PROGRAM PROGRAMME
EXCELLENCE
RED SEAL · SCEAU ROUGE

TRADE PROFILE

Industrial Mechanic (Millwright)

2017

INTERPROVINCIAL STANDARD
CANADA
NORME INTERPROVINCIALE

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STRUCTURE OF THE TRADE PROFILE

This profile has two sections that provide a snapshot of the trade's description, and all trade activities as they are organized in the Red Seal Occupational Standard:

Description of the Industrial Mechanic (Millwright) trade: An overview of the trade's duties, work environment, job requirements, similar occupations and career progression

Task Matrix: a chart which outlines graphically the major work activities, tasks and sub-tasks of this trade

Major Work Activity (MWA): the largest division within the standard that is comprised of a distinct set of trade activities

Task: distinct actions that describe the activities within a major work activity

Sub-task: distinct actions that describe the activities within a task

A complete version of the occupational standard, which provides additional detail for the trade activities, skills and knowledge can be found at www.red-seal.ca

DESCRIPTION OF THE INDUSTRIAL MECHANIC (MILLWRIGHT) TRADE

"Industrial Mechanic (Millwright)" is this trade's official Red Seal occupational title approved by the CCDA. This analysis covers tasks performed by industrial mechanics (millwrights) whose occupational title has been identified by some provinces and territories of Canada under the following names:

	NL	NS	PE	NB	QC	ON	MB	SK	AB	BC	NT	YT	NU
Industrial Mechanic (Millwright)	■	■	■	■	■		■	■		■	■	■	■
Millwright									■				
Industrial Mechanic Millwright						■							

Industrial mechanics (millwrights) work on industrial and mechanical equipment and components. This equipment may include mechanical, pneumatic, hydraulic, fuel, lubrication, cooling and exhaust systems and equipment. Some components worked on include pumps, gear boxes, fans, tanks, conveyors, presses, generators, prime movers, pneumatic and hydraulic systems, robotics and automated equipment.

Industrial mechanics (millwrights) are responsible for assembling, installing, aligning, commissioning, maintaining, repairing, diagnosing, inspecting, dismantling, moving and decommissioning equipment. Servicing may include diagnosing irregularities and malfunctions, making adjustments, and repairing or replacing parts. Cleaning and lubricating equipment are also important maintenance tasks of the trade.

Other tasks that may be performed include welding, cutting, rigging and machining as required. Industrial mechanics (millwrights) may prepare bases for equipment. In certain jurisdictions, industrial mechanics (millwrights) may assist other trades in troubleshooting and repairing other systems.

Industrial mechanics (millwrights) may refer to schematics, engineered drawings and manuals, both hard copy and electronic, to determine work procedures.

Industrial mechanics (millwrights) work with a wide variety of tools. They may use hand and power tools and access equipment in installation and repair work. Larger machine tools such as lathes, milling machines, drill presses and grinders may be used in fabrication of machine parts. Rigging, hoisting/lifting and moving equipment such as cranes, jacks and powered mobile equipment (PME) are commonly used to position large machines or machine parts.

Industrial mechanics (millwrights) are employed in all sectors of industry that involve mechanical moving equipment including mining, petrochemical, power generation, manufacturing, forestry, and processing facilities (food, service) among others. Industrial mechanics (millwrights) are involved with the installation, diagnosis, maintenance and repair of equipment and components.

The work environment for industrial mechanics (millwrights) is varied and may involve working in extreme or adverse conditions. They often work shift work. They may work in confined spaces, underground (in mines), at heights, with heavy equipment and around moving equipment. The work often requires considerable standing, kneeling and lifting of materials.

Key skills for people in this trade are mechanical aptitude, problem-solving, communication, job planning and organizing and the ability to use trade-related calculations. They have the ability to detect

malfunctions through sensory tests which are often confirmed by condition-based monitoring. Other important attributes include good coordination, manual dexterity and spatial visualization.

Industrial mechanics (millwrights) often possess overlapping skills with other tradespeople such as steamfitter/pipefitters, industrial instrument mechanics, power engineers, welders, machinists or industrial electricians. Industrial mechanics (millwrights) may work in specialized areas of the trade such as vibration analysis, thermography, tribology (fluid analysis) and laser/optical alignment. With experience, they may advance to other positions such as mentor, supervisor, planner, superintendent, manager, instructor or trainer.

INDUSTRIAL MECHANIC (MILLWRIGHT)

TASK MATRIX

A - PERFORMS COMMON OCCUPATIONAL SKILLS — 19%

Task A-1 **Performs safety-related functions** **17%**	**A-1.01 Uses personal protective equipment (PPE) and safety equipment**	**A-1.02 Maintains safe worksite**	**A-1.03 Protects the environment**
	A-1.04 Performs lock-out/tag-out and zero-energy state procedures		
Task A-2 **Uses tools and equipment** **21%**	**A-2.01 Uses hand and portable power tools**	**A-2.02 Uses shop machines**	**A-2.03 Uses access equipment**
Task A-3 **Performs routine trade tasks** **26%**	**A-3.01 Plans work**	**A-3.02 Fabricates work piece**	**A-3.03 Lubricates systems and components**
	A-3.04 Performs leveling of components and systems	**A-3.05 Uses fastening and retaining devices**	**A-3.06 Performs material identification**
	A-3.07 Performs heat treatment of metal	**A-3.08 Uses mechanical drawings and schematics**	
Task A-4 **Uses communication and mentoring techniques** **10%**	**A-4.01 Uses communication techniques**	**A-4.02 Uses mentoring techniques**	

Task A-5 **Performs measuring and layout** **16%**	**A-5.01 Prepares work area, tools and materials**	**A-5.02 Measures material and components**	**A-5.03 Lays out components**
	A-5.04 Maintains precision measuring and layout tools		
Task A-6 **Performs cutting and welding operations** **10%**	**A-6.01 Cuts material with oxy-fuel and plasma arc equipment**	**A-6.02 Joins material using oxy-fuel welding equipment**	**A-6.03 Welds material using shielded metal arc welding (SMAW) equipment**
	A-6.04 Welds material with gas metal arc welding (GMAW) equipment	**A-6.05 Welds material with gas tungsten arc welding (GTAW) equipment (NOT COMMON CORE)**	**A-6.06 Maintains welding equipment**

B - PERFORMS RIGGING, HOISTING/LIFTING AND MOVING — 13%

Task B-7 **Plans rigging, hoisting/lifting and moving** **48%**	**B-7.01 Determines load**	**B-7.02 Selects rigging equipment**	**B-7.03 Selects hoisting/lifting and moving equipment**
	B-7.04 Secures area		
Task B-8 **Rigs, hoists/lifts and moves load** **52%**	**B-8.01 Sets up rigging, hoisting/lifting and moving equipment**	**B-8.02 Performs hoist/lift and move**	**B-8.03 Maintains rigging, hoisting/lifting and moving equipment**

C - SERVICES MECHANICAL POWER TRANSMISSION COMPONENTS AND SYSTEMS

23%

Task C-9 **Services prime movers** **16%**	**C-9.01 Installs prime movers**	**C-9.02 Diagnoses prime movers**	**C-9.03 Maintains prime movers**
	C-9.04 Repairs prime movers		
Task C-10 **Services shafts, bearings and seals** **20%**	**C-10.01 Installs shafts, bearings and seals**	**C-10.02 Diagnoses shafts, bearings and seals**	**C-10.03 Maintains shafts, bearings and seals**
	C-10.04 Repairs shafts, bearings and seals		
Task C-11 **Services couplings, clutches and brakes** **16%**	**C-11.01 Installs couplings, clutches and brakes**	**C-11.02 Diagnoses couplings, clutches and brakes**	**C-11.03 Maintains couplings, clutches and brakes**
	C-11.04 Repairs couplings, clutches and brakes		
Task C-12 **Services chain and belt drive systems** **15%**	**C-12.01 Installs chain and belt drive systems**	**C-12.02 Diagnoses chain and belt drive systems**	**C-12.03 Maintains chain and belt drive systems**
	C-12.04 Repairs chain and belt drive systems		

Task C-13 **Services gear systems** **16%**	**C-13.01 Installs gear systems**	**C-13.02 Diagnoses gear systems**	**C-13.03 Maintains gear systems**
	C-13.04 Repairs gear systems		
Task C-14 **Performs shaft alignment procedures** **17%**	**C-14.01 Performs rough alignment**	**C-14.02 Performs dial alignment**	**C-14.03 Performs laser alignment**

D - SERVICES MATERIAL HANDLING / PROCESS SYSTEMS — 18%

Task D-15 **Services robotics and automated equipment** **7%**	**D-15.01 Installs robotics and automated equipment**	**D-15.02 Diagnoses robotics and automated equipment**	**D-15.03 Maintains robotics and automated equipment**
	D-15.04 Repairs robotics and automated equipment		
Task D-16 **Services fans and blowers** **17%**	**D-16.01 Installs fans and blowers**	**D-16.02 Diagnoses fans and blowers**	**D-16.03 Maintains fans and blowers**
	D-16.04 Repairs fans and blowers		
Task D-17 **Services pumps** **21%**	**D-17.01 Installs pumps**	**D-17.02 Diagnoses pumps**	**D-17.03 Maintains pumps**

	D-17.04 Repairs pumps		
Task D-18 **Services compressors** **20%**	D-18.01 Installs compressors	D-18.02 Diagnoses compressors	D-18.03 Maintains compressors
	D-18.04 Repairs compressors		
Task D-19 **Services process piping, tanks and containers** **15%**	D-19.01 Installs process tanks and containers	D-19.02 Installs process piping	D-19.03 Diagnoses process tanks and containers
	D-19.04 Diagnoses process piping	D-19.05 Maintains process tanks and containers	D-19.06 Maintains process piping
	D-19.07 Repairs process tanks and containers	D-19.08 Repairs process piping	
Task D-20 **Services conveying systems** **20%**	D-20.01 Installs conveying systems	D-20.02 Diagnoses conveying systems	D-20.03 Maintains conveying systems
	D-20.04 Repairs conveying systems		

E - SERVICES FLUID POWER SYSTEMS — 15%

Task E-21 **Services hydraulic systems** **57%**	**E-21.01 Installs hydraulic systems**	**E-21.02 Diagnoses hydraulic systems**	**E-21.03 Maintains hydraulic systems**
	E-21.04 Repairs hydraulic systems		
Task E-22 **Services pneumatic and vacuum systems** **43%**	**E-22.01 Installs pneumatic and vacuum systems**	**E-22.02 Diagnoses pneumatic and vacuum systems**	**E-22.03 Maintains pneumatic and vacuum systems**
	E-22.04 Repairs pneumatic and vacuum systems		

F - PERFORMS PREVENTATIVE AND PREDICTIVE MAINTENANCE, COMMISSIONING AND DECOMMISSIONING — 12%

Task F-23 **Performs preventative and predictive maintenance** **66%**	**F-23.01 Performs preventative maintenance activities**	**F-23.02 Performs vibration analysis procedures**	**F-23.03 Performs balancing procedures**
	F-23.04 Performs non-destructive testing (NDT) procedures	**F-23.05 Performs fluid analysis procedures**	**F-23.06 Performs predictive maintenance activities**
Task F-24 **Commissions and decommissions equipment** **34%**	**F-24.01 Commissions systems and components**	**F-24.02 Decommissions systems and components**	