



National Institute for Metalworking Skills, Inc.

Credentialing Achievement Record

Screw Machining Level II Operate with Single Spindles

National Institute for Metalworking Skills
3251 Old Lee Highway, Suite 205
Fairfax, VA 22030
<http://nims-skills.org>



SCREW MACHINING CREDENTIALING PROGRAM

LEVEL II CREDENTIALING ACHIEVEMENT RECORD (CAR)

and

Official Performance CHECKLISTs (Skill Checks)

☒ Please print

NAME:	Reg. No.	Job Title:
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Site Name:	Site No.
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STATUS:	<i>Non-Completer</i> <input type="checkbox"/>	<i>Candidate has Successfully Completed all NIMS Performance Requirements in the Following Credentialing Area:</i>
	Reason:	Duty Cluster Name: OPERATE SINGLE SPINDLE SCREW MACHINE 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 (or logbook) of individual on-the-job performance. The CAR is the *vehicle* that will allow eligible candidates to take the NIMS written 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**.

Candidates may select as many credentialing Duty Clusters as applicable to the facility or appropriate to the job. There are separate CAR booklets for each credentialing Duty Cluster. The CAR opens with a list of Critical Work Activities (or experience statements) that must be acknowledged and documented. However, actual performance is assessed two ways: **1)** by fulfilling these general experience and historical statements and **2)** by an examiner administering *Skill Checks* (or performance assessments). Two successful Skill Check attempts are required. Skill Checks are clearly marked with the title - **CAR SKILL CHECK**. Candidate performance is documented by a on the Examiner's CHECKLIST. All Skill Checks must be co-signed and dated by the trainer/supervisor and candidate. Work Activity sign-offs must be co-initialed by the trainer/supervisor or manager and candidate then dated. If a particular Skill Check step or standard does not apply at your facility, check-off the applicable *NA* box and continue. Skill Checks may require the candidate to perform work a bit differently than his normal procedure or learn how to do something that may not be part of his typical day-to-day responsibilities. However, you may only check-off *NA* if the process-standard does not apply because the equipment or tooling is not available or the machining process itself does not require this activity or competency.

For additional information about administering *CAR* Skill Checks, see the CAR Administration Guide or consult with your facility Credentialing Coordinator.



SCREW MACHINING CREDENTIALING PROGRAM
LEVEL II CREDENTIALING ACHIEVEMENT RECORD (CAR)

Operate a Single Spindle Screw Machine

Level II Automatic Bar and Chucking Machine

Critical Work Activities & Experience	Date Completed	Supervisor Initials	Trainer Initials	Trainee Initials
All of the following statements must be completed prior to submission of the CAR		and /or		
Single Spindle Screw Machining				
Candidate has successfully completed all required safety training/courses as specified by the work facility or required by OHSA. Candidate has working knowledge of applicable OHSA, ISO, and ANSI regulations and guidelines.				
Candidate has successfully completed the probationary period for this position (job title) as specified by the work facility.				
Candidate has met the attendance policy of the facility over the last 12 consecutive months.				
Candidate has had no company documented safety violations within the last 12 consecutive months.				
Candidate has no reported incidents of non-conforming parts contaminating quality parts over the last three (3) consecutive months.				
Candidate has demonstrated the ability to maintain a clean and orderly work area in compliance with facility housekeeping policies and has no reported violations for a period of three (3) consecutive months.				
Candidate demonstrated the ability to recognize and explain the type of screw machine and its function (including controls, mechanical devices, tooling, and auxiliaries if applicable).				
Candidate has demonstrated basic knowledge of material/part conformance standards and basic SPC/QC recording techniques.				



Critical Work Activities & Experience	Date Completed	Supervisor Initials	Trainer Initials	Trainee Initials
Given specific duties to perform, instructions, and necessary written documentation, candidate has demonstrated the ability to locate, read and use information to plan, execute, and control a machining process to defined quality standards.				
Candidate has demonstrated basic abilities in decision making and problem solving.				
Candidate has demonstrated ability to link <i>cause and effect</i> to solve simple to moderately complex problems.				
Candidate has demonstrated appropriate social and communicative skills in resolving conflicts with supervisors, team leaders, and/or co-workers or when verbally presenting new ideas.				
Candidate has worked cooperatively with others and has contributed to company efforts with ideas, suggestions, and/or feedback to improve a process, resolve a problem, or improvise a new method.				
Candidate can recognize appropriate codes of conduct and values in the workplace and has exhibited honesty, integrity, and responsibility when doing work and communicating with others.				
Candidate has demonstrated competency interpreting blueprints and/or technical drawings (Standard and GDT orthographics, geometric dimensioning and tolerancing, etc.)				
Candidate has applied knowledge of precision measuring instruments and has used those devices to determine work piece compliance along selected dimensions (as per blueprints, technical drawings and/or reference parts).				
Candidate can explain basic concepts of heat, shock, friction, zone of distortion, cutting interface, metallurgy, cutter presentation/geometry, and chip-breaking capabilities as they relate to specific screw machining operations.				

NOTE: Further details and specifics regarding worker competencies, see Duties & Standards for Screw Machining Skills - Level II & III, National Institute for Metalworking Skills/Precision Machined Products Association

Skill Checks begin on next page



NIMS SCREW MACHINING SKILL CHECK
Level II

Candidate:	Date: 199
Examiner:	(For examiner use only) Results: Pass <input type="checkbox"/> Yes Date Started: Date Ended::

Work Activity **Operate a Single Spindle Automatic Screw Machine**

Performance Conditions

Setting Shop, bench, and QC area(s). Candidate will plan a single-spindle screw machining job, perform pre-production work, startup/shutdown equipment, make parts, and inspect parts for quality. A non-CNC single spindle automatic screw machine has already been set-up and verified for function and safety. The first bar is (stocked and loaded) in the machine. The screw machine is shut-off or at rest (idle mode). The job to be demonstrated has already been approved as a “new run.” Two (2) successful Skill Check attempts required for on-the-job performance recognition.

To take these Skill Checks, the metal piece-parts to be made must have (at minimum) the following attributes and characteristics:

- a Cut-Off
- a Formed or Shaved OD
- a Reamed or Drilled Hole, and
- an ID or OD Thread.

Safety Equipment:

- *Personal Protection Equipment/Clothing (PPE/PPC)*

Tools, Equipment and Materials:

- Bar Stock/Raw Material
- Cutting Oil/ Lube Oil
- Tote Pans and Chip/Part Containers
- Shop Wipes/Lint Free Wipes
- Optical Charts/Overlays
- Prints, Charts, Drawings, etc.
- Common Hand Tools
- Flashlight/Mirror
- Watch/Stop Watch
- Housekeeping Supplies
- Production Documentation

Measuring Instruments:

- Scales
- Micrometer
- Dial Calipers
- Dial Indicators
- Thread Gages
- Plug Gages
- Functional/ Fixture Gages
- Optical Comparator or CMM/Vision System

Attainment Standards

1. 100% of all applicable procedural steps and process standards, without assistance and within company-specific time limit, following all safety, ISO, equipment manufacturer, and plant-specific practices and procedures.
2. 100% conformance with all QC and final product standards and performance criteria.

Trainee Directions

The above referenced tools, equipment, materials and supplies may be used to Operate a Non-CNC, Single Spindle Automatic Screw Machine. All safety and plant-specific procedures must be followed. The examiner will evaluate both the process used and final result of the process. Process steps should be performed in the sequence, and all process elements must meet the standards for successful completion.


The skill check you are about to take is a hands-on performance assessment administered as part of the credentialing process. This assessment will enable you to verify your experience and demonstrate your competency by completing practical job tasks. The Skill Check will cover areas that you should know and problems you should be able to solve. If you need any additional materials or experience any problems with equipment during the assessment, notify the examiner immediately.

Examiner Instructions

For successful completion of this Skill Check, the candidate must demonstrate the ability to successfully complete the work activity under controlled assessment conditions. All work must be completed to standard.

Before administering the Skill Check:

- ◆ Read/review the CAR *Administration Guide* developed for the program.
- ◆ Ensure that you have a copy of this Skill Check for the candidate to review before demonstrating the work. Be sure all applicable equipment and supplies are available.

 **Stop the Skill Check immediately if the candidate violates a safety/environmental regulation or procedure or if there is any possibility of personal injury or damage to equipment.**

Do not provide assistance during the Skill Check. Monitor work in-progress and evaluate for *process standard*. Assess the completed work for conformance with **final product** criteria. Mark *NA* if a process-product is not appropriate.

Examiner Instructions

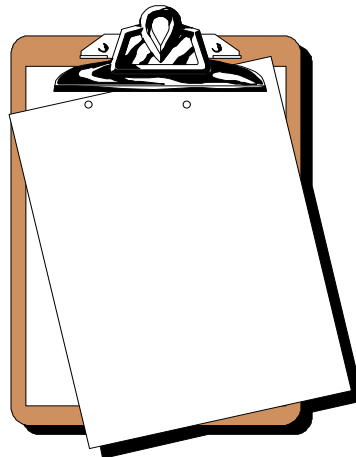
Before assessment, the examiner may discuss appropriate safety requirements and loss potential issues (*i.e.*, *Lock and Tag/Zero Energy*, *HAZMAT*, *personal protection equipment*, *pinch points*, *compressed air/fluids*, *high or residual voltage*, *E-Stops*, *OHSA-1910 Loss Potential*, *etc.*).

EXAMINER: Read aloud the *Skill Check Script* from the *Administration Guide* (*verbatim*).

When the candidate indicates that he/she has completed the Skill Check or when your maximum time allowed has run out, assess Final Product Standards and follow the closing procedures outlined in the *Administration Guide*.

Checklist

Scoring Procedures: Observe the candidate's performance for each Process Step and mark the *CHECKLIST* whether or not the *Process-Product Standards* were attained (*Do not rely on your memory*). *Process-Product Standards* are to be marked as each element is completed.





Examiner's CHECKLIST - SKILL CHECK #1
Operate a Non-CNC Single Spindle Automatic Screw Machine

Process Steps	Process-Product Standards			
DATE STARTED:		Yes	No	NA
A - JOB PLANNING				
1. Verify Availability of Tools, Equipment and Supplies.	<ul style="list-style-type: none"> • Machine selected was appropriate for, or assigned to the job. • Gage calibrations are current. • Gage checklist obtained and reviewed. • Part pans and production tags/tickets prepared. • Tool box at job site. • Bench cleared and tools staged. • Chip and part containers positioned. • No loose objects lying on/in machine. • Chips removed from machine. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2. Review Prints, Drawings and Quality Specifications	<ul style="list-style-type: none"> • Correct and current prints/drawings obtained. • Work or job order matched print/drawing number. • Print/part number matched equipment/tooling number. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3. Obtain Production Sheet and Lot Size Requirements	<ul style="list-style-type: none"> • Layout checked for tooling application, tool position, and hardware (gears, accessories, etc.) • Coolant/lubricant supply verified for job (type, application, viscosity, etc.) • Demonstrated good coolant/lubricant handling and application techniques. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
B- PRE-PRODUCTION & QUALITY CONTROL				
1. Check Fluid/Air Levels and Pressures	<ul style="list-style-type: none"> • Fluid reservoirs full or @ indicated levels for maximum machine performance. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Check Splash Guards and Safety Devices	<ul style="list-style-type: none"> • All splashguard(s) set and verified for function. • Floor will remain dry during operations. • All physical barrier guards are in-place and secure/closed. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>



Process Steps	Process-Product Standards			
		Yes	No	NA
B - PRE-PRODUCTION & QUALITY CONTROL <i>Continued</i>				
3. Clear Machine and Clean Work Area	<ul style="list-style-type: none"> • No previous, broken, non-conforming or setup parts present in or around machine. • Previous parts not contaminated with new parts. • Chips removed/exited and disposed (splashguard clean). • Floor clean and dry (No standing oil, coolant, water, etc.) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Inspect Tooling/Cutting Tools	<ul style="list-style-type: none"> • Tooling verified and appropriate for job. • Each tool matched to layout requirements. • Tooling clean, sharp, and showing no damage or excessive wear. • Steel grade/hardness and design of tooling appropriate for the job. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Start/Re-Start Single Spindle Screw Machine	<ul style="list-style-type: none"> • Spindle is running and safety devices are operational. • Lubrication/coolant system functioning (within flow and pressure requirements). • Collet closed completely on bar. • No unusual sounds, odors, smoke, or excessive vibration present. • No alarms present. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Inspect and Adjust Lines and Flow	<ul style="list-style-type: none"> • Pressurized lines are not leaking oil, coolant, or air. • No air present in coolant (not foaming). • Coolant line(s) pointed at the work area. • Tool will remain cool (adequate flow for job). 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Cycle Machine	<ul style="list-style-type: none"> • Selected proper mode of operation (machine energized/indicator light "On"). • Cams and tooling mechanisms operational. • Bar in position and collet tension correct. • No smoke, unusual odors, belt squeal, or excessive vibration or noise present. • Machine successfully dry-cycled. • Bar end linkage set. • Production cycle time verified. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Process Steps	Process-Product Standards			
		Yes	No	NA
B - PRE-PRODUCTION & QUALITY CONTROL <i>Continued</i>				
8. Make Sample Parts	<ul style="list-style-type: none"> • 3 to 5 first piece parts made. • Parts machined fell into hopper or exited machine without damage. • Part features look like print/drawing (visual inspection). 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Inspect Sample Parts Using Hand-Held Measuring Devices	<ul style="list-style-type: none"> • ID/OD conforms to diameter specifications. • OAL in conformance with part specifications. • Specified lengths/setbacks with tolerance • Threads within specifications (major/minor/pitch). • ID/OD depths conform to print specifications. • No burn marks, burring, chatter, glazing or damage present on part • Demonstrated proficiency using and reading hand-held precision measuring instruments. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Inspect Sample Parts for Dimensional Characteristics Using an Optical Comparator.	<ul style="list-style-type: none"> • Hands clean before use. • Part(s) cleaned prior to viewing. • Turned on instrument and verified operation for function (lamp on, controls work, screen active, etc.). • View screen and lens clean (no scratches or film present on screen or lens). • Magnification or focus adjusted to clear viewing requirements. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CMM or Vision System may be used in addition to, or in lieu of an optical comparator		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Part properly staged and positioned in/on QC instrument. • Instrument focused, image clear and sharp. • Part manipulated and all angles and radius/radii are within +/- tolerances and specifications. • Accurately checked profiles/control limits as specified by Quality Plan or SPC. • Achieved part dimensional conformance or notified proper authority of any non-conformance profiles. • Turned off instrument (screen, lens, surface area, work holder(s), and inspection site left clean and undamaged). 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Process Steps	Process-Product Standards			
		Yes	No	NA
B - PRE-PRODUCTION & QUALITY CONTROL <i>Continued</i>				
11. Inspect Sample Parts for Quality Attributes	<ul style="list-style-type: none"> • No glazing or withdrawal marks present. • No flaking, tearing, or pitting present. • No burrs, nicks, chipping, or chatter present. • All appropriate finish areas smooth. • Features conform to print requirements. • Completed all quality control/SPC documentation accurately and legibly (including sign-offs). • Sample parts inspected met production standards. • Process adjusted to maintain production and QC standards. • Machine and guards production ready. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
C - PRODUCTION OPERATIONS & PROCESS CONTROL				
1. Re-Start/Start Production	<ul style="list-style-type: none"> • Selected proper mode of operation (machine active and cycling). • Production card punched or logged into job. • Coolant line(s) bathing work area with sufficient flow. • Piece parts machined on an on-going basis. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2. Monitor Running Processes <i>(Machine Parts)</i>	<ul style="list-style-type: none"> • Slide operating smoothly (no chatter or jerking). • Quality parts came down chute efficiently without damaging part surfaces. • Chips pulled as needed (sump not plugging up). • Coolant line(s) remain set and providing steady flow/adequate pressure. • No excessive vibration, squealing, or smoke present. • Quality parts machined on a continuous basis to production standards (e.g., “parts-per-minute”) 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3. Load Next/Another Bar Stock and Make Sample Parts	<ul style="list-style-type: none"> • Part from previous bar removed (no contamination). • Bar end removed and turret repositioned. • Next bar (or magazine) loaded and set. • Verified/compared part yield per bar. • Machine activated, cycling and sample parts made (3 to 5) for inspection. • Parts pulled immediately after each sample run (no cross contamination). 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Process Steps	Process-Product Standards			
		Yes	No	NA
C - PRODUCTION OPERATIONS & PROCESS CONTROL <i>Continued</i>				
4. Inspect Parts Using Hand-Held Precision Measurement Devices (Applicable to next bar sampling or in-process intermediate inspections)	<ul style="list-style-type: none"> • ID/OD conforms to diameter specifications. • OAL in conformance with part specifications. • Threads within specifications (major/minor/pitch). • IO/OD depths conform to print specifications. • Surface finish matched quality specifications. • Demonstrated proficiency using hand-held precision measuring instruments. • Parts pulled immediately after sample (no cross contamination) 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Inspect Parts for Dimensional Characteristics Using an Optical Comparator.	<ul style="list-style-type: none"> • Hands clean before use. • Part(s) cleaned prior to viewing. • Turned on instrument and functioning (lamp on, controls work, screen active, etc.). • View screen and lens clean (no scratches or film present on screen or lens). • Magnification/focus adjusted to viewing requirements. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CMM or Vision System may be used in addition to, or in lieu of an optical comparator	<ul style="list-style-type: none"> • Part properly staged and positioned in/on optical comparator/instrument. • Optics focused (20/20) and image sharp and clear. • Part manipulated and all angles and radius/radii are within +/- tolerances and specifications. • Accurately checked profiles/control limits as specified in Quality/Sample Plan. • Achieved part conformance or notified proper authority of any non-conformance profiles. • Turned off instrument (screen, lens, surface area, work holder(s), and inspection site left clean and undamaged). 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Maintain Process and Service Machine	<ul style="list-style-type: none"> • Coolant/lubricant @ indicated levels and provided adequate flow and circulation. • No smoke, excessive vibration, or unusual odors/sound present. • Cams tight (no excessive wear present). • Sheer/rolling pins replaced as needed. • Chip containers maintained and not over flowing. • Part/chip containers replaced when full. • Floor clean, dry and free of debris. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Continued

Process Steps	Process-Product Standards			
	Yes	No	NA	
C - PRODUCTION OPERATIONS & PROCESS CONTROL <i>Continued</i>				
7. Shutdown Single Spindle Screw Machine	<ul style="list-style-type: none"> • Cycle stopped at correct position (control lights/lever in “off” setting). <input type="checkbox"/> • Spindle is not turning. <input type="checkbox"/> • Feed dog secured and/or bar removed. <input type="checkbox"/> • Quality parts identified and sent to next production area or stage. <input type="checkbox"/> • No chips in machine or on floor. <input type="checkbox"/> • Screens clean. <input type="checkbox"/> • Workstation and tooling clean. <input type="checkbox"/> • Maintenance (equipment servicing) items noted/requested or provided. <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DATE FINISHED:	<ul style="list-style-type: none"> • Machine locked out (<i>@ zero energy</i>) for total shutdown or at safety rest (idle) for handoff. <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FINAL PRODUCT STANDARDS

“Work is Done As Expected When:”

- a. All written/verbal instructions, checklists, and guidelines were followed and candidate demonstrated safe workplace practices in materials handling, machine operations, guarding, and coolant applications.
- b. Condition of each tool was verified prior to operations and acceptable tolerances established (minimum accuracy levels @ $\leq \pm 1/16^{\text{th}}$ on most factions and/or $\leq + .006 - .000$ on drilled diameters required).
- c. All quality control inspections were performed to Quality Plan criteria (procedures), result within SPC/QC requirements, and recorded compliance within the part’s required profile(s), tolerances, and dimensions.
- d. Following the process plan, machine was verified for function necessary for a smooth and continuous run.
- e. Parts were machined and inspected on an on-going basis without contaminating good/bad parts.
- f. Current print and tangible part features and characteristics met specified or implied needs as per usability, reliability, maintainability, and economics.
- g. All shop safety and housekeeping practices and procedures have been followed.



COMMENTS

Operate Single Spindle Screw Machine

Candidate: _____

Examiner: _____

Equipment Model/Machine Type Used

Signatures: _____ **Date:** _____
(Manager) Title: _____

_____ **Date:** _____
(Supervisor/Trainer) Title: _____

_____ **Date:** _____
(Candidate)



Examiner's CHECKLIST - SKILL CHECK #2
Operate a Non-CNC Single Spindle Automatic Screw Machine

Process Steps	Process-Product Standards			
DATE STARTED:		Yes	No	NA
A - JOB PLANNING				
1. Verify Availability of Tools, Equipment and Supplies.	<ul style="list-style-type: none"> • Machine selected was appropriate for, or assigned to the job. • Gage calibrations current. • Gage checklist obtained and reviewed. • Part pans and production tags/tickets prepared. • Tool box at job site. • Bench cleared and tools staged. • Chip and part containers positioned. • No loose objects lying on/in machine. • Chips removed from machine. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2. Review Prints, Drawings and Quality Specifications	<ul style="list-style-type: none"> • Correct and current prints/drawings obtained. • Work or job order matched print/drawing number. • Print/part number matched equipment/tooling number. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3. Obtain Production Sheet and Lot Size Requirements	<ul style="list-style-type: none"> • Layout checked for tooling application, tool position, and hardware (gears, accessories, etc.) • Coolant/lubricant supply verified for job (type, application, viscosity, etc.) • Demonstrated good coolant/lubricant handling and application techniques. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
B- PRE-PRODUCTION & QUALITY CONTROL				
1. Check Fluid/Air Levels and Pressures	<ul style="list-style-type: none"> • Fluid reservoirs full or @ indicated levels for maximum machine performance. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Check Splash Guards and Safety Devices	<ul style="list-style-type: none"> • All splashguard(s) set and verified for function. • Floor will remain dry during operations. • All physical barrier guards are in-place and secure/closed. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>



Process Steps	Process-Product Standards			
	Yes	No	NA	
B - PRE-PRODUCTION & QUALITY CONTROL <i>Continued</i>				
3. Clear Machine and Clean Work Area	<ul style="list-style-type: none"> • No previous, broken, non-conforming or setup parts present in or around machine. <input type="checkbox"/> • Previous parts not contaminated with new parts. <input type="checkbox"/> • Chips removed/exited and disposed (splashguard clean). <input type="checkbox"/> • Floor clean and dry (No standing oil, coolant, water, etc.) <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Inspect Tooling/Cutting Tools	<ul style="list-style-type: none"> • Tooling verified and appropriate for job. <input type="checkbox"/> • Each tool matched to layout requirements. <input type="checkbox"/> • Tooling clean, sharp, and showing no damage or excessive wear. <input type="checkbox"/> • Steel grade/hardness and design of tooling appropriate for the job. <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Start/Re-Start Single Spindle Screw Machine	<ul style="list-style-type: none"> • Spindle is running and safety devices are operational. <input type="checkbox"/> • Lubrication/coolant system functioning (within flow and pressure requirements). <input type="checkbox"/> • Collet closed completely on bar. <input type="checkbox"/> • No unusual sounds, odors, smoke, or excessive vibration present. <input type="checkbox"/> • No alarms present. <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Inspect and Adjust Lines and Flow	<ul style="list-style-type: none"> • Pressurized lines are not leaking oil, coolant, or air. <input type="checkbox"/> • No air present in coolant (not foaming). <input type="checkbox"/> • Coolant line(s) pointed at the work area. <input type="checkbox"/> • Tool will remain cool (adequate flow for job). <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Cycle Machine	<ul style="list-style-type: none"> • Selected proper mode of operation (machine energized/indicator light "On"). <input type="checkbox"/> • Cams and tooling mechanisms operational. <input type="checkbox"/> • Bar in position and collet tension correct. <input type="checkbox"/> • No smoke, unusual odors, belt squeal, or excessive vibration or noise present. <input type="checkbox"/> • Machine successfully dry-cycled. <input type="checkbox"/> • Bar end linkage set. <input type="checkbox"/> • Production cycle time verified. <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Process Steps	Process-Product Standards			
		Yes	No	NA
B - PRE-PRODUCTION & QUALITY CONTROL <i>Continued</i>				
8. Make Sample Parts	<ul style="list-style-type: none"> • 3 to 5 first piece parts made. • Parts machined fell into hopper or exited machine without damage. • Part features look like print/drawing (visual inspection). 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Inspect Sample Parts Using Hand-Held Measuring Devices	<ul style="list-style-type: none"> • ID/OD conforms to diameter specifications. • OAL in conformance with part specifications. • Specified lengths/setbacks with tolerance • Threads within specifications (major/minor/pitch). • ID/OD depths conform to print specifications. • No burn marks, burring, chatter, glazing or damage present on part • Demonstrated proficiency using and reading hand-held precision measuring instruments. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Inspect Sample Parts for Dimensional Characteristics Using an Optical Comparator.	<ul style="list-style-type: none"> • Hands clean before use. • Part(s) cleaned prior to viewing. • Turned on instrument and verified operation for function (lamp on, controls work, screen active, etc.). • View screen and lens clean (no scratches or film present on screen or lens). • Magnification or focus adjusted to clear viewing requirements. 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CMM or Vision System may be used in addition to, or in lieu of an optical comparator		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<ul style="list-style-type: none"> • Part properly staged and positioned in/on QC instrument. • Instrument focused, image clear and sharp. • Part manipulated and all angles and radius/radii are within +/- tolerances and specifications. • Accurately checked profiles/control limits as specified by Quality Plan or SPC. • Achieved part dimensional conformance or notified proper authority of any non-conformance profiles. • Turned off instrument (screen, lens, surface area, work holder(s), and inspection site left clean and undamaged). 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
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Process Steps	Process-Product Standards			
	Yes	No	NA	
B - PRE-PRODUCTION & QUALITY CONTROL <i>Continued</i>				
11. Inspect Sample Parts for Quality Attributes	<ul style="list-style-type: none"> • No glazing or withdrawal marks present. • No flaking, tearing, or pitting present. • No burrs, nicks, chipping, or chatter present. • All appropriate finish areas smooth. • Features conform to print requirements. • Completed all quality control/SPC documentation accurately and legibly (including sign-offs). • Sample parts inspected met production standards. • Process adjusted to maintain production and QC standards. • Machine and guards production ready. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
C - PRODUCTION OPERATIONS & PROCESS CONTROL				
1. Re-Start/Start Production	<ul style="list-style-type: none"> • Selected proper mode of operation (machine active and cycling). • Production card punched or logged into job. • Coolant line(s) bathing work area with sufficient flow. • Piece parts machined on an on-going basis. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
2. Monitor Running Processes <i>(Machine Parts)</i>	<ul style="list-style-type: none"> • Slide operating smoothly (no chatter or jerking). • Quality parts came down chute efficiently without damaging part surfaces. • Chips pulled as needed (sump not plugging up). • Coolant line(s) remain set and providing steady flow/adequate pressure. • No excessive vibration, squealing, or smoke present. • Quality parts machined on a continuous basis to production standards (e.g., “parts-per-minute”). 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
3. Load Next/Another Bar Stock and Make Sample Parts	<ul style="list-style-type: none"> • Part from previous bar removed (no contamination). • Bar end removed and turret repositioned. • Next bar (or magazine) loaded and set. • Verified/compared part yield per bar. • Machine activated, cycling and sample parts made (3 to 5) for inspection. • Parts pulled immediately after each sample run (no cross contamination). 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>



Process Steps	Process-Product Standards			
	Yes	No	NA	
C - PRODUCTION OPERATIONS & PROCESS CONTROL <i>Continued</i>				
4. Inspect Parts Using Hand-Held Precision Measurement Devices (Applicable to next bar sampling or in-process intermediate inspections)	<ul style="list-style-type: none"> • ID/OD conforms to diameter specifications. • OAL in conformance with part specifications. • Threads within specifications (major/minor/pitch). • IO/OD depths conform to print specifications. • Surface finish matched quality specifications. • Demonstrated proficiency using hand-held precision measuring instruments. • Parts pulled immediately after sample (no cross contamination) 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
5. Inspect Parts for Dimensional Characteristics Using an Optical Comparator.	<ul style="list-style-type: none"> • Hands clean before use. • Part(s) cleaned prior to viewing. • Turned on instrument and functioning (lamp on, controls work, screen active, etc.). • View screen and lens clean (no scratches or film present on screen or lens). • Magnification/focus adjusted to viewing requirements. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
CMM or Vision System may be used in addition to, or in lieu of an optical comparator	<ul style="list-style-type: none"> • Part properly staged and positioned in/on optical comparator/instrument. • Optics focused (20/20) and image sharp and clear. • Part manipulated and all angles and radius/radii are within +/- tolerances and specifications. • Accurately checked profiles/control limits as specified in Quality/Sample Plan. • Achieved part conformance or notified proper authority of any non-conformance profiles. • Turned off instrument (screen, lens, surface area, work holder(s), and inspection site left clean and undamaged). 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
6. Maintain Process and Service Machine	<ul style="list-style-type: none"> • Coolant/lubricant @ indicated levels and provided adequate flow and circulation. • No smoke, excessive vibration, or unusual odors/sound present. • Cams tight (no excessive wear present). • Sheer/rolling pins replaced as needed. • Chip containers maintained and not over flowing. • Part/chip containers replaced when full. • Floor clean, dry and free of debris. 	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>



Continued

Process Steps	Process-Product Standards			
	Yes	No	NA	
C - PRODUCTION OPERATIONS & PROCESS CONTROL <i>Continued</i>				
7. Shutdown Single Spindle Screw Machine	<ul style="list-style-type: none"> • Cycle stopped at correct position (control lights/lever in “off” setting). <input type="checkbox"/> • Spindle is not turning. <input type="checkbox"/> • Feed dog secured and/or bar removed. <input type="checkbox"/> • Quality parts identified and sent to next production area or stage. <input type="checkbox"/> • No chips in machine or on floor. <input type="checkbox"/> • Screens clean. <input type="checkbox"/> • Workstation and tooling clean. <input type="checkbox"/> • Maintenance (equipment servicing) items noted/requested or provided. <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
DATE FINISHED:	<ul style="list-style-type: none"> • Machine locked out (<i>@ zero energy</i>) for total shutdown or at safety rest (idle) for handoff. <input type="checkbox"/> 	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

FINAL PRODUCT STANDARDS

“Work is Done As Expected When:”

- a. All written/verbal instructions, checklists, and guidelines were followed and candidate demonstrated safe workplace practices in materials handling, machine operations, guarding, and coolant applications.
- b. Condition of each tool was verified prior to operations and acceptable tolerances established (minimum accuracy levels @ $\leq \pm 1/16^{\text{th}}$ on most factions and/or $\leq + .006 - .000$ on drilled diameters required).
- c. All quality control inspections were performed to Quality Plan criteria (procedures), result within SPC/QC requirements, and recorded compliance within the part’s required profile(s), tolerances, and dimensions.
- d. Following the process plan, machine was verified for function necessary for a smooth and continuous run.
- e. Parts were machined and inspected on an on-going and repeatable basis without contaminating good/bad parts.
- f. Current print and tangible part features and characteristics met specified or implied needs as per usability, reliability, maintainability, and economics.
- g. All shop safety and housekeeping practices and procedures have been followed.



COMMENTS

Operate Single Spindle Screw Machine

Candidate: _____

Examiner: _____

Equipment Model/Machine Type Used

Signatures: _____ **Date:** _____
(Manager) Title: _____

_____ **Date:** _____
(Supervisor/Trainer) Title: _____

_____ **Date:** _____
(Candidate)



Affidavit of Successful Completion
NIMS Level II Screw Machining Credentialing Program
☞ Credentialing Achievement Record ☞

Please print

Candidate Name	Reg. No.	Date Completed:
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The credentialing candidate named above has completed all necessary CAR requirements for NIMS Level II OJT recognition.

Site Name and Address:	Site No.
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Indicate in the number of Skill Checks completed and dates of successful performance for each Skill Check

Duty Cluster Name	Required Skill Checks	Number of Skill Checks Completed
<i>OPERATE SINGLE SPINDLE SCREW MACHINE</i>	2	
Successful Skill Check Attempt #1	Date:	
Successful Skill Check Attempt #2	Date:	
Work activity experience-eligibility statements have been completed, dated, and co-initialed.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

 Site Coordinator/Manager *Signature*

 Date Year

 Supervisor/Trainer *Signature*

 Date Year

 Candidate *Signature*

 Date Year

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



The National Institute for Metalworking Skills
3251 Old Lee Highway, Suite 205
Fairfax, Virginia, 22030
<http://nims-skills.org>



**COMMENTS, SPECIAL AWARDS, OR OTHER PROFESSIONAL
ACKNOWLEDGMENTS**

See attachments if provided