Power Tools Service Manual

CONFIDENTIAL
Jun. 2023

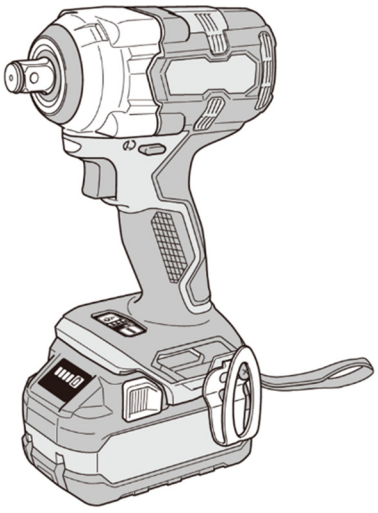
PRODUCT NAME

Cordless Impact Wrench

Models WR 36DH

WR 18DH

CONTENTS



WR 36DH

Koki Holdings Co., Ltd.

Overseas Sales Management Dept.

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TROUBLESHOOTING GUIDE

When troubleshooting, be sure to wipe off all dust, water, and other foreign matter from the internal parts, and then dry the parts adequately before conducting the following investigation.

Trouble	Cause	Check method	Action
(1) Motor does not run.	• Switch connector cable poorly inserted	• Check the insertion status of connector cable. (See "1. Mounting the wiring ass'y" on page 6.)	• Reinsert the connector cable.
	• Rotor ass'y magnet poorly adhered	• Check whether the rotor ass'y magnet is inserted to the same level as the rotor core edge.	• Replace the rotor ass'y.
	• DC-speed control switch breakdown	• Check the metal terminals (pin) in the switch connectors for corrosion.	• Replace the DC-speed control switch.
	• Wiring ass'y breakdown	• Check the board surface for any urethane peelings, device damage, and drop dents.	• Replace the wiring ass'y.
	• Fuse breakdown (WR 36DH only)	• Check for continuity between the terminals of the fuse. • Check for cracks or wear on the battery mount of the housing plate set.	• Replace the wiring ass'y. • Replace the housing plate set.
(2) Rotor does not switch direction.	• Switch connector cable poorly inserted	• Check the insertion status of connector cable. (See "1. Mounting the wiring ass'y" on page 6.)	• Reinsert the connector cable.
	• Faulty switch connectors	• Check the conductor (i.e., copper foil portion of connector connections) of connector cable. • Check the metal terminals (pin) in the switch connectors for corrosion.	• Replace the DC-speed control switch and the wiring ass'y.
	• Imperfect contact in the switch	• If the connector cable of the wiring ass'y and the switch connector are trouble-free	• Replace the DC-speed control switch.
(3) Rotating speed does not rise (due to lack of gear transmis-sion).	• Wiring ass'y breakdown	• Check the board surface for any urethane peelings, device damage, and drop dents.	• Replace the wiring ass'y.
	• Switch connector cable poorly inserted	• Check the insertion status of connector cable. (See "1. Mounting the wiring ass'y" on page 6.)	• Reinsert the connector cable.
	• Faulty switch connectors	• Check the conductor (i.e., copper foil portion of connector connections) of connector cable. • Check the metal terminals (pin) in the switch connectors for corrosion.	• Replace the DC-speed control switch and the wiring ass'y.
	• Imperfect contact in the switch	• If the connector cable of the wiring ass'y and the switch connector are trouble-free	• Replace the DC-speed control switch.
(4) Tightening mode cannot be switched.	• Wiring ass'y breakdown	• Use fully charged battery and operate the tightening mode selector switch to check whether the battery operates normally.	• Replace the wiring ass'y.
(5) LED light does not go on.	• Wiring ass'y breakdown	• Use fully charged battery and operate the light switch to check whether the LED light goes on.	• Replace the wiring ass'y.

REPAIR GUIDE

WARNING: Always remove the battery 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.

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 WR 36DH, and **<Bold>** numbers to those for the Model WR 18DH.
Some abbreviated part names are used in this manual. See the parts list for the full names.

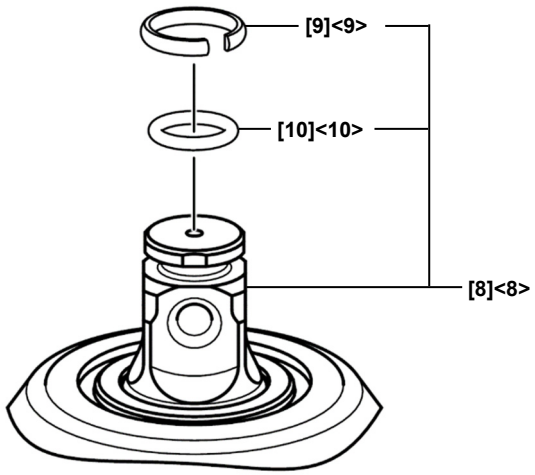
Disassembly

1. Removal of friction ring (B)

Remove Friction Ring (B) **[9]<9>** first and then remove the O-ring (P-8) **[10]<10>** with a small flat-blade screwdriver.

NOTE: Disassembly can be done without removing Friction Ring (B) [9]<9>. Perform the above step only when Friction Ring (B) [9]<9> needs replacement. Do not reuse the removed Friction Ring (B) [9]<9> and O-ring (P-8) [10]<10>. Removed Friction Ring (B) [9]<9> and O-ring (P-8) [10]<10> may be deformed or scratched, and the socket cannot be attached or come off if reused.

• Removal of friction ring (B)



2. Removal of the exterior parts

(1) Remove the Front Cap **[1]<1>** by inserting a small flat-blade screwdriver between the Front Cap **[1]<1>** and the Protector **[2]<2>**. After removing the Front Cap **[1]<1>**, remove the Protector **[2]<2>**.
(2) Remove the Truss Hd. Screw M4 (Black) **[31]<30>** and the Hook **[32]<31>**.
The Hook **[32]<31>** need not be removed, but is removed here to facilitate disassembly work.

3. Removal of the hammer case

(1) Remove the four Seal Lock Hex. Socket Hd. Bolts M5 x 25 **[3]<3>**.
(2) Remove the Hammer Case **[4]<4>**. Then remove the Anvil Ass'y **[8]<8>** and the hammer assembly.
(3) Remove the Packing **[5]<5>**. Then remove Washer (F) **[7]<7>** and Thrust Damper **[6]<6>**.

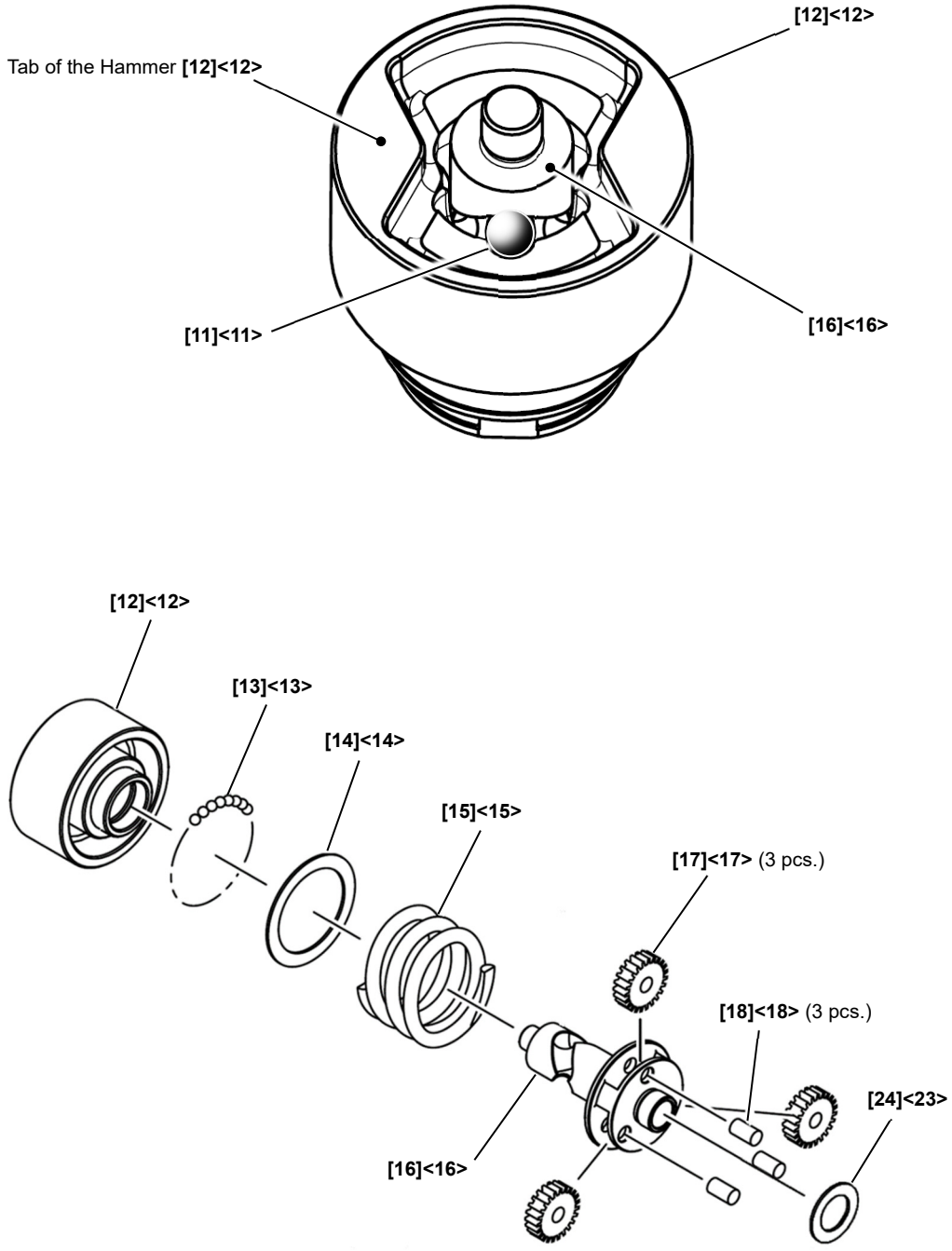
4. Disassembly of the hammer assembly

(1) Remove Washer (E) **[24]<23>**, three Needle Rollers **[18]<18>**, and Idle Gear Set (3 pcs.) **[17]<17>** from the hammer assembly.

(2) Supporting the end face of the Spindle **[16]<16>**, push down the tabs of the Hammer **[12]<12>** with a hand press or similar tool to compress the Hammer Spring **[15]<15>**. In this state, use a small flat-blade screwdriver or similar tool to draw out two Steel Balls D6.35 **[11]<11>** from inside the cam groove in the Spindle **[16]<16>** and the Hammer **[12]<12>**.

(3) Release the hand press and put the Hammer **[12]<12>** on a workbench. Pull out the Spindle **[16]<16>** from the Hammer **[12]<12>** to remove the Hammer Spring **[15]<15>**, Washer (J) **[14]<14>**, and thirty Steel Balls D 3.175 **[13]<13>**.

• Disassembly of the hammer assembly



5. Disassembly of the housing plate set

(1) Remove the nine Tapping Screws (W/Flange) D4 x 20 **[19]<19>** to remove the Housing Plate Set **[30]<29>**.

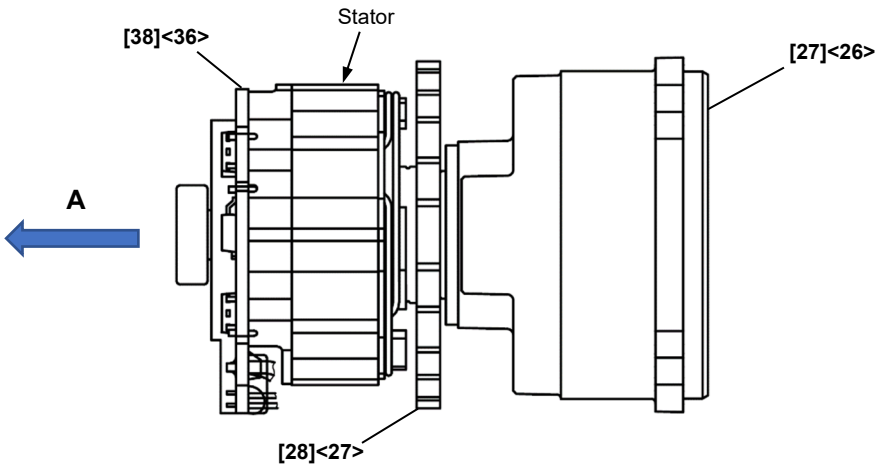
(2) Remove housing (B) of the Housing Plate Set **[30]<29>** to remove the Strap (Black) **[36]<34>**.

(3) Remove the Inner Cover **[27]<26>**, Rotor Pinion Ass'y **[28]<27>**, Wiring Ass'y **[38]<36>**, and DC-Speed Control Switch **[40]<38>** together as one unit. Remove the Pushing Button **[39]<37>** and Felt **[37]<35>**.

6. Separation of the wiring ass'y from the rotor pinion ass'y

The Rotor Pinion Ass'y **[28]<27>** has strong magnetic force. Securely hold the Inner Cover **[27]<26>** and pull out the stator of the Wiring Ass'y **[38]<36>** in the direction "A."

• Separation of the wiring ass'y from the rotor pinion ass'y



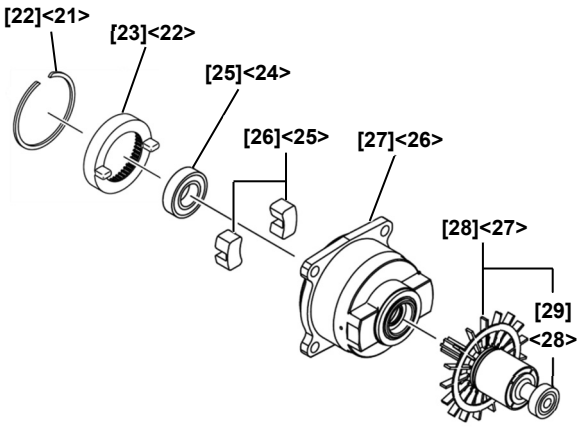
7. Removal of the rotor pinion ass'y and inner cover

(1) Insert a small flat-blade screwdriver into the groove on the inner wall of the Inner Cover **[27]<26>** and remove the Retaining Ring D47 **[22]<21>**. After removing the Retaining Ring D47 **[22]<21>**, remove the Ring Gear **[23]<22>** and Damper (B) **[26]<25>**.

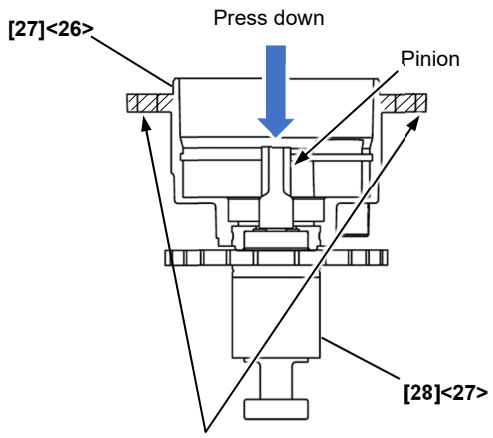
(2) Support the Inner Cover **[27]<26>** so as to prevent its contact with the fan of the Rotor Pinion Ass'y **[28]<27>**. Then push the pinion tip of the Rotor Pinion Ass'y **[28]<27>** to detach it.

(3) Tap the Inner Cover **[27]<26>** lightly with a wooden hammer or similar tool to remove the Ball Bearing 6901VV-N **[25]<24>**.

• Removal of the rotor pinion ass'y and inner cover (1)



• Removal of the rotor pinion ass'y and inner cover (2)



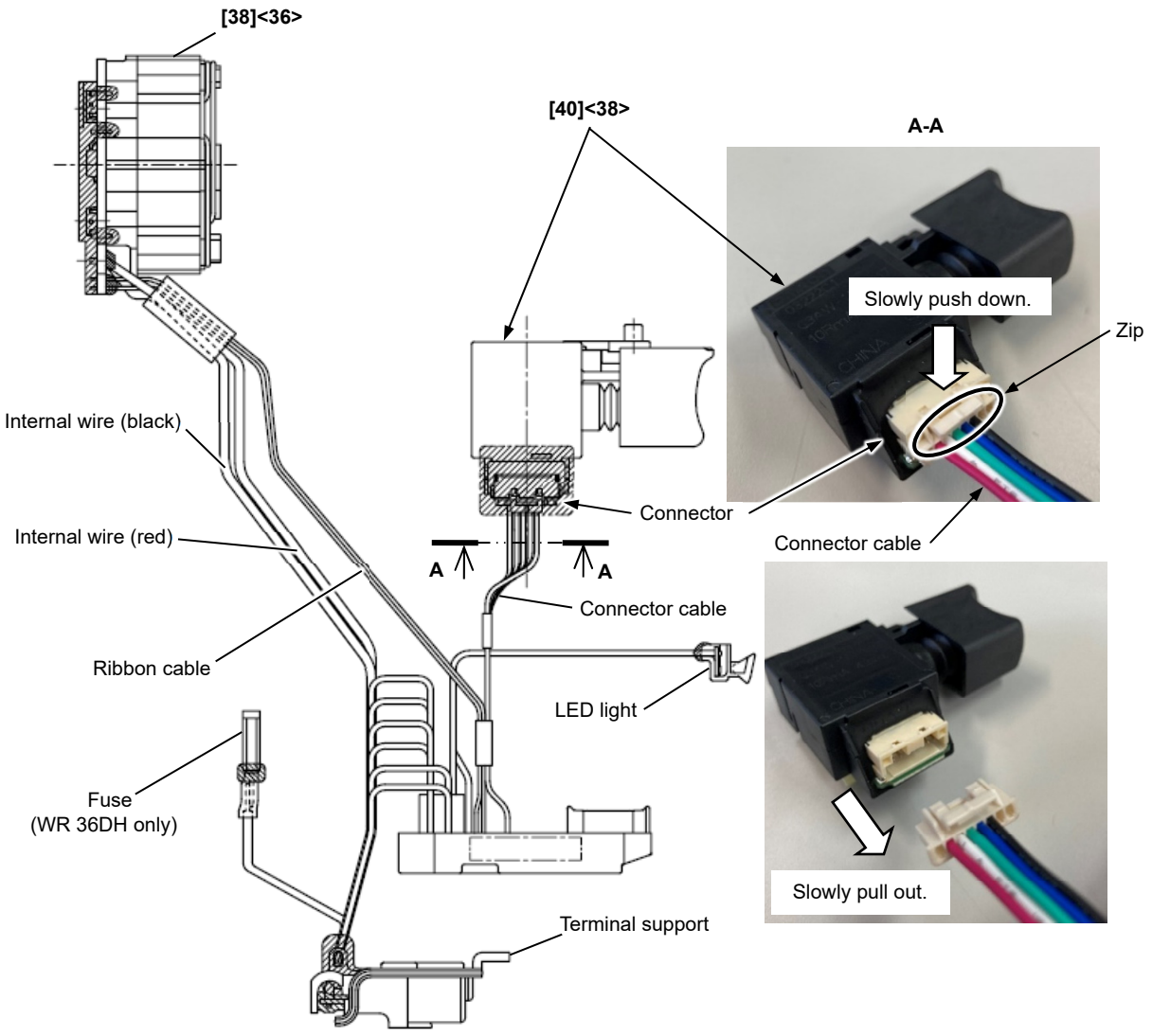
Support the Inner Cover **[27]<26>** here.

8. Removal of the wiring ass'y

Peel off silicone rubber from the connectors of the DC-Speed Control Switch **[40]<38>** with a flat-blade screwdriver or similar tool. Slowly push down the connector zip and then slowly pull out the connector cable of the Wiring Ass'y **[38]<36>**.

NOTE: When peeling off silicone rubber, be careful not to damage the connector of the connector cable.

• Removal of the wiring ass'y



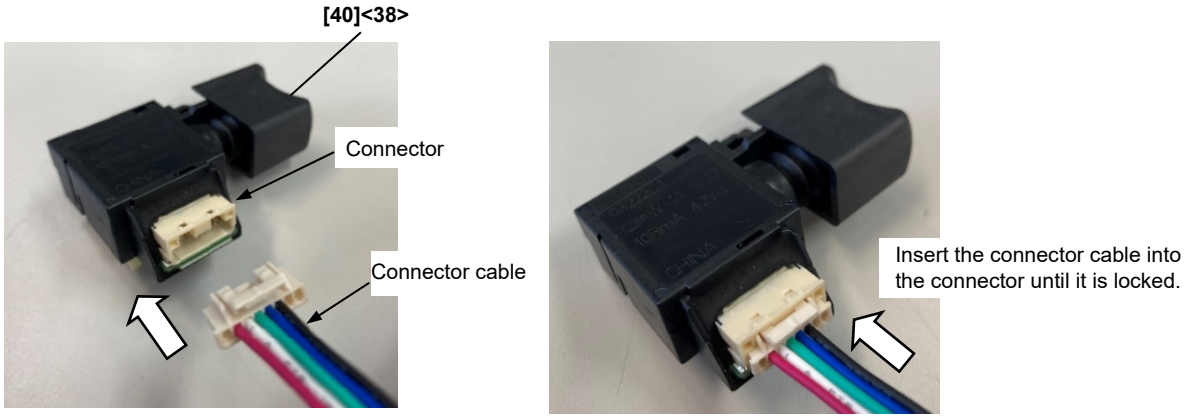
Reassembly

Reassembly can be conducted by reversing the disassembly procedure, but note the following.

1. Mounting the wiring ass'y

(1) When connecting the DC-Speed Control Switch **[40]<38>**, insert the connector cable into the connector ("A" portion in the figure on the next page) securely until it is locked.

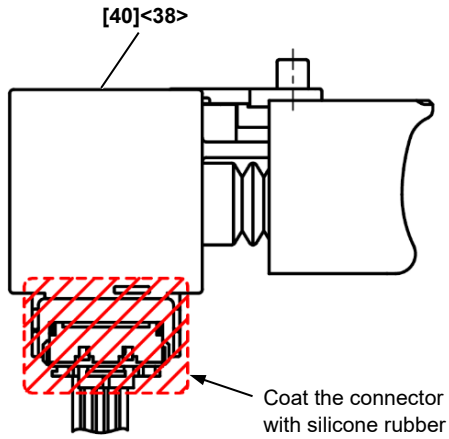
• Inserting the connector cable



(2) After inserting the connector cable into the connector, coat the connector ("B" portion in the figure on the next page) with silicone rubber (ThreeBond 1211) entirely.

NOTE: Do not carry or pull on the connector cable.

• Coating the connector with silicone rubber



(3) Put the ribbon cable, connector cable, internal wires of the Wiring Ass'y **[38]<36>**, and fuse (WR 36DH only) between the housing ribs as shown in the figures on page 8.

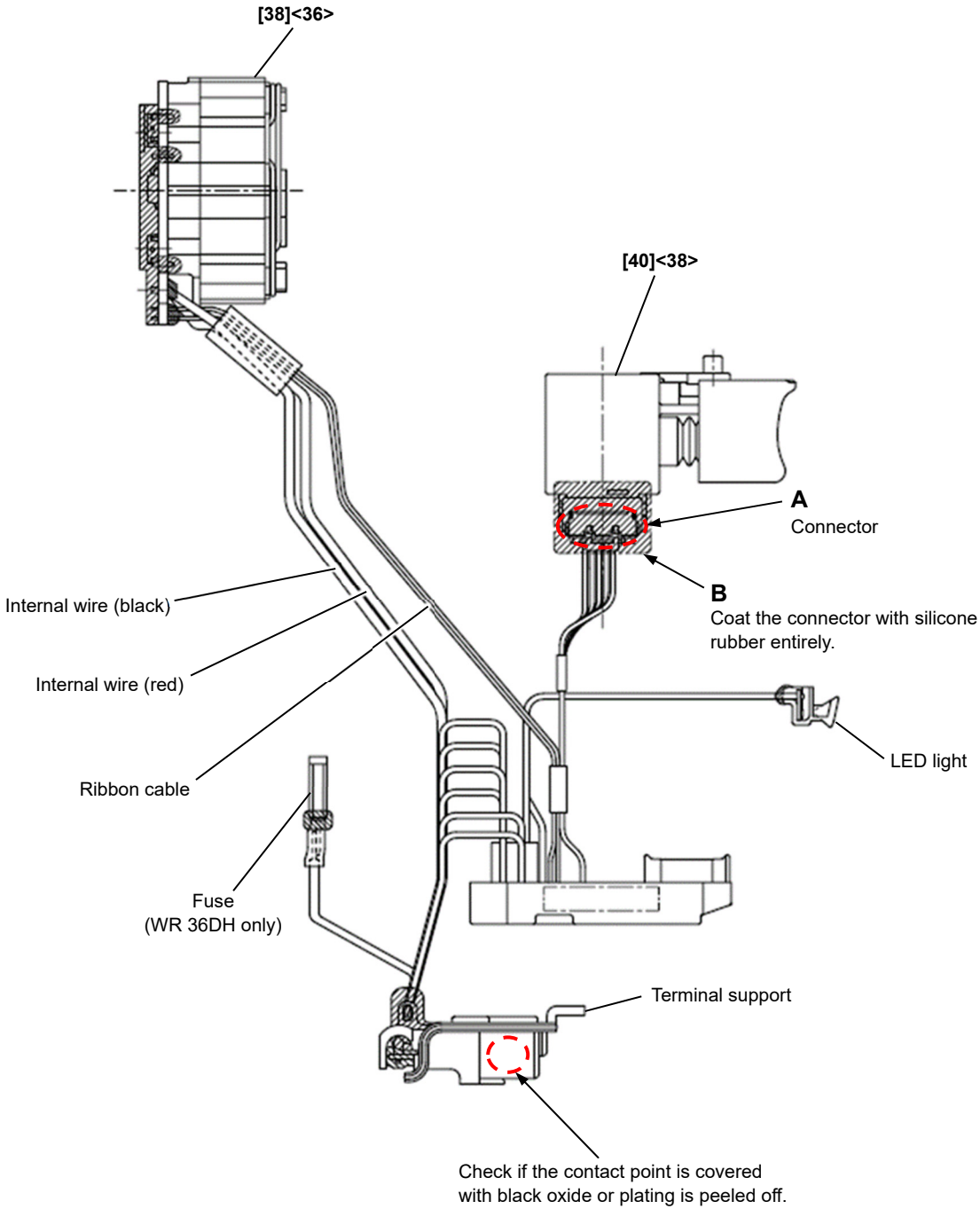
NOTE: Support (D) is provided for the Model WR 18DH instead of the fuse to eliminate the gap.

(4) Insert the protrusion of the direction selector lever at the top of the DC-Speed Control Switch **[40]<38>** into the hole on the Pushing Button **[39]<37>**. Then mount it to housing (A).

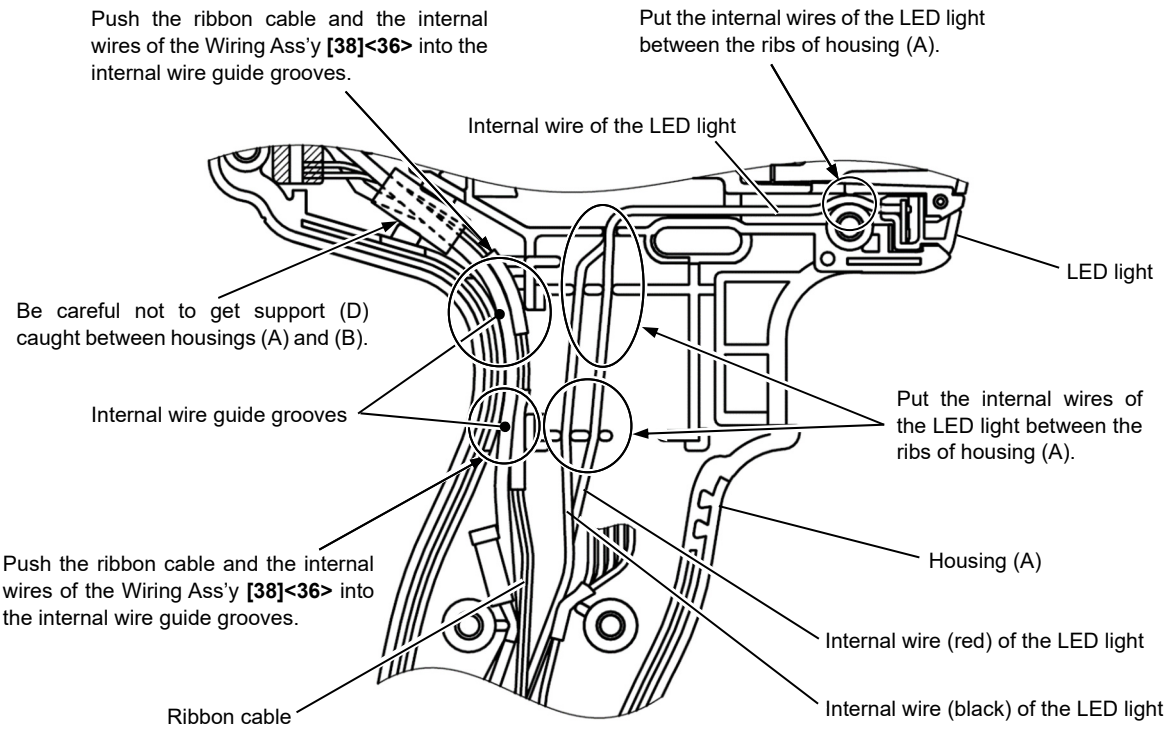
(5) Push the internal wire connected to the LED light firmly into the internal wire guide groove of housing (A). Be sure to prevent the wires from getting caught on anything.

NOTE: If the terminal support in contact with the battery is covered with black oxide or plating on the terminal support is peeled off, the contact point may be hot, causing the battery and the tool to malfunction. In such a case, replace the Wiring Ass'y [38]<36> with a new one.

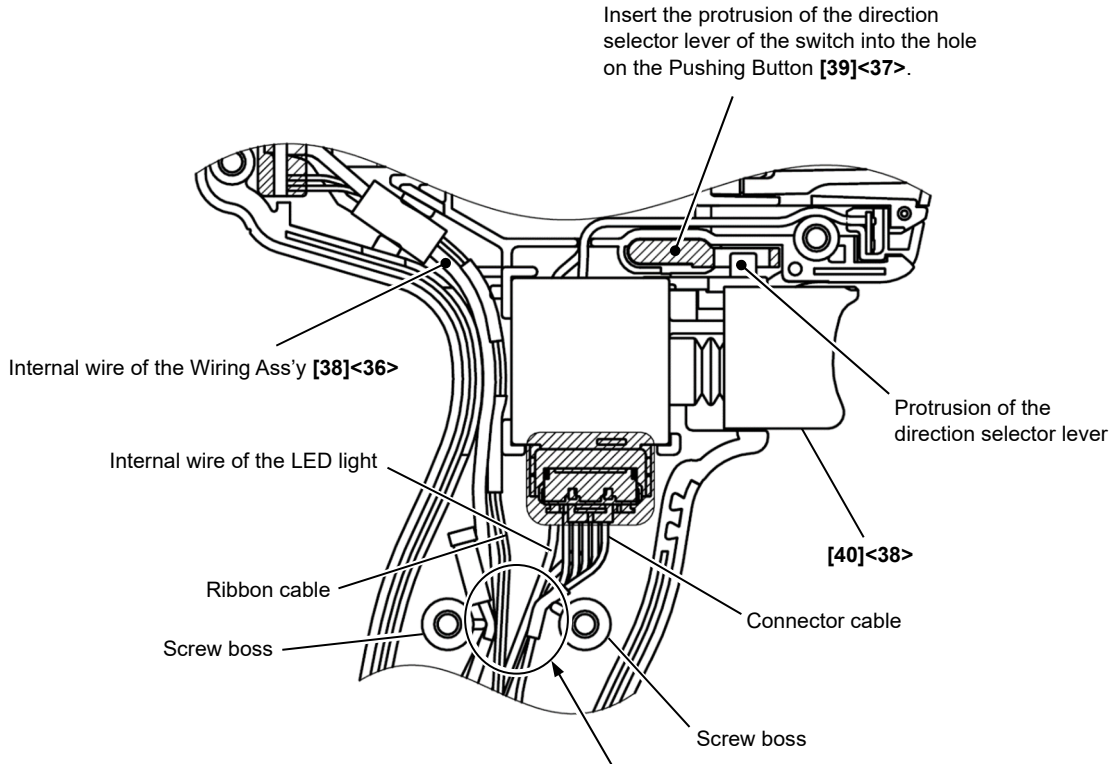
• Mounting the wiring ass'y (1)



• Mounting the wiring ass'y (2)



• Mounting the wiring ass'y (3)



2. Mounting the rotor pinion ass'y and inner cover

(1) Press-fit the Ball Bearing 6901VV-N **[25]<24>** into the Inner Cover **[27]<26>**. Insert Damper (B) **[26]<25>** and Ring Gear **[23]<22>** aligning with the Inner Cover **[27]<26>**.

(2) Press-fit the Rotor Pinion Ass'y **[28]<27>** into the Inner Cover **[27]<26>** as far as it will go. After press-fitting, check that the Rotor Pinion Ass'y **[28]<27>** turns smoothly.

NOTE: Do not tilt the Rotor Pinion Ass'y [28]<27> when press-fitting into the Inner Cover [27]<26>.

3. Reassembly of the housing plate set

(1) Mount the Felt **[37]<35>** to housing (A) as shown in the figure below.

(2) Integrate the Inner Cover **[27]<26>**, Rotor Pinion Ass'y **[28]<27>**, and Wiring Ass'y **[38]<36>** (including the DC-Speed Control Switch **[40]<38>**) as one unit, and then mount the unit to housing (A).

NOTE: • Check whether the Wiring Ass'y [38]<36> and the Inner Cover [27]<26> are correctly inserted in the housing.

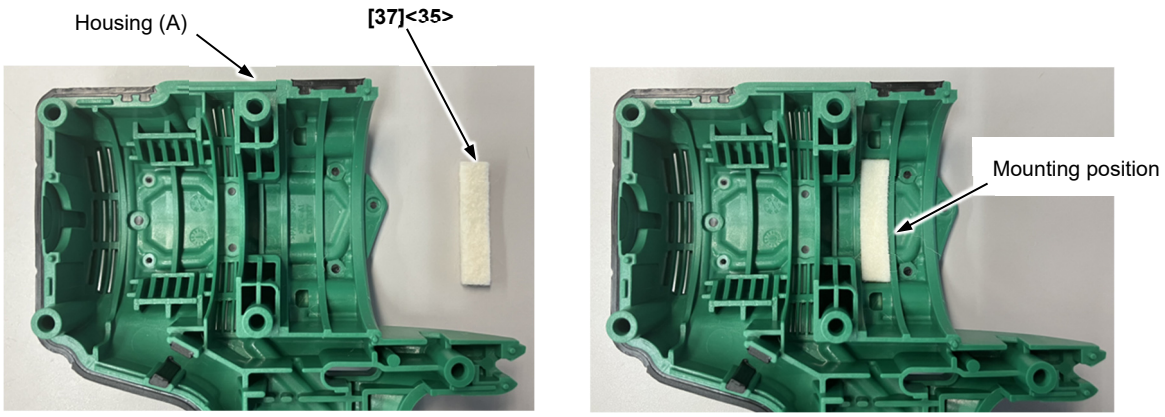
• If the Inner Cover [27]<26> does not fit in the specified groove of the housing, or if the Wiring Ass'y [38]<36> does not fit in the specified groove of the housing, reassemble it.

(3) Mount the Strap (Black) **[36]<34>** to boss (A) on housing (A) as shown in the figure on the next page. Mount housing (B) to housing (A) and tighten the nine Tapping Screws (W/Flange) D4 x 20 **[19]<19>**.

(4) Apply grease (NIPPECO SEP-3A) to the outside of the two Rear Bumpers **[35]<33>** entirely and then mount them to the Housing Plate Set **[30]<29>**.

(5) Degrease the Housing Plate Set **[30]<29>** where Dampers (A) **[34]<32>** are to be attached. Then, attach Dampers (A) **[34]<32>** to the Housing Plate Set **[30]<29>**.

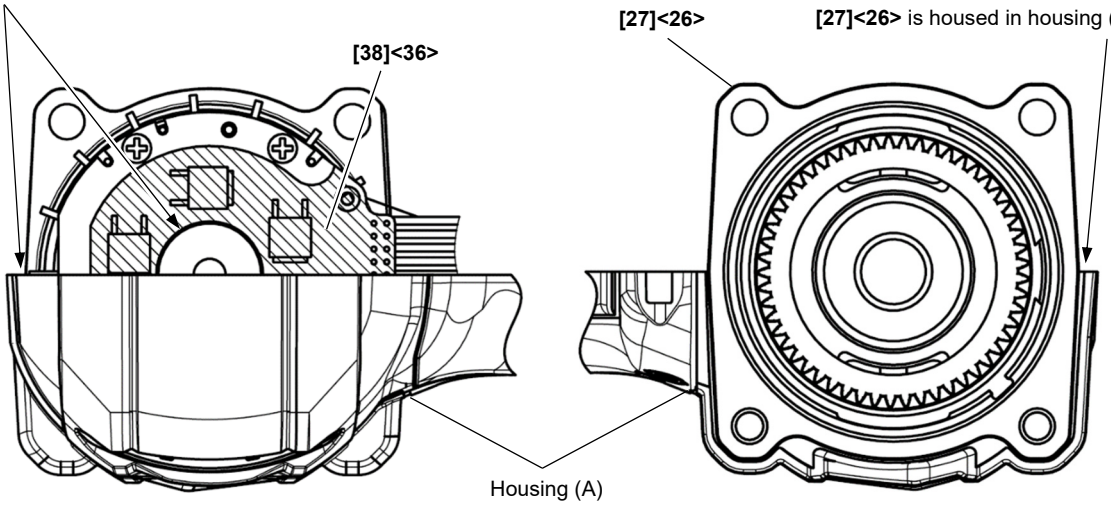
• Reassembly of the housing plate set (1)

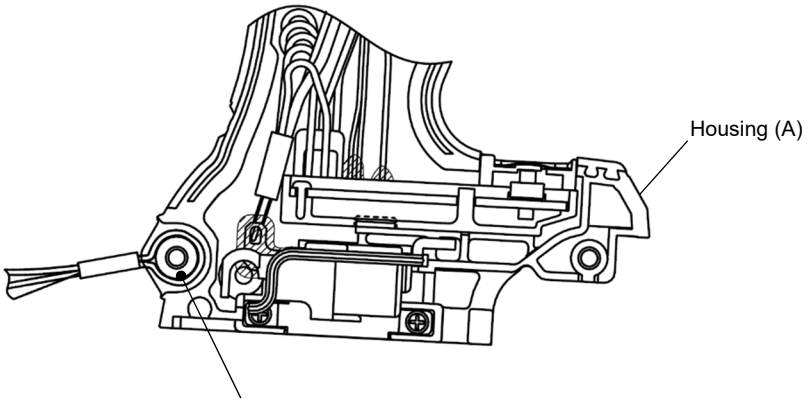


• Reassembly of the housing plate set (2)

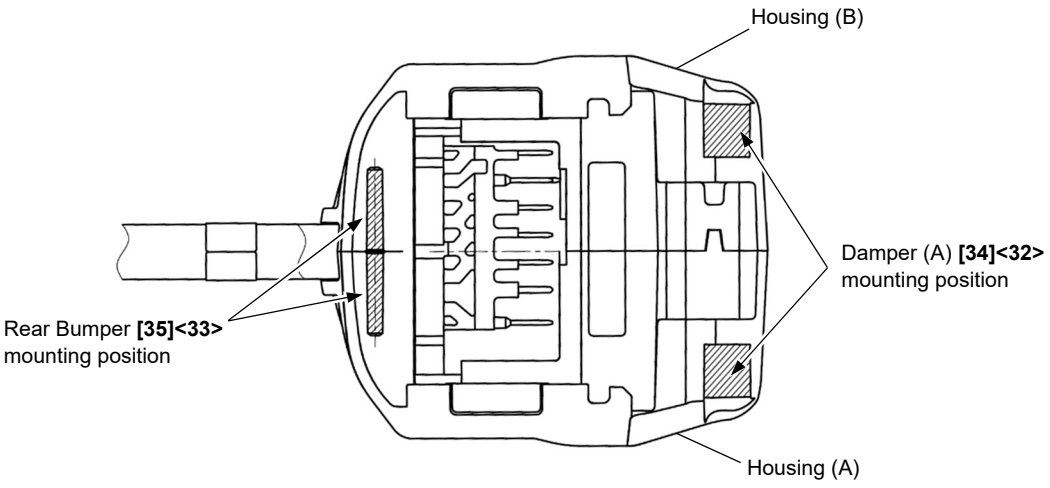
Check that half the Wiring Ass'y **[38]<36>** and half the Rotor Pinion Ass'y **[28]<27>** are housed in housing (A).

Check that half the Inner Cover **[27]<26>** is housed in housing (A).





• Reassembly of the housing plate set (3)



4. Reassembly of the hammer assembly

(1) With thirty Steel Balls D3.175 **[13]<13>** put in the steel ball groove on the Hammer **[12]<12>**, mount Washer (J) **[14]<14>**, Hammer Spring **[15]<15>**, and Spindle **[16]<16>** to the Hammer **[12]<12>** in that order.

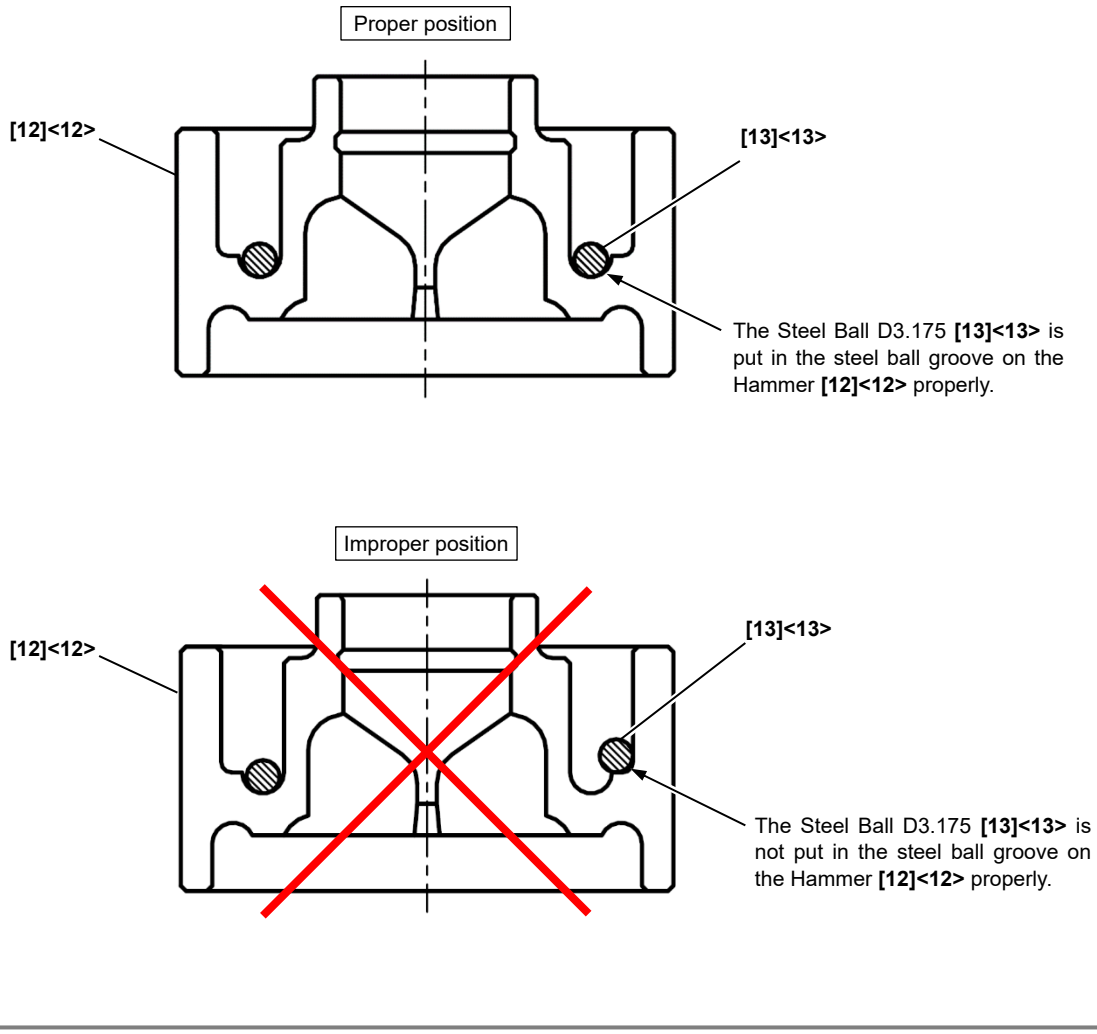
NOTE: Put thirty Steel Balls D3.175 [13]<13> in the steel ball groove on the Hammer [12]<12> properly.

(2) Align the top of the cam groove on the Spindle **[16]<16>** with the cam groove on the Hammer **[12]<12>**. Push down the end tabs of the Hammer **[12]<12>** with a hand press or similar tool and compress the Hammer Spring **[15]<15>** until it contacts the Spindle **[16]<16>** and hold it there.

(3) Insert one Steel Ball D6.35 **[11]<11>** into the cam groove, then insert another Steel Ball D6.35 **[11]<11>** into the other groove. Check that the two Steel Balls D6.35 **[11]<11>** are in each groove, and then loosen the hand press.

(4) Mount the Idle Gear Set (3 pcs.) **[17]<17>**, three Needle Rollers **[18]<18>**, and Washer (E) **[24]<23>** to the Spindle **[16]<16>**.

• Reassembly of the hammer assembly



5. Mounting the hammer case

(1) Mount the Packing **[5]<5>** to the Inner Cover **[27]<26>**.

NOTE: Align the contour of the Packing [5]<5> with the contour of the Inner Cover [27]<26>.

(2) Mount the hammer assembly to the Inner Cover **[27]<26>** paying attention to the engagement of the Idle Gear Set (3 pcs.) **[17]<17>**, Ring Gear **[23]<22>**, and the pinion of the Rotor Pinion Ass'y **[28]<27>**.

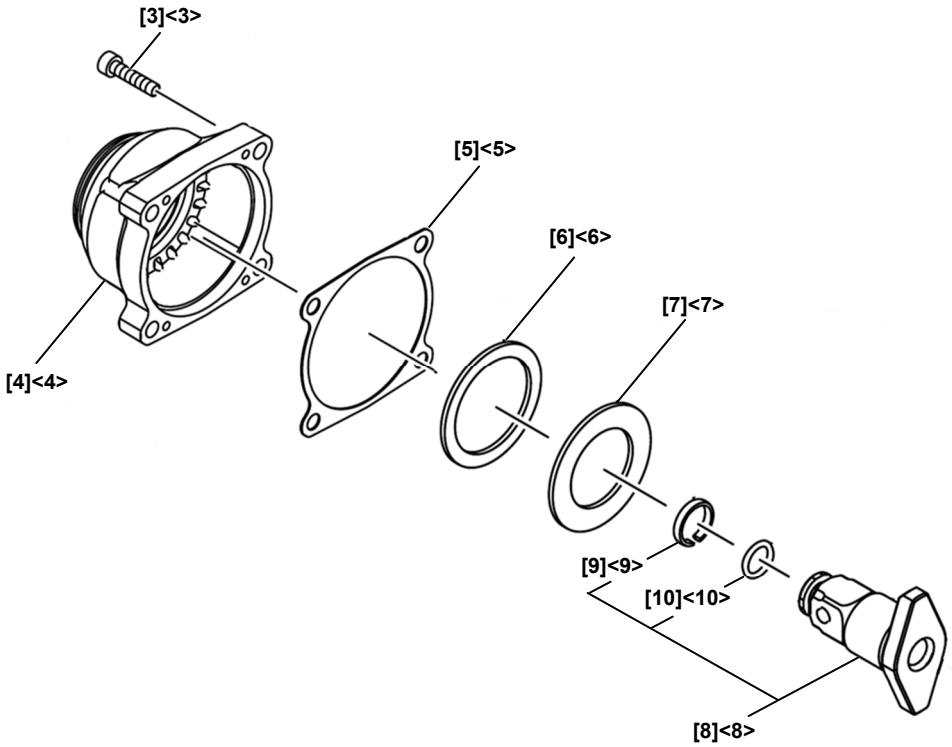
NOTE: The gears do not mesh and the hammer assembly cannot be positioned correctly if the centers of the hammer assembly and the Inner Cover [27]<26> are misaligned.

(3) Mount the Anvil Ass'y **[8]<8>** to the tip of the Spindle **[16]<16>** of the hammer assembly. Check that the Thrust Damper **[6]<6>** and Washer (F) **[7]<7>** are mounted to the Hammer Case **[4]<4>** in the correct order. Then mount the hammer assembly into the Hammer Case **[4]<4>**.

(4) Secure the Hammer Case **[4]<4>** to the Housing Plate Set **[30]<29>** by tightening the four Seal Lock Hex. Socket Hd. Bolts M5 x 25 **[3]<3>** with the specified tightening torque. Then, retighten the four Seal Lock Hex. Socket Hd. Bolts M5 x 25 **[3]<3>** with the specified tightening torque.

NOTE: Do not reuse the Seal Lock Hex. Socket Hd. Bolts M5 x 25 [3]<3>. Be sure to replace the Seal Lock Hex. Socket Hd. Bolts M5 x 25 [3]<3> with new ones at reassembly.

• Mounting the hammer case



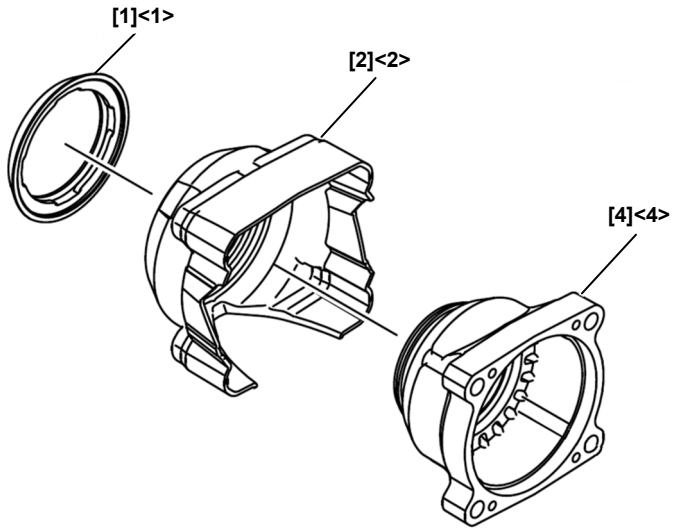
6. Mounting the exterior parts

(1) Mount the Front Cap **[1]<1>** and Protector **[2]<2>** to the Hammer Case **[4]<4>**.

(2) Insert the Hook **[32]<31>** into the groove on the side of the Housing Plate Set **[30]<29>**, and then secure it in place with the Truss Hd. Screw M4 (Black) **[31]<30>**.

NOTE: The Hook [32]<31> can be mounted on either side of the unit.

• Mounting the exterior parts



7. Mounting friction ring (B)

(1) Fit the O-ring (P-8) **[10]<10>** in the groove on the Anvil Ass'y **[8]<8>**. Using the ring inserters (1) and (2), fit Friction Ring (B) **[9]<9>** in the groove on the anvil.

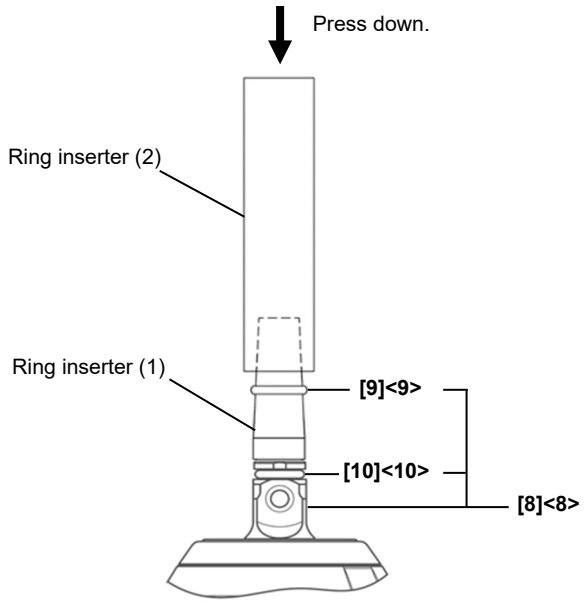
• Ring inserter (1): J-393 ring inserter (A) (Code No. 371221)

• Ring inserter (2): J-393 ring inserter (B) (Code No. 371222)

NOTE: Be sure to replace Friction Ring (B) [9]<9> and O-ring (P-8) [10]<10> with new ones. Removed friction ring and O-ring may be deformed or scratched, and the socket cannot be attached or come off if reused.

(2) After mounting Friction Ring (B) **[9]<9>**, attach and detach the socket several times to check that the socket is properly attached and it does not come off.

• Mounting the friction ring



Type of silicone rubber

Please purchase the following silicone rubber as necessary.

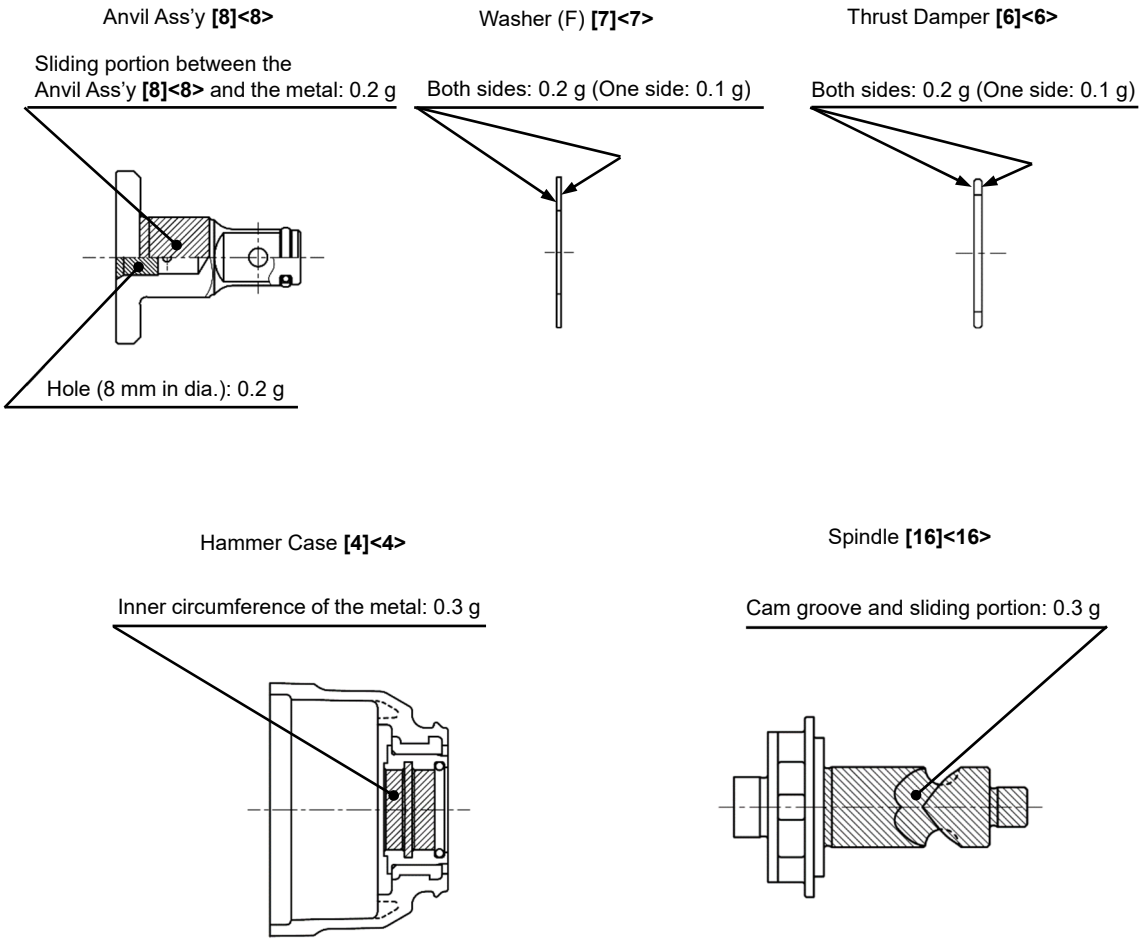
Item	Registered part name	Net weight	Code No.
Three Bond 1211	Silicone rubber	100 g	306927

Application of lubricant

Apply specified amount of grease to the following portions.

Item	Registered part name	Net weight	Code No.
MOLUB-ALLOY 777-1	Grease (Molub-Alloy No. 777-1) 75 g	75 g	325149
ATTOLUB MS NO. 2	Grease (Attolub MS No. 2) 500 g	500 g	309922
NIPPECO SEP-3A	Grease (SEP-3A) (100 g)	100 g	930035
	Grease (SEP-3A) (2.5 kg)	2.5 kg	930038

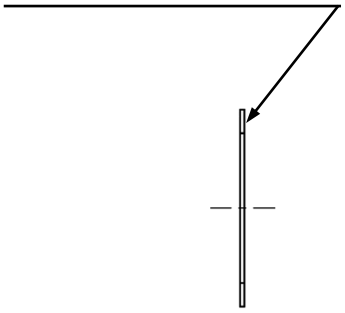
MOLUB-ALLOY 777-1 (Code No. 325149)



MOLUB-ALLOY 777-1 (Code No. 325149)

Washer (J) **[14]<14>**

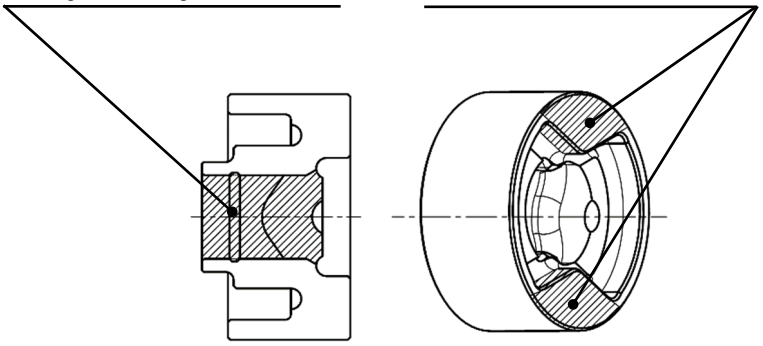
Contact surface with the Steel Ball D3.175 **[13]<13>** (30 pcs.): 0.2 g



Hammer **[12]<12>**

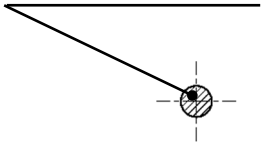
Cam groove, sliding portion, and oiled groove: 0.3 g

Tab portion: 0.4 g (One side: 0.2 g)



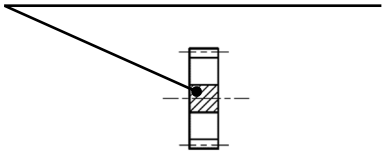
Steel Ball D6.35 **[11]<11>**

Entire circumference: 0.1 g x 2 pcs. (total 0.2 g)



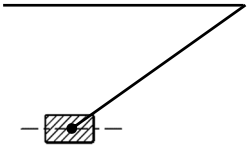
Idle Gear Set **[17]<17>**

Inner circumference of the hole (5 mm in dia.): 0.1 g x 3 pcs. (total 0.3 g)



Needle Roller **[18]<18>**

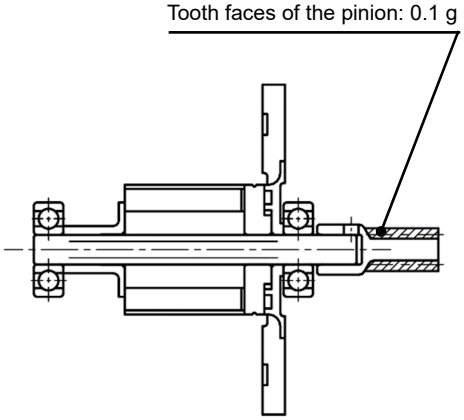
Entire circumference: 0.1 g x 3 pcs. (total 0.3 g)



ATTOLUB MS NO. 2 (Code No. 309922)

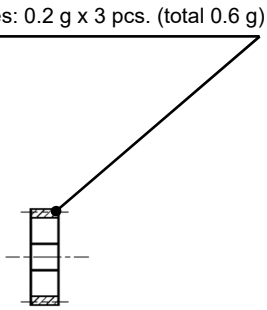
Rotor Pinion Ass'y **[28]<27>**

Tooth faces of the pinion: 0.1 g



Idle Gear Set **[17]<17>**

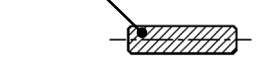
Tooth faces: 0.2 g x 3 pcs. (total 0.6 g)



NIPPECO SEP-3A (Code No. 930035, 930038)

Rear Bumper **[35]<33>**

Entire circumference: 0.05 g x 2 pcs. (total 0.1 g)



Tightening torque

- Tapping Screws (W/Flange) D4 x 20 **[19]<19>**····· 1.96 ± 0.49 N•m {20 ± 5 kgf•cm}
- Seal Lock Hex. Socket Hd. Bolt M5 x 25 **[3]<3>**·····4.9 ± 1.0 N•m {50 ± 10 kgf•cm}
- Truss Hd. Screw M4 (Black) **[31]<30>** ····· 1.8 ± 0.40 N•m {18 ± 4 kgf•cm}

Checking after reassembly

After reassembly, check the following.

(1) Check that the equipment runs smoothly and starts, stops, changes speed, and changes direction securely.

(2) Check that the rotating direction of the Anvil Ass'y **[8]<8>** matches that of the pushed side of the Pushing Button **[39]<37>**.

(3) Press the LED light switch and check that the LED light goes on and off.

(4) Press the tightening mode selector switch and check that the rotating speed changes between four different modes.

(5) Push the Pushing Button **[39]<37>** to the clockwise side and press the mode selector switch to check that the auto stop mode can be selected.

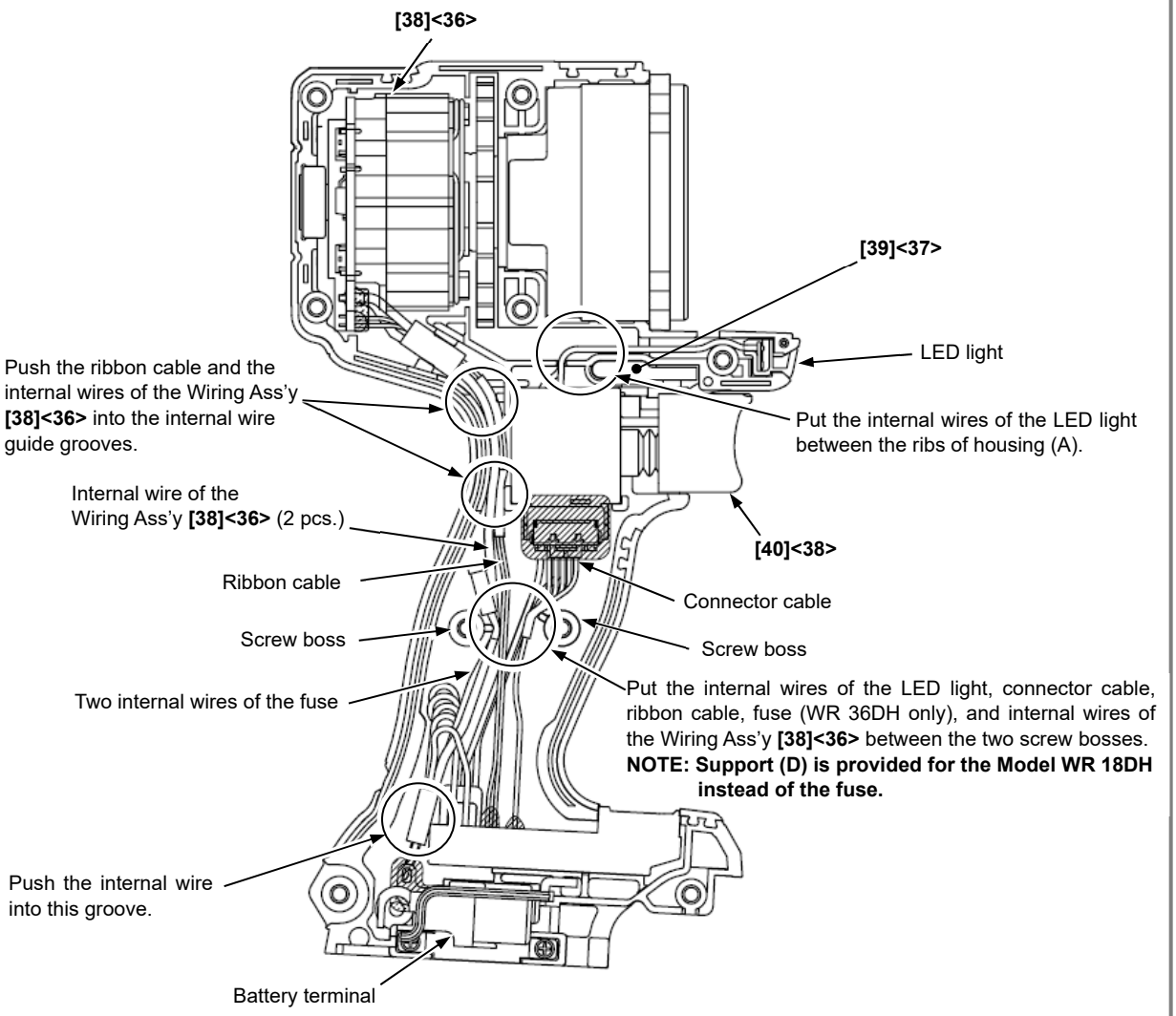
(6) Push the Pushing Button **[39] <37>** to the counterclockwise side and press the mode selector switch to check that the auto slow mode can be selected.

No-load current

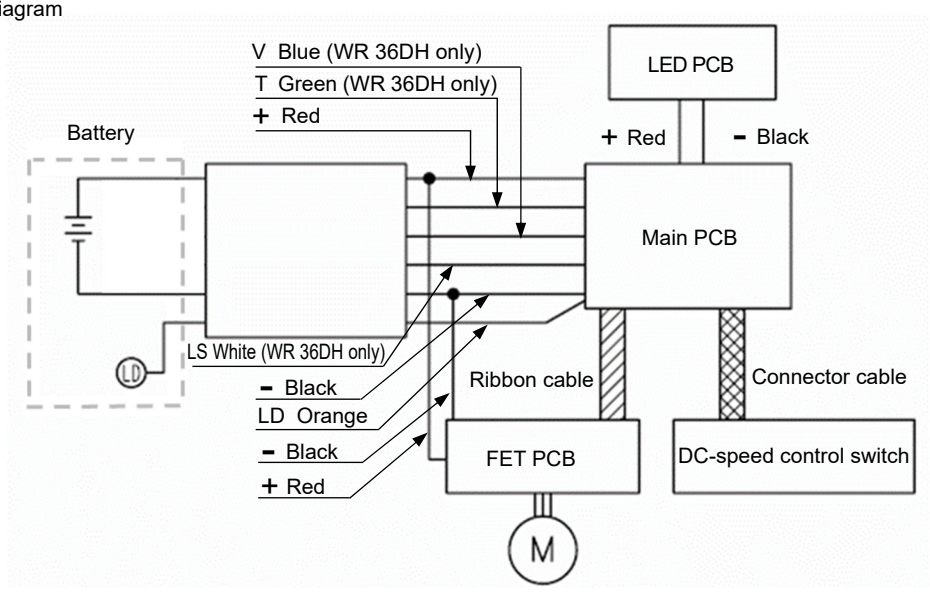
- WR 36DH 3.0 ± 1.0 A (39.6 VDC—equivalent to the voltage of a fully charged battery)
- WR 18DH 5.0 ± 1.0 A (19.8 VDC—equivalent to the voltage of a fully charged battery)

Wiring diagram

• Wiring diagram

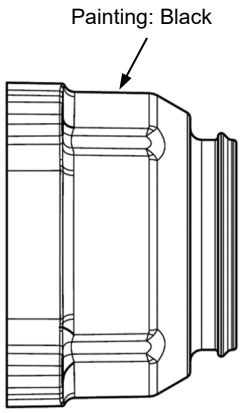
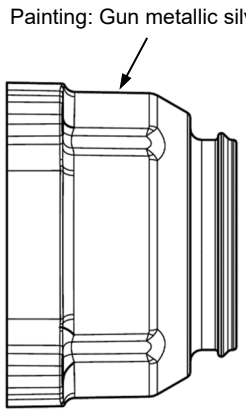
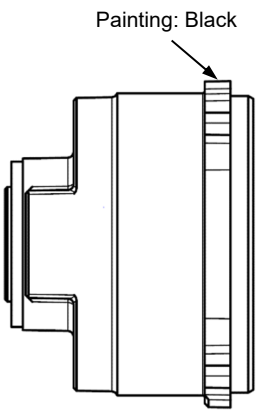
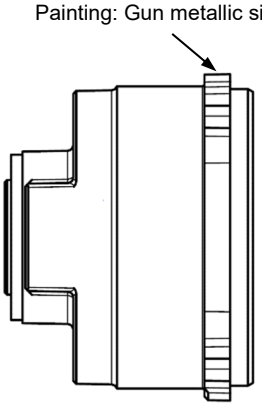
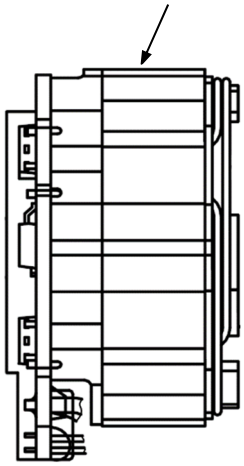
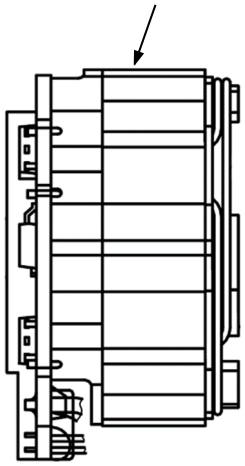


• Connecting diagram



Compatibility

Common parts are used for the Models WR 36DH and WR 18DH except the following parts. Be careful not to make a mistake in removing or mounting the following non-common parts.

Part name	WR 36DH	WR 18DH
Hammer Case **[4]<4>**		
Inner Cover **[27]<26>**		
Wiring Ass'y **[38]<36>**		

2. Precautions on disassembly and reassembly of the charger

Refer to the service manual for precautions on disassembly and reassembly of the charger Models UC 18YSL3 and UC 18YFSL.

STANDARD REPAIR TIME (UNIT) SCHEDULES

Model	Repair time	10	20	30	40	50	60 min.
WR 36DH WR 18DH	General Assembly	Hook	Inner Cover Rotor Pinion Ass'y DC-Speed Control Switch Wiring Ass'y Hammer Case Anvil Ring Gear	Housing Plate Set Hammer Steel Ball D3.175 Hammer Spring Spindle Idle Gear Set Needle Roller Ball Bearing 6901VV-N			