CT-2981

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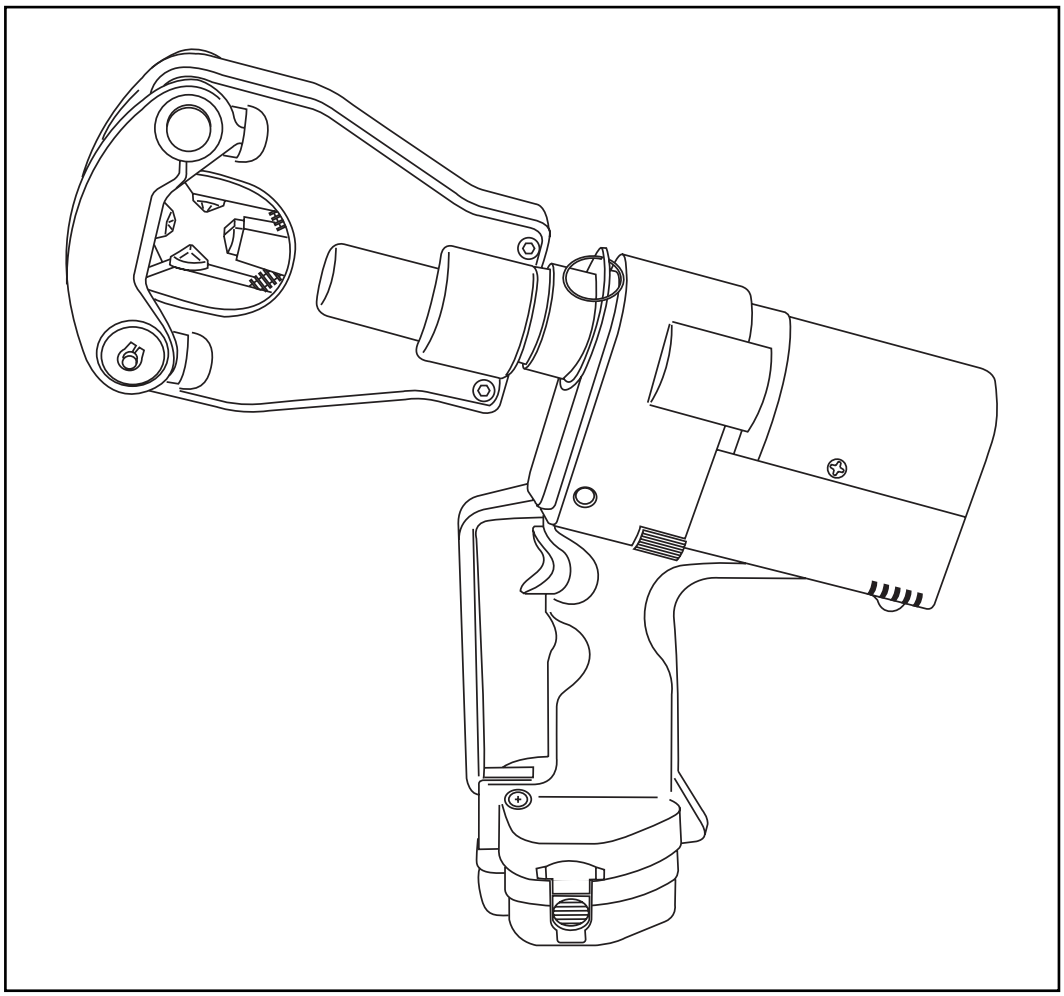
UNI-DIE HYDRAULIC COMPRESSION TOOL OPERATION INSTRUCTIONS



Read and **understand** all of the instructions and safety information in this manual prior to operating or servicing this tool.
Retain this manual for future reference.

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888-506-5400, ext. 3255
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PANDUIT CT-2981

UNI-DIE HYDRAULIC COMPRESSION TOOL
OPERATION INSTRUCTIONS

TABLE OF CONTENTS

Purpose of this Manual

This manual is intended to familiarize the user with the safe operation and maintenance procedures for this tool.

Keep this manual available to all personnel.

Replacement manuals are available upon request.

INTRODUCTION

The CT-2981 *UNI-DIE* Hydraulic Compression Tool can crimp #4 AWG thru 750 kcmil *PANDUIT* Copper Compression Connectors and #6 AWG thru 500 kcmil *PANDUIT* Aluminum Compression Connectors using only one set of *UNI-DIE* universal nibs. The Hydraulic Compression Tool develops up to 6.2 tons (5.6 metric tons) of compressive force.

This manual will guide you step-by-step in the set-up, operation, and maintenance of your CT-2981 Tool. Proper maintenance is vital to the continued trouble-free operation of the tool. If you have a problem not covered in the manual, call:

(888) 506-5400, Ext. 3255

Ask for one of our Tool Service Technicians

Safety

Safety is essential in the use and maintenance of *PANDUIT* tools and equipment. This manual and any markings on the tool provide information for avoiding hazards and unsafe practices related to the use or service of this tool. Observe all of the safety information provided.

TOOL SPECIFICATIONS

Hydraulic Compression Tool	Output:	6.2 tons / (5.6 metric tons)
	Applicable Range:	*PANDUIT* Connectors - #4 AWG to 750 kcmil copper compression lugs and splices; and #6 AWG to 500 kcmil aluminum lugs and splices
	Motor:	12 V DC motor
	Dimensions:	14.87" L x 3.0" H x 12.25" W - with battery 377.7 mm L x 76.2 mm H x 311.2 mm W
	Weight:	10.8 lbs. / (4.9 kg) - with battery
	Sound Level	75 dB (A) at 1 meter
	Vibration	$<2.5\ m/s^2$
	Motor Type	DC permanent field motor
	Motor Voltage	12 VDC
Makita Battery Cartridge Part No.: 1234	Battery Type:	Nickel Metal Hydride (NiMH)
	Output:	12 V DC
	Capacity:	2.6 AH
	Charging time:	1 hour
	Weight:	1.45 lbs. / (.659 kg)
Makita Battery Charger Part No.: DC1413	Input:	120 Volt AC 50Hz - 60Hz
	Output:	7.2 V - 14.4 Volt DC
	Dimensions:	7-1/8" L x 2-1/16" H x 3-5/8" W 181 mm L x 78 mm H x 92 mm W
	Weight:	1.17 lbs. / (.528 kg)

OPTIONAL ACCESSORIES

Makita NiCad 12 Volt replacement battery cartridge	Makita Part No.: 1222
Makita NiMH 12 Volt replacement battery cartridge	Makita Part No.: 1234
Makita 7.2 Volt - 14.4 Volt DC replacement battery charger	Makita Part No.: DC1413

Replacement Makita Batteries and Battery Chargers are available for purchase from local Makita products distributors.

Test Slug Package (SS-1) and Test Slug Gauge (SS-1Gage) are available for purchase from your local *PANDUIT* distributor.

CT-2981 TOOL

The CT-2981 Tool includes:

1 - Hydraulic Compression Tool
2 - Makita NiMH Battery Cartridges
1 - Makita Battery Charger
1 - Carrying Case
1 - Crimp Test Slug Gauge
1 - Package Crimp Test Slugs

PRECAUTIONS AND GENERAL GUIDELINES

IMPORTANT SAFETY INFORMATION

SAFETY ALERT SYMBOL

This symbol is used to call your attention to hazards or unsafe practices which could result in an injury or property damage. The signal word, defined below, indicates the severity of the hazard. The message after the signal word provides information for preventing or avoiding the hazard.

⚠ DANGER

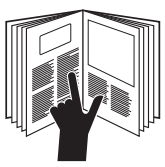
Immediate hazards which, if not avoided, WILL result in severe injury or death.

⚠ WARNING

Hazards which, if not avoided, COULD result in severe injury or death.

⚠ CAUTION

Hazards or unsafe practices which, if not avoided, MAY result in injury or property damage.



⚠ WARNING

Read and understand all of the instructions and safety information in this manual before operating or servicing this tool.

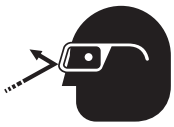
Failure to observe this warning can result in severe injury or death.

⚠ WARNING

Electric Shock Hazard:

This tool is not insulated. When using this unit on or near energized electrical lines, use proper personal protective equipment.

Failure to observe this warning can result in severe injury or death.



⚠ WARNING

Wear eye protection when operating or servicing this tool.

Failure to wear eye protection can result in serious eye injury from flying debris or hydraulic oil.

⚠ WARNING

Skin Injection Hazard:

Oil under pressure easily punctures skin causing serious injury, gangrene, or death. If you are injured by escaping oil, seek medical attention immediately.

- Do not use hands to check for leaks.
- Depressurize the hydraulic system before servicing.

⚠ WARNING

Do not use solvents or flammable liquids to clean the crimping tool. Solvents or flammable liquids could ignite and cause serious injury or property damage.

PRECAUTIONS AND GENERAL GUIDELINES (continued)

⚠ WARNING

Keep hands away from the crimping tool head when crimping.

Failure to observe this warning can result in severe injury or death.

⚠ WARNING

An incomplete crimp can cause a fire.

- Use proper connector and cable combinations. Improper combinations can result in an incomplete crimp.
- The relief valve will sound to indicate a completed crimp. If you do not hear the sound of the relief valve, the crimp is not complete.

Failure to observe these warnings can result in severe injury or death.

⚠ WARNING

Do not dispose of batteries in a fire. They will vent fumes and may explode.

Failure to observe this warning can result in severe injury from harmful fumes or burns from flying debris.

⚠ WARNING

Inspect tool before use. A worn or damaged tool may result in breakage striking the operator or nearby personnel.

Failure to observe this warning can result in severe injury, death or property damage.

⚠ CAUTION

Do not perform any service or maintenance other than as described in this manual. Injury or damage to the tool may result.

Failure to observe this precaution can result in injury and property damage.

⚠ CAUTION

- Do not operate the tool without a connector in place. Damage to the ram or crimping tool head can result.
- This tool is not designed for continuous use. After 30 to 40 crimping cycles, allow the crimping tool to cool for 15 minutes.
- Do not place the tool in a vise. The crimping tool is designed for hand-held operation.
- Protect the crimping tool from rain and moisture. Water will damage the crimping tool and battery.
- Use this tool for the manufacturer's intended purpose only.

Failure to observe these precautions can result in injury or property damage.

⚠ CAUTION

Do not allow anything to contact the battery terminals.

- Do not immerse the batteries in liquid. Liquid may create a short circuit and damage the battery. If batteries are immersed, contact your service center for proper handling.
- Do not place the battery into a pocket, tool pouch, or tool box with conductive objects. Conductive objects may create a short circuit and damage the battery.
- Do not place a battery on moist ground or grass. Moisture may create a short circuit and damage the battery.

Failure to observe these precautions can result in injury or property damage.

⚠ CAUTION

- Do not store the battery at more than 60°C (140°F). Damage to the battery can result.
- Do not use another manufacturer's charger. Other manufacturers' chargers may overcharge and damage the battery.
- Do not attempt to open the battery. It contains no user-serviceable parts.

Failure to observe these precautions can result in injury or property damage.

PRECAUTIONS AND GENERAL GUIDELINES (continued)

HYDRAULIC COMPRESSION TOOL

1. Always verify the proper size connector for the conductor, by checking the color code and the printing on the connector.

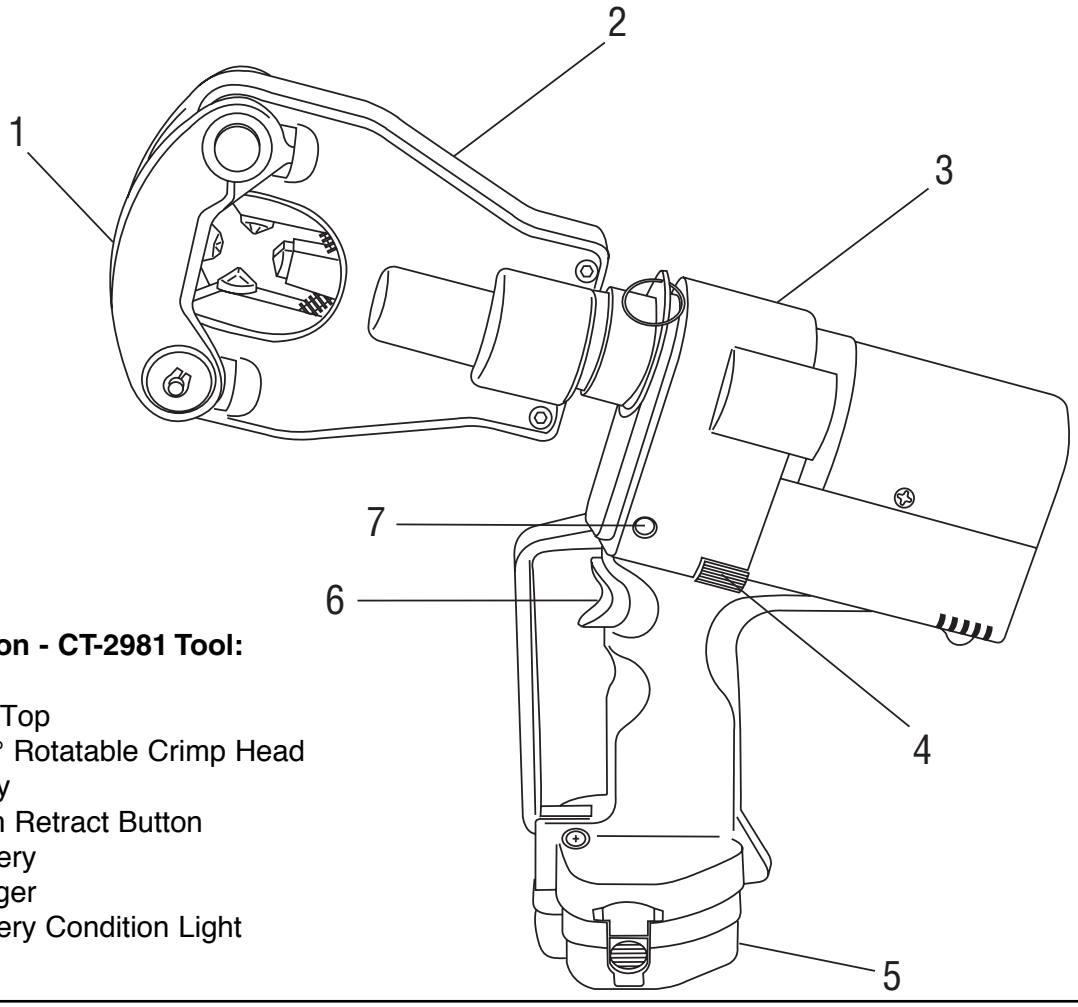
   NOTE:
   CONNECTIONS UTILIZING THIS TOOL ARE U.L. LISTED AND C.S.A. CERTIFIED ONLY WHEN *PANDUIT* COPPER COMPRESSION CONNECTORS ARE USED. USE OF ANY OTHER BRAND OF COMPRESSION CONNECTORS IS NOT RECOMMENDED.

⚠ CAUTION

Before crimping a connection, verify that the flip top on the tool head is locked in the closed position. The lockout pin must be engaged completely through the tool head and both surfaces of the tool flip top. Failure to lock the tool flip top in the closed position may result in damage to the tool and personal injury.

2. Keep the tool head portion clean and free from debris. Excessive dirt and grit can contribute to the premature wear of the tool's internal mechanical parts. Always store the tool in its clean, dry carrying case when not in use. When using the tool, regularly check that no foreign matter or debris exists in the open areas between the nibs in the tool head. A tool that is dirty with excessive foreign matter may jam and become damaged during operation. Soap and a damp cloth should be used to clean the tool body.

3. Avoid dropping the tool. Extreme shock may damage the hydraulic circuit and result in malfunction of the tool.



Identification - CT-2981 Tool:

1. Flip Top
2. 360° Rotatable Crimp Head
3. Body
4. Ram Retract Button
5. Battery
6. Trigger
7. Battery Condition Light

PRECAUTIONS AND GENERAL GUIDELINES (continued)

BATTERY CHARGER
Read the instructions supplied with the battery charger.

TERMINATIONS PER BATTERY CHARGE
The estimated number of terminations before the battery will need to be recharged is dependent on variables such as the connector size and type being terminated, ambient temperature, and time lapsed between termination cycles as well as other variables. It is recommended that the spare battery be kept at full charge for uninterrupted tool use.

BATTERY CONDITION	
Battery Load Display	Battery Condition
Momentary illumination at beginning of crimp	Normal
Flickering at end of crimp	Normal
Flickering during entire crimp	Low charge
Constant illumination during entire crimp	Low charge

TOOL OPERATION

⚠ WARNING

Electric Shock Hazard:

This tool is not insulated. When using this unit on or near energized electrical lines, use proper personal protective equipment.

Failure to observe this warning can result in severe injury or death.

⚠ WARNING

An incomplete crimp can cause a fire.

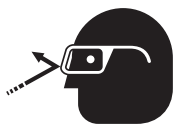
- Use proper connector and cable combinations. Improper combinations can result in an incomplete crimp.
- The relief valve will sound to indicate a completed crimp. If you do not hear the sound of the relief valve, the crimp is not complete.

Failure to observe these warnings can result in severe injury or death.

⚠ WARNING

Inspect tool before use. A worn or damaged tool may result in breakage striking the operator or nearby personnel.

Failure to observe this warning can result in severe injury, death or property damage.



⚠ WARNING

Wear eye protection when operating or servicing this tool.

Failure to wear eye protection can result in serious eye injury from flying debris or hydraulic oil.

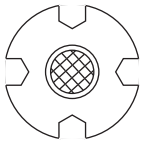
⚠ WARNING

Keep hands away from the crimping tool head when crimping.

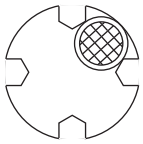
Failure to observe this warning can result in severe injury or death.

CRIMPING
To simplify operation, the tool head may be rotated, by hand, 360° relative to the tool body. Also, the tool flip top may be opened to accommodate splices and large connectors. To open the tool flip top, pull the lock pin allowing the tool flip top to swing open.

Before crimping, lock the tool flip top in the closed position by lowering the tool flip top, and sliding the lock pin completely through the tool head and both surfaces of the tool flip top.



RIGHT



WRONG

IMPORTANT

Small connectors may become wedged between the nibs of the tool. Center the connector between the four nibs before crimping.

Failure to observe this precaution can cause property damage.

1. Verify the proper size connector for the conductor, by checking the color code and the printing on the connector. Also, consult the connector installation instructions to verify the correct number of crimps to apply to the connector being used.

2. Verify that the hinged tool flip top is locked in the closed position with the lock pin. Center the connector against the stationary nib.

4. Depress the trigger to advance the nibs toward the connector. Release the trigger once the connector is held by the nibs.

   CAUTION: **DO NOT** crimp the connector at this time.

5. Insert the prepared conductor completely into the connector barrel (see connector installation instructions for conductor preparation requirements).

6. Depress the trigger until the crimp is completed; the ram will automatically retract when crimp cycle is complete.

   NOTE: Pressure relief occurs at approximately 690 bar (10,000 psi) and is indicated by an audible “pop”.

   CAUTION: **DO NOT** release the trigger or interrupt the crimping cycle until the crimp is completed. The tool ram will automatically retract upon completion of the crimping cycle.

   NOTE: If the tool stalls during the crimping operation, the battery may need recharging, or an improper connector or wire was used. Replace the battery to verify battery power status; also verify that correct connector and conductor are being crimped. Complete the crimping cycle until the release pressure is attained.

   Should the crimp cycle need to be interrupted prior to termination completion, the operator can release the tool trigger - stopping the ram advancement, then depress the ram retract button to retract the tool ram.

   WARNING: Interruption of the crimp cycle may result in an incomplete termination between the connector and conductor. It is the responsibility of the operator to complete the termination or remove and replace the connector.

7. Complete the number of crimps required per the connector installation instructions.

MAINTENANCE

⚠ WARNING

Do not use solvents or flammable liquids to clean the crimping tool. Solvents or flammable liquids could ignite and cause serious injury or property damage.

⚠ WARNING

Skin Injection Hazard:

Oil under pressure easily punctures skin causing serious injury, gangrene, or death. If you are injured by escaping oil, seek medical attention immediately.

- Do not use hands to check for leaks.
- Depressurize the hydraulic system before servicing.

PERIODIC MAINTENANCE

1. Daily maintenance is important to keep the tool in good working condition. Keep the tool head portion clean and free from debris. Excessive dirt and grit can contribute to the premature wear of the tool's internal mechanical parts. Wipe the tool surfaces with a damp cloth and mild detergent.

   Check the nibs for wear and damage such as cracks, gouges, or chips. Inspect the tool for damage or oil leaks Return a damaged tool to *PANDUIT* for repair by contacting *PANDUIT* Tool Service at (888) 506-5400, Ext. 3255.

   Fully retract the ram and store the tool in its clean, dry carrying case when not in use.

   Charge the battery before storage.

2. Avoid humidity wherever possible for efficient operation and the prevention of corrosion.

3. The hydraulic tool has been calibrated and sealed at the factory. Contact *PANDUIT* Tool Service at (888) 506-5400, Ext. 3255; or your distributor if hydraulic problems are experienced. The hydraulic fluid should be changed annually or every 10,000 cycles.

CLEANING AND LUBRICATION OF TOOL HEAD

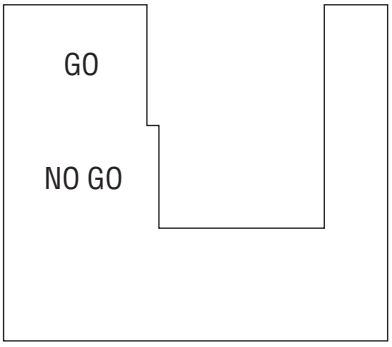
Thorough cleaning and lubrication of the tool head is recommended annually, or every 10,000 cycles. It is recommended that the CT-2981 Tool be returned to Panduit Corporation for proper maintenance by our trained service staff.

PERIODIC PRESSURE RELIEF VALVE CHECK

Test the compression force of the CT-2981 tool, monthly, whenever possible damage has occurred, or as often as operating conditions warrant. Follow the test instructions below (Testing the Crimping Tool).

PANDUIT's trained Tool Service staff provides tool Inspection and Calibration service. Contact *PANDUIT* Tool Service at: (888) 506-5400, ext. 3255.

Testing the Crimping Tool



1. Center a test slug between the nibs.

2. Pull the trigger to advance the nibs. Hold the trigger down until the pressure relief valve activates.

3. After achieving pressure relief, the ram automatically returns to the start position and the nibs retract.

4. Evaluate the test slug as follows:
   - If any part of the test slug does not fit into GO slot, the pressure relief valve is set too high. Contact *PANDUIT* Tool Service.
   - If the test slug fits into the GO slot, the pressure relief valve is set correctly.
   - If the test slug fits into the NO GO slot, the pressure relief valve is set too low. Contact *PANDUIT* Tool Service.

TROUBLESHOOTING

Before you begin, make sure that the battery is charged.

Problem	Probable Cause	Probable Remedy
Tool is inoperative	Dirt, contaminants, etc., in ram area of tool.	Clean tool.
	Tool battery contacts damaged.	Reform contacts.
	Tool battery contacts corroded.	Clean contacts with pencil eraser or contact cleaner.
	Tool components worn or damaged.	Contact *PANDUIT* Tool Service.
Ram does not advance completely.	Oil level is low.	Contact *PANDUIT* Tool Service.
	Air in hydraulic system.	Pull trigger and hold retract button simultaneously. Hold for approximately 10 seconds.
Battery load display flashes constantly.	Battery charge low.	Charge or replace battery.
Tool loses oil.	Damaged internal seal.	Contact *PANDUIT* Tool Service.

PARTS LIST - CT-2981 Tool:

Key	Part Number	Qty.
31	Latch Mounting Pin	1
33	Lock Pin	1
37	Snap Ring	2