Power Tools Service Manual

CONFIDENTIAL
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PRODUCT NAME

18 V Cordless Stapler

Model 10 mm N 1810DA

CONTENTS

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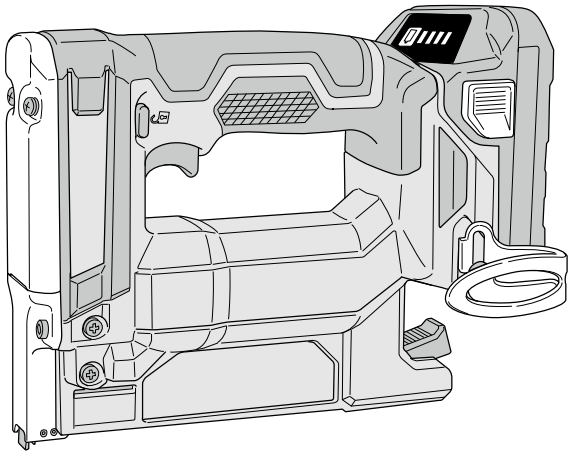


Koki Holdings Co., Ltd.

Overseas Sales Management Dept.

TROUBLESHOOTING GUIDE

1. Troubleshooting when the LED light blinks

In case of operation error, LED light shows as below.

LED light warning signal	Possible cause			Corrective action
On 0.5 second/ Off 0.5 second 	Dry fire lockout mechanism is activated. (The number of remaining staples is less than the specified value.)			Load staples.
	Overdischarge protection function is activated. (The battery voltage is lower than the specified value.)			Charge the battery.
	Response error (The response time is longer than the specified value.)	The motor takes a longer time to hoist due to the battery voltage drop.		Charge the battery.
		The standby position of the driver blade is not stable.		The driver blade is out of the standby position in the first operation immediately after reassembly. Operate the stapler several times to adjust the standby position.
				Remove foreign matter from the pushing lever section or the mechanical section.
		The mechanical section is hard to slide because any of the following parts is defective. • Driver blade (B) • Plunger • Plunger guide • Housing (A).(B) set • Ring gear • Idle gear • Second pinion ass'y • Gear • Gear holder • Motor		Replace defective parts.
	Switch time out	Four seconds passed after pulling the switch trigger without pressing the pushing lever against a workpiece.		Release the switch trigger and try stapling operation again.
		Four seconds passed after pressing the pushing lever against a workpiece without pulling the switch trigger.		Release the pushing lever and try stapling operation again.
On 0.25 second/ Off 0.25 second 	High temperature protection	Temperature of the FET or motor is high due to continuous operation.		Cool the stapler body sufficiently.
	Overcurrent protection	The motor locked (e.g., jammed staples, foreign matter in the mechanical section or pushing lever section, damaged gear or spring).		Eliminate the cause of overcurrent.
		The motor is faulty (e.g., layer short, disconnection, faulty commutator, broken carbon brush).		Replace the motor.
On 0.05 second/ Off 0.05 second	Time out error (The stapling cycle time is longer than the specified value.)	No signal for the micro switch for the top dead point. (A couple of staples are fired at startup in this case.)	The micro switch is damaged.	Replace the controller.
			The micro switch retaining rib on the housing is damaged.	Replace housing (A).(B) set.
		The motor locked or nearly locked (e.g., jammed staples, foreign matter, damaged parts). (Load is high but the overcurrent protection function is not activated.)		• Remove foreign matter. • Remove jammed staples. • Replace defective parts.
		The motor is faulty (e.g., layer short, disconnection, faulty commutator, broken carbon brush).		Replace the motor.
	Short circuit of FET	FET is short-circuited.		Replace the controller.

2. Troubleshooting in other cases

Problem	Possible cause (*: Most common cause)	Inspection method	Corrective action
(1) Staples cannot be driven.	*• Unwanted objects (e.g., jammed staples, adhesives, dust, wood dust) in the staple inlet groove formed by magazine plate (A), muzzle ass'y, feeder, and magazine base (B).	• Load the stapler with proper staples and check for smooth operation.	• Remove unwanted objects (e.g., jammed staples, adhesives, dust, wood dust).
	• Loose hex. socket bolt M4 x 6 of the pushing lever section	• Tighten the bolt at the specified torque and check for stapling operation.	• Tighten the bolt at the specified torque.
	• Abnormal staples are loaded (e.g., bent staples, abnormal collation). • Unspecified staples are used.	• Load the stapler with proper staples and check for stapling operation.	• Use proper staples. • Use specified staples.
	• Staple inlet groove of the pushing lever section has burrs. • Muzzle ass'y or magazine base (B) is deformed. • Staple inlet groove formed by housings (A) and (B) is too narrow or too wide. • Staple inlet groove of the muzzle ass'y is too narrow or too wide.	• Load the stapler with proper staples and check for smooth operation.	• Replace defective parts. • Remove burrs from the staple inlet groove.
	• Broken or worn-out feeder spring in the feeder • Feeder spring is dusty.	• Check for any abnormality.	• Replace defective parts. • Remove dust from the feeder spring.
	• Abnormal driver blade (B) (e.g., burred, deformed, damaged, worn)		• Replace defective parts.
	• Abnormal feeder (e.g., burred, deformed, damaged, worn)		• Replace defective parts. • Remove burrs from the feeder.
	• Abnormal plunger	• Check whether the plunger is broken or not.	• Replace defective parts.
	• Broken gear	• Check the gear, second pinion ass'y, idle gear, and ring gear for any abnormality.	• Replace defective parts.
	• Dry fire lockout mechanism does not work.	• Check whether foreign matter is around the switch holder or not. • Move magazine base (B) and check whether the LED light blinks or not. • Check the feeder for any abnormality.	• Remove foreign matter. • Replace defective parts.
(2) Staples are driven but bent.	• Loose hex. socket bolt M4 x 6 of the pushing lever section	• Tighten the bolt at the specified torque and check for stapling operation.	• Tighten the bolt at the specified torque.
	• Unspecified staples are used.	• Load the stapler with proper staples and check for stapling operation.	• Use proper staples.
	• Pushing lever section is abnormal in shape (e.g., warped, deformed, worn). • Abnormal driver blade (B) (e.g., burred, deformed, damaged, worn)	• Check the following parts for any trouble. • Magazine base (B) • Driver blade (B) • Feeder • Blade holder (A) • Blade holder (C) • Blade holder (E) • Muzzle piece (B) • Pushing lever	• Replace defective parts.
	• Wood material too hard to be stapled	• Drive staples into soft wood and check whether the driven staples are bent or not.	• This stapler is not for hard wood.

Problem	Possible cause (*: Most common cause)	Inspection method	Corrective action
(3) Staples cannot be driven into the workpiece completely: the heads cannot be made flush.	• Abnormal staples are loaded (e.g., bent staples, abnormal collation). • Unspecified staples are used.	• Load the stapler with proper staples and check for stapling operation.	• Use proper staples.
	• Abnormal driver blade (B) (e.g., burred, deformed, damaged, worn)	• Check for any abnormality.	• Replace defective parts.
	• Pushing lever section is abnormal in shape (e.g., warped, deformed, worn).	• Check for any abnormality.	• Replace defective parts.
	• Wood material too hard to be stapled	• Drive staples into soft wood and check whether the staple heads are lifted or not.	• Use proper staples with shorter legs.
	• Broken main spring	• Check whether the main spring is broken or not.	• Replace the main spring with new one.
(4) Staples jam.	*• Unwanted objects (e.g., jammed staples, adhesives, dust, wood dust) in the staple inlet groove formed by magazine plate (A), muzzle ass'y, feeder, and magazine base (B).	• Load the stapler with proper staples and check for smooth operation.	• Remove unwanted objects (e.g., jammed staples, adhesives, dust, wood dust).
	• Loose hex. socket bolt M4 x 6 of the pushing lever section	• Tighten the bolt at the specified torque and check for stapling operation.	• Tighten the bolt at the specified torque.
	• Unspecified staples are used.	• Load the stapler with proper staples and check for stapling operation.	• Use proper staples.
	• Staple inlet groove of the pushing lever section has burrs.	• Load the stapler with proper staples and check for smooth operation.	• Replace defective parts. • Remove burrs from the staple inlet groove.
	• Broken or worn-out feeder spring in the feeder • Feeder spring is dusty.	• Check for any abnormality.	• Replace defective parts. • Remove dust from the feeder spring.
	• Abnormal driver blade (B) (e.g., burred, deformed, damaged, worn)	• Check for any abnormality.	• Replace defective parts.
	• Abnormal feeder (e.g., burred, deformed, damaged, worn)	• Check for any abnormality.	• Replace defective parts.
	• Pushing lever section is abnormal in shape (e.g., warped, deformed, worn).	• Check for any abnormality.	• Replace defective parts.
	• Wood material too hard to be stapled	• Drive staples into soft wood and check whether the driven staples are bent or not.	• Use proper staples with shorter legs.

(5)
Stapling started just by pulling the switch trigger.
	• Pushing lever is kept pressed.
	• Any of the following parts is faulty.
	  • Pushing lever
	  • Switch holder
	  • Micro switch lever
	• Broken or worn-out spring (P)
	• Unwanted objects (e.g., dust, adhesives) in the pushing lever.
		• Check whether the pushing lever moves smoothly or not.	• Replace defective parts.
			• Remove dust or adhesive from the pushing lever.

Problem	Possible cause (*: Most common cause)	Inspection method	Corrective action
(6) No stapling operation without motor rotation sound. LED light indicates no error.	• Micro switch for the switch trigger is broken.	• Keep pulling the switch trigger for 4 seconds while the micro computer is activating (LED light is turning on). Check whether the LED light blinks or not. (Checking for switch time out described on page 1)	• Replace controller ass'y (A) with new one.
	• Abnormal switch trigger		• Replace defective parts.
	• Micro switch of the pushing lever section (for the pushing lever) is broken.	• Press the pushing lever against a workpiece and check whether the micro computer activates (LED light turns on) or not.	• Replace defective parts.
	• Abnormal micro switch lever		• Replace defective parts.
	• Abnormal pushing lever		• Replace defective parts.
	• Broken controller ass'y (A)	• Replace controller ass'y (A) and check for stapling operation.	• Replace controller ass'y (A) with new one.
	• Parts other than the above are broken.	• Check the following parts for any trouble (e.g., deformed, damaged, worn). • Switch trigger • Trigger spring • Switch holder • Micro switch lever • Pushing lever	• Replace defective parts.

REPAIR GUIDE

The Model N 1810DA consists mainly of three sections: the pushing lever section, magazine section, and output section.

1. Precautions on disassembly and reassembly

[Bold] numbers in the description below correspond to the item numbers in the parts list and exploded assembly diagram for the Model N 1810DA.

WARNING: • Ensure that the driver blade (plunger) is lowered to the bottom dead point in the Maintenance Mode according to the Technical Data for the Models N 1812DA and N 1810DA before disassembly.

• Remove the battery and all remaining staples from the main body before starting repair or maintenance work. Because the tool is cordless, inadvertently activating the switch with the battery left in the main body will start the motor rotating unexpectedly, and could cause serious injury.

Disassembly and reassembly of the pushing lever section

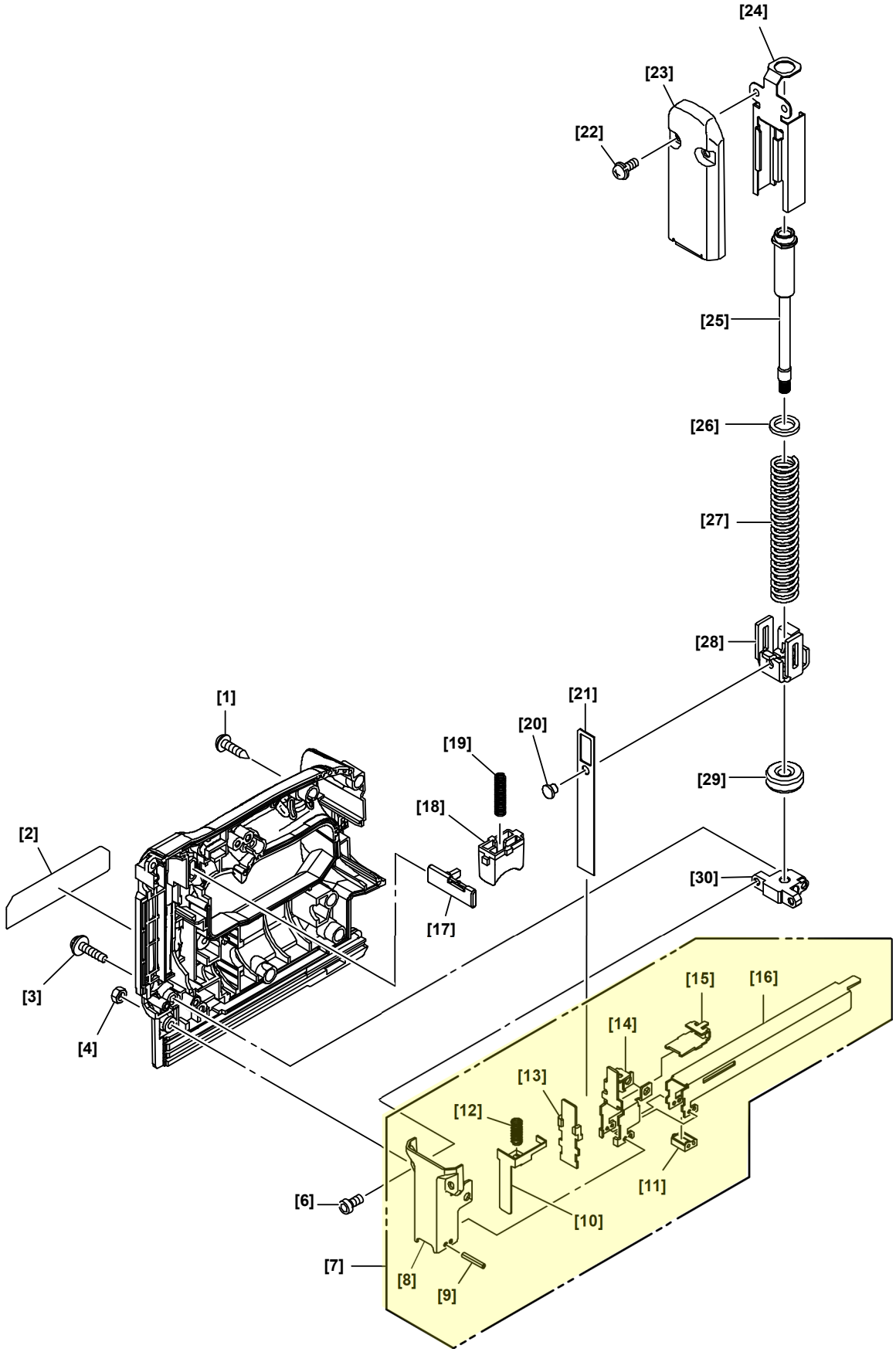
<Tools required>

• Phillips-head screwdriver

• Hex. bar wrench

• Roll pin puller 2 mm in diameter

• Disassembly and reassembly of the pushing lever section



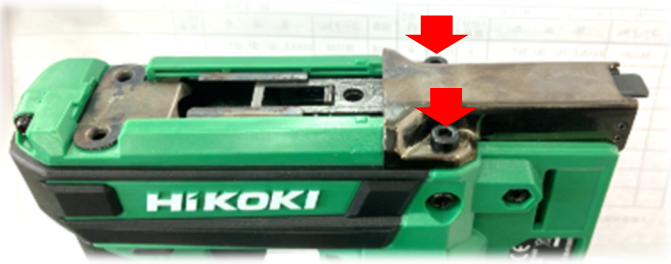
1. Disassembly (Following pictures show the Model N 1812DA.)

(1) Remove the two Machine Screws (W/Sp. Washer) M4 x 6 (Black) **[22]**.

(2) Remove Upper Cover (B) **[23]**.

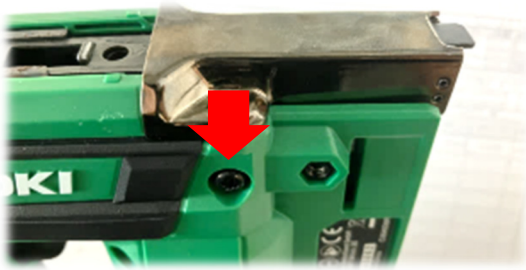
(3) Remove the Pin **[20]**.

(4) Remove the two Hex. Socket Bolts M4 x 6 **[6]**.

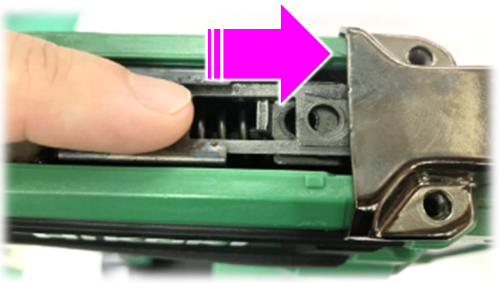


(5) Remove the Machine Screw (W/Washers) M4 x 14 (Black) **[3]**.

(6) Loosen the Machine Screw (W/Washers) M4 x 14 (Black) **[3]** on the nameplate side for ease of removal of the Muzzle Ass'y **[7]**.

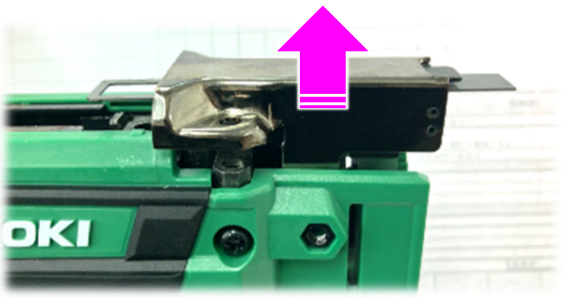


(7) Slide Driver Blade (B) **[21]** toward the pushing lever section as shown in the picture.



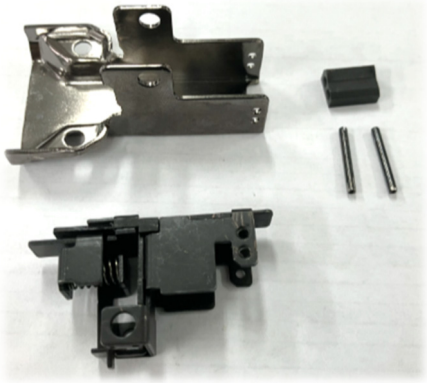
This picture shows the status after sliding Driver Blade (B) **[21]**.

(8) Pull up the Muzzle Ass'y **[7]**.
NOTE: If the driver blade is not lowered to the bottom dead point in the Maintenance Mode before disassembly, the Muzzle Ass'y [7] cannot be pulled up.



(9) Remove the Roll Pin D2 x 18 **[9]** from the tip of the Muzzle Ass'y **[7]**.
NOTE: It is a little difficult to remove thin and long Roll Pin D2 x 18 [9].

(10) Remove Muzzle Piece (B) **[11]**, Blade Holder (A) **[14]**, Blade Holder (F) **[13]**, Blade Holder (C) **[15]**, Pushing Lever **[10]**, and Spring (P) **[12]**.
NOTE: Be careful that Spring (P) [12] may pop up at the time of removal.



2. Reassembly

Reverse the disassembly procedure to reassemble. Note the following points.

(1) Align the holes on Upper Cover (B) **[23]**, Blade Holder (A) **[14]**, and Muzzle Piece (B) **[11]** with each other when press-fitting the Roll Pin D2 x 18 **[9]**.

(2) Check that the Pushing Lever **[10]** slides smoothly after reassembling the pushing lever section.

(3) Tighten the two Hex. Socket Bolts M4 x 6 **[6]** first, and then mount Upper Cover (B) **[23]** when mounting the Muzzle Ass'y **[7]**.
NOTE: If not reassembled in this order, staple head lift or dry firing may occur.

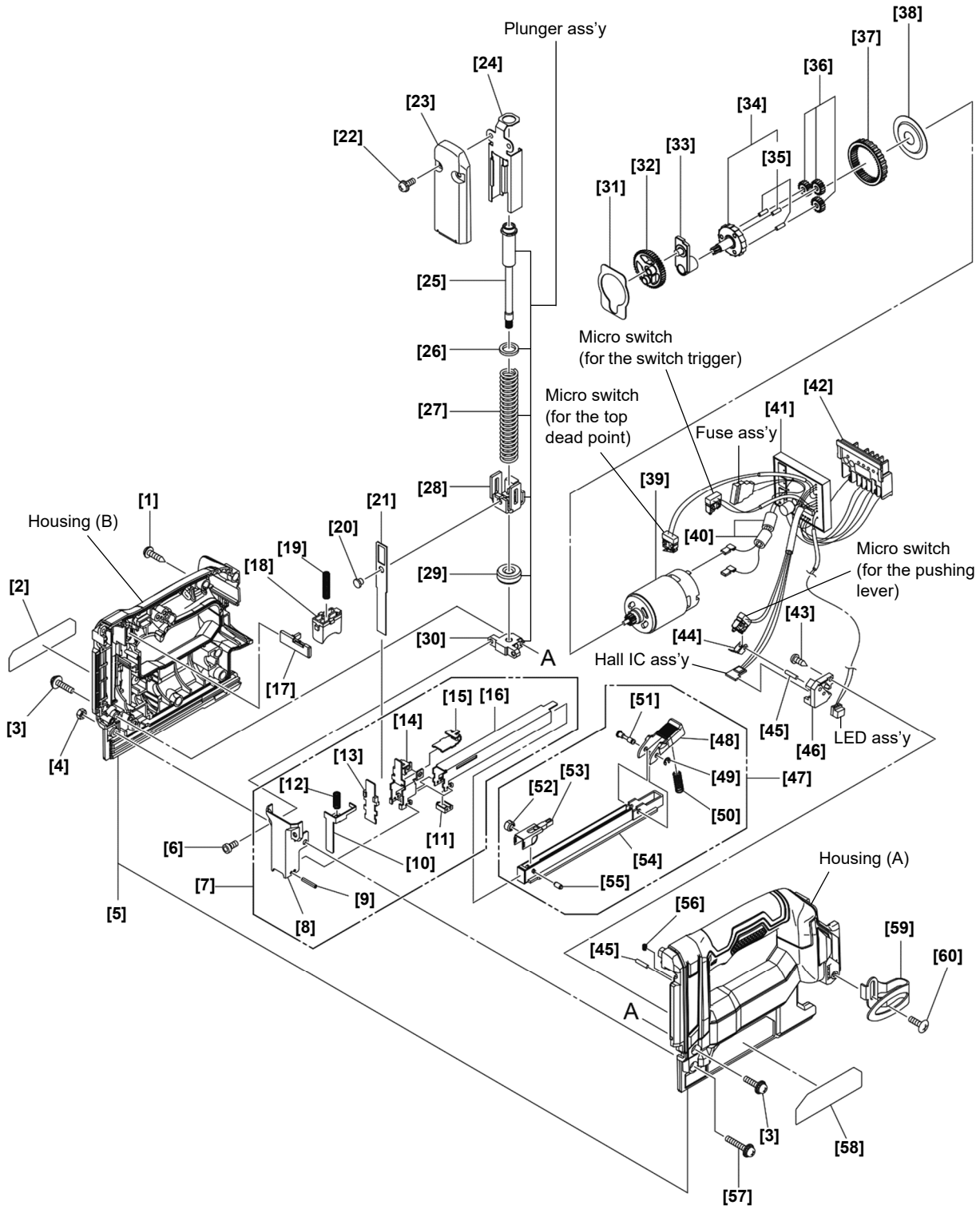
Disassembly and reassembly of the output section

<Tools required>

• Phillips-head screwdriver

• Adjustable wrench

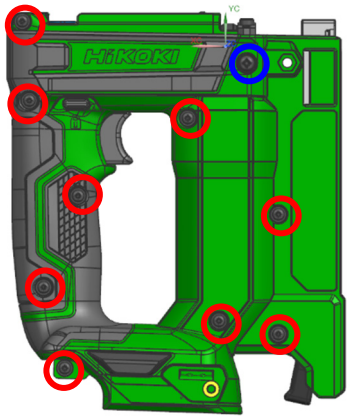
• Disassembly and reassembly of housing (A).(B) set and power ass'y



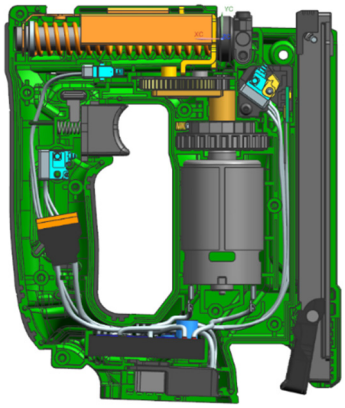
1. Disassembly

• Disassembly of housing (A).(B) set

(1) Remove the nine Tapping Screws (W/Flange) D3 x 16 (Black) **[1]** and one Machine Screw (W/Washers) M4 x 14 (Black) **[3]**.

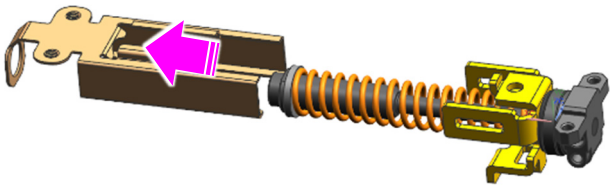


(2) Remove housing (B). Then, all units such as the power ass'y, power supply unit, and gear unit can be removed.



• Disassembly of the power ass'y

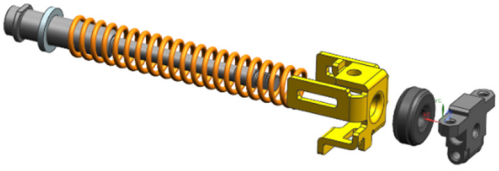
(1) Remove the plunger ass'y from the Plunger Guide **[24]**.



(2) Fix Guide Bar Holder (A) **[30]** at the tip of the plunger ass'y with a vise. Turn the width-across-flats portion at the rear end of the plunger ass'y counterclockwise with an adjustable wrench.

(3) Remove Plunger Damper (A) **[29]**, Plunger **[28]**, Main Spring **[27]**, Spring Washer **[26]**, and Guide Bar **[25]**.

NOTE: Be careful that these parts may pop out by the force of the spring if Guide Bar Holder (A) [30] is loosened completely.



2. Reassembly

• Reassembly of the power ass'y

Reverse the disassembly procedure to reassemble. Note the following points.

(1) Apply grease (Attolub MS No. 2) to the following parts. See page 11.
- Both sides of Driver Blade (B) **[21]**: 0.1 g
- Inner wall of the Plunger Guide **[24]**: 0.5 g
- Sliding surfaces between the cam rollers and Plunger Guide **[24]**: 0.5 g
- Surfaces on the Plunger **[28]** where the Plunger Guide **[24]** and Gear **[32]** contact: 0.5 g
- All circumferences of the Guide Bar **[25]**: 0.2 g
- Surface on Plunger Damper (A) **[29]** where the Plunger **[28]** contacts: 0.1 g

(2) Tighten the width-across-flats portion of the Guide Bar **[25]** at 5.9 ± 1.5 N•m (60 ± 15 kgf•cm).

• Reassembly of housing (A).(B) set

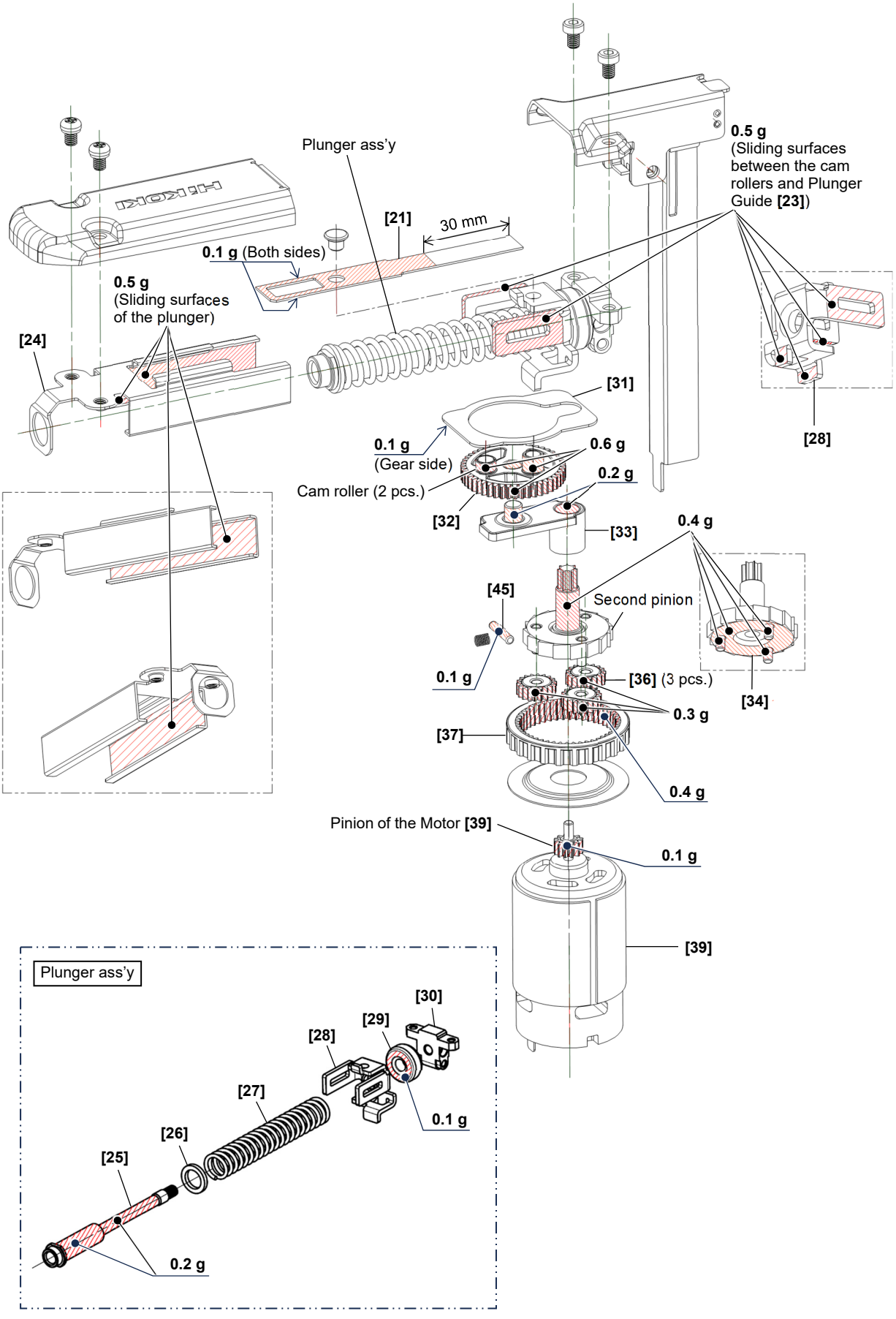
Follow the steps below to reassemble Housing (A).(B) Set **[5]**.

(1) Apply grease (Attolub MS No. 2) to the following parts. See page 11.
- Pinion of the Motor **[39]**: 0.1 g
- Inner circumference of the Ring Gear **[37]**: 0.4 g
- Outer circumference of the Idle Gear (3 pcs.) **[36]**: 0.3 g
- Outer circumference of the Second Pinion Ass'y **[34]**, three Needle Rollers **[35]**, and tooth surface: 0.4 g in total
- Needle Roller D3 x 13.8 **[45]**: 0.1 g
- Outer circumference of the pin and hole of the Gear Holder **[33]**: 0.2 g
- Tooth surface and pin of the Gear **[32]**: 0.6 g in total
- Gear Plate **[31]** (gear side): 0.1 g

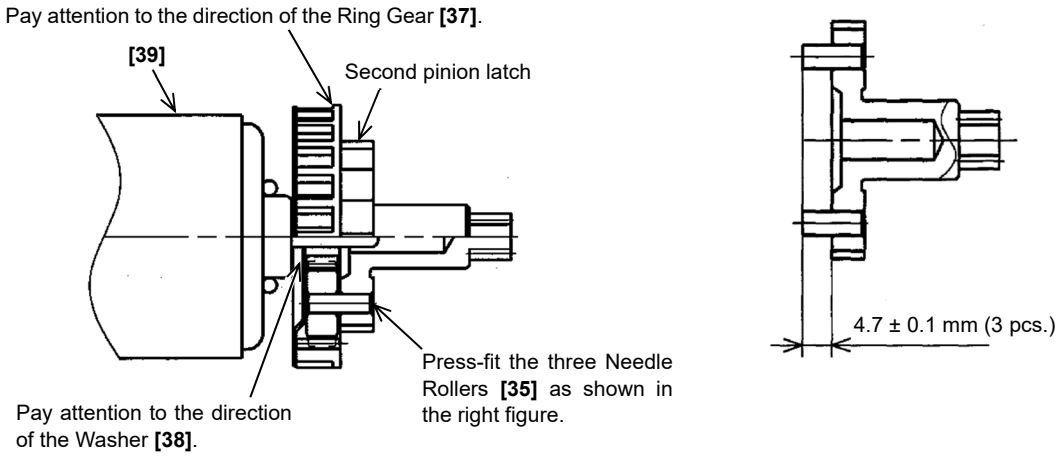
(2) Mount the Washer **[38]**, Ring Gear **[37]**, Idle Gear **[36]**, and Second Pinion Ass'y **[34]** to the Motor **[39]**, and then mount it to the housing so that the center of the hole on the Idle Gear **[36]** aligns with the center of the shaft of the Needle Roller **[35]** in the Second Pinion Ass'y **[34]**. See page 12.
NOTE: If not aligned, the second pinion cannot turn in the housing after reassembly.

(3) Be careful not to get the internal wires of the power supply unit caught between housings (A) and (B). See the wiring diagram on page 13.

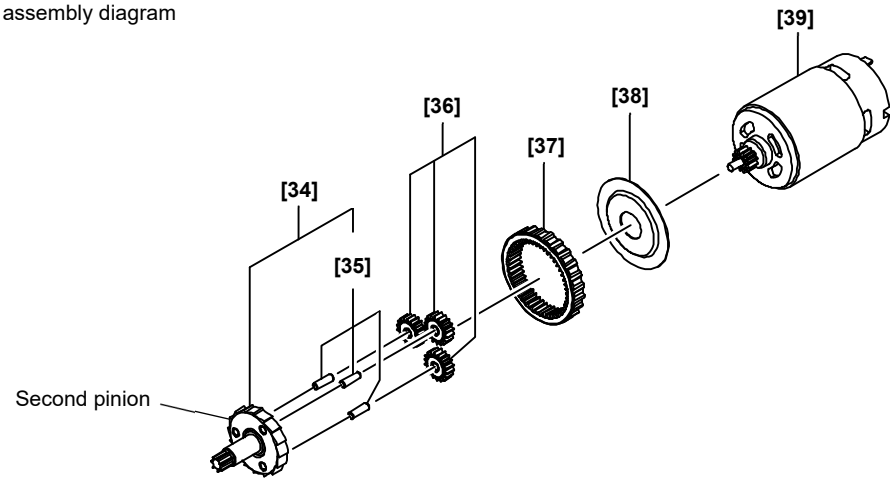
• Greasing area (Apply grease to the diagonally shaded areas shown below.)



• Reassembly of the planet gear mechanism

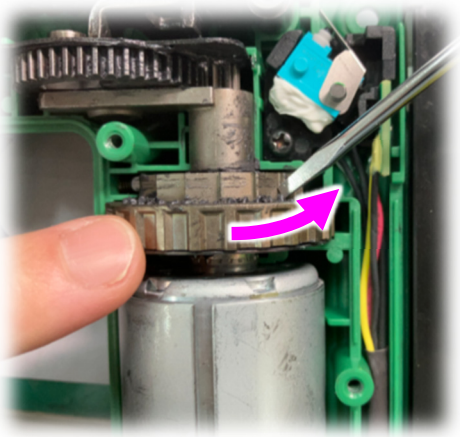


• Exploded assembly diagram



• Note for reassembly

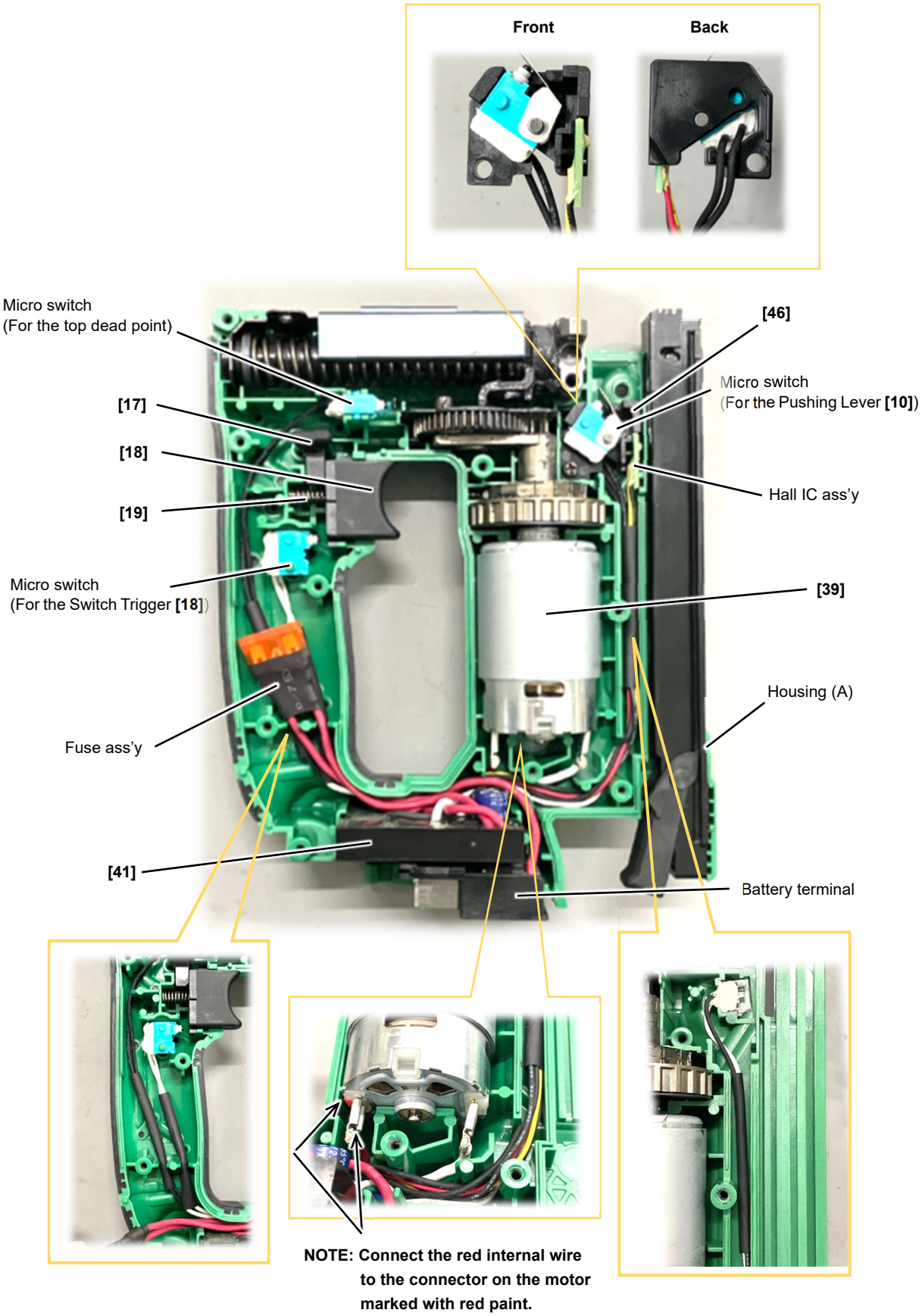
NOTE: Mount the Ring Gear [37] and second pinion to the Motor [39] aligning the centers with each other. If not aligned, the second pinion cannot turn in the housing after reassembly.



How to check

After mounting the motor ass'y to the housing, turn the second pinion by pushing the tooth of the second pinion with a flat-blade screwdriver while holding the Ring Gear **[37]** as shown in the picture.

• Wiring diagram (Following picture shows the Model N 1812DA.)

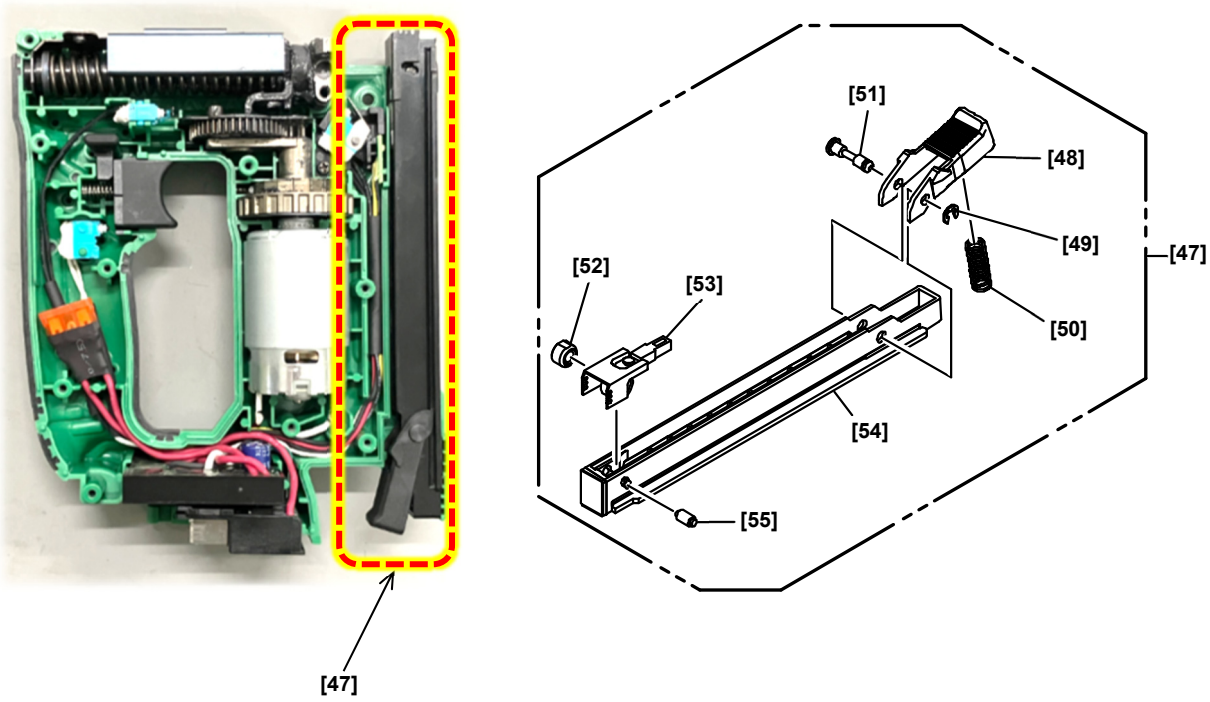


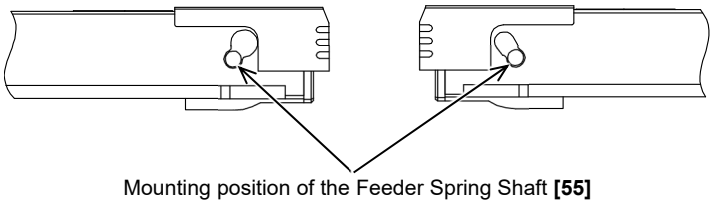
Disassembly and reassembly of the magazine section

<Tool required>

• Precision flat-blade screwdriver

• Disassembly and reassembly of the magazine section (Following picture shows the Model N 1812DA.)





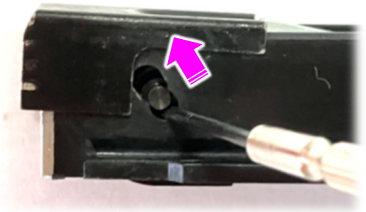
Mounting position of the Feeder Spring Shaft **[55]**

1. Disassembly

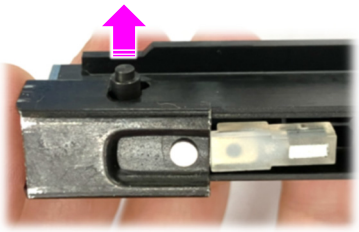
(1) Remove the Magazine Ass'y **[47]** from the main body.

NOTE: Handle the feeder spring in the Feeder [53] with care as it is very thin (0.13 mm thick) and easily deformed plastically.

(2) Move the Feeder Spring Shaft **[55]** in the arrow direction using a precision flat-blade screwdriver (both sides).

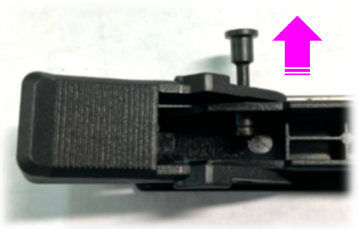


(3) Pull out the Feeder Spring Shaft **[55]** and then remove the Feeder **[53]**.



(4) Remove the Retaining Ring (E-type) for D3 Shaft **[49]** from Pin (M) **[51]**.

(5) Pull out Pin (M) **[51]**.



(6) Remove the Magazine Lever **[48]** and Magazine Lever Spring **[50]**.

2. Reassembly

Reverse the disassembly procedure to reassemble. Note the following points.

- Pay attention to the mounting position of the Feeder Spring Shaft **[55]**. After mounting, check that the Feeder **[53]** moves smoothly.

Type of lubricant

Please purchase the following grease as necessary.

Item	Registered part name	Net weight	Code No.
Attolub MS No. 2	Grease (Attolub MS No. 2) 500 g	500 g	309922

Tightening torque

Item No.	Part name	Tightening torque	
		N•m	kgf•cm
[1]	Tapping Screw (W/Flange) D3 x 16 (Black)	1.5 ± 0.4	15 ± 4
[3]	Machine Screw (W/Washers) M4 x 14 (Black)	1.8 ± 0.4	18 ± 4
[6]	Hex. Socket Bolt M4 x 6	5.0 ± 0.5	50 ± 5
[22]	Machine Screw (W/Sp. Washer) M4 x 6 (Black)	1.8 ± 0.4	18 ± 4
[43]	Tapping Screw D3 x 12 (Black)	1.3 ± 0.3	13 ± 3
[57]	Machine Screw (W/Washers) M4	1.8 ± 0.4	18 ± 4
[60]	Truss Hd. Screw M4 (Black)	1.8 ± 0.4	18 ± 4

Checking after reassembly

Before checking the following, slide open the magazine base and perform dry firing two or three times without loading staples.

(1) Operational check of the pushing lever
- Check that the Pushing Lever **[10]** works smoothly.
- Check that the Pushing Lever **[10]** returns to the uppermost position reliably.

NOTE: The LED light may blink in the first and second operation after reassembly. However, it is not faulty. In such a case, remove the battery from the stapler and install it again to recover.

(2) Operational check of the LED light
- Install the battery and keep pressing the Pushing Lever **[10]** against a workpiece. Check that the LED light turns on and then turns off after about ten seconds.

(3) Operational check
- Pull the trigger without pressing the Pushing Lever **[10]** against a workpiece to check that the motor does not run.
- Check that staples can be loaded into the stapler smoothly.
- Check that HiKOKI's genuine staples (10 mm in width and length) can be driven without any problem.
- Check that the dry fire lockout mechanism works when about 8 staples are left in the magazine.

Connecting diagram

• Connecting diagram