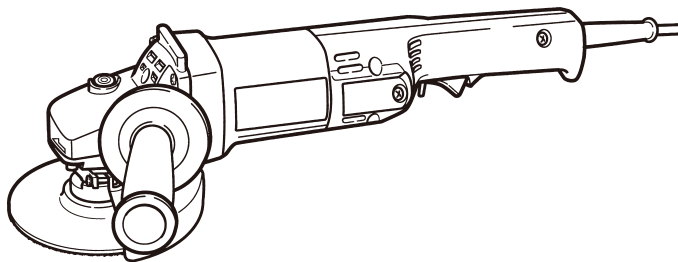




Disc Grinder 手提圓盤電磨機

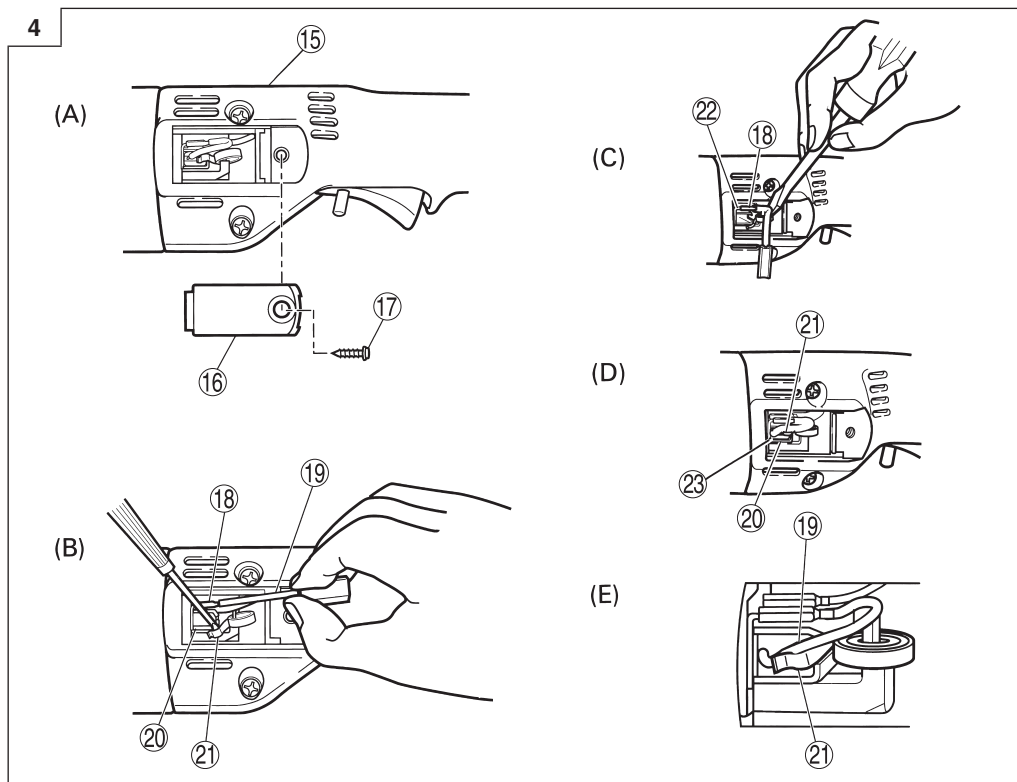
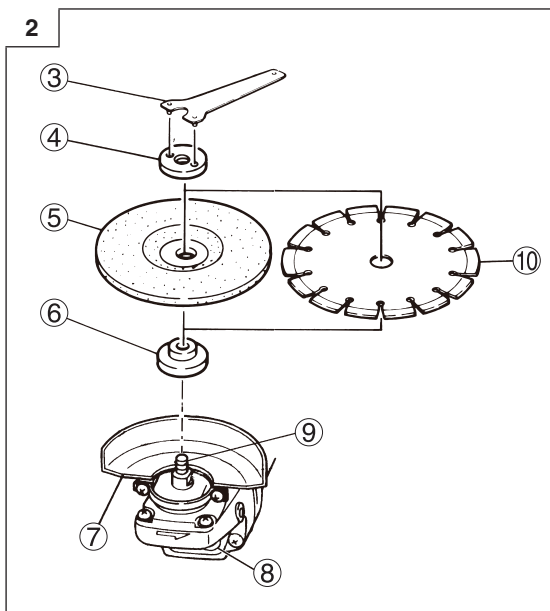
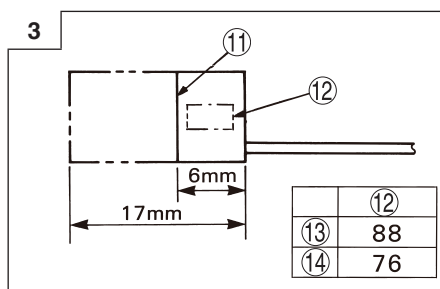
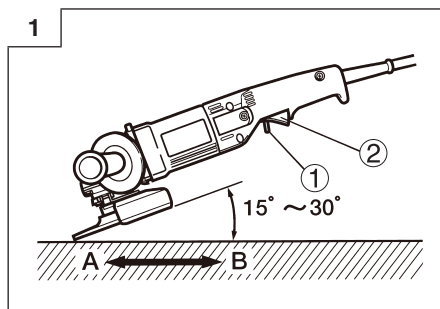
G13SP

Handling instructions
使用說明書



Read through carefully and understand these instructions before use.

使用前務請詳加閱讀



①	Locking button	鎖定鈕
②	Switch lever	開關桿
③	Wrench	扳手
④	Wheel nut	砂輪螺帽
⑤	Depressed center wheel	砂輪片
⑥	Wheel washer	砂輪墊圈
⑦	Wheel guard	砂輪保護裝置
⑧	Push button	鎖定銷
⑨	Spindle	主軸
⑩	Diamond wheel	金剛石砂輪片
⑪	Wear limit	磨損極限
⑫	No. of carbon brush	碳刷號
⑬	Usual carbon brush	通常碳刷
⑭	Auto-stop carbon brush	自動停止碳刷
⑮	Handle	把手
⑯	Brush cover	碳刷蓋
⑰	D4 Tapping screw	D4分支螺絲
⑱	Carbon brush plug	碳刷端腳
⑲	Pigtail	引線
⑳	Brush holder	碳刷支架
㉑	Spring end	彈簧末端
㉒	Brush holder terminal	碳刷支架終端
㉓	Carbon brush	碳刷

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.

1) Work area safety

a) Keep work area clean and well lit.

Cluttered or dark areas invite accidents.

b) 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.

c) Keep children and bystanders away while operating a power tool.

Distractions can cause you to lose control.

2) Electrical safety

a) 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.

b) 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.

c) Do not expose power tools to rain or wet conditions.

Water entering a power tool will increase the risk of electric shock.

d) 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.

e) 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.

f) 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.

3) Personal safety

a) 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.

b) 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.

c) 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.

d) 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.

e) Do not overreach. Keep proper footing and balance at all times.

This enables better control of the power tool in unexpected situations.

f) 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.

g) 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.

4) Power tool use and care

a) 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.

b) 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.

c) 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.

d) 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.

e) 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.

f) Keep cutting tools sharp and clean.

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

g) 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.

5) Service

a) 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.

PRECAUTION

Keep children and infirm persons away.

When not in use, tools should be stored out of reach of children and infirm persons.

SAFETY WARNINGS COMMON FOR GRINDING OR ABRASIVE CUTTING-OFF OPERATIONS

- a) **This power tool is intended to function as a grinder or cut-off tool. 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.
- b) **Operations such as sanding, wire brushing or polishing are not recommended to be performed with this power tool.**
Operations for which the power tool was not designed may create a hazard and cause personal injury.
- c) **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.
- d) **The rated speed of the accessory must be at least equal to the maximum speed marked on the power tool.**
Accessories running faster than their rated speed can break and fly apart.
- e) **The outside diameter and the thickness of your accessory must be within the capacity rating of your power tool.**
Incorrectly sized accessories cannot be adequately guarded or controlled.
- f) **Threaded mounting of accessories must match the grinder spindle thread. For accessories mounted by flanges, the arbour hole of the accessory must fit the locating diameter of the flange.**
Accessories that do not match the mounting hardware of the power tool will run out of balance, vibrate excessively and may cause loss of control.
- g) **Do not use a damaged accessory. Before each use inspect the accessory such as abrasive wheels for chips and cracks, backing pad for cracks, tear or excess wear, wire brush for loose or cracked wires. If power tool or accessory is dropped, inspect for damage or install an undamaged accessory. After inspecting and installing an accessory, position yourself and bystanders away from the plane of the rotating accessory and run the power tool at maximum no-load speed for one minute.**
Damaged accessories will normally break apart during this test time.
- h) **Wear personal protective equipment. Depending on application, use face shield, safety goggles or safety glasses. As appropriate, wear dust mask, 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 filtering particles generated by your operation. Prolonged exposure to high intensity noise may cause hearing loss.
- i) **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.
- j) **Hold the power tool by insulated gripping surfaces only, when performing an operation where the cutting accessory may contact hidden wiring or its own cord.**
Cutting accessory contacting a "live" wire may make exposed metal parts of the power tool "live" and could give the operator an electric shock.

- k) **Position the cord clear of the spinning accessory.**
If you lose control, the cord may be cut or snagged and your hand or arm may be pulled into the spinning accessory.
- l) **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.
- m) **Do not run the power tool while carrying it at your side.**
Accidental contact with the spinning accessory could snag your clothing, pulling the accessory into your body.
- n) **Regularly clean the power tool's air vents.**
The motor's fan will draw the dust inside the housing and excessive accumulation of powdered metal may cause electrical hazards.
- o) **Do not operate the power tool near flammable materials.**
Sparks could ignite these materials.
- p) **Do not use accessories that require liquid coolants.**
Using water or other liquid coolants may result in electrocution or shock.

KICKBACK AND RELATED WARNINGS

Kickback is a sudden reaction to a pinched or snagged rotating wheel, backing pad, brush or any other accessory. Pinching or snagging causes rapid stalling of the rotating accessory which in turn causes the uncontrolled power tool to be forced in the direction opposite of the accessory's rotation at the point of the binding.

For example, if an abrasive wheel is snagged or pinched by the workpiece, the edge of the wheel that is entering into the pinch point can dig into the surface of the material causing the wheel to climb out or kick out. The wheel may either jump toward or away from the operator, depending on direction of the wheel's movement at the point of pinching.

Abrasive wheels may also break under these conditions.

Kickback is the result of power tool misuse and/or incorrect operating procedures or conditions and can be avoided by taking proper precautions as given below.

- a) **Maintain a firm grip on the power tool and position your body and arm to allow you to resist kickback forces. Always use auxiliary handle, if provided, for maximum control over kickback or torque reaction during start-up.**
The operator can control torque reactions or kickback forces, if proper precautions are taken.
- b) **Never place your hand near the rotating accessory.**
Accessory may kickback over your hand.
- c) **Do not position your body in the area where power tool will move if kickback occurs.**
Kickback will propel the tool in direction opposite to the wheel's movement at the point of snagging.
- d) **Use special care when working corners, sharp edges etc. Avoid bouncing and snagging the accessory.**
Corners, sharp edges or bouncing have a tendency to snag the rotating accessory and cause loss of control or kickback.
- e) **Do not attach a saw chain woodcarving blade or toothed saw blade.**
Such blades create frequent kickback and loss of control.

SAFETY WARNINGS SPECIFIC FOR GRINDING AND ABRASIVE CUTTING-OFF OPERATIONS

- a) **Use only wheel types that are recommended for your power tool and the specific guard designed for the selected wheel.**
Wheels for which the power tool was not designed cannot be adequately guarded and are unsafe.

- b) **The grinding surface of centre depressed wheels must be mounted below the plane of the guard lip.**
An improperly mounted wheel that projects through the plane of the guard lip cannot be adequately protected.
- c) **The guard must be securely attached to the power tool and positioned for maximum safety, so the least amount of wheel is exposed towards the operator.**
The guard helps to protect the operator from broken wheel fragments, accidental contact with wheel and sparks that could ignite clothing.
- d) **Wheels must be used only for recommended applications. For example: do not grind with the side of cut-off wheel.**
Abrasive cut-off wheels are intended for peripheral grinding, side forces applied to these wheels may cause them to shatter.
- e) **Always use undamaged wheel flanges that are of correct size and shape for your selected wheel.**
Proper wheel flanges support the wheel thus reducing the possibility of wheel breakage. Flanges for cut-off wheels may be different from grinding wheel flanges.
- f) **Do not use worn down wheels from larger power tools.**
Wheel intended for larger power tool is not suitable for the higher speed of a smaller tool and may burst.

ADDITIONAL SAFETY WARNINGS SPECIFIC FOR ABRASIVE CUTTING-OFF OPERATIONS

- a) **Do not “jam” the cut-off wheel or apply excessive pressure. Do not attempt to make an excessive depth of cut.**
Overstressing the wheel increases the loading and susceptibility to twisting or binding of the wheel in the cut and the possibility of kickback or wheel breakage.
- b) **Do not position your body in line with and behind the rotating wheel.**
When the wheel, at the point of operation, is moving away from your body, the possible kickback may propel the spinning wheel and the power tool directly at you.
- c) **When wheel is binding or when interrupting a cut for any reason, switch off the power tool and hold the power tool motionless until the wheel comes to a complete stop. Never attempt to remove the cut-off wheel from the cut while the wheel is in motion otherwise kickback may occur.**
Investigate and take corrective action to eliminate the cause of wheel binding.
- d) **Do not restart the cutting operation in the workpiece. Let the wheel reach full speed and carefully re-enter the cut.**
The wheel may bind, walk up or kickback if the power tool is restarted in the workpiece.
- e) **Support panels or any oversized workpiece to minimize the risk of wheel pinching and kickback.**
Large workpieces tend to sag under their own weight. Supports must be placed under the workpiece near the line of cut and near the edge of the workpiece on both sides of the wheel.
- f) **Use extra caution when making a “pocket cut” into existing walls or other blind areas.**
The protruding wheel may cut gas or water pipes, electrical wiring or objects that can cause kickback.

GENERAL SAFETY INSTRUCTIONS FOR GRINDERS

- Check that speed marked on the wheel is equal to or greater than the rated speed of the grinder;
- Ensure that the wheel dimensions are compatible with the grinder;
- Abrasive wheels shall be stored and handled with care in accordance with manufacturer's instructions;
- Inspect the grinding wheel before use, do not use chipped, cracked or otherwise defective products;
- Ensure that mounted wheels and points are fitted in accordance with the manufacturer's instructions;
- Ensure that blotters are used when they are provided with the bonded abrasive product and when they are required;
- Ensure that the abrasive product is correctly mounted and tightened before use and run the tool at no-load for 30 seconds in a safe position, stop immediately if there is considerable vibration or if other defects are detected. If this condition occurs, check the machine to determine the cause;
- If a guard is equipped with the tool never use the tool without such a guard;
- When using a abrasive cutting wheel, be sure to remove the standard accessory wheel guard and attach the wheel guard with side guard (sold separately);
- Do not use separate reducing bushings or adapters to adapt large hole abrasive wheels;
- For tools intended to be fitted with threaded hole wheel, ensure that the thread in the wheel is long enough to accept the spindle length;
- Check that the work piece is properly supported;
- Do not use cutting off wheel for side grinding;
- Ensure that sparks resulting from use do not create a hazard e.g. do not hit persons, or ignite flammable substances;
- Ensure that ventilation openings are kept clear when working in dusty conditions, if it should become necessary to clear dust, first disconnect the tool from the mains supply (use non metallic objects) and avoid damaging internal parts;
- Always use eye and ear protection. Other personal protective equipment such as dust mask, gloves, helmet and apron should be worn;
- Pay attention to the wheel that continues to rotate after the tool is switched off.

ADDITIONAL SAFETY WARNINGS

1. Ensure that the power source to be utilized conforms to the power requirements specified on the product nameplate.
2. Ensure that the power switch is in the OFF position. If the plug is connected to a receptacle while the power switch is in the ON position, the power tool will start operating immediately, which could cause a serious accident.
3. When the work area is removed from the power source, use an extension cord of sufficient thickness and rated capacity. The extension cord should be kept as short as practicable.
4. Ensure that the depressed center wheel to be utilized is the correct type and free of cracks or surface defects. Also ensure that the depressed center wheel is properly mounted and the wheel nut is securely tightened.
5. Confirm that the push button is disengaged by pushing push button two or three times before switching the power tool on.

6. To prolong the life of the machine and ensure a first class finish, it is important that the machine should not be overloaded by applying too much pressure. In most applications, the weight of the machine alone is sufficient for effective grinding. Too much pressure will result in reduced rotational speed, inferior surface finish, and overloading which could reduce the life of the machine.
7. The wheel continues to rotate after the tool is switched off.
After switching off the machine, do not put it down until the depressed center wheel has come to a complete stop. Apart from avoiding serious accidents, this precaution will reduce the amount of dust and swarf sucked into the machine.
8. When the machine is not use, the power source should be disconnected.
9. Be sure to switch OFF and disconnect the attachment plug from the receptacle to avoid a serious accident before the depressed center wheel is assembling and disassembling.
10. RCD
The use of a residual current device with a rated residual current of 30 mA or less at all times is recommended.

SPECIFICATIONS

Voltage (by areas)*	(110 V, 220 V, 230 V) ~	
Power Input*	860 W*	
No-load speed	9500 /min	
Max. Peripheral Speed	80 m/s (4800 m/min)	
Wheel size	Outer dia.	125 mm
	Thickness	6 mm
	Hole dia.	22.23 mm
Weight (only main body)	2.1 kg	

* Be sure to check the nameplate on product as it is subject to change by areas.

STANDARD ACCESSORIES

- (1) Wrench 1
 (2) Side Handle 1
 Standard accessories are subject to change without notice.

APPLICATIONS

- Removal of casting fin and finishing of various types of steel, bronze and aluminum materials and castings.
- Grinding of welded sections or sections cut by means of a cutting torch.
- Grinding of brick, marble, etc.
- Cutting and scribing of concrete, stone, tile, (use the diamond wheel)

PRIOR TO OPERATION

1. **Power source**
Ensure that the power source to be utilized conforms to the power requirements specified on the product nameplate.
2. **Power switch**
Ensure that the power switch is in the OFF position. If the plug is connected to a receptacle while the power switch is in the ON position, the power tool will start operating immediately, which could cause a serious accident.
3. **Extension cord**
When the work area is removed from the power source, use an extension cord of sufficient thickness and rated capacity. The extension cord should be kept as short as practicable.
4. **Confirming condition of the environment**
Confirm that the work site is placed under appropriate conditions conforming to prescribed precautions.
When grinding a thin steel plate, depending upon the state of the workbench, a loud noise will be created due to resounding noise from the steel plate being ground. To eliminate unwanted noise in this instance, place a rubber mat beneath the material to be ground.

5. Mounting the wheel guard

The wheel guard is a protective device to prevent injury should the depressed center wheel be shattered during operation. Ensure that the wheel guard is properly fitted and fastened before commencing grinding operation.

By slightly loosening the setting screw, the wheel guard can be turned and set at any desired angle for maximum operational effectiveness. Ensure that the setting screw is thoroughly tightened after adjusting the wheel guard.

6. Confirming and mounting the depressed center wheel.

Thoroughly check that a specified depressed center wheel is free of cracks and splits is mounted.

Confirm that the depressed center wheel is mounted under the specified condition and is firmly clamped.

For details, refer to the item "Assembling and Disassembling the depressed center wheel."

7. Apply a trial run

To start grinding work without checking for possible cracks and splits in the depressed center wheel is very dangerous. Prior to start of grinding, direct the grinder in a direction where no one is present, and apply a trial run without fail to confirm that the grinder displays no abnormalities.

Duration of the trial run is as follows:

When depressed center wheels is replaced
 3 minutes or more

When starting daily work 1 minute or more

8. Confirm the spindle lock mechanism.

Confirm that the spindle lock is disengaged by pushing the push button two or three times before switching the power tool on (See Fig. 2)

9. Fixing the side handle.

Screw the side handle into the gear cover.

PRACTICAL GRINDER APPLICATIONS

1. Since grinding by utilizing only the grinder's own weight is feasible, the grinder should never be pressed forcibly against the plane to be ground. Hold the grinder lightly so that it only slightly contacts the plane to be ground. Heavy pressure will reduce the revolving speed and such deteriorate the finished surface, and phenomena as overload will lead to burning out of the motor.
2. Do not utilize the grinder entire surface when grinding. Use only its peripheral surface by tilting the wheel at an angle of 15-30°, as shown in **Fig. 1**.
3. When a grinder equipped with a new depressed center wheel is pushed forward (direction A), the wheel edge may occasionally cut into the material to be ground. Always pull it backward (direction B) in this instance. However, once the depressed center wheel angle has been adequately abraded, both forward and backward operations are permissible.
4. The provided depressed center wheel (resinoid wheel) is rated as Class A grain and #36 grain size. Accordingly, its range of applications cover a wide variety, proving to be most suitable for heavy grinding of general steel materials. Since the wheel grain size is rather coarse, creating a fine-surfaced finish is very difficult.
In this instance, hold the grinder lightly as through trying to lift it, and apply grinding slowly at a constant low speed. Whereby a fine finish similar to that accomplished with a fine-grain depressed center wheel is obtainable.
5. **Switching on the grinder**
The switch can be turned ON by turning its lever ON side, or turn OFF by turning its lever to the OFF side.
6. **Precaution after use**
Do not lay the grinder down immediately after use in a place where there are many shavings and much dirt and dust until it has completely stopped revolving.

CAUTION

- Shock to the main body can be the cause of cracks or splits in the depressed center wheel. Be especially careful to avoid sudden shocks when using the equipment. If the main unit is accidentally bumped or dropped, make a careful check for cracks or splits on the depressed center wheel before further use.
- Do not press the lock pin when the equipment is turning. Also, do not turn on the switch when the lock pin is pressed down.

ASSEMBLING AND DISASSEMBLING THE DEPRESSED CENTER WHEEL (Fig. 2)

CAUTION

Be sure to switch power OFF and disconnect the attachment plug from the power receptacle to avoid serious trouble.

1. Assembling (Fig. 2)

- (1) Turn the equipment upsidedown so that the spindle will be facing up.
- (2) Mount the wheel washer onto the spindle.
- (3) Fit the protuberance of the depressed center wheel or diamond wheel onto the wheel washer.
- (4) Assemble the wheel nut onto the spindle.
(For diamond wheel assembling, use the wheel nut with the convex side against the diamond wheel.)
- (5) Insert the push button to prevent rotation of the spindle, and tighten the wheel nut securely with provided wrench, as shown in **Fig. 2**.

2. Disassembling

Follow the above procedures in reverse.

CAUTION: Confirm that the depressed center wheel is mounted firmly.
Confirm that the lock pin is disengaged by pushing lock pin two or three times before switching the power tool on.

MAINTENANCE AND INSPECTION

1. Inspecting the depressed center wheel

Ensure that the depressed center wheel is free of cracks and surface defects.

Replace the depressed center wheel when it has been worn out to about 60 mm in external diameter.

2. Inspecting the mounting screws

Regularly inspect all mounting screws and ensure that they are properly tightened. Should any of the screws be loose, retighten them immediately. Failure to do so could result in serious hazard.

3. Maintenance of the motor

The motor unit winding is the very "heart" of the power tool. Exercise due care to ensure the winding does not become damaged and/or wet with oil or water.

4. Inspecting the carbon brushes (Fig. 3)

The motor employs carbon brushes which are consumable parts.

When they become worn to or near the "wear limit", it could result in motor trouble. When an auto-stop carbon brush is equipped, the motor will stop automatically.

At that time, replace both carbon brushes with new ones which have the same carbon brush numbers shown in the figure. In addition, always keep carbon brushes clean and ensure that they slide freely within the brush holders.

5. Carbon Brush Replacement

<Disassembly>

- (1) Loosen the D4 tapping screw fastening the brush cover and remove the brush cover from the handle (**Fig. 4-A**).
- (2) Use a small screwdriver or similar tool, to shift the end of the spring holding the carbon brush toward the outside of the brush holder (**Fig. 4-B**).
- (3) Remove the carbon brush from the brush holder, grasp the pigtail and disconnect the carbon brush plug by pulling out (**Fig. 4-B**).

<Assembly>

- (1) Use a small screwdriver, etc., to insert the carbon brush plug into the brush holder terminal (**Fig. 4-C**).
- (2) Insert the carbon brush into the brush holder, use a small screwdriver or similar tool, to shift the end of the spring onto the top of the carbon brush (**Fig. 4-D**).

NOTE: Make sure the end of the spring is not holding the pigtail (**Fig. 4-E**).

- (3) Engage the brush cover on the handle and tighten the D4 tapping screw.

NOTE: Make sure the pigtail is not pinched by the brush cover.

CAUTION

In the operation and maintenance of power tools, the safety regulations and standards prescribed in each country must be observed.

NOTE

Due HiKOKI's continuing program of research and development, the specifications herein are subject to change without prior notice.

一般安全規則

⚠ 警告

閱讀所有安全警告說明

未遵守警告與說明可能導致電擊、火災或其他嚴重傷害。

請妥善保存本使用說明書，以供未來參考之用。

「電動工具」一詞在警告中，係指電源操作（有線）之電動工具或電池操作（無線）之電動工具。

1) 工作場所安全

- a) 保持工作場所清潔及明亮。
雜亂或昏暗的區域容易發生意外。
- b) 勿在易產生爆炸之環境中操作，譬如有易燃液體、瓦斯或粉塵存在之處。
電動工具產生火花會引燃粉塵或煙氣。
- c) 當操作電動工具時，確保兒童及過往人員遠離。
分神會讓您失去控制。

2) 電氣安全

- a) 電動工具插頭必須與插座配合，絕不可以任何方法修改插頭，且不得使用任何轉接插頭於有接地之電動工具。
不修改插頭及所結合之插座，可減少電擊。
- b) 避免身體接觸到地面，諸如管子、散熱器、爐灶及冰箱。
如果您的身體接地或觸地，會增加電擊的危險。
- c) 勿讓電動工具淋雨或曝露在潮濕的環境下。
電動工具進水會增加電擊的危險。
- d) 勿濫用電源線。請勿使用電源線去纏繞、拖拉電動工具或拔插頭，保持電源線遠離熱氣、油氣、尖角或可動零件。
損壞或纏繞的電源線會增加電擊之危險。
- e) 電動工具在室外操作時，請務必使用適合室外用的延長線。
使用合適之室外用延長線會減少電擊的危險。
- f) 若無法避免在潮濕地區操作電動工具，請使用以漏電斷路器 (RCD) 來保護電源。
使用 RCD，可降低觸電危險。

3) 人員安全

- a) 保持機警，注意您正在做什麼，並運用正確常識操作電動工具。
當你感到疲勞或受藥品、酒精或醫療影響時，請勿操作電動工具。
操作中瞬間的不注意，可能造成人員嚴重的傷害。

- b) 使用個人防護裝備，經常配戴安全眼鏡。
配戴防塵口罩、防滑安全鞋、硬帽等防護裝備，或在適當情況下使用聽覺防護，可減少人員傷害。
- c) 防止意外發生。在連接電源或電池組、拿起或攜帶工具前，請確認開關是在「off」（關閉）的位置。
以手指放在開關握持電動工具，或在電動工具的開關於「on」的狀況下插上插頭，都會導致意外發生。
- d) 在電動工具啟動前，先卸下任何調整用鑰匙或扳手。
扳手或鑰匙遺留在電動工具的轉動部位時，可能導致人員傷害。
- e) 身體勿過度伸張，任何時間要保持站穩及平衡。
以便在不預期的狀態下，能對電動工具有較好的控制。
- f) 衣著要合宜，別穿太鬆的衣服或戴首飾。
保持你的頭髮、衣服及手套遠離轉動部位。
寬鬆的衣服、手飾及長髮會被捲入轉動部位。
- g) 如果裝置要用於粉塵抽取及集塵設施，要確保其連接及正當使用。
使用集塵裝置可減少與灰塵相關的危險。

4) 電動工具之使用及注意事項

- a) 勿強力使用電動工具，使用正確之電動工具為您所需。
正確使用電動工具，會依其設計條件，使工作做得更好更安全。
- b) 如果開關不能轉至開或關的位置，勿使用電動工具。
任何電動工具不能被開關所控制是危險的，必須要修理。
- c) 進行任何調整、更換配件或收存電動工具時，必須將插頭與電源分開，且需將電池組從電動工具中取出。
此種預防安全措施，可減少意外開啟電動工具之危險。
- d) 收存停用之電動工具，需遠離兒童，且不容許不熟悉電動工具或未瞭解操作電動工具說明的人操作電動工具。
在未受過訓練的人手裡，電動工具極為危險。
- e) 保養電動工具，檢查是否可動零件有錯誤的結合或卡住、零件破裂及可能影響電動工具操作的任何其他情形。
電動工具如果損壞，在使用前要修好。
許多意外皆肇因於不良的保養。
- f) 保持切割工具銳利清潔。
適當的保養切割工具，保持銳利之切削鋒口，可減少卡住並容易控制。

- g) 按照說明書使用電動工具、配件及刀具時，必須考量工作條件及所執行之工作。
若未依照這些使用說明操作電動工具時，可能造成相關之危害情況。
- 5) 維修
 - a) 讓您的電動工具由合格修理人員僅使用相同的維修零件更換。
如此可確保電動工具的安全得以維持。

注意事項

不可讓孩童和體弱人士靠近工作場所。

應將不使用的電動工具存放在孩童和體弱人士伸手不及的地方。

對砂輪機或砂輪片操作的通用安全警告

- a) 該電動工具是用於實現研磨或切斷工具功能的。閱讀隨該電動工具提供的使用說明書內的所有安全警告、說明、圖解和規定。
不瞭解所列的說明，將導致電擊、著火或嚴重傷害。
- b) 不推薦用該電動工具進行諸如砂光、刷光、拋光或切斷等操作。
電動工具不按指定的功能去操作，可能會發生危險和引起人身傷害。
- c) 不使用非工具製造商推薦和專門設計的附件。
若該附件被裝到您的電動工具上，它可能不能保證操作安全。
- d) 砂輪片的額定速度，必須至少等於電動工具上標出的最大速度。
砂輪片在比額定速度大的速度運轉時，會發生爆裂和飛濺。
- e) 砂輪片的外徑和厚度，必須在電動工具額定能力範圍之內。
不正確的砂輪片尺寸，不能得到充分防護或控制。
- f) 安裝配件的螺紋必須與砂輪機主軸螺紋相配。對於以法蘭安裝的配件，配件的軸孔必須符合法蘭的定位直徑。
與電動工具的安裝硬體不相配的配件會失去平衡，劇烈振動，並可能導致失去控制。
- g) 不要使用損壞的砂輪片。在每次使用前要檢查砂輪片，例如砂輪片是否有碎片和裂縫，靠背墊是否有裂縫、撕裂或過度磨損，鋼絲刷是否鬆動或金屬絲是否斷裂。如果電動工具或砂輪片跌落了，檢查是否有損壞或安裝沒有損壞的砂輪片。檢查和安裝砂輪片後，讓自己和旁觀者的位置遠離旋轉砂輪片的空間，並以電動工具最大空載速度運行1分鐘。
損壞的砂輪片通常在該試驗時會碎裂。
- h) 戴上防護用品。根據操作情況，使用面罩、安全護目鏡或安全眼鏡。必要時，戴上防塵面具、聽力保護器、手套和能攔小磨料或工件碎片的工作圍裙。防護用品必須擋住各種操作產生的飛屑。防塵面具或口罩必須能過濾操作產生的顆粒。長期暴露在高強度雜訊中會引起失聰。
- i) 讓旁觀者與工作區域保持一定的安全距離。任何進入工作區域的人必須戴上防護用品。
工件或破損砂輪片的碎片可能會飛出，並引起緊靠著操作區域的旁觀者的傷害。
- j) 進行操作時，若切割配件可能接觸到暗線或其自身的電線，請握著電動工具的絕緣手柄表面。
接觸到「通電」電線的切割配件，可能使電動工具的金屬零件「通電」，而造成操作人員觸電。
- k) 讓軟線遠離旋轉的砂輪片。
如果控制不當，軟線可能被切斷或纏繞，並使得你的手或手臂可能被捲入旋轉砂輪片中。
- l) 直到砂輪片完全停止運轉，才可以放下電動工具。
旋轉的砂輪片可能會抓住表面，並拉動電動工具而讓您失去對工具的控制。
- m) 當攜帶電動工具時不要開動它。
意外觸及旋轉砂輪片，可能會纏繞你的衣服而使砂輪片傷害身體。
- n) 經常清理電動工具的通風口。
砂輪機風扇會將灰塵吸進機殼，過多的金屬粉末沈積會導致電氣危險。
- o) 不要在易燃材料附近操作電動工具。
火星可能會點燃這些材料。
- p) 不要使用需用冷卻液的砂輪片。
用水或其他冷卻液可能會導致電腐蝕或電擊。

反衝和相關警告

反衝是因卡住或纏繞住的旋轉砂輪片、靠背墊、鋼絲刷或其他附件而產生的突然反作用力。卡住或纏繞會引起旋轉砂輪片的迅速堵轉，隨之使失控的電動工具在卡住點產生與砂輪片旋轉方向相反的運動。
例如，如果砂輪片被工件纏繞或卡住，伸入卡住點的砂輪片邊緣可能會進入材料表面而引起砂輪片飛出或反彈。砂輪片可能飛向或飛離操作者，這取決於砂輪在卡住點的運動方向。
在此條件下砂輪片也可能碎裂。
反衝是電動工具誤用或不正確操作工序或條件的結果，但透過採取以下適當的預防措施得以避免。

- a) 保持緊握電動工具，使你的身體和手臂處於正確狀態以抵抗反彈力。如有輔助手柄，則要一直使用，以便最大限度控制住起動時的反彈力或反力矩。
如採取適當的預防措施，操作者就可以控制反力矩或反彈力。

- b) 絕不能將手靠近旋轉砂輪片。
砂輪片可能會反彈碰到手。
- c) 不要站在發生反衝時，電動工具可能移動到的地方。
反衝將在纏繞點讓砂輪片轉動方向逆向轉動。
- d) 當在尖角、銳邊等處作業時要特別小心。避免砂輪片的彈跳和纏繞。
尖角、銳邊和彈跳具有纏繞旋轉砂輪片的情形，並引起反衝的失控。
- e) 不要加裝鋸鏈、木雕刀片或帶齒鋸片。
這些鋸片會產生頻繁的反彈和失控。

對砂輪片使用的專用安全警告

- a) 只使用所推薦的砂輪片型號和為選用砂輪片專門設計的護罩。
不是為電動工具設計的砂輪片不能充分得到防護，是不安全的。
- b) 去壓中心輪的磨削表面必須安裝在護刀器唇的平面下方。
突出護刀器唇平面，未妥善安裝的砂輪片，無法得到適當的保護。
- c) 護罩必須牢固地裝在電動工具上，且放置得最具安全性，只有最小的砂輪部分暴露在操作人面前。
護罩有助於保護操作者免於碰觸到損壞的砂輪碎片，可能點燃衣物的火花，以及與砂輪片的意外接觸。
- d) 砂輪片只用作推薦的用途。例如：不要用切割砂輪片的側面進行磨削。
施加到砂輪片側面的力可能會使其碎裂。
- e) 要經常為砂輪片選用未損壞的、有恰當規格和形狀的砂輪法蘭盤。
合適的砂輪法蘭盤支承砂輪片可以減小砂輪片破裂的可能性。切割砂輪片的法蘭盤可以不同於砂輪法蘭盤。
- f) 不要使用從大規格電動工具上用剩的磨損砂輪片。
用於大規格電動工具上的砂輪片，不適於較小規格工具的高速工況並可能會爆裂。

對砂輪切割操作的附加專用安全警告

- a) 不要“夾”住砂輪片或施加過大的壓力。不要試圖做過深的切割。
給砂輪片施加過大的應力，會增加砂輪片在切割時的負載，容易纏繞或卡住，增加了反衝或砂輪片爆裂的可能性。
- b) 身體不要對著旋轉砂輪片，也不要站在其後。
當把砂輪片從操作者身邊的操作點移開時，可能的反衝，會使旋轉砂輪片和電動工具朝您衝來。

- c) 當砂輪片被卡住或任何原因而中斷切割時，關掉電動工具並握住工具不要動，直到砂輪片完全停止。決不要試圖當砂輪片仍然運轉時，讓砂輪片脫離切割，否則會發生反衝。
調查並採取校正措施以消除砂輪片卡住的原因。
- d) 不能在工件上重新起動切割操作。讓砂輪片達到全速後再小心地重新進入切割。
如果電動工具在工件上重新起動，砂輪片可能會卡住、飛出或反衝。
- e) 過大工件時需使用支撐座，使砂輪片受夾住或產生反衝作用力的風險降到最低。
大工件由於其自身重量，容易趨於下陷。支撐座必須置於工件下方的砂輪片兩側，靠近鋸切路徑與工件邊緣。
- f) 在進行牆壁或其他隱蔽區域之局部鋸切時，請格外小心。
凸出的砂輪片可能會鋸切到瓦斯管、水管、電線或足以產生反衝作用力的物體。

砂輪機的一般安全說明

- 確認砂輪片上所標示的轉速等於或大於砂輪機的額定轉速；
- 確保砂輪片尺寸與砂輪機相符；
- 須按照廠家的使用說明書小心存放和使用砂輪；
- 使用前檢查砂輪片，不要使用破損、有裂縫或其他缺陷的產品；
- 確保所安裝的砂輪片和重點已按照廠家的使用說明固定；
- 在需要時使用吸油紙；
- 在使用前確保已正確安裝並鎖緊砂輪片，並在安全場所的空載狀態下運轉30秒鐘，若有較大的振動或察覺到其他缺陷，則應立即停止運轉。遇此情況時，檢查電動工具以究明原因；
- 若電動工具配備保護裝置，切勿在未使用此保護裝置時使用電動工具；
- 使用砂輪片切割時，務必先拆下屬於標準配件的砂輪護板，再裝上附帶側邊護板的砂輪護板（需另購）；
- 請勿使用單獨的異徑軸套或接頭，來適應大孔砂輪片；
- 若要用螺紋孔砂輪片來安裝的工具，需確保砂輪片的螺紋足夠長，以適合軸長；
- 檢查工件已被正確固定；
- 請勿使用切斷砂輪片進行側面研磨；
- 確保使用時產生的火花不會引起危險，例如不要濺在身體上或點燃易燃物；
- 在多塵的條件下工作時，確保通風口暢通無堵塞現象。如果需要清除灰塵，首先使電動工具斷開電源（使用非金屬物品）並避免損壞內部零件；

- 一 要經常做好視力和聽力的保護。可使用其他個人保護裝置，如口罩、手套、頭盔和圍裙等。
- 一 在切斷本電動工具的電源之後，砂輪片仍會繼續旋轉一段時間，請特別注意。

附加安全警告

- 1. 確認所使用的電源與工具銘牌上標示的規格是否相符。
- 2. 確認電源開關是否切斷。若電源開關接通，則插頭插入電源插座時，電動工具將出其不意地立刻轉動，從而招致嚴重事故。
- 3. 若作業場所遠離電源地點，應使用足夠、安全又合適的延長電線，並且要盡可能地短些。
- 4. 確認要使用的砂輪片是正確類型，無裂縫或表面缺陷。同時也要確保砂輪片安裝妥當，砂輪螺母已牢固鎖緊。

- 5. 打開電動工具的電源之前，請推動按鈕兩或三次，確認按鈕鬆開。
- 6. 本機不可施加過大壓力使其過載，以延長使用壽命並確保加工品質。在大部份的用法中，機器本身的重量即夠研磨。加壓過大將導致轉速降低、表面加工不良以及過載，從而縮短機器壽命。
- 7. 在關閉本電動工具的電源之後，砂輪片仍會繼續旋轉一段時間。關掉機器之後，需等電動工具完全停止才能放下，以免造成嚴重事故，而且還可減少吸入機器的塵埃與切削量。
- 8. 未使用本電動工具時，請斷開電源。
- 9. 組裝和拆卸電動工具之前，請務必將開關關閉並從插座拔下插頭，以避免嚴重事故。
- 10. RCD
使用漏電斷路器時，建議採 30 mA 以下的額定感度電流。

規 格

電壓(按地區)*		(110 V, 220 V, 230 V) ~
輸入功率*		860 W
額定輸出功率		520 W
無負載速度		9500轉/分
最高周速		80 m/秒 (4800 m/分)
砂輪片尺寸	外徑	125 mm
	厚度	6 mm
	孔徑	22.23 mm
重量(僅主機身)		2.1 kg

* 請務必檢查產品上的銘牌，因其依地區會有所變更。

標 準 附 件

- (1) 扳手..... 1
 - (2) 側柄..... 1
- 標準附件可能不預先通告而徑予更改。

用 途

- 用於去除鑄品毛刺、飛邊等物及拋光各種型號的鋼、青銅、鋁及鑄造品。
- 研磨焊接部分或研磨用焊接切割的部分。
- 研磨磚塊、大理石等等。
- 研磨和切割混凝土、石頭、瓦片（用金剛石砂輪片）。

作業之前

- 1. 電源
請確認所使用的電源與工具銘牌上標示的規格是否相符。
- 2. 電源開關
請確認電源開關是否切斷。若電源開關接通，則插頭插入電源插座時電動工具將出其不意地立刻轉動，從而招致嚴重事故。
- 3. 延長電線
若作業場所遠離有電源的地點，應使用厚度足夠、額定電流的延長電線，並且要盡可能地短些。
- 4. 確認環境條件
確認工作場地安排在符合規定措施的條件下。當研磨薄鋼板時，因工作臺的狀態會產生很大的噪音，它是因為研磨鋼板引起的。為了消除這種有害的噪音可在被研磨的材料下放一塊橡皮墊。

5. 砂輪護罩的安裝

輪罩是一種保護裝置，用來防止作業中因砂輪破裂而受傷。開始研磨作業之前，請確認輪罩裝好緊固。稍微擰鬆固定螺絲，輪罩即可轉動並固定在所需角度，以得到最大工作效果，調整輪罩後，確認固定螺絲是否完全鎖緊。

6. 砂輪片的檢查和安裝

仔細檢查所安裝的砂輪片確無破損和裂縫。

確認所安裝的砂輪片在規定的條件下牢固地被夾持。

詳細參閱“砂輪片的裝卸”一節。

7. 試運轉

不檢查砂輪上是否存在著破損和裂縫就開始研磨，將非常危險。所以在開始正式研磨之前，應讓該圓盤電磨機在無人的情況下試運轉，如果沒有問題，就表明此圓盤電磨機沒有異常。

試運轉的持續時間如下：

當更換砂輪片時.....3 分鐘以上

當開始日常工作前.....1 分鐘以上

8. 檢查主軸鎖的裝置

在打開電源開關之前，撤兩、三下鎖定銷檢查鎖定銷是否被釋放。(圖2)

9. 固定側柄

把側柄旋進齒輪罩。

圓盤電磨機的應用

1. 因為只用圓盤電磨機本身的重量研磨是確實可行的，千萬不要把圓盤電磨機強壓在被研磨的表面上，輕輕地握住圓盤電磨機，以使它輕輕地和磨削面接觸。

較重的壓力將降低旋轉速度並會磨損拋光表面，且所引起的過負載現象將導致馬達燒毀。

2. 研磨時不要利用圓盤電磨機的整個表面，如圖 1 所示使砂輪片傾斜 $15^{\circ} \sim 30^{\circ}$ ，只利用它的周邊表面。

3. 當裝上新砂輪片的圓盤電磨機向前推行時（方向 A），可能偶爾地切進所研磨的材料，這時要立即拉它後退（方向 B）。

然而，當凹陷中心砂輪片的棱角被磨損時，前進和後退都可以。

4. 若提供的砂輪片（人造樹脂黏結砂輪片）的額定粒度級是 A，粒度尺寸是 # 36 時，它的應用範圍涉及面很廣，事實證明它最適合於普通鋼材的重研磨。因為這類鋼材的粒度大小相當粗糙要產生一個細的表面拋光是很困難的。

在本例中輕輕地握住圓盤電磨機，提起它，慢慢地用一固定的低速進行研磨。如此可以得到與用細粒度砂輪片時得到的細研磨相類似。

5. 圓盤電磨機的開關

開關是槓桿手柄式的，按它的 ON 端，開關就被接通，按它的 OFF 端，開關就會斷開。

6. 使用後的注意事項

使用後在完全停止轉動前，不要把圓盤電磨機立刻放在有許多細屑和污物和灰塵的地方。

注意

○ 本機受到衝擊時，會導致砂輪片的破裂或發生裂痕。因此，在使用本電磨機時，請留意勿使它受到衝擊。

在使用本電磨機前，不小心碰到或掉下本電磨機時，請充分地檢查一下砂輪片是否有破裂或裂痕。

○ 本電磨機在旋轉時，請勿按下鎖定銷。如鎖定銷被按下的話，則請勿按下開關。

砂輪片的裝卸（圖2）

注意

請確認開關已斷開，並且從電源插座中拔去電源插頭，以避免嚴重事故。

1. 裝配(圖2)

(1) 把工具倒置使主軸朝上。

(2) 把砂輪墊圈裝到主軸上。

(3) 將砂輪片或金剛石砂輪片的突出部裝入砂輪墊圈。

(4) 將砂輪片螺帽旋入主軸。

（使用金剛石砂輪片時，請把砂輪螺帽的凸面裝到朝金屬輪的相反方向上，並且把螺帽擰到主軸上）

(5) 按下鎖定銷以防止主軸轉動，並如圖2所示用附送的扳手鎖緊砂輪螺帽。

2. 拆卸

按照上述步驟相反的順序進行拆卸。

注意

確認砂輪片安裝是否牢固。

確認鎖定銷被解除鎖定；可在打開電源開關之前通過按二、三次鎖定銷來進行檢查。

維護和檢查

1. 檢查砂輪片

檢查砂輪片確實無破裂和表面缺陷。

當砂輪外徑被磨損 60 mm 時，要更換砂輪片。

2. 檢查安裝螺絲

要經常檢查安裝螺絲是否確實鎖緊。若發現螺絲鬆了，應立即重新鎖緊，否則會導致嚴重事故。

3. 馬達的維護

馬達繞線是電動工具的心臟部。應仔細檢查有無損傷，是否被油液或水沾濕。

4. 檢查碳刷（圖 3）

馬達使用碳刷，它是消耗部品。

碳刷一旦使用到磨損極限，馬達就會出現各種障礙；如果所使用的碳刷是“自停式”，馬達將自動地停止轉動。遇到上述情況，應立即換上與圖上代號一致的新碳刷。

此外，碳刷應經常保持乾淨狀態，以保證能在刷握裏自由滑動。

5. 更換碳刷

〈拆卸〉

- (1) 將固定碳刷蓋的D4自攻螺絲鬆開，從把手上取下碳刷蓋。（圖4-A）
- (2) 用小號螺絲起子等工具取下壓在碳刷上的彈簧，放到碳刷支架的外面。（圖4-B）
- (3) 將碳刷從碳刷支架上取出，夾住引線拔掉碳刷的端腳。（圖4-B）

〈組裝〉

- (1) 用小號螺絲起子等工具將碳刷的端腳插入碳刷支架的末端。（圖4-C）
- (2) 將碳刷插入碳刷支架，用小號螺絲起子等工具將彈簧放回碳刷的頂部。（圖4-D）

註：請不要讓彈簧壓在引線上。（圖4-E）

- (3) 將碳刷蓋蓋在把手上，並鎖緊D4自攻螺絲。

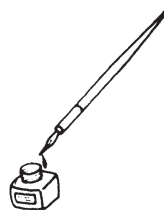
註：請確認不得讓碳刷蓋卡住引線。

注意

在操作和維護電動工具中，必須遵守各國的安全規則和標準規定。

註

為求改進，本說明書所載規格可能不預先通告而徑予更改。



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104

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