



Credentialing Achievement Record

Industrial Technology Maintenance Basic Hydraulic 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 Hydraulic 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 *Examiner’s Checklist*. All Skill Checks must be co-initialed and dated by the trainer/supervisor and candidate. Work activity sign-offs must be co-initiated 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 Hydraulic Systems Level I

Critical Work Activities & Experiences	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
All of the following statements must be completed prior to submission of the CAR			
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: <ul style="list-style-type: none"> • 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 hydraulic schematics			
Identify component types by the schematic symbol shown on a schematic			
Identify line types and describe function on a hydraulic schematic			
Describe the operation of a hydraulic system given a schematic			
Draw a schematic given an actual hydraulic system			
1.2 Start up and shut down a hydraulic system and adjust system pressure			
Locate machine operation manual and determine normal operation pressure			
Perform pre-start procedure for machine, including: <ul style="list-style-type: none"> • Verify zero energy state • Verify guards are in place • Verify reservoir oil level is good • Do a machine walk around, looking for any loose items, leaks or other potential problems 			
With assistance of qualified operator, put machine in manual mode			
Start hydraulic system			
While system is in operation, do the following: <ul style="list-style-type: none"> • Check system pressure on a pressure gauge • Use system relief valve to adjust system pressure to a different pressure as given by inspector • Return system pressure to normal machine operation state • Adjust a pressure reducing valve to a pressure given by inspector (check for standard NIMS nomenclature) • Return pressure reducing valve to original setting • Locate a manual valve and determine if it is open or closed 			
Shut down hydraulic system			
Perform post-shutdown procedures for system, including: <ul style="list-style-type: none"> • Verify zero energy state • Verify no leaks • Clean up • Install lockout/tagout 			

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Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.3 Adjust hydraulic actuator speed using a flow control valve			
Identify location of the flow control valve that controls each direction of motion for each actuator			
Perform pre-start procedures			
With assistance of qualified operator, put machine in manual mode and start the machine			
With assistance of qualified 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, install lockout, and verify zero energy state			
1.4 Service a hydraulic filter			
Locate hydraulic systems that have spin-on filters and / or cartridge filters			
Determine the specifications of filters given part numbers			
Use manufacturer's specifications and flow rates to determine if the filter size is the correct size for the machine			
Use filter indicators to determine if each type of filter needs to be changed			
With machine lockout/tagout installed and zero state verified: <ul style="list-style-type: none"> • Change element in a spin-on filter • Change element in a cartridge filter • Use proper cleanliness and installation procedures 			
Perform pre-start procedures			
Perform functional check with assistance from operator: <ul style="list-style-type: none"> • Verify that indicators show normal and no leaks 			
Perform post-shutdown procedures			

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Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.5 Service hydraulic fluid			
Determine specifications of oil given product number and oil manufacturer's data and verify that it matches specifications for use in machine			
Remove fluid from an existing system			
Add new fluid			
Verify correct fluid level			
Perform pre-start procedures			
Operate machine to bleed and remove trapped air			
Bleed actuators			
Use a filter cart to flush a system			
Take a sample from a hydraulic reservoir and label for inspection lab <ul style="list-style-type: none"> • Verify correct location for sample 			
Perform post-shutdown procedures			

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Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.6 Install hydraulic conductors and hydraulic components			
Given sample tubing and fittings, identify type and size: <ul style="list-style-type: none"> • Hydraulic hose • Hose fittings types and sizes 			
Perform pre-start procedures			
Given a hydraulic schematic, locate and install these conductors and fittings on a hydraulic system, assuring correct orientation and tightening: <ul style="list-style-type: none"> • Steel tubing with ferrule fittings • Hoses with swivel, flared fittings • Straight thread o ring fittings • Pipe thread fittings • Flared fittings 			
Remove and install a directional control valve onto a subplate			
Remove and install a threaded port hydraulic valve			
Install and align a hydraulic cylinder with a load			
Perform pre-start inspection and then remove lockout/tagout			
Perform functional check with assistance from qualified operator: <ul style="list-style-type: none"> • Verify no leaks • Bleed system 			
Perform post-shutdown procedures			

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Skill Check #1	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.7 Install and test hydraulic components in a circuit			
Locate one or more hydraulic schematics with 3-position and 2-position directional control valves, pressure reducing valve, pressure-compensated and non-compensated 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: <ul style="list-style-type: none"> • Verify no leaks • Bleed system as necessary • Explain operation of each circuit • Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			
1.8 Troubleshoot a basic hydraulic circuit			
Locate the manufacturer's operation manual and hydraulic schematic of a basic hydraulic system with electronic controller, limit sensors, 3-position and 2-position directional control valves, pressure reducing valve, flow control valves, check valves, cylinders, motors, solenoid operated valves, and instrumentation			
Remove lockout/tagout and perform functional check with assistance from operator			
Troubleshoot three of four machine symptoms: <ul style="list-style-type: none"> • Actuator will not move • Actuator moves at incorrect speed • Actuator moves erratically • No or low system pressure 			
Replace/Repair failed component			
Perform pre-start procedures			
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 hydraulic schematics			
Identify component types by the schematic symbol shown on a schematic			
Identify line types and describe function on a hydraulic schematic			
Describe the operation of a hydraulic system given a schematic			
Draw a schematic given an actual hydraulic system			
1.2 Start up and shut down a hydraulic system and adjust system pressure			
Locate machine operation manual and determine normal operation pressure			
Perform pre-start procedure for machine, including: <ul style="list-style-type: none"> • Verify zero energy state • Verify guards are in place • Verify reservoir oil level is good • Do a machine walk around, looking for any loose items, leaks or other potential problems 			
With assistance of qualified operator, put machine in manual mode			
Start hydraulic system			
While system is in operation, do the following: <ul style="list-style-type: none"> • Check system pressure on a pressure gauge • Use system relief valve to adjust system pressure to a different pressure as given by inspector • Return system pressure to normal machine operation state • Adjust a pressure reducing valve to a pressure given by inspector (check for standard NIMS nomenclature) • Return pressure reducing valve to original setting • Locate a manual valve and determine if it is open or closed 			
Shut down hydraulic system			
Perform post-shutdown procedures for system, including: <ul style="list-style-type: none"> • Verify zero energy state • Verify no leaks • Clean up • Install lockout/tagout 			

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Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.3 Adjust hydraulic actuator speed using a flow control valve			
Identify location of the flow control valve that controls each direction of motion for each actuator			
Perform pre-start procedures			
With assistance of qualified operator, put machine in manual mode and start the machine			
With assistance of qualified 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, install lockout, and verify zero energy state			
1.4 Service a hydraulic filter			
Assemble PPE and tools required			
Locate hydraulic systems that have spin-on filters and / or cartridge filters			
Determine the specifications of filters given part numbers			
Use manufacturer's specifications and flow rates to determine if the filter size is the correct size for the machine			
Use filter indicators to determine if each type of filter needs to be changed			
With machine lockout/tagout installed and zero state verified: <ul style="list-style-type: none"> • Change element in a spin-on filter • Change element in a cartridge filter • Use proper cleanliness and installation procedures 			
Perform pre-start procedures			
Perform functional check with assistance from operator: <ul style="list-style-type: none"> • Verify that indicators show normal and no leaks 			
Perform post-shutdown procedures			

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Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.5 Service hydraulic fluid			
Determine specifications of oil given product number and oil manufacturer's data and verify that it matches specifications for use in machine			
Remove fluid from an existing system			
Add new fluid			
Verify correct fluid level			
Perform pre-start procedures			
Operate machine to bleed and remove trapped air			
Bleed actuators			
Use a filter cart to flush a system			
Take a sample from a hydraulic reservoir and label for inspection lab <ul style="list-style-type: none"> • Verify correct location for sample 			
Perform post-shutdown procedures			

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Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.6 Install hydraulic conductors and hydraulic components			
Given sample tubing and fittings, identify type and size: <ul style="list-style-type: none"> • Hydraulic hose • Hose fittings types and sizes 			
Perform pre-start procedures			
Given a hydraulic schematic, locate and install these conductors and fittings on a hydraulic system, assuring correct orientation and tightening: <ul style="list-style-type: none"> • Steel tubing with ferrule fittings • Hoses with swivel, flared fittings • Straight thread o ring fittings • Pipe thread fittings • Flared fittings 			
Remove and install a directional control valve onto a subplate			
Remove and install a threaded port hydraulic valve			
Install and align a hydraulic cylinder with a load			
Perform pre-start inspection and then remove lockout/tagout			
Perform functional check with assistance from qualified operator: <ul style="list-style-type: none"> • Verify no leaks • Bleed system 			
Perform post-shutdown procedures			

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Skill Check #2	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.7 Install and test hydraulic components in a circuit			
Locate one or more hydraulic schematics with 3-position and 2-position directional control valves, pressure reducing valve, pressure-compensated and non-compensated 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: <ul style="list-style-type: none"> • Verify no leaks • Bleed system as necessary • Explain operation of each circuit • Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			
1.8 Troubleshoot a basic hydraulic circuit			
Assemble PPE and tools required			
Locate the manufacturer's operation manual and hydraulic schematic of a basic hydraulic system with electronic controller, limit sensors, 3-position and 2-position directional control valves, pressure reducing valve, flow control valves, check valves, cylinders, motors, solenoid operated valves, and instrumentation			
Remove lockout/tagout and perform functional check with assistance from operator			
Troubleshoot three of four machine symptoms: <ul style="list-style-type: none"> • Actuator will not move • Actuator moves at incorrect speed • Actuator moves erratically • No or low system pressure 			
Replace/Repair failed component			
Perform pre-start procedures			
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 hydraulic schematics			
Identify component types by the schematic symbol shown on a schematic			
Identify line types and describe function on a hydraulic schematic			
Describe the operation of a hydraulic system given a schematic			
Draw a schematic given an actual hydraulic system			
1.2 Start up and shut down a hydraulic system and adjust system pressure			
Locate machine operation manual and determine normal operation pressure			
Perform pre-start procedure for machine, including: <ul style="list-style-type: none"> • Verify zero energy state • Verify guards are in place • Verify reservoir oil level is good • Do a machine walk around, looking for any loose items, leaks or other potential problems 			
With assistance of qualified operator, put machine in manual mode			
Start hydraulic system			
While system is in operation, do the following: <ul style="list-style-type: none"> • Check system pressure on a pressure gauge • Use system relief valve to adjust system pressure to a different pressure as given by inspector • Return system pressure to normal machine operation state • Adjust a pressure reducing valve to a pressure given by inspector (check for standard NIMS nomenclature) • Return pressure reducing valve to original setting • Locate a manual valve and determine if it is open or closed 			
Shut down hydraulic system			
Perform post-shutdown procedures for system, including: <ul style="list-style-type: none"> • Verify zero energy state • Verify no leaks • Clean up • Install lockout/tagout 			

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Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.3 Adjust hydraulic actuator speed using a flow control valve			
Identify location of the flow control valve that controls each direction of motion for each actuator			
Perform pre-start procedures			
With assistance of qualified operator, put machine in manual mode and start the machine			
With assistance of qualified 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, install lockout, and verify zero energy state			
1.4 Service a hydraulic filter			
Locate hydraulic systems that have spin-on filters and / or cartridge filters			
Determine the specifications of filters given part numbers			
Use manufacturer's specifications and flow rates to determine if filter the size is the correct size for the machine			
Use filter indicators to determine if each type of filter needs to be changed			
With machine lockout/tagout installed and zero state verified: <ul style="list-style-type: none"> • Change element in a spin-on filter • Change element in a cartridge filter • Use proper cleanliness and installation procedures 			
Perform pre-start procedures			
Perform functional check with assistance from operator: <ul style="list-style-type: none"> • Verify that indicators show normal and no leaks 			
Perform post-shutdown procedures			

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Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.5 Service hydraulic fluid			
Determine specifications of oil given product number and oil manufacturer's data and verify that it matches specifications for use in machine			
Remove fluid from an existing system			
Add new fluid			
Verify correct fluid level			
Perform pre-start procedures			
Operate machine to bleed and remove trapped air			
Bleed actuators			
Use a filter cart to flush a system			
Take a sample from a hydraulic reservoir and label for inspection lab <ul style="list-style-type: none"> • Verify correct location for sample 			
Perform post-shutdown procedures			

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Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.6 Install hydraulic conductors and hydraulic components			
Given sample tubing and fittings, identify type and size: <ul style="list-style-type: none"> • Hydraulic hose • Hose fittings types and sizes 			
Perform pre-start procedures			
Given a hydraulic schematic, locate and install these conductors and fittings on a hydraulic system, assuring correct orientation and tightening: <ul style="list-style-type: none"> • Steel tubing with ferrule fittings • Hoses with swivel, flared fittings • Straight thread o ring fittings • Pipe thread fittings • Flared fittings 			
Remove and install a directional control valve onto a subplate			
Remove and install a threaded port hydraulic valve			
Install and align a hydraulic cylinder with a load			
Perform pre-start inspection and then remove lockout/tagout			
Perform functional check with assistance from qualified operator: <ul style="list-style-type: none"> • Verify no leaks • Bleed system 			
Perform post-shutdown procedures			

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Skill Check #3	Date Completed	Supervisor's or Trainer's Initials	Candidate's Initials
1.7 Install and test hydraulic components in a circuit			
Locate one or more hydraulic schematics with 3-position and 2-position directional control valves, pressure reducing valve, pressure-compensated and non-compensated 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: <ul style="list-style-type: none"> • Verify no leaks • Bleed system as necessary • Explain operation of each circuit • Adjust system to operate as specified by inspector 			
Perform post-shutdown procedures			
1.8 Troubleshoot a basic hydraulic circuit			
Locate the manufacturer's operation manual and hydraulic schematic of a basic hydraulic system with electronic controller, limit sensors, 3-position and 2-position directional control valves, pressure reducing valve, flow control valves, check valves, cylinders, motors, solenoid operated valves, and instrumentation			
Remove lockout/tagout and perform functional check with assistance from operator			
Troubleshoot three of four machine symptoms: <ul style="list-style-type: none"> • Actuator will not move • Actuator moves at incorrect speed • Actuator moves erratically • No or low system pressure 			
Replace/Repair failed component			
Perform pre-start procedures			
Perform functional check with assistance of operator			
Perform post-shutdown procedures			

Affidavit of Successful Completion

NIMS ITM Basic Hydraulic 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:
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The credentialing candidate named above has completed all necessary CAR requirements for NIMS ITM Basic Hydraulic 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 Hydraulic Systems Level I		
	Yes	No
Successful completion of Critical Work Activities & Experiences statements have been completed, dated, and co-initialed.	<input type="checkbox"/>	<input type="checkbox"/>
Successful completion of Skill Check #1, all components have been completed, dated, and co-initialed.	<input type="checkbox"/>	<input type="checkbox"/>
Successful completion of Skill Check #2, all components have been completed, dated, and co-initialed.	<input type="checkbox"/>	<input type="checkbox"/>
Successful completion of Skill Check #3, all components have been completed, dated, and co-initialed.	<input type="checkbox"/>	<input type="checkbox"/>

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
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<http://nims-skills.org>
support@nims-skills.org