

Pedestal Grinder

This study guide will cover the major working parts, functions, and machining techniques that can be found/used on most **Pedestal Grinders**

This study guide has been designed to directly represent the questions that will be found on the open book written assessment and as an aid for the hands-on usability assessment. Both assessments will also include questions related to standard machine shop safety and APS internal user safety guidelines.

Answering the questions found at the end of the study guide will enable the user to successfully pass the hands-on usability and written assessments.
Study guide practice test and answers can be found at the end of the guide.

Grinding is the process of removing material by the cutting action of the countless hard and sharp abrasive particles of a revolving grinding wheel as they come in contact with the surface to be ground.

Grinding machines are made in a variety of types and sizes, depending upon the class of work for which they are to be used.

Pedestal grinders are used to sharpen high-speed steel cutting tools used on the lathes and milling machines, debur, or used to remove surface imperfections and to work extremely hard materials.

Pedestal Grinder

The grinding wheels are held between two flanged disks. A roughing or coarse-grained wheel is usually mounted on one end of the spindle and a fine wheel on the other. There can also be a wire wheel mounted on one side for special applications. A tool rest is provided for each wheel so that tools may be held or steadied while being ground (Figure 1).

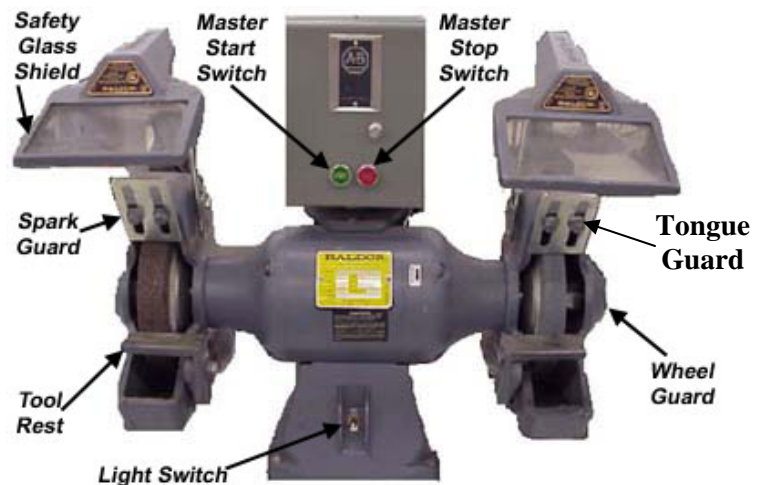


Fig. 1 Main Parts of a Pedestal Grinder

The operator is protected against flying abrasive particles and ground material by the wheel guards, which are an integral part of a machine. Safety glass shields are also provided for additional protection.

These grinders are used for all kinds of general off-hand grinding and for the sharpening of drills, chisels, tool bits, and other small tools.

Procedure for Grinding

Note: Grinders should be lubricated according to the manufacturer's instructions.

1. Examine the grinder to see that the tool rest is set at the required height, is within 1/8 of an inch to the face of the wheel, and is securely fastened in this position (Figure 2).
Tongue guard is to be set at 1/4" from the wheel (figure 1).



Fig. 2 Position of the tool rest

2. Adjust safety glass shields on the grinder to permit clear vision of the part to be ground and still protect the operator from flying particles.
CAUTION: Always wear safety glasses and/or face shield when using a grinder.
3. Start the grinder.
CAUTION: Stand to one side of the wheel when operating the grinder.
4. Hold the work in one hand, and steady it with the other. Place the work on the tool rest; then guide it against the face of the revolving wheel and apply enough pressure to grind, depending upon the hardness of the material and the wheel itself.
Note: Support the work on the tool rest to steady it when grinding, except in the case of the small tool bits which can be guided better by supporting them with the fingers or with a hand resting on the tool rest.
5. Cool work in a water pot as it becomes heated from grinding, especially the small hardened tools that would lose their temper if overheated. Twist **drills should not** be cooled by dipping in water, as it may cause cracking. Grind the job to the required shape or size by moving the work back and forth across the face of the wheel. This will prevent wearing a groove into the wheel and will result in a flatter surface on the work.

CAUTION: Keep fingers away from the revolving wheel, especially when grinding small pieces. Also make sure that the tool rest is close enough to the wheel to prevent the work from slipping into the space between the two.

Procedure for Grinding (cont.)

Note: Remove as much metal by rough grinding as is possible; then use the finer wheel for finishing.

Do not grind on the side of the wheel except when absolutely necessary, and then with only **light** pressure.

6. Check work with a gage or other measuring tool.
7. Stop grinder.

Dressing a Grinding Wheel

Dressing is the process of restoring the sharpness of the grinding wheel by breaking away the dulled abrasive crystals or by removing the glazed or loaded surface of the wheel, thus presenting new sharp cutting edges of the abrasive grains. This breaking away is caused by the pressure of the dresser crushing the bond and releasing the dull abrasive.

This process should not be confused with treeing, which refers to the shaping of any part of the wheel to run true or to alter it to some desired shape.

The tools used for dressing are made in a variety of types and are called dressers. The more commonly used off-hand dressers are: the star type and the diamond stick (Figure 3).



Fig. 3 Grinding Wheel Dressers

To dress the wheel, support the dresser on the tool rest so that the point of contact is slightly above the center, and with the handle tilted upward at an angle as shown in Figure 4.

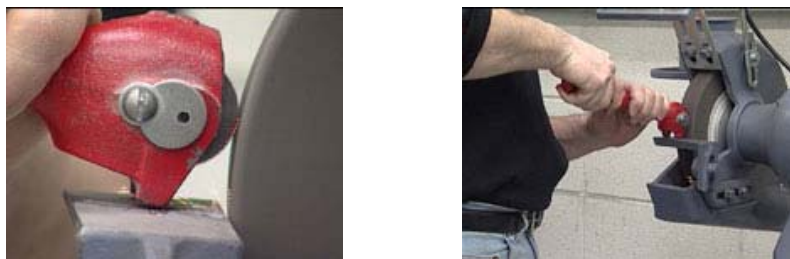


Figure 4 Dressing face of a grinding wheel

Dressing Cont.

Slowly press the dresser against the face of the revolving wheel until it "bites." Then move it back and forth to obtain a straight surface, and at the same time, hold the dresser rigidly enough on the tool rest to maintain trueness while dressing.

Wheel Loading is caused by:

- 1) metal too soft and/or
- 2) wheel bond too strong (Figure 5). When self-sharpening the wheel, the pressure of grinding will either fracture the grain or pull it out of the bond when it becomes dull. This action exposes new, sharp-cutting edges.

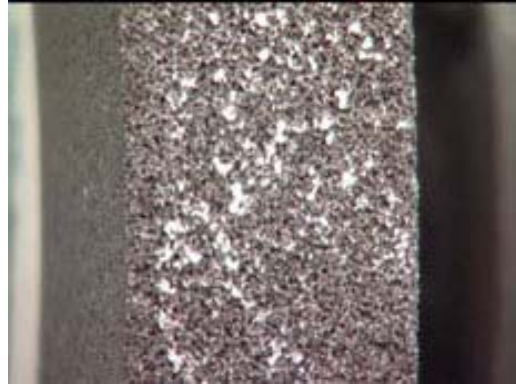


Fig.5 Loaded Wheel

Grinding is a safe operation if a few basic safety rules are followed. Use the rules listed below as a guide for safe grinding. These rules are based on material contained in ANSI B7.1 safety code for safe use and operation of abrasive wheels.

WARNING

IMPROPER USE MAY CAUSE BREAKAGE AND SERIOUS INJURY.

DON'T USE A CRACKED WHEEL OR ONE THAT HAS BEEN DROPPED or has become damaged.

DON'T FORCE A WHEEL ONTO THE MACHINE OR ALTER the size of the mounting hole - if the wheel won't fit the machine, get one that will.

DON'T EVER EXCEED MAXIMUM OPERATING SPEED established for the wheel.

DON'T GRIND ON THE SIDE OF THE WHEEL. (see ANSI Safety Code B7.1 for exception.)

DON'T START THE MACHINE UNTIL THE WHEEL GUARD IS IN PLACE.

DON'T JAM work into the wheel.

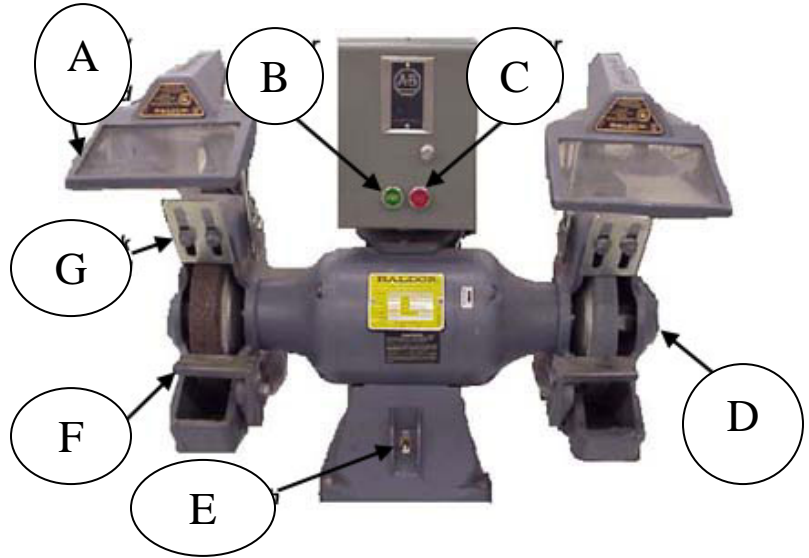
DON'T STAND DIRECTLY IN FRONT of a grinding wheel whenever a grinder is started.

Practice Test

The following questions have been designed to directly represent the questions that will be found on the written assessment and as an aid for the hands-on usability assessment.

Identify the parts of a Pedestal Grinder

1. ____ Start Button
2. ____ Tool Rest
3. ____ Spark Guard
4. ____ Stop Button
5. ____ Safety Glass Shield
6. ____ Light switch
7. ____ Wheel Guard



8. The clearance between the tool rest and the wheel should never exceed _____.
 - A. 3/16"
 - B. 1/16"
 - C. 1/4"
 - D. 1/8"
9. Grinding is the process of removing material by a _____ action.
 - A. Rubbing
 - B. Cutting
 - C. Polishing
 - D. Wearing
10. After dressing a wheel it may be necessary to adjust the _____.
 - A. Guard
 - B. Eye shield
 - C. Tool rest

11. The main purpose of a grinding wheel guard is to?
 - A. Limit grinding to a small part of the wheel
 - B. Protect the operator from flying sparks
 - C. Prevent pieces from being thrown from a broken grinding wheel
 - D. Prevent the work piece from being pulled into the grinding wheel
 - E. All of the above

12. The use of excessive part pressure against the grinding wheel on a pedestal grinder or a bench grinder can cause:
 - A. The wheel to break
 - B. Hand to slip and hit the wheel
 - C. Finger burns from hot part
 - D. All conditions listed

13. For best eye protection when grinding, always:
 - A. Use the grinder's glass eye shield
 - B. Use the grinder's glass eye shield and wear goggles
 - C. Use the grinder's glass eye shield and wear a face shield
 - D. Either B or C

14. Use vises or clamps to hold work pieces.
True False

15. Always keep hands at a safe distance from moving machine parts.
True False

16. Always prop the machine shop door open upon entering shop.
True False

17. Be thoroughly familiar with the placement of the machine's "stop" switch or lever.
True False

18. Which one of the following parts of a grinding wheel should not be used when grinding a part on a bench or pedestal grinder?
 - A. The side of the wheel
 - B. Left edge of the wheel
 - C. Right edge of wheel
 - D. Center of wheel

19. A utility grinder mounted on its own freestanding base is called?
 - A. freestanding grinder
 - B. An upright grinder
 - C. A post grinder
 - D. A pedestal grinder

20. How close to the grinding wheel should the tool rest be placed?
 - A. As close as possible
 - B. 1/16" (1.6 mm)
 - C. 1/8" (3.2 mm)
 - E. 1/4" (6.35 mm)

21. When hand grinding a very short part on a bench or pedestal grinder, the part should be:
 - A. Clamped to the tool rest
 - B. Held with vise grip pliers
 - C. Held with long nose pliers
 - D. Held by hand

22. A grinding wheel should never be mounted on the motor spindle of a bench or pedestal grinder if the:
 - A. Wheel blotter is made of paper
 - B. Wheel is silicon
 - C. Wheel is aluminum oxide
 - D. Rated RPM is less than motor RPM

23. Which of the following are used to dress and true an abrasive grinding wheel on a tool and utility grinder?
- A. Diamond tool wheel dresser
 - B. Abrasive stick wheel dressing tool
 - C. Huntington wheel dresser and abrasive wheel dresser
 - D. All of the preceding
24. Do not turn on a grinder if the grinder wheel looks damaged.
- True False
25. Do not make tool rest adjustments on a pedestal grinder while the wheels are revolving.
- True False
26. Grinder eye shields should be in place before doing any grinding on a pedestal grinder.
- True False
27. Wear safety glasses, goggles, or a face shield when performing grinding operations, even though the machine is fitted with eye shields.
- True False
28. Never force a grinder wheel onto the machine or the size of the mounting hole.
- True False
29. It is OK to stand directly in front of a grinding wheel whenever a grinder is started.
- True False
30. If the grinding wheel becomes loaded it is not necessary to dress it.
- True False

Study Guide
Answer Sheet

- | | |
|----------|-----------|
| 1. B | 16. True |
| 2. F | 17. True |
| 3. G | 18. A |
| 4. C | 19. D |
| 5. A | 20. C |
| 6. E | 21. B |
| 7. D | 22. D |
| 8. B | 23. D |
| 9. B | 24. True |
| 10. D | 25. True |
| 11. E | 26. True |
| 12. D | 27. True |
| 13. D | 28. True |
| 14. True | 29. False |
| 15. True | 30. False |