

MODEL

**WH 9DM**

**WR 9DM**

# HITACHI

## POWER TOOLS

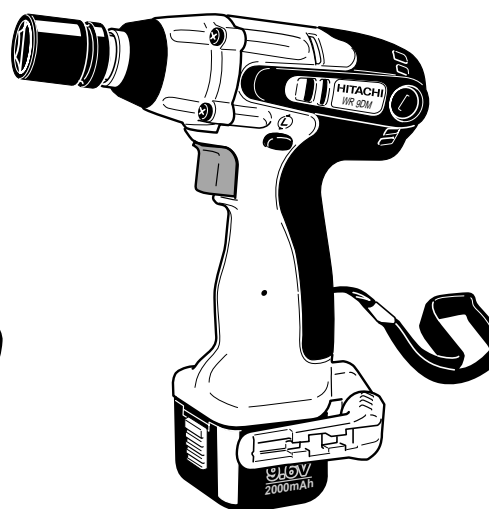
**CORDLESS IMPACT DRIVER  
WH 9DM**

**CORDLESS IMPACT WRENCH  
WR 9DM**

**TECHNICAL DATA  
AND  
SERVICE MANUAL**



WH 9DM



WR 9DM

LIST Nos. WH 9DM: F863  
WR 9DM: F865

Oct. 2001

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:

WH 9DM

Symbol Utilized	Competitor	
	Company Name	Model Name
C	MAKITA	6990D



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## **1. PRODUCT NAME**

Hitachi Cordless Impact Driver, Model WH 9DM

Hitachi Cordless Impact Wrench, Model WR 9DM

## **2. MARKETING OBJECTIVE**

The new cordless impact driver Model WH 9DM and the new cordless impact wrench Model WR 9DM are brought out as DC 9.6 V products of the Super Impact series. They are upgraded versions of the previous Models WH 8DH and WR 8DH, developed under the concept for more compact, powerful and convenient models to expand the market share of our cordless impact products.

The Model WH 9DM provides 30% faster tightening speed than the previous Model WH 8DH and this is the class-top speed. The WR 9DM has a square drive dimension of 9.5 mm. Since the Model WR 12DM has a square dimension of 12.7 mm, two square drive dimensions are available with those Impact series.

## **3. APPLICATIONS**

- Tightening/loosening of small screws, tapping screws, wood screws, bolts, nuts, etc.
- Drilling into wood and various other materials (with use of optional accessory drill chuck adapter).

### **[Applicable Markets]**

- Wood-product assembly: Tightening/loosening of wood screws, lag bolts, etc.
- Construction industry: Assembly of scaffolding, roofing, aluminum sashes, fencing, etc.; removal of plastic cones from concrete forms, mounting/removal of form ties; drilling into the wood frames of concrete forms, etc.
- Manufacturing industry: Assembly work for automobiles, rolling stock, shipbuilding, agricultural machinery and tools, industrial machines, steel furniture, etc.
- Utility industry: Assembly and installation of electric equipment, plumbing facilities, air conditioning (duct assembly, etc.), sanitary fixtures and various other facilities.
- Service industry: General repair work; installation of advertising signs, automobile repair, assembly of garages and carports storage sheds, etc.
- Various other assembly, construction or repair facilities.

#### 4. SELLING POINTS

##### (1) Cordless Impact Driver: WH 9DM

#### Class-top tightening speed

30% faster than the previous model  
(Example: When tightening a wood screw 90 mm in length)

WH 9DM: 3.8 seconds

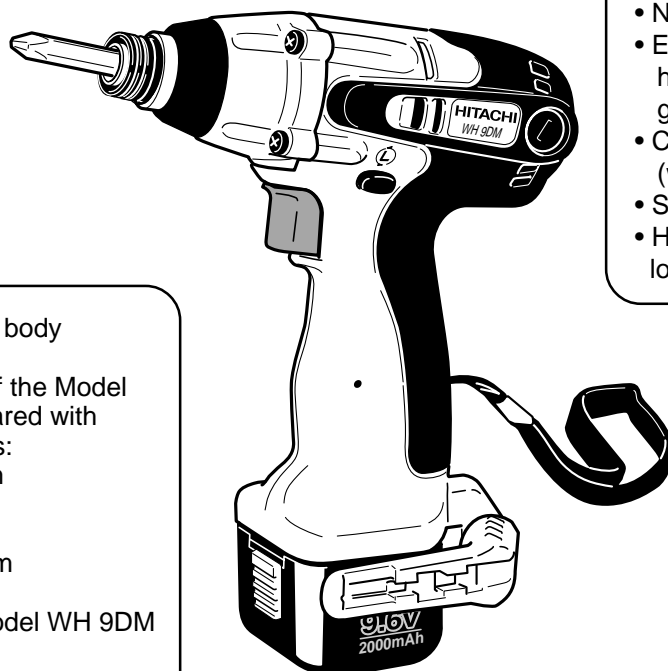
WH 8DH: 5.2 seconds

C: 5.0 seconds

-Reference-

WH 12DM (new model): 2.9 seconds

WH 12DH (previous model): 4.1 seconds



Selling points common to the  
Model WH 12DM

- Newly designed compact body
- Ergonomically designed comfortable handle (slip-resistant double-molded grip)
- Convenient hook (with the torsion bit holder)
- Stable flat battery (interchangeable)
- High durability, dust resistance and long service life

#### Compact body

Overall length of the Model  
WH 9DM compared with  
following models:

WH 8DH: -9 mm

C: -1 mm

(Reference)

WH 12DM: 0 mm

Height of the Model WH 9DM  
with respect to:

WH 8DH: +1 mm

C: -10 mm

(Reference)

WH 12DM: -5 mm

#### Lightweight

Weight of the Model WH 9DM  
compared with following models:

WH 8DH: -200 g

C: 0 g

(Reference)

WH 12DM: -200 g

(2) Cordless Impact Wrench: WR 9DM

9.5 mm (3/8")  
(Reference) WR 12DM: 12.7 mm (1/2")

Compact body

Overall length of the Model WR 9DM  
compared with following models:

WR 8DH: -14 mm

(Reference)

WR 12DM: -6 mm

Height of the Model WR 9DM with  
respect to:

WR 8DH: +1 mm

(Reference)

WR 12DM: -5 mm

Selling points common to the  
Model WH 12DM

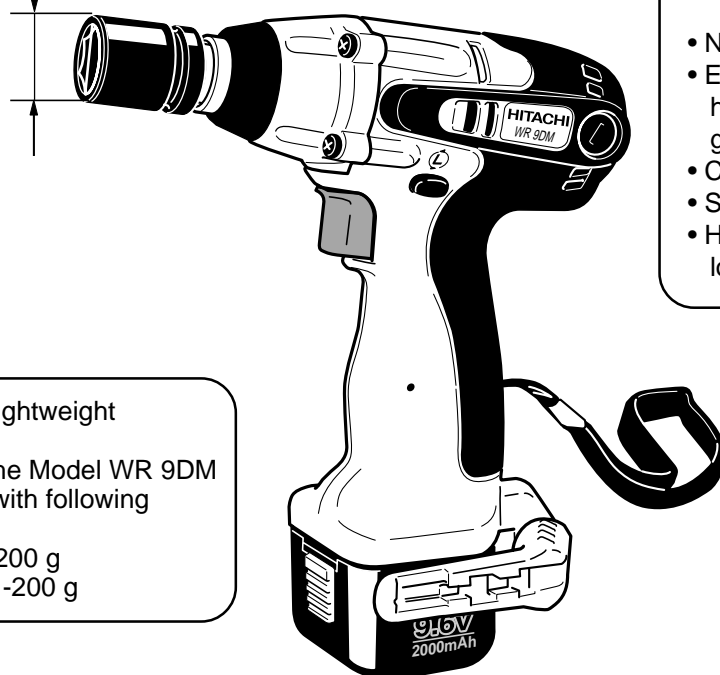
- Newly designed compact body
- Ergonomically designed comfortable handle (slip-resistant double-molded grip)
- Convenient hook
- Stable flat battery (interchangeable)
- High durability, dust resistance and long service life

Lightweight

Weight of the Model WR 9DM  
compared with following  
models:

WR 8DH: -200 g

WR 12DM: -200 g

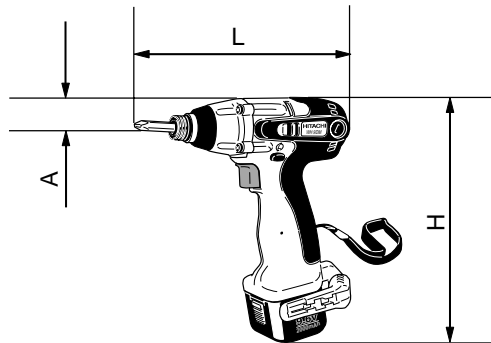


#### 4-1. Selling Point Descriptions

Refer to pages 4 through 8 of Technical Data Service Manual for the Models WH 12DM/WR 12DM for common selling points.

##### (1) Compact body (WH 9DM/WR 9DM)

The Models WH 9DM/WR 9DM are equipped with a separate-type motor in which the armature is separated from the magnet like a 100-V motor while the previous models are equipped with an integrated-type motor contained in a steel case. Thanks to the new separate-type motor, the steel case is eliminated and the motor section is downsized. In addition, the hammer case is downsized. The overall length of the Models WH 9DM/WR 9DM is shortened by 8 mm and the girth is shortened by 10 mm in comparison with the previous models WH 8DH/WR 8DH. The Models WH 9DM/WR 9DM are convenient for working in narrow places. The weight is about 70 g lighter than the Model WH 12DM (12-V product). The reason why the Models WH 9DM/WR 9DM are heavier than C by 80 g is because they are equipped with a metal ring gear while C is equipped with a plastic ring gear. In performance, however, the Model WH 9DM provides 30% faster tightening speed than C and this is the class-top speed.



Cordless impact driver: WH 9DM

Model		Unit	WH 9DM	WH 8DH	6990D	WH 12DM (12-V product)
L	Overall length	mm	167 (6-37/64")	176 (6-15/16")	168 (6-39/64")	167 (6-37/64")
A	Center height	mm	26 (1-1/64")	26 (1-1/64")	26 (1-1/64")	26 (1-1/64")
H	Height	mm	221 (8.7")	220 (8-21/32")	231 (9-3/32")	226 (8.9")
Weight	Catalog weight	kg	1.4 (3.0 lbs)	1.6 (3.5 lbs)	1.4 (3.0 lbs)	1.6 (3.5 lbs.)
	Actual weight	kg	1.49 (3.3 lbs)	1.60 (3.5 lbs)	1.41 (3.1 lbs)	1.66 (3.7 lbs.)






Cordless impact driver: WR 9DM

Model		Unit	WR 9DM	WR 8DH	WH 12DM (12-V product)
L	Overall length	mm	167 (6-37/64")	181	173 (6-13/16")
A	Center height	mm	26 (1-1/64")	26 (1-1/64")	26 (1-1/64")
H	Height	mm	221 (8.7")	220 (8-21/32")	226 (8.9")
Weight	Catalog weight	kg	1.4 (3.0 lbs)	1.6 (3.5 lbs)	1.6 (3.5 lbs)
	Actual weight	kg	1.49 (3.3 lbs)	1.60 (3.5 lbs)	1.67 (3.7 lbs)

## (2) Class-top tightening speed (WH 9DM)

The Model WH 9DM is equipped with the new rare-earth magnet motor that is more powerful than the previous model by 30%. Thanks to the new motor and the computer analysis, the Model WH 9DM gives optimum impact at tightening screws and the tightening speed is 30% higher than the previous model and is the class-top speed (also 30% higher than C). Tightening time comparison of the Model WH 9DM with the previous Model WH 8DH and C is shown below (refer to pages 15 and later for detailed data on the tightening time and the working capacity). For reference, the tightening speed of the Model WH 9DM is about 8% higher than the previous Model WH 12DH (12 V product) though it is about 40% slower than the Model WH 12DM.

Tightening time comparison (Wood screw: 4.5 mm dia. x 90 mm length, hemlock spruce)

Model	← Fast                      Slow →										sec.
	1	2	3	4	5	6	7	8	9	10	
HITACHI WH 9DM											3.8 sec.
HITACHI WH 8DH											5.2 sec.
C											5.0 sec.
Reference (12-V product): WH 12DM											2.4 sec.
WH 12DH											4.1 sec.

\* Tightening time may vary depending on hardness of the workpiece, ambient temperature, characteristics of the battery, etc.



## 5. SPECIFICATIONS

### 5-1. Specifications

Model		Cordless Impact Driver WH 9DM	Cordless Impact Wrench WR 9DM
Item			
Capacity		Small screw M4 – M8 (5/32" – 5/16")* <sup>1</sup> Ordinary bolt M5 – M12 (3/16" – 15/32")	Ordinary bolt M6 – M14 (1/4" – 9/16") High-strength bolt M6 – M10 (1/4" – 3/8")
Tightening torque		95 N·m (970 kgf·cm, 840 in-lbs.)* <sup>2</sup>	88.2 N·m (900 kgf·cm, 780 in-lbs.)* <sup>3</sup>
Tip condition		6.35 mm (1/4") Bit holder	9.5 mm (3/8") Square drive
Type of motor		Fan cooled DC magnet motor	
Enclosure		Main body: Polyamide resin ..... Housing Aluminum alloy die casting ..... Hammer case Storage battery: ABS resin (black) Charger: ABS resin (black)	
Type of switch		Trigger switch with forward / reverse changeover pushing button (with brake and variable)	
Handle configuration		T-type	
No-load rotational speed		0 – 2,300 /min	
Impact rate		0 – 3,000 /min	
Weight	Main body	1.4 kg (3.0 lbs.) (Includes battery)* <sup>4</sup>	
	Battery	0.55 kg (1.2 lbs.)	
Overall length x height		167 mm (6-37/64") x 221 mm (8.7")	167 mm (6-37/64") x 221 mm (8.7")
Center height		26 mm (1-1/64")	
Battery (Type EB 9B)		Sealed cylindrical nickel-cadmium batteries Nominal voltage: DC 9.6V Nominal life: Charging/discharging approximately 1,000 cycles (in case of Model UC 14YF2) Nominal capacity: 2.0 Ah	
Battery (Type EB 930H)		Sealed cylindrical nickel-metal hydride batteries Nominal voltage: DC 9.6V Nominal life: Charging/discharging approximately 500 cycles (in case of Model UC 14YF2) Nominal capacity: 3.0 Ah	
Charger (UC 14YF2)		Charger power source: single-phase AC, 50/60 Hz Voltage: Depending on the order specification Power input: 44 W Charging system: Constant current charge with full wave phase control Overcharge protection system: (1) Battery voltage detection ( $\Delta^2V$ system) (2) Battery surface temperature detection (thermostat or thermistor) (3) 120 minute timer  Output voltage: 7.2 V – 14.4 V Output current: 1.9 A Charging time: Approx. 60 minutes (for B-type storage battery at 20 °C) Approx. 90 minutes (for H-type storage battery at 20 °C) Product weight: 1.3 kg Operable ambient temperature range: 0 °C – 40 °C The maximum allowable temperature of the EB 9B type battery is 60 °C and the EB 930H type battery is 45 °C.	

\*<sup>1</sup>: In the case of tapping screws and wood screws, a minimum of M3 (1/8") is possible.

\*<sup>2</sup>: This torque is based on tightening an M12 (15/32") bolt (strength grade: 12.9) for 3 seconds with a hexagonal socket.

\*<sup>3</sup>: This torque is based on tightening an M12 (15/32") bolt (strength grade: 12.9) for 3 seconds with a hexagonal socket.

\*<sup>4</sup>: Main body does not include accessory tools (hexagonal bit, etc.).

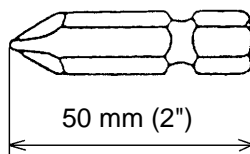
## Pilot lamp indications (UC 14YF2)

Red pilot lamp remains lit or flashes.	Prior to charging	Blinks	0.5 sec ON, 0.5 sec OFF ■ ■ ■ ■ ■	
	During charging	Lit	Stays ON constantly ■■■■■■■■■■	
	Charging completed	Blinks	0.5 sec ON, 0.5 sec OFF ■ ■ ■ ■ ■	
	Charging not possible	Flickers	0.1 sec ON, 0.1 sec OFF ■ ■ ■ ■ ■ ■ ■ ■	Storage battery or charger is faulty.
Green pilot lamp is lit.	High battery temperature	Lit	Stays ON constantly ■■■■■■■■■■	Charging not possible because storage battery temperature is too high.

## 5-2. Optional Accessories

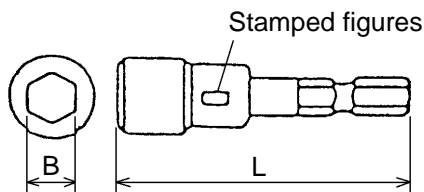
(1) Optional accessories for the Model WH 9DM

### ● Plus driver bit



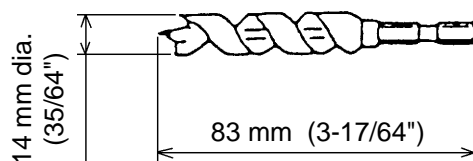
Bit No.	Code No.
No. 2	992671
No. 3	992672

### ● Hexagon socket



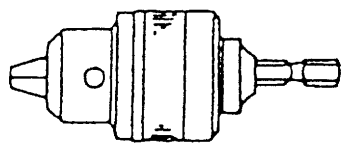
Part name	Stamped figures	L (mm)	B (mm)	Code No.
5 mm Hexagon socket	8	65 (2-9/16")	8 (5/16")	996177
6 mm Hexagon socket	10	65 (2-9/16")	10 (3/8")	985329
5/16" Hexagon socket	12	65 (2-9/16")	12 (15/32")	996178
8 mm Hexagon socket	13	65 (2-9/16")	13 (1/2")	996179
10 mm Hexagon socket (small type)	14	65 (2-9/16")	14 (9/16")	996180
10 mm Hexagon socket	16	65 (2-9/16")	16 (5/8")	996181
10 mm Hexagon socket	17	65 (2-9/16")	17 (21/32")	996182
1/2" Hexagon long socket	21	166 (6-17/32")	21 (53/64")	996197

### ● Woodworking drill bit (Code No. 959183)



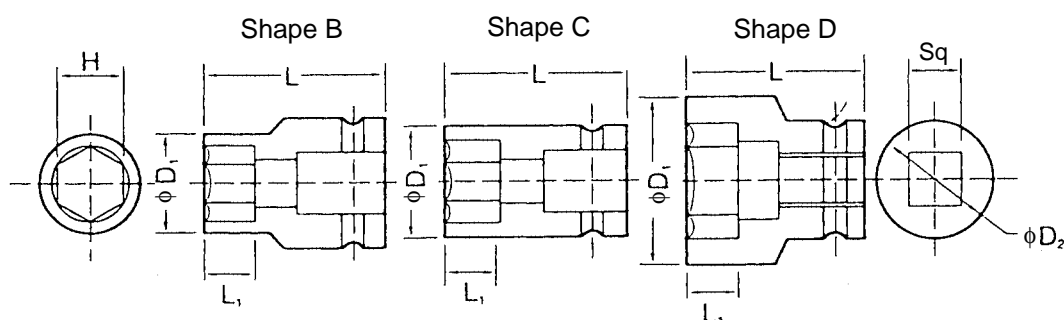
• Drill chuck adaptor set (Code No. 996195)

The drill chuck adaptor set permits mounting of various types of locally-available drill bits for a variety of drilling operations.



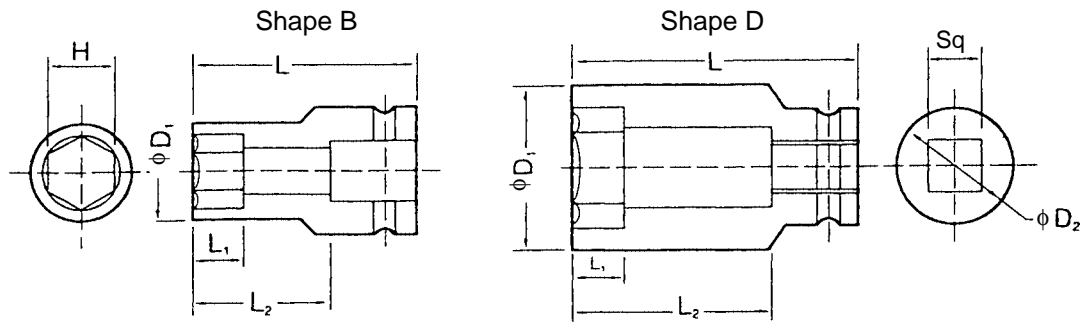
(2) Optional accessories for the Model WR 9DM

• Primary dimensions and applicable bolts for accessory hexagon sockets:



Square drive dimension Sq (mm)	Part name	Code No.	Nominal diameter of applicable bolts			Dihedral width H (mm)	Shape	Socket primary dimensions (mm)				Socket pin
			ISO (Ordinary)	ISO (Small)	Inch			L	L <sub>1</sub>	φ D <sub>1</sub>	φ D <sub>2</sub>	
9.5 (3/8")	Hexagon socket	8 mm 996125	M 5 (3/16")			8 (5/16")	B	33 (1.5/16")	5 (3/16")	13 (1/2")	19 (3/4")	a
		10 mm 996126	M 6 (1/4")			10 (3/8")	B	33 (1.5/16")	6 (1/4")	16 (5/8")	19 (3/4")	a
		12 mm 996127		M 8 (5/16")	W 5/16"	12 (15/32")	C	33 (1.5/16")	7 (9/32")	19 (3/4")	19 (3/4")	a
		13 mm 996128	M 8 (5/16")			13 (1/2")	B	33 (1.5/16")	8 (5/16")	20 (25/32")	22 (7/8")	b
		14 mm 996129		M 10 (3/8")		14 (9/16")	B	33 (1.5/16")	8 (5/16")	21 (13/16")	22 (7/8")	b
		16 mm 996130	M 10 (3/8")			16 (5/8")	D	33 (1.5/16")	9 (11/32")	24 (15/16")	22 (7/8")	b
		17 mm 996131	(M 10) (3/8")	M 12 (15/32")	W 3/8"	17 (21/32")	D	33 (1.5/16")	10 (3/8")	25 (1")	22 (7/8")	b
		18 mm 996132	M 12 (15/32")			18 (23/32")	D	33 (1.5/16")	10 (3/8")	26 (1-1/32")	22 (7/8")	b
		19 mm 996133	(M 12) (15/32")	M 14 (9/16")	W 7/16"	19 (3/4")	D	33 (1.5/16")	12 (15/32")	27.5 (1-1/16")	22 (7/8")	b

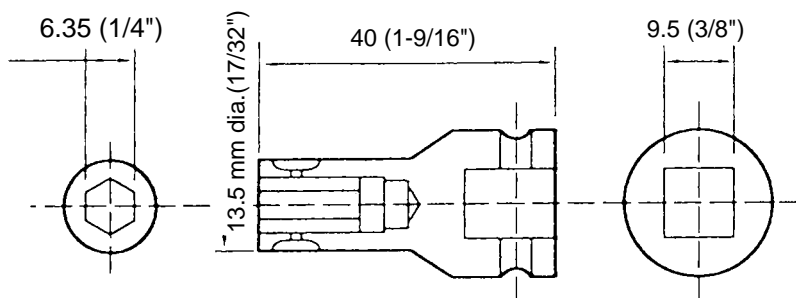
- Primary dimensions and applicable bolts for accessory long sockets:



Square drive dimension Sq (mm)	Part name	Code No.	Nominal diameter of applicable bolts			Dihedral width H (mm)	Shape	Socket primary dimensions (mm)					Socket pin
			ISO (Ordinary)	ISO (Small)	Inch			L	L <sub>1</sub>	L <sub>2</sub>	φ D <sub>1</sub>	φ D <sub>2</sub>	
9.5 (3/8")	Long socket	8 mm 996134	M 5 (3/16")			8 (5/16")	B	60 (2-3/8")	12 (15/32")	48 (1-7/8")	13 (1/2")	19 (3/4")	a
		10 mm 996135	M 6 (1/4")			10 (3/8")	B	60 (2-3/8")	12 (15/32")	48 (1-7/8")	16 (5/8")	19 (3/4")	a
		12 mm 996136		M 8 (5/16")	W 5/16"	12 (15/32")	B	60 (2-3/8")	14 (9/16")	48 (1-7/8")	18.4 (22/32")	19 (3/4")	a
		13 mm 996137	M 8 (5/16")			13 (1/2")	B	60 (2-3/8")	14 (9/16")	48 (1-7/8")	18.9 (3/4")	22 (7/8")	b
		14 mm 996138		M 10 (3/8")		14 (9/16")	B	60 (2-3/8")	15 (19/32")	48 (1-7/8")	19.5 (49/64")	22 (7/8")	b
		16 mm 996139	M 10 (3/8")			16 (5/8")	D	60 (2-3/8")	15 (19/32")	48 (1-7/8")	24 (15/16")	22 (7/8")	b
		17 mm 996140	(M 10) (3/8")	M 12 (15/32")	W 3/8"	17 (21/32")	D	60 (2-3/8")	15 (19/32")	48 (1-7/8")	25 (1")	22 (7/8")	b
		18 mm 996141	M 12 (15/32")			18 (23/32")	D	60 (2-3/8")	16 (5/8")	48 (1-7/8")	26 (1-1/32")	22 (7/8")	b
		19 mm 996142	(M 12) (15/32")	M 14 (9/16")	W 7/16"	19 (3/4")	D	60 (2-3/8")	17 (21/32")	48 (1-7/8")	27.5 (1-1/16")	22 (7/8")	b

[NOTE] Although the ISO (Ordinary) M10 (3/8") and M12 (15/32") bolts listed in hexagon sockets and long sockets are from the old standards of the International Standard Organization, they are still commonly available in international markets.

- Bit adaptor (Code No. 996144):



Part name	Overall length	Code No.
Cross-recessed (Phillips) hd. driver bit No.2	45	955229
	70	955654
Cross-recessed (Phillips) hd. driver bit No.3	45	955230
	70	955655

- Extension bar [Overall length 100 mm (3-15/16") ] ..... Code No. 996143
  - Universal joint ..... Code No. 996147
  - 12.7 mm (1/2") square adapter ass'y [Overall length 36 mm (1-13/32") ] ..... Code No. 996145
- Square drive dimensions: Anvil side 9.5 mm (3/8")  
Socket side 12.7 mm (1/2")

## 6. COMPARISONS WITH SIMILAR PRODUCTS

### 6-1. Specification Comparisons (Cordless Impact Driver)

Item			Maker	HITACHI		C
			Model	WH 9DM	WH 8DH	
Catalog specifications	Capacity	Small screw		M 4 – M 8 (5/32" – 5/16")* <sup>1</sup>	M 4 – M 8 (5/32" – 5/16")* <sup>1</sup>	M 4 – M 8 (5/32" – 5/16")
		Ordinary bolt		M 5 – M 12 (3/16" – 15/32")	M 5 – M 12 (3/16" – 15/32")	M 5 – M 12 (3/16" – 15/32")
		High-strength bolt		M 5 – M 10 (3/16" – 3/8")	M 5 – M 10 (3/16" – 3/8")	M 5 – M 10 (3/16" – 3/8")
	Max. tightening torque* <sup>2</sup>		N·m	95 (970 kgf·cm, 840 in-lbs.)	88.2 (900 kgf·cm, 781 ft-lbs.)* <sup>2</sup>	90 (918 kgf·cm, 797 in-lbs.)
	No-load rotation speed		/min	0 – 2,300	0 – 2,200	0 – 2,300
	Impact rate		/min	0 – 3,000	0 – 2,900	0 – 3,000
	Main body weight* <sup>3</sup>		kg	1.4 (3.0 lbs)	1.6 (3.5 lbs)	1.4 (3.0 lbs)
Measured figures	Max. tightening torque* <sup>2</sup>		N·m	99 (1010 kgf·cm, 877 in-lbs.)	92 (940 kgf·cm, 816 in-lbs.)	90 (920 kgf·cm, 799 in-lbs.)
	No-load rotation speed		/min	0 – 2,360	0 – 2,230	0 – 2,480
	Impact rate		/min	0 – 3,185	0 – 2,790	0 – 2,700
	Overall length x height		mm	167 x 221 (6-37/64" x 8.7")	176 x 220 (6-15/16" x 8-21/32")	168 x 231 (6-39/64" x 9-3/32")
	Center height		mm	26 (1-1/64")	26 (1-1/64")	26 (1-1/64")
	Main body weight* <sup>3</sup>		kg	1.49 (3.3 lbs)	1.6 (3.5 lbs)	1.41 (3.1 lbs)
	No-load sound pressure level		dB(A)	70	67	70
Tool tip mounting system				Driver chuck	Driver chuck	Driver chuck
Type of switch				Trigger switch with forward / reverse changeover pushing button with brake and variable	Trigger switch with forward / reverse changeover pushing button with brake and variable	Trigger switch with forward / reverse changeover pushing button with brake and variable
Type of motor				DC magnet	DC magnet	DC magnet
Voltage		V		9.6	9.6	9.6
Current		A		27	20	22
Battery	Type			EB 9B or EB 930H	EB 9B or EB 9H	9122
	Nominal capacity	Ah		EB 9B: 2.0 EB 930H: 3.0	EB 9B: 2.0 EB 9H: 2.2	2.0
	Nominal voltage	V		9.6	9.6	9.6
	Ambient temperature	°C		0 – 40	0 – 40	—
Charger	Model			UC 14YF2	UC 14YF2	DC1411
	Power input capacity	VA		44	44	—
	Recharging voltage	V		7.2 – 14.4	7.2 – 14.4	7.2 – 14.4
Standard accessories				●Plastic tool case ●Charger (UC 14YF2)	●Plastic tool case ●Charger (UC 14YF2)	●Plastic tool case ●Charger (DC1411)

<sup>\*1</sup>: In the case of tapping screws and wood screws, a minimum of M3 (1/8") is possible.

<sup>\*2</sup>: Max. tightening torque is based on tightening an M12 (5/32") bolt (strength grade: 12.9) for 3 seconds with a hexagon socket.

<sup>\*3</sup>: Main body weight does not include accessory tools (hexagon bit, etc.).

## 6-2. Specification Comparisons (Cordless Impact Wrench)

Maker				HITACHI	
Model				WR 9DM	WR 8DH
Catalog specifications	Capacity	Ordinary bolt		M 6 – M 14 (1/4" – 9/16")	M 6 – M 14 (1/4" – 9/16")
		High-strength bolt		M 6 – M 10 (1/4" – 3/8")	M 6 – M 10 (1/4" – 3/8")
	Max. tightening torque *1		N·m	88.2 (900 kgf·cm, 780 in-lbs.)	98 (1,000 kgf·cm, 868 in-lbs.)
	No-load rotation speed		/min	0 – 2,300	0 – 2,200
	Impact rate		/min	0 – 3,000	0 – 2,900
	Main body weight *2		kg	1.4 (3.0 lbs.)	1.6 (3.5 lbs.)
	Measured figures	Max. tightening torque *1		N·m	88.2 (900 kgf·cm, 780 in-lbs.)
No-load rotation speed		/min	0 – 2,360	0 – 2,230	
Impact rate		/min	0 – 3,185	0 – 2,790	
Overall length x height		mm	167 x 221 (6-37/64" x 8.7")	181 x 220 (7-1/8" x 8-21/32")	
Center height		mm	26 (1-1/64")	26 (1-1/64")	
Main body weight *2		kg	1.45 (3.2 lbs.)	1.6 (3.5 lbs.)	
No-load sound pressure level		dB(A)	70	67	
Tip condition			9.5 mm (3/8") square drive		12.7 mm (1/2") square drive
Tool tip mounting system			Plunger		Plunger
Type of switch			Trigger switch with forward/reverse changeover pushing button with brake and variable		Trigger switch with forward / reverse changeover pushing button with brake and variable
Type of motor			DC magnet		DC magnet
Voltage		V	9.6		9.6
Current		A	18		20
Battery	Type		EB 9B or EB 930H		EB 9B or EB 9H
	Nominal capacity	Ah	EB 9B: 2.0 EB 930H: 3.0		EB 9B: 2.0 EB 9H: 2.2
	Nominal voltage	V	9.6		9.6
	Ambient temperature	°C	0 – 40		0 – 40
Charger	Model		UC 14YF2		UC 14YF2
	Power input capacity	VA	44		44
	Recharging voltage	V	7.2 – 14.4		7.2 – 14.4
Standard accessories			●Plastic tool case ●Charger (UC 14YF2)		●Plastic tool case ●Charger (UC 14YF2)

\*1: Max. tightening torque is based on tightening an M12 (5/32") bolt (strength grade: 12.9) for 3 seconds with a hexagon socket.

\*2: Main body weight does not include accessory tools (hexagon bit, etc.).

6-3. Tightening Torque

6-3-1. Tightening torque characteristic comparisons

(1) Impact driver

Thanks to the high-power rare-earth magnet motor and the computer analysis, the Model WH 9DM gives optimum impact at tightening screws and the tightening torque is increased.

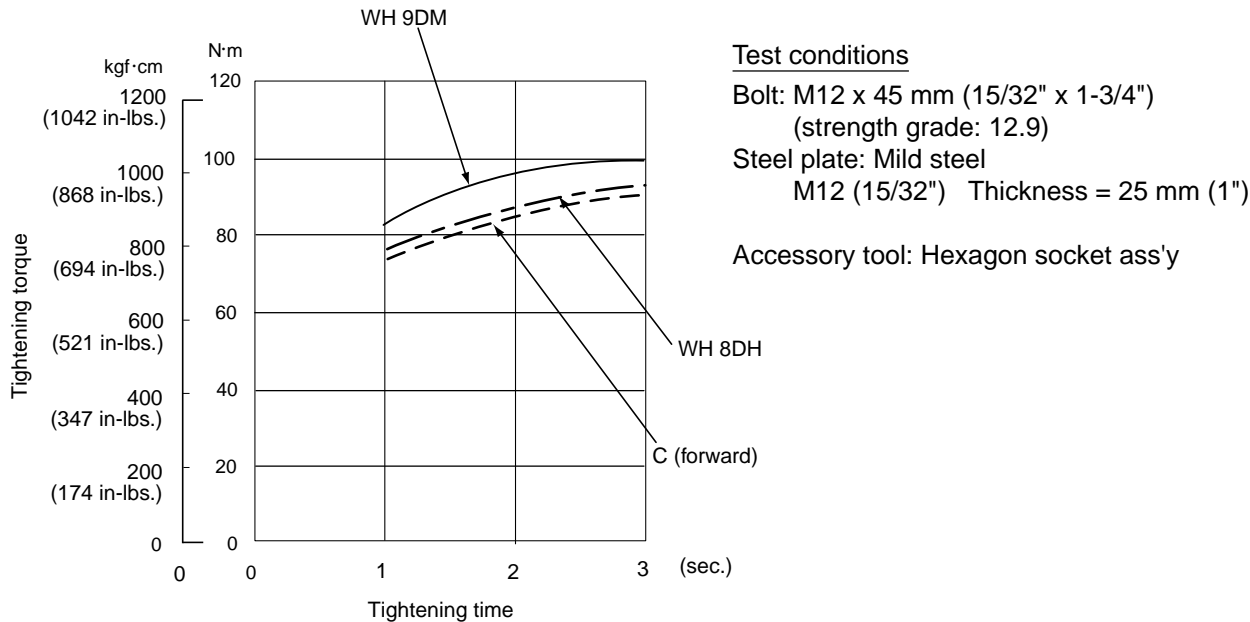


Fig. 1-1

(2) Impact wrench

The Model WR 9DM has lower tightening torque than the Model WR 8DH (square dimension 12.7 mm (1/2 ")) because the square drive dimension is 9.5 mm (3/8 ").

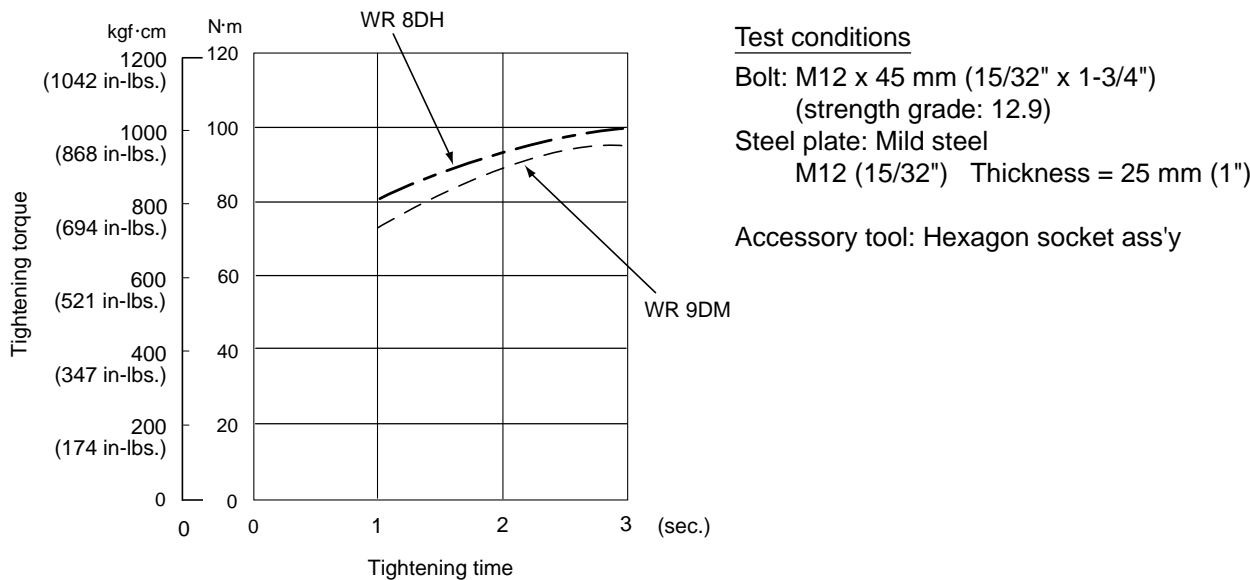


Fig. 1-2

### 6-3-2. Screw diameter and appropriate tightening torque

Generally speaking, the appropriate tightening torque for a screw can be determined by the strength grade of the screw and the material tightened. Tables 1 and 2, and Fig. 2 below list data relative to the strength grade of various screws and the appropriate tightening torque. For further reference, appropriate tightening torque is calculated with the following formula. Study and use this formula for accurate selection of tightening torque.

$$T = k \cdot d \cdot p$$

T: Appropriate tightening torque (kgf·cm)

k: Torque coefficient (0.17)

d: Nominal diameter for the screw (mm)

p: Recommended axial tightening force to be applied to the screw (kgf)

$p = \text{rated axial stress (kgf/cm}^2\text{)} \times 0.8 \times \text{effective sectional area of the thread (mm}^2\text{)}$

#### • Strength grade and rated axial stress of threads

**Table 1**

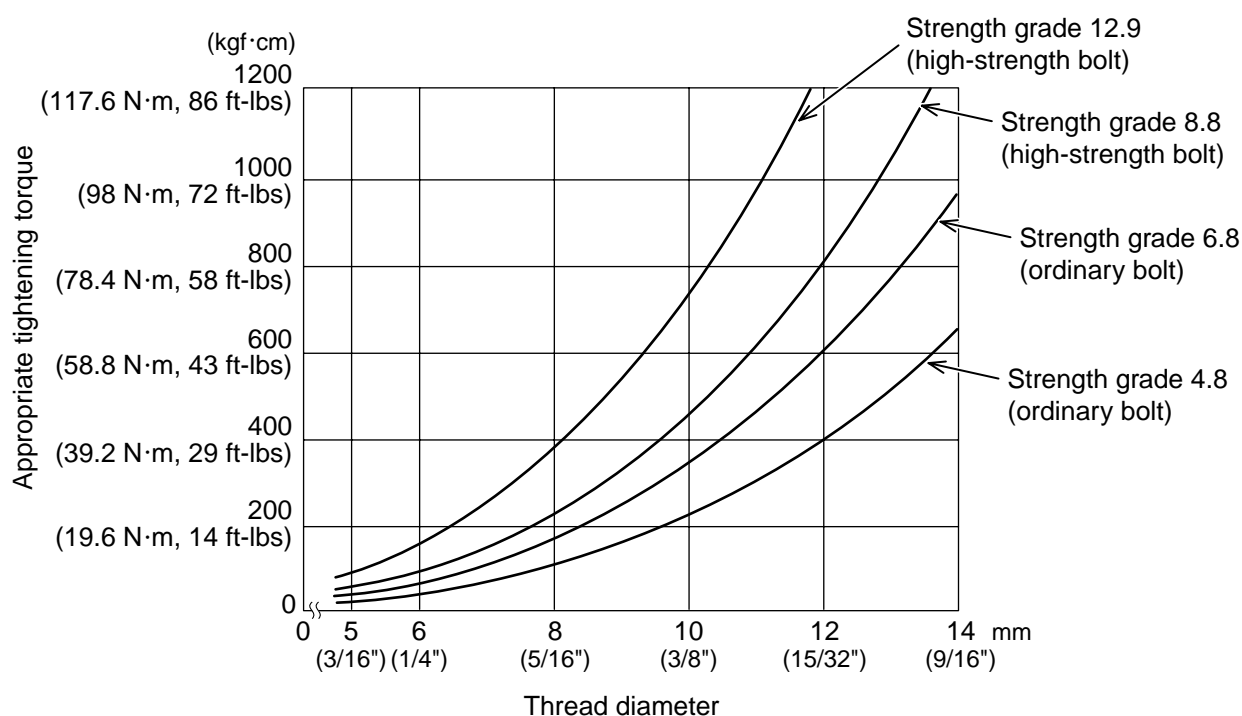
Strength grade	4.8	6.8	8.8	12.9
Rated axial stress (kgf/mm <sup>2</sup> )	29.1	43.7	58.2	95
Material	Mild steel		Alloy steel including Ni, Mn, Cr, etc.	
Heat treatment	None		Processed-hard material	

#### • Diameter and effective sectional areas of threads

**Table 2**

Kind of thread (x pitch)	M5 x 0.8 mm (3/16")	M6 x 1 mm (1/4")	M8 x 1.25 mm (5/16")	M10 x 1.5 mm (3/8")	M12 x 1.75 mm (15/32")	M14 x 2 mm (9/16")
Effective sectional area of thread (mm <sup>2</sup> )	14.2	20.1	36.6	58.0	84.3	115

#### • Thread diameter and appropriate tightening torque



**Fig. 2**

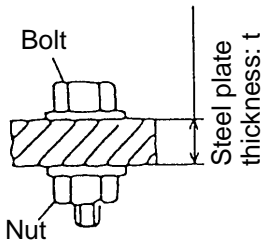


### 6-3-3. Bolt tightening torque characteristics

Figs. 3-1 and 3-2 show relationships between time and tightening torque for individual bolt types and sizes. While the data are useful for handy reference, actual tightening torque will vary depending on tightening conditions and other variables. For details, please refer to Para. 7-3, "Tightening Torque Variation".

#### (Note)

- The term "tightening time" indicates the impact time after the lower surface of the bolt has come in contact with the material into which it is being tightened.
- In the tightening conditions shown in Figs. 6-1 and 6-2, the screws are being tightened directly into a steel plate; accordingly, the torque goes up very abruptly in comparison with ordinary bolt tightening conditions.



\* The following bolts were utilized:  
 Ordinary bolt; strength grade 4.8  
 High-strength bolt; strength grade 12.9

Strength grade is read as follows:

4.8  
 — Yield point or durable force: (45,500 psi)  
 — Tensile strength of the bolt: (56,900 psi)

#### • Model WH 9DM

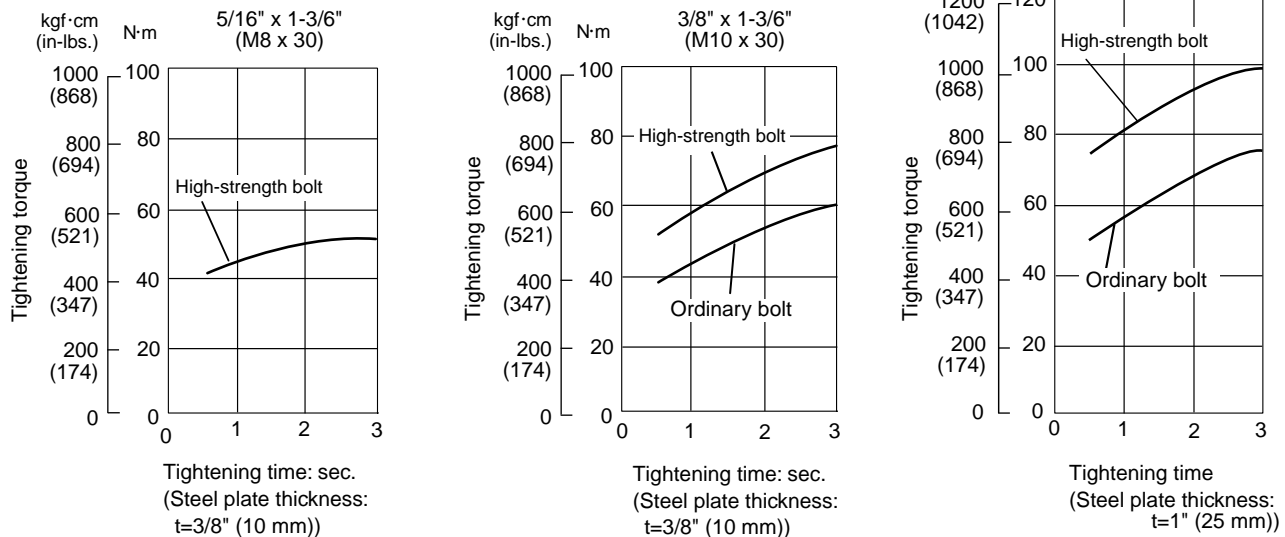


Fig. 3-1

#### • Model WR 9DM

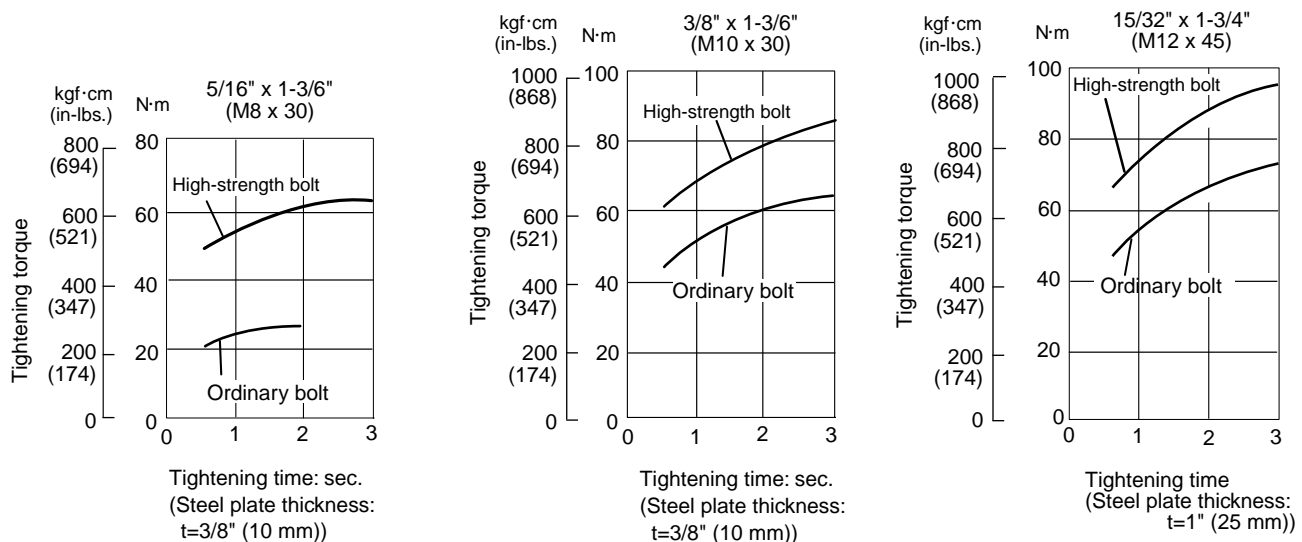
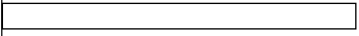




Fig. 3-2

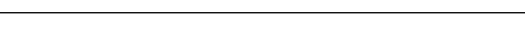


## 6-4. Tightening Speed

The tables below show the tightening speeds for individual screw types and sizes. Please note that the data below are intended for general reference only as the actual tightening speed will vary depending on the tightening conditions such as ambient temperature and characteristics of battery.

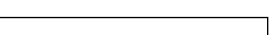

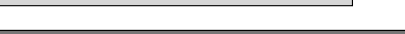
### ① Wood screw 4.2 mm dia. x 90 mm length, hemlock spruce

Model	← Fast                      Slow →										
	1	2	3	4	5	6	7	8	9	10	sec.
HITACHI WH 9DM											3.8 sec.
HITACHI WH 8DH											5.2 sec.
C											5.0 sec.




### ② Wood screw 4.2 mm dia. x 90 mm length, lauan

Model	← Fast                      Slow →					sec.
	1	2	3	4	5	
HITACHI WH 9DM						2.7 sec.
HITACHI WH 8DH						3.3 sec.
C						3.7 sec.

### ③ Wood screw 4.2 mm dia. x 75 mm length, soft wood

Model	← Fast                      Slow →					sec.
	1	2	3	4	5	
HITACHI WH 9DM						1.5 sec.
HITACHI WH 8DH						1.9 sec.
C						2.1 sec.

### ④ Wood screw 5.3 mm dia. x 120 mm length, soft wood

Model	← Fast                      Slow →										sec.
	1	2	3	4	5	6	7	8	9	10	
HITACHI WH 12DM											5.4 sec.
HITACHI WH 12DH											6.6 sec.
C											6.5 sec.

## 6-5. Number of Screws or Bolts Driven

### 6-5-1. Per-charge working capacity comparisons

Test data on the number of screws or bolts which can be driven per battery charge by the new models vs. the previous models are shown in the tables below. Please note that the data below are intended for general reference only as the number of screws which can be tightened per charge will vary slightly depending on screw tightening conditions, screw sizes, ambient temperatures and the charging capacity of the battery.

#### (1) Number of screws or bolts driven (Cordless impact driver)

Tightening condition \ Model		HITACHI WH 9DM	HITACHI WH 8DH	C
Battery		EB 9B	EB 9B	9122 (Corresponding EB 9B)
Wood screw	4.0 mm dia. x 50 mm (soft wood)	385	400	425
Wood screw	4.2 mm dia. x 90 mm (hard wood)	80	75	63
Wood screw	5.3 mm dia. x 120 mm (hard wood)	35	33	30
Machine screw (M8 x 16 mm)		1,025	1,060	1,130

Note 1) The Model WH 9DM is equipped with the higher-power motor for the higher tightening speed. Although the higher tightening speed is realized, the Model WH 9DM has the following disadvantage.

#### ○ High startup current

The Model WH 9DM consumes higher power than C for driving a short or machine screw because it requires high startup current. Thus the number of machine screws driven per charge is different as shown above.

#### (2) Ordinary bolt (Cordless impact wrench)

Tightening condition \ Model		HITACHI WR 9DM	HITACHI WR 8DH
Battery		EB 9B	EB 9B
M8 (5/16") ordinary bolt	Number of bolts	880	880
	Time (sec.)	0.4	0.4
M10 (3/8") ordinary bolt	Number of bolts	430	430
	Time (sec.)	0.8	0.8
M12 (15/32") ordinary bolt	Number of bolts	220	220
	Time (sec.)	1.5	1.5

## **7. PRECAUTIONS IN SALES PROMOTION**

### **7-1. Safety Instructions**

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

#### **A. Handling Instructions**

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

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

New units are not fully charged. Even if the units were fully charged at the factory, long periods without use, such as during shipping, cause the storage battery to lose its charge. Customers must be instructed to fully charge the unit prior to use.

- (2) When charging storage batteries, use only the exclusive Model UC 14YF2 Charger provided with the tool.

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

- (3) Follow prescribed steps in using the charger.

First connect the EB 9B or EB 930H Storage Battery to the Model UC 14YF2 Charger, then plug the charger into an AC outlet (ensuring that the voltage matches that indicated on the unit). If this order is reversed, the charger may not function properly.

- (4) Ensure the power source voltage is the same as that indicated on the Name Plate of the charger. Use of any other power source (DC outlet, fuel powered generator, etc.) will cause the charger to overheat and burn out.

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

If the charger is used with voltage over and above that indicated on the unit, it will not function properly.

- (6) 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 temperatures under 0 °C (32 °F), the thermostat will not function properly, and the storage battery may be over-charged. At temperatures over 40 °C (104 °F), the storage battery cannot be sufficiently charged. The optimum temperature range is 20 °C – 25 °C (68 °F – 77 °F).

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

At high ambient temperatures, if over three storage batteries are charged in succession, the temperature of the coils on the transformer will rise and there is a chance that the temperature fuse inserted in the interior of the transformer will inadvertently melt. After charging one battery, please charge the next battery after about a fifteen-minute interval.

- (8) 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 electric shock, fire or other serious hazards.

- (9) 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.

- (10) Disposal of the Type EB 9B or EB 930H Storage Battery

Ensure that all customers understand that Type EB 9B or EB 930H Storage Batteries should be turned into any Hitachi power tool 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 discarded indiscriminately, leakage of the cadmium compound contained in the battery may cause environmental pollution.

## B. Caution Plates

- (1) The following precautions are listed on the Name Plate or Caution Plate attached to the main body of each tool.

For the U.S.A. (excludes French) or 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.

For Oceania

### CAUTION

- Read thoroughly HANDLING INSTRUCTIONS before use.

- (2) The following cautions are listed on the Name Plate attached to each type EB 9B or EB 930H Storage Battery.

For Europe

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

For the U.S.A.

### CAUTION

- For safe operation, see Instruction Manual.
- Use HITACHI charger UC 12Y, -14Y, -24Y series for recharging.

- (3) The following caution is listed on the Name Plate attached to the Model UC 14YF2 Charger.

For the U.S.A.

### CAUTION

- For safe operation, see Instruction Manual.
- Charge HITACHI rechargeable batteries Type EB 7, EB 9, EB 12 and EB 14 series. Other types of batteries may burst causing personal injury and damage.
- Charge between 32 and 104 °F.
- Indoor use only.
- Replace defective cord immediately.

## 7-2. Tightening Torque Inspection Prior to Operation

As described and shown in Para. 6-3-3, the output tightening torque of which the Models WH 9DM and WR 9DM are capable in excess of the rated tightening torque of certain bolts and screws. Accordingly, if the tightening time is prolonged for such bolts and screws, it could cause damage to their threads or, in the worst case, cause them to be sheared off. (This phenomenon is common to all existing impact drivers.) Particularly when tightening M6 (1/4") or smaller screws, tightening time must be kept extremely short: 0.5 seconds or less. The customer should be advised to carry out several screw tightening operations and adjust the tightening time as necessary by measuring the tightening torque with an appropriate torque wrench or driver before commencing continuous operation.

## 7-3. Tightening Torque Variation

The tightening torque of the cordless impact driver or wrench may vary slightly in accordance with the factors described below. Salespersons are requested to advise the customer to confirm that appropriate tightening torque is obtained by measuring the torque with an appropriate torque wrench or torque driver at the beginning of the tightening operations, and as necessary during the tightening operations. In addition, the torque values shown in Para. 6-3-2 above are useful as a handy reference, and may be utilized as tentative standards.

### (1) Voltage of battery

Tightening torque is affected by the voltage output of the battery. For example, the relationship between tightening torque and the number of M12 x 45 mm (15/32" x 1-3/4") high-strength bolts tightened is shown in Fig. 4 below. As can be seen in the graph, tightening torque decreases as the number of bolts tightened increases. This phenomenon is caused by the decline in voltage output of the battery due to the increasing number of bolts tightened. In particular, the tightening torque decreases rapidly just before the battery is fully discharged (range "a" in the graph). As this phenomenon is an inherent drawback in any cordless impact driver, salespersons are requested to ensure that the customer is fully aware of and understands this characteristic.

#### Model WR 9DM

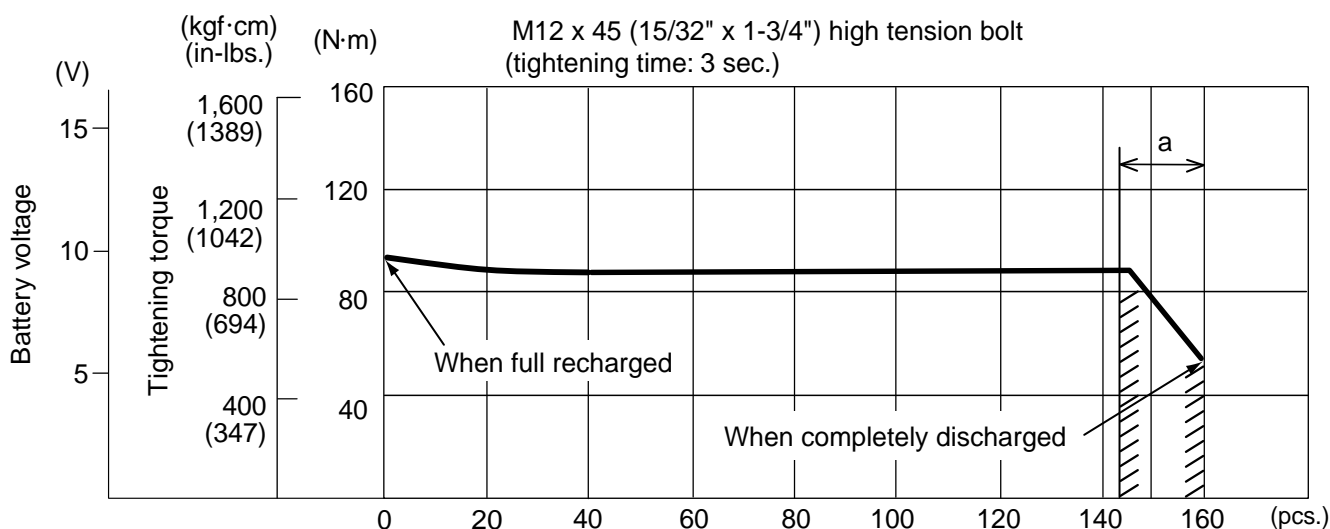


Fig. 4 Number of bolts driven per charge (EB 930H battery)

(2) Effects of low ambient temperatures

The tightening torque required may be reduced at low ambient temperatures or under the influence of grease and different torque coefficients (dependent on manufacturing and finishing processes, and specified by bolt manufacturers).

(3) Different bolt diameter

Differences in bolt diameter will cause variation of the required levels of tightening torque. Generally speaking, tightening torque is higher for large bolts.

(4) Different materials being tightened

When a bolt is tightened into a soft material such as aluminum, plastic, wood, etc., the tightening torque is considerably less than when the bolt is tightened into a hard material such as steel.

(5) Different tightening conditions

The tightening torque may vary in accordance with bolt torque coefficient (dependent on manufacturing process, and specified by bolt manufactures), bolt grade and bolt length, even though the dimensions of the bolts are the same. Tightening torque may also vary depending on the surface finishing state of tightening materials (steel, aluminum, etc.), and materials to be tightened. In addition, if there is seal packing, clearance, etc., between tightening materials, the tightening torque is decreased.

(6) Wear and looseness of the socket

With extended use, the hexagonal portion of the socket which is fitted to the head of the bolt or drill bit, and/or hexagonal portion of the driver chuck which is fitted onto the anvil in the main body will become worn and loose. Wear and looseness will cause a proportionate loss of tightening torque.

In addition, use of an incorrect size socket (slightly larger than the bolt being tightened) will also result in decreased torque.

(7) Bolt and nut rotate together

Tightening torque that can be achieved will be considerably decreased if the bolt and nut rotate together during the tightening operation. The customer should be advised to carefully observe the operation and ensure this does not occur.

#### **7-4. Suggestions and Precautions for the Efficient Use of the Charger**

(1) Batteries may not be rechargeable immediately after use

If the Type EB 9B or EB 930H Storage Batteries are exposed to direct sunshine for an extended period, or if the temperature of the batteries is 40 °C (104 °F) or higher immediately after they have been used in the tool, the pilot lamp may not light up when the batteries are connected to the Model UC 14YF2 Charger. This is because the built-in thermostat functions to stop the charging when the temperature of the storage batteries reach 40 °C (104 °F) or more. In such a case, the customer should be advised to place the batteries in a shaded area with a good airflow, and allow sufficient cooling before recharging.

This phenomenon is common to all existing batteries which employ temperature sensitive overcharge devices. The cooling time required before charging can be accomplished varies from a few minutes to about 30 minutes, depending on the load, duration of use, and ambient temperatures.

## 8. OTHER PRECAUTIONS

### (1) Check for cracks or other damage on the socket

Cracks or any other faults on the socket are very hazardous. In addition, cracks or other damage to accessories will cause loss of tightening torque efficiency. Advise the customer to inspect accessories often, and ensure there are no abnormalities.

### (2) Socket dimensions

Without fail, utilize an appropriate socket which matches the bolt and/or nut dimensions. If the socket dimensions are larger than the bolts or nuts, it will not only cause insufficient tightening torque, but could also easily cause damage to the socket. Please refer to the tables in Para. 5-2 for appropriate socket dimensions.

### (3) Hammering section lubrication

Grease (ATTOLUB MS No. 2) is utilized in the hammering section. Frequent or continuous use of the tool will cause excessive temperature rise of the hammering section, resulting in depletion of the grease and subsequent increased wear of components which will, in turn, cause loss of tightening efficiency. Accordingly, it is necessary to periodically replenish the grease in the hammering section to ensure proper lubrication of moving and sliding components.

### (4) Vent holes in the handle

Do not stop up or cover the holes on either face of the handle. They are essential for ventilation.



## 9. REPAIR GUIDE

**WARNING:** Without fail, remove the Model EB 9B or EB 930H Battery from the main body before starting repair or maintenance work. Because the tool is cordless, if the battery is left in and the switch is activated inadvertently, the motor will start rotating unexpectedly, which could cause serious injury.

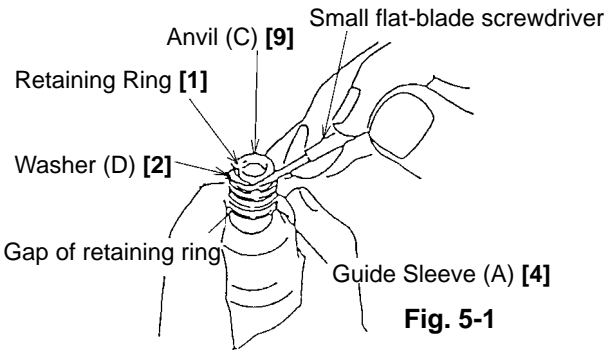
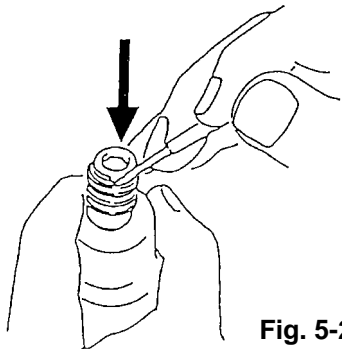
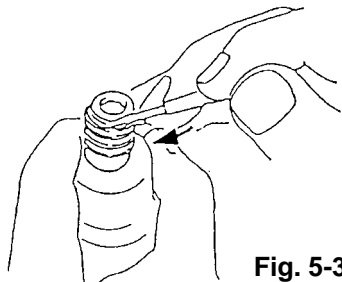
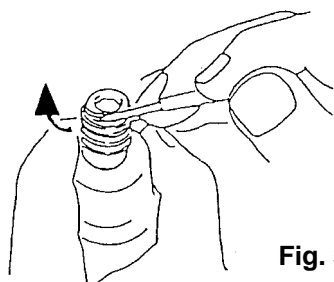
### 9-1. Precautions in Disassembly and Reassembly

The **[bold]** and **<bold>** numbers correspond to the item numbers in the Parts List and the exploded assembly diagram. ( **[ ]**: WH 9DM, **< >**: WR 9DM )

#### 9-1-1. Disassembly

##### (1) Removal of Guide Sleeve (A) **[4]** (Model WH 9DM only)

Remove the Retaining Ring **[1]**, Washer (D) **[2]**, Guide Spring **[3]** and Guide Sleeve (A) **[4]** in order by following the procedure shown in Figs. 5-1 to 5-4. Be sure not to lose the two Steel Balls D3.5 **[8]** in Anvil (C) **[9]**.

<p>1</p>  <p>Hold the body and adjust the gap of the retaining ring to the groove of anvil (B), then insert a small flat-blade screwdriver into the groove at an angle.</p>	<p>2</p>  <p>Press down the Washer (D) with the small flat-blade screwdriver.</p>
<p>3</p>  <p>Slide the small flat-blade screwdriver under one side of the gap of the retaining ring.</p>	<p>4</p>  <p>Slowly raise the retaining ring using the end face of guide sleeve (A) as a fulcrum.</p>

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

(2) Removal of the Hammer Case [7] <3> and the hammer assembly

Remove the four Tapping Screws (W/SP. Washer) D4 x 25 (Black) [6] <2> that connect the Hammer Case [7] <3> with Housing (A). (B) Set [33] <28> and remove the Hammer Case [7] <3> and the hammer assembly from Housing (A). (B) Set [33] <28>.

(3) Disassembly of the hammer assembly

Mount the hammer assembly onto the J-297 base for washer (S). With a hand press, push down the top of the Spindle [17] <12> to compress the Hammer Spring [14] <9>. In this position, remove the Stopper [16] <11> with a flat-blade screwdriver, then release the hand press. (See Fig. 6.)

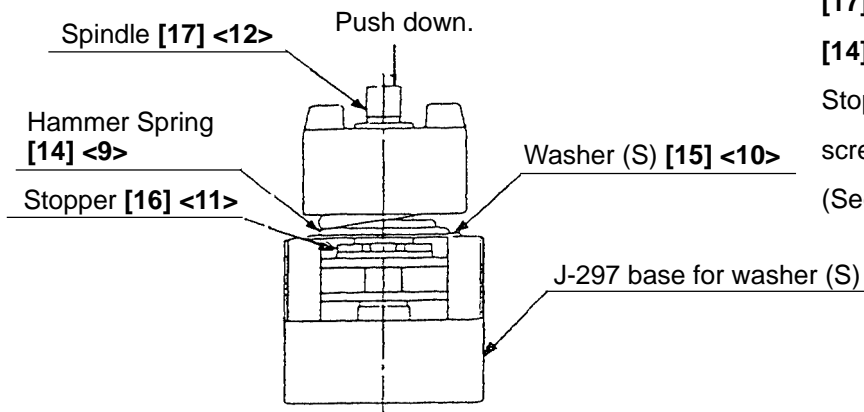


Fig. 6

Remove the hammer assembly from the J-297 base for washer (S) and support the end surface of the Spindle [17] <12>. With a hand press, push down either of the raised faces of Hammer (A) [11] <6> to compress the Hammer Spring [14] <9>. In this position, extract the two Steel Balls D5.556 [10] <5> from the cam grooves of the Spindle [17] <12> and Hammer (A) [11] <6> with a small flat-blade screwdriver or a similar tool. Then, slowly release the hand press and lift Hammer (A) [11] <6> and Washer (S) [15] <10> together to extract them from the Spindle [17] <12>. The Hammer Spring [14] <9> can then be removed.

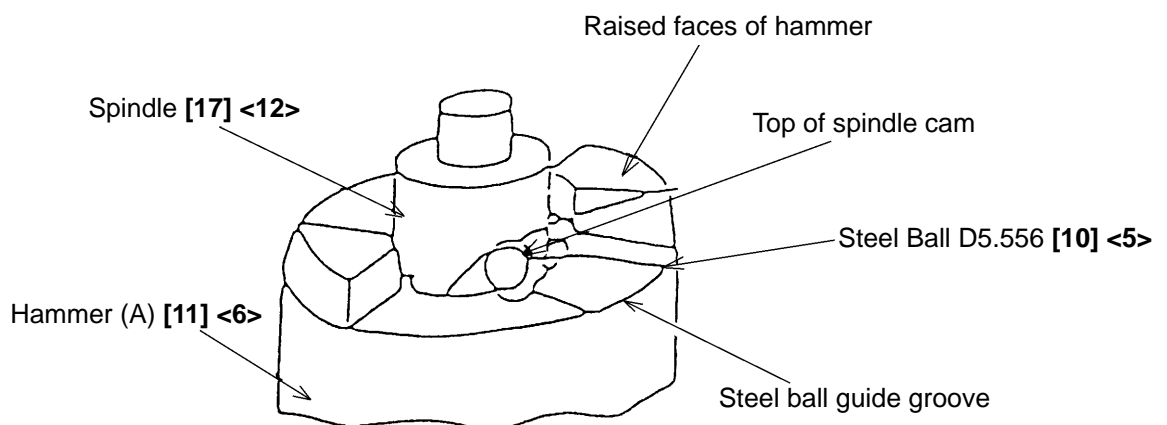


Fig. 7

(4) Removal of the Carbon Brushes 5 x 6 x 11.5 [29] <24>

Remove the two Brush Caps [30] <25>. Catch the flanges of the Carbon Brushes 5 x 6 x 11.5 [29] <24> with a small flat-blade screwdriver or a similar tool and remove the Carbon Brushes [29] <24> at both sides.

(5) Removal of the Hook Ass'y [39] <34>

Remove the Special Screw M5 [43] <38> with a flat-blade screwdriver or a coin and remove the Hook Ass'y [39] <34> and the Hook Spring [42] <37>.

(6) Removal of Housing (B)

Remove the seven Tapping Screws (W/Flange) D4 x 20 (Black) [31] <26> from the main body. Before removing Housing (B), be sure to remove the Brush Caps [30] <25> because Housing (B) cannot be removed if the Brush Caps [30] <25> are mounted.

(7) Remove the FET of the DC-Speed Control Switch [36] <31> from the Dust Guard Fin [27] <22>. Then, the Inner Cover [24] <19>, Armature ass'y [25] <20>, Magnet [26] <21>, Brush Block [28] <23> and DC-Speed Control Switch [36] <31> can be removed in a piece. The Pushing Button [37] <32> and the Strap [41] <36> can also be removed.

(8) Removal of the switch assembly

Remove the two Machine Screws (W/SP. Washer) M3 x 5 [35] <30> that secure the flag terminal and then disconnect the internal wires (purple and black) of the Brush Block [28] <23> from the DC-Speed Control Switch [36] <31>.

**(Note)** Do not disconnect the three FET internal wires soldered to the DC-Speed Control Switch.

(9) Removal of the Magnet [26] <21> and the Dust Guard Fin [27] <22>

Remove the Magnet [26] <21> in the "B" direction (see Fig. 8) holding the Inner Cover [24] <19> securely because the Magnet [26] <21> has a strong magnetism. The Dust Guard Fin [27] <22> can be easily removed from the Magnet [26] <21> by pulling it in the "B" direction (see Fig. 8) because it is mounted to the Magnet [26] <21> magnetically.

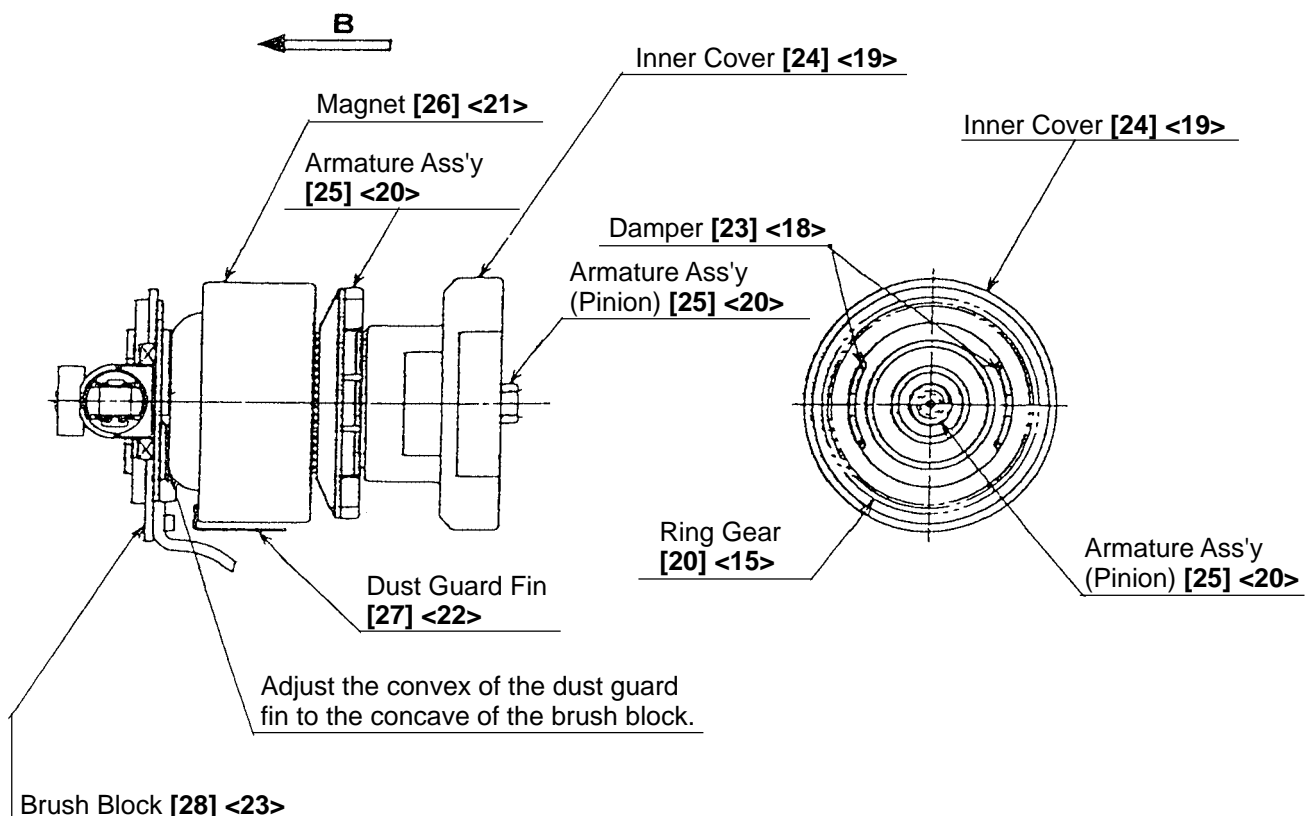


Fig. 8

(10) Removal of the Armature Ass'y [25] <20>

Support the Inner Cover [24] <19> so that it does not contact the fan of the Armature Ass'y [25] <20>. With a hand press, push down the tip portion of Armature Ass'y (pinion) [25] <20> to remove it.

(11) Removal of the Ring Gear [20] <15> and the Damper [23] <18>

Remove the Ring Gear [20] <15> from the Inner Cover [24] <19> and remove the Damper [23] <18> with a small flat-blade screwdriver.

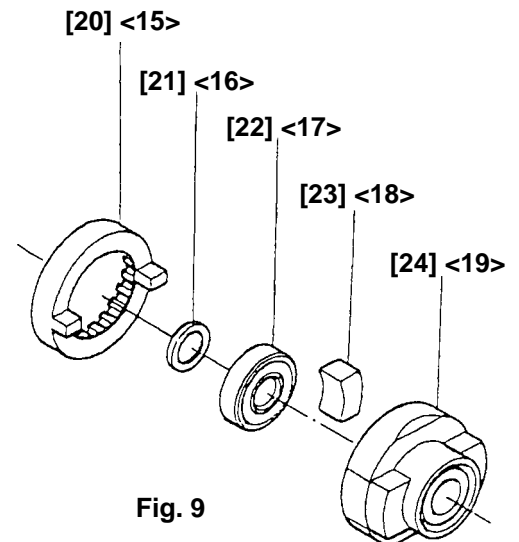


Fig. 9

### 9-1-2. Reassembly

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

(1) Reassembly of the housing assembly

- (a) Be sure to follow the wiring diagram (Fig. 10) for proper wiring.
- (b) When connecting the internal wires of the Brush Block [28] <23> to the DC-Speed Control Switch [36] <31>, fasten them with the Machine Screw (W/SP. Washer) M3 x 5 [35] <30> paying attention to the direction of the flag terminal (Fig. 10).

**(Note)** If the flag terminal is mounted in wrong direction, the flag terminal may be damaged due to contact with the housing. In addition, the gap between the housings (A) and (B) is widened and dust may get into the housings (A) and (B).

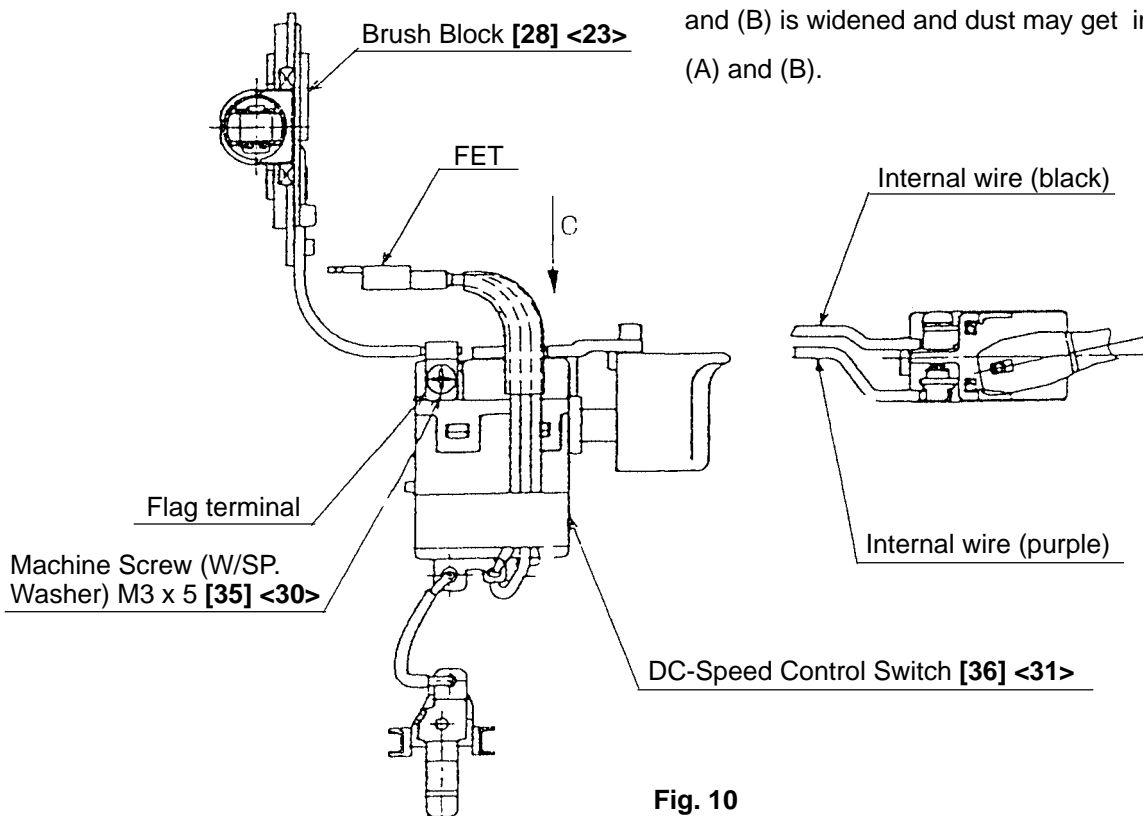


Fig. 10

(c) Mount a unit of the Inner Cover [24] <19>, Magnet [26] <21> (including the Dust Guard Fin [27] <22>) and the Brush Block [28] <23> to housing (A) (see Fig. 12). Pay attention to the following items.

- Adjust the protrusion of the Dust Guard Fin [27] <22> to the notch of the Magnet [26] <21> when mounting the Dust Guard Fin [27] <22> to the Magnet [26] <21> (see Fig. 11).
- Insert the two Dampers [23] <18> so that they fit into the Inner Cover [24] <19>. Fit the locking rib of the Ring Gear [20] <15> to the concave portion of the Damper [23] <18>. Press-fit the Armature Ass'y [25] <20> into the Inner Cover [24] <19>.
- Adjust the convex portion of the Dust Guard Fin [27] <22> to the concave portion of the Brush Block [28] <23> (see Fig. 11).
- Adjust the notch (for locking) of the Magnet [26] <21> to the protrusion of housing (A) (see Figs. 11 and 12).
- Position the plate of the Dust Guard Fin [27] <22> under the rib of housing (A) (see Fig. 13).

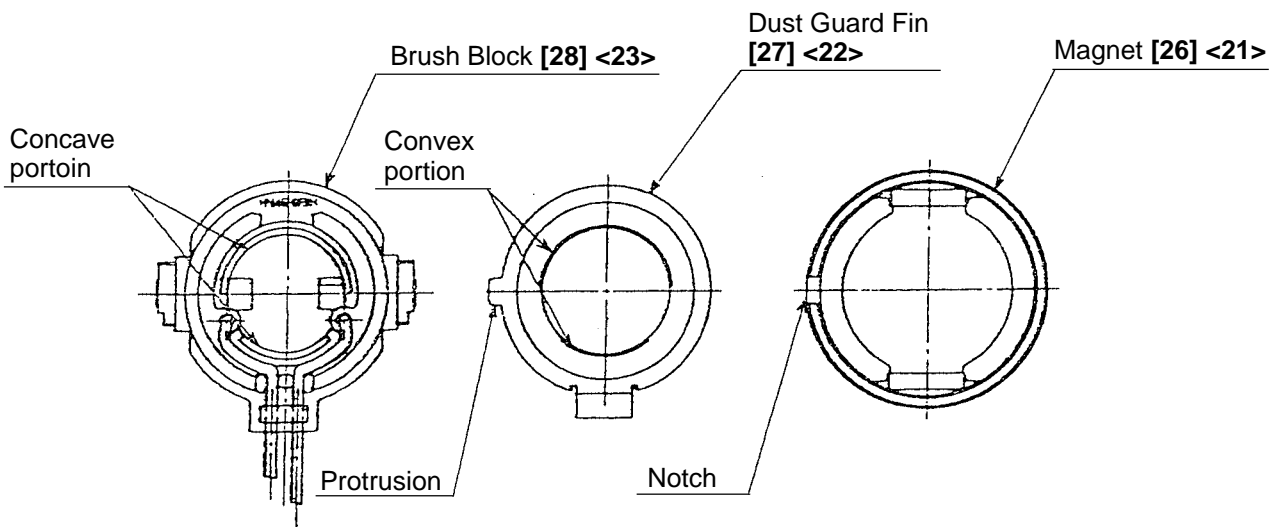


Fig. 11

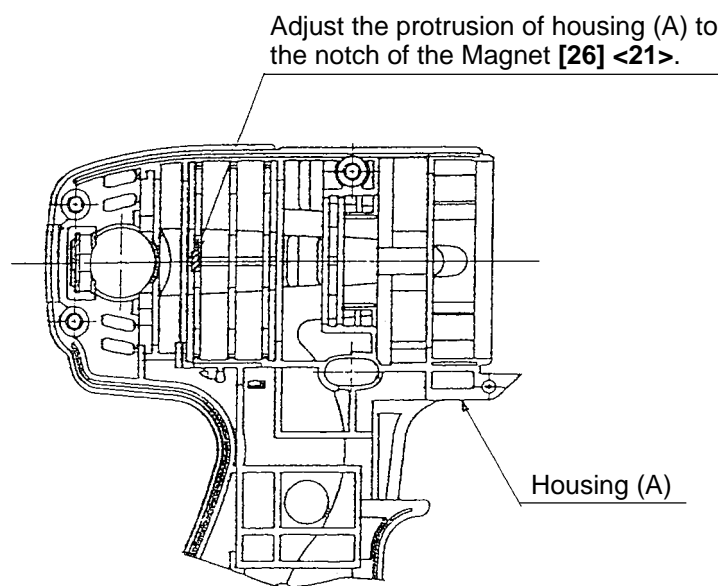


Fig. 12

(d) Mount the DC-Speed Control Switch [36] <31> to housing (A) so that the protrusion of the forward/reverse lever at the top of the switch is inserted into the U-shaped groove of the Pushing Button [37] <32>. Apply silicone grease (KS609, Shin-Etsu Chemical Co., Ltd.) to the contacting surfaces of the FET of the DC-Speed Control Switch [36] <31> and the Dust Guard Fin [27] <22> then mount them to housing (A).

(Note) The temperature of the FET may be high if the silicone grease is not applied. Make sure that the three internal wires from the FET are passed above the DC-Speed Control Switch [36] <31> (see Fig. 13).

(2) Mount the Strap [41] <36> to housing (A) and apply silicone rubber (ThreeBond 1211) to housing (A) as shown in Fig. 13. Mount housing (B) to housing (A) and secure them with seven Tapping Screws (W/Flange) D4 x 20 (Black) [31] <26>. Wipe the silicone rubber coming out of the housing with a cloth.

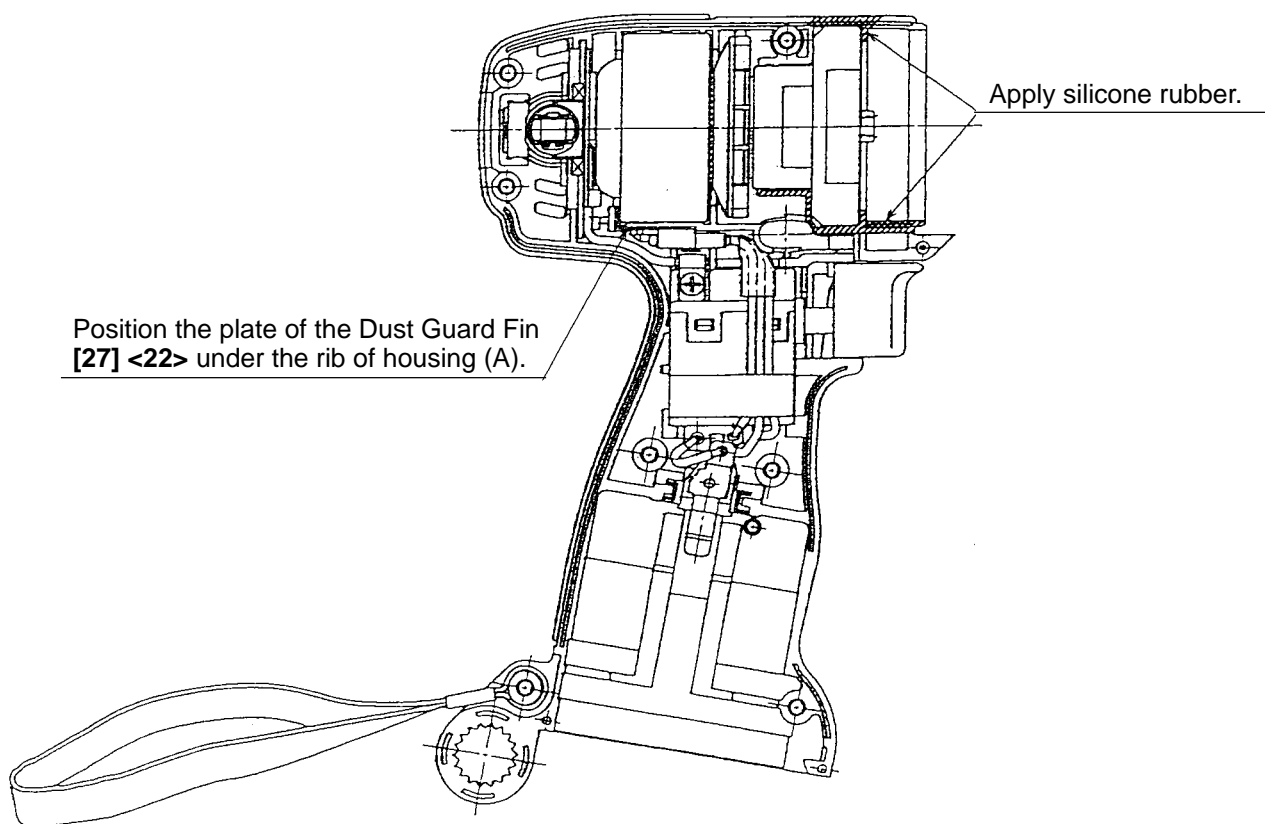


Fig. 13

### (3) Mounting the mechanical parts

(a) Put Washer (S) [15] <10> onto the shaft of the Spindle [17] <12> and mount Hammer (A) [11] <6> containing the twenty-eight Steel Balls D3.175 [12] <7>, Washer (J) [13] <8> and the Hammer Spring [14] <9> to the Spindle [17] <12>.

(b) Align the top of the cam groove on the Spindle [17] <12> with the steel ball guide groove on Hammer (A) [11] <6> as illustrated in Fig. 7. Press down either of the raised faces of Hammer (A) [11] <6> with a hand press to compress the Hammer Spring [14] <9> until the end surface of the hammer contacts the Spindle [17] <12>.

(c) Insert the two Steel Balls D5.556 [10] <5> into the steel ball guide groove. Check that the steel balls are properly inserted in the cam groove. Then release the hand press.

(d) Mount the hammer assembly onto the J297 base for washer (S). With a hand press, push down the top of the Spindle [17] <12> to compress the Hammer Spring [14] <9>. On this condition, mount the Stopper [16] <11> onto the spindle shaft and then release the hand press.

(4) Mounting the hammer assembly to the housing

Raise the housing assembled in step (2) and mount the hammer assembly to the housing being careful of proper engagement between the Idle Gear Set [18] <13> of the hammer assembly (check that Washer (E) [21] <16> is mounted on the Spindle [17] <12>) and the Ring Gear [20] <15>. After mounting, check that the hammer assembly turns. If the hammer assembly does not turn, the gears engage improperly.

(5) Mounting the hammer case

Put Anvil (C) [9] or Anvil (M) <4> on the Spindle [17] <12>. Cover it with the Hammer Case [7] <3> and secure with the four Tapping Screws (W/SP. Washer) D4 x 25 (Black) [6] <2>.

(6) Mounting Guide Sleeve (A) [4] (WH 9DM only)

Insert the two Steel Balls D3.5 [8] into the hole of Anvil (C) [9]. Mount the Guide Sleeve (A) [4], Guide Spring [3] and Washer (D) [2] in sequence. Mount the Retaining Ring [1] into the groove of anvil using the J295 jigs (A) and (B) for retaining ring as illustrated in Fig. 14.

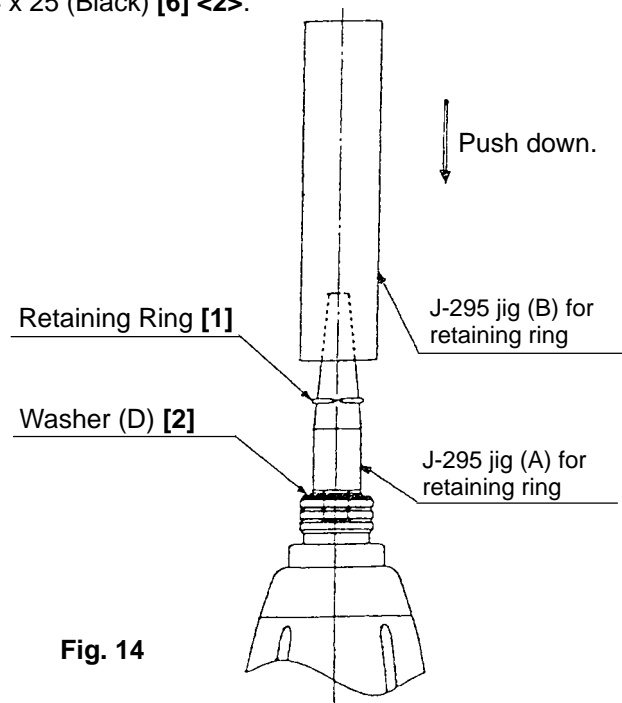


Fig. 14

(7) Reassembly of the hook

Check that the V-Lock Nut M5 [40] <35> is mounted into the Hook Ass'y [39] <34>. Mount the Hook Spring [42] <37> and secure it with the Special Screw M5 [43] <38>. (Make sure to mount the Hook Spring [42] <37> with its larger diameter side pointing inward the housing.)

(8) Checking the direction of rotation

Check whether the direction of rotation of Anvil (C) [9] or Anvil (M) <4> coincides with the directional markings on the push-on side of the Pushing Button [37] <32>. When the Pushing Button [37] <32> is turned to (R) side, the direction of rotation of Anvil (C) [9] or Anvil (M) <4> should be clockwise, as viewed from behind.

(9) Lubrication

(a) ATTOLUB MS No. 2

- Cam groove and sliding section of the Spindle [17] <12>
- Cam groove and oil groove of the Hammer (A) [11] <6>
- 8 mm diameter hole of Anvil (C) [9] or Anvil (M) <4>, sliding section between Anvil (C) [9] or Anvil (M) <4> and the metal, and upper surface of the claw
- Two Steel Balls D5.556 [10] <5>
- Pinion tooth flanks of the Armature Ass'y [25] <20>, tooth flanks of the Ring Gear [20] <15>, tooth flanks of the Idle Gear Set (2 pcs.) [18] <13>
- Metal oil groove of the Hammer Case [7] <3>
- Twenty-eight Steel Balls D3.175 [12] <7>

(b) HITACHI MOTOR GREASE No. 29 (WH 9DM only)

- Two Steel Balls D3.5 [8]
- Sliding section between Anvil (C) [9] and Guide Sleeve (A) [4]

(c) MOLUB-ALLOY 777-1

- All around the Needle Roller [19] <14>
- 5 mm diameter hole of Idle Gear Set (2 pcs.) [18] <13>

(10) Screw tightening torque

- Tapping Screw (W/SP. Washer) D4 x 25 (Black) [6] <2> ...  $1.96 \pm 0.49 \text{ N}\cdot\text{m}$  ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ ,  $17.4 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
- Tapping Screw (W/Flange) D4 x 20 (Black) [31] <26> .....  $1.96 \pm 0.49 \text{ N}\cdot\text{m}$  ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ ,  $17.4 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
- Machine Screw (W/SP. Washer) M3 x 5 [35] <30> .....  $0.29 - 0.39 \text{ N}\cdot\text{m}$  ( $3 - 4 \text{ kgf}\cdot\text{cm}$ ,  $2.6 - 3.5 \text{ in}\cdot\text{lbs.}$ )
- Special Screw M5 [43] <38> .....  $1.96 \pm 0.49 \text{ N}\cdot\text{m}$  ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ ,  $17.4 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
- Brush Cap [30] <25> .....  $0.78 \pm 0.10 \text{ N}\cdot\text{m}$  ( $8 \pm 1 \text{ kgf}\cdot\text{cm}$ ,  $6.9 \pm 0.9 \text{ in}\cdot\text{lbs.}$ )

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

Refer to the Technical Data and Service Manual for precautions in disassembly and reassembly of the Model UC 14YF2 Battery Charger.



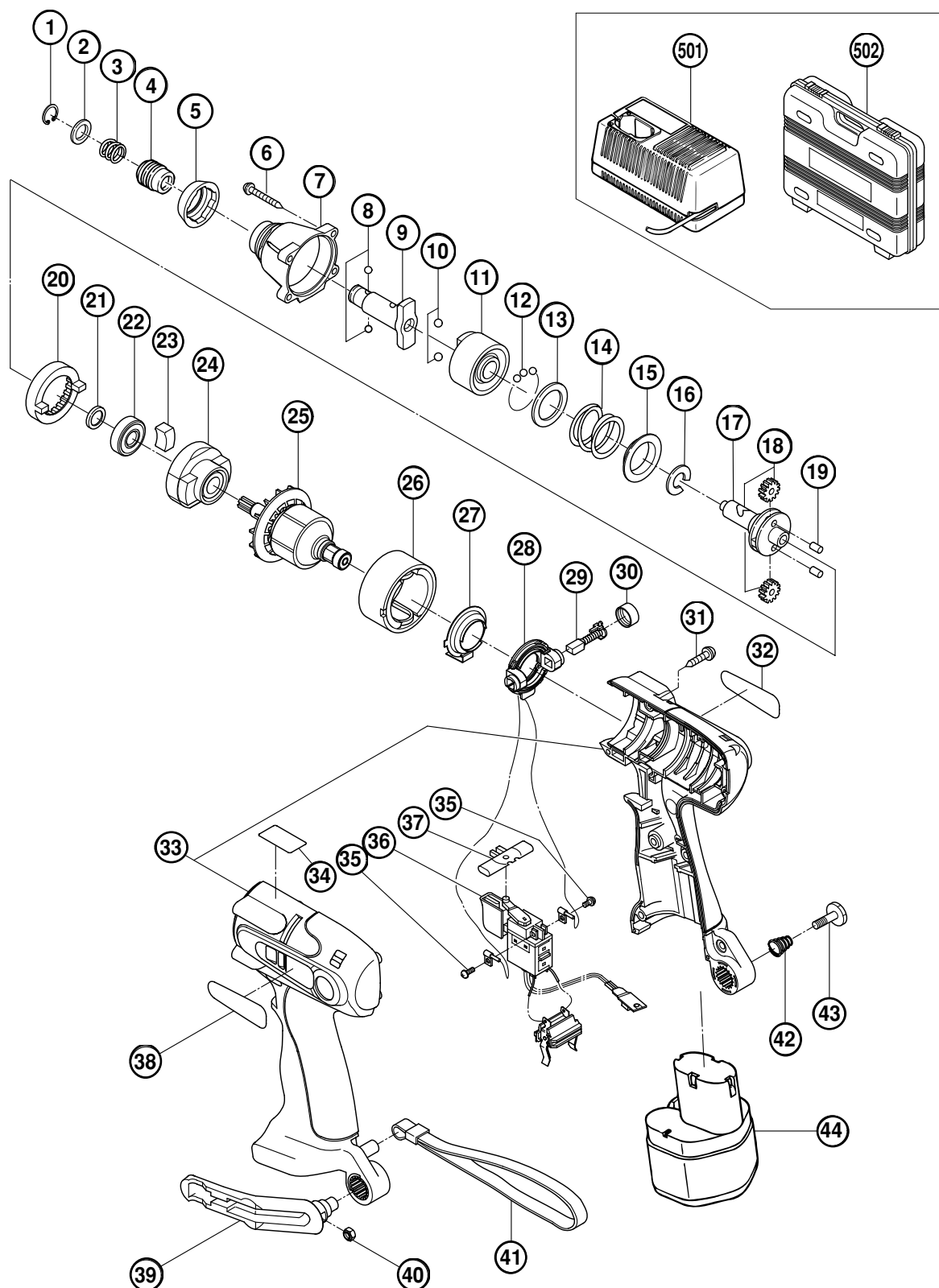
## 10. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
<div>WH 9DM</div> <div>WR 9DM</div>		Work Flow						
		<div>DC-Speed Control Switch</div> <div>Inner Cover</div> <div>Armature Ass'y</div> <div>Magnet</div> <div>Brush Block</div>			<div>Housing (A).(B) Set</div>			
		<div>General Assembly</div>		<div>Hammer Case</div> <div>Washer</div> <div>Anvil (B)</div> <div>Ring Gear</div>	<div>Steel Ball</div> <div>Hammer (A)</div> <div>Washer</div> <div>Hammer Spring</div> <div>Spindle</div> <div>Idle Gear Set</div> <div>Needle Roller</div> <div>Ball Bearing (6901VV)</div>			

## ELECTRIC TOOL PARTS LIST

■ CORDLESS IMPACT DRIVER  
Model WH 9DM

2001・10・25  
(E1)



# PARTS

WH 9DM

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	315-984	RETAINING RING	1		
2	315-983	WASHER (D)	1		
3	320-409	GUIDE SPRING	1		
4	319-921	GUIDE SLEEVE (A)	1		
5	320-418	FRONT CAP	1		
6	319-917	TAPPING SCREW (W/SP. WASHER) D4X25 (BLACK)	4		
7	320-411	HAMMER CASE	1		
8	319-535	STEEL BALL D3.5 (10 PCS.)	2		
9	320-417	ANVIL (C)	1		
10	959-154	STEEL BALL D5.556 (10 PCS.)	2		
11	320-408	HAMMER (A)	1		
12	959-148	STEEL BALL D3.175 (10 PCS.)	28		
13	315-978	WASHER (J)	1		
14	320-407	HAMMER SPRING (A)	1		
15	316-172	WASHER (S)	1		
16	316-171	STOPPER	1		
17	319-912	SPINDLE	1		
18	319-913	IDLE GEAR SET (2 PCS.)	2		
19	319-914	NEEDLE ROLLER	2		
20	319-910	RING GEAR	1		
21	319-911	WASHER (E)	1		
22	690-1VV	BALL BEARING 6901VVCMP52L	1		
23	319-909	DAMPER	2		
24	319-908	INNER COVER	1		
25	360-564	ARMATURE ASS'Y (W/BALL BEARING) DC 9.6V	1		
26	319-919	MAGNET	1		
27	319-907	DUST GUARD FIN	1		
28	319-905	BRUSH BLOCK	1		
29	999-054	CARBON BRUSH 5X6X11.5 (1 PAIR)	2		
30	319-918	BRUSH CAP	2		
31	302-086	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	7		
32		NAME PLATE	1		
33	320-412	HOUSING (A).(B) SET	1		
* 34		CAUTION PLATE	1	FOR USA	
35	994-532	MACHINE SCREW (W/SP. WASHER) M3X5	2		
36	319-906	DC-SPEED CONTROL SWITCH	1		
37	316-166	PUSHING BUTTON	1		
38		HITACHI LABEL	1		
39	320-287	HOOK ASS'Y	1	INCLUD.40	
40	320-288	V-LOCK NUT M5	1		
41	306-952	STRAP (BLACK)	1		
42	319-926	HOOK SPRING	1		
43	319-927	SPECIAL SCREW M5	1		
* 44	310-377	BATTERY EB 9B (W/ENGLISH N.P.)	1		
* 44	310-451	BATTERY EB 9B (W/ENGLISH N.P.)	1	FOR USA	

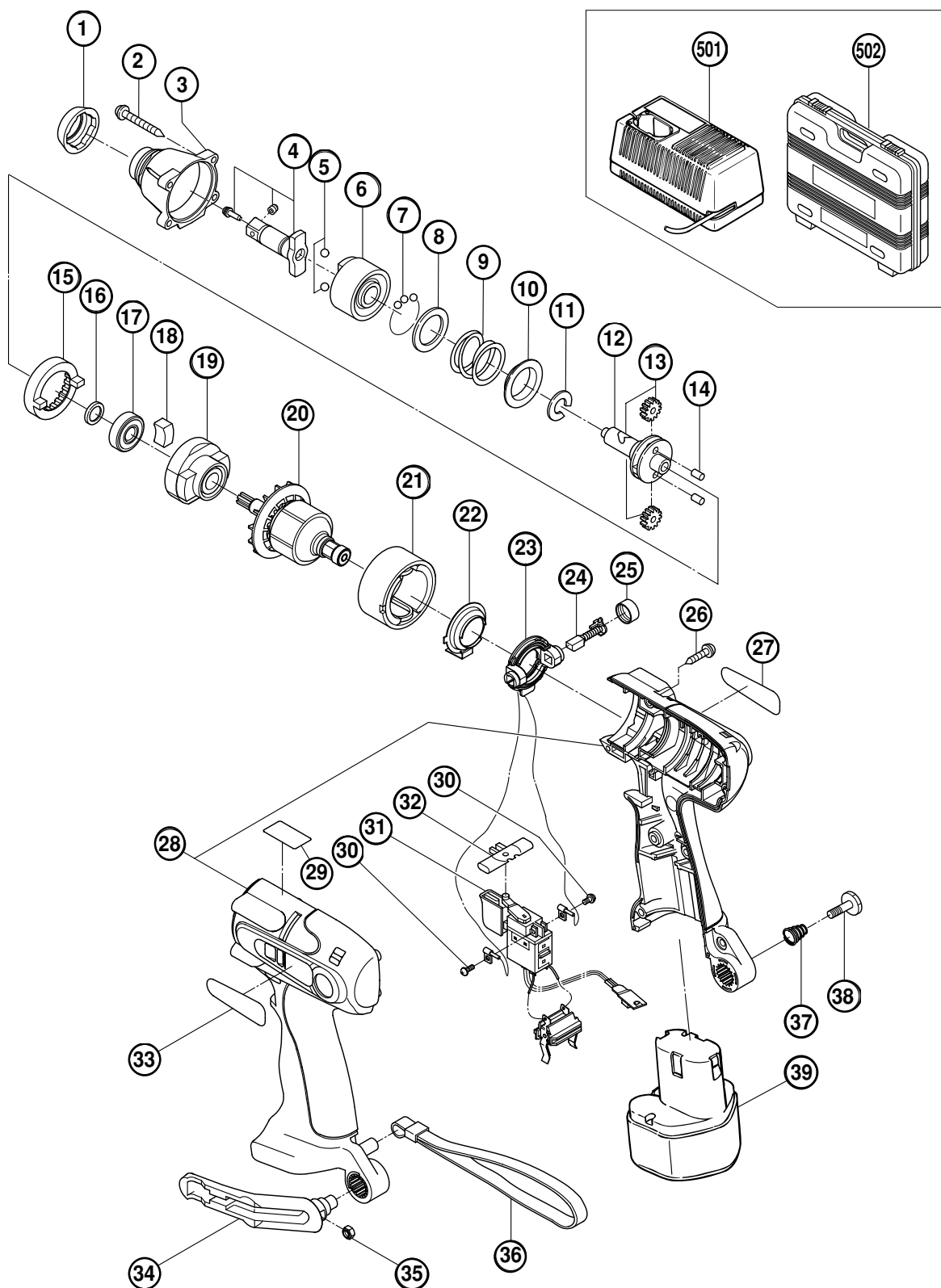
**WH 9DM**

[illegible]

## ELECTRIC TOOL PARTS LIST

■ CORDLESS IMPACT WRENCH  
Model WR 9DM

2001・10・25  
(E1)



## PARTS

WR 9DM

[illegible]

## WR 9DM

[illegible]

## OPTIONAL ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
601	996-125	HEX. SOCKET ASS'Y 8MMX33L	1	INCLUD.602,603	
602	996-124	SOCKET PIN (A)	1		
603	873-095	O-RING (P-16)	1		
604	996-126	HEX. SOCKET ASS'Y 10MMX33L	1	INCLUD.602,603	
605	996-127	HEX. SOCKET ASS'Y 12MMX33L	1	INCLUD.602,603	
606	996-128	HEX. SOCKET ASS'Y 13MMX33L	1	INCLUD.607,608	
607	996-123	SOCKET PIN (B)	1		
608	873-570	O-RING (P-18)	1		
609	996-129	HEX. SOCKET ASS'Y 14MMX33L	1	INCLUD.607,608	
610	996-130	HEX. SOCKET ASS'Y 16MMX33L	1	INCLUD.607,608	
611	996-131	HEX. SOCKET ASS'Y 17MMX33L	1	INCLUD.607,608	
612	996-132	HEX. SOCKET ASS'Y 18MMX33L	1	INCLUD.607,608	
613	996-133	HEX. SOCKET ASS'Y 19MMX33L	1	INCLUD.607,608	
614	996-134	HEX. SOCKET ASS'Y (LONG) 8MMX60L	1	INCLUD.602,603	
615	996-135	HEX. SOCKET ASS'Y (LONG) 10MMX60L	1	INCLUD.602,603	
616	996-136	HEX. SOCKET ASS'Y (LONG) 12MMX60L	1	INCLUD.602,603	
617	996-137	HEX. SOCKET ASS'Y (LONG) 13MMX60L	1	INCLUD.607,608	
618	996-138	HEX. SOCKET ASS'Y (LONG) 14MMX60L	1	INCLUD.607,608	
619	996-139	HEX. SOCKET ASS'Y (LONG) 16MMX60L	1	INCLUD.607,608	
620	996-140	HEX. SOCKET ASS'Y (LONG) 17MMX60L	1	INCLUD.607,608	
621	996-141	HEX. SOCKET ASS'Y (LONG) 18MMX60L	1	INCLUD.607,608	
622	996-142	HEX. SOCKET ASS'Y (LONG) 19MMX60L	1	INCLUD.607,608	
623	996-143	EXTENSION BAR ASS'Y	1	INCLUD.602,603	
624	996-144	BIT ADAPTER ASS'Y	1	INCLUD.602,603	
625	996-145	ADAPTER ASS'Y 12.7MM	1	INCLUD.607,608	
626	996-147	UNIVERSAL JOINT ASS'Y	1	INCLUD.607,608,627	
627	996-163	UNIVERSAL JOINT PIN	1		
628	309-922	GREASE FOR IMPACT DRIVER (500G)	1		





