



2024 Millwright/Industrial Maintenance Mechanic Competition

FACT SHEET

Project Manager

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For questions related specifically to the millwright competition, contact Michael Leyva at mleyva@keenprojectsolutions.com. For all event questions, contact Jarrell Jackson, National Craft Championships director, at (202) 595-1789 or jackson@abc.org.

Specific Competition Eligibility

The Millwright competition has no competition-specific eligibility requirements. Please refer to overall eligibility requirements listed on page 3 of the guidebook.

Online Exam

The online exam must be completed before competitors arrive on site, at a local NCCER Accredited Training Sponsor or Assessment Center. Accommodations will be made for extreme circumstances with prior approval of the NCC director. All competitors must sit for the online exam or face disqualification from the NCC. The online exam continues to make up 25% of one's overall competition score. It is the responsibility of the sponsor organization to schedule test sessions directly with NCCER. Test registration and guidelines will be available in January 2024.

Practical Performance Test Description

Each competitor will perform several tasks utilizing their knowledge and skills applicable to the Millwright and Industrial Maintenance trade. The competitor will be issued an equipment drawing, an equipment manual for a Summit Pump, Model 2196, and additional materials. Working on a benchtop, the competitor will be required to complete several tasks within the six (6) hour time window. The decision on the order of the tasks completed will be up to the competitor.

- The competitor will need to disassemble and assemble a Summit Pump, Model 2196.
 - Record specified measurements of the pump and bearings.
 - Reassemble the pump, set the proper impeller clearance, and install a mechanical seal.
- Using the trade-specific layout tools, the competitor will be required to layout, drill, and tap all equipment, mounting holes on the baseplate provided for the equipment on hand.
- Using the builders level provided, the competitor will be required to set the correct elevation of equipment.
- The competitor will be required to use a machinist level to set equipment within the required tolerances.
- The competitor will need to thoroughly understand rough alignment and laser alignment skills. A laser alignment unit will be provided.
- The competitor must also be proficient in print and manual reading, understanding general notes and equipment layout. A medal-winning performance can come to those who best utilize their time, materials, and skills knowledge to safely and accurately complete the practical skills challenge before them to the best of their ability. Construction Master Calculator or equivalent will be permitted. Safety will play a big part in your practical test. Review the score sheet and safety scope.

Knowledge and Skills Required

The knowledge and skills for this competition are based on all levels of the NCCER millwright and industrial maintenance mechanic curriculum. It is strongly recommended that competitors have a working knowledge equivalent to a third-year apprentice.

Tools Required

Each competitor should bring only the tools listed below to the competition. Tools will be inspected prior to the practical performance test. Points shall be deducted from the competitor's score for not having the required tools. Any additional tools will not be allowed in the competition area. Points will also be deducted from the competitor's score for any tools that are used by the competitor that are not called for in the specific task instructions. If a tool, necessary to complete the practical performance test, is not listed, the National Craft Championships Committee will provide it:

- 1/16- to 3/8-inch Allen wrenches
 - 1- to 3-lb. rubber or hard plastic hammer
 - ¼- to at least 15/16-inch combination wrenches
 - Two indicator jigs for shaft alignment
 - Two dial indicators to fit jigs
 - Small ball-peen hammer
 - Small pry bar
 - Feeler gauges
 - Center punch
 - Non-programmable scientific calculator
 - Pencil and paper
 - 12-inch and 6-inch scales, 64th-inch graduations
 - Machinist level, Starrett 98 Series*
 - Scribe
 - One or two magnetic bases with indicators
 - Starrett: Yankee Spring Divider 6"*
 - Electronic or Dial Caliper Gauge 6" or larger
 - Starrett: Yankee Spring Type Inside Caliper 6"*
 - Starrett: Yankee Spring Type Outside Caliper 6"*
 - Inspection mirror
 - Non-safety prescription eyewear may only be worn under safety goggles
 - Competitors may bring their own work gloves
- * Starrett is used as a reference for the competitor. Any brand that is equivalent will be allowed.*

The following is specifically **NOT PERMITTED**:

- Any millwright/industrial maintenance mechanic reference materials

Sample Score Sheet

The following sample score sheet is provided to give competitors an **example** of the criteria that may be included in the practical performance test. **However, this score sheet is only a sample and not intended to act as a study guide in preparation or to imply specific criteria that will be judged during the actual practical performance test.**

ABC National Craft Championships Millwright/Industrial Maintenance Mechanic Sample Score Sheet

Judging Criteria	Competitor Identification Numbers					
	Maximum Points					
Communication skills						
Professionalism (organization, neatness)						
Disassembly of unit						
Assembly of unit						
Outside micrometers (use and knowledge)						
Total travel (bowl to backing plate)						
Feeler gauges (use and knowledge)						
Telescoping gauges (use and knowledge)						
Laser alignment setup						
Indicator setup (bar sag, graph labeling)						
Soft foot						
Mechanical seal (installed correctly and set to proper tension)						
Gasket (making of new gasket for casing)						
Keyway vs. keyway (correct alignment)						
Base plate layout (from drawing)						
Timeframe						
Mechanical aptitude						
SUBTOTAL:	160					
PPE						
Use tools properly—doesn't use wrench as hammer						
Safe procedures—proper lifting						
Housekeeping						
Behavior—Position—safe working						
Behavior—Reaction—Does person change work techniques when someone observes?						
Behavior—pace of work						
SUBTOTAL:	40					
GRAND TOTAL:	200					
Tie Breaker #1						
Tie Breaker #2						
Tie Breaker #3						
Tie Breaker #4						