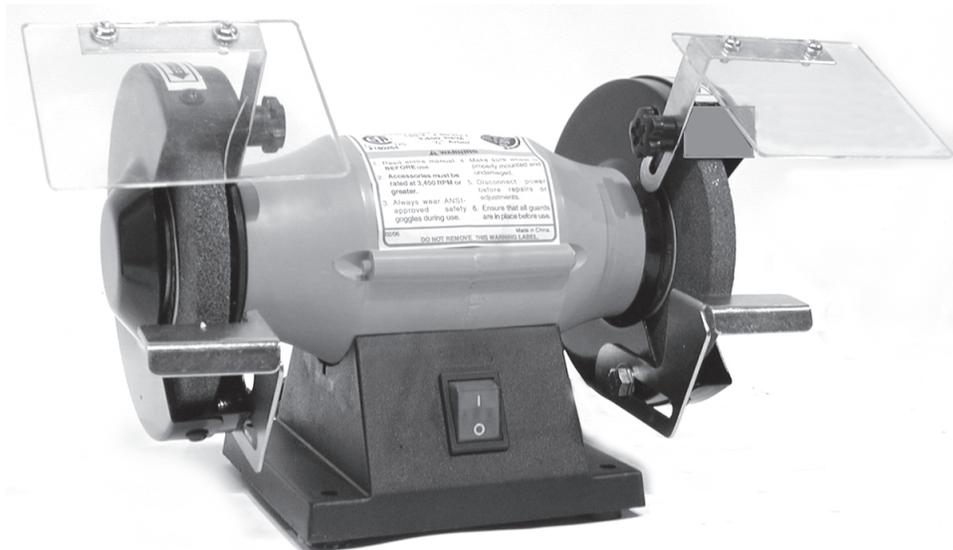


CENTRAL MACHINERY®

5 INCH BENCH GRINDER

Model 94186

ASSEMBLY AND OPERATING INSTRUCTIONS



Due to continuing improvements, actual product may differ slightly from the product described herein.



3491 MISSION OAKS BLVD., CAMARILLO, CA 93011
VISIT OUR WEB SITE AT [HTTP://WWW.HARBORFREIGHT.COM](http://www.harborfreight.com)

Copyright © 2006 by Harbor Freight Tools®. All rights reserved. No portion of this manual or any artwork contained herein may be reproduced in any shape or form without the express written consent of Harbor Freight Tools.

For technical questions and replacement parts, please call 1-800-444-3353

SPECIFICATIONS

Item	Description
Motor	1/3 HP (maximum); 120 VAC, 60 Hz; 3450 RPM; Sealed radial armature bearings
Line Cord	3-prong grounded plug, 5.5 feet long, 18 AWG x 3C
Spindle	½ inch x 12 TPI threads; Right side: forward threads; Left side: reverse threads
Wheel Size	5 inch diameter
Switch	Lighted, rocker type
Grinding Wheels	One 36 grit and one 60 grit, aluminum oxide
Overall Dimensions	5-3/4 (L) x 10-1/2 (W) x 7 (H) inches
Rest Dimensions	1 (L) x 2 (W) x 2-1/2 (H) inches; Brackets: 2-1/2 (H) x 3-1/2 inches; Eye shields: 3-3/4 (W) x 1/8 (thick)
Weight	9.1 lbs.



SAVE THIS MANUAL

You will need the manual for the safety warnings and precautions, assembly instructions, operating and maintenance procedures, parts list and diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep the manual and invoice in a safe and dry place for future reference.

GENERAL SAFETY RULES

 **WARNING!**

READ AND UNDERSTAND ALL INSTRUCTIONS. Failure to follow all instructions listed below may result in electric shock, fire, and/or serious injury.

SAVE THESE INSTRUCTION

Work Area

1. **Keep your work area clean and well lit.** Cluttered benches and dark areas invite accidents.
2. **Do not operate power tools in explosive atmospheres, such as in the presence of flammable liquids, gases, or dust.** Power tools create sparks which may ignite the dust or fumes.
3. **Keep bystanders, children, and visitors away while operating a power tool.**
Distractions can cause you to lose control. Protect others in the work area from debris such as chips and sparks. Provide barriers or shields as needed.

Electrical Safety

4. **Avoid body contact with grounded surfaces such as pipes, radiators, ranges, and refrigerators.** There is an increased risk of electric shock if your body is grounded.
5. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
6. **Grounded tools must be plugged into an outlet properly installed and grounded in accordance with all codes and ordinances. Never remove the grounding prong or modify the plug in any way. Do not use any adapter plugs. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded.** If the tools should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user.
7. **Double insulated tools are equipped with a polarized plug (one blade is wider than the other). This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician to install a polarized outlet. Do not change the plug in any way.** Double insulation eliminates the need for the three wire grounded power cord and grounded power supply system.
8. **Do not abuse the Power Cord. Never use the Power Cord to carry the tools or pull the Plug from an outlet. Keep the Power Cord away from heat, oil, sharp edges, or moving parts. Replace damaged Power Cords immediately.** Damaged Power Cords increase the risk of electric shock.
9. **When operating a power tool outside, use an outdoor extension cord marked “W-A” or “W”.** These extension cords are rated for outdoor use, and reduce the risk of electric shock.

Personal Safety

10. **Stay alert. Watch what you are doing, and use common sense when operating a power tool. Do not use a power tool while tired or under the influence of drugs, alcohol, or medication.** A moment of inattention while operating power tools may result in serious personal injury.
11. **Dress properly. Do not wear loose clothing or jewelry. Contain long hair. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewelry, or long hair can be caught in moving parts.
12. **Avoid accidental starting. Be sure the Power Switch is off before plugging in.** Carrying power tools with your finger on the Power Switch, or plugging in power tools with the Power Switch on, invites accidents.
13. **Remove adjusting keys or wrenches before turning the power tool on.** A wrench or a key that is left attached to a rotating part of the power tool may result in personal injury.

14. **Do not overreach. Keep proper footing and balance at all times.** Proper footing and balance enables better control of the power tool in unexpected situations.
15. **Use safety equipment. Always wear eye protection.** Dust mask, non-skid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

Tool Use and Care

16. **Do not force the tool. Use the correct tool for your application.** The correct tool will do the job better and safer at the rate for which it is designed.
17. **Do not use the power tool if the Power Switch does not turn it on or off.** Any tool that cannot be controlled with the Power Switch is dangerous and must be replaced.
18. **Disconnect the Power Cord Plug from the power source before making any adjustments, changing accessories, or storing the tool.** Such preventive safety measures reduce the risk of starting the tool accidentally.
19. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.
20. **Maintain tools with care. Keep cutting tools sharp and clean.** Properly maintained tools with a sharp cutting edge are less likely to bind and are easier to control. Do not use a damaged tool. Tag damaged tools “Do not use” until repaired.
21. **Check for misalignment or binding of moving parts, breakage of parts, and any other condition that may affect the tool’s operation. If damaged, have the tool serviced before using.** Many accidents are caused by poorly maintained tools.
22. **Use only accessories that are recommended by the manufacturer for your model.** Accessories that may be suitable for one tool may become hazardous when used on another tool.

Service

23. **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury.
24. **When servicing a tool, use only identical replacement parts. Follow instructions in the “*Inspection, Maintenance, And Cleaning*” section of this manual.** Use of unauthorized parts or failure to follow maintenance instructions may create a risk of electric shock or injury.

Note: Performance of this tool may vary depending on variations in local line voltage. Extension cord usage may also affect tool performance.

SAFETY INSTRUCTIONS FOR BENCH GRINDER

1. **Maintain labels and nameplates on the Bench Grinder.** These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.
2. **Always wear ANSI-approved safety impact eye goggles and heavy work gloves when using the Bench Grinder.** Using personal safety devices reduce the risk for injury. Safety impact eye goggles and heavy work gloves are available from Harbor Freight Tools.
3. **Maintain a safe working environment.** Keep the work area well lit. Make sure there is adequate surrounding workspace. Always keep the work area free of obstructions, grease, oil, trash, and other debris. Do not use a power tool in areas near flammable chemicals, dusts, and vapors. Do not use this product in a damp or wet location.
4. **Avoid unintentional starting.** Make sure you are prepared to begin work before turning on the Bench Grinder.
5. **Do not force the Bench Grinder.** This tool will do the work better and safer at the speed and capacity for which it was designed.
6. **Always unplug the Bench Grinder from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.**
7. **Never leave the Bench Grinder unattended while running.** Turn power off if you have to leave the Bench Grinder.
8. **Before each use, check all nuts, bolts, and screws for tightness.** Vibration during mixing may cause these to loosen.
9. **Keep extension cord off the ground and away from water.**
10. **Always connect the Line Cord to a Ground Fault Circuit Interrupter (GFCI) protected electrical outlet.**
11. **Install this product on a proper surface.** Locate on a flat, level, and solid surface that is capable of supporting the weight of the Bench Grinder.
12. **Use a full face mask when grinding any metals.** The grinder can produce sparks which may land on your clothing, or hit your face. Also ensure that you are not operating the grinder around flammable materials or liquids. Always make sure the safety shields and wheel guards are in place at all times.
13. **Make sure the grinding wheels are of the proper speed (3450 RPM or greater) rating.**
14. **Frequently quench the workpiece in water to prevent overheating.**
15. **Use the tool rest to steady the work piece.** If the tool rest is not used, the torque of the spinning grinding wheel may pull the workpiece from your hands.
16. **Do not use aluminum oxide wheels when grinding nonferrous metals such as aluminum and brass.** Use silicon carbide wheels for nonferrous metals.
17. **When buffing material, always hold the material on the lower side of the buffing wheel.**

 **WARNING!**

People with pacemakers should consult their physician(s) before using this product. Operation of electrical equipment in close proximity to a heart pacemaker could cause interference or failure of the pacemaker.

Some dust created by power sanding, sawing, grinding, drilling, and other construction activities, contain chemicals known (to the State of California) to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are: lead from lead-based paints, crystalline silica from bricks and cement or other masonry products, arsenic and chromium from chemically treated lumber. Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals: work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles. (California Health & Safety Code 25249.5, et seq.)

GROUNDING

 **WARNING!**

Improperly connecting the grounding wire can result in the risk of electric shock. Check with a qualified electrician if you are in doubt as to whether the outlet is properly grounded. Do not modify the power cord plug provided with the tool or product. Never remove the grounding prong from the plug. Do not use the tool if the power cord or plug is damaged. If damaged, have it repaired by a service facility before use. If the plug will not fit the outlet, have a proper outlet installed by a qualified electrician.

Grounded Tools with Three Prong Plugs

The Bench Grinder comes with a 3-prong grounded plug.

1. Tools marked with “Grounding Required” have a three wire cord and three prong grounding plug. The plug must be connected to a properly grounded outlet. If the tool should electrically malfunction or break down, grounding provides a low resistance path to carry electricity away from the user, reducing the risk of electric shock. (See Figure A.)
2. The grounding prong in the plug is connected through the green wire inside the cord to the grounding system in the tool. The green wire in the cord must be the only wire connected to the tool’s grounding system and must never be attached to an electrically “live” terminal. (See Figure A.)
3. Your tool must be plugged into an appropriate outlet, properly installed and grounded in accordance with all codes and ordinances. The plug and outlet should look like those in the following illustration. (See Figure A.)

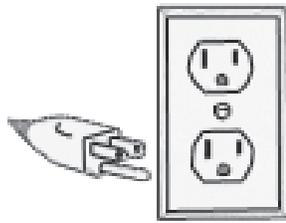


Figure A

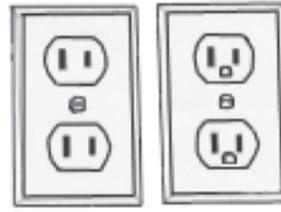


Figure B

Double Insulated Tools with Two Prong Plugs

4. A polarized plug (one blade is wider than the other) is a feature to reduce the risk of electric shock. This plug will fit in a polarized outlet only one way. If the plug does not fit fully in the outlet, reverse the plug. If it still does not fit, contact a qualified electrician. Never use with an extension cord unless plug can be fully inserted. Do not alter the plug.”
5. Tools marked “Double Insulated” do not require grounding. They have a special double insulation system which satisfies OSHA requirements and complies with the applicable standards of Underwriters Laboratories, Inc., the Canadian Standard Association, and the National Electrical Code. (See Figure B above.)
6. Double insulated tools may be used in either of the 120 volt outlets shown in the following illustration. (See Figure B above.)

EXTENSION CORDS

1. Grounded tools require a three wire extension cord. Double Insulated tools can use either a two or three wire extension cord.
2. As the distance from the supply outlet increases, you must use a heavier gauge extension cord. Using extension cords with inadequately sized wire causes a serious drop in voltage, resulting in loss of power and possible tool damage. (See Table A.)
3. The smaller the gauge number of the wire, the greater the capacity of the cord. For example, a 14 gauge cord can carry a higher current than a 16 gauge cord. (See Table A.)
4. When using more than one extension cord to make up the total length, make sure each cord contains at least the minimum wire size required. (See Table A.)
5. If you are using one extension cord for more than one tool, add the nameplate amperes and use the sum to determine the required minimum cord size. (Table A.)
6. If you are using an extension cord outdoors, make sure it is marked with the suffix “W-A” (“W” in Canada) to indicate it is acceptable for outdoor use.
7. Make sure your extension cord is properly wired and in good electrical condition. Always replace a damaged extension cord or have it repaired by a qualified electrician before using it.
8. Protect your extension cords from sharp objects, excessive heat, and damp or wet areas.

Table A

RECOMMENDED MINIMUM WIRE GAUGE FOR EXTENSION CORDS* (120 VOLT)					
NAMEPLATE AMPERES (At Full Load)	EXTENSION CORD LENGTH				
	25 Feet	50 Feet	75 Feet	100 Feet	150 Feet
0 – 2.0	18	18	18	18	16
2.1 – 3.4	18	18	18	16	14
3.5 – 5.0	18	18	16	14	12
5.1 – 7.0	18	16	14	12	12
7.1 – 12.0	16	14	12	10	-
12.1 – 16.0	14	12	10	-	-
16.1 – 20.0	12	10	-	-	-

* Based on limiting the line voltage drop to five volts at 150% of the rated amperes.

SYMBOLGY

Table B

	Double Insulated
	Canadian Standards Association
	Underwriters Laboratories, Inc.
V ~	Volts Alternating Current
A	Amperes
n_0 <u>xxxx</u> /min.	No Load Revolutions per Minute (RPM)

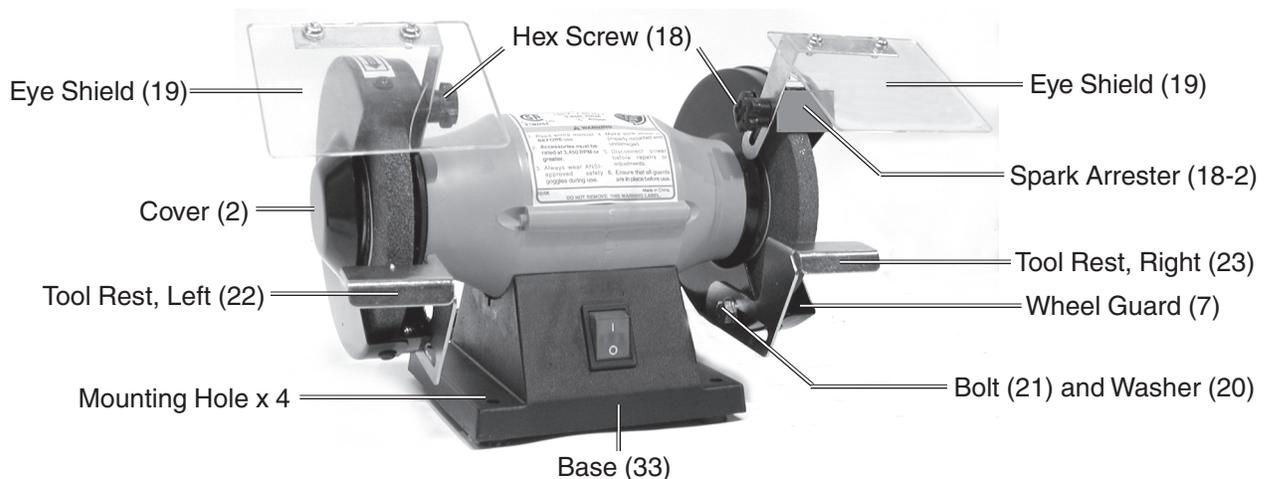
UNPACKING

When unpacking, check to make sure that all the parts are included. Refer to the Assembly section, and the Assembly Drawing and Parts List at the end of this manual.

If any parts are missing or broken, please call Harbor Freight Tools at the number on the cover of this manual as soon as possible.

ASSEMBLY INSTRUCTIONS

1. Mount the **right Tool Rest (23)** to the right Wheel Guard (7) using Bolt (21) and Washer (20).
2. Mount the **left Tool Rest (22)** to the left Wheel Guard (7) using Bolt (21) and Washer (20). See photo below.
3. Adjust each Tool Rest so that there is 1/16 inch (minimum) clearance from the Grinding Wheel. At the same time, adjust each Tool Rest so that the workpiece contacts the Grinding Wheel slightly above the center-line of the Motor Rotor (14). Securely tighten both Tool Rests.



4. Attach the **Left Spark Arrestor (18-3)** to the top-left Wheel Guard (7) using Washer (18-1) and Hex Screw (18). Adjust Spark Arrestor to no closer than 1/16" to the Grinding Wheel. Tighten Hex Screw (18). Do the same with the **Right Spark Arrestor (18-2)**.
5. Mount the **right Eye Shield (19)**, secured to the Right Bracket (17), to the Wheel Guard (7) using Hex Screw (18). See photo above. Adjust to the desired eye protection level and securely tighten Hex Screw (18).
6. Mount the **left Eye Shield (19)**, secured to the Left Bracket (16), to the Wheel Guard (7) using Hex Screw (18). Adjust to the desired eye protection level and securely tighten Hex Screw (18).

Bench Mounting

1. Select a sturdy work bench able to withstand the weight of the Bench Grinder and the workpiece pressure exerted by the operator.
2. When the mounting location of the Bench Grinder is located, place a marker through each of the Base (33) mounting holes.
3. Move the Bench Grinder aside and drill four 1/4 inch mounting holes into the workbench.
4. Place Bolts (not supplied) through the Base (33) mounting holes and secure to the workbench using hardware (not supplied).

OPERATING INSTRUCTIONS

WARNING!

The grinding wheel can fly apart and cause injury. Grinding wheels must always be checked for cracks or imperfections. This is done with the “ring test”. With the Grinding Wheel mounted, tap the wheel gently near the outer rim with the handle of a screwdriver. You should hear a clear bell-like ring. If a dull thud occurs, do not use the wheel. The wheel may be damaged and could come apart during operation.

1. Insert the Line Cord (28) into a grounded electrical outlet.
2. To turn on the Bench Grinder, press the Switch (27) to the (I) ON position. The motor will start. See photo on page 9.
3. Put on the ANSI-approved safety impact glasses and full face shield.

Note: Do not use aluminum oxide grinding wheels when grinding nonferrous metals such as aluminum and brass. Use silicon carbide grinding wheels for nonferrous metals.

Note: Do not grind with the sides of the grinding wheel.

4. When the Motor reaches full speed, bring the workpiece into the wheel gently, without jarring.

The workpiece will quickly become heated, therefore frequent quenching in water is required. When grinding high speed steels such as drill and tool bits, avoid high temperature buildup as this can affect the temper of the steel.

For small workpieces such as drill bits or chisels, avoid applying pressure to the Grinding Wheel at a high angle that could cause the workpiece to become lodged between the Tool Rest and the Grinding Wheel.

5. To turn off the Bench Grinder, press the Switch (27) to the (O) OFF position.

INSPECTION, MAINTENANCE, AND CLEANING

WARNING!

Make sure the Power Switch of the Bench Grinder is in its “OFF” position and that the tool is unplugged from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

1. **Before each use**, inspect the general condition of the Bench Grinder Check for loose screws, misalignment or binding of moving parts, cracked or broken parts, damaged electrical wiring, and any other condition that may affect its safe operation. If abnormal noise or vibration occurs, have the problem corrected before further use. **Do not use damaged equipment.**
2. Periodically recheck all nuts, bolts, and screws for tightness.
3. Store in a clean and dry location.

Dressing the Grinding Wheel

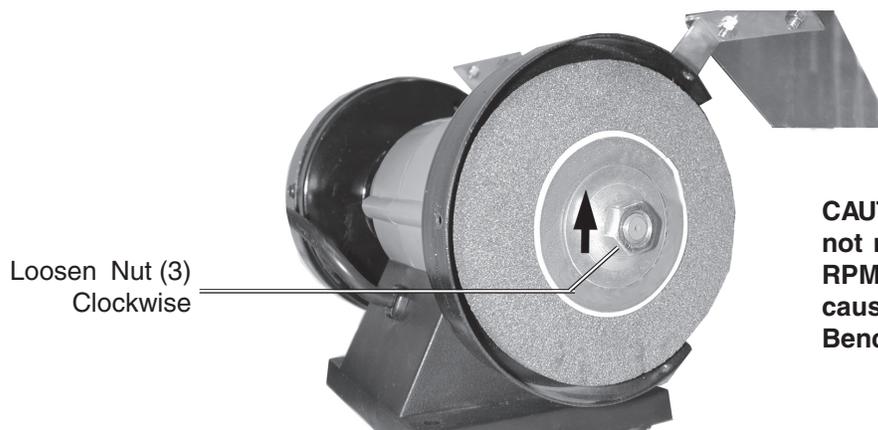
New grinding wheels frequently are not true and during operation will often become grooved, glazed (build up), out of round, or misshapen. You will need a grinding wheel dresser (not provided) for this operation. Dressers are available from Harbor Freight Tools.

To dress the grinding wheel:

1. Stand to the side of the wheel for this operation.
2. If the grinding wheel is new, let it run for a minute with no load. If the grinding wheel runs straight and true, you will not need to dress it prior to operation. If it does not, proceed with the following instructions.
3. If you are using a “pistol grip” dresser, grip the handle firmly with one hand and the arm of the dresser with the other. Allow the wheel to reach full speed. Use the tool rest to support your hand and the dresser, and evenly apply the dresser to all surfaces of the wheel. The wheel can be dressed in a few minutes.
4. If you are using an “in-line” dresser, hold the handle firmly, put the dresser on the tool rest so that its wheels can move freely (i.e., the exposed part of the wheel should be facing up). Let the wheel reach full speed and apply the dresser evenly to all surfaces.

Changing Grinding Wheels

1. Unplug the Bench Grinder from the electrical outlet.
2. Remove three Screws holding the Cover (2). Set aside Cover and Screws.
3. Loosen Hex Screw (18) and move the Eye Shield above the Grinding Wheel.
4. Remove the Tool Rest from the Wheel Guard (7) by removing Bolt (21) and Washer (20).
5. While holding the Motor Rotor (14) in place with a large, flat blade screwdriver, turn the Nut (3) clockwise to loosen and remove Grinding Wheel and Flange (4). If removing the right Grinding Wheel, turn the Nut (3) counterclockwise to loosen and remove.
6. Replace Grinding Wheel with a new one rated to run to at least to the maximum speed of the Bench Grinder. See Grinding Wheel Specifications on page 2. Securely tighten Nut (3).



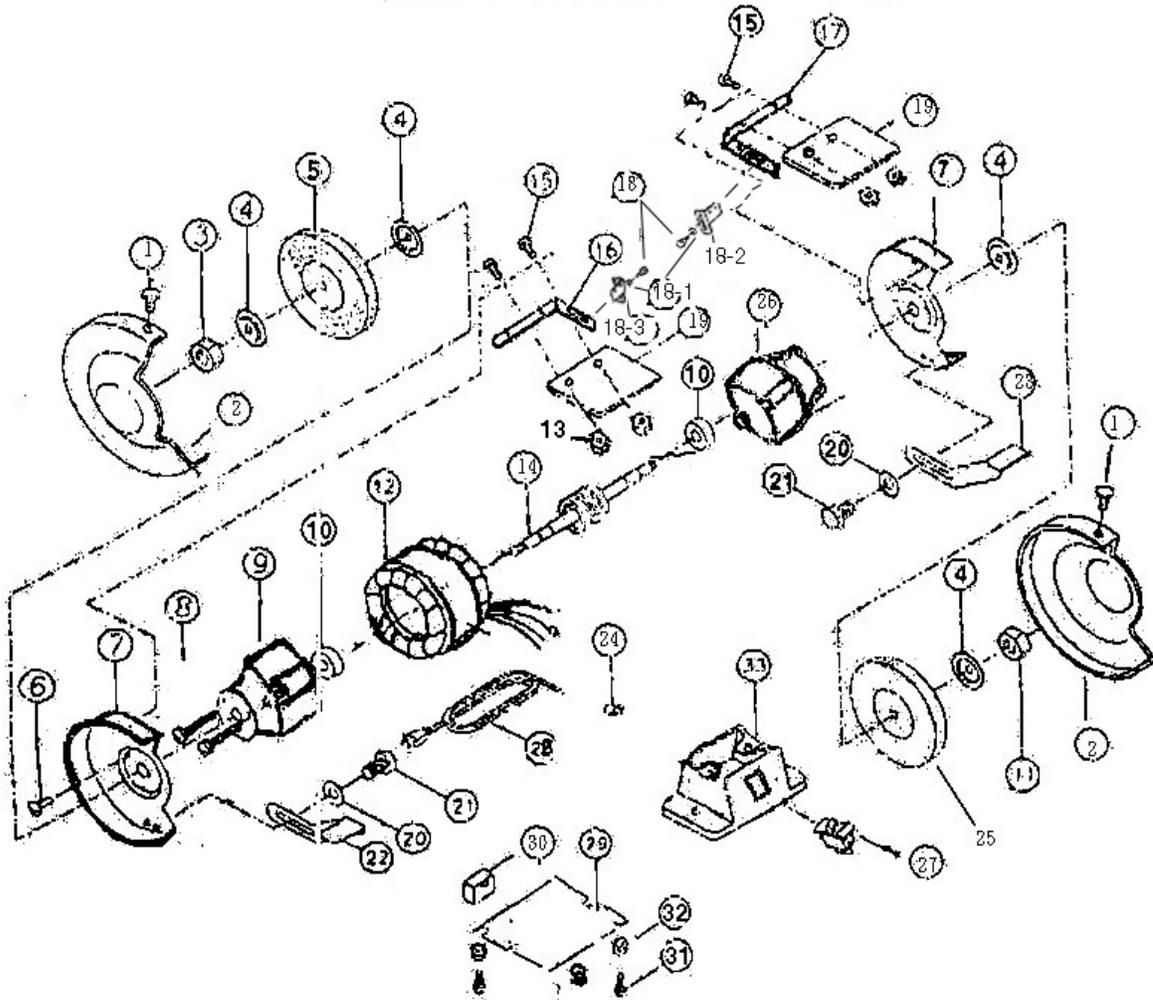
CAUTION: Using a Grinding Wheel not rated to run at least to 3450 RPM could cause it to fly apart, causing injury, or damage to the Bench Grinder.

PARTS LIST

Part #	Description
1	Screw
2	Cover
3	Nut
4	Flange
5	Grinding Wheel, 60 Grit
6	Screw
7	Wheel Guard
8	Screw
9	Motor Housing
10	Ball Bearing
11	Nut
12	Motor Stator
13	Nut
14	Motor Rotor
15	Screw
16	Bracket, Left
17	Bracket, Right
18	Screw, Hex
18-1	Washer
18-2	Spark Arrester, Right
18-3	Spark Arrester, Left
19	Eye Shield
20	Washer
21	Bolt
22	Tool Rest, Adjustable, Left
23	Tool Rest, Adjustable, Right
24	Strain Relief
25	Grinding Wheel, 36 Grit
26	Motor Housing
27	Switch
28	Line Cord
29	Base Plate
30	Condenser
31	Screw
32	Pad
33	Base

NOTE: Some parts are listed and shown for illustration purposes only and are not available individually as replacement parts.

ASSEMBLY DRAWING



PLEASE READ THE FOLLOWING CAREFULLY

THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER NOR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT OR THAT HE OR SHE IS QUALIFIED TO REPLACE ANY PARTS OF THE PRODUCT. IN FACT, THE MANUFACTURER AND/OR DISTRIBUTOR EXPRESSLY STATES THAT ALL REPAIRS AND PARTS REPLACEMENTS SHOULD BE UNDERTAKEN BY CERTIFIED AND LICENSED TECHNICIANS AND NOT BY THE BUYER. THE BUYER ASSUMES ALL RISK AND LIABILITY ARISING OUT OF HIS OR HER REPAIRS TO THE ORIGINAL PRODUCT OR REPLACEMENT PARTS THERETO, OR ARISING OUT OF HIS OR HER INSTALLATION OF REPLACEMENT PARTS THERETO.

CENTRAL MACHINERY[®]

LIMITED 90 DAY/1 YEAR WARRANTY

Harbor Freight Tools Co. makes every effort to assure that its products meet high quality and durability standards, and warrants to the original purchaser for a period of ninety days from date of purchase that the motor, the belts (if so equipped), and the blades (if so equipped) are free of defects in materials and workmanship. Harbor Freight Tools also warrants to the original purchaser, for a period of one year from date of purchase, that all other parts and components of the product are free from defects in materials and workmanship. This warranty does not apply to damage due directly or indirectly to misuse, abuse, negligence or accidents; repairs or alterations outside our facilities; or to lack of maintenance. We shall in no event be liable for death, injuries to persons or property, or for incidental, contingent, special or consequential damages arising from the use of our product. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation of exclusion may not apply to you. THIS WARRANTY IS EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS.

To take advantage of this warranty, the product or part must be returned to us with transportation charges prepaid. Proof of purchase date and an explanation of the complaint must accompany the merchandise. If our inspection verifies the defect, we will either repair or replace the product at our election or we may elect to refund the purchase price if we cannot readily and quickly provide you with a replacement. We will return repaired products at our expense, but if we determine there is no defect, or that the defect resulted from causes not within the scope of our warranty, then you must bear the cost of returning the product.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

3491 Mission Oaks Blvd. • PO Box 6009 • Camarillo, CA 93011 • (800) 444-3353