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Instruction Manual 2683-220 Circular Saw

Getting the most out of your tool.

Please take time to read this manual and pay particular attention to the safety rules we've provided for your protection. If you have any questions about your tool please call:

1-800-9-BD TOOL (1-800-923-8665)







FOR YOUR SAFETY - ALL TOOLS

WARNING: When using electric tools, basic safety precautions should always be followed to reduce risk of fire, electric shock, and personal injury, including the following:

READ ALL INSTRUCTIONS

Grounding Instructions

This tool should be grounded while in use to protect the operator from electric shock. The tool is equipped with a 3-conductor cord to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal.



The two grounding contacts and the grounding receptacle in the plug must be connected to a permanent ground, such as a properly grounded outlet. No adapter is available for a plug as shown in Figure A.

Safety Instructions For All Tools

- KEEP WORK AREA CLEAN. Cluttered areas and benches invite injuries.
- CONSIDER WORK AREA ENVIRONMENT. Don't expose power tools to rain. Don't use power tools in damp or wet locations. Keep work area well lit. Do not use tool in presence of flammable liquids or gases.
- GUARD AGAINST ELECTRIC SHOCK. Prevent body contact with grounded surfaces. For example; pipes, radiators, ranges, and refrigerator enclosures.
- KEEP CHILDREN AWAY. Do not let visitors contact tool or extension cord. All visitors should be kept away from work area.
- STORE IDLE TOOLS. When not in use, tools should be stored in dry, and high or locked-up place — out of reach of children.
- DON'T FORCE TOOL. It will do the job better and safer at the rate for which it was intended.
- USE RIGHT TOOL. Don't force small tool or attachment to do the job of a heavy-duty tool. Don't use tool for purpose not intended.
- DRESS PROPERLY. Do not wear loose clothing or jewelry. They can be caught in moving parts. Rubber gloves and non-skid footwear are recommended when working outdoors. Wear protective hair covering to contain long hair.
- USE SAFETY GLASSES. Also use face or dust mask if operation is dusty.
- DON'T ABUSE CORD. Never carry tool by cord or yank it to disconnect from receptacle. Keep cord from heat, oil, and sharp edges.
- SECURE WORK. Use clamps or a vise to hold work. It's safer than using your hand and it frees both hands to operate tool.
- DON'T OVERREACH. Keep proper footing and balance at all times.
- MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for better and safer performance. Follow instructions for lubricating and changing accessories. Inspect tool cords periodically and if damaged, have repaired by authorized service facility. Inspect extension cords periodically and replace if damaged. Keep handles dry, clean, and free from oil and grease.
- DISCONNECT OR LOCK OFF TOOLS when not in use, before servicing, and when changing accessories, such as blades, bits, cutters.
- REMOVE ADJUSTING KEYS AND WRENCHES. Form habit of checking to see
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that keys and adjusting wrenches are removed from tool before turning it on.

- **AVOID UNINTENTIONAL STARTING.** Don't carry tool with finger on switch. Be sure switch is off when plugging in.
- EXTENSION CORDS. Make sure your extension cord is in good condition. When using an extension cord, be sure to use one heavy enough to carry the current your product will draw. An undersized cord will cause a drop in line voltage resulting in loss of power and overheating. The following table shows the correct size to use depending on cord length and nameplate ampere rating. If in doubt, use the next heavier gage. The smaller the gage number, the heavier the cord.

Minimum Gage for Cord Sets Volts Total Length of Cord in Feet						
120	V		0-25	26-50	51-100	101-150
240	V	Doting	0-50	51-100	101-200	201-300
Ampere haung						
More		Not more		AWG		
Than		Than				
0	-	6	18	16	16	14
6	-	10	18	16	14	12
10	-	12	16	16	14	12
12	-	16	14	12	Not Recommended	

- OUTDOOR USE EXTENSION CORDS. When tool is used outdoors, use only
 extension cords intended for use outdoors and so marked.
- **STAY ALERT.** Watch what you are doing. Use common sense. Do not operate tool when you are tired.
- CHECK DAMAGED PARTS. Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated elsewhere in this instruction manual. Have defective switches replaced by authorized service center. Do not use tool if switch does not turn it on and off.

SAVE THESE INSTRUCTIONS

SAFETY INSTRUCTIONS - CIRCULAR SAWS

- DISCONNECT PLUG FROM POWER SUPPLY before changing blades, making cutting depth or bevel adjustments, inspecting, cleaning or when saw is not being used.
- KEEP GUARDS IN PLACE AND IN WORKING ORDER. Never wedge or tie lower guard open. Check operation of lower guard before each use. Do not use if lower guard does not close briskly and completely over saw blade.
 CAUTION: If saw is dropped, lower guard may be bent, restricting full return. Do not use saw until the lower guard is returned to the proper working order.
- 3. **KEEP BLADES CLEAN AND SHARP.** Sharp blades minimize stalling, overload, kickback, and give a cleaner cut.
- DANGER: Keep hands away from cutting area. Keep hands away from blades. Do not reach underneath work while blade is rotating. Do not attempt to remove cut material when blade is moving.

CAUTION: Blades continue to coast after trigger is released. Never place your hand on the work surface in front of or behind the saw.

- 5. SUPPORT LARGE PANELS. Large panels must be supported as shown in Figure 15 to minimize the risk of overload and kickback from blade pinching. When cutting operation requires the resting of the saw on the work piece, the saw should be rested on the larger portion and the smaller piece cut off.
- 6. USE RIP FENCE. Always use a fence or straight edge guide when ripping.
- 7. GUARD AGAINST KICKBACK. Kickback occurs when the saw begins to stall rapidly and is driven back towards the operator. Release the switch immediately if blade binds or saw stalls. Keep blades sharp. Don't force tool. Stay alert. Exercise control. Don't remove saw from work during a cut while the blade is moving. A more detailed explanation of kickback follows in the operation section of this manual.
- 8. **LOWER GUARD**. When necessary for accurate starts or when pocket cutting, raise lower guard with the retracting lever.
- 9. ADJUSTMENTS. Before cutting be sure depth and bevel adjustments are tight. 10. USE ONLY CORRECT BLADES. Use only blades with 5/8" arbor. Do not use
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blades with incorrect size holes. Never use defective or incorrect blade washers or bolts.

- 11. AVOID CUTTING NAILS. Inspect for and remove all nails from lumber before cutting.
- 12. CAUTION: When sawing into walls, floors, or wherever "live" electrical wires may be encountered, DO NOT TOUCH ANY METAL PARTS OF THE TOOL! Hold the saw only by its plastic handles to prevent electric shock if you accidentally saw into a "live" wire.
- 13. CAUTION: Some wood contains preservatives such as copper chromium arsenate (CCA) which can be toxic. When cutting these materials extra care should be taken to avoid inhalation and minimize skin contact.

SAVE THESE INSTRUCTIONS FOR FUTURE USE

Motor

Your tool is powered by a B&D-built motor. Be sure your power supply agrees with nameplate marking. 220/240 volts AC means your saw will operate on alternating current. Lower voltage will cause loss of power and can result in overheating. All B&D tools are factory tested; if this tool does not operate, check the power supply.

ADJUSTMENTS AND SET UP

Attaching and Removing Blades

To attach the blade:

- 1. TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.
- Retract lower blade guard and place inner clamp washer and blade on saw spindle with printed side of blade out (teeth at bottom of blade pointing forward - Figure 1). Place outer clamp washer on saw spindle. The larger

surfaces of both washers must face the blade.

- 3. Thread on blade clamping screw firmly by hand to hold washer in position.
- 4. Lightly depress the blade lock (Figure 2) while turning the spindle until the blade stops rotating.
- 5. Tighten blade clamping screw (clockwise) firmly with the blade wrench (Figure 3).

NEVER ENGAGE BLADE LOCK WHILE SAW IS RUNNING, OR ENGAGE IN AN EFFORT TO STOP THE TOOL. NEVER TURN SWITCH ON WHEN BLADE LOCK IS ENGAGED. SERIOUS DAMAGE TO YOUR SAW WILL RESULT.

When removing the blade:

- 1. TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.
- Engage the blade lock and unscrew the blade clamping screw by turning it counterclockwise with the blade wrench.

Cutting Depth Adjustment

- 1. TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.
- 2. Hold the saw firmly as shown in Figure 4.
- 3. Loosen (counterclockwise) the depth adjustment lever and move shoe to obtain the desired depth of cut, as shown in Figure 5.
- Make sure depth adjustment lever has been retightened (clockwise) before operating saw.

For the most efficient cutting action, set the depth adjustment so that one tooth of the blade will project below the material to be cut. This distance is from the tip of the tooth to the bottom of the gullet in front of it. This keeps blade friction at a minimum, removes sawdust from the cut, results in cooler, faster sawing and reduces the chance of kickback. A method for checking for

correct cutting depth is shown in Figure 6. Lay a piece of the material you plan to cut along the side of the blade, as shown, and observe how much tooth projects beyond the material.

NOTE: When using carbide-tipped blades, make an exception to the above rule and allow only one-half of a tooth to project above the material to be cut.

Bevel Angle Adjustment

The full range of the bevel adjustment is from 0° to 50° . The quadrant is graduated in increments of 5° . On the front of the saw is a bevel angle adjustment mechanism (Figure 7) consisting of a calibrated quadrant and a lever. To set the saw for a bevel cut:

- 1. TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.
- 2. Loosen (counterclockwise) the quadrant lever or knob and tilt shoe to the desired angle by aligning the pointer with the desired angle mark.
- 3. Retighten lever firmly (clockwise).

NOTE: The quadrant pointer, located between the quadrant lever or knob and the quadrant, can be adjusted after loosening its screw. Retighten firmly after adjustment.

Kerf Indicator

The front of the saw shoe has a kerf indicator (Figure 7) for vertical and bevel cutting. This indicator enables you to guide the saw along cutting lines penciled on the material being cut. The indicator lines up with the left (inner) side of the saw blade, which makes the slot or "kerf" cut by the moving blade fall to the right of the indicator. Guide along the penciled cutting line so that the kerf falls into the waste or surplus material (Figure 8). Figure 8 shows the dimensions of the shoe. Note that the left side is 5-1/2" between the left side of

the blade and the left edge of the shoe (standard 6x lumber). The right dimension is 1-1/2" (standard 2x lumber).

Shoe Alignment

Your saw has been set at the factory for accurate vertical cuts (a 90° angle between the bottom of the shoe and the blade). The edge of the shoe has also been set parallel to the blade so that it will not bind when using an edge guide. If the saw should ever need adjusting, it may be done as follows:

ADJUSTING FOR 90° CUTS

- 1. TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.
- 2. Adjust the saw to 0° bevel.

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- 3. Place the saw on blade side (Figure 9). Retract blade guard.
- 4. Loosen quadrant lever or knob (Figure 9). Place a square against the blade and shoe to adjust the 90° setting.
- 5. Loosen the hex nut with a wrench or needle nose pliers, and move the adjustment screw so that the shoe will stop at the proper angle as shown in Figure 10. Lock the screw in place by tightening the hex nut.
- It may be necessary to adjust the quadrant angle pointer to line up on "0" after shoe has been adjusted.













7. Confirm the accuracy of the setting by checking the squareness of an actual cut on a scrap piece of material.

ADJUSTING THE SHOE PARALLEL TO THE BLADE

Your saw is adjusted at the factory so that the blade and shoe are parallel. If these parts become misaligned, adjust as follows:

- 1. TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.
- 2. Loosen the 2 screws at the adjusting bracket at the rear of the shoe, as shown in Figure 11.
- 3. Adjust the shoe until it is parallel to the blade by measuring from the edge of the shoe to the blade, front & rear. You can measure from the outside edge of the blade to the shoe as shown in Figure 11 or from the the inner edge of the blade to the wider part of the shoe. (Do not measure from the tips of any saw blade teeth.)
- 4. When the shoe is parallel, tighten all screws.
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ADJUSTING DEPTH ADJUSTMENT AND QUADRANT LEVER OR KNOB

It may be desirable to adjust the depth adjustment and quadrant adjustment levers. (They will sometimes hit the shoe before fully tightening or loosening completely.)

To adjust either lever, follow the steps below.

- 1. TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.
- 2. Using a small screwdriver, pry the lock ring off, as shown in Figure 12.
- 3. Remove the lever and rotate it in the desired direction about 1/8 revolution. (More or less as necessary.)
- 4. Reinstall the lever and insert the lock ring with *concave side against lever* to hold it in place. (see Figure 13)



TOOL OPERATION

Switch

Pull the trigger switch to turn the motor ON. Releasing the trigger turns the motor OFF. Releasing the trigger also automatically actuates the electric brake on units so equipped. This tool has no provision to lock the switch in the ON position, and should never be locked ON by any other means.

Work Piece Support

Figure 14 shows proper sawing position. Note that hands are kept away from cutting area, and power cord is positioned clear of the cutting area so that it will not get caught or hung up on the work. Note that a special cord keeper has been provided on the tool's handle. Press the cord firmly into the cord keeper to keep it out of the way but in sight so you know where it is at all times.



To avoid kickback, DO support board or panel NEAR the cut, (Figure 15). DON'T support board or panel away from the cut, (Figure 16).

WARNING: It is important to support the work properly and to hold the saw firmly to prevent loss of control which could cause personal injury. Figure 14 illustrates typical hand support of the saw.

ALWAYS TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY BEFORE MAKING ANY ADJUSTMENTS!

Place the work with its good side - the one on which appearance is most important- down. The saw cuts upward, so any splintering will be on the work face that is up when you saw it.

Cutting

Support the work so that the cut will be on your right. Place the wider portion of the saw shoe on that part of the work piece which is solidly supported, not on the section that will fall off when the cut is made. As examples, Figure 14 illustrates the RIGHT way to cut off the end of a board, and Figure 17 the WRONG way. Always clamp work. Don't try to hold short pieces by hand! Remember to support cantilevered and overhanging material. Use caution when sawing material from below.

Be sure saw is up to full speed before blade contacts material to be cut. Starting saw with blade against material to be cut or pushed forward into kerf can result in kickback.

Push the saw forward at a speed which allows the blade to cut without laboring. Hardness and toughness can vary even in the same piece of material, and knotty or damp sections can put a heavy load on the saw. When this happens, push the saw more slowly, but hard enough to keep it working without much decrease in speed. Forcing the saw can cause rough cuts,



inaccuracy, kickback, and overheating of the motor.

Should your cut begin to go off the line, don't try to force it back on. Release the switch and allow blade to come to a complete stop. Then you can withdraw the saw, sight anew, and start a new cut slightly inside the wrong one. In any event, withdraw the saw if you must shift the cut. Forcing a correction inside the cut can stall the saw and lead to kickback. IF SAW STALLS, RELEASE THE TRIGGER AND BACK THE SAW UNTIL IT IS LOOSE. BE SURE BLADE IS STRAIGHT IN THE CUT AND CLEAR OF THE CUTTING EDGE BEFORE RESTARTING.

As you finish a cut, release the trigger and allow the blade to stop before lifting the saw from the work. As you lift the saw, the spring-tensioned telescoping guard will automatically close under the blade. Remember the blade is exposed until this occurs. Never reach under the work for any reason whatsoever. When you have to retract the telescoping guard manually (as is necessary for starting pocket cuts) always use the retracting lever. **NOTE:** When cutting thin strips, be careful to ensure that small cutoff pieces don't hang up on inside of lower guard.

Ripping

Ripping is the process of cutting wider boards into narrower strips- cutting grain lengthwise. Hand guiding is more difficult for this type of sawing and some type of guide should be used. A *rip fence* (Figure 18) may be purchased separately for this purpose.

Pocket Cutting

A pocket cut is one that is made in a floor, wall, or other flat surface. Adjust saw shoe so blade cuts at desired depth.

TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY.

Tilt saw forward and rest front of the shoe on material to be cut. Using the retracting lever, retract blade guard to an upward position. Lower rear of shoe until blade teeth almost touch cutting line. Now release the blade guard (its contact with the work will keep it in position to open freely as you start the cut) Figure 19. Start the motor and gradually lower the saw until its shoe rests



Figure 14



flat on the material to be cut. Advance saw along the cutting line until cut is completed. Release trigger and allow blade to stop completely before withdrawing the blade from the material. When starting each new cut, repeat as above. Never tie the blade guard in a raised position.

Kickback

When the saw blade becomes pinched or twisted in the cut kickback can occur. The saw is thrust rapidly back toward the operator. When the blade is pinched or bound tightly by the kerf closing down, the blade stalls and the motor reaction drives the unit backward. When the blade becomes twisted or misaligned in the cut, the teeth at the back edge of the blade can dig into the top surface of the wood causing the blade to climb out of the kerf and jump back toward the operator. Kickback is more likely to occur when any of the following conditions exist.

Improper work piece support

Sagging or improper lifting of the cutoff piece causing pinching of the blade. Cutting through material supported at the outer ends only (Figure 16). As the

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Figure 17 Figure 17 Figure 18 Figure 18 Figure 18 Figure 18 Figure 18 Figure 10

material weakens it sags, closing down the kerf and pinching the blade.

Cutting off a cantilevered or overhanging piece of material from the bottom up in a vertical direction. The falling cut off piece can pinch the blade.

Cutting off long narrow strips (as in ripping). The cutoff strip can sag or twist closing the kerf and pinching the blade.

Snagging the lower guard on a surface below the material being cut momentarily reducing operator control. The saw can lift partially out of the cut increasing the chance of blade twist.

Improper depth of cut setting on saw

Using the saw with an excessive depth of cut setting increases loading on the unit and susceptibility to twisting of the blade in the kerf. It also increases the surface area of the blade available for pinching under conditions of kerf close down.

Blade twisting (Misalignment in Cut)

Pushing harder to cut through a knot, a nail, or hard grain area can cause blade to twist.

Trying to turn the saw in the cut (trying to get back on the marked line) can cause blade twist.

Extended reach or operating saw with poor body control (out of balance) can result in twisting the blade.

Changing grip or body position while cutting can result in blade twist.

Backing unit up to clear blade can lead to twist if not done carefully.

Insufficient allowance for particularly tough materials

Materials that require extra attention: wet lumber, green lumber (material freshly cut or not kiln dried), pressure treated lumber (material treated with preservatives or anti-rot chemicals)

Use of dull or dirty blades

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Dull blades cause increased loading of the saw. To compensate, an operator will usually push harder which further loads the unit and promotes twisting of the blade in the kerf. Worn blades may also have insufficient body clearance which increases the chance of binding and increased loading.

Lifting the saw when making bevel cuts

Bevel cuts require special operator attention to proper cutting techniques especially guidance of the saw. Both blade angle to the shoe and greater blade surface in the material increase the chance for binding and misalignment (twist) to occur.

Restarting a cut with the blade teeth jammed against the material



The saw should be brought up to full operating speed before starting a cut or restarting a cut after the unit has been stopped with the blade in the kerf. Failure to do so can cause stalling and kickback.

Any other conditions which could result in pinching, binding, twisting, or misalignment of the blade could cause kickback. Refer to the sections on "Adjustments and Set-Up" and "Operation" for procedures and techniques that will minimize the occurrence of kickback.

MAINTENANCE

Cleaning

Use only mild soap and a damp cloth to clean the tool. Many household cleaners contain chemicals which could seriously damage plastic. Also, do not use gasoline, turpentine, lacquer or paint thinner, dry cleaning fluids or similar products. Never let any liquid get inside the tool; never immerse any part of the tool into a liquid.

Lubrication

Self lubricating ball and roller bearings are used in the tool and relubrication is not required. However, it is recommended that, once a year, you take or send the tool to a B&D authorized service center for a thorough cleaning, inspection, and lubrication of the gear case.

Brushes

TURN OFF TOOL AND DISCONNECT FROM POWER SUPPLY BEFORE SERVICING.

Inspect carbon brushes regularly by unplugging tool, removing the brush inspection cap (Figure 2) and withdrawing the brush assembly. Keep brushes

clean and sliding freely in their guides. Always replace a used brush in the same orientation in the holder as it was prior to removal. Carbon brushes have varying symbols stamped into their sides, and if the brush is worn down to the line closest to the spring, they must be replaced. Use only identical B&D brushes. Use of the correct grade of brush is essential for proper operation of electric brakes on units so equipped. New brush assemblies are available at B&D service centers. The tool should be allowed to "run in" (run at no load without a blade) for 10 minutes before use to seat new brushes. This is especially important for saws equipped with electric brakes which may be erratic in operation until the brushes are properly seated (worn in). While "running in" DO NOT TIE, TAPE, OR OTHERWISE LOCK THE TRIGGER SWITCH ON. HOLD SWITCH BY HAND ONLY.

IMPORTANT!

To assure product SAFETY and RELIABILITY, particularly for double insulated tools, repairs, maintenance and adjustment (excluding maintenance described in this manual) should be performed by B&D service centers or authorized service centers, using identical B&D replacement parts.

Blades

A dull blade will cause slow, inefficient cutting overload on the saw motor, excessive splintering, and could increase the possibility of kickback. It is a good practice to keep extra blades on hand so that sharp blades are available while the dull ones are being sharpened. (See "Saws-Sharpening" in the yellow pages.) In fact, many lower priced blades can be replaced with new ones at very little cost over the sharpening price.

Hardened gum on the blade will slow down the cutting. This gum can best be removed with kerosene, turpentine, or oven cleaner. B&D manufactures a complete line of saw blades and the following types of blades are available from your dealer.

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Combination Blade- For general-purpose ripping and cutting.

Chisel Tooth Combination- Specially designed for general-purpose ripping and crosscutting.

Framing/Rip Combination- For facing, roofing, siding, sub-flooring, framing, form cutting.

Cross Cut Blade- For smoother, faster cross cutting.

Ripping Blade- Fast for rip cuts.

Plywood Blade- For smooth cuts in plywood. Reduce splintering.

Planer Blade- For very smooth ripping and cross cutting.

Flooring Blade- For sawing where nails may be occasionally encountered. Metal Cutting Blade- For cutting aluminum, copper and other soft metals. Friction Blade-For cutting corrugated, galvanized sheets.

Carbide Tipped Blade- For longest sawing without blade sharpening. Cuts wood, transite, cemesto board, asbestos, formica, masonite, and similar materials.

ACCESSORIES

Recommended accessories for use with your tool are available at extra cost from your distributor or your local service center. A complete listing of service centers is included with your tool.

CAUTION: The use of any non-recommended accessory may be hazardous. If you need any assistance in locating any accessory, call 1-800-9-BD TOOL (1-800-923-8665) or contact Black & Decker, Consumer Services Department, 626 Hanover Pike, P.O. Box 618, Hampstead, MD 21074.

RIP FENCE: Attaches to top of saw shoe. Permits rip cuts without a penciled guide line.

SAW PROTRACTOR: Guides saw for accurate cut-off work. Adjusts from 0 to 70 degrees.

Every B&D tool is of the highest quality. If you wish to contact us regarding this product, please call toll free between 8:00am and 8:00pm ET, seven days a week:

> 1-800-9-BD TOOL (1-800-923-8665)

One Year Free Maintenance

All B&D tools for Industry and Construction are covered under a one year free maintenance program where B&D will inspect your tool for safety and provide necessary maintenance or repairs, including normal wear and tear parts, for one year, FREE OF CHARGE.

Full Warranty

All B&D tools for Industry and Construction are warranted to be free of any defects in materials or workmanship. Upon thorough examination of tool, B&D will repair or replace, at our option, any product that is determined to be defective.

Conditions

The service/safety check and the warranty do not apply to: repairs made or attempted by anyone other than an authorized B&D service location; misuse, abuse, neglect, improper application of the tool; missing parts; or normal wear and tear (after first year of ownership). Please return the complete unit, transportation prepaid, to any B&D factory owned or B&D authorized service center location (list provided with tool or see yellow pages under "Tools Electric").