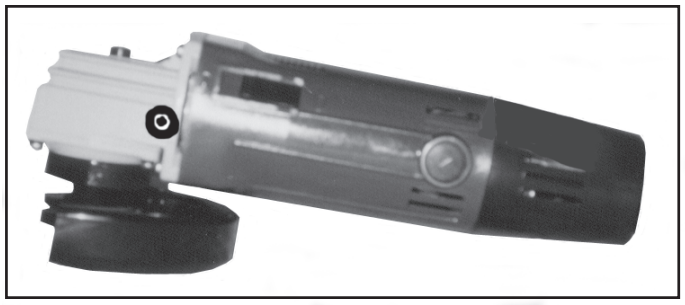
DRILL MASTER®

4-1/2” ANGLE GRINDER

Model 03150

ASSEMBLY AND OPERATING INSTRUCTIONS



Distributed Exclusively by HARBOR FREIGHT TOOLS®

3491 Mission Oaks Blvd., Camarillo, CA 93011
Visit our Web site at: http://www.harborfreight.com

For technical questions, please call 1-800-444-3353.

PRODUCT SPECIFICATIONS

Item	Description
Electrical Requirements	120 Volt/60 Hz/580 Watts/12,000 RPM/ 4.8 Amps Maximum
Grinding Wheel Size (Not Included)	4-1/2” Diameter, 7/8 Arbor
Spindle Size	5/8” – 11 TPI
Accessories	Auxiliary Handle (Qty. 1) Wrench (Qty. 1) Carbon Brush (Qty. 2)

E194601

SAVE THIS MANUAL

You will need this manual for the safety warnings and precautions, assembly, operating, inspection, maintenance and cleaning procedures, parts list and assembly diagram. Keep your invoice with this manual. Write the invoice number on the inside of the front cover. Keep this 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 INSTRUCTIONS

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. **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.

5. **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.

6. **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.

7. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.

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, nonskid safety shoes, hard hat, or hearing protection must be used for appropriate conditions.

TOOL USE AND CARE

16. **Use clamps (not included) or other practical ways to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body is unstable and may lead to loss of control.

17. **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.

18. **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.

19. **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.

20. **Store idle tools out of reach of children and other untrained persons.** Tools are dangerous in the hands of untrained users.

21. **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.

22. **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.

23. **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

24. **Tool service must be performed only by qualified repair personnel.** Service or maintenance performed by unqualified personnel could result in a risk of injury.

25. **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.

SPECIFIC SAFETY RULES

1. **Always use proper guard with grinding wheel. A guard protects the operator from broken wheel fragments.**

2. **Hold tool by insulated gripping surfaces when performing an operation where the cutting tool may contact hidden wiring or its own cord. Contact with a "live" wire will make exposed metal parts of the tool "live" and shock the operator.**

3. **Maintain labels and nameplates on the Polisher/Waxer.** These carry important information. If unreadable or missing, contact Harbor Freight Tools for a replacement.

4. **Always wear safety impact eye goggles and heavy work gloves when using this tool.** Using personal safety devices reduce the risk for injury. Safety impact eye goggles and heavy work gloves are available from Harbor Freight Tools.

5. **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.

6. ⚠ **WARNING! All accessories for this tool must be rated for at least 12,000 RPM.** Grinding Wheels and other accessories running over the rated 12,000 RPM speed can fly apart and cause injury.

7. **When using a handheld power tool, always maintain a firm grip on the tool with both hands to resist starting torque.**

8. Use only 4-1/2" diameter Grinding Wheels that having a 5/8" center mounting hole. Never disable or modify the Wheel Guard.

8. **Avoid unintentional starting.** Make sure you are prepared to begin work before turning on this tool.

9. **Do not force this tool.** This tool will do the work better and safer at the speed and capacity for which it was designed. Do not force the rotating Grinding Wheel (not included) into the object being ground. Apply moderate pressure, allowing the Grinding Wheel to rotate freely without being forced.

10. **WARNING! Never install a carbide tipped or steel circular saw blade for use on this tool. Never install a wood carving blade, carving disc with saw chain cutters, or a cutting carving disc on this tool.**

11. **For safest operation, it is recommended that only these accessories be used with this tool: Abrasive Cut-Off Discs and Wheels, Flap Wheels, Wire Brushes, Wire Wheel Brushes.**

12. **Never lay this tool down until the Rotating Grinding Wheel has come to a complete stop.** The Rotating Pad can grab the surface and pull the tool out of your control.

13. **Never leave this tool unattended when it is plugged into an electrical outlet.** Turn off the tool, and unplug it from its electrical outlet before leaving.

14. **Always unplug this tool from its electrical outlet before performing inspection, maintenance, or cleaning procedures.**

15. **WARNING!** 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.)*

16. **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.

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. 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: TOOLS WITH THREE PRONG PLUGS

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.)**

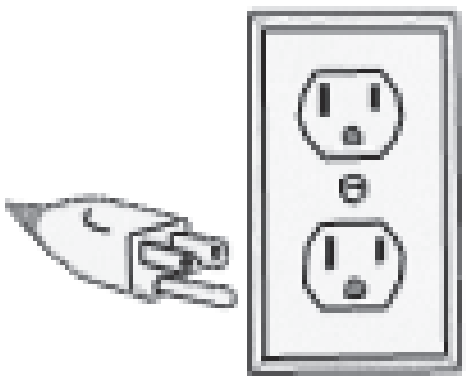


FIGURE A

DOUBLE INSULATED TOOLS: TOOLS WITH TWO PRONG PLUGS

4. 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.)**

5. Double insulated tools may be used in either of the 120 volt outlets shown in the following illustration. **(See Figure B.)**

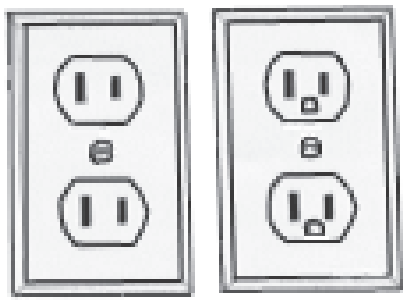


FIGURE B

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 Figure C, next page.)**

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 Figure C.)**

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 Figure C.)**

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. **(See Figure C.)**

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.

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	18	14	12	10	-
12.1 – 16.0	14	12	10	-	-
16.1 – 20.0	12	10	-	-	-

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

SYMBOLOGY

	Double Insulated
	Canadian Standards Association
	Underwriters Laboratories, Inc.
V ~	Volts Alternating Current
A	Amperes
$n_{o\ xxxx}$/min.	No Load Revolutions per Minute (RPM)

UNPACKING

When unpacking, check to make sure all the parts shown on the **Parts List on page 12** are included. If any parts are missing or broken, please call Harbor Freight Tools at the number shown on the cover of this manual as soon as possible.

ASSEMBLY AND OPERATING INSTRUCTIONS

NOTE: For additional information regarding the parts listed in the following pages, refer to the **Assembly Diagram on page 13**.

1. **WARNING!** Always make sure the Power Cord (part #50) of the Angle Grinder is unplugged from its electrical outlet *prior* to adding any accessories or making any adjustments to the tool.

2. To install a **4-1/2"** diameter Grinding Wheel (not included), depress the Stop Pin (part #11) to keep the Spindle (part #27) from turning. Insert the Wrench (part #58) into the two holes located in the Flange Nut (part #32). Unscrew and remove the Flange Nut. Then, release pressure on the Stop Pin. **(See Figure D.)**

3. Insert the 4-1/2" diameter Grinding Wheel **fully** onto the Spindle (part #27), making sure the Grinding Wheel fits snugly against the inner Flange (part #30). Depress the Stop Pin (part #11) to keep the Spindle (part #27) from turning. Make sure the Flange Nut (part #32) is **firmly** retightened onto the Spindle. Then, release pressure on the Stop Pin. **(See Figure D.)**

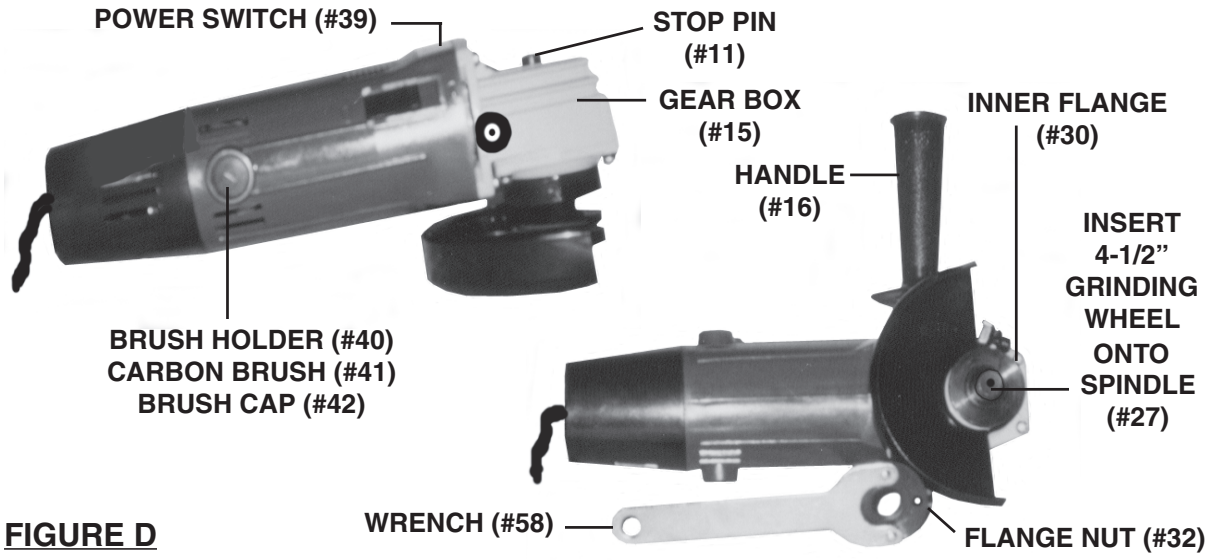


FIGURE D

4. To attach the Handle (part #16), screw the threaded portion of the Handle into either the right or left side threaded mounting hole located on the sides of the Gear Box (part #15). **(See Figure D.)**

5. To operate the Angle Grinder, plug the Power Cord (part #50) into a grounded, 120 volt, electrical outlet.

6. Grip the Angle Grinder firmly with both hands. Then turn the Power Switch (part #39) to its "ON" position and allow the Grinding Wheel to rotate to its fullest speed. **(See Figure D.)**

7. Do not force the rotating Grinding Wheel into the object being ground. Apply moderate pressure, allowing the Grinding Wheel to rotate freely without being forced.

8. After the grinding job is completed, turn the Power Switch (part #39) to its "OFF" position. Then unplug the Power Cord (part #50) from its electrical outlet.

INSPECTION, MAINTENANCE, AND CLEANING

1. **WARNING!** Make sure the Power Switch (part #39) of the Angle Grinder is in its "OFF" position and that the tool is unplugged from its electrical outlet before performing any inspection, maintenance, or cleaning procedures.

2. **BEFORE EACH USE,** inspect the general condition of the Angle Grinder. Check for loose screws, misalignment or binding of moving parts, cracked or broken Grinding Wheel, 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.

3. **PERIODICALLY,** the two Carbon Brushes (part #41) should be checked. If the Carbon Brushes are simply dirty, they may be cleaned by rubbing them with a pencil eraser. If the Carbon Brushes are excessively worn, they must both be replaced at the same time. To clean or replace the Carbon Brushes, unscrew and remove the Brush Caps (part #42) to expose the Carbon Brushes. Pull out both Carbon Brushes from their Brush Holders (part #40), and insert two new Carbon Brushes in the Brush Holders. Then, replace the Brush Caps.
(See Figure D.)

4. Use only a clean cloth and mild detergent to clean the body of the Angle Grinder. Do not use solvents. Do not immerse any part of the tool in liquid.

PLEASE READ THE FOLLOWING CAREFULLY

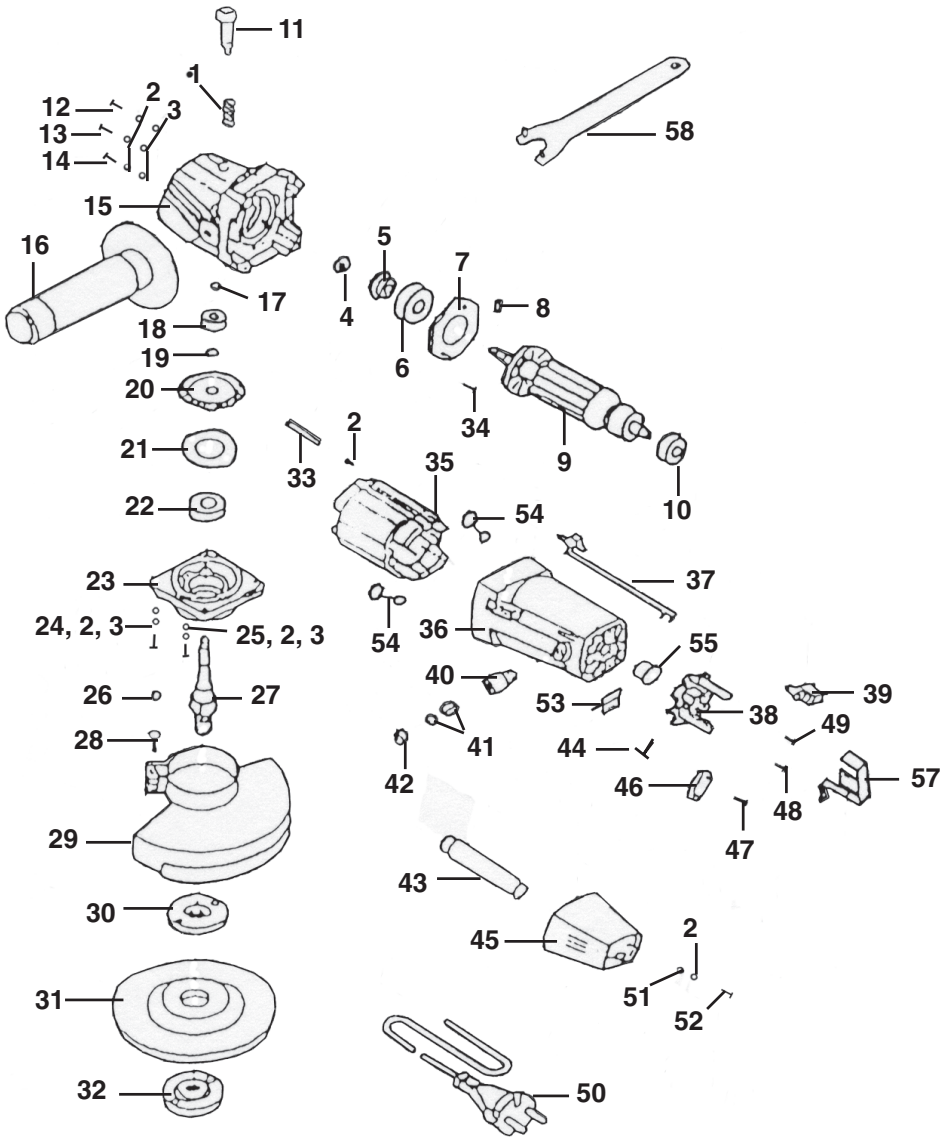
THE MANUFACTURER AND/OR DISTRIBUTOR HAS PROVIDED THE PARTS LIST AND ASSEMBLY DIAGRAM IN THIS MANUAL AS A REFERENCE TOOL ONLY. NEITHER THE MANUFACTURER OR DISTRIBUTOR MAKES ANY REPRESENTATION OR WARRANTY OF ANY KIND TO THE BUYER THAT HE OR SHE IS QUALIFIED TO MAKE ANY REPAIRS TO THE PRODUCT, OR THAT HE 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.

PARTS LIST

Part #	Description	Part #	Description
1	Spring	30	Flange
2	Spring Washer	31	Grinding Wheel
3	Washer	32	Flange Nut
4	Nut	33	Screw
5	Pinion Gear	34	Screw
6	Bearing	35	Stator
7	Bearing Cap	36	Cabinet
8	Roller	37	Switch Knob
9	Armature	38	Switch Shelf
10	Bearing	39	Power Switch
11	Stop Pin	40	Brush Holder
12	Screw	41	Carbon Brush
13	Screw	42	Brush Cap
14	Screw	43	Cord Protector
15	Gear Box	44	Screw
16	Handle	45	Back Cap
17	Check Ring	46	Cord Clamp
18	Bearing	47	Screw
19	Check Ring	48	Screw
20	Gear	49	Screw
21	Bearing Cap	50	Power Cord
22	Bearing	51	Washer
23	Front Cap	52	Screw
24	Screw	53	Condenser
25	Screw	54	Inductor
26	Wood Ruff Key	55	Rubber Bearing Shoe
27	Spindle	57	Ring
28	Screw	58	Wrench
29	Guard		

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

ASSEMBLY DIAGRAM



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