

MODEL

DS 7DF

HITACHI
POWER TOOLS

CORDLESS DRIVER DRILL
DS 7DF

TECHNICAL DATA
AND
SERVICE MANUAL

D



LIST No. F881

Mar. 2003

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

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
B	BOSCH	GSR7.2-1



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1. PRODUCT NAME

Hitachi 7.2 V Cordless Driver Drill, Model DS 7DF

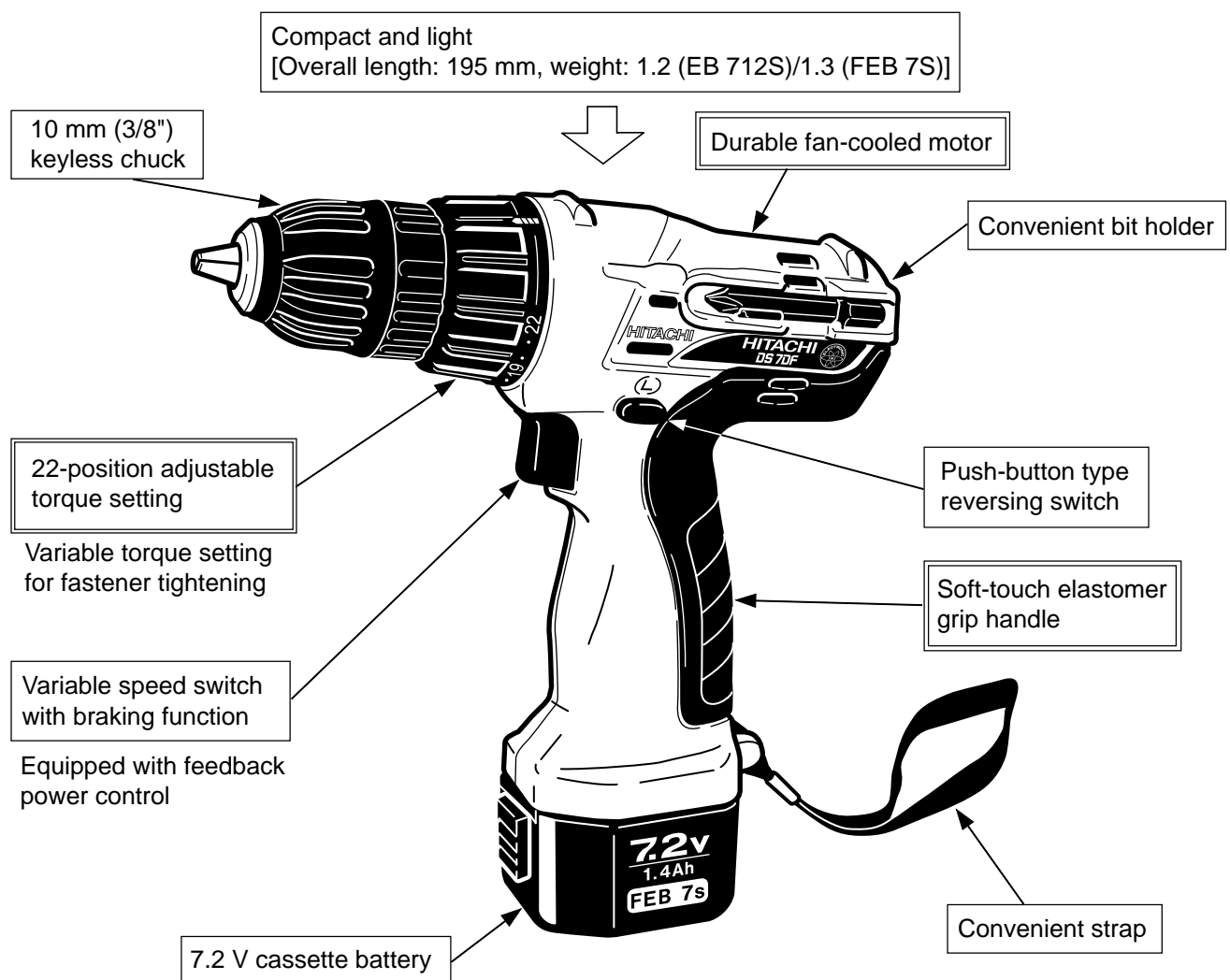
2. MARKETING OBJECTIVE

The new Model DS 7DF was developed based on the well-reputed Model DN 10DSA to reinforce the 7.2-V product line. As the Model DS 7DF is equipped with the T-type handle and the clutch, small screws can be tightened easily (it is difficult by the Model DN 10DSA). Besides, the Model DS 7DF is equipped with the soft-touch and nonskid grip handle made of elastomer (soft resin). The cooling fan incorporated in the motor greatly enhances the cooling effect, and the variable speed switch with feedback system ensures a sufficiently large torque even at a low speed.

3. APPLICATIONS

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

4. SELLING POINTS

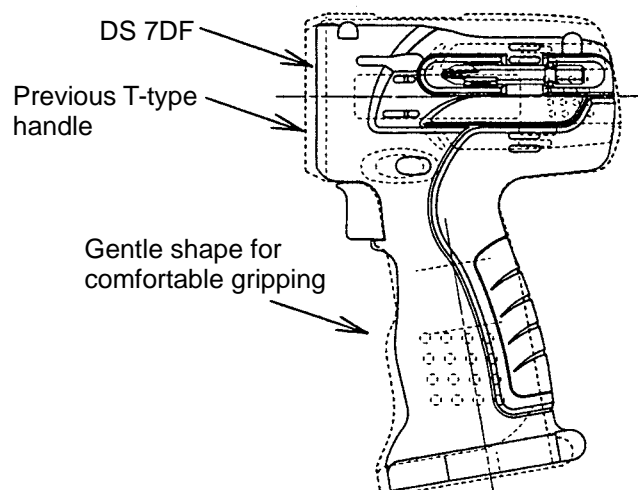
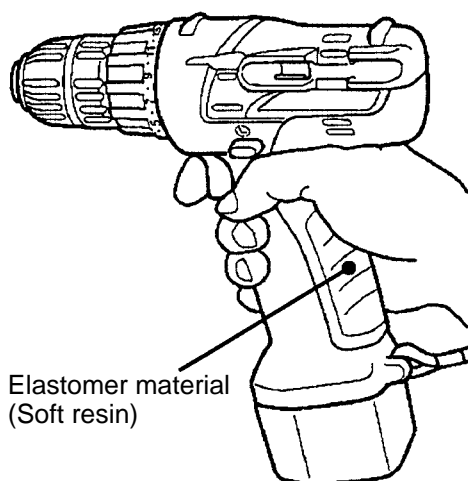


4-1. Selling Point Descriptions

4-1-1. Soft-touch elastomer grip handle

The Model DS 7DF is equipped with the soft-touch and nonskid grip handle made of elastomer (soft resin). Besides, the shape of the handle is improved for comfortable gripping.

Maker	HITACHI		B
Model	DS 7DF	DN 10DSA	
Soft grip handle	Equipped	None	None

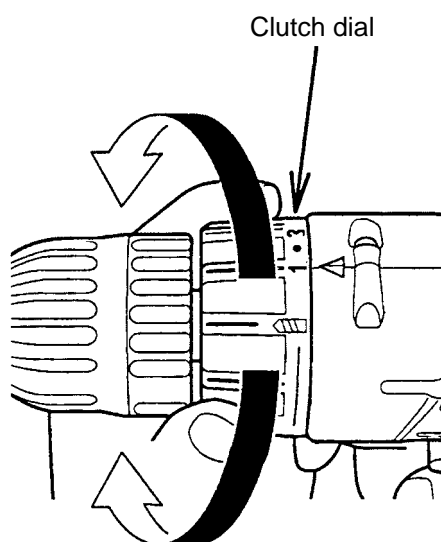


4-1-2. 22-position Adjustable Torque Setting

The torque can be set finely thanks to adoption of the 22 clutch positions to improve the operability.

Guide for selecting proper tightening torque

Clutch position	Torque
1	0.49 N·m [5 kgf·cm]
•	~
4 (Indication: •)	0.98 N·m [10 kgf·cm]
•	~
7	1.47 N·m [15 kgf·cm]
•	~
10 (Indication: •)	1.96 N·m [20 kgf·cm]
•	~
13	2.45 N·m [25 kgf·cm]
•	~
16 (Indication: •)	2.94 N·m [30 kgf·cm]
•	~
19	3.43 N·m [35 kgf·cm]
•	~
22	3.92 N·m [40 kgf·cm]



* Tightening torque may be different depending on types of screws and workpieces. Instruct the customer to check the types of screws and workpieces to be used before operation.

4-1-3. Durable fan-cooled motor

The cooling fan incorporated in the motor and the air vents provided in its outer frame greatly enhance the cooling effect, ensuring improved durability in continuous operation.

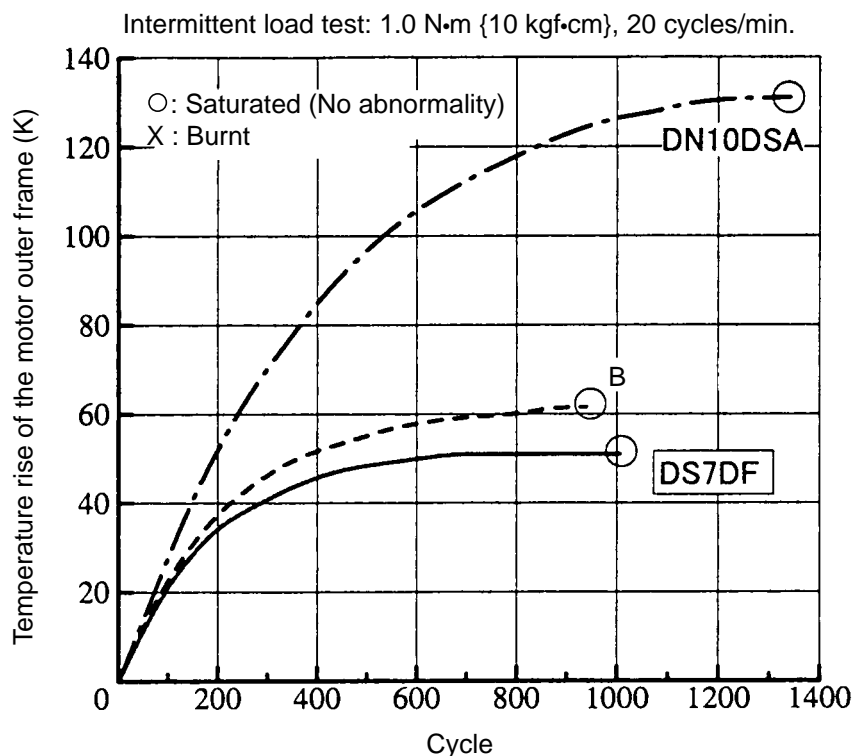


Fig. 1 Curves of motor temperature rise

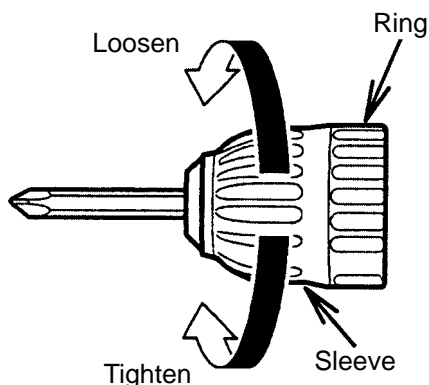
4-1-4. Variable speed switch with braking function

The braking function allows the driver unit to stop rotation immediately when the trigger switch is released, which is a convenient feature during actual working. Also, the feedback system ensures a sufficiently large torque even in the variable speed range.

Maker	HITACHI		B
Model	DS 7DF	DN 10DSA	
Type	Variable speed	On-off	Variable speed
Feedback circuit	Equipped	None	Not indicated
Electric brake	Equipped	Equipped	Equipped

4-1-5. 10 mm (3/8") keyless chuck

The keyless chuck facilitates fast and easy replacement of driver bits. Replacement can be carried out simply by holding the ring with one hand, while turning the sleeve with the other hand.



5. SPECIFICATIONS

Capacity	Screwdriver Machine screw6 mm (1/4") Wood screw5.1 dia. x 32 mm (#11 x 1-1/4") Drill MetalMild steel 10 mm (3/8") [Thickness 1.6 mm (1/16")] Aluminum 10 mm (3/8") [Thickness 1.6 mm (1/16")] Wood.....15 mm (19/32") [Thickness 18 mm(11/16")]
Keyless chuck (10TLRG-N)	Mount type Screw-on (UNF 1/2" – 20) Diameter 0.8 – 10 mm (1/32" – 3/8")
Rotation speed	0 – 600/min
Torque	Slip torque5 – 40 N•m (5 – 40 kgf•cm, 5 – 35 in-lbs.) [22 stages] Max. torque 8 N•m (82 kgf•cm (71 in-lbs.))
Type of motor	DC magnet motor
Type of switch	Trigger switch with push button for forward and reverse rotation changeover
Handle configuration	T-type
Enclosure	Body Glassfiber reinforced polycarbonate resin (green) and thermoplastic elastomer (black) Battery ABS resin (black) Charger ABS resin (black)
Battery (Type FEB 7S/EB 712S)	Sealed cylindrical nickel cadmium battery Nominal voltage DC 7.2 V Nominal life Charging/discharging: approximately 500/300 times Nominal capacity 1.4 Ah/1.2 Ah Charging time 60/50 minutes (with standard accessory charger at ambient temperature of 20 °C) Charging temperature 10 °C – 40 °C (50 °F – 104 °F)
Charger (Model UC 7SD)	<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: 28 W Function: OnDuring charging OffCharging completed
Weight	Main body (including FEB 7S/EB 712S) 1.3 kg (2.8 lbs.)/1.2 kg (2.6 lbs.) Charger unit (including cord) 1.2 kg (2.6 lbs.) Gross with 2 batteries (FEB 7S) and charger, case 4.1 kg (9.0 lbs.) Gross with battery (FEB 7S) and charger, case 3.8 kg (8.8 lbs.) Gross with 2 batteries (EB 712S) and charger, case 4.0 kg (8.4 lbs.) Gross with battery (EB 712S) and charger, case 3.7 kg (8.2 lbs.)
Standard accessories	Charger (UC 7SD)1 Cross-recessed head (plus) driver bit (No. 2) 1 Case1

6. COMPARISONS WITH SIMILAR PRODUCTS

Catalog specifications

Maker			HITACHI		B
Model			DS 7DF	DN 10DSA	
Max. capacity	Drilling	Mild steel	10 mm (3/8")	10 mm (3/8")	10 mm (3/8")
		Aluminum	10 mm (3/8")	10 mm (3/8")	10 mm (3/8")
		Wood	15 mm (19/32")	10 mm (3/8")	15 mm (19/32")
	Screw driving	Machine screw	6 mm (1/4" dia.)	—	Not indicated
		Wood screw	5.1 dia. x 32 (#11 x 1-1/4")	4.5 dia. x 20 (3/16 x 3/4")	6 dia. x — (1/4 x —)
Rotation speed			0 – 600 /min	0 – 600 /min	0 – 600 /min
Slip torque			0.5 – 3.9 N•m 5 – 40 kgf•cm (4.3 – 35 in-lbs.)	—	Not indicated
			[22 positions]	—	[5 positions]
Max. torque			8.0 N•m 82 kgf•cm (71 in-lbs.)	8.0 N•m 82 kgf•cm (71 in-lbs.)	8.0 N•m 82 kgf•cm (71 in-lbs.)
Drill chuck	Type	Keyless	Keyless	Keyless	
	Capacity	10 mm (3/8")	10 mm (3/8")	10 mm (3/8")	
Switch	Type	Variable speed	On-off	Variable speed	
	Feedback circuit	Equipped	None	Not indicated	
	Electric brake	Equipped	Equipped	Equipped	
Reversing switch			Push-button	Lever	Push-button
Handle shape			T-type	Pistol type	T-type
Soft grip handle			Equipped	None	None
Strap			Equipped	None (hook)	None
Battery	Nominal capacity		1.4 Ah	1.2 Ah	1.4 Ah
	Nominal voltage		7.2 V		7.2 V
	Charging time*		60 min.	50 min.	60 min.
Dimension	Overall length		195 mm (7-43/64")		202 mm (7-61/64")
	Overall height		222 mm (8-47/64")	214 mm (8-27/64")	236 mm (9-19/64")
Weight			1.3 kg	1.2 kg	1.1 kg
			(2.9 lbs.)	(2.6 lbs.)	(2.4 lbs.)

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

7. WORKING PERFORMANCE PER SINGLE CHARGE

Drilling and fastening performance comparison per charge

Test conditions	Maker	Model name	No. of drilling or fastening operations per charge (*1)					Working time (sec./pc.)
			0	*400 100	*800 200	*1200 300		
<p>HSS Drill bit T1.6 (1/16") 6.5mm dia. (1/4") Mild steel</p>	HITACHI	DS 7DF (W/FEB 7S)	20					29
		DS 7DF (W/EB 712S)	17					29
	B		17					29
<p>Wood boring T18 (11/16") 10mm dia. (3/8") American pine</p>	HITACHI	DS 7DF (W/FEB 7S)	165					2.4
		DS 7DF (W/EB 712S)	140					2.4
	B		130					2.4
<p>Wood screw 20mm (3/4") 4.5mm dia. (3/16") American pine</p>	HITACHI	DS 7DF (W/FEB 7S)	285					1.2
		DS 7DF (W/EB 712S)	245					1.2
	B		220					1.2
<p>Machine screw 12mm (15/32") 6mm (1/4")</p>	HITACHI	DS 7DF (W/FEB 7S)	510					1.2
		DS 7DF (W/EB 712S)	435					1.2
	B		375					1.2

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 obtained using the battery which is standard for this tool.

As actually measured values listed in the above table may vary depending on sharpness of drill bit, workpiece hardness (particularly in wood materials), moisture content of wood, charging condition, operator skill, etc. This data should be used as a comparative guide only.

8. PRECAUTIONS IN SALES PROMOTION

8-1. Safety Instructions

In the interest of promoting the safest and most efficient use of the Model DS 7DF Cordless Driver Drill by all of our customers, it is very important that at the time of sale, the salesperson carefully ensures that the buyer seriously recognizes the importance of the contents of the Handling Instructions, and fully understands the meaning of the precautions listed on the Caution Plate and Name Plate attached to each tool.

A. Handling Instructions

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

- (1) Before use, ensure that the unit is fully charged.

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

- (2) When charging storage batteries, use only the Model UC 7SD Charger provided with the tool.

Because of the designed rapid-charging feature (about one hour), use of other battery chargers is hazardous.

- (3) Connect the charger to an AC power outlet only.

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

- (4) Do not use any voltage increasing equipment (transformer, etc.) between the power source and the charger.

If the charger is used with voltage higher than that indicated on the unit, it will not function properly.

- (5) Conduct battery charging at an ambient temperature range of 10 °C – 40 °C (50 °F – 104 °F).

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

- (6) The battery charger should not be used continuously.

At high ambient temperature, if over three storage batteries are charged in succession, the temperature of the coils on the transformer will rise and there is a chance that the temperature fuse inserted in the interior of the transformer will inadvertently melt. After charging one battery, please wait about 15 minutes before charging the next battery.

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

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

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

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

- (9) Disposal of the type FEB 7S or EB 712S storage battery

Ensure that all customers understand that Type FEB 7S or EB 712S storage batteries should be turned in to any Hitachi Power Tools sales outlet or 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 discharged 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 each Type FEB 7S or EB 712S storage battery.

For Asia, Europe and Oceania

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

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) Do not insert a foreign object into body vent holes.

The body on 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.

(3) 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.)

(4) Variation in amount of work possible per charge

Although the nominal chargeable capacity of the storage batteries used with the Model DS 7DF is 1.4 Ah or 1.2 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.

(5) Precautions in the use of HSS drill bits

Although the Model DS 7DF is designed for drilling capacities of 15 mm (19/32") in wood, and 10 mm (3/8") in aluminum, and 10 mm (3/8") in mild steel, this capability is not as efficient as conventional electric power tools. In particular, when drilling through aluminum material with a 10 mm (3/8") 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 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.

(6) 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.

(7) Avoid continuous use.

Although the Model DS 7DF 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 Model DS 7DF 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 the Type FEB 7S or EB 712S storage batteries are exposed to direct sunlight for an extended period or if the tool has just been operated for a long time, charging may not be possible if the temperature of a battery (type FEB 7S or EB 712S) is above 40 °C (104 °F). In such a case, the customer should be advised to place the battery in a shaded area with a good airflow, and allow sufficient cooling before recharging. This phenomenon is common to all existing batteries and chargers which employ temperature sensitive overcharge protection devices. The cooling time required before recharging can be accomplished varies from a few minutes to about 30 minutes, depending on the load, duration of use, and ambient temperature.

9. REFERENCE MATERIALS

9-1. Feedback System

The Model DS 7DF has the variable speed switch equipped with the feedback system. This feedback system ensures a sufficiently large torque even in the variable speed range (Fig. 2). For example, when operating the Model DS 7DF at a speed about 80% of the full speed, the maximum torque is about 95% of that at a full speed (curve "A"). Even when the Model DS 7DF is operated at a speed about 30% of the full speed, the maximum torque does not decrease under about 65% of that at a full speed (curve "B") to ensure a sufficiently large torque at a low speed.

Besides, the braking function allows the driver unit to stop rotation immediately when the trigger switch is released,

which is a convenient feature for continuous screw tightening or drilling works. The step-less variable speed mechanism controls the speed depending on the depressed amount of the trigger switch within the range from 0 to 600 cycles per minute. Thanks to this mechanism, positioning is easily done for screw tightening and drilling works.

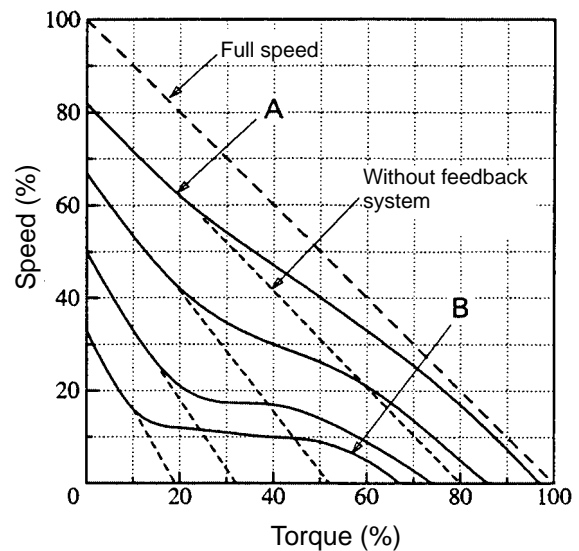


Fig. 2 Schematic diagram of the feedback system

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 diagram for the Model DS 7DF.

10-1-1. Disassembly

(1) Removal of Housing (A). (B) Set **[21]**

(a) First, align the "Drill mark" at the Clutch Dial **[3]** with the "Triangle mark" at Housing (A).(B) Set **[21]**.

Remove the eight Tapping Screws (W/Washer) D3 x 16 **[19]** secured to the main body. Gently open Housing (A) and Housing (B) while holding their battery loading sections.

(b) 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 **[18]** and the Clutch Dial **[3]**.

(2) Pull the Motor **[18]** from the Motor Spacer **[15]** and remove it from the Gear Box Ass'y **[17]**. (See Fig. 1.)

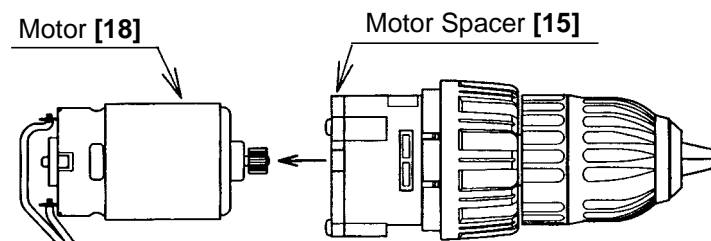


Fig. 1

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

(a) Mount the assembly of the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]**, Clutch Dial **[3]** and Gear Box Ass'y **[17]** in special repair tool J-331 (Code No. 321936) clamped in the vise as illustrated in Fig. 2.

In this operation, check that the pinion press-fitted in the special repair tool J-331 and Planet Gear (A) Set **[13]** are engaged properly.

(b) Fully open the jaws of the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]**, and turn the Special Screw (Left Hand) M5 x 25 **[1]** clockwise and remove it. (Note that the Special Screw is left-hand threaded.)

(c) Fit the hexagonal bar wrench M10 into the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]** as illustrated in Fig. 2 and remove the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]** by turning the hexagonal bar wrench counterclockwise. If it is difficult to loosen, use a pipe or other tool.

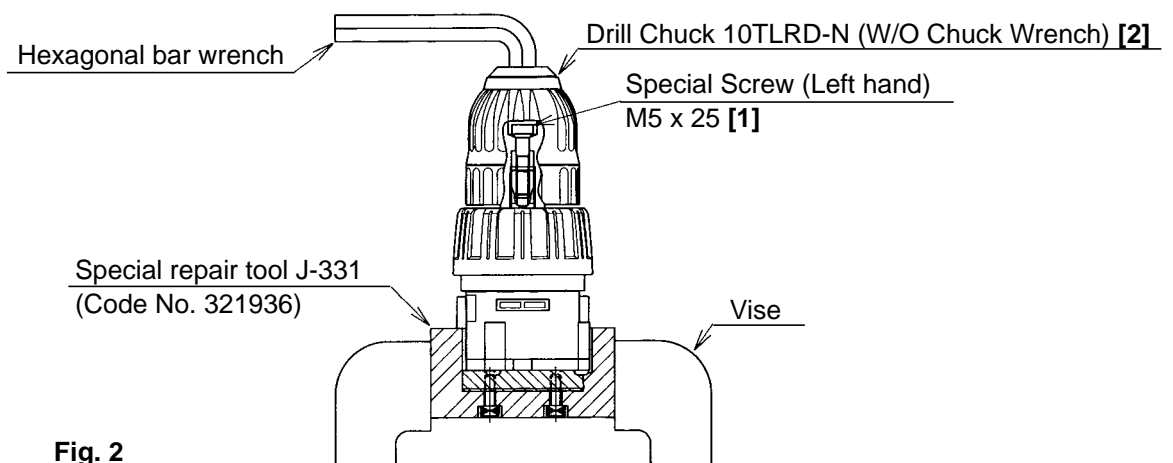


Fig. 2

(4) Disassembly of the clutch unit

- (a) After press up the hook of Clutch Dial [3] with the small flat-blade screwdriver, the Clutch Dial [3] and Click Spring [4] can be taken out as they are. (See Fig. 3.)
- (b) Turn the Nut [5] counterclockwise and remove it from the Gear Case [8], then remove the Spring [6], Washer (D) [7], and the sixteen Stall Balls D4 [9] from the Gear Case [8]. Take care not to lose the sixteen Steel Balls in this operation.

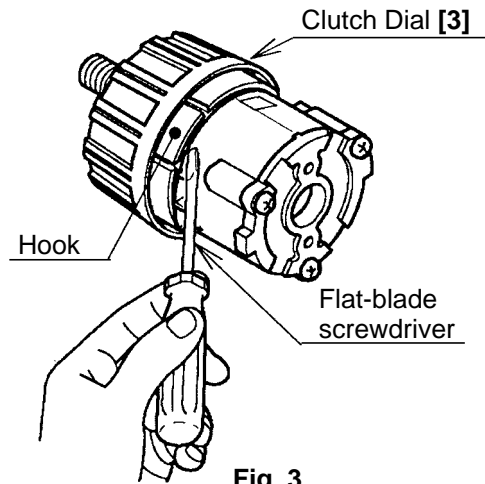


Fig. 3

(5) Removal of the gear unit

Remove the three Screw Sets D3 x 12 [16] connecting the Gear Case [8] and Motor Spacer [15]. Remove Washer (A) [14], Planet Gear (A) Set [13], Pinion (B) [12], Planet Gear (B) Set [11], Ring Gear [10] from the Gear Case [8] in order.

(Note) Do not remove the Gear Case [8].

(6) Disassembly of the power supply unit

(Note) Do not remove the fin secured to the DC-Speed Control Switch [24] with a screw.

Disconnect Internal Wires (B) [22] [23] from the Motor [18] with a soldering iron, then disconnect them from the DC-Speed Control Switch [24] with a soldering iron in the same manner.

10-1-2. Reassembly

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

(1) Reassembly of the power supply unit

- (a) Be sure to perform wiring connections as indicated in the wiring diagram. (See Fig. 4.)

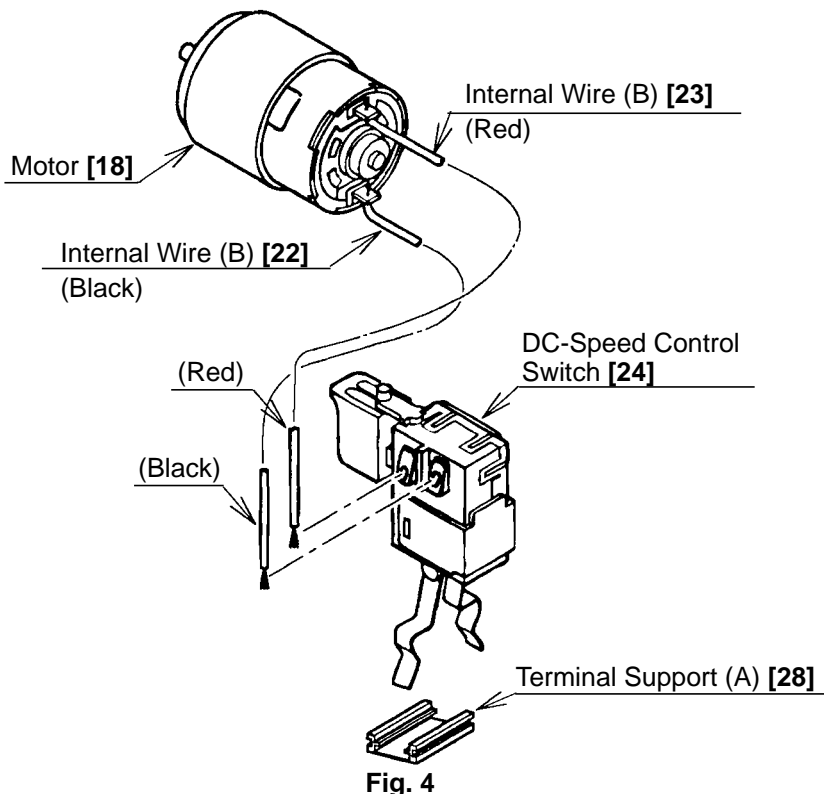


Fig. 4

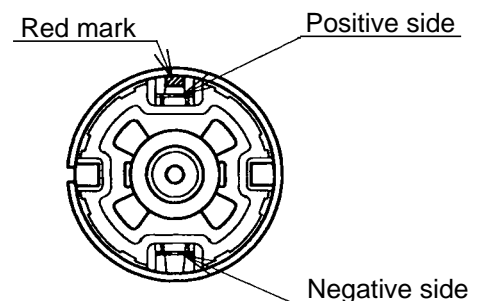


Fig. 5

- (b) Pay attention to the polarity of the Motor **[18]** when soldering Internal Wires (B) **[22]** and **[23]** to the Motor **[18]**. The red-marked side of the Motor **[18]** is positive. (See Fig. 5.)

(2) 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 Ring Gear **[10]** to Screw Set D3 x 12 **[16]** into the Gear Case **[8]**. (See Fig. 6.)
- (i) Note the direction of each parts when installing the Ring Gear **[10]**, Pinion (B) **[12]** as illustrated in Fig. 6.
- (ii) Install the Gear Case **[8]** and the Motor Spacer **[15]** together with the recess on the Gear Case **[8]** aligned with the projection on the Motor Spacer **[15]**.

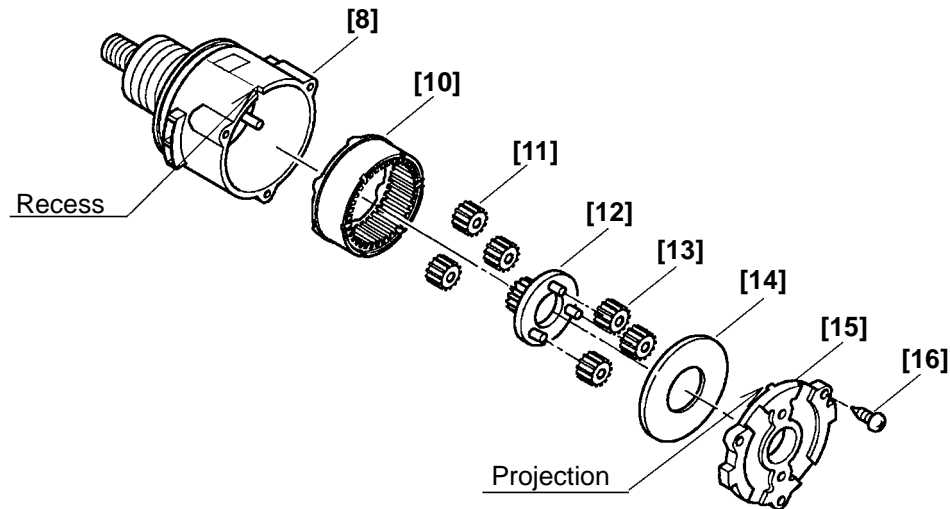


Fig. 6

(3) Reassembly of the clutch unit

- (a) Install the Steel Ball D4 **[9]** into the Gear Case **[8]** and mount Washer (D) **[7]** and the Spring **[6]** to the Gear Case **[8]**. (See Fig. 7.) When mounting Washer (D) **[7]** into the Gear Case **[8]**, align the projection on the Gear Case **[8]** with the notch of Washer (D) **[7]**.

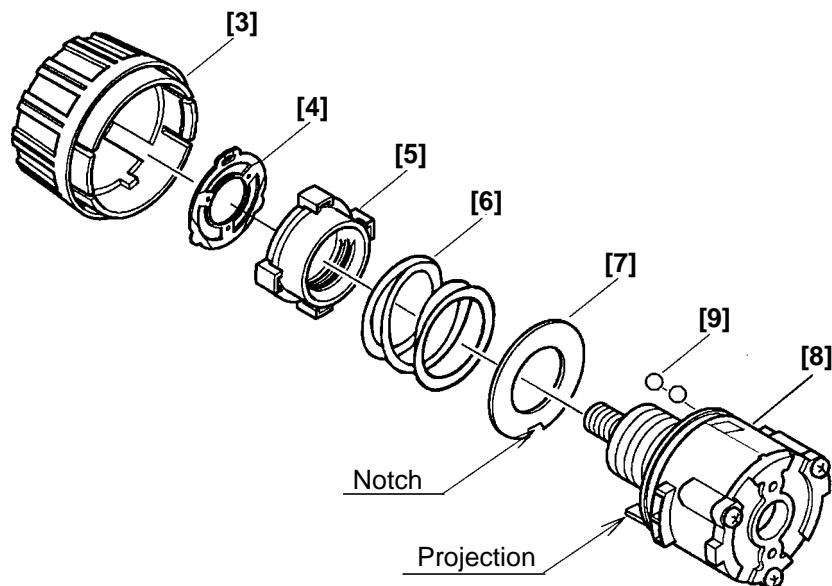


Fig. 7

(b) Mount the Nut [5] to the Gear Case [8]. (See Fig. 8.)

Align the register mark (o) on the Nut [5] with the register mark on the Gear Case [8]. Turn the Nut [5] about 1-1/2 turns clockwise so that the register mark (oo) on the Nut [5] is aligned with the register mark on the Gear Case [8]. Check that the Y surface of the Nut [5] is aligned with the Z surface of the Gear Case [8].

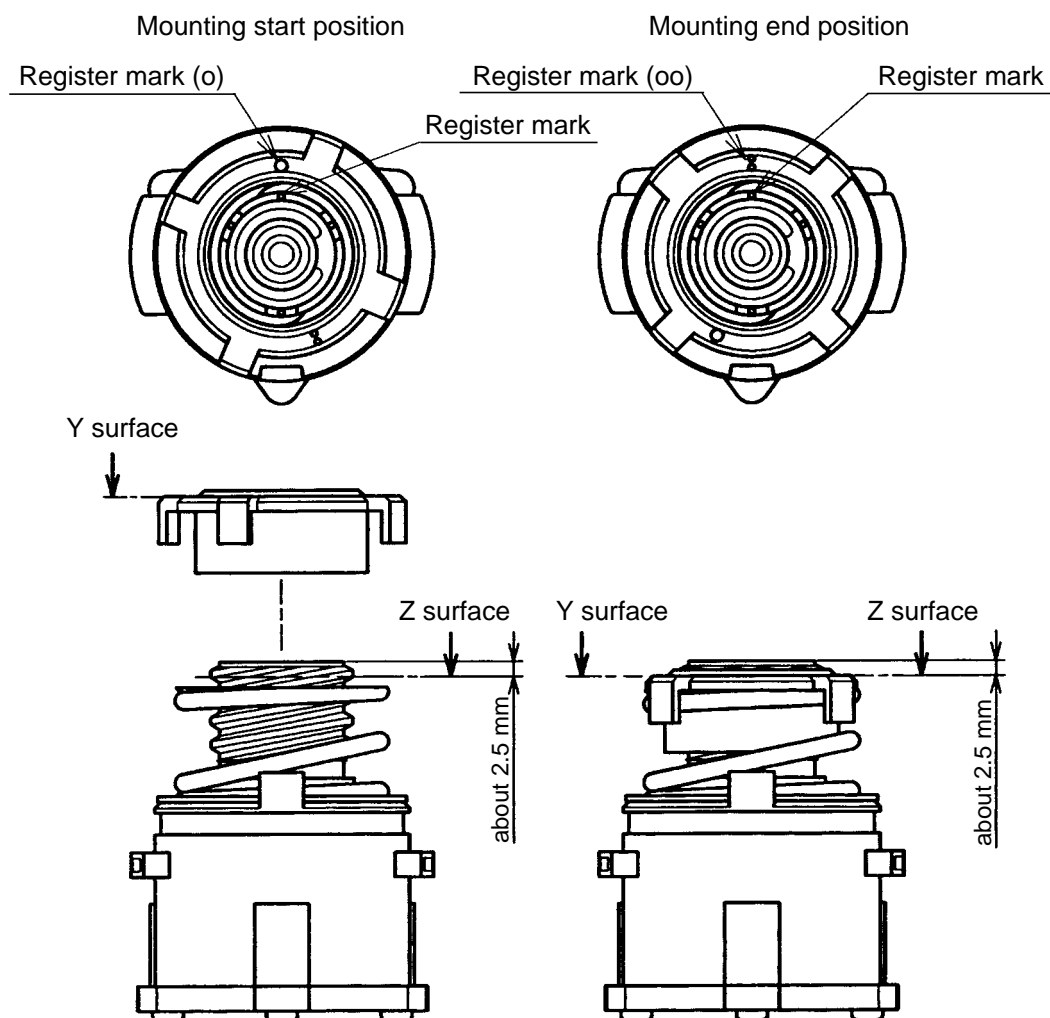


Fig. 8

(c) With the ridge at the Click Spring [4] facing the front-side, insert Click Spring [4] into the projection of the Gear Case [8] together with the three projections on the Gear Case [8] aligned with the three holes at the Click Spring [4]. (See Fig. 9.)

Apply grease (Hitachi Motor Grease No. 29, Code No. 930035) to the ridge at the Click Spring [4]. Insert the Clutch Dial [3] to the Gear Case [8] (See Fig. 10.)

Mount the Nut [5] into the Clutch Dial [3] engaging the wider projection of the Nut [5] with the wider recess of the Clutch Dial [3]. (The wider recess of Clutch Dial [3] is positioned at "5" when viewed from the outside.) Make sure that the hook of Clutch Dial [3] are fitted into the groove in the Gear Case [8].

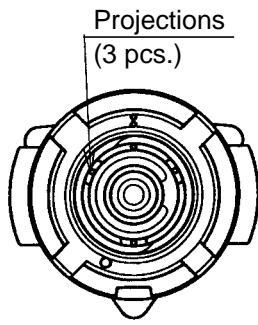


Fig. 9

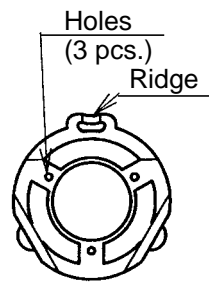
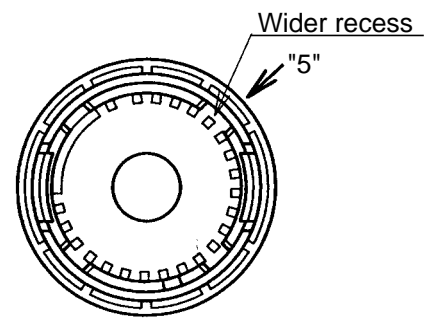
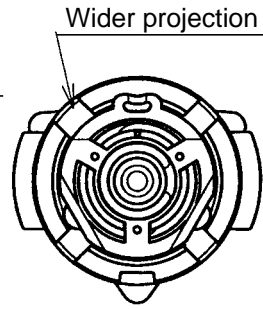


Fig. 10



- (4) Install the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]** using the special repair tool J-331 (Code No. 321936) and secure it with the Special Screw (Left Hand) M5 x 25 **[1]**.
- (5) Install the assembly reassembled in step (1) and the assembly reassembled in step (4) together.
Apply grease (Hitachi Motor Grease No. 29, Code No. 930035 is recommended) to the pinion press-fitted on the Motor **[18]** shaft. Check that the pinion press-fitted onto the shaft of the Motor **[18]** and Planet Gear (A) Set **[13]** mesh properly.
- (6) Installation of the Bit Holder **[26]** into Housing (A)
Fit the upper and lower projections of the Bit Holder **[26]** in the grooves in Housing (A).
- (7) Reassembly of main body (See Fig. 11.)
 - (a) Install the Pushing Button **[25]** into Housing (A).
 - (b) Install the assembly reassembled in step (5) into Housing (A).

Note that the projections on the Gear Case **[8]** and the Motor Spacer **[15]** are engaged in the recess in Housing (A). (B) Set **[21]**, and the recess on Motor **[18]** is engaged in the projections of Housing (A). (B) Set **[21]**.

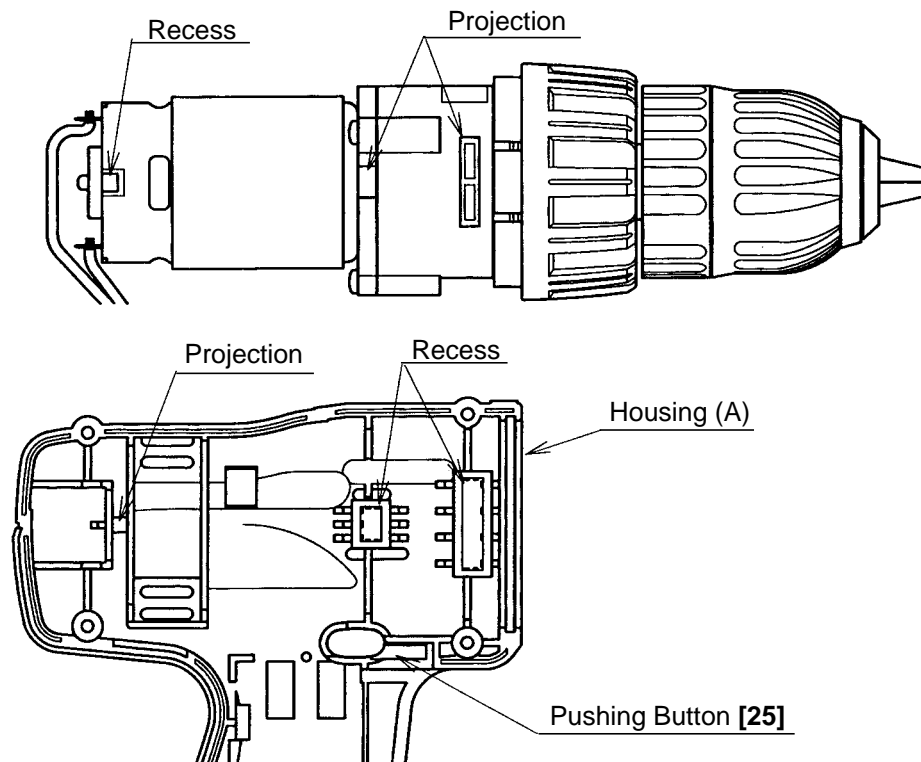


Fig. 11

- (c) Install the Strap **[29]** into Housing (A).
- (d) Set the assembly reassembled in step (b) to Housing (A). (B) Set **[21]** and secure it with the eight Tapping Screws (W/Washer) D3 x 16 **[19]**.
- (e) Verify proper operation of the Clutch Dial **[3]**.

When the assembly procedure up to step (c) is completed, ensure that the number "1" on the Clutch Dial **[3]** and the drill mark " <img alt="triangle symbol" data-bbox="385 175 415 190" style="vertical-align: middle;" " are in alignment with the triangle mark on Housing (A). (B) Set **[21]**. If the Clutch Dial **[3]** turns loosely, correctly re-install the Click Spring **[4]** as it is improperly installed. If the number "1" on the Clutch Dial **[3]** or the drill mark " <img alt="triangle symbol" data-bbox="385 215 415 230" style="vertical-align: middle;" " cannot reach the triangle mark on Housing (A). (B) Set **[21]**, correctly re-install the Clutch Dial **[3]** referring to step (3) as it is improperly installed.

(6) Other precautions in reassembly

- (a) When the assembly is completed, make sure that the turning direction of the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]** corresponds to the position of the Pushing Button **[25]**. When the Pushing Button **[25]** is pressed from the (R)-marked side, the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]** should turn clockwise when viewed from the rear.

Also, make sure that the run-out of the Drill Chuck 10TLRD-N (W/O Chuck Wrench) **[2]** holding a 9 mm dia. test bar is below 0.8 mm at a distance of 85 mm from the front of the drill chuck.

(b) Tightening torques

Tapping Screw (W/Washer) D3 x 16 [19]	: 1.1 — 1.9 N•m (11 — 19 kgf•cm, 9.5 — 16.5 in-lbs.)
Special Screw (Left Hand) M5 x 25 [1]	: 2.9 — 3.9 N•m (30 — 40 kgf•cm, 26.1 — 34.8 in-lbs.)
Drill Chuck 10TLRD-N (W/O Chuck Wrench) [2]	: 12.7 — 16.7 N•m (130 — 170 kgf•cm, 113 — 148 in-lbs.)
Screw Set D3 x 12 [16]	: 0.6 — 1.0 N•m (6 — 10 kgf•cm, 5.2 — 8.7 in-lbs.)

10-2. Precautions in Disassembly and Reassembly of the Battery Charger

Please refer to the Technical Data and Service Manual for precautions in disassembly and reassembly of the battery charger UC 7SD.

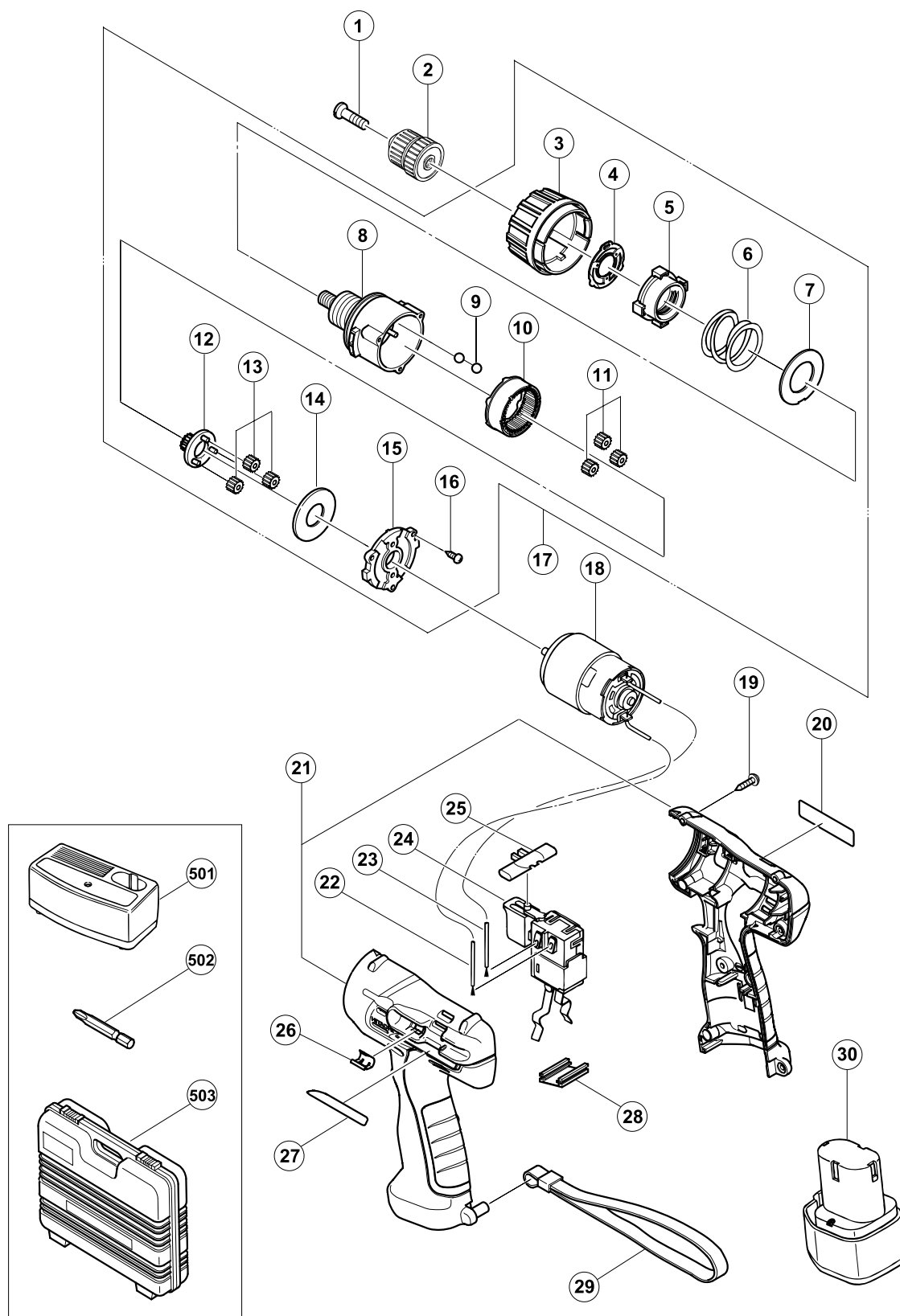
11. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60
	Fixed							
DS 7DF		Work Flow						

ELECTRIC TOOL PARTS LIST

■ CORDLESS DRIVER DRILL
Model DS 7DF

2003 • 2 • 25
(E1)



PARTS

DS 7DF

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	321-932	SPECIAL SCREW (LEFT HAND) M5X25	1		
2	312-516	DRILL CHUCK 10TLRD-N (W/O CHUCK WRENCH)	1		
3	321-904	CLUTCH DIAL	1		
4	321-903	CLICK SPRING	1		
5	321-902	NUT	1		
6	321-901	SPRING	1		
7	312-714	WASHER (D)	1		
8	321-900	GEAR CASE	1		
9	321-905	STEEL BALL D4 (10 PCS.)	16		
10	321-906	RING GEAR	1		
11	321-907	PLANET GEAR (B) SET (3 PCS.)	3		
12	321-908	PINION (B)	1		
13	321-909	PLANET GEAR (A) SET (3 PCS.)	3		
14	312-704	WASHER (A)	1		
15	321-910	MOTOR SPACER	1		
16	315-817	SCREW SET D3X12 (6 PCS.)	3		
17	321-899	GEAR BOX ASS'Y	1	INCLUD. 3-16	
18	321-897	MOTOR	1		
19	991-672	TAPPING SCREW (W/WASHER) D3X16	8		
20		NAME PLATE	1		
21	321-896	HOUSING (A).(B) SET	1		
22	306-041	INTERNAL WIRE (B) (BLACK)	1		
23	306-040	INTERNAL WIRE (B) (RED)	1		
24	321-898	DC-SPEED CONTROL SWITCH	1		
25	321-871	PUSHING BUTTON	1		
26	318-237	BIT HOLDER	1		
27		HITACHI LABEL	1		
28	315-141	TERMINAL SUPPORT (A)	1		
29	306-952	STRAP (BLACK)	1		
* 30	321-749	BATTERY EB 712S (W/ENGLISH N.P)	1		
* 30	321-748	BATTERY EB 712S (W/ENGLISH N.P)	1	FOR EUROPE	
* 30	320-101	BATTERY FEB 7S (W/ENGLISH N.P)	1		
30	320-102	BATTERY FEB 7S (W/ENGLISH N.P)	1	FOR EUROPE	

STANDARD ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501		CHARGER (MODEL UC 7SD)	1		
502	318-236	+ DRIVER BIT NO.2 55L	1		
503	318-246	CASE	1		

