

Credentialing Achievement Record

Industrial Technology Maintenance Basic Pneumatic Systems Level I

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ITM CREDENTIALING PROGRAM

Level I Credentialing Achievement Record (CAR)

Name:	Job Title / Student ID:
Duty Cluster Name: Basic Pneumatic Systems Level I	
Date Completed:	

Directions

This Credentialing Achievement Record (**CAR**) is the official training and performance document for the above named NIMS credentialing candidate. The CAR is used by the trainer/supervisor and candidate as a record of individual performance. The CAR is the vehicle that will allow eligible candidates to take the NIMS online theory credentialing examination(s). Supervisors, trainers, and candidates should take care of this record and be sure that it is accurate, kept up to date, filled out correctly, and properly stored. All information recorded in the CAR should be considered **CONFIDENTIAL**. The CAR is the property of the candidate and must be returned to the candidate when employment ends or at the completion of the training / school program.

Candidates may select as many credentialing areas as applicable to the facility or appropriate to the job. There are separate CAR booklets for each credentialing area. This CAR opens with a list of Critical Work Activities & Experiences (or experience statements) that must be acknowledged and documented. However, actual performance is assessed in two ways: 1) by fulfilling these general experience and historical statements and 2) by an examiner administering the *Skill Checks (or performance assessments)*. Three successful Skill Check attempts are required. Skill Checks are clearly marked with the title **"Skill Check."**

Candidate performance is documented by a checkmark on the <u>Examiner's Checklist</u>. All Skill Checks must be <u>co-initialed</u> and dated by the trainer/supervisor and candidate. Work activity sign-offs must be <u>co-initiated</u> by the trainer/supervisor and candidate then dated.

When the candidate has successfully demonstrated abilities in each of the critical work activities and experiences and skills checks to the satisfaction of the supervisor or trainer, he/she is eligible to take the online theory credentialing exam. The Affidavit of Successful Completion is completed and signed by the sponsor. It is co-signed by the trainer/ supervisor and the candidate, and then e-mailed to **support@nims-skills.org** to request access to the online theory exam. The candidate's sponsor will be notified when the online theory exam is made available on the NIMS testing system.

ITM CREDENTIALING PROGRAM

Level I Credentialing Achievement Record (CAR)

Examiner's Checklist: Basic Pneumatic Systems Level I

Critical Work Activities & Experiences All of the following statements must be completed prior to submission of the CAR	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.1 Adhere to safety, health and environmental rules and regulations			
Describe use and selection of fire extinguishers			
Demonstrate use of fall protection safety in use of ladders and platforms			
Demonstrate use of common PPE for maintenance work to be performed			
Perform a job safety analysis of work to be performed			
1.2 Describe, locate, and interpret safety data sheets			
 Describe, locate, and interpret the following for safety data sheets: Locate current safety material data sheets for given machines or processes Interpret information on SDS and apply Determine appropriate PPE required Describe uses of SDS 			
1.3 Technical documentations			
Locate and Interpret function and operation using technical documents			
Identify symbols for duty area			
Demonstrate knowledge of how to locate and maintain maintenance documents			

Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.1 Interpret basic pneumatic schematics			
Identify component types by the schematic symbol shown on a pneumatic schematic			
Identify line types and describe function on a pneumatic schematic			
Draw a schematic given an actual pneumatic system			
Describe the operation of a pneumatic system given a schematic			
1.2 Start up and shut down a reciprocating-type air compressor and adjust system pressure			
Assemble PPE and tools required			
Locate a compressor operation manual and determine normal operation pressure or obtain from plant procedure manuals			
 Perform pre-start procedures for compressor, including: Verify zero energy state Verify guards are in place Verify crankcase oil level (if applicable) is good Do a machine walk around, looking for any loose items, leaks, or other potential problems Check drain valve and close if open Check main line valves (if applicable) and open if closed 			
Start air compressor			
 While compressor is in operation, do the following: Check system pressure on tank Check system for leaks Monitor system pressure to determine cut-out and cut-in pressures Verify operating pressure band meets plant requirements Adjust pressure switch to different cut-out pressure as given by inspector Return pressure settings to original settings Shut down pneumatic system: Switch to off Open compressor drain valve 			
 Perform post-shutdown procedures for system, including: Verify zero energy state 			
Store PPE and machine operation manual			

Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.3 Adjust pneumatic system branch operating pressure using a regulator			
Locate a branch line of a pneumatic system that has a pressure regulator and shutoff valve installed			
Locate manufacturer's manual for the system installed at the branch to determine proper pressure setting			
Open the shutoff valve (if applicable) to the branch line			
If a pneumatic circuit is connected to the branch, verify with the operator that it is permissible to adjust system pressure			
Verify that main line compressed air is available. If not, start up the air compressor			
Determine if the current pressure regulator setting meets the machine specification			
 Adjust the pressure regulator to two different pressures, one above and one below the set pressure as given by the inspector: Use a pressure gauge to verify settings Read the pressures in both psig and kPa units 			
Return the pressure regulator setting to its original setting			

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Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.4 Adjust pneumatic actuator speed using a flow control valve			
Locate a schematic of a machine that has multiple actuators and flow control valves			
Identify location of the flow control valve that controls each direction of motion of each actuator			
 Perform pre-start procedures for machine, including: Verify zero energy state Verify guards are in place 			
 Verify branch line pressure is correct Do a machine walk around, looking for any loose items, leaks or other potential problems 			
With assistance of operator, put machine in manual mode and start the machine			
With assistance of operator, manually operate system to measure actuator stroke time or rotational speed			
Adjust actuator stroke times or RPMs to different values given by inspector			
Shut down system			
Close branch line valve, install lockout, and verify zero energy state			

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Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.5 Service a pneumatic filter			
Locate pneumatic system that has an element type filter			
Determine the specifications of filter given its part number			
Use manufacturer's specifications to determine if filter size is correct for machine			
Describe how to determine if the filter needs to be changed			
Inspect and drain water from a pneumatic filter			
Close the branch line shutoff valve			
 With machine pneumatic blockout/lockout/tagout installed and zero state verified: Change element on the filter Use proper cleanliness and installation procedures 			
Perform pre-start procedures			
 Perform functional check with assistance from operator: Verify no leaks Verify machine operates at proper pressures 			
Shut down system			
Close branch line valve and verify zero energy state			
1.6 Service a pneumatic lubricator			
Locate pneumatic system that has a lubricator			
Determine the specifications of lubricator given its part number			
Use manufacturer's specifications to determine if lubricator size is correct for machine			
Use manufacturer's specifications to determine if lubricator rate is correct for machine			
Use manufacturer's specifications to determine correct lubricant			
Adjust lubricator rate to rate given by inspector. Then return to original state			
Inspect pneumatic lubricator reservoir to determine if refilling is needed			
Refill lubricator			

Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.7 Install pneumatic conductors and pneumatic components			
 Given sample tubing and fittings identify type and size: Steel tubing Pneumatic hose Tubing fittings types and sizes Hose fittings types and sizes 			
Perform pre-start procedures			
 Given a pneumatic schematic, locate and install these conductors and fittings on a pneumatic system, assuring correct orientation and tightening: Steel tubing with ferrule fittings Polyurethane and other types of plastic hoses Push-on fittings Pipe thread fittings with thread sealant Barb fittings 			
Remove and install a directional control valve onto a subplate			
Remove and install a threaded port pneumatic valve			
Install and align a pneumatic cylinder with a load			
Perform pre-start inspection and then remove lockout/tagout			
Perform functional check with assistance from operator:Verify no leaks			
Perform post-shutdown procedures			

Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.8 Install and test pneumatic components in a circuit			
Locate one or more pneumatic schematics with 3-position and 2- position directional control valves, flow control valves, check valves, cylinders, motors, and instrumentation			
Assemble components into a circuit required by each schematic, identifying components given part numbers			
Perform pre-start procedures			
 Remove lockout/tagout and perform functional check with assistance from operator: Verify no leaks Bleed system as necessary Explain operation of each circuit Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			
1.9 Install and test components in a pneumatic vacuum generator circuit			
Locate one or more pneumatic schematics with directional control valves, flow control valves, vacuum cups, vacuum generators, and regulators			
Determine correct pressure settings for vacuum given machine documentation			
Adjust system to correct vacuum levels given machine documentation			
Assemble components into a circuit required by each schematic, identifying components given part numbers			
Perform pre-start procedures			
 Remove pneumatic blockout/lockout/tagout and perform functional check with assistance from operator: Verify no leaks Explain operation of each circuit Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			

Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.10 Troubleshoot a basic pneumatic circuit			
Locate the pneumatic system diagram			
Perform pre-start procedures			
 Troubleshoot three of four machine symptoms: Actuator will not move Actuator moves at incorrect speed Actuator moves erratically No or low system pressure 			
Perform pre-start procedures			
Replace/repair failed component			
Perform functional check with assistance of operator			
Perform post-shutdown procedures			

Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.1 Interpret basic pneumatic schematics			
Identify component types by the schematic symbol shown on a pneumatic schematic			
Identify line types and describe function on a pneumatic schematic			
Draw a schematic given an actual pneumatic system			
Describe the operation of a pneumatic system given a schematic			
1.2 Start up and shut down a reciprocating-type air compressor and adjust system pressure			
Locate a compressor operation manual and determine normal operation pressure or obtain from plant procedure manuals			
 Perform pre-start procedures for compressor, including: Verify zero energy state Verify guards are in place Verify crankcase oil level (if applicable) is good Do a machine walk around, looking for any loose items, leaks, or other potential problems Check drain valve and close if open Check main line valves (if applicable) and open if closed 			
Start air compressor			
 While compressor is in operation, do the following: Check system pressure on tank Check system for leaks Monitor system pressure to determine cut-out and cut-in pressures Verify operating pressure band meets plant requirements Adjust pressure switch to different cut-out pressure as given by inspector Return pressure settings to original settings 			
Shut down pneumatic system:			
 Switch to off Open compressor drain valve 			
Perform post-shutdown procedures for system, including:Verify zero energy state			

Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.3 Adjust pneumatic system branch operating pressure using a regulator			
Locate a branch line of a pneumatic system that has a pressure regulator and shutoff valve installed			
Locate manufacturer's manual for the system installed at the branch to determine proper pressure setting			
Open the shutoff valve (if applicable) to the branch line			
If a pneumatic circuit is connected to the branch, verify with the operator that it is permissible to adjust system pressure			
Verify that main line compressed air is available. If not, start up the air compressor			
Determine if the current pressure regulator setting meets the machine specification			
 Adjust the pressure regulator to two different pressures, one above and one below the set pressure as given by the inspector: Use a pressure gauge to verify settings Read the pressures in both psig and kPa units 			
Return the pressure regulator setting to its original setting			

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Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.4 Adjust pneumatic actuator speed using a flow control valve			
Locate a schematic of a machine that has multiple actuators and flow control valves			
Identify location of the flow control valve that controls each direction of motion of each actuator			
 Perform pre-start procedures for machine, including: Verify zero energy state Verify guards are in place Verify branch line pressure is correct Do a machine walk around, looking for any loose items, 			
leaks or other potential problems With assistance of operator, put machine in manual mode and start the machine			
With assistance of operator, manually operate system to measure actuator stroke time or rotational speed			
Adjust actuator stroke times or RPMs to different values given by inspector			
Shut down system			
Close branch line valve, install lockout, and verify zero energy state			

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Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.5 Service a pneumatic filter			
Locate pneumatic system that has an element type filter			
Determine the specifications of filter given its part number			
Use manufacturer's specifications to determine if filter size is correct for machine			
Describe how to determine if the filter needs to be changed			
Inspect and drain water from a pneumatic filter			
Close the branch line shutoff valve			
 With machine pneumatic blockout/lockout/tagout installed and zero state verified: Change element on the filter Use proper cleanliness and installation procedures 			
Perform pre-start procedures			
 Perform functional check with assistance from operator: Verify no leaks Verify machine operates at proper pressures 			
Shut down system			
Close branch line valve and verify zero energy state			
1.6 Service a pneumatic lubricator			
Locate pneumatic system that has a lubricator			
Determine the specifications of lubricator given its part number			
Use manufacturer's specifications to determine if lubricator size is correct for machine			
Use manufacturer's specifications to determine if lubricator rate is correct for machine			
Use manufacturer's specifications to determine correct lubricant			
Adjust lubricator rate to rate given by inspector. Then return to original state			
Inspect pneumatic lubricator reservoir to determine if refilling is needed			
Refill lubricator			

Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.7 Install pneumatic conductors and pneumatic components			
 Given sample tubing and fittings identify type and size: Steel tubing Pneumatic hose Tubing fittings types and sizes Hose fittings types and sizes 			
Perform pre-start procedures			
 Given a pneumatic schematic, locate and install these conductors and fittings on a pneumatic system, assuring correct orientation and tightening: Steel tubing with ferrule fittings Polyurethane and other types of plastic hoses Push-on fittings Pipe thread fittings with thread sealant Barb fittings 			
Remove and install a directional control valve onto a subplate			
Remove and install a threaded port pneumatic valve			
Install and align a pneumatic cylinder with a load			
Perform pre-start inspection and then remove lockout/tagout			
Perform functional check with assistance from operator:Verify no leaks			
Perform post-shutdown procedures			

Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.8 Install and test pneumatic components in a circuit			
Locate one or more pneumatic schematics with 3-position and 2- position directional control valves, flow control valves, check valves, cylinders, motors, and instrumentation			
Assemble components into a circuit required by each schematic, identifying components given part numbers			
Perform pre-start procedures			
 Remove lockout/tagout and perform functional check with assistance from operator: Verify no leaks Bleed system as necessary Explain operation of each circuit Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			
1.9 Install and test components in a pneumatic vacuum generator circuit			
Locate one or more pneumatic schematics with directional control valves, flow control valves, vacuum cups, vacuum generators, and regulators			
Determine correct pressure settings for vacuum given machine documentation			
Adjust system to correct vacuum levels given machine documentation			
Assemble components into a circuit required by each schematic, identifying components given part numbers			
Perform pre-start procedures			
 Remove pneumatic blockout/lockout/tagout and perform functional check with assistance from operator: Verify no leaks Explain operation of each circuit Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			

Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.10 Troubleshoot a basic pneumatic circuit			
Locate the pneumatic system diagram			
Perform pre-start procedures			
 Troubleshoot three of four machine symptoms: Actuator will not move Actuator moves at incorrect speed Actuator moves erratically No or low system pressure 			
Perform pre-start procedures			
Replace/repair failed component			
Perform functional check with assistance of operator			
Perform post-shutdown procedures			

Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.1 Interpret basic pneumatic schematics			
Identify component types by the schematic symbol shown on a pneumatic schematic			
Identify line types and describe function on a pneumatic schematic			
Draw a schematic given an actual pneumatic system			
Describe the operation of a pneumatic system given a schematic			
1.2 Start up and shut down a reciprocating-type air compressor and adjust system pressure			
Locate a compressor operation manual and determine normal operation pressure or obtain from plant procedure manuals			
 Perform pre-start procedures for compressor, including: Verify zero energy state Verify guards are in place Verify crankcase oil level (if applicable) is good Do a machine walk around, looking for any loose items, leaks, or other potential problems Check drain valve and close if open Check main line valves (if applicable) and open if closed 			
Start air compressor			
 While compressor is in operation, do the following: Check system pressure on tank Check system for leaks Monitor system pressure to determine cut-out and cut-in pressures Verify operating pressure band meets plant requirements Adjust pressure switch to different cut-out pressure as given by inspector Return pressure settings to original settings 			
Shut down pneumatic system:			
 Switch to off Open compressor drain valve 			
Perform post-shutdown procedures for system, including:Verify zero energy state			

Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.3 Adjust pneumatic system branch operating pressure using a regulator			
Locate a branch line of a pneumatic system that has a pressure regulator and shutoff valve installed			
Locate manufacturer's manual for the system installed at the branch to determine proper pressure setting			
Open the shutoff valve (if applicable) to the branch line			
If a pneumatic circuit is connected to the branch, verify with the operator that it is permissible to adjust system pressure			
Verify that main line compressed air is available. If not, start up the air compressor			
Determine if the current pressure regulator setting meets the machine specification			
 Adjust the pressure regulator to two different pressures, one above and one below the set pressure as given by the inspector: Use a pressure gauge to verify settings Read the pressures in both psig and kPa units 			
Return the pressure regulator setting to its original setting			

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Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.4 Adjust pneumatic actuator speed using a flow control valve			
Locate a schematic of a machine that has multiple actuators and flow control valves			
Identify location of the flow control valve that controls each direction of motion of each actuator			
 Perform pre-start procedures for machine, including: Verify zero energy state Verify guards are in place Verify branch line pressure is correct 			
• Do a machine walk around, looking for any loose items, leaks or other potential problems			
With assistance of operator, put machine in manual mode and start the machine			
With assistance of operator, manually operate system to measure actuator stroke time or rotational speed			
Adjust actuator stroke times or RPMs to different values given by inspector			
Shut down system			
Close branch line valve, install lockout, and verify zero energy state			

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Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.5 Service a pneumatic filter			
Locate pneumatic system that has an element type filter			
Determine the specifications of filter given its part number			
Use manufacturer's specifications to determine if filter size is correct for machine			
Describe how to determine if the filter needs to be changed			
Inspect and drain water from a pneumatic filter			
Close the branch line shutoff valve			
 With machine pneumatic blockout/lockout/tagout installed and zero state verified: Change element on the filter Use proper cleanliness and installation procedures 			
Perform pre-start procedures			
 Perform functional check with assistance from operator: Verify no leaks Verify machine operates at proper pressures 			
Shut down system			
Close branch line valve and verify zero energy state			
1.6 Service a pneumatic lubricator			
Locate pneumatic system that has a lubricator			
Determine the specifications of lubricator given its part number			
Use manufacturer's specifications to determine if lubricator size is correct for machine			
Use manufacturer's specifications to determine if lubricator rate is correct for machine			
Use manufacturer's specifications to determine correct lubricant			
Adjust lubricator rate to rate given by inspector. Then return to original state			
Inspect pneumatic lubricator reservoir to determine if refilling is needed			
Refill lubricator			

Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.7 Install pneumatic conductors and pneumatic components			
 Given sample tubing and fittings identify type and size: Steel tubing Pneumatic hose Tubing fittings types and sizes Hose fittings types and sizes 			
Perform pre-start procedures			
 Given a pneumatic schematic, locate and install these conductors and fittings on a pneumatic system, assuring correct orientation and tightening: Steel tubing with ferrule fittings Polyurethane and other types of plastic hoses Push-on fittings Pipe thread fittings with thread sealant Barb fittings 			
Remove and install a directional control valve onto a subplate			
Remove and install a threaded port pneumatic valve			
Install and align a pneumatic cylinder with a load			
Perform pre-start inspection and then remove lockout/tagout			
Perform functional check with assistance from operator:Verify no leaks			
Perform post-shutdown procedures			

Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.8 Install and test pneumatic components in a circuit			
Locate one or more pneumatic schematics with 3-position and 2- position directional control valves, flow control valves, check valves, cylinders, motors, and instrumentation			
Assemble components into a circuit required by each schematic, identifying components given part numbers			
Perform pre-start procedures			
 Remove lockout/tagout and perform functional check with assistance from operator: Verify no leaks Bleed system as necessary Explain operation of each circuit Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			
1.9 Install and test components in a pneumatic vacuum generator circuit			
Locate one or more pneumatic schematics with directional control valves, flow control valves, vacuum cups, vacuum generators, and regulators			
Determine correct pressure settings for vacuum given machine documentation			
Adjust system to correct vacuum levels given machine documentation			
Assemble components into a circuit required by each schematic, identifying components given part numbers			
Perform pre-start procedures			
 Remove pneumatic blockout/lockout/tagout and perform functional check with assistance from operator: Verify no leaks Explain operation of each circuit Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			

Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.10 Troubleshoot a basic pneumatic circuit			
Locate the pneumatic system diagram			
Perform pre-start procedures			
 Troubleshoot three of four machine symptoms: Actuator will not move Actuator moves at incorrect speed Actuator moves erratically No or low system pressure 			
Perform pre-start procedures			
Replace/repair failed component			
Perform functional check with assistance of operator			
Perform post-shutdown procedures			

Comments:

Affidavit of Successful Completion

NIMS ITM Basic Pneumatic Systems Level I Credentialing Program Credentialing Achievement Record (CAR)

The affidavit must be filled-out in its entirety in order to ensure timely processing.

Candidate Name:	Date Completed:	
The credentialing candidate named above has completed all necessary CAR requirements for NIMS ITM Basic Pneumatic Systems Level I Recognition. Site Name and Address:		

Indicate successful completion of Critical Work Activities & Experiences and Skills Checks, by checking either Yes or No.

Basic Pneumatic Systems Level I			
	Yes	No	
Successful completion of Critical Work Activities & Experiences statements have been completed, dated, and co-initialed.			
Successful completion of Skill Check #1, all components have been completed, dated, and co-initialed.			
Successful completion of Skill Check #2, all components have been completed, dated, and co-initialed.			
Successful completion of Skill Check #3, all components have been completed, dated, and co-initialed.			

Sponsor Signature	Date
Trainer/Supervisor Signature	Date
Candidate Signature	Date

Make a copy of the completed Affidavit of Successful Completion for your records and email the CAR to:

NIMS 10565 Fairfax Boulevard, Suite 10 Fairfax, VA 22030 http://nims-skills.org support@nims-skills.org