

MODEL

DV 12DV

HITACHI
POWER TOOLS

**CORDLESS IMPACT DRILL
DV 12DV**

**TECHNICAL DATA
AND
SERVICE MANUAL**

D



LIST No. F852

Jul. 2001

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

Notice for use

Specifications and parts are subject to change for improvement.

Refer to Hitachi Power Tool Technical News for further information.

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
P	DEWALT	DW912K
C	MAKITA	8412DWA

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1. PRODUCT NAME

Hitachi 12 V Cordless Impact Drill, Model DV 12DV

2. MARKETING OBJECTIVE

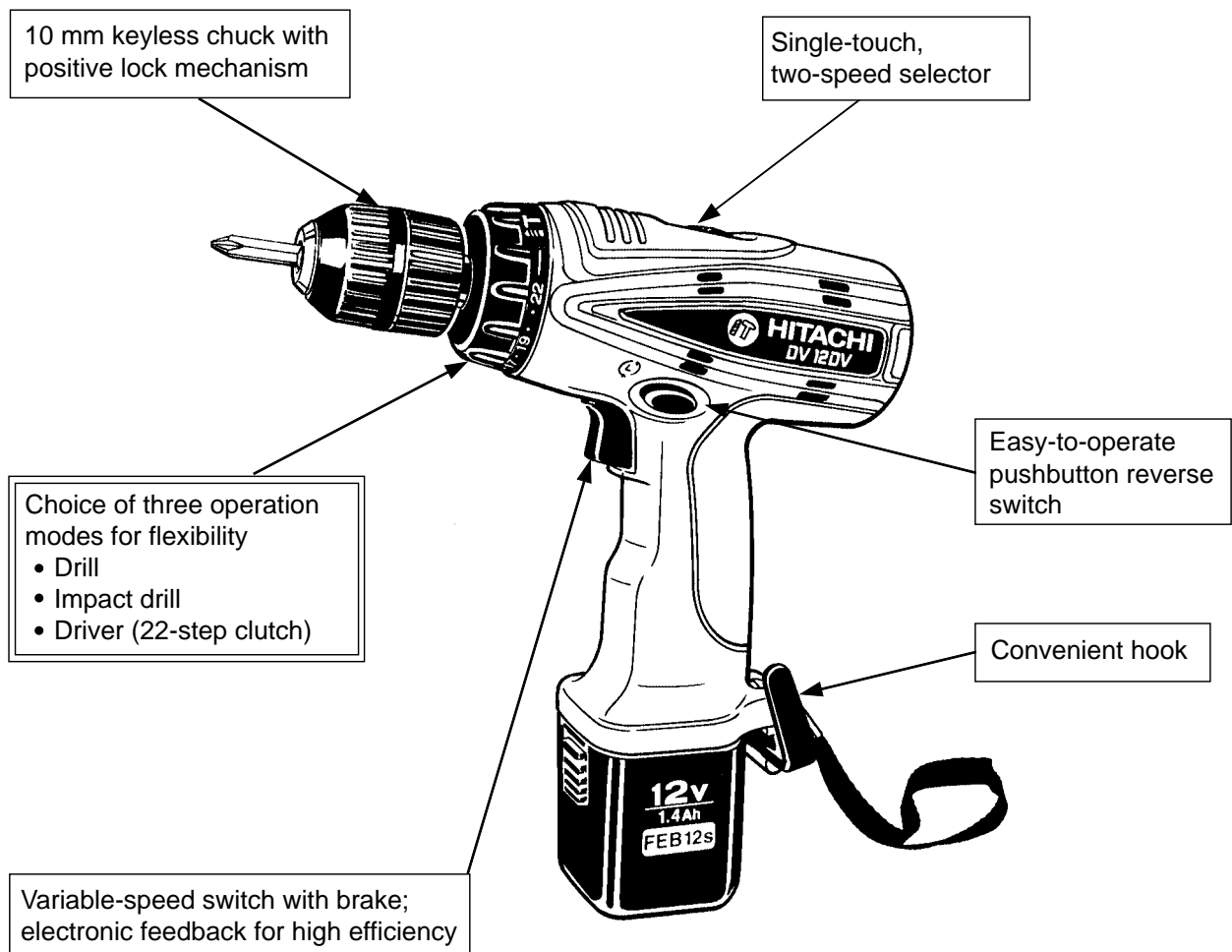
European competitors are now preparing to have a wide selection of cordless impact drills (combination drills), and it is expected that cordless impact drills will be the growing segment of the power tool industry.

The Model DV 12DV cordless impact drill has been newly developed as an upgraded version of the current Model DV 10DVA. The Model DV 12DV is more powerful than the Model DV 10DVA and equipped with the T-type handle and the 22-step clutch for easier operation as a driver drill.

3. APPLICATIONS

- Drilling into brick and concrete block
- Drilling into wood, metal and plastic
- Driving and loosening machine screws, wood screws and tapping screws

4. SELLING POINTS



4-1. Selling Point Descriptions

4-1-1. Choice of three operation modes for flexibility

This Model can be easily switched between three modes, screwdriving, drilling and impact drilling, simply by turning the cap dial. To use it as a screwdriver, set the cap to any position between 1 and 22, depending on the types of screws and the material to be fastened. The clutch is then coupled to adjust the tightening force among the corresponding 22 different levels.

In order to fasten large wood screws and drill metals, woods and plastics, align the cap drill mark "◁□□□" with the triangle mark on the main body. The clutch is then directly coupled to provide the maximum power output. Drilling into very hard materials such as brick and concrete block can be efficiently carried out by aligning the cap impact mark "⊣" with the triangle mark on the main body. (See Fig. 1.)

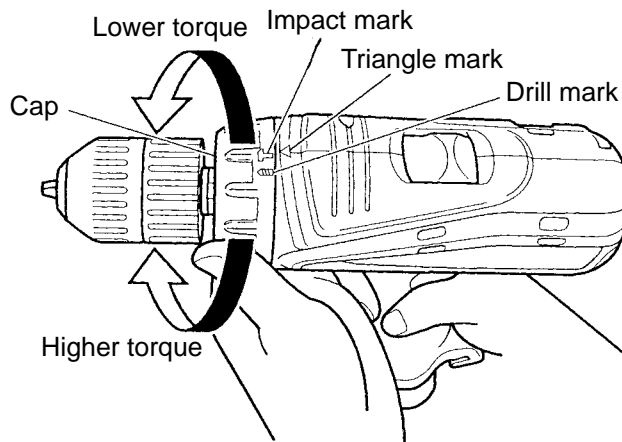


Fig. 1

4-1-2. Variable-speed switch with brake (and electronic feedback mechanism)

The brake immediately brings the operation to a stop with a simple release of the switch lever, making the unit most convenient for continuous screw tightening and drilling.

The variable-speed switch is able to freely control the rotation speed depending on how far the switch lever is pulled, between 0 and 350/min. for the low speed mode and between 0 and 1,250 min. for the high speed mode.

This facilitates positional adjustment, for instance, when tightening a wood screw.

The feedback mechanism ensures a greater torque even in the lower end of the variable-speed range.

4-1-3. 10 mm keyless chuck with positive lock mechanism

The handle-free keyless chuck makes replacement of bits easier. Replace the drill or driver bit simply by turning the sleeve with one hand while holding the ring with the other. (See Fig. 2.)

The lock mechanism is provided to prevent loosening of the chuck during operation.

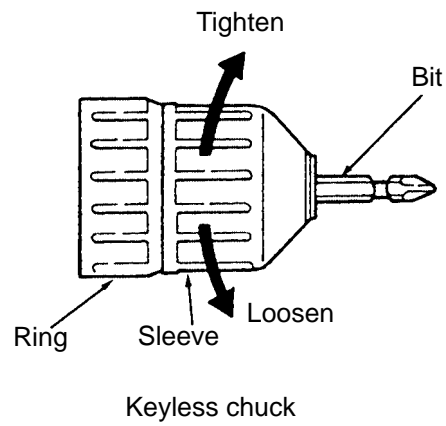


Fig. 2

5. SPECIFICATIONS

Capacity (Low/High)	Drilling	Brick 10 mm (3/8")/10 mm (3/8") [Depth 30 mm (1-3/16")] Metal Mild steel 10 mm (3/8")/6.5 mm (1/4") [Thickness 1.6 mm (1/16")] Aluminum 10 mm (3/8")/6.5 mm (1/4") [Thickness 1.6 mm (1/16")] Wood..... 18 mm (23/32")/18 mm (23/32") [Thickness 18 mm (23/32")]
	Screw driving	Wood screw 5.1 dia. x 32 mm (#11 x 1-1/4") /4.8 dia. x 40 mm (#10 x 1-9/16") Machine screw 6 mm (1/4")
Keyless chuck (13VLR-N)		Mount type Screw-on (UNF 1/2" – 20) Diameter 0.8 – 10 mm (1/32" – 3/8")
Rotation speed (No-load)		Low: 0 – 350/min. High: 0 – 1,250/min.
Impact rate (No-load)		Low: 0 – 5,250/min. High: 0 – 18,750/min.
Torque		Slip torque 1.0 – 5.9 N•m (10 – 60 kgf•cm, 9 – 52 in-lbs.) [22 stages] Max. torque 24 N•m (245 kgf•cm, 213 in-lbs.)
Type of motor		DC magnet motor
Type of switch		Trigger switch with change lever for CW* and CCW** rotation(w/o stopper)
Handle configuration		T-type
Enclosure		Body Glassfiber reinforced polycarbonate resin (green) Battery ABS resin (black) Charger ABS resin (black)
Battery (Type FEB12S)	Kind of battery	Sealed cylindrical nickel-cadmium storage battery
	Nominal battery	DC 12 V
	Nominal life	Charging/discharging: approximately 500 times
	Nominal capacity	1.4 Ah
	Charging time	60 minues (with standard accessory charger at ambient temperature of 20°C)
Ambient charging temperature		10 °C – 40°C (50°F – 104°F)
Charger (Model UC 12SD)		<ul style="list-style-type: none"> • 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: 51 W • Indication method: Pilot lamp indicator of battery charging • Function: On During charging Off Charging completed
Weight	Net	Main body unit (including battery) 1.9 kg (4.2 lbs.) Charger unit (including cord) 1.4 kg (3.1 lbs.)
	Gross	Main body and standard accessories DV 12DV (SSX) 5.7 kg (12.6 lbs.) DV 12DV (SSK) 6.0 kg (13.2 lbs.)
Standard accessories	DV 12DV (SSX)	Charger (UC12SD) 1 Battery 1 Cross-recessed head (plus) driver bit (No. 2) 1 Case 1 Bit set 1 Torchlight 1
	DV 12DV (SSK)	Charger (UC12SD) 1 Battery 2 Cross-recessed head (plus) driver bit (No. 2) 1 Case 1 Bit set 1

CW*: Clockwise

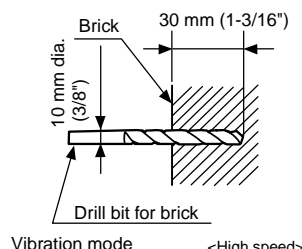
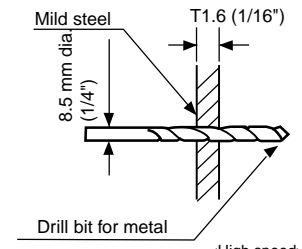
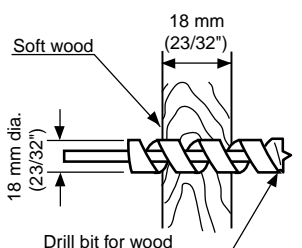
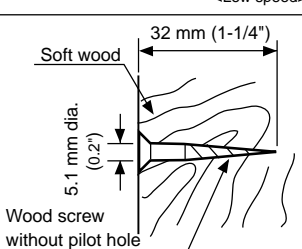
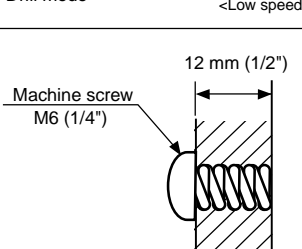
CCW**: Counterclockwise

6. COMPARISONS WITH SIMILAR PRODUCTS

Maker		HITACHI	HITACHI	P	C	
Model		DV 12DV	DV 10DVA			
Max. capacity	Drilling	Brick	10 mm (3/8")	10 mm (3/8")	10 mm (3/8")	10 mm (3/8")
		Mild steel	10 mm (3/8")	10 mm (3/8")	13 mm (1/2")	10 mm (3/8")
		Soft wood	18 mm (23/32")	18 mm (23/32")	25 mm (1")	24 mm (15/16")
	Screw driving	Wood screw	5.1 mm dia. x 32 mm length (#11 x 1-1/4")	5.1 mm dia. x 32 mm length (#11 x 1-1/4")	Not indicated	6.4 mm dia. x 55 mm length (#14 x 2-5/32")
		Machine screw	6 mm (1/4")	6 mm (1/4")	Not indicated	Not indicated
Rotation speed (min ⁻¹)	Low	0 – 350	0 – 350	0 – 460	0 – 370	
	High	0 – 1,250	0 – 1,100	0 – 1,400	0 – 1,200	
Impact rate (min ⁻¹)	Low	0 – 5,250	0 – 6,300	0 – 5,000	0 – 4,100	
	High	0 – 18,750	0 – 19,800	0 – 15,400	0 – 12,700	
Slip torque		1.0 – 5.9 N•m 10 – 60 kgf•cm (9 – 52 in-lbs.)	1.0 – 4.9 N•m 10 – 50 kgf•cm (9 – 43 in-lbs.)	Not indicated	Not indicated	
		[22 stages]	[5 stages]	[15 stages]	[10 stages]	
Max. torque		24 N•m (245 kgf•cm) (213 in-lbs.)	14 N•m (143 kgf•cm) (124 in-lbs.)	32 N•m (326 kgf•cm) (283 in-lbs.)	20.5 N•m (209 kgf•cm) (182 in-lbs.)	
Battery	Nominal capacity	1.4 Ah	1.3 Ah	2.0 Ah	2.0 Ah	
	Nominal voltage	12 V	12 V	12 V	12 V	
	Charging time*	60 minutes	60 minutes	60 minutes	60 minutes	
Drill chuck	Capacity	10 mm (3/8")	10 mm (3/8")	13 mm (1/2")	13 mm (1/2")	
	Type	Keyless	Keyless	Keyless	Keyless	
Switch	Feedback circuit	Equipped	Equipped	Equipped	Equipped	
	Electric brake	Equipped	Equipped	Equipped	Equipped	
Dimensions	Overall length	232 mm (9-9/64")	284 mm (11-3/16")	235 mm (9-1/4")	313 mm (12-21/64")	
	Overall height	255 mm (10-3/64")	240 mm (9-29/64")	255 mm (10-3/64")	225 mm (8-55/64")	
Weight		1.9 kg (4.2 lbs.)	1.9 kg (4.2 lbs.)	1.9 kg (4.2 lbs.)	2.2 kg (4.9 lbs.)	

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

7. WORKING PERFORMANCE PER SINGLE CHARGE

Task description	Maker	Model	Working capacity (*1)			Working time (sec./pc.)
			*2 250 100	*2 500 200	*2 750 300	
 <p>Vibration mode <High speed></p>	HITACHI	DV 12DV	43			6.5
		DV 10DVA	40 (43)			9.7
	P	68 (48)			7.7	
	C	37 (26)			10.8	
 <p>Drill mode <High speed></p>	HITACHI	DV 12DV	65			7.5
		DV 10DVA	60 (65)			7.7
	P	90 (65)			5.5	
	C	60 (45)			7.7	
 <p>Drill mode <Low speed></p>	HITACHI	DV 12DV	148			3.7
		DV 10DVA	125 (135)			4.5
	P	185 (130)			3.8	
	C	140 (98)			4.2	
 <p>Drill mode <Low speed></p>	HITACHI	DV 12DV	180			2.8
		DV 10DVA	180 (170)			2.8
	P	245 (170)			2.4	
	C	185 (130)			2.7	
 <p>Max. clutch position <High speed></p>	HITACHI	DV 12DV		*2 615		0.6
		DV 10DVA		*2 445 (480)		0.7
	P			*2 545 (380)		0.6
	C			*2 440 (305)		0.7

- The above table shows an example of test data obtained by using the battery which is standard for this tool. Working capacity and working time may increase or decrease depending on the sharpness of the drill bit, the condition of the material and work method.
- Figures in parentheses () indicate values for the 1.4 Ah battery.
Remarks *1 Number of holes or fastenings per charge
Remarks *2 Number of machine screws fastened per charge

8. PRECAUTIONS IN SALES PROMOTION

8-1. Safety Instructions

In the interest of promoting the safest and most efficient use of the Model DV 12DV Cordless Impact 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 in the use of cordless (battery charger type) electric power 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 out of use, such as during shipping, cause the storage battery to lose its charge.

The customers must be instructed to fully charge the unit prior to use.

- (2) When charging storage batteries, use only the exclusive Model UC 12SD charger provided with the tool.

Because of the designed rapid-charging feature (about one hour), 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 over and above 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 the customer is instructed to use the charger at the indicated ambient temperature range. At temperatures under 10 °C (50 °F), the thermostat will not function properly, and the storage battery may be overcharged.

At temperatures 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 temperatures, 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 of 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 the 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 Type FEB 12S Storage Battery

Ensure that all customers understand that Type FEB 12S 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 plates

(1) The following cautions are listed on the Name Plate attached to the main body of each tool. Be particularly careful to ensure that the customer understands the necessity of locking the switch prior to bit replacement, cleaning, inspection or transporting of the tool when not in use.

For Oceania

CAUTION

- Read thoroughly **HANDLING INSTRUCTIONS** before use.

For the U.S.A. and Canada

Warning

- To reduce the risk of injury, user must read and understand **Instruction Manual**.

AVERTISSEMENT

- Afin de réduire le risque de blessures, l'utilisateur doit lire et bien comprendre le mode d'emploi.

(2) The following cautions are listed on the Name Plate attached to each Type FEB 12S Storage Battery.

For Europe, Asia and Oceania

- CAUTION**
- Read thoroughly **HANDLING INSTRUCTIONS** before use.
 - Do not disassemble or throw into fire.

For the U.S.A.

- CAUTION**
- For safe operation, see **instruction manual**.
 - Use **HITACHI Charger UC 12SD** for recharging.

8-2. Inherent Drawbacks of Cordless Impact Drills Requiring Particular Attention during Sales Promotion

The cordless impact 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 electric power 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 impact drill for comparatively light-duty work.

Because it is battery driven, the output of the motor in cordless impact drill is rather low in comparison with conventional plug-in type models. Accordingly, it is not suitable for continuous drilling of many holes in succession, or for drilling into particularly hard materials which require a heavy load. Salespersons should recommend conventional plug-in type models for such heavy work.

- (2) Drilling of large diameter holes should be conducted at low speed.

Instruct the customer that drilling of large diameter holes or other work which requires particularly strong torque should be attempted at low speed. Because there is less torque at high speed, attempting such work at high speed will not improve working efficiency.

- (3) Do not place any foreign substance in the vent hole of the main body.

The outer frame of this unit is provided with a vent hole for greater cooling efficiency. Since the motor has a built-in cooling fan, a foreign substance inserted into the vent hole is likely to cause mechanical failure. Alert your customer to never cover or block the vent hole.

- (4) Use a drive force of 100 to 150 N (10 – 15 kgf, 22 – 33 lbs).

It would not accelerate the drilling speed of this unit to apply a strong drive force as is done with a usual AC impact drill. It would instead damage the drill bit, resulting not only in a poorer working efficiency but also burning out the motor.

- (5) Avoid "locking" of the motor.

Locking of the motor will cause an overload current that could result in burning out 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 for reverse rotation, or by manually turning the main body of the tool.)

- (6) Variation in amount of work possible per charge

Although the nominal chargeable capacity of the storage batteries used with the Model DV 12DV is 1.4 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.

(7) Precautions in the use of HSS drill bits

Although the Model DV 12DV is designed for drilling capacities of 18 mm (23/32") in wood, and 10 mm (3/8") into aluminum and mild steel, its capability is not as efficient as conventional plug-in type models. In particular when drilling through aluminum material with a 10 mm (3/8") drill bit, the drill bit tends to become locked when the drill bit penetrates the material. For this reason, the customer should be cautioned to reduce the pressure on the main body of the drill just before 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 out of the motor.

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

If the Type FEB 12S 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 a battery (type FEB 12S) is above 40°C (104 °C). In such a case, the customer should be advised to place the battery in a shaded area with a good airflow, and allows 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. REFERENCE MATERIALS

9-1. Speed Control Mechanism

Spindle rotation speed of the Model DV 12DV can be controlled by simply varying the amount by which the trigger switch is depressed. The relationship between the amount the trigger switch is depressed (in millimeters) and the rotation speed is illustrated in Fig. 3.

Note: The gradient and values illustrated in Fig. 3 are intended for reference only, and will vary slightly due to differences in the discharge condition of the battery, the ambient temperature, and individual speed-control element accuracy.

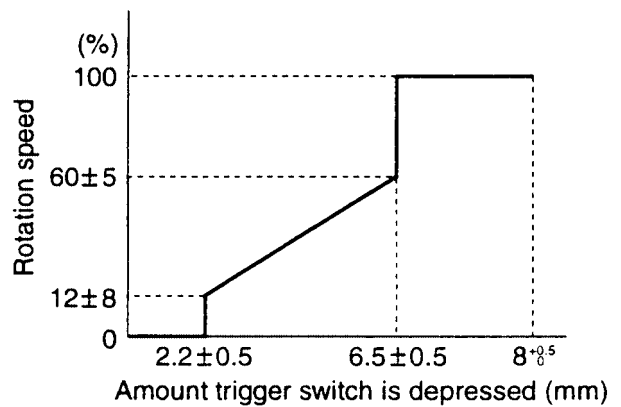


Fig. 3

10. REPAIR GUIDE

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

10-1. Precautions in Disassembly and Reassembly

The **[Bold]** numbers in the description below correspond to the item numbers in the Parts List and exploded assembly diagram for the Model DV 12DV.

10-1-1. Disassembly

(1) Removal of the Drill Chuck 10VLR-N (W/O Chuck Wrench) **[2]** (See Fig. 4.)

Remove the Drill Chuck 10VLR-N (W/O Chuck Wrench) **[2]** of the fully assembled main body in accordance with the following procedures.

- (a) Fully open the jaws of the Drill Chuck 10VLR-N (W/O Chuck Wrench) **[2]**, and turn the Special Screw (Left Hand) M6 x 23 **[1]** clockwise and remove it. Take care that it is left-hand threaded.
- (b) Fix the hexagonal bar wrench M10 into the Drill Chuck 10VLR-N (W/O Chuck Wrench) **[2]** as indicated in Fig.4. Next, apply the Wrench 14 mm (special repair tool, Code No. 873929) **[601]** to the flat surfaces on the spindle to hold it steady, and remove it by turning counterclockwise. If it is difficult to loosen, use a pipe extension or similar tool.

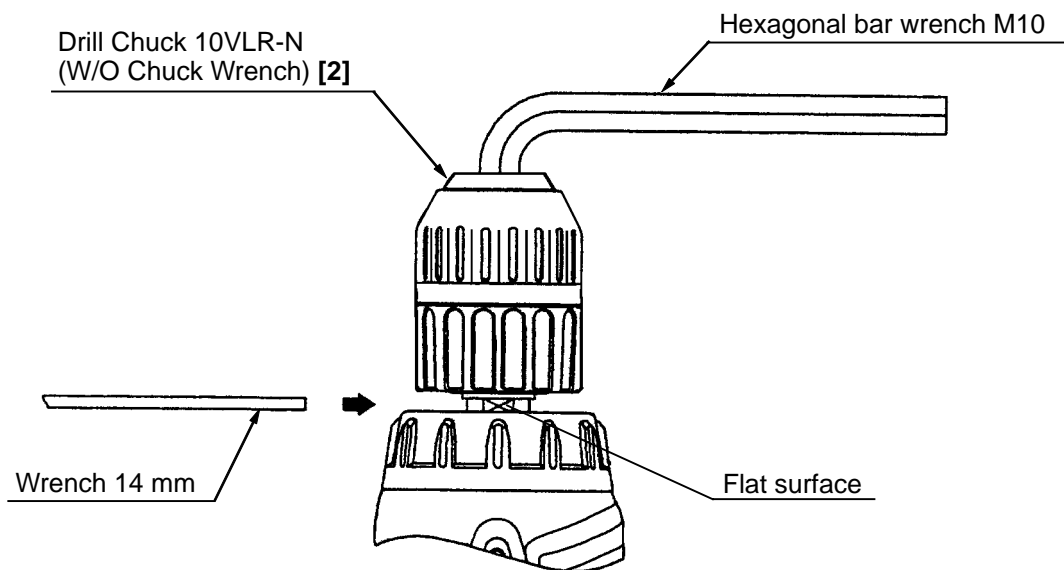


Fig. 4

(2) Removal of Housing (B) **[36]**

First, align the drill mark " " on the Cap **[4]** with the triangle mark on Housing (A). (B) Set **[36]**.

Remove the seven Tapping Screws (W/Flange) D3 x 16 (Black) **[32]** secured to the main body. Gently open Housing (A). (B) Set **[36]** while holding their battery loading sections.

(3) After Housing (B) **[36]** has been removed, all the internal parts, assembled or separate, can be taken out as they are. Lift the entire contents from Housing (A) **[36]** while holding the Motor **[31]** and the Cap **[4]**.

(4) Disassembly of the gear unit

- (a) Remove the Cap [4] from the Front Case [12]. Take care not to remove the Switch Plate [8] and the Nut [9] from the Front Case [12] in this operation.
- (b) Turn the Motor [31] counterclockwise when viewed from the rear and remove it from the Rear Case [20].
- (c) Remove the Shift Arm [22] from the Rear Case [20], and remove the Shift Knob [42] from the Shift Arm [22].
- (d) Remove the Screw Set M3 x 12 (4 pcs.) [21] connecting the Front Case [12] and the Rear Case [20].
- (e) Remove Washer (A) [19], Planet Gear (C) Set (3 pcs.) [18], Carrier [17], Ring Gear [16], Spacer Washer [15], six Steel Balls D5 [14] and six Rollers [13] in sequence from the Front Case [12]. Take care not to lose the six Steel Balls D5 [14] and the six Rollers [13] in this operation.

(5) Removal of the Switch Plate [8]

Turn the switch flange so as to fit the projection of the switch flange to the recess of the Switch Plate [8], then remove the Switch Plate [8] from the Front Case [12]. (See Fig. 5.)

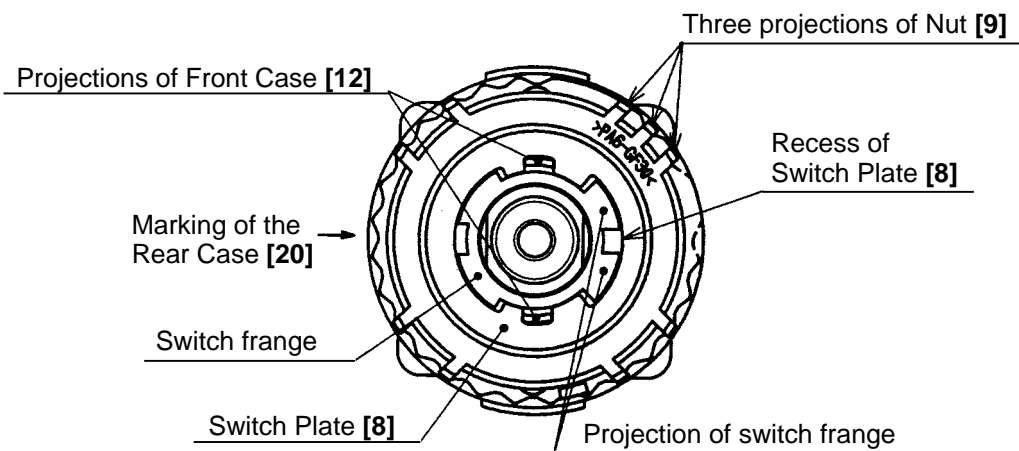


Fig. 5

(6) Removal of the Spring [10] and the Thrust Washer [11]

Turn the Nut [9] counterclockwise and remove it from the Front Case [12], then remove the Spring [10] and the Thrust Washer [11] from the Front Case [12].

(Note) Do not remove the Front Case [12].

(7) Removal of the O-ring [6]

Pull out the Lock Washer [7] from the Cap [4] and remove the O-ring [6]. (See Fig. 6.)

(8) Disassembly of the power supply unit

(Note) Do not remove the fin secured to the DC-speed Control Switch [39] with a screw.

Remove the two Machine Screws (W/SP. Washers) M4 x 6 [35], and take the Motor [31] and the Motor Spacer [30] apart.

Disconnect the Internal Wires (Black) [37] and (Red) [38] from the Motor [31] with a soldering iron, then disconnect them from the DC-speed Control Switch [39] with a soldering iron in the same manner.

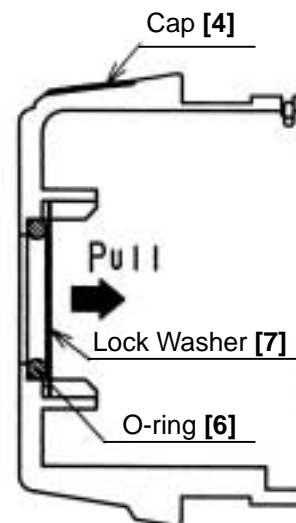


Fig. 6

10-1-2. Reassembly

Reassembly can generally be carried out as the reverse of the disassembly procedure, with some items to be noted as follows.

(1) Reassembly of the power supply unit

(a) Mount the Ferrite Core [41], Internal Wire (Black) [37] and Internal Wire (Red) [38] as shown in Fig. 7.

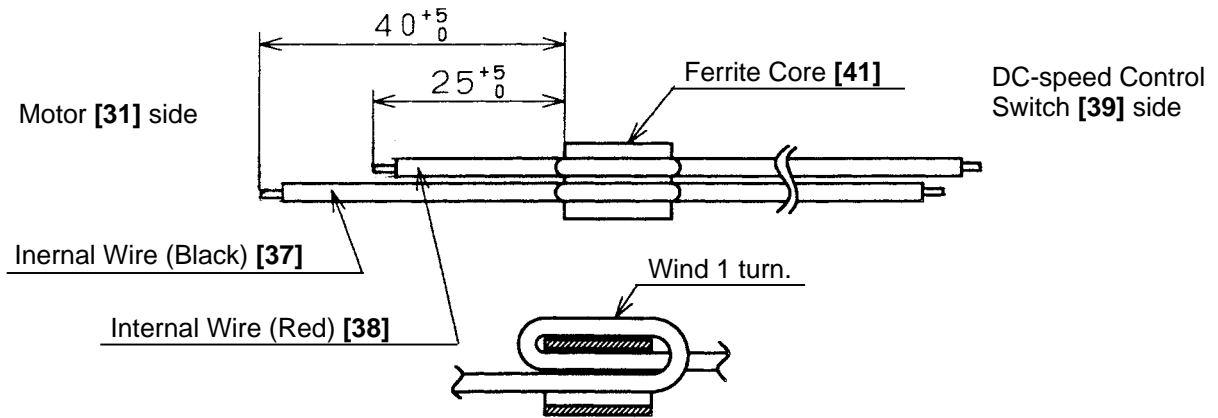


Fig. 7

(b) Be sure to perform wiring connections as indicated in the wiring diagram. (See Fig. 8.)

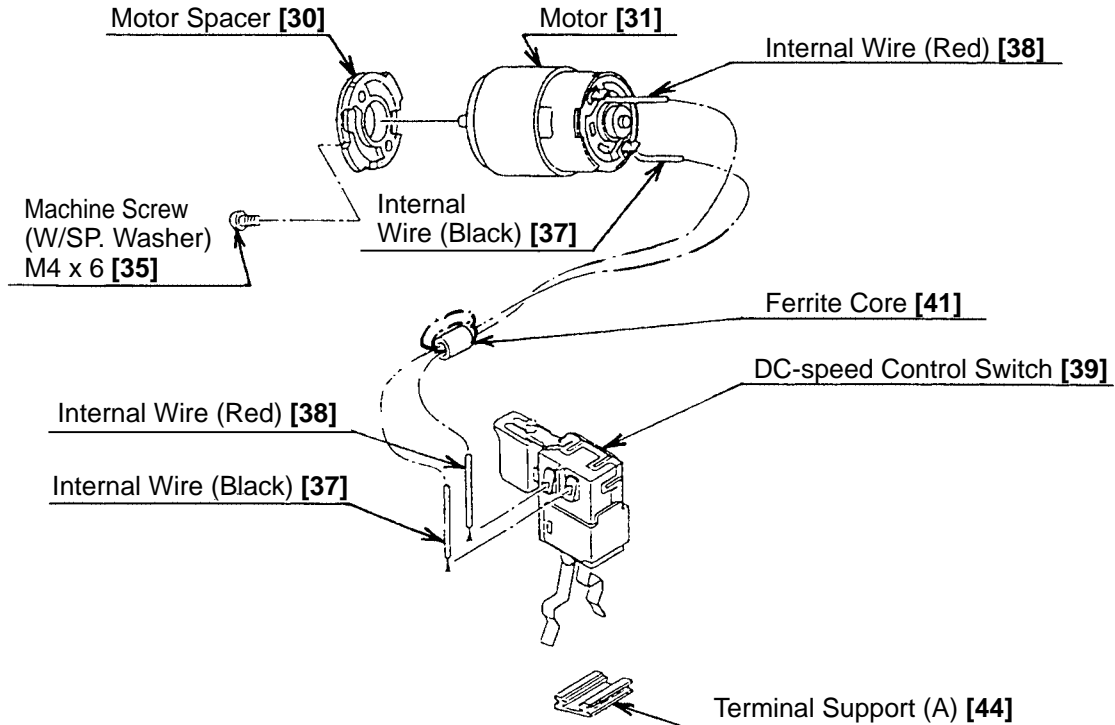


Fig. 8

- (c) Pay attention to the polarity of the Motor [31] when soldering Internal Wires [37] and [38] to the Motor [31].
The red-marked side of the Motor [31] is positive. (See Fig. 9.)
- (d) Apply grease (Hitachi Motor Grease No. 29, Code No. 930035 is recommended) to the pinion press-fitted on the Motor [31] shaft.

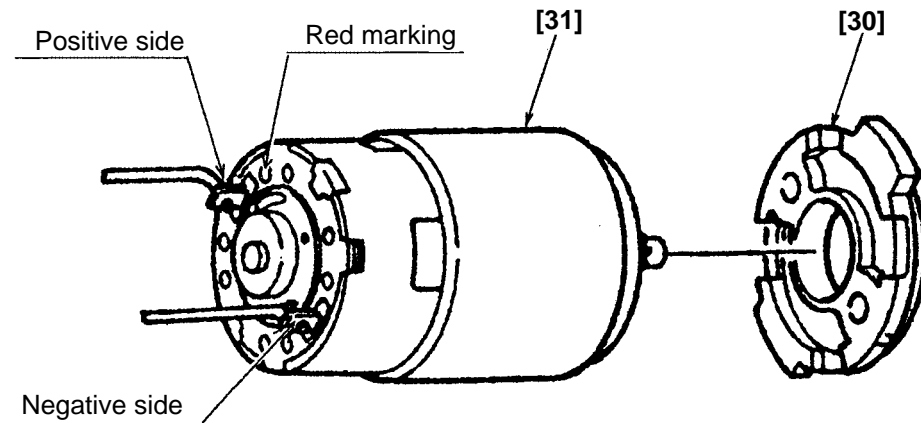


Fig. 9

(2) Reassembly of the clutch unit

Mount the Thrust Washer [11], Spring [10] and Nut [9] to the Front Case [12].

Screw the Nut [9] in the Front Case [12] about 1-3/8 turns (495°). Mount the Switch Plate [8] aligning with the projections of the Front Case [12] as shown in Fig. 5.

(3) Reassembly of the gear unit

(a) Apply grease (Hitachi Motor Grease No. 29, Code No. 930035) to the meshing parts of the gear.

(b) Install the parts series from the six Rollers [13] to Washer (B) [29] into the assembly reassembled in step (2). (See Fig. 10.)

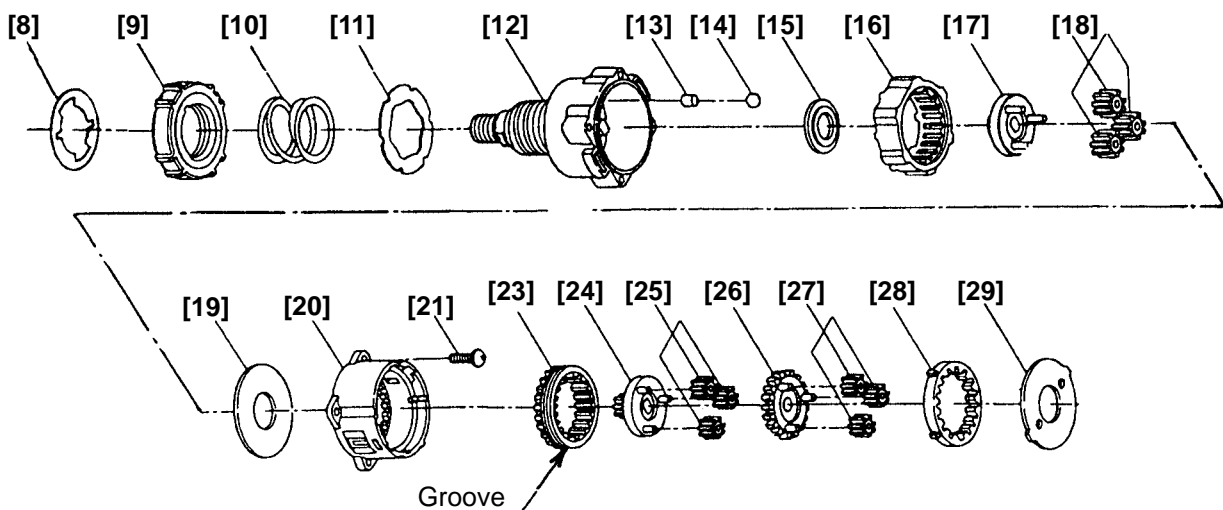


Fig. 10

- (i) Note the direction of the groove when installing the Slide Ring Gear [23] so that the groove faces toward the Motor [31].
- (ii) Install Washer (B) [29] in the Rear Case [20] with the projections of Washer (B) [29] engaged with the recesses in the Rear Case [20], and turn Washer (B) [29] clockwise until it can turn no further. (See Fig. 11.)

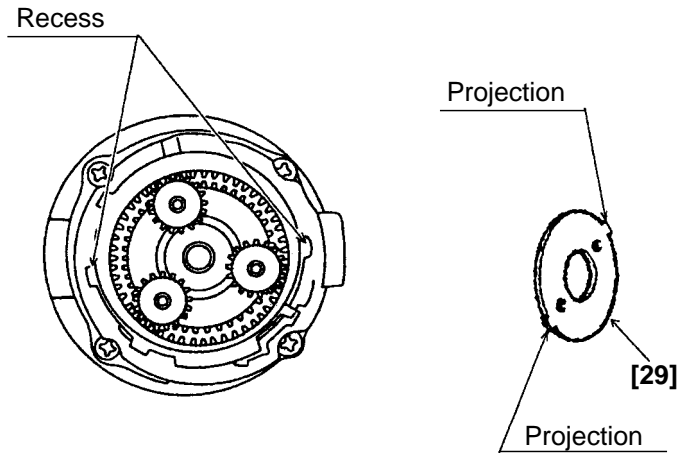


Fig. 11

(c) Install the Click Spring [5] and the Cap [4] to the assembly reassembled in step (b). (See Fig. 12.)

(i) Insert the ridge and the projections of the Click Spring [5] into the holes of the Cap [4].

(ii) When the Nut [9] is screwed in the Front Case [12] about 1-3/8 turns (495°), the three projections of the Nut [9] and the marking of the Rear Case [20] are positioned as shown in Fig. 12. Set the narrow slit of switch flange as shown in Fig. 12 and mount the Cap [4] aligning the ridge of the Click Spring [5] with the three projections of the Nut [9].

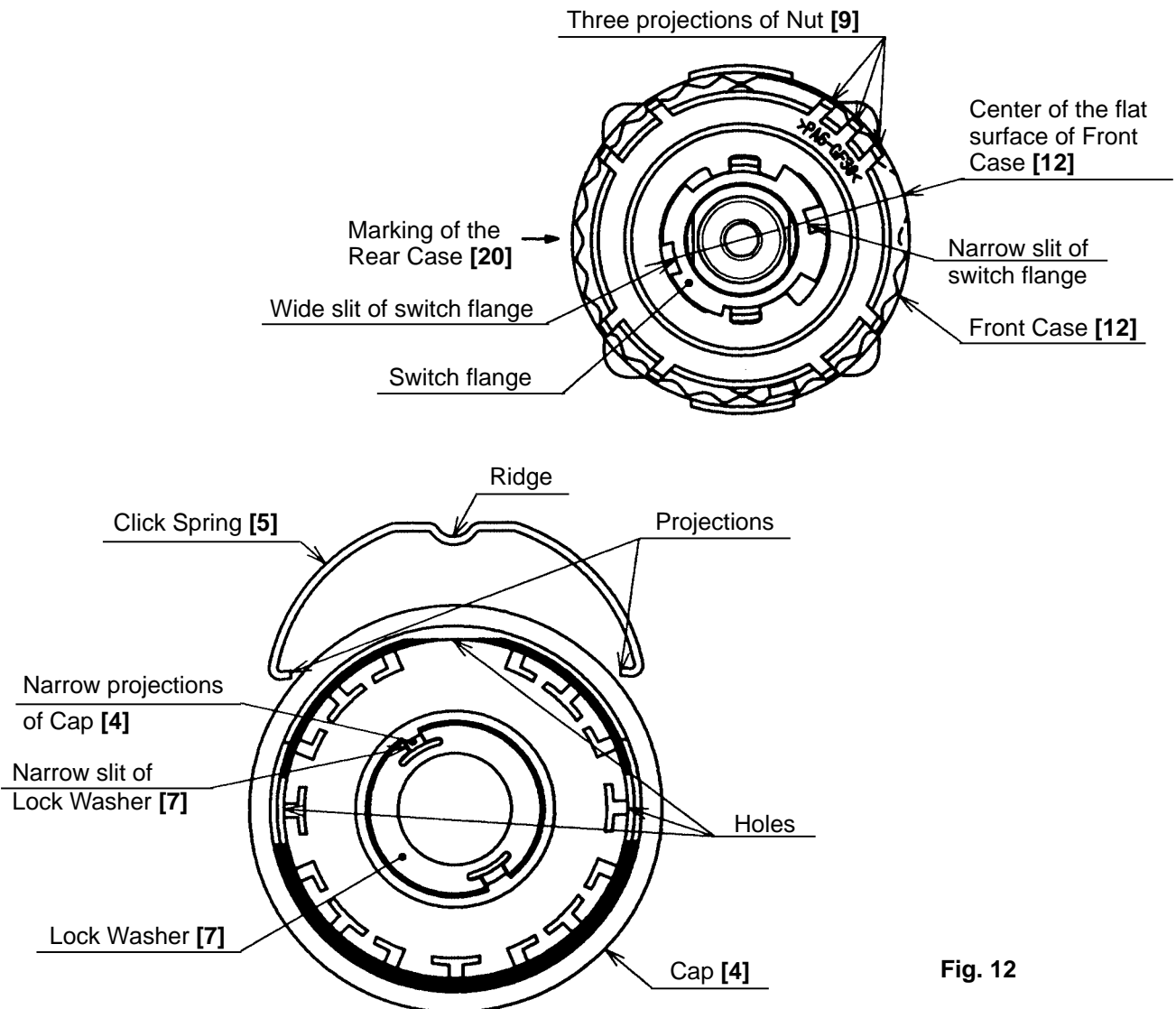


Fig. 12

(d) Install the Shift Arm [22] into the assembly reassembled in step (c).

With the ridge at the Shift Arm [22] facing the Motor [31] side, first install them on the unmarked side of the assembly reassembled in step (c). Then insert the projections on the Shift Arm [22] into the holes in the Rear Case [20] and make sure that the projections are fitted into the grooves in the Slide Ring Gear [23] mounted within the Rear Case [20]. (See Fig. 13.)

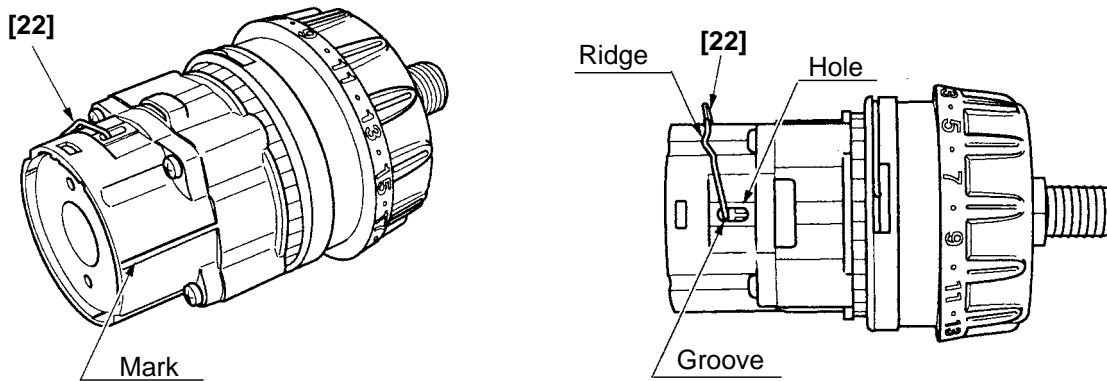


Fig. 13

(e) Install the Drill Chuck 10VLR-N (W/O Chuck Wrench) [2].

Install the Drill Chuck 10VLR-N (W/O Chuck Wrench) [2] using the Wrench 14 mm (special repair tool, Code No. 873929) [601] and secure it with the Special Screw (Left Hand) M6 x 23 [1].

(f) Install the Shift Knob [42] into the assembly reassembled in step (e).

When installing the Shift Knob [42] into the Shift Arm [22], note that the "LOW" mark on the Shift Knob [42] faces the Motor [31] with the Shift Arm [22] engaged with the recess in the Shift Knob [42].

(g) Install the assembly reassembled in step (1) and the assembly reassembled in step (f) together. (See Fig. 14.)

Fit the projection on the Motor Spacer [30] into the recess in the Rear Case [20] while ensuring that the Shift Knob [42] is aligned with the positive side of the Motor [31] and turn the Motor Spacer [30] clockwise when viewed from the rear of the Motor [31] until it can turn no further. During installation, make sure that the pinion press-fitted onto the shaft of the Motor [31] and Planet Gear (A) Set (3 pcs.) [27] mesh properly.

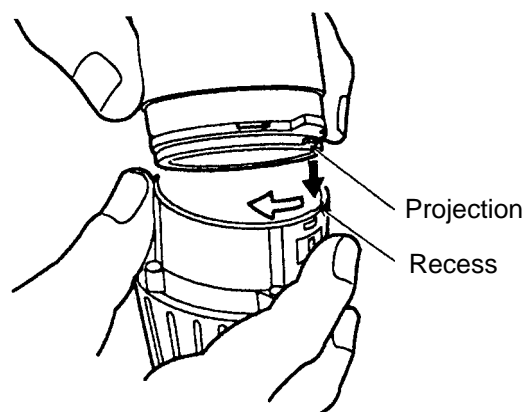


Fig. 14

(4) Installation of the assembly reassembled in step (3) into Housing (A). (B) Set [36]

(a) Install the Pushing Button [40] into Housing (B) [36]. (See Fig. 15.)

(b) Install the assembly reassembled in step (3) into Housing (A) [36]. Note that the projections on the Front Case [12] and the Motor Spacer [30] are engaged in the recesses in Housing (A) [36], and the projection on Housing (A) [36] is engaged in the groove of the Cap [4]. (See Fig. 16.)

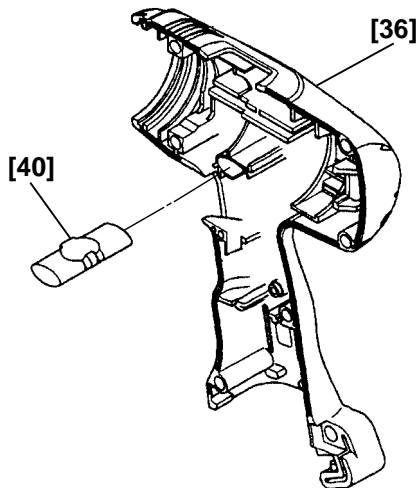


Fig. 15

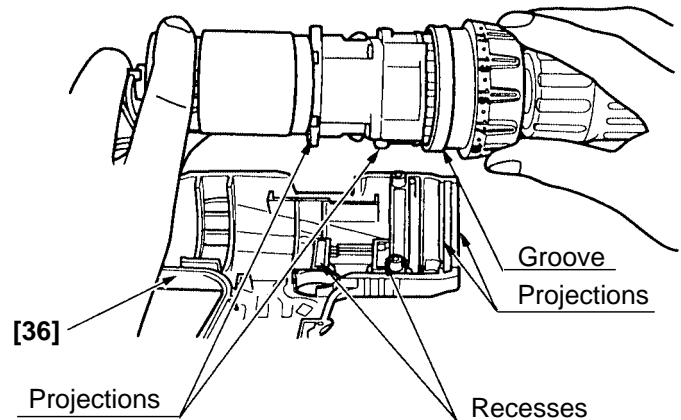




Fig. 16

(c) Set the assembly reassembled in step (b) to Housing (B) [36] and secure it with the seven Tapping Screws (W/Flange) D3 x 16 (Black) [32].

(d) Verify proper operation of the Cap [4].

When the assembly procedure up to step (c) is completed, ensure that the number "1" on the Cap [4] and the impact mark "  " are in alignment with the triangle mark on Housing (A). (B) Set [36]. If the Cap [4] turns loosely, correctly reinstall the Click Spring [5] as it is improperly installed. If the number "1" on the Cap [4] or the impact mark "  " cannot reach the triangle mark on Housing (A). (B) Set [36], correctly reinstall the Cap [4] referring to step (3) (c), as it is improperly installed.

(5) Other precautions in reassembly

(a) When the assembly procedure is completed, make sure that the turning direction of the Drill Chuck 10VLR-N (W/O Chuck Wrench) [2] corresponds to the position of the Pushing Button [40]. When the Pushing Button [40] is pressed from the (R)-marked side, the Drill Chuck 10VLR-N (W/O Chuck Wrench) [2] should turn clockwise when viewed from the rear (opposite side of the Drill Chuck 10VLR-N (W/O Chuck Wrench) [2]). Also make sure that the turning speed of the Drill Chuck 10VLR-N (W/O Chuck Wrench) [2] switches between "HIGH" and "LOW" by switching over the Shift Knob [42]. Make sure that the run-out of the Drill Chuck 10VLR-N (W/O Chuck Wrench) [2] holding a 9 mm dia. test bar is below 0.8 mm at a distance of 85 mm from the chuck end.

(b) The tightening torque of each screw is given below.

Special Screw (Left Hand) M6 x 23 [1]	: 2.9 – 3.9 N•m (30 – 40 kgf•cm, 26.1 – 34.8 in-lbs.)
Drill Chuck 10VLR-N (W/O Chuck Wrench) [2]	: 12.7 – 16.7 N•m (130 – 170 kgf•cm, 113 – 148 in-lbs.)
Screw Set M3 x 12 (4 pcs.) [21]	: 0.6 – 1.0 N•m (6 – 10 kgf•cm, 5.2 – 8.7 in-lbs.)
Machine Screw (W/SP. Washer) M4 x 6 [35]	: 1.1 – 1.9 N•m (11 – 19 kgf•cm, 9.5 – 16.5 in-lbs.)
Tapping Screw (W/Flange) D3 x 16 [32]	: 1.1 – 1.9 N•m (11 – 19 kgf•cm, 9.5 – 16.5 in-lbs.)

10-2. 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 UC 12SD.

11. STANDARD REPAIR TIME (UNIT) SCHEDULES

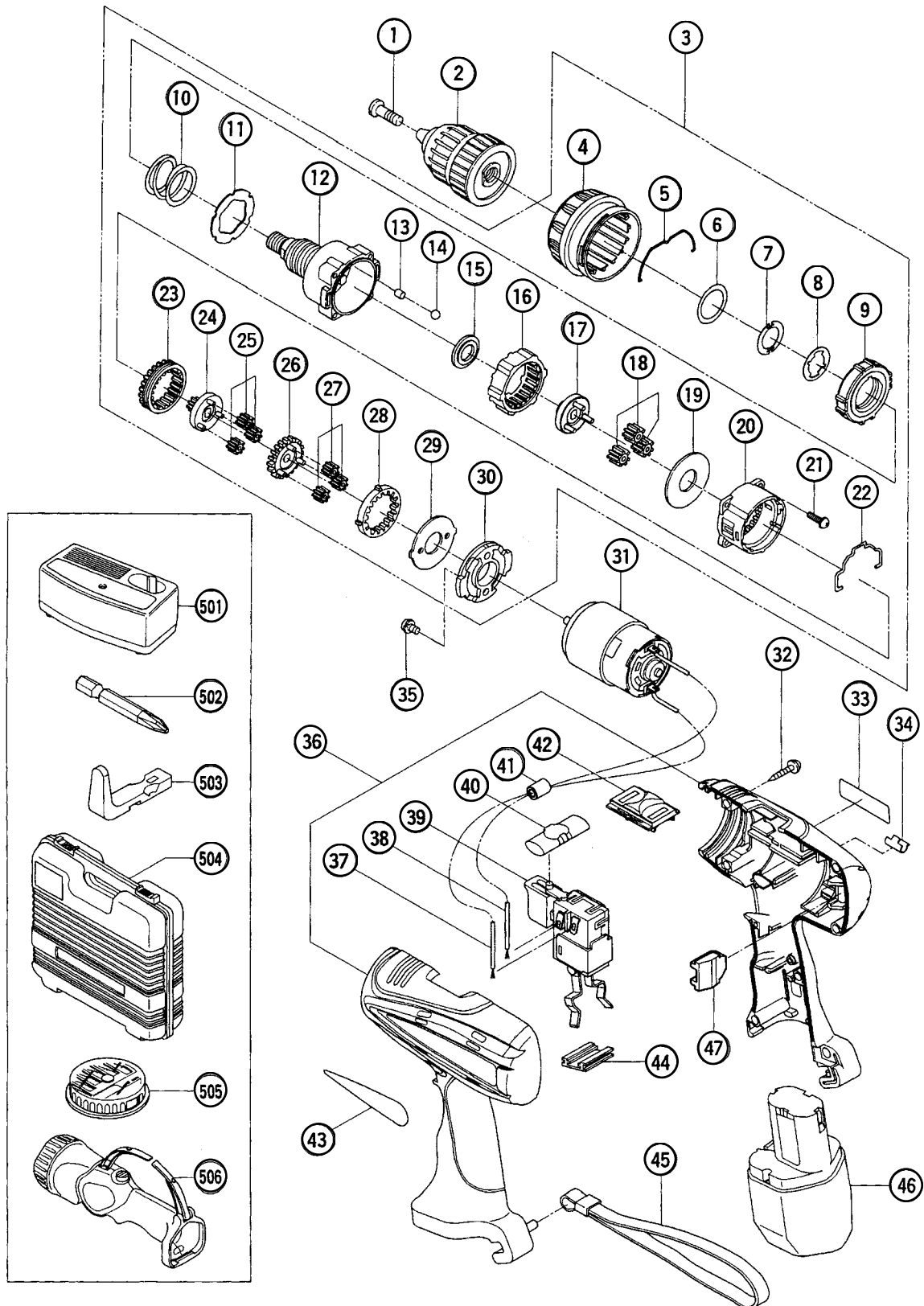
MODEL	Variable		10	20	30	40	50	60
	Fixed							
DV 12DV		Work Flow						
	General Assembly	Spring Drill Chuck Housing (A).(B) Set Motor Cap DC-speed Control Switch O-ring Nut Shift Arm (Gear Box Ass'y) Front Case Ring Gear Carrier First Ring Gear Planet Gear (A) Set Pinion (B) Planet Gear (B) Set Pinion (C) Slide Ring Gear Planet Gear (C) Set Rear Case						

ELECTRIC TOOL PARTS LIST



■ CORDLESS IMPACT DRILL
Model DV 12DV

2001・5・10
(E1)



PARTS

DV 12DV

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	311-959	SPECIAL SCREW (LEFT HAND) M6X23	1	
2	310-154	DRILL CHUCK 10VLR-N (W/O CHUCK WRENCH)	1	
3	319-959	GEAR BOX ASS'Y	1	INCLUD.4-30
4	319-963	CAP	1	
5	319-754	CLICK SPRING	1	
6	320-088	O-RING	1	
7	320-089	LOCK WASHER	1	
8	320-090	SWITCH PLATE	1	
9	319-743	NUT	1	
10	319-742	SPRING	1	
11	319-741	THRUST WASHER	1	
12	319-960	FRONT CASE	1	
13	319-744	ROLLER	6	
14	306-936	STEEL BALL D5	6	
15	319-746	SPACER WASHER	1	
16	319-745	RING GEAR	1	
17	319-747	CARRIER	1	
18	319-769	PLANET GEAR (C) SET (3 PCS.)	3	
19	312-704	WASHER (A)	1	
20	319-748	REAR CASE	1	
21	320-087	SCREW SET M3X12 (4 PCS.)	4	
22	319-753	SHIFT ARM	1	
23	319-750	SLIDE RING GEAR	1	
24	319-749	PINION (C)	1	
25	319-768	PLANET GEAR (B) SET (3 PCS.)	3	
26	319-751	PINION (B)	1	
27	319-767	PLANET GEAR (A) SET (3 PCS.)	3	
28	319-752	FIRST RING GEAR	1	
29	312-716	WASHER (B)	1	
30	316-955	MOTOR SPACER	1	
31	319-966	MOTOR	1	
32	313-687	TAPPING SCREW (W/FLANGE) D3X16 (BLACK)	7	
* 33		NAME PLATE	1	
34	318-237	BIT HOLDER	1	
35	317-333	MACHINE SCREW (W/SP. WASHER) M4X6	2	
36	319-965	HOUSING (A).(B) SET	1	
* 37	319-759	INTERNAL WIRE (BLACK) 100L	1	
* 37	320-133	INTERNAL WIRE (BLACK) 195L	1	FOR GBR,FRG,NOR,SWE,DEN
* 38	319-758	INTERNAL WIRE (RED) 130L	1	
* 38	320-132	INTERNAL WIRE (RED) 185L	1	FOR GBR,FRG,NOR,SWE,DEN
39	318-245	DC-SPEED CONTROL SWITCH	1	
40	319-760	PUSHING BUTTON	1	
* 41	318-247	FERRITE CORE	1	FOR GBR,FRG,NOR,SWE,DEN
42	318-234	SHIFT KNOB	1	
43		HITACHI LABEL	1	
44	315-141	TERMINAL SUPPORT (A)	1	
45	306-952	STRAP (BLACK)	1	
* 46	318-241	BATTERY FEB 12S (W/ENGLISH N.P)	3	
* 46	318-240	BATTERY FEB 12S (W/ENGLISH N.P)	2	FOR USA,CAN
* 46	318-239	BATTERY FEB 12S (W/ENGLISH N.P)	2	FOR NZL,SAF
* 47	320-131	CORE PROTECTOR	1	FOR GBR,FRG,NOR,SWE,DEN

