(07.02.2022)
(Version: 0.1)

(Andrii Kutsiak)

Manual tools + cabinets



Makita ddf484 Brushless Hand-Drill/Screwgun



Makita dtd171 Brushless Impact Driver



Makita Multitool DTM51ZJX3



EinHell TH-HA 2000/1 Heat-gun



Dremel Multitool model 3000



Other Hand tools

(07.02.2022) (Andrii Kutsiak)
(Version: 0.1)

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No specific knowledge that would require formal training is needed. The only requirement is to ask for help if something is not fully understandable how to use, and to have straight hands. 4
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Version overview:	
1.0	General document

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Introduction

In this document the use, rules and guidelines for the Manual tools will be described. The main focus for the document is to provide the full applicable information about following tools: Hand-Drills, Dremel, Dremel Station, HBM Machine tools: Ratchets; Sockets; keys; screwdrivers; files; wrenches; hex keys; Torx; pliers; snap rings; hammers, high precision tools, hand saws.
There will be described the location of manual tools, purpose of cabinets, and rules of exploitation within the location of Makersplayce.

Machine Expert	Contact	Date
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Safety rules and regulations

Before using the Manual tools, you should read and follow the suggested safety regulations and conditions, to precent unnecessary injuries (we don't want to clean your blood)

- Do not use any tool unless you have used you are trained to use it, or you used it before without accidents
- ALWAYS wear safety glasses before using manual tools that are located right next to the door in the workshop area over the sink. (That is especially applicable to electric tools: Hand drills, Impact driver, Multitool, Dremel and to hand saws and a heat gun)
- Considering Electric tools:
  - ALWAYS TURN OFF a tool while it is not in use:
    1. Makita ddf484 Brushless Hand-Drill/Screwgun turn it off while not in use by simply not pressing the button and then set the direction-of-rotation switch to the middle possition.
    2. Makita dtd171 Brushless Impact Driver turn it off while not in use by simply not pressing the button and then set the direction-of-rotation switch to the middle
    3. Makita Multitool DTM51ZJX3 set the power switch position to (o)
    4. Dremel Multitool model 3000 set the slider of a Dremel to 0 and unplug from the power circuit.
    5. EinHell TH-HA 2000/1 Heat-gun the power switch should be set to the "(o)" position (middle position) and unplugged from the power circuit

  - While working with fast spinning tools - polishing wood, metal, working with materials that tend to create little particles of material in the air, preferably wear your own standard face mask.
  - Some metals tend to create a lot of sparks while cutting or polishing, like: Carbon steel, stainless steel, cast iron, titanium etc. Therefore, ALWAYS wear safety glasses and preferably a workshop coat to protect yourself.
  - If you see visible malfunctions or damage to a tool Inform the staff of MakersPlayce immediately!
  - If you can smell burning smell or a smell of burning insulation from the electric tool, immediately unplug it from the power circuit, and inform the staff of the MakersPlayce
  - For more specific Safety rules and regulations for each specific electric tool, see the Appendix

- Do not work with long sleeves, keep your sleeves rolled up.
- Do not bring ani drinking liquids and/or food to the area of the workshop to prevent dirt and damage to the tools (don't be a swine please)
- If you have low tolerance for high volume noises, wear a sound insulation headphones.
- While using vice-grip, make sure you don't stick your fingers in it accidentally. Make sure that the part that will be gripped in the vice is gripped properly without any backlash.

Required knowledge before operation

No specific knowledge that would require formal training is needed. The only requirement is to ask for help if something is not fully understandable how to use, and to have straight hands.

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Materials and build specs

Give an explanation of what material can be processed in the machine and what advantages and disadvantages each material has. Also give the build specs, size, speed and overall information about what can be made

Considering materials to work with there is no certain limitations or suggestions. With the use of Manual tools, it is possible to work with multiple solid materials. Different kinds of wood, common Metals Iron, steel alloys, carbonated steel, stainless steel, plastics and polycarbonates.
The limitations are;

- Not to work with liquids that can cause a damage to tools
- Not to work with explosives or with metals that can cause an explosion while in contact with other material
- Not to work with toxic materials, or materials that can cause permanent damage to your health or the electronics
- Not to work with materials that can burn easily without application of direct heating

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Startup and Shutdown process

Step by step explanation of how to safely start up and shut down the machine, also how to prepare it for operation

Startup

Considering Electronic tools:
Manual electronic tools are located in the cabinet Marked as MO1 that is located in the main workshop area.

1. Check if cabinet is open, If it is not, then ask a member of MakersPlayce workshop to open it.
2. Hand-Drill, Heat gun, dremel, Impact driver and multitool are all located there, select what tool you need, take it and notify staff member that you will be working with it.
3. Depending on the tool check for the damage of the tool.
4. Connect the battery to the hand-drill, if not connected. Check that there is enough charge in battery by pressing the button near the indicator. Put the direction-of-movement switch to the middle position. Choose a bid that you are going to use, put it inside a bid positioning hole, rotate the vices of gripping mechanism till it clicks, it means it is properly gripped, now you can proceed with your work.
5. Impact driver works and starts up almost the same way as Hand-Drill. Connect the battery to the Impact driver, if not connected. Check that there is enough charge in battery by pressing the button near the indicator. Put the direction-of-movement switch to the middle position. Choose a bid that you are going to use, put it inside the driver hole while moving forward the dark grey connection ring. Let it go a bit deeper till you hear a click. Now you can proceed with your work.
6. Makita Multitool. Connect the battery to the Multitool, if not connected. Check that there is enough charge in battery by pressing the button near the indicator. Choose the blade that you want to use and then put it on a rotation mechanism, connect it to the tool hold using an Allen key. Any tool can be connected with a step of 30 degrees, therefore make sure you position your blade properly. Then you can turn on the power switch and regulate the speed with slider.
7. Dremel 3000. Take the Dremel out of the box. Make sure the power slider is at minimum (0). Choose a bid that you will use for polishing, cutting, etc. If there is a bid already installed in Dremel, remove it by pressing the lock button on the tip of a Dremel, take small wrench and unscrew the fixing nozzle, take out the bid that you don’t need and put in the bid that you are going to use. Screw the fixing nozzle while still keeping the lock button pressed. Once the bid is tightly in, plug in the Dremel wire to the socket. You can manipulate the power of a Dremel via the slider. Now you can proceed with your work.
8. The Heat Gun. Take the heat gun out of the box, choose a nozzle attachment that you want to use. Put it on the heat output. Plug the heater wire to the socket, then you can set the power switch to either rated position 1 or to the maximum rated position 2, and you can proceed with your work.

Considering all other tools from the cabinets, drawers or lockers, a they don’t require any kind of special start up, you can simply take them out of drawers according to your needs.

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Shutdown

Shutting down nonelectrical tools can be done by:

1. ALWAYS Clean the tool after you used it with a piece of fabric or rolled blue paper.
2. ALWAYS Clean up the space where you worked, so that its tidy for future use.
3. Put the tool back from where it belongs. Put it back to corresponding drawer. If you don’t know where to put it back, ask one of the staff members

Considering Electrical Manual tools:

1. Simply put the power switches to the minimum if applicable.
2. Unplug the electric tool from the socket if applicable. You don’t have to remove battery from hand drill, multitool and impact driver.
3. ALWAYS Clean the tool after you used it with a piece of fabric or rolled blue paper.
4. ALWAYS Clean up the space where you worked, so that its tidy for future use.
5. Put the tool back from where it belongs. Put it back to corresponding drawer. If you don’t know where to put it back, ask one of the staff members

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Maintenance

Most of the manual tools both electrical and nonelectrical are simple in terms of maintenance and does not require any specific actions. Although it is important to act according to following rules:
First of all, always clean a tool after a use, if you see a tool being dirty, clean it before use as well. Keep tools away from liquids and try to clean it without applying any liquid. If u see the tool is damaged or rusting it might be not applicable anymore, inform about that. Inspect the tool for any visible damage. In case of electrical tools, broken bids should be removed and replaced with a new ones. Using broken bids might cause damage to you and the tool.
For the better use of a hand drill, while working with metals, use lubrication in form of standard drilling oil.
Always put tools and bids to their place.

Common issues and fixes

Manual tools are simple and easy to use, besides that they are durable and do not require any parts to be removed except of: drilling bids; polishing bids and cutting discs for the Dremel; blades for the multitool, blades for hand saws. All of those should be replaced only in case it is worn out.

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Appendix

Manufacturer's manual
Heat Gun:

Hot Air Gun

TH-HA 2000/1

Item No.: 4520179

Ident No.: 11029

Bar Code: 4006825593235

The TH-HA 2000/1 hot air gun is a powerful tool which provides good service to DIY enthusiasts on jobs involving the removal of old lacquer and paint, the fitting of plastic tubes, and much more besides. There are two power settings to adjust the temperature and air rate to the particular requirements.

Features & Benefits

- High-power hot air gun, 2 power settings
- 2 temperature and air flow settings
- Stable base, suitable for stationary applications as well
- Overheating protection for safe operation
- Large range of accessories for great versatility
- Incl. paint scraper and four nozzles
- Supplied in practical case















Technical Data

- Mains supply	230/240 V | 50 Hz
- Power	2000 W
- Temperature at setting 1	350 °C
- Temperature at setting 2	550 °C
- Airflow rate at setting 1	300 L/min
- Airflow rate at setting 2	500 L/min

Logistic Data

- Product weight	0.68
- Gross weight single packaging	1.48 kg
- Dimensions single packaging	296 x 85 x 275 mm
- Pieces per export carton	10 Pieces
- Gross weight export carton	16 kg
- Dimensions export carton	450 x 565 x 300 mm
- Container quantity (20"/40"/40"HC)	3500 | 7200 | 0

Illustrations can contain accessories, which are not included in standard extent of delivery
Illustration similar (in design), production-wise modifications reserved
GS mark belongs to the product itself only, excluded accessory
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Dremel 3000:

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IMPORTANT:
Read Before Using

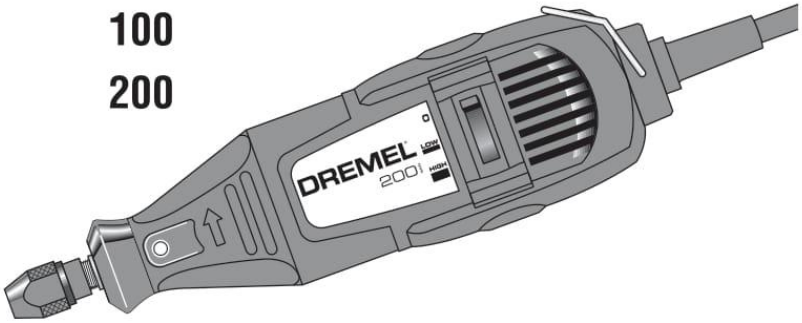
IMPORTANT :
Lire avant usage

IMPORTANTE:
Leer antes de usar



Operating/Safety Instructions
Consignes de fonctionnement/sécurité
Instrucciones de funcionamiento y seguridad

100
200



3000



DREMEL®

P.O. Box 1468 Racine, Wisconsin 53401

Call Toll Free for Consumer Information & Service Locations

Pour obtenir des informations et les adresses de nos centres de service après-vente, appelez ce numéro gratuit

Llame gratis para obtener información para el consumidor y ubicaciones de servicio

1-800-4-DREMEL (1-800-437-3635) www.dremel.com

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Version française Voir page 23

Versión en español Ver la página 45

General Power Tool Safety Warnings

⚠ WARNING **Read all safety warnings and all instructions.** Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

SAVE ALL WARNINGS AND INSTRUCTIONS FOR FUTURE REFERENCE

The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

Work area safety

Keep work area clean and well lit. Cluttered or dark areas invite accidents.

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.

Keep children and bystanders away while operating a power tool. Distractions can cause you to lose control.

Electrical safety

Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools. Unmodified plugs and matching outlets will reduce risk of electric shock.

Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators. There is an increased risk of electric shock if your body is earthed or grounded.

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

Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts. Damaged or entangled cords increase the risk of electric shock.

When operating a power tool outdoors, use an extension cord suitable for outdoor use. Use of a cord suitable for outdoor use reduces the risk of electric shock.

If operating the power tool in damp locations is unavoidable, use a Ground Fault Circuit Interrupter (GFCI) protected supply. Use of an GFCI reduces the risk of electric shock.

Personal safety

Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication. A moment of inattention while operating power tools may result in serious personal injury.

Use personal protective equipment. Always wear eye protection. Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.

Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and / or battery pack, picking up or carrying the tool. Carrying power tools with your finger on the switch or energizing power tools that have the switch on invites accidents.

Remove any adjusting key or wrench before turning the power tool on. A wrench or a key left attached to a rotating part of the power tool may result in personal injury.

Do not overreach. Keep proper footing and balance at all times. This enables better control of the power tool in unexpected situations.

Dress properly. Do not wear loose clothing or jewelry. Keep your hair, clothing and gloves away from moving parts. Loose clothes, jewelry or long hair can be caught in moving parts.

If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used. Use of dust collection can reduce dust-related hazards.

Power tool use and care

Do not force the power tool. Use the correct power tool for your application. The correct power tool will do the job better and safer at the rate for which it was designed.

Do not use the power tool if the switch does not turn it on and off. Any power tool that cannot be controlled with the switch is dangerous and must be repaired.

Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools. Such preventive safety measures reduce the risk of starting the power tool accidentally.

Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool. Power tools are dangerous in the hands of untrained users.

Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use. Many accidents are caused by poorly maintained power tools.

Keep cutting tools sharp and clean. Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.

Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed. Use of the power tool for operations different from those intended could result in a hazardous situation.

Service

Have your power tool serviced by a qualified repair person using only identical replacement parts. This will ensure that the safety of the power tool is maintained.

Safety Rules for Rotary Tools

Hold power tool by insulated gripping surfaces, because the cutter may contact its own cord. Cutting a "live" wire may make exposed metal parts of the power tool "live" and shock the operator.

Use clamps or another practical way to secure and support the workpiece to a stable platform. Holding the work by your hand or against the body leaves it unstable and may lead to loss of control.

Accessories must be rated for at least the speed recommended on the tool warning label. Wheels and other accessories running over rated speed can fly apart and cause injury.

If cutting into existing walls or other blind areas where electrical wiring may exist is unavoidable, disconnect all fuses or circuit breakers feeding this worksite.

Do not operate the flexible shaft with a sharp bend. Over bending the shaft can generate excessive heat on the jacket or hand piece. The recommended minimum is 5" radius.

Always disconnect the power cord from the power source before making any adjustments or attaching any accessories. You may unexpectedly cause the tool to start leading to serious personal injury.

Be aware of the switch location, when placing the tool down or when picking the tool up. You may accidentally activate the switch.

Always hold the hand piece firmly in your hands during the start-up. The reaction torque of the motor, as it accelerates to full speed, can cause the shaft to twist.

Always wear safety goggles and dust mask. Use only in well ventilated area. Using personal safety devices and working in safe environment reduces risk of injury.

After changing the bits or making any adjustments, make sure the collet nut and the EZ TWIST™ integrated wrench/nose cap are both securely tightened. Loose adjustment devices can unexpectedly shift, causing loss of control, loose rotating components will be violently thrown.

Do not reach in the area of the spinning bit. The proximity of the spinning bit to your hand may not always be obvious.

Allow brushes to run at operating speed for at least one minute before using wheel. During this time no one is to stand in front or in line with the brush. Loose bristles or wires will be discharged during the run-in time.

Wire and bristle brushes must never be operated at speeds greater than 15,000/min. Direct the discharge of the

Safety Rules for Rotary Tools - (cont.)

spinning wire brush away from you. Small particles and tiny wire fragments may be discharged at high velocity during the "cleaning" action with these brushes and may become imbedded in your skin. Bristles or wires will be discharged from the brush at high speeds.

Wear protective gloves and face shield with wire or bristle brushes. Apply wire or bristle brushes lightly to the work as only the tips of the wire/bristles do the work. "Heavy" pressure on bristles will cause the wire or bristle to become overstressed, resulting in a wiping action and will cause the bristles/wire to be discharged.

Carefully handle both the tool and individual grinding wheels to avoid chipping or cracking. Install a new wheel if tool is dropped while grinding. Do not use a wheel that may be damaged. Fragments from a wheel that bursts during operation will fly away at great velocity possibly striking you or bystanders.

Never use dull or damaged bits. Sharp bits must be handled with care. Damaged bits can snap during use. Dull bits require more force to push the tool, possibly causing the bit to break.

Use clamps to support workpiece whenever practical. Never hold a small workpiece in one hand and the tool in the other hand while in use. Allow for sufficient space, at least 6", between your hand and the spinning bit. Round material such as dowel rods, pipes or tubing have a tendency to roll while being cut, and may cause the bit to "bite" or jump toward you. Clamping a small workpiece allows you to use both hands to control the tool.

Inspect your workpiece before cutting. When cutting irregularly shaped workpieces, plan your work so it will not slip and pinch the bit and be torn from your hand. For example, if carving wood, make sure there are no nails or foreign objects in the workpiece. Nails or foreign objects can cause the bit to jump.

Never start the tool when the bit is engaged in the material. The bit cutting edge may grab the material causing loss of control of the cutter.

Avoid bouncing and snagging the wheel, especially when working corners, sharp edges etc. This can cause loss of control and kick-back.

The direction of feed with the bit into the material when carving, routing or cutting is very important. Always feed the bit into the material in the same direction as the cutting edge is exiting from the material (which is the same direction as the chips are thrown). Feeding the tool in the wrong direction, causes the cutting edge of the bit to climb out of the work and pull the tool in the direction of this feed.

If the workpiece or bit becomes jammed or bogged down, turn the tool "OFF" by the switch. Wait for all moving parts to stop and unplug the tool, then work to free the jammed material. If the switch to the tool is left "ON" the tool could restart unexpectedly causing serious personal injury.

Do not leave a running tool unattended, turn power off. Only when tool comes to a complete stop is it safe to put it down.

Do not grind or sand near flammable materials. Sparks from the wheel could ignite these materials.

Do not touch the bit or collet after use. After use the bit and collet are too hot to be touched by bare hands.

Regularly clean the tool's air vents by compressed air. Excessive accumulation of powdered metal inside the motor housing may cause electrical failures.

Do not allow familiarity gained from frequent use of your rotary tool to become commonplace. Always remember that a careless fraction of a second is sufficient to inflict severe injury.

Do not alter or misuse tool. Any alteration or modification is a misuse and may result in serious personal injury.

This product is not intended for use as a dental drill, in human or veterinary medical applications. Serious personal injury may result.

When using the steel saws, cutoff wheels, high speed cutters or tungsten carbide cutters, always have the work securely clamped. Never attempt to hold the work with one hand while using any of these accessories. The reason is that these wheels will grab if they become slightly canted in the groove, and can kickback causing loss of control resulting in serious injury. Your second hand should be used to steady and guide the hand holding the tool. When a cutoff wheel grabs, the wheel itself usually breaks. When the steel saw, high speed cutters or tungsten carbide cutter grab, it may jump from the groove and you could lose control of the tool.

Additional Safety Warnings

GFCI and personal protection devices like electrician's rubber gloves and footwear will further enhance your personal safety.

Do not use AC only rated tools with a DC power supply. While the tool may appear to work, the electrical components of the AC rated tool are likely to fail and create a hazard to the operator.

Keep handles dry, clean and free from oil and grease. Slippery hands cannot safely control the power tool.

Develop a periodic maintenance schedule for your tool. When cleaning a tool be careful not to disassemble any portion of the tool since internal wires may be misplaced or pinched or safety guard return springs may be improperly mounted. Certain cleaning agents such as gasoline, carbon tetrachloride, ammonia, etc. may damage plastic parts.

Risk of injury to user. The power cord must only be serviced by a Dremel Service Facility.

⚠ WARNING Some dust created by power sanding, sawing, grinding, drilling, and other construction activities contains chemicals known 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 and other masonry products, and
- 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.

Symbols

IMPORTANT: Some of the following symbols may be used on your tool. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to operate the tool better and safer.

Symbol	Name	Designation/Explanation
V	Volts	Voltage (potential)
A	Amperes	Current
Hz	Hertz	Frequency (cycles per second)
W	Watt	Power
kg	Kilograms	Weight
min	Minutes	Time
s	Seconds	Time
⌀	Diameter	Size of drill bits, grinding wheels, etc.
n_0	No load speed	Rotational speed, at no load
n	Rated speed	Maximum attainable speed
.../min	Revolutions or reciprocation per minute	Revolutions, strokes, surface speed, orbits etc. per minute
0	Off position	Zero speed, zero torque...
1, 2, 3, ... I, II, III,	Selector settings	Speed, torque or position settings. Higher number means greater speed
0	Infinitely variable selector with off	Speed is increasing from 0 setting
	Arrow	Action in the direction of arrow
~	Alternating current	Type or a characteristic of current
⎓	Direct current	Type or a characteristic of current
≂	Alternating or direct current	Type or a characteristic of current
⧈	Class II construction	Designates Double Insulated Construction tools.
⏚	Earthing terminal	Grounding terminal
	Warning symbol	Alerts user to warning messages
RECYCLE RBRC Li-ion 1-800-822-8837	Li-ion RBRC seal	Designates Li-ion battery recycling program
RECYCLE RBRC Ni-Cd 1-800-822-8837	Ni-Cad RBRC seal	Designates Ni-Cad battery recycling program
	Read manual symbol	Alerts user to read manual
	Wear eye protection symbol	Alerts user to wear eye protection

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Symbols (continued)

IMPORTANT: Some of the following symbols may be used on your tool. Please study them and learn their meaning. Proper interpretation of these symbols will allow you to operate the tool better and safer.

This symbol designates that this tool is listed by Underwriters Laboratories.

This symbol designates that this tool is recognized by Underwriters Laboratories.

This symbol designates that this tool is listed by Underwriters Laboratories, to United States and Canadian Standards.

This symbol designates that this tool is listed by the Canadian Standards Association.

This symbol designates that this tool is listed by the Canadian Standards Association, to United States and Canadian Standards.

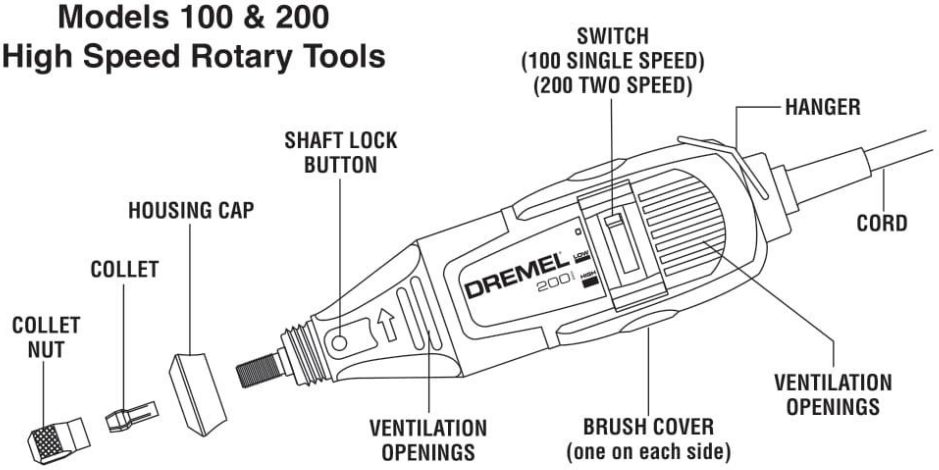
This symbol designates that this tool is listed by the Intertek Testing Services, to United States and Canadian Standards.

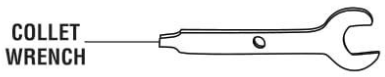
This symbol designates that this tool complies to NOM Mexican Standards.

Functional Description and Specifications

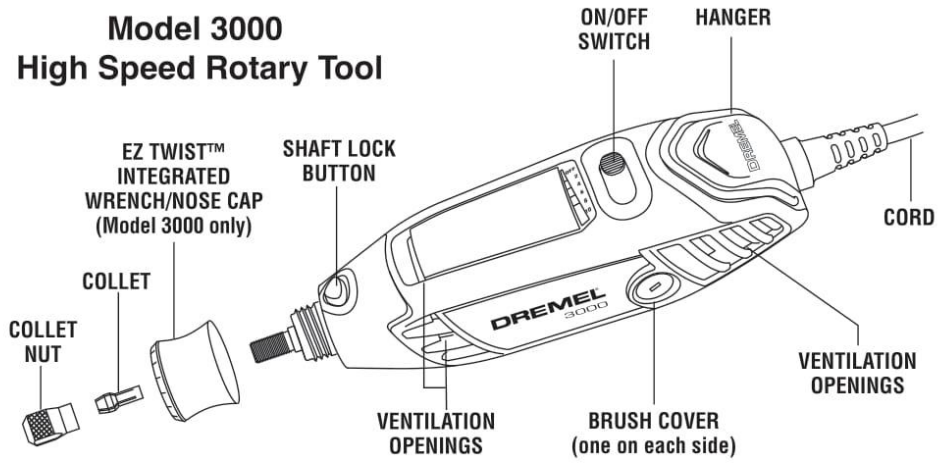
⚠ WARNING **Disconnect the plug from the power source before making any assembly, adjustments or changing accessories**. Such preventive safety measures reduce the risk of starting the tool accidentally.

Models 100 & 200 High Speed Rotary Tools





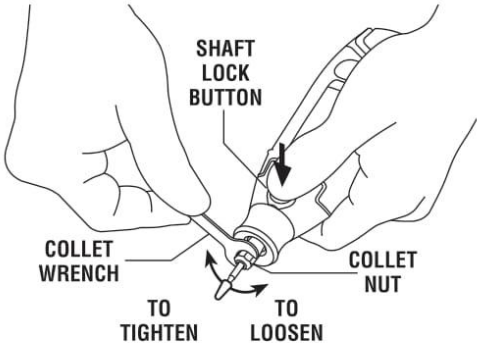
Model 3000 High Speed Rotary Tool

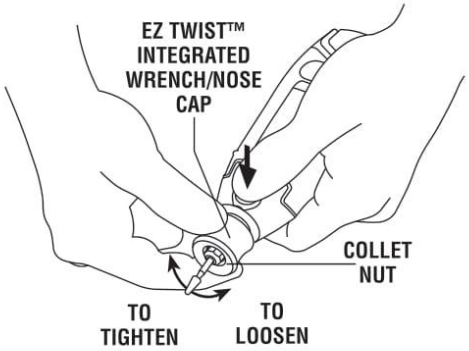


Model number	100	200	3000
Voltage rating	120V ∿ 50 - 60Hz	120V ∿ 50 - 60Hz	120V ∿ 50 - 60Hz
Amperage rating	1,15A	HI 1,15A, LO 0,80A	1,2A
No load speed	n_0 35,000/min	n_0 15,000/35,000/min	n_0 5,000-32,000/min
Collet capacities	1/32, 1/16", 3/32", 1/8"	1/32, 1/16", 3/32", 1/8"	1/32, 1/16", 3/32", 1/8"

Assembly

⚠ WARNING **Always unplug Rotary Tool before changing accessories, changing collets or servicing your Rotary Tool.**





COLLET NUT — To loosen, first press shaft lock button and rotate the shaft by hand until the lock engages the shaft preventing further rotation.

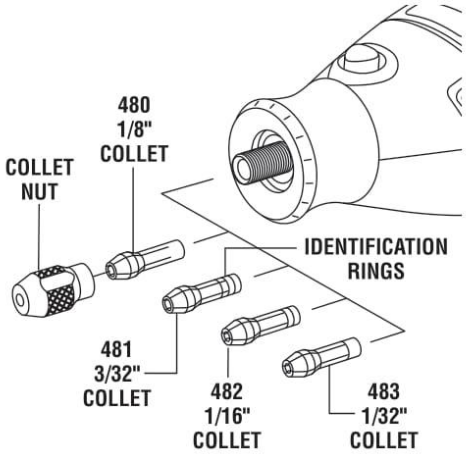
⚠ CAUTION **Do not engage lock while the Rotary Tool is running.**

With the shaft lock engaged use the collet wrench to loosen the collet nut if necessary. The collet nut must be loosely threaded on when inserting an accessory. Change accessories by inserting the new one into the collet as far as possible to minimize runout and unbalance. With the shaft lock engaged, finger tighten the collet nut until the accessory shank is gripped by the collet. **Avoid excessive tightening of the collet nut when there is no bit inserted.**

EZ TWIST™ INTEGRATED WRENCH/NOSE CAP (Model 3000 only)

The nose cap of your tool has an integrated wrench allowing you to loosen and tighten the collet nut without the use of the standard collet wrench. Unscrew the nose cap from the tool, line-up steel insert on inside of cap with collet nut. With the shaft lock engaged twist nose cap clockwise to tighten, and counter-clockwise to loosen.

COLLETS — Four different size collets (see illustration), to accommodate different shank sizes, are available for your Rotary Tool. To install a different collet, remove the collet nut and remove the old collet. Insert the unslotted end of the collet in the hole in the end of the tool shaft. Replace collet nut on the shaft.



⚠ CAUTION **Always use the collet which matches the shank size of the accessory you plan to use.** Never force a larger diameter shank into a collet.

Note: Most rotary tool kits do not include all four collets sizes.

COLLET IDENTIFICATION CHART

Collet sizes can be identified by the rings on the back end of collet.

1/32" Collet has one (1) ring.
1/16" Collet has two (2) rings.
3/32" Collet has three (3) rings.
1/8" Collet has no rings. **(Included in most tool kits on the tool)**

BALANCING ACCESSORIES — For precision work, it is important that all accessories be in good balance (much the same as the tires on your automobile). To true up or balance an accessory, slightly loosen collet nut and give the accessory or collet a 1/4 turn. Retighten collet nut and run the Rotary Tool. You should be able to tell by the sound and feel if your accessory is running in balance. Continue adjusting in this fashion until best balance is achieved. To maintain balance on abrasive wheel points, before each use, with the wheel point secured in the collet, turn on the Rotary Tool and run the 415 Dressing Stone lightly against the revolving wheel point. This removes high spots and trues up the wheel point for good balance.

The hanger is provided for the use of hanging your tool while using the flex-shaft or for storage. If you do not use the hanger, remove it from the tool and snap it back into place underneath the cord so it will be out of the way while the tool is in use.

Operating Instructions

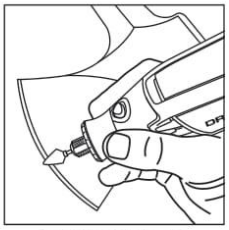
The Rotary Tool is a handful of high-speed power. It serves as a carver, grinder, polisher, sander, cutter, power brush, drill and more.

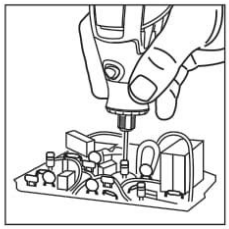
The Rotary Tool has a small, powerful electric universal motor, is comfortable in the hand, and is made to accept a large variety of accessories including abrasive wheels, drill bits, wire brushes, polishers, engraving cutters, router bits, cutting wheels and attachments. Accessories come in a variety of shapes and permit you to do a number of different jobs. As you become familiar with the range of accessories and their uses, you will learn just how versatile the Rotary Tool is. You'll see dozens of uses you hadn't thought of before.

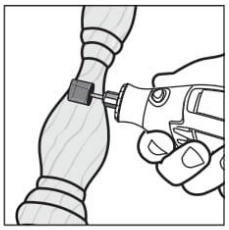
The real secret of the Rotary Tool is its speed. To understand the advantages of its high speed, you have to know that the standard portable electric drill runs at speeds up to 2,800 revolutions per minute. The Rotary Tool operates at speeds up to 35,000 revolutions per minute. The typical electric drill is a low-speed, high torque tool; the Rotary Tool is just the opposite – a high-speed, low torque tool. The major difference to the user is that in the high speed tools, the speed combined with the accessory mounted in the collet does the work. You don't apply pressure to the tool, but simply hold and guide it. In the low speed tools, you not only guide the tool, but also apply pressure to it, as you do, for example, when drilling a hole.

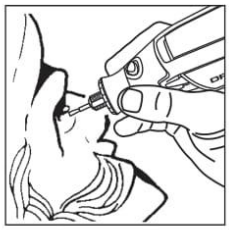
It is this high speed, along with its compact size and wide variety of special accessories and attachments, that makes the Rotary Tool different from other tools. The speed enables it to do jobs low speed tools cannot do, such as cutting hardened steel, engraving glass, etc.

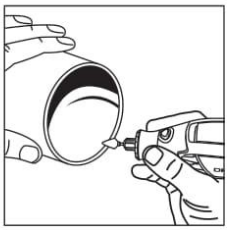
Getting the most out of your Rotary Tool is a matter of learning how to let this speed work for you. To learn about more uses and the versatility of Dremel accessories and attachments refer to this Owner's Manual or check our website at www.Dremel.com.

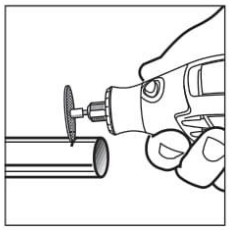

Sharpen Tools


Drilling


Shape Wood


Carve Wood


Deburr Metal


Cut Metal

Using the Rotary Tool

The first step in learning to use the Rotary Tool is to get the "feel" of it. Hold it in your hand and feel its weight and balance. Feel the taper of the housing. This taper permits the Rotary Tool to be grasped much like a pen or pencil (Figure A).

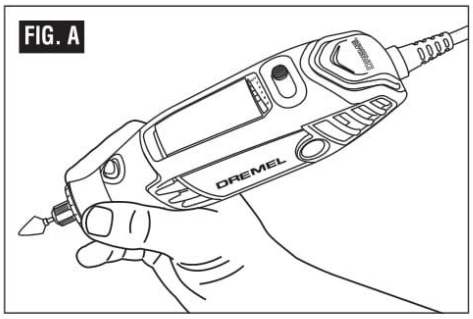
Always hold the tool away from your face.

Accessories can be damaged during handling, and can fly apart as they come up to speed. This is not common, but it does happen.

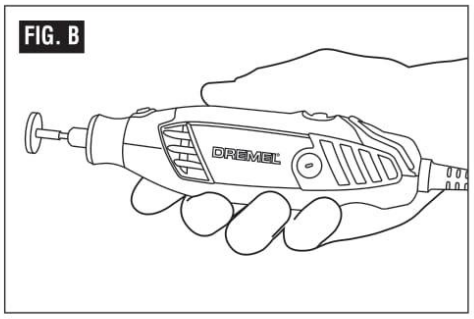
Practice on scrap materials first to see how the Rotary Tool's high speed action performs. Keep in mind that the work is done by the speed of the tool and by the accessory in the collet. You should not lean on or push the tool during use.

Instead, lower the spinning accessory lightly to the work and allow it to touch the point at which you want cutting (or sanding or etching, etc.) to begin. Concentrate on guiding the tool over the work using very little pressure from your hand. Allow the accessory to do the work.

Usually, it is best to make a series of passes with the tool rather than attempt to do all the work in one pass. To make a cut, for example, pass the tool back and forth over the work, much as you would a small paint brush. Cut a little material on each pass until you reach the desired depth. For most work, the gentle touch is best. With it, you have the best control, are less likely to make errors, and will get the most



For best control in close work, grip the Rotary Tool like a pencil between your thumb and forefinger.



The "Golf Grip" method of holding the tool is used for more aggressive operations such as grinding a flat surface or using cutoff wheels.



CAUTION **Whenever you hold the tool, be careful not to cover the air vents with your hand. This blocks the air flow and causes the motor to overheat.**

Questions or Problems? Call 1-800-437-3635
or check our website at www.Dremel.com

Operating Speeds

To select the right speed for each job, use a practice piece of material.

NOTE: Speed is affected by voltage changes. A reduced incoming voltage will slow the RPM of the tool.

(MODEL 100)

On the single speed model, there is an ON-OFF switch. When the switch is on, the tool runs at 35,000 RPM.

(MODEL 200)

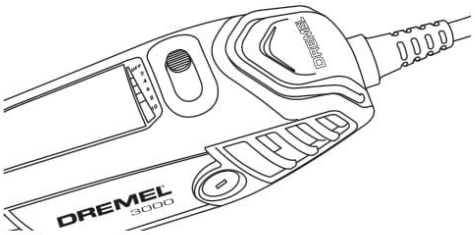
On the two-speed model, there is a LO and HI switch. When the switch indicator is on the low setting, the tool runs at about 15,000 RPM. When the switch indicator is on the high setting, the tool runs at about 35,000 RPM.

(MODEL 3000)

On the variable speed model, there are switch setting indicators marked with a line. Slide to the number on the housing to select the operating speed needed from 5,000 – 32,000 RPM. **You can refer to the charts on page 19, 20, 21 and 22 to determine the proper speed, based on the material being worked and the type of accessory being used. These charts enable you to select**

both the correct accessory and the optimum speed at a glance.

The speed of Rotary Tool is controlled by setting this indicator on the housing.



The Settings for Approximate Revolutions Per Minute on Rotary Tool Variable Speed Model 3000.

Switch Setting	Speed Range
2	5,000 – 8,000 RPM
*4	9,000 – 15,000 RPM
6	16,000 – 21,000 RPM
8	22,000 – 27,000 RPM
10	28,000 – 32,000 RPM

* 3000 Wire Brush Setting.

Needs for Slower Speeds

Certain materials, however, (some plastics and precious metals, for example) require a relatively slow speed because at high speed the friction of the accessory generates heat and may cause damage to the material.

Slow speeds (15,000 RPM or less) usually are best for polishing operations employing the felt polishing accessories. They may also be best for working on delicate projects as “eggery” work, delicate wood carving and fragile model parts. (All brushing applications require lower speeds to avoid wire discharge from the holder.)

If you need it, single-speed models also can have speed control by using a Model 221 foot control unit.

⚠ CAUTION Not for use with two speed or variable speed models 200 or 3000. Use with external speed control will damage the variable/two speed electronics.

Higher speeds are better for carving, cutting, routing, shaping, cutting dadoes or rabbets in wood.

Hardwoods, metals and glass require high speed operation, and drilling should also be done at high speeds.

The point to remember is this: You can do the great majority of work with the single speed at its regular speed of 35,000 RPM. But for certain materials and types of work, you need slower speeds — which is the reason the variable speed models are available.

To aid you in determining the optimum operational speed for different materials and different accessories, we have constructed a series of tables that appear on page 19, 20, 21 and 22. By referring to these tables, you can discover the recommended speeds for each type of accessory. Look these tables over and become familiar with them.

Ultimately, the best way to determine the correct speed for work on any material is to practice for a few minutes on a piece of scrap, even after referring to the chart. You can quickly learn that a slower or faster speed is more effective just by observing what happens as you make a pass or two at different speeds. When working with plastic, for example, start at a slow rate of speed and increase the speed until you observe that the plastic is melting at the point of contact. Then reduce the speed slightly to get the optimum working speed.

Some rules of thumb in regard to speed:

1. Plastic and other materials that melt at low temperatures should be cut at low speeds.
2. Polishing, buffing and cleaning with any type of bristle brush must be done at speeds not greater than 15,000 RPM to prevent damage to the brush.
3. Wood should be cut at high speed.
4. Iron or steel should be cut at high speed. If a high speed steel cutter starts to chatter — this normally means it is running too slow.
5. Aluminum, copper alloys, lead alloys, zinc alloys and tin may be cut at various speeds, depending on the type of cutting being done. Use paraffin or other suitable lubricant on the cutter to prevent the cut material from adhering to the cutter teeth.

Increasing the pressure on the tool is not the answer when it is not performing as you think it should. Perhaps you should be using a different accessory, and perhaps an adjustment in speed would solve the problem. Leaning on the tool does not help.

Let speed do the work!

Use only Dremel®, high-performance accessories.

Maintenance Information

Service

⚠ WARNING **Preventive maintenance performed by unauthorized personnel may result in misplacing of internal wires and components which could cause serious hazard.** We recommend that all tool service be performed by a Dremel Service Facility.

⚠ WARNING **To avoid injury from unexpected starting or electrical shock, always remove plug from wall outlet before performing service or cleaning.**

CARBON BRUSHES

The brushes and commutator in your tool have been engineered for many hours of dependable service.

In order to prepare your brushes for use, run your tool at full speed for 5 minutes under no load. This will properly "seat" your brushes, which extends the life of both your brushes and your tool.

To maintain peak efficiency of the motor, we recommend every 40 - 50 hours the brushes be examined. Only genuine Dremel replacement brushes specially designed for your tool should be used.

MAINTENANCE OF REPLACEABLE BRUSHES ON MODELS 100, 200 & 3000

The brushes should be inspected frequently when tools are used continuously. If your tool runs sporadically, loses power, makes unusual noises or runs at a reduced speed, check the brushes.

⚠ CAUTION **To continue using the tool in this condition will permanently damage your tool.**

Follow these steps to check/change the rotary tool brushes:

1. With the power cord unplugged, place the tool on a clean surface. Use the tool wrench as a screwdriver to remove the brush caps in a counter-clockwise direction (Figure C).
2. Remove the brushes from the tool by pulling on the spring that is attached to the carbon brush. If the brush is less than 1/8" long and the end surface of the brush that contacts the commutator is rough and/or pitted, they should be replaced. Check both brushes (Figure D).

   Usually the brushes will not wear out simultaneously. If one brush is worn out, replace both brushes. Make sure the brushes are installed as illustrated. The curved surface of the brush must match the curvature of the commutator.
3. After replacing brushes the tool should be run at no-load; place it on a clean surface and run it freely at full speed for 5 minutes before loading (or using) the tool. This will allow the brushes to "seat" properly and will give you more hours of life from each set of brushes. This will also extend the total life of your tool since the commutator surface will "wear" longer.

FIG. C

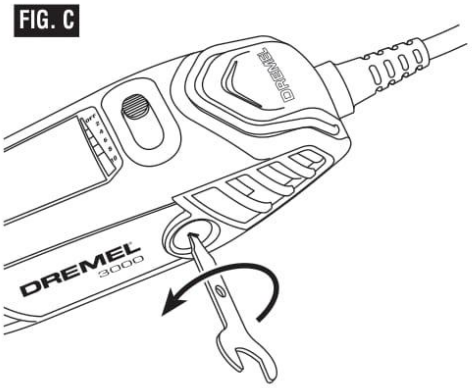
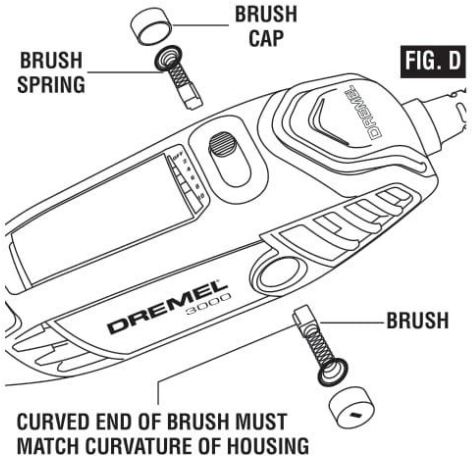


FIG. D



BEARINGS

Models 100, 200 & 3000 have double ball bearing construction. Under normal use they will not require lubrication.

Cleaning

⚠ WARNING To avoid accidents always disconnect the tool from the power supply before cleaning or performing any maintenance. The tool may be cleaned most effectively with compressed dry air. **Always wear safety goggles when cleaning tools with compressed air.**

Ventilation openings and switch levers must be kept clean and free of foreign matter. Do not attempt to clean by inserting pointed objects through openings.

⚠ CAUTION Certain cleaning agents and solvents damage plastic parts. Some of these are: gasoline, carbon tetrachloride, chlorinated cleaning solvents, ammonia and household detergents that contain ammonia.

Extension Cords

⚠ WARNING If an extension cord is necessary, a cord with adequate size conductors that is capable of carrying the current necessary for your tool must be used. This will prevent excessive voltage drop, loss of power or overheating. Grounded tools must use 3-wire extension cords that have 3-prong plugs and receptacles.

NOTE: The smaller the gauge number, the heavier the cord.

RECOMMENDED SIZES OF EXTENSION CORDS 120 VOLT ALTERNATING CURRENT TOOLS

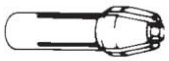
Tool's Ampere Rating	Cord Size in A.W.G.				Wire Sizes in mm^2			
	Cord Length in Feet				Cord Length in Meters			
	25	50	100	150	15	30	60	120
3-6	18	16	16	14	0.75	0.75	1.5	2.5
6-8	18	16	14	12	0.75	1.0	2.5	4.0
8-10	18	16	14	12	0.75	1.0	2.5	4.0
10-12	16	16	14	12	1.0	2.5	4.0	—
12-16	14	12	—	—	—	—	—	—

Dremel Accessories

⚠ WARNING Use only Dremel®, high-performance accessories. Other accessories are not designed for this tool and may lead to personal injury or property damage.

The number and variety of accessories for the Rotary Tool are almost limitless. There is a category suited to almost any job you might have to do — and a variety of sizes and shapes within each category which enables you to get the perfect accessory for every need.

Refer to the DREMEL ACCESSORY ORDER FORM for illustrations of the accessories available. These accessories may be found at your local hardware, hobby or home center dealers.

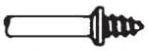


Collets

If you expect to use a variety of accessories, we recommend that in the beginning you purchase a complete set of four collets. Store these so that you will have the proper size of collet for any accessory or drill bit you want to use. **Currently, the 1/8", 3/32",1/32" and 1/16" collets accommodate all of the available Dremel accessories. 1/8" collets are included in most rotary tool kits.**

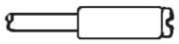
Mandrels

A mandrel is a shank with a threaded or screw head, which are required when you use polishing accessories, cutting wheels, sanding discs, and polishing points. The reason mandrels are used is that sanding discs, cutting wheels and similar accessories must be replaced frequently. The mandrel is a permanent shank, allowing you to replace only the worn head when necessary, thus saving the expense of replacing the shaft each time.



Screw Mandrel N° 401

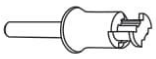
This is a screw mandrel used with the felt polishing tip and felt polishing wheels. 1/8" shank.



Small Screw Mandrel N° 402

This is a mandrel with a small screw at its tip, and is used with emery and fiberglass cutting wheels, sanding discs and polishing wheels. 1/8" shank.

EZ Lock™



EZ Lock Mandrel N° 402

The Dremel EZ Lock makes accessory changes easy as PULL - TWIST - RELEASE. The one-piece mandrel design simplifies the process of changing cutting wheels and makes it easy to cut through plastic.



High Speed Cutters

Available in many shapes, high speed cutters are used in carving, cutting and slotting in wood, plastics and soft metals such as aluminum, copper and brass. These are the accessories to use for freehand routing or carving in wood or plastic, and for precision cutting. Made of high quality steel. 1/8" shank.



Tungsten Carbide Cutters

These are tough, long-lived cutters for use on hardened steel, fired ceramics and other very hard materials. They can be used for engraving on tools and garden equipment. 1/8" shanks.



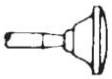
Engraving Cutters

This group has a wide variety of sizes and shapes, and are made for intricate work on ceramics (greenware), wood carvings, jewelry and scrimshaw. They often are used in making complicated printed circuit boards. They should not be used on steel and other very hard materials but are excellent on wood, plastic and soft metals. 3/32" shank.



Structured Tooth Tungsten Carbide Cutters

Fast cutting, needle-sharp teeth for greater material removal with minimum loading. Use on fiberglass, wood, plastic, epoxy and rubber. 1/8" shank.



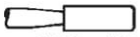
Aluminum Oxide Grinding Stones (orange/brown)

Round, pointed, flat — you name the shape and there is one available in this category. These are made of aluminum oxide and cover virtually every possible kind of grinding application. Use them for sharpening lawn mower blades, screwdriver tips, knives, scissors, chisels and other cutting tools. Use to remove flash from metal castings, deburring any metal after cutting, smoothing welded joints, grinding off rivets and removing rust. These grinding stones can be resharped with a dressing stone. In machine shops, high speed drills and cutters normally are ground with aluminum oxide wheels. 1/8" shank.



Silicon Carbide Grinding Stones (blue/green)

Tougher than aluminum oxide points, these are made especially for use on hard materials such as glass and ceramics. Typical uses might be the removal of stilt marks and excess glaze on ceramics and engraving on glass. 1/8" shank.



Diamond Wheel Points

Excellent for fine detail work on wood, jade, ceramic, glass and other hard material. Bits are covered with diamond particles. 3/32" shanks. (Not recommended for drilling)

Dremel Accessories (Cont.)



Wire Brushes

Three different shapes of wire brushes are available. **For best results wire brushes should be used at speeds not greater than 15,000 RPM. Refer to Operating Speeds section for proper tool speed setting.** The three shapes come in three different materials: stainless steel, brass and carbon wire. The stainless steel perform well on pewter, aluminum, stainless steel, and other metals, without leaving "after-rust". Brass brushes are non sparking, and softer than steel; making them good for use on soft metal like gold, cooper and brass. The carbon wire brushes are good for general purpose cleaning.



Bristle Brushes

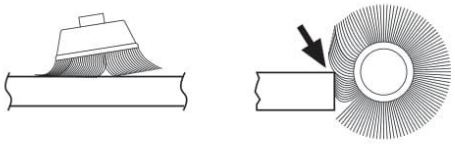
These are excellent cleaning tools on silverware, jewelry and antiques. The three shapes make it possible to get into tight corners and other difficult places. Bristle brushes can be used with polishing compound for faster cleaning or polishing.

Brushing Pressure

1. Remember, the tips of a wire brush do the work. Operate the brush with the lightest pressure so only the tips of the wire come in contact with the work.

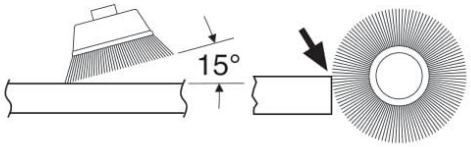
2. If heavier pressures are used, the wires will be overstressed, resulting in a wiping action; and if this is continued, the life of the brush will be shortened due to wire fatigue.

INCORRECT:
Excessive pressure can cause wire breakage.



3. Apply the brush to the work in such a way that as much of the brush face as possible is in full contact with the work. Applying the side or edge of the brush to the work will result in wire breakage and shortened brush life.

CORRECT:
Wire tips doing the work.





Polishing Accessories

These include an impregnated polishing point and an impregnated polishing wheel for bringing metal surfaces to smooth finish; a felt polishing tip and felt polishing wheel, and cloth polishing wheel, all used for polishing plastics, metals, jewelry and small parts. Also included in this group is a polishing compound (No. 421) for use with the felt and cloth polishers.

Polishing points make a very smooth surface, but a high luster is obtained using felt or cloth wheels and polishing compound. **For best results polishing accessories should be used at speeds not greater than 15,000 RPM.**

No polishing compound is needed when using the 425 Polishing Wheel.



Aluminum Oxide Abrasive Wheels

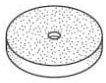
Use to remove paint, deburr metal, polish stainless steel and other metals. Available in fine and medium grits. 1/8" shank.

Dremel Accessories (Cont.)



Sanding Accessories

Sanding discs in fine, medium and coarse grades are made to fit mandrel No. 402. They can be used for nearly any small sanding job you might have, from model making to fine furniture finishing. In addition, there is the drum sander, a tiny drum which fits into the Rotary Tool and makes it possible to shape wood, smooth fiberglass, sand inside curves and other difficult places, and other sanding jobs. You replace the sanding bands on the drum as they become worn and lose their grit. Bands come in fine medium and coarse grades. Flapwheels grind and polish flat or contoured surfaces. They are used most effectively as a finishing sander after heavier surface sanding and material removal is completed. Flapwheels come in fine and coarse grades. Buffs are a great finishing accessory for cleaning and light sanding. They work effectively on metal, glass, wood, aluminum and plastics. Coarse and medium buffs are sold together. Do not exceed 15,000 RPM in speed. 1/8" shank.



Grinding Wheel

Use for deburring, removing rust, and general purpose grinding. Use with Mandrel #402.



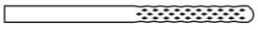
Cutting Wheels

These thin discs of emery or fiberglass are used for slicing, cutting off and similar operations. Use them for cutting off frozen bolt heads and nuts, or to reslot a screw head which has become so damaged that the screwdriver won't work in it. Fine for cutting BX cable, small rods, tubing, cable and cutting rectangular holes in sheet metal.



Drywall Cutting Bit

Gives you fast, clean cuts in drywall.



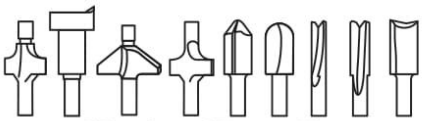
Tile Cutting Bit

Cuts ceramic wall tile, cement board, and plaster.



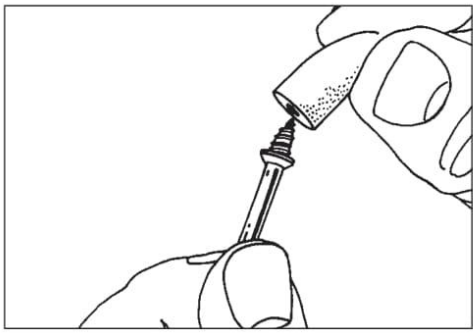
Spiral Cutting Bit

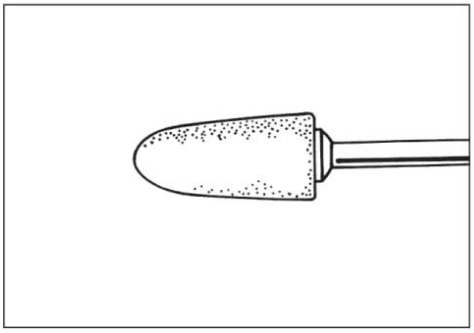
Cuts through all types of wood and wood composites.



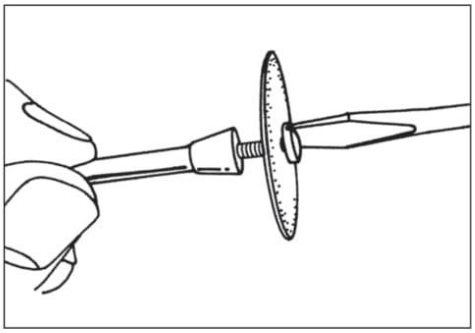
High Speed Router Bits

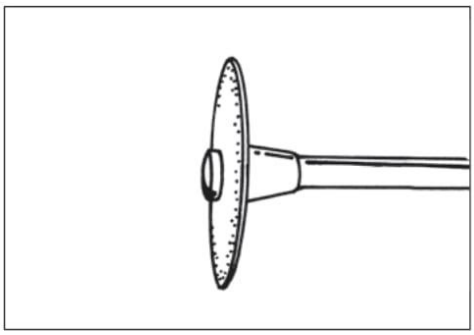
For routing, inlaying, and mortising in wood and other soft materials. Use with Dremel No. 335 Router attachment and No. 231 Shaper/Router table.



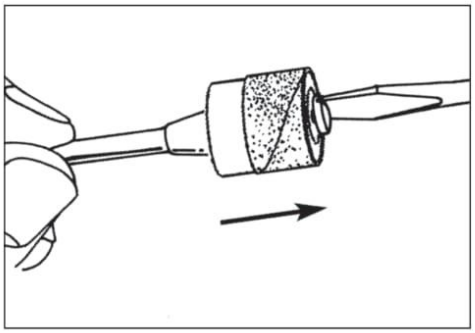


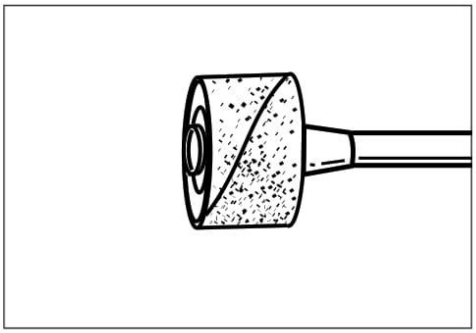
Mandrel No. 401 is used with the felt polishing tip and wheels. Thread the tip on to the screw carefully. The felt tip must thread down straight on the screw Mandrel, and be turned all the way to the collar.





Mandrel N° 402 has a small screw at its tip, and is used with emery cutting wheels and sanding discs. Higher speeds, usually maximum, are best for most work, including cutting steel. Which is shown here.





To replace a band on the **Drum Sander,** loosen the screw without removing it to contract the drum then slide the old band off. Slide the new sanding band on and then expand the drum by tightening the screw once again.

⚠ WARNING **Before each use, check to make certain that all components are assembled to accessory shank and that the drum is sufficiently expanded to secure the band during use.** If sanding band is loose on the drum during operation it may “fly” off and strike you or bystanders.

Speed Settings

* Speed for light cuts; Caution - burning on deep grooves.
• Depending on cutting direction relative to grain.

Not all speed settings can be achieved on 100 and 200 series tool. For certain applications, a variable speed tool is required.

2 = 5,000 - 8,000 RPM's 4 = 9,000 - 15,000 RPM's
6 = 16,000 - 21,000 RPM's 8 = 22,000 - 27,000 RPM's 10 = 28,000 - 32,000 RPM's

High Speed Cutters

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
100, 121, 131	10	10	6	6	8	-	-	-
114, 124, 134, 144	10	6	4	6	6	-	-	-
190	10	10	4	6	10	-	-	-
118, 191, 192, 193, 194	10	10	4	6	10	-	-	-
116, 117, 125, 196	10	6	4	6	6	-	-	-
115	10	10	4	6	6	-	-	-
198	10	8	4	6	6	-	-	-
199	10	8	4	6	6	-	-	-

Engraving Cutters

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
105, 108	10	10	8	4	6	-	-	-
106, 109,	10	10	6	4	6	-	-	-
107, 110	10	10	6	4	6	-	-	-
111	10*	10*	8*	4	6	-	-	-
112	10*	10*	6*	4	6	-	-	-
113	10*	10*	6*	4	6	-	-	-

Diamond Wheel Points

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
7103, 7105, 7117, 7120, 7122, 7123, 7134, 7144	10	8	-	-	-	10	10	10

Structured Tooth Tungsten Carbide Cutters

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
9931, 9932, 9933, 9934, 9935, 9936	10	8	4	-	6	-	-	-

Speed Settings (Continued)

* Speed for light cuts; Caution - burning on deep grooves.
• Depending on cutting direction relative to grain.

Not all speed settings can be achieved on 100 and 200 series tool. For certain applications, a variable speed tool is required.

2 = 5,000 - 8,000 RPM's 4 = 9,000 - 15,000 RPM's
6 = 16,000 - 21,000 RPM's 8 = 22,000 - 27,000 RPM's 10 = 28,000 - 32,000 RPM's

Chain Saw Sharpening Stones

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
453, 454, 455	-	-	-	10	-	-	-	-

Cutting Accessories

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
409, 420, 426 540, EZ409	-	-	2-4	10	10	10	10	-
543, EZ544	10	8-10	2-4	-	-		-	-
545, EZ545	8-10	8	-	-	-	6-8	6-8	-
560	For use on drywall. For best results, use at 30,000 rpm.							
561	6-10	6-10	2-4	-	10	-	-	-
562	-	-	-	-	-	-	10	
EZ456	-	-	-	10	10	-	-	-
EZ476	-	-	2-4	-	-	-	-	-

Polishing Accessories

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
461, 462, 463	-	-	-	8	8	8	8	8
414, 422, 429	-	-	-	6	6	6	6	6
425, 427	-	-	-	8	8	-	-	-
423E	-	-	-	6-8	2	2	2	6-8

Wire Brushes

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
403, 404, 405	4	4	2-4	6	2	-	-	-
428, 442, 443	4	4	2	4	4	-	-	-
530, 531, 532	-	4	-	4	-	-	-	-
535, 536, 537	4	4	-	4	4	4	-	-

Sanding Bands and Discs

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
430, 431, 438	2-10	2-10	2-6	10	10	2-10	2-10	-
439, 440, 444	2-10	2-10	2-6	10	10	2-10	2-10	-
407, 408, 432	2-10	2-10	2-6	10	10	2-10	2-10	-
411, 412, 413	6	6	2	-	2	-	-	-

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Speed Settings (Continued)

* Speed for light cuts; Caution - burning on deep grooves.
• Depending on cutting direction relative to grain.

Not all speed settings can be achieved on 100 and 200 series tool. For certain applications, a variable speed tool is required.

2 = 5,000 - 8,000 RPM's 4 = 9,000 - 15,000 RPM's
6 = 16,000 - 21,000 RPM's 8 = 22,000 - 27,000 RPM's 10 = 28,000 - 32,000 RPM's

Flapwheels

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
502, 503, 504, 505	10	8	2	10	8-10	-	-	-

Finishing Abrasive Buffs

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
511E, 512E	6	6	4	6	6	-	-	-

Detail Abrasive Brushes

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
EZ471SA, EZ472SA, EZ473SA	2-6	2-6	2-4	2-6	2-6			

Drill Bit

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
150	10	8-10	2-4	-	6	-	-	-

Glass Drilling Bits

Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
662DR, 663DR	-	-	-	-	-	4-6	4-6	4-6

Grout Removal Bits

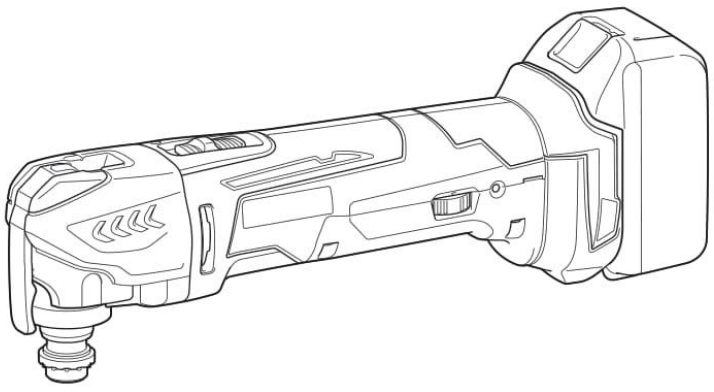
Catalog Number	Soft Wood	Hard Wood	Laminates /Plastic	Steel	Aluminum, Brass, etc.	Shell/ Stone	Ceramic	Glass
569,570	For Use on Wall and Floor Grout						6-8	

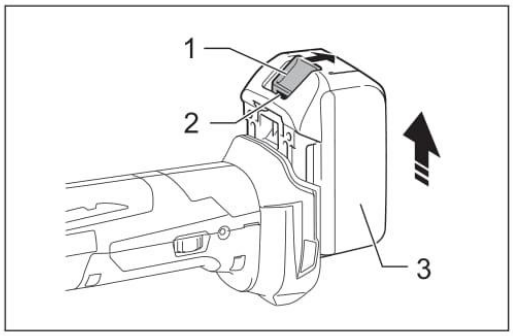
(07.02.2022) (Andrii Kutsiak)
(Version: 0.1)

Makita Multitool:

GB	**Cordless Multi Tool**	**Instruction Manual**
F	**Outil Multi-Fonctions Sans Fil**	**Manuel d'instructions**
D	**Akku-Multifunktions-Werkzeug**	**Betriebsanleitung**
I	**Utensile multifunzione a batteria**	**Istruzioni per l'uso**
NL	**Snoerloze zaag- en schuurmachine**	**Gebruiksaanwijzing**
E	**Multitool Inalámbrica**	**Manual de instrucciones**
P	**Multicortadora Oscilante a Bateria**	**Manual de instruções**
DK	**Akku-multimaskine**	**Brugsanvisning**
GR	Φορητό πολυεργαλείο	Οδηγίες χρήσεως
TR	Akülü Çok Fonksiyonlu Alet	Kullanma kılavuzu

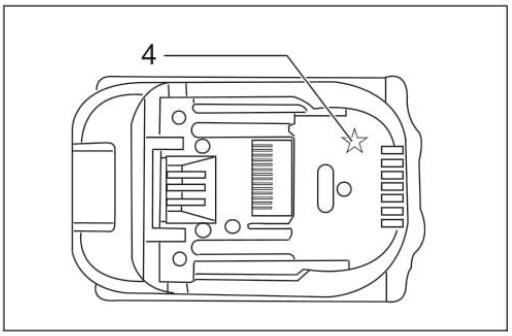
DTM41
DTM51





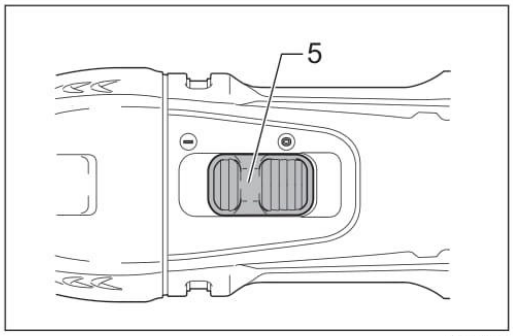
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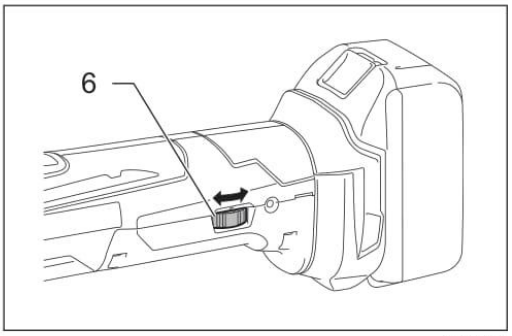
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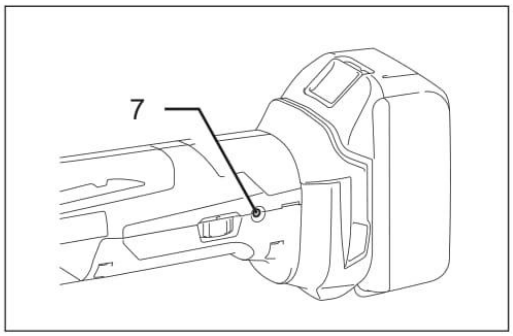
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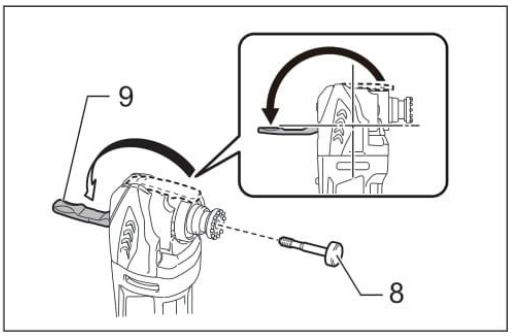
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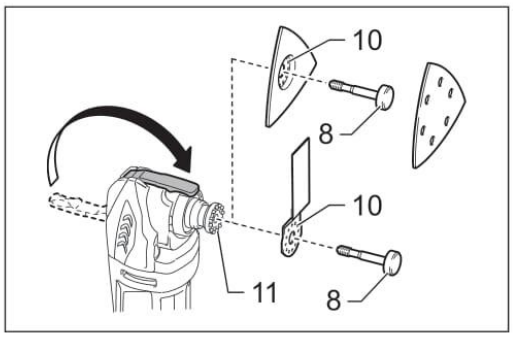
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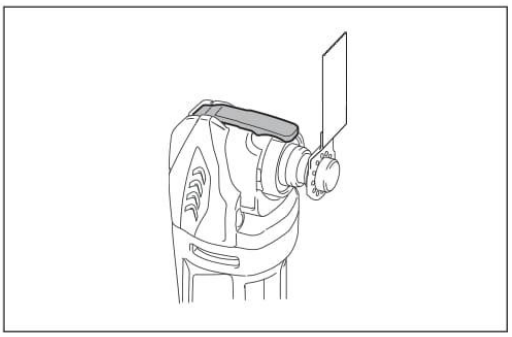
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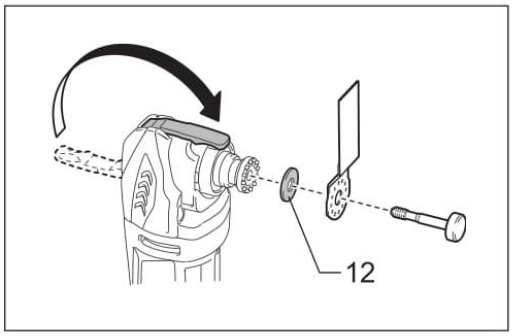
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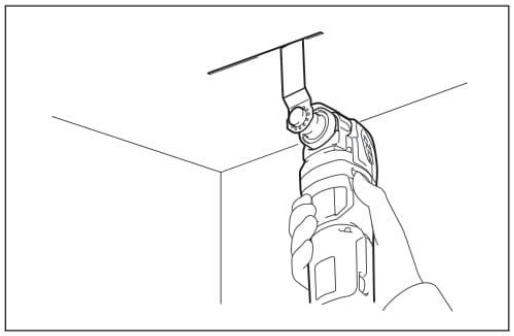


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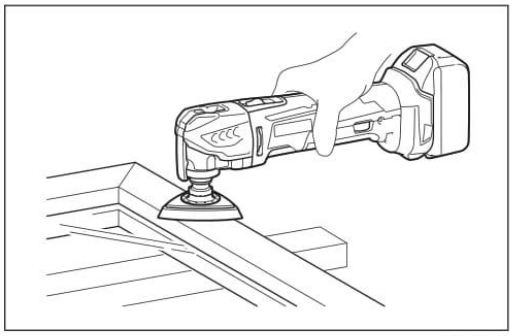
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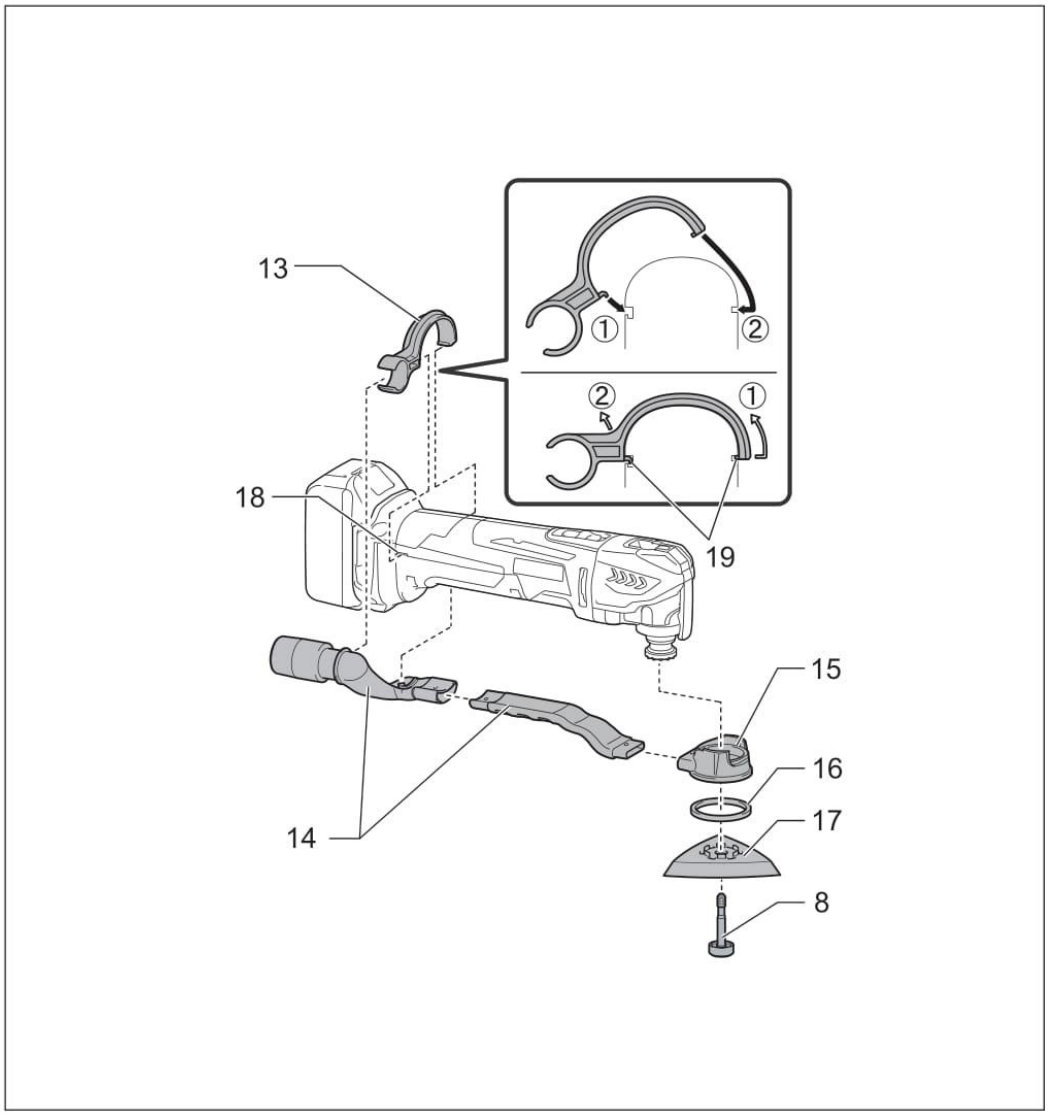
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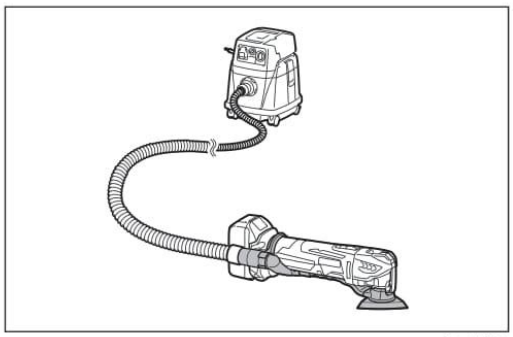


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014562

13

ENGLISH (Original instructions)

Explanation of general view

1 Button
2 Red indicator
3 Battery cartridge
4 Star marking
5 Slide switch
6 Dial
7 Indication lamp
8 Holder bolt
9 Lock lever
10 Holes in the application tool
11 Protrusions of the tool flange
12 Adapter
13 Nozzle band
14 Dust nozzle
15 Dust attachment
16 Felt ring
17 Pad
18 Holes in the tool
19 Protrusions on the nozzle band

SPECIFICATIONS

Model		DTM41		DTM51	
Oscillation per minute		6,000 – 20,000 (min^{-1})			
Oscillation angle, left/right		1.6° (3.2° total)			
Standard battery cartridge		BL1430/ BL1440	BL1415*	BL1830/ BL1840	BL1815*/ BL1815N*
Overall length		340 mm	326 mm	340 mm	326 mm
Net weight	without dust extraction attachment	2.1 kg	2.0 kg	2.2 kg	2.0 kg
	with dust extraction attachment	2.2 kg	2.1 kg	2.3 kg	2.1 kg
Rated voltage		D.C. 14.4 V		D.C. 18 V	

GEB094-2

* NOTE: For continuous operation, high capacity battery cartridge BL1430, BL1440, BL1830 and BL1840 is recommended.

- Due to our continuing program of research and development, the specifications herein are subject to change without notice.
- Specifications and battery cartridge may differ from country to country.
- Weight, with battery cartridge, according to EPTA-Procedure 01/2003

ENE080-1

Intended use

The tool is intended for sawing and cutting wood, plastic, gypsum, non-ferrous metals, and fastening elements (e. g. unhardened nails and staples). It is also intended for working soft wall tiles, as well as dry sanding and scraping of small surfaces. It is especially for working close to edge and flush cutting.

GEA010-1

General Power Tool Safety Warnings

⚠ **WARNING Read all safety warnings and all instructions.** Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

CORDLESS MULTI TOOL SAFETY WARNINGS

1. **This power tool is intended to function for sawing, cutting, grinding and sanding. Read all safety warnings, instructions, illustrations and specifications provided with this power tool.** Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.
2. **Hold power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring.** Cutting accessory contacting a “live” wire may make exposed metal parts of the power tool “live” and could give the operator an electric shock.
3. **Use clamps or another practical way to secure and support the workpiece to a stable platform.** Holding the work by hand or against your body leaves it unstable and may lead to loss of control.
4. **Always use safety glasses or goggles. Ordinary eye or sun glasses are NOT safety glasses.**
5. **Avoid cutting nails. Inspect workpiece for any nails and remove them before operation.**
6. **Hold the tool firmly.**
7. **Make sure the application tool is not contacting the workpiece before the switch is turned on.**
8. **Keep hands away from moving parts.**
9. **Do not leave the tool running. Operate the tool only when hand-held.**
10. **Always switch off and wait for the blade to come to a complete stop before removing the blade from the workpiece.**
11. **Do not touch the application tool or the workpiece immediately after operation; they may be extremely hot and could burn your skin.**
12. **Do not operate the tool at no-load unnecessarily.**
13. **Always use the correct dust mask/respirator for the material and application you are working with.**

14. **Some material contains chemicals which may be toxic. Take caution to prevent dust inhalation and skin contact. Follow material supplier safety data.**
15. **This tool has not been waterproofed, so do not use water on the workpiece surface.**
16. **Ventilate your work area adequately when you perform sanding operations.**
17. **Use of this tool to sand some products, paints and wood could expose user to dust containing hazardous substances. Use appropriate respiratory protection.**
18. **Be sure that there are no cracks or breakage on the pad before use. Cracks or breakage may cause a personal injury.**
19. **Do not use accessories which are not specifically designed and recommended by the tool manufacturer.** Just because the accessory can be attached to your power tool, it does not assure safe operation.
20. **Wear personal protective equipment. Depending on application, use face shield, safety goggles or safety glasses. As appropriate, wear hearing protectors, gloves and workshop apron capable of stopping small abrasive or workpiece fragments.** The eye protection must be capable of stopping flying debris generated by various operations. The dust mask or respirator must be capable of filtrating particles generated by your operation. Prolonged exposure to high intensity noise may cause hearing loss.
21. **Keep bystanders a safe distance away from work area. Anyone entering the work area must wear personal protective equipment.** Fragments of workpiece or of a broken accessory may fly away and cause injury beyond immediate area of operation.
22. **Never lay the power tool down until the accessory has come to a complete stop.** The spinning accessory may grab the surface and pull the power tool out of your control.
23. **Do not run the power tool while carrying it at your side.** Accidental contact with the accessory could snag your clothing, pulling the accessory into your body.
24. **Do not operate the power tool near flammable materials.** Sparks could ignite these materials.
25. **Do not use accessories that require liquid coolants.** Using water or other liquid coolants may result in electrocution or shock.
26. **Always be sure that the tool is switched off and unplugged or that the battery cartridge is removed before carrying out any work on the tool.**
27. **Always be sure you have a firm footing. Be sure no one is below when using the tool in high locations.**

SAVE THESE INSTRUCTIONS.

⚠ **WARNING:**
DO NOT let comfort or familiarity with product (gained from repeated use) replace strict adherence to safety rules for the subject product. MISUSE or failure to follow the safety rules stated in this instruction manual may cause serious personal injury.

ENC007-8

IMPORTANT SAFETY INSTRUCTIONS

FOR BATTERY CARTRIDGE

1. **Before using battery cartridge, read all instructions and cautionary markings on (1) battery charger, (2) battery, and (3) product using battery.**
2. **Do not disassemble battery cartridge.**
3. **If operating time has become excessively shorter, stop operating immediately. It may result in a risk of overheating, possible burns and even an explosion.**
4. **If electrolyte gets into your eyes, rinse them out with clear water and seek medical attention right away. It may result in loss of your eyesight.**
5. **Do not short the battery cartridge:**
   (1) Do not touch the terminals with any conductive material.
   (2) Avoid storing battery cartridge in a container with other metal objects such as nails, coins, etc.
   (3) Do not expose battery cartridge to water or rain.
   A battery short can cause a large current flow, overheating, possible burns and even a breakdown.
6. **Do not store the tool and battery cartridge in locations where the temperature may reach or exceed 50°C (122°F).**
7. **Do not incinerate the battery cartridge even if it is severely damaged or is completely worn out. The battery cartridge can explode in a fire.**
8. **Be careful not to drop or strike battery.**
9. **Do not use a damaged battery.**
10. **Follow your local regulations relating to disposal of battery.**

SAVE THESE INSTRUCTIONS.

Tips for maintaining maximum battery life

1. **Charge the battery cartridge before completely discharged.**
   Always stop tool operation and charge the battery cartridge when you notice less tool power.
2. **Never recharge a fully charged battery cartridge. Overcharging shortens the battery service life.**
3. **Charge the battery cartridge with room temperature at 10°C – 40°C (50°F – 104°F). Let a hot battery cartridge cool down before charging it.**
4. **Charge the battery cartridge once in every six months if you do not use it for a long period of time.**

FUNCTIONAL DESCRIPTION

⚠ **WARNING:**
- **Always be sure that the tool is switched off and battery cartridge is removed before adjusting or checking function on the tool.** Failure to switch off and remove the battery cartridge may result in serious personal injury from accidental start-up.

Installing or removing battery cartridge (Fig. 1)

⚠ **CAUTION:**
- Always switch off the tool before installing or removing of the battery cartridge.
- **Hold the tool and the battery cartridge firmly when installing or removing battery cartridge.** Failure to hold the tool and the battery cartridge firmly may cause them to slip off your hands and result in damage to the tool and battery cartridge and a personal injury.

To remove the battery cartridge, slide it from the tool while sliding the button on the front of the cartridge.
To install the battery cartridge, align the tongue on the battery cartridge with the groove in the housing and slip it into place. Insert it all the way until it locks in place with a little click. If you can see the red indicator on the upper side of the button, it is not locked completely.

⚠ **CAUTION:**
- Always install the battery cartridge fully until the red indicator cannot be seen. If not, it may accidentally fall out of the tool, causing injury to you or someone around you.
- Do not install the battery cartridge forcibly. If the cartridge does not slide in easily, it is not being inserted correctly.

Battery protection system (Lithium-ion battery with star marking) (Fig. 2)

Lithium-ion batteries with a star marking are equipped with a protection system. This system automatically cuts off power to the tool to extend battery life.
The tool will automatically stop during operation if the tool and/or battery are placed under one of the following conditions:
- Overloaded:
  The tool is operated in a manner that causes it to draw an abnormally high current.
  In this situation, slide the slide switch on the tool toward the “O (OFF)” position and stop the application that caused the tool to become overloaded. Then slide the slide switch toward the “I (ON)” position again to restart.
  If the tool does not start, the battery is overheated. In this situation, let the battery cool before sliding the slide switch toward the “I (ON)” position again.
- Low battery voltage:
  The remaining battery capacity is too low and the tool will not operate. In this situation, remove and recharge the battery.

Overheat protection

When the tool is overloaded and the tool temperature reaches a certain level, the tool automatically stops. In this situation, let the tool cool before turning on the tool again.

Switch action (Fig. 3)

⚠ **CAUTION:**
- Before installing the battery cartridge into the tool, always check to see that the tool is switched off.

To start the tool, slide the slide switch toward the “I (ON)” position.
To stop the tool, slide the slide switch toward the “O (OFF)” position.

Adjusting the orbital stroke rate (Fig. 4)

The orbital stroke rate is adjustable. To change the orbital stroke rate, turn the dial between 1 and 6. The higher the number is, the higher the orbital stroke rate is. Preset the dial to the number suitable for your workpiece.

NOTE:
- The dial cannot be turned directly from 1 to 6 or from 6 to 1. Forcing the dial may damage the tool. When changing the dial direction, always turn the dial moving it through each intermediate number.

Indication lamp (Fig. 5)

- When the remaining battery capacity gets low, the indication lamp blinks.
- When the remaining battery capacity gets much lower, the tool stops during operation and the indication lamp lights up about 10 seconds.

At this time, remove the battery cartridge from the tool and charge it.

ASSEMBLY

⚠ **CAUTION:**
- Always be sure that the tool is switched off and the battery cartridge is removed before carrying out any work on the tool.

Installing or removing application tool (optional accessory) (Fig. 6, 7, 8 & 9)

⚠ **WARNING:**
- Do not install application tool upside down. Installing application tool upside down may damage the tool and cause serious personal injury.
- Install attachment tool in the correct direction according to your work. Application tool can be installed at an angle of every 30 degree.

⚠ **CAUTION:**
- Be careful when closing the lock lever. The lock lever may close suddenly and pinch your finger.
- Clean up dust and perform lubrication on the moving part of the lock lever from time to time.
  Otherwise dust may accumulate in the moving part of the lock lever and hinder its smooth movement.
- Do not start the tool while the lever opens. The tool may be damaged.

1. Open the lock lever fully. And remove the holder bolt.
2. Put an application tool (optional accessory) on the tool flange so that the protrusions of the tool flange fit in the holes in the application tool.
3. Insert the holder bolt till it stops. And then, return the lock lever to its original position.

When using sanding application tool, mount the application tool on the sanding pad so that it matches the sanding pad direction.
The sanding pad has a hook and loop type fitting system which allows easy and rapid fitting of a sanding paper.

As sanding papers have holes for dust extraction, mount a sanding paper so that the holes in a sanding paper match those in the sanding pad.

To remove a sanding paper, raise its end and peel it off.

To remove the holder bolt, follow the installation procedures in reverse.

When using application tools with a different type of installation section, use a correct adapter (optional accessory).

OPERATION

⚠ **WARNING:**
- Before starting the tool and during operation, keep your hand and face away from the application tool.

⚠ **CAUTION:**
- Do not apply excessive load to the tool which may cause a motor lock and stop the tool.

Cutting, sawing and scraping (Fig. 10)

⚠ **CAUTION:**
- Do not move on the tool forcibly in the direction (eg. towards either side) of tool application with no cutting edge. It may damage the tool.

Put the application tool on the workpiece.
And then move the tool forward so that the application tool movement does not slow down.

NOTE:
- Forcing or excessive pressure on the tool may reduce efficiency.
- Before cutting operation, it is recommended to preset the orbital stroke rate 4 – 6.
- Remove sawdust by drawing the tool adequately. It increases work efficiency.
- The round saw is recommended for cutting long straight line.

Sanding (Fig. 11)

⚠ **CAUTION:**
- Do not reuse a sanding paper used for sanding metal to sand wood.
- Do not use a worn sanding paper or sanding paper without grit.

Apply a sanding paper on the workpiece.

NOTE:
- Using a test material sample to try is recommendable to determine a correct orbital stroke rate suitable for your work.
- Use a sanding paper with the same grit until sanding the whole workpiece is completed. Replacing a sanding paper with different grit sanding paper may not get a fine finish.

Dust extraction attachment (optional accessory) (Fig. 12 & 13)
- Install dust nozzles and dust attachment.
- Install the nozzle band on the tool so that its protrusions fit in the holes in the tool to secure it.
- Put the felt ring and the sanding pad on the dust attachment and then secure them with the application tool installation bolt.

When you wish to perform cleaner operation, connect a vacuum cleaner to your tool. Connect a hose of vacuum cleaner to the dust extraction attachment (optional accessory).

MAINTENANCE

⚠ **CAUTION:**
- Always be sure that the tool is switched off and the battery cartridge is removed before attempting to perform inspection or maintenance.
- Never use gasoline, benzine, thinner, alcohol or the like. Discoloration, deformation or cracks may result.

To maintain product SAFETY and RELIABILITY, repairs, carbon brush inspection and replacement, any other maintenance or adjustment should be performed by Makita Authorized Service Centers, always using Makita replacement parts.

OPTIONAL ACCESSORIES

⚠ **CAUTION:**
- These accessories or attachments are recommended for use with your Makita tool specified in this manual. The use of any other accessories or attachments might present a risk of injury to persons. Only use accessory or attachment for its stated purpose.

If you need any assistance for more details regarding these accessories, ask your local Makita Service Center.

- Segment saw blade
- Round saw blade
- Plunge cut saw blade
- Scraper (rigid)
- Scraper (flexible)
- Serrated seg blade
- General joint cutter
- HM remover
- HM seg saw blade
- HM sanding plate
- Diamond seg sawblade
- Sanding pad
- Adapter
- Abrasive paper delta (red / white / black)
- Fleece delta (medium / coarse / without grit)
- Polishing felt delta
- Hex wrench
- Dust extraction attachment
- Makita genuine battery and charger

NOTE:
- Some items in the list may be included in the tool package as standard accessories. They may differ from country to country.

ENG905-1

Noise

The typical A-weighted noise level determined according to EN60745:

Work mode: Sanding

Model DTM41

Sound pressure level (L_{pA}): 76 dB (A)
Uncertainty (K): 3 dB (A)

The noise level under working may exceed 80 dB (A).

Model DTM51

Sound pressure level (L_{pA}): 77 dB (A)
Uncertainty (K): 3 dB (A)

The noise level under working may exceed 80 dB (A).

Work mode: Cutting with plunge cut saw blade

Model DTM41

Sound pressure level (L_{pA}): 80 dB (A)
Sound power level (L_{WA}): 91 dB (A)
Uncertainty (K): 3 dB (A)

Model DTM51

Sound pressure level (L_{pA}): 81 dB (A)
Sound power level (L_{WA}): 92 dB (A)
Uncertainty (K): 3 dB (A)

Work mode: Cutting with segmental saw blade

Model DTM41

Sound pressure level (L_{pA}): 77 dB (A)
Uncertainty (K): 3 dB (A)
The noise level under working may exceed 80 dB (A).

Model DTM51

Sound pressure level (L_{pA}): 76 dB (A)
Uncertainty (K): 3 dB (A)
The noise level under working may exceed 80 dB (A).

Work mode: Scraping

Model DTM41

Sound pressure level (L_{pA}): 78 dB (A)
Uncertainty (K): 3 dB (A)
The noise level under working may exceed 80 dB (A).

Model DTM51

Sound pressure level (L_{pA}): 80 dB (A)
Sound power level (L_{WA}): 91 dB (A)
Uncertainty (K): 3 dB (A)

Wear ear protection

ENG900-1

Vibration
The vibration total value (tri-axial vector sum) determined according to EN60745:

Model DTM41

Work mode: sanding
Vibration emission (a_h): 3.0 m/s^2
Uncertainty (K): 1.5 m/s^2

Model DTM51

Work mode: sanding
Vibration emission (a_h): 3.0 m/s^2
Uncertainty (K): 1.5 m/s^2

Model DTM41

Work mode: cutting with plunge cut saw blade
Vibration emission (a_h): 7.0 m/s^2
Uncertainty (K): 1.5 m/s^2

Model DTM51

Work mode: cutting with plunge cut saw blade
Vibration emission (a_h): 7.0 m/s^2
Uncertainty (K): 1.5 m/s^2

Model DTM41

Work mode: cutting with segment saw blade
Vibration emission (a_h): 4.5 m/s^2
Uncertainty (K): 1.5 m/s^2

Model DTM51

Work mode: cutting with segment saw blade
Vibration emission (a_h): 4.5 m/s^2
Uncertainty (K): 1.5 m/s^2

Model DTM41

Work mode: scraping
Vibration emission (a_h): 5.0 m/s^2
Uncertainty (K): 1.5 m/s^2

Model DTM51

Work mode: scraping
Vibration emission (a_h): 5.5 m/s^2
Uncertainty (K): 1.5 m/s^2

ENG901-1

- The declared vibration emission value has been measured in accordance with the standard test method and may be used for comparing one tool with another.
- The declared vibration emission value may also be used in a preliminary assessment of exposure.

⚠ **WARNING:**

- The vibration emission during actual use of the power tool can differ from the declared emission value depending on the ways in which the tool is used.
- Be sure to identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle in addition to the trigger time).

ENH101-17

For European countries only

EC Declaration of Conformity

Makita declares that the following Machine(s):
Designation of Machine:
Cordless Multi Tool
Model No./ Type: DTM41, DTM51
Conforms to the following European Directives:
2006/42/EC
They are manufactured in accordance with the following Standard or standardized documents:
EN60745
The Technical file in accordance with 2006/42/EC is available from:
Makita, Jan-Baptist Vinkstraat 2, 3070, Belgium

18.7.2013



Yasushi Fukaya
Director
Makita, Jan-Baptist Vinkstraat 2, 3070, Belgium

(07.02.2022) (Andrii Kutsiak)
(Version: 0.1)

Impact driver:

EN	Cordless Impact Driver	INSTRUCTION MANUAL	5
SV	Batteridriven slagskruvdragare	BRUKSANVISNING	13
NO	Batteridrevet slagskrutrekker	BRUKSANVISNING	21
FI	Akkukäyttöinen iskuväännin	KÄYTTÖOHJE	30
LV	Bezvada triecienskrūvgriezis	LIETOŠANAS INSTRUKCIJA	39
LT	Belaidis smūginis suktuvas	NAUDOJIMO INSTRUKCIJA	48
ET	Juhtmeta löökkruvikeeraja	KASUTUSJUHEND	57
RU	Аккумуляторный ударный шуруповерт	РУКОВОДСТВО ПО ЭКСПЛУАТАЦИИ	66

DTD171



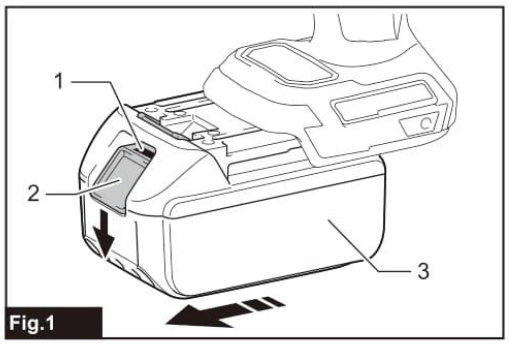


Fig.1

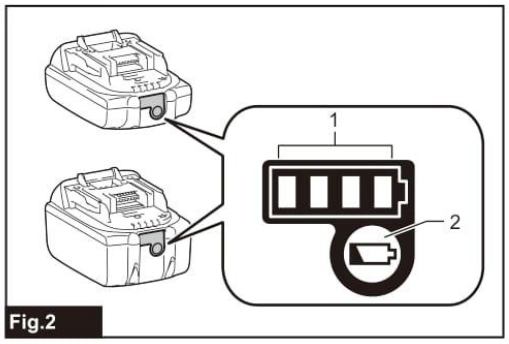


Fig.2

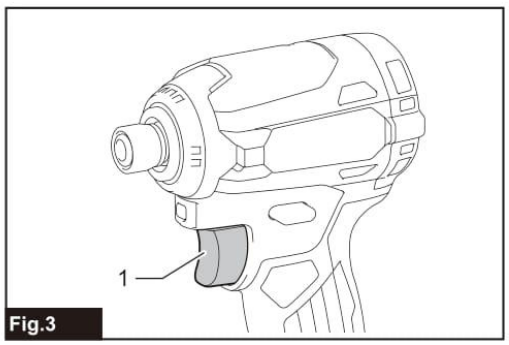


Fig.3

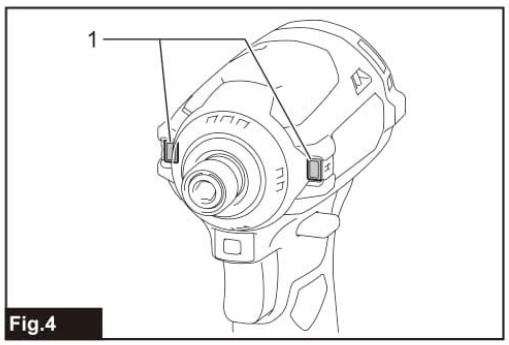


Fig.4

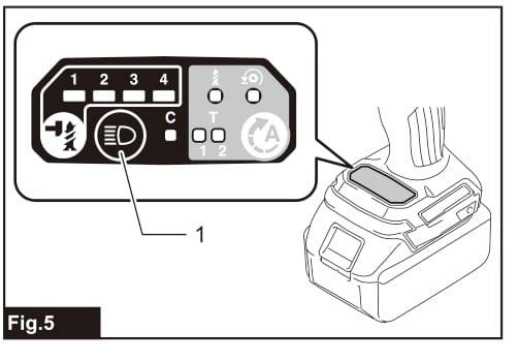


Fig.5

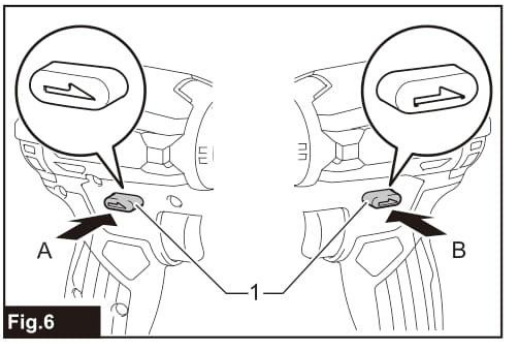


Fig.6

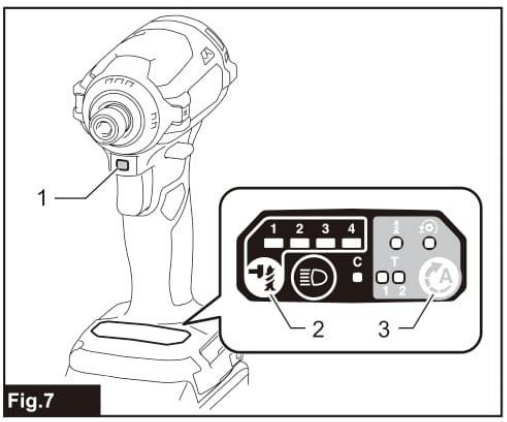


Fig.7

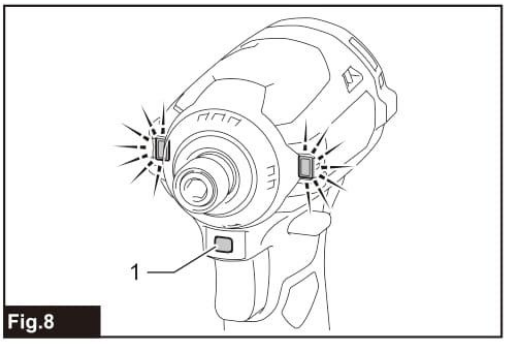


Fig.8

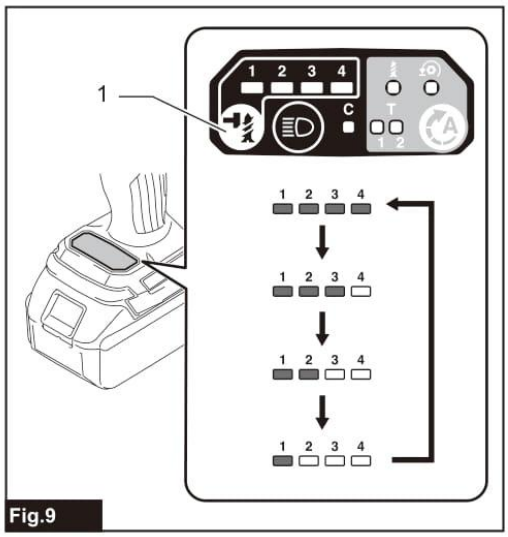


Fig.9

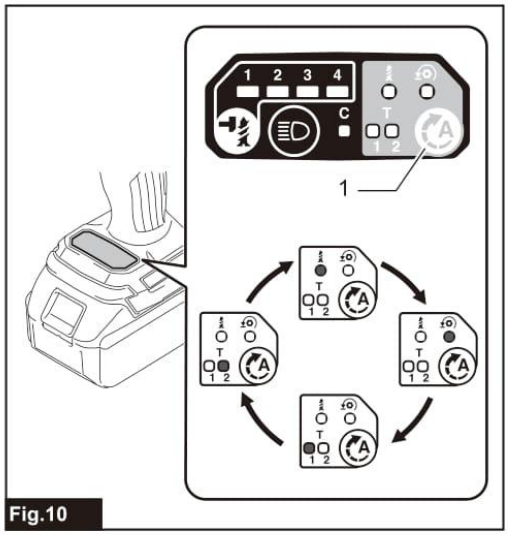


Fig.10

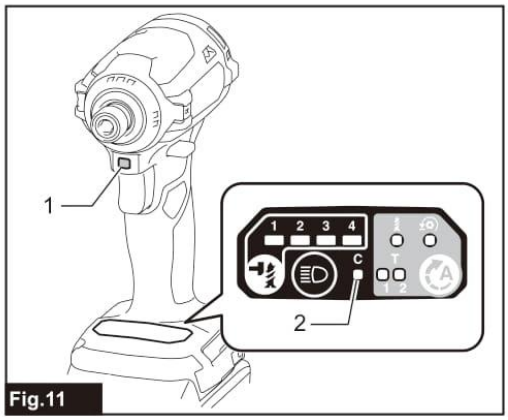


Fig.11

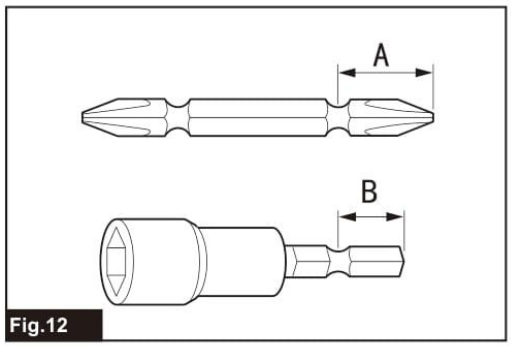


Fig.12

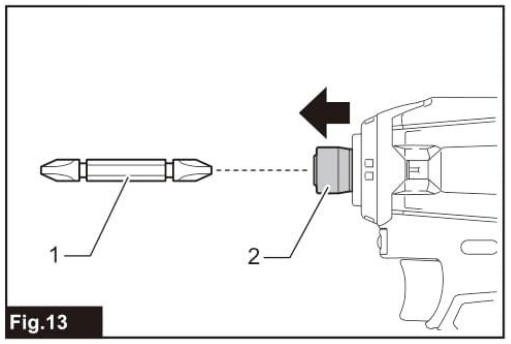


Fig.13

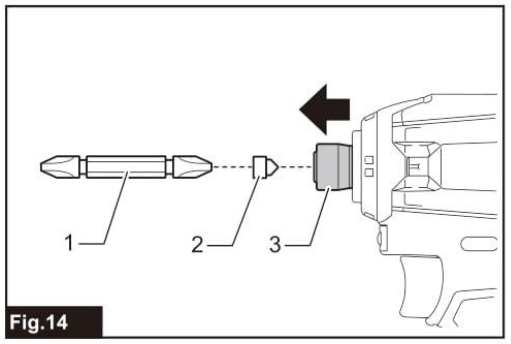


Fig.14

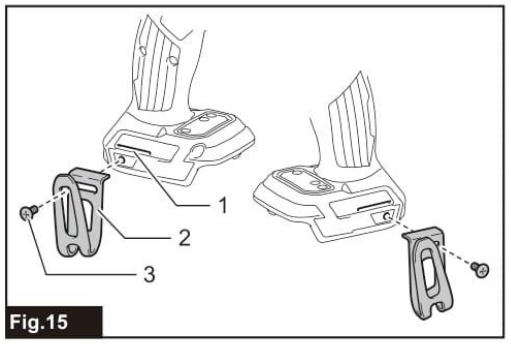


Fig.15

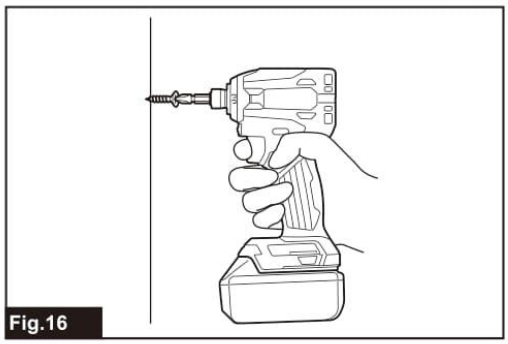


Fig.16

ENGLISH (Original instructions)

SPECIFICATIONS

Model:		DTD171
Fastening capacities	Machine screw	4 mm - 8 mm
	Standard bolt	5 mm - 16 mm
	High tensile bolt	5 mm - 14 mm
No load speed	Max impact mode	0 - 3,600 min^{-1}
	Hard impact mode	0 - 3,200 min^{-1}
	Medium impact mode	0 - 2,100 min^{-1}
	Soft impact mode	0 - 1,100 min^{-1}
	Wood mode	0 - 1,800 min^{-1}
	Bolt mode	0 - 3,600 min^{-1}
	T mode (1)	0 - 2,900 min^{-1}
	T mode (2)	0 - 3,600 min^{-1}
Impacts per minute	Max impact mode	0 - 3,800 min^{-1}
	Hard impact mode	0 - 3,600 min^{-1}
	Medium impact mode	0 - 2,600 min^{-1}
	Soft impact mode	0 - 1,100 min^{-1}
	Wood mode	0 - 3,800 min^{-1}
	Bolt mode	0 - 3,800 min^{-1}
	T mode (1)	-
	T mode (2)	0 - 2,600 min^{-1}
Rated voltage		D.C. 18 V
Overall length		116 mm
Net weight		1.2 - 1.5 kg

- Due to our continuing program of research and development, the specifications herein are subject to change without notice.
- Specifications may differ from country to country.
- The weight may differ depending on the attachment(s), including the battery cartridge. The lightest and heaviest combination, according to EPTA-Procedure 01/2014, are shown in the table.

Applicable battery cartridge and charger

Battery cartridge	BL1815N / BL1820 / BL1820B / BL1830 / BL1830B / BL1840 / BL1840B / BL1850 / BL1850B / BL1860B
Charger	DC18RC / DC18RD / DC18RE / DC18SD / DC18SE / DC18SF

- Some of the battery cartridges and chargers listed above may not be available depending on your region of residence.

⚠ ***WARNING:*** **Only use the battery cartridges and chargers listed above.** Use of any other battery cartridges and chargers may cause injury and/or fire.

Intended use

The tool is intended for screw driving in wood, metal and plastic.

Noise

The typical A-weighted noise level determined according to EN62841-2-2:
Sound pressure level (L_{pA}) : 97 dB(A)
Sound power level (L_{WA}) : 108 dB (A)
Uncertainty (K) : 3 dB(A)

⚠ ***WARNING:*** **Wear ear protection.**

Vibration

The vibration total value (tri-axial vector sum) determined according to EN62841-2-2:
Work mode: impact tightening of fasteners of the maximum capacity of the tool
Vibration emission (a_h) : 13.5 m/s^2
Uncertainty (K) : 1.5 m/s^2

NOTE: The declared vibration emission value has been measured in accordance with the standard test method and may be used for comparing one tool with another.

NOTE: The declared vibration emission value may also be used in a preliminary assessment of exposure.

⚠***WARNING:*** The vibration emission during actual use of the power tool can differ from the declared emission value depending on the ways in which the tool is used.

⚠***WARNING:*** Be sure to identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle in addition to the trigger time).

EC Declaration of Conformity

For European countries only

The EC declaration of conformity is included as Annex A to this instruction manual.

SAFETY WARNINGS

General power tool safety warnings

⚠***WARNING:*** **Read all safety warnings, instructions, illustrations and specifications provided with this power tool.** Failure to follow all instructions listed below may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

Cordless impact driver safety warnings

1. **Hold the power tool by insulated gripping surfaces, when performing an operation where the fastener may contact hidden wiring.** Fasteners contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.
2. **Always be sure you have a firm footing. Be sure no one is below when using the tool in high locations.**
3. **Hold the tool firmly.**
4. **Wear ear protectors.**
5. **Do not touch the bit or the workpiece immediately after operation. They may be extremely hot and could burn your skin.**
6. **Keep hands away from rotating parts.**
7. **Use auxiliary handle(s), if supplied with the tool.** Loss of control can cause personal injury.
8. **Hold the power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring.** Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.

SAVE THESE INSTRUCTIONS.

⚠***WARNING:*** **DO NOT let comfort or familiarity with product (gained from repeated use) replace strict adherence to safety rules for the subject product.**

MISUSE or failure to follow the safety rules stated in this instruction manual may cause serious personal injury.

Important safety instructions for battery cartridge

1. **Before using battery cartridge, read all instructions and cautionary markings on (1) battery charger, (2) battery, and (3) product using battery.**
2. **Do not disassemble battery cartridge.**
3. **If operating time has become excessively shorter, stop operating immediately. It may result in a risk of overheating, possible burns and even an explosion.**
4. **If electrolyte gets into your eyes, rinse them out with clear water and seek medical attention right away. It may result in loss of your eyesight.**
5. **Do not short the battery cartridge:**
   (1) **Do not touch the terminals with any conductive material.**
   (2) **Avoid storing battery cartridge in a container with other metal objects such as nails, coins, etc.**
   (3) **Do not expose battery cartridge to water or rain.**

   A battery short can cause a large current flow, overheating, possible burns and even a breakdown.
6. **Do not store the tool and battery cartridge in locations where the temperature may reach or exceed 50 °C (122 °F).**
7. **Do not incinerate the battery cartridge even if it is severely damaged or is completely worn out. The battery cartridge can explode in a fire.**
8. **Be careful not to drop or strike battery.**
9. **Do not use a damaged battery.**
10. **The contained lithium-ion batteries are subject to the Dangerous Goods Legislation requirements.** For commercial transports e.g. by third parties, forwarding agents, special requirement on packaging and labeling must be observed.
    For preparation of the item being shipped, consulting an expert for hazardous material is required.
    Please also observe possibly more detailed national regulations.
    Tape or mask off open contacts and pack up the battery in such a manner that it cannot move around in the packaging.
11. **Follow your local regulations relating to disposal of battery.**
12. **Use the batteries only with the products specified by Makita.** Installing the batteries to non-compliant products may result in a fire, excessive heat, explosion, or leak of electrolyte.

SAVE THESE INSTRUCTIONS.

⚠***CAUTION:*** **Only use genuine Makita batteries.** Use of non-genuine Makita batteries, or batteries that have been altered, may result in the battery bursting causing fires, personal injury and damage. It will also void the Makita warranty for the Makita tool and charger.

Tips for maintaining maximum battery life

1. **Charge the battery cartridge before completely discharged. Always stop tool operation and charge the battery cartridge when you notice less tool power.**
2. **Never recharge a fully charged battery cartridge. Overcharging shortens the battery service life.**
3. **Charge the battery cartridge with room temperature at 10 °C - 40 °C (50 °F - 104 °F). Let a hot battery cartridge cool down before charging it.**
4. **Charge the battery cartridge if you do not use it for a long period (more than six months).**

FUNCTIONAL DESCRIPTION

⚠*CAUTION:* Always be sure that the tool is switched off and the battery cartridge is removed before adjusting or checking function on the tool.

Installing or removing battery cartridge

⚠*CAUTION:* Always switch off the tool before installing or removing of the battery cartridge.

⚠*CAUTION:* Hold the tool and the battery cartridge firmly when installing or removing battery cartridge. Failure to hold the tool and the battery cartridge firmly may cause them to slip off your hands and result in damage to the tool and battery cartridge and a personal injury.

► **Fig.1:** **1.** Red indicator **2.** Button **3.** Battery cartridge

To remove the battery cartridge, slide it from the tool while sliding the button on the front of the cartridge.

To install the battery cartridge, align the tongue on the battery cartridge with the groove in the housing and slip it into place. Insert it all the way until it locks in place with a little click. If you can see the red indicator on the upper side of the button, it is not locked completely.

⚠*CAUTION:* Always install the battery cartridge fully until the red indicator cannot be seen. If not, it may accidentally fall out of the tool, causing injury to you or someone around you.

⚠*CAUTION:* Do not install the battery cartridge forcibly. If the cartridge does not slide in easily, it is not being inserted correctly.

Tool / battery protection system

The tool is equipped with a tool/battery protection system. This system automatically cuts off power to the motor to extend tool and battery life. The tool will automatically stop during operation if the tool or battery is placed under one of the following conditions:

Overload protection

When the battery is operated in a manner that causes it to draw an abnormally high current, the tool stops automatically. In this situation, turn the tool off and stop the application that caused the tool to become overloaded. Then turn the tool on to restart.

Overheat protection

When the tool/battery is overheated, the tool stops automatically. In this situation, let the tool/battery cool before turning the tool on again.

Overdischarge protection

When the battery capacity is not enough, the tool stops automatically. In this case, remove the battery from the tool and charge the battery.

Indicating the remaining battery capacity

Only for battery cartridges with the indicator

► **Fig.2:** **1.** Indicator lamps **2.** Check button

Press the check button on the battery cartridge to indicate the remaining battery capacity. The indicator lamps light up for a few seconds.

Indicator lamps			Remaining capacity
Lighted	Off	Blinking	
■ ■ ■ ■			75% to 100%
■ ■ ■ □			50% to 75%
■ ■ □ □			25% to 50%
■ □ □ □			0% to 25%
◪ □ □ □			Charge the battery.
■ ■ □ □ ↑ ↓ □ □ ■ ■			The battery may have malfunctioned.

NOTE: Depending on the conditions of use and the ambient temperature, the indication may differ slightly from the actual capacity.

Switch action

► **Fig.3:** **1.** Switch trigger

⚠*CAUTION:* Before installing the battery cartridge into the tool, always check to see that the switch trigger actuates properly and returns to the "OFF" position when released.

To start the tool, simply pull the switch trigger. Tool speed is increased by increasing pressure on the switch trigger. Release the switch trigger to stop.

NOTE: The tool automatically stops if you keep pulling the switch trigger for about 6 minutes.

NOTE: While pulling the switch trigger, any other buttons do not work.

Lighting up the front lamp

⚠CAUTION: Do not look in the light or see the source of light directly.

► **Fig.4: 1.** Lamp

► **Fig.5: 1.** Button

Pull the switch trigger to turn on the lamp. To turn off, release it. The lamp goes out approximately 10 seconds after releasing the switch trigger.

To keep the lamp off, turn off the lamp status. To turn off the lamp status, first pull and release the switch trigger. And then press the button within 10 seconds.
To turn on the lamp status again, press the button again similarly.

NOTE: When the tool is overheated, the light flashes for one minute, and then the LED display goes off. In this case, cool down the tool before operating again.

NOTE: To confirm the lamp status, pull the trigger. When the lamp lights up by pulling the switch trigger, the lamp status is ON. When the lamp does not come on, the lamp status is OFF.

NOTE: Use a dry cloth to wipe the dirt off the lens of the lamp. Be careful not to scratch the lens of lamp, or it may lower the illumination.

Reversing switch action

► **Fig.6: 1.** Reversing switch lever

⚠CAUTION: Always check the direction of rotation before operation.

⚠CAUTION: Use the reversing switch only after the tool comes to a complete stop. Changing the direction of rotation before the tool stops may damage the tool.

⚠CAUTION: When not operating the tool, always set the reversing switch lever to the neutral position.

This tool has a reversing switch to change the direction of rotation. Depress the reversing switch lever from the A side for clockwise rotation or from the B side for counterclockwise rotation.
When the reversing switch lever is in the neutral position, the switch trigger cannot be pulled.

Changing the application mode

What's the application mode?

The application mode is the variation of the driving rotation and impact which are already preset in the tool. By choosing a suitable application mode depending on the work, you can accomplish quicker work and/or more beautiful finish.

This tool features following application modes:
Impact force
- Max
- Hard
- Medium
- Soft

Assist type
- Wood mode
- Bolt mode
- T mode (1)
- T mode (2)

The application mode can be changed by the button , , or the quick mode-switching button.
► **Fig.7: 1.** Quick mode-switching button **2.** Button **3.** Button

By registering a certain application mode to the tool, you can switch to the registered application mode by just pressing the quick mode-switching button (quick mode-switching function).

NOTE: When none of the lamp on the panel is lit, pull the switch trigger once before pressing the quick mode-switching button.

NOTE: You will not be able to change the application mode if you do not operate the tool for approximately one minute. In this case, pull the switch trigger once and press the button, button, or quick mode-switching button.

NOTE: Refer to "Registering the application mode" in "Quick mode-switching function" section for how to register the application mode.

Quick mode-switching button

The function of the quick mode-switching button varies depending on whether you have registered the application mode to the tool.
► **Fig.8: 1.** Quick mode-switching button

When the application mode is not registered:

The level of impact force changes every time you press the quick mode-switching button. The front lamps on both sides will flash once when the impact force is changed by pressing the quick mode-switching button.

When the application mode is registered:

The tool switches between the registered application mode and current application mode every time you press the quick mode-switching button. The front lamps on both sides will flash once when the application mode is changed by pressing the quick mode-switching button.

NOTE: When the lamp status is off, the lamps will not flash even when the application mode is changed by pressing the quick mode-switching button.

NOTE: Refer to "Registering the application mode" in "Quick mode-switching function" section for how to register the application mode.

Disabling the quick mode-switching button

You can also disable the quick mode-switching button. After disabling, the quick mode-switching button will not work for changing the impact force and switching the application mode.

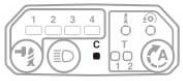
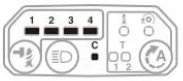
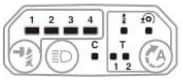
To disable the quick mode-switching button, press and hold the quick mode-switching button and the button at the same time until the all lamps on the panel blink.

To resume the quick mode-switching button, perform the same procedure as above again.

NOTE: Registering and erasing the application mode can be performed even if the quick mode-switching button is disabled. After registering or erasing the application mode, the quick mode-switching button will be activated.

Quick reference

The following table shows the functions of the quick mode-switching button.
▢ indicates the quick mode-switching button.

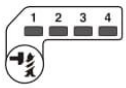
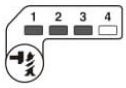
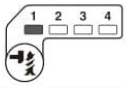
Button(s) / Purpose	How to confirm
▢ +  **Registering the application mode**	 The customize lamp and the lamp of desired application mode blinks.
▢ **(When quick mode-switching function is OFF) Changing the impact force by the quick mode-switching button**	 The lamps on the tool flash once.
▢ **(When quick mode-switching function is ON) Switching to the registered application mode**	 The lamps on the tool flash once.
▢ +  **Erasing the registered application mode**	 The customize lamp and all impact force grade lamps blink.
▢ +  **Disabling/resuming the quick mode-switching button**	 All lamps on the panel blink.

Changing the impact force

You can change the impact force in four steps: max, hard, medium, and soft.
This allows a tightening suitable to the work.
The level of impact force changes every time you press the button or the quick mode-switching button.

You can change the impact force within approximately one minute after releasing the switch trigger or pressing the button , , or the quick mode-switching button.

► **Fig.9: 1.** Button

Application mode (Impact force grade displayed on panel)	Maximum blows	Purpose	Example of application
Max 	3,800 min^{-1} (/min)	Tightening with the maximum force and speed.	Driving screws to underwork materials, tightening long screws or bolts.
Hard 	3,600 min^{-1} (/min)	Tightening with less force and speed than Max mode (easier to control than Max mode).	Driving screws to underwork materials, tightening bolts.
Medium 	2,600 min^{-1} (/min)	Tightening when a good finishing is needed.	Driving screws to finishing boards or plaster boards.
Soft 	1,100 min^{-1} (/min)	Tightening with less force to avoid screw thread breakage.	Tightening sash screws or small screws such as M6.

NOTE: When none of the lamp on the panel is lit, pull the switch trigger once before pressing the button  or the quick mode-switching button.

NOTE: All lamps on the switch panel go out when the tool is turned off to save the battery power. The impact force grade can be checked by pulling the switch trigger to the extent that the tool does not operate.

Changing assist type

This tool employs assist function that offers several easy-to-use application modes for driving screws with good control.

The type of the application mode changes every time you press the button .

You can change the assist type within approximately one minute after releasing the switch trigger or pressing the button , , or the quick mode-switching button.

► **Fig.10: 1.** Button

Application mode (Assist type displayed on panel)	Maximum blows	Feature	Purpose
Wood mode *1 	3,800 min^{-1} (/min)	This mode helps to prevent a screw from falling at the beginning of driving. The tool drives a screw with low-speed rotation at first. After the tool starts to impact, the rotation speed increases and reaches the maximum speed.	Tightening long screws.
Bolt mode (reverse rotation auto stop) *1 *2 	3,800 min^{-1} (/min)	This mode helps to prevent a bolt from falling off. When loosening a bolt with the tool driving in counterclockwise rotation, the tool automatically stops after the bolt/nut gets enough loosened. The stroke of the switch trigger to reach maximum speed will become short in this mode.	Loosening bolts.
T mode (1) *1 	– (The tool stops rotating soon after impact starts.)	This mode helps to prevent the screws from over-tightening. It also accomplishes quick operation and good finish at the same time. The tool drives a screw with high-speed rotation and stops soon after the tool starts to impact. **NOTE: The timing to stop the driving varies depending on the type of the screw and material to be driven. Make a test driving before using this mode.**	Driving self-drilling screws to a thin metal plate with good finish.
T mode (2) *1 	2,600 min^{-1} (/min)	This mode helps to prevent the screws from breakage and stripping. It also accomplishes quick operation and good finish at the same time. The tool drives a screw with high-speed rotation and slows down the rotation when the tool starts to impact. **NOTE: Release the switch trigger as soon as the tightening finished to avoid overtightening.**	Driving self-drilling screws to a thick metal plate with good finish.

*1 : Automatic speed control works only when the switch trigger is fully pulled.
*2 : Reverse rotation auto stop works only when the tool is driving in counterclockwise rotation.

NOTE: When none of the lamp on the panel is lit, pull the switch trigger once before pressing the button .

NOTE: All lamps on the switch panel go out when the tool is turned off to save the battery power. The type of the application mode can be checked by pulling the switch trigger to the extent that the tool does not operate.

Quick mode-switching function

What you can do with the quick mode-switching function

The quick mode-switching function saves the time for changing the application mode of the tool. You can switch to your desired application mode by just pressing the quick mode-switching button. It is helpful when doing a repetitive work which requires to switch between two application modes alternately.

EXAMPLE If you have a work to use T mode and max impact force, register the max impact force for quick mode-switching function. Once register it, you can switch to the max impact force from T mode by just one click of the quick mode-switching button. Also, you can return to T mode by pressing the quick mode-switching button again.

Even if the tool is in other application mode than T mode, pressing the quick mode-switching button changes to max impact force. It is convenient for you to register a application mode that you frequently use.

You can choose one of following application modes for quick mode-switching function:

Impact force

- Max
- Hard
- Medium
- Soft

Assist type

- Wood mode
- Bolt mode
- T mode (1)
- T mode (2)

Registering application mode

To use the quick mode-switching function, register your desired application mode to the tool beforehand.

1. With the button or , choose your desired application mode.

2. Press and hold the button and the quick mode-switching button at the same time until the customize lamp and the lamp of desired application mode blinks.
► **Fig.11:** **1.** Quick mode-switching button **2.** Customize lamp

NOTE: You can overwrite the current application mode with new one by performing the procedure above.

Using the quick mode-switching function

When the tool is in the mode that is not registered, press the quick mode-switching button to switch to the registered application mode. The tool switches between the registered application mode and last application mode every time you press the quick mode-switching button. The front lamps on both sides will flash once when switching to the registered application mode.

NOTE: The customize lamp will light up when the application mode registered to the tool is chose.

Cancelling the quick mode-switching function

Press and hold the button and quick mode-switching button at the same time until the customize lamp and all impact force grade lamps blink.

NOTE: After cancelling the quick mode-switching function, the quick mode-switching button works for changing the impact force.

ASSEMBLY

⚠*CAUTION:* Always be sure that the tool is switched off and the battery cartridge is removed before carrying out any work on the tool.

Installing or removing driver bit/socket bit

► **Fig.12**

Use only driver bit/socket bit that has inserting portion shown in the figure. Do not use any other driver bit/socket bit.

For tool with shallow driver bit hole

A=12mm B=9mm	Use only these type of driver bit. Follow the procedure 1. (Note) Bit-piece is not necessary.

For tool with deep driver bit hole

A=17mm B=14mm	To install these types of driver bits, follow the procedure 1.
A=12mm B=9mm	To install these types of driver bits, follow the procedure 2. (Note) Bit-piece is necessary for installing the bit.

Procedure 1

For tool without one-touch type sleeve
► **Fig.13:** **1.** Driver bit **2.** Sleeve

To install the driver bit, pull the sleeve in the direction of the arrow and insert the driver bit into the sleeve as far as it will go. Then release the sleeve to secure the driver bit.

For tool with one-touch type sleeve
To install the driver bit, insert the driver bit into the sleeve as far as it will go.

Procedure 2

In addition to **Procedure 1**, insert the bit-piece into the sleeve with its pointed end facing in.
► **Fig.14:** **1.** Driver bit **2.** Bit-piece **3.** Sleeve

To remove the driver bit, pull the sleeve in the direction of the arrow and pull the driver bit out.

NOTE: If the driver bit is not inserted deep enough into the sleeve, the sleeve will not return to its original position and the driver bit will not be secured. In this case, try re-inserting the bit according to the instructions above.

NOTE: When it is difficult to insert the driver bit, pull the sleeve and insert it into the sleeve as far as it will go.

NOTE: After inserting the driver bit, make sure that it is firmly secured. If it comes out, do not use it.

Installing hook

⚠*CAUTION:* When installing the hook, always secure it with the screw firmly. If not, the hook may come off from the tool and result in the personal injury.

► **Fig.15:** **1.** Groove **2.** Hook **3.** Screw

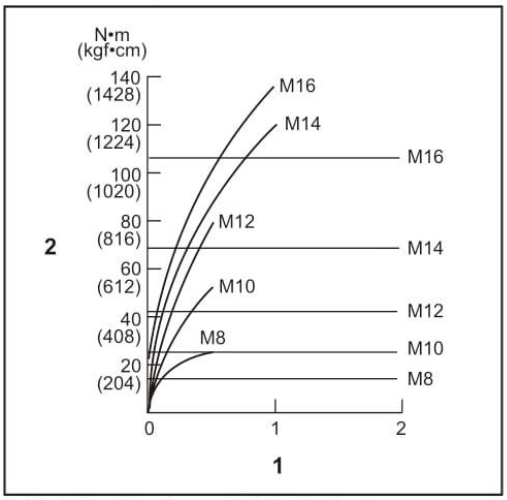
The hook is convenient for temporarily hanging the tool. This can be installed on either side of the tool. To install the hook, insert it into a groove in the tool housing on either side and then secure it with a screw. To remove, loosen the screw and then take it out.

OPERATION

► **Fig.16**

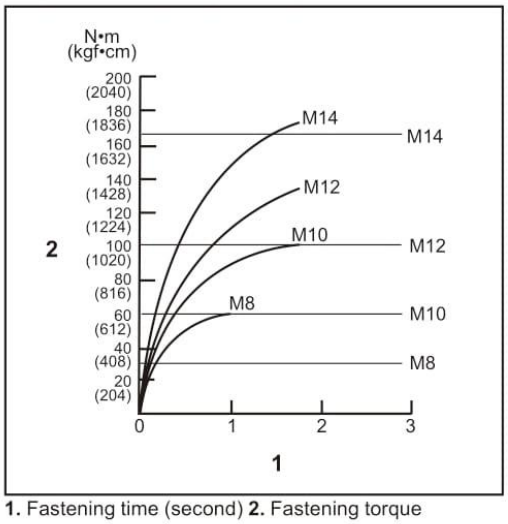
The proper fastening torque may differ depending upon the kind or size of the screw/bolt, the material of the workpiece to be fastened, etc. The relation between fastening torque and fastening time is shown in the figures.

Proper fastening torque for standard bolt



1. Fastening time (second) **2.** Fastening torque

Proper fastening torque for high tensile bolt



1. Fastening time (second) **2.** Fastening torque

Hold the tool firmly and place the point of the driver bit in the screw head. Apply forward pressure to the tool to the extent that the bit will not slip off the screw and turn the tool on to start operation.

NOTICE: **If you use a spare battery to continue the operation, rest the tool at least 15 min.**

NOTE: Use the proper bit for the head of the screw/bolt that you wish to use.

NOTE: When fastening M8 or smaller screw, choose a proper impact force and carefully adjust pressure on the switch trigger so that the screw is not damaged.

NOTE: Hold the tool pointed straight at the screw.

NOTE: If the impact force is too strong or you tighten the screw for a time longer than shown in the figures, the screw or the point of the driver bit may be over-stressed, stripped, damaged, etc. Before starting your job, always perform a test operation to determine the proper fastening time for your screw.

The fastening torque is affected by a wide variety of factors including the following. After fastening, always check the torque with a torque wrench.

1. When the battery cartridge is discharged almost completely, voltage will drop and the fastening torque will be reduced.
2. Driver bit or socket bit
   Failure to use the correct size driver bit or socket bit will cause a reduction in the fastening torque.
3. Bolt
   - Even though the torque coefficient and the class of bolt are the same, the proper fastening torque will differ according to the diameter of bolt.
   - Even though the diameters of bolts are the same, the proper fastening torque will differ according to the torque coefficient, the class of bolt and the bolt length.
4. The manner of holding the tool or the material of driving position to be fastened will affect the torque.
5. Operating the tool at low speed will cause a reduction in the fastening torque.

MAINTENANCE

CAUTION: **Always be sure that the tool is switched off and the battery cartridge is removed before attempting to perform inspection or maintenance.**

NOTICE: **Never use gasoline, benzine, thinner, alcohol or the like. Discoloration, deformation or cracks may result.**

To maintain product SAFETY and RELIABILITY, repairs, any other maintenance or adjustment should be performed by Makita Authorized or Factory Service Centers, always using Makita replacement parts.

OPTIONAL ACCESSORIES

CAUTION: **These accessories or attachments are recommended for use with your Makita tool specified in this manual.** The use of any other accessories or attachments might present a risk of injury to persons. Only use accessory or attachment for its stated purpose.

If you need any assistance for more details regarding these accessories, ask your local Makita Service Center.

- Driver bits
- Socket bits
- Bit piece
- Hook
- Tool hanger
- Plastic carrying case
- Makita genuine battery and charger
- Battery protector

NOTE: Some items in the list may be included in the tool package as standard accessories. They may differ from country to country.

(07.02.2022) (Andrii Kutsiak)
(Version: 0.1)

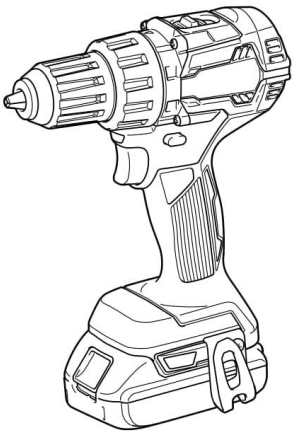
Hand drill:

ENGLISH: Original instructions

INSTRUCTION MANUAL

Cordless Driver Drill

DDF484



Read before use.

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SPECIFICATIONS

Model:		DDF484	
Drilling capacities	Steel	13 mm	
	Wood	38 mm	
Fastening capacities	Wood screw	10 mm x 90 mm	
	Machine screw	M6	
No load speed	High (2)	0 - 2,000 min^{-1}	
	Low (1)	0 - 500 min^{-1}	
Overall length		172 mm	
Rated voltage		D.C. 18 V	
Battery cartridge		BL1815N, BL1820, BL1820B	BL1830, BL1840, BL1850, BL1830B, BL1840B, BL1850B, BL1860B
Net weight		1.5 kg	1.8 kg

- Due to our continuing program of research and development, the specifications herein are subject to change without notice.
- Specifications and battery cartridge may differ from country to country.
- Weight, with battery cartridge, according to EPTA-Procedure 01/2003

Symbols

The following show the symbols used for the equipment. Be sure that you understand their meaning before use.



Read instruction manual.



Only for EU countries
Do not dispose of electric equipment or battery pack together with household waste material!
In observance of the European Directives, on Waste Electric and Electronic Equipment and Batteries and Accumulators and Waste Batteries and Accumulators and their implementation in accordance with national laws, electric equipment and batteries and battery pack(s) that have reached the end of their life must be collected separately and returned to an environmentally compatible recycling facility.

Intended use

The tool is intended for drilling and screw driving in wood, metal and plastic.

Noise

The typical A-weighted noise level determined according to EN60745:
Sound pressure level (L_{pA}) : 76 dB(A)
Uncertainty (K) : 3 dB(A)

The noise level under working may exceed 80 dB (A).

⚠ ***WARNING:*** **Wear ear protection.**

Vibration

The vibration total value (tri-axial vector sum) determined according to EN60745:
Work mode: drilling into metal
Vibration emission ($a_{h,D}$) : 2.5 m/s^2 or less
Uncertainty (K) : 1.5 m/s^2

NOTE: The declared vibration emission value has been measured in accordance with the standard test method and may be used for comparing one tool with another.

NOTE: The declared vibration emission value may also be used in a preliminary assessment of exposure.

⚠ ***WARNING:*** The vibration emission during actual use of the power tool can differ from the declared emission value depending on the ways in which the tool is used.

⚠ ***WARNING:*** Be sure to identify safety measures to protect the operator that are based on an estimation of exposure in the actual conditions of use (taking account of all parts of the operating cycle such as the times when the tool is switched off and when it is running idle in addition to the trigger time).

EC Declaration of Conformity

For European countries only

The EC declaration of conformity is included as Annex A to this instruction manual.

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SAFETY WARNINGS

General power tool safety warnings

⚠*WARNING:* Read all safety warnings and all instructions. Failure to follow the warnings and instructions may result in electric shock, fire and/or serious injury.

Save all warnings and instructions for future reference.

The term "power tool" in the warnings refers to your mains-operated (corded) power tool or battery-operated (cordless) power tool.

Work area safety

1. **Keep work area clean and well lit.** Cluttered or 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 children and bystanders away while operating a power tool.** Distractions can cause you to lose control.

Electrical Safety

1. **Power tool plugs must match the outlet. Never modify the plug in any way. Do not use any adapter plugs with earthed (grounded) power tools.** Unmodified plugs and matching outlets will reduce risk of electric shock.
2. **Avoid body contact with earthed or grounded surfaces such as pipes, radiators, ranges and refrigerators.** There is an increased risk of electric shock if your body is earthed or grounded.
3. **Do not expose power tools to rain or wet conditions.** Water entering a power tool will increase the risk of electric shock.
4. **Do not abuse the cord. Never use the cord for carrying, pulling or unplugging the power tool. Keep cord away from heat, oil, sharp edges or moving parts.** Damaged or entangled cords increase the risk of electric shock.
5. **When operating a power tool outdoors, use an extension cord suitable for outdoor use.** Use of a cord suitable for outdoor use reduces the risk of electric shock.
6. **If operating a power tool in a damp location is unavoidable, use a residual current device (RCD) protected supply.** Use of an RCD reduces the risk of electric shock.

Personal Safety

1. **Stay alert, watch what you are doing and use common sense when operating a power tool. Do not use a power tool while you are tired or under the influence of drugs, alcohol or medication.** A moment of inattention while operating power tools may result in serious personal injury.
2. **Use personal protective equipment. Always wear eye protection.** Protective equipment such as dust mask, non-skid safety shoes, hard hat, or hearing protection used for appropriate conditions will reduce personal injuries.
3. **Prevent unintentional starting. Ensure the switch is in the off-position before connecting to power source and/or battery pack, picking up or carrying the tool.** Carrying power tools with your finger on the switch or energising power tools that have the switch on invites accidents.
4. **Remove any adjusting key or wrench before turning the power tool on.** A wrench or a key left attached to a rotating part of the power tool may result in personal injury.
5. **Do not overreach. Keep proper footing and balance at all times.** This enables better control of the power tool in unexpected situations.
6. **Dress properly. Do not wear loose clothing or jewellery. Keep your hair, clothing, and gloves away from moving parts.** Loose clothes, jewellery or long hair can be caught in moving parts.
7. **If devices are provided for the connection of dust extraction and collection facilities, ensure these are connected and properly used.** Use of dust collection can reduce dust-related hazards.

Power tool use and care

1. **Do not force the power tool. Use the correct power tool for your application.** The correct power tool will do the job better and safer at the rate for which it was designed.
2. **Do not use the power tool if the switch does not turn it on and off.** Any power tool that cannot be controlled with the switch is dangerous and must be repaired.
3. **Disconnect the plug from the power source and/or the battery pack from the power tool before making any adjustments, changing accessories, or storing power tools.** Such preventive safety measures reduce the risk of starting the power tool accidentally.
4. **Store idle power tools out of the reach of children and do not allow persons unfamiliar with the power tool or these instructions to operate the power tool.** Power tools are dangerous in the hands of untrained users.
5. **Maintain power tools. Check for misalignment or binding of moving parts, breakage of parts and any other condition that may affect the power tool's operation. If damaged, have the power tool repaired before use.** Many accidents are caused by poorly maintained power tools.
6. **Keep cutting tools sharp and clean.** Properly maintained cutting tools with sharp cutting edges are less likely to bind and are easier to control.
7. **Use the power tool, accessories and tool bits etc. in accordance with these instructions, taking into account the working conditions and the work to be performed.** Use of the power tool for operations different from those intended could result in a hazardous situation.

Battery tool use and care

1. **Recharge only with the charger specified by the manufacturer.** A charger that is suitable for one type of battery pack may create a risk of fire when used with another battery pack.
2. **Use power tools only with specifically designated battery packs.** Use of any other battery packs may create a risk of injury and fire.

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3. **When battery pack is not in use, keep it away from other metal objects, like paper clips, coins, keys, nails, screws or other small metal objects, that can make a connection from one terminal to another.** Shorting the battery terminals together may cause burns or a fire.
4. **Under abusive conditions, liquid may be ejected from the battery; avoid contact. If contact accidentally occurs, flush with water. If liquid contacts eyes, additionally seek medical help.** Liquid ejected from the battery may cause irritation or burns.

Service

1. **Have your power tool serviced by a qualified repair person using only identical replacement parts.** This will ensure that the safety of the power tool is maintained.
2. **Follow instruction for lubricating and changing accessories.**
3. **Keep handles dry, clean and free from oil and grease.**

Cordless driver drill safety warnings

1. **Use auxiliary handle(s), if supplied with the tool.** Loss of control can cause personal injury.
2. **Hold power tool by insulated gripping surfaces, when performing an operation where the cutting accessory may contact hidden wiring.** Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.
3. **Hold power tool by insulated gripping surfaces, when performing an operation where the fastener may contact hidden wiring.** Fasteners contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.
4. **Always be sure you have a firm footing. Be sure no one is below when using the tool in high locations.**
5. **Hold the tool firmly.**
6. **Keep hands away from rotating parts.**
7. **Do not leave the tool running. Operate the tool only when hand-held.**
8. **Do not touch the drill bit or the workpiece immediately after operation; they may be extremely hot and could burn your skin.**
9. **Some material contains chemicals which may be toxic. Take caution to prevent dust inhalation and skin contact. Follow material supplier safety data.**

SAVE THESE INSTRUCTIONS.

⚠*WARNING:* DO NOT let comfort or familiarity with product (gained from repeated use) replace strict adherence to safety rules for the subject product. MISUSE or failure to follow the safety rules stated in this instruction manual may cause serious personal injury.

Important safety instructions for battery cartridge

1. **Before using battery cartridge, read all instructions and cautionary markings on (1) battery charger, (2) battery, and (3) product using battery.**
2. **Do not disassemble battery cartridge.**
3. **If operating time has become excessively shorter, stop operating immediately. It may result in a risk of overheating, possible burns and even an explosion.**
4. **If electrolyte gets into your eyes, rinse them out with clear water and seek medical attention right away. It may result in loss of your eyesight.**
5. **Do not short the battery cartridge:**
   (1) **Do not touch the terminals with any conductive material.**
   (2) **Avoid storing battery cartridge in a container with other metal objects such as nails, coins, etc.**
   (3) **Do not expose battery cartridge to water or rain.**

   A battery short can cause a large current flow, overheating, possible burns and even a breakdown.
6. **Do not store the tool and battery cartridge in locations where the temperature may reach or exceed 50 °C (122 °F).**
7. **Do not incinerate the battery cartridge even if it is severely damaged or is completely worn out. The battery cartridge can explode in a fire.**
8. **Be careful not to drop or strike battery.**
9. **Do not use a damaged battery.**
10. **The contained lithium-ion batteries are subject to the Dangerous Goods Legislation requirements.**
    For commercial transports e.g. by third parties, forwarding agents, special requirement on packaging and labeling must be observed.
    For preparation of the item being shipped, consulting an expert for hazardous material is required.
    Please also observe possibly more detailed national regulations.
    Tape or mask off open contacts and pack up the battery in such a manner that it cannot move around in the packaging.
11. **Follow your local regulations relating to disposal of battery.**

SAVE THESE INSTRUCTIONS.

⚠*CAUTION:* Only use genuine Makita batteries. Use of non-genuine Makita batteries, or batteries that have been altered, may result in the battery bursting causing fires, personal injury and damage. It will also void the Makita warranty for the Makita tool and charger.

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Tips for maintaining maximum battery life

1. **Charge the battery cartridge before completely discharged. Always stop tool operation and charge the battery cartridge when you notice less tool power.**
2. **Never recharge a fully charged battery cartridge. Overcharging shortens the battery service life.**
3. **Charge the battery cartridge with room temperature at 10 °C - 40 °C (50 °F - 104 °F). Let a hot battery cartridge cool down before charging it.**
4. **Charge the battery cartridge if you do not use it for a long period (more than six months).**

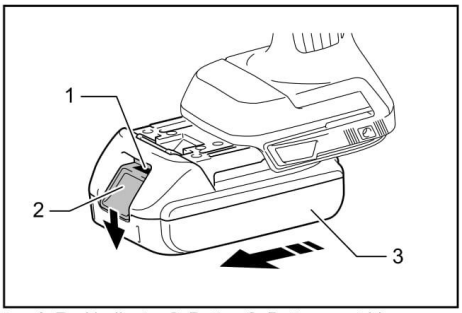
FUNCTIONAL DESCRIPTION

⚠*CAUTION:* Always be sure that the tool is switched off and the battery cartridge is removed before adjusting or checking function on the tool.

Installing or removing battery cartridge

⚠*CAUTION:* Always switch off the tool before installing or removing of the battery cartridge.

⚠*CAUTION:* Hold the tool and the battery cartridge firmly when installing or removing battery cartridge. Failure to hold the tool and the battery cartridge firmly may cause them to slip off your hands and result in damage to the tool and battery cartridge and a personal injury.



► **1.** Red indicator **2.** Button **3.** Battery cartridge

To remove the battery cartridge, slide it from the tool while sliding the button on the front of the cartridge.

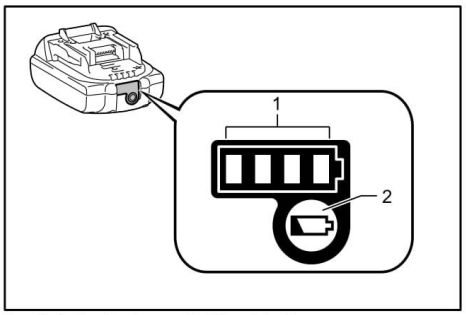
To install the battery cartridge, align the tongue on the battery cartridge with the groove in the housing and slip it into place. Insert it all the way until it locks in place with a little click. If you can see the red indicator on the upper side of the button, it is not locked completely.

⚠*CAUTION:* Always install the battery cartridge fully until the red indicator cannot be seen. If not, it may accidentally fall out of the tool, causing injury to you or someone around you.

⚠*CAUTION:* Do not install the battery cartridge forcibly. If the cartridge does not slide in easily, it is not being inserted correctly.

Indicating the remaining battery capacity

Only for battery cartridges with "B" at the end of the model number



► **1.** Indicator lamps **2.** Check button

Press the check button on the battery cartridge to indicate the remaining battery capacity. The indicator lamps light up for few seconds.

Indicator lamps			Remaining capacity
Lighted	Off	Blinking	
■ ■ ■ ■			75% to 100%
■ ■ ■ □			50% to 75%
■ ■ □ □			25% to 50%
■ □ □ □			0% to 25%
◪ □ □ □			Charge the battery.
■ ■ □ □ ↑↓ □ □ ■ ■			The battery may have malfunctioned.

NOTE: Depending on the conditions of use and the ambient temperature, the indication may differ slightly from the actual capacity.

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Tool / battery protection system

The tool is equipped with a tool/battery protection system. This system automatically cuts off power to the motor to extend tool and battery life. The tool will automatically stop during operation if the tool or battery is placed under one of the following conditions:

Overload protection

When the tool/battery is operated in a manner that causes it to draw an abnormally high current, the tool automatically stops without any indication. In this situation, turn the tool off and stop the application that caused the tool to become overloaded. Then turn the tool on to restart.

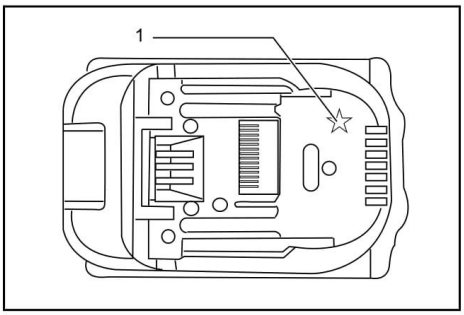
Overheat protection

When the tool/battery is overheated, the tool stops automatically. In this situation, let the tool/battery cool before turning the tool on again.

Overdischarge protection

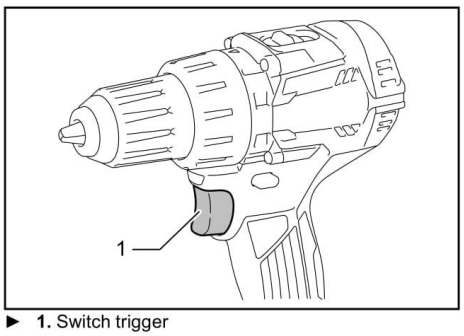
When the battery capacity is not enough, the tool stops automatically. In this case, remove the battery from the tool and charge the battery.

NOTE: Overheat protection (for battery) will work only with batteries with star marking.



► **1.** Star marking

Switch action



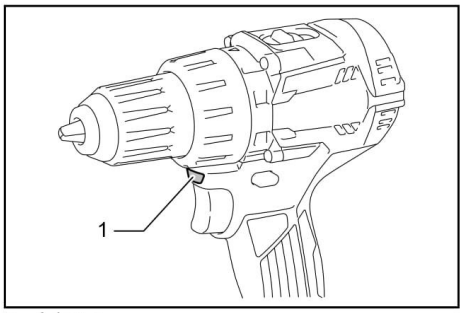
► **1.** Switch trigger

⚠*CAUTION:* Before installing the battery cartridge into the tool, always check to see that the switch trigger actuates properly and returns to the "OFF" position when released.

To start the tool, simply pull the switch trigger. Tool speed is increased by increasing pressure on the switch trigger. Release the switch trigger to stop.

NOTE: The tool automatically stops if you keep pulling the switch trigger for about 6 minutes.

Lighting up the front lamp



► **1.** Lamp

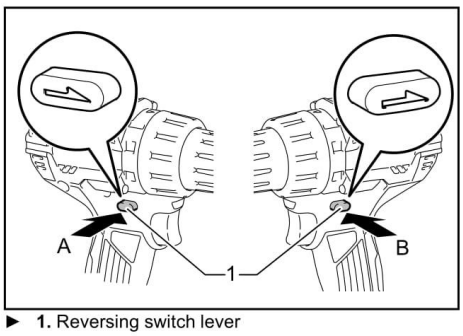
⚠*CAUTION:* Do not look in the light or see the source of light directly.

Pull the switch trigger to light up the lamp. The lamp keeps on lighting while the switch trigger is being pulled. The lamp goes out approximately 10 seconds after releasing the switch trigger.

NOTE: When the tool is overheated, the tool stops automatically and the lamp starts flashing. In this case, release the switch trigger. The lamp turns off in one minute.

NOTE: Use a dry cloth to wipe the dirt off the lens of the lamp. Be careful not to scratch the lens of lamp, or it may lower the illumination.

Reversing switch action



► **1.** Reversing switch lever

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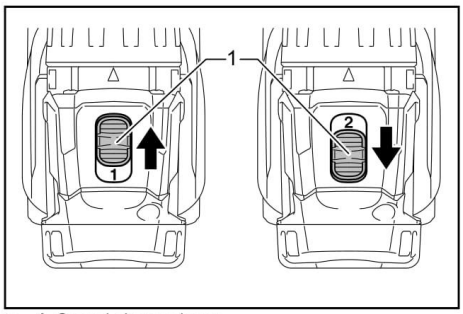
⚠CAUTION: Always check the direction of rotation before operation.

⚠CAUTION: Use the reversing switch only after the tool comes to a complete stop. Changing the direction of rotation before the tool stops may damage the tool.

⚠CAUTION: When not operating the tool, always set the reversing switch lever to the neutral position.

This tool has a reversing switch to change the direction of rotation. Depress the reversing switch lever from the A side for clockwise rotation or from the B side for counterclockwise rotation.
When the reversing switch lever is in the neutral position, the switch trigger cannot be pulled.

Speed change



► **1.** Speed change lever

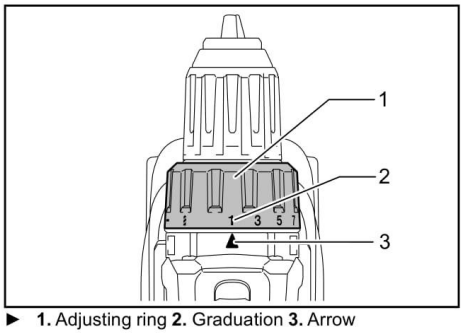
⚠CAUTION: Always set the speed change lever fully to the correct position. If you operate the tool with the speed change lever positioned halfway between the "1" side and "2" side, the tool may be damaged.

⚠CAUTION: Do not use the speed change lever while the tool is running. The tool may be damaged.

Displayed Number	Speed	Torque	Applicable operation
1	Low	High	Heavy loading operation
2	High	Low	Light loading operation

To change the speed, switch off the tool first. Push the speed change lever to display "2" for high speed or "1" for low speed but high torque. Be sure that the speed change lever is set to the correct position before operation.
If the tool speed is coming down extremely during the operation with display "2", push the lever to display "1" and restart the operation.

Adjusting the fastening torque



► **1.** Adjusting ring **2.** Graduation **3.** Arrow

The fastening torque can be adjusted in 22 levels by turning the adjusting ring. Align the graduations with the arrow on the tool body. You can get the minimum fastening torque at 1 and maximum torque at marking.
The clutch will slip at various torque levels when set at the number 1 to 21. The clutch does not work at the marking.
Before actual operation, drive a trial screw into your material or a piece of duplicate material to determine which torque level is required for a particular application.
The following shows the rough guide of the relationship between the screw size and graduation.

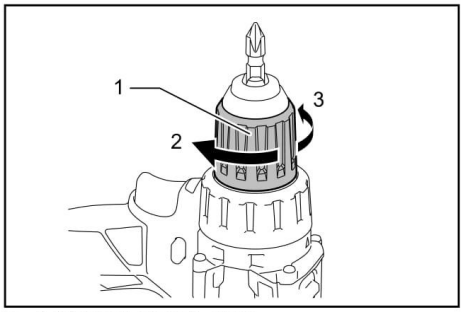
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Graduation		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Machine screw		M4					M5									M6						
Wood screw	Soft wood (e.g. pine)	–						ϕ3.5 x 22				ϕ4.1x 38				–						
	Hard wood (e.g. lauan)	–							ϕ3.5 x 22						ϕ4.1x 38				–			

ASSEMBLY

⚠CAUTION: Always be sure that the tool is switched off and the battery cartridge is removed before carrying out any work on the tool.

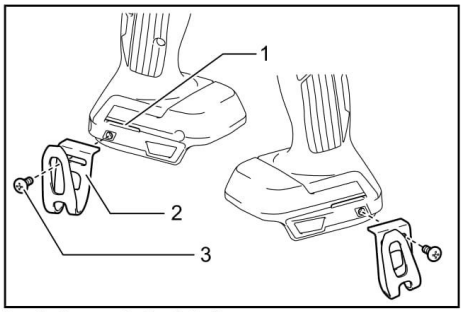
Installing or removing driver bit/ drill bit



► **1.** Sleeve **2.** Close **3.** Open

Turn the sleeve counterclockwise to open the chuck jaws. Place the driver bit/drill bit in the chuck as far as it will go. Turn the sleeve clockwise to tighten the chuck. To remove the driver bit/drill bit, turn the sleeve counterclockwise.

Installing hook

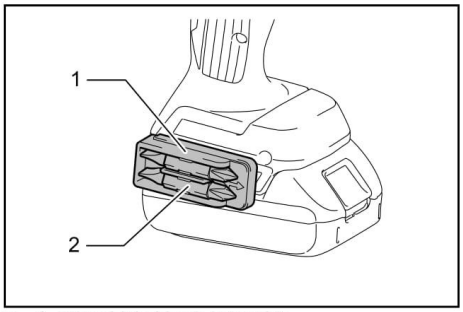


► **1.** Groove **2.** Hook **3.** Screw

The hook is convenient for temporarily hanging the tool. This can be installed on either side of the tool. To install the hook, insert it into a groove in the tool housing on either side and then secure it with a screw. To remove, loosen the screw and then take it out.

Installing driver bit holder

Optional accessory



► **1.** Driver bit holder **2.** Driver bit

Fit the driver bit holder into the protrusion at the tool foot on either right or left side and secure it with a screw. When not using the driver bit, keep it in the driver bit holders. Driver bits 45 mm-long can be kept there.

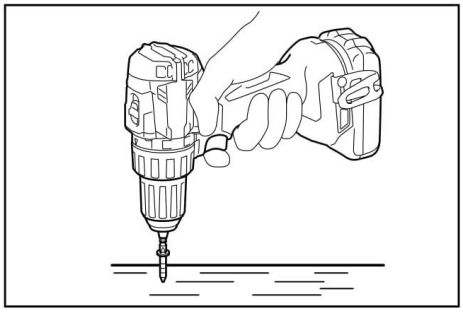
OPERATION

⚠CAUTION: Always insert the battery cartridge all the way until it locks in place. If you can see the red indicator on the upper side of the button, it is not locked completely. Insert it fully until the red indicator cannot be seen. If not, it may accidentally fall out of the tool, causing injury to you or someone around you.

⚠CAUTION: When the speed comes down extremely, reduce the load or stop the tool to avoid the tool damage.

Hold the tool firmly with one hand on the grip and the other hand on the bottom of the battery cartridge to control the twisting action.

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Screwdriving operation

⚠ ***CAUTION:*** **Adjust the adjusting ring to the proper torque level for your work.**

⚠ ***CAUTION:*** **Make sure that the driver bit is inserted straight in the screw head, or the screw and/or driver bit may be damaged.**

Place the point of the driver bit in the screw head and apply pressure to the tool. Start the tool slowly and then increase the speed gradually. Release the switch trigger as soon as the clutch cuts in.

NOTE: When driving wood screw, pre-drill a pilot hole 2/3 the diameter of the screw. It makes driving easier and prevents splitting of the workpiece.

Drilling operation

First, turn the adjusting ring so that the arrow points to the marking. Then proceed as follows.

Drilling in wood

When drilling in wood, the best results are obtained with wood drills equipped with a guide screw. The guide screw makes drilling easier by pulling the drill bit into the workpiece.

Drilling in metal

To prevent the drill bit from slipping when starting a hole, make an indentation with a center-punch and hammer at the point to be drilled. Place the point of the drill bit in the indentation and start drilling.
Use a cutting lubricant when drilling metals. The exceptions are iron and brass which should be drilled dry.

⚠ ***CAUTION:*** **Pressing excessively on the tool will not speed up the drilling.** In fact, this excessive pressure will only serve to damage the tip of your drill bit, decrease the tool performance and shorten the service life of the tool.

⚠ ***CAUTION:*** **Hold the tool firmly and exert care when the drill bit begins to break through the workpiece.** There is a tremendous force exerted on the tool/drill bit at the time of hole break through.

⚠ ***CAUTION:*** **A stuck drill bit can be removed simply by setting the reversing switch to reverse rotation in order to back out. However, the tool may back out abruptly if you do not hold it firmly.**

⚠ ***CAUTION:*** **Always secure workpieces in a vise or similar hold-down device.**

⚠ ***CAUTION:*** **If the tool is operated continuously until the battery cartridge has discharged, allow the tool to rest for 15 minutes before proceeding with a fresh battery.**

MAINTENANCE

⚠ ***CAUTION:*** **Always be sure that the tool is switched off and the battery cartridge is removed before attempting to perform inspection or maintenance.**

NOTICE: **Never use gasoline, benzine, thinner, alcohol or the like. Discoloration, deformation or cracks may result.**

To maintain product SAFETY and RELIABILITY, repairs, any other maintenance or adjustment should be performed by Makita Authorized or Factory Service Centers, always using Makita replacement parts.

OPTIONAL ACCESSORIES

⚠ ***CAUTION:*** **These accessories or attachments are recommended for use with your Makita tool specified in this manual.** The use of any other accessories or attachments might present a risk of injury to persons. Only use accessory or attachment for its stated purpose.

If you need any assistance for more details regarding these accessories, ask your local Makita Service Center.

- Drill bits
- Driver bits
- Driver bit holder
- Hook
- Makita genuine battery and charger

NOTE: Some items in the list may be included in the tool package as standard accessories. They may differ from country to country.

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