BLACK & DECKER
INDUSTRY & CONSTRUCTION
B&D
TM

Cyclone™ Series

Instruction Manual
2870 • 2872 • 2862 • 2874
Versa Clutch Driver/Drill

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. Don't forget to send in your owner's registration card. If you have any questions about your tool please call:

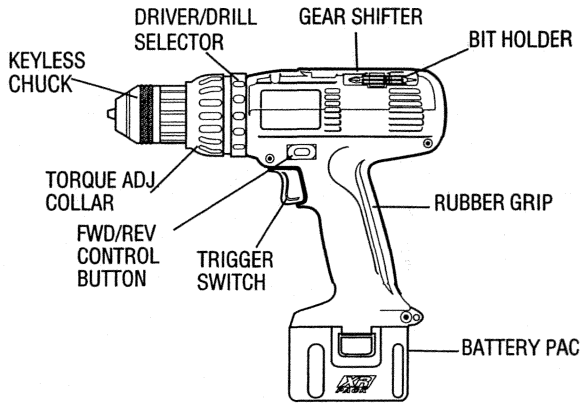
1-800-9-BD TOOL
(1-800-923-8665)

Ergonomics that make a difference

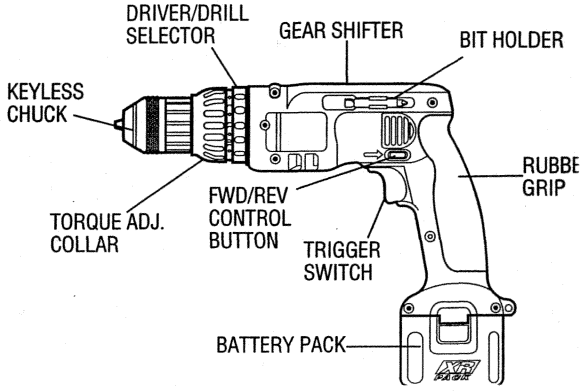
Your Driver/Drill has been designed with concern for work conditions which have quite an effect on the operator. The innovative design of this tool allows for comfort in handling, neutral wrist positions, balanced weight, excellent gripping, and low trigger pressure.

Cat #	Voltage	Grip Style	Chuck Capacity	Battery Pack	RPM
2870	9.6V	Mid Rubber	3/8"	XR PACK™	0-400/0-1200
2872	12.0V	Mid Rubber	3/8"	XR PACK™	0-450/0-1400
2862	12.0V	Pistol Rubber	3/8"	XR PACK™	0-450/0-1400
2874	14.4V	Mid Rubber	3/8"	XR PACK™	0-450/0-1400

MID HANDLE RUBBER GRIP



PISTOL HANDLE RUBBER GRIP



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:

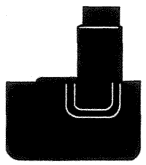
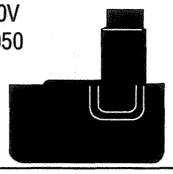
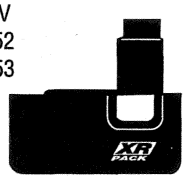
1. **READ ALL INSTRUCTIONS.**
2. **KEEP WORK AREA CLEAN**. Cluttered areas and benches invite injuries
3. **CONSIDER WORK AREA ENVIRONMENT**. Don't expose power tools to rain. Don't use power tools in damp or wet locations. Keep work area well lit.
4. **KEEP CHILDREN AWAY**. All visitors should be kept away from work area. Do not let visitors contact tool.
5. **STORE IDLE TOOLS**. When not in use, tools should be stored in dry, and high or locked-up place – out of reach of children.
6. **DON'T FORCE TOOL.** It will do the job better and safer at the rate for which it was intended.
7. **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, for example, don't use circular saw for cutting tree limbs or logs.
8. **DRESS PROPERLY**. Do not wear loose clothing or jewelry. They can be caught in moving parts. Non-skid footwear is recommended when working outdoors. Wear protective hair covering to contain long hair.
9. **USE SAFETY GLASSES**. Also use face or dustmask if operation is dusty.
10. **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.
11. **DON'T OVERREACH**. Keep proper footing and balance at all times.
12. **MAINTAIN TOOLS WITH CARE**. Keep tools sharp and clean for better and safe performance. Follow instructions for lubricating and changin accessories. Keep handles dry, clean, and free from oil and grease.
13. **LOCK OFF TOOL** when not in use, before servicing, and when changin accessories.
14. **REMOVE ADJUSTING KEYS AND WRENCHES**. Form habit of checking to se that keys and adjusting wrenches are removed from tool before turning it on
15. **AVOID UNINTENTIONAL STARTING**. Don't carry tool with finger on switch.
16. **STAY ALERT.** Watch what you are doing. Use common sense. Do no operate tool when you are tired.
17. **CHECK DAMAGED PARTS.** Have defective switches replaced by authorize service center. Do not use tool if switch does not turn it on and off.
18. **DO NOT OPERATE** portable electric tools near flammable liquids or i gaseous or explosive atmospheres. Motors in these tools normally spark and the sparks might ignite fumes.
19. **BE AWARE** that this tool is always in an operating condition because it doe not have to be plugged into an electrical outlet. Keep the switch control leve in the lock "OFF" position, as shown in Figure 5c, when you are not using th tool.
20. **CAUTION:** When drilling or driving into walls, floors or wherever "live electrical wires may be encountered, DO NOT TOUCH ANY FRONT METAI PARTS OF THE TOOL! Hold the tool only by the plastic handle to preven shock if you drill or drive into a "live" wire.

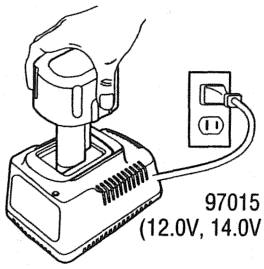
SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Important Safety Instructions for Battery Chargers

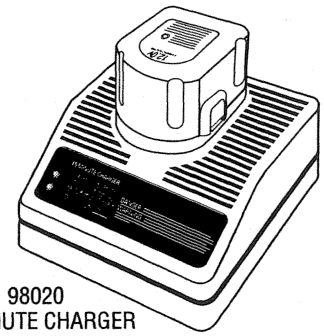
This manual contains important safety and operating instructions.

- Before using charger, read all instructions and cautionary markings on (1) charger, (2) battery pack, and (3) product using battery pack.
- ⚠ **DANGER:** 120 volts present at charging terminals. Do not probe with conductive objects. Danger of electric shock or electrocution.
- ⚠ **DANGER:** If battery pack case is cracked or damaged, do not insert into charger. Danger of electric shock or electrocution.
- The charger and battery pack are specifically designed to work together. DO NOT attempt to charge the battery pack with any chargers other than the ones in this manual.
- Do not expose charger to rain or snow.
- These chargers are not intended for any uses other than charging B&D rechargeable batteries. Any other uses may result in risk of fire, electric shock or electrocution.
- To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
- Make sure cord is located so that it will not be stepped on, tripped over, or otherwise subjected to damage or stress.
- An extension cord should not be used unless absolutely necessary. Use of improper extension cord could result in risk of fire, electric shock, or electrocution.
- An extension cord must have adequate wire size (AWG or American Wire Gauge) for safety. The smaller the gauge number of the wire, the greater the capacity of the cable, that is 16 gauge has more capacity than 18 gauge. When using more than one extension to make up the total length, be sure each individual extension contains at least the minimum wire size.

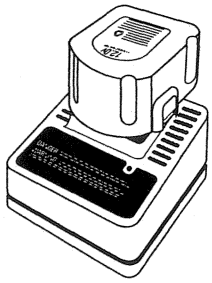
Extended Run-Time Battery Packs	Standard Battery Packs
9.6V 97148 	9.6V 97048 
12.0V 97150 	12.0V 97050 
14.4V 97152 97153 	**NOTE:** Your tool will accept either standard or Extended Run Time battery packs. However, you must be sure to select the proper voltage.



97015
(12.0V, 14.0V ONLY)



98020
15 MINUTE CHARGER



98014, 97014
1 HOUR CHARGERS

Recommended Minimum AWG Size for Extension Cords

Total Extension Cord Length (feet)						
25	50	75	100	125	150	175
Wire Gauge						
18	18	16	16	14	14	12

- The charger is ventilated through slots in the top and the bottom of the housing. Do not place any object on top of charger or place the charger on a soft surface that might block the ventilation slots and result in excessive internal heat. Place the charger in a position away from any heat source.
- Do not operate charger with damaged cord or plug — have them replace immediately.
- Do not operate charger if it has received a sharp blow, been dropped, or otl erwise damaged in any way; take it to an authorized service center.
- Do not disassemble charger; take it to an authorized service center when se: vice or repair is required. Incorrect reassembly may result in a risk of electr: shock, electrocution or fire.
- To reduce risk of electric shock, unplug charger from outlet before attemp: ing any cleaning. Removing the battery pack will not reduce this risk.
- NEVER attempt to connect 2 chargers together.
- DO NOT store or use the tool and battery pack in locations where the tempe: ature may reach or exceed 105°F (such as outside sheds or metal building in summer).
- The charger is designed to operate on standard household electrical powe (120 Volts). Do not attempt to use it on any other voltage!

Important Safety Instructions for Battery Packs

The battery pack is not fully charged out of the carton! First read the safet instructions below. Then follow charging notes and procedures.

READ ALL INSTRUCTIONS.

- Do not incinerate the battery pack even if it is severely damaged or i completely worn out.The battery pack can explode in a fire.
- A small leakage of liquid from the battery pack cells may occur unde extreme usage or temperature conditions. This does not indicate a failur However, if the outer seal is broken and this leakage gets on your skin:
  a. Wash quickly with soap and water.
  b. Neutralize with a mild acid such as lemon juice or vinegar.
  c. If battery liquid gets into your eyes, flush them with clean water for minimum of 10 minutes and seek immediate medical attention. (Medic note: The liquid is 25-35% solution of potassium hydroxide.)
- Never attempt to open the battery pack for any reason. If the plasti

housing of the battery pack breaks or cracks, immediately discontinue use and do not recharge.

- Do not carry extra battery packs in aprons, pockets, or tool boxes along with other metal objects. Battery pack could be short circuited causing damage to the battery pack and possibly causing severe burns or fire.
- Charge the battery packs only in B&D chargers.
- **NOTE:** Review and observe all of the "Important Charging Notes" in the charger instruction section of this manual.
- **NOTE:** The batteries in your battery pack are the nickel–cadmium type. Cadmium is considered to be a toxic material by the Environmental Protection Agency. Before disposing of damaged or worn out Nickel–Cadmium battery packs, check with your state Environmental Protection Agency to find out about special restrictions on the disposal of these battery packs or return them to a B&D certified service center for recycling.

Battery Packs

Your tool uses a 9.6 Volt, a 12.0 Volt, or a 14.4 Volt battery pack. When ordering replacement battery packs, be sure to include catalog number and voltage.

XR PACK™ Extended Run-Time battery packs deliver 25% more run-time than standard battery packs. **NOTE:** Your tool will accept either standard or Extended Run Time battery packs. However, be sure to select proper voltage.

Charging Procedure

These chargers require no adjustment and are designed to be as easy as possible to operate. Simply place your battery pack into the receptacle of a plugged in charger (FIG.1) and it will automatically charge the pack.

98014/97014 (1 Hour Chargers)

1. Plug the charger into an appropriate AC power outlet.
2. Insert the battery pack into the charger, as shown in FIG.1, making s the pack is fully seated in the charger. The red (charging) light will bl continuously indicating that the charging process has started.
3. The battery pack will be fully charged in about 1 hour. The complet of charge will be indicated by the red light remaining ON continuou The pack is fully charged and may be used at this time or left in charger.

98020 (15 Minute Charger)

1. Plug the charger into an appropriate AC power outlet. The charger beep twice, the red light will blink and go off.
2. Insert the battery pack into the charger, as shown in FIG. 1, mak sure the pack is fully seated in the charger. The red light will blink the charger will beep once indicating the charging process has starte
3. The battery pack will be fully charged in less than 15 minutes un most conditions. This will be indicated by the red light remaining and 3 beeps. The pack is fully charged and may be used at this time left in the charger.

Weak Battery Packs (98020). The charger can also detect a weak batt Such batteries are still usable but should not be expected to perform much work. In such cases, about 10 seconds after battery insertion, charger will beep rapidly 8 times to indicate a weak battery condition. charger will then go on to charge the battery to the highest capa possible.

97015

1. Plug the charger into an appropriate AC power outlet.
2. Insert the battery pack into the charger, as shown in FIG. 1, mal sure the pack is fully seated in the charger. The red (charging) light

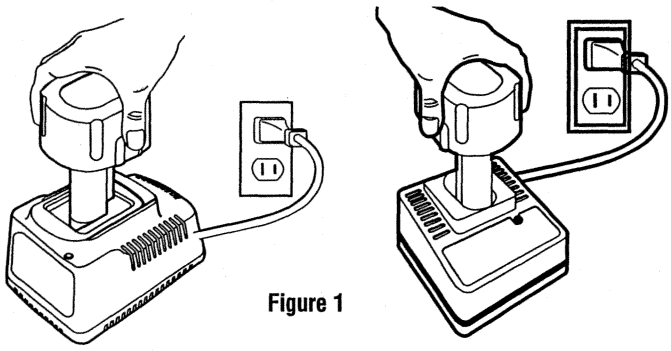


Figure 1

blink continuously indicating that the charging process has started.

3. The completion of charge will be indicated by the red light remaining ON continuously. The pack is fully charged and may be used at this time or left in the charger.

Leaving the battery pack in the charger: When the red light remains ON, the charger has switched to its "equalize charge" mode which lasts approximately 4 hours, after which the charger will switch to "maintenance charge" mode. The battery pack can be removed at any time during these charge cycles, but will only be fully charged if the red light is continuously ON. The charger and battery pack can be left connected with the red light glowing indefinitely. The charger will keep the battery pack fresh and fully charged. A battery pack will slowly lose its charge when kept out of the charger. If the battery pack has not been kept on maintenance charge, it may need to be recharged before use. A battery pack may also slowly lose its charge if left in a charger that is not plugged into an appropriate AC source.

Trouble Indicators: These chargers are designed to detect certain problems that can arise with battery packs which would be indicated by the red light flashing at a fast rate (and continuous beeping for 98020, 98014, 97014). this occurs, re-insert battery pack. If problem persists, try a different batte pack to determine if the charger is OK. If the new pack charges correctl then the original pack is defective and should be returned to a service cent for recycling. If the new battery pack elicits the same trouble indication a the original, have charger tested at an authorized service center.

Problem Power Line (97015)
When these chargers are used with some portable power sources such a generators or sources that convert DC to AC, the chargers may temporari suspend operation, **flashing the red light with two fast blinks followed by pause.** This indicates the power source is out of limits.

SAVE THESE INSTRUCTIONS FOR FUTURE USE.

Chargers (98014, 97014, 97015, 98020)

Your battery can be charged in the **98014, 97014** (1 Hour Chargers), t **98020** (15 Minute Charger), or the **97015** Charger. Be sure to read all safe instructions before using your charger.

Important!

This product is not user servicable. There are no user servicable parts ins the charger. Servicing at an authorized service center is required to av damage to static sensitive internal components.

READ ALL OF THE INSTRUCTIONS IN THE BATTERY CHARGER SECTION THIS MANUAL BEFORE ATTEMPTING TO CHARGE THE BATTERY PACK F YOUR TOOL.

Always use correct battery pack (pack supplied with tool or replacement p exactly like it.) See chart on inside cover to determine correct battery p voltage. Never install any other battery pack. It will ruin your tool and may c ate a hazardous condition.

Removing and Installing the Battery Pack

NOTE: YOUR BATTERY PACK WILL NOT BE FULLY CHARGED OUT OF THE CARTON.

To install the battery pack into the tool handle, align the base of the tool with the notch inside the tool's handle and slide the battery pack firmly into the handle until you hear the lock snap into place as shown in Figures 2 and 3.

To remove the battery pack from the tool, press the release buttons, as shown in Figure 3, and firmly pull the battery pack out of the tool handle. Insert it into the charger as described in the charger section of this instruction manual.

To turn the tool "ON", squeeze the trigger switch. To turn the tool "OFF", release the trigger switch (Figure 4). Your Driver/Drill is equipped with a brake. The chuck will stop as soon as the trigger switch is fully released.

Your Driver/Drill is equipped with a variable speed switch which enables you to select the best speed for a particular application. The farther you squeeze the trigger, the faster the tool will operate.

Use lower speeds for starting holes without a centerpunch, drilling in metals or plastics, driving screws and drilling ceramics, or in any application requiring high torque. Higher speeds are better for drilling in wood, wood compositions and for using abrasive and polishing accessories. For maximum tool life, use variable speed only for starting holes or fasteners.

NOTE: Continuous use in variable speed range is not recommended. It may damage the switch and should be avoided.

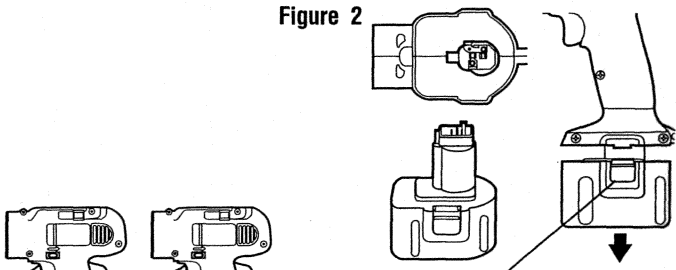
TOOL OPERATION

Forward/Reverse Control Button

A forward/reverse control button determines the direction of the tool also serves as a "lock off" button. To select forward rotation, release trigger switch and depress the forward/reverse control button on the side of the tool, as shown in Figure 5a.

To select reverse, depress the forward/reverse control button on the left of the tool as shown in Figure 5b. The center position of the control bu locks the tool in the "OFF" position as shown in Figure 5c.

Figure 2



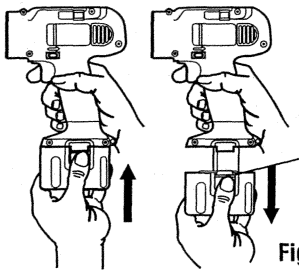


Figure 3

When changing the position of the forward/reverse control button, be sure the trigger is released.

NOTE: The first time the tool is run after changing the direction of rotation, you may hear a click on start up. This is normal and does not indicate a problem.

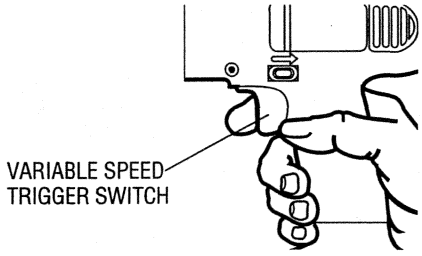
Torque Adjustment Collar

The **Versa Clutch feature** of your Driver/Drill is an adjustable torque screwdriver mechanism for driving and removing a wide array of fastener shapes and sizes. The Versa Clutch allows you to instantaneously regulate the torque, based on the force applied.

Circling the collar are numbers ranging from 0 to 11. These numbers (and half numbers designated by dots on the collar) are used to set the clutch to deliver a torque range.

The higher the number on the collar, the higher the torque and the larger the fastener which can be driven. To select any of the numbers, rotate until the desired number aligns with the selector, shown in Figure 6.

Figure 4



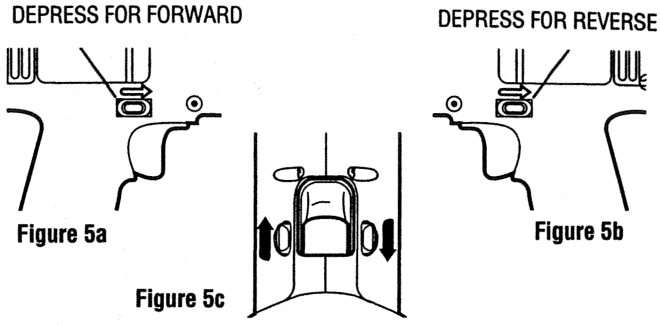


Figure 5a **Figure 5b**

Figure 5c

CENTER POSITION: LOCKED OFF

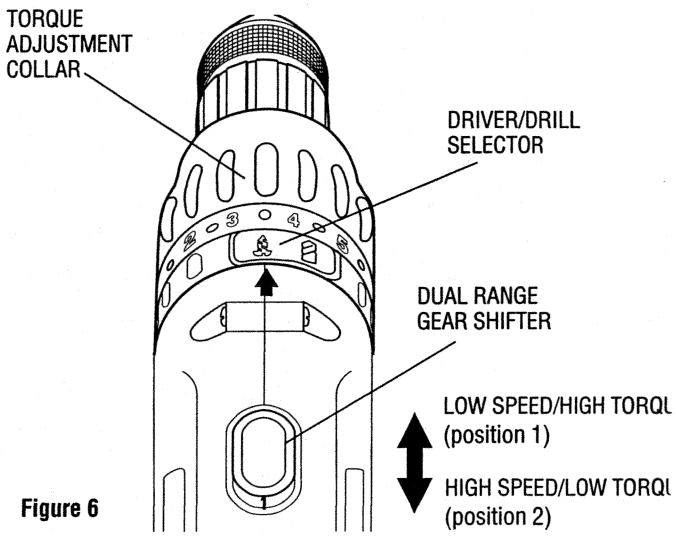


Figure 6

Dual Range Gearing

The dual range feature of your Driver/Drill allows you to shift gears for greater versatility. To select the low speed, high torque setting (position 1), turn the tool off and permit to stop. Push the button forward towards the chuck, as shown in Figure 6. To select the high speed, low torque setting (position 2), turn the tool off and permit to stop. Slide the gear shifter back (away from chuck).

NOTE: Do not change gears when the tool is running.

Troubleshooting Tip!

If you are having trouble changing gears, make sure that the dual range gear shifter is either completely pushed forward or completely pushed back.

Catalog No.	Low Range	High Range
2870	0 - 400	0 - 1200
2872	0 - 450	0 - 1400
2862	0 - 450	0 - 1400
2874	0 - 450	0 - 1400

Clutch Lock

To lock the clutch for drilling operations, simply move the Driver/Drill selector to the "Drill" position as described under "Operation as a Drill." (You may shift the Driver/Drill selector regardless of the adjustment collar setting.)

Since the adjustment collar and the Driver/Drill selector are distinctly different controls, you can switch between drilling and screwdriving without touching the adjustment collar. Once the collar is set, it remains unchanged until you decide to change it.

Keyless Chuck

Your tool features a keyless chuck for greater convenience. To insert a d bit or other accessory, follow the steps listed below.

1. Lock the trigger switch in the OFF position as described on page 8
2. Grasp the rear half of the chuck with one hand and use your oti hand to rotate the front half counterclockwise, as shown in Figure Rotate far enough so that the chuck opens sufficiently to accept desired accessory.
3. Insert the bit or other accessory about 3/4" into the chuck and tigh securely by holding the rear half of the chuck and rotating the fr portion in the clockwise direction.

   To release the accessory, repeat step 2 listed above.

WARNING: Do not attempt to tighten drill bits (or any other accessory) gripping the front part of the chuck and turning the tool on. Damage to chuck and personal injury may result. Always lock off trigger switch wl changing accessories.

Chuck Removal

Always wear eye protection.

Lock off the tool and turn the adjustment collar to the "drill" position and speed gear shifter to position 1. Tighten the chuck around the shorter en a hex key (not supplied) of 1/4" or greater size. Using a wooden malle similar object, strike the longer end in the clockwise direction, as show Figure 8. This will loosen the screw inside the chuck.

Open chuck jaws fully, insert screwdriver (or Torx tool if required) into fi of chuck between jaws to engage screw head. Remove screw by turn clockwise (left-hand-thread). Place hex key in chuck and tighten, as sh

in Figure 9. Using a wooden mallet or similar object, strike key sharply in the counterclockwise direction. This will loosen the chuck so that it can be unscrewed by hand.

Chuck Installation

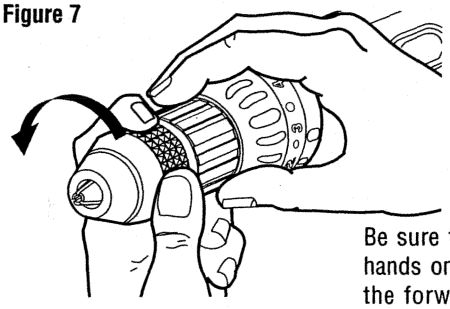
Lock off the tool. Screw the chuck on by hand as far as it will go. Tighten the chuck around the shorter end of a 1/4" or larger hex key (not supplied) strike the longer end in the clockwise direction with a wooden mallet, as shown in Figure 8. Insert and tighten the screw by turning in a counter clockwise direction.

Operation as a Drill

Turn the collar to the drill bit symbol. Install and tighten the desired drill bit in the chuck. Select the desired speed/torque range using the dual range gear shifter to match the speed and torque to the planned operation.

Follow these instructions for best results when drilling.

Figure 7



Be sure to tighten chuck with two hands on both the rear sleeve and the forward sleeve for maximum tightness.

DRILLING

1. Use sharp drill bits only. For WOOD, use twist drill bits, spade bit power auger bits, or hole saws. For METAL, use high speed steel twi drill bits or hole saws. For MASONRY, such as brick, cement, cind block, etc., use carbide-tipped bits.
2. Be sure the material to be drilled is anchored or clamped firmly. drilling thin material, use a "back-up" block to prevent damage to tl material.
3. Always apply pressure in a straight line with the bit. Use enough pre sure to keep the drill bit biting, but do not push hard enough to stall tl motor or deflect the bit.
4. Hold tool firmly to control the twisting action of the drill.
5. **IF DRILL STALLS**, it is usually because it is being overloaded. **RELEAS TRIGGER IMMEDIATELY**, remove drill bit from work, and determi cause of stalling. **DO NOT CLICK TRIGGER OFF AND ON IN A ATTEMPT TO START A STALLED DRILL – THIS CAN DAMAGE TH DRILL.**
6. To minimize stalling on breaking through the material, reduce pressu on drill and ease the bit through the last fractional part of the hole.

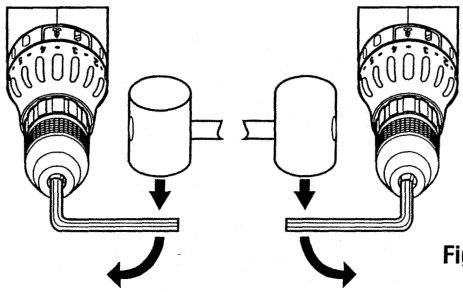


Figure 8 **Figure 9**

7. Keep the motor running when pulling the bit back out of a drilled hole. This will help prevent jamming.
8. With variable speed drills there is no need to center punch the point to be drilled. Use a slow speed to start the hole and accelerate by squeezing the trigger harder when the hole is deep enough to drill without the bit skipping out. Operate at full on after starting the bit.

Drilling in Wood

Holes in wood can be made with the same twist drills used for metal. These bits may overheat unless pulled out frequently to clear chips from the flutes. For larger holes, use Power Drill Wood Bits. Work that is apt to splinter should be backed up with a block of wood.

Drilling in Metal

Use a cutting lubricant when drilling metals. The exceptions are cast iron and brass which should be drilled dry. The cutting lubricants that work best are sulphurized cutting oil or lard oil; bacon grease will also serve the purpose.

Drilling in Masonry

Use carbide tipped masonry bits at low speeds. Keep even force on the drill but not so much that you crack the brittle materials. A smooth, even flow of dust indicates the proper drilling rate.

Operation as a Screwdriver

Turn the Driver/Drill selector to the symbol of a screw. Select the desired speed/torque range using the dual range gear shifter on the top of tool to match the speed and torque to the planned operation. Insert the desired fastener accessory into the chuck as you would any drill bit. Make a few practice runs in scrap or unseen areas to determine the proper position of the clutch collar.

Pressure Activated Chuck

When in the screwdriving mode, THE CHUCK WILL NOT TURN UN PRESSURE IS APPLIED IN LINE WITH THE FASTENER. Likewise, the ch stops when pressure is released. This pressure activated chuck feat improves accuracy of work and significantly increases the rate at wh screws can be driven.

MAINTENANCE

CLEANING: With the motor running, blow dirt and dust out of all air ve with dry air at least once a week. Wear safety glasses when performing t Exterior plastic parts may be cleaned with a damp cloth and mild deterg Although these parts are highly solvent resistant, NEVER use solvents.

Charger Cleaning Instructions:

Warning: Disconnect the charger from the AC outlet before cleaning. and grease may be removed from the exterior of the charger using a clot soft non-metallic brush. Do not use water or any cleaning solutions.

Accessories

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

CAUTION: The use of any non-recommended accessory may be hazardou

If you need any assistance in locating any accessory call 1-800-9-BD T (1-800-923-8665) or contact Black & Decker (U.S.) Inc., Consumer Serv Department, P.O. Box 618, 626 Hanover Pike, Hampstead, MD 21074.

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.

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 Service/Safety Check

All B&D tools for Industry and Construction are covered under a service/saf ty check program where B&D will inspect your tool for safety and provide ne essary maintenance or repairs, including normal wear and tear parts, for o year, FREE OF CHARGE.

Full Warranty

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

Conditions

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

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