FLEX FX4221 24V Trim Router Instruction Manual

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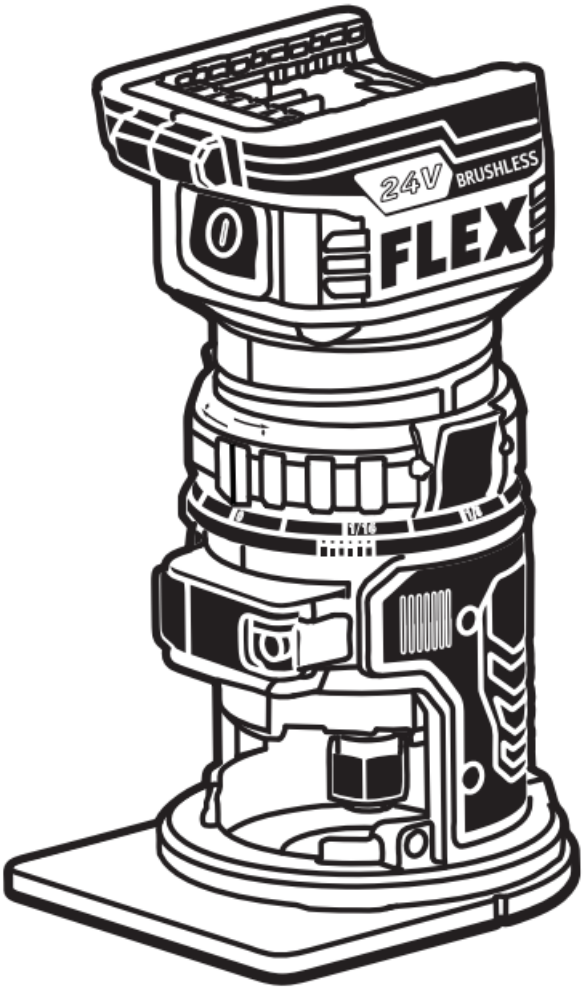
24V
BRUSHLESS
FLEX

Contents

SAFETY SYMBOLS

The purpose of safety symbols is to attract your attention to possible dangers. The safety symbols and the explanations with them deserve your careful attention and understanding. The symbol warnings do not, by themselves, eliminate any danger. The instructions and warnings they give are no substitutes for proper accident prevention measures.

⚠ WARNING Be sure to read and understand all safety instructions in this Operator's Manual, including all safety alert symbols such as **"DANGER," "WARNING,"** and **"CAUTION"** before using this tool. Failure to follow all instructions listed below may result in electric shock, fire, and/or serious personal injury.

The definitions below describe the level of severity for each signal word. Please read the manual and pay attention to these symbols.	
	This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.
⚠ DANGER	DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.
⚠ WARNING	WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.
⚠ CAUTION	CAUTION, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, will result in minor or moderate injury.

Damage Prevention and Information Messages

These inform the user of important information and/or instructions that could lead to equipment or other property damage if they are not followed. Each message is preceded by the word “NOTICE”, as in the example below:

NOTICE: Equipment and/or property damage may result if these instructions are not followed.

The operation of any power tools can result in foreign objects being thrown into your eyes, which can result in severe eye damage. Before beginning power tool operation, always wear safety goggles or safety glasses with side shields and a full face shield when needed. We recommend a Wide Vision Safety Mask for use over eyeglasses or standard safety glasses with side shields. Always use eye protection which is marked to comply with ANSI Z87.1.

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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.

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 a power tool in a damp location is unavoidable, use a ground fault circuit interrupter (GFCI) protected supply. Use of a 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 a 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 and clothing 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.

Do not let familiarity gained from frequent use of tools allow you to become complacent and ignore tool safety principles. A careless action can cause severe injury within a fraction of a second.

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 remove the battery pack, if detachable, 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 and accessories. 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.

Keep handles and grasping surfaces dry, clean and free from oil and grease. Slippery handles and grasping surfaces do not allow for safe handling and control of the tool in unexpected situations.

Battery tool use and care

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.

Use power tools only with specifically designated battery packs. Use of any other battery packs may create a risk of injury and fire.

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.

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.

Do not use a battery pack or tool that is damaged or modified. Damaged or modified batteries may exhibit unpredictable behavior resulting in fire, explosion or risk of injury.

Do not expose a battery pack or tool to fire or excessive temperature. Exposure to fire or temperature above 265 °F (130 °C) may cause explosion.

Follow all charging instructions and do not charge the battery pack or tool outside the temperature range specified in the instructions. Charging improperly or at temperatures outside the specified range may damage the battery and increase the risk of fire.

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.

Never service damaged battery packs. Service of battery packs should only be performed by the manufacturer or authorized service providers.

SAFETY WARNINGS FOR TRIM ROUTER

- **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.
- **Never operate cutter bits at speeds that are higher than their maximum rated speed.** Cutter bits running faster than their rated speed can break and fly apart.
- **Never use cutter bits with a diameter exceeding the maximum diameter specified in the technical data section.**
- **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.**
- **Wear a dust mask specifically designed for protection against lead paint dust and fumes and ensure that persons within or entering the work area are also protected.**
- **Wear ear protection.** Exposure to noise can cause hearing loss.
- **Always use safety glasses.** Also use a face or dust mask if the cutting operation is dusty. Everyday eyeglasses only have impact resistant lenses. They are not safety glasses.
- **Never lay the tool down until the motor has come to a complete standstill**. The spinning cutter bit can grab the surface and pull the tool out of your control.

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
A	Amperes	Current
Hz	Hertz	Frequency (cycles per second)
W	Watt	Power
kg	Kilograms	Weight
min	Minutes	Time
s	Seconds	Time
Wh	Watt-hours	Battery capacity
Ah	Ampere-hours	Battery capacity
ø	Diameter	Size of drill bits, grinding wheels, etc.
n0	No load speed	Rotational speed, at no load
n	Rated speed	Maximum attainable speed
…/min	Revolutions or reciprocations per min ute (rpm)	Revolutions, strokes, surface speed, orbits, etc. p er minute
O	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 (AC)	Type or a characteristic of current
	Direct current (DC)	Type or a characteristic of current
	Alternating or direct current (AC / DC)	Type or a characteristic of current
	Class II tool	Designates Double Insulated Construction tools.
	Protective earth	Grounding terminal
	Li-ion RBRC seal	Designates Li-ion battery recycling program
	Read the instructions	Alerts user to read manual
	Wear eye protection symbol	Alerts user to wear eye protection
	Always operate with two hands	Alerts user to always operate with two hands
	Do not use the guard for cut off operat ions	Do not use the guard for cut-off operations

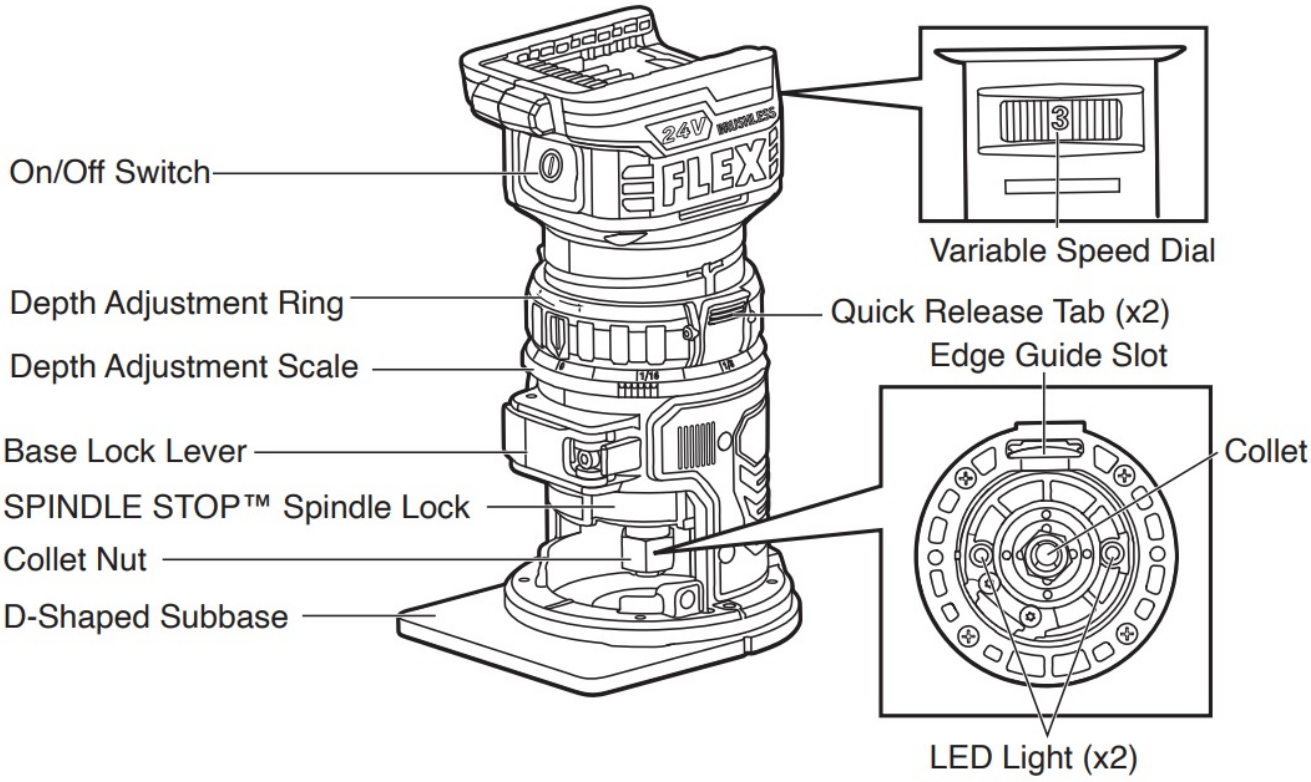
SYMBOLS (CERTIFICATION INFORMATION)

Symbol	Designation/Explanation
	This symbol designates that this tool is listed by Underwriters Laboratories.
	This symbol designates that this component 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.

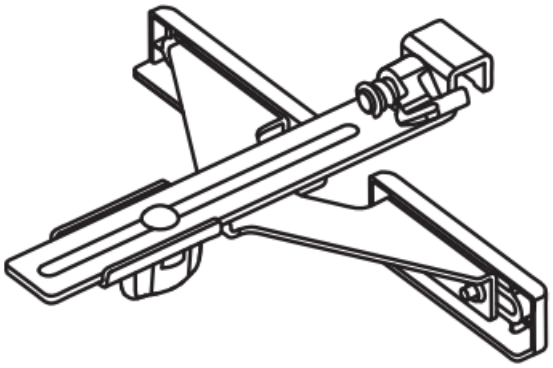
FUNCTIONAL DESCRIPTIONS & SPECIFICATIONS

24V TRIM ROUTER

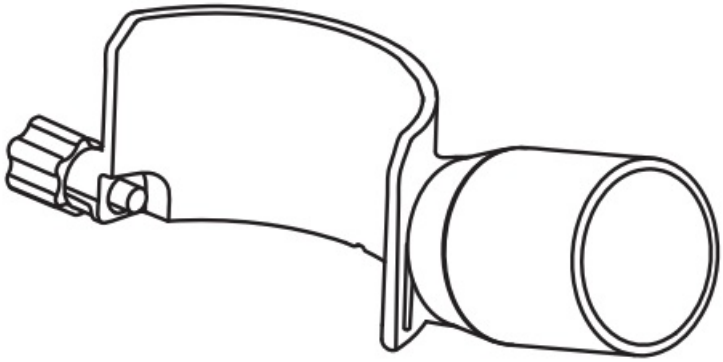
Fig. 1



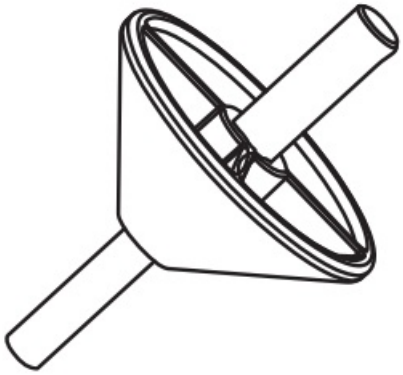
- Edge Guide Assembly



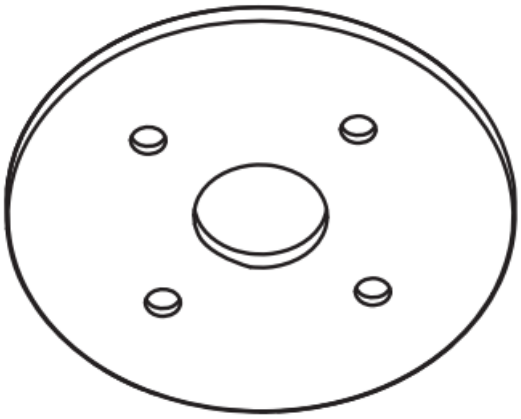
- Dust Extraction Hood



- Centering Cone



- Round Subbase



- 17mm Wrench

- 12mm Wrench

Model No.	FX4221
Rated Voltage	24 V d.c.
Collet Capacity	1/4”
No-load Speed	Up to 31000 /min
Recommended operating temperature	-4 – 104 °F (-20 – 40 oC)
Recommended storage temperature	122 °F (< 50 oC)

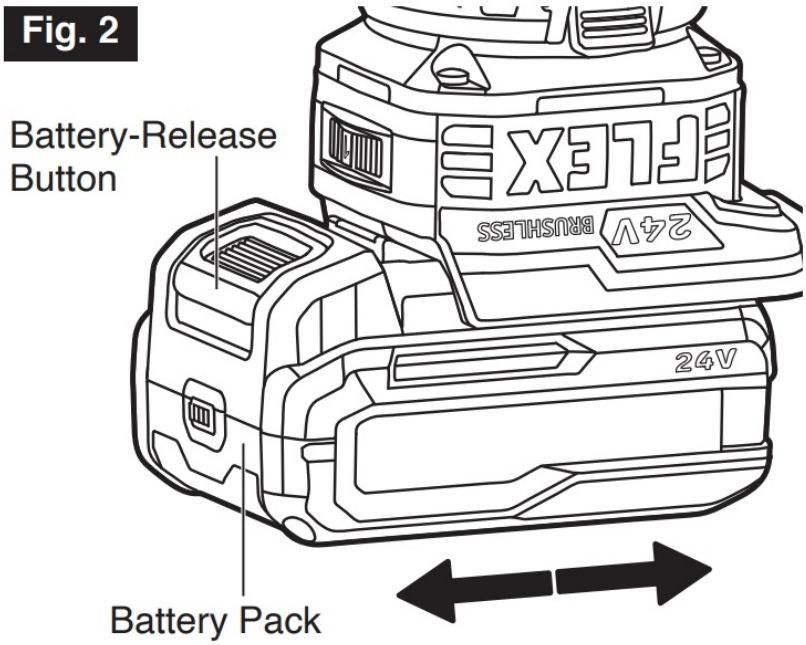
ASSEMBLY

⚠ WARNING Detach the battery pack from the tool before performing any assembly or adjustments, or changing accessories. Such preventive safety measures reduce the risk of starting the tool accidentally.

⚠ WARNING Do not attempt to modify this tool or create accessories not recommended for use with this tool. Any such alteration or modification is misuse and could result in a hazardous condition leading to possible serious injury.

TO ATTACH/DETACH BATTERY PACK (FIG. 2)

Fig. 2



⚠ WARNING Make sure the on/off switch is not pressed when attaching or detaching the battery pack. Such preventive safety measures reduce the risk of starting the tool accidentally

To attach the battery pack:

Align the raised rib on the battery pack with the grooves in the tool, and then slide the battery pack onto the tool.

NOTICE: When placing the battery pack onto the tool, be sure that the raised rib on the battery pack aligns with the groove inside the tool and that the latches snap into place properly. Improper attachment of the battery pack can cause damage to internal components.

To detach the battery pack:

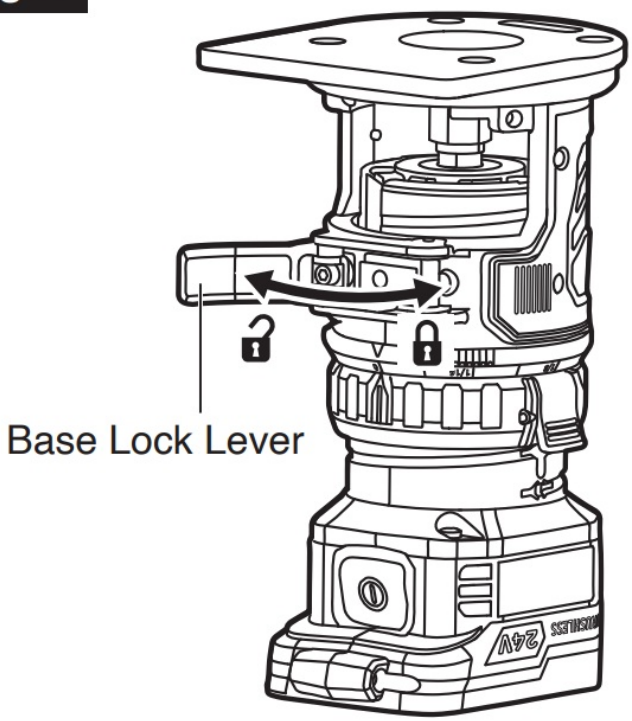
Depress the battery-release button located on the front of the battery pack, to release the battery pack. Pull the battery pack out and remove it from the tool.

INSTALLING AND REMOVING THE BASE (FIG. 3 AND 4)

To remove the base

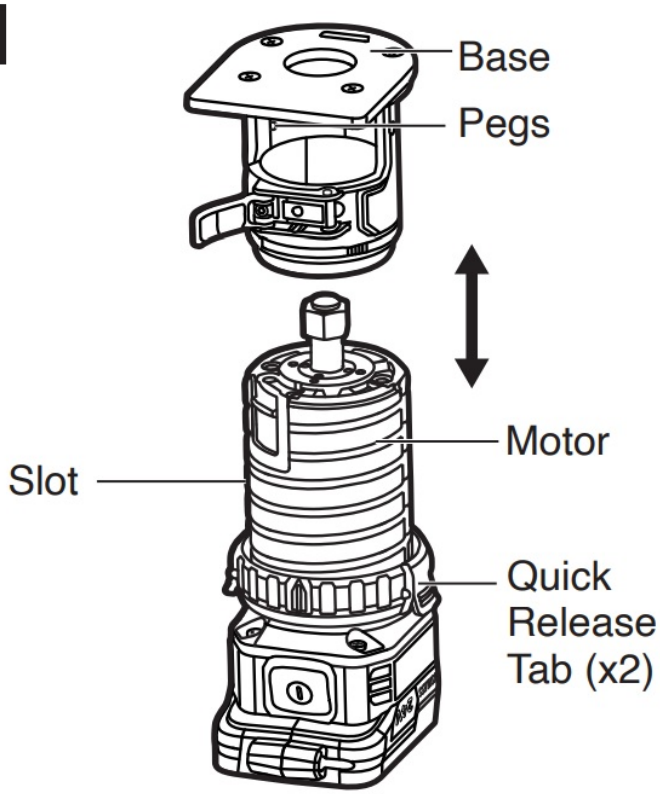
1. Detach the battery pack.
2. Place the tool upside down.
3. Open the lock lever on the base unit **(Fig. 3).**

Fig. 3



4. Depress both quick release tabs on the motor unit with one hand. With the other hand, pull the base unit from the motor unit **(Fig. 4).**

Fig. 4



To install the base

1. Align the vertical slot on the motor unit with the pegs on the inside of the base unit as shown in Fig. 4. It is recommended to make the spindle lock face the dust outlet for easy operation on the spindle lock.
2. Lower the base unit onto the motor unit. Push the base unit down until you hear a “click”, which means the base unit is mounted onto the motor unit properly.
3. Close the lock lever on the base unit.

INSTALLING AND REMOVING BITS (FIG. 5, AND 6)

⚠ WARNING Do not use bits with damaged shanks.

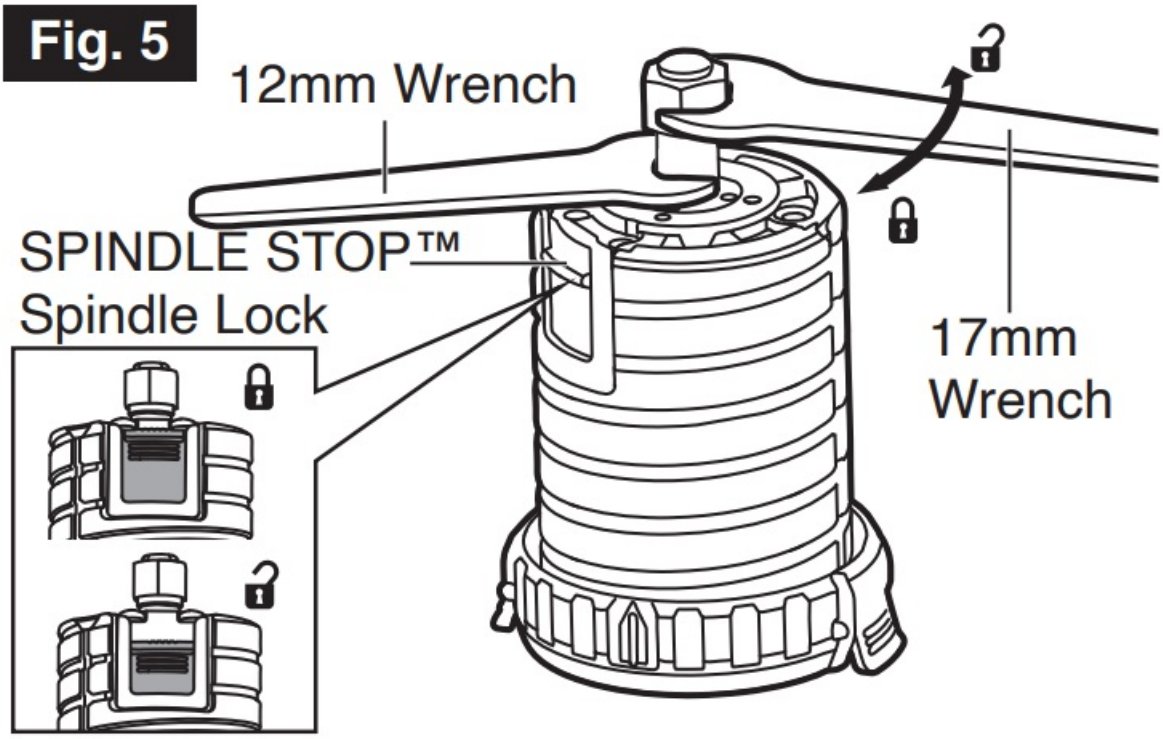
⚠ WARNING Use protective gloves when removing the bit from the tool, or first allow the bit to cool down. The bit may be hot after prolonged use.

Select the bit

This router is shipped with a 1/4” collet that accepts cutter bits with 1/4” shanks.

1. Detach the battery pack.
2. Place the tool upside down and remove the base unit following above section **“TO REMOVE THE BASE”.**
3. Slide the spindle lock down, until it audibly clicks, to lock the spindle shaft in place. Alternatively, you can use the 12 mm wrench to hold the spindle securely.
4. Use the 17 mm wrench to turn the collet nut counterclockwise **(Fig. 5).**

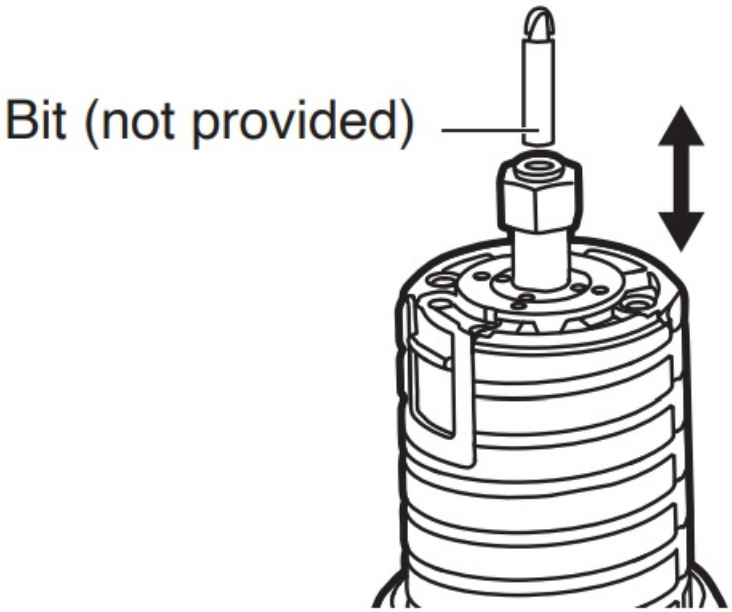
Fig. 5



5. Install or remove the bit/collet as follows:

   • To install a bit, clean and insert the round shank of the desired router bit into the collet so that the cutting surfaces are approximately 1/8” (3.2 mm) to 1/4” (6.4 mm) away from the face of the collet **(Fig. 6).**

Fig. 6



   • To remove the bit, pull the bit out of the collet.

6. Turn the collet nut clockwise to tighten the bit using the 17 mm.
7. Slide the spindle lock up to release the spindle shaft.

   NOTE: The tool could be started only when the spindle lock is released. The LED lights will flash to signal that the spindle is locked when the On/Off switch is pressed.

8. Install the base following above section **“TO INSTALL THE BASE”.**

⚠ WARNING Tighten the collet nut securely to prevent the cutter bit from slipping. If the collet nut is not tightened securely, the cutter bit may detach during use, causing serious personal injury.

NOTICE: To prevent damage to tool, do not tighten the collet nut without a cutter bit installed.

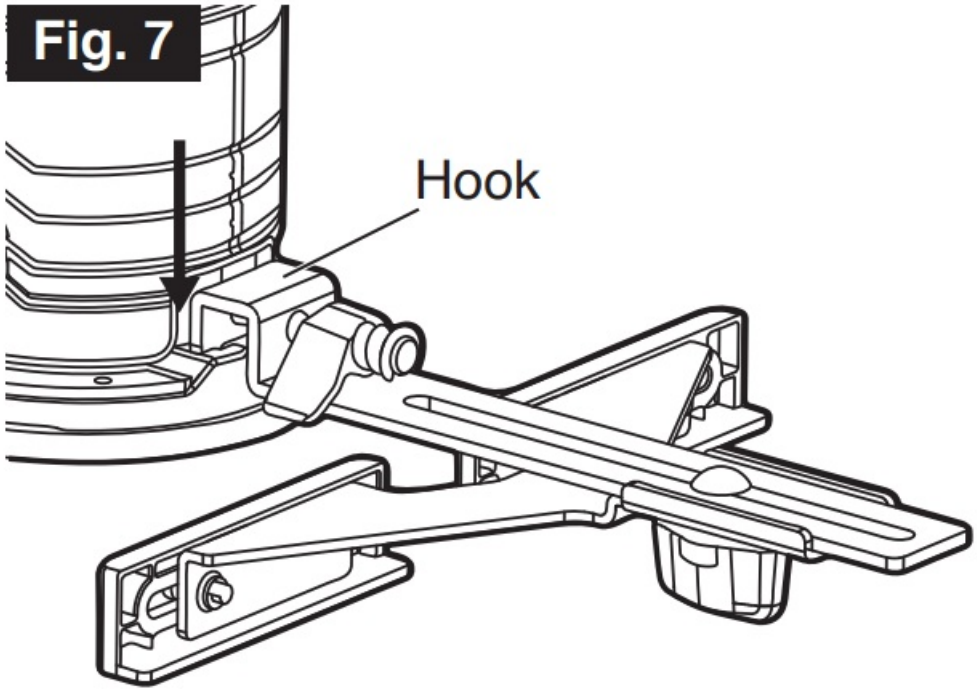
NOTICE: To ensure proper gripping of the cutter bit shank and minimize run-out, the shank of the cutter bit must be inserted at least 5/8” (16 mm) into the collet.

INSTALLING AND REMOVING THE EDGE GUIDE ASSEMBLY (FIG. 7, 8, 9, AND 10)

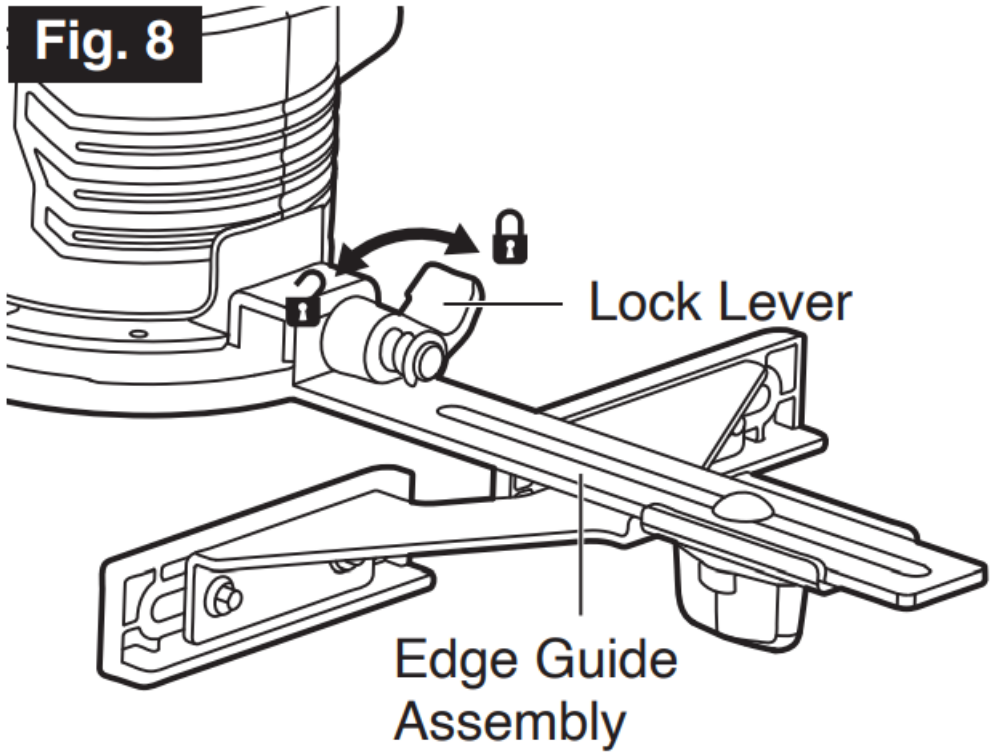
The edge guide assembly is used to trim or cut a straight edge.

To install the edge guide assembly

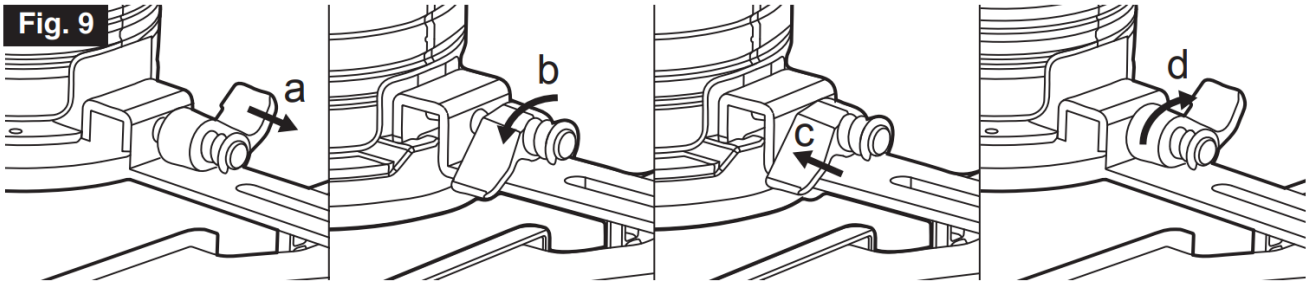
1. Turn the lock lever of the edge guide assembly to the left as far as it will go.
2. Insert the “hook” of the edge guide assembly into the edge guide slot **(Fig. 7).**



3. Turn the lock lever to the right as far as it will go to secure the edge guide assembly to the base **(Fig. 8).**



NOTE: If the connection of edge guide assembly is loose, perform the following steps **(Fig. 9):**



a. With the lock lever in the right-most position, pull the lock lever away from the hook until the lever can freely turn left or right

b. With the spring compressed, rotate the lock lever to the left. You shouldn't feel any resistance!

c. Release the lock lever to let it spring back and engage with the tightening mechanism.

d. Turn the lock lever to the right until the edge guide assembly is securely attached to the base.

To remove the edge guide assembly

1. Turn the lock lever all the way to the left.
2. Remove the edge guide assembly from the slot.

   NOTE: If the edge guide assembly could not be removed easily, perform the following steps **(Fig. 10):**

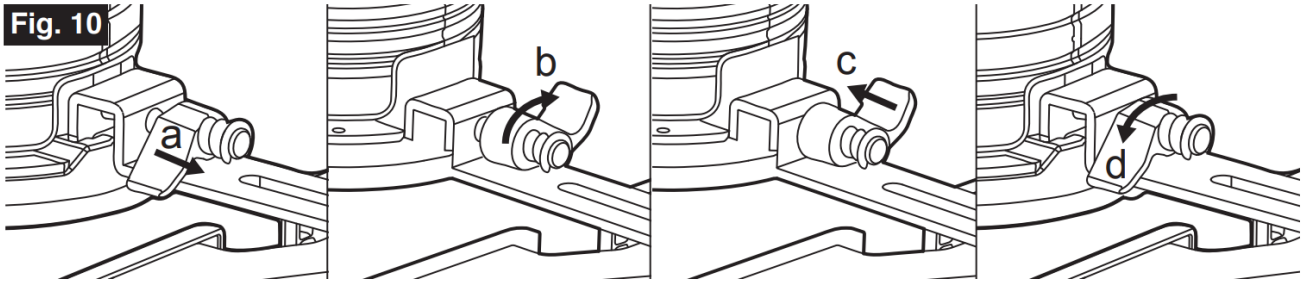
   a. With the lock lever in the left-most position, pull the lock lever away from the hook until the lever can freely turn left or right.

   b. With the spring compressed, rotate the lock lever to the right. You shouldn't feel any resistance!

   c. Release the lock lever to let it spring back and engage with the tightening mechanism.

   d. Turn the lock lever to the left until the edge guide assembly can be removed from the edge guide slot.

Fig. 10



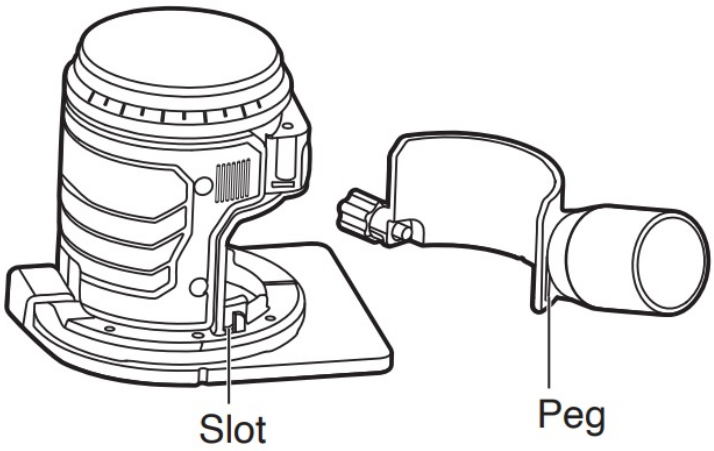
INSTALLING AND REMOVING THE DUST EXTRACTION HOOD (FIG. 11 AND 12)

The dust extraction hood attaches to the router base for dust free routing when used in combination with a suitable vacuum cleaner/ dust extractor. The dust extraction hood allows connection of a 1-1/4” (32 mm) vacuum hose or adaptor.

To install the dust extraction hood

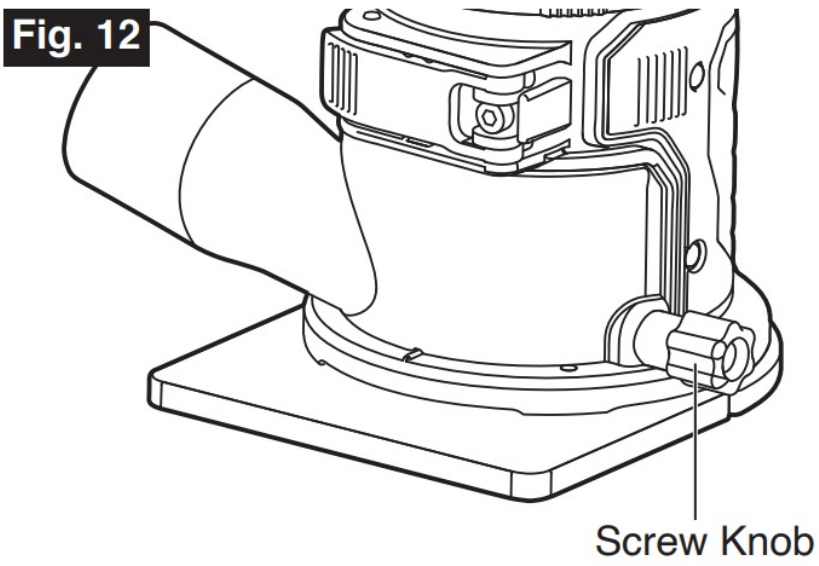
1. Insert the peg on the left side of the dust extraction hood into the slot on the left side of the base **(Fig. 11).**

Fig. 11



2. Snap the right side of the hood with the screw knob onto the right side of the base.
3. Manually thread and tighten the screw knob into a threaded opening on the right side of the base **(Fig. 12).**

Fig. 12



To remove the dust extraction hood

1. Fully unscrew the screw knob from the base.
2. Release the peg of the hood from the slot on the left side of the base.
3. Pull the dust extraction hood away from the base.

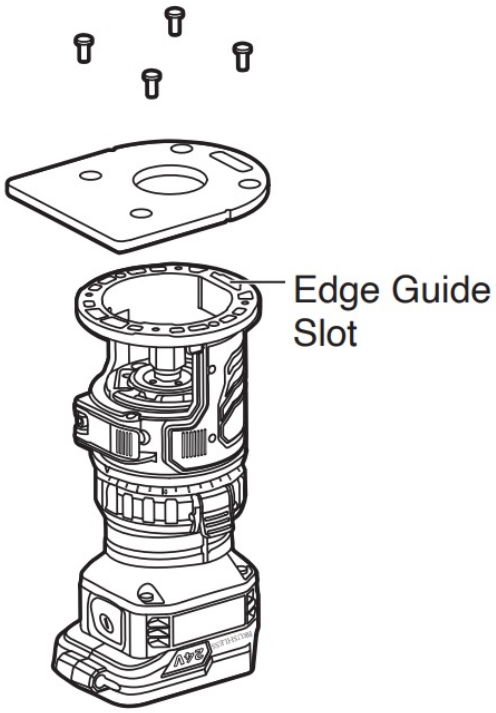
INSTALLING AND REMOVING THE SUBBASE (FIG. 13, 14, AND 15)

To remove subbase, just loosen and remove the subbase screws and the subbase.

To install subbase

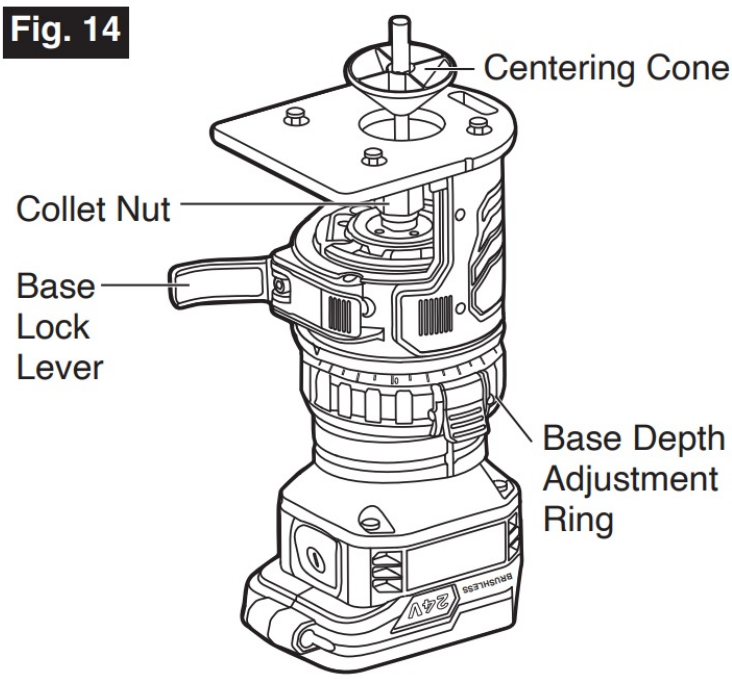
1. Align the holes on the subbase with the holes at the bottom of the tool. The edge guide slot can be used as a reference during the alignment of the D-shaped subbase **(Fig. 13).**

Fig. 13



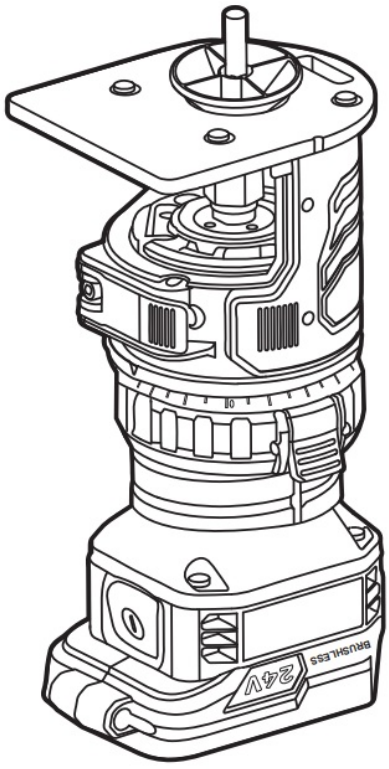
2. Thread in but do not tighten the screws. Make sure the subbase can move freely.
3. Insert the pin of the centering cone into the collet and tighten the collet nut..
4. Open the base lock lever and turn the depth adjustment ring until the centering cone stops and centers the subbase **(Fig. 14).**

Fig. 14



5. Close the base lock lever **(Fig. 14)** and tighten the subbase screws to fix the subbase **(Fig. 15).**

Fig. 15



6. Loosen the collet nut and remove the centering cone.

TEMPLATE GUIDES (NOT PROVIDED)

The round subbase will accept universal template guides. Use only a maximum 1-3/16″ (30.5 mm) template guide with this tool.

To use a template guide:

1. Center the round subbase following the instruction in above section **“TO INSTALL SUBBASE”.**

2. Insert the template guide into the center hole of the round subbase and secure according to the template guide instructions.

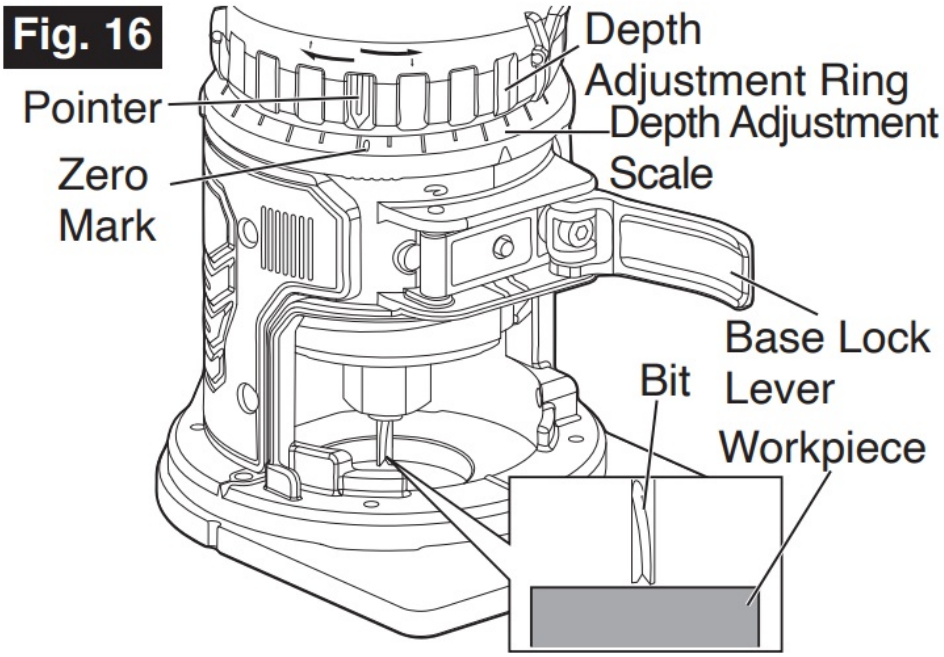
NOTICE: The D-shaped subbase does not accommodate template guides and is designed to accommodate bits up to 1-1/2” (38 mm) in diameter.

ADJUSTMENTS

⚠ WARNING **Detach the battery pack from the tool before performing any assembly or adjustments, or changing accessories**. Such preventive safety measures reduce the risk of starting the tool accidentally.

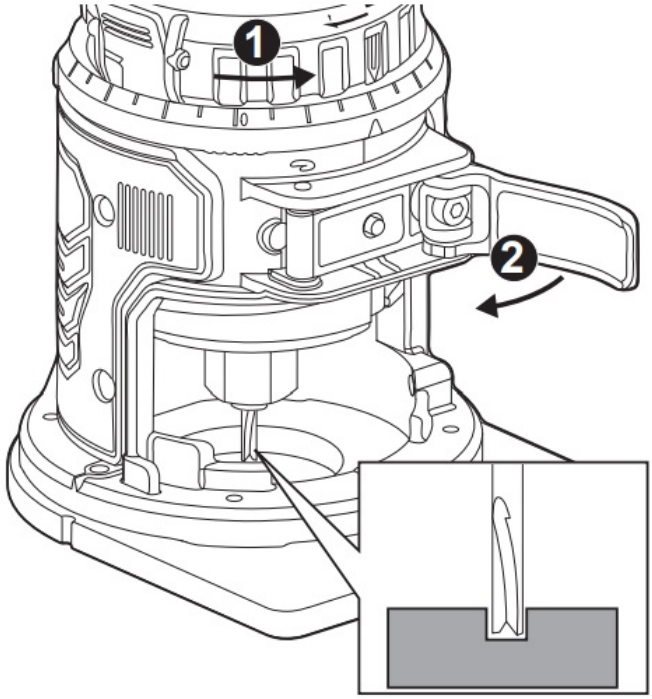
ADJUSTING THE DEPTH OF CUT (FIG. 16 AND 17)

1. Select and install the desired cutter bit following the instructions in the section **“INSTALLING AND REMOVING BITS”.**
2. Open the base lock lever.
3. Turn the depth adjustment ring until the bit just touches the work piece. Turning the ring clockwise raises the cutter bit (reduces the cutting depth) while turning it counterclockwise lowers the cutter bit (increases the cutting depth).
4. Turn the depth adjustment scale clockwise until the zero mark on the scale lines up with the pointer on the depth adjustment ring **(Fig. 16).**



5. Turn the depth adjustment ring counterclockwise until the pointer lines up with desired depth of cut marking on the depth adjustment scale **(Fig. 17).**

Fig. 17



NOTE: Each mark on the depth adjustment scale represents a depth change of 1/64” (0.4 mm) and one full (360°) turn of the ring changes the depth by 1/2” (12.7 mm).

6. Close the base lock lever.

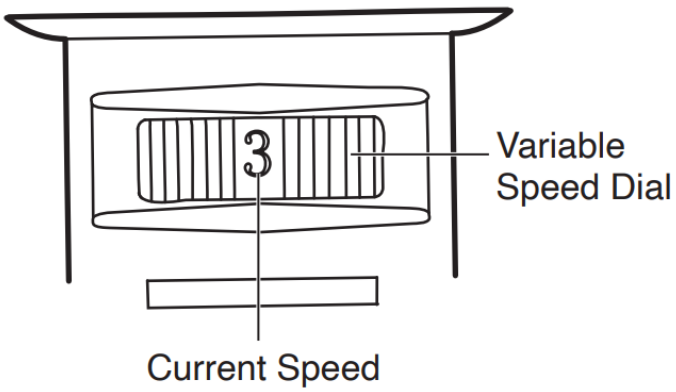
   NOTICE: Making a single deep cut is never advisable. Smaller diameter cutter bits are easily broken by too much lateral thrust and torque. Larger cutter bits will cause a rough cut and will be difficult to guide and control. For these reasons, do not exceed 1/8” (3.2 mm) cutting depth in a single pass.

Deep Cuts

- Determining the proper cutting depth (for each pass) should always be based on the material, the size and type of cutter bit, and the power of the motor.
- Always make several progressively deeper cuts. Start at one depth and then make several passes, increasing the cutting depth each time, until the desired depth is reached.
- Making a cut that is too deep will put stress on the motor and the cutter bit, and it may burn the workpiece and dull the cutter bit. It could also “grab” too much of the workpiece and result in loss of control of the router, causing a serious accident.
- To be certain that the depth settings are as desired, always make test cuts in scrap material similar to the workpiece before beginning the final cut.
- Remember, knowing the right depth for each cut comes with routing experience.

VARIABLE SPEED DIAL (FIG. 18)

Fig. 18



The router is equipped with a variable speed dial. Turn the variable speed dial to control the router speed.

The speed dial is numbered “1” to “6”, with position “1” being the lowest speed and position “6” being the highest speed.

⚠ WARNING Never change the speed while the tool is running. Failure to obey this could make you lose of control of the tool and result in serious personal injury and property damage.

OPERATION INSTRUCTIONS

⚠ WARNING To reduce the risk of fire, personal injury, and product damage due to a short circuit, never immerse your tool, battery pack or charger in fluid or allow a fluid to flow inside them. Corrosive or conductive fluids, such as seawater, certain industrial chemicals, and bleach or bleach-containing products, etc. can cause a short circuit.

⚠ WARNING If any parts are damaged or missing, do not operate this product until the parts are replaced. Use of this product with damaged or missing parts could result in serious personal injury.

This TRIM Router must be used only with the battery packs and chargers listed below:

Battery Pack							**Charger**			
2.5Ah	3.5Ah	5.0Ah	6Ah	8.0Ah	10Ah	12Ah				
FX0111	FX0321	FX0121	FX0331	FX0221	FX0341	FX0231	FLEX FX0411	FLEX FX0421	FLEX FX0431	FLEX FX0451

NOTICE: Please refer to the battery pack and charger manuals for detailed operating information.

SOFT START FEATURE

The soft-start feature minimizes torque twist, which is customary in router motors, by limiting the speed at which the motor starts. This increases the life of the motor.

ON/OFF SWITCH (FIG. 19)

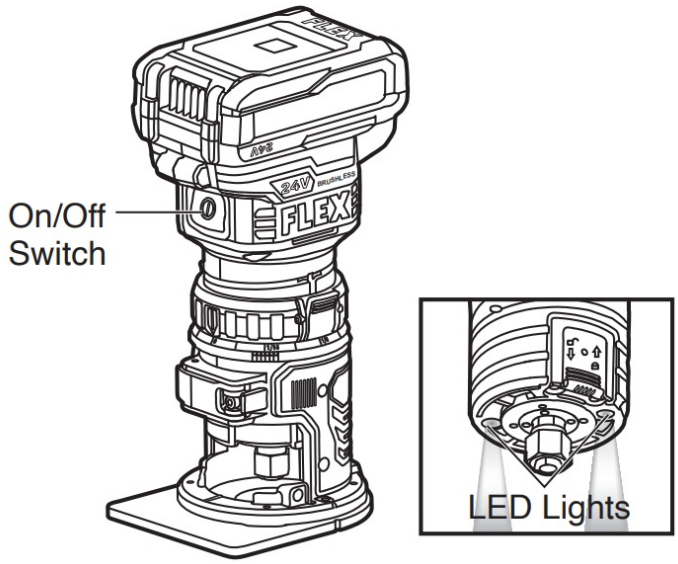
To start the router, depress and release the on/off switch once.

To stop the router, depress and release the on/ off switch again.

Always hold the tool and cutter bit away from the workpiece when turning on the switch. Only allow the tool and cutter bit to come into contact with the workpiece after it has reached full speed.

LED LIGHTS (FIG. 19)

Fig. 19



The tool is equipped with 2 built-in LED lights located around the collet. They provide additional light on the surface of the workpiece for operation in lower-light areas.

The LED light will automatically turn on when starting the tool, and will turn off approximately 10 seconds after the tool is stopped.

NOTE:

- The LED lights will flash to signal that the spindle lock is engaged when the On/Off switch is pressed. Release the spindle lock and start the tool again.
- The LED lights will rapidly flash when the tool and/or battery pack becomes overloaded or too hot, and the internal sensors will turn the tool off. Rest the tool for a while or place the tool and battery pack separately under air flow to cool them.
- The LED lights will flash more slowly to indicate that the battery is at low-battery capacity. Recharge the battery pack.

GENERAL OPERATIONS WITH THE TRIM ROUTER

Making test cuts is essential with most routing applications. A test cut yields information about the set-up, the speed of the tool, the cutting depth, and how the cutter bit reacts to the workpiece. Much of routing is a trial-and error process of making various adjustments, followed by test cuts, while learning all of the tool's operational abilities. To avoid ruining good material, make test cuts on scrap material.

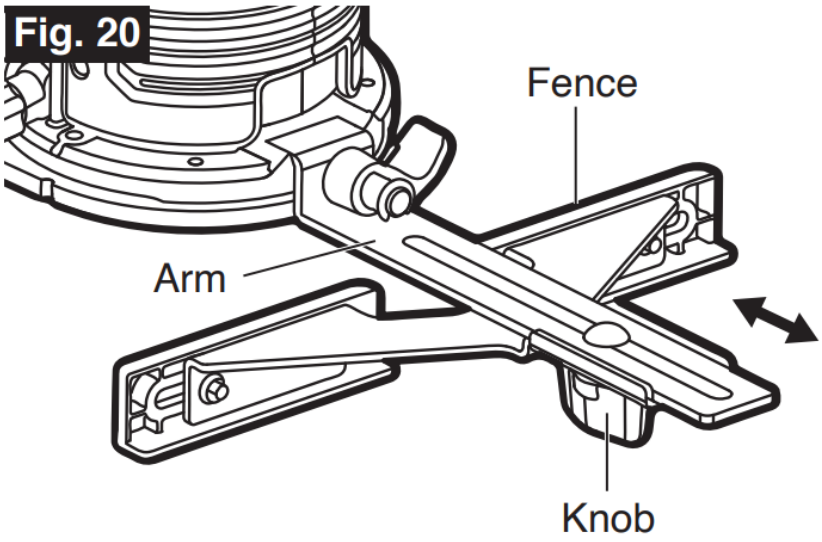
When operating the tool, always hold it firmly with both hands to maintain proper control.

ROUTING WITH THE EDGE GUIDE

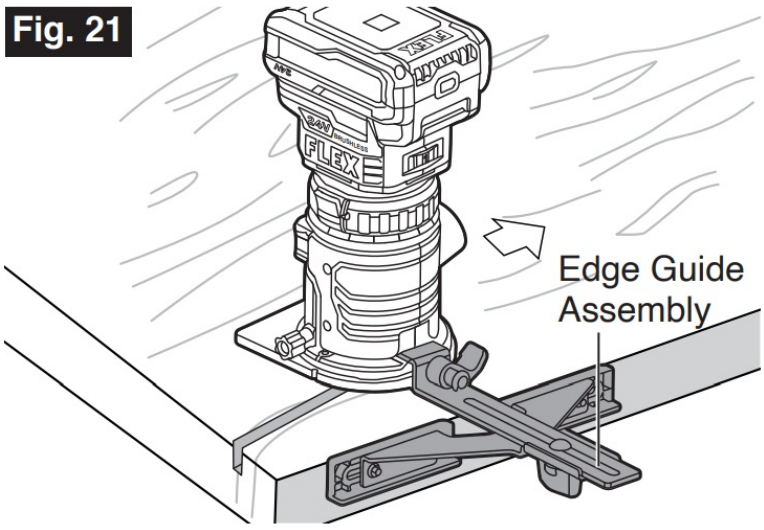
The edge guide can be used as an aid in routing applications such as decorative edging, straight-edge planning and trimming, grooving, da doing, and slotting.

Straight Routing (Fig. 20, 21, and 22)

1. Loosen the knob and slide the fence along the arm of the edge guide. Once the desired length is reached, tighten the knob **(Fig. 20).**



2. With the cutting depth set, place the tool on the edge of the workpiece, making sure that the cutter does not contact the workpiece **(Fig. 21).**



3. Turn the tool ON and allow it to reach its full speed.
4. To begin the cut, gradually feed the cutter bit into the edge of the workpiece.

5. Move the tool while keeping the edge guide flush with the side of the workpiece.
6. When the cut is complete, turn the tool OFF and allow the cutter bit to come to a complete stop before removing it from the workpiece.
7. Remove the battery, place the tool upsidedown on the worktable, and inspect the finished cut.

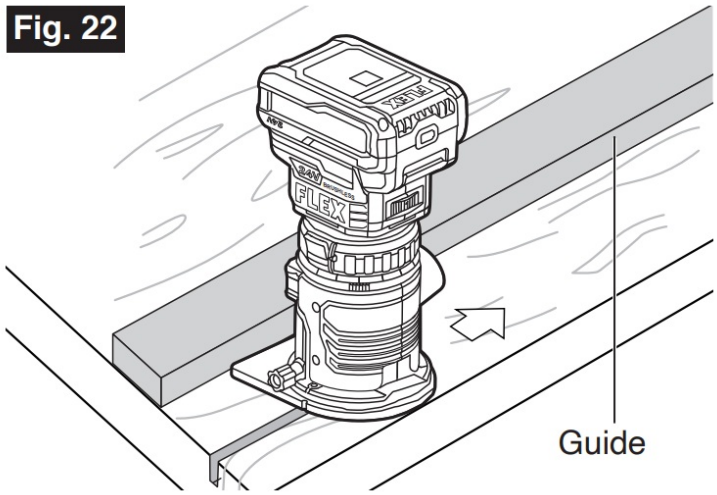
NOTE: Round over bits with bearings are excellent for shaping the edge of any workpiece that is either straight or curved, if the curvature is at least as great as the radius of the bit to be used.

⚠ WARNING Always clamp the workpiece securely and keep a firm grip on the tool base with both hands at all times. Failure to do so could result in loss of control, causing possibly serious personal injury.

⚠ WARNING Removing the cutter bit from the workpiece while it is still rotating could damage the workpiece and result in loss of control, causing possibly serious personal injury.

NOTE: If the distance between the side of the workpiece and the cutting position is too wide for the edge guide, or if the side of the workpiece is not straight, firmly clamp a straight board to the workpiece and use it as a guide against the router base. Feed the tool in the direction of the arrow **(Fig. 22).**

Fig. 22



Circular Routing (Fig, 23, 24, and 25)

For circular work, reassemble the knob and screw on the edge guide assembly as shown in **Fig. 23** (smaller radius of cut) or **Fig. 24** (larger radius of cut).

Fig. 23

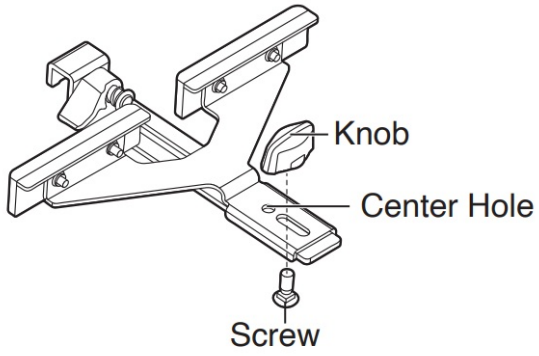
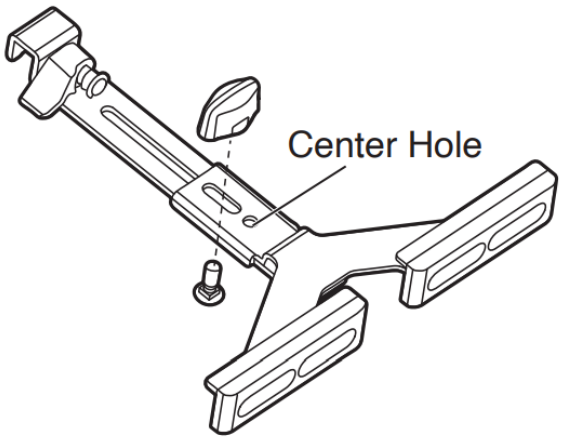


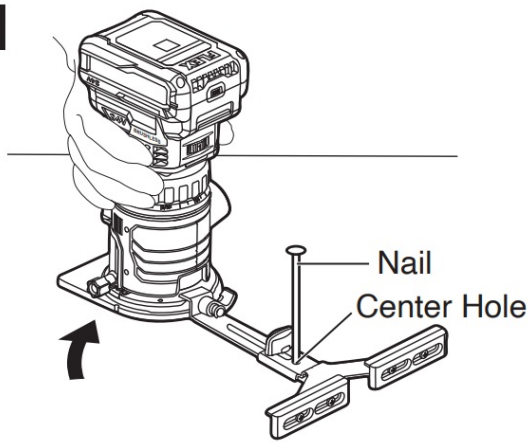
Fig. 24



The minimum and maximum radius of circles to be cut (distance between the center of circle and the center of bit) are 4-21/64” (110 mm) and 9-29/64” (240 mm), respectively.

1. Turn off the tool and detach the battery pack.
2. Securely attach the edge guide to the base.
3. Align the center hole in the edge guide with the center of the circle to be cut. Adjust the length of the edge guide. Reconfigure it, if necessary, as shown in **Figures 23 and 24.**
4. Drive a nail slightly less than 17/64” (6.5 mm) in diameter into the center hole to secure the edge guide.
5. Attach the battery pack, turn on the tool and allow it to reach its full speed.
6. Gradually feed the cutter bit into the workpiece until the sub-base is level with the workpiece.
7. Pivot the tool clockwise around the nail to make the circle cut **(Fig. 25).**

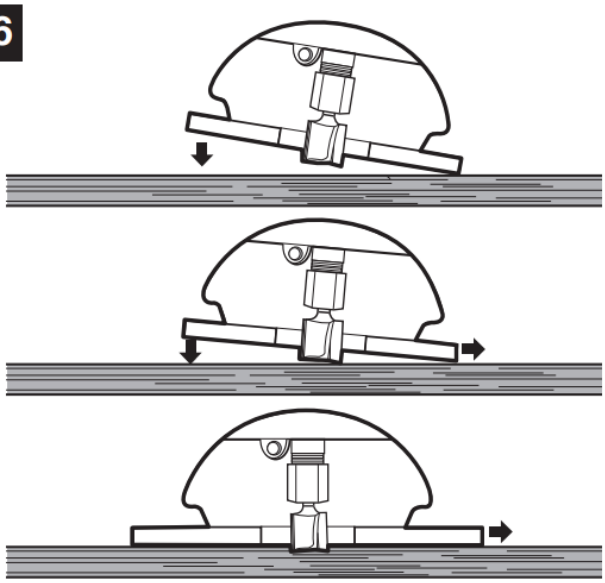
Fig. 25



8. When the cut is complete, turn the tool OFF and allow the cutter bit to come to a complete stop before removing it from the workpiece

INTERNAL ROUTING (FIG. 26)

Fig. 26

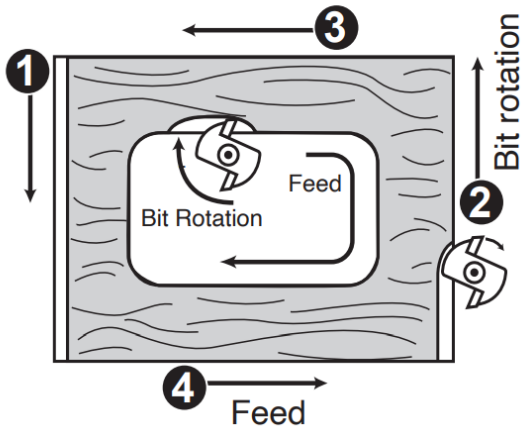


1. With the cutting depth set, tilt the tool and place it on the workpiece, with only the leading edge of the subbase contacting the workpiece.
2. Turn on the tool and allow it to reach its full speed, being careful not to allow the cutter bit to contact the workpiece.
3. To begin the cut, gradually feed the cutter bit into the workpiece until the subbase is level with the workpiece, then move the router to make the cut.
4. When the cut is completed, turn off the tool and allow the cutter bit to come to a complete stop before removing it from the workpiece.
5. Remove battery pack and place the tool upside down on the worktable and inspect the finished cut.

⚠ WARNING **Always clamp the workpiece securely and keep a firm grip on the tool base with both hands at all times.** Failure to do so could result in loss of control, causing possibly serious personal injury.

FEEDING THE TRIM ROUTER (FIG. 27)

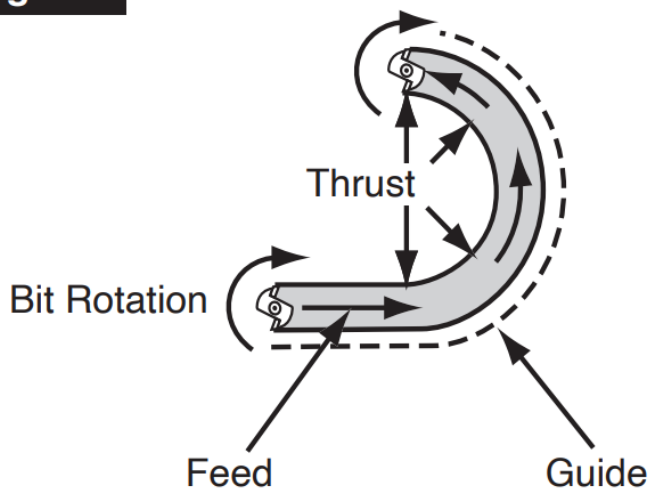
Fig. 27



When routing or doing related work, the best finishes will result from setting up the cut carefully, selecting the proper cutting depth, knowing how the cutter bit reacts in the workpiece, and selecting the appropriate rate and direction of feed for the project.

Direction of Feed for External Cuts (Fig. 27a)

Fig. 27a



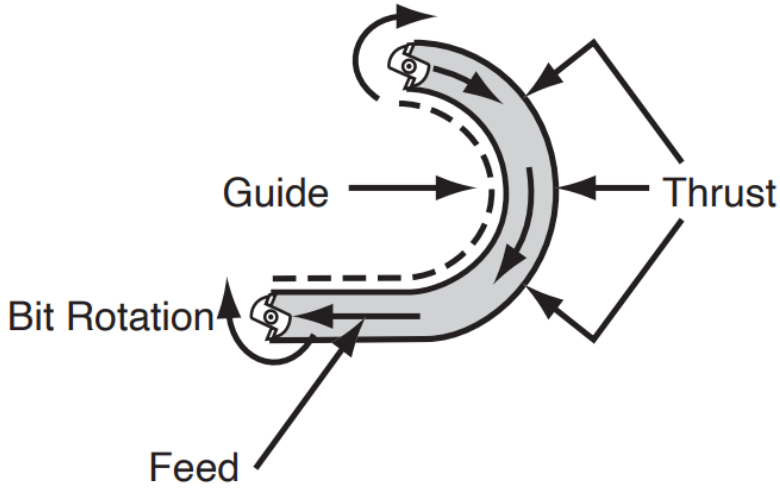
The cutter bit rotates clockwise. This means that feeding the bit from left to right will cause the bit to pull the tool toward the workpiece.

If the tool is fed in the opposite direction (right to left), the rotating force of the cutter bit will tend to push the bit away from the workpiece. This is called “climb-cutting”.

“Climb-cutting” may cause loss of control, resulting in possibly personal injury. When “climb-cutting” is required, exercise extreme caution to maintain control of the tool.

Direction of Feed for Internal Cuts (Fig. 27b)

Fig. 27b



When making an internal cut, such as groove, dado, or slot, always position the guide (edge guide, straight edge, or board guide) on the right-hand side of the tool as the cut is made.

Always be alert and exercise extreme caution in order to maintain control of the tool when making this type of cut around curves.

In either case, the lateral thrust of the cutting is always against the guide, as is proper.

⚠ WARNING Always clamp the workpiece securely and keep a firm grip on the tool base with both hands at all times.

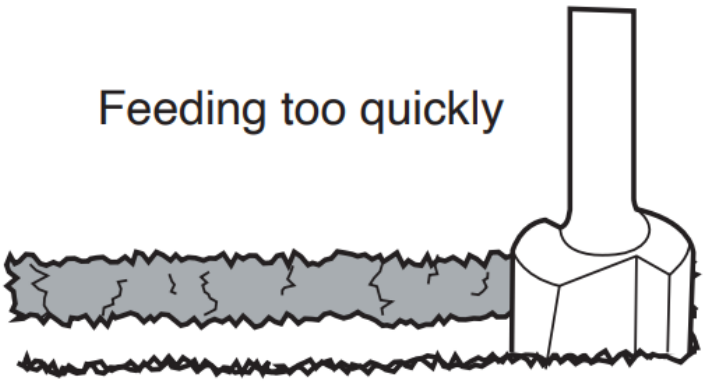
Failure to do so could result in loss of control, causing possibly serious personal injury.

Rate of Feed

The proper rate of feed depends on several factors: the hardness and moisture content of the workpiece, the cutting depth, and the cutting diameter of the bit. Use a faster rate of feed when cutting shallow grooves in soft woods, such as pine. Use a slower rate of feed when making deep cuts in hardwoods, such as oak.

Feeding too quickly (Fig. 27c)

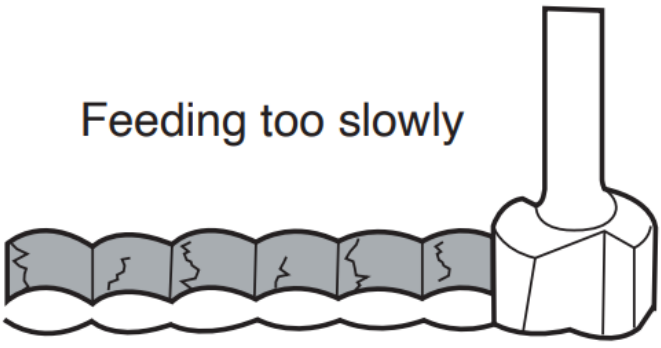
Fig. 27c



Forcing the feed of the cutter bit forward too quickly slows the rotational speed of the cutter bit and the bit takes larger bites as it rotates, causing splintering and gouging of the workpiece. This forcing action can also cause the router motor to overheat. The high speed of the cutter bit during a proper feeding operation (left to right) results in very little kickback under normal conditions. Kickback may damage the workpiece and could result in losing control of the tool, causing possible personal injury.

Feeding too slowly (Fig. 27d)

Fig. 27d



When the cutter bit is fed too slowly, the rotating cutter bit does not cut into new wood rapidly enough to take a

bite. Instead, it scrapes away sawdust-like particles. This scraping produces heat, which can glaze, burn, and mar the cut in the workpiece, and in extreme cases, can overheat the cutter bit.

MAINTENANCE

To avoid serious personal injury, always remove the battery pack from the tool when cleaning or performing any maintenance.

Preventive maintenance performed by unauthorized personnel may result in misplacing of internal wires and components which could cause a serious hazard. We recommend that all tool service be performed by a FLEX Factory Service Center or Authorized FLEX Service Station.

GENERAL MAINTENANCE

⚠ WARNING When servicing, use only identical replacement parts. Use of any other parts could create a hazard or cause product damage. Periodically inspect the entire product for damaged, missing, or loose parts such as screws, nuts, bolts, caps, etc. Tighten securely all fasteners and caps and do not operate this product until all missing or damaged parts are replaced. Please contact customer service or an authorized service center for assistance.

CLEANING

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

⚠ WARNING 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.

STORAGE

Store the tool indoors in a place that is inaccessible to children. Keep away from corrosive agents.

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Documents / Resources

	**FLEX FX4221 24V Trim Router** [pdf] Instruction Manual FX4221 24V Trim Router, FX4221, 24V Trim Router, Trim Router, Router

References

- **Lleve potencia al sitio de construcción | FLEX**
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