

Millwright Red Seal practice test

Independent practice questions, not official exam questions

25 original multiple-choice questions, with answers and short explanations at the end. In Ontario this trade is code 433A. The real Red Seal exam has 135 questions in four hours with a 70% pass mark. These questions do not come from the official exam and do not predict a result.

Online version with scoring: <https://redsealreadycanada.com/millwright-red-seal-practice-test>

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Questions

Question 1 • Maintenance, commissioning and decommissioning

An infrared image shows a hot patch on a polished bearing housing, but the patch moves across the surface when the camera angle changes. What should the technician conclude and verify?

- A. Treat the moving patch as the true housing hot spot, use its peak pixel as bearing temperature, and assume the camera automatically rejects all reflected radiation.
- B. Lower emissivity until the moving patch matches the expected bearing temperature, then accept that adjusted number without checking nearby radiant sources or changing viewing angle.
- C. Replace the bearing because the shifting image proves an internal rotating heat source, using apparent motion instead of a repeatable surface-location or emissivity check.
- D. Treat the moving patch as a probable reflection, identify nearby hot sources, and repeat the measurement from another angle or on an appropriate high-emissivity target under the same operating condition.

Question 2 • Common occupational skills

Five micrometer readings are taken at the same marked location on a journal. Four agree within 0.01 mm, but one is 0.08 mm higher. What is the best next step?

- A. Pause, clean the visible journal surface, discard the isolated high reading because four values agree, then average the remaining values without checking the contacts or reference.
- B. Discard the high reading because four values agree, average the remaining values, and issue the result without taking another measurement.
- C. Adjust the micrometer zero until the high reading joins the group, lock that setting, and continue measuring the journal from the altered reference.
- D. Pause, clean the anvils and journal, verify zero or a reference standard, confirm seating and technique, and repeat the readings before deciding whether the value is an outlier.

Question 3 · Fluid power systems

A double-acting pneumatic cylinder drives a horizontal slide whose resistance changes during the stroke. Which flow-control arrangement is most likely to produce stable speed in both directions?

- A. Use correctly oriented one-way flow controls so inlet air flows freely and exhaust from the moving side is throttled in each direction.
- B. Use correctly oriented one-way controls for meter-in operation so each exhaust flows freely, then increase supply pressure whenever changing resistance causes the slide to surge.
- C. Use one needle valve in the common supply line and leave both cylinder-port exhaust paths fully open in both directions.
- D. Use the main regulator as the speed control, lower pressure until motion slows and omit flow controls from the cylinder ports.

Question 4 · Common occupational skills

A hydraulic actuator has been isolated for maintenance, but its hose is still pressurized. Before loosening any connection, what must the millwright do?

- A. Release stored pressure through the designated bleed point, then verify zero pressure in the section to be opened.
- B. Loosen the nearest fitting behind a splash shield until oil stops escaping.
- C. Proceed when the gauge on the pump side of the locked supply valve reads zero.
- D. Cycle the directional valve once after lockout and treat that action as proof that pressure is gone.

Question 5 · Material handling and process systems

A packed pump has just been repacked. Seal-water pressure is available at the flush connection, but no flow reaches the shaft sleeve. What should be checked first inside the stuffing box?

- A. Isolate the pump, remove the gland follower, drill a small radial passage through the nearest packing rings until it meets the pressurized flush port, reinstall those rings in their original order, and raise seal-water pressure until flow appears at the sleeve.
- B. Tighten the gland evenly until external leakage stops, then increase seal-water pressure and use the resulting gland temperature to judge flow.
- C. Remove the lantern ring, replace its full axial space with another packing ring, and rely on leakage along the shaft for cooling.
- D. Isolate the pump, verify that the lantern ring is axially aligned with the flush port, and confirm that the port and annular passage are clear before repacking correctly.

Question 6 · Material handling and process systems

A fan wheel clears the housing when cold but begins a light metallic rub only after the fan reaches stable operating temperature. What is the best next action?

- A. Stop and isolate the fan, then investigate thermal movement, bearing condition, shaft position, support or casing strain and the specified hot clearance before making a correction.
- B. Stop and isolate the fan, grind only the polished contact band from the wheel, then restart at the same load to prove clearance.
- C. Pull the cold casing sideways with the duct connection until the rubbed side shows twice the specified cold clearance.
- D. Balance the assembled wheel in place and treat disappearance of the once-per-revolution rub as proof that unbalance caused it.

Question 7 · Rigging, hoisting/lifting and moving

A hoist sheave has sharp groove lips, and the wire rope is polished and flattened where it runs in the groove. What should be done before the next lift?

- A. Remove the hoist from service long enough to polish the groove lips by hand, lubricate the rope and resume if it tracks centrally without load.
- B. Machine the sharp lips flush in place using the rope diameter as the groove-radius guide, without separately inspecting the flattened rope.
- C. Remove the hoist from service and have both the sheave groove and the affected rope section inspected against their rejection criteria; replace or repair only by an approved method.
- D. Cycle the hoist unloaded at low speed until the rope burnishes a smooth path through the existing groove.

Question 8 · Fluid power systems

The colour indicator on a hydraulic reservoir's desiccant breather shows saturation, and the reservoir repeatedly cools in humid washdown air. What maintenance is required?

- A. Blow compressed air through the installed element until its indicator returns to the dry colour.
- B. Drill a second vent opening in the fill cap so humid air does not have to pass through the saturated element.
- C. Raise the reservoir oil level above its maximum mark to reduce the volume of humid air entering during cooldown.
- D. Replace or regenerate the desiccant element as its instructions permit, and seal any fill-cap, gasket or breather bypass that lets air enter around it.

Question 9 · Mechanical power transmission

A replacement gear unit has a backstop, and the driven machine requires a known direction of rotation. What must be confirmed before the unit is coupled?

- A. Trace the old unit's input and output arrows, transfer them to the replacement housing and couple it first without checking the new backstop orientation.
- B. Assume equal gear ratios provide identical shaft directions and verify rotation only after the driven machine reaches operating speed.
- C. Remove the backstop for the first coupled start, observe the resulting rotation and reinstall it in the same factory position.
- D. Trace the required input and output directions from the machine, verify them against the gear-unit nameplate and instructions, and confirm free permitted rotation before coupling and controlled startup.

Question 10 · Mechanical power transmission

A shaft must resist axial load in either direction and a substantial overturning moment. How should a matched pair of angular-contact ball bearings be arranged when the design specifies maximum moment stiffness?

- A. Mount the pair back-to-back, with the contact-angle lines diverging outward as specified.
- B. Mount the pair face-to-face and assume its narrower effective spread gives the greatest moment stiffness.
- C. Mount both bearings in tandem so the pair carries the same axial capacity in both directions.
- D. Install either orientation and set the same endplay because contact direction does not affect the bearing arrangement.

Question 11 · Common occupational skills

The maintenance procedure for a SEW X..e gear unit fitted with an /ET oil expansion tank calls for an oil-level check after shutdown. Which method follows that procedure?

- A. Stop the unit at stable operating temperature, record the expansion-tank level, oil temperature, system pressure, and shutdown time immediately, then fill the settled indication to the upper operating mark.
- B. Shut down, wait a fixed ten minutes for complete drainback, and record the resulting level without checking the oil temperature.
- C. Stop the drive, incline the casing toward the gauge, and accept the first stable indication at the centre line.
- D. Stop the unit, let its temperature fall into the specified 20 °C to 40 °C range, and then check the dipstick or level glass by the standard procedure.

Question 12 · Common occupational skills

A service fastener has oily threads, and the drawing calls for a specific removable anaerobic threadlocker. How should the joint be prepared?

- A. Clean and wipe the exposed crests while leaving oil within the engagement, then substitute an oil-tolerant high-strength compound and document that grade.
- B. Retain a uniform oil film, apply extra specified compound throughout the full thread engagement, rotate the fastener repeatedly to distribute it evenly, and extend curing before loading the joint.
- C. Clean and dry both thread surfaces as the product instructions require, use an activator if specified, apply the stated grade, and assemble within its working time.
- D. Torque the dry cleaned fastener first, then wick removable compound around the exposed thread and allow complete cure.

Question 13 · Common occupational skills

During training on a multistage overhaul, an apprentice can perform individual operations but loses the sequence when the entire job is demonstrated at once. What should the trainer do next?

- A. Teach the overhaul in safe, meaningful stages, require a supervised return demonstration and check at each stage, then combine the stages progressively.
- B. Teach the overhaul by repeating the complete demonstration at normal production speed, then require the apprentice to reproduce the full sequence from memory without staged checks.
- C. Provide the full written procedure, authorize independent work before a supervised return demonstration, and assess competence from the completed machine after it returns to service.
- D. Skip prerequisite checks and final verification, teaching the mechanical steps to shorten the lesson.

Question 14 · Rigging, hoisting/lifting and moving

In British Columbia, a rigging assembly combines a lifting beam, shackles and sling legs used at an angle, and their marked limits differ. How is the allowable load established?

- A. Average the marked capacities after converting each component to its vertical rating, then use the calculated mean as the assembly limit for the angled lift.
- B. Determine the permissible capacity of every component and connection in its actual hitch, angle and loading direction, then limit the lift to the lowest applicable value.
- C. Determine the lifting-beam nameplate capacity in the planned loading direction and use that larger value for the complete assembly because the beam distributes force among the sling legs, shackles and connections.
- D. Add the vertical ratings of the sling legs, apply one angle factor to their sum and omit separate checks of the shackles and beam connections.

Question 15 • Rigging, hoisting/lifting and moving

A suspended pump casing is likely to swing while passing a pipe rack, so the lift plan calls for a tag line. Which worker-position plan is appropriate?

- A. Have the handler stand between the casing and rack and push the load away if it swings inward.
- B. Use the tag line while walking directly beneath the casing so the line remains nearly vertical and the handler can react from the load centreline.
- C. Tie the line to the pipe rack and let it oppose rotation while the crane passes the opening.
- D. Use the tag line from outside the suspended-load path, never stand between the swinging casing and a fixed object, and maintain clear lift communication.

Question 16 • Mechanical power transmission

A bearing inner ring will be installed with a heavy interference fit, and the inner ring is expected to operate hotter than the outer ring. How should radial internal clearance be selected?

- A. Calculate or estimate only the clearance loss from the heavy shaft fit, then select the smallest initial class that remains positive at room temperature.
- B. Calculate or obtain the clearance reductions caused by the fits and temperature difference, then select and verify the specified initial clearance that leaves the required operating clearance.
- C. Specify the next larger clearance class automatically whenever a heavy interference fit is shown, using that class increase as the allowance for the operating temperature difference.
- D. Retain normal initial clearance and accept the installation when the unloaded shaft turns freely by hand before the unit reaches operating temperature.

Question 17 • Mechanical power transmission

A layout uses classic C-section belts with a standard length of 120 in. According to the Dodge take-up table, what centre-distance adjustment range must the base provide around the calculated standard position?

- A. 0.75 in below for installation and 1.50 in above for take-up.
- B. 1.00 in below for installation and 2.50 in above for take-up.
- C. 2.00 in below for installation and 2.00 in above for take-up.
- D. 1.50 in below for installation and 3.00 in above for take-up.

Question 18 • Mechanical power transmission

The driving faces of a roller-chain sprocket are hooked, and the chain approaches its elongation limit. What should be done before the drive returns to service?

- A. Reverse the worn sprocket on its shaft, install the nearly elongated chain in the opposite running direction and verify only that the rollers seat quietly.
- B. Replace the worn sprocket and evaluate the chain and mating sprockets against their wear limits, replacing the worn set together as required.
- C. File each hooked driving face to a common visual profile, preserve the present centre distance and reinstall the same chain after measuring slack.
- D. Replace the chain only, leave the hooked sprocket and inspect roller seating after the first shift.

Question 19 · Mechanical power transmission

A compressor train repeatedly misses its calculated thermal alignment target after reaching stable load. Which evidence should be used to revise the next cold alignment target?

- A. Use an approved hot-check after one startup, revise the cold target from that single shutdown result, and disregard whether load and temperature had stabilized.
- B. Retain the original calculated growth and add half of the largest one-cycle error to both alignment planes without preserving the measured operating conditions.
- C. Collect live readings beside the exposed coupling and move the machine under stable load until both hot shaft readings display zero.
- D. Use an approved hot-check or offline movement-measurement method under repeatable operating conditions, confirm the movement over more than one cycle, and update the cold target from those data.

Question 20 · Material handling and process systems

A horizontal pump suction line repeatedly loses prime because a concentric reducer leaves a high point where air collects. The replacement layout allows an eccentric reducer. How should it be installed?

- A. Install the eccentric reducer flat side down, creating a gradual lower transition while leaving the upper suction pocket permanently available to collect air.
- B. Fit another concentric reducer and increase pump speed until the moving liquid carries the trapped air through the casing.
- C. Install the specified eccentric reducer with the flat side on top so the upper suction profile remains continuous, and support the piping without straining the pump nozzle.
- D. Rotate the eccentric reducer ninety degrees and support its heavy side from the pump nozzle so the air pocket moves laterally.

Question 21 · Material handling and process systems

Immediately after a conveyor belt splice is installed, the belt steers left and then right once during every complete belt revolution. What should be checked before changing the idler alignment?

- A. Skew one return idler until the belt remains centred while the splice is away from that idler.
- B. Increase take-up tension on the side toward which the splice first steers.
- C. Trim the belt edge that travels farthest from centre during the cycle.
- D. Measure the splice for squareness to the belt centreline and remake it by the approved method if it is outside tolerance.

Question 22 · Fluid power systems

On cold mornings a hydraulic power unit starts slowly, the pump sounds harsh, and inlet vacuum is much higher than after the oil warms. What should be done before increasing pump speed?

- A. Verify the viscosity only after the oil warms, then increase pump speed immediately and use the quieter sound as proof that cold suction is adequate.
- B. Verify the specified viscosity grade and oil temperature, follow the approved warm-up method, and inspect the suction path for restrictions or air leaks.
- C. Close the suction valve slightly during each cold start, then reopen it only after inlet vacuum returns to the warm-oil reading.
- D. Raise the discharge relief setting and hold the pump against relief until the cold fluid reaches normal operating temperature.

Question 23 · Fluid power systems

Leak-test solution forms bubbles where a nylon tube enters a push-in fitting. The tube has been removed several times and its end shows collet marks. What is the proper repair?

- A. Depressurize the circuit, rotate the same marked end so its deepest scratches face away from the collet, insert it farther and omit inspection of the seal.
- B. Polish the collet marks in place, taper the tube end with a knife and coat it with thread sealant before reinsertion.
- C. Depressurize the circuit, cut the tube square behind all damage with the approved cutter, inspect the tube outside diameter, seal and collet, then fully reinsert or replace the damaged parts.
- D. Replace the fitting alone, preserve the damaged tube end and push it past the new seal while the branch remains isolated.

Question 24 · Maintenance, commissioning and decommissioning

Work-order history shows that a scheduled reservoir-opening task has found no target defect for years and has caused contamination twice. What is the defensible way to optimize the task?

- A. Reassess the protected function, failure mode and consequence, compare the task's benefit with its contamination risk, and document a safer effective task or justified program change.
- B. Reassess the zero-find history alone, declare the protected failure impossible, delete the task and omit review of function, consequence or contamination harm.
- C. Double the reservoir-opening frequency so the next intrusive inspection can detect contamination introduced by the previous one, without changing the task method.
- D. Keep the harmful task and its interval unchanged permanently because preventive work entered in the CMMS must never be revised from operating evidence.

Question 25 · Maintenance, commissioning and decommissioning

A steel shaft has passed magnetic-particle inspection and will operate beside rolling bearings and fine ferrous debris. What final magnetic check may be required before release?

- A. When the powder is removed, wipe the shaft clean and accept it without measuring residual magnetism.
- B. Apply one direct-current shot stronger than the inspection field in its original direction, remove current abruptly, and infer successful demagnetization from the absence of loose particles on the cleaned shaft.
- C. Hold the shaft stationary inside an energized AC coil, switch it off abruptly, and release the part without measuring remanence.
- D. When the procedure or service limit requires it, demagnetize with the prescribed decreasing or withdrawing field method and measure the residual field before acceptance.

Answers and explanations

1. Answer D

Treat the moving patch as a probable reflection, identify nearby hot sources, and repeat the measurement from another angle or on an appropriate high-emissivity target under the same operating condition. A true surface hot spot stays at the same physical location, whereas a reflected source changes with viewing geometry on a low-emissivity surface.

2. Answer D

Pause, clean the anvils and journal, verify zero or a reference standard, confirm seating and technique, and repeat the readings before deciding whether the value is an outlier. A chip, tilted contact, instrument shift or real local defect can all produce a single high value, and averaging would conceal the cause.

3. Answer A

Use correctly oriented one-way flow controls so inlet air flows freely and exhaust from the moving side is throttled in each direction. Meter-out control maintains backpressure against the compressible air and changing resistance, reducing the tendency to accelerate and then stick.

4. Answer A

Release stored pressure through the designated bleed point, then verify zero pressure in the section to be opened. A locked supply valve prevents new flow but can leave pressure trapped between closed components.

5. Answer D

Isolate the pump, verify that the lantern ring is axially aligned with the flush port, and confirm that the port and annular passage are clear before repacking correctly. If the packing count or compression shifts the lantern ring past the port, the available seal water cannot enter the space around the sleeve.

6. Answer A

Stop and isolate the fan, then investigate thermal movement, bearing condition, shaft position, support or casing strain and the specified hot clearance before making a correction. A rub that appears only at temperature shows that operating movement changes the relative position; removing material without locating that movement can weaken the wheel and leave the fault active.

7. Answer C

Remove the hoist from service and have both the sheave groove and the affected rope section inspected against their rejection criteria; replace or repair only by an approved method. A pinching or sharp groove concentrates contact stress and can damage wires even when the rope still travels through the sheave.

8. Answer D

Replace or regenerate the desiccant element as its instructions permit, and seal any fill-cap, gasket or breather bypass that lets air enter around it. Saturated desiccant no longer removes moisture effectively, and even a new element cannot protect the reservoir if humid air has another entry path.

9. Answer D

Trace the required input and output directions from the machine, compare them with the gear-unit markings and instructions, and confirm free rotation in the permitted direction before coupling and controlled startup. An incorrect command can force the drive against the backstop before the operator can react.

10. Answer A

Mount the pair back-to-back, with the contact-angle lines diverging outward as specified. The wide effective bearing spread of a back-to-back pair provides strong moment support while the opposed contact directions carry axial load in either direction.

11. Answer D

For this /ET configuration, the specified check is made with the unit stopped and cooled to 20 °C to 40 °C before the normal dipstick or sight-glass method is used. A running, immediate or tilted reading does not reproduce the stated inspection condition.

12. Answer C

Clean and dry both thread surfaces as the product instructions require, use an activator if specified, apply the stated grade, and assemble within its working time. Oil can inhibit adhesion or cure, while substituting a stronger grade can make later service removal unsafe or damaging.

13. Answer A

Teach the overhaul in safe, meaningful stages, require a supervised return demonstration and check at each stage, then combine the stages progressively. Staging reduces the amount that must be managed at one time while preserving safety controls and providing evidence of competence before independent work.

14. Answer B

Determine the permissible capacity of every component and connection in its actual hitch, angle and loading direction, then limit the lift to the lowest applicable value. A rigging assembly cannot safely exceed its least-capable element or a reduced rating caused by configuration.

15. Answer D

The tag line provides remote guidance while the handler remains clear of the overhead-load path and the crushing space between a swinging load and fixed structure. Clear warnings and signals keep the movement coordinated.

16. Answer B

Calculate or obtain the clearance reductions caused by the fits and temperature difference, then select and verify the specified initial clearance that leaves the required operating clearance. Interference expands the inner ring, and a hotter inner ring expands relative to the outer ring; both effects reduce radial clearance in service.

17. Answer D

A 120 in C belt falls in the “over 112 to 144” row. That row reserves 1.50 in of inward travel so the belt can be installed without force and 3.00 in of outward travel for tension maintenance.

18. Answer B

Replace the worn sprocket and evaluate the chain and mating sprockets against their wear limits, replacing the worn set together as required. Hooked teeth no longer match normal roller engagement, and an elongated chain or worn mating sprocket can rapidly damage a single new component.

19. Answer D

Use an approved hot-check or offline movement-measurement method under repeatable operating conditions, confirm the movement over more than one cycle, and update the cold target from those data. Repeatable measured movement of the actual machine is stronger evidence than a thermal-growth estimate that has repeatedly failed to predict operating alignment.

20. Answer C

Install the specified eccentric reducer with the flat side on top so the upper suction profile remains continuous, and support the piping without straining the pump nozzle. Eliminating the high pocket prevents gas from collecting ahead of the pump, where it can disrupt prime and reduce effective inlet pressure.

21. Answer D

Measure the splice for squareness to the belt centreline and remake it by the approved method if it is outside tolerance. A splice cut on an angle creates a different effective belt length at each edge, producing a steering disturbance that returns at the splice once per revolution.

22. Answer B

Verify the specified viscosity grade and oil temperature, follow the approved warm-up method, and inspect the suction path for restrictions or air leaks. Cold high-viscosity oil increases suction loss; higher speed demands more inlet flow and can worsen cavitation rather than cure it.

23. Answer C

Depressurize the circuit, cut the tube square behind all damage with the approved cutter, inspect the tube outside diameter, seal and collet, then fully reinsert or replace the damaged parts. Longitudinal scratches, an angled cut or collet damage can cross the sealing contact; deeper insertion does not restore a damaged surface.

24. Answer A

Reassess the protected function, failure mode and consequence, compare the task's benefit with its contamination risk, and document a safer effective task or justified program change. Reliability-centred analysis asks whether a maintenance action is technically suitable and worthwhile; intrusive work can itself introduce error, but a zero-find history alone does not prove the failure risk has vanished.

25. Answer D

When the procedure or service limit requires it, demagnetize with the prescribed decreasing or withdrawing field method and measure the residual field before acceptance. Residual magnetism can attract ferrous debris or interfere with later service, and cleaning inspection media does not remove magnetization.