



## MODELS

## DS 7DT/DS 7DV

### 1. REPAIR GUIDE:

Without fail, remove the Type EB 7 Battery from the main body of the tool before attempting repair work.

Because the tool is cordless, if the battery is left in and the switch is activated inadvertently, the motor will start rotating unexpectedly and could cause serious injury.

#### 1-1. Directions and Precautions for Disassembly and Reassembly of the Main Body:

The circled numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram for the Model DS 7DT. The numbers in squares are for the Model DS 7DV.

##### 1-1-1. Disassembly:

- (1) Remove the Hook ④⑤ ④⑦:

Place your fingers inside the Hook ④⑤ ④⑦, and expand it outward enough so that it can be removed from the main body.

- (2) Disassembly of Housing (B):

Remove the six D3 x 16 Tapping Screws ②⑧ ②⑧ which fix the main body. Then grasp the lower portions of Housing (A) and Housing (B) where the battery is inserted, and gently separate them.

- (3) After Housing (B) has been removed, the parts inside may either be removed together in an assembled state, or separated and removed individually.

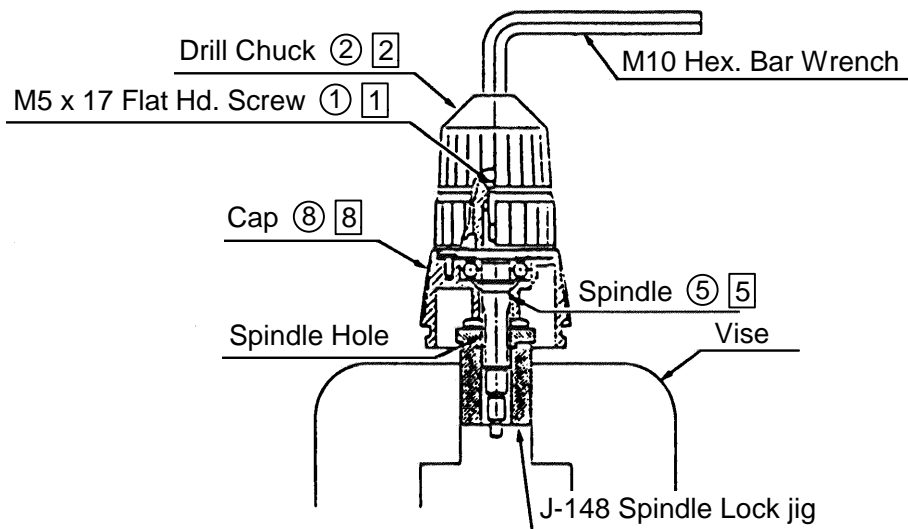
First, remove the Second Pinion ③④ ③④ together with the Metal ③⑧ ③⑧ and the 607MC3 Ball Bearing ②⑨ ②⑨, which are mounted on the ends of the Second Pinion. Then, grasp the Motor ②③ ②③ and the Cap ⑧ ⑧, and lift them upward from Housing (A).

- (4) Disassembly of Drill Chuck ② ②:

The 626VVMC2ERPS2S Ball Bearing ①⑥ ①⑥ mounted on the rear part of the Spindle ⑤ ⑤ is not press fitted, and can be removed by hand.

When removing the Final Gear ①⑤ ①⑤, be careful not to lose the three D4.76 Steel Balls ①④ ①④ which are retained in the Ball Holder ①③ ①③. Next, remove the Thrust Needle Bearing ①② ①②, Thrust Plate ①① ①①, Spring ①⑩ ①⑩, and Spring Holder ⑨ ⑨, in that order. As illustrated in Fig. 1, secure a J-148 Spindle Lock Jig (Special Repair Tool, Code No. 970928) in a vise, and insert the assembled Drill Chuck ② ②, Spindle ⑤ ⑤, Cap ⑧ ⑧, and related parts into the Spline hole of the J-148 Spindle Lock Jig. Next, fully open the jaws of the Drill Chuck ② ②, and remove the M5 x 17 Flat Hd. Screw ① ① by turning it clockwise with a slotted screwdriver. (Carefully remember that the M5 x 17 Flat Hd. Screw is left-hand threaded, and must be loosened by turning it clockwise.)

Finally, as illustrated in Fig. 1, clamp an M10 Hex Bar Wrench in the Drill Chuck ② ②, and turn it counterclockwise to loosen and remove the Drill Chuck.



**Fig. 1**

**(5) Disassembly of the Transmission Section:**

First, remove the assembled Second Pinion (34) [34], Metal (38) [38], 607MC3 Ball Bearing (29) [29], and related parts from Housing (A), as described in paragraph (3), above. The Metal (38) [38] and the 607MC3 Ball Bearing (29) [29] are not fitted tightly, and can be removed by hand. If it is difficult to remove the 607MC3 Ball Bearing (29) [29] by hand, use a bearing puller (the J-30 Bearing Puller, Code No. 970804, is recommended). Then, after removing the Retaining Ring (30) [30], spring (A) (31) [31] and the Low Speed Gear (33) [33] can be removed.

**(6) Disassembly of Electrical Components:**

**(a) Model DS 7DT:**

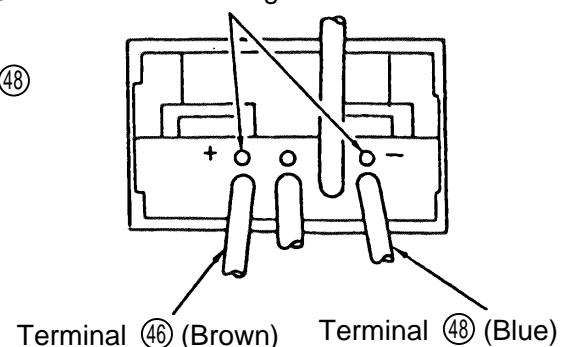
First, remove the assembled Motor (23), Cap (8), and related parts from Housing (A), as described in paragraph (3), above. Then, separate the Motor (23), Switch (42) and Terminals (46) (48) by following the procedures described and illustrated below.

Disconnect the Internal Wires (B) (24) (25) from the Motor (23) Holes for inserting the J-86 Pin

by melting their soldered connections with a soldering iron. The Internal Wires (B) (24) (25) and the Terminals (46) (48) can be extracted from the terminals of the Switch (42) by inserting a J-86 Pin (Special Repair Tool, Code No. 970828) into the holes provided on the Switch, as illustrated in Fig. 2, and bending the leaf springs away from the inner walls of the terminals of the Switch so that the internal wires can be gently pulled out by hand.

However, when extracting the internal wires, special attention must be given to the following points:

- Extract the internal wires with the J-86 Pin by gently and gradually bending back the leaf springs.
- Be very careful not to bend the leaf springs excessively. If bent excessively, they may become permanently deformed and lose their resiliency. In this case, replace the switch with a new one.



**Fig. 2**

(b) Model DS 7DV:

First, remove the assembled Motor [23], Cap [8], and related parts from Housing (A), as described in paragraph (3), above. Then, separate the Motor [23], DC-Speed Control Switch [43], and Fin [42] by following the procedures described below.

Disconnect the Internal Wires (B) [24] (Red) and [25] (Black) from the DC Speed Control Switch [43] by melting their soldered connections with a soldering iron.

Remove the M3 x 7 Bind Screw [48] from the Fin [42], and remove the Fin [42].

Disconnect the Internal Wires (B) [24] (Red) and [25] (Black) from the Motor [23] by melting their soldered connections with a soldering iron.

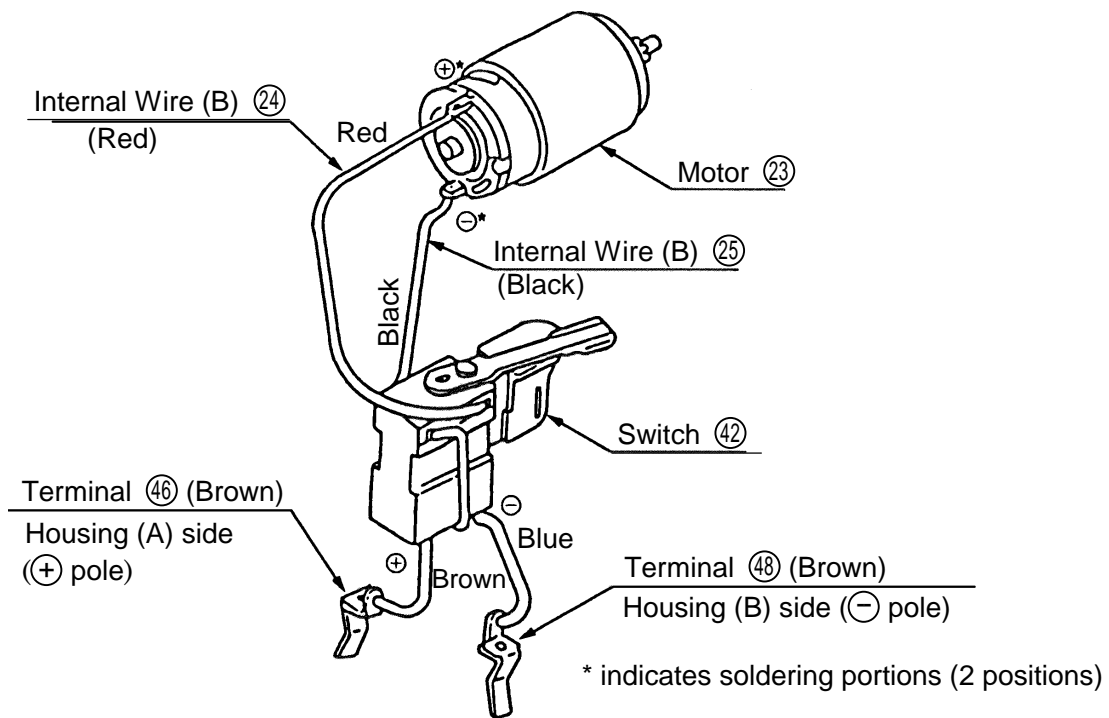
(7) Disassembly of the Housing (A) (B) Set ②⑥ [26]:

Remove the M4 x 8 Flat Hd. Screw ④① [41], and take off the Shift Knob ④⑤ [45] and the Shift Arm ④① [40]. At this time, be very careful not to lose the Shift Spring ③⑨ [39] which is mounted between the Shift Arm ④① [40] and Housing (A). Also, be very careful not to lose the Damper ②① [20] which is mounted beside the Ring Gear ②① [21].

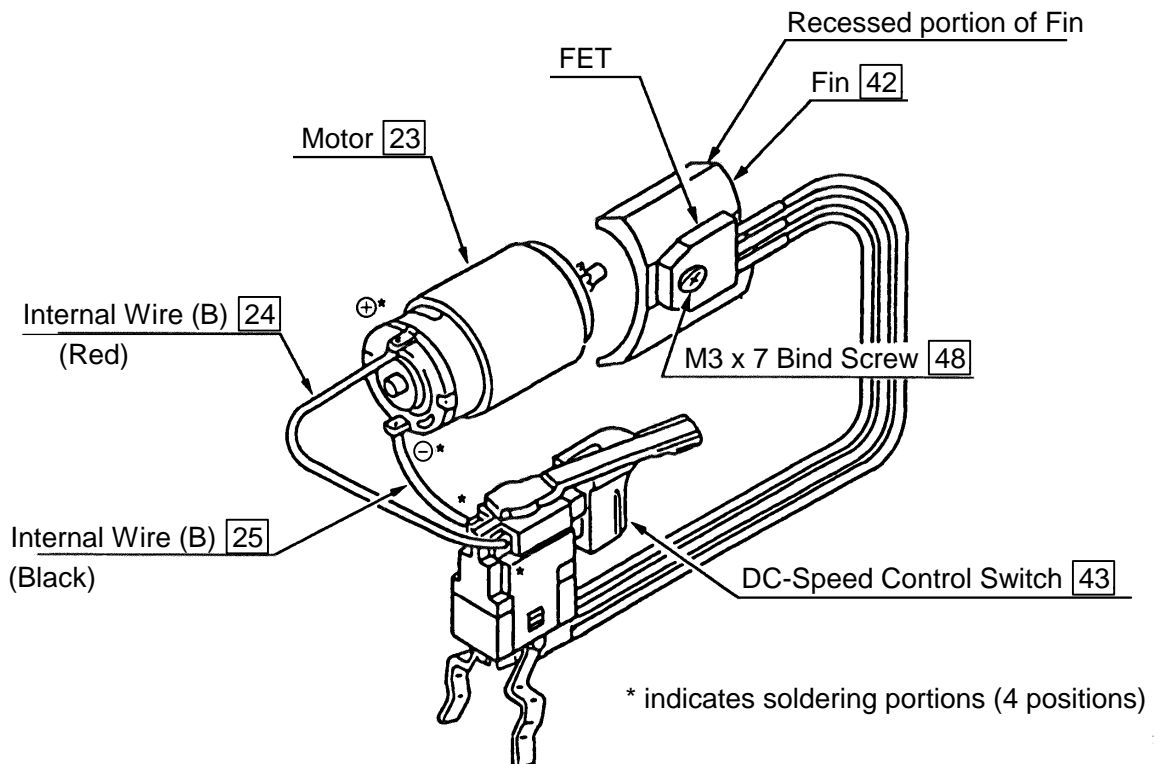
**1-1-2. Reassembly:**

Reassembly can be accomplished by following the disassembly procedures in reverse. However, special attention should be given to the following points. Please note that paragraphs (1) and (2) are applicable to the Model DS 7DT only, paragraphs (3) - (5) are applicable to the Model DS 7DV only, and the remaining paragraphs are applicable to both models.

- (1) Ensure that the wiring of the Model DS 7DT is connected in accordance with the internal wire arrangement illustrated in Fig. 3.
- (2) When inserting the internal wires into the terminals of the Switch ④②, carefully confirm that the leaf spring connector for each wire is not excessively deformed. On completion of internal wire connections, ensure that they cannot be easily pulled out of the Switch when gently pulled by hand.



**Fig. 3 Internal wire Arrangement of the Model DS 7DT**

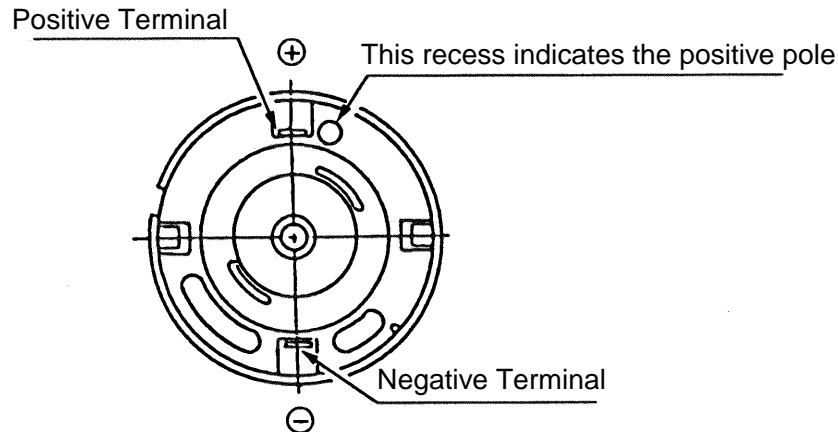


**Fig. 4 Internal wire Arrangement of the Model DS 7DV**

- (3) Ensure that the wiring of the Model DS 7DV is connected in accordance with the internal wire arrangement illustrated in Fig. 4.
- (4) When mounting the Fin (42) onto the FET, which is connected to the DC-Speed Control Switch (43), the

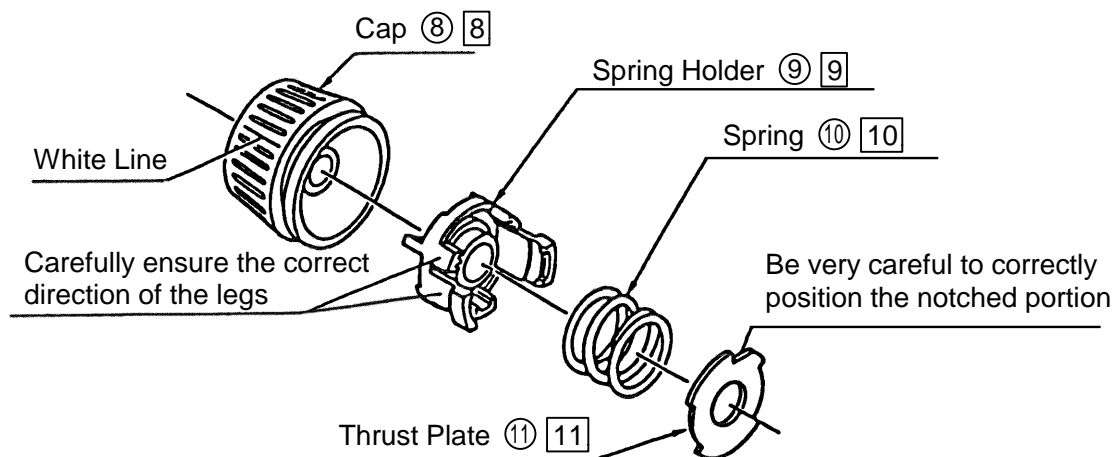
tightening torque of the M3 x 7 Bind Screw [48] should be within 0.29 - 0.49 N-m (3 - 5 kgf-cm, 0.22 - 0.36 ft-lb).

- (5) Be very careful not to bend or otherwise damage the base portions of the internal wires of the FET which are connected to the DC-Speed Control Switch [43],
- (6) When soldering the Internal Wires (B) ②④ [24] (Red) and ②⑤ [25] (Black) onto the Motor ②③ [23], be very careful to ensure correct Motor polarity. As illustrated in Fig. 5, there is a circular recessed mark close to the terminal which indicates the positive pole.



**Fig. 5**

- (7) When assembling the Spring Holder ⑨ [9] and the Thrust Plate ⑪ [11], special attention must be given to their positioning alignment with relation to the Cap ⑧ [8], as illustrated in Fig. 6.



**Fig. 6**

Fig. 6 illustrates the correct positioning and alignment direction of the Spring Holder ⑨ [9] and Thrust Plate ⑪ [11] when the white line on the Cap ⑧ [8] is aligned with clutch position "1" on the Housing (A) (B) Set ②⑥ [26]. At this time, the Spring Holder ⑨ [9] is inserted most deeply into the Cap ⑧ [8].

- (8) As various kinds of washers are utilized, special attention must be given to ensure they are not mixed up or lost.

<u>Description/No.</u>	<u>Outer Dia. x Hole Dia.</u>	<u>Thickness</u>
Washer ②② 22	φ 29 mm x φ 9 mm	0.4 mm
Washer ③⑦ 37	φ 9 mm x φ 4 mm	0.4 mm
Washer ③② 32	φ 12 mm x φ 7 mm	0.4 mm
Washer ①⑦ 17	φ 13 mm x φ 4 mm	1.2 mm

- (9) Liberally coat grease (Hitachi Motor Grease, Code No. 930035, is recommended) on all sliding and rotating portions, and on the gear teeth. Particularly when the Second Pinion ③④ 34, High Speed Gear ③⑥ 36, and/or Low Speed Gear ③③ 33 are replaced, apply a generous amount of grease (Molub-Alloy Grease, Code No. 971042) on the circumference of the Second Pinion and on the inner surfaces of the High Speed Gear and/or Low Speed Gear.

- (10) Ensure that the Motor ②③ 23 is installed so that its recessed portion is properly aligned and engaged with the matching chock in the Housing (A) (B) Set ②⑥ 26. (See Fig. 7)

- (11) Ensure that the convex portion of the Ring Gear ②① 21 is properly engaged into the matching concave portion of the Damper ②① 20.

- (12) Ensure that the protruding arms of the Shift Arm ④① 40 are properly engaged with the groove on the Clutch Plate ③⑤ 35. (See Fig. 8)

- (13) On completion of assembly, confirm that the Spindle ⑤ 5 rotates easily and smoothly when the Drill Chuck ② 2 is rotated by hand. Before turning on the switch, carefully confirm that the white line on the Cap ⑧ 8 can be properly aligned with each of the clutch position numbers marked on the housing.

- (14) Confirm without fail that the rotation direction of the Spindle ⑤ 5 conforms to the (R) and (L) settings of the rotation direction changeover lever on the Switch ④② 43. When the lever is set to the (R) position, the Drill Chuck ② 2 must rotate clockwise when viewed from the tail end of the tool (the end opposite from the Drill Chuck).

- (15) Tighten each fastening screw with the appropriate tightening torque indicated below.

- M4 x 8 Flat Hd. Screw ④① 41 .....0.25 - 0.34 N·m (2.5 - 3.5 kgf-cm, 0.18 - 0.25 ft-lb)
- D3 x 8 Tapping Screws ③ 3 .....0.79 - 1.18 N·m (8 - 12 kgf-cm, 0.58 - 0.87 ft-lb)
- D3 x 16 Tapping Screws ②⑧ 28 .....0.79 - 1.18 N·m (8 - 12 kgf-cm, 0.58 - 0.87 ft-lb)
- M3 x 7 Bind Screw ④⑧ 48 .....0.29 - 0.49 N·m (3 - 5 kgf-cm, 0.22 - 0.36 ft-lb)
- M5 x 17 Flat Hd. Screw ① 1 .....2.94 - 3.63 N·m (30 - 37 kgf-cm, 2.2 - 2.7 ft-lb)
- Drill Chuck ② 2 .....12.8 - 16.7 N·m (130 - 170 kgf-cm, 9.4 - 12.3 ft-lb)

## 1-2. Precautions on Disassembly and Reassembly of the Model UC 7SB Charger:

For details concerning the disassembly, reassembly and precautions in use of the Model UC 7SB Charger, please refer to the Technical Data and Service Manual for the Model UC 7SB Charger.

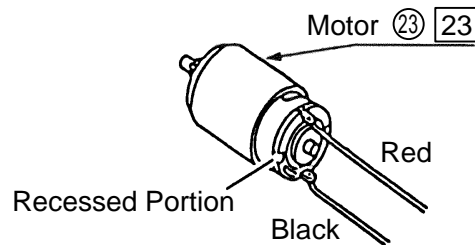


Fig. 7

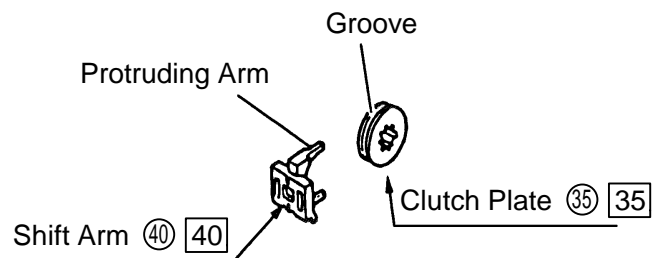


Fig. 8

## 2. STANDARD RERAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
DS7DV DS7DT		Work Flow						
		<div><div>Hook</div><div></div></div>		<div><div>Spring Holder Spring Holder Spring (A) Thrust Ne- edle Bearing Spindle Retaining Ring Second Pinion Gear Ball Holder Damper Metal</div><div></div></div>				
	<div>General Assembly Fixed Costs Battery Ass'y : 0 minutes Hook : 0 minutes Others : 20 minutes</div>	<div><div>Drill Chuck</div><div></div></div>	<div><div>Cap Plate Spindle BB (6000 VVCM) Retaining Ring</div><div></div></div>	<div><div>Housing (A) Housing (B) Motor Switch</div><div></div></div>				