HUBBELL®

BURNDY®

SAFETY OPERATING &
MAINTENANCE INSTRUCTIONS
(ENGLISH)

PATRIOT® 221 SERIES

Scan this code with your mobile device for the latest SOMI revision

Scan this code with your mobile device for the latest Crimping Die Selection Guide and installation information

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SAFETY INFORMATION

The above symbols are used to call your attention to instructions concerning your personal safety. Look for these symbols; read and follow the instructions that accompany them. Failure to follow the safety information provided can lead to serious personal injury or death.

SYMBOL	MEANING
⚠ DANGER	Hazards that, if not avoided, will result in severe injury or death.
⚠ WARNING	Hazards that, if not avoided, could result in severe injury or death.
⚠ CAUTION	Hazards that, if not avoided, could result in minor or moderate injury.

ELECTRO-MECHANICAL POWER SOURCE

⚠WARNING

Do NOT disassemble this tool at any time. Disassembly of this tool may result in severe personal injury or tool damage and will void the warranty.

The electro-mechanical power system is a non-field serviceable item. If you suspect that your tool is not functioning properly, please contact the BURNDY® Tool Service Center at 1-800-426-8720 or 1-603-444-6781.

SAFETY FIRST

⚠WARNING

The information provided in this manual is essential for the safe handling, operation, and maintenance of a BURNDY® PATRIOT® 221 series tool. The operator must read, understand, and follow these instructions and ALL safety warnings and labels before operating this tool.

Use this tool only in accordance with the manufacturer's specifications. Other use of this tool may lead to serious personal injury or death.

Each employer shall instruct each employee and user in the recognition and avoidance of unsafe working conditions and the laws and regulations applicable to his/her work environment to control or eliminate any hazards or other exposure to illness or injury. Reference: OSHA 29CFR 1910 et seq.

If a conflict arises between the material contained in this manual, rules of the user, his/her employer or company, and legal or industry guidelines, the more stringent rules take precedence and must be followed. Observe and follow all other safety rules and regulations for the job.

Safety is everyone's responsibility.

OPERATING SAFETY PRECAUTIONS

⚠WARNING

Tool is NOT insulated for use on or near energized conductors. Use of this tool near energized conductors may lead to electrical shock, causing severe injury or death. Do NOT use this tool near energized conductors without adequately insulating operator and surroundings.

Pinch point hazard. Crimp jaws can operate at high speed and force and can cause severe personal injury. Keep all body parts away from moving parts of the tool during operation.

Do NOT over-reach while operating this tool. Loss of balance can cause serious personal injury or death. Move closer to work area and securely support yourself and your work. ALWAYS keep proper footing and balance.

Projectile hazard. Wear eye protection and personal protective equipment.

Explosive hazard. Do NOT use tool in an explosive environment.

⚠WARNING

Use all appropriate personal safety equipment when handling, operating, and servicing this tool such as: safety shoes, hard hat, eye and ear protection, work gloves, and long sleeves.

To help ensure safe operation of this tool, keep all safety labels clean and legible. Replace labels with new labels when necessary.

USE

This tool has been specifically designed for use with BURNDY® products. Use of non-BURNDY® products is limited to those which conform to BURNDY® Technical Specifications applicable to the tool. Use of non-BURNDY®, non-conforming products with the tool shall be deemed misuse or abuse.

Do not immerse the tool in water, as the BURNDY® PAT221 tool is not designed to operate underwater. This is considered abuse and will void the warranty. It is recommended to use the D-Ring to support the tool and prevent dropping the tool. Wrist straps are sold separately [pg. 19].

⚠CAUTION

The tool may only be operated with dies installed. Attempting to operate the tool without paired BURNDY® PAT221 dies may result in tool damage. Attempting to use the incorrect BURNDY® PAT221 dies or grooves for a given connector may result in tool damage.

IMPORTANT

When storing the tool, the following steps should be followed to avoid potential injury:

- Push Trigger outward to ensure the jaws are fully open
- Engage the Safety Switch to the locked position (towards padlock icon)
- Remove the battery

DESCRIPTION

The BURNDY® PAT221 is a handheld battery mechanical tool that can accommodate a wide range of compression connectors. A variety of dies are available which can be used to crimp different conductor sizes and connector families.

SPECIFICATIONS

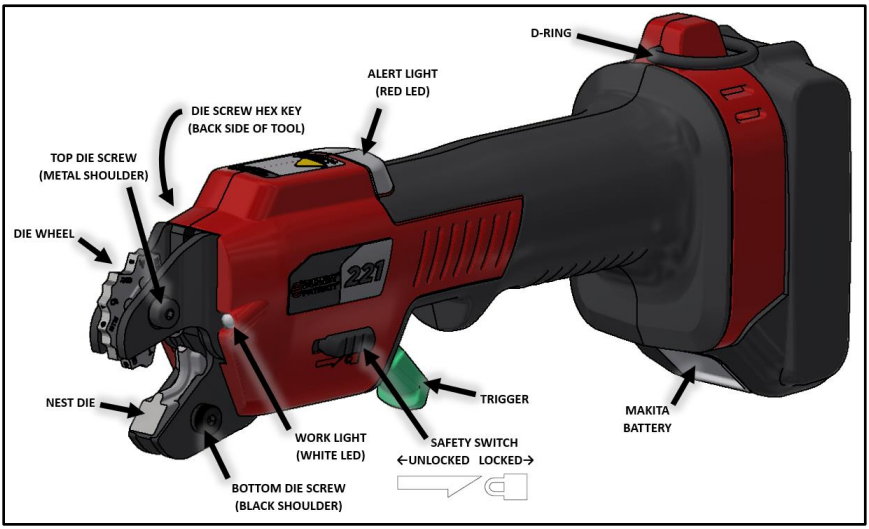
Crimp force:	2 tons (1.8 metric tons)
Tool weight (with 2.0Ah battery):	3.5 lb (1.6 kg)
Length:	11.8 in (300 mm)
Width:	2.8 in (71 mm)
Height:	4.2 in (107 mm)
Operating Voltage:	18 V-DC
2.0 Ah (36 Wh) Battery recharge time:	<25 mins

FEATURES AND BENEFITS

1. Battery-powered design reduces hand actuation force by up to 90%, compared to conventional ratchet hand tools.
2. Jaw fits into the same envelope as conventional BURNDY® ratchet hand tools, allowing the user to fit the tool into tight spaces and cabinets.
3. Half-scissor jaw provides a stationary jaw which can be used to more easily line up the connector in the die for crimping.
4. Connector hold feature allows the user to grip the connector prior to crimping so that the wire can be inserted.
5. One button operation for hold, crimp, and retract simplifies the user experience.
6. LED work light illuminates dimly lit work areas.
7. Red LED light indicates incomplete crimp (see PRE-OPERATION instructions under ALERT LIGHT [pg. 7] for more information).
8. Emergency Release Feature can reverse the crimping motion if the wrong connector, wire, or foreign object is crimped.
9. Safety Switch prevents unintentional actuation of the tool.
10. Industry standard Makita 18V LXT Lithium-Ion batteries and charger provide long-lasting power and are widely available.
11. 2.0 Ah battery weighs 35% less than 3.0 Ah and 5.0 Ah battery.

PARTS OF THE TOOL

Before using the BURNDY® PAT221 tool, take a moment to familiarize yourself with the parts of the tool. Doing so will make you aware of the terms used in the following sections.



AUTO-CALIBRATION FEATURE

The tool uses an Auto-Calibration process to ensure that each tool cycle is as consistent as the last. At the completion of each tool cycle, or after an emergency release, the tool will set its home/open position after a few seconds. The tool will provide a brief impulse of haptic feedback to the user to indicate it is prepared for the next crimp cycle.

⚠ CAUTION

Do not attempt to remove the Makita battery while the tool is operating. Attempting to do so may result in tool damage. It is recommended to wait at least one full second after Auto-Calibration before removing the battery to ensure the tool's state has been saved.

The Auto-Calibration process will be required if the battery was removed while the tool was not at rest in its home position. If the battery is removed while the tool is not at its rest position, then use the Emergency Release Feature to initiate an Auto-Calibration process.

EMERGENCY RELEASE FEATURE

The Trigger can be used to interrupt and reverse the crimp cycle in the case where the wrong connector, wire or crimp groove is selected, or if a foreign object is crimped within the dies. In this case, release the Trigger to interrupt the crimp cycle, then reach behind the Trigger and push it outwards away from the tool to open the jaws and allow the tool to Auto-Calibrate. The Alert Light will slowly blink. Refer to this label on the top side of the tool.

FLUTTER PREVENTION FEATURE

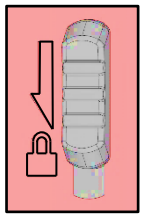
To ensure the tool achieves the calibrated compressive load, the tool uses Flutter Prevention to limit tool misuse. Flutter is when the Trigger is pulled to turn on the motor, then released and pulled repeatedly before completing a crimp cycle. The tool will stop and the Alert Light will rapidly blink. The tool will not continue to crimp until it has returned to the open position. Reach behind the Trigger and push it outwards away from the tool to open the jaws and allow the tool to Auto-Calibrate.

ALERT LIGHT (RED LED)

There are several actions that can cause the Alert Light to flash red. Refer to the Troubleshooting section for resolution [pg. 17].

- The Emergency Release Feature has started due to pushing the Trigger outwards away from the tool to open the jaws.
- The tool has lost confidence in its position due to fluttering the Trigger or losing power while not at the open position. Push the Trigger out to return to the open position and perform an Auto-Calibration.
- The maximum force threshold has been reached before the crimp is completed. Be sure to use only the recommended dies and connectors and ensure the correct die and crimp groove are selected.

SAFETY SWITCH



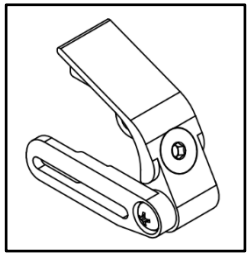
The Safety Switch can be used to lock out the tool mechanically and electrically. When the tool jaws are in the open position, the switch can be toggled towards the padlock icon to engage the lock. In this state, the Trigger can be pulled but the jaws will not close, and the tool will not begin a crimp cycle.

If the tool is performing an Auto-Calibration when the Safety Switch is engaged, it will complete the Auto-Calibration.

⚠ CAUTION

Do not attempt to engage the Safety Switch while the jaw is not in the open position, or while the tool is crimping. Attempting to do so may result in tool damage.

LOCATOR PLATE



The Locator Plate is provided to ensure correct alignment of connectors in the Die Sets (CAT NOs: 2210NV221 and 2210B221). It cannot be used with any Die Wheel Sets. The use of the Locator Plate is recommended when installing the connector families as shown in the PAT221 Crimping Die Selection Guide (scan QR code on this cover).

SETUP

The following instructions cover proper wire preparation, insertion requirements, die selection and installation to ensure safe and reliable connections. UL Listing and CSA Certification are only valid when using the BURNDY® Engineered System and following BURNDY® Installation Instructions.

CONNECTOR AND DIE SELECTION

1. Select the appropriate connector based on Wire Material, Wire Construction/Class, and Wire Size.
2. Select the appropriate die per the following:

DIE SET CATALOG	DIE SET STYLE	CONNECTOR TYPE	WIRE RANGE*
81WHL221	DIE WHEEL AND NEST	BARE/UNINSULATED	#8 - #1 AWG
122WHL221	DIE WHEEL AND NEST	BARE/UNINSULATED	#12 - #2 AWG
2210NV221	NEST AND INDENTOR	INSULATED (NYLON/VINYL)	#22 - #10 AWG
2210B221	NEST AND INDENTOR	BARE/UNINSULATED	#22 - #10 AWG

* See PAT221 Crimping Die Selection Guide or Sales Drawings for specific wire ranges and stranding.

3. To determine the recommended number of crimps for the chosen connector and PAT221 Die Set, refer to the PAT221 Crimping Die Selection Guide (scan QR code on this cover).

   To identify connector families with UL Listings, refer to the chosen PAT221 Die sales drawing or check that the PAT221 tool is included on the connector's packaging, sales drawing, or BURNDY® Master Catalog page.

4. Select the appropriate groove per the following:
   a. For Die Wheel Sets 81WHL221 and 122WHL221, identify the Die Color from the connector's labeling, packaging, sales drawing, or Master Catalog page. Locate the corresponding color groove on the Die Wheel.
   b. For Die Set 2210NV221, identify the Die Color from the connector's insulation, labeling, packaging, sales drawing, or Master Catalog page. Locate the corresponding groove with the matching color.
   c. For Die Set 2210B221, identify the Connector Size from the connector's labeling, packaging, sales drawing, or Master Catalog page. Do NOT consider the Wire Size. Locate the corresponding sized groove that matches the Connector Size.

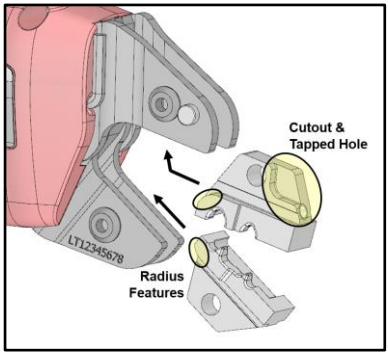
DIE INSTALLATION

To install dies:

1. Remove battery and engage/lock the Safety Switch.
2. Using the provided Die Screw Hex Key (1/8”), remove the die screws on the fixed and moveable jaws.

NOTE: For Die Sets (e.g. 2210NV221 and 2210B221) the
Top and Bottom Dies can only be installed in the correct jaw and orientation:

- All Top Dies have a **cutout** for the ball detent and may have a **tapped hole**.
- Both dies have a **radius feature** on the side that goes toward the tool.



3. First, insert the Die Wheel or Top Die in between the stationary jaws. When installing the Die Wheel, ensure the ball detent feature is engaged. Insert the Top Die Screw (Metal Shoulder) through the stationary jaws and die. Hand-tighten loosely.
4. Next, insert the Nest or Bottom Die in between the moveable jaws. Insert the Bottom Die Screw (Black Shoulder) through the moveable jaws and die. Hand-tighten loosely.
5. Disengage/unlock the Safety Switch and pull the Trigger to close the jaws to confirm that the dies are aligned properly.
6. While continuing to hold the Trigger, use the provided Die Screw Hex Key (1/8”) to tighten both shoulder screws until they bottom out. No more than 1 ft-lb of torque is required. DO NOT force anything to fit together.

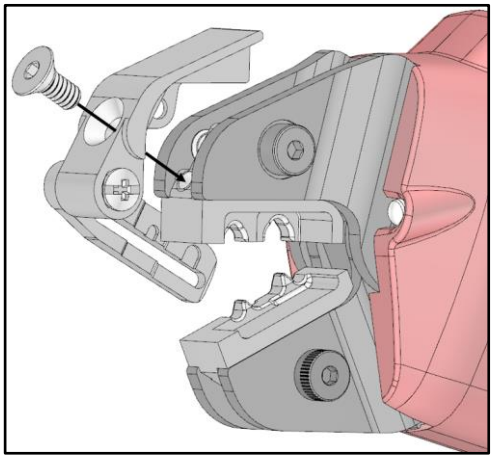
To remove dies:

1. Remove battery and engage/lock the Safety Switch.
2. Remove the Locator Plate if installed (see below).
3. Using the provided Die Screw Hex Key (1/8”), remove the die screws on the stationary and moveable jaws.
4. Slide the dies out of the tool and place them in a secure location. Replace the die screws until hand-tight. DO NOT overtighten if there are no dies installed in the tool.

LOCATOR PLATE INSTALLATION

To install the Locator Plate:

1. Remove battery and engage/lock the Safety Switch. Ensure the Die Sets are fully installed (see above).
2. Insert Locator Plate assembly in between frames above the Top Die as shown. Press down until it clicks into place.



3. Using the provided Die Screw Hex Key (1/8”), insert the provided flathead screw through the Locator Plate assembly. Hand tighten until the assembly is securely fastened.
4. Rotate the Stop Plate to ensure it can move but is still property secured.

To remove the Locator Plate:

1. Remove battery and engage/lock the Safety Switch.
2. Using the provided Die Screw Hex Key (1/8”), remove the flathead screw from the Locator Plate assembly.
3. Slide the Locator Plate assembly out of the tool and place them and the flathead screw in a secure location. NOTE: The flathead screw may be left in the Top Die if desired.

WIRE/CONDUCTOR PREPARATION

1. Strip the insulation to the appropriate wire strip length, based on the packaging, catalog page, or sales drawing.
2. As a best practice, wire brush the bare conductor to remove any oxides. DO NOT wire brush tin-plated conductor.

PRE-OPERATION INSTRUCTIONS

⚠WARNING

Read and follow all PRE-OPERATION and safety instructions provided for your BURNDY® PAT221 Crimper and Makita Battery Charger. Failure to follow the proper operating instructions and safety information provided can lead to serious personal injury or death.

Follow these PRE-OPERATION instructions to ensure your tool is in proper working condition. If your tool does not exhibit normal functions as described below, see the Troubleshooting Section of this manual [pg. 16].

We recommend only connectors and dies designed and manufactured by BURNDY® be used and installed with the BURNDY® PAT221.

⚠CAUTION

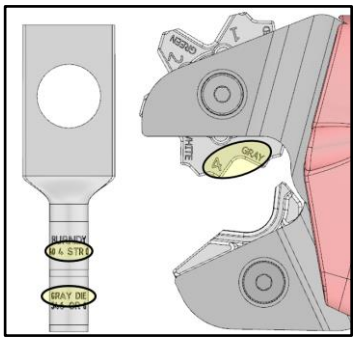
The tool may only be operated with dies installed. Attempting to operate the tool without paired BURNDY® PAT221 dies may result in tool damage. Attempting to use the incorrect BURNDY® PAT221 dies or grooves for a given connector may result in tool damage.

OPERATIONS TEST

1. Ensure that dies are installed in the jaws and that all body parts are away from the pinch points prior to operating tool.
2. With a charged battery installed, disengage/unlock the Safety Switch and pull the Trigger until the dies are touching. NOTE: The motor should not turn ON at this time.
3. Continue to pull and hold the Trigger. The motor will cycle ON. When the tool reaches the end of its cycle, the motor will automatically turn OFF. Release the Trigger and the motor will cycle ON in the reverse direction. Once the tool is open, it will perform a brief Auto-Calibration procedure.

OPERATION

1. Install the appropriate Die Set and locate the appropriate groove per the Setup instructions [pg. 9]. If using the Die Wheel, rotate the selected groove into position such that it is facing the Nest. Ensure the Wheel clicks into position.

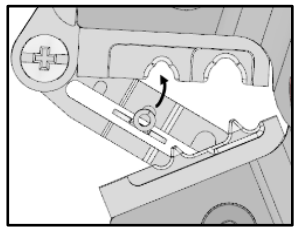


2. Insert a battery into the tool and disengage/unlock the Safety Switch only after all body parts are clear of the jaw pinch points.

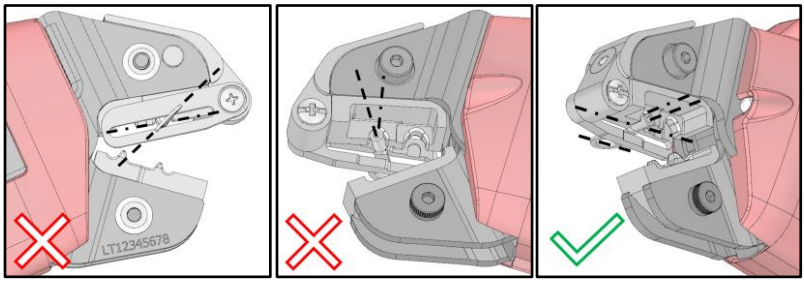
3. Position the tool properly on the connector. Make certain that the die is aligned over any crimp area indicators. Follow any other connector specific installation instructions.

    a. The use of the Locator Plate is recommended when installing the following connector families: T/YAD-, TP/BA-, TN/YAES-, YAE-, YAV-, and YAEV-. Refer to the PAT221 Crimping Die Selection Guide for the latest guidance.

    b. The tongue/pad of the connector must be inserted into the slot on the Locator Plate such that the barrel axis is in line with the indentations on the Stop Plate. As a result, the tongue/pad will be towards the bottom/moveable jaw.



Regardless whether the Locator Plate is used, check that the tongue is parallel with the stationary jaw and that the barrel is perpendicular to the tool.



4. Lightly depress the Trigger to move the jaws so that they hold the connector in place for wire/conductor insertion. DO NOT YET fully depress the Trigger. Check that the tongue is still parallel with the top/stationary jaw and the barrel is perpendicular to the tool.

5. Fully insert the wire/conductor into the connector. Ensure the wire/conductor does not overextend past the tip of the barrel. NOTE: The Locator Plate is not guaranteed to prevent wire from overextending.

6. While holding the wire/conductor in one hand, and the tool gripping the connector in the other hand, fully depress and hold the Trigger to begin the crimping cycle.

⚠WARNING

Pinch point hazard. Crimp jaws can operate at high speed and force and can cause severe personal injury. Keep all body parts away from moving parts of the tool during operation.

7. Continue holding the Trigger until the motor stops, indicating that the crimp is complete.

8. Release the Trigger to begin the retraction operation. NOTE: If the tool does NOT begin the retraction operation, the tool has not completed its crimping cycle. If Flutter Prevention [pg. 7] has not been activated, you may continue to fully depress the Trigger until the crimping operation is complete.

9. The jaws will fully open and the tool will perform Auto-Calibration [pg. 7]. Continue crimping the connector until the proper number of crimps have been performed.

   NOTE: When using a groove on the Die Wheel Set, confirm the die index and BURNDY® bug are embossed onto the connector after the crimp is completed for permanent inspection capability.

⚠CAUTION

Do not attempt to remove the Makita battery while the tool is operating. Attempting to do so may result in tool damage. It is recommended to wait at least one full second after Auto-Calibration before removing the battery to ensure the tool's state has been saved.

MAINTENANCE

⚠CAUTION

Failure to perform regular maintenance tasks could result in bodily injury and/or property damage.

The service life of a tool can be greatly improved with proper care and maintenance. To extend the life of your BURNDY® PAT221 tool, follow the recommended maintenance tasks outlined below.

- Always remove the battery prior to working on the tool. The tool must be in the open position with the Jaws fully retracted and the Safety Switch engaged/locked before cleaning, removing, or installing dies.
- Always keep the tool exterior clean. Remove dirt, debris, and other foreign substances from external surfaces daily to help prevent corrosion and damage to the tool and internal mechanisms.
- Remove all surface contaminants. When surface contaminants cannot be removed with a cloth, spray jaws with a general-purpose cleaning solution to help loosen contaminants. The cleaning solution must be recommended for cleaning steel. Avoid getting solvents onto the plastic housing as some cleaners and solvents may damage the housing material or internal lubricants. Using a stiff brush, never metal, remove all contaminants in and around the jaw area and allow solvent to drain off the tool.
- Spray a conservative amount of aerosolized industrial grade molybdenum lubricant (Recommend LOCTITE® LB 8012 #1852755, Jet-Lube #28541, or comparable) behind the Trigger. BURNDY® recommends performing this step roughly every 5000 tool cycles, though precise recommendations will vary depending on the size of connectors used.
- Inspect the tool for signs of cracks, wear, or damage. Wipe the tool with a clean, dry rag before placing the tool into the case.

DIE INSPECTION

To confirm dies are still within specifications and the tool has proper alignment, the following steps may be taken to inspect the die grooves. BURNDY® recommends performing these steps roughly every 5000 cycles on a Die Set.

1. Ensure that dies are installed in the jaws per the Die Installation instructions [pg. 10] and that all body parts are away from the pinch points prior to operating tool.
2. With a charged battery installed, disengage/unlock the Safety Switch and pull the Trigger until the dies are touching. NOTE: The motor should not turn ON at this time.
3. Continue to pull and hold the Trigger. The motor will cycle ON. When the tool reaches the end of its cycle, the motor will automatically turn OFF. Continue to hold the Trigger closed.
4. Use the following Go and No-Go inspection pins on the given grooves:

DIE	GROOVE	GO	NO-GO
2210B221	22-14	0.058	0.068
	12-10	0.080	0.090
2210NV221	22-18 Red	0.084	0.091
	16-14 Blue	0.097	0.105
	12-10 Yellow	0.132	0.14
122WHL221	10-12	0.099	0.115
122WHL221 & 81WHL221	8	0.161	0.171
	6	0.187	0.203
	4	0.247	0.264
	3	0.283	0.293
	2	0.323	0.338
81WHL221	1	0.347	0.365

SERVICE

⚠WARNING

We do not recommend that you attempt to service or repair any tool yourself.
Tool servicing by unqualified personnel will void the warranty
and may lead to serious personal injury.

DISASSEMBLY OF THE TOOL IS NOT RECOMMENDED.
DO NOT HESITATE TO CONTACT THE BURNDY® TOOL SERVICE CENTER FOR SERVICING AND REPAIR RELATED QUESTIONS AT
1-800-426-8720 OR 1-603-444-6781.

TROUBLESHOOTING

It is not recommended that the end user attempt to perform repairs on this tool, as specialized repair tools, training, and/or procedures may be required.

Should you have any questions or problems with your BURNDY® PAT221 tool, please do not hesitate to contact the Customer or Technical Service Departments by calling 1-800-346-4175 or the BURNDY® Tool Service Center for tool service and repair related questions at 1-800-426-8720 or 1-603-444-6781.

TROUBLESHOOTING GUIDE

SYMPTOM/PROBLEM	CAUSE	REMEDY
The Jaws do not close when Trigger is lightly pulled.	• Safety Switch is engaged. • Trigger is damaged.	• Press the black Safety Switch toward the head of the tool to disengage. • Return to factory for repair.
The tool motor does not turn on when Trigger is fully pulled.	• Battery is not charged. • Trigger or Safety Switch is damaged.	• Charge the battery according to the Battery Charger Instruction Manual provided with your tool. • Return to factory for repair.
Excessive or unusual noise from tool.	• Mechanical vibrations • Insufficient grease	• Return to factory for repair. • Return to factory for repair.
Number of crimps per charge decreases with each battery recharge.	• Battery is too warm due to frequent discharge/recharge cycling.	• Allow battery to cool to room temperature before recharging. • Alternate batteries often.
Trigger was pulled while the Safety Switch was unlocked and there were no dies installed, and now the Jaws do not reopen.	• Jam between Trigger and Jaws.	• With no battery installed, squeeze the Jaws together while pushing the Trigger out. Then release the Jaws. • Never attempt to operate the tool without paired BURNDY® PAT221 dies.
Dies do not fit in the stationary/top or moveable/bottom Jaw.	• Mistaken assembly • The dies or tool is damaged.	• Ensure the correct dies and die screws are being used for the correct top and bottom Jaws. • Return to factory for repair.

For further assistance, contact the BURNDY® Tool Service Center at 1-800-426-8720.

ALERT LIGHT (RED LED) GUIDE

PATTERN	TRIGGERING EVENTS	REMEDY
Slow blinking 	• Emergency Release (pg. 7) The Trigger was pushed out while the Jaws were not in the open position.	• The tool will automatically return the tool to the open position and then perform an auto-calibration.
Brief rapid blinking 	• Flutter Prevention (pg. 7) The Trigger is depressed, released, depressed, and released before completing a crimp cycle. The tool will not continue to crimp until it has returned to the open position. • The Battery was previously removed while the tool was not at the open position. The tool detects it was powered on while not in the open position.	• Push the Trigger out to begin an Emergency Release and wait for the tool to return to the open position. • If the Battery was previously removed while the tool was not at the open position, the following return to the open position may take longer than usual as the tool carefully determines its position.
Solid Light - while attempting to crimp an invalid/ incorrect connector for the installed die/groove. 	• High Current Detected The maximum force threshold was reached before the crimp was completed. Be sure to use only the recommended BURNDY® dies and connectors and ensure the correct die and crimp groove are selected.	• Push the Trigger out to begin an Emergency Release and wait for the tool to return to the open position. • If the current limit is tripped again while opening, remove and reinsert the battery, and restart the Emergency Release. Repeat as needed.
Solid Light - while attempting to crimp a valid/correct connector for the installed die/groove. 	• Power Issue The tool has detected an internal error and shut down to prevent damage to itself and the battery. • Tool is Damaged The tool has detected it is in a state that should not be achievable if the tool is not damaged or misused.	• Push the Trigger out to attempt an Emergency Release. • Remove the battery and replace it with a fully charged battery. Push the Trigger out to begin an Emergency Release and wait for the tool to return to the open position. • Return to factory for repair.

For further assistance, contact the BURNDY® Tool Service Center at 1-603-444-6781.

COMMONLY ASKED QUESTIONS

1. Q - How many crimps can I get before I need to recharge the battery?

It is very difficult to estimate the number of crimps you will get before recharging the battery. This will depend on many factors such as temperature, size, and type of material being crimped, how the tool is used, the weather, etc. (see below for more information).

The weather - Extreme cold temperatures can reduce the battery charge by up to 60%. Keep charged batteries in a warm place, but not in your pockets, since coins and other metal parts may contact the battery terminal strips, causing a short circuit. Warm weather users will find they get more crimps/cuts per charge than users in colder climates.

How you use the tool - If you make multiple crimps, one right after another, you will need more frequent battery recharging than if you make a few and pause a moment prior to crimping again. The vast number of variables makes it difficult to provide exact number of crimps per charge for every possible situation.

2. Q - How long will the batteries last?

Under ideal circumstances each battery could be recharged up to 1000 times before it will no longer accept a charge. This number may vary due to individual use and charging habits.

3. Q - Can the batteries be recycled?

YES! Once the battery no longer accepts a recharge, simply follow the recycling instruction included in this manual for proper recycling. If your local community or company has a recycling program, you may choose to contact them for instructions on recycling. Always properly dispose of spent batteries by following the manufacturers recommended recycling procedures. (See "BATTERY RECYCLING" section for details.)

4. Q - How far can the tool be dropped without damaging it?

The BURNDY® PAT221 tool has been designed to withstand drops of six feet; however, due to the endless angles at which a tool can be dropped, damage can still occur. The outer housing is designed of a high strength composite polymer plastic but can be broken depending upon the surface (pavement, grass, rocks, etc.) being dropped upon and/or the angle of impact. The internal working assemblies should survive without damage. We strongly recommend that a tool lanyard or wrist strap be used with the D-Ring to help prevent dropping the tool.

5. Q - How do I know when I've properly completed a crimp?

The BURNDY® PAT221 tool will stop automatically once it has reached the calibrated compression. One the Trigger is released the Jaws will open, then the tool performs brief impulse/haptic feedback when auto-calibration is complete and the tool is prepared for the next cycle.

6. Q - Does the tool require a charged battery to open the jaws?

YES, the BURNDY® PAT221 tool utilizes an electromechanical system which requires the motor to turn to return the tool to its initial open state.

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 Lithium-ion battery cartridge when you do not use it for more than 6 months.

5. Remove the battery cartridge when not using the tool or placing it in storage.

PARTS

Replacement Labels

CATALOG NUMBER	DESCRIPTION
LBLPRODLPAT221	PRODUCT LABEL, LEFT
LBLWARNRPAT221	WARNING LABEL, RIGHT
LBLSFTYPAT221	SAFETY (EMERGENCY RELEASE) LABEL, TOP
LBLCASEPAT221	CASE LABEL

Batteries and Charger

CATALOG NUMBER	DESCRIPTION
BAT18V2AHLI	BATTERY, MAKITA, 18V LI-ION, 2.0AH
BAT18VLI	BATTERY, MAKITA, 18V LI-ION, 3.0AH
BAT18V5AHLI	BATTERY, MAKITA, 18V LI-ION, 5.0AH
PATCHGRLI	CHARGER, MAKITA, 18V LI-ION, AC

Accessories

CATALOG NUMBER	DESCRIPTION
CASEPAT221	PAT221 CASE
PT10074020	WRIST STRAP

Die Sets

CATALOG NUMBER	DESCRIPTION
2210B221	BARE (UNINSULATED) DIE SET, #22 - #10 AWG
2210NV221	NYLON/VINYL DIE SET, #22 - #10 AWG
81WHL221	DIE WHEEL SET, #8 - #1 AWG
122WHL221	DIE WHEEL SET, #12 - #2 AWG

MAKITA BATTERY INFORMATION

When the 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.

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 cartridges in a container with other metal objects such as nails, coins, etc. (3) Do not expose the 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 the battery.

LITHIUM-ION (Li-ion) SHIPPING REGULATIONS:

Check with all organizations for current shipping regulations pertaining to Lithium Cells and Batteries prior to shipping. Review all country specific regulations on safe handling and shipping of Lithium Cells and Batteries prior to shipping. Organizations include:

- US Department of Transportation (DOT) 49CFR 173.185 Lithium Cells and Batteries
- International Civil Aviation Organization (ICAO) Dangerous Goods Technical Instructions on Lithium Batteries
- International Air Transport Association (IATA) Dangerous Goods Regulations on The Transport of Lithium Ion and Lithium Metal Batteries
- International Maritime Dangerous Goods (IMDG) Code 38-16 Lithium Batteries

APPROVED BATTERY RECYCLING LOCATION:
BURNDY® encourages recycling of its products whenever feasible. Recycling regulations and methods vary within North America and BURNDY® does not endorse any one recycling method or company. Consumers that wish to recycle BURNDY® products in North America are asked to do so according to your local, state and federal regulations. Recycling resources for the United States can be found at the US EPA web site at the following link: http://www.epa.gov/recycle

If you wish to recycle batteries, please use the above link and/or contact your local RBRC recycling center. If additional information is needed, please contact the BURNDY®, Littleton Tool Service Center.

When recycling batteries you must include a bill of lading to comply with all applicable state and federal requirements, or the recycling center may be forced to return the shipment at your expense. If you have any questions, please contact the recycling center directly.

The EPA certified RBRC Recycling Seal indicates BURNDY® is voluntarily participating in a program to recycle these batteries at the end of their useful life. The RBRC program provides a convenient alternative to placing batteries into the trash, which may be illegal in your area. Please call 1-800-822-8837 for more information. BURNDY® is committed to preserving our environment and conserving natural resources.

SAFETY GUIDELINES FOR BATTERY COLLECTION
LITHIUM-ION BATTERIES

- Used batteries may have a significant residual charge. It is important that they are prevented form short-circuiting. This can be done by placing the batteries separately in plastic bags or by placing non-conductive tape over the battery terminals.
- While these batteries are normally safe to handle, they do contain caustic materials that may have "vented" due to misuse during the life of the battery. If the battery appears to be "dirty" or have a white "film-like" substance around the terminal, exercise caution when handling the battery. Do not touch the dirty area. Wash your hands with soap and water if they feel itchy, and avoid touching your eyes, nose, mouth.
- Do not attempt to discharge the battery by short-circuiting the terminals, consult your battery supplier for proper instructions on discharging batteries.
- Do not bite or place the battery in your mouth or nose.
- Do not place wet batteries in a plastic bag. The trapped moisture will cause the battery to rust.

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For more information contact:

BURNDY® TOOL SERVICE CENTER
150 Burndy Road
Littleton, NH 03561
1-800-426-8720
1-603-444-6781

Additional or replacement manuals may be obtained free of charge from the BURNDY® Tool Service Center.

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