



TORQ Analysis of Maintenance Workers, Machinery to Welders, Cutters, and Welder Fitters

ANALYSIS INPUT

Transfer	Title	O*NET	Filters		
From Title:	Maintenance Workers, Machinery	49-9043.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Welders, Cutters, and Welder Fitters	51-4121.06	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS

Grand TORQ:

91

Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	94	Level	85	Level	93

Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
Arm-Hand Steadiness	51	5	75	No Skills Upgrade Required!				No Knowledge Upgrades Required!			
Near Vision	50	4	65								
Visualization	51	5	50								
Oral Expression	50	4	56								
Multilimb Coordination	44	3	56								
Manual Dexterity	46	2	62								

LEVEL and IMPT (IMPORTANCE) refer to the Target Welders, Cutters, and Welder Fitters. GAP refers to level difference between Maintenance Workers, Machinery and Welders, Cutters, and Welder Fitters.

ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

Description	Maintenance Workers, Machinery	Welders, Cutters, and Welder Fitters	Importance
Arm-Hand Steadiness	46	51	75
Near Vision	46	50	65
Manual Dexterity	44	46	62
Control Precision	48	44	62
Oral Expression	46	50	56
Problem Sensitivity	42	39	56
Finger Dexterity	44	42	56



Multilimb Coordination	41	44	56
Oral Comprehension	50	46	53
Visualization	46	51	50
Selective Attention	44	44	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Maintenance Workers, Machinery	Welders, Cutters, and Welder Fitters	Importance
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Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Maintenance Workers, Machinery	Welders, Cutters, and Welder Fitters	Importance
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Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Maintenance Workers, Machinery	Welders, Cutters, and Welder Fitters	Description	Maintenance Workers, Machinery	Welders, Cutters, and Welder Fitters
10+ years	0%	1%	Doctoral	0%	0%
8-10 years	3%	1%	Professional Degree	0%	0%
6-8 years	0%	0%	Post-Masters Cert	0%	0%
4-6 years	10%	0%	Master's Degree	0%	0%
2-4 years	10%	17%	Post-Bachelor Cert	0%	0%
1-2 years	48%	23%	Bachelors	2%	0%
6-12 months	5%	28%	AA or Equiv	0%	0%
3-6 months	10%	6%	Some College	6%	8%
1-3 months	0%	1%	Post-Secondary Certificate	25%	26%
0-1 month	0%	6%	High School Diploma or GED	64%	26%
None	9%	11%	No HSD or GED	0%	38%

Maintenance Workers, Machinery

Welders, Cutters, and Welder Fitters

Most Common Educational/Training Requirement:

Short-term on-the-job training

Long-term on-the-job training

Job Zone Comparison

1 - Job Zone One: Little or No Preparation Needed

2 - Job Zone Two: Some Preparation Needed

No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.

Some previous work-related skill, knowledge, or experience may be helpful in these occupations, but usually is not needed. For example, a teller might benefit from experience working directly with the public, but an inexperienced person could still learn to be a teller with little difficulty.

These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.

These occupations usually require a high school diploma and may require some vocational training or job-related course work. In some cases, an associate's or bachelor's degree could be needed.

Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.

Employees in these occupations need anywhere from a few months to one year of working with experienced employees.

Tasks



Maintenance Workers, Machinery

Core Tasks

Generalized Work Activities:

- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Specific Tasks

Occupation Specific Tasks:

- Clean machines and machine parts, using cleaning solvents, cloths, air guns, hoses, vacuums, or other equipment.
- Collaborate with other workers to repair or move machines, machine parts, or equipment.
- Collect and discard worn machine parts and other refuse in order to maintain machinery and work areas.
- Dismantle machines and remove parts for repair, using hand tools, chain falls, jacks, cranes, or hoists.
- Inspect or test damaged machine parts, and mark defective areas or advise supervisors of repair needs.
- Install, replace, or change machine parts and attachments, according to production specifications.
- Inventory and requisition machine parts, equipment, and other supplies so that stock can be maintained and replenished.
- Lubricate or apply adhesives or other materials to machines, machine parts, or other equipment, according to specified procedures.
- Measure, mix, prepare, and test chemical solutions used to clean or repair machinery and equipment.
- Read work orders and specifications to determine machines and equipment requiring repair or maintenance.

Welders, Cutters, and Welder Fitters

Core Tasks

Generalized Work Activities:

- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Communicating with Supervisors, Peers, or Subordinates - Providing information to supervisors, co-workers, and subordinates by telephone, in written form, e-mail, or in person.
- Evaluating Information to Determine Compliance with Standards - Using relevant information and individual judgment to determine whether events or processes comply with laws, regulations, or standards.

Specific Tasks

Occupation Specific Tasks:

- Adjust electric current and timing cycles of resistance welding machines to heat metals to bonding temperature.
- Align and clamp workpieces together, using rules, squares, or hand tools, or position items in fixtures, jigs, or vises.
- Brush flux onto joints of workpieces or dip braze rods into flux, to prevent oxidation of metal.
- Clean equipment parts, such as tips of soldering irons, using chemical solutions or cleaning compounds.
- Clean joints of workpieces with wire brushes or by dipping them into cleaning solutions.
- Clean workpieces to remove dirt and excess acid, using chemical solutions, files, wire brushes, or grinders.
- Connect hoses from torches to regulator valves and cylinders of oxygen and specified gas fuels.
- Cut carbon electrodes to specified sizes and shapes, using cutoff saws.
- Dip workpieces into molten solder, or place solder strips between seams and heat seams with irons, to bond items together.
- Examine seams for defects, and rework defective joints or broken parts.
- Grind, cut, buff, or bend edges of workpieces to be joined to ensure snug fit, using power grinders and hand tools.
- Guide torches and rods along joints of



- Reassemble machines after the completion of repair or maintenance work.
- Record production, repair, and machine maintenance information.
- Remove hardened material from machines or machine parts, using abrasives, power and hand tools, jackhammers, sledgehammers, or other equipment.
- Replace or repair metal, wood, leather, glass, or other lining in machines, or in equipment compartments or containers.
- Replace, empty, or replenish machine and equipment containers such as gas tanks or boxes.
- Set up and operate machines, and adjust controls to regulate operations.
- Start machines and observe mechanical operation to determine efficiency and to detect problems.
- Transport machine parts, tools, equipment, and other material between work areas and storage, using cranes, hoists, or dollies.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- apply cleaning solvents
- assist mechanic, or extractive or construction trades craft worker
- clean equipment or machinery
- clean rooms or work areas
- construct, erect, or repair wooden frameworks or structures
- cut, shape, fit, or join wood or other construction materials
- erect scaffold
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- install equipment or attachments on machinery or related structures
- inventory stock to ensure adequate supplies
- load or unload material or workpiece into machinery
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain repair records
- mix paint, ingredients, or chemicals, according to specifications
- move materials or goods between work areas
- move or fit heavy objects
- observe or listen to machinery or

workpieces to heat them to brazing temperature, melt braze alloys, and bond workpieces together.

- Heat soldering irons or workpieces to specified temperatures for soldering, using gas flames or electric current.
- Melt and apply solder along adjoining edges of workpieces to solder joints, using soldering irons, gas torches, or electric-ultrasonic equipment.
- Melt and apply solder to fill holes, indentations, and seams of fabricated metal products, using soldering equipment.
- Melt and separate brazed or soldered joints to remove and straighten damaged or misaligned components, using hand torches, irons or furnaces.
- Place solder bars into containers, and turn knobs to specified positions to melt solder and regulate its temperature.
- Remove workpieces from fixtures, using tongs, and cool workpieces, using air or water.
- Remove workpieces from molten solder and hold parts together until color indicates that solder has set.
- Select torch tips, flux, and brazing alloys from data charts or work orders.
- Smooth soldered areas with alternate strokes of paddles and torches, leaving soldered sections slightly higher than surrounding areas for later filing.
- Sweat together workpieces coated with solder.
- Turn dials to set intensity and duration of ultrasonic impulses, according to work order specifications.
- Turn valves to start flow of gases, and light flames and adjust valves to obtain desired colors and sizes of flames.

Detailed Tasks

Detailed Work Activities:

- adjust welding equipment
- apply cleaning solvents
- apply flux to workpiece before soldering or brazing
- braze metal parts or components together
- clean or degrease weld, or parts to be welded or soldered
- examine products or work to verify conformance to specifications
- fabricate, assemble, or disassemble manufactured products by hand
- file, sand, grind, or polish metal or plastic objects
- identify properties of metals for repair or fabrication activities
- load or unload material or workpiece into machinery
- monitor the quantity of assembly output



- equipment operation to detect malfunctions
- operate crane in construction, manufacturing or repair setting
 - operate hoist, winch, or hydraulic boom
 - operate sandblasting equipment
 - operate vacuum or air hose
 - perform safety inspections in industrial, manufacturing or repair setting
 - read specifications
 - read work order, instructions, formulas, or processing charts
 - repair or replace malfunctioning or worn mechanical components
 - repair sheet metal products
 - requisition stock, materials, supplies or equipment
 - signal directions or warnings to coworkers
 - test materials or solutions
 - test mechanical products or equipment
 - understand service or repair manuals
 - understand technical operating, service or repair manuals
 - use acetylene welding/cutting torch
 - use basic carpentry techniques
 - use control or regulating devices to adjust or maintain industrial machinery
 - use hand or power tools
 - use hand or power woodworking tools
 - use high voltage apparatus
 - use knowledge of metric system
 - use measuring devices in repairing industrial or heavy equipment
 - use pneumatic tools
 - use precision measuring devices in mechanical repair work
 - use pressure gauges
 - work as a team member

Technology - Examples

Data base user interface and query software

- Database software

Spreadsheet software

- Spreadsheet software

Word processing software

- Word processing software

Tools - Examples

- Abrasive wheels
- Abrasive rubbing stones
- Adjustable widemouth pliers
- Adjustable wrenches

- move or fit heavy objects
- perform safety inspections in industrial, manufacturing or repair setting
- position, clamp or assemble workpiece prior to welding
- preheat metal before welding, brazing, or soldering
- read blueprints
- read production layouts
- read technical drawings
- read work order, instructions, formulas, or processing charts
- sharpen metal objects
- solder metal parts or components together
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use braze-welding equipment
- use hand or power tools
- use soldering equipment

Technology - Examples

Analytical or scientific software

- Scientific Software Group Filter Drain FD

Calendar and scheduling software

- OmniFleet Equipment Maintenance Management

Computer aided design CAD software

- EZ Pipe software

Project management software

- Recordkeeping software

Tools - Examples

- Wrenches
- Anvils
- Bandsaws
- Slitters
- Motorized cutting torches
- Calipers
- Desktop computers
- Underwater electrode holders
- Files
- Gas flow measurement instruments
- Forklifts
- Current converters



- Bandsaws
- Oxyacetylene torches
- Dial calipers
- Compressed air guns
- Deburring tools
- Dollies
- Drill bits
- Ear plugs
- Forklifts
- Dial indicators
- Grease guns
- Lapping equipment
- Hammers
- Hard hats
- Chain falls
- Hold down clamps
- Jacks
- Ladders
- Lathes
- Levels
- Lockout hasps
- Metal cutters
- Metal inert gas MG welders
- Micrometers
- Milling machines
- Personal computers
- Plumb bobs
- Jackhammers
- Buffing machines
- Power drills
- Grinding machines
- Bench saws
- Brazing equipment
- Goggles
- Grinding machinery
- Hand chipping hammers
- Clamps
- Temperature measurement instruments
- Electric overhead hoists
- Hydraulic presses
- Impact wrenches
- Hydraulic jacks
- Ladders
- Laser printers
- Laser welders
- Lathes
- Levels
- Light trucks
- Hydraulic truck lifts
- Metal inert gas MG welders
- Metal markers
- Punches
- Computerized numerical control CNC programmable welding robot controllers
- Micrometers
- Milling machines
- Nibblers
- Personal computers
- Pipe cutters
- Plasma welders
- Air drills
- Air chisels
- Air scalers
- Buffers
- Power chippers



- Punches
- Reamers
- Respirators
- Rivet guns
- Rulers
- Safety glasses
- Safety belts
- Hacksaws
- Scaffolding
- Screwdrivers
- Shears
- Rigging equipment
- Socket wrench sets
- Soldering guns
- Steel rules
- Sheet metal folders
- Dies
- Pipe threaders
- Tungsten inert gas TIG welding equipment
- Industrial vacuums
- Arc welders
- Welding tips
- Spot-welding equipment
- Workshop cranes
- Brakes
- Power drills
- Power grinders
- Cutoff saws
- Steamers
- Waterproof gloves
- Angle finders
- Pinchbars
- Comealongs
- Ratchets
- Self-contained breathing equipment
- Respirator hose masks
- Welding lenses
- Scaffolding
- Scribes
- Shears
- Socket sets
- Soldering irons
- Wire feed rate measurement instruments
- Squares
- Straightedges
- Metal benders
- Dies
- Fillet weld gauges
- Electric pipe threaders
- Hand pipe threaders
- Tungsten inert gas TIG welding equipment
- Two way radios
- Ultrasonic welding equipment
- Arc voltage measurement instruments
- Arc welders
- Underwater electrodes
- Direct current DC sources



- Face shields
- Welding tips
- Welding robots
- Rod ovens
- Electrode wires
- Dive suits
- Winches
- Power wire brushes
- Wire cutters
- Overhead cranes
- Brakes

Labor Market Comparison

Maine Department of Labor.

Description	Maintenance Workers, Machinery	Welders, Cutters, and Welder Fitters	Difference
Median Wage	\$ 34,100	\$ 38,030	\$ 3,930
10th Percentile Wage	\$ 18,630	\$ 22,680	\$ 4,050
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 38,610	\$ 46,190	\$ 7,580
90th Percentile Wage	\$ 43,370	\$ 50,780	\$ 7,410
Mean Wage	\$ 32,410	\$ 38,260	\$ 5,850
Total Employment - 2521	290	1,610	1,320
Employment Base - 2006	337	1,691	1,354
Projected Employment - 2530	278	1,816	1,538
Projected Job Growth - 2006-2530	-17.5 %	7.4 %	24.9 %
Projected Annual Openings - 2006-2530	5	49	44
Special			

Special Occupations:

National Job Posting Trends

Trend for Maintenance Workers, Machinery and Welders, Cutters, and Welder Fitters



Programs			
Related Programs			
Welder/Welding Technologist			
<p>Welding Technology/Welder. A program that prepares individuals to apply technical knowledge and skills to join or cut metal surfaces. Includes instruction in arc welding, resistance welding, brazing and soldering, cutting, high-energy beam welding and cutting, solid state welding, ferrous and non-ferrous materials, oxidation-reduction reactions, welding metallurgy, welding processes and heat treating, structural design, safety, and applicable codes and standards.</p>			
Institution	Address	City	URL
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu
Wasington County Community College	One College Drive	Calais	www.wccc.me.edu

Maine Statewide Promotion Opportunities for Maintenance Workers, Machinery									
O* NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
49-9043.00	Maintenance Workers, Machinery	100	1	290	\$34,100.00	\$0.00	-17%	5	
51-4121.06	Welders, Cutters, and Welder Fitters	91	2	1,610	\$38,030.00	\$3,930.00	7%	49	★



49-9044.00	Millwrights	90	3	830	\$41,280.00	\$7,180.00	-12%	11	
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	88	3	110	\$34,350.00	\$250.00	-9%	2	
47-5021.00	Earth Drillers, Except Oil and Gas	88	3	140	\$37,470.00	\$3,370.00	2%	4	
49-9041.00	Industrial Machinery Mechanics	88	3	990	\$39,370.00	\$5,270.00	7%	25	★
49-3051.00	Motorboat Mechanics	88	3	240	\$34,980.00	\$880.00	6%	8	★
49-3042.00	Mobile Heavy Equipment Mechanics, Except Engines	87	4	880	\$37,010.00	\$2,910.00	5%	22	★
47-2011.00	Boilermakers	87	4	60	\$39,260.00	\$5,160.00	12%	3	
49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	87	3	1,180	\$34,210.00	\$110.00	6%	34	★
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	86	3	440	\$49,450.00	\$15,350.00	-19%	15	
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	85	3	130	\$35,960.00	\$1,860.00	4%	4	
51-4111.00	Tool and Die Makers	85	3	160	\$51,670.00	\$17,570.00	-11%	2	
51-4041.00	Machinists	84	3	1,860	\$41,560.00	\$7,460.00	4%	35	★
53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	84	3	60	\$42,890.00	\$8,790.00	5%	2	

Special Occupations:

Top Industries for Welders, Cutters, and Welder Fitters



Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Architectural and structural metals manufacturing	332300	11.33%	46,347	52,658	13.62%
Agriculture, construction, and mining machinery manufacturing	333100	6.36%	26,009	25,834	-0.67%
Self-employed workers, primary job	000601	5.26%	21,505	24,372	13.33%
Motor vehicle body and trailer manufacturing	336200	5.12%	20,924	21,779	4.09%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	4.38%	17,916	20,168	12.57%
Other general purpose machinery manufacturing	333900	3.83%	15,672	15,050	-3.97%
Boiler, tank, and shipping container manufacturing	332400	3.10%	12,686	12,161	-4.14%
Motor vehicle parts manufacturing	336300	3.03%	12,410	10,511	-15.31%
Machine shops	332710	3.03%	12,381	10,895	-12.00%
Other fabricated metal product manufacturing	332900	2.73%	11,163	10,522	-5.74%
Employment services	561300	2.58%	10,544	14,196	34.64%
Ship and boat building	336600	2.51%	10,285	12,246	19.07%
Ventilation, heating, air-conditioning, and commercial refrigeration equipment manufacturing	333400	2.39%	9,762	9,553	-2.14%
Nonresidential building construction	236200	2.03%	8,323	9,921	19.20%
Industrial machinery manufacturing	333200	1.31%	5,341	4,655	-12.85%

Top Industries for Maintenance Workers, Machinery

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Local government, excluding education and hospitals	939300	6.40%	5,397	6,063	12.34%
Motor vehicle parts manufacturing	336300	3.89%	3,278	2,610	-20.39%
Plastics product manufacturing	326100	3.16%	2,666	2,826	6.00%
Animal production; primary job	112000	2.73%	2,304	2,043	-11.34%
Animal slaughtering and processing	311600	2.47%	2,079	2,373	14.13%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	2.36%	1,988	2,104	5.82%
Support activities for air transportation	488100	2.25%	1,897	2,292	20.80%
Coal mining	212100	1.76%	1,483	1,498	0.99%
Pharmaceutical and medicine manufacturing	325400	1.71%	1,439	1,814	26.03%
Colleges, universities, and professional schools, public and private	611300	1.70%	1,437	1,608	11.87%
Fabric mills	313200	1.53%	1,286	908	-29.38%

Commercial and industrial machinery and equipment rental and leasing	532400	1.52%	1,281	1,565	22.19%
Pulp, paper, and paperboard mills	322100	1.49%	1,256	871	-30.64%
Electric power generation, transmission and distribution	221100	1.47%	1,241	1,141	-8.03%
Converted paper product manufacturing	322200	1.39%	1,168	980	-16.08%

TORQ Analysis of Maintenance Workers, Machinery to Millwrights

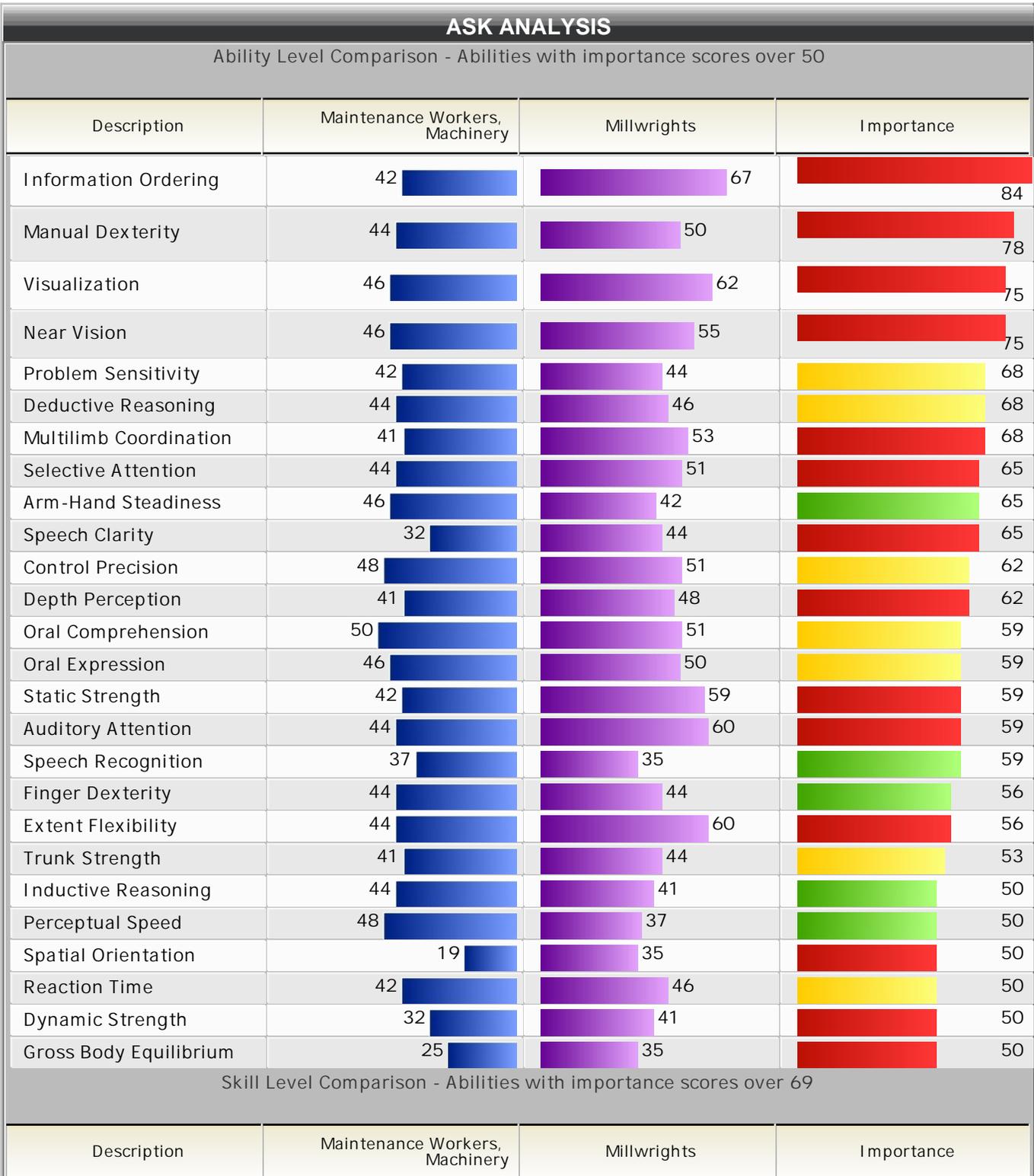
ANALYSIS INPUT					
Transfer	Title	O*NET	Filters		
From Title:	Maintenance Workers, Machinery	49-9043.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Millwrights	49-9044.00	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS					
Grand TORQ:					90
Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	 84	Level	 91	Level	 97

Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
Information Ordering	67	25	84	Judgment and Decision Making	57	16	81	No Knowledge Upgrades Required!			
Visualization	62	16	75	Mathematics	69	6	74				
Static Strength	59	17	59	Equipment Selection	66	5	82				
Auditory Attention	60	16	59								
Extent Flexibility	60	16	56								
Multilimb Coordination	53	12	68								
Spatial Orientation	35	16	50								
Speech Clarity	44	12	65								
Near Vision	55	9	75								
Gross Body Equilibrium	35	10	50								
Manual Dexterity	50	6	78								
Selective Attention	51	7	65								
Dynamic Strength	41	9	50								
Depth Perception	48	7	62								
Oral Expression	50	4	59								
Reaction Time	46	4	50								
Control Precision	51	3	62								

Trunk Strength	44	3	53
Problem Sensitivity	44	2	68
Deductive Reasoning	46	2	68
Oral Comprehension	51	1	59

LEVEL and IMPT (IMPORTANCE) refer to the Target Millwrights. GAP refers to level difference between Maintenance Workers, Machinery and Millwrights.





Equipment Selection	61	66	82
Judgment and Decision Making	41	57	81
Mathematics	63	69	74
Knowledge Level Comparison - Knowledge with importance scores over 69			
Description	Maintenance Workers, Machinery	Millwrights	Importance

Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Maintenance Workers, Machinery	Millwrights	Description	Maintenance Workers, Machinery	Millwrights
10+ years	0%	8%	Doctoral	0%	0%
8-10 years	3%	0%	Professional Degree	0%	0%
6-8 years	0%	7%	Post-Masters Cert	0%	0%
4-6 years	10%	29%	Master's Degree	0%	0%
2-4 years	10%	8%	Post-Bachelor Cert	0%	0%
1-2 years	48%	17%	Bachelors	2%	0%
6-12 months	5%	19%	AA or Equiv	0%	0%
3-6 months	10%	0%	Some College	6%	1%
1-3 months	0%	0%	Post-Secondary Certificate	25%	33%
0-1 month	0%	0%	High School Diploma or GED	64%	43%
None	9%	7%	No HSD or GED	0%	22%

Maintenance Workers, Machinery	Millwrights
Most Common Educational/Training Requirement:	
Short-term on-the-job training	Long-term on-the-job training
Job Zone Comparison	
1 - Job Zone One: Little or No Preparation Needed	3 - Job Zone Three: Medium Preparation Needed
No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.	Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.
These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.	Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.
Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.	Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

Tasks

Maintenance Workers, Machinery	Millwrights
Core Tasks	Core Tasks



Generalized Work Activities:

- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Specific Tasks

Occupation Specific Tasks:

- Clean machines and machine parts, using cleaning solvents, cloths, air guns, hoses, vacuums, or other equipment.
- Collaborate with other workers to repair or move machines, machine parts, or equipment.
- Collect and discard worn machine parts and other refuse in order to maintain machinery and work areas.
- Dismantle machines and remove parts for repair, using hand tools, chain falls, jacks, cranes, or hoists.
- Inspect or test damaged machine parts, and mark defective areas or advise supervisors of repair needs.
- Install, replace, or change machine parts and attachments, according to production specifications.
- Inventory and requisition machine parts, equipment, and other supplies so that stock can be maintained and replenished.
- Lubricate or apply adhesives or other materials to machines, machine parts, or other equipment, according to specified procedures.
- Measure, mix, prepare, and test chemical solutions used to clean or repair machinery and equipment.
- Read work orders and specifications to determine machines and equipment requiring repair or maintenance.
- Reassemble machines after the completion of repair or maintenance work.
- Record production, repair, and machine maintenance information.

Generalized Work Activities:

- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Operating Vehicles, Mechanized Devices, or Equipment - Running, maneuvering, navigating, or driving vehicles or mechanized equipment, such as forklifts, passenger vehicles, aircraft, or water craft.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Making Decisions and Solving Problems - Analyzing information and evaluating results to choose the best solution and solve problems.

Specific Tasks

Occupation Specific Tasks:

- Align machines and equipment, using hoists, jacks, hand tools, squares, rules, micrometers, and plumb bobs.
- Assemble and install equipment, using hand tools and power tools.
- Assemble machines, and bolt, weld, rivet, or otherwise fasten them to foundation or other structures, using hand tools and power tools.
- Attach moving parts and subassemblies to basic assembly unit, using hand tools and power tools.
- Bolt parts, such as side and deck plates, jaw plates, and journals, to basic assembly unit.
- Connect power unit to machines or steam piping to equipment, and test unit to evaluate its mechanical operation.
- Construct foundation for machines, using hand tools and building materials such as wood, cement, and steel.
- Dismantle machinery and equipment for shipment to installation site, usually performing installation and maintenance work as part of team.
- Dismantle machines, using hammers, wrenches, crowbars, and other hand tools.
- Insert shims, adjust tension on nuts and bolts, or position parts, using hand tools and measuring instruments, to set specified clearances between moving and stationary parts.
- Install robot and modify its program, using teach pendant.
- Lay out mounting holes, using measuring instruments, and drill holes with power drill.



Maintenance Information:

- Remove hardened material from machines or machine parts, using abrasives, power and hand tools, jackhammers, sledgehammers, or other equipment.
- Replace or repair metal, wood, leather, glass, or other lining in machines, or in equipment compartments or containers.
- Replace, empty, or replenish machine and equipment containers such as gas tanks or boxes.
- Set up and operate machines, and adjust controls to regulate operations.
- Start machines and observe mechanical operation to determine efficiency and to detect problems.
- Transport machine parts, tools, equipment, and other material between work areas and storage, using cranes, hoists, or dollies.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- apply cleaning solvents
- assist mechanic, or extractive or construction trades craft worker
- clean equipment or machinery
- clean rooms or work areas
- construct, erect, or repair wooden frameworks or structures
- cut, shape, fit, or join wood or other construction materials
- erect scaffold
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- install equipment or attachments on machinery or related structures
- inventory stock to ensure adequate supplies
- load or unload material or workpiece into machinery
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain repair records
- mix paint, ingredients, or chemicals, according to specifications
- move materials or goods between work areas
- move or fit heavy objects
- observe or listen to machinery or equipment operation to detect malfunctions
- operate crane in construction, manufacturing or repair setting

- Level bedplate and establish centerline, using straightedge, levels, and transit.
- Move machinery and equipment, using hoists, dollies, rollers, and trucks.
- Operate engine lathe to grind, file, and turn machine parts to dimensional specifications.
- Position steel beams to support bedplates of machines and equipment, using blueprints and schematic drawings, to determine work procedures.
- Repair and lubricate machines and equipment.
- Replace defective parts of machine or adjust clearances and alignment of moving parts.
- Shrink-fit bushings, sleeves, rings, liners, gears, and wheels to specified items, using portable gas heating equipment.
- Signal crane operator to lower basic assembly units to bedplate, and align unit to centerline.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- align or adjust clearances of mechanical components or parts
- assemble and install pipe sections, fittings, or plumbing fixtures
- assemble, dismantle, or reassemble equipment or machinery
- conduct performance testing
- conduct tests to locate mechanical system malfunction
- construct, erect, or repair wooden frameworks or structures
- cut, bend, or thread pipe for gas, air, hydraulic, or water lines
- determine installation, service, or repair needed
- determine project methods and procedures
- diagnose mechanical problems in machinery or equipment
- drive truck with capacity greater than 3 tons
- erect scaffold
- estimate time or cost for installation, repair, or construction projects
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- identify properties of metals for repair or fabrication activities
- inspect electrical installation for code conformance
- install electrical conduit or tubing
- install electrical fixtures or components



- operate hoist, winch, or hydraulic boom
- operate sandblasting equipment
- operate vacuum or air hose
- perform safety inspections in industrial, manufacturing or repair setting
- read specifications
- read work order, instructions, formulas, or processing charts
- repair or replace malfunctioning or worn mechanical components
- repair sheet metal products
- requisition stock, materials, supplies or equipment
- signal directions or warnings to coworkers
- test materials or solutions
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use basic carpentry techniques
- use control or regulating devices to adjust or maintain industrial machinery
- use hand or power tools
- use hand or power woodworking tools
- use high voltage apparatus
- use knowledge of metric system
- use measuring devices in repairing industrial or heavy equipment
- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use pressure gauges
- work as a team member

Technology - Examples

Data base user interface and query software

- Database software

Spreadsheet software

- Spreadsheet software

Word processing software

- Word processing software

Tools - Examples

- Abrasive wheels
- Abrasive rubbing stones
- Adjustable widemouth pliers
- Adjustable wrenches
- Bandsaws

- install electronic equipment, components, or systems
- install equipment or attachments on machinery or related structures
- install generating plant equipment
- install industrial machinery or related heavy equipment
- install or replace meters, regulators, or related measuring or control devices
- install/connect electrical equipment to power circuit
- install/string electrical or electronic cable or wiring
- lay out machining, welding or precision assembly projects
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain or repair work tools or equipment
- maintain welding machines or equipment
- move materials or goods between work areas
- move or fit heavy objects
- operate hoist, winch, or hydraulic boom
- operate lathes
- operate pneumatic test equipment
- perform detailed welding techniques
- perform hydraulic plumbing
- perform safety inspections in industrial, manufacturing or repair setting
- plan or organize work
- position, align, or level machines, equipment, or structures
- program computer numerical controlled machines
- read blueprints
- read schematics
- read specifications
- read technical drawings
- read work order, instructions, formulas, or processing charts
- repair or replace malfunctioning or worn mechanical components
- set up and operate variety of machine tools
- set up computer numerical control machines
- signal directions or warnings to coworkers
- test electrical/electronic wiring, equipment, systems or fixtures
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use arc welding equipment
- use basic carpentry techniques



- Oxyacetylene torches
- Dial calipers
- Compressed air guns
- Deburring tools
- Dollies
- Drill bits
- Ear plugs
- Forklifts
- Dial indicators
- Grease guns
- Lapping equipment
- Hammers
- Hard hats
- Chain falls
- Hold down clamps
- Jacks
- Ladders
- Lathes
- Levels
- Lockout hasps
- Metal cutters
- Metal inert gas MIG welders
- Micrometers
- Milling machines
- Personal computers
- Plumb bobs
- Jackhammers
- Buffing machines
- Power drills
- Grinding machines
- Bench saws
- Punches

- use basic plumbing techniques
- use combination welding procedures
- use concrete fabrication techniques
- use control or regulating devices to adjust or maintain industrial machinery
- use electrical or electronic test devices or equipment
- use hand or power tools
- use high voltage apparatus
- use knowledge of metric system
- use knowledge of welding filler rod types
- use machine tools in installation, maintenance, or repair
- use measuring devices in repairing industrial or heavy equipment
- use pipe fitting equipment
- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use pressure gauges
- use robotics systems technology
- use soldering equipment
- verify levelness or verticality, using level or plumb bob
- weld together metal parts, components, or structures
- work as a team member

Technology - Examples

Computer aided design CAD software

- Autodesk AutoCAD software
- Computer aided design CAD software
- SolidWorks CAD software

Office suite software

- Microsoft Office

Tools - Examples

- Adjustable wrenches
- Air compressors
- Bandsaws
- Workshop bench vises
- Block and tackle equipment
- Oxyacetylene torches
- Box end wrenches
- Keyway broaches
- Dial calipers



- Reamers
- Respirators
- Rivet guns
- Rulers
- Safety glasses
- Safety belts
- Hacksaws
- Scaffolding
- Screwdrivers
- Shears
- Rigging equipment
- Socket wrench sets
- Soldering guns
- Steel rules
- Sheet metal folders
- Dies
- Pipe threaders
- Tungsten inert gas TIG welding equipment
- Industrial vacuums
- Arc welders
- Welding tips
- Spot-welding equipment
- Workshop cranes
- Brakes

- Cold chisels
- Combination wrenches
- Dividers
- Depth gauges
- Diagonal cutters
- Dollies
- Cylinder hones
- Protective ear muffs
- Welding electrode holders
- Angled feeler gauges
- Flat files
- Forklifts
- Gage blocks
- Gas-powered generators
- Dial indicators
- Gear shapers
- Safety goggles
- Filler pumps
- Surface grinders
- Chipping hammers
- Ball peen hammers
- Hand clamps
- Bucket pumps
- Handtrucks
- Height gauges
- Allen wrenches
- Chain falls
- Gasket cutters
- Hydraulic press frames
- Hydraulic pumps
- Bearing heaters
- Hydraulic jacks



- Ladders
- Turning lathes
- Transit levels
- Carpenters' levels
- Hoisting hooks
- Inspection mirrors
- Chain cutters
- Metal inert gas MIG welders
- Prick punches
- Teach pendants
- Depth micrometers
- End mills
- Needlenose pliers
- Nibblers
- Nut splitters
- Lubrication guns
- Personal computers
- Pipe cutters
- Pipe wrenches
- Planing machines
- Plasma welders
- Plumb bobs
- Pneumatic needle scalers
- Core drills
- Power grinders
- Belt sanders
- Cutoff saws
- Welding gloves
- Bevel protractors
- Crowbars
- Bearing pullers
- Center punches



- Putty knives
- Pyrometers
- Scrapers
- Reamers
- Respirators
- Retaining ring pliers
- Rivet guns
- Shrink rules
- Scaffolding
- Spiral screw extractors
- Scribes
- Honing stones
- Scissors
- Material-hoisting slings
- Socket sets
- Soldering guns
- Spanner wrenches
- Chain wrenches
- Stroboscopes
- Combination squares
- Straightedges
- Strap wrenches
- Tachometers
- Tap extractors
- Measuring tapes
- Dies
- Alignment telescopes
- Layout templates
- Tension indicators
- Snap gauges
- Thread gauges
- Pipe threading machines



- Tin snips
- Torque multipliers
- Tungsten inert gas TIG welding equipment
- Ultrasonic thickness detectors
- Utility knives
- Vibration indicators
- Arc welders
- Welding shields
- Spot welding equipment
- Wire brushes
- Cable cutters
- Hydraulic cranes
- Arbor presses

Labor Market Comparison

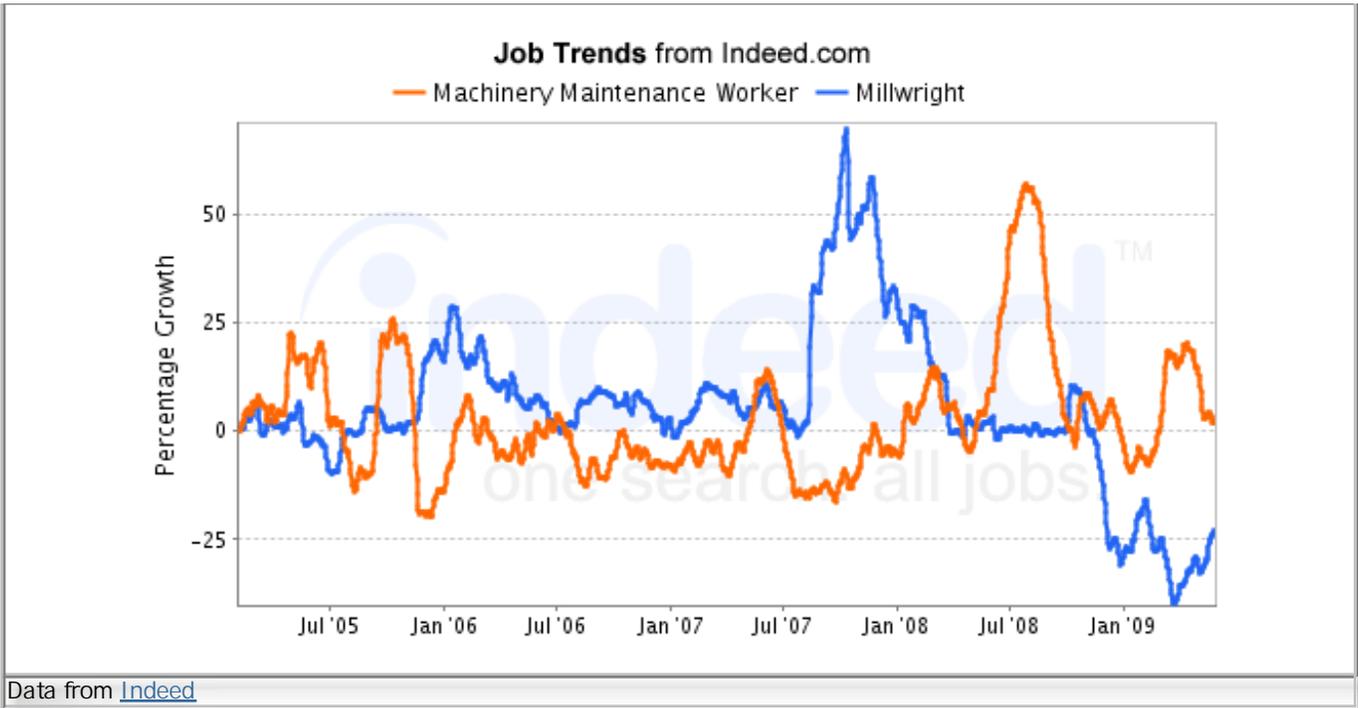
Maine Department of Labor.

Description	Maintenance Workers, Machinery	Millwrights	Difference
Median Wage	\$ 34,100	\$ 41,280	\$ 7,180
10th Percentile Wage	\$ 18,630	\$ 30,940	\$ 12,310
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 38,610	\$ 49,110	\$ 10,500
90th Percentile Wage	\$ 43,370	\$ 54,780	\$ 11,410
Mean Wage	\$ 32,410	\$ 41,500	\$ 9,090
Total Employment - 2521	290	830	540
Employment Base - 2006	337	883	546
Projected Employment - 2530	278	774	496
Projected Job Growth - 2006-2530	-17.5 %	-12.3 %	5.2 %
Projected Annual Openings - 2006-2530	5	11	6
Special			

Special Occupations:

National Job Posting Trends

Trend for Maintenance Workers, Machinery and Millwrights



Programs			
Related Programs			
Heavy/Industrial Equipment Maintenance Technologies, Other			
Heavy/Industrial Equipment Maintenance Technologies, Other. Any instructional program in industrial equipment maintenance and repair not listed above.			
No information on schools for the program			
Industrial Machinery Main. and Repairer			
Industrial Mechanics and Maintenance Technology. A program that prepares individuals to apply technical knowledge and skills to repair and maintain industrial machinery and equipment such as cranes, pumps, engines and motors, pneumatic tools, conveyor systems, production machinery, marine deck machinery, and steam propulsion, refinery, and pipeline-distribution systems.			
Institution	Address	City	URL
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu

Maine Statewide Promotion Opportunities for Maintenance Workers, Machinery									
O*NET Code	Title	Grand TORO	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
49-9043.00	Maintenance Workers, Machinery	100	1	290	\$34,100.00	\$0.00	-17%	5	
51-4121.06	Welders, Cutters, and Welder Fitters	91	2	1,610	\$38,030.00	\$3,930.00	7%	49	



49-9044.00	Millwrights	90	3	830	\$41,280.00	\$7,180.00	-12%	11	
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	88	3	110	\$34,350.00	\$250.00	-9%	2	
47-5021.00	Earth Drillers, Except Oil and Gas	88	3	140	\$37,470.00	\$3,370.00	2%	4	
49-9041.00	Industrial Machinery Mechanics	88	3	990	\$39,370.00	\$5,270.00	7%	25	★
49-3051.00	Motorboat Mechanics	88	3	240	\$34,980.00	\$880.00	6%	8	★
49-3042.00	Mobile Heavy Equipment Mechanics, Except Engines	87	4	880	\$37,010.00	\$2,910.00	5%	22	★
47-2011.00	Boilermakers	87	4	60	\$39,260.00	\$5,160.00	12%	3	
49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	87	3	1,180	\$34,210.00	\$110.00	6%	34	★
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	86	3	440	\$49,450.00	\$15,350.00	-19%	15	
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	85	3	130	\$35,960.00	\$1,860.00	4%	4	
51-4111.00	Tool and Die Makers	85	3	160	\$51,670.00	\$17,570.00	-11%	2	
51-4041.00	Machinists	84	3	1,860	\$41,560.00	\$7,460.00	4%	35	★
53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	84	3	60	\$42,890.00	\$8,790.00	5%	2	

Special Occupations:

Top Industries for Millwrights



Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Other building equipment contractors	238290	20.13%	11,049	12,977	17.45%
Nonresidential building construction	236200	8.45%	4,639	5,633	21.42%
Pulp, paper, and paperboard mills	322100	5.62%	3,084	2,318	-24.83%
Iron and steel mills and ferroalloy manufacturing	331100	4.25%	2,335	1,703	-27.05%
Plumbing, heating, and air-conditioning contractors	238220	3.94%	2,160	2,644	22.38%
Sawmills and wood preservation	321100	3.80%	2,088	1,814	-13.12%
Self-employed workers, primary job	000601	3.19%	1,752	2,023	15.45%
Veneer, plywood, and engineered wood product manufacturing	321200	2.94%	1,615	1,905	18.01%
Foundries	331500	2.50%	1,371	1,077	-21.42%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	2.19%	1,204	1,381	14.68%
Employment services	561300	1.22%	671	921	37.15%
Nonferrous metal (except aluminum) production and processing	331400	1.15%	633	480	-24.19%
Other specialty trade contractors	238900	1.14%	627	751	19.77%
Other heavy and civil engineering construction	237900	0.88%	486	565	16.39%
Resin, synthetic rubber, and artificial synthetic fibers and filaments manufacturing	325200	0.85%	466	406	-13.01%

Top Industries for Maintenance Workers, Machinery

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Local government, excluding education and hospitals	939300	6.40%	5,397	6,063	12.34%
Motor vehicle parts manufacturing	336300	3.89%	3,278	2,610	-20.39%
Plastics product manufacturing	326100	3.16%	2,666	2,826	6.00%
Animal production; primary job	112000	2.73%	2,304	2,043	-11.34%
Animal slaughtering and processing	311600	2.47%	2,079	2,373	14.13%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	2.36%	1,988	2,104	5.82%
Support activities for air transportation	488100	2.25%	1,897	2,292	20.80%
Coal mining	212100	1.76%	1,483	1,498	0.99%
Pharmaceutical and medicine manufacturing	325400	1.71%	1,439	1,814	26.03%
Colleges, universities, and professional schools, public and private	611300	1.70%	1,437	1,608	11.87%
Fabric mills	313200	1.53%	1,286	908	-29.38%



Commercial and industrial machinery and equipment rental and leasing	532400	1.52%	1,281	1,565	22.19%
Pulp, paper, and paperboard mills	322100	1.49%	1,256	871	-30.64%
Electric power generation, transmission and distribution	221100	1.47%	1,241	1,141	-8.03%
Converted paper product manufacturing	322200	1.39%	1,168	980	-16.08%



TORQ Analysis of Maintenance Workers, Machinery to Maintenance and Repair Workers, General

ANALYSIS INPUT

Transfer	Title	O*NET	Filters		
From Title:	Maintenance Workers, Machinery	49-9043.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Maintenance and Repair Workers, General	49-9042.00	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS

Grand TORQ:					89						
Ability TORQ		Skills TORQ		Knowledge TORQ							
Level		88	Level		93						
Level			Level		85						
Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
Information Ordering	60	18	68	No Skills Upgrade Required!				No Knowledge Upgrades Required!			
Multilimb Coordination	53	12	65								
Problem Sensitivity	51	9	75								
Inductive Reasoning	51	7	62								
Visualization	53	7	59								
Static Strength	48	6	56								
Manual Dexterity	48	4	68								
Oral Expression	51	5	53								
Near Vision	50	4	65								
Deductive Reasoning	48	4	56								
Speech Clarity	34	2	53								
LEVEL and IMPT (IMPORTANCE) refer to the Target Maintenance and Repair Workers, General. GAP refers to level difference between Maintenance Workers, Machinery and Maintenance and Repair Workers, General.											

ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

Description	Maintenance Workers, Machinery	Maintenance and Repair Workers, General	Importance
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Problem Sensitivity	42	51	75
Information Ordering	42	60	68
Manual Dexterity	44	48	68
Multilimb Coordination	41	53	65
Near Vision	46	50	65
Inductive Reasoning	44	51	62
Arm-Hand Steadiness	46	44	62
Visualization	46	53	59
Deductive Reasoning	44	48	56
Selective Attention	44	44	56
Finger Dexterity	44	44	56
Static Strength	42	48	56
Oral Comprehension	50	50	53
Oral Expression	46	51	53
Control Precision	48	48	53
Speech Clarity	32	34	53

Skill Level Comparison - Abilities with importance scores over 69

Description	Maintenance Workers, Machinery	Maintenance and Repair Workers, General	Importance
Knowledge Level Comparison - Knowledge with importance scores over 69			
Description	Maintenance Workers, Machinery	Maintenance and Repair Workers, General	Importance

Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Maintenance Workers, Machinery	Maintenance and Repair Workers, General	Description	Maintenance Workers, Machinery	Maintenance and Repair Workers, General
10+ years	0%	0%	Doctoral	0%	0%
8-10 years	3%	5%	Professional Degree	0%	0%
6-8 years	0%	7%	Post-Masters Cert	0%	0%
4-6 years	10%	19%	Master's Degree	0%	0%
2-4 years	10%	18%	Post-Bachelor Cert	0%	0%
1-2 years	48%	24%	Bachelors	2%	0%
6-12 months	5%	4%	AA or Equiv	0%	8%
3-6 months	10%	0%	Some College	6%	21%
1-3 months	0%	0%	Post-Secondary Certificate	25%	31%
0-1 month	0%	10%	High School Diploma or GED	64%	25%
None	9%	8%	No HSD or GED	0%	11%

Maintenance Workers, Machinery

Maintenance and Repair Workers, General

Most Common Educational/Training Requirement:

Short-term on-the-job training

Moderate-term on-the-job training

Job Zone Comparison



<p>1 - Job Zone One: Little or No Preparation Needed</p>	<p>3 - Job Zone Three: Medium Preparation Needed</p>
<p>No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.</p>	<p>Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.</p>
<p>These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.</p>	<p>Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.</p>
<p>Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.</p>	<p>Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.</p>

Tasks

Maintenance Workers, Machinery	Maintenance and Repair Workers, General
<p>Core Tasks</p>	<p>Core Tasks</p>
<p>Generalized Work Activities:</p> <ul style="list-style-type: none"> • Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles. • Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles). • Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things. • Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects. • Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials. 	<p>Generalized Work Activities:</p> <ul style="list-style-type: none"> • Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects. • Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials. • Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles. • Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things. • Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
<p>Specific Tasks</p>	<p>Specific Tasks</p>
<p>Occupation Specific Tasks:</p> <ul style="list-style-type: none"> • Clean machines and machine parts, using cleaning solvents, cloths, air guns, hoses, vacuums, or other equipment. • Collaborate with other workers to repair or move machines, machine parts, or equipment. • Collect and discard worn machine parts and other refuse in order to maintain machinery and work areas. • Dismantle machines and remove parts for repair, using hand tools, chain falls, jacks, cranes, or hoists. • Inspect or test damaged machine parts, and mark defective areas or advise supervisors of repair needs. • Install, replace, or change machine parts 	<p>Occupation Specific Tasks:</p> <ul style="list-style-type: none"> • Adjust functional parts of devices and control instruments, using hand tools, levels, plumb bobs, and straightedges. • Align and balance new equipment after installation. • Assemble, install and/or repair wiring, electrical and electronic components, pipe systems and plumbing, machinery, and equipment. • Clean and lubricate shafts, bearings, gears, and other parts of machinery. • Diagnose mechanical problems and determine how to correct them, checking blueprints, repair manuals, and parts catalogs as necessary. • Dismantle devices to gain access to and remove defective parts, using hoists,



and attachments, according to production specifications.

- Inventory and requisition machine parts, equipment, and other supplies so that stock can be maintained and replenished.
- Lubricate or apply adhesives or other materials to machines, machine parts, or other equipment, according to specified procedures.
- Measure, mix, prepare, and test chemical solutions used to clean or repair machinery and equipment.
- Read work orders and specifications to determine machines and equipment requiring repair or maintenance.
- Reassemble machines after the completion of repair or maintenance work.
- Record production, repair, and machine maintenance information.
- Remove hardened material from machines or machine parts, using abrasives, power and hand tools, jackhammers, sledgehammers, or other equipment.
- Replace or repair metal, wood, leather, glass, or other lining in machines, or in equipment compartments or containers.
- Replace, empty, or replenish machine and equipment containers such as gas tanks or boxes.
- Set up and operate machines, and adjust controls to regulate operations.
- Start machines and observe mechanical operation to determine efficiency and to detect problems.
- Transport machine parts, tools, equipment, and other material between work areas and storage, using cranes, hoists, or dollies.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- apply cleaning solvents
- assist mechanic, or extractive or construction trades craft worker
- clean equipment or machinery
- clean rooms or work areas
- construct, erect, or repair wooden frameworks or structures
- cut, shape, fit, or join wood or other construction materials
- erect scaffold
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- install equipment or attachments on machinery or related structures

cranes, hand tools, and power tools.

- Estimate repair costs.
- Fabricate and repair counters, benches, partitions, and other wooden structures such as sheds and outbuildings.
- Grind and reseal valves, using valve-grinding machines.
- Inspect drives, motors, and belts, check fluid levels, replace filters, and perform other maintenance actions, following checklists.
- Inspect used parts to determine changes in dimensional requirements, using rules, calipers, micrometers, and other measuring instruments.
- Inspect, operate, and test machinery and equipment in order to diagnose machine malfunctions.
- Lay brick to repair and maintain buildings, walls, arches and other structures.
- Maintain and repair specialized equipment and machinery found in cafeterias, laundries, hospitals, stores, offices, and factories.
- Operate cutting torches or welding equipment to cut or join metal parts.
- Order parts, supplies, and equipment from catalogs and suppliers, or obtain them from storerooms.
- Paint and repair roofs, windows, doors, floors, woodwork, plaster, drywall, and other parts of building structures.
- Perform routine preventive maintenance to ensure that machines continue to run smoothly, building systems operate efficiently, and the physical condition of buildings does not deteriorate.
- Plan and lay out repair work using diagrams, drawings, blueprints, maintenance manuals, and schematic diagrams.
- Record maintenance and repair work performed and the costs of the work.
- Repair or replace defective equipment parts using hand tools and power tools, and reassemble equipment.
- Set up and operate machine tools to repair or fabricate machine parts, jigs and fixtures, and tools.
- Use tools ranging from common hand and power tools, such as hammers, hoists, saws, drills, and wrenches, to precision measuring instruments and electrical and electronic testing devices.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- align or adjust clearances of mechanical components or parts



- inventory stock to ensure adequate supplies
- load or unload material or workpiece into machinery
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain repair records
- mix paint, ingredients, or chemicals, according to specifications
- move materials or goods between work areas
- move or fit heavy objects
- observe or listen to machinery or equipment operation to detect malfunctions
- operate crane in construction, manufacturing or repair setting
- operate hoist, winch, or hydraulic boom
- operate sandblasting equipment
- operate vacuum or air hose
- perform safety inspections in industrial, manufacturing or repair setting
- read specifications
- read work order, instructions, formulas, or processing charts
- repair or replace malfunctioning or worn mechanical components
- repair sheet metal products
- requisition stock, materials, supplies or equipment
- signal directions or warnings to coworkers
- test materials or solutions
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use basic carpentry techniques
- use control or regulating devices to adjust or maintain industrial machinery
- use hand or power tools
- use hand or power woodworking tools
- use high voltage apparatus
- use knowledge of metric system
- use measuring devices in repairing industrial or heavy equipment
- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use pressure gauges
- work as a team member

Technology - Examples

Data base user interface and query software

- Database software

Spreadsheet software

- apply cleaning solvents
- assemble and install pipe sections, fittings, or plumbing fixtures
- assemble, dismantle, or reassemble equipment or machinery
- bend tubing or conduit
- build or repair structures in construction, repair, or manufacturing setting
- burn (cut), trim, or scarf metal objects
- climb ladders, scaffolding, or utility or telephone poles
- conduct tests to locate mechanical system malfunction
- construct, erect, or repair wooden frameworks or structures
- control HVAC equipment
- coordinate production maintenance activities
- cut, bend, or thread pipe for gas, air, hydraulic, or water lines
- cut, shape, fit, or join wood or other construction materials
- determine installation, service, or repair needed
- diagnose mechanical problems in machinery or equipment
- erect scaffold
- estimate time or cost for installation, repair, or construction projects
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- follow safe waste disposal procedures
- identify properties of metals for repair or fabrication activities
- inspect machinery or equipment to determine adjustments or repairs needed
- install doors, wood floors, window frames, trim, or stairs
- install electrical fixtures or components
- install electronic equipment, components, or systems
- install equipment or attachments on machinery or related structures
- install industrial machinery or related heavy equipment
- install insulating materials
- install locks, hinges, or related finish hardware
- install or replace glass in windows, skylights, or other structural surfaces
- install or replace meters, regulators, or related measuring or control devices
- install shingles, tile, slate, asphalt, or related roofing materials
- install/connect electrical equipment to power circuit
- install/string electrical or electronic cable or wiring



- Spreadsheet software

Word processing software

- Word processing software

Tools - Examples

- Abrasive wheels
- Abrasive rubbing stones
- Adjustable widemouth pliers
- Adjustable wrenches
- Bandsaws
- Oxyacetylene torches
- Dial calipers
- Compressed air guns
- Deburring tools
- Dollies
- Drill bits
- Ear plugs
- Forklifts
- Dial indicators
- Grease guns
- Lapping equipment
- Hammers
- Hard hats
- Chain falls
- Hold down clamps
- Jacks
- Ladders
- Lathes
- Levels
- Lockout hasps
- Metal cutters
- Metal inert gas MIG welders
- Micrometers
- Milling machines

- lay or install brick, block, stone, tile, or related masonry material
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain or repair work tools or equipment
- maintain repair records
- maintain specialized manufacturing or commercial equipment or machinery
- maintain welding machines or equipment
- measure and mark reference points or cutting lines on workpieces
- move or fit heavy objects
- observe or listen to machinery or equipment operation to detect malfunctions
- operate crane in construction, manufacturing or repair setting
- operate hoist, winch, or hydraulic boom
- order or purchase supplies, materials, or equipment
- paint walls or other structural surfaces
- perform safety inspections in industrial, manufacturing or repair setting
- plan or organize work
- position, align, or level machines, equipment, or structures
- prepare building surfaces for paint, finishes, wallpaper, or adhesives
- pressure test piping system or equipment for leaks
- read blueprints
- read schematics
- read specifications
- read technical drawings
- read work order, instructions, formulas, or processing charts
- repair cracks, defects, or damage in installed building materials
- repair electronic components, equipment, or systems
- repair or adjust measuring or control devices
- repair or replace electrical wiring, circuits, fixtures, or equipment
- repair or replace gas, steam, sewer, or water piping or fixtures
- repair or replace locks, hinges, or related finish hardware
- repair or replace malfunctioning or worn mechanical components
- replace electronic components
- requisition stock, materials, supplies or equipment
- set up and operate variety of machine tools
- solder electrical or electronic connections or components
- test electrical/electronic wiring, equipment, systems or fixtures



- Personal computers
- Plumb bobs
- Jackhammers
- Buffing machines
- Power drills
- Grinding machines
- Bench saws
- Punches
- Reamers
- Respirators
- Rivet guns
- Rulers
- Safety glasses
- Safety belts
- Hacksaws
- Scaffolding
- Screwdrivers
- Shears
- Rigging equipment
- Socket wrench sets
- Soldering guns
- Steel rules
- Sheet metal folders
- Dies
- Pipe threaders
- Tungsten inert gas TIG welding equipment
- Industrial vacuums
- Arc welders
- Welding tips
- Spot-welding equipment
- Workshop cranes
- Brakes

- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use arc welding equipment
- use basic carpentry techniques
- use basic plumbing techniques
- use building materials for routine building maintenance
- use combination welding procedures
- use control or regulating devices to adjust or maintain industrial machinery
- use electrical or electronic test devices or equipment
- use hand or power tools
- use hand or power woodworking tools
- use high voltage apparatus
- use knowledge of metric system
- use knowledge of ventilation systems
- use knowledge of welding filler rod types
- use machine tools in installation, maintenance, or repair
- use measuring devices in repairing industrial or heavy equipment
- use pipe fitting equipment
- use precision measuring devices in mechanical repair work
- use precision tools in electronics repair
- use pressure gauges
- use soldering equipment
- use tube bending equipment
- use voltmeter, ammeter, or ohmmeter
- verify levelness or verticality, using level or plumb bob
- weld together metal parts, components, or structures

Technology - Examples

Calendar and scheduling software

- Computerized time management systems

Electronic mail software

- Microsoft Outlook

Facilities management software

- Computerized maintenance management system
CMMS software

Industrial control software

- Digital Direct Control DDC Energy Management software

Internet browser software

- Web browser software

Office suite software



- Microsoft Office

Spreadsheet software

- Microsoft Excel

Word processing software

- Microsoft Word

Tools - Examples

- Adjustable widemouth pliers
- Adjustable crescent wrenches
- Air compressors
- Security alarm systems
- Volt-ammeters
- Augers
- Tractors with backhoe attachments
- Workshop bench vises
- Biscuit joiners
- Block and tackle equipment
- Cutting torches
- Locking C-clamps
- Dial calipers
- Caulking guns
- Metal chisels
- Conduit benders
- Desktop computers
- Utility pumps
- Diagonal cut pliers
- Dollies
- Closet augers
- Plungers
- Dump trucks
- Side cutting pliers
- Feeler gauges
- Hand files
- Fish tape pullers



- Two-wheel drive front end loaders
- Fuse pullers
- Brazing equipment
- Dial indicators
- Safety goggles
- Grease guns
- Hand grinders
- Valve grinding machines
- Hammer drills
- Ball peen hammers
- Hand operated spray guns
- Hand trucks
- Electric trimmers
- Allen wrenches
- Hoisting equipment
- Circle cutters
- Gasket cutters
- Boom trucks
- Hand jacks
- Step ladders
- Lathes
- Lawn mowers
- Bubble levels
- Power lifts
- Ultrasonic leak detectors
- Channel lock pliers
- Inspection mirrors
- Rubber mallets
- Digital micrometers
- Miter boxes
- Needlenose pliers
- Laptop computers



- Nut drivers
- Hollow core socket wrenches
- Ohmmeters
- Oil dispensing cans
- Paint application brushes
- Paint application rollers
- Paint spray guns
- Personal computers
- Handheld computers
- Copper cutting machines
- Pipe vises
- End pipe wrenches
- Plumb bobs
- Jackhammers
- Chipping hammers
- Cordless power drills
- Electric nail guns
- Electric planers
- Power routers
- Electric sanders
- Circular saws
- High pressure water sprayers
- Safety gloves
- Crowbars
- Bearing pullers
- Center punches
- Putty knives
- Comealongs
- Dust and particulate respirators
- Rulers
- Protective harnesses
- Protective footwear



- Hacksaws
- Scaffolding
- Screw extractor sets
- Flat blade screwdrivers
- Scribing tools
- Sewage pumps
- Sharpening equipment
- Shears
- Rigging equipment
- Slip joint pliers
- Snow blowers
- Snow plows
- Socket wrench sets
- Soldering equipment
- Basin wrenches
- Combination squares
- Straightedges
- Wire strippers
- Stud locators
- Measuring tapes
- Taps and dies
- Tension gauges
- Pipe threaders
- Tin snips
- Torque wrenches
- Trenchers
- Concrete trowels
- Tube benders
- Flaring tools
- Portable two way radios
- Utility knives
- Current testers



- Water sampling equipment
- Arc welders
- Wire cutting tools
- Wire crimpers
- Conduit cutters
- Workshop cranes
- Drill presses

Labor Market Comparison

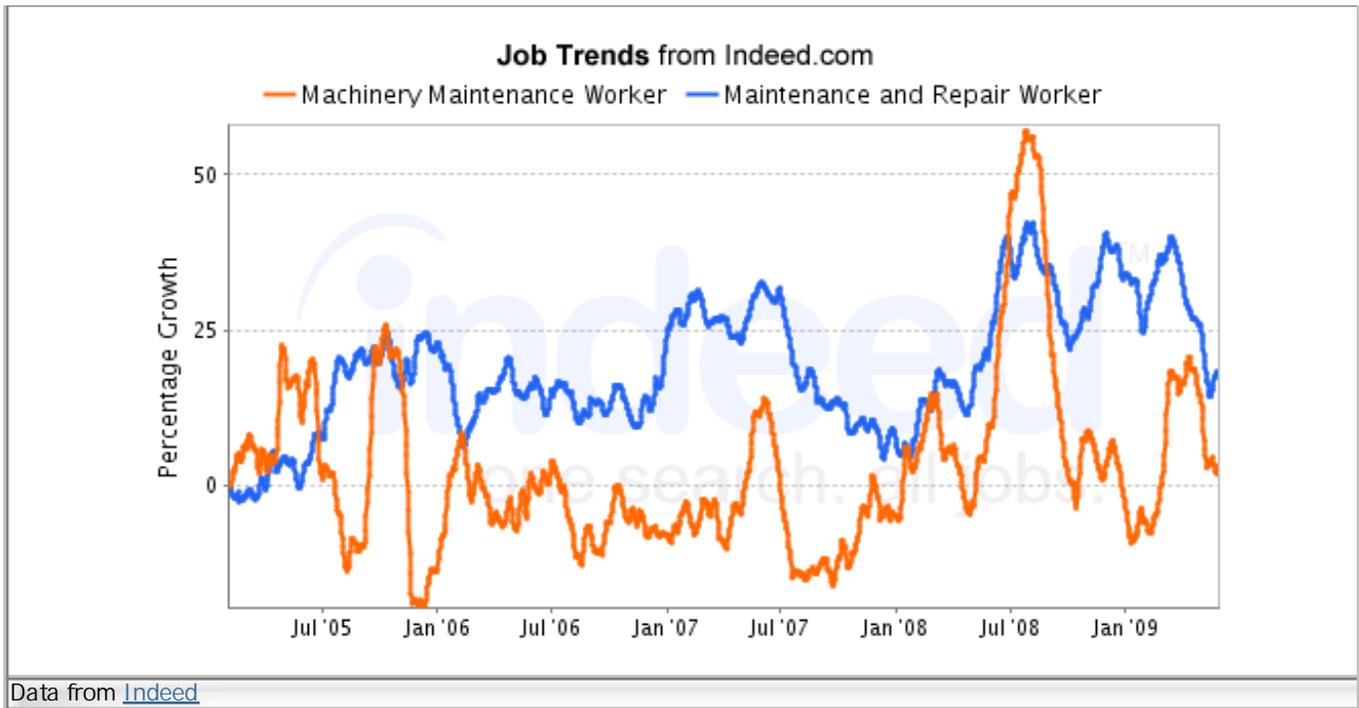
Maine Department of Labor.

Description	Maintenance Workers, Machinery	Maintenance and Repair Workers, General	Difference
Median Wage	\$ 34,100	\$ 31,020	\$(3,080)
10th Percentile Wage	\$ 18,630	\$ 21,110	\$ 2,480
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 38,610	\$ 38,440	\$(170)
90th Percentile Wage	\$ 43,370	\$ 49,520	\$ 6,150
Mean Wage	\$ 32,410	\$ 32,940	\$ 530
Total Employment - 2521	290	5,140	4,850
Employment Base - 2006	337	5,391	5,054
Projected Employment - 2530	278	5,572	5,294
Projected Job Growth - 2006-2530	-17.5 %	3.4 %	20.8 %
Projected Annual Openings - 2006-2530	5	31	26
Special			

Special Occupations:

National Job Posting Trends

Trend for Maintenance Workers, Machinery and Maintenance and Repair Workers, General



Programs

Related Programs

Agricultural Mechanization, General

Agricultural Mechanization, General. A program that generally prepares individuals to sell, select, and service agricultural or agribusiness technical equipment and facilities, including computers, specialized software, power units, machinery, equipment structures, and utilities. Includes instruction in agricultural power systems; planning and selecting materials for the construction of support facilities; mechanical practices associated with irrigation and water conservation; erosion control; and agricultural data processing systems.

No information on schools for the program

Building/Construction Site Management/Manager

Building/Construction Site Management/Manager. A program that prepares individuals to supervise, manage, and inspect construction sites, buildings, and associated facilities. Includes instruction in site safety, personnel supervision, labor relations, diversity training, construction documentation, scheduling, resource and cost control, bid strategies, rework prevention, construction insurance and bonding, accident management and investigation, applicable law and regulations, and communication skills.

No information on schools for the program

Building/Property Main. and Manager

Building/Property Maintenance and Management. A program that prepares individuals to apply technical knowledge and skills to keep a building functioning, and to service a variety of structures including commercial and industrial buildings and mobile homes. Includes instruction in the basic maintenance and repair skills required to service building systems, such as air conditioning, heating, plumbing, electrical, major appliances, and other mechanical systems.

No information on schools for the program

Mechanics and Repairers, Other

Mechanic and Repair Technologies/Technicians, Other. Any instructional program in mechanics and repairs not listed above.

Institution	Address	City	URL
Washington County Community College	One College Drive	Calais	www.wccc.me.edu



Washington County Community College

One College Drive

Calais

www.wccc.me.edu**Maine Statewide Promotion Opportunities for Maintenance Workers, Machinery**

O*NET Code	Title	Grand TORO	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
49-9043.00	Maintenance Workers, Machinery	100	1	290	\$34,100.00	\$0.00	-17%	5	
51-4121.06	Welders, Cutters, and Welder Fitters	91	2	1,610	\$38,030.00	\$3,930.00	7%	49	★
49-9044.00	Millwrights	90	3	830	\$41,280.00	\$7,180.00	-12%	11	
49-3051.00	Motorboat Mechanics	88	3	240	\$34,980.00	\$880.00	6%	8	★
47-5021.00	Earth Drillers, Except Oil and Gas	88	3	140	\$37,470.00	\$3,370.00	2%	4	
49-9041.00	Industrial Machinery Mechanics	88	3	990	\$39,370.00	\$5,270.00	7%	25	★
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	88	3	110	\$34,350.00	\$250.00	-9%	2	
49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	87	3	1,180	\$34,210.00	\$110.00	6%	34	★
47-2011.00	Boilermakers	87	4	60	\$39,260.00	\$5,160.00	12%	3	
49-3042.00	Mobile Heavy Equipment Mechanics, Except Engines	87	4	880	\$37,010.00	\$2,910.00	5%	22	★
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	86	3	440	\$49,450.00	\$15,350.00	-19%	15	



49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	85	3	130	\$35,960.00	\$1,860.00	4%	4
51-4111.00	Tool and Die Makers	85	3	160	\$51,670.00	\$17,570.00	-11%	2
49-9012.00	Control and Valve Installers and Repairers, Except Mechanical Door	84	3	170	\$47,860.00	\$13,760.00	-9%	3
49-2095.00	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	84	5	20	\$60,790.00	\$26,690.00	5%	1
Special Occupations:								

Top Industries for Maintenance and Repair Workers, General

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Lessors of real estate	531100	9.05%	125,853	138,660	10.18%
Local government, excluding education and hospitals	939300	7.30%	101,552	114,081	12.34%
Activities related to real estate	531300	5.42%	75,449	96,150	27.44%
Elementary and secondary schools, public and private	611100	3.99%	55,510	58,497	5.38%
Colleges, universities, and professional schools, public and private	611300	2.72%	37,891	42,390	11.87%
General medical and surgical hospitals, public and private	622100	2.48%	34,495	38,189	10.71%
Religious organizations	813100	2.44%	33,871	40,648	20.01%
Employment services	561300	2.30%	31,932	40,414	26.56%
State government, excluding education and hospitals	929200	1.58%	21,973	21,562	-1.87%
Offices of real estate agents and brokers	531200	1.45%	20,200	24,604	21.81%
Nursing care facilities	623100	1.36%	18,977	20,624	8.68%
Management of companies and enterprises	551100	1.34%	18,609	21,453	15.28%
Plastics product manufacturing	326100	1.10%	15,246	16,161	6.00%
Motor vehicle parts manufacturing	336300	0.96%	13,311	10,598	-20.39%
Animal slaughtering and processing	311600	0.91%	12,633	14,418	14.13%



Top Industries for Maintenance Workers, Machinery

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Local government, excluding education and hospitals	939300	6.40%	5,397	6,063	12.34%
Motor vehicle parts manufacturing	336300	3.89%	3,278	2,610	-20.39%
Plastics product manufacturing	326100	3.16%	2,666	2,826	6.00%
Animal production; primary job	112000	2.73%	2,304	2,043	-11.34%
Animal slaughtering and processing	311600	2.47%	2,079	2,373	14.13%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	2.36%	1,988	2,104	5.82%
Support activities for air transportation	488100	2.25%	1,897	2,292	20.80%
Coal mining	212100	1.76%	1,483	1,498	0.99%
Pharmaceutical and medicine manufacturing	325400	1.71%	1,439	1,814	26.03%
Colleges, universities, and professional schools, public and private	611300	1.70%	1,437	1,608	11.87%
Fabric mills	313200	1.53%	1,286	908	-29.38%
Commercial and industrial machinery and equipment rental and leasing	532400	1.52%	1,281	1,565	22.19%
Pulp, paper, and paperboard mills	322100	1.49%	1,256	871	-30.64%
Electric power generation, transmission and distribution	221100	1.47%	1,241	1,141	-8.03%
Converted paper product manufacturing	322200	1.39%	1,168	980	-16.08%



TORQ Analysis of Maintenance Workers, Machinery to Electric Motor, Power Tool, and Related Repairers

ANALYSIS INPUT

Transfer	Title	O*NET	Filters		
From Title:	Maintenance Workers, Machinery	49-9043.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Electric Motor, Power Tool, and Related Repairers	49-2092.00	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS

Grand TORQ:

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Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	87	Level	90	Level	86

Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Imp	Skill	Level	Gap	Imp	Knowledge	Level	Gap	Imp
Finger Dexterity	59	15	75	Critical Thinking	61	7	71	No Knowledge Upgrades Required!			
Visual Color Discrimination	53	16	59								
Speed of Closure	41	15	53								
Manual Dexterity	55	11	68								
Hearing Sensitivity	48	13	56								
Depth Perception	50	9	53								
Auditory Attention	53	9	50								
Selective Attention	51	7	56								
Information Ordering	48	6	62								
Control Precision	55	7	53								
Category Flexibility	44	7	50								
Reaction Time	48	6	56								
Near Vision	51	5	62								
Written Comprehension	48	6	50								
Far Vision	42	5	53								
Arm-Hand Steadiness	50	4	62								
Visualization	50	4	59								
Speech Clarity	35	3	50								



Deductive Reasoning

46

2

56

LEVEL and IMPT (IMPORTANCE) refer to the Target Electric Motor, Power Tool, and Related Repairers. GAP refers to level difference between Maintenance Workers, Machinery and Electric Motor, Power Tool, and Related Repairers.

ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Importance
Finger Dexterity	44	59	75
Manual Dexterity	44	55	68
Problem Sensitivity	42	42	65
Information Ordering	42	48	62
Arm-Hand Steadiness	46	50	62
Near Vision	46	51	62
Inductive Reasoning	44	44	59
Visualization	46	50	59
Visual Color Discrimination	37	53	59
Deductive Reasoning	44	46	56
Selective Attention	44	51	56
Reaction Time	42	48	56
Hearing Sensitivity	35	48	56
Speed of Closure	26	41	53
Control Precision	48	55	53
Far Vision	37	42	53
Depth Perception	41	50	53
Oral Comprehension	50	50	50
Written Comprehension	42	48	50
Oral Expression	46	44	50
Category Flexibility	37	44	50
Flexibility of Closure	42	39	50
Multilimb Coordination	41	41	50
Rate Control	37	37	50
Auditory Attention	44	53	50
Speech Recognition	37	37	50
Speech Clarity	32	35	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Importance
Critical Thinking	54	61	71

Knowledge Level Comparison - Knowledge with importance scores over 69

Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Importance
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Experience & Education Comparison

Related Work Experience Comparison			Required Education Level Comparison		
Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers
10+ years	0%	0%	Doctoral	0%	0%
8-10 years	3%	0%	Professional Degree	0%	0%
6-8 years	0%	0%	Post-Masters Cert	0%	0%
4-6 years	10%	21%	Master's Degree	0%	0%
2-4 years	10%	28%	Post-Bachelor Cert	0%	0%
1-2 years	48%	16%	Bachelors	2%	0%
6-12 months	5%	9%	AA or Equiv	0%	6%
3-6 months	10%	0%	Some College	6%	0%
1-3 months	0%	2%	Post-Secondary Certificate	25%	39%
0-1 month	0%	2%	High School Diploma or GED	64%	43%
None	9%	18%	No HSD or GED	0%	10%

Maintenance Workers, Machinery

Electric Motor, Power Tool, and Related Repairers

Most Common Educational/Training Requirement:

Short-term on-the-job training

Postsecondary vocational award

Job Zone Comparison

1 - Job Zone One: Little or No Preparation Needed

3 - Job Zone Three: Medium Preparation Needed

No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.

Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.

These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.

Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.

Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.

Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.

Tasks

Maintenance Workers, Machinery

Electric Motor, Power Tool, and Related Repairers

Core Tasks

Core Tasks

Generalized Work Activities:

- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating

Generalized Work Activities:

- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic)



things.

- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Specific Tasks

Occupation Specific Tasks:

- Clean machines and machine parts, using cleaning solvents, cloths, air guns, hoses, vacuums, or other equipment.
- Collaborate with other workers to repair or move machines, machine parts, or equipment.
- Collect and discard worn machine parts and other refuse in order to maintain machinery and work areas.
- Dismantle machines and remove parts for repair, using hand tools, chain falls, jacks, cranes, or hoists.
- Inspect or test damaged machine parts, and mark defective areas or advise supervisors of repair needs.
- Install, replace, or change machine parts and attachments, according to production specifications.
- Inventory and requisition machine parts, equipment, and other supplies so that stock can be maintained and replenished.
- Lubricate or apply adhesives or other materials to machines, machine parts, or other equipment, according to specified procedures.
- Measure, mix, prepare, and test chemical solutions used to clean or repair machinery and equipment.
- Read work orders and specifications to determine machines and equipment requiring repair or maintenance.
- Reassemble machines after the completion of repair or maintenance work.
- Record production, repair, and machine maintenance information.
- Remove hardened material from machines or machine parts, using abrasives, power and hand tools, jackhammers, sledgehammers, or other equipment.
- Replace or repair metal, wood, leather, glass, or other lining in machines, or in equipment compartments or containers.
- Replace, empty, or replenish machine and equipment containers such as gas tanks or boxes.
- Set up and operate machines, and adjust controls to regulate operations.
- Start machines and observe mechanical operation to determine efficiency and to

principles.

- Making Decisions and Solving Problems - Analyzing information and evaluating results to choose the best solution and solve problems.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.

Specific Tasks

Occupation Specific Tasks:

- Add water or acid to battery cell solutions to obtain specified concentrations.
- Adjust working parts, such as fan belts, contacts, and springs, using hand tools and gauges.
- Assemble electrical parts such as alternators, generators, starting devices, and switches, following schematic drawings and using hand, machine, and power tools.
- Bolt porcelain insulators to wood parts in order to assemble hot stools.
- Clean cells, cell assemblies, glassware, leads, electrical connections, and battery poles, using scrapers, steam, water, emery cloths, power grinders, or acid.
- Clean, rinse, and dry transformer cases, using boiling water, scrapers, solvents, hoses, and cloths.
- Cut and form insulation, and insert insulation into armature, rotor, or stator slots.
- Disassemble defective equipment so that repairs can be made, using hand tools.
- Drain and filter transformer oil and refill transformers with oil until coils are submerged.
- Hammer out dents and twists in tools and equipment.
- Inspect and test equipment in order to locate damage or worn parts and diagnose malfunctions, or read work orders or schematic drawings to determine required repairs.
- Inspect batteries for structural defects such as dented cans, damaged carbon rods and terminals, and defective seals.
- Inspect electrical connections, wiring, relays, charging resistance boxes, and storage batteries, following wiring diagrams.
- Lift units or parts such as motors or generators, using cranes or chain hoists, or signal crane operators to lift heavy parts or subassemblies.
- Lubricate moving parts.
- Maintain stocks of parts.
- Measure velocity, horsepower, revolutions per minute (rpm), amperage, circuitry, and voltage of units or parts to diagnose problems, using ammeters, voltmeters, wattmeters, and other testing devices.



operation to determine efficiency and to detect problems.

- Transport machine parts, tools, equipment, and other material between work areas and storage, using cranes, hoists, or dollies.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- apply cleaning solvents
- assist mechanic, or extractive or construction trades craft worker
- clean equipment or machinery
- clean rooms or work areas
- construct, erect, or repair wooden frameworks or structures
- cut, shape, fit, or join wood or other construction materials
- erect scaffold
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- install equipment or attachments on machinery or related structures
- inventory stock to ensure adequate supplies
- load or unload material or workpiece into machinery
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain repair records
- mix paint, ingredients, or chemicals, according to specifications
- move materials or goods between work areas
- move or fit heavy objects
- observe or listen to machinery or equipment operation to detect malfunctions
- operate crane in construction, manufacturing or repair setting
- operate hoist, winch, or hydraulic boom
- operate sandblasting equipment
- operate vacuum or air hose
- perform safety inspections in industrial, manufacturing or repair setting
- read specifications
- read work order, instructions, formulas, or processing charts
- repair or replace malfunctioning or worn mechanical components
- repair sheet metal products
- requisition stock, materials, supplies or

- Position and level battery cells, anodes, or cathodes, using hoists or leveling jacks, or signal other workers to perform positioning and leveling.
- Pour compounds into transformer-case terminal openings in order to seal out moisture.
- Read service guides to find information needed to perform repairs.
- Reassemble repaired electric motors to specified requirements and ratings, using hand tools and electrical meters.
- Record repairs required, parts used, and labor time.
- Reface, ream, and polish commutators and machine parts to specified tolerances, using machine tools.
- Remove and replace defective parts such as coil leads, carbon brushes, and wires, using soldering equipment.
- Repair and operate battery-charging equipment.
- Repair and rebuild defective mechanical parts in electric motors, generators, and related equipment, using hand tools and power tools.
- Rewind coils on cores in slots, or make replacement coils, using coil-winding machines.
- Rewire electrical systems, and repair or replace electrical accessories.
- Scrape and clean units or parts, using cleaning solvents and equipment such as buffing wheels.
- Seal joints with putty, mortar, and asbestos, using putty extruders and knives.
- Set machinery for proper performance, using computers.
- Sharpen tools such as saws, picks, shovels, screwdrivers, and scoops, either manually or by using bench grinders and emery wheels.
- Solder, wrap, and coat wires to ensure proper insulation.
- Steam-clean polishing and buffing wheels to remove abrasives and bonding materials, and spray, brush, or recoat surfaces as necessary.
- Test battery charges, and replace or recharge batteries as necessary.
- Test conditions, fluid levels, and specific gravities of electrolyte cells, using voltmeters, hydrometers, and thermometers.
- Test equipment for overheating, using speed gauges and thermometers.
- Verify and adjust alignments and dimensions of parts, using gauges and tracing lathes.
- Weld, braze, or solder electrical connections.

Detailed Tasks



equipment

- signal directions or warnings to coworkers
- test materials or solutions
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use basic carpentry techniques
- use control or regulating devices to adjust or maintain industrial machinery
- use hand or power tools
- use hand or power woodworking tools
- use high voltage apparatus
- use knowledge of metric system
- use measuring devices in repairing industrial or heavy equipment
- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use pressure gauges
- work as a team member

Technology - Examples

Data base user interface and query software

- Database software

Spreadsheet software

- Spreadsheet software

Word processing software

- Word processing software

Tools - Examples

- Abrasive wheels
- Abrasive rubbing stones
- Adjustable widemouth pliers
- Adjustable wrenches
- Bandsaws
- Oxyacetylene torches
- Dial calipers
- Compressed air guns
- Deburring tools
- Dollies
- Drill bits
- Ear plugs

Detailed Work Activities:

- apply cleaning solvents
- assemble gear systems
- clean equipment or machinery
- determine installation, service, or repair needed
- distinguish colors
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- inspect transformer for defects
- install or replace meters, regulators, or related measuring or control devices
- install/connect electrical equipment to power circuit
- lubricate machinery, equipment, or parts
- maintain inventory of supplies
- maintain or repair industrial or related equipment/machinery
- maintain or repair work tools or equipment
- maintain production or work records
- move or fit heavy objects
- operate coil winding machines
- operate hoist, winch, or hydraulic boom
- operate lathes
- perform safety inspections in industrial, manufacturing or repair setting
- read blueprints
- read schematics
- read technical drawings
- read work order, instructions, formulas, or processing charts
- repair electrical transformers
- repair or replace electrical wiring, circuits, fixtures, or equipment
- service batteries or transformers with specified fluids
- sharpen metal objects
- signal directions or warnings to coworkers
- solder electrical or electronic connections or components
- solder metal parts or components together
- test electrical/electronic wiring, equipment, systems or fixtures
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use electrical or electronic test devices or equipment
- use hand or power tools
- use high voltage apparatus
- use measuring devices in repairing industrial or heavy equipment



- Forklifts
- Dial indicators
- Grease guns
- Lapping equipment
- Hammers
- Hard hats
- Chain falls
- Hold down clamps
- Jacks
- Ladders
- Lathes
- Levels
- Lockout hasps
- Metal cutters
- Metal inert gas MIG welders
- Micrometers
- Milling machines
- Personal computers
- Plumb bobs
- Jackhammers
- Buffing machines
- Power drills
- Grinding machines
- Bench saws
- Punches
- Reamers
- Respirators
- Rivet guns
- Rulers
- Safety glasses
- Safety belts
- Hacksaws

repair of heavy equipment

- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use soldering equipment
- use voltmeter, ammeter, or ohmmeter

Technology - Examples



- Scaffolding
- Screwdrivers
- Shears
- Rigging equipment
- Socket wrench sets
- Soldering guns
- Steel rules
- Sheet metal folders
- Dies
- Pipe threaders
- Tungsten inert gas TIG welding equipment
- Industrial vacuums
- Arc welders
- Welding tips
- Spot-welding equipment
- Workshop cranes
- Brakes

Labor Market Comparison

Maine Department of Labor.

Description	Maintenance Workers, Machinery	Electric Motor, Power Tool, and Related Repairers	Difference
Median Wage	\$ 34,100	\$ 31,210	\$(2,890)
10th Percentile Wage	\$ 18,630	\$ 21,230	\$ 2,600
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 38,610	\$ 39,540	\$ 930
90th Percentile Wage	\$ 43,370	\$ 46,250	\$ 2,880
Mean Wage	\$ 32,410	\$ 32,930	\$ 520
Total Employment - 2521	290	170	-120
Employment Base - 2006	337	153	-184
Projected Employment - 2530	278	135	-143
Projected Job Growth - 2006-2530	-17.5 %	-11.8 %	5.7 %
Projected Annual Openings - 2006-2530	5	6	1

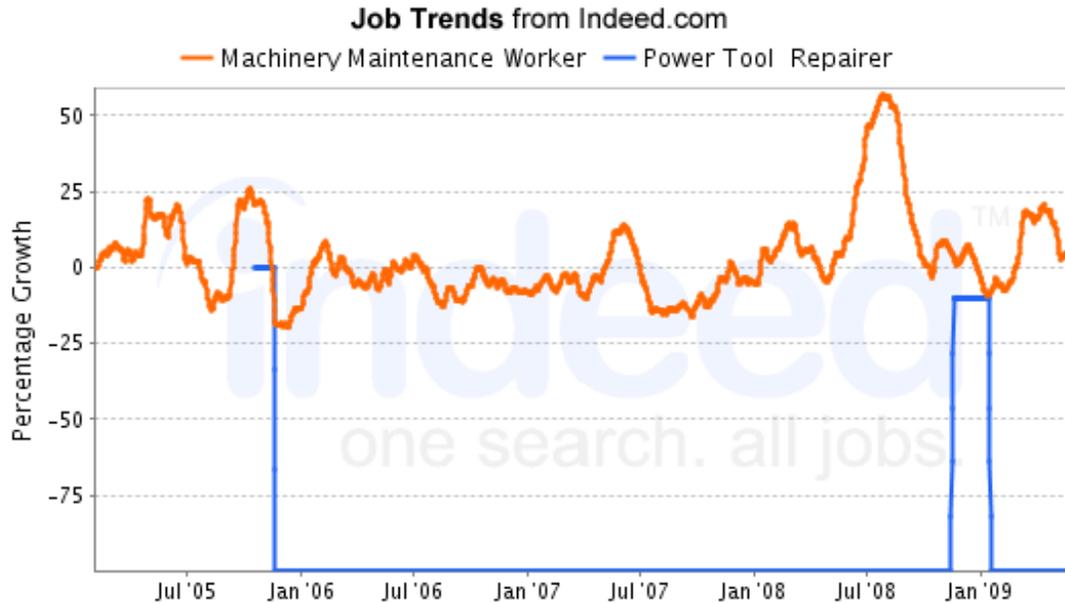


Special

Special Occupations:

National Job Posting Trends

Trend for Maintenance Workers, Machinery and Electric Motor, Power Tool, and Related Repairers

Data from [Indeed](http://Indeed.com)

Programs

Related Programs

Electrical and Electronics Equipment Installer and

Electrical/Electronics Equipment Installation and Repair, General. A program that generally prepares individuals to apply technical knowledge and skills to operate, maintain, and repair electrical and electronic equipment. Includes instruction in electrical circuitry, simple gearing, linkages and lubrication of machines and appliances, and the use of testing equipment.

No information on schools for the program

Electrical and Electronics Equipment Installer and

Electrical/Electronics Maintenance and Repair Technology, Other. Any instructional program in electrical and electronics equipment installation and repair not listed above.

No information on schools for the program

Electrician

Electrician. A program that prepares individuals to apply technical knowledge and skills to install, operate, maintain, and repair electric apparatus and systems such as residential, commercial, and industrial electric-power wiring; and DC and AC motors, controls, and electrical distribution panels. Includes instruction in the principles of electronics and electrical systems, wiring, power transmission, safety, industrial and household appliances, job estimation, electrical testing and inspection, and applicable codes and standards.

Institution	Address	City	URL
Eastern Maine Community College	354 Hogan Rd	Bangor	www.emcc.edu



Washington County Community College	One College Drive	Calais	www.wccc.me.edu
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu
Kennebec Valley Community College	92 Western Ave	Fairfield	www.kvcc.me.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Northern Maine Community College	33 Edgemont Dr	Presque Isle	www.nmcc.edu
Southern Maine Community College	2 Fort Road	South Portland	www.smccME.edu

Major Appliance Installer and Repairer

Appliance Installation and Repair Technology/Technician. A program that prepares individuals to apply technical knowledge and skills to repair, install, and service major gas, electric, and microwave consumer appliances such as stoves, refrigerators, dryers, water heaters, washers, dishwashers, and commercial units such as ice makers and coffee makers.

No information on schools for the program

Miscellaneous Mechanics and Repairers, Other

Precision Systems Maintenance and Repair Technologies, Other. Any instructional program in miscellaneous mechanics and repairers not listed above.

No information on schools for the program

Maine Statewide Promotion Opportunities for Maintenance Workers, Machinery

O* NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
49-9043.00	Maintenance Workers, Machinery	100	1	290	\$34,100.00	\$0.00	-17%	5	
51-4121.06	Welders, Cutters, and Welder Fitters	91	2	1,610	\$38,030.00	\$3,930.00	7%	49	★
49-9044.00	Millwrights	90	3	830	\$41,280.00	\$7,180.00	-12%	11	
49-3051.00	Motorboat Mechanics	88	3	240	\$34,980.00	\$880.00	6%	8	★
47-5021.00	Earth Drillers, Except Oil and Gas	88	3	140	\$37,470.00	\$3,370.00	2%	4	
49-9041.00	Industrial Machinery Mechanics	88	3	990	\$39,370.00	\$5,270.00	7%	25	★
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	88	3	110	\$34,350.00	\$250.00	-9%	2	



49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	87	3	1,180	\$34,210.00	\$110.00	6%	34	★
47-2011.00	Boilermakers	87	4	60	\$39,260.00	\$5,160.00	12%	3	
49-3042.00	Mobile Heavy Equipment Mechanics, Except Engines	87	4	880	\$37,010.00	\$2,910.00	5%	22	★
49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	86	3	440	\$49,450.00	\$15,350.00	-19%	15	
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	85	3	130	\$35,960.00	\$1,860.00	4%	4	
51-4111.00	Tool and Die Makers	85	3	160	\$51,670.00	\$17,570.00	-11%	2	
49-9012.00	Control and Valve Installers and Repairers, Except Mechanical Door	84	3	170	\$47,860.00	\$13,760.00	-9%	3	
49-2095.00	Electrical and Electronics Repairers, Powerhouse, Substation, and Relay	84	5	20	\$60,790.00	\$26,690.00	5%	1	

Special Occupations:

Top Industries for Electric Motor, Power Tool, and Related Repairers

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	27.62%	7,037	6,702	-4.76%
Self-employed workers, primary job	000601	8.55%	2,178	2,088	-4.12%
Electrical and electronic goods merchant wholesalers	423600	7.99%	2,035	2,159	6.11%
Self-employed workers, secondary job	000602	3.96%	1,008	903	-10.40%
Building material and supplies dealers	444100	3.90%	994	1,143	15.01%



Electronic and precision equipment repair and maintenance	811200	2.84%	724	592	-18.20%
Automotive mechanical and electrical repair and maintenance	811110	2.78%	709	758	6.86%
Electrical contractors	238210	2.78%	709	669	-5.63%
Electrical equipment manufacturing	335300	1.74%	444	340	-23.53%
Hardware, and plumbing and heating equipment and supplies merchant wholesalers	423700	1.69%	430	439	2.17%
Converted paper product manufacturing	322200	1.48%	377	285	-24.47%
Personal and household goods repair and maintenance	811400	1.45%	369	308	-16.47%
Professional and commercial equipment and supplies merchant wholesalers	423400	1.29%	329	345	4.91%
Motor vehicle and motor vehicle parts and supplies merchant wholesalers	423100	1.23%	314	323	2.73%
Local government, excluding education and hospitals	939300	1.08%	275	278	1.10%

Top Industries for Maintenance Workers, Machinery

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Local government, excluding education and hospitals	939300	6.40%	5,397	6,063	12.34%
Motor vehicle parts manufacturing	336300	3.89%	3,278	2,610	-20.39%
Plastics product manufacturing	326100	3.16%	2,666	2,826	6.00%
Animal production; primary job	112000	2.73%	2,304	2,043	-11.34%
Animal slaughtering and processing	311600	2.47%	2,079	2,373	14.13%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	2.36%	1,988	2,104	5.82%
Support activities for air transportation	488100	2.25%	1,897	2,292	20.80%
Coal mining	212100	1.76%	1,483	1,498	0.99%
Pharmaceutical and medicine manufacturing	325400	1.71%	1,439	1,814	26.03%
Colleges, universities, and professional schools, public and private	611300	1.70%	1,437	1,608	11.87%
Fabric mills	313200	1.53%	1,286	908	-29.38%
Commercial and industrial machinery and equipment rental and leasing	532400	1.52%	1,281	1,565	22.19%
Pulp, paper, and paperboard mills	322100	1.49%	1,256	871	-30.64%
Electric power generation, transmission and distribution	221100	1.47%	1,241	1,141	-8.03%
Converted paper product manufacturing	322200	1.39%	1,168	980	-16.08%



TORQ Analysis of Maintenance Workers, Machinery to Motorboat Mechanics

ANALYSIS INPUT					
Transfer	Title	O*NET	Filters		
From Title:	Maintenance Workers, Machinery	49-9043.00	Abilities:	Importance Level: 50	Weight: 1
To Title:	Motorboat Mechanics	49-3051.00	Skills:	Importance Level: 69	Weight: 1
Labor Market Area:	Maine Statewide		Knowledge:	Importance Level: 69	Weight: 1

TORQ RESULTS					
Grand TORQ:					88
Ability TORQ		Skills TORQ		Knowledge TORQ	
Level	 92	Level	 90	Level	 82

Gaps To Narrow if Possible				Upgrade These Skills				Knowledge to Add			
Ability	Level	Gap	Impt	Skill	Level	Gap	Impt	Knowledge	Level	Gap	Impt
Hearing Sensitivity	50	15	62	Judgment and Decision Making	59	16	72	No Knowledge Upgrades Required!			
Multilimb Coordination	55	14	65	Installation	83	9	80				
Problem Sensitivity	50	8	72	Monitoring	56	7	71				
Inductive Reasoning	50	6	65	Repairing	93	5	76				
Finger Dexterity	50	6	65	Reading Comprehension	65	3	80				
Control Precision	53	5	68								
Extent Flexibility	50	6	53								
Oral Comprehension	55	5	62								
Deductive Reasoning	48	4	65								
Speech Clarity	37	5	50								
Oral Expression	50	4	62								
Near Vision	50	4	62								
Information Ordering	46	4	56								
Category Flexibility	41	4	50								
Flexibility of Closure	46	4	50								
Depth Perception	44	3	56								



Arm-Hand Steadiness	48	2	72
Manual Dexterity	46	2	68
Visualization	48	2	56
Speech Recognition	39	2	56
Trunk Strength	42	1	53

LEVEL and IMPT (IMPORTANCE) refer to the Target Motorboat Mechanics. GAP refers to level difference between Maintenance Workers, Machinery and Motorboat Mechanics.

ASK ANALYSIS

Ability Level Comparison - Abilities with importance scores over 50

Description	Maintenance Workers, Machinery	Motorboat Mechanics	Importance
Problem Sensitivity	42	50	72
Arm-Hand Steadiness	46	48	72
Manual Dexterity	44	46	68
Control Precision	48	53	68
Deductive Reasoning	44	48	65
Inductive Reasoning	44	50	65
Finger Dexterity	44	50	65
Multilimb Coordination	41	55	65
Oral Comprehension	50	55	62
Oral Expression	46	50	62
Near Vision	46	50	62
Hearing Sensitivity	35	50	62
Information Ordering	42	46	56
Visualization	46	48	56
Depth Perception	41	44	56
Speech Recognition	37	39	56
Trunk Strength	41	42	53
Extent Flexibility	44	50	53
Category Flexibility	37	41	50
Flexibility of Closure	42	46	50
Selective Attention	44	42	50
Speech Clarity	32	37	50

Skill Level Comparison - Abilities with importance scores over 69

Description	Maintenance Workers, Machinery	Motorboat Mechanics	Importance
Reading Comprehension	62	65	80
Installation	74	83	80
Repairing	88	93	76



Judgment and Decision Making	43	59	72
Monitoring	49	56	71
Knowledge Level Comparison - Knowledge with importance scores over 69			
Description	Maintenance Workers, Machinery	Motorboat Mechanics	Importance

Experience & Education Comparison					
Related Work Experience Comparison			Required Education Level Comparison		
Description	Maintenance Workers, Machinery	Motorboat Mechanics	Description	Maintenance Workers, Machinery	Motorboat Mechanics
10+ years	0%	10%	Doctoral	0%	0%
8-10 years	3%	0%	Professional Degree	0%	0%
6-8 years	0%	11%	Post-Masters Cert	0%	0%
4-6 years	10%	12%	Master's Degree	0%	0%
2-4 years	10%	14%	Post-Bachelor Cert	0%	0%
1-2 years	48%	23%	Bachelors	2%	0%
6-12 months	5%	25%	AA or Equiv	0%	0%
3-6 months	10%	0%	Some College	6%	0%
1-3 months	0%	0%	Post-Secondary Certificate	25%	63%
0-1 month	0%	0%	High School Diploma or GED	64%	16%
None	9%	1%	No HSD or GED	0%	19%
Maintenance Workers, Machinery			Motorboat Mechanics		
Most Common Educational/Training Requirement:					
Short-term on-the-job training			Long-term on-the-job training		
Job Zone Comparison					
1 - Job Zone One: Little or No Preparation Needed			3 - Job Zone Three: Medium Preparation Needed		
<p>No previous work-related skill, knowledge, or experience is needed for these occupations. For example, a person can become a cashier even if he/she has never worked before.</p> <p>These occupations may require a high school diploma or GED certificate. Some may require a formal training course to obtain a license.</p> <p>Employees in these occupations need anywhere from a few days to a few months of training. Usually, an experienced worker could show you how to do the job.</p>			<p>Previous work-related skill, knowledge, or experience is required for these occupations. For example, an electrician must have completed three or four years of apprenticeship or several years of vocational training, and often must have passed a licensing exam, in order to perform the job.</p> <p>Most occupations in this zone require training in vocational schools, related on-the-job experience, or an associate's degree. Some may require a bachelor's degree.</p> <p>Employees in these occupations usually need one or two years of training involving both on-the-job experience and informal training with experienced workers.</p>		

Tasks	
Maintenance Workers, Machinery	Motorboat Mechanics
Core Tasks	Core Tasks



Generalized Work Activities:

- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Controlling Machines and Processes - Using either control mechanisms or direct physical activity to operate machines or processes (not including computers or vehicles).
- Handling and Moving Objects - Using hands and arms in handling, installing, positioning, and moving materials, and manipulating things.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.
- Performing General Physical Activities - Performing physical activities that require considerable use of your arms and legs and moving your whole body, such as climbing, lifting, balancing, walking, stooping, and handling of materials.

Specific Tasks

Occupation Specific Tasks:

- Clean machines and machine parts, using cleaning solvents, cloths, air guns, hoses, vacuums, or other equipment.
- Collaborate with other workers to repair or move machines, machine parts, or equipment.
- Collect and discard worn machine parts and other refuse in order to maintain machinery and work areas.
- Dismantle machines and remove parts for repair, using hand tools, chain falls, jacks, cranes, or hoists.
- Inspect or test damaged machine parts, and mark defective areas or advise supervisors of repair needs.
- Install, replace, or change machine parts and attachments, according to production specifications.
- Inventory and requisition machine parts, equipment, and other supplies so that stock can be maintained and replenished.
- Lubricate or apply adhesives or other materials to machines, machine parts, or other equipment, according to specified procedures.
- Measure, mix, prepare, and test chemical solutions used to clean or repair machinery and equipment.
- Read work orders and specifications to determine machines and equipment requiring repair or maintenance.

Generalized Work Activities:

- Repairing and Maintaining Mechanical Equipment - Servicing, repairing, adjusting, and testing machines, devices, moving parts, and equipment that operate primarily on the basis of mechanical (not electronic) principles.
- Getting Information - Observing, receiving, and otherwise obtaining information from all relevant sources.
- Identifying Objects, Actions, and Events - Identifying information by categorizing, estimating, recognizing differences or similarities, and detecting changes in circumstances or events.
- Monitor Processes, Materials, or Surroundings - Monitoring and reviewing information from materials, events, or the environment, to detect or assess problems.
- Inspecting Equipment, Structures, or Material - Inspecting equipment, structures, or materials to identify the cause of errors or other problems or defects.

Specific Tasks

Occupation Specific Tasks:

- Adjust carburetor mixtures, electrical point settings, and timing while motors are running in water-filled test tanks.
- Adjust generators and replace faulty wiring, using hand tools and soldering irons.
- Disassemble and inspect motors to locate defective parts, using mechanic's hand tools and gauges.
- Document inspection and test results, and work performed or to be performed.
- Idle motors and observe thermometers to determine the effectiveness of cooling systems.
- Inspect and repair or adjust propellers and propeller shafts.
- Mount motors to boats and operate boats at various speeds on waterways to conduct operational tests.
- Repair engine mechanical equipment such as power-tilts, bilge pumps, or power take-offs.
- Repair or rework parts, using machine tools such as lathes, mills, drills, and grinders.
- Replace parts such as gears, magneto points, piston rings, and spark plugs, and reassemble engines.
- Set starter locks, and align and repair steering or throttle controls, using gauges, screwdrivers, and wrenches.
- Start motors, and monitor performance for signs of malfunctioning such as smoke, excessive vibration, and misfiring.



- Reassemble machines after the completion of repair or maintenance work.
- Record production, repair, and machine maintenance information.
- Remove hardened material from machines or machine parts, using abrasives, power and hand tools, jackhammers, sledgehammers, or other equipment.
- Replace or repair metal, wood, leather, glass, or other lining in machines, or in equipment compartments or containers.
- Replace, empty, or replenish machine and equipment containers such as gas tanks or boxes.
- Set up and operate machines, and adjust controls to regulate operations.
- Start machines and observe mechanical operation to determine efficiency and to detect problems.
- Transport machine parts, tools, equipment, and other material between work areas and storage, using cranes, hoists, or dollies.

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- apply cleaning solvents
- assist mechanic, or extractive or construction trades craft worker
- clean equipment or machinery
- clean rooms or work areas
- construct, erect, or repair wooden frameworks or structures
- cut, shape, fit, or join wood or other construction materials
- erect scaffold
- fabricate sheet metal parts or items
- fabricate, assemble, or disassemble manufactured products by hand
- inspect machinery or equipment to determine adjustments or repairs needed
- install equipment or attachments on machinery or related structures
- inventory stock to ensure adequate supplies
- load or unload material or workpiece into machinery
- lubricate machinery, equipment, or parts
- maintain or repair industrial or related equipment/machinery
- maintain repair records
- mix paint, ingredients, or chemicals, according to specifications
- move materials or goods between work areas
- move or fit heavy objects
- observe or listen to machinery or equipment operation to detect malfunctions

Detailed Tasks

Detailed Work Activities:

- adhere to safety procedures
- adjust or set mechanical controls or components
- align or adjust clearances of mechanical components or parts
- align or adjust clearances of vehicle body parts or components
- analyze test information to determine equipment operating efficiency
- assemble, dismantle, or reassemble equipment or machinery
- conduct tests to locate mechanical system malfunction
- determine installation, service, or repair needed
- diagnose mechanical problems in machinery or equipment
- fabricate, assemble, or disassemble manufactured products by hand
- follow vehicle repair procedures
- inspect machinery or equipment to determine adjustments or repairs needed
- install or replace meters, regulators, or related measuring or control devices
- lubricate machinery, equipment, or parts
- maintain or repair ship/boat engine, machinery or equipment
- maintain or repair small engines
- maintain repair records
- move or fit heavy objects
- observe or listen to machinery or equipment operation to detect malfunctions
- operate hoist, winch, or hydraulic boom
- operate vehicle engine electrical system test equipment
- overhaul vehicle major operating units, such as engines or transmissions
- perform safety inspections in industrial, manufacturing or repair setting
- prepare reports
- read blueprints
- read specifications
- read technical drawings
- read vehicle manufacturer's specifications
- read work order, instructions, formulas, or processing charts
- repair or replace electrical wiring, circuits, fixtures, or equipment
- repair or replace malfunctioning or worn mechanical components
- service vehicle with water, fuel, or oil
- set up and operate variety of machine tools
- solder electrical or electronic connections or components



- operate crane in construction, manufacturing or repair setting
- operate hoist, winch, or hydraulic boom
- operate sandblasting equipment
- operate vacuum or air hose
- perform safety inspections in industrial, manufacturing or repair setting
- read specifications
- read work order, instructions, formulas, or processing charts
- repair or replace malfunctioning or worn mechanical components
- repair sheet metal products
- requisition stock, materials, supplies or equipment
- signal directions or warnings to coworkers
- test materials or solutions
- test mechanical products or equipment
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use acetylene welding/cutting torch
- use basic carpentry techniques
- use control or regulating devices to adjust or maintain industrial machinery
- use hand or power tools
- use hand or power woodworking tools
- use high voltage apparatus
- use knowledge of metric system
- use measuring devices in repairing industrial or heavy equipment
- use pneumatic tools
- use precision measuring devices in mechanical repair work
- use pressure gauges
- work as a team member

Technology - Examples

Data base user interface and query software

- Database software

Spreadsheet software

- Spreadsheet software

Word processing software

- Word processing software

Tools - Examples

- Abrasive wheels
- Abrasive rubbing stones
- Adjustable widemouth pliers
- Adjustable wrenches

- test electrical/electronic wiring, equipment, systems or fixtures
- test mechanical products or equipment
- test operate vehicles before or after repair
- understand service or repair manuals
- understand technical operating, service or repair manuals
- use 2-cycle engine technology
- use basic plumbing techniques
- use electrical or electronic test devices or equipment
- use electronic calibration devices
- use engine diagnostic equipment
- use hand or power tools
- use knowledge of metric system
- use machine tools in installation, maintenance, or repair
- use precision measuring devices in mechanical repair work
- use soldering equipment
- use voltmeter, ammeter, or ohmmeter

Technology - Examples



- Bandsaws
- Oxyacetylene torches
- Dial calipers
- Compressed air guns
- Deburring tools
- Dollies
- Drill bits
- Ear plugs
- Forklifts
- Dial indicators
- Grease guns
- Lapping equipment
- Hammers
- Hard hats
- Chain falls
- Hold down clamps
- Jacks
- Ladders
- Lathes
- Levels
- Lockout hasps
- Metal cutters
- Metal inert gas MG welders
- Micrometers
- Milling machines
- Personal computers
- Plumb bobs
- Jackhammers
- Buffing machines
- Power drills
- Grinding machines
- Bench saws



- Punches
- Reamers
- Respirators
- Rivet guns
- Rulers
- Safety glasses
- Safety belts
- Hacksaws
- Scaffolding
- Screwdrivers
- Shears
- Rigging equipment
- Socket wrench sets
- Soldering guns
- Steel rules
- Sheet metal folders
- Dies
- Pipe threaders
- Tungsten inert gas TIG welding equipment
- Industrial vacuums
- Arc welders
- Welding tips
- Spot-welding equipment
- Workshop cranes
- Brakes

Labor Market Comparison

Maine Department of Labor.

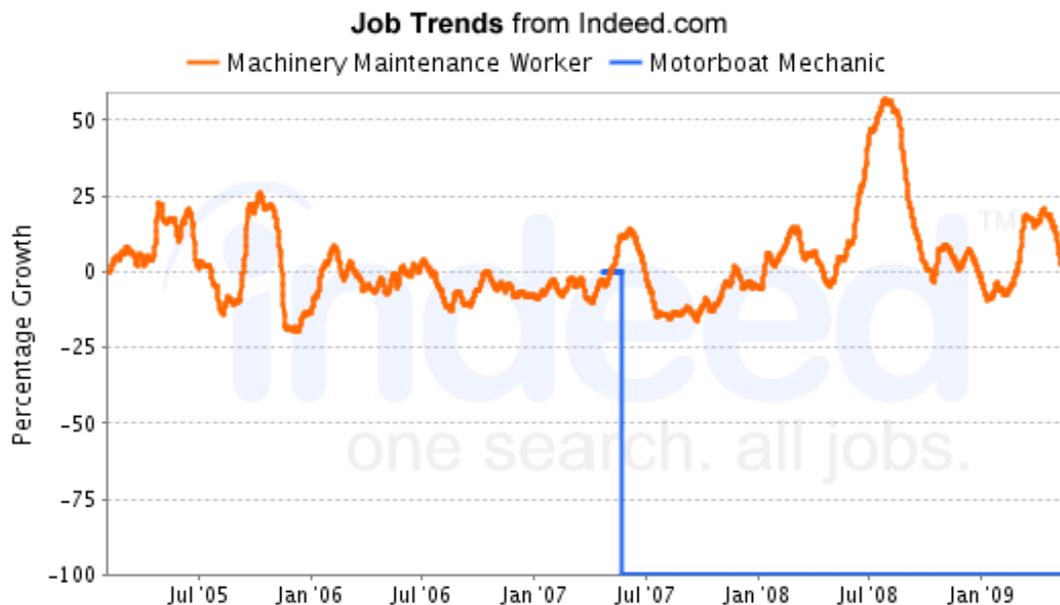
Description	Maintenance Workers, Machinery	Motorboat Mechanics	Difference
Median Wage	\$ 34,100	\$ 34,980	\$ 880
10th Percentile Wage	\$ 18,630	\$ 24,940	\$ 6,310
25th Percentile Wage	N/A	N/A	N/A
75th Percentile Wage	\$ 38,610	\$ 42,120	\$ 3,510



90th Percentile Wage	\$ 43,370	\$ 49,060	\$ 5,690
Mean Wage	\$ 32,410	\$ 35,530	\$ 3,120
Total Employment - 2521	290	240	-50
Employment Base - 2006	337	288	-49
Projected Employment - 2530	278	305	27
Projected Job Growth - 2006-2530	-17.5 %	5.9 %	23.4 %
Projected Annual Openings - 2006-2530	5	8	3
Special		★	
Special Occupations:			

National Job Posting Trends

Trend for Maintenance Workers, Machinery and Motorboat Mechanics



Data from [Indeed](#)

Programs

Related Programs

Marine Maintenance/Fitter and Ship Repair Technology/Technician

Marine Maintenance/Fitter and Ship Repair Technology/Technician. A program that prepares individuals to apply technical knowledge and skills to repair outboard and inboard engines; test, maintain, and repair steering devices and electrical systems; repair metal, wood, and fiberglass hulls and vessel components; fabricate and maintain sails; and repair and balance propellers and drive shafts.

Institution	Address	City	URL
Washington County Community College	One College Drive	Calais	www.wccc.me.edu



Wasington County Community College

One College Drive

Calais

www.wccc.me.edu

Small Engine Mechanic and Repairer

Small Engine Mechanics and Repair Technology/Technician. A program that prepares individuals to apply technical knowledge and skills to repair, service, and maintain small internal-combustion engines used on portable power equipment such as lawnmowers, chain saws, rotary tillers, and snowmobiles.

No information on schools for the program

Maine Statewide Promotion Opportunities for Maintenance Workers, Machinery

O*NET Code	Title	Grand TORQ	Job Zone	Employment	Median Wage	Difference	Growth	Annual Job Openings	Special
49-9043.00	Maintenance Workers, Machinery	100	1	290	\$34,100.00	\$0.00	-17%	5	
51-4121.06	Welders, Cutters, and Welder Fitters	91	2	1,610	\$38,030.00	\$3,930.00	7%	49	★
49-9044.00	Millwrights	90	3	830	\$41,280.00	\$7,180.00	-12%	11	
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic	88	3	110	\$34,350.00	\$250.00	-9%	2	
47-5021.00	Earth Drillers, Except Oil and Gas	88	3	140	\$37,470.00	\$3,370.00	2%	4	
49-9041.00	Industrial Machinery Mechanics	88	3	990	\$39,370.00	\$5,270.00	7%	25	★
49-3051.00	Motorboat Mechanics	88	3	240	\$34,980.00	\$880.00	6%	8	★
49-3042.00	Mobile Heavy Equipment Mechanics, Except Engines	87	4	880	\$37,010.00	\$2,910.00	5%	22	★
47-2011.00	Boilermakers	87	4	60	\$39,260.00	\$5,160.00	12%	3	
49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	87	3	1,180	\$34,210.00	\$110.00	6%	34	★



49-2094.00	Electrical and Electronics Repairers, Commercial and Industrial Equipment	86	3	440	\$49,450.00	\$15,350.00	-19%	15	
49-2093.00	Electrical and Electronics Installers and Repairers, Transportation Equipment	85	3	130	\$35,960.00	\$1,860.00	4%	4	
51-4111.00	Tool and Die Makers	85	3	160	\$51,670.00	\$17,570.00	-11%	2	
51-4041.00	Machinists	84	3	1,860	\$41,560.00	\$7,460.00	4%	35	★
53-6051.07	Transportation Vehicle, Equipment and Systems Inspectors, Except Aviation	84	3	60	\$42,890.00	\$8,790.00	5%	2	

Special Occupations:

Top Industries for Motorboat Mechanics

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Other motor vehicle dealers	441200	38.93%	9,389	12,582	34.01%
Self-employed workers, primary job	000601	19.75%	4,762	5,073	6.54%
Personal and household goods repair and maintenance	811400	12.93%	3,117	2,893	-7.19%
Ship and boat building	336600	2.94%	709	794	11.93%
Self-employed workers, secondary job	000602	2.89%	698	695	-0.45%
Support activities for water transportation	488300	1.37%	331	383	15.76%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	0.63%	151	160	5.82%
Consumer goods rental	532200	0.63%	153	166	8.77%
Miscellaneous durable goods merchant wholesalers	423900	0.61%	146	168	14.80%
Scenic and sightseeing transportation	487000	0.50%	121	156	29.38%
Inland water transportation	483200	0.40%	96	108	12.28%
Automotive mechanical and electrical repair and maintenance	811110	0.35%	84	100	18.73%
State government, excluding education and hospitals	929200	0.30%	73	72	-1.88%



Top Industries for Maintenance Workers, Machinery

Industry	NAICS	% of Industry	Employment	Projected Employment	% Change
Local government, excluding education and hospitals	939300	6.40%	5,397	6,063	12.34%
Motor vehicle parts manufacturing	336300	3.89%	3,278	2,610	-20.39%
Plastics product manufacturing	326100	3.16%	2,666	2,826	6.00%
Animal production; primary job	112000	2.73%	2,304	2,043	-11.34%
Animal slaughtering and processing	311600	2.47%	2,079	2,373	14.13%
Commercial and industrial machinery and equipment (except automotive and electronic) repair and maintenance	811300	2.36%	1,988	2,104	5.82%
Support activities for air transportation	488100	2.25%	1,897	2,292	20.80%
Coal mining	212100	1.76%	1,483	1,498	0.99%
Pharmaceutical and medicine manufacturing	325400	1.71%	1,439	1,814	26.03%
Colleges, universities, and professional schools, public and private	611300	1.70%	1,437	1,608	11.87%
Fabric mills	313200	1.53%	1,286	908	-29.38%
Commercial and industrial machinery and equipment rental and leasing	532400	1.52%	1,281	1,565	22.19%
Pulp, paper, and paperboard mills	322100	1.49%	1,256	871	-30.64%
Electric power generation, transmission and distribution	221100	1.47%	1,241	1,141	-8.03%
Converted paper product manufacturing	322200	1.39%	1,168	980	-16.08%

Industry & Occupational Data Sources

TORQ Results: The TORQ Scores is based upon an proprietary algorithm applied against Knowledge, Skills and Ability levels and importance derived from O*NET 12.

ASK Analysis, Experience & Education Levels and Tasks: O*Net 12

Labor Market Comparisons Occupational Projections data from Maine Department of Labor

National Posting Trends Indeed.com

Labor Pool & Promotions Opportunities: Occupational Projections data from Maine Department of Labor

Top Industries: Occupational Employment Statistics program (U.S. Bureau of Labor Statistics)