NAVAC

Empowering you to work smarter

NTB7L

BreakFree® Power Tube Bender
User Manual

NAVAC Inc.

SAVE THIS MANUAL
FOR FUTURE REFERENCE

BREAKFREE®
CORDLESS SERIES

Safety Guide

Warning: To avoid injury, please read this instruction manual carefully before use.

1. Keep work area as clean as possible to avoid slips, falls or other injury while using tool.
2. Do not operate this or any other tool while under the influence of medications, drugs, or alcohol.
3. Keep this and all other power tools away from minors and any other untrained individuals.
4. Do not attempt to operate this tool with bending tool components from other manufacturers. Use the OEM parts included in the kit to avoid injury, tool destruction and a void warranty.
5. Keep all body parts, appendages, or objects away from moving parts during operation.
6. Product warranty is void if any changes, modifications, or customizations of the tool have taken place.
7. Batteries must be left intact and sealed; in addition to a void warranty, opening lithium-ion batteries may result in severe injury. Dispose of and handle batteries in accordance with local environmental regulations.
8. For troubleshooting faults or technical issues, please refer to table 2 and table 3.

NTB7L Parts Diagram

Fig. 1

Empowering you to work smarter NAVAC

Technical parameters

Model	NTB7L
Tubing OD	1/4”, 5/16”, 3/8”, 1/2”, 5/8”, 3/4”, 7/8”
Dimension	12.6"x9.8"x7"(325×250×180mm)
Weight	13 lbs (5.9 kg)

Battery pack

Battery	7.4V 2Ah 14.8Wh
Quick Charge	30 minutes
Ambient Temperature	41°F-104°F (5°C-40°C)

Charger

Power Supply	AC 100-240V (50/60Hz) 50W
Output Voltage	8.3 V
Output Current	3.5 A
Ambient Temperature	41°F-104°F (5°C-40°C)

Table 1

Tube bender operating instructions

1. Preparation

Always use the tool for **FRESH SOFT COPPER** tubing. Hard copper tubing will result in failure. Deformed (squished, kinked, oval, etc.), oxidized copper tubing or non-copper tubing will result in failure.

2. Crossbar installation

Tighten crossbar screw to lock the crossbar on the tool.

3. Battery installation

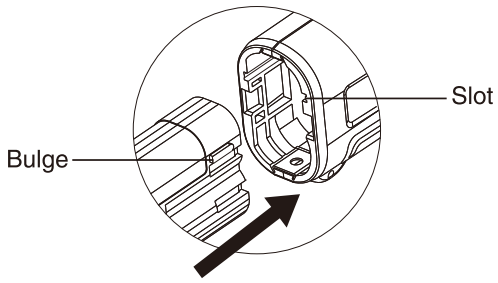


Fig. 2

Tube bender operating instructions

4. Use of tube bender

4.1 Set up tubing size selector, then lock;
Loosen locking nut on tubing size selector, slide it to the desired position: as shown below (①, ②, ③), tighten locking nut on the tubing positioner.

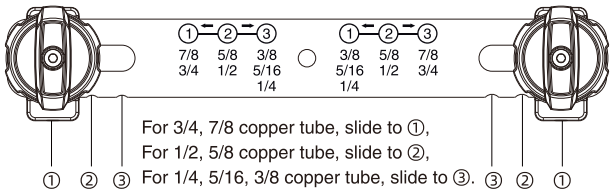


Fig. 3

4.2 Align size notch to copper tube
Turn size selection wheel, let the right size notch facing towards tool body, align tube onto the notches on both sides. WRONG SIZE NOTCH WILL RESULT IN FAILED BEND, OR FUTHER DAMAGE THE TOOL ITSELF.

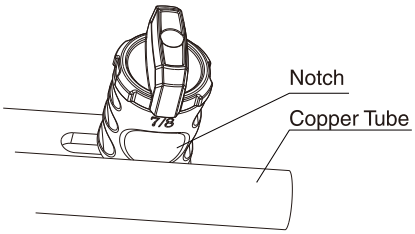


Fig. 4

4.3 Mandrel installation
Choose the correct size mandrel. Allow angle marks facing up. Attach mandrel to the top of the Pushing Head by simply pressing down until you feel the spring latch engages. To disassemble, push mandrel out using two hands, each on one side of the mandrel.

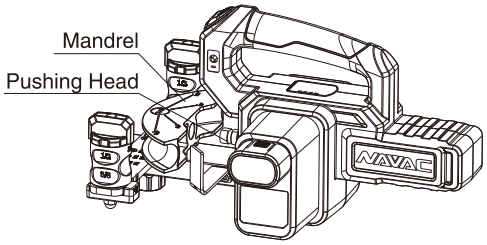


Fig. 5

Empowering you to work smarter NAVAC

Tube bender operating instructions

4.4 Bend tube
Press power switch to turn the tool on. When the indicator light is green, hold the copper tube with one hand, put it into tube notch so it's well fit. Use the other hand to push the control button forward.
Warning: Avoid physical contact with moving parts of the tool when bending.

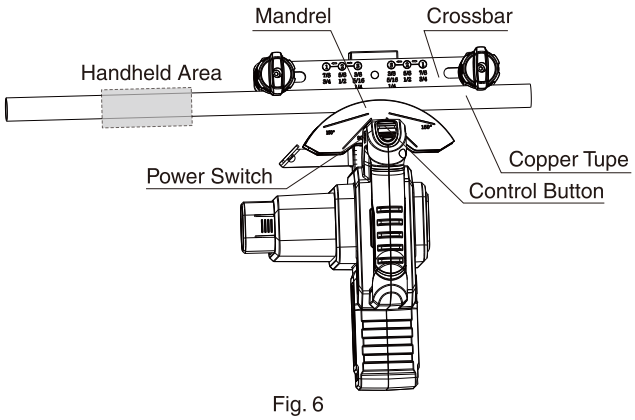


Fig. 6

The copper tube will be bent to 90° when bender stops automatically. To bend other angles, refer to angle marks on mandrel.

5. Release tube

Pull control button backward, mandrel will back up. Tube will be pushed out automatically.

6. Standby

6.1 After bending, tap Power Switch, turn tool to standby mode.
6.2 Tool will automatically enter power saving mode, indicator light will go out if no operation in 5 minutes.

Reverse bender (*Reverse bender is sold separately)

1. Lock reverse bend retaining block using **Screw A** onto tube bender, press appropriately sized Mandrel with angle mark side facing down into the reverse bend retaining block.
2. Lock crossbar onto reverse bend retaining block, then insert it into the pushing head and lock it with **Screw B**.
3. Slide tubing size selector into the right position (refer to 4.1). Select desired notch size on tube size selector facing toward mandrel, put copper tube into size notch on both side, then start to reverse bend.

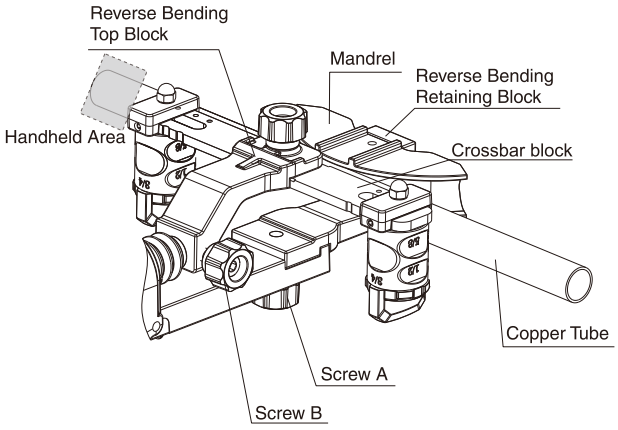


Fig. 7

Empowering you to work smarter NAVAC

Charging

1. Press down battery release tabs to remove battery.

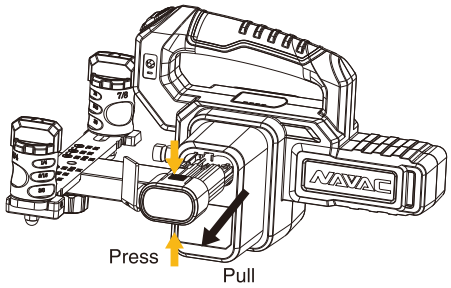


Fig. 8

2. Insert battery into the charger notch.

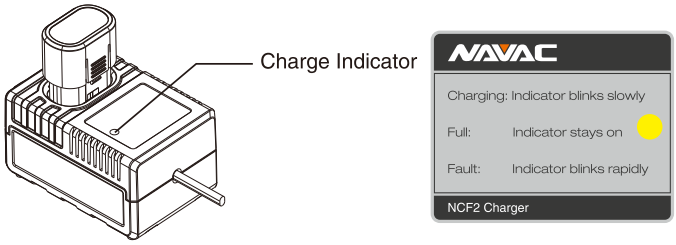


Fig. 9

Troubleshooting

1. Electrical Failures

Problem	Possible Cause	Solution
Work indicator one flash one off	Short circuit	Contact the manufacturer or dealer to repair
Work indicator two flash one off	ID detection failure	Check the battery or ID pin position
Work indicator three flash one off	Battery temperature protection	Wait for the battery to cool down or heat up
Work indicator four flash one off	Overcurrent protection	Reboot
Work indicator five flash one off	Motor temperature protection	Waiting for the motor to cool down
Work indicator six flash one off	Limit switch protection	Contact the manufacturer or dealer to repair
Charger indicator light flashes rapidly	Battery or charger failure	Contact the manufacturer or dealer to repair

Table 2

2. Other Failures

Problem	Possible Cause	Solution
Bender does not run or stops while operating when power switch and operation button is pressed	Low battery power	Charge
	Line or motor failure	Contact the manufacturer or dealer to repair
Copper tube deformation, fracture, poor angle	The selected tubing size selector notch does not match the copper tube	Select a suitable tubing size selector notch
	The selected mandrel does not match the copper tube	Select a suitable mandrel
	The selected gear on the crossbar does not match the copper tube	Follow the instructions on the crossbar to select the appropriate gear
	Tubing size selector is not locked	Lock the tubing size selector
	The bent copper tube is hard copper tube	Use the tool for FRESH SOFT COPPER tubing.

Table 3

Empowering you to work smarter NAVAC

NAVAC

Empowering you to work smarter

BreakFree™ Power Tube Expander

NTE11L

User Manual

Failure to follow warnings could result in death or serious injury.

SAVE THIS MANUAL FOR FUTURE REFERENCE

BREAKFREE
CORDLESS SERIES

CONTENTS

Safety Guide

Caution: Read this manual thoroughly before using.

- Keep the working area clean and tidy.
- Do not operate while under the influence of alcohol.
- Keep children and untrained people from using.
- Use original parts and auxiliary.
- Long time using may overheat its motor which activate overheat protection.
- Temperature higher than 158°F (70°C) or lower than 41°F (5°C) may activate the motor overheat or subcooled protection.
- Don't dismantle NTE11L at random which may void warranty.
- Product is warranted against defects in materials and workmanship for two years from the date of purchase.
- Dispose the battery according to local regulations.
- Pending patent.

Empowering you to work smarter NAVAC

Structure

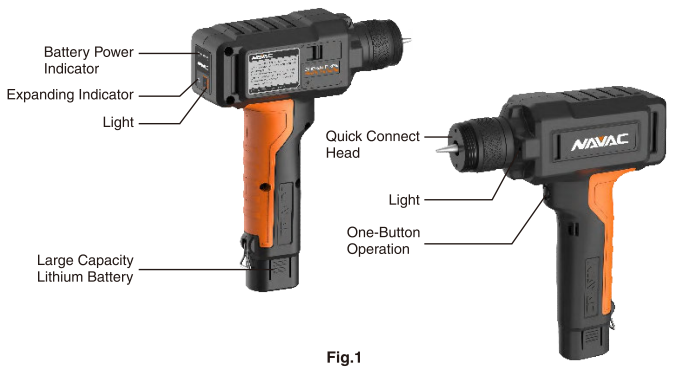


Fig.1

Technical Parameters

Model	NTE11L
Tube OD	3/8", 1/2", 5/8", 3/4", 7/8", 1", 1-1/8"
Power	DC motor
Cone Speed	120 RPM
Battery Capacity	Up to 200 expansions per charge
Time to Expanding	Complete an expansion in 12 seconds
Dimension	8.2"x2.6"x9.8"(209x67x249mm)
Weight	3.4 lbs

Battery pack

Battery	7.4V 2Ah 14.8Wh
Quick Charge	30 minutes
Ambient Temperature	41°F-104°F (5°C-40°C)

Charger

Power Supply	AC 100-240V (50/60Hz) 50W
Output Voltage	8.4V
Output Current	3.5A
Ambient Temperature	41°F-104°F (5°C-40°C)

Table 1

Operating Instructions for Tube Expander

1. Tube Expansion

1.1 Deburr and anneal copper tube (Note1: Soft tube doesn't need to be annealed)

Fig.2

1.2 Insert copper tube onto expander head, press start button to operate.
The expander stops automatically after expansion is completed.

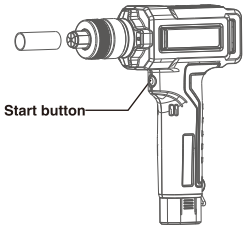


Fig.3

(If you accidentally press start button during operation, expander will stop working, press start button again to restore tube expansion operation)
(Note2: if start button is pressed but expander doesn't respond, manually release pressure by pushing pressure release button and then press start button again)

Empowering you to work smarter

Operating Instructions for Tube Expander

2. Pressure Relief

2.1. Automatic pressure relief
Expansion pressure will be relieved automatically after tube expansion process is completed.

2.2. Manual pressure relief
Manual pressure relief push button is to be used only when expander is running abnormally (pressure relief button is shown in the figure below). When pressure relief is needed, push this button in the direction of arrow to release pressure.

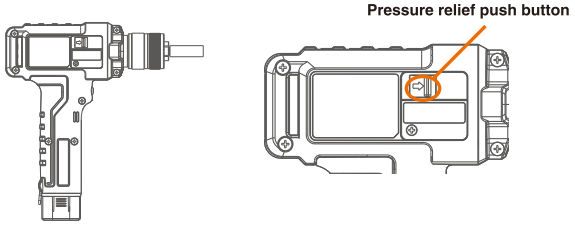


Fig.4

3. Illumination

3.1 Click light button to turn on light.

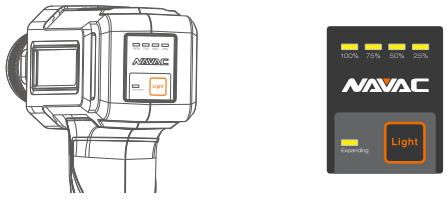


Fig.5

Operating Instructions for Tube Expander

4. Charge

4.1 Press tabs on both sides of battery to remove it.

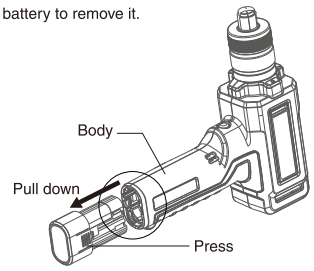
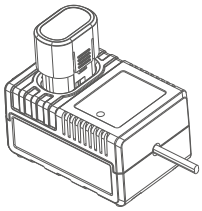


Fig.6

4.2 Make sure the battery pack is connected properly.

Charging



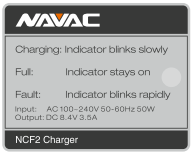


Fig.7

4.3 Place back the battery pack.

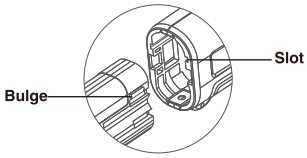


Fig.8

Operating Instructions for Tube Expander

5. Oil Change

To ensure the excellent performance of the expander, replace hydraulic oil every 1 year or every 6000 expansions.

5.1 How to change oil:

1). Put cone sleeve on the oil bottle cone, and then the O-ring.
2). Unscrew the small screw of oil change cover and remove it.
3). Use flat head screwdriver to unscrew the refueling plug (clean up dust near the refueling hole to prevent dust from falling into).
4). Turn expander upside down, press the exhaust pressure plate, drain old oil from expander, turn expander over, lay expander flat. (Dispose of used oil properly).
5). Press the exhaust pressure plate while inserting oil bottle into the refueling hole.
6). Loosen the exhaust pressure plate. After the exhaust pressure plate returns to its original position, press it repeatedly until no more bubbles get in oil bottle.
7). Pull away oil bottle, put back refueling plug screw, screw oil change cover back on expander.

1

2

3

4

5

6

Fig.9

Lubrication

Add appropriate amount of grease to the cone hole of expander head regularly to avoid expander head from being stuck or unable to reset during the expansion process due to poor lubrication.

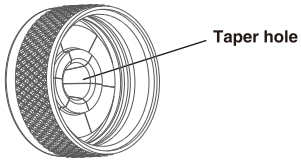


Fig.10

CAUTION

1. Put expander back into its box after work to prevent water and dust from entering expander.
2. If expander is used continuously for long time, it may trigger temperature protection, the indicator will flash 5 times. Wait until expander cools down for a while, after temperature drop back, you can used it again.
3. Expander will power off automatically if no activity for 20 seconds.
4. Use the dedicated oil bottle and hydraulic oil for oil change/refill to avoid damage to expander.
5. This expander is designed for soft copper tubes. If hard copper tube is used, tube must be annealed before operation, otherwise tube will not expand or will split. Hard copper tube that is not annealed will damage the tools and invalidate the warranty.
6. If abnormal shutdown occurs during operation, please follow below procedures:
   a.Push manual pressure release button to release the pressure;
   b.Remove and re-plug battery pack;
   c.Start expander again to see if the problem is solved;
   d.If problem is not solved, please contact NAVAC Technical Support.

Empowering you to work smarter NAVAC

NAVAC

Empowering you to work smarter

Cordless Power Flaring Tool

NEF6LM

User Manual

Failure to follow warnings could result in death or serious injury.

SAVE THIS MANUAL FOR FUTURE REFERENCE

BREAKFREE CORDLESS SERIES

Contents

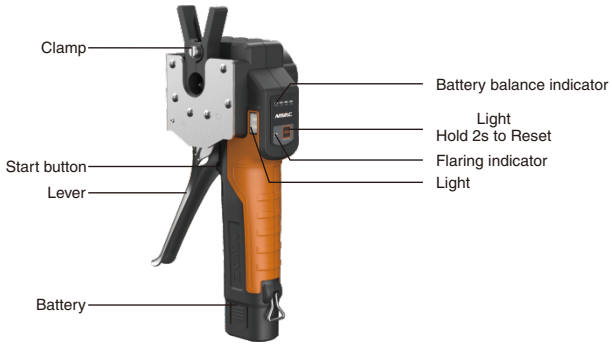
Safety Guide

Caution: Read this manual thoroughly before using.

- Keep the working area clean and tidy.
- Do not operate while under the influence of alcohol.
- Keep children and untrained people from using.
- Use original parts and auxiliary.
- Long time using may overheat its motor which activate overheat protection.
- Temperature higher than 158°F (70°C) or lower than 41°F (5°C)may activate the motor overheat or subcooled protection.
- Don't dismantle NEF6LM at random which may void warranty.
- Product is warranted against defects in materials and workmanship for two years from the date of purchase.
- Dispose the battery according to local regulations.
- Pending patent.

Empowering you to work smarter NAVAC

Structure



Technical Parameters

Model	NEF6LM
Tubing Type	Copper
Tubing OD	1/4", 3/8", 1/2", 5/8",3/4"
Power	DC motor
Cone Speed	120 RPM
Battery Capacity	Up to 100 flares per charge
Time to Flare	Complete a flare in < 30 seconds
Dimension	10"x4"x4" (265x101x100mm)
Weight	2.9 lbs (1.3kg)

Battery pack

Battery	7. 4V 2Ah 14.8Wh
Quick Charge	30 minutes
Ambient Temperature	41°F-104°F (5°C-40°C)

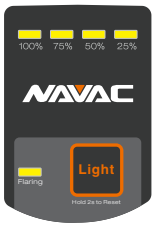
Charger

Power Supply	AC 100-240V (50/60Hz) 50W
Output Voltage	8.4V
Output Current	3.5A
Ambient Temperature	41°F-104°F (5°C-40°C)

Table 1

Light/Hold 2s to Reset Button:

- Press to show battery life.
- Press to turn on/off the light.
- Press 2 seconds to reset (draw back) the cone.



Empowering you to work smarter

Operation Instruction

1. Get the copper placed.

- Open the clamp by pressing the legs and insert the tubing.
- Use the baffle to set the correct depth of the tubing.

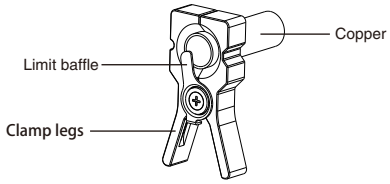


Figure 1

2. Get the clamp placed.

- Keep the lever open and put in the clamp. A locked lever resists the clamp being placed.
- Push the lever inward to lock the clamp.

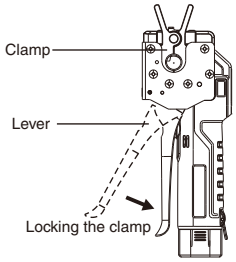


Figure 2

Caution:
Make sure hash marks lineup. Otherwise it may cause a defective flare and damage the clamp.

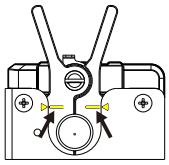


Figure 3

3. Press the START button to flare.

Caution:

- Don't open the lever during flaring, otherwise the automatic flaring stops.
- If it happens, press the reset button 2 seconds to draw back the cone.
- Make sure the clamp is still horizontally placed.
- Press inward the lever to lock the clamp again.
- Press the start button to reflare.

4. It takes less than 30 seconds to complete a flare automatically.

- After the flaring indicator turns off, open the lever.
- Remove the clamp and tubing.

Battery Charge

1. Charge battery when the last indicator flashes which means low battery.

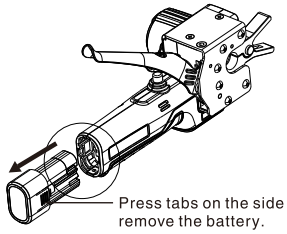


Figure 4

2. Make sure the battery pack is connected properly.

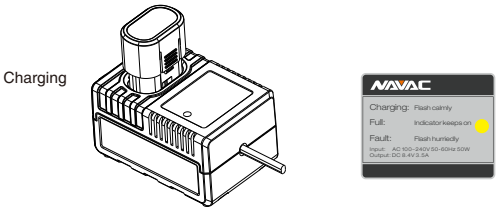


Figure 5

3. Place back the battery pack.

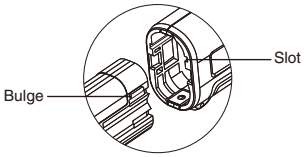


Figure 6

Troubleshooting

Problem	Possible cause	Solution
Flaring indicator flashes once cyclically.	Short circuit.	Contact NAVAC TechSupport.
Flaring indicator flashes twice cyclically.	Battery ID not recognized.	Use an original battery.
Flaring indicator flashes three times cyclically.	Overheat or subcooled of the battery pack.	Cool down or warm up the battery pack.
Flaring indicator flashes four times cyclically.	Overload. Or the cone cannot be reset.	Contact NAVAC TechSupport.
It does not flare or it stops during flaring.	Low battery balance.	Charge the battery.
	Motor or circuit board failure.	Contact NAVAC TechSupport.
	Dirty on the batter connections.	Clean the connections.
The copper flare is too small.	Lever's locking is loose.	Tighten the lever. (Figure 7)
	Copper does not touch the baffle.	Make them contact.
	Copper not deburred.	Debur the copper.
Charger		
Charger indicator flashes hurriedly.	Battery damaged.	Try another battery.

Table 2

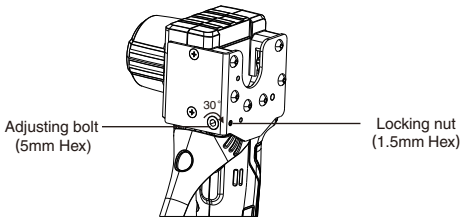


Figure 7

Caution:
- To tighten the lock, loose the locking nut first.
- Then turn the bolt clockwise 30 degree each time to check the tightness.
- Don't turn clockwise too much each time because it may over-tight the lever and cause damage.

Exploded View

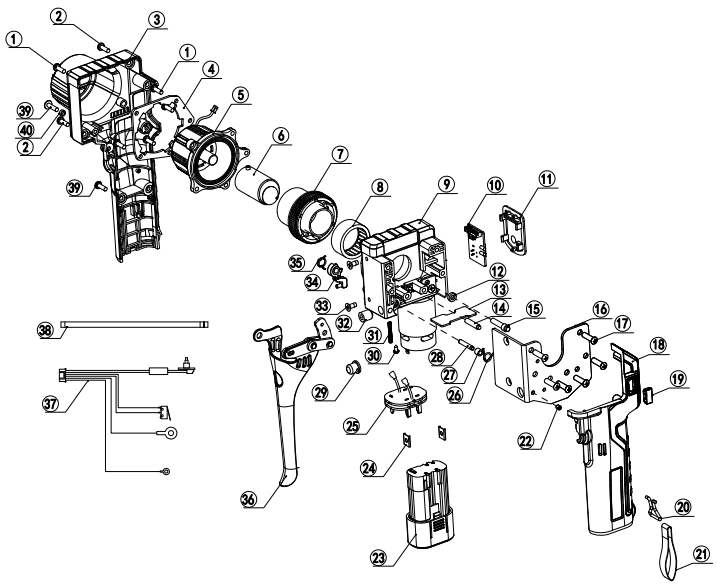


Figure 8

Spare Parts List

Ref No.	Part No.	Item
1	PNEF1	Screw
2	PNEF2	Screw
3	PNEF3	Right Cover
4	PNEF4	Plate
5	PNEF5	Chamber Assembly
6	PNEF6	Axis Assembly
7	PNEF7	Turbine Bushing
8	PNEF8	Bearing
9	PNEF9	Transmission Chamber
10	PNEF10	Circuit Board
11	PNEF11	Display Panel
12	PNEF12	Bushing
13	PNEF13	Subplate
14	PNEF14	Stop Pin
15	PNEF15	Pin
16	PNEF16	Front Cover
17	PNEF17	Screw
18	PNEF18	Cover
19	PNEF19	LED Plate
20	PNEF20	Ring
21	PNEF21	Strap
22	PNEF22	Screw
23	PNEF23	Battery Pack
24	PNEF24	Dead Plate
25	PNEF25	Circuit Board
26	PNEF26	Spring
27	PNEF27	Bushing
28	PNEF28	Pin
29	PNEF29	Button
30	PNEF30	Screw
31	PNEF31	Spring
32	PNEF32	Screw
33	PNEF33	Screw
34	PNEF34	Switch
35	PNEF35	Spring
36	PNEF36	Lever
37	PNEF37	Circuit
38	PNEF38	Wire
39	PNEF39	Screw
40	PNEF40	Bushing

Table 3