

Level 1

Date Completed:	Training Provider:
Mark:	Instructor:

Level 2

Date Completed:	Training Provider:
Mark:	Instructor:

Level 3

Date Completed:	Training Provider:
Mark:	Instructor:

Level 4

Date Completed:	Training Provider:
Mark:	Instructor:

COMPLETION REQUIREMENTS

Instructions

Keep a record of each program completion requirement achieved.

INDUSTRIAL ELECTRICIAN

- Level 1 - Technical Training
- Level 2 - Technical Training
- Level 3 - Technical Training
- Level 4 - Technical Training

- 6,000 Work-Based Training Hours
- Logbook Completion Signoff

- ITA Interprovincial Red Seal examination
- Recommendation for Certification signed by sponsor

Note: After all other completion requirements have been met, ITA sends a Recommendation for Certification form to the sponsor requesting signoff.

CERTIFICATIONS

Instructions

Keep a record of the credentials and endorsements you have earned, including the certification number and date of issue.

CREDENTIAL EARNED	NUMBER	DATE OF ISSUE

If you have any questions, please contact ITA Customer Service at customerservice@itabc.ca 778-328-8700 or toll free (within BC) at 1-800-660-6011