MODEL

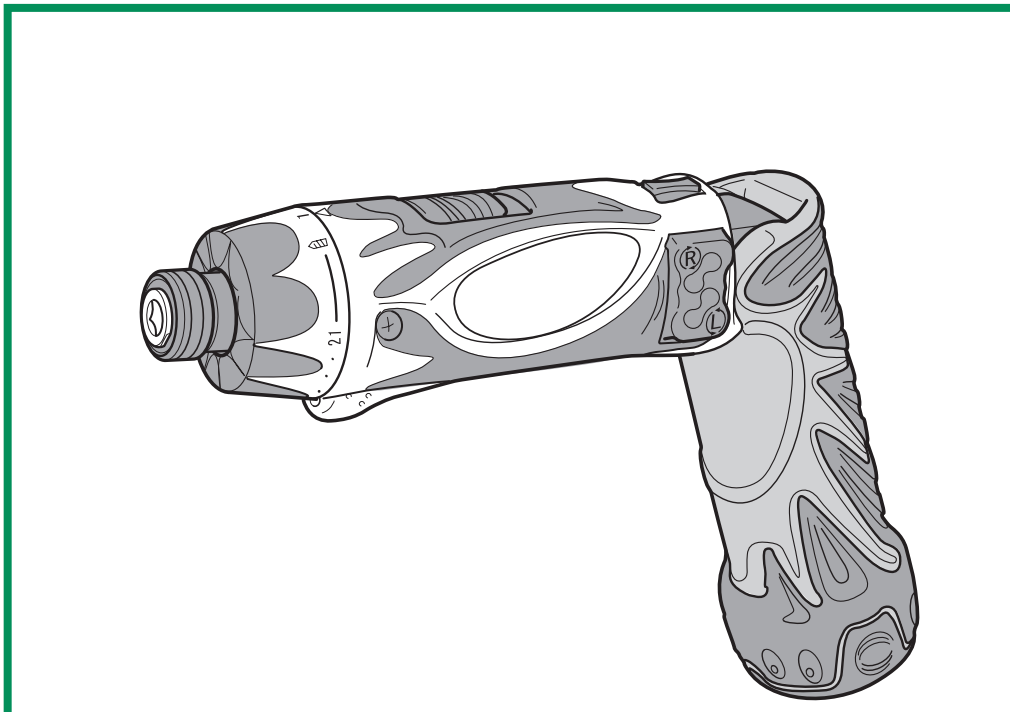
DB 3DL

Hitachi
Power Tools

D

CORDLESS DRIVER DRILL
DB 3DL

TECHNICAL DATA
AND
SERVICE MANUAL



LIST No.: G857

Sep. 2006

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, a symbol(s) is(are) used in the place of company name(s) and model name(s) of our competitor(s). The symbol(s) utilized here is(are) as follows:

Symbols Utilized	Competitors	
	Company Name	Model Name
C	DeWalt	DC600KA

CONTENTS

1. PRODUCT NAME

Hitachi 3.6 V Cordless Driver Drill, Model DB 3DL

2. MARKETING OBJECTIVE

The Model DB 3DL is a cordless driver drill equipped with a 3.6-V lithium-ion battery. The Model DB 3DL has the following main features:

(1) Equipped with the newly developed lithium-ion battery (3.6 V, 1.5 Ah). This battery can be fully charged in 30 minutes.

(2) Flexibly changeable handle between L shape and straight shape

(3) Lightweight and compact

(4) Yellow LED light

(5) Manual tightening mechanism. Easy to tighten screws manually thanks to the comfortable handle shape and the soft grip.

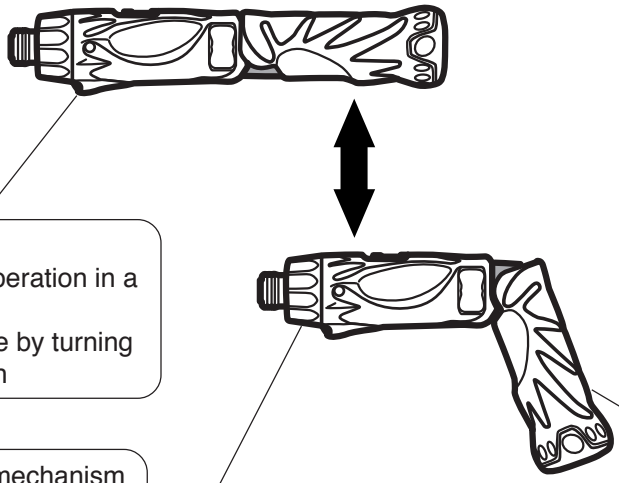
We aim to expand our market share with the new Model DB 3DL.

3. APPLICATIONS

- Constructing electric facilities, assembling machines and servicing
- Tightening and loosening wood screws and machine screws
- Drilling into plastic and mild steel

4. SELLING POINTS

Equipped with the new lithium-ion battery
- 3.6 V, 1.5 Ah
- Terminal cover is closed automatically to prevent improper short circuit.



Flexibly changeable handle
- The handle is flexibly changeable between L shape and straight shape for various applications.

Yellow LED light
- Convenient for operation in a dark place
- Usable at anytime by turning on the light switch

Lightweight and compact
- Easy to handle thanks to the lightweight design
- The compact body is convenient for operation in narrow spaces.

Manual tightening mechanism
- Usable as a manual screwdriver

Soft-grip handle
- Soft and slip-resistant thanks to the elastomer resin
- The handle end is knobbed for stable gripping in manual tightening.

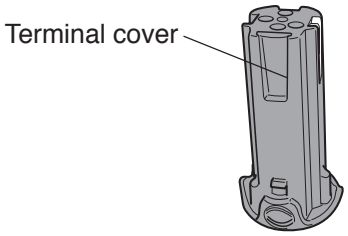
21-stage clutch
- Fine torque adjustment

Blow-molded case
- The blow-molded case is compact and convenient for carrying.

4-1. Selling Point Descriptions

4-1-1. Equipped with the new lithium-ion battery

The newly developed Type EBM 315 lithium-ion battery (3.6 V, 1.5 Ah) can be fully charged by the Model UC 3SFL charger in 30 minutes. The minus terminal has a terminal cover to prevent improper short circuit. There is no need to put a battery cover required for a conventional battery.

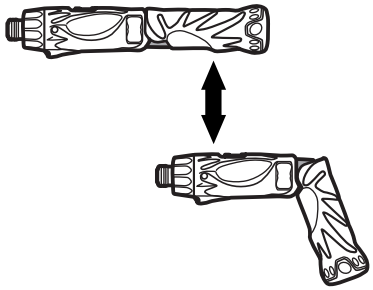


4-1-2. Lightweight and compact

The Model DB 3DL is most compact and lightweight in the class. It is easy to handle and convenient for operation in narrow spaces.

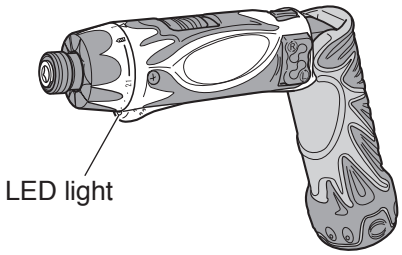
4-1-3. Flexibly changeable handle

The handle is flexibly changeable between L shape and straight shape for various applications.



4-1-4. Yellow LED light

The Model DB 3DL is equipped with a yellow LED light at the tip. It is usable regardless of the handle shape, either L shape or straight shape.



4-1-5. Soft-grip handle

The handle is soft and slip-resistant. In addition, the handle end is knobbed for stable gripping in manual tightening.

4-1-6. Manual tightening mechanism

The Model DB 3DL is usable as a manual screwdriver. When a screw cannot be tightened completely with the clutch setting, power off the Model DB 3DL and use it as a manual screwdriver by turning the main body (maximum manual tightening torque: 5 N·m {51 kgf·cm}).

4-1-7. 21-stage clutch

The torque can be finely adjusted by the 21-stage clutch.

4-1-8. Lock button

The lock button is provided to prevent inadvertent start of the motor even if the switch is turned on by mistake.

4-1-9. Blow-molded case

The compact blow-molded case is convenient for carrying the tool. A spare battery (optional accessory) can also be stored in the case.

5. SPECIFICATIONS

Capacity	Screw driving	Machine screw ····· 5 mm (1/5") Wood screw ····· 3.5 mm dia. x 20 mm (#6 x 25/32")
	Drilling	Metal ····· Mild steel 2 mm (5/64") [Thickness 1.0 mm (3/64")]
Tool retainer		6.35 mm (1/4") bit holder
Rotation speed		Low: 200/min. High: 600/min.
Torque		Slip torque ····· 0.3 – 2.9 N·m (3 – 30 kgf·cm, 3 – 26 in-lbs.) [21 stages] Max. torque ····· 5 N·m (51 kgf·cm, 44 in-lbs.)
Type of motor		DC magnet motor
Type of switch		Tumbler switch with forward/reverse changeover pushing button
Enclosure		Body ····· Glassfiber reinforced polycarbonate resin (black) and thermoplastic elastomer (green) Battery ····· Polycarbonate resin (black) Charger ····· ABS resin (black)
Battery (Type EBM 315)	Type of battery	Sealed cylindrical lithium-ion storage battery
	Nominal voltage	DC 3.6 V
	Nominal life	Charging/discharging: approximately 500 times
	Nominal capacity	1.5 Ah
	Charging time	30 minutes (with standard accessory charger at ambient temperature of 20 ˚C)
	Charging temperature	10 ˚C – 40 ˚C (50 ˚F – 104 ˚F)
Charger (Model UC 3SFL)		• Overcharge prevention circuit: A thermostat monitors the surface temperature of the battery and, on detecting the temperature rise which occurs on completion of charging, automatically turns off the unit to prevent the battery from overcharge. • Input capacity: 21 W • Indication method: Pilot lamp indicates the charging state. • Function: On ····· During charging Off ····· Charging completed
Weight	Net	Main body (including Type EBM 315 battery) ····· 0.4 kg (0.9 lbs.) Charger unit (including cord) ····· 0.3 kg (0.7 lbs.)
	Gross	DB 3DL (2MSK) (including Type EBM 315 battery) ····· 1.8 kg (4.0 lbs.)
Standard accessories		Charger (UC 3SFL) ····· 1 Battery (Type EBM 315) ····· 2 Phillips plus driver bit (No. 2) ····· 1 Case ····· 1

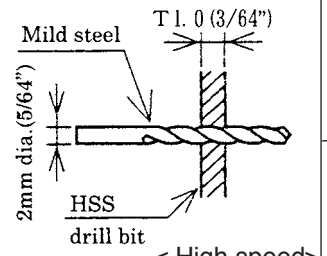
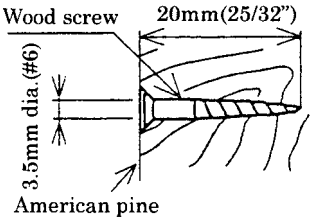
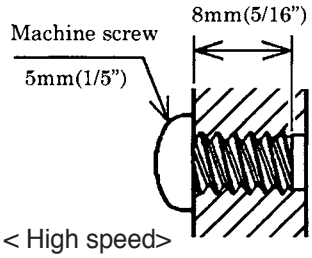
6. COMPARISONS WITH SIMILAR PRODUCTS

Maker			HITACHI	C
Model name			DB 3DL	
Max. capacity	Screw driving	Machine screw	5 mm (1/5")	Not indicated
		Wood screw	3.5 mm dia. x 20 mm (#6 x 25/32")	Not indicated
	Drilling	Mild steel	2 mm (5/64")	Not indicated
Rotation speed (/min.)		Low	200	200
		High	600	600
Slip torque			0.3 – 2.9 N·m 3 – 30 kgf·cm (3 – 26 in-lbs.)	Not indicated
			[21 stages]	[8 stages]
Max. torque			5 N·m (51 kgf·cm) (44 in-lbs.)	5 N·m (51 kgf·cm) (44 in-lbs.)
Battery type			Li-ion	Ni-Cd
Battery	Nominal capacity		1.5 Ah	1.2 Ah
	Nominal voltage		3.6 V	3.6 V
	Charging time*		30 min. (Model UC 3SFL)	60 min.
Tool tip mounting system			Driver chuck	Driver chuck
Spindle lock function			Equipped	Equipped
Soft-grip handle			Equipped	Equipped
LED light			Equipped	Equipped
Dimesions	Straight-shape	Overall length	249 mm (9-13/16")	295 mm (11-39/64")
		Overall height	45 mm (1-49/64")	67 mm (2-41/64")
	L-shape	Overall length	196 mm (7-23/32")	195 mm (7-43/64")
		Overall height	126 mm (4-61/64")	170 mm (6-11/16")
	Width		45 mm (1-49/64")	46 mm (1-13/16")
Weight			0.4 kg (0.9 lbs.)	0.7 kg (1.5 lbs.)

*: Charging time may vary depending on the type of charger to be used.

7. WORKING PERFORMANCE PER SINGLE CHARGE

Drilling and fastening performance comparison per charge

Type of work	Maker	Model name	Working capacity (*1) *0 (0) *250 (50) *500 (100) *750 (150) *1000 (200)	Drilling speed (sec./pc.)
 < High speed>	HITACHI	DB 3DL	210	4.7
	C		190	4.8
 < Low speed>	HITACHI	DB 3DL	70	6.5
	C		60	6.7
 < High speed>	HITACHI	DB 3DL	*1000	0.8
	C		*760	0.8

*: Number of machine screws fastened per charge
*1: Number of holes or fasteners per charge
The above table shows an example of test data obtained using the battery which is standard for this tool.
As actually measured values listed in the above table may vary depending on the sharpness of the drill bit, workpiece hardness (particularly in wood materials), moisture content of wood, charging condition, operator skill, etc. This data should be used as a comparative guide only.

8. PRECAUTIONS IN SALES PROMOTION

8-1. Safety Instructions

In the interest of promoting the safest and most efficient use of the Model DB 3DL cordless driver drill by all of our customers, it is very important that at the time of sale, the salesperson carefully ensures that the buyer seriously recognizes the importance of the contents of the Handling Instructions, and fully understands the meaning of the precautions listed on the Caution Plate and Name Plate attached to each tool.

A. Handling Instructions

Salespersons must be thoroughly familiar with the contents of the Handling Instructions in order to give pertinent advice to the customer. In particular, they must have a thorough understanding of the precautions for use of the cordless tools which are different from those of ordinary electric power tools.

(1) Before use, ensure that the unit is fully charged.
New units are not fully charged. Even if the units were fully charged at the factory, long periods of inactivity, such as during shipping, cause the storage battery to lose its charge. Customers must be instructed to fully charge the unit prior to use.

(2) When charging storage batteries, use only the exclusive Model UC 3SFL charger provided with the tool.
Because of the designed rapid-charging feature (about 30 minutes), use of other battery chargers is hazardous.

(3) Connect the charger to an AC power outlet only.
Use of any other power source (DC outlet, fuel powered generator, etc.) will cause the charger to overheat and burn out.

(4) Do not use any voltage increasing equipment (transformer etc.) between the power source and the charger.
If the charger is used with voltage higher than that indicated on the unit, it will not function properly.

(5) Conduct battery charging at an ambient temperature range of 10 ˚C – 40 ˚C (50 ˚F – 104 ˚F).
Special temperature sensitive devices are employed in the charger to permit rapid charging. Ensure that customers are instructed to use the charger at the indicated ambient temperature range. At temperature under 10 ˚C (50 ˚F) the thermostat will not function properly, and the storage battery may be overcharged. At temperature over 40 ˚C (104 ˚F), the storage battery cannot be sufficiently charged. The optimum temperature range is 20 ˚C – 25 ˚C (68 ˚F – 77 ˚F).

(6) The battery charger should not be used continuously.
At high ambient temperature, if over three storage batteries are charged in succession, the temperature of the coils on the transformer will rise and there is a chance that the temperature fuse inserted in the interior of the transformer will inadvertently melt. After charging one battery, please wait about 15 minutes before charging the next battery.

(7) Do not insert foreign objects into the air vents on the charger

The charger case is equipped with air vents to protect the internal electronic components from overheating. Caution the customer not to allow foreign materials, such as metallic or flammable objects, to be dropped or inserted into the air vents. This could cause electrical shock, fire, or other serious hazards.

(8) Do not attempt to disassemble the storage battery or the charger.

Special devices, such as a thermostat, are built into the storage battery and charger to permit rapid charging. Incorrect parts replacement and/or wiring will cause malfunctions which could result in fire or other hazards. Instruct the customer to bring these units to an authorized service center in the event repair or replacement is necessary.

(9) Disposal of the storage battery (Type EBM 315)

Ensure that all customers understand that Type EBM 315 storage battery should be returned to the Hitachi power tool sales outlet or the authorized service center when they are no longer capable of being recharged or repaired. If thrown into a fire, the battery may explode, or, if discarded indiscriminately, leakage of the cadmium compound contained in the battery may cause environmental pollution.

B. Caution Plate

The following cautions are listed on the Name Plate attached to each Type EBM 315 storage battery.

For Europe

CAUTION before use.
- Read thoroughly HANDLING INSTRUCTIONS
- Do not disassemble nor throw into fire.

For the U.S.A. and Canada

CAUTION
- For safe operation, see instruction manual.
- Use HITACHI charger recommended in instruction manual for recharging.

8-2. Inherent Drawbacks of Cordless Driver Drills Requiring Particular Attention During Sales Promotion

The cordless driver drill offers many advantages; it can be used in places where no power source is available, the absence of a cord allows easy use, etc. However, any cordless tool has certain inherent drawbacks. Salespersons must be thoroughly familiar with these drawbacks in order to properly advise the customer in the most efficient use of the tool.

A. Suggestions and precautions for the efficient use of the tool

(1) Use the cordless driver drill for comparatively light work.

Because they are battery driven, the output of the motor in cordless driver drills is rather low in comparison with conventional electric power tools. Accordingly, they are not suitable for continuous drilling of many holes in succession, or for drilling into particularly hard materials which creates a heavy load. Salespersons should recommend conventional electric power tools for such heavy work.

(2) The work which requires particularly strong torque should be conducted at low speed.

Instruct the customer that the work which requires particularly strong torque should be done at low speed. Because it is easy to lock the motor at high speed.

(3) Do not insert a foreign object into body.

A foreign object inserted through a hole may cause a failure. Please instruct customers to never insert a foreign object into body.

(4) Avoid "Locking" of the motor.

Locking of the motor will cause an overload current that could result in burning of the motor and/or rapid deterioration of the battery. Salespersons should advise the customer to immediately release the switch and stop operation if the motor becomes locked. (A jammed drill bit can be disengaged from the workpiece material by setting the switch to reverse rotation, or by manually turning the main body of the tool.)

(5) Variation in amount of work possible per charge

Although the nominal chargeable capacity of the storage battery used with the Model DB 3DL is 1.5 Ah, the actual capacity may vary within 10% of that value depending on the ambient temperature during use and charging, and the number of times the batteries have been recharged. It should be noted that other factors which may have a bearing on the amount of work possible per charge are the working conditions (ambient temperature, type and moisture content of the workpiece, sharpness of the drill bit, etc.) and the operational skill of the user.

(6) Precautions in the use of HSS drill bits

For example, although the Model DB 3DL is designed for drilling capacities of 2 mm (5/64") in mild steel, this capability is not as efficient as conventional electric power tools. In particular, the drill tends to become locked when the drill bit penetrates through the material. For this reason, the customer should be cautioned to reduce the thrust on the main body of the drill when drilling completely through the material to avoid locking the tool. Repeated locking of the drill causes excessive current flow from the batteries which not only decreases the amount of work possible per charge, but could also result in burning of the motor.

B. Suggestions and precautions for the efficient use of the charger and storage battery

If the Type EBM 315 storage battery is exposed to direct sunlight for an extended period or if the tool has just been operated for a long time, charging may not be possible if the temperature of the battery is above 40˚C (104˚F). In such a case, the customer should be advised to place the battery in a shaded area with a good airflow, and allow sufficient cooling before recharging. This phenomenon is common to all existing batteries and chargers which employ temperature sensitive overcharge protection devices. The cooling time required before recharging can be accomplished varies from a few minutes to about 30 minutes, depending on the load, duration of use, and ambient temperature.

9. REPAIR GUIDE

Be sure to remove the storage batteries from the main body before servicing. Inadvertent triggering of the switch with the storage battery connected will result in danger of accidental turning of the motor.

9-1. Precautions in Disassembly and Reassembly

The **[Bold]** numbers in the description below correspond to the item numbers in the Parts List and the exploded assembly diagram for the Model DB 3DL.

9-1-1. Disassembly

(1) Removal of Handle (A).(B) Set **[49]**

(a) Removal of the Clip **[48]** (2 pcs.)

Insert a flat-blade screwdriver in the dent of the Clip **[48]** and remove the Clip **[48]**. (Fig. 1)

(b) Remove the Tapping Screws (W/Flange) D4 x 20 (Black) **[37]**.

(c) Grip the battery insertion part and open Handle (A).(B) Set **[49]**. Since there are latches in Handle (A).(B) Set **[49]**, it is hard to open. Open Handle (A).(B) set **[49]** from the LED button side. Then remove the Button **[45]**. Do not remove the Steel Ball D3 **[36]** from Handle (A).(B) Set **[49]**.

Fig. 1

(2) Removal of Housing (A).(B) Set **[32]**

Remove the two Click Plates **[35]**, Hitachi Label **[38]**, Pan Hd. Tapping Screw D3 x 8 **[33]** and Handle Cover **[43]**. Since there are latches in Housing (A).(B) Set **[32]**, it is hard to open. Open Housing (A).(B) Set **[32]** from the Shift Knob **[39]** side. After opening Housing (A).(B) Set **[32]**, all the internal parts (drive unit) can be removed. Pull out the drive unit (consisting of the gear unit, Motor **[31]** and power supply unit).

(3) Disassembly of the drive unit (internal parts)

(a) Remove the Shift Arm **[12]** from the Gear Box Ass'y **[1]**.

(b) Pull up the Motor **[31]** and remove it from the Gear Box Ass'y **[1]**. Remove the two Machine Screws (W/Sp. Washer) M2.6 x 8 **[29]**, then remove the Motor Spacer **[30]** from the Motor **[31]**.

(c) Pull up the Switch (W/Lock) **[40]** and remove it from the Motor **[31]**. When it is hard to remove, use a flat-blade screwdriver.

(4) Disassembly of the gear unit

(a) Removal of the gear

Take out Washer (A) **[28]**, First Ring Gear **[27]**, Planet Gear (A) Set (3 pcs.) **[26]**, Pinion (B) **[25]**, Slide Ring Gear **[24]**, Planet Gear (B) Set (3 pcs.) **[23]** and Pinion (C) **[22]** one by one. Then remove the two Needles **[17]** from the Gear Case **[11]**. Take out Washer (B) **[21]**, Ring Gear **[20]**, Planet Gear (C) Set (3 pcs.) **[19]**, Carrier **[18]**, Needle Roller Set (6 pcs.) **[16]**, Lock Ring **[15]**, three Steel Balls D3 **[14]** and Pin Set (3 pcs.) **[13]** one by one.

(b) Removal of Guide Sleeve (A) **[5]**

Remove the Retaining Ring **[2]**, Washer (D) **[3]**, Guide Spring **[4]** and Guide Sleeve (A) **[5]** in order by following the procedure shown in Figs. 2-1 to 2-4.

1

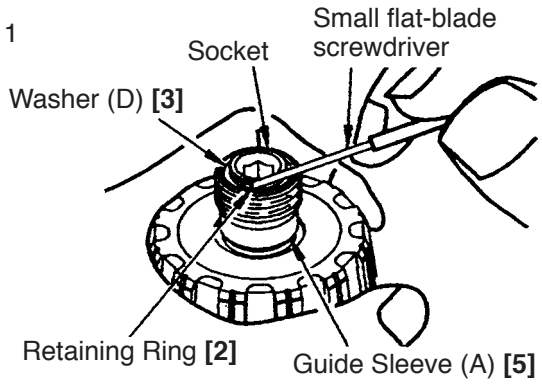


Fig. 2-1

Hold the body and adjust the gap of the Retaining Ring **[2]** to the groove of socket, then insert a small flat-blade screwdriver into the groove at an angle.

2

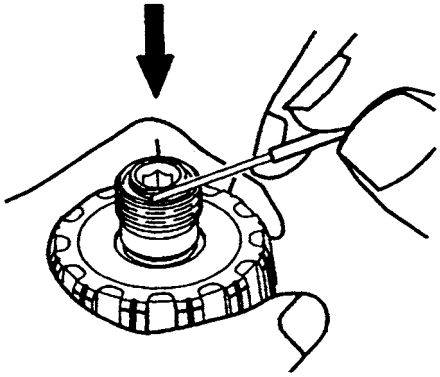


Fig. 2-2

Press down Washer (D) **[3]** with the small flat-blade screwdriver.

3

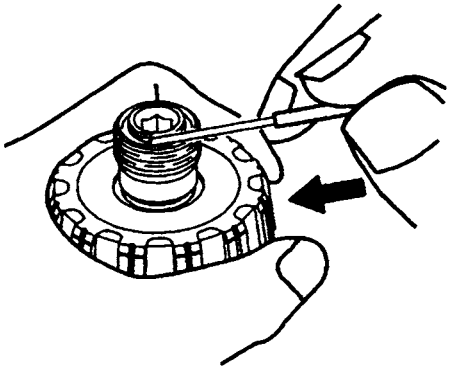


Fig. 2-3

Slide the small flat-blade screwdriver under one side of the gap of the Retaining Ring **[2]**.

4

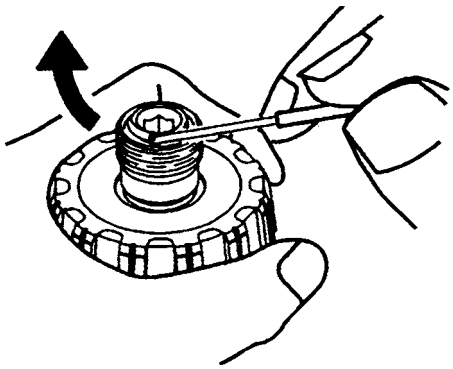


Fig. 2-4

Slowly raise the retaining ring using the end face of Guide Sleeve (A) **[5]** as a fulcrum.

Then slowly raise the other side of the retaining ring with the small flat-blade screwdriver until it is free. Avoid quickly raising the retainer ring or it may fly out forcefully.

(c) Disassembly of the clutch unit

Remove the Clutch Dial **[6]** after removal of Guide Sleeve (A) **[5]**. Turn the Nut **[7]** counterclockwise and remove it from the Gear Case **[11]**. Remove the Spring **[8]** and Washer (D) **[9]** from the Gear Case **[11]**.

NOTE: Do not remove the Gear Case [11].

(5) Disassembly of the power supply unit

Remove the Terminal **[44]** from the Terminal Support **[46]**. The internal wires of the Switch (W/Lock) **[40]** and the Printed Circuit Board **[41]** are soldered to the Terminal **[44]**. Unsolder and remove the internal wires.

NOTE: Do not remove the Printed Circuit Board [41] from the Switch (W/Lock) [40].

9-1-2. Reassembly

Reassembly can be accomplished by following the disassembly procedure in reverse. However, special attention should be given to the following items.

(1) Reassembly of the power supply unit

Perform wiring according to the wiring diagram (Fig. 3).

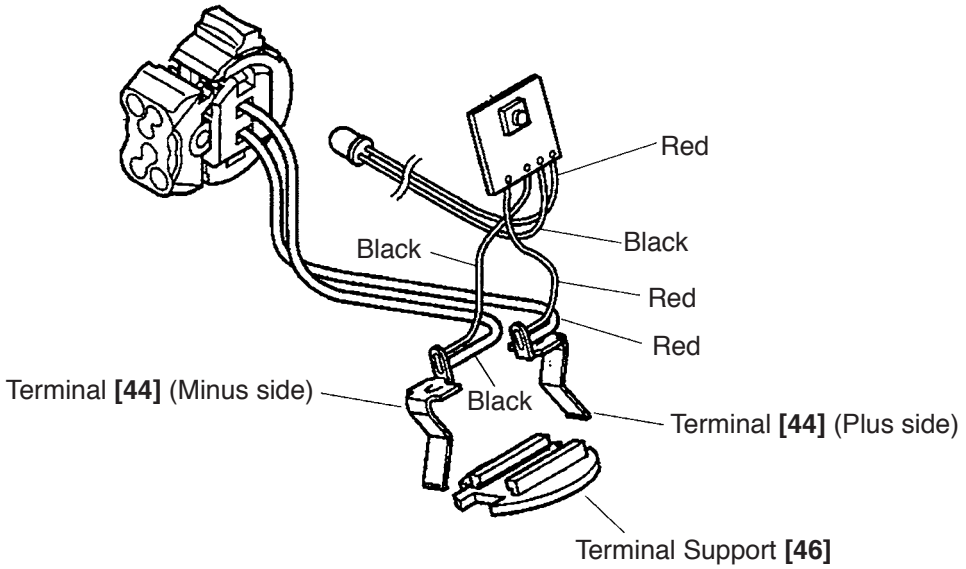


Fig. 3

(2) Reassembly of the clutch unit

(a) Mount Washer (D) **[9]** and the Spring **[8]** to the Gear Case **[11]**.

(b) Mount the Nut **[7]** to the Gear Case **[11]**. (See Fig. 4.)

Align the register mark (i) on the Nut **[7]** with the register mark on the Gear Case **[11]**. Turn the Nut **[7]** about 1-1/12 turns clockwise so that the register mark (ii) on the Nut **[7]** is aligned with the register mark on the Gear Case **[11]**. Check that the Y surface of the Nut **[7]** is aligned with the Z surface of the Gear Case **[11]**.

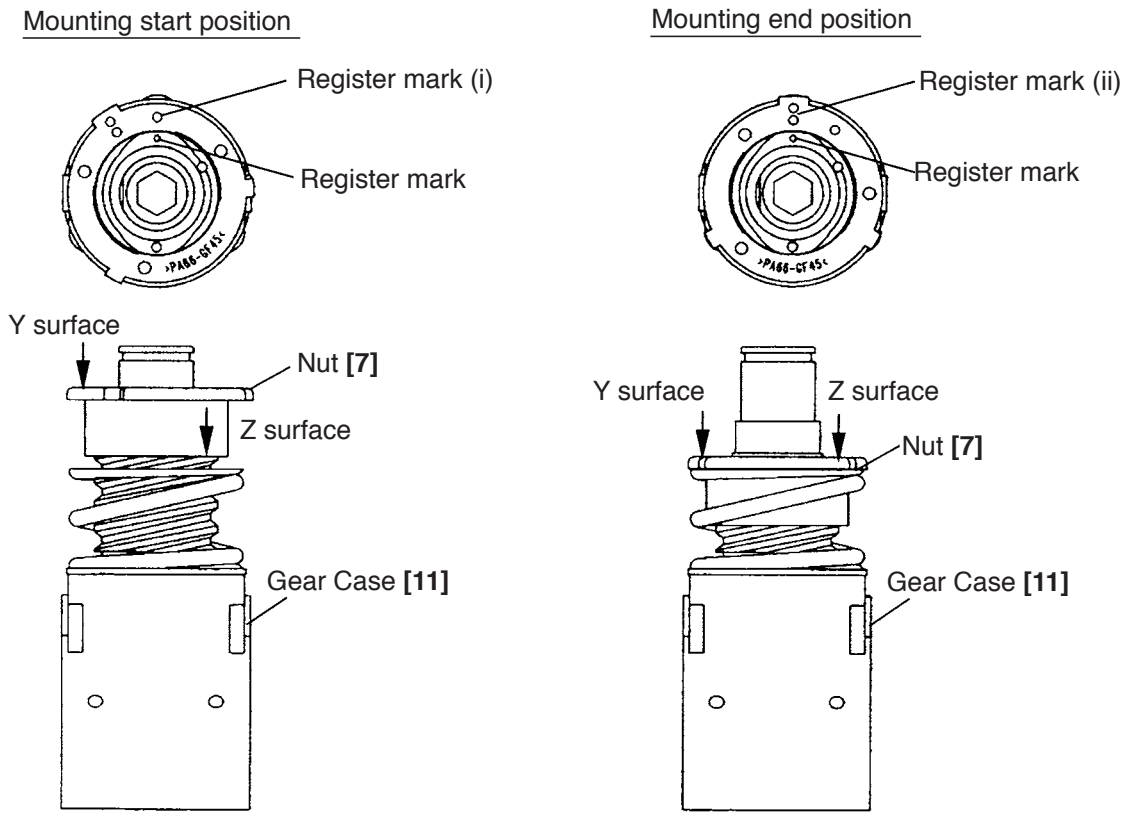


Fig. 4

(3) Reassembly of the manual tightening mechanism

(a) Mount the Lock Ring **[15]** to the Gear Case **[11]** so that the protrusion of the Lock Ring **[15]** alignes with the concave portion of the Gear Case **[11]**. At this time, mount the Lock Ring **[15]** so that the stepped protrusion faces forward.

(b) Mount the Needle Roller Set (6 pcs.) **[16]**.

NOTE: Do not apply grease to the Lock Ring [15] and the Needle Roller Set (6 pcs.) [16].

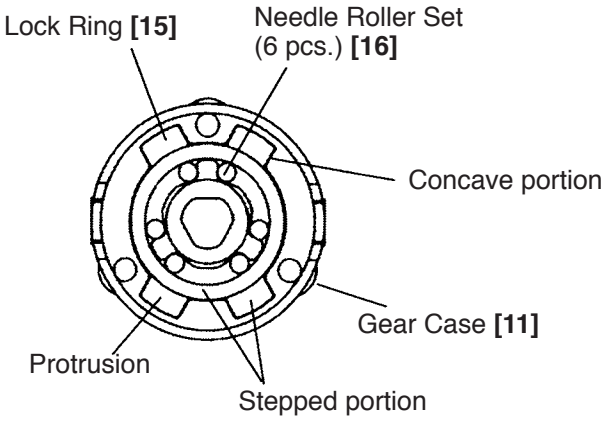


Fig. 5

(4) Reassembly of the deceleration mechanism

(a) Apply grease (Hitachi Motor Grease No. 29) to the engaging portions of each gear and the needle roller unit, and the contacting surfaces of the steel balls of the ring gear properly.

(b) Mount the parts from the Pin Set (3 pcs.) **[13]** to Washer (A) **[28]** to the part assembled in the following (2) in order. (See Fig. 6.)

(1) Mount the Pin Set (3 pcs.) **[13]** and the Steel Ball D3 **[14]**.

(2) Pay attention to the mounting direction of the Ring Gear **[20]**, Carrier **[18]**, Pinion (C) **[22]** and Pinion (B) **[25]**. (See Fig. 6.)

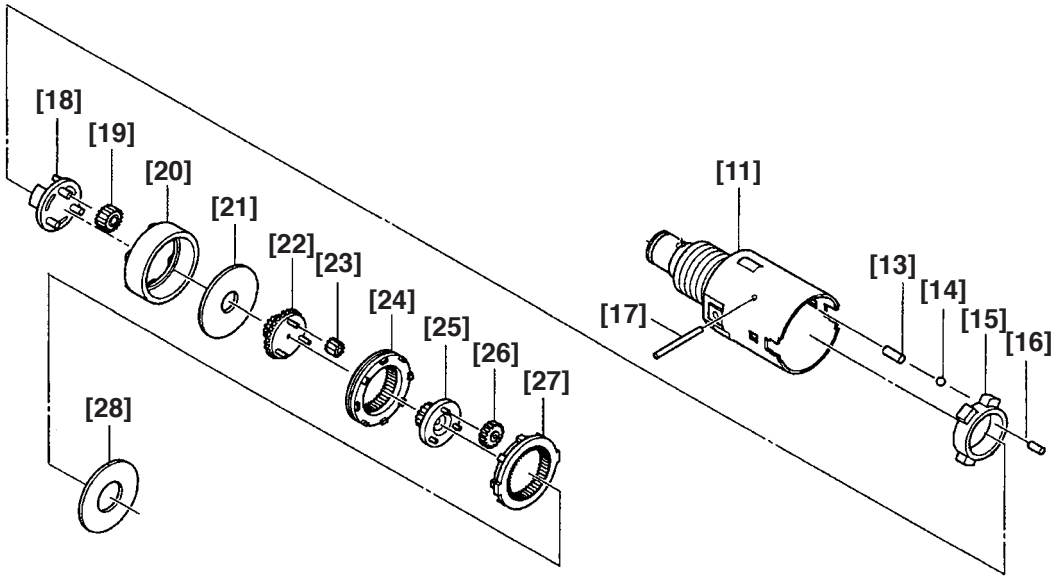


Fig. 6

(5) Reassembly of the drive unit

(a) Pay attention to the mounting direction of the Motor **[31]** and the Switch (W/Lock) **[40]**. Insert the red-marked terminal of the Motor **[31]** into the terminal at the lock switch side of the Switch (W/Lock) **[40]**. At this time, insert each terminal of the Motor **[31]** between the terminal and the convex portion of the Switch (W/Lock) **[40]**. (See Fig. 7.)

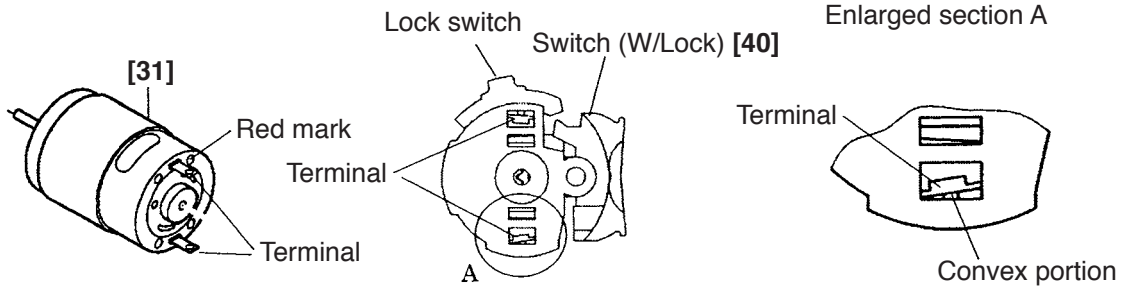


Fig. 7

(b) Mount the Motor Spacer **[30]** to the Motor **[31]** with the two Machine Screws (W/Sp. Washer) M2.6 x 8 **[29]**. Do not mistake the head and the tail of the Motor Spacer **[30]**. Note that there is no difference in circumferential direction. Pay attention to the mounting direction when mounting the Motor **[31]** to the Gear Box Ass'y **[1]**. (See Fig. 8.)

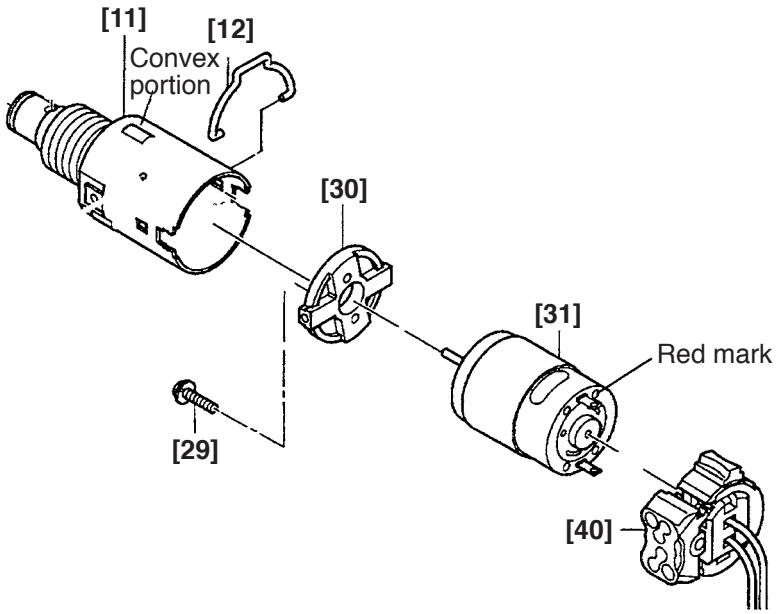


Fig. 8

(c) Mount the Shift Arm **[12]** to the Shift Knob **[39]** by pushing the Shift Arm **[12]** in the groove of the Shift Knob **[39]** completely with a small flat-blade screwdriver. Insert the end of the Shift Arm **[12]** into the hole of the Gear Case **[11]** and fit it in the groove of the Slide Ring Gear **[24]**. Pay attention to the direction of the Gear Case **[11]**. Do not mount the Shift Arm **[12]** downward. (See Fig. 9.)

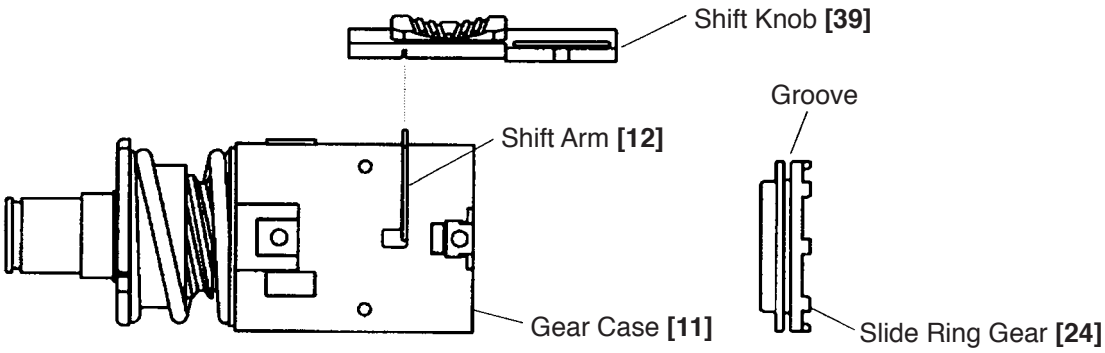


Fig. 9

(3) Mounting the Clutch Dial **[6]** to the Gear Case **[11]**

The Nut **[7]** has three protrusions. One of these protrusions is wider than the others. The Clutch Dial **[6]** has three concave portions. One of these concave portions is wider than the others. Mount the Nut **[7]** to the Clutch Dial **[6]** aligning the wider protrusion of the Nut **[7]** with the wider concave portion of the Clutch Dial **[6]**. (The wider concave portion in the Clutch Dial **[6]** is at the position indicated with "1" on the outside of the Clutch Dial **[6]**.) (See Fig. 10.)

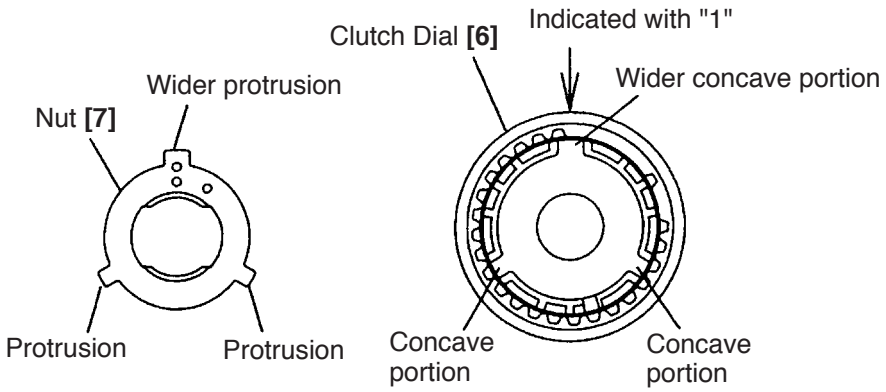


Fig. 10

(7) Reassembly of the housing unit

(a) Mount the Click Spring **[42]** to Housing (A). (B) Set **[32]** so that the convex portion of the Click Spring **[42]** can be seen. Apply grease (Hitachi Motor Grease No. 29) to the Click Spring **[42]**. (See Fig. 11.)

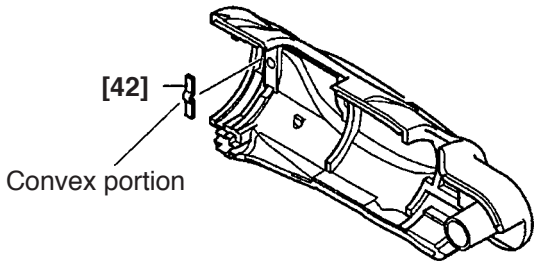


Fig. 11

(b) Mount the LED to Housing (A).(B) Set **[32]** and fix the internal wires with the seal. Put the internal wires of the LED between the ribs of Housing (A).(B) Set **[32]**. (See Fig. 12.)

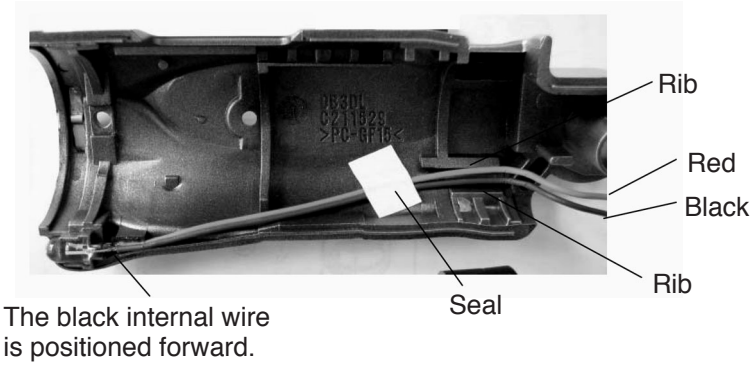


Fig. 12

(c) Mount the drive unit to Housing (A).(B) Set **[32]**. Put the internal wires of the LED and the Switch (W/Lock) **[40]** through the rib of the housing in the order of red and black internal wires of the LED, then black and red internal wires of the Switch (W/Lock) **[40]**.

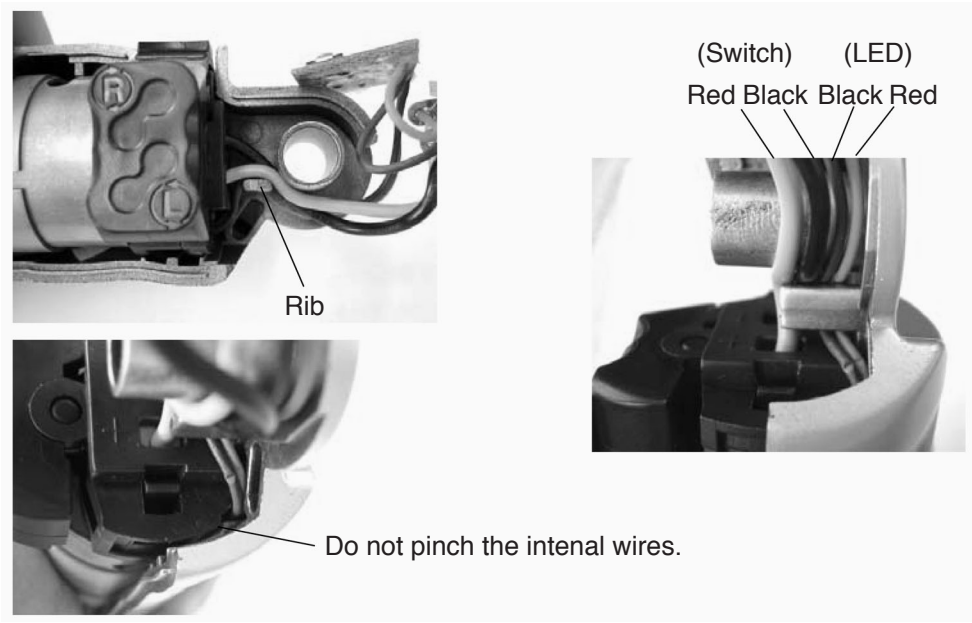


Fig. 13

(d) Close Housing (A).(B) Set **[32]** and mount the Handle Cover **[43]**. Tighten the four Pan Hd. Tapping Screws D3 x 8 **[33]**.

(e) Mount the two Click Plates **[35]** to Housing (A).(B) Set **[32]** and apply grease (Hitachi Motor Grease No. 29).

(f) Check for proper operation of the Clutch Dial **[6]**.

When the reassembly procedure is completed up to step (e), ensure that every indication on the Clutch Dial **[6]** from number "1" to the drill mark " ◁ " can be aligned with the triangle mark on Housing (A).(B) Set **[32]** respectively and that the Clutch Dial **[6]** turns moderately. If any indication on the Clutch Dial **[6]** cannot be aligned with the triangle mark on Housing (A).(B) Set **[32]**, correctly remount the Clutch Dial **[6]** according to step (2) (b) as it is improperly mounted.

(g) Check that the internal wires of the Switch (W/Lock) **[40]** do not intersect with the internal wires of the LED. (See Fig. 14.)

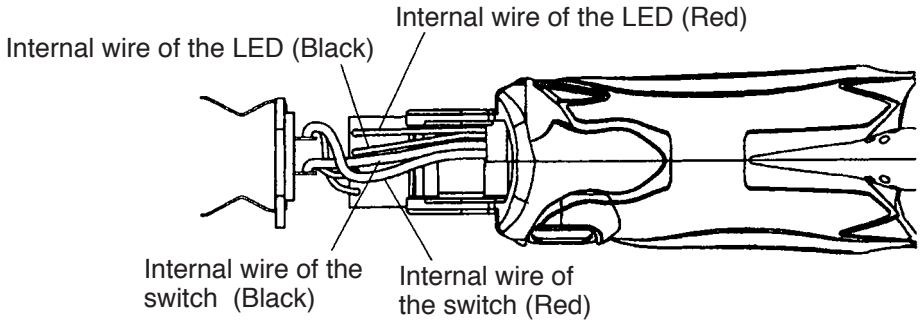


Fig. 14

(8) Reassembly of the handle unit

Mount either of Handle (A).(B) Set **[49]** to Housing (A).(B) Set **[32]**. Fit the Printed Circuit Board **[41]** and the Terminal Support **[46]** in the grooves of the handle. (See Fig. 15.) Mount the Button **[45]** to the switch of the Printed Circuit Board **[41]** and close Handle (A).(B) Set **[49]**. Tighten the Tapping Screw (W/Flange) D4 x 20 (Black) **[37]**. Mount the two Clips **[48]** to the groove of Handle (A).(B) Set **[49]** using a flat-blade screwdriver.

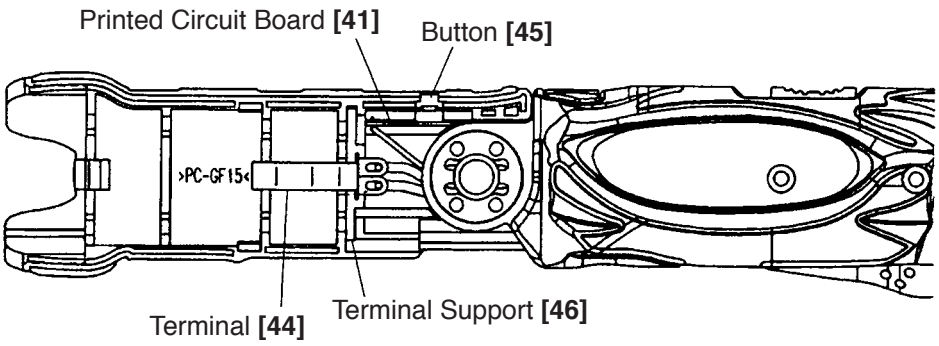


Fig. 15

(9) Mounting Guide Sleeve (A) **[5]**

Put the Steel Ball D3.5 (10 pcs.) **[10]** in the hole of the socket. Mount Guide Sleeve (A) **[5]**, Guide Spring **[4]** and Washer (D) **[3]** in sequence. Fit the Retaining Ring **[2]** in the groove of the socket using the J295 jigs (A) and (B) for retaining ring as illustrated in Fig. 16.

NOTE: Be sure to replace the Retaining Ring [2] with new one because the Retaining Ring [2] may be deformed if it is removed. Guide Sleeve (A) [5] may come off if the deformed Retaining Ring [2] is used again.

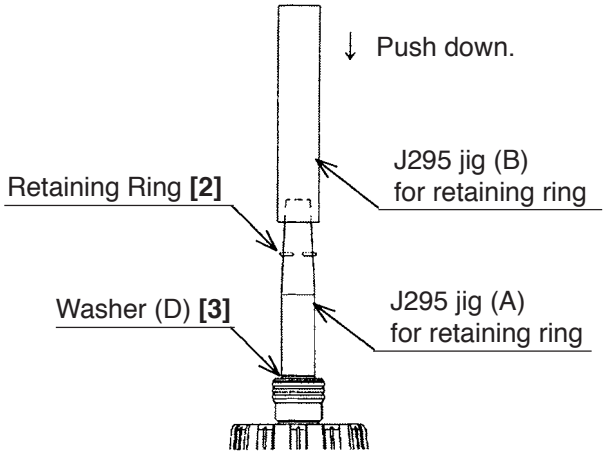


Fig. 16

(10) Other precautions in reassembly

After completion of reassembly, set the storage battery and check for operation.

(a) Check the rotating direction of Guide Sleeve (A) **[5]**.

Press the (R) side of the Switch (W/Lock) **[40]** to check that Guide Sleeve (A) **[5]** rotates clockwise as viewed from behind.

(b) Check for proper operation of the Shift Knob **[39]**.

Check that the speed changes between high and low properly by shifting the Shift Knob **[39]**. If the speed does not change properly or moderately, correctly remount the Shift Knob **[39]** according to step (6) (c) as it is improperly mounted.

(c) Check that the LED is lit and turned off by pushing the Button **[45]**. (Although the LED cannot react when turned on/off too quickly, it is not a failure.)

(d) Check for flexible change of the handle between L shape and straight shape.

(11) Screw tightening torque

Machine Screw (W/Sp. Washer) M2.6 x 8 **[29]**	: 0.1 — 0.2 N·m {1 — 3 kgf·cm}
Pan Hd. Tapping Screw D3 x 8 **[33]**	: 0.49 — 0.64 N·m {5 — 6.5 kgf·cm}
Tapping Screw (W/Flange) D4 x 20 (Black) **[37]**	: 1.5 — 2.5 N·m {15 — 25 kgf·cm}

9-2. Precautions in Disassembly and Reassembly of Battery Charger

Please refer to the Technical Data and Service Manual for precautions in disassembly and reassembly of the Battery Charger Model UC 3SFL.

10. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable / Fixed	10	20	30	40	50	60
DB 3DL		Work Flow					
				Housing (A).(B) Set			
	General Assembly						
		Handle (A). (B) Set	Motor				
		Click Plate	Shift Knob				
			Switch				
			Gear Box Ass'y				
		Guide Sleeve Set	Clutch Dial				
			Nut				
			Spring				
			Gear Case				
			Shift Arm				
			Lock Ring				
			Carrier				
			Planet Gear (C) Set				
			Ring Gear				
			Pinion (C)				
			Planet Gear (B) Set				
			Slide Ring Gear				
			Pinion (B)				
			Planet Gear (A) Set				
			First Ring Gear				

Hitachi Power Tools

LIST NO. G857

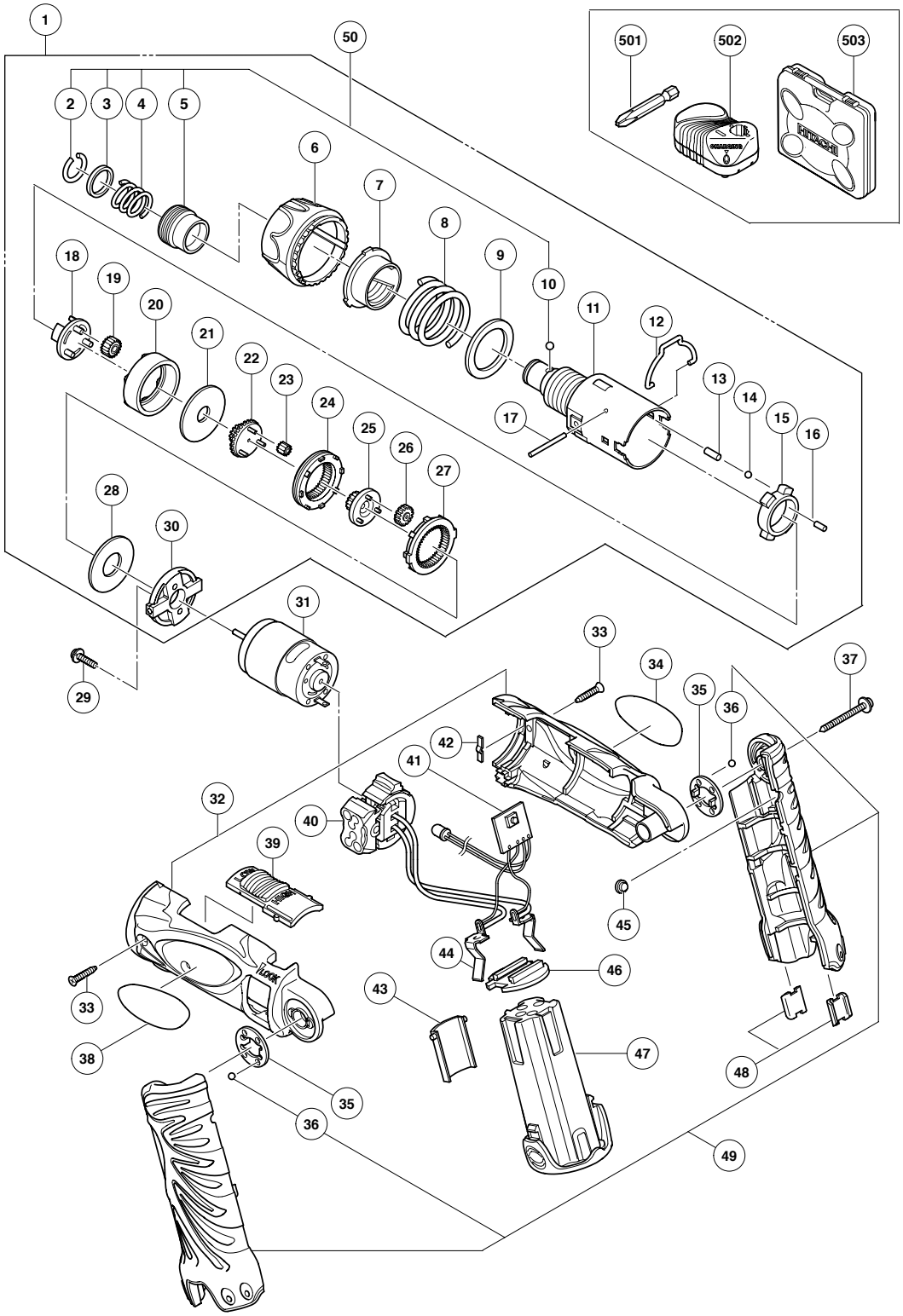
ELECTRIC TOOL PARTS LIST

■ CORDLESS DRIVER DRILL

2006 · 9 · 15

Model DB 3DL

(E1)



	ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
	1	326-348	GEAR BOX ASS'Y	1	INCLUD. 2-28, 30	
	2	315-984	RETAINING RING	1		
	3	315-983	WASHER (D)	1		
	4	320-409	GUIDE SPRING	1		
	5	319-921	GUIDE SLEEVE (A)	1		
	6	326-342	CLUTCH DIAL	1		
	7	326-341	NUT	1		
	8	326-340	SPRING	1		
	9	326-339	WASHER (D)	1		
	10	319-535	STEEL BALL D3.5 (10 PCS.)	1		
	11	326-349	GEAR CASE	1		
	12	326-345	SHIFT ARM	1		
	13	326-338	PIN SET (3 PCS.)	3		
	14	317-788	STEEL BALL D3	3		
	15	326-323	LOCK RING	1		
	16	326-324	NEEDLE ROLLER SET (6 PCS.)	6		
	17	326-329	NEEDLE	2		
	18	326-325	CARRIER	1		
	19	326-327	PLANET GEAR (C) SET (3 PCS.)	3		
	20	326-326	RING GEAR	1		
	21	326-328	WASHER (B)	1		
	22	326-330	PINION (C)	1		
	23	326-332	PLANET GEAR (B) SET (3 PCS.)	3		
	24	326-331	SLIDE RING GEAR	1		
	25	326-333	PINION (B)	1		
	26	326-335	PLANET GEAR (A) SET (3 PCS.)	3		
	27	326-334	FIRST RING GEAR	1		
	28	326-336	WASHER (A)	1		
	29	326-319	MACHINE SCREW (W/SP. WASHER) M2.6X8	2		
	30	326-337	MOTOR SPACER	1		
	31	326-310	MOTOR	1		
	32	326-307	HOUSING (A).(B) SET	1		
	33	984-319	PAN HD. TAPPING SCREW D3X8	4		
	34		NAME PLATE	1		
	35	326-315	CLICK PLATE	2		
	36	317-788	STEEL BALL D3	4		
	37	302-086	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	1		
	38		HITACHI LABEL	1		
	39	326-308	SHIFT KNOB	1		
	40	326-311	SWITCH (W/LOCK)	1		
	41	326-313	PRINTED CIRCUIT BOARD	1		
	42	326-309	CLICK SPRING	1		
	43	326-314	HANDLE COVER	1		
	44	326-312	TERMINAL	2		
	45	326-317	BUTTON	1		
	46	326-316	TERMINAL SUPPORT	1		
*	47	326-299	BATTERY EBM 315 (EUROPE, AUS, NZL)	2		
*	47	326-263	BATTERY EBM 315 (USA, CAN)	2		
	48	326-318	CLIP	2		
	49	326-347	HANDLE (A).(B) SET	1	INCLUD. 36	
	50	320-085	GUIDE SLEEVE SET	1	INCLUD. 2-5, 10	

STANDARD ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501	992-671	+ DRIVER BIT (B) NO. 2 50L	1		
502		CHARGER (MODEL UC 3SFL)	1		
503	326-346	CASE	1		

OPTIONAL ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
601	326-665	HOLSTER	1		
602	992-670	+ DRIVER BIT (B) NO. 1 50L	1		
603	992-672	+ DRIVER BIT (B) NO. 3 50L	1		
604	992-675	- DRIVER BIT (B) 4MMX50	1		
605	992-676	- DRIVER BIT (B) 5MMX50	1		
606	992-677	- DRIVER BIT (B) 6MMX50	1		
607	321-823	DRILL CHUCK AND ADAPTER SET	1	INCLUD. 608, 609	
608	307-543	CHUCK ADAPTER	1		
609	987-575	CHUCK WRENCH FOR 10VLB-D, 10VLR-D	1		

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	

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Hitachi Koki Co., Ltd.

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