

MODELS

**DV 18DMR**

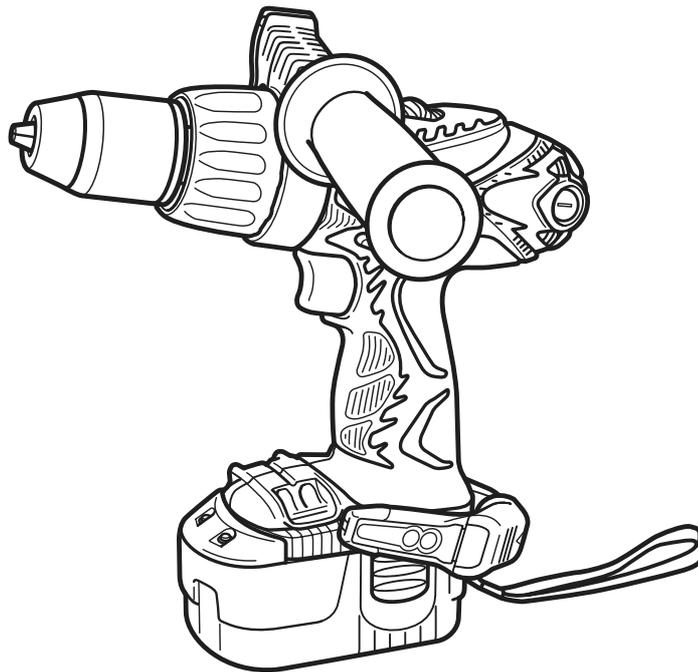
**DV 14DMR**

# Hitachi Power Tools

**CORDLESS IMPACT  
DRIVER DRILL  
DV 18DMR  
DV 14DMR**

**TECHNICAL DATA  
AND  
SERVICE MANUAL**

**D**



LIST Nos. DV 18DMR: E485  
DV 14DMR: E486

Mar. 2005

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, symbols are used in the place of company names and model names of our competitors. The symbols utilized here are as follows:

Symbols Utilized	Competitors	
	Company Name	Model Name
P	RIDGID	R841151
E	MILWAIKEE	0624-20, 0614-20
Q	DEWALT	DC988, DC984
B	BOSCH	GSB18VE-2/13618, GSB14, 4VE-2/13614
C	MAKITA	8443D, 8433D

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## **1. PRODUCT NAME**

Hitachi 18 V Cordless Impact Driver Drill/Cordless Hammer Drill, Model DV 18DMR

Hitachi 14.4 V Cordless Impact Driver Drill/Cordless Hammer Drill, Model DV 14DMR

## **2. MARKETING OBJECTIVE**

The Models DV 18DMR and DV 14DMR are the excellent top-end cordless driver drills developed to reinforce our 18-V and 14.4-V product lines and also to meet the market demands. While the Model DV 18DMR is compact and lightweight (entire length 253 mm, weight 2.7 kg), it provides the class-top maximum torque 62 N·m thanks to the optimally designed motor and mechanical unit. The Models DV 18DMR and DV 14DMR are improved in "performance, operability and maintainability" thanks to the adoption of the powerful motor with a large radial fan, sturdy metal chuck and metal clutch cap, soft-touch grip widely covered with elastomer, angle-adjustable one-touch hook, etc. In addition, the separate-type motor is the same as a driver drill with a power cord. The carbon brushes and the armature can be replaced singly.

## **3. APPLICATIONS**

- Tightening and loosening wood screw, self-tapping screw and machine screw
- Drilling into wood materials, plastic, mild steel and aluminum
- Drilling into brick and concrete block

## 4. SELLING POINTS

**No. 1 torque:** Max. torque 62 N·m (DV 18DMR)  
52 N·m (DV 14DMR)  
**No. 1 compact:** Overall length 253 mm

### 22-position torque adjustable clutch

- Fine torque adjustment

### 3-mode selection

- Drill
- Impact drill
- Driver

Side handle

### Improved overload durability (improved cooling efficiency)

- Large radial fan
- Optimally designed cooling air path

### 13 mm keyless chuck is operable with one hand and equipped with ratcheting lock mechanism

- Prevents the driver bit from loosening
- Operable with one hand

### Externally replaceable carbon brushes and separate-type motor

The carbon brushes and armature are  
singly replaceable.

Soft-grip handle

### New flat battery (DV 18DMR)

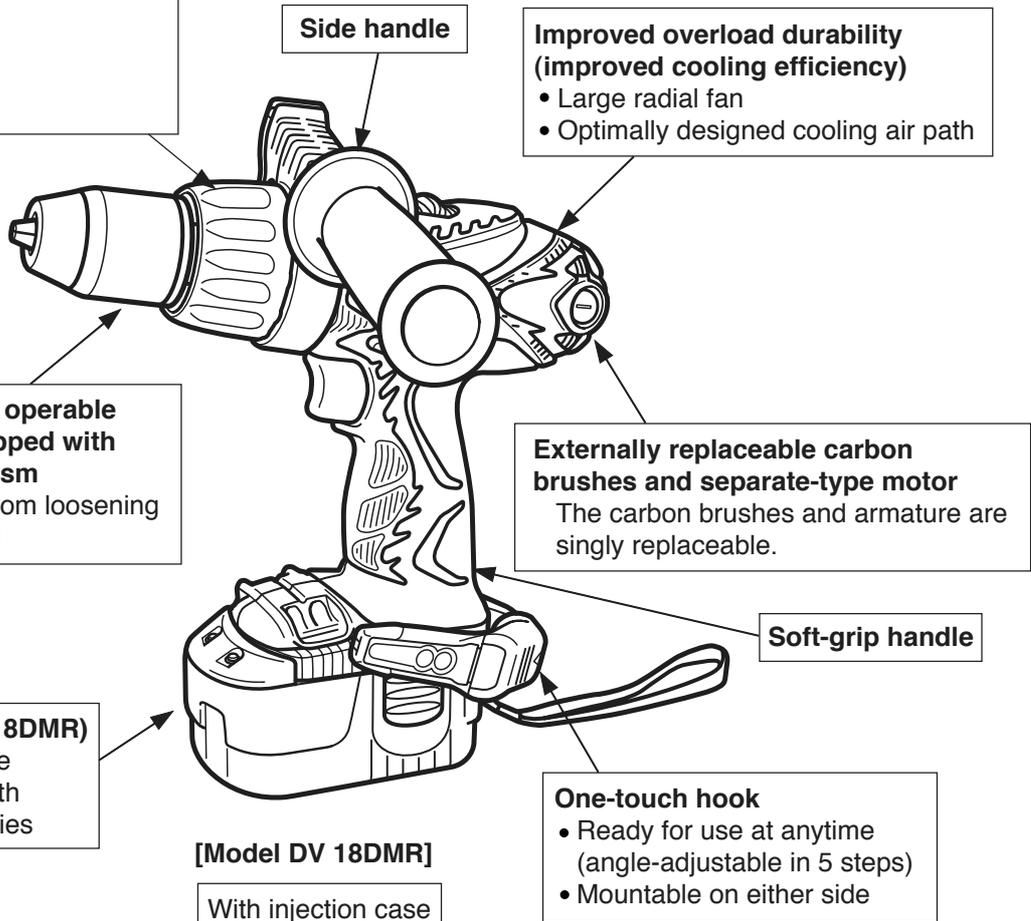
- Compact and stable
- Interchangeable with  
conventional batteries

[Model DV 18DMR]

With injection case

### One-touch hook

- Ready for use at anytime  
(angle-adjustable in 5 steps)
- Mountable on either side



## 4-1. Selling Point Descriptions

### 4-1-1. Compact and high power: Max. torque 62 N·m (DV 18DMR)

While the Model DV 18DMR is compact and lightweight (entire length 253 mm, weight 2.7 kg), it provides the class-top maximum torque 62 N·m thanks to the optimum design (see Tables 1 and 2). The Models DV 18DMR and DV 14DMR can drill large diameter holes and tighten screws effortlessly.

**Table 1**

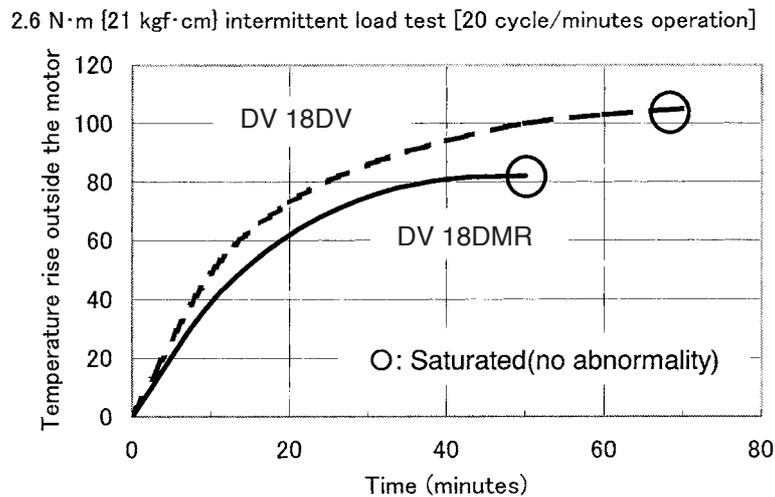
Model	DV 18DMR	DV 18DV	P	E	Q	B	C
Max. torque [N·m]	62	45	58	56	55	54	45
Overall length [mm]	253	242	325	273	263	262	267
Overall height [mm]	248	247	264	252	241	267	250
Overall width [mm]	76	76	87	80	90	87	95
Weight [kg]	2.7	2.5	3.1	2.9	2.7	2.7	2.6

**Table 2**

Model	DV 14DMR	DV 14DV	E	Q	B	C
Max. torque [N·m]	52	39	52	51	45	38
Overall length [mm]	253	242	273	263	262	267
Overall height [mm]	245	242	252	237	260	244
Overall width [mm]	76	76	80	79	86	94
Weight [kg]	2.5	2.2	2.7	2.4	2.5	2.4

### 4-1-2. Improved overload durability (improved cooling efficiency)

The Models DV 18DMR and DV 14DMR are equipped with the separate-type motor. To improve the overload durability in continuous operation, the optimally designed cooling air path that is descended from the Model DS 12DM increases the cooling efficiency as well as the large radial fan increases the volume of air (See Fig. 1).



**Fig. 1 Curves of motor temperature rise**

#### 4-1-3. 22-position torque adjustable clutch

The 22-stage clutch ensures fine torque adjustment (see Table 3). The tightening torque is selectable up to 7 N·m. The wider torque selectable range extends the range of applicable works.

**Table 3**

Clutch cap position	Tightening torque
1	$1.5 \pm 0.5$ N·m { $15 \pm 5$ kgf·cm}
4	$2.3 \pm 0.6$ N·m { $23 \pm 6$ kgf·cm}
10	$3.8 \pm 0.7$ N·m { $38 \pm 7$ kgf·cm}
13	$4.6 \pm 0.8$ N·m { $46 \pm 8$ kgf·cm}
19	$6.2 \pm 0.9$ N·m { $62 \pm 9$ kgf·cm}
22	$7 \pm 1.0$ N·m { $70 \pm 10$ kgf·cm}

\* There may be difference in operation depending on the screw shapes and workpieces. Perform a test before actual driving.

#### 4-1-4. 13 mm keyless chuck is operable with one hand and equipped with ratcheting lock mechanism

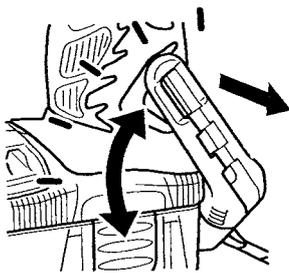
The sleeve can be turned with one hand. The driver bits can be easily replaced by holding the main unit with one hand while turning the sleeve with the other hand. The Models DV 18DMR and DV 14DMR are also equipped with the ratcheting lock mechanism to prevent the sleeve from loosening during operation. A simple twist until a click is heard locks the sleeve tight.

#### 4-1-5. Soft-grip handle

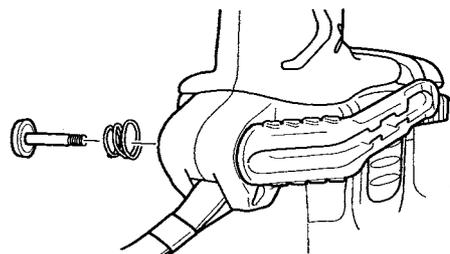
The handle is widely covered with soft-touch elastomer (rubber-like soft resin). It is slip-resistant and securely fits in the palm of a hand even if the gripping hand sweats.

#### 4-1-6. One-touch hook

- (1) The hook can be quickly slid out whenever necessary and slid in when not necessary.
- (2) The hook is mountable on either side using a flat-blade screwdriver or a coin.
- (3) The angle of the hook is adjustable in five steps.



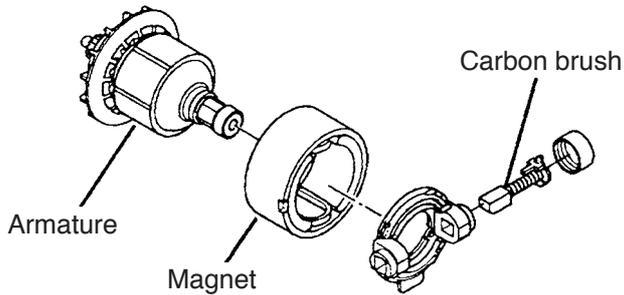
Angle-adjustable in 5 steps



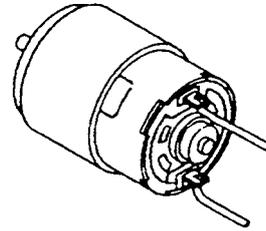
Mountable on either side

#### 4-1-7. Externally replaceable carbon brushes and separate-type motor

The carbon brushes are replaceable from the outside. In addition, the armature is singly replaceable through the adoption of the separate-type motor that is the same as a driver drill with a power cord. Thus the Models DV 18DMR and DV 14DMR are easier to maintain.



Separate-type motor  
[Models DV 18DMR and DV 14DMR]



Case-type motor (carbon brushes are built in)  
[Conventional model]

#### 4-1-8. New flat battery

The battery is flat enough to stand the Model DV 18DMR upright stability. The conventional Hitachi 18-V batteries are also usable.

#### 4-1-9. Others

The Models DV 18DMR and DV 14DMR have the following features common to the previous model.

- The terminal is movable according to the movement of the battery to prevent damage to the contact portion.
- The contact between the housing and the battery is changed from line contact to surface contact to minimize rattling due to wear.

## 5. SPECIFICATIONS

### 5-1. Model DV 18DMR

Capacity	<p>Screwdriver Machine screw ..... 6 mm (1/4") Wood screw ..... 8 dia. x 100 mm (#20 x 4")</p> <p>Drill Brick ..... 16 mm (5/8") [Depth 30 mm (1-1/4")] Metal ..... Mild steel 13 mm (1/2") [Thickness 1.6 mm (1/16")] Aluminum 13 mm (1/2") [Thickness 1.6 mm (1/16")] Wood ..... 50 mm (2") [Thickness 18 mm (11/16")]</p>																						
Keyless chuck (13VLRL-N)	<p>Mount type ..... Screw-on (UNF 1/2" – 20)</p> <p>Diameter ..... 1.5 – 13 mm (1/16" – 1/2")</p>																						
Rotation speed (No-load)	Low: 0 – 400/min, High: 0 – 1,800/min																						
Torque	<p>Slip torque ..... 1.5 – 7 N·m (15 – 70 kgf·cm, 13 – 61 in-lbs.) [22 stages]</p> <p>Max. torque ..... Low: 62 N·m (633 kgf·cm, 550 in-lbs.), High: 12 N·m (122 kgf·cm, 106 in-lbs.)</p>																						
Type of motor	Fan cooled DC magnet motor																						
Type of switch	Trigger switch with pushing button for forward and reverse rotation changeover (with brake)																						
Handle configuration	T-type (with soft-grip handle)																						
Enclosure	<p>Body ..... Glassfiber reinforced polycarbonate resin (black) and thermoplastic elastomer (green)</p> <p>Battery ..... Glassfiber reinforced polyamide resin (black)</p> <p>Charger ... ABS resin (black)</p>																						
Battery (Type EB 1820L)	<p>Sealed cylindrical nickel-cadmium storage battery</p> <p>Nominal voltage ..... DC 18 V</p> <p>Nominal life ..... Charging/discharging: Approx. 1,000 times</p> <p>Nominal capacity ..... 2.0 Ah</p>																						
Battery (Type EB 1826HL/EB 1830HL)	<p>Sealed cylindrical nickel-metal-hydride storage battery</p> <p>Nominal voltage ..... DC 18 V</p> <p>Nominal life ..... Charging/discharging: Approx. 500 times</p> <p>Nominal capacity ..... 2.6/3.0 Ah</p>																						
Charger (Model UC 24YFA)	<p>Overcharge protection system:</p> <p>(1) Battery voltage detection (<math>\Delta^2V</math> system) for Ni-Cd battery Mi-MH battery temperature detection (dT/dt system) for Ni-MH battery</p> <p>(2) Battery surface temperature detection (thermostat or thermistor)</p> <p>(3) 120 minutes timer</p> <p>Power input: 90 W</p> <p>Charging time: Approx. 50 minutes [for type EB 1820L battery at 20°C (68°F)] Approx. 60 minutes [for type EB 1826HL battery at 20°C (68°F)] Approx. 70 minutes [for type EB 1830HL battery at 20°C (68°F)]</p> <p>Operable ambient temperature range: 0 °C – 40°C (32°F – 104°F)</p> <p>The maximum allowable temperature of the type EB 1820L battery is 60°C (140°F) and the type EB 1826HL or EB 1830HL battery is 45°C (113°F).</p> <p>Indication method of battery charging function:</p> <table border="1"> <thead> <tr> <th colspan="4">Indications of the pilot lamp</th> </tr> </thead> <tbody> <tr> <td>Before charging</td> <td>Blinks (RED)</td> <td>Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">/</td> </tr> <tr> <td>While charging</td> <td>Lights (RED)</td> <td>Lights continuously</td> </tr> <tr> <td>Charging complete</td> <td>Blinks (RED)</td> <td>Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)</td> </tr> <tr> <td>Charging impossible</td> <td>Flickers (RED)</td> <td>Lights for 0.1 seconds. Does not light for 0.1 seconds. (off for 0.1 seconds)</td> <td>Malfunction in the battery or the charger</td> </tr> <tr> <td>Charging impossible</td> <td>Lights (GREEN)</td> <td>Lights continuously</td> <td>The battery temperature is high, making recharging impossible.</td> </tr> </tbody> </table>	Indications of the pilot lamp				Before charging	Blinks (RED)	Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)	/	While charging	Lights (RED)	Lights continuously	Charging complete	Blinks (RED)	Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)	Charging impossible	Flickers (RED)	Lights for 0.1 seconds. Does not light for 0.1 seconds. (off for 0.1 seconds)	Malfunction in the battery or the charger	Charging impossible	Lights (GREEN)	Lights continuously	The battery temperature is high, making recharging impossible.
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Charger (Model UC 24YJ)		<p>Overcharge protection system:  (1) Battery voltage detection (<math>\Delta^2V</math> system) for Ni-Cd battery  Ni-MH battery temperature detection (dT/dt system) for Ni-MH battery  (2) Battery surface temperature detection (thermostat or thermistor)  (3) 120 minutes timer  Power input: 200 W  Charging time: 28 minutes [for type EB 1830HL battery at 20°C (68°F)]  Operable ambient temperature range: 0 °C – 40°C (32°F – 104°F)  The maximum allowable temperature of the type EB 1830HL battery is 50°C (122°F).</p> <p>Indication method of battery charging function:</p> <table border="1"> <thead> <tr> <th colspan="3">Lamp indications</th> <th>Status lamp</th> </tr> </thead> <tbody> <tr> <td rowspan="3">Charge time lamp (red/ orange/ green)</td> <td>Charging time 30 minutes</td> <td>Lights red ██████████</td> <td>Lights continuously ██████████</td> <td>30 minutes until charging complete.</td> </tr> <tr> <td>Charging time 20 minutes</td> <td>Lights orange ██████████</td> <td>Lights continuously ██████████</td> <td>20 minutes until charging complete.</td> </tr> <tr> <td>Charging time 5 minutes</td> <td>Lights green ██████████</td> <td>Lights continuously ██████████</td> <td>5 minutes until charging complete.</td> </tr> <tr> <td></td> <td>Overheat standby</td> <td>Blinks red ██████████</td> <td>Lights for 0.3 seconds, off 0.3 seconds ██████████</td> <td>Battery overheated. Unable to charge. (Charging will commence when battery cools.)</td> </tr> <tr> <td rowspan="3">Charge status lamp (red/ orange/ green)</td> <td>Before charging</td> <td>Blinks red ██████████</td> <td>Lights for 0.5 seconds, off 0.5 seconds ██████████</td> <td>Power cord is connected to receptacle.</td> </tr> <tr> <td>Charging complete</td> <td>Lights green ██████████</td> <td>Lights continuously ██████████</td> <td></td> </tr> <tr> <td>Charging impossible</td> <td>Blinks orange ██████████</td> <td>Lights for 0.1 seconds, off 0.1 seconds ██████████</td> <td>Battery or charger malfunction.</td> </tr> </tbody> </table>				Lamp indications			Status lamp	Charge time lamp (red/ orange/ green)	Charging time 30 minutes	Lights red ██████████	Lights continuously ██████████	30 minutes until charging complete.	Charging time 20 minutes	Lights orange ██████████	Lights continuously ██████████	20 minutes until charging complete.	Charging time 5 minutes	Lights green ██████████	Lights continuously ██████████	5 minutes until charging complete.		Overheat standby	Blinks red ██████████	Lights for 0.3 seconds, off 0.3 seconds ██████████	Battery overheated. Unable to charge. (Charging will commence when battery cools.)	Charge status lamp (red/ orange/ green)	Before charging	Blinks red ██████████	Lights for 0.5 seconds, off 0.5 seconds ██████████	Power cord is connected to receptacle.	Charging complete	Lights green ██████████	Lights continuously ██████████		Charging impossible	Blinks orange ██████████	Lights for 0.1 seconds, off 0.1 seconds ██████████	Battery or charger malfunction.
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Weight	Net	Main body unit (including battery) ..... 2.7 kg (6.0 lbs.) Charger unit (UC 24YFA, including cord) ..... 0.6 kg (1.3 lbs.) Charger unit (UC 24YJ, including cord) ..... 1.0 kg (2.2 lbs.)																																						
	Gross	DV 18DMR (2BLFK)/(2HLFK) ..... 6.9 kg (15.2 lbs.) DV 18DMR (3BLFK)/(3HLFK) ..... 8.0 kg (17.7 lbs.) DV 18DMR (2HLCK) ..... 7.6 kg (16.8 lbs.)																																						
Standard accessories	(2BLFK) (2HLFK)	Charger (UC 24YFA) ..... 1																																						
		Battery (EB 1820L/EB 1826HL) ..... 2																																						
		Phillips (plus) driver bit (No. 2) ..... 1																																						
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5-2. Model DV 14DMR

Capacity	Screwdriver Machine screw ..... 6 mm (1/4") Wood screw ..... 8 dia. x 75 mm (#20 x 3") Drill Brick ..... 14 mm (9/16") [Depth 30 mm (1-1/4")] Metal ..... Mild steel 13 mm (1/2") [Thickness 1.6 mm (1/16")] Aluminum 13 mm (1/2") [Thickness 1.6 mm (1/16")] Wood ..... 45 mm (1-25/32") [Thickness 18 mm (11/16")]																						
Keyless chuck (13VLRL-N)	Mount type ..... Screw-on (UNF 1/2" – 20) Diameter ..... 1.5 – 13 mm (1/16" – 1/2")																						
Rotation speed (No-load)	Low: 0 – 400/min, High: 0 – 1,750/min																						
Torque	Slip torque ..... 1.5 – 7.0 N·m (15 – 70 kgf·cm, 13 – 61 in-lbs.) [22 stages] Max. torque ..... Low: 52 N·m (530 kgf·cm, 460 in-lbs.) High: 10 N·m (102 kgf·cm, 89 in-lbs.)																						
Type of motor	Fan cooled DC magnet motor																						
Type of switch	Trigger switch with pushing button for forward and reverse rotation changeover (with brake)																						
Handle configuration	T-type (with soft-grip handle)																						
Enclosure	Body ..... Glassfiber reinforced polycarbonate resin (black) and thermoplastic elastomer (green) Battery ..... Glassfiber reinforced polyamide resin (black) Charger ..... ABS resin (black)																						
Battery (Type EB 14B)	Sealed cylindrical nickel-cadmium storage battery Nominal voltage ..... DC 14.4 V Nominal life ..... Charging/discharging: Approx. 1,000 times Nominal capacity ..... 2.0 Ah																						
Battery (Type EB 1426H/EB 1430H)	Sealed cylindrical nickel-metal-hydride storage battery Nominal voltage ..... DC 14.4 V Nominal life ..... Charging/discharging: Approx. 500 times Nominal capacity ..... 2.6/3.0 Ah																						
Charger (Model UC 14YFA)	Overcharge protection system: (1) Battery voltage detection ( $\Delta^2V$ system) Ni-MH battery temperature detection (dT/dt system) for Ni-MH battery (2) Battery surface temperature detection (thermostat or thermistor) (3) 120 minutes timer Power input: 56 W Charging time: Approx. 50 minutes [for type EB 14B battery at 20°C (68°F)] Approx. 60 minutes [for type EB 1426H battery at 20°C (68°F)] Approx. 70 minutes [for type EB 1430H battery at 20°C (68°F)] Operable ambient temperature range: 0 °C – 40 °C (32°F – 104°F) The maximum allowable temperature of the type EB 14B battery is 60°C (140°F) and the type EB 1426H or EB 1430H battery is 45°C (113°F). Indication method of battery charging function: <table border="1" data-bbox="384 1458 1409 1845"> <thead> <tr> <th colspan="4">Indications of the pilot lamp</th> </tr> </thead> <tbody> <tr> <td>Before charging</td> <td>Blinks (RED)</td> <td>Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)</td> <td rowspan="3" style="text-align: center; vertical-align: middle;">/</td> </tr> <tr> <td>While charging</td> <td>Lights (RED)</td> <td>Lights continuously</td> </tr> <tr> <td>Charging complete</td> <td>Blinks (RED)</td> <td>Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)</td> </tr> <tr> <td>Charging impossible</td> <td>Flickers (RED)</td> <td>Lights for 0.1 seconds. Does not light for 0.1 seconds. (off for 0.1 seconds)</td> <td>Malfunction in the battery or the charger</td> </tr> <tr> <td>Charging impossible</td> <td>Lights (GREEN)</td> <td>Lights continuously</td> <td>The battery temperature is high, making recharging impossible.</td> </tr> </tbody> </table>	Indications of the pilot lamp				Before charging	Blinks (RED)	Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)	/	While charging	Lights (RED)	Lights continuously	Charging complete	Blinks (RED)	Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)	Charging impossible	Flickers (RED)	Lights for 0.1 seconds. Does not light for 0.1 seconds. (off for 0.1 seconds)	Malfunction in the battery or the charger	Charging impossible	Lights (GREEN)	Lights continuously	The battery temperature is high, making recharging impossible.
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While charging	Lights (RED)	Lights continuously																					
Charging complete	Blinks (RED)	Lights for 0.5 seconds. Does not light for 0.5 seconds. (off for 0.5 seconds)																					
Charging impossible	Flickers (RED)	Lights for 0.1 seconds. Does not light for 0.1 seconds. (off for 0.1 seconds)	Malfunction in the battery or the charger																				
Charging impossible	Lights (GREEN)	Lights continuously	The battery temperature is high, making recharging impossible.																				

Weight	Net	Main body unit (including battery) ..... 2.5 kg (5.5 lbs.) Charger unit (UC 14YFA, including cord) ..... 0.6 kg (1.3 lbs.)
	Gross	DV 14DMR (2BFK)/(2HFK) ..... 6.5 kg (14.3 lbs.) DV 14DMR (3BFK)/(3HFK) ..... 7.4 kg (16.3 lbs.)
Standard accessories	(2BFK) (2HFK)	Charger (UC 14YFA) ..... 1
		Battery (EB 14B/EB 1426H/EB 1430H) ..... 2
		Phillips (plus) driver bit (No. 2) ..... 1
		Side handle ..... 1
		Case (injection type)..... 1
	(3BFK) (3HFK)	Charger (UC 14YFA) ..... 1
		Battery (EB 14B/ EB 1430H) ..... 3
		Phillips (plus) driver bit (No. 2) ..... 1
		Side handle ..... 1
		Case (injection type)..... 1

## 6. COMPARISONS WITH SIMILAR PRODUCTS

### 6-1. Model DV 18DMR

Maker			HITACHI		P	E
Model			DV 18DMR	DV 18DV		
Max. capacity	Screw driving	Machine screw	6 mm (1/4")	6 mm (1/4")	Not indicated	Not indicated
		Wood screw	8 mm dia. x 100 mm (#20 x 4")	8 mm dia. x 75 mm (#20 x 3")	Not indicated	6 mm dia. (1/4")
	Drilling	Brick	16 mm (5/8")	16 mm (5/8")	Not indicated	10 mm (3/8")
		Mild steel	13 mm (1/2")	13 mm (1/2")	Not indicated	13 mm (1/2")
		Aluminum	13 mm (1/2")	13 mm (1/2")	Not indicated	Not indicated
		Soft wood	50 mm (2")	38 mm (1-1/2")	Not indicated	54 mm (2-1/8")
Rotation speed	Low	0 – 400/min	0 – 400/min	0 – 400/min	0 – 500/min	
	High	0 – 1,800/min	0 – 1,500/min	0 – 1,600/min	0 – 1,700/min	
Impact rate	Low	0 – 4,800/min	0 – 6,000/min	0 – 6,400/min	0 – 7,500/min	
	High	0 – 21,600/min	0 – 22,500/min	0 – 25,600/min	0 – 25,500/min	
Slip torque			1.5 – 7.0 N·m (15 – 70 kgf·cm) (13 – 61 in-lbs.) [22 positions]	1.0 – 5.9 N·m (10 – 60 kgf·cm) (9 – 52 in-lbs.) [22 positions]	Not indicated [23 positions]	Not indicated [20 positions]
Max. torque			62 N·m (633 kgf·cm) (550 in-lbs.)	45 N·m (460 kgf·cm) (400 in-lbs.)	58 N·m (587 kgf·cm) (510 in-lbs.)	56 N·m (569 kgf·cm) (495 in-lbs.)
Max. torque (hard) (actually measured value)			86 N·m (881 kgf·cm) (766 in-lbs.)	61 N·m (620 kgf·cm) (539 in-lbs.)	103 N·m (1051 kgf·cm) (913 in-lbs.)	88 N·m (893 kgf·cm) (776 in-lbs.)
Drill chuck	Type	Single sleeve	Double sleeve	Double sleeve	Single sleeve	
	Capacity	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	
	Outer material	Metal	Plastic sleeve and metal ring	Metal	Metal	
	Locking device	Equipped	Equipped	Equipped	Equipped	
Switch	Type	Variable speed	Variable speed	Variable speed	Variable speed	
	Feedback circuit	Equipped	Equipped	Equipped	Equipped	
	Electric brake	Equipped	Equipped	Equipped	Equipped	
Automatic spindle lock			Equipped	None	None	Equipped
Reversing switch			Push-button	Push-button	Push-button	Push-button
Replaceable carbon brushes			Equipped	None	None	Equipped
Replaceable armature			Equipped	None	None	None
Handle shape			T-type	T-type	Gun-type	T-type
Soft-grip handle			Equipped	Equipped	Equipped	Equipped
Side handle			Equipped	None	Equipped	Equipped
Belt hook			Equipped	Equipped	None	None
Strap			Equipped	Equipped	None	None
Battery	Nominal capacity	2.0/2.6/3.0 Ah	1.4/2.0/2.6/3.0 Ah	2.0 Ah	2.4 Ah	
	Nominal voltage	18 V	18 V	18 V	18 V	
	Charging time*	50/60/70 or 28 min.	40/50/60/70 min.	30 min.	60 min.	
Dimensions	Overall length	253 mm (9-61/64")	242 mm (9-17/32")	325 mm (12-51/64")	273 mm (10-3/4")	
	Overall height	248 mm (9-49/64")	247 mm (9-23/32")	264 mm (10-25/64")	252 mm (9-59/64")	
	Overall width	76 mm (3")	76 mm (3")	87 mm (3-27/64")	80 mm (3-5/32")	
Weight			2.7 kg (6.0 lbs.)	2.5 kg (5.5 lbs.)	(3.1 kg (6.8 lbs.))	2.9 kg (6.5 lbs.)

Remarks\* ..... Charging time varies depending on the type of charger to be used.

Maker		Q	B (EURO)	B (U.S.A.)	C	
Model						
Max. capacity	Screw driving	Machine screw	Not indicated	Not indicated	Not indicated	Not indicated
		Wood screw	Not indicated	8 mm dia.	6 mm dia. x 100 mm (#16 x 4")	Not indicated
	Drilling	Brick	16 mm (5/8")	14 mm	Not indicated	16 mm (5/8")
		Mild steel	13 mm (1/2")	13 mm	16 mm (5/8")	13 mm (1/2")
		Aluminum	Not indicated	Not indicated	Not indicated	Not indicated
Soft wood	50 mm (2")	35 mm	50 mm (2")	38 mm (1-1/2")		
Rotation speed	Low	0 – 450/min	0 – 500/min	0 – 450/min	0 – 450/min	
	High	0 – 1,450/min/ 0 – 2,000/min	0 – 1,800/min	0 – 1,500/min	0 – 1,400/min	
Impact rate	Low	0 – 7,650/min	0 – 6,000/min	0 – 5,400/min	0 – 6,750/min	
	High	0 – 24,650/min/ 0 – 34,000/min	0 – 21,000/min	0 – 18,000/min	0 – 21,000/min	
Slip torque		Not indicated [22 positions]	1.5 – 9 N·m (15 – 92 kgf·cm) [15 stages]	Not indicated [15 positions]	Not indicated [16 positions]	
Max. torque		55 N·m (575 kgf·cm) (500 in-lbs.)	Not indicated	54 N·m (547 kgf·cm) (475 in-lbs.)	45 N·m (465 kgf·cm) (400 in-lbs.)	
Max. torque (hard) (actually measured value)		92 N·m (940 kgf·cm) (817 in-lbs.)	74 N·m (757 kgf·cm) (658 in-lbs.)	84 N·m (858 kgf·cm) (746 in-lbs.)	74 N·m (749 kgf·cm) (651 in-lbs.)	
Drill chuck	Type	Single sleeve	Single sleeve	Single sleeve	Single sleeve	
	Capacity	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	
	Outer material	Metal	Plastics	Plastics	Plastics	
	Locking device	Equipped	Equipped	Equipped	Equipped	
Switch	Type	Variable speed	Variable speed	Variable speed	Variable speed	
	Feedback circuit	Equipped	Equipped	Equipped	Equipped	
	Electric brake	Equipped	Equipped	Equipped	Equipped	
Automatic spindle lock		Equipped	Equipped	Equipped	Equipped	
Reversing switch		Push-button	Push-button	Push-button	Push-button	
Replaceable carbon brushes		Equipped	Equipped	Equipped	Equipped	
Replaceable armature		None	None	None	None	
Handle shape		T-type	T-type	T-type	T-type	
Soft-grip handle		Equipped	Equipped	Equipped	Equipped	
Side handle		Equipped	Equipped	Equipped	Equipped	
Belt hook		None	None	Equipped (Snap hook)	None	
Strap		None	None	None	None	
Battery	Nominal capacity	2.0/2.4/3.0 Ah	2.0 Ah	2.0 Ah	2.0/2.6/3.0 Ah	
	Nominal voltage	18 V	18 V	18 V	18 V	
	Charging time*	60 min.	60 min.	60 min.	60/75/90 min.	
Dimensions	Overall length	263 mm (10-23/64")	262 mm (10-5/16")	262 mm (10-5/16")	267 mm (10-33/64")	
	Overall height	241 mm (9-31/64")	267 mm (10-33/64")	267 mm (10-33/64")	250 mm (9-27/32")	
	Overall width	90 mm (3-35/64")	87 mm (3-27/64")	87 mm (3-27/64")	95 mm (3-3/4")	
Weight		2.7 kg (5.95 lbs.)	2.7 kg (6.0 lbs.)	3.0 kg (6.7 lbs.)	2.6 kg (5.7 lbs.)	

Remarks\* ..... Charging time varies depending on the type of charger to be used.

## 6-2. Model DV 14DMR

Maker		HITACHI			
Model		DV 14DMR	DV 14DV	E	
Max. capacity	Screw driving	Machine screw	6 mm (1/4")	6 mm (1/4")	Not indicated
		Wood screw	8 mm dia. x 75 mm (#20 x 3")	8 mm dia. x 50 mm (#20 x 2")	6 mm dia. (1/4")
	Drilling	Brick	14 mm (9/16")	14 mm (9/16")	10 mm (3/8")
		Mild steel	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")
		Aluminum	13 mm (1/2")	13 mm (1/2")	Not indicated
		Soft wood	45 mm (1-49/64")	36 mm (1-27/64")	54 mm (2-1/8")
Rotation speed	Low	0 – 400/min	0 – 350/min	0 – 500/min	
	High	0 – 1,750/min	0 – 1,200/min	0 – 1,700/min	
Impact rate	Low	0 – 4,800/min	0 – 5,250/min	0 – 7,500/min	
	High	0 – 21,000/min	0 – 18,000/min	0 – 25,500/min	
Slip torque		1.5 – 7 N·m (15 – 70 kgf·cm) (13 – 61 in-lbs.) [22 positions]	1.0 – 5.9 N·m (10 – 60 kgf·cm) (9 – 52 in-lbs.) [22 positions]	Not indicated [20 positions]	
Max. torque		52 N·m (530 kgf·cm) (460 in-lbs.)	39 N·m (400 kgf·cm) (346 in-lbs.)	52 N·m (529 kgf·cm) (460 in-lbs.)	
Max. torque (hard) (actually measured value)		75 N·m (764 kgf·cm) (664 in-lbs.)	51 N·m (520 kgf·cm) (460 in-lbs.)	88 N·m (898 kgf·cm) (780 in-lbs.)	
Drill chuck	Type	Single sleeve	Double sleeve	Single sleeve	
	Capacity	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	
	Outer material	Metal	Plastic sleeve and metal ring	Metal	
	Locking device	Equipped	Equipped	Equipped	
Switch	Type	Variable speed	Variable speed	Variable speed	
	Feedback circuit	Equipped	Equipped	Equipped	
	Electric brake	Equipped	Equipped	Equipped	
Automatic spindle lock		Equipped	None	Equipped	
Reversing switch		Push-button	Push-button	Push-button	
Replaceable carbon brushes		Equipped	None	Equipped	
Replaceable armature		Equipped	None	None	
Handle shape		T-type	T-type	T-type	
Soft-grip handle		Equipped	Equipped	Equipped	
Side handle		Equipped	None	Equipped	
Belt hook		Equipped	Equipped	None	
Strap		Equipped	Equipped	None	
Battery	Nominal capacity	2.0/2.6/3.0 Ah	1.4/2.0/2.6/3.0 Ah	2.4 Ah	
	Nominal voltage	14.4 V	14.4 V	14.4 V	
	Charging time*	50/60/70 min.	40/50/60/70 min.	60 min.	
Dimensions	Overall length	253 mm (9-61/64")	242 mm (9-31/64")	273 mm (10-3/4")	
	Overall height	245 mm (9-41/64")	242 mm (9-31/64")	252 mm (9-59/64")	
	Overall width	76 mm (3")	76 mm (3")	80 mm (3-5/32")	
Weight		2.5 kg (5.5 lbs.)	2.2 kg (4.9 lbs.)	2.7 kg (6.0 lbs.)	

Remarks\* ..... Charging time varies depending on the type of charger to be used.

Maker			Q	B (EURO)	B (U.S.A.)	C
Model						
Max. capacity	Screw driving	Machine screw	Not indicated	Not indicated	Not indicated	Not indicated
		Wood screw	Not indicated	8 mm dia.	6 mm dia. x 75 mm (#16 x 3")	Not indicated
	Drilling	Brick	14 mm (9/16")	12 mm	Not indicated	14 mm (9/16")
		Mild steel	13 mm (1/2")	13 mm	13 mm (1/2")	13 mm (1/2")
		Aluminum	Not indicated	Not indicated	Not indicated	Not indicated
		Soft wood	44 mm (1-3/4")	32 mm	44 mm (1-3/4")	36 mm (1-27/64")
Rotation speed	Low	0 – 450/min	0 – 500/min	0 – 450/min	0 – 400/min	
	High	0 – 1,400/min 0 – 1,800/min	0 – 1,750/min	0 – 1,500/min	0 – 1,300/min	
Impact rate	Low	0 – 7,650/min	0 – 6,000/min	0 – 5,400/min	0 – 6,000/min	
	High	0 – 23,800/min 0 – 30,600/min	0 – 21,000/min	0 – 18,000/min	0 – 19,500/min	
Slip torque		Not indicated [22 positions]	1.5 – 9 N·m (15 – 92 kgf·cm) [15 stages]	Not indicated [15 positions]	Not indicated [16 positions]	
Max. torque		51 N·m (518 kgf·cm) (450 in-lbs.)	Not indicated	45 N·m (461 kgf·cm) (400 in-lbs.)	38 N·m (387 kgf·cm) (337 in-lbs.)	
Max. torque (hard) (actually measured value)		65 N·m (660 kgf·cm) (574 in-lbs.)	75 N·m (768 kgf·cm) (667 in-lbs.)	78 N·m (798 kgf·cm) (694 in-lbs.)	78 N·m (798 kgf·cm) (694 in-lbs.)	
Drill chuck	Type	Single sleeve	Single sleeve	Single sleeve	Single sleeve	
	Capacity	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	
	Outer material	Metal	Plastics	Plastics	Plastics	
	Locking device	Equipped	Equipped	Equipped	Equipped	
Switch	Type	Variable speed	Variable speed	Variable speed	Variable speed	
	Feedback circuit	Equipped	Equipped	Equipped	Equipped	
	Electric brake	Equipped	Equipped	Equipped	Equipped	
Automatic spindle lock		Equipped	Equipped	Equipped	Equipped	
Reversing switch		Push-button	Push-button	Push-button	Push-button	
Replaceable carbon brushes		Equipped	Equipped	Equipped	Equipped	
Replaceable armature		None	None	None	None	
Handle shape		T-type	T-type	T-type	T-type	
Soft-grip handle		Equipped	Equipped	Equipped	Equipped	
Side handle		Equipped	Equipped	Equipped	Equipped	
Belt hook		None	None	Equipped (Snap hook)	None	
Strap		None	None	None	None	
Battery	Nominal capacity	2.0/2.4/3.0 Ah	2.4 Ah	2.0 Ah	2.0/2.6/3.0 Ah	
	Nominal voltage	14.4 V	14.4 V	14.4 V	14.4 V	
	Charging time*	60 min.	60 min.	60 min.	60/75/90 min.	
Dimensions	Overall length	263 mm (10-23/64")	262 mm (10-5/16")	262 mm (10-5/16")	267 mm (10-33/64")	
	Overall height	237 mm (9-21/64")	260 mm (10-15/64")	260 mm (10-15/64")	244 mm (9-5/8")	
	Overall width	79 mm (3-7/64")	86 mm (3-25/64")	86 mm (3-25/64")	94 mm (3-11/16")	
Weight		2.4 kg (5.25 lbs.)	2.5 kg (5.5 lbs.)	2.8 kg (6.2 lbs.)	2.4 kg (5.3 lbs.)	

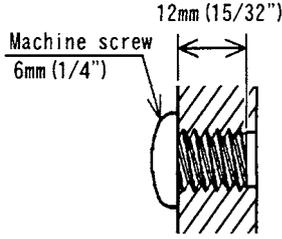
Remarks\* ..... Charging time varies depending on the type of charger to be used.

## 7. WORKING PERFORMANCE PER SINGLE CHARGE

### 7-1. Model DV 18DMR

Drilling and fastening performance comparison per charge

Type of work	Maker	Model	Working capacity (*1)						Drilling speed (sec./pc.)
			0	50	100	150	200	250	
<p>Brick D30 mm (1-1/4") 10 mm dia. (3/8") Drill bit for concrete</p> <p>&lt; High speed &gt;</p>	HITACHI	DV 18DMR			130			5.5	
		DV 18DV		80				9.7	
		P		70				5.5	
		E		80				6.5	
		Q		100				7.0	
		B (EURO)		60				7.5	
		B (U.S.A.)		60				8.2	
		C		80				9.6	
<p>Wood boring T18 (11/16") 36mm dia. (1-13/32") American pine</p> <p>&lt; Low speed &gt;</p>	HITACHI	DV 18DMR			130		3.7		
		DV 18DV			130			4.0	
		P		90				3.4	
		E		110				3.1	
		Q		140				3.3	
		B (EURO)		90				3.3	
		B (U.S.A.)		90				3.3	
		C		120				3.8	
<p>HSS Drill bit T1.6 (1/16") 8mm dia. (5/16") Mild steel</p> <p>&lt; High speed &gt;</p>	HITACHI	DV 18DMR			180		4.4		
		DV 18DV			150			6.5	
		P		60				7.7	
		E		140				5.0	
		Q		120				5.8	
		B (EURO)		110				5.7	
		B (U.S.A.)		90				6.6	
		C		100				9.9	
<p>American Pine L100mm (4") 8mm dia. (#20) Wood Screw with <math>\phi</math>5 (3/16") Pilot Hole</p> <p>&lt; Low speed &gt;</p>	HITACHI	DV 18DMR	50				7.0		
		DV 18DV	50					7.5	
		P	40					6.0	
		E	40					6.0	
		Q	50					6.5	
		B (EURO)	30					6.3	
		B (U.S.A.)	30					6.5	
		C	40					7.8	

Type of work	Maker	Model	Working capacity (*1)					Drilling speed (sec./pc.)
			*0	*600	*1200	*1800	*2400	
 <p>&lt; High speed &gt;</p>	HITACHI	DV 18DMR			*1370			0.4
		DV 18DV			*1740			0.5
	P		*690					0.5
	E		*1050					0.5
	Q		*1050					0.4
	B (EURO)		*1030					0.5
	B (U.S.A.)		*780					0.5
	C				*1400			0.6

Remark\* Number of machine screws fastened per charge

Remark\*1 Number of holes or fasteners per charge

The above table shows an example of test data. The batteries used in this test are as follows:

Model DV 18DMR, DV 18DV, Q, C: 3.0 Ah

P, B (EURO), B (U.S.A.): 2.0 Ah

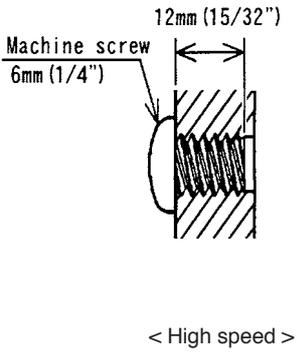
E: 2.4 Ah

As actually measured values listed in the above table may vary depending on 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.

## 7-2. Model DV 14DMR

Drilling and fastening performance comparison per charge

Type of work	Maker	Model	Working capacity (*1)					Drilling speed (sec./pc.)
			0	50	100	150	200	
<p>Brick D30 mm (1-1/4") 10 mm dia. (3/8") Drill bit for concrete</p> <p>&lt; High speed &gt;</p>	HITACHI	DV 14DMR			100			6.2
		DV 14DV		60				15.1
		E		80				5.8
		Q		80				7.8
		B (EURO)		60				8.3
		B (U.S.A.)		30				11.7
		C		70				9.3
<p>Wood boring T18 (11/16") 36mm dia. (1-13/32") American pine</p> <p>&lt; Low speed &gt;</p>	HITACHI	DV 14DMR			90			4.6
		DV 14DV		90				5.6
		E		80				3.4
		Q		110				3.7
		B (EURO)		80				3.7
		B (U.S.A.)		70				3.9
		C		90				4.6
<p>HSS Drill bit T1.6 (1/16") 8mm dia. (5/16") Mild steel</p> <p>&lt; High speed &gt;</p>	HITACHI	DV 14DMR			150			5.3
		DV 14DV		130				8.8
		E		80				8.1
		Q		100				7.2
		B (EURO)		80				7.7
		B (U.S.A.)		60				8.1
		C		100				9.0
<p>American Pine L75mm (3") 8mm dia. (#20) Wood Screw with <math>\phi 5</math> (3/16") Pilot Hole</p> <p>&lt; Low speed &gt;</p>	HITACHI	DV 14DMR		70				5.4
		DV 14DV		70				7.0
		E		60				4.4
		Q		70				4.9
		B (EURO)		60				4.6
		B (U.S.A.)		40				5.0
		C		60				6.2

Type of work	Maker	Model	Working capacity (*1)					Drilling speed (sec./pc.)
			*0	*600	*1200	*1800	*2400	
	HITACHI	DV 14DMR	*1350					0.4
		DV 14DV	*1730					0.6
	E	*990					0.4	
	Q	*980					0.5	
	B (EURO)	*970					0.5	
	B (U.S.A.)	*790					0.5	
	C	*1350					0.5	
	< High speed >							

Remark\* Number of machine screws fastened per charge

Remark\*1 Number of holes or fasteners per charge

The above table shows an example of test data. The batteries used in this test are as follows:

Model DV 14DMR, DV 14DV, Q, C: 3.0 Ah

E, B (EURO): 2.4 Ah

B (U.S.A.): 2.0 Ah

As actually measured values listed in the above table may vary depending on 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 Models DV 18DMR and DV 14DMR Cordless Impact Driver Drills 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) 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.

(3) 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.

(4) Conduct battery charging at an ambient temperature range of 0 °C – 40 °C (32 °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 0 °C (32 °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).

(5) 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.

(6) 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.

(7) 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.

(8) Disposal of the Storage Batteries

Ensure that all customers understand that the Storage Batteries 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 batteries 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.

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 Storage Battery.

For Europe

**CAUTION**  
· Read thoroughly HANDLING INSTRUCTIONS before use.  
· 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.

(3) The following caution is listed on the Name Plate to the Model UC 24YJ Charger.

For the U.S.A. and Canada

**CAUTION** ● For safe operation, see Instruction Manual. ● Charge HITACHI rechargeable batteries types EB7, EB9, EB12, EB14, EB18 and EB24 series. Other types of batteries may burst causing personal injury and damage. ● Charge between 32°F and 104°F. Rest 15 minutes between the charging of batteries. ● Indoor use only. ● Replace defective cord immediately.

(4) The following caution is listed on the Name Plate attached to the Model UC 14YFA Charger.

For the U.S.A. and Canada

**CAUTION** ● For safe operation, see Instruction Manual. ● Charge HITACHI rechargeable batteries types EB7, EB9, EB12, EB14 series. Other types of batteries may burst causing personal injury and damage. ● Charge between 32°F and 104°F. Rest 15 minutes between the charging of batteries. ● Indoor use only. ● Replace defective cord immediately.

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

The cordless impact 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) 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 done 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 insert a foreign object into body vent holes.

The body of this tool has vent holes for improving the cooling efficiency. As a fan is built into the motor, a foreign object inserted through a vent hole may cause a failure. Please instruct customers to never insert a foreign object into the vent hole.

- (4) Use at thrust of 100 to 150 N (10 to 15 kgf, 22 to 23 lbs.).

It would not accelerate the drilling speed of this unit to press the tool strongly against the workpiece 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 could also cause burning out of the motor.

- (5) 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.)

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

Although the nominal chargeable capacity of the storage batteries used with the Model DV 18DMR and DV 14DMR is 2.0 Ah, 2.6 Ah or 3.0 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

For example, although the Model DV 18DMR is designed for drilling capacities of 50 mm (2") in wood, and 13 mm (1/2") in aluminum and mild steel, this capability is not as efficient as conventional electric power tools. In particular, when drilling through aluminum material with a 13 mm (1/2") drill bit, 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.

(8) Securely tighten the sleeve of the keyless chuck.

The keyless chuck may slip during operation if the shape of the drill bit shank is cylindrical depending on the surface conditions, materials, etc. Please instruct the customers to retighten the keyless chuck more securely if the keyless chuck slips during operation. The holding force of the keyless chuck is increased as the tightening force of the keyless chuck is increased. The Models DV 18DMR and DV 14DMR are equipped with the locking device to prevent loosening of the keyless chuck. The sleeve makes noise when tightening or loosening. This is because of the locking device and there is no problem.

(9) Avoid continuous use.

Although the Model DV 18DMR can bear continuous operation under certain conditions, operating conditions are different depending on material of workpiece and sharpness of the drill bit in use. Please instruct the customers to avoid continuous use of the Models DV 18DMR and DV 14DMR and take a pause about 15 minutes after a single charge operation as a guide.

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

If any of the storage batteries is exposed to direct sunlight for an extended period or if the temperature of the battery is high immediately after it has been used in the tool, the pilot lamp (red) or the charge time lamp may not be turned on when the battery is connected to the charger. Chargeable temperature ranges of each type of battery are specified as follows.

< UC 24YFA >

Type EB 1820L: from -5°C to 60°C (from 23°F to 140°F)

Types EB 1826HL and EB 1830HL: from 0°C to 45°C (from 32°F to 113°F)

< UC 14YFA >

Type EB 14B: from -5°C to 60°C (from 23°F to 140°F)

Types EB 1426H and EB 1430H: from 0°C to 45°C (from 32°F to 113°F)

< UC 24YJ >

Type EB 1830HL: from -5°C to 50°C (from 23°F to 122°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 that employ a thermostat. The cooling time required before charging 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 Models DV 18DMR and DV 14DMR 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. 2.

NOTE: The gradient and values illustrated in Fig. 2 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.

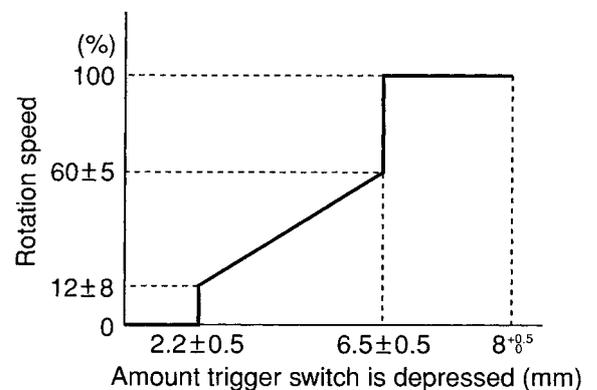


Fig. 2

## 10. 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.

### 10-1. Precautions in Disassembly and Reassembly

The **[Bold]** numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagrams for the Models DV 18DMR and DV 14DMR.

#### 10-1-1. Disassembly

##### (1) Removal of the Hook Ass'y **[51]** **[53]**

Remove Special Screw (A) M5 **[57]** with a flat-blade screwdriver or a coin. Remove the Hook Ass'y **[51]** **[53]** and the Hook Spring **[56]**.

##### (2) Removal of the Carbon Brushes 5 x 6 x 11.5 **[34]**

Remove the Brush Cap **[35]** first then pry the Carbon Brush 5 x 6 x 11.5 **[34]** off with a flat-blade screwdriver (at the position of collars). Remove the Brush Caps **[35]** and the Carbon Brushes 5 x 6 x 11.5 **[34]** at both sides.

##### (3) Removal of the Drill Chuck 13VLRL-N (W/O Chuck Wrench) **[2]**

Perform the following steps (a) and (b) with the main unit mounted in the vise for removal of the Drill Chuck 13VLRL-N (W/O Chuck Wrench) **[2]**. At this time, it is recommended to sandwich a cloth between the main unit and the vise to prevent Housing (A).(B) Set **[38]** from being scratched.

(a) Fully open the jaws of the Drill Chuck 13VLRL-N (W/O Chuck Wrench) **[2]** and remove the Special Screw (Left Hand) M6 x 23 **[1]** by turning clockwise (be careful that it is a left-handed screw).

(b) Fix the hexagonal bar wrench M10 into the Drill Chuck 13VLRL-N (W/O Chuck Wrench) **[2]** as shown in Fig. 3 then turn it counterclockwise to remove the Drill Chuck 13VLRL-N (W/O Chuck Wrench) **[2]**.

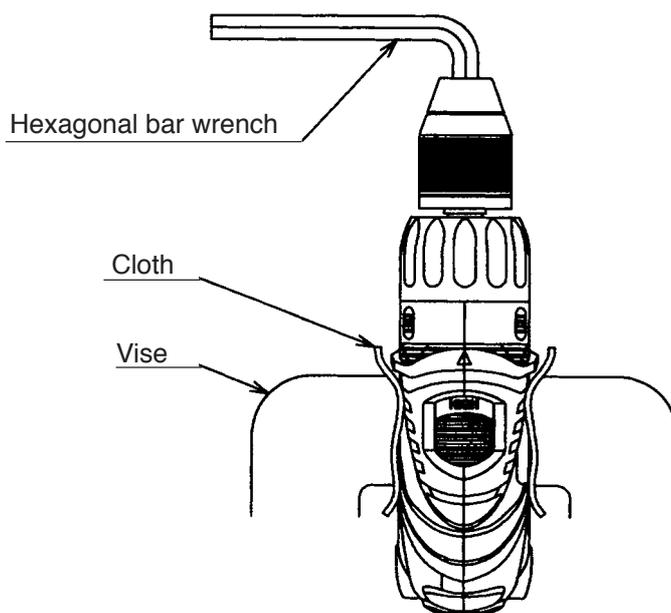


Fig. 3

(4) Adjust the Front Cap [4] to '  ".

(5) Disassembly of the main unit

Remove the ten Tapping Screws (W/Flange) D3 x 16 (Black) [36] from the main unit. Holding the battery chamber of Housing (B) [38], gently remove Housing (B) [38]. Then the inside parts can be removed in an assembled or single state. All the parts can be easily removed by raising the Front Cap [4]. Parts are separated into the drive unit (an assembly of the armature and the gear unit), power supply unit, Pushing Button [44] and Strap [55].

(6) Disassembly of the drive unit

(a) Remove the Front Cap [4] and the Click Spring [11] from the Front Case [12].

**NOTE: Do not remove the Nut [6] from the Front Case [12] in this step.**

(b) Remove the Shift Arm [21] from the Gear Box Ass'y [3] and remove the Shift Knob [42] from the Shift Arm [21]. Do not deform the Shift Arm [21] by applying excessive force.

(c) Turn the Motor Spacer [30] until a click is heard counterclockwise viewing from the rear of the Armature and Pinion Set [31]. Remove the Motor Spacer [30] from the Rear Case [20]. Thus the armature unit is separated from the gear unit.

(7) Disassembly of the armature unit

(a) Removal of the Magnet [32]

Note that the magnetic force of the Magnet [32] is strong. Hold the Motor Spacer [30] securely and pull toward the back of the Armature and Pinion Set [31] to remove.

**NOTE: Be careful that the ball bearing and the washer behind the Armature and Pinion Set [31] may be attracted to the Magnet [32] and come off the Armature and Pinion Set [31] when removing the Magnet [32].**

(b) Removal of the Motor Spacer [30]

Remove the Motor Spacer [30] from the Armature and Pinion Set [31]. If it is too hard to remove, support the Motor Spacer [30] and press down the tip of the armature shaft of the Armature and Pinion Set [31] with a hand press.

(8) Disassembly of the gear unit

(a) Disassembly of the deceleration mechanism

Turn Washer (B) [29] mounted in the Rear Case [20] counterclockwise to remove. Take out the First Ring Gear [28], Planet Gear (A) Set (4 pcs.) [27], Pinion (B) [26], Planet Gear (B) Set (4 pcs.) [25], Pinion (C) [24] and Slide Ring Gear [23] in order. Then remove the Screw Set M3 x 12 (4 pcs.) [22] that connects the Front Case [12] with the Rear Case [20]. Take out Washer (A) [19], Planet Gear (C) Set (5 pcs.) [18], Carrier [17], Ring Gear [16], Pin Set (6 pcs.) [13], Lock Ring [15] and Washer (D) [14] from the Front Case [12] in order.

**NOTE: Do not lose small parts. Pay special attention to the Pin Set (6 pcs.) [13], because they are apt to roll.**

(b) Removal of the Switch Plate [5]

Turn the switch flange so as to fit the projection of the switch flange to the recess of the Switch Plate [5], then remove the Switch Plate [5] from the Front Case [12]. (See Fig. 4)

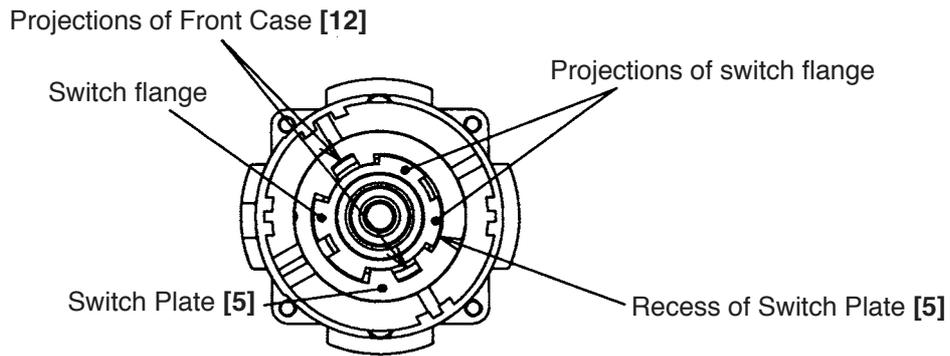


Fig. 4

(c) Disassembly of the clutch mechanism

Turn the Nut [6] counterclockwise to remove from the Front Case [12]. Take out the Spring [7], Thrust Washer [8], Stopper [9] and Stopper Spring [10] in order.

(9) Disassembly of the power supply unit

Disconnect each internal wire of Brush Block [33] and Terminals [48] [50] with a solder iron.

**NOTE: Do not remove the fin secured to the DC-speed control switch with a screw.**

### 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

Perform wiring according to the wiring diagram (Fig. 5). Pay attention to the connecting direction of the internal wires and the terminals.

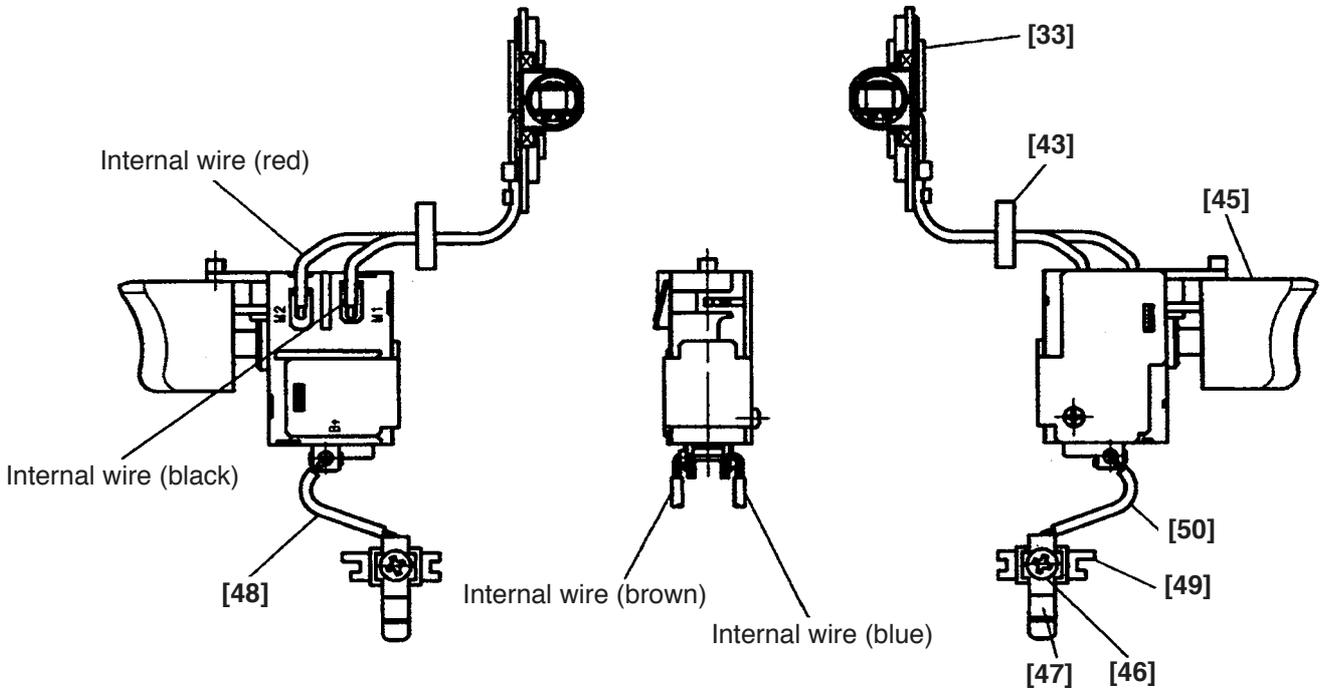


Fig. 5

#### (2) Reassembly of the clutch mechanism

(a) Mount the Stopper Spring [10] (2 pcs.), Stopper [9] (2 pcs.), Thrust Washer [8] and Spring [7] to the Front Case [12] in order (see Fig. 6).

**NOTE: Be careful not to drop the Stopper [9] and the Stopper Spring [10] until the Nut [6] is inserted.**

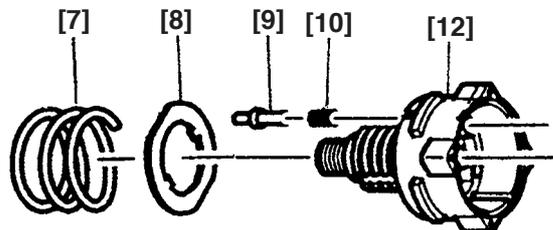


Fig. 6

(b) Screw the Nut [6] in the Front Case [12] (see Fig. 7).

Align the mark (i) on the Nut [6] with the mark on the Front Case [12] then screw it in. Rotate the Nut [6] about a turn clockwise to align the mark (i) on the Nut [6] with the mark on the Front Case [12].

At this time, check that the "Y" surface of the Nut [6] is almost flush with the "Z" surface of the Front Case [12]. After above step, tighten the Nut [6] so that the Nut [6] pushes the Stopper [9] into the Front Case [12].

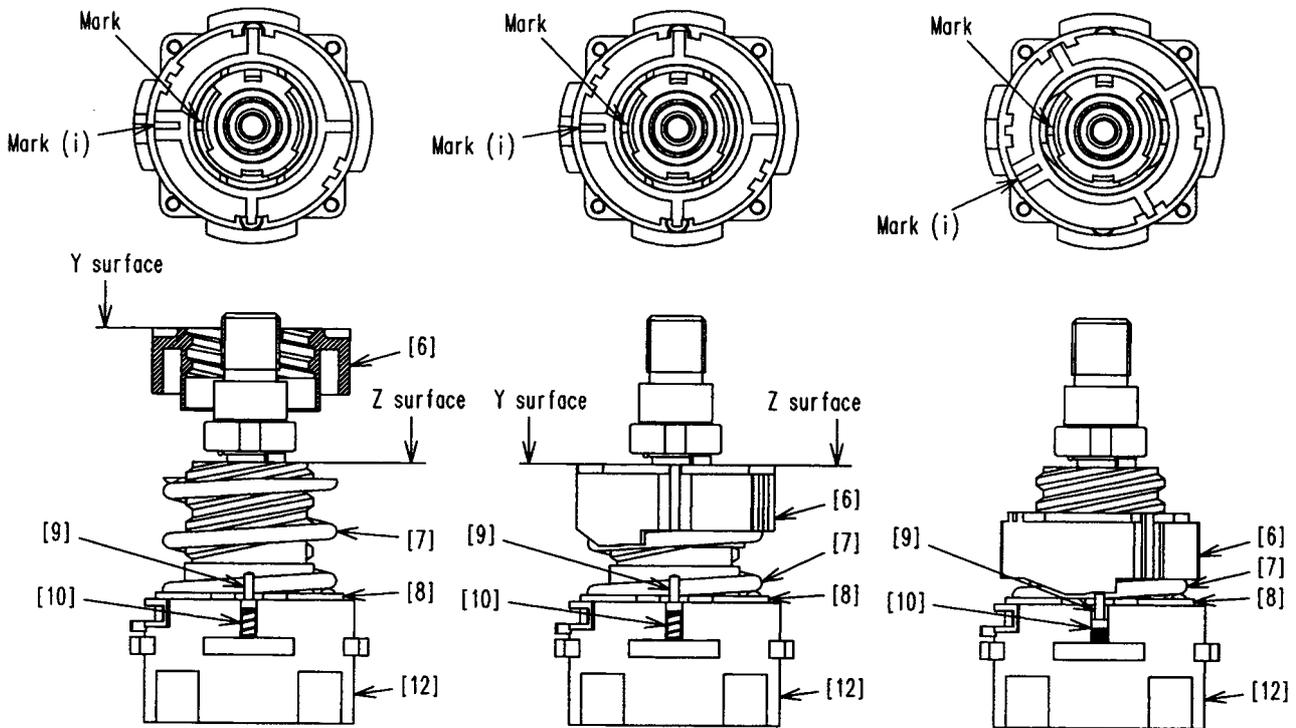


Fig. 7

### (3) Reassembly of the gear unit

(a) Apply grease (Hitachi Motor Grease No. 29) to the engaging portions of each gear and contacting surfaces with the pin set (6 pcs.) of the ring gear properly.

(b) Mount the parts from the Pin Set (6 pcs.) [13] to Washer (B) [29] to the part assembled in the above (2) in order (see Fig. 8).

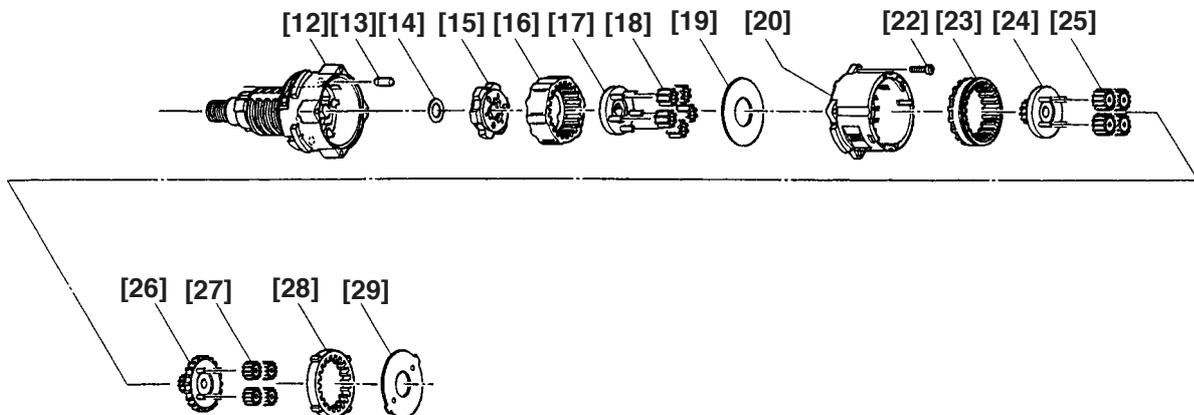


Fig. 8

① Apply grease approx. 1.2 g (Hitachi Motor Grease No. 29) to the shaded portion in the Front Case [12] (See Fig. 9).

**NOTE: Be sure to apply grease to the shaded portion in the Front Case [12]. Otherwise, the spindle lock may not work properly.**

② When installing the Lock Ring [15] into the Front Case [12], assemble so that the projections on the Lock Ring [15] engage with the recesses in the Front Case [12]. Make sure that the flat plane of Lock Ring [15] faces the Front Case [12] (see Fig. 9).

③ When installing the Carrier [17], assemble so that recess (A) on the Lock Ring [15] is aligned with projection (B) on the Carrier [17] (be careful of the direction). Then make sure that the flat plane of the spindle faces the flat plane of the Carrier [17]. If assembled in wrong direction, the flat plane of the spindle may be stopped at the position about 2 mm lower than the flat plane of the Carrier [17] (see Figs. 10 and 11).

**NOTE: When assembling the Carrier [17] to the Lock Ring [15], never apply the grease between the plate of the Lock Ring [15] and Carrier [17]. Otherwise, the spindle lock may not work properly.**

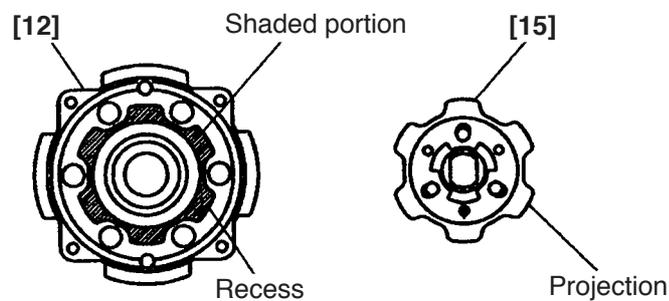


Fig. 9

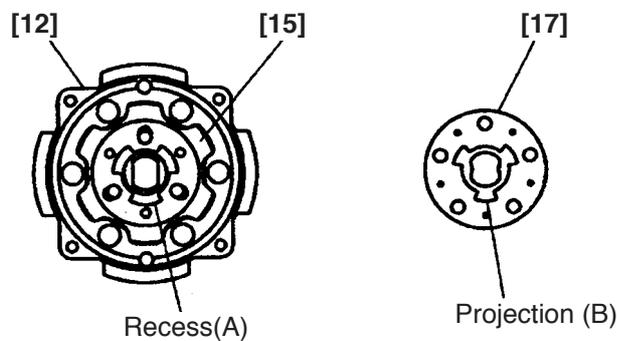


Fig. 10

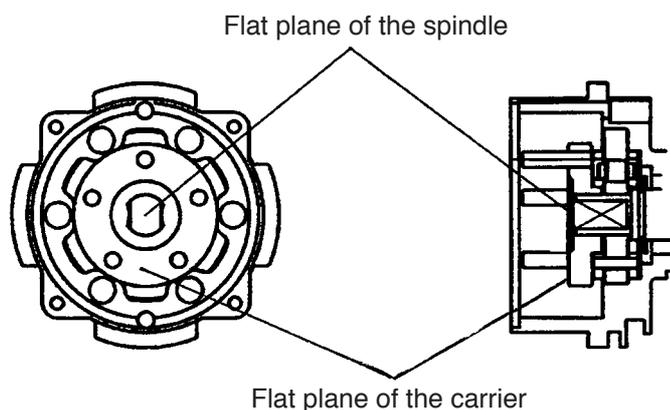


Fig. 11

- ④ Pay attention to the mounting direction of the Ring Gear [16], Slide Ring Gear [23], Pinion (C) [24] and Pinion (B) [26] (see Fig. 8).
- ⑤ Mount the Front Case [12] to the Rear Case [20] so that the concave portion of the Front Case [12] aligns with the protrusion of the Rear Case [20] (see Fig. 15).
- ⑥ Fit the protrusion of Washer (B) [29] in the concave portion of the Rear Case [20] and turn it clockwise viewing from the armature until it contacts the Rear Case [20] (see Fig. 12).

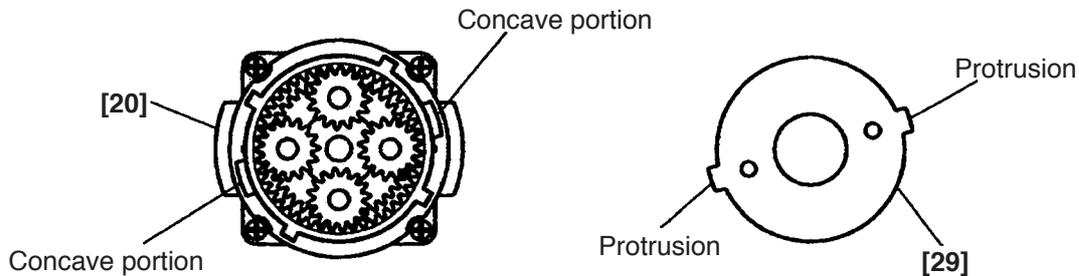


Fig. 12

(4) Reassembly of the armature unit

(a) Mounting the Motor Spacer [30]

Mount the Motor Spacer [30] to the Armature and Pinion Set [31]. If it is too hard to mount, support the Motor Spacer [30] and press down the rear end of the armature shaft of the Armature and Pinion Set [31] with a hand press.

(b) Mounting the Magnet [32]

Mount the Magnet [32] to the Armature and Pinion Set [31] so that the notch of the Magnet [32] faces the rear of the Armature and Pinion Set [31]. Hold each part securely as the Armature and Pinion Set [31] may be attracted to the Magnet [32] by the strong magnetic force (see Fig. 13).

**NOTE: Be careful that the ball bearing and the washer at the rear of the Armature and Pinion Set [31] may come off due to the magnetic force of the Magnet [32].**

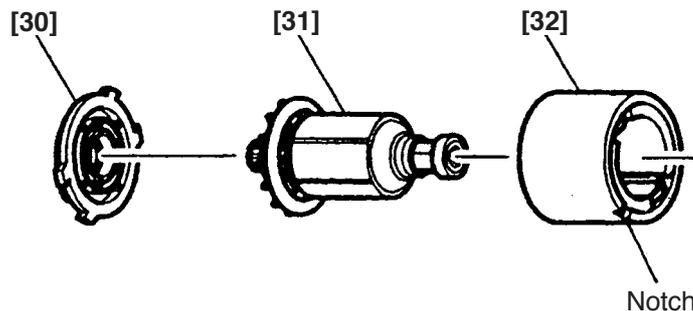


Fig. 13

(5) Reassembly of the drive unit

- (a) Fit the protrusion of the Motor Spacer [30] in the concave portion of the Rear Case [20] engaging the pinion of the Armature and Pinion Set [31] with Planet Gear (A) Set (4 pcs.) [27]. Turn it fully clockwise viewing from the rear of the Armature and Pinion Set [31] (see Fig. 14).

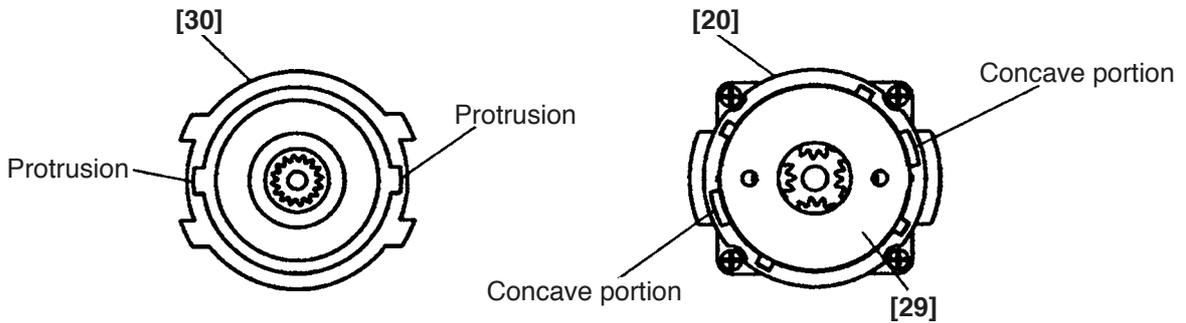


Fig. 14

- (b) Mounting the Shift Arm [21] and the Shift Knob [42] (see Fig. 15).

- ① Mount the Shift Arm [21] to the protruded side of the Rear Case [20]. At this time, insert the protrusion of the Shift Arm [21] into the hole of the Rear Case [20] and check that the protrusion is inserted into the groove of the Slide Ring Gear [23] that is mounted in the Rear Case [20] (see Fig. 8).
- ② Insert the Shift Arm [21] into the groove of the Shift Knob [42] facing "LOW" indication on the Shift Knob [42] backward.

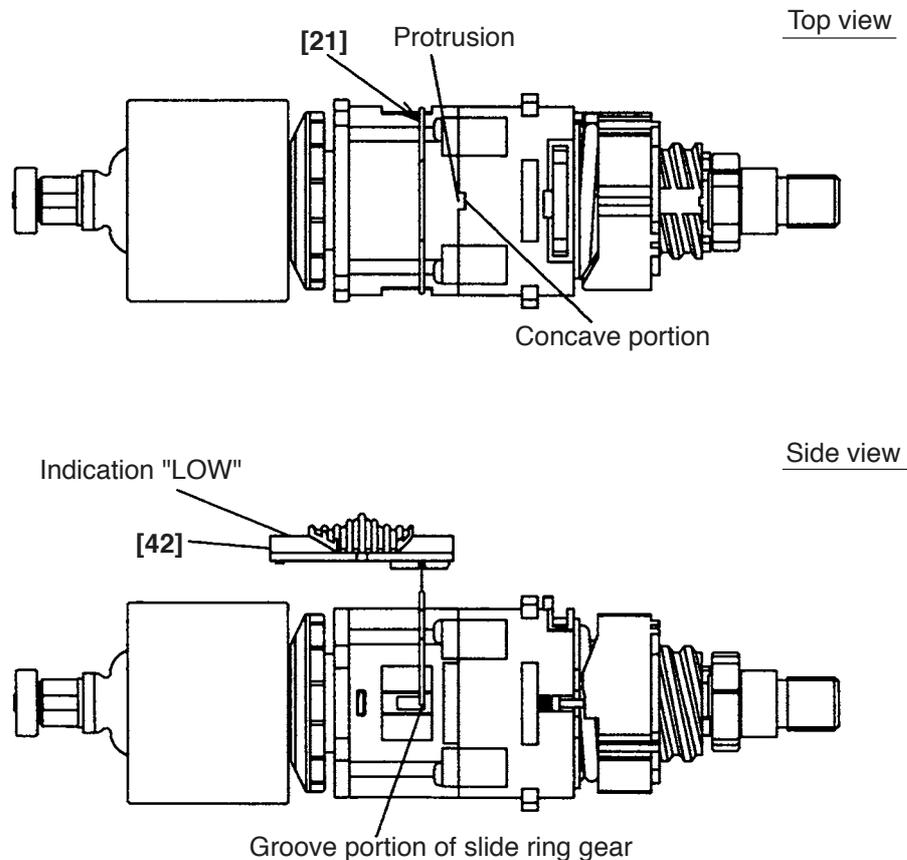


Fig. 15

(c) Mounting the Click Spring [11] and the Front Cap [4].

- ① Mount the Switch Plate [5] aligning with the projections of the Front Case [12] as shown in Fig. 4.
- ② Mount the Click Spring [11] to the Front Case [12].
- ③ When the Nut [6] is screwed in the Front case [12] about 1-11/12 turns (690°), the mark (i) of the Nut [6] and the marking of Switch Plate [5] are positioned as shown in Fig. 16. Set the narrow slit of switch flange as shown in Fig. 16. Mount the Front Cap [4] aligning the narrow projection of Front Cap [4] with the mark (i) of the Nut [6]. (The narrow projection of Front Cap [4] is positioned at "1" when viewed from the outside.)

Check that the protrusion of the Click Spring [11] is inserted into the groove inside the Front Cap [4].

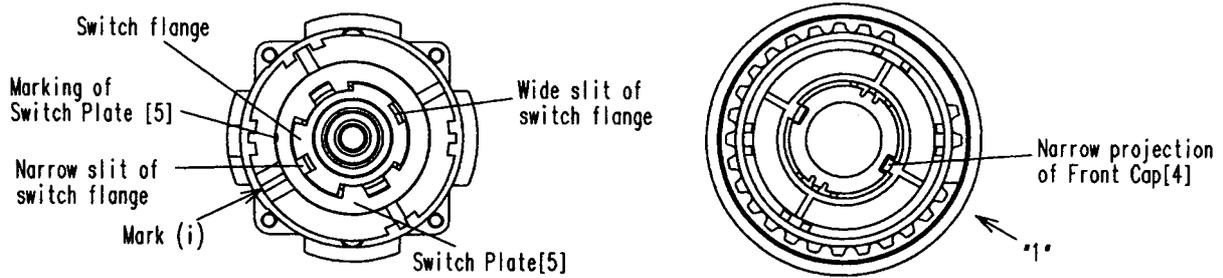


Fig. 16

(6) Reassembly of the main unit

- (a) Mount the power supply unit and the drive unit that were reassembled in the above procedure to Housing (A) [38]. At this time, align the protrusions of the Brush Block [33], Front Case [12] and Motor Spacer [30] with the concave portions of Housing (A) [38], the notch of the Magnet [32] with the protrusion of Housing (A) [38], and the groove of the Front Cap [4] with the protrusion of Housing (A) [38] (see Fig. 17).

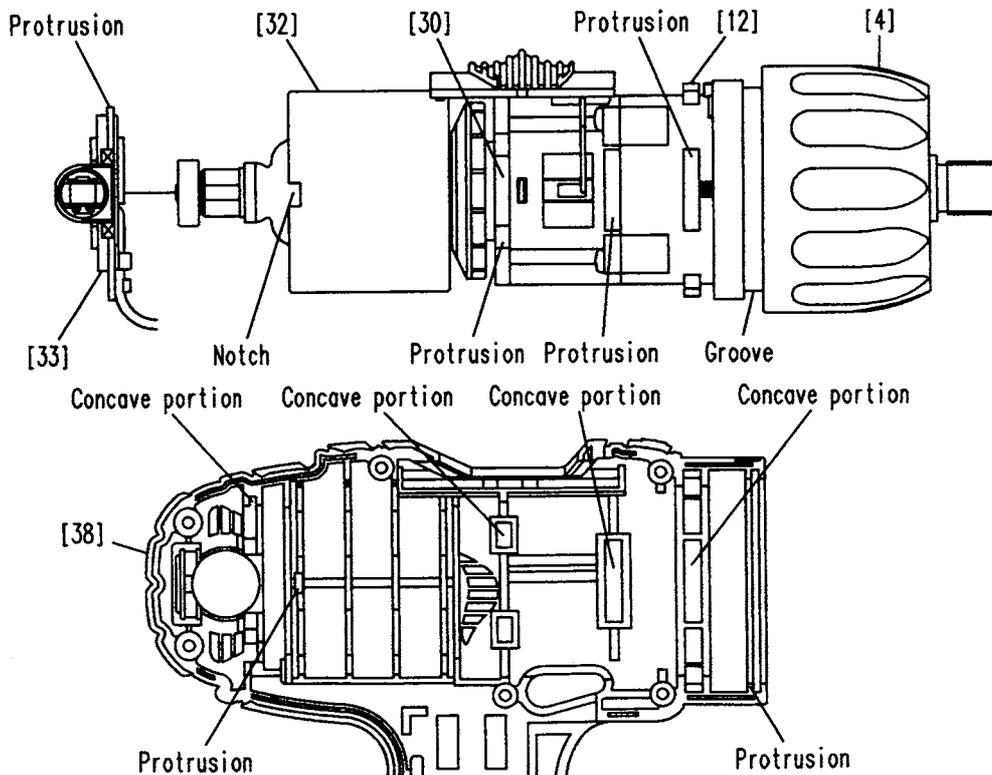


Fig. 17

(b) Mount the DC-Speed Control Switch [45] that was not mounted in the above step (a) to Housing (A) [38]. Mount the Pushing Button [44] to Housing (A) [38]. Check that the protrusion of the forward/reverse changeover lever of the DC-Speed Control Switch [45] is inserted into the groove of the Pushing Button [44].

(c) Mount the Strap [55] to Housing (A) [38].

(d) Align Housing (A) [38] with Housing (B) [38] and secure with ten Tapping Screws (W/Flange) D3 x 16 (Black) [36].

(e) Verify proper operation of the Front Cap [4] and the Shift Knob [42]. When the reassembly procedure up to step (e) is completed, ensure that the number "1" through the hammer mark "⚡" on the Front Cap [4] are in alignment with the triangle mark on Housing (A). (B) Set [38] respectively and the Front Cap [4] turns moderately. If the number "1" or the hammer mark "⚡" on the Front Cap [4] cannot reach the triangle mark on Housing (A). (B) Set [38], correctly reinstall the Front Cap [4] referring to step (2) or (5) (c) as it is improperly mounted. Verify proper operation of the Shift Knob [42]. Check that the speed changes between high and low properly by shifting the Shift Knob [42]. If the speed cannot change properly or moderately, correctly reinstall the Shift Knob [42] referring to step (3) (b) or (5) (b) as it is improperly mounted.

(7) Mounting the Drill Chuck 13VLRL-N (W/O Chuck Wrench) [2]

Mount the Drill Chuck 13VLRL-N (W/O Chuck Wrench) [2] to the spindle and tighten the Special Screw (Left Hand) M6 x 23 [1].

(8) Mounting the Carbon Brushes 5 x 6 x 11.5 [34]

Mount the two Carbon Brushes 5 x 6 x 11.5 [34] to the Brush Block [33] and secure the two Brush Caps [35] to the Brush Block [33]. Check that the claws of the Carbon Brushes 5 x 6 x 11.5 [34] are properly inserted into the brush tubes.

(9) Reassembly of the Hook Ass'y [51] [53]

Check that the V-Lock Nut M5 [52] is mounted to the Hook Ass'y [51] [53]. Mount the Hook Spring [56] and secure it with Special Screw (A) M5 [57]. Make sure to mount the Hook Spring [56] with its larger diameter side pointing inward the housing.

(10) Other precautions in reassembling

After completion of reassembly, check that the rotating direction of the Drill Chuck 13VLRL-N (W/O Chuck Wrench) [2] matches the position of the Pushing Button [44]. When the Pushing Button [44] is pressed from the (R) side, the rotating direction of the Drill Chuck 13VLRL-N (W/O Chuck Wrench) [2] should be clockwise as viewed from behind. Switch on and off the Models DV 18DMR and DV 14DMR using the battery. Then turn the Drill Chuck 13VLRL-N (W/O Chuck Wrench) [2] by hand in forward and reverse direction to check that the spindle lock properly works in either direction within a half rotation. Check that the runout of the Drill Chuck 13VLRL-N (W/O Chuck Wrench) [2] is 0.8 mm or less at the position 110 mm away from the tip of the chuck using a 12-mm dia. test bar.

(11) Screw tightening torque

Special Screw (Left Hand) M6 x 23 [1].....	3.92 – 4.9 N·m (40 – 50 kgf·cm)
Drill Chuck 13VLRN-N (W/O Chuck Wrench) [2].....	17.6 – 21.6 N·m (180 – 220 kgf·cm)
Screw Set M3 x 12 [22].....	0.62 – 0.94 N·m (6 – 10 kgf·cm)
Brush Cap [35].....	0.68 – 0.88 N·m (7 – 9 kgf·cm)
Tapping Screw (W/Flange) D3 x 16 (Black) [36].....	1.0 – 1.6 N·m (10 – 16 kgf·cm)
Special Screw (A) M5 [57].....	1.47 – 2.45 N·m (15 – 25 kgf·cm)

**10-2. Precaution in Disassembly and Reassembly of Battery Charger**

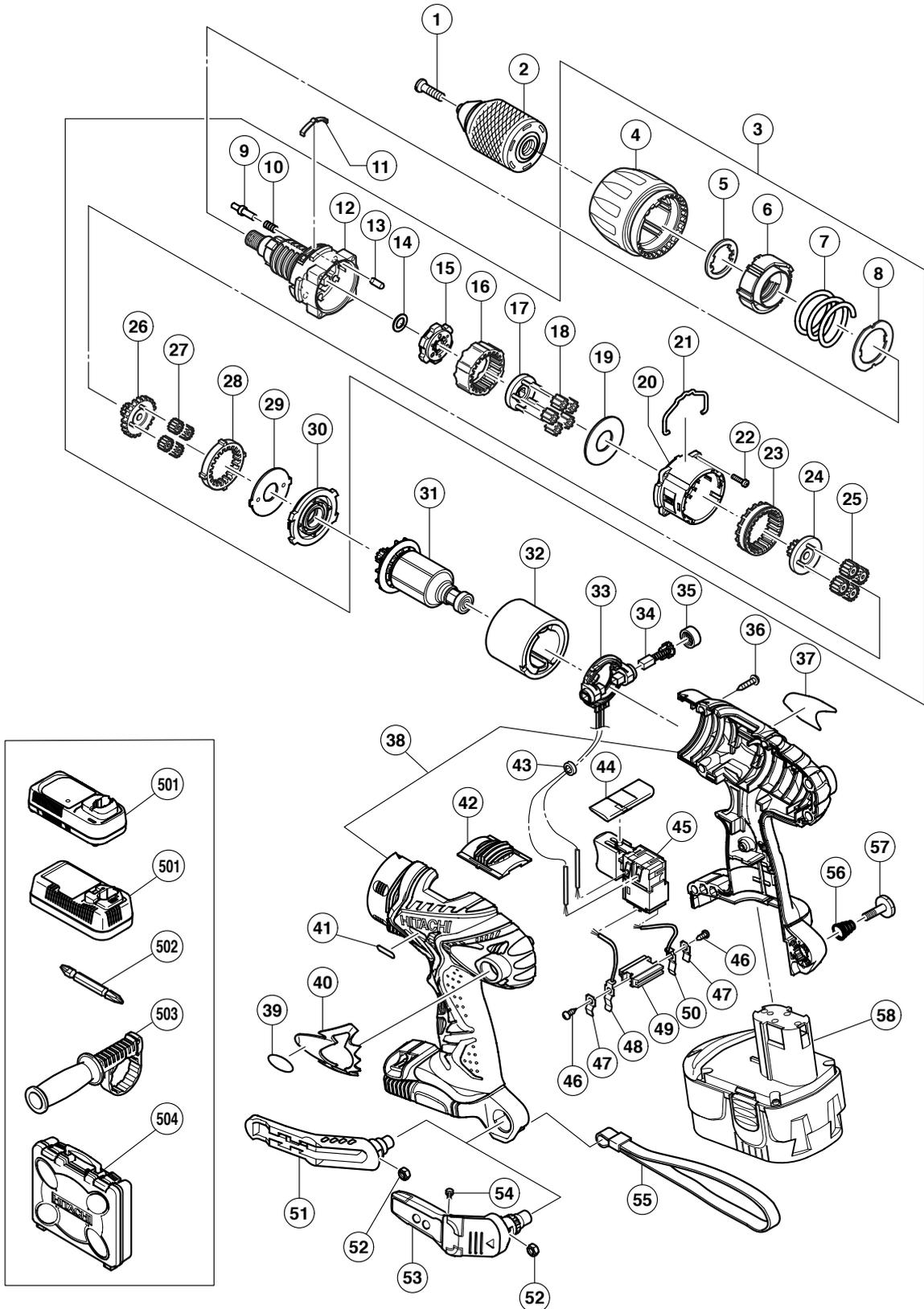
Please refer to the Technical Data and Service Manual for precautions in disassembly and reassembly of the Battery Chargers UC 14YFA, UC 24YFA and UC 24YJ.

### 11. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60
	Fixed							
(DV 14DMR) (DV 18DMR)		Work Flow						
	General Assembly			Armature and Pinion Set Magnet Brush Block DC-Speed Control Switch Shift Knob				
				Gear Box Ass'y				
		Drill Chuck (Keyless)						
		Hook Ass'y						
					Housing (A).(B) Set  Front Cap Nut Spring Front Case Lock Ring Ring Gear Carrier Planet Gear (C) Set Rear Case Shift Arm Slide Ring Gear Pinion (C) Planet Gear (B) Set Pinion (B) Planet Gear (A) Set First Ring Gear			

## ELECTRIC TOOL PARTS LIST

### CORDLESS IMPACT DRIVER DRILL 2005 · 3 · 10 Model DV 18DMR (E1)



**PARTS**

DV 18DMR

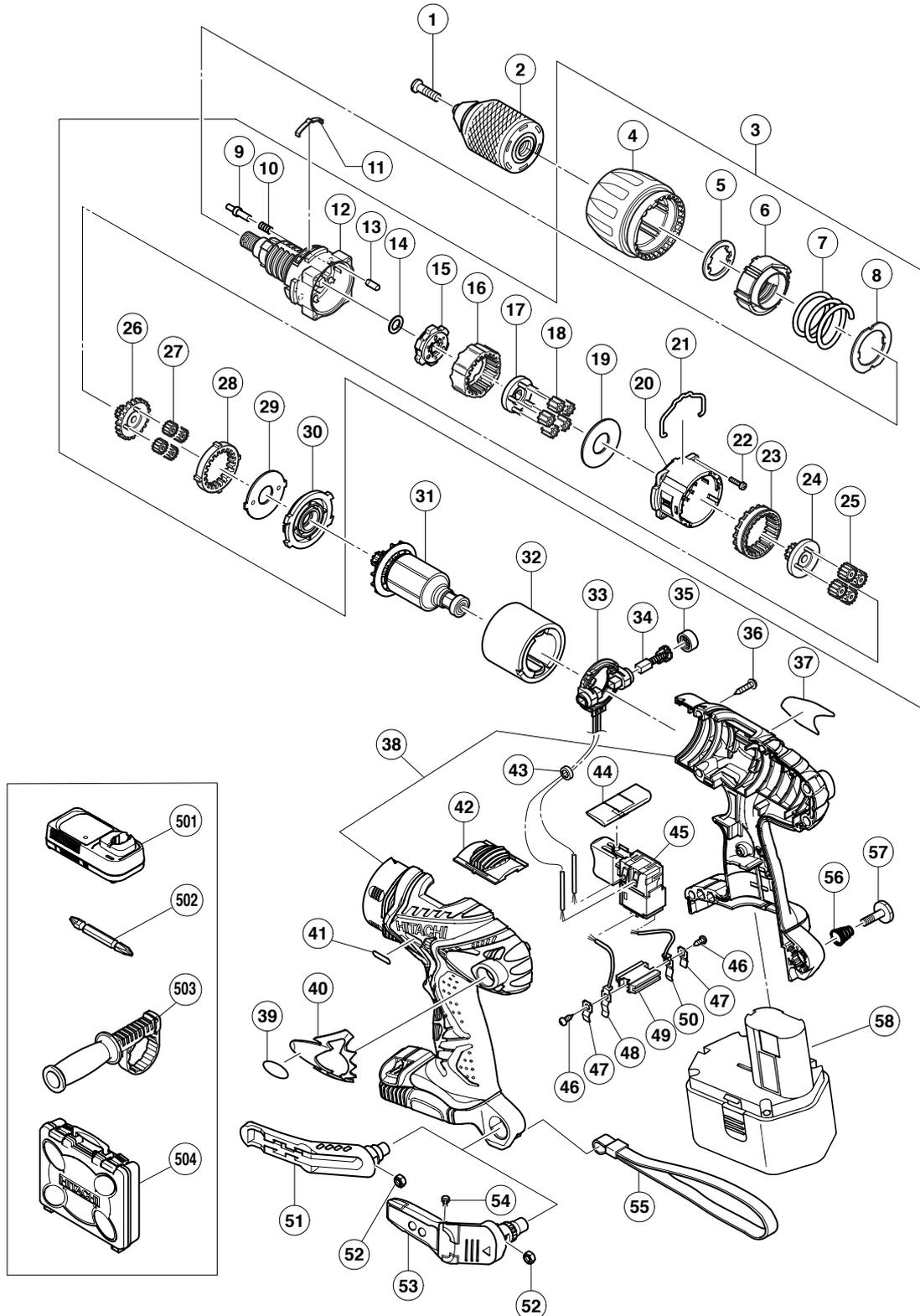
ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	311-959	SPECIAL SCREW (LEFT HAND) M6X23	1	
2	323-898	DRILL CHUCK 13VLRL-N (W/O CHUCK WRENCH)	1	
3	324-061	GEAR BOX ASS'Y	1	INCLUD. 4-10, 12-30
4	324-074	FRONT CAP	1	
5	324-136	SWITCH PLATE	1	
6	324-064	NUT	1	
7	324-135	SPRING	1	
8	324-063	THRUST WASHER	1	
9	322-972	STOPPER	2	
10	322-971	STOPPER SPRING	2	
11	320-773	CLICK SPRING	1	
12	324-062	FRONT CASE	1	
13	322-975	PIN SET (6 PCS.)	6	
14	324-065	WASHER (D)	1	
15	322-976	LOCK RING	1	
16	324-066	RING GEAR	1	
17	322-978	CARRIER	1	
18	324-067	PLANET GEAR (C) SET (5 PCS.)	5	
19	322-980	WASHER (A)	1	
20	322-981	REAR CASE	1	
21	322-990	SHIFT ARM	1	
22	320-087	SCREW SET M3X12 (4 PCS.)	4	
23	324-069	SLIDE RING GEAR	1	
24	324-068	PINION (C)	1	
25	324-070	PLANET GEAR (B) SET (4 PCS.)	4	
26	324-071	PINION (B)	1	
27	324-073	PLANET GEAR (A) SET (4 PCS.)	4	
28	324-072	FIRST RING GEAR	1	
29	322-988	WASHER (B)	1	
30	322-989	MOTOR SPACER	1	
31	360-701	ARMATURE AND PINION SET	1	
32	322-996	MAGNET	1	
33	322-993	BRUSH BLOCK	1	
34	999-054	CARBON BRUSH 5X6X11.5 (1 PAIR)	2	
35	319-918	BRUSH CAP	2	
36	313-687	TAPPING SCREW (W/FLANGE) D3X16 (BLACK)	10	
37		NAME PLATE	1	
38	322-998	HOUSING (A). (B) SET	1	
39		LABEL	1	
40	322-999	PLATE (A)	1	
41		HITACHI LABEL	1	
42	324-137	SHIFT KNOB	1	
* 43	323-229	FERRITE CORE	1	EXCEPT FOR NZL, AUS, USA, CAN
44	322-997	PUSHING BUTTON	1	
45	322-994	DC-SPEED CONTROL SWITCH	1	
46	958-715	TAPPING SCREW D4X10	2	
47	996-118	HOLDER SPRING	2	
48	322-995	TERMINAL	1	
49	320-997	TERMINAL PIECE	1	
50	323-003	TERMINAL	1	
* 51	320-287	HOOK ASS'Y	1	INCLUD. 52





## ELECTRIC TOOL PARTS LIST

### CORDLESS IMPACT DRIVER DRILL 2005 · 3 · 15 Model DV 14DMR (E1)



# PARTS

DV 14DMR

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	311-959	SPECIAL SCREW (LEFT HAND) M6X23	1	
2	323-898	DRILL CHUCK 13VLRL-N (W/O CHUCK WRENCH)	1	
3	324-061	GEAR BOX ASS'Y	1	INCLUD. 4-10, 12-30
4	324-074	FRONT CAP	1	
5	324-136	SWITCH PLATE	1	
6	324-064	NUT	1	
7	324-135	SPRING	1	
8	324-063	THRUST WASHER	1	
9	322-972	STOPPER	2	
10	322-971	STOPPER SPRING	2	
11	320-773	CLICK SPRING	1	
12	324-062	FRONT CASE	1	
13	322-975	PIN SET (6 PCS.)	6	
14	324-065	WASHER (D)	1	
15	322-976	LOCK RING	1	
16	324-066	RING GEAR	1	
17	322-978	CARRIER	1	
18	324-067	PLANET GEAR (C) SET (5 PCS.)	5	
19	322-980	WASHER (A)	1	
20	322-981	REAR CASE	1	
21	322-990	SHIFT ARM	1	
22	320-087	SCREW SET M3X12 (4 PCS.)	4	
23	324-069	SLIDE RING GEAR	1	
24	324-068	PINION (C)	1	
25	324-070	PLANET GEAR (B) SET (4 PCS.)	4	
26	324-071	PINION (B)	1	
27	324-073	PLANET GEAR (A) SET (4 PCS.)	4	
28	324-072	FIRST RING GEAR	1	
29	322-988	WASHER (B)	1	
30	322-989	MOTOR SPACER	1	
31	360-721	ARMATURE AND PINION SET	1	
32	322-996	MAGNET	1	
33	322-993	BRUSH BLOCK	1	
34	999-054	CARBON BRUSH 5X6X11.5 (1 PAIR)	2	
35	319-918	BRUSH CAP	2	
36	313-687	TAPPING SCREW (W/FLANGE) D3X16 (BLACK)	10	
37		NAME PLATE	1	
38	323-002	HOUSING (A). (B) SET	1	
39		LABEL	1	
40	322-999	PLATE (A)	1	
41		HITACHI LABEL	1	
42	324-137	SHIFT KNOB	1	
* 43	323-229	FERRITE CORE	1	EXCEPT FOR NZL, AUS, USA, CAN
44	322-997	PUSHING BUTTON	1	
45	322-994	DC-SPEED CONTROL SWITCH	1	
46	958-715	TAPPING SCREW D4X10	2	
47	996-118	HOLDER SPRING	2	
48	322-995	TERMINAL	1	
49	320-997	TERMINAL PIECE	1	
50	323-003	TERMINAL	1	
* 51	320-287	HOOK ASS'Y	1	INCLUD. 52





