Trade essentials

More skills … more opportunities

Professional Skills Record
Refrigeration and
Air Conditioning Mechanic
NOC 7313

Canada

Prince Edward Island
CANADA

ACKNOWLEDGEMENTS

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This handbook is designed to help skilled trades Journeypersons manage the skills and learning of their Apprentices who are using a Professional Skills Record.

1 Why Do I Need this Handbook?

Eighty percent of all learning in a trade happens on the job. This means the apprentice has the responsibility to learn and you, as their journeyperson, have the responsibility to mentor and teach.

Signing off for the learning an apprentice has completed under your supervision is a huge responsibility. With all the skills needed in a trade, it is important that both you and the apprentice have a tool to help you record and sign off on that learning.

2 But We Have Logbooks

When a tradesperson registers as an apprentice in most provinces or territories in Canada, they are given a Logbook.

A Logbook:

- is issued by the apprenticeship authority within a jurisdiction
- is created from the National Occupational Analysis (NOA) in a trade
- is a list of all the general skill areas (**Blocks and Tasks**) in a trade
- records an apprentice's progress in the general skill areas of a trade
- is signed off by a journeyperson to guarantee that an apprentice is performing these tasks to Industry Standard.

A Logbook lists the Blocks and Tasks from the NOA **but** the Interprovincial Red Seal exam and trades training courses in colleges and trade schools use **all** the information in the NOA. This includes the Blocks, Tasks, **Sub-tasks and the Knowledge and Abilities** listed in the NOA.

Each apprentice needs a tool that lists **all** the skills and learning they need in their trade career. Then, if they have one employer or several employers over their entire term of apprenticeship, both the apprentice and the journeyperson know what learning has been completed:

- the journeyperson knows what skills they are signing off to verify what has been taught; and

- the apprentice knows what they need to learn to be successful in their Red Seal exam.

3 What is a National Occupational Analysis (NOA)?

The Canadian Council of Directors of Apprenticeship, which is made up of managers and directors of apprenticeship from every province and territory in Canada, guides a Human Resources and Skills Development Canada (HRSDC) sponsored program to develop NOAs.

Under this partnership, joint planning committees made up of tradespeople who have a Certificate of Qualification, Red Seal endorsement from each province and territory in Canada, come together in Ottawa every four to five years to review and revise the NOA in all of the 45 skilled trades.

Each NOA is accepted as the national standard in that trade. The NOA is then used to:

- identify and group tasks performed by skilled workers in each trade in every province and territory in Canada

- group these tasks by Blocks, Tasks, Sub-tasks, Knowledge, Skills and Abilities (also called "**competencies**") required in a trade

- give information on the breakdown of questions from all sections of the NOA in the Interprovincial Red Seal exam

- create all the questions for the Red Seal exam

- create curriculum for trade school programs and Block Release/Period/Level* programs in a trade.

*   *The in-school portion of apprenticeship has several names across Canada. In some provinces and territories it is called Block Release, in others it is called Period Training or Level.*

4 If there is an NOA, why do we need a Professional Skills Record (PSR)?

The NOA is designed to be used for creating curriculum and for developing test questions for the Red Seal exam.

The PSR is designed to be used by an apprentice and a journeyperson in the workplace. The PSR provides a fair and objective assessment tool to record the apprentice's learning and skills.

The PSR has been developed **with** apprentices during a three-year research project on PEI called Trade Essentials. Recommendations made by the apprentices who tested the tool have been built into the document.

The PSR was then validated by teams of tradespeople who have a Certification of Qualification, Red Seal endorsement in each trade who came together and discussed what an apprentice is expected to learn from their journeyperson in the workplace.

The apprentice has the main responsibility for completing the PSR. It is designed as a self-assessment tool so the apprentice can keep track of his/her skills and learning and make plans to fill any technical skills training gaps.

The PSR takes information from the NOA and:

- lays it out in a chart
- lists the percentage and number of questions for the Red Seal exam from each task on every page
- takes the skills from the NOA and describes them in terms of what a tradesperson does on the job, for example:

   In the **NOA**, the skill says – "knowledge of blueprints and drawings"

   In the **PSR**, the skill says – "read and interpret blueprints and drawings"

- has a rating chart so the apprentice can judge his/her level of learning and have it all recorded for you to review
- provides you, the journeyperson, with a tool to discuss details of an apprentice's skill areas that are great and areas that may need to improve
- helps the apprentice make a plan so he/she can improve skills
- helps you know what skills you still have to teach the apprentice.

5 Am I expected to teach all the skills in a PSR?

No. A PSR contains **all** the skills and learning a tradesperson has to learn over all their years as an apprentice. You, as their journeyperson, can help make this tool useful by completing the sign-off on the learning and skill you know they have. Some of the ways you can assess the skills your apprentice has are:

- **OBSERVATION** – you watch them use their knowledge, skills and abilities or competencies to perform a task or sub-task

  For example, you ask them to select a tool for a specific job, then watch them use that tool to do a task.

- **INTERVIEW** – you have a discussion with your apprentice to find out if they can demonstrate an understanding of what they are doing

  For example, you ask them to tell you about any safety precautions that have to be followed before they start a certain task.

- **DOCUMENTATION** – an apprentice may have a document that provides proof of skills they already have. You can use the PSR to sign-off on tasks the document covers. The document or certificate could be from:

  - another employer,
  - a trade school or college,
  - an industry training course,
  - another province or territory,
  - or even from another country.

  For example, you need all your employees to be trained in WHMIS. A new apprentice you just hired shows you a WHMIS certificate he/she have from a job they were working on a couple of months ago in northern Canada.

Apprentices will also tell you, through their self-assessments, the best way they think they can prove the skills they have. This can help guide you, as their mentor, to choose a way to assess your apprentice that works best for both of you.

6 Are there any tips on how to be a good mentor to my apprentice?

Mentoring has always been the foundation of apprenticeship. In trades, a mentor is a person who has a great deal of learning and skills from experience in a trade who helps a less experienced person by guiding, teaching and sharing their skills and learning.

Along with having learning and experience in their trade, the most successful mentors are:

- **Patient** - and understand the apprentice needs time to learn and practise their skills to become as good as their mentor.

- **Organized** - and set a schedule to meet regularly with their apprentice to track their learning and make plans for new learning.

- **Positive** – and supportive in helping an apprentice tackle new learning and encourage them to keep working on skills they find difficult to learn.

- **Respectful** – so that other employees in the workplace accept the apprentice and are willing to help and encourage the new apprentice.

As a mentor, you are a role model for your apprentice. To create a successful relationship between you and your apprentice you can:

- **Lead by example**. If you set safety and quality assurance as firsts on your list each and every day, so will your apprentice.

- **Build trust**. If you want your apprentice to trust and respect you, you can show trust in them by assigning them some responsibility as soon as you see an opportunity.

- **Communicate**. Communication is a two-way street. Be willing to listen as you give directions and be available to your apprentice when they need you. Always treat every question seriously. If your apprentice has the confidence to ask, it is important to give a respectful answer.

- **Be reliable.** Your apprentices need to know they can depend on you when they run into a problem. Create supportive relationships with other employees so if you are away from the workplace, your apprentice feels confident in approaching another employee for help.

6.1 Tips

- **Give clear instructions**. When assigning a task and giving direction, give step-by-step instructions, then ask your apprentice to repeat the instructions. This gives them the opportunity to ask questions on things that might not be clear to them.

    Checklist for giving instructions:

    ✓ **explain the task**

    ✓ **show them how it is done**

    ✓ **answer their questions**

    ✓ **oversee the work**

    ✓ **give them time to practise**

    ✓ **give feedback on how they are doing**

    ✓ **take time to show them how to do the task better**

- **Give feedback.** Giving feedback often helps your apprentice to have a clear understanding of what you want them to do and how you want them to perform. The PSR helps you to give feedback because each knowledge, skills and ability (competency) statement is clear.

    There are three types of feedback that work best in the workplace:

    Positive feedback means you want your apprentice to continue what they are doing. People are motivated by hearing they are doing a good job. They usually do more and try harder.

    Constructive feedback means you want your apprentice to change how or what they are doing. Offering support and guidance to your apprentice to make the changes you need usually brings the best results.

    Direct feedback focuses on what you have seen, not on secondhand information. Focus on how the apprentice is doing and what you have planned for them to do.

- **Give your apprentice experience in many skills.** Sometimes apprentices end up performing the same set of skills over and over again because they are really good at them. They are required to learn the scope of the entire trade during their apprenticeship. If you have the capability, it would be helpful to take advantage of the opportunity to cover a wide range of skills by moving your apprentice from one set of skills to another on a regular basis.

- **Track and Document learning.** Every employer cannot offer an apprentice training in every skill in a trade because each workplace is unique. Some workplaces are specialists in one area of a trade.

  As a journeyperson, you have the responsibility to sign off on the skills your apprentice learns under your guidance in your workplace. A PSR can help you identify those skills.

  Setting a regular review date once every month or two, and keeping that time just for you and your apprentice, can increase their scope in their trade and increase their knowledge which will be an asset in the workplace.

  This meeting time gives you the best opportunity to:

  - monitor your apprentice's progress,
  - make a plan with him/her to learn more skills, and
  - find out if there are any problem areas where he/she may need help.

  Regular meeting dates also help your apprentice to be prepared and able to track his/her learning. This can be done by using a Professional Skills Record (PSR).

7 So how do I use a Professional Skills Record (PSR) with my apprentice?

The PSR is laid out in a chart. Each skill your apprentice has to learn has an action word to tell them how they are supposed to perform a skill. It gives you a level you can use to judge whether they are performing that skill properly. **Industry standard** is the term used to describe when your apprentice can complete a task to the level and quality of performance required by industry without assistance or supervision.

When you see the words "demonstrate an understanding of," you may find it easier to ask them questions about the skill to make sure they know what they are doing.

Your apprentice has the responsibility to complete the "Knowledge, Skills and Abilities – Competencies" section.

When you are sure your apprentice has proven to you they have completed the learning they say they have, you verify it by initialing the sub-task.

⇩   Knowledge, Skills and Abilities - <u>Competencies</u>

Trade Name
IP Exam – 125 Questions
BLOCK A 5% - 6 questions on the IP
<u>Learning Category</u> OCCUPATIONAL SKILLS
Task 1 – A 3 questions on the IP exam <u>Learning Outcome</u> **Uses and maintains tools and equipment**
Journeyperson Sign-off Task 1 Complete ☐   Incomplete ☐

SUB-TASK 1.01 <u>Learning Objective</u> **Uses hand tools** **JP Sign-off ____**	1.01.01 Identify boring tools **Rating ____ Complete** **Proof ____** ☐ **Use ____**	1.01.02 Identify hand cutting tools **Rating ____ Complete** **Proof ____** ☐ **Use ____**

⇦ When your apprentice proves to you that he/she has finished enough sub-tasks to have a good grasp of the task, you verify that learning by initialing "complete".

⇦ If your apprentice has not completed enough sub-tasks or you do not agree with the ratings they have given themselves, initial "incomplete".

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Task I Learning Needs
Sub-Tasks Learning Objectives to be completed Comments

⇦

If you have any sub-tasks you want your apprentice to work on, list them in this section and add any comments you have.

You might
- set a timeframe when you want these skills to improve

- suggest some manuals they could read

- suggest they go to their local college or training school for technical skills help

- suggest they go for help to an adult education facility if they need any academic help, for example, help in math or help in using the code book.

You have now created a learning plan for your apprentice using a PSR.

Your apprentice can then begin working on these sub-tasks or follow up on suggestions you have made to help them be successful in their trade career. By using a PSR, you now have a documented, written performance review that you can use in later sessions with your apprentice.

The PSR can help you give a fair assessment of your apprentice's ability to perform each technical skill task. If you are assigned an apprentice from another employer, province, territory or country, you can use the PSR to review his/her skills so you do not waste your valuable time teaching them skills they already know and can do.

PROFESSIONAL SKILLS RECORD

A tool for recording and recognizing skills and learning of trade apprentices

Refrigeration and Air Conditioning Mechanic

NOC 7313

A project of:
The Province of PEI
and
Human Resources and Skills Development Canada

Prince Edward Island

Human Resources and
Skills Development Canada

Ressources humaines et
Développement des compétences Canada

The **Professional Skills Record (PSR)** is a technical skills assessment tool designed to be used in the workplace by an apprentice and a journeyperson. The PSR has taken the content from the National Occupational Analysis (NOA) and arranged it so apprentices can use it to measure their progress in their trade from the time they sign up for apprenticeship through to Red Seal certification.

This PSR has been through a validation process with a team of trade professionals with Certificate of Qualification, Red Seal endorsement, who reached agreement on the wording of each and every knowledge and skill *(competency)* to make it measurable.

The PSR was originally designed as a tool to help apprentices move through a Recognition for Skills and Learning (RSL) process so they can receive recognition for skills they have, no matter where they learned them. Through completion of a PSR, they can avoid relearning what they already know and can do by entering the apprenticeship Block/Period/Level in-school process at a higher level. For example, move directly into Block/Period/Level three rather than relearning Block/Period/Level One and Two.

Feedback from testing and validation of the PSR has opened many new possibilities for using this tool.
The PSR can be used:

- as a tool for valid assessment in a Recognition for Skills and Learning (RSL) process

- as a tool that new Canadians and people planning to emigrate can use, to assess their skills against Canadian standards, receive recognition for skills they already have and, if necessary, make a plan to fill any technical skill gaps they may still have

- in the secondary-school system and in post-secondary trades training so students can know the full scope of the trade they are entering

- as a tool to guide journeypersons while they are mentoring apprentices so they are aware of <u>all</u> the skills apprentices need to learn to be fully competent in their professional trade designation.

INFORMATION SITES: PROJECT   SITE   CANADIAN   RED SEAL SITE

www.tradeessentials.ca   www.red-seal.ca

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APPENDIX A – REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES

Refrigeration and Air Conditioning Mechanic Trade Information

Name: __ _____   Full Address: _____

Email Address: _____   __   _____

Phone: Home _____ Work _____ Cell _____

Technical Skills Journeyperson Assessor/s

Name: _____   Business Name: _____

Phone: Home: _____ Work: _____ Cell: _____   Business Address: _____

Email Address: _____   _____

Name: _____   Business Name: _____

Phone: Home: _____ Work: _____ Cell: _____   Business Address: _____

Email Address: _____   _____

Name: _____   Business Name: _____

Phone: Home: _____ Work: _____ Cell: _____   Business Address: _____

Email Address: _____   _____

Apprenticeship Program Start Date _____   Completion Date: _____   Red Seal Certification Date _____

Apprenticeship Training Officer: Provincial/Territorial Apprenticeship Manager:

Signature: _____   Signature: _____

Province/Territory: _____

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Professional Skills Record (PSR) Development

Professional Skills Record (PSR)

The Professional Skills Record (PSR) is designed as a tool of assessment. Learning and skills are validated through the PSR when they are signed-off by a journeyperson in the trade in which the apprenticeship is being served.

All skills and learning assessed in this PSR are measured against the standards listed in the National Occupational Analysis (NOA). The NOA is recognized by the Canadian Council of Directors of Apprenticeship (CCDA) as the national standard for the occupation of Refrigeration and Air Conditioning Mechanic.

PSR Refrigeration and Air Conditioning Mechanic Document Validation

To conduct a reliable assessment through a formal recognition process, skills and learning statements must be measurable. To assess skills and learning using a PSR in the trades, the Knowledge, Skills and Abilities listed in the NOA have been made into measurable competency statements by adding an "action word." This action word describes the skill and learning level which must be reached by an apprentice on the job in order to meet industry standards. Each PSR has been validated by a trades team, all of whom hold a Certificate of Qualification with Red Seal endorsement, and who reached consensus on each action word used in every knowledge, skill and ability statement.

Where Technical Trade Learning Happens

This Professional Skills Record (PSR) records and recognizes directly related trade technical skills and knowledge learned through:

- **Formal Learning** – structured learning that occurs in formal education and training institutions (for example, high school, trades school, apprenticeship programs, registered union and industry training programs)

- **Non-formal Learning** – learning that happens through planned, structured training or education outside the formal education system (for example, workshops, seminars, community school)

- **Informal/Experiential Learning** – learning that results from experience, occurs outside a structured environment, and is controlled by the learner (for example, experience on-the-job, volunteer work, self-study and life experiences). Informal or experiential learning must be current and essential to the trade.

Definitions: Adopted and/or interpreted from Work-related Informal Learning: Research and Practice in the Canadian Context, CAPLA 2008

Academic Trade Requirement

Trade Designation: Refrigeration and Air Conditioning Mechanic National Occupational Classification (NOC) 7313

One of the following prerequisites must be met before writing the Interprovincial Red Seal exam: an academic Grade 12 certificate or a General Education Diploma (GED) or successful assessment in the following Essential Skills.

Essential Skills common to all trades are listed in Appendix A of this document. Specific Essential Skills for the Refrigeration and Air Conditioning Mechanic trade are listed on the Red Seal website: www.red-seal.ca. (Once on that site, you will find the Essential Skills Profiles under "National Occupational Analysis.")

A document can prove valuable learning that is recognized by industry and learning institutions.
Record and save every document earned in industry, trade school or union.

Document Record							
Document Name	**Issued By**	**Place Issued**	**Date Issued**	**Evidence of recognition for:**			**Recognition Awarded**
				Block/s **Learning Category/s** Completed	**Task/s** **Learning Outcome/s** Completed	**Academic** **Requirement**	

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PLAR is a formal recognition process in which a variety of tools are used to help people identify, demonstrate and receive recognition for skills and learning they have from the workplace, educational institutions, credentialing organizations or regulatory bodies.

The **Professional Skills Record (PSR)** is a tool designed to assist a trades apprentice to record skills and learning, and then receive recognition for the skills and learning through a PLAR trades process called:

RECOGNITION FOR SKILLS AND LEARNING (RSL)

Traditionally, 80% of learning in a trade happens in the workplace. Through a **Recognition for Skills and Learning (RSL)** process, an apprentice can advance in a trade when they prove they have the required hours, skills and learning for that trade. Proof of skills and learning is **recorded** by the apprentice in a **PSR** and **verified** when signed-off by a journeyperson in that trade.

Through the completion of a **PSR**, an apprentice can avoid relearning what they already know and can do. Through an **RSL** process, a trade apprentice can submit a PSR for assessment to:

- advance in Block/Period/Level in-school training by not having to complete a Block/Period/Level in which proof is provided that skills and learning have already been achieved for that Block/Period/Level.

- transfer common skills from one trade to another - **Skills and learning must be transferred prior to writing the Interprovincial Red Seal exam. The same skills and learning cannot be recognized toward certification in two trades.**

- compare skills and learning in a trade from another country to Canadian standards **(as stated in the National Occupational Analysis)** and receive recognition for the skills and learning that meet Canadian standards.

Refrigeration and Air Conditioning Mechanic
NOC 7313

The following assessment indicators (Rating, Proof, Use) have been developed to help record and then assess skills and learning in accordance with the standards of the trade outlined in the National Occupational Analysis (NOA).

Assessment Standard ONE

Rating: Self-assessment performance rating in the workplace

Workplace Performance	Rating	Examples of Workplace position/s
Can perform this task and series of sub-tasks: - to meet or shorten task timelines - beyond the expected level and quality of performance required by industry - can **manage, lead and train others** to perform this task and series of sub-tasks	6	**Journeyperson with a Certificate of Qualification, Red Seal endorsement** and/or **Gold Seal tradesperson** who is an expert in their field - Project Manager/Foreman - Highly skilled and experienced Manager/Supervisor - Expert who comes from industry to serve as an instructor in a trades training program
Can perform this task and series of sub-tasks: - to meet or shorten task timelines - to the highest level and quality of performance required by industry - take the initiative to **respond to unexpected situations when they arise and supervise others**	5	**Highly skilled and experienced journeyperson with a Certificate of Qualification, Red Seal endorsement** to whom co-workers turn for **direction and help**
Can perform this task and series of sub-tasks: - to meet task timelines - to the **highest level and quality required by industry without supervision**	4	**Experienced, skilled journeyperson with a Certificate of Qualification, Red Seal endorsement**
Can perform this task and series of sub-tasks: - to the level and quality required by industry **without assistance or supervision**	3	**Newly certified journeyperson with a Certificate of Qualification, Red Seal endorsement**
Can perform this task and series of sub-tasks: - to the required level and quality of performance **with direction, some assistance and supervision**	2	**Apprentice** working **under the direction** of a **journeyperson with a Certificate of Qualification, Red Seal endorsement**
Can perform this task and series of sub-tasks: - to the required level and quality of performance **with assistance and constant supervision**	1	**A helper or new apprentice** who must work directly under the **constant supervision** of a **journeyperson with a Certificate of Qualification, Red Seal endorsement**

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Proof: Self-assessment options to prove skills and learning have been achieved

Type of Proof – Observation … Interview … Documentation

Observation   When you choose "Observation" to prove that you can perform a task, the person who verifies your work must be Red Seal Certified in the trade in which you are an apprentice.

Interview   When you choose "Interview" to prove that you can perform the task, the person who verifies your work must be Red Seal Certified in the trade in which you are an apprentice. In the case of a panel, at least one person on the panel must be Red Seal Certified in the trade in which you are an apprentice.

Documentation   When you choose "Documentation" to prove that you can perform a task, the document must be from a certified training school or from an industry training course. Course content must be part of the requirements of your trade. If the document is from another country, it must be verified as equivalent to Canadian requirements in the trade.

                     NOTE: Gather all your documents and keep them with your PSR.

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Use: Self-assessment rating to help make a plan for additional learning and skill updates needed to be successful in achieving goals in a trade

Use of Knowledge, Skills and Abilities –	1 Daily	2 Often	3 Seldom	4 Never

Show how often you use a skill. This will help you to know:

♦ what skills you do well because you do them on a regular basis

♦ what skills you have to update if you want to transfer to another employer or move to another province or territory

♦ what skills you have to get from a training school, industry program or other employer

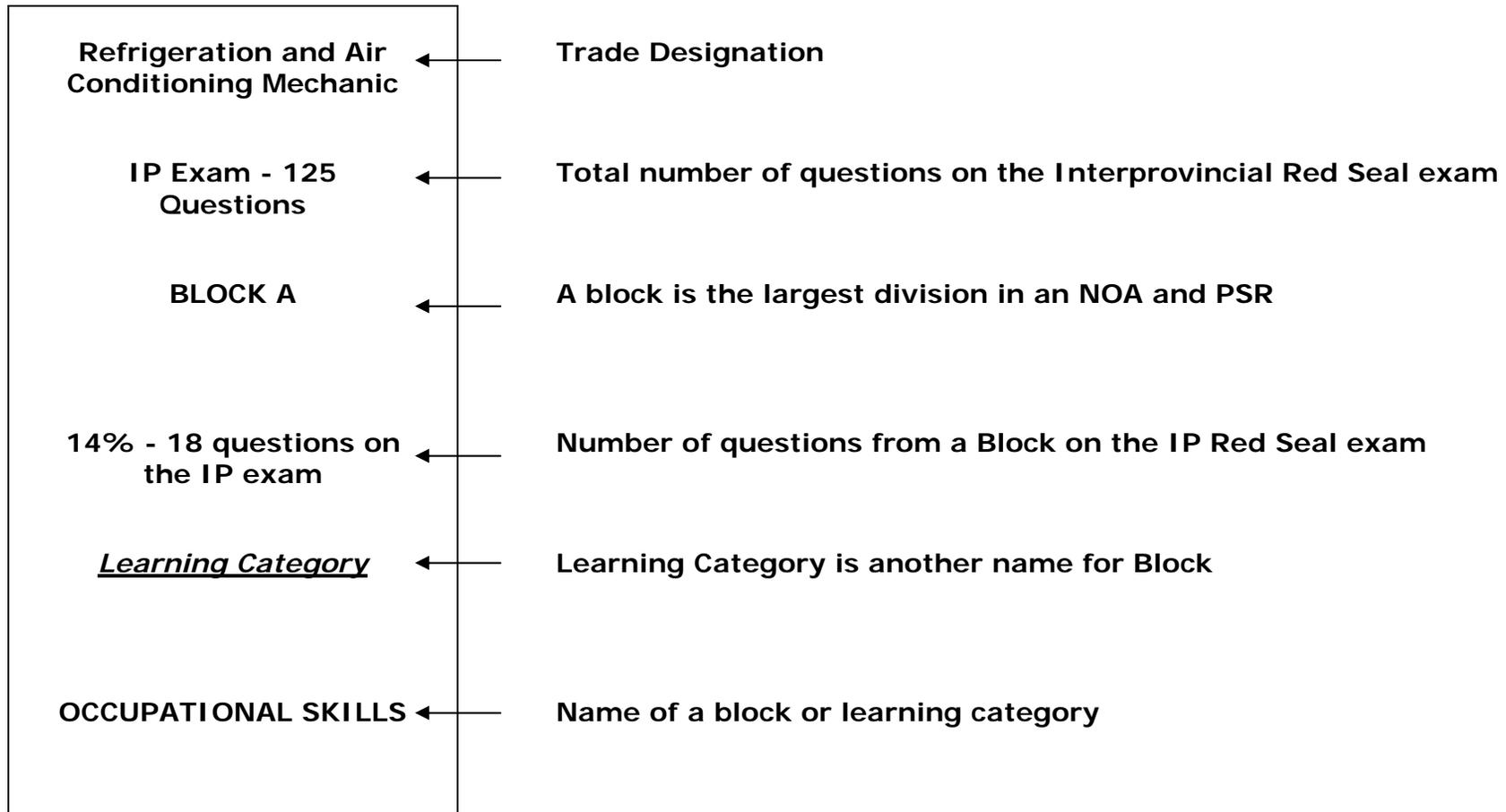**Completing this PSR can help you:**

♦ know the full scope of your trade by exploring <u>all</u> the technical skills in your trade

♦ highlight the skills you already have

♦ identify any gaps that you may have to fill so you can be successful in writing your Interprovincial Red Seal certification exam

♦ create a plan you can follow to fill these technical skills gaps

Information from the National Occupational Analysis (NOA) is the foundation document for the Professional Skills Record (PSR). The PSR has been designed so that information is easily found to help a trade apprentice take control and direct his/her own individual skills and learning path.

Information in the PSR includes:

Refrigeration and Air Conditioning Mechanic	**Trade Designation**
IP Exam - 125 Questions	**Total number of questions on the Interprovincial Red Seal exam**
BLOCK A	**A block is the largest division in an NOA and PSR**
14% - 18 questions on the IP exam	**Number of questions from a Block on the IP Red Seal exam**
Learning Category	**Learning Category is another name for Block**
OCCUPATIONAL SKILLS	**Name of a block or learning category**

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Task 1 – A ← Task Number and Block/Category (letter number)

3 questions on the IP exam ← Number of questions on the IP Red Seal exam from the task

Learning Outcome ← Learning Outcome is another name for a task

Utilizes mechanical and architectural drawings, acts, codes, standards, legislation and service and operating manuals ← Task or learning outcome description

Journeyperson
Sign-off
Task 1

Complete [ ] ← Journeyperson's initials verify that an apprentice can perform the task to industry standards.

Incomplete [ ] ← Journeyperson's initials indicate "incomplete" when the apprentice requires more work because the task is not being performed to industry standards.

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**Task 1
Learning Needs**

**Sub-Tasks
*Learning Objectives***

To be completed

Comments

Journeyperson lists any Sub-Tasks (Learning Objectives that an apprentice must improve before they can have their Task (Learning Outcome) signed off).

When completed, this column becomes a learning plan for the apprentice.

**Sub-Task
1.02**

Sub-Task   Number

Learning Objective
Interprets service and operating manuals, technical bulletins and warranties

Learning Objective is another name for sub-task

Sub-task or learning objective description

JP Sign-off _____

Journeyperson assesses and signs off when the apprentice can perform a sub-task or learning objective to industry standard

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For easier use, the self-assessment charts have been shortened into an assessment key which is located at the top of each two-page section in a PSR. The "3" rating is considered "Industry Standard."

RATING:

6 - <u>Expert</u> perform a task <u>beyond expected level</u> and quality of performance, <u>lead and/or teach</u> others

5 - <u>Highly skilled</u> perform a task to the <u>highest level</u> and quality of performance, <u>supervise</u> others

4 - <u>Meet task timelines and perform tasks to the highest level and quality</u> required by industry, without supervision

3 - Complete a task to the <u>level and quality of performance required by industry without assistance or supervision</u>

2 - Complete a task with <u>some assistance</u> and supervision

1 - Complete task with assistance and <u>constant supervision</u>

TYPE OF PROOF: O - Observation   I - Interview   D - Documentation

USE: 1 – Daily   2 – Often   3 – Seldom   4 - Never

Self-assessment takes place where the learning of skills takes place in each of the _Knowledge, Skills and Abilities_. (Knowledge, Skills and Abilities can also be called _**Competencies)**_.

1.02.01

Determine operation of equipment and components   ⟵   Skill and Learning that must meet industry standard.

Rating   __5__   ⟵   Choose and insert a number from the RATING key that best describes your level of performance in the workplace.

Proof   __I__   ⟵   Choose and insert a letter from the PROOF key that indicates your best choice to provide proof that you have this knowledge, skill and ability in the trade.

Use   __2__   ⟵   Choose and insert a number from the USE key that indicates how often you use the knowledge, skills and ability (competency).

Complete   [✓]   ⟵   Insert a check mark in the box to indicate completion of the competency to industry standard.

Tips to making sure you get recognition for all your skills and learning:

- take your **time** when you are working on your PSR
- do not try to complete **too much** at any one time
- be **fair and honest** with yourself; remember, this is a **self-assessment** tool
- **focus** on each task _(learning outcome)_ and sub-task _(learning objective)_

BLOCK A
14% - 18 Questions on the IP exam

Learning Category
FUNDAMENTAL OCCUPATIONAL SKILLS

Rating:
6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: | O - Observation | I - Interview | D - Documentation

Use: | 1 - Daily | 2 - Often | 3 - Seldom | 4 - Never

Knowledge, Skills and Abilities - Competencies

Task 1 - A
3 questions on the IP exam

Learning Outcome
Utilizes mechanical and architectural drawings, acts, codes, standards, legislation and service and operating manuals

Journeyperson
Sign-off
Task 1

Complete ☐

Incomplete ☐

Task 1
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 1.01	1.01.01 Identify all types and formats of drawings and schematics	1.01.02 Demonstrate an understanding of drawing conventions	1.01.03 Identify information contained on drawings and schematics such as dimensions, tolerances and components	1.01.04 Read system drawings	1.01.05 Recognize symbols and abbreviations
Learning Objective **Interprets blueprints, drawings and schematics** JP Sign-off _____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____
	1.01.06 Calculate dimensions	1.01.07 Visualize three dimensional structures, components, piping and ducting	1.01.08 Perform unit conversions	1.01.09 Document changes to drawings and schematics	1.01.10 Prepare sketches
	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____

SUB-TASK 1.02	1.02.01 Determine operation of equipment and components	1.02.02 Read service/ operating manuals	1.02.03 Read technical bulletins	1.02.04 Interpret warranties	1.02.05 Define equipment specifications
Learning Objective **Interprets service and operating manuals, technical bulletins and warranties** JP Sign-off _____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____
	1.02.06 Locate product information, operating service procedures and maintenance schedules	1.02.07 Access information from the Internet, compact discs or supplier/ manufacturer representative	1.02.08 Recognize need for and locate technical updates and technical bulletins		
	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____		

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Task 1 - A (cont'd)

<u>Learning Outcome</u>
Utilizes mechanical and architectural drawings, acts, codes, standards, legislation and service and operating manuals

</td>
<td>

SUB-TASK 1.03

<u>Learning Objective</u>
Interprets tables, charts and diagrams

JP Sign-off _____

</td>
<td>

1.03.01
Read all types of refrigeration tables, charts and diagrams

Rating ____ **Complete**
Proof ____ ☐
Use ____

</td>
<td>

1.03.02
Read and interpret refrigeration and electrical and gas, acts, codes, legislation, regulations and specifications

Rating ____ **Complete**
Proof ____ ☐
Use ____

</td>
<td>

1.03.03
Recognize mechanical, electrical, pneumatic, electronic and communication symbols and abbreviations

Rating ____ **Complete**
Proof ____ ☐
Use ____

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Task 1 Learning Needs
Sub-Tasks <u>**Learning Objectives**</u> to be completed Comments

SUB-TASK 1.04 <u>Learning Objective</u> **Interprets manufacturers' specifications** **JP Sign-off** _____	**1.04.01** Identify operating conditions such as voltage, pressures, amperage, capacities and temperature **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.04.02** Determine design data such as tolerances, dimensions, weights, sound ratings, vibrations, volumes and speed **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.04.03** Evaluate energy consumptions **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.04.04** Recognize inconsistencies between specifications and equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.04.05** Recognize limitations of equipment design **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____

SUB-TASK 1.05 <u>Learning Objective</u> **Complies with government acts, codes, standards and regulations** **JP Sign-off** _____	**1.05.01** Read and interpret government standards and regulations such as OHSA, ASHRAE, WHMIS and TDG **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.05.02** Recognize safety regulations, inspections and standards **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.05.03** Demonstrate an understanding of federal, provincial/territorial and municipal codes and by-laws such as fire, gas, building, plumbing and electrical **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.05.04** Identify types of permits such as electrical, gas, mechanical and hoisting **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.05.05** Follow procedures to obtain permits and inspections **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	1.05.06 Locate and access standards, codes and regulations **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.05.07** Apply standards, codes and regulations **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**1.05.08** Document inspections **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____		

Journeyperson
Sign-off
Task 2

Complete   ☐

Incomplete   ☐

Task 2
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.01 — Learning Objective **Utilizes hand tools** — JP Sign-off _____	2.01.01 Identify types and functions of common hand tools	2.01.02 Identify metric and imperial tool sizes	2.01.03 Follow operating procedures and techniques for hand tools	2.01.04 Select hand tools required for task to be performed	2.01.05 Clean and lubricate hand tools
	Rating ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____
	2.01.06 Store hand tools	2.01.07 Perform minor repairs such as sharpening, straightening and cleaning	2.01.08 Calibrate hand tools		
	Rating ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____		

SUB-TASK 2.02 — Learning Objective **Utilizes portable and stationary power tools** — JP Sign-off _____	2.02.01 Identify types and functions of air, electric and hydraulic portable and stationary power tools	2.02.02 Determine operating procedures for air, electric and hydraulic portable and stationary power tools	2.02.03 Recognize capabilities and limitations of air, electric and hydraulic portable and stationary power tools	2.02.04 Identify power supply requirements for selected portable and stationary power tools	2.02.05 Read and follow maintenance schedules for equipment
	Rating ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____
	2.02.06 Select the portable and stationary power tools for the job to be performed	2.02.07 Clean and lubricate portable and stationary power tools	2.02.08 Perform minor repairs such as replacing power cord ends, air line connectors and hydraulic or air hoses	2.02.09 Store portable power tools	2.02.10 Calibrate power tools
	Rating ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____

Task 2 - A (cont'd)

Learning Outcome
Operates and maintains tools and equipment

Task 2
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 2.03	2.03.01 Identify types and functions of oxy-fuel and air-fuel equipment	2.03.02 Follow operating procedures for oxy-fuel and air-fuel equipment	2.03.03 Recognize capabilities and limitations of oxy-fuel and air-fuel equipment	2.03.04 Read and interpret local fire codes and safety legislation	2.03.05 Select oxy-fuel and air-fuel equipment for the job to be performed
Learning Objective **Utilizes oxy-fuel and air-fuel equipment**	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____
JP Sign-off ____	2.03.06 Clean oxy-fuel and air-fuel equipment	2.03.07 Perform minor repairs such as replacing o-rings, hoses and gauges, and tightening connections	2.03.08 Store, transport and secure oxy-fuel and air-fuel equipment		
	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____		

SUB-TASK 2.04	2.04.01 Read and interpret government legislation, codes and regulations	2.04.02 Identify types, functions and limitations of recovery and recycle equipment	2.04.03 Determine application of recovery and recycle equipment to refrigeration and air conditioning systems	2.04.04 Identify types of refrigerants and oils and their compositions	2.04.05 Identify techniques and procedures to recover and recycle refrigerants and oils
Learning Objective **Utilizes recovery and recycle equipment**	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____
JP Sign-off ____	2.04.06 Select handling and storage techniques for refrigerants and oils	2.04.07 Operate recovery and recycle equipment	2.04.08 Maintain recovery and recycle equipment	2.04.09 Transport recovered and recycled refrigerants and oils	
	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	

4

Task 2
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof:	O - Observation	I - Interview	D - Documentation	
Use:	1 - Daily	2 - Often	3 - Seldom	4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 2.05	2.05.01 Read and interpret government legislation, codes and regulations	2.05.02 Identify types and functions of evacuation equipment and tools	2.05.03 Demonstrate techniques and procedures for evacuation and dehydra-tion of refrigeration and air conditioning systems	2.05.04 Identify and demonstrate an understanding of vacuum levels and durations required for refrigeration and air conditioning application	2.05.05 Recognize effects of temperature, electrical connections, power interruptions and line sizing on evacuation
Learning Objective **Utilizes evacuation equipment and tools** JP Sign-off _____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____
	2.05.06 Operate evacuation equipment and tools	2.05.07 Maintain evacuation equipment and tools such as replacing vacuum pump oil	2.05.08 Interpret vacuum readings to adequately evacuate and dehydrate		
	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____		

SUB-TASK 2.06	2.06.01 Read and interpret government legislation and regulations	2.06.02 Identify types and functions of charging equipment and tools such as charging cylinders, charging scales and sight glass	2.06.03 Demonstrate an understanding of techniques and procedures for operation of charging equipment and tools	2.06.04 Determine refrigerant types and properties	2.06.05 Calculate system refrigerant charge
Learning Objective **Utilizes charging equipment and tools** JP Sign-off _____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____
	2.06.06 Interpret name plate data	2.06.07 Interpret manufacturer's charging instructions	2.06.08 Operate charging equipment and tools	2.06.09 Maintain charging equipment and tools	
	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	Rating ____ Complete Proof ____ Use ____	

Task 2 - A (cont'd)

Learning Outcome
Operates and maintains tools and equipment

**Task 2
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

SUB-TASK 2.07 Learning Objective **Utilizes access/egress equipment** JP Sign-off _____	**2.07.01** Identify types of access/ egress equipment such as ladders, staging and scaffolding **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.07.02** Demonstrate an understanding of load bearing capacity of access equipment **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.07.03** Read and interpret standards, specifications and regulations for access equipment such as OHSR **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.07.04** Secure access equipment **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.07.05** Employ fall arrest equipment such as harnesses, safety belts and lines **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	2.07.06 Erect, dismantle and maintain stationary/rolling scaffolding **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.07.07** Erect, dismantle and maintain staging **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____			

SUB-TASK 2.08 Learning Objective **Utilizes hoisting and rigging equipment** JP Sign-off _____	**2.08.01** Identify government legislation, codes and regulations **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.08.02** Identify types and functions of hoisting, tugging and lifting devices such as jacks, hoists and come-alongs **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.08.03** Identify types and functions of rigging equipment such as belts, ropes, cables and slings **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.08.04** Use operating procedures and techniques for hoisting, tugging and lifting devices **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.08.05** Determine hoisting, tugging and lifting capacities **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	2.08.06 Determine loads and weights **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.08.07** Clean, lubricate and store rigging, hoisting, tugging and lifting devices **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.08.08** Recognize damaged, worn, defective and leaking components **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.08.09** Perform minor repairs and replenish fluids **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	

Task 2 - A (cont'd)

<u>Learning Outcome</u>
Operates and maintains tools and equipment

**Task 2
Learning Needs**

**Sub-Tasks
<u>Learning Objectives</u>**
to be completed
Comments

Rating:

6 - <u>Expert,</u> perform a task <u>beyond expected level and quality</u> of performance, <u>lead and/or teach others</u>
5 - <u>Highly skilled,</u> perform a task to the <u>highest level</u> and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with <u>some assistance</u> and supervision
1 - Complete task with assistance and <u>constant supervision</u>

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - <u>Competencies</u>

SUB-TASK 2.09 <u>Learning Objective</u> **Utilizes mechanical measuring equipment** **JP Sign-off** _____	**2.09.01** Identify types and functions of mechanical measuring equipment such as vernier calipers, micrometers and dial indicators **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.09.02** Apply operating procedures for mechanical measuring equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.09.03** Select handling and storage requirements for mechanical measuring equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.09.04** Check mechanical measuring equipment for accuracy and calibration **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.09.05** Convert between metric and imperial measurements **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	2.09.06 Identify damaged or worn mechanical measuring equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.09.07** Clean mechanical measuring equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.09.08** Store mechanical measuring equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.09.09** Calibrate mechanical measuring equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	
SUB-TASK 2.10 <u>Learning Objective</u> **Utilizes electric and electronic diagnostic tools** **JP Sign-off** _____	**2.10.01** Identify types and functions of electric and electronic diagnostic tools **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.10.02** Determine proper care and handling of electric and electronic diagnostic tools **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.10.03** Apply operating procedures for electric and electronic diagnostic tools **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.10.04** Determine capabilities and limitations of electric and electronic diagnostic tools **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.10.05** Interpret readings and fault codes **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	2.10.06 Hook up electric and electronic diagnostic tools **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.10.07** Perform minor maintenance such as changing batteries or cleaning connectors **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.10.08** Store electric and electronic diagnostic tools **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**2.10.09** Calibrate electric and electronic diagnostic tools **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	

Task 2 - A
(cont'd)

Learning Outcome
Operates and maintains tools and equipment

Task 2
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 2.11 Learning Objective **Utilizes computer equipment to interface with refrigeration and air conditioning systems** **JP Sign-off** _____	**2.11.01** Identify techniques and procedures to interface computer equipment with refrigeration and air conditioning systems **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.11.02** Identify hardware and software requirements **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.11.03** Determine and perform computer operations **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.11.04** Follow manufacturer's specifications **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**2.11.05** Interface computer to refrigeration and air conditioning automated control system **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	2.11.06 Confirm communication link with refrigeration and air conditioning system **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____				

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
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1 - Complete task with assistance and constant supervision

Type of Proof:	O - Observation	I - Interview	D - Documentation	
Use:	1 - Daily	2 - Often	3 - Seldom	4 - Never

Knowledge, Skills and Abilities - Competencies

Journeyperson Sign-off Task 3
Complete ▢
Incomplete ▢

Task 3 Learning Needs Sub-Tasks Learning Objectives to be completed Comments

SUB-TASK 3.01	3.01.01	3.01.02	3.01.03	3.01.04	3.01.05
Learning Objective **Installs fasteners, brackets and hangers**	Identify types, styles, purposes and sizes of fasteners, brackets and hangers	Determine capabilities and limitations of fasteners, brackets and hangers	Follow replacement procedures and techniques for fasteners, brackets and hangers	Determine torque limits	Identify required lubricants and sealants on fittings, brackets and hangers
JP Sign-off _____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	3.01.06	3.01.07	3.01.08	3.01.09	3.01.10
	Determine isolation, vibration and seismic conditions	Select fasteners, brackets and hangers compatible with job specifications	Torque fasteners	Lubricate and seal fasteners	Apply fasteners for seismic loads
	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____

SUB-TASK 3.02	3.02.01	3.02.02	3.02.03	3.02.04	3.02.05
Learning Objective **Performs lock-out tagging and isolation procedures**	Determine hazardous energy sources	Follow lock-out, tag-out, blank-off and hold-off procedures and techniques	Determine site lock-out procedures	Implement hazardous energy lock-out and tag-out procedures	Affix restraints, tags and signage
JP Sign-off _____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____

Task 3 - A (cont'd)

Learning Outcome
Demonstrates work practices and procedures

Task 3
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 3.03	3.03.01 Select types and sizes of piping and tubing and their applications	3.03.02 Determine specific techniques and procedures such as soldering, brazing, threading, flaring, swaging, compression and barbed fittings to join material types	3.03.03 Identify components to be joined	3.03.04 Determine techniques for piping practices such as nitrogen purging, pre- and post-cleaning, piping and tubing supports	3.03.05 Determine applications requiring piping and tubing such as refrigeration and air conditioning, secondary refrigerant, water and pneumatic
Learning Objective **Installs piping and tubing** JP Sign-off _____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____
	3.03.06 Mount and secure piping and tubing	3.03.07 Cut, prep and join piping and tubing such as soldering compression fittings and brazing	3.03.08 Connect piping and tubing to components	3.03.09 Bend, flare, ream or thread and swage piping and tubing	3.03.10 Route piping and tubing
	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____

SUB-TASK 3.04	3.04.01 Identify and select types and properties of adhesives and sealants	3.04.02 Determine application techniques for sealants and adhesives	3.04.03 Apply sealants and adhesives		
Learning Objective **Applies sealants and adhesives** JP Sign-off _____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____		

SUB-TASK 3.05	3.05.01 Select cleaning equipment	3.05.02 Select lubricating equipment	3.05.03 Identify characteristics, applications, qualities and capabilities of lubricants and cleaners	3.05.04 Follow cleaning and lubricating equipment operating procedures and techniques	3.05.05 Use personal and work area protective equipment
Learning Objective **Cleans and lubricates parts and components** JP Sign-off _____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____
	3.05.06 Determine ventilation requirements	3.05.07 Determine and follow environmental protection requirements for cleaners and lubricants such as recovery, disposal, storage and handling	3.05.08 Apply lubricants	3.05.09 Operate cleaning equipment	3.05.10 Operate lubricating equipment
	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____

Task 3
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - <u>Expert,</u> perform a task <u>beyond expected level and quality</u> of performance, <u>lead and/or teach others</u>
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Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - <u>Competencies</u>

SUB-TASK 3.06 Learning Objective **Performs internal electrical wiring of systems** **JP Sign-off** _____	**3.06.01** Identify types, sizes and gauges of wire **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.02** Determine electrical requirements of the system and components **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.03** Determine internal power wiring procedures and techniques **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.04** Determine termination procedures and techniques **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.05** Select wire size and type compatible with the application **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	3.06.06 Cut, join and crimp wiring **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.07** Label, verify and record installation of internal wiring of system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.08** Check continuity of wiring **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.09** Route and secure internal wiring of system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**3.06.10** Terminate internal wiring of system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____

Task 4 - A
4 questions on the IP exam

<u>Learning Outcome</u>
Coordinates refrigeration and air conditioning installation and maintenance

Journeyperson
Sign-off
Task 4

Complete

Incomplete

Task 4
Learning Needs

Sub-Tasks
<u>**Learning Objectives**</u>
to be completed
Comments

| **SUB-TASK 4.01**

<u>Learning Objective</u>
Estimates work requirements

JP Sign-off _____ | **4.01.01**
Identify system specifications

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.01.02**
Determine types, sizes, prices, sources and availability of parts and accessories

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.01.03**
Determine substitute equipment, parts and accessories

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.01.04**
Estimate quantities, times and costs

Rating ____ **Complete**
Proof ____ ▢
Use ____ | |

| **SUB-TASK 4.02**

<u>Learning Objective</u>
Conducts work area inspection

JP Sign-off _____ | **4.02.01**
Select components to be installed

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.02.02**
Create inspection check lists

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.02.03**
Read equipment and system specifications

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.02.04**
Recognize work area hazards

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.02.05**
Select hoisting and rigging equipment

Rating ____ **Complete**
Proof ____ ▢
Use ____ |
| | **4.02.06**
Document work area inspections

Rating ____ **Complete**
Proof ____ ▢
Use ____ | | | | |

| **SUB-TASK 4.03**

<u>Learning Objective</u>
Coordinates work requirements

Continued next page | **4.03.01**
Determine coordination techniques

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.02**
Read equipment and system specifications

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.03**
Identify suppliers, vendors and outside sub-trades

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.04**
Read and interpret material lists, work orders and permits

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.05**
Recognize service reports

Rating ____ **Complete**
Proof ____ ▢
Use ____ |
| | **4.03.06**
Organize work

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.07**
Consult with end user on a project

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.08**
Process work orders

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.09**
Confirm materials availability

Rating ____ **Complete**
Proof ____ ▢
Use ____ | **4.03.10**
Identify system specific tools and equipment

Rating ____ **Complete**
Proof ____ ▢
Use ____ |

Rating:

6 - <u>Expert,</u> perform a task <u>beyond expected level and quality</u> of performance, <u>lead and/or teach others</u>
5 - <u>Highly skilled,</u> perform a task to the <u>highest level</u> and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with <u>some assistance</u> and supervision
1 - Complete task with assistance and <u>constant supervision</u>

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

**Task 4
Learning Needs**

**Sub-Tasks
<u>Learning Objectives</u>**
to be completed
Comments

Knowledge, Skills and Abilities - <u>Competencies</u>

SUB-TASK 4.03 Continued <u>Learning Objective</u> **Coordinates work requirements** **JP Sign-off** _____	**4.03.11** Select parts and equipment to correspond to system specifications **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.03.12** Store and secure equipment and accessories **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.03.13** Coordinate with other trades **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____		
SUB-TASK 4.04 <u>Learning Objective</u> **Maintains customer relations** **JP Sign-off** _____	**4.04.01** Read and interpret warranties, guarantees, return and exchange policies **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.02** Demonstrate an understanding of features and benefits of refrigeration and air conditioning systems **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.03** Perform customer service practices such as follow up **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.04** Respond to end user queries **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.05** Instruct end user on operation and maintenance **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____
	4.04.06 Clarify end user problems **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.07** Recommend corrective action **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.08** Process claim forms **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.09** Demonstrate features of equipment **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.10** Handle end user complaints **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____
	4.04.11 Recommend service and maintenance requirements **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.12** Solicit approval to perform service or maintenance requirements **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.13** Demonstrate equipment operation and maintenance **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**4.04.14** Follow up with end user on system performance **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	

Task 4 - A (cont'd)

Learning Outcome
Coordinates refrigeration and air conditioning installation and maintenance

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**Task 4
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

SUB-TASK 4.05	4.05.01	4.05.02	4.05.03	4.05.04	4.05.05
Learning Objective **Clarifies end user problems with refrigeration and air conditioning systems** JP Sign-off _____	Identify end users' system such as location, type of equipment and controls	Verify operation of equipment	Assess repair/ maintenance history	Identify common types of problems	Confirm end user contacts
	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____
	4.05.06	4.05.07	4.05.08	4.05.09	
	Question client regarding problem	Qualify/paraphrase end user information	Interpret customer information	Develop troubleshooting plan of action	
	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	

SUB-TASK 4.06	4.06.01	4.06.02	4.06.03	4.06.04	4.06.05
Learning Objective **Completes work-related documentation** JP Sign-off _____	Identify required work-related documents such as repair orders, preventative/ predictive maintenance sheets and government inspection forms	Determine information required for specific work-related documents such as work performed, date performed, signature, time required and parts replaced	Complete TDG (transport of dangerous goods) forms	Update service records such as equipment logs and service cards	Process manufacturers' pre-start-up and start-up sheets, purchase orders, warranties and material return sheets
	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____
	4.06.06	4.06.07			
	Process TDG forms	Process refrigerant management records			
	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____			

**Task 4
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

3 - Complete a task to the level and quality of performance required by industry without assistance or supervision

2 - Complete a task with some assistance and supervision

1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

| **SUB-TASK 4.07**

Learning Objective
Generates maintenance documentation

JP Sign-off _____ | **4.07.01**
Recognize normal machine operating conditions

Rating ____ **Complete**
Proof ____ ▭
Use ____ | **4.07.02**
Follow company's policy relating to reporting procedures

Rating ____ **Complete**
Proof ____ ▭
Use ____ | **4.07.03**
Log machine operating conditions

Rating ____ **Complete**
Proof ____ ▭
Use ____ | **4.07.04**
Organize operating information for report

Rating ____ **Complete**
Proof ____ ▭
Use ____ | **4.07.05**
Interpret operating conditions such as reading and work completed

Rating ____ **Complete**
Proof ____ ▭
Use ____ |
| | **4.07.06**
Prepare reports and documentation

Rating ____ **Complete**
Proof ____ ▭
Use ____ | | | | |

15

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Task 5 - A
2 questions on the IP exam

<u>Learning Outcome</u>
Performs system components, accessories and materials acquisition and handling

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Journeyperson
Sign-off
Task 5

Complete ☐

Incomplete ☐

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Task 5
Learning Needs

Sub-Tasks
<u>Learning Objectives</u>
to be completed
Comments

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SUB-TASK 5.01 <u>Learning Objective</u> **Requisitions equipment** **JP Sign-off** _____	**5.01.01** Identify equipment requirements **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.01.02** Identify equipment suppliers and vendors **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.01.03** Apply and follow company rental and purchasing policies **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.01.04** Complete material order/requisition **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.01.05** Track orders **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___
	5.01.06 Arrange and schedule deliveries **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___				

SUB-TASK 5.02 <u>Learning Objective</u> **Receives materials/ equipment** **JP Sign-off** _____	**5.02.01** Read specifications for materials/equipment ordered **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.02.02** Read transportation documents such as bills of lading, packing slips and invoices **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.02.03** Follow special storage requirements for received goods **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.02.04** Conduct visual inspection for damage and loss **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.02.05** Remove packaging material **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___
	5.02.06 Process packing slips, bills of lading, invoices and damage reports **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**5.02.07** Verify equipment specifications **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___			

**Task 5 - A
(cont'd)**

Learning Outcome
Performs system components, accessories and materials acquisition and handling

**Task 5
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

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1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 5.03 — Learning Objective **Transfers equipment to designated location** — JP Sign-off _____	5.03.01 Identify designated destination — **Rating** ____ **Complete** **Proof** ____ **Use** ____	5.03.02 Verify equipment specifications — **Rating** ____ **Complete** **Proof** ____ **Use** ____	5.03.03 Determine rigging requirements — **Rating** ____ **Complete** **Proof** ____ **Use** ____	5.03.04 Determine special handling requirements — **Rating** ____ **Complete** **Proof** ____ **Use** ____	5.03.05 Determine transfer permits, obstruction permits and transportation restrictions — **Rating** ____ **Complete** **Proof** ____ **Use** ____
	5.03.06 Schedule transfer — **Rating** ____ **Complete** **Proof** ____ **Use** ____	5.03.07 Operate materials and handling equipment — **Rating** ____ **Complete** **Proof** ____ **Use** ____	5.03.08 Perform pre-site inspection — **Rating** ____ **Complete** **Proof** ____ **Use** ____		

**Refrigeration and
Air Conditioning**

**BLOCK B
38% - 47 Questions on the IP exam**
<u>**Learning Category**</u>
**REFRIGERATION AND AIR
COOLING SYSTEMS**

**Task 6 - B
6 questions on the IP exam**

<u>Learning Outcome</u>
**Plans installations of
refrigeration and air cooling
systems**

Journeyperson
Sign-off
Task 6

Complete ▢

Incomplete ▢

**Task 6
Learning Needs**

**Sub-Tasks
<u>Learning Objectives</u>**
to be completed
Comments

SUB-TASK 6.01	6.01.01 Identify design criteria and parameters	6.01.02 Read and interpret trade engineering standards such As ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers)	6.01.03 Identify load calculation methods such as manufacturers' load charts and calculations	6.01.04 Apply load calculation methods	6.01.05 Calculate load
<u>Learning Objective</u> **Verifies refrigeration and air cooling system parameters and requirements** JP Sign-off _____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____
SUB-TASK 6.02	6.02.01 Identify design criteria, parameters and code requirements	6.02.02 Determine types, sizes, capacities, limitations and applications of refrigeration and air cooling equipment, components and accessories	6.02.03 Read and interpret manufacturers' specifications	6.02.04 Identify system requirements	6.02.05 Choose refrigeration and air cooling equipment/ components/accessories to match application to optimize performance
<u>Learning Objective</u> **Selects refrigeration and air cooling components, equipment and accessories** JP Sign-off _____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____
SUB-TASK 6.03	6.03.01 Read and interpret manufacturers' specifications	6.03.02 Determine site restrictions	6.03.03 Determine function and application of components, equipment and accessories	6.03.04 Identify where components, equipment and accessories are located in system	6.03.05 Select locations of components, equipment and accessories for optimum performance and accessibility
<u>Learning Objective</u> **Prepares components, equipment and accessories layout** JP Sign-off _____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____
	6.03.06 Plan components, equipment and accessories locations	6.03.07 Assess external energy sources	6.03.08 Produce a layout plan		
	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____		
SUB-TASK 6.04	6.04.01 Identify design criteria, parameters and mechanical codes	6.04.02 Identify refrigerant types and properties	6.04.03 Assess refrigerant performance	6.04.04 Read and interpret manufacturer's requirements	6.04.05 Choose refrigerant for application
<u>Learning Objective</u> **Selects refrigerant** JP Sign-off _____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

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1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Task 6
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 6.05	6.05.01 Assess pipe sizing methods for fluids and gases such as primary/ secondary refrigerant, fuels and water	6.05.02 Determine piping practices such as flow, velocity and oil return	6.05.03 Select piping and tubing to match system requirements
Learning Objective **Sizes piping**			
JP Sign-off _____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____

SUB-TASK 6.06	6.06.01 Identify layout methods and techniques	6.06.02 Follow manufacturers' recommended procedures	6.06.03 Produce a piping layout plan
Learning Objective **Lays out piping**			
JP Sign-off _____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____

SUB-TASK 6.07	6.07.01 Identify types, application and rating of insulation	6.07.02 Follow manufacturers' recommended application	6.07.03 Choose insulation for the application
Learning Objective **Selects insulation**			
JP Sign-off _____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____	Rating ____ Complete Proof ____ [ ] Use ____

Task 7 - B
14 questions on the IP exam

Learning Outcome
Installs refrigeration and air cooling systems

Journeyperson
Sign-off
Task 7

Complete ☐

Incomplete ☐

Task 7
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 7.01	7.01.01 Determine specifications of refrigeration and air conditioning equipment such as size, weight and capacity	7.01.02 Identify installation requirements related to utilities, roofing and structure support	7.01.03 Schedule project activities related to sub-trades and end user deadlines	7.01.04 Calculate labour requirements	7.01.05 Schedule project teams
Learning Objective **Prepares site/location**	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____
JP Sign-off _____					

7.01.06 Schedule connection of system to utilities
Rating ____ **Complete** Proof ____ ☐ Use ____

SUB-TASK 7.02	7.02.01 Follow equipment manufacturer's recommended assembly techniques and procedures	7.02.02 Identify equipment application	7.02.03 Remove protective applications	7.02.04 Follow assembly instructions	7.02.05 Verify assembly
Learning Objective **Assembles refrigeration and air cooling components, equipment and accessories**	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____
JP Sign-off _____					

SUB-TASK 7.03	7.03.01 Follow equipment manufacturer's installation techniques and procedures	7.03.02 Determine isolation and vibration requirements	7.03.03 Determine service accessibility requirements	7.03.04 Select equipment location	7.03.05 Select fastening and positioning equipment and accessories
Learning Objective **Positions and secures refrigeration and air cooling components, equipment and accessories**	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____
JP Sign-off _____					

7.03.06 Anchor components, equipment and accessories in position	7.03.07 Verify installation of refrigeration and air cooling components, equipment and accessories
Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
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1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Task 7
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 7.04 — Learning Objective **Routes and connects refrigerant piping** — JP Sign-off _____	**7.04.01** Identify piping layout	**7.04.02** Determine techniques and procedures for routing and connecting refrigerant piping	**7.04.03** Calculate sizes and capacity of refrigerant piping	**7.04.04** Determine vibration elimination and support requirements	**7.04.05** Interpret refrigerant piping schematics
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____
	7.04.06 Install refrigerant piping	**7.04.07** Terminate refrigerant piping			
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____			

SUB-TASK 7.05 — Learning Objective **Performs leak test on system** — JP Sign-off _____	**7.05.01** Identify types and properties of refrigerants	**7.05.02** Determine application of leak detectors	**7.05.03** Determine techniques and procedures for leak testing	**7.05.04** Evaluate site conditions such as temperature and hazards	**7.05.05** Operate test equipment
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____
	7.05.06 Select test procedure for application	**7.05.07** Interpret test results	**7.05.08** Document test results		
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____		

**Task 7 - B
(cont'd)**

Learning Outcome
Installs refrigeration and air cooling systems

**Task 7
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

SUB-TASK 7.06 — Learning Objective **Evacuates system** — JP Sign-off _____	**7.06.01** Apply vacuum pump fundamentals	**7.06.02** Connect vacuum pump and vacuum gauge	**7.06.03** Operate evacuation systems	**7.06.04** Interpret vacuum readings
	Rating ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____

SUB-TASK 7.07 — Learning Objective **Charges system** — JP Sign-off _____	**7.07.01** Determine refrigerant requirements such as volume, type and weight	**7.07.02** Follow manufacturer's specifications for required refrigerant type	**7.07.03** Weigh in refrigerant	**7.07.04** Operate charging equipment
	Rating ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____

Journeyperson
Sign-off
Task 8

Complete [ ]

Incomplete [ ]

Task 8
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
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Type of Proof:	O - Observation	I - Interview	D - Documentation	
Use:	1 - Daily	2 - Often	3 - Seldom	4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 8.01 Learning Objective **Performs pre-start-up checks** **JP Sign-off** _____	**8.01.01** Follow manufacturer's recommendations for pre-start inspection and source of energy **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.01.02** Identify available energy sources and utilities **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.01.03** Verify that equipment specifications match energy sources and utilities **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.01.04** Verify energy sources and utilities' connection integrity **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.01.05** Check phase rotation **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____
	8.01.06 Check isolation valve positions **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.01.07** Verify movement of drives and rotating equipment **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.01.08** Make adjustments **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.01.09** Complete pre-start-up sheets **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	
SUB-TASK 8.02 Learning Objective **Starts up refrigeration and air conditioning system** **JP Sign-off** _____	**8.02.01** Follow manufacturer's recommended start-up procedures **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.02.02** Perform start-up procedures **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.02.03** Verify equipment application **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.02.04** Determine sequence of operation for system **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.02.05** Coordinate activation of utilities **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____
	8.02.06 Connect instrumentation **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.02.07** Follow manufacturer's recommended procedures for start-up **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.02.08** Make adjustments **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**8.02.09** Document start-up **Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	

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**Task 8 - B
(cont'd)**

<u>Learning Outcome</u>
**Commissions refrigeration
and air cooling systems**

**Task 8
Learning Needs**

**Sub-Tasks
<u>Learning Objectives</u>**
to be completed
Comments

SUB-TASK 8.03 <u>Learning Objective</u> **Completes system charge** **JP Sign-off** _____	**8.03.01** Identify pre-charge refrigerant weight and type **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.02** Select charging procedures **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.03** Determine optimum operating conditions **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.04** Verify operation of regulating valves and metering devices **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.05** Verify operation of system equipment and components **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	8.03.06 Operate charging equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.07** Weigh added refrigerant **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.08** Measure operating conditions such as pressures and temperatures **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.09** Interpret operating conditions **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.03.10** Adjust operating components such as metering devices, pressure regulating valves, pneumatic controls, test operations and safety controls **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	8.03.11 Verify operation of safety controls **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____				

SUB-TASK 8.04 <u>Learning Objective</u> **Sets up primary and secondary refrigeration system adjustable switches, values and regulators** **JP Sign-off** _____	**8.04.01** Determine operating control system for primary and secondary systems **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.04.02** Determine sequence of operation **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.04.03** Verify control application and function for primary and secondary systems **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.04.04** Adjust controls for primary and secondary systems **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**8.04.05** Interpret control readings for primary and secondary systems **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____

Rating:	6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
	5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
	4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
	3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
	2 - Complete a task with some assistance and supervision
	1 - Complete task with assistance and constant supervision

Type of Proof:	O - Observation	I - Interview	D - Documentation

Use:	1 - Daily	2 - Often	3 - Seldom	4 - Never

Knowledge, Skills and Abilities - Competencies

Journeyperson Sign-off Task 9	
Complete	☐
Incomplete	☐

Task 9
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 9.01	9.01.01 Identify components of refrigeration and air cooling systems	9.01.02 Read and interpret equipment specifications and limitations	9.01.03 Evaluate equipment and system design	9.01.04 Apply inspection procedures and techniques	9.01.05 Conduct visual, physical, odour and noise examination of equipment for worn, damaged or fouled components
Learning Objective **Inspects refrigeration and air cooling systems** **JP Sign-off** _____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____
	9.01.06 Recognize loose, worn, damaged or fouled components	9.01.07 Recommend corrective action			
	Rating ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____			

SUB-TASK 9.02	9.02.01 Apply fundamental electricity principles	9.02.02 Identify and select electrical and electronic test instruments	9.02.03 Determine types of components	9.02.04 Read and interpret equipment electrical and electronic specifications	9.02.05 Verify equipment operation
Learning Objective **Tests electrical and electronic components** **JP Sign-off** _____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____
	9.02.06 Select test procedures and techniques	9.02.07 Simulate a condition	9.02.08 Operate test instruments	9.02.09 Isolate electrical/ electronic faults	9.02.10 Interpret and report test results
	Rating ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____	**Rating** ____ **Complete** ☐ **Proof** ____ **Use** ____

Task 9 - B (cont'd) <u>Learning Outcome</u> **Maintains refrigeration and air cooling systems**

Task 9 **Learning Needs** **Sub-Tasks** <u>**Learning Objectives**</u> to be completed Comments

SUB-TASK **9.03** <u>Learning Objective</u> **Tests mechanical components** **JP Sign-off** _____	**9.03.01** Identify mechanical test instruments **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.03.02** Determine types of components **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.03.03** Follow equipment specifications **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.03.04** Determine equipment operation **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.03.05** Determine test procedures and techniques **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	9.03.06 Simulate an environmental condition **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.03.07** Operate test equipment **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.03.08** Isolate mechanical faults **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.03.09** Interpret and report test results **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	
SUB-TASK **9.04** <u>Learning Objective</u> **Recommends corrective action** **JP Sign-off** _____	**9.04.01** Determine repairs/ replacement procedures **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.02** Evaluate repair/ replacement alternatives/options **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.03** Identify and assess criteria such as cost, time and availability of equipment **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.04** Recognize potential consequences of recommended action **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.05** Follow company repair/replacement policies **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	9.04.06 Read and interpret warranties and maintenance agreements **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.07** Estimate repair/ replacement costs **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.08** Determine repair options **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.09** Report fault and explain options to end user **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.10** Secure approval **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	9.04.11 Schedule repair **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**9.04.12** Prepare report **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____			

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Task 9
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - Competencies

SUB-TASK 9.05 — Learning Objective **Selects refrigeration and air cooling equipment and components** JP Sign-off _____	9.05.01 Determine refrigeration and air cooling equipment/component specifications such as voltages and sizes	9.05.02 Determine refrigeration and air cooling equipment sources and availability	9.05.03 Identify equipment alternatives such as original equipment manufacturer or generic	9.05.04 Follow company acquisition policies such as preferred suppliers and purchasing procedures	9.05.05 Assess time constraints
	Rating ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____
	9.05.06 Evaluate equipment options	9.05.07 Evaluate logistical requirements such as transportation			
	Rating ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____			

SUB-TASK 9.06 — Learning Objective **Replaces defective components and equipment** JP Sign-off _____	9.06.01 Follow required replacement procedures/ techniques	9.06.02 Select tools, equipment and resources required to complete job	9.06.03 Recognize components and equipment limitations/ specifications such as weight, capacity, voltages, limitations, tolerances and programming	9.06.04 Shut down system	9.06.05 Isolate/lock out system
	Rating ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____ [ ]	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____
9.06.06 Access equipment and components	9.06.07 Dismantle equipment	9.06.08 Assemble equipment	9.06.09 Adjust equipment/ components	9.06.10 Recover and dispose of refrigerant	9.06.11 Pressure test, evacuate and charge system
Rating ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____	**Rating** ____ **Complete** [ ] **Proof** ____ **Use** ____

Task 9 - B (cont'd) <u>Learning Outcome</u> **Maintains refrigeration and air cooling systems**	**SUB-TASK 9.07** <u>Learning Objective</u> **Repairs/overhauls defective components and equipment** **JP Sign-off** _____	**9.07.01** Determine repair/ overhaul procedures and techniques **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.02** Identify equipment/ component specifications including tolerances and limitations **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.03** Interpret manufacturer's specifications **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.04** Shut down system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.05** Isolate/lock out and tag out system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
		9.07.06 Dismantle equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.07** Assemble equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.08** Recover refrigerant **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.09** Pressure test, evacuate and charge system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.07.10** Fabricate components such as brackets, hangers and mounts **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
		9.07.11 Repair/replace defective parts **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____				
	SUB-TASK 9.08 <u>Learning Objective</u> **Verifies refrigeration and air cooling system and component function** **JP Sign-off** _____	**9.08.01** Assess refrigeration and air conditioning equipment/component operation/function **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.08.02** Select test equipment for refrigeration and air conditioning systems **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.08.03** Verify original design parameters **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.08.04** Determine equipment specifications such as capacity, voltages and sequence **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.08.05** Simulate an environmental condition **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
		9.08.06 Test component operation for functionality **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**9.08.07** Interpret and report test results **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____			

Task 9
Learning Needs

Sub-Tasks
<u>**Learning Objectives**</u>
to be completed
Comments

**Task 9 - B
(cont'd)**

Learning Outcome
**Maintains refrigeration and
air cooling systems**

**Task 9
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 9.09 — Learning Objective **Performs predictive maintenance** — JP Sign-off _____	9.09.01 Identify predictive maintenance procedures	9.09.02 Assess the need for non-destructive testing such as oil analysis, refrigerant analysis, eddy current and X-rays	9.09.03 Conduct non-destructive testing	9.09.04 Operate test equipment	9.09.05 Interpret and report test results
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____

SUB-TASK 9.10 — Learning Objective **Performs preventative maintenance** — JP Sign-off _____	9.10.01 Determine preventative maintenance requirements such as schedule and manufacturer's recommendations	9.10.02 Follow preventative maintenance procedures	9.10.03 Assess the need to replace consumables	9.10.04 Replace consumables such as belts, filters, lubricants and electrical controls	9.10.05 Conduct maintenance activities such as cleaning, lubricating, tightening and adjusting
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____

9.10.06
Return systems to operation

Rating ____ Complete ☐
Proof ____
Use ____

Refrigeration and Air Conditioning

BLOCK C
29% - 36 Questions on the IP exam
<u>Learning Category</u>
HEATING, VENTILATING AND AIR CONDITIONING SYSTEMS

10 - C
5 questions on the IP exam

<u>Learning Outcome</u>
Plans installation of heating, ventilating and air conditioning systems

Journeyperson
Sign-off
Task 10

Complete ▢

Incomplete ▢

Task 10
Learning Needs

Sub-Tasks
<u>Learning Objectives</u>
to be completed
Comments

SUB-TASK 10.01 <u>Learning Objective</u> **Verifies heating, ventilating and air conditioning systems, parameters and requirements** **JP Sign-off** _____	**10.01.01** Identify and select design criteria and parameters	**10.01.02** Determine types of heating, ventilating and air conditioning equipment and applications	**10.01.03** Follow manufacturer's requirements	**10.01.04** Assess energy sources available at site	**10.01.05** Observe indoor poor air quality indicators
	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____
	10.01.06 Verify the heating, ventilating and air conditioning systems design	**10.01.07** Verify the heating, ventilating and air conditioning systems specifications	**10.01.08** Test indoor air quality, air distribution and humidity	**10.01.09** Match energy source with equipment requirements	**10.01.10** Determine system needs with end user
	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____	Rating ____ **Complete** **Proof** ____ ▢ **Use** ____
	10.01.11 Schedule utility connection Rating ____ **Complete** **Proof** ____ ▢ **Use** ____				

Learning Outcome
Plans installation of heating, ventilating and air conditioning systems

Task 10
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:
6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 10.02 Learning Objective **Selects heating, ventilating and air conditioning components and equipment** JP Sign-off _____	10.02.01 Identify types, sizes, capacities and applications of heating, ventilating and air conditioning equipment and components Rating ____ Complete Proof ____ Use ____	10.02.02 Follow manufacturer's specifications Rating ____ Complete Proof ____ Use ____	10.02.03 Identify site restrictions Rating ____ Complete Proof ____ Use ____	10.02.04 Evaluate equipment/ component function and application Rating ____ Complete Proof ____ Use ____	10.02.05 Verify equipment/ component location in systems Rating ____ Complete Proof ____ Use ____
	10.02.06 Choose heating, ventilating and air conditioning equipment/ components to match applications Rating ____ Complete Proof ____ Use ____	10.02.07 Plan heating, ventilating and air conditioning equipment and component location Rating ____ Complete Proof ____ Use ____	10.02.08 Select equipment/ component locations for optimum performances Rating ____ Complete Proof ____ Use ____		
SUB-TASK 10.03 Learning Objective **Confirms heating, ventilating and air conditioning components** JP Sign-off _____	10.03.01 Identify heating, ventilating and air conditioning systems/ components such as diffusers, grills, terminal devices, balancing dampers, boilers, evaporators and humidistats Rating ____ Complete Proof ____ Use ____	10.03.02 Determine heat capacity Rating ____ Complete Proof ____ Use ____	10.03.03 Assess air flow/air quality psychrometric calculations and techniques Rating ____ Complete Proof ____ Use ____	10.03.04 Calculate air flow/air quality requirements Rating ____ Complete Proof ____ Use ____	10.03.05 Calculate heating capacity Rating ____ Complete Proof ____ Use ____
	10.03.06 Calculate psychrometric values such as quantity and quality Rating ____ Complete Proof ____ Use ____				

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11 - C
10 questions on the IP exam

Learning Outcome
Installs heating, ventilating and air conditioning systems

Journeyperson
Sign-off
Task 11

Complete ☐

Incomplete ☐

Task 11
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 11.01	11.01.01 Read and interpret specifications of heating, ventilating and air conditioning equipment such as size, weight and capacity	11.01.02 Determine installation and equipment related to utilities, roofing, venting and structural support	11.01.03 Schedule project activities related to sub-trades and end user deadlines	11.01.04 Calculate labour requirements	11.01.05 Schedule project teams
Learning Objective **Prepares heating, ventilating and air conditioning equipment site/location** **JP Sign-off** _____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	11.01.06 Schedule connection of system to utilities **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____				

SUB-TASK 11.02	11.02.01 Follow equipment manufacturer's recommended assembly techniques and procedures	11.02.02 Determine equipment application	11.02.03 Evaluate equipment layout	11.02.04 Remove protective material	11.02.05 Follow assembly instructions
Learning Objective **Assembles heating, ventilating and air conditioning equipment** **JP Sign-off** _____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	11.02.06 Verify assembly of components **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____				

**11 - C
(cont'd)**

<u>Learning Outcome</u>
**Installs heating, ventilating
and air conditioning
systems**

**Task 11
Learning Needs**

**Sub-Tasks
<u>Learning Objectives</u>**
to be completed
Comments

Rating:

6 - <u>Expert,</u> perform a task <u>beyond expected level and quality</u> of performance, <u>lead and/or teach others</u>

5 - <u>Highly skilled,</u> perform a task to the <u>highest level</u> and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

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2 - Complete a task with <u>some assistance</u> and supervision

1 - Complete task with assistance and <u>constant supervision</u>

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - <u>Competencies</u>

SUB-TASK 11.03	11.03.01 Follow equipment manufacturer's installation techniques and procedures	11.03.02 Select isolation, vibration and seismic requirements	11.03.03 Determine service accessibility requirements	11.03.04 Determine sequence of positioning and connecting accessories and components	11.03.05 Determine types, sizes and function of components and accessories
<u>Learning Objective</u> **Positions and secures heating, ventilating and air conditioning equipment** **JP Sign-off** _____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____
	11.03.06 Select equipment location	11.03.07 Anchor equipment and components in position	11.03.08 Sequence accessories and components	11.03.09 Connect components and accessories to manufacturer's specifications	11.03.10 Position and secure prefabricated ducting and accessories
	Rating ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____
	11.03.11 Verify installation of heating, ventilating and air conditioning equipment	11.03.12 Coordinate connection of heating, ventilating and air conditioning systems to utilities			
	Rating ____ **Complete** **Proof** ____ [ ] **Use** ____	**Rating** ____ **Complete** **Proof** ____ [ ] **Use** ____			

12 - C
9 questions on the IP exam

Learning Outcome
Commissions heating, ventilating and air conditioning systems

Journeyperson
Sign-off
Task 12

Complete ☐

Incomplete ☐

Task 12
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 12.01	12.01.01 Follow manufacturer's recommendations for pre-start inspections and energy sources	12.01.02 Evaluate available energy sources and utilities	12.01.03 Evaluate air psychometrics	12.01.04 Verify energy sources and utilities' connection integrity	12.01.05 Verify that equipment specification match energy sources
Learning Objective **Performs pre-start-up checks**	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____
JP Sign-off _____	12.01.06 Verify movement of drives and rotating equipment	12.01.07 Make adjustments	12.01.08 Complete pre-start-up sheets		
	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____		

SUB-TASK 12.02	12.02.01 Read and interpret manufacturer's recommended start-up procedures and documentation requirements	12.02.02 Determine start-up procedures	12.02.03 Verify start-up conditions such as ambient temperatures, pressures, voltage and current	12.02.04 Verify equipment application	12.02.05 Determine sequence of operation for systems
Learning Objective **Starts up heating, ventilating and air conditioning systems** Continued next page	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____
	12.02.06 Determine operation of system equipment and components	12.02.07 Demonstrate an understanding of flame characteristics	12.02.08 Demonstrate an understanding of draft characteristics	12.02.09 Coordinate activation of energy sources	12.02.10 Connect diagnostic instrumentation
	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____	Rating ____ **Complete** Proof ____ ☐ Use ____

Task 12
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 12.02 Continued Learning Objective **Starts up heating, ventilating and air conditioning systems** JP Sign-off _____	**12.02.11** Follow manufacturer's recommended procedures for start-up	**12.02.12** Measure operating conditions for heating, ventilating and air conditioning systems	**12.02.13** Interpret operating conditions for heating, ventilating and air conditioning systems	**12.02.14** Test operation of safety controls	**12.02.15** Verify operation of safety controls
	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____
	12.02.16 Make adjustments	**12.02.17** Verify flame characteristics	**12.02.18** Document start-up		
	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____	Rating ____ Complete Proof ____ ▢ Use ____		

35

Task 13 - C
12 questions on the IP exam

<u>Learning Outcome</u>
Maintains heating, ventilating and air conditioning systems

Journeyperson
Sign-off
Task 13

Complete ☐

Incomplete ☐

Task 13
Learning Needs

Sub-Tasks
<u>**Learning Objectives**</u>
to be completed
Comments

SUB-TASK 13.01 <u>Learning Objective</u> **Inspects heating, ventilating and air conditioning systems** **JP Sign-off** _____	**13.01.01** Identify components of heating, ventilating and air conditioning systems **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.01.02** Determine equipment specifications and limitations **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.01.03** Evaluate equipment and system design **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.01.04** Apply inspection procedures and techniques **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.01.05** Conduct visual, physical, odour and noise examination of equipment for worn, damaged or fouled components **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___
	13.01.06 Recognize loose, worn, damaged or fouled components **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.01.07** Recommend corrective action **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___			
SUB-TASK 13.02 <u>Learning Objective</u> **Tests electrical/ electronic components in heating, ventilating and air conditioning systems** **JP Sign-off** _____	**13.02.01** Apply electricity principles **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.02** Identify and select electric and electronic test instruments **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.03** Identify types of components **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.04** Determine equipment electrical and electronic specifications **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.05** Verify equipment operation **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___
	13.02.06 Follow test procedures and techniques **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.07** Simulate a condition **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.08** Operate test instruments **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.09** Isolate electrical/electronic fault **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___	**13.02.10** Interpret and report test results **Rating** ___ **Complete** **Proof** ___ ☐ **Use** ___

Task 13 - C
(cont'd)

Learning Outcome
**Maintains heating,
ventilating and air
conditioning systems**

**Task 13
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
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3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
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Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 13.03 Learning Objective **Tests mechanical components in heating, ventilating and air conditioning systems** JP Sign-off _____	**13.03.01** Identify mechanical test instruments	**13.03.02** Identify types of components	**13.03.03** Read equipment specifications	**13.03.04** Verify equipment operation	**13.03.05** Follow test procedures and techniques
	Rating ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____
	13.03.06 Simulate an environmental condition	**13.03.07** Operate test equipment/instruments	**13.03.08** Isolate mechanical fault	**13.03.09** Interpret and report test results	
	Rating ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	

37

Task 13 - C (cont'd)

Learning Outcome
Maintains heating, ventilating and air conditioning systems

Task 13 Learning Needs

Sub-Tasks Learning Objectives
to be completed
Comments

SUB-TASK 13.04	13.04.01 Determine repair/ replacement procedures	13.04.02 Evaluate repair/ replacement alternatives/ options	13.04.03 Assess potential consequences of recommended action	13.04.04 Follow company repair/replacement policies	13.04.05 Read and interpret warranties and maintenance agreements
Learning Objective **Recommends corrective action** JP Sign-off _____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____
13.04.06 Estimate repair/ replacement costs	13.04.07 Determine repair options	13.04.08 Report fault and explain options to end user	13.04.09 Secure approval	13.04.10 Schedule repair	13.04.11 Prepare report
Rating ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____

SUB-TASK 13.05 Learning Objective **Selects heating, ventilating and air conditioning equipment and components** JP Sign-off _____	13.05.01 Determine heating, ventilating and air conditioning systems' equipment/component specifications such as voltages and sizes	13.05.02 Identify heating, ventilating and air conditioning systems' equipment sources and availability	13.05.03 Determine equipment alternatives such as original equipment manufacturer or generic	13.05.04 Follow of company acquisition policies such as preferred suppliers and purchasing procedures	13.05.05 Assess time constraints
	Rating ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____
	13.05.06 Order equipment/ components	13.05.07 Evaluate equipment options	13.05.08 Evaluate logistical requirements such as transportation	13.05.09 Fabricate components such as brackets, hangers and mounts	
	Rating ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	**Rating** ____ **Complete** **Proof** ____ **Use** ____	

Task 13
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
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1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 13.06 Learning Objective **Replaces defective heating, ventilating and air conditioning components and equipment** **JP Sign-off** _____	**13.06.01** Follow required replacement procedures/ techniques	**13.06.02** Select tools, equipment and resources required to complete job	**13.06.03** Determine components and equipment limitations/ specifications such as weight, capacity, voltages and programming	**13.06.04** Schedule required equipment, human resources, tools and material	**13.06.05** Source required tools, resources and equipment such as cranes, helicopter and lifts
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____
	13.06.06 Transport or arrange transportation of required tools and equipment to job site	**13.06.07** Shut down system	**13.06.08** Isolate/lock out and tag out system	**13.06.09** Access equipment and components	**13.06.10** Dismantle equipment
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____
	13.06.11 Assemble equipment	**13.06.12** Adjust equipment/ components			
	Rating ____ Complete ☐ Proof ____ Use ____	Rating ____ Complete ☐ Proof ____ Use ____			

**Task 13 - C
(cont'd)**

Learning Outcome
**Maintains heating,
ventilating and air
conditioning systems**

**Task 13
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

SUB-TASK 13.07	13.07.01 Follow repair/ overhaul procedures and techniques	13.07.02 Identify and determine equipment/component specifications including tolerances and limitations	13.07.03 Interpret manufacturer's specifications	13.07.04 Recommend adjustments	13.07.05 Shut down system
Learning Objective **Repairs/overhauls defective components and equipment for heating, ventilating and air conditioning systems** JP Sign-off _____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____
	13.07.06 Isolate/lock out and tag out system	13.07.07 Dismantle equipment	13.07.08 Assemble equipment		
	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____		

SUB-TASK 13.08	13.08.01 Determine heating, ventilating and air conditioning systems equipment/component operation/function	13.08.02 Select test equipment for heating, ventilating and air conditioning systems	13.08.03 Determine original design parameters	13.08.04 Identify equipment specifications such as capacity, voltages and sequence	13.08.05 Simulate an environmental condition
Learning Objective **Verifies heating, ventilating and air conditioning systems and component function** JP Sign-off _____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____
	13.08.06 Test component operation for functionality	13.08.07 Interpret specifications	13.08.08 Interpret and report test results		
	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____		

SUB-TASK 13.09	13.09.01 Demonstrate an understanding of system analyzing and testing procedures	13.09.02 Conduct system analysis and testing procedures
Learning Objective **Performs predictive maintenance on heating system** JP Sign-off _____	Rating ____ **Complete** Proof ____ ▢ Use ____	Rating ____ **Complete** Proof ____ ▢ Use ____

**Task 13
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

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Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 13.10 Learning Objective **Performs preventative maintenance on heating, ventilating and air conditioning systems** **JP Sign-off** _____	**13.10.01** Determine preventative maintenance requirements such as schedule and manufacturer's recommendations **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**13.10.02** Follow preventative maintenance procedures **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**13.10.03** Identify local water conditions **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**13.10.04** Assess the need to replace consumables **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**13.10.05** Replace consumables such as belts, filters, cylinders and elements **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	13.10.06 Conduct maintenance activities such as cleaning, lubricating, tightening and adjusting **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**13.10.07** Check flame characteristics **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**13.10.08** Return system to operation **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____		

Refrigeration and Air Conditioning

BLOCK D
19% - 24 Questions on the IP exam

Learning Category
CONTROLS SYSTEMS

Task 14 - D
4 questions on the IP exam

<u>Learning Outcome</u>
Plans installation of control systems

Journeyperson
Sign-off
Task 14

Complete ☐

Incomplete ☐

Task 14
Learning Needs

Sub-Tasks
<u>Learning Objectives</u>
to be completed
Comments

SUB-TASK 14.01	14.01.01 Determine end user requirements	14.01.02 Read and interpret trade standards such as ASHRAE	14.01.03 Identify types and applications of controls such as electric, electronic, pneumatic and direct digital controls (DDC)	14.01.04 Read and interpret manufacturer's specifications	14.01.05 Apply control fundamentals and strategies
<u>Learning Objective</u> **Selects controls** **JP Sign-off** _____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____
	14.01.06 Determine system control requirements	14.01.07 Identify control programming methods	14.01.08 Specify design criteria and parameters	14.01.09 Outline sequence of operations of control system	14.01.10 Assess compatibility of controls with a system
	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____
	14.01.11 Choose controls to match application				
	Rating ____ Complete Proof ____ ☐ Use ____				

SUB-TASK 14.02	14.02.01 Identify installation methods and requirements	14.02.02 Determine wiring and connecting methods and procedures	14.02.03 Identify equipment function and operation	14.02.04 Determine sequence of operations of control system	14.02.05 Demonstrate an understanding of layout techniques and terminology
<u>Learning Objective</u> **Lays out control system components and wiring** **JP Sign-off** _____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____
	14.02.06 Assess electrical requirements of control systems	14.02.07 Optimize control system functions	14.02.08 Produce a layout plan		
	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____	Rating ____ Complete Proof ____ ☐ Use ____		

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
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Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

Journeyperson Sign-off Task 15
Complete ▭
Incomplete ▭

Task 15 Learning Needs
Sub-Tasks **Learning Objectives** to be completed Comments

SUB-TASK 15.01 Learning Objective **Prepares site/location for control system** JP Sign-off _____	15.01.01 Identify available locations for control panels and components Rating ____ Complete Proof ____ Use ____	15.01.02 Determine installation requirements related to utilities such as communication network and electrical Rating ____ Complete Proof ____ Use ____	15.01.03 Determine control system operation and application Rating ____ Complete Proof ____ Use ____	15.01.04 Schedule project activities related to sub-trades and end user deadlines Rating ____ Complete Proof ____ Use ____	15.01.05 Calculate labour requirements Rating ____ Complete Proof ____ Use ____
	15.01.06 Schedule project teams Rating ____ Complete Proof ____ Use ____	15.01.07 Schedule connection of control system to utilities Rating ____ Complete Proof ____ Use ____			
SUB-TASK 15.02 Learning Objective **Positions and secures control system components** JP Sign-off _____	15.02.01 Follow equipment manufacturer's recommended installation techniques and procedures Rating ____ Complete Proof ____ Use ____	15.02.02 Determine equipment application Rating ____ Complete Proof ____ Use ____	15.02.03 Determine isolation and vibration requirements Rating ____ Complete Proof ____ Use ____	15.02.04 Ensure service accessibility requirements Rating ____ Complete Proof ____ Use ____	15.02.05 Determine sequence of positioning and connecting accessories and components Rating ____ Complete Proof ____ Use ____
15.02.06 Assess types, sizes and function of components and accessories Rating ____ Complete Proof ____ Use ____	15.02.07 Anchor components in position Rating ____ Complete Proof ____ Use ____	15.02.08 Sequence accessories and components Rating ____ Complete Proof ____ Use ____	15.02.09 Connect components and accessories to manufacturer's specifications Rating ____ Complete Proof ____ Use ____	15.02.10 Verify installation of control system components Rating ____ Complete Proof ____ Use ____	15.02.11 Coordinate connection of control system to utilities Rating ____ Complete Proof ____ Use ____

15 - D
(cont'd)

Learning Outcome
Installs control systems

Task 15
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK **15.03** Learning Objective **Connects system wiring and tubing** **JP Sign-off** _____	**15.03.01** Follow equipment manufacturer's specifica- tions, procedures and techniques for installing control systems	**15.03.02** Identify electrical noise interference	**15.03.03** Select types, sizes and capacities of tubing	**15.03.04** Apply tube routing techniques and company's labelling strategies	**15.03.05** Terminate mechanical connections
	Rating ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____

15.03.06
Label/tag controls, wiring and tubing

Rating ____ **Complete**
Proof ____ ☐
Use ____

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others

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Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

Journeyperson
Sign-off
Task 16

Complete ▭

Incomplete ▭

Task 16
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 16.01 Learning Objective **Performs pre-start-up checks** **JP Sign-off** _____	**16.01.01** Follow manufacturer's recommendations for pre-start inspections and sources of energy Rating ____ Complete ▭ Proof ____ Use ____	**16.01.02** Identify site specific conditions such as controller, sensor, computer and actuator locations Rating ____ Complete ▭ Proof ____ Use ____	**16.01.03** Evaluate available energy sources Rating ____ Complete ▭ Proof ____ Use ____	**16.01.04** Verify energy sources and connection integrity Rating ____ Complete ▭ Proof ____ Use ____	**16.01.05** Comply with equipment specifications Rating ____ Complete ▭ Proof ____ Use ____
	16.01.06 Verify movement of drives and rotating equipment Rating ____ Complete ▭ Proof ____ Use ____	**16.01.07** Check isolation devices, disconnect switches and valves Rating ____ Complete ▭ Proof ____ Use ____	**16.01.08** Verify required voltage Rating ____ Complete ▭ Proof ____ Use ____	**16.01.09** Verify completion of controls, wiring and tubing Rating ____ Complete ▭ Proof ____ Use ____	**16.01.10** Make adjustments Rating ____ Complete ▭ Proof ____ Use ____
	16.01.11 Complete pre-start-up sheets Rating ____ Complete ▭ Proof ____ Use ____				
SUB-TASK 16.02 Learning Objective **Sets operating parameters** **JP Sign-off** _____	**16.02.01** Identify site-specific operating parameters Rating ____ Complete ▭ Proof ____ Use ____	**16.02.02** Follow manufacturer's programming and configuration Rating ____ Complete ▭ Proof ____ Use ____	**16.02.03** Program controllers such as microprocessors, timers and analog control systems Rating ____ Complete ▭ Proof ____ Use ____	**16.02.04** Verify operating parameters Rating ____ Complete ▭ Proof ____ Use ____	**16.02.05** Interpret control system's specifications Rating ____ Complete ▭ Proof ____ Use ____

16 - D
(cont'd)

<u>Learning Outcome</u>
Commissions control systems

Task 16
Learning Needs

Sub-Tasks
<u>**Learning Objectives**</u>
to be completed
Comments

SUB-TASK **16.03** <u>Learning Objective</u> **Starts up control system** **JP Sign-off** _____	**16.03.01** Follow manufacturer's recommended start-up procedures and documentation requirements **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.02** Determine start-up procedures **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.03** Identify equipment application **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.04** Determine sequence of operation for system **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.05** Verify operation of system equipment and components **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	16.03.06 Coordinate activation of energy source **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.07** Connect diagnostic instrumentation **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.08** Follow manufacturer's recommended procedures for start-up **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.09** Make adjustments **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.10** Verify safety and operating controls **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	16.03.11 Document start-up **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**16.03.12** Create and save a backup file **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____			

Rating:

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Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

Journeyperson
Sign-off
Task 17

Complete ☐

Incomplete ☐

Task 17
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

SUB-TASK 17.01 — Learning Objective **Inspects control systems** — JP Sign-off _____	17.01.01 Identify components of control system — Rating ____ Complete ☐ Proof ____ Use ____	17.01.02 Determine equipment specifications and limitations — Rating ____ Complete ☐ Proof ____ Use ____	17.01.03 Evaluate equipment and system design — Rating ____ Complete ☐ Proof ____ Use ____	17.01.04 Determine inspection procedures and techniques — Rating ____ Complete ☐ Proof ____ Use ____	17.01.05 Conduct visual, physical, odour and noise examination of equipment for worn, damaged or fouled components — Rating ____ Complete ☐ Proof ____ Use ____
	17.01.06 Recognize loose, worn, damaged or fouled components — Rating ____ Complete ☐ Proof ____ Use ____	17.01.07 Recommend corrective action — Rating ____ Complete ☐ Proof ____ Use ____			

SUB-TASK 17.02 — Learning Objective **Verifies and resets operating parameters** — JP Sign-off _____	17.02.01 Apply electricity, pneumatic and hydraulic principles — Rating ____ Complete ☐ Proof ____ Use ____	17.02.02 Select test instruments — Rating ____ Complete ☐ Proof ____ Use ____	17.02.03 Identify operating parameters — Rating ____ Complete ☐ Proof ____ Use ____	17.02.04 Demonstrate an understanding of control strategies such as PID loops, proportional control and on/off control — Rating ____ Complete ☐ Proof ____ Use ____	17.02.05 Follow manufacturer's specifications, tolerances and ranges — Rating ____ Complete ☐ Proof ____ Use ____
	17.02.06 Identify interface equipment — Rating ____ Complete ☐ Proof ____ Use ____	17.02.07 Interface devices — Rating ____ Complete ☐ Proof ____ Use ____	17.02.08 Simulate conditions such as temperature, current or voltage — Rating ____ Complete ☐ Proof ____ Use ____	17.02.09 Test and confirm functionality — Rating ____ Complete ☐ Proof ____ Use ____	17.02.10 Adjust parameters such as set points, differentials, scheduling and sequences — Rating ____ Complete ☐ Proof ____ Use ____

**17 - D
(cont'd)**

<u>Learning Outcome</u>
Maintains control systems

**Task 17
Learning Needs**

**Sub-Tasks
<u>Learning Objectives</u>**
to be completed
Comments

SUB-TASK 17.03 <u>Learning Objective</u> **Tests electrical/ electronic components in control system** **JP Sign-off** _____	**17.03.01** Apply electricity principles **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.02** Select electric and electronic test instruments **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.03** Identify types of control system components **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.04** Read and interpret equipment's electrical and electronic specifications **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.05** Verify equipment operation **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	17.03.06 Demonstrate an understanding of test procedures and techniques including voltage, amperage and ohm tests **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.07** Operate test instruments **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.08** Simulate a condition **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.09** Isolate electrical/electronic fault **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.03.10** Interpret and report test results **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
SUB-TASK 17.04 <u>Learning Objective</u> **Test mechanical components in control system** **JP Sign-off** _____	**17.04.01** Select mechanical test instruments **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.04.02** Identify types of components **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.04.03** Read and interpret equipment specifications **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.04.04** Verify equipment operation **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.04.05** Follow test procedures and techniques **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____
	17.04.06 Operate test equipment **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.04.07** Isolate a mechanical fault **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.04.08** Simulate an environmental condition **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	**17.04.09** Interpret and report test results **Rating** ____ **Complete** **Proof** ____ ▢ **Use** ____	

Task 17
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 17.05 Learning Objective **Recommends corrective action** **JP Sign-off** _____	**17.05.01** Determine repair/ replacement procedures Rating ____ Complete Proof ____ ☐ Use ____	**17.05.02** Evaluate repair/ replacement alternatives/options Rating ____ Complete Proof ____ ☐ Use ____	**17.05.03** Assess criteria such as cost, time and availability of equipment Rating ____ Complete Proof ____ ☐ Use ____	**17.05.04** Evaluate potential consequences of recommended action Rating ____ Complete Proof ____ ☐ Use ____	**17.05.05** Follow company repair/replacement policies Rating ____ Complete Proof ____ ☐ Use ____
	17.05.06 Read and interpret warranties and maintenance agreements Rating ____ Complete Proof ____ ☐ Use ____	**17.05.07** Estimate repair/ replacement costs Rating ____ Complete Proof ____ ☐ Use ____	**17.05.08** Determine repair options Rating ____ Complete Proof ____ ☐ Use ____	**17.05.09** Report fault and explain options to end user Rating ____ Complete Proof ____ ☐ Use ____	**17.05.10** Secure approval Rating ____ Complete Proof ____ ☐ Use ____
	17.05.11 Schedule repair Rating ____ Complete Proof ____ ☐ Use ____	**17.05.12** Prepare report Rating ____ Complete Proof ____ ☐ Use ____			

**17 - D
(cont'd)**

Learning Outcome
Maintains control systems

**Task 17
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

SUB-TASK 17.06 Learning Objective **Selects control system equipment and components** **JP Sign-off** _____	**17.06.01** Read and interpret control system equipment/ component specifications such as voltages and sizes **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.02** Identify control system equipment sources and availability **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.03** Determine equipment alternatives such as original equipment manufacturer or generic **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.04** Follow company policies such as preferred suppliers and purchasing **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.05** Evaluate time constraints **Rating** ____ **Complete** **Proof** ____ **Use** ____
	17.06.06 Coordinate ordering of equipment/components **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.07** Evaluate equipment options **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.08** Evaluate logistical requirements such as shipping **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.09** Expedite orders **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.06.10** Fabricate components such as brackets, hangers and mounts **Rating** ____ **Complete** **Proof** ____ **Use** ____
SUB-TASK 17.07 Learning Objective **Replaces defective control components and equipment** **JP Sign-off** _____	**17.07.01** Identify required replacement procedures/ techniques **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.02** Select tools, equipment and resources required to complete job **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.03** Evaluate equipment limitations/specifications such as weight, capacity, voltages and programming **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.04** Schedule required equipment, human resources, tools and materials **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.05** Source required tools, resources and equipment such as meters, gauges and recorders **Rating** ____ **Complete** **Proof** ____ **Use** ____
	17.07.06 Transport or arrange transportation of required tools and equipment to job site **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.07** Shut down system **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.08** Isolate/lock out and tag out system **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.09** Access equipment and components **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.10** Dismantle equipment **Rating** ____ **Complete** **Proof** ____ **Use** ____
	17.07.11 Assemble equipment **Rating** ____ **Complete** **Proof** ____ **Use** ____	**17.07.12** Adjust equipment/ components **Rating** ____ **Complete** **Proof** ____ **Use** ____			

Rating:

6 - <u>Expert,</u> perform a task <u>beyond expected level and quality</u> of performance, <u>lead and/or teach others</u>

5 - <u>Highly skilled,</u> perform a task to the <u>highest level</u> and quality of performance, supervise others

4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision

3 - Complete a task to the level and quality of performance required by industry without assistance or supervision

2 - Complete a task with <u>some assistance</u> and supervision

1 - Complete task with assistance and <u>constant supervision</u>

Type of Proof: O - Observation   I - Interview   D - Documentation

Use: 1 - Daily   2 - Often   3 - Seldom   4 - Never

Task 17
Learning Needs

Sub-Tasks
Learning Objectives
to be completed
Comments

Knowledge, Skills and Abilities - <u>Competencies</u>

SUB-TASK 17.08 **Learning Objective** **Repairs/overhauls defective components and equipment for control system** **JP Sign-off** _____	**17.08.01** Identify repair/ overhaul procedures and techniques **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.02** Read and interpret equipment/component specifications including tolerances and limitations **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.03** Interpret manufacturer's specifications **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.04** Recommend adjustments **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.05** Shut down system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	17.08.06 Isolate/lock out and tag out system **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.07** Dismantle equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.08** Assemble parts **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.09** Override/bypass controls **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.10** Reprogram and adjust control systems **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	17.08.11 Create backup of data **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.08.12** Restore original parameters **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____			

17 - D **(cont'd)** <u>Learning Outcome</u> **Maintains control systems**	

Task 17
Learning Needs

Sub-Tasks
<u>Learning Objectives</u>
to be completed
Comments

SUB-TASK **17.09** <u>Learning Objective</u> **Verifies control system** **component function** **JP Sign-off** _____	**17.09.01** Determine control system equipment/component operation/function **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.02** Select test equipment for control systems **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.03** Determine original design parameters **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.04** Read and interpret equipment specifications such as capacity, voltages and sequence **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.05** Follow calibration techniques and procedures **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	17.09.06 Identify interface equipment such as computers, micro-processors and hand- held modules **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.07** Evaluate implications/ possible consequences of adjustments to items such as set points, schedules and sequences **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.08** Simulate fault conditions **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.09** Test component operation for functionality **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.10** Interpret specifications **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	17.09.11 Interpret and report test results **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.12** Override/bypass controls **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.13** Calibrate controllers and transmitters **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.14** Utilize interface equipment **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.09.15** Adjust parameters such as set points, differentials, scheduling and sequences **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____

SUB-TASK **17.10** <u>Learning Objective</u> **Performs preventative** **maintenance on control** **system** **JP Sign-off** _____	**17.10.01** Read an interpret preventative maintenance requirements such as schedule and manufacturer's recommendations **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.10.02** Follow preventative maintenance procedures **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.10.03** Assess the need to replace consumables **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.10.04** Replace consumables such as filters and batteries **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____	**17.10.05** Conduct maintenance activities such as cleaning, lubricating, tightening and adjusting **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____
	17.10.06 Return system to operation **Rating** ____ **Complete** **Proof** ____ ☐ **Use** ____				

**Task 17
Learning Needs**

**Sub-Tasks
Learning Objectives**
to be completed
Comments

Rating:

6 - Expert, perform a task beyond expected level and quality of performance, lead and/or teach others
5 - Highly skilled, perform a task to the highest level and quality of performance, supervise others
4 - Meet task timelines and perform tasks to the highest level and quality required by industry, without supervision
3 - Complete a task to the level and quality of performance required by industry without assistance or supervision
2 - Complete a task with some assistance and supervision
1 - Complete task with assistance and constant supervision

Type of Proof: O - Observation I - Interview D - Documentation

Use: 1 - Daily 2 - Often 3 - Seldom 4 - Never

Knowledge, Skills and Abilities - Competencies

SUB-TASK 17.11 Learning Objective **Calibrates operating and safety controls** JP Sign-off _____	**17.11.01** Identify operation of control systems Rating ____ Complete Proof ____ Use ____	**17.11.02** Determine testing and calibration procedures and techniques Rating ____ Complete Proof ____ Use ____	**17.11.03** Test operating and safety controls for range of calibration Rating ____ Complete Proof ____ Use ____	**17.11.04** Calibrate controls to specified range Rating ____ Complete Proof ____ Use ____	**17.11.05** Calibrate controllers and transmitters Rating ____ Complete Proof ____ Use ____

APPENDIX A

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Technical Reading	➢ Find and use information from one source - i.e., a book, Internet, and work order ➢ Find and use information from many parts of a single source - i.e., a code book ➢ Recognize what is important from several sources of information ➢ Interpret information using more than one source ➢ Apply information to the task
Document Use	➢ Use large or difficult documents which are organized into units, headings chapters or sub-headings -i.e., a code book ➢ Find information in large or very specialized documents which may have many smaller documents - i.e., operations manuals, safety manuals ➢ Find information from many sources - i.e., code books, blueprints, work manuals ➢ Enter information into pre-set documents and forms - i.e., accident report forms, order forms ➢ Combine information from several sources and use it – i.e., alter a work order using information from code books, manuals and blueprints ➢ Create new documents using information from a variety of sources – i.e., create work orders, material lists, time log sheets

Trade essentials
More skills … more opportunities

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Writing	➢ Write information into a pre-set form – i.e., contract, lease, building permit ➢ Write short messages, explanations, requests or directions – i.e., write a work order, memo, written message for a foreman, supervisor or client ➢ Write longer messages, explanations, requests or directions – i.e., write an accident report, a detailed message to a foreman, supervisor or client ➢ Write a longer article which may need to be organized into headings with a table of contents, i.e., work report, section of a work manual ➢ Write detailed, non-routine articles – i.e., make recommendations, use technical language to give directions to or ask for information from other tradespeople
Math	➢ Perform math calculations using formulas, fractions, decimals and percent ➢ Combine one or more math operations to solve a problem ➢ Estimate numbers ➢ Convert between imperial and metric measurement systems ➢ Solve equations ➢ Use trigonometry to solve problems (not a requirement in every trade)

Trade essentials
More skills … more opportunities

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Computer Use	➢ Perform basic computer operations needed to produce a document – i.e., a letter ➢ Find information on the Internet ➢ Find information in workplace databases ➢ Send and receive e-mail ➢ Enter data into a set format – i.e., form, spreadsheet, chart ➢ Manage electronic information – i.e., save files ➢ Choose and use the best software program for the task
Oral Communication	➢ Take directions from a supervisor or co-workers on work-related projects ➢ Give directions to co-workers on work-related projects ➢ Exchange information using trade terminology ➢ Provide details on facts ➢ Provide opinions on work-related projects ➢ Organize, present and interpret ideas in a logical manner ➢ Communicate one-on-one or in a group about complex work-related matters

Trade essentials
More skills … more opportunities

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Thinking Skills	- Identify problems - Apply learning from previous experiences to identify possible solutions to a problem - Find, evaluate and choose appropriate information to solve a problem - Evaluate the best possible solution to a problem - Make decisions - Plan and organize job tasks to set time-lines - Ensure quality control standards are met
Working with Others	- Complete tasks to industry standard under supervision - Complete tasks to industry standard without supervision - Complete assigned tasks to meet time-lines that meet project deadlines - Accept feedback - Give feedback - Evaluate and apply recommendations from co-workers - Resolve conflict - Mentor an apprentice

Trade essentials
More skills … more opportunities

ESSENTIAL SKILL	REQUIRED ESSENTIAL SKILLS TASKS FOR TRADES
Continuous Learning	➢ Identify work/career strengths and areas for improvement ➢ Develop a work/career learning plan ➢ Set goals ➢ Participate in learning opportunities to meet workplace goals ➢ Apply new learning in the workplace environment ➢ Revisit, reflect and revise the learning plan regularly ➢ Engage in learning opportunities to keep skills current and meet career goals