

MODELS

DS 18DVF3

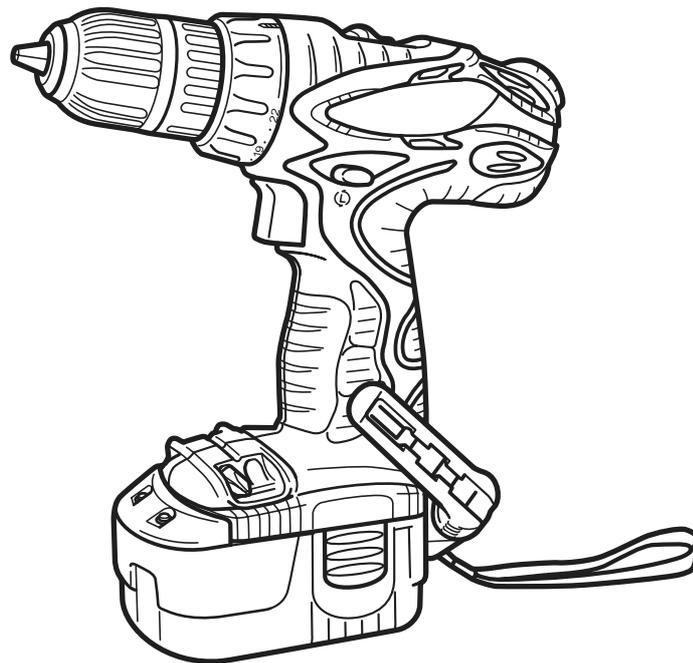
DS 14DVF3

Hitachi Power Tools

**CORDLESS DRIVER DRILL
DS 18DVF3
DS 14DVF3**

**TECHNICAL DATA
AND
SERVICE MANUAL**

D



LIST Nos. DS 18DVF3: G823
DS 14DVF3: G822

Apr. 2005

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
Q	DEWALT	DC759, DC728
B	BOSCH	32618, GSR14, 4V/32614
C	MAKITA	6228D



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1. PRODUCT NAME

Hitachi 18 V Cordless Driver Drill, Model DS 18DVF3

Hitachi 14.4 V Cordless Driver Drill, Model DS 14DVF3

2. MARKETING OBJECTIVE

The new Models DS 18DVF3 and DS 14DVF3 are upgraded versions of the current DSxxDVF2 series cordless driver drills highly reputed as reasonable professional-use cordless driver drills. These new models are added to reinforce the excellent cost/performance cordless driver drill series including the Models DS 9DVF3 and DS 12DVF3 released in advance.

The Model DS 14DVF3 (battery voltage 14.4 V) is higher-performance and more convenient thanks to the powerful motor increased in size and the angle-adjustable one-touch hook as well as the same operability as the current Model DS 14DVF2. In addition, the Model DS 14DVF3 is balanced best with the optimally designed position of center of gravity for various applications.

The Model DS 18DVF3 (battery voltage 18 V) is most powerful in this series. The Model DS 18DVF3 is suitable for heavy-load works that cannot be accomplished by the Model DS 14DVF3. Although the overall length of the Model DS 18DVF3 is 10 mm longer than the Model DS 14DVF3 owing to adoption of the new 13-mm chuck, the overall height is equivalent to the Model DS 14DVF3 thanks to the adoption of the flat battery.

Both the Models DS 18DVF3 and DS 14DVF3 are provided with convenient standard accessories such as spare batteries, bit set and torchlight.

3. APPLICATIONS

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

4. SELLING POINTS

Powerful and compact		
Max. torque	45 N·m (DS 18DVF3)	34 N·m (DS 14DVF3)
Overall length	220 mm (DS 18DVF3)	210 mm (DS 14DVF3)

All new cyber design

22-stage adjustable clutch

- For precise torque setting

**Improved overload durability
(improved cooling efficiency)**

- Large diameter powerful unit motor
- Optimally designed cooling air path

**13 mm keyless chuck (DS 18DVF3)
10 mm keyless chuck (DS 14DVF3)**
• For tool-less bit changes

Soft grip handle

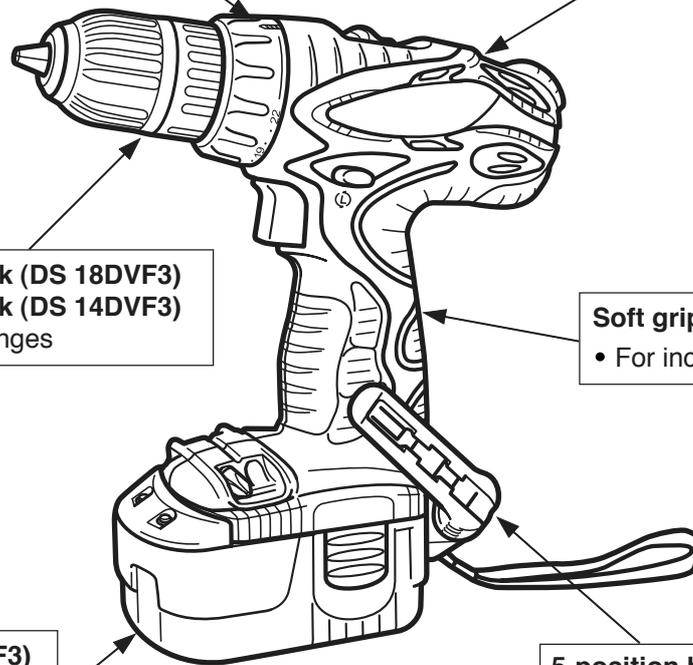
- For increased comfort

Flat battery (DS 18DVF3)

- Compact and stable
- Interchangeable with conventional batteries

**5-position belt hook with
integrated bit holder**

- For convenient bit storage



[Model DS 18DVF3]

4-1. Selling Point Descriptions

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

The Model DS 14DVF3 ensures durability in continuous operation thanks to the powerful motor increased in size and the improved air ducts. The Model DS 18DVF3 is equipped with the larger motor than the Model DS 14DVF3. (See Fig. 1.)

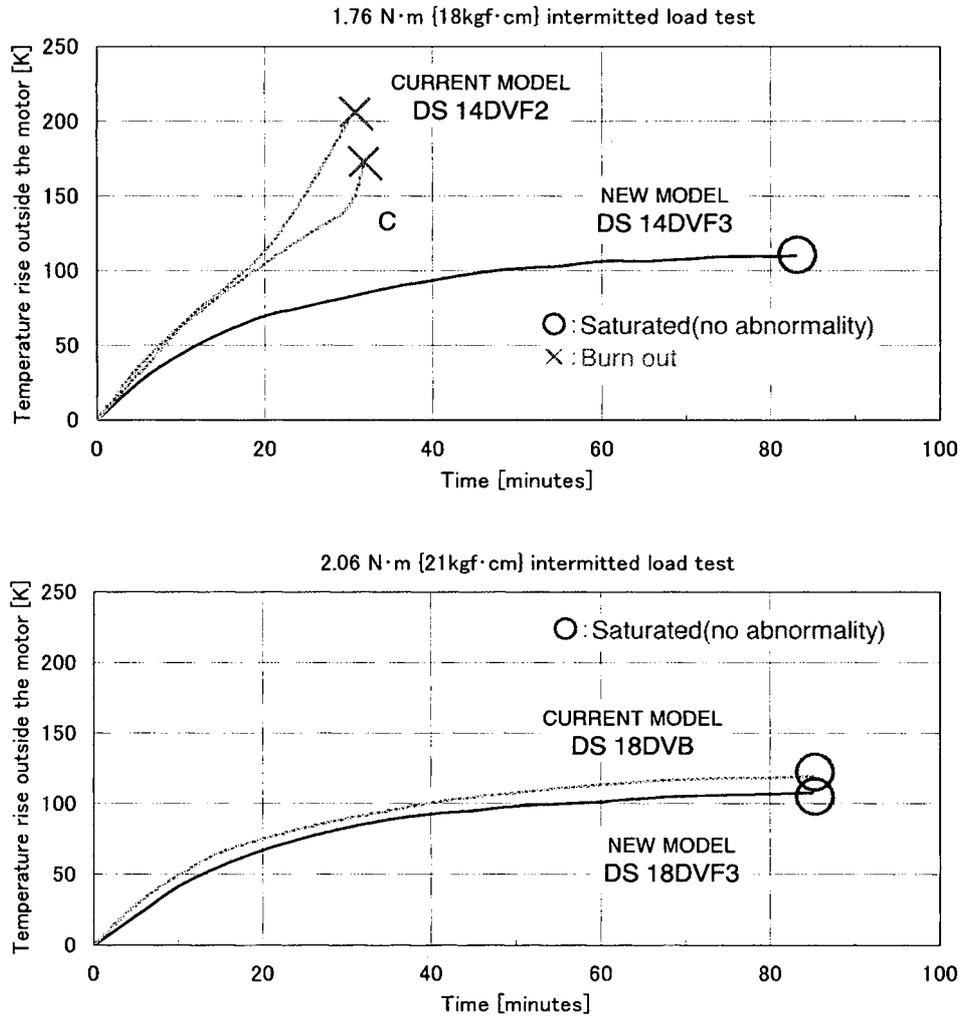


Fig. 1 Curves of the motor temperature rise

4-1-2. 22-position torque adjustable clutch (Max. clutch torque 5.9 N·m)

The torque can be set finely thanks to the adoption of the 22 clutch positions to improve the operability (see Table 1).

Table 1

Clutch dial position	Tightening torque
1	1.0 ± 0.5 N·m {10 ± 5 kgf·cm}
4	1.7 ± 0.6 N·m {17 ± 6 kgf·cm}
10	3.1 ± 0.7 N·m {31 ± 7 kgf·cm}
13	3.8 ± 0.8 N·m {38 ± 8 kgf·cm}
19	5.2 ± 0.9 N·m {53 ± 9 kgf·cm}
22	5.9 ± 1.0 N·m {60 ± 10 kgf·cm}

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

4-1-3. 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.

4-1-4. 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.

4-1-5. Flat battery (DS 18DVF3)

The battery is flat enough to stand the Model DS 18DVF3 upright stability. The conventional Hitachi 18 V batteries are also usable.

5. SPECIFICATIONS

5-1. Model DS 18DVF3

Capacity		Screwdriver Machine screw 6 mm (1/4") Wood screw 8 dia. x 75 mm (#20 x 3") Drill 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 38 mm (1-1/2") [Thickness 18 mm (11/16")]
Keyless chuck (13VLRM-N)		Mount type Screw-on (UNF 1/2" – 20) Diameter 2 – 13 mm (5/64" – 1/2")
Rotation speed (No-load)		Low: 0 – 400/min, High: 0 – 1,200/min
Torque		Slip torque 1 – 6 N·m (10 – 60 kgf·cm, 9 – 52 in-lbs.) [22 stages] Max. torque Low: 45 N·m (459 kgf·cm, 400 in-lbs.), High: 11 N·m (112 kgf·cm, 97 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 1814SL/ EB 1820L)		Sealed cylindrical nickel-cadmium storage battery Nominal voltage DC 18 V Nominal life Charging/discharging: Approx. 500 times Nominal capacity 1.4/2.0 Ah
Charger (Model UC 18YG)		<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: 70 W • Indication method: Pilot lamp indicator of battery charging Function: On During charging Off Charging completed
Weight	Net	Main body unit (including battery) 2.0 kg (4.4 lbs.) Charger unit (UC 18YG, including cord) 0.3 kg (0.7 lbs.)
	Gross	DS 18DVF3 (2SLGX) 5.6 kg (12.4 lbs.)
Standard accessories (2SLGX)		Charger (UC 18YG) 1
		Battery (EB 1814SL) 2
		Phillips (plus) driver bit (No. 2) 1
		Torchlight (Flashlight) (UB 18D) 1
		Bit set 1
		Case 1

5-2. Model DS 14DVF3

Capacity		Screwdriver Machine screw 6 mm (1/4") Wood screw 6.2 dia. x 63 mm (#14 x 2-1/2") Drill Metal Mild steel 12 mm (15/32") [Thickness 1.6 mm (1/16")] Aluminum 15 mm (19/32") [Thickness 1.6 mm (1/16")] Wood 30 mm (1-3/16") [Thickness 18 mm (11/16")]
Keyless chuck (10VLRN-N)		Mount type Screw-on (UNF 1/2" – 20) Diameter 0.8 – 10 mm (1/32" – 3/8")
Rotation speed (No-load)		Low: 0 – 400/min, High: 0 – 1,200/min
Torque		Slip torque 1 – 5.9 N·m (10 – 60 kgf·cm, 9 – 52 in-lbs.) [22 stages] Max. torque Low: 34 N·m (347 kgf·cm, 300 in-lbs.) High: 8 N·m (82 kgf·cm, 71 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 1414S)		Sealed cylindrical nickel-cadmium storage battery Nominal voltage DC 14.4 V Nominal life Charging/discharging: Approx. 500 times Nominal capacity 1.4 Ah
Charger (Model UC 18YG)		<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: 70 W • Indication method: Pilot lamp indicator of battery charging Function: On During charging Off Charging completed
Weight	Net	Main body unit (including battery) 1.8 kg (4.0 lbs.) Charger unit (UC 18YG, including cord) 0.3 kg (0.7 lbs.)
	Gross	DS 14DVF3 (2SGX) 4.9 kg (10.8 lbs.) DS 14DVF3 (3SGX) 5.2 kg (11.5 lbs.)
Standard accessories	(2SGX)	Charger (UC 18YG) 1
		Battery (EB 1414S) 2
		Phillips (plus) driver bit (No. 2) 1
		Torchlight (Flashlight) (UB 18D) 1
		Bit set 1
		Case 1
	(3SGK)	Charger (UC 18YG) 1
		Battery (EB 1414S) 3
		Phillips (plus) driver bit (No. 2) 1
		Bit set 1
Case 1		

6. COMPARISONS WITH SIMILAR PRODUCTS

6-1. Model DS 18DVF3

Maker		HITACHI			Q (EURO)	Q (U.S.A.)
Model		DS 18DVF3	DS 18DVB (USA)			
Max. capacity	Screw driving	Machine screw	6 mm (1/4")	6 mm (1/4")	Not indicated	Not indicated
		Wood screw	8 mm dia. x 75 mm (#20 x 3")	8 mm dia. x 75 mm (#20 x 3")	Not indicated	Not indicated
	Drilling	Mild steel	13 mm (1/2")	10 mm (3/8")	13 mm (1/2")	13 mm (1/2")
		Aluminum	13 mm (1/2")	10 mm (3/8")	Not indicated	Not indicated
		Soft wood	38 mm (1-1/2")	25 mm (1")	38 mm (1-1/2")	38 mm (1-1/2")
Rotation speed	Low	0 – 400/min	0 – 400/min	0 – 400/min	0 – 400/min	
	High	0 – 1,200/min	0 – 1,400/min	0 – 1,400/min	0 – 1,500/min	
Slip torque		1.0 – 5.9 N·m (10 – 60 kgf·cm) (9 – 52 in-lbs.) [22 positions]	1.0 – 5.9 N·m (10 – 60 kgf·cm) (9 – 52 in-lbs.) [22 positions]	Not indicated [17 positions]	Not indicated [17 positions]	
Max. torque		45 N·m (459 kgf·cm) (400 in-lbs.)	45 N·m (459 kgf·cm) (400 in-lbs.)	44 N·m (449 kgf·cm)	450 in-lbs. (518 kgf·cm)	
Max. torque (hard) (actually measured value)		57 N·m (585 kgf·cm) (508 in-lbs.)	61 N·m (630 kgf·cm) (550 in-lbs.)	Can not measure (Slip)	Can not measure (Slip)	
Drill chuck	Type	Double sleeve	Double sleeve	Single sleeve	Single sleeve	
	Capacity	13 mm (1/2")	10 mm (3/8")	13 mm (1/2")	13 mm (1/2")	
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		None	None	Equipped	Equipped	
Reversing switch		Push-button	Push-button	Push-button	Push-button	
Handle shape		T-type	T-type	T-type	T-type	
Soft-grip handle		Equipped	Equipped	Equipped	Equipped	
Belt hook		Equipped	Equipped	None	None	
Strap		Equipped	Equipped	None	None	
Battery	Nominal capacity	1.4/2.0 Ah	1.2 Ah	2.0 Ah	1.7 Ah	
	Nominal voltage	18 V	18 V	18 V	18 V	
	Charging time*	30/50 min.	60 min.	60 min.	45 min.	
Dimensions	Overall length	220 mm (8-21/32")	232 mm (9-9/64")	230 mm (9-1/16")	230 mm (9-1/16")	
	Overall height	233 mm (9-11/64")	257 mm (10-1/8")	239 mm (9-13/32")	239 mm (9-13/32")	
	Overall width	76 mm (3")	76 mm (3")	90 mm (3-35/64")	90 mm (3-35/64")	
Weight		2.0 kg (4.4 lbs.)	2.0 kg (4.4 lbs.)	2.4 kg (5.2 lbs.)	2.4 kg (5.2 lbs.)	

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

Maker		B	
Model			
Max. capacity	Screw driving	Machine screw	Not indicated
		Wood screw	6.8 mm dia. x 76 mm (#16 x 3")
	Drilling	Mild steel	13 mm (1/2")
		Aluminum	Not indicated
		Soft wood	50 mm (2")
Rotation speed	Low	0 – 400/min	
	High	0 – 1,300/min	
Slip torque		Not indicated [15 stages]	
Max. torque		310 in-lbs. (357 kgf-cm)	
Max. torque (hard) (actually measured value)		Can not measure (Slip)	
Drill chuck	Type	Single sleeve	
	Capacity	10 mm (3/8")	
Switch	Type	Variable speed	
	Feedback circuit	Equipped	
	Electric brake	Equipped	
Automatic spindle lock		Equipped	
Reversing switch		Push-button	
Handle shape		T-type	
Soft-grip handle		Equipped	
Belt hook		None	
Strap		None	
Battery	Nominal capacity	2.0 Ah	
	Nominal voltage	18 V	
	Charging time*	60 min.	
Dimensions	Overall length	220 mm (8-21/32")	
	Overall height	257 mm (10-1/8")	
	Overall width	87 mm (3-27/64")	
Weight		2.0 kg (4.5 lbs.)	

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

6-2. Model DS 14DVF3

Maker		HITACHI			
Model		DS 14DVF3	DS 14DVF2	C	
Max. capacity	Screw driving	Machine screw	6 mm (1/4")	6 mm (1/4")	6 mm (1/4")
		Wood screw	6.2 mm dia. x 63 mm (#14 x 2-1/2")	5.5 mm dia. x 63 mm (#12 x 2-1/2")	5.1 mm dia. x 63 mm (3/16" x 2-1/2")
	Drilling	Mild steel	12 mm (15/32")	12 mm (15/32")	10 mm (3/8")
		Aluminum	15 mm (19/32")	15 mm (19/32")	Not indicated
		Soft wood	30 mm (1-3/16")	25 mm (1")	24 mm (15/16")
Rotation speed	Low	0 – 400/min	0 – 400/min	0 – 350/min	
	High	0 – 1,200/min	0 – 1,200/min	0 – 1,100/min	
Slip torque		1 – 6 N·m (10 – 60 kgf·cm) (9 – 52 in-lbs.) [22 positions]	1.0 – 5.9 N·m (10 – 60 kgf·cm) (9 – 52 in-lbs.) [22 positions]	Not indicated [16 positions]	
Max. torque		34 N·m (347 kgf·cm) (300 in-lbs.)	30 N·m (306 kgf·cm) (213 in-lbs.)	22 N·m (224 kgf·cm) (200 in-lbs.)	
Max. torque (hard) (actually measured value)		54 N·m (546 kgf·cm) (475 in-lbs.)	40 N·m (410 kgf·cm) (356 in-lbs.)	31 N·m (319 kgf·cm) (277 in-lbs.)	
Drill chuck	Type	Double sleeve	Double sleeve	Double sleeve	
	Capacity	10 mm (3/8")	10 mm (3/8")	10 mm (3/8")	
Switch	Type	Variable speed	Variable speed	Variable speed	
	Feedback circuit	Equipped	Equipped	Equipped	
	Electric brake	Equipped	Equipped	Equipped	
Automatic spindle lock		None	None	None	
Reversing switch		Push-button	Push-button	Push-button	
Handle shape		T-type	T-type	T-type	
Soft-grip handle		Equipped	Equipped	None	
Belt hook		Equipped	None	None	
Strap		Equipped	Equipped	None	
Battery	Nominal capacity	1.4 Ah	1.4 Ah	1.3 Ah	
	Nominal voltage	14.4 V	14.4 V	14.4 V	
	Charging time*	30 min.	60 min.	30 min.	
Dimensions	Overall length	210 mm (8-17/64")	210 mm (8-17/64")	210 mm (8-17/64")	
	Overall height	229 mm (9")	241 mm (9-1/2")	249 mm (9-51/64")	
	Overall width	76 mm (3")	76 mm (3")	95 mm (3-47/64")	
Weight		1.8 kg (4.0 lbs.)	1.7 kg (3.7 lbs.)	1.7 kg (3.7 lbs.)	

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

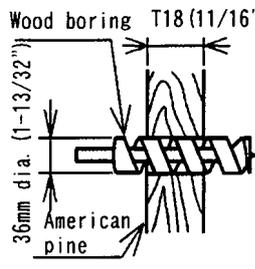
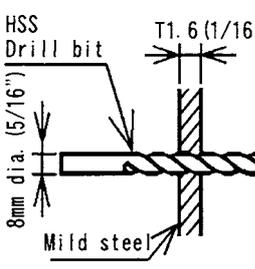
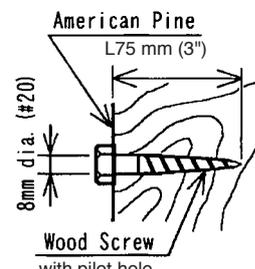
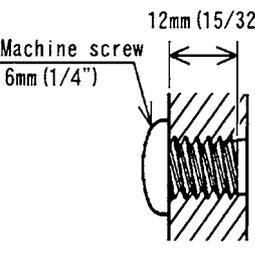
Maker		Q (EURO)	Q (U.S.A.)	B (EURO)	B (U.S.A.)	
Model						
Max. capacity	Screw driving	Machine screw	Not indicated	Not indicated	Not indicated	Not indicated
		Wood screw	Not indicated	Not indicated	8 mm dia.	#16 x 3" (6.8 x 76 mm)
	Drilling	Mild steel	10 mm (3/8")	10 mm (3/8")	11 mm	13 mm (1/2")
		Aluminum	Not indicated	Not indicated	Not indicated	Not indicated
		Soft wood	32 mm	38 mm (1-1/2")	32 mm	51 mm (2")
Rotation speed	Low	0 – 400/min	0 – 400/min	0 – 400/min	0 – 400/min	
	High	0 – 1,400/min	0 – 1,400/min	0 – 1,200/min	0 – 1,200/min	
Slip torque		Not indicated [17 positions]	Not indicated [17 positions]	1 – 8 N·m (10 – 82 kgf·cm) [15 stages]	Not indicated [15 stages]	
Max. torque		35 N·m (357 kgf·cm)	400 in-lbs. (357 kgf·cm)	35 N·m (357 kgf·cm)	300 in-lbs. (336 kgf·cm)	
Max. torque (hard) (actually measured value)		58.3 N·m (594 kgf·cm)	516 N·m (594 kgf·cm)	Can not measure (Break down)	Can not measure (Break down)	
Drill chuck	Type	Single sleeve	Single sleeve	Single sleeve	Single sleeve	
	Capacity	10 mm (3/8")	13 mm (1/2")	10 mm (3/8")	10 mm (3/8")	
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	
Handle shape		T-type	T-type	T-type	T-type	
Soft-grip handle		Equipped	Equipped	Equipped	Equipped	
Belt hook		None	None	None	None	
Strap		None	None	None	None	
Battery	Nominal capacity	1.3 Ah	1.7 Ah	1.5 Ah	2.0 Ah	
	Nominal voltage	14.4 V	14.4 V	14.4 V	14.4 V	
	Charging time*	60 min.	45 min.	60 min.	60 min.	
Dimensions	Overall length	220 mm (8-21/32")	230 mm (9-1/16")	220 mm (8-21/32")	220 mm (8-21/32")	
	Overall height	230 mm (9-1/16")	230 mm (9-1/16")	255 mm (10-3/64")	255 mm (10-3/64")	
	Overall width	84 mm (3-5/16")	84 mm (3-5/16")	86 mm (3-25/64")	86 mm (3-25/64")	
Weight		1.9 kg (4.3 lbs.)	2.2 kg (4.8 lbs.)	1.8 kg (4.0 lbs.)	1.9 kg (4.3 lbs.)	

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

7. WORKING PERFORMANCE PER SINGLE CHARGE

7-1. Model DS 18DVF3

Drilling and fastening performance comparison per charge

Type of work	Maker	Model	Working capacity (*1)						Drilling speed (sec./pc.)
			*0 0	*300 50	*600 100	*900 150	*1200 200	*1500 250	
 <p>Wood boring T1.8 (11/16") 36mm dia. (1-13/32") American pine < Low speed ></p>	HITACHI	DS 18DVF3	80 (115)						4.7
		DS 18DVB	65						5.3
	Q		115						5.3
	B		115						5.2
 <p>HSS Drill bit T1.6 (1/16") 8mm dia. (5/16") Mild steel < High speed ></p>	HITACHI	DS 18DVF3	65 (90)						11
		DS 18DVB	60						12
	Q		95						11
	B		75						13
 <p>American Pine L75 mm (3") 8mm dia. (#20) Wood Screw with pilot hole < Low speed ></p>	HITACHI	DS 18DVF3	35 (50)						5.9
		DS 18DVB	35						6.1
	Q		65						5.4
	B		50						5.8
 <p>Machine screw 6mm (1/4") 12mm (15/32") < High speed ></p>	HITACHI	DS 18DVF3	* 650 (930)						0.9
		DS 18DVB	* 540						0.9
	Q		* 810						0.9
	B		* 750						1.0

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 DS 18DVF3: 1.4 Ah

Model DS 18DVB: 1.2 Ah

Q, B: 2.0 Ah

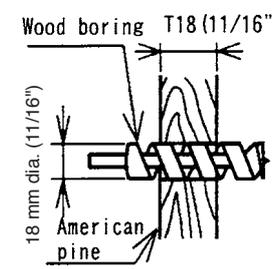
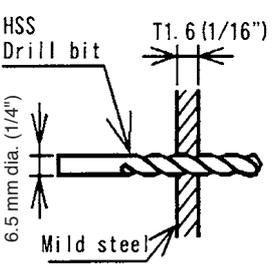
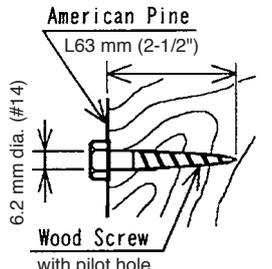
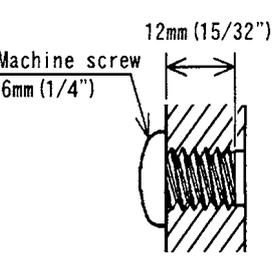
The figures in parentheses () indicate the values for a 2.0 Ah battery.

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 DS 14DVF3

Drilling and fastening performance comparison per charge

Type of work	Maker	Model	Working capacity (*1)						Drilling speed (sec./pc.)
			*0 0	*300 50	*600 100	*900 150	*1200 200	*1500 250	
 <p>Wood boring T18 (11/16") 18 mm dia. (11/16") American pine < Low speed ></p>	HITACHI	DS 14DVF3	130						4.4
		DS 14DVF2	170						4.8
	C	130						7.0	
	Q	110						5.6	
	B	115						6.3	
 <p>HSS Drill bit T1.6 (1/16") 6.5 mm dia. (1/4") Mild steel < High speed ></p>	HITACHI	DS 14DVF3	60						12
		DS 14DVF2	55						13
	C	55						15	
	Q	50						11	
	B	50						14	
 <p>American Pine L63 mm (2-1/2") 6.2 mm dia. (#14) Wood Screw with pilot hole < Low speed ></p>	HITACHI	DS 14DVF3	80						4.4
		DS 14DVF2	80						5.0
	C	70						6.3	
	Q	70						7.5	
	B	75						5.4	
 <p>Machine screw 6mm (1/4") 12mm (15/32") < High speed ></p>	HITACHI	DS 14DVF3	* 610						1.0
		DS 14DVF2	* 570						1.0
	C	* 920						1.2	
	Q	* 380						0.9	
	B	* 530						1.0	

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:

Models DS 14DVF3, DS 14DVF2: 1.4 Ah

C, Q: 1.3 Ah

B: 1.5 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 DS 18DVF3 and DS 14DVF3 Cordless 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 10 °C – 40 °C (50 °F – 104 °F).

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

(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 18YG Charger.

For the U.S.A. and Canada

CAUTION ● For safe operation, see instruction manual. ● Charge HITACHI rechargeable batteries types EB7, EB9, EB12, EB14 and EB18 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 Driver Drills Requiring Particular Attention During Sales Promotion

The cordless driver drill offers many advantages; it can be used in places where no power source is available, the absence of a cord allows easy use, etc. However, any cordless tool has certain inherent drawbacks.

Salespersons must be thoroughly familiar with these drawbacks in order to properly advise the customer in the most efficient use of the tool.

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

(1) Use the Cordless Driver Drill for comparatively light work.

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

(2) 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) Avoid "Locking" of the motor.

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

(5) Variation in amount of work possible per charge

Although the nominal chargeable capacity of the storage batteries used with the Model DS 18DVF3 and DS 14DVF3 is 1.4 Ah or 2.0 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.

(6) Precautions in the use of HSS Drill Bits

For example, although the Model DS 18DVF3 is designed for drilling capacities of 38 mm (1-1/2") 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.

(7) 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.

(8) Avoid continuous use.

Although the Models DS 18DVF3 and DS 14DVF3 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 DS 18DVF3 and DS 14DVF3 and take a pause about 15 minutes after a single charge operation as a guide.

9. REPAIR GUIDE

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

9-1. Precautions in Disassembly and Reassembly

The **[Bold]** and **<Bold>** numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram. (**[Bold]**: DS 18DVF3, **<Bold>**: DS 14DVF3)

9-1-1. Disassembly

(1) Removal of the Hook Ass'y **[37]** **<38>**

Remove Special Screw (A) M5 **[42]** **<43>** with a flat-blade screwdriver or a coin. Remove the Hook Ass'y **[37]** **<38>** and the Hook Spring **[41]** **<42>**.

(2) Removal of Housing (A). (B) Set **[29]** **<30>**

First, align the drill mark "▲▲▲▲" at the Clutch Dial **[4]** **<4>** with the triangle mark at Housing (A). (B) Set **[29]** **<30>**. Remove the eight Tapping Screws (W/Flange) D3 x 16 (Black) **[26]** **<27>** secured to the main body. Gently open housing (A) and housing (B) while holding their battery loading sections.

(3) After housing (B) has been removed, all the internal parts, assembled or separate, can be taken out as they are. Lift the entire contents from housing (A) while holding the Motor **[25]** **<25>** and the Clutch Dial **[4]** **<4>**.

(4) Removal of the Drill Chuck **[2]** **<2>** (See Fig. 2.)

(a) Turn the Motor **[25]** **<25>** counterclockwise (when viewed from the rear) and remove it from the Rear Case **[14]** **<14>**. Remove the Shift Knob **[35]** **<36>** from the Shift Arm **[16]** **<16>**. Take care not to remove the Shift Arm **[16]** **<16>** from the Rear Case **[14]** **<14>** in this operation.

(b) Attach the motor spacer (an accessory of the special repair tool J-342, Code No. 324-582) to the assembly of the Drill Chuck **[2]** **<2>**, Clutch Dial **[4]** **<4>**, Front Case **[9]** **<9>** and Rear Case **[14]** **<14>** then mount it in special repair tool J-342 clamped in the vise as illustrated in Fig. 2. In this operation, check that the pinion press-fitted in the special repair tool J-342 and Planet Gear (A) Set **[21]** **<21>** are engaged properly.

(c) Secure the Slide Ring Gear **[17]** to the Front Case **[9]** **<9>** side with the Shift Arm **[16]** **<16>**.

(d) Turn the sleeve of the Drill Chuck **[2]** **<2>** counterclockwise (when viewed from the front) to fully open the jaws of the Drill Chuck **[2]** **<2>**. Turn the Special Screw (Left Hand) M6 x 23 **[1]** **<1>** clockwise and remove it. (Note that the special screw is left-hand threaded.)

(e) Fit the hexagonal bar wrench M10 into the Drill Chuck **[2]** **<2>** as illustrated in Fig. 2 and remove the Drill Chuck **[2]** **<2>** by turning the hexagonal bar wrench counterclockwise.

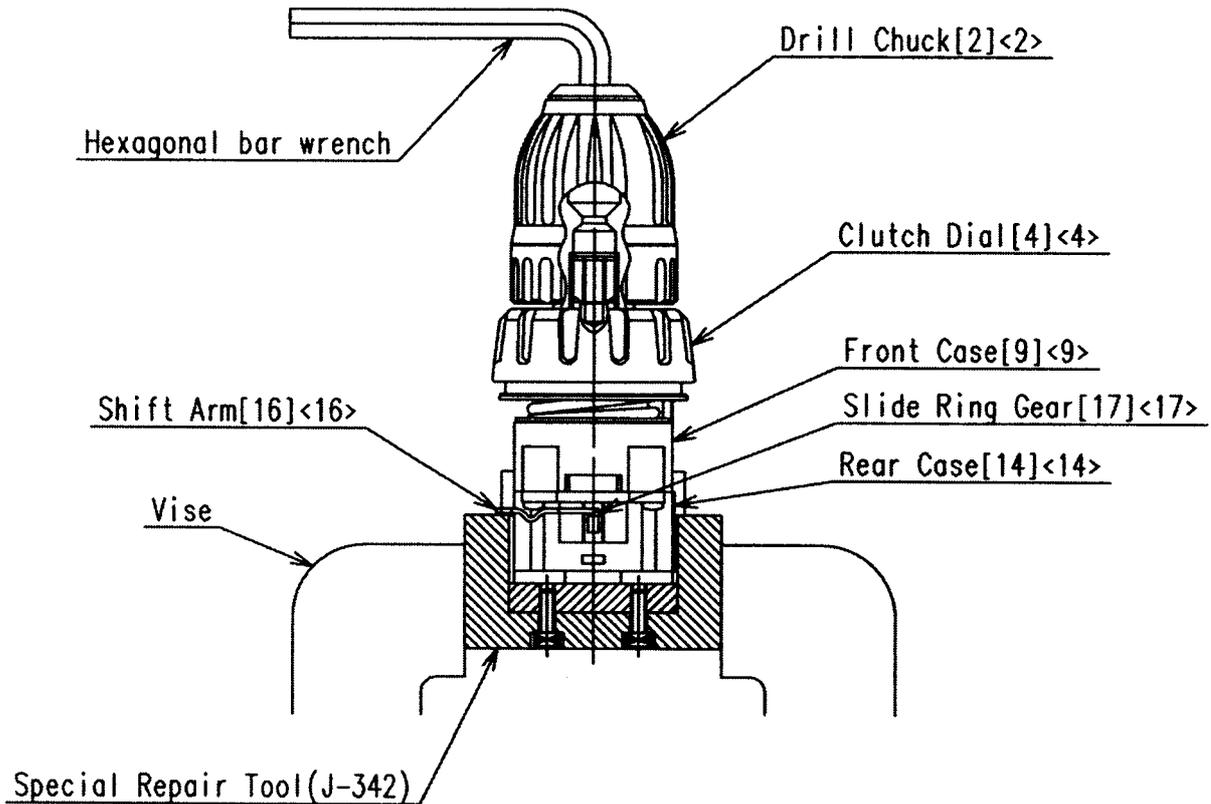


Fig. 2

(5) Disassembly of the gear unit

Remove the Shift Arm [16] <16> from the Rear Case [14] <14>, then remove the Screw Set D3 x 12 (4 pcs.) [15] <15> connecting the Front Case [9] <9> and the Rear Case [14] <14>. Remove Washer (A) [13] <13>, Planet Gear (C) Set (3 pcs.) [12] <12>, Ring Gear [11] <11>, six Steel Balls D5 [10] <10> from the Front Case [9] <9> in order. Take care not to lose the six Steel Balls D5 [10] <10> in this operation.

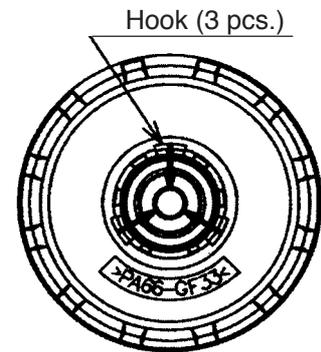


Fig. 3

(6) Disassembly of the clutch unit

(a) After press up the hook of Front Case [9] <9> with the small flat-blade screwdriver, the Clutch Dial [4] <4> and the Click Spring [5] <5> can be taken out as they are. (See Fig. 3.)

(b) Turn the Nut [6] <6> counterclockwise and remove it from the Front Case [9] <9>, then remove the Spring [7] <7> and Washer (D) [8] <8> from the Front Case [9] <9>.

NOTE: Do not remove the Front Case [9] <9>.

(7) Disassembly of the power supply unit

NOTE: Do not remove the heat sink secured to the DC-Speed Control Switch [32] <33> with a screw. Remove the two Machine Screws (W/Sp. Washer) M4 x 6 [28] <29>, and take the Motor [25] <25> and the Motor Spacer [24] <24> apart. Disconnect the Internal Wires [30] [31] <31> <32> from the Motor [25] <25> with a soldering iron, then disconnect them from the DC-Speed Control Switch [32] <33> with a soldering iron in the same manner.

9-1-2. 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) Perform wiring according to the wiring diagram (Fig. 4).

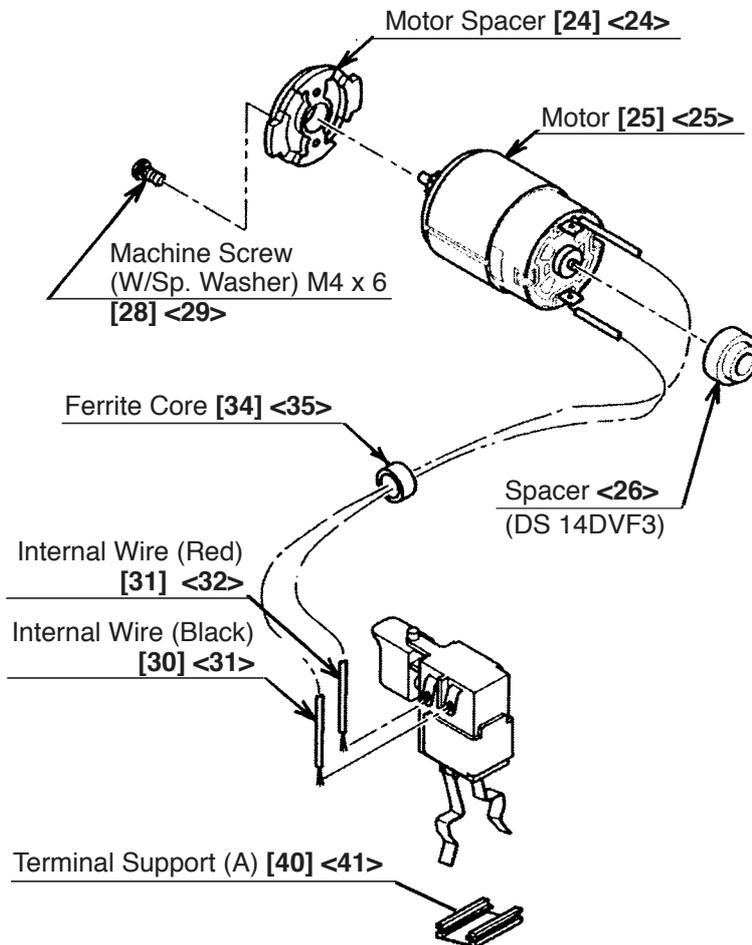


Fig. 4

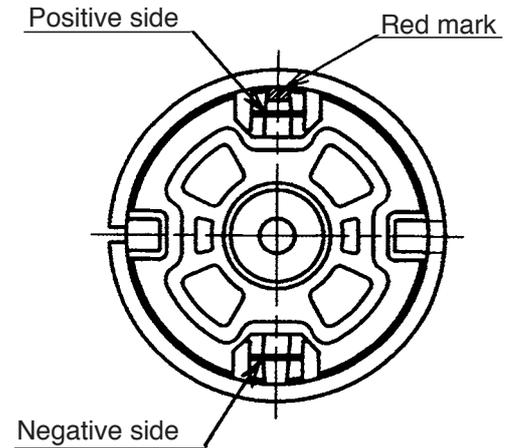


Fig. 5

(b) Pay attention to the polarity of the Motor [25] <25> when soldering Internal Wires [30] <31> and [31] <32> to the Motor [25] <25>. The red-marked side of the Motor [25] <25> is positive. (See Fig. 5.)

(c) Apply grease (Hitachi Motor Grease No. 29, Code No. 930035 is recommended) to the pinion press-fitted on the Motor [25] <25> shaft.

(2) Reassembly of the clutch unit

(a) Mount Washer (D) [8] <8> and the Spring [7] <7> to the Front Case [9] <9>. (See Fig. 6.)

When mounting Washer (D) [8] <8> into the Front Case [9] <9>, align the projection on the Front Case [9] <9> with the notch of Washer (D) [8] <8>.

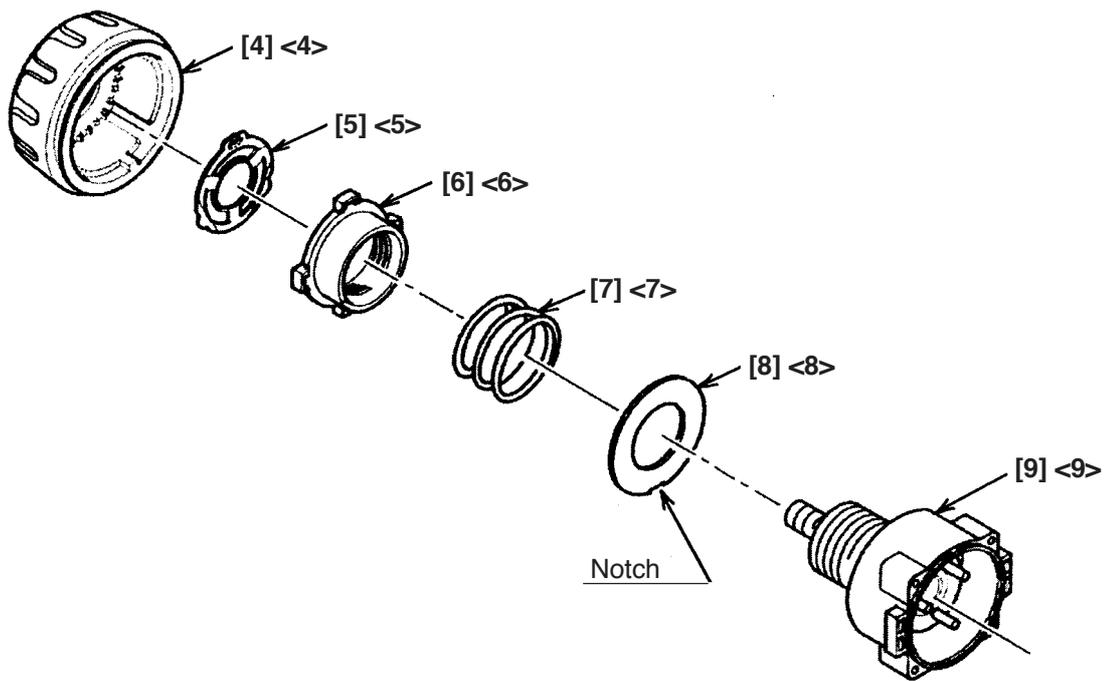


Fig. 6

(b) Mount the Nut [6] <6> to the Front Case [9] <9>. (See Fig. 7.)

Align the register mark (o) on the Nut [6] <6> with the register mark on the Front Case [9] <9>. Turn the Nut [6] <6> about 1-1/2 turns clockwise so that the register mark (Δ) on the Nut [6] <6> is aligned with the register mark on the Front Case [9] <9>. Check that the Y surface of the Nut [6] <6> is aligned with the Z surface of the Front Case [9] <9>.

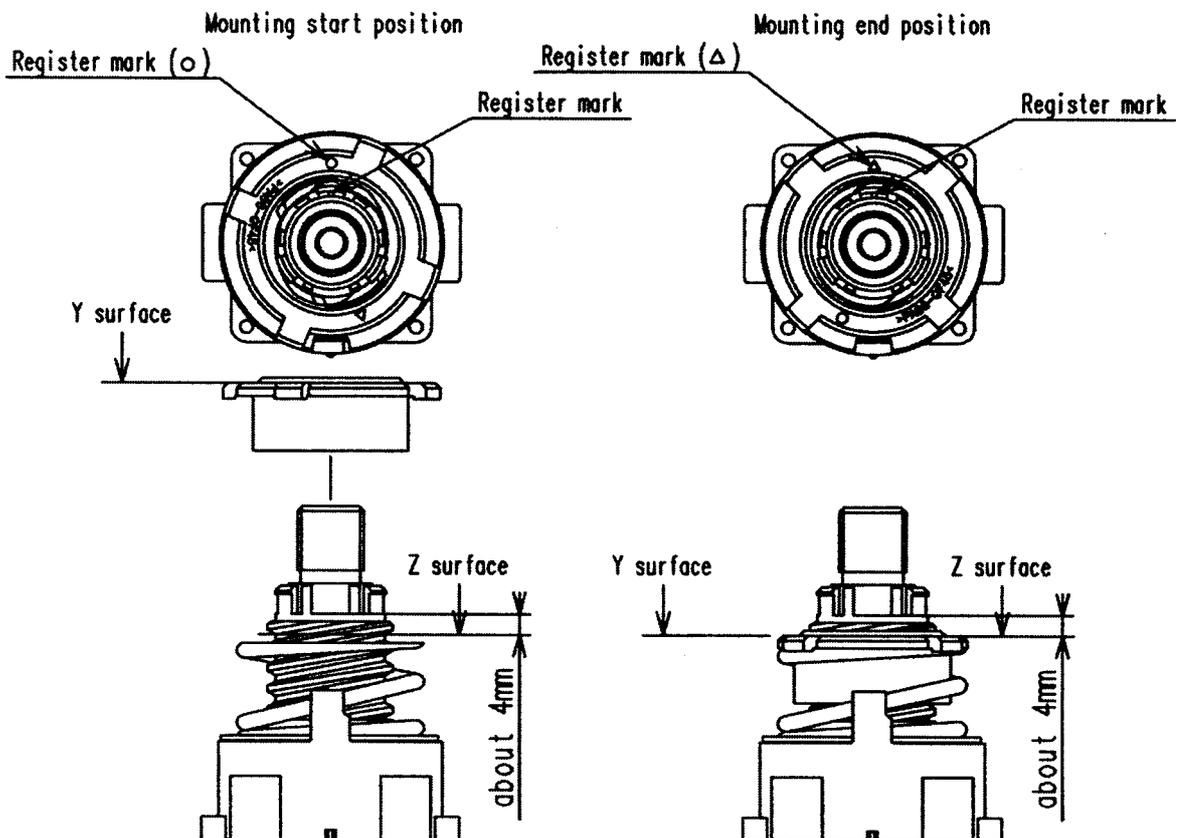


Fig. 7

(c) With the ridge at the Click Spring [5] <5> facing the front-side, insert Click Spring [5] <5> into the recess of the Front Case [9] <9>. (See Fig. 8.)

(d) Insert the Clutch Dial [4] <4> to the Front Case [9] <9>. (See Fig. 9.)

Mount the Nut [6] <6> into the Clutch Dial [4] <4> engaging the wider projection of the Nut [6] <6> with the wider recess of the Clutch Dial [4] <4>. (The wider recess of the Clutch Dial [4] <4> is positioned at "5" when viewed from the outside.) Make sure that the hook of Front Case [9] <9> is fitted into the hole in the Clutch Dial [4] <4>.

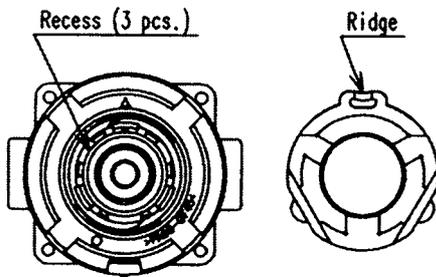


Fig. 8

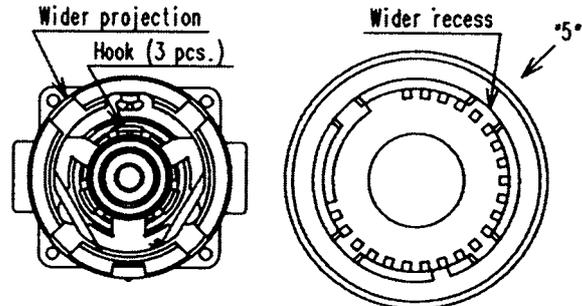


Fig. 9

(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 Steel Balls D5 [10] <10> to Washer (B) [23] <23> into the assembly reassembled in step (2). (See Fig. 10.)

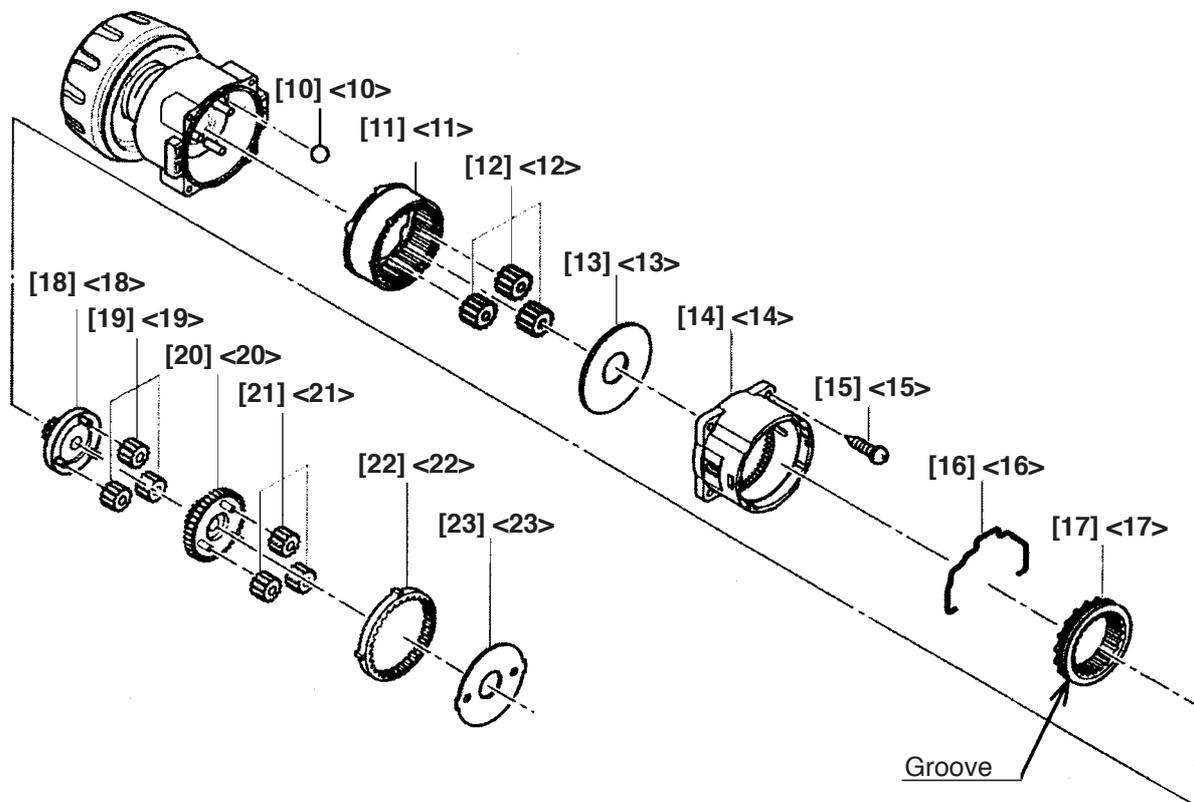


Fig. 10

- (i) Note the direction of the groove when installing the Slide Ring Gear [17] <17> so that the groove faces toward the Motor [25] <25>.
- (ii) Install the Front Case [9] <9> and the Rear Case [14] <14> together with the mark on the Front Case [9] <9> aligned with the mark on the Rear Case [14] <14>. (See Fig. 12.)
- (iii) Install Washer (B) [23] <23> in the Rear Case [14] <14> with the projections of Washer (B) [23] <23> engaged with the recesses in the Rear Case [14] <14>, and turn Washer (B) [23] <23> clockwise until it can turn no further. (See Fig. 11.)

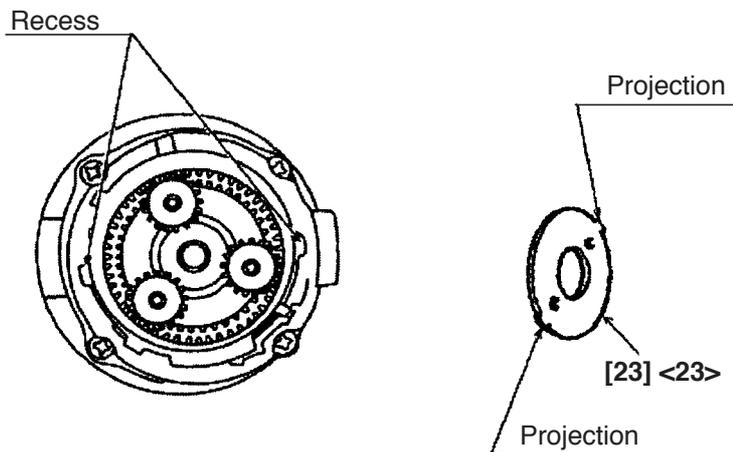


Fig. 11

- (c) Install the Shift Arm [16] <16> into the assembly reassembled in step (b).
 With the ridge at the Shift Arm [16] <16> facing the Motor [25] <25> side, first install them on the unmarked side of the assembly reassembled in step (b). Then insert the projections on the Shift Arm [16] <16> into the holes in the Rear Case [14] <14> and make sure that the projections are fitted into the grooves in the Slide Ring Gear [17] <17> mounted within the Rear Case [14] <14>. (See Fig. 12.)

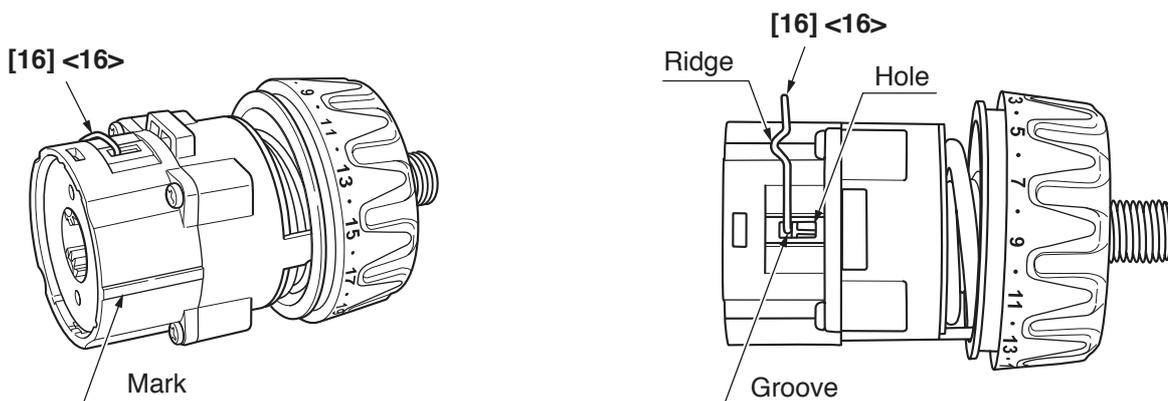


Fig. 12

- (d) Install the Drill Chuck [2] <2>.
 Install the Drill Chuck [2] <2> using the special repair tool (J-342, Code No. 324-582) and secure it with the Special Screw (Left Hand) M6 x 23 [1] <1>.
- (e) Install the Shift Knob [35] <36> into the assembly reassembled in step (d).
 When installing the Shift Knob [35] <36> into the Shift Arm [16] <16>, note that the "LOW" mark on the Shift Knob [35] <36> faces the Motor [25] <25> with the Shift Arm [16] <16> engaged with the recess in the Shift Knob [35] <36>.

(f) Install the assembly reassembled in step (1) and the assembly reassembled in step (e) together. (See Fig. 13.)

Fit the projection on the Motor Spacer [24] <24> into the recess in the Rear Case [14] <14> while ensuring that the Shift Knob [35] <36> is aligned with the positive side of the Motor [25] <25> and turn the Motor Spacer [24] <24> clockwise when viewed from the rear of the Motor [25] <25> until it can turn no further. During installation, make sure that the pinion press-fitted onto the shaft of the Motor [25] <25> and Planet Gear (A) Set [21] <21> mesh properly.

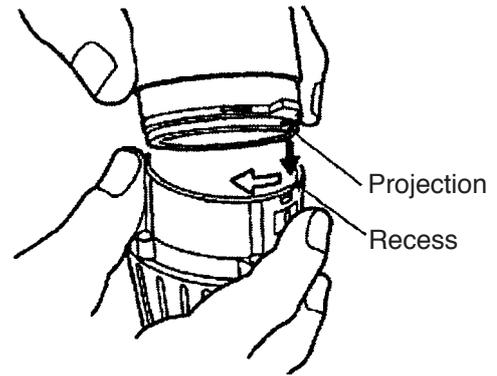


Fig. 13

(4) Installation of the assembly reassembled in step (3) into Housing (A). (B) Set [29] <30>

(a) Install the assembly reassembled in step (3) into housing (A). Note that the projections on the Front Case [9] <9> and the Motor Spacer [24] <24> are engaged in the recesses in housing (A), and the projection on housing (A) is engaged in the groove of the Clutch Dial [4] <4>. (See Fig. 14.)

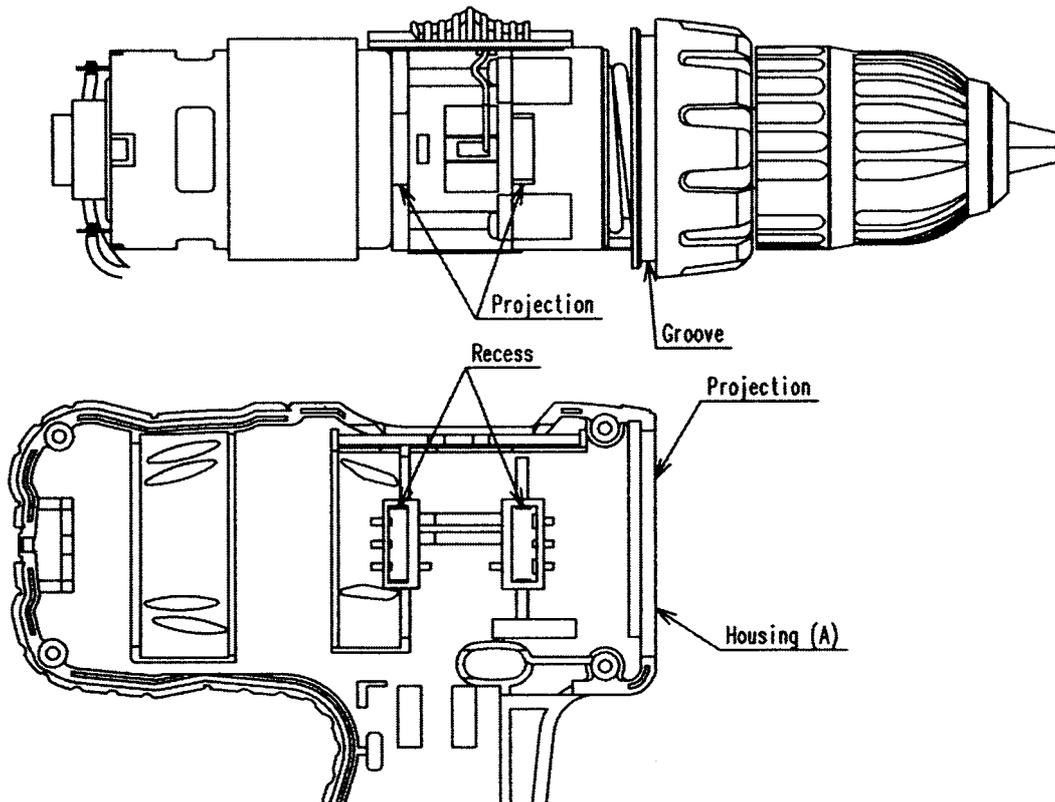


Fig. 14

(b) Mount the Pushing Button [33] <34> to housing (A). Check that the protrusion of the forward/reverse changeover lever of the DC-Speed Control Switch [32] <33> is inserted into the groove of the Pushing Button [33] <34> .

(c) Mount the Strap [39] <40> to housing (A) [29] <30> .

(d) Set the assembly reassembled in step (c) to housing (B) and secure it with the eight Tapping Screws (W/ Flange) D3 x 16 (Black) [26] <27>.

(e) Verify proper operation of the Clutch Dial [4] <4> and the Shift Knob [35] <36>.

When the reassembly procedure up to step (d) is completed, ensure that the number "1" through the drill mark "▲▲▲▲" on the Clutch Dial [4] <4> are in alignment with the triangle mark on Housing (A). (B) Set [29] <30> respectively and the Clutch Dial [4] <4> turns moderately. If the number "1" or the drill mark "▲▲▲▲" on the Clutch Dial [4] <4> cannot reach the triangle mark on Housing (A). (B) Set [29] <30>, correctly reinstall the Clutch Dial [4] <4> referring to step (2) as it is improperly mounted. Verify proper operation of the Shift Knob [35] <36>. Check that the speed changes between high and low properly by shifting the Shift Knob [35] <36>. If the speed cannot change properly or moderately, correctly reinstall the Shift Knob [35] <36> referring to step (3) as it is improperly mounted.

(5) Reassembly of the Hook Ass'y [37] <38>

Check that the V-Lock Nut M5 [38] <39> is mounted to the Hook Ass'y [37] <38>. Mount the Hook Spring [41] <42> and secure it with Special Screw (A) M5 [42] <43>. Make sure to mount the Hook Spring [41] <42> with its larger diameter side pointing inward the housing.

(6) Other precautions in reassembling

After completion of reassembly, check that the rotating direction of the Drill Chuck [2] <2> matches the position of the Pushing Button [33] <34>. When the Pushing Button [33] <34> is pressed from the (R) side, the rotating direction of the Drill Chuck [2] <2> should be clockwise as viewed from behind. Switch on and off the Model DS 18DVF3/DS 14DVF3 using the battery. Check that the runout of the Drill Chuck [2] <2> is 0.8 mm or less at the position 110 mm (DS 18DVF3, 85 mm: DS 14DVF3) away from the tip of the chuck using a 12-mm dia. (DS 18DVF3, 9-mm dia.: DS 14DVF3) test bar.

(7) Screw tightening torque

Special Screw (Left Hand) M6 x 23 [1] <1>	: 3.9 – 4.9 N·m (40 – 50 kgf·cm)
Drill Chuck [2] <2>	: 17.6 – 21.6 N·m (180 – 220 kgf·cm)
Screw Set D3 x 12 [15] <15>	: 0.6 – 1.0 N·m (6 – 10 kgf·cm)
Machine Screw (W/Sp. Washer) M4 x 6 [28] <29>	: 1.1 – 1.9 N·m (11 – 19 kgf·cm)
Tapping Screw (W/Flange) D3 x 16 (Black) [26] <27>	: 1.1 – 1.9 N·m (11 – 19 kgf·cm)
Special Screw (A) M5 [42] <43>	: 1.5 – 2.5 N·m (15 – 25 kgf·cm)

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

Please refer to the Technical Data and Service Manual for precautions in disassembly and reassembly of the Battery Charger UC 18YG.

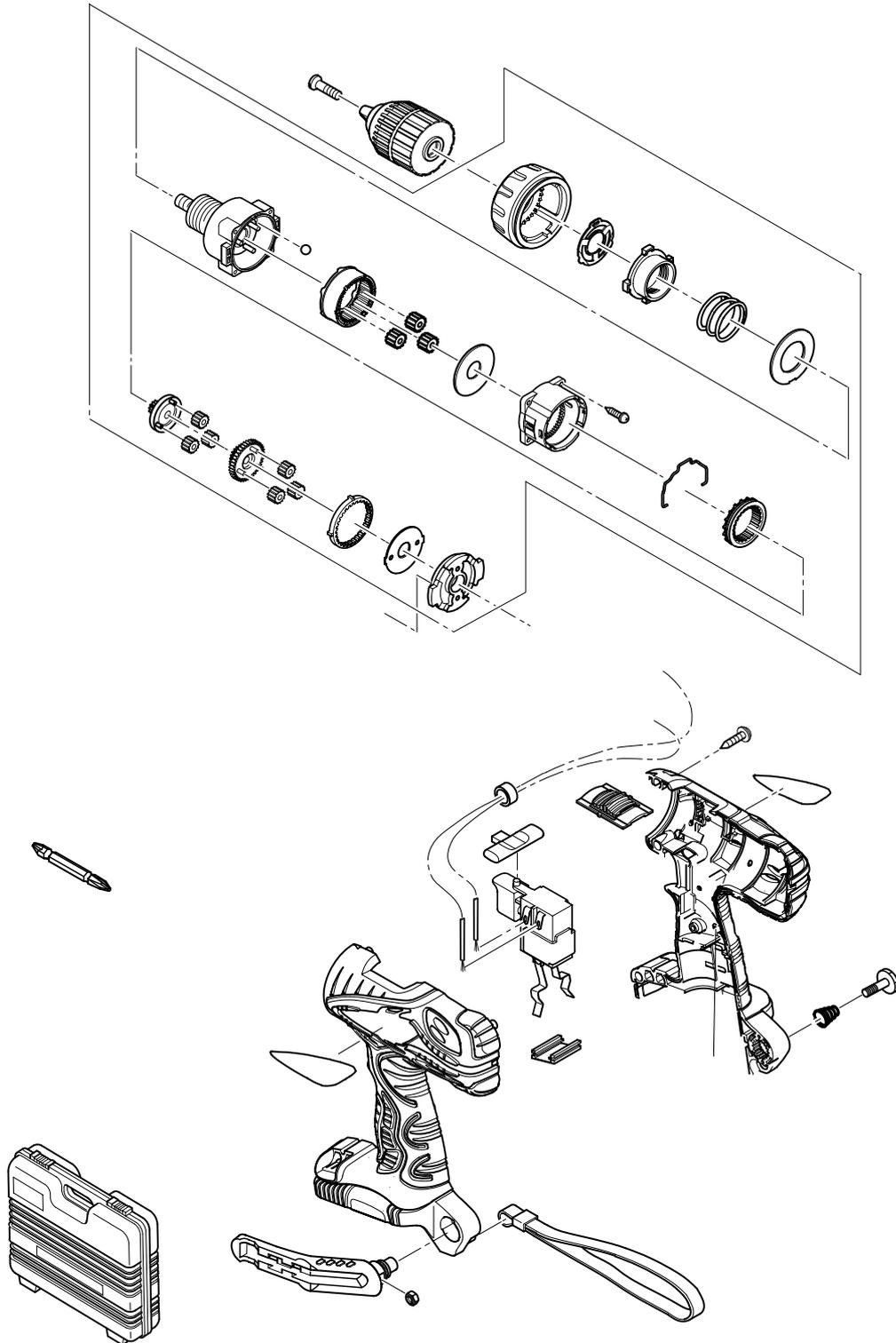
10. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60
	Fixed							
DS 14DVF3 DS 18DVF3		Work Flow						
	General Assembly			Housing (A),(B) Set Motor DC-Speed Control Switch Shift Knob				
				Gear Box Ass'y Clutch Dial Click Spring Nut Spring Front Case Ring Gear 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				
		Drill Chuck (Keyless)						
		Hook Ass'y						

ELECTRIC TOOL PARTS LIST

■ CORDLESS DRIVER DRILL
Model DS 18DVF3

2005 · 4 · 10
(E1)



ELECTRIC TOOL PARTS LIST

CORDLESS DRIVER DRILL
Model DS 14DVF3

2005 · 4 · 10
(E1)

