

**MODELS**

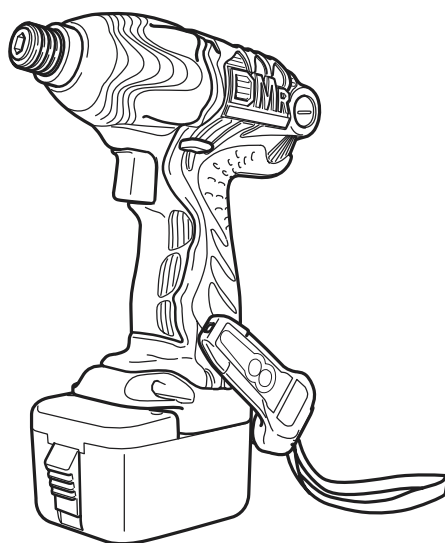
**WH 12DMR**

**WR 12DMR**

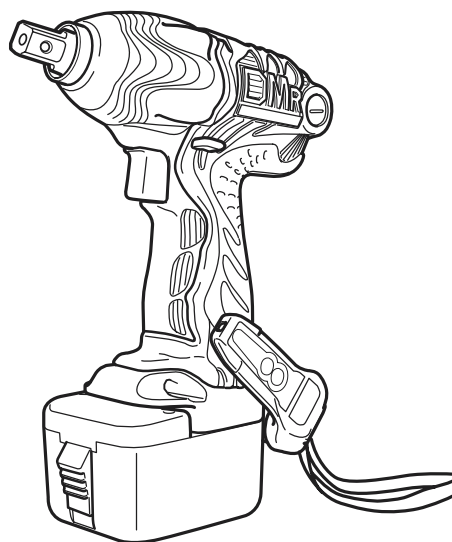
# Hitachi Power Tools

**CORDLESS IMPACT DRIVER  
WH 12DMR  
CORDLESS IMPACT WRENCH  
WR 12DMR**

**TECHNICAL DATA  
AND  
SERVICE MANUAL**



WH 12DMR



WR 12DMR

LIST Nos. WH 12DMR: G814  
WR 12DMR: G821

Revised Jun. 2005

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, a symbol(s) is(are) used in the place of company name(s) and model name(s) of our competitor(s). The symbol(s) utilized here is(are) as follows:

WH 12DMR

Symbol Utilized	Competitor	
	Company Name	Model Name
P	DEWALT	DW052

WR 12DMR

Symbol Utilized	Competitor	
	Company Name	Model Name
P1	DEWALT	DW051
P2	DEWALT	DW053

## CONTENTS



### Page

<b>1. PRODUCT NAME .....</b>	<b>1</b>
<b>2. MARKETING OBJECTIVE .....</b>	<b>1</b>
<b>3. APPLICATIONS .....</b>	<b>1</b>
<b>4. STANDARD EQUIPMENT .....</b>	<b>1</b>
<b>5. SELLING POINTS .....</b>	<b>2</b>
5-1. Selling Point Descriptions .....	4
<b>6. SPECIFICATIONS .....</b>	<b>7</b>
6-1. Specifications .....	7
6-2. Optional Accessories .....	9
<b>7. COMPARISONS WITH SIMILAR PRODUCTS .....</b>	<b>12</b>
7-1. Specification Comparisons (Cordless Impact Driver) .....	12
7-2. Specification Comparisons (Cordless Impact Wrench) .....	13
7-3. Tightening Torque .....	14
7-4. Tightening Time .....	17
7-5. Number of Screws or Bolts Driven .....	18
<b>8. PRECAUTIONS IN SALES PROMOTION .....</b>	<b>19</b>
8-1. Safety Instructions .....	19
8-2. Tightening Torque Inspection Prior to Operation .....	22
8-3. Tightening Torque Variation .....	22
8-4. Suggestions and Precautions for the Efficient Use of the Charger .....	23
<b>9. OTHER PRECAUTIONS .....</b>	<b>24</b>
<b>10. REPAIR GUIDE .....</b>	<b>25</b>
10-1. Precautions in Disassembly and Reassembly .....	25
10-2. Precautions in Disassembly and Reassembly of Battery Charger .....	33
<b>11. STANDARD REPAIR TIME (UNIT) SCHEDULES .....</b>	<b>34</b>
For Model WH 12DMR .....	34
For Model WR 12DMR .....	35
Assembly Diagram for WH 12DMR	
Assembly Diagram for WR 12DMR	

## **1. PRODUCT NAME**

Hitachi Cordless Impact Driver, Model WH 12DMR

Hitachi Cordless Impact Wrench, Model WR 12DMR

## **2. MARKETING OBJECTIVE**

The current Models WH 12DM2 and WR 12DM2, developed under the concept for "more compact, powerful and convenient models", have been highly evaluated. However, the market is becoming fiercely competitive due to a price war of the 9.6-V, 12-V, 14.4-V and 18-V impact driver/wrench series products. To address the severe situation, we have developed the new high-performance impact driver/wrench series Models WH 12DMR and WR 12DMR under the same concept as the current impact driver/wrench series. The new Models WH 12DMR and WR 12DMR can take on the low-price competitors.

- The performance level is in between the current Model WH 12DM2 and the competitors.
- The cost is reduced by adoption of the new magnet and the like.

## **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
- 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 aids, automobile repair, assembly of garages and carports storage sheds, etc.
- Various other assembly, construction or repair facilities.

## **4. STANDARD EQUIPMENT**

(1) 2BLGK specification: Two EB 1220BL batteries (NiCd, capacity 2.0 Ah), UC 18YG charger and case

(2) 2HLFK specification: Two EB 1226HL or EB 1230HL batteries (NiMH, capacity 2.6 Ah or 3.0 Ah), UC 14YFA charger and case

## 5. SELLING POINTS

### (1) Cordless impact driver Model WH 12DMR

**Class-top short body 155 mm and lightweight 1.6 kg**

● P: 165 mm, 1.7 kg

**Class-top tightening speed and  
tightening torque 130 N·m**

● P: 113 N·m

Common to the Model WH 12DM2

High durability, dust resistance  
and long service life

Common to the Model WH 12DM2

Replaceable carbon brushes

Common to the Model WH 12DM2

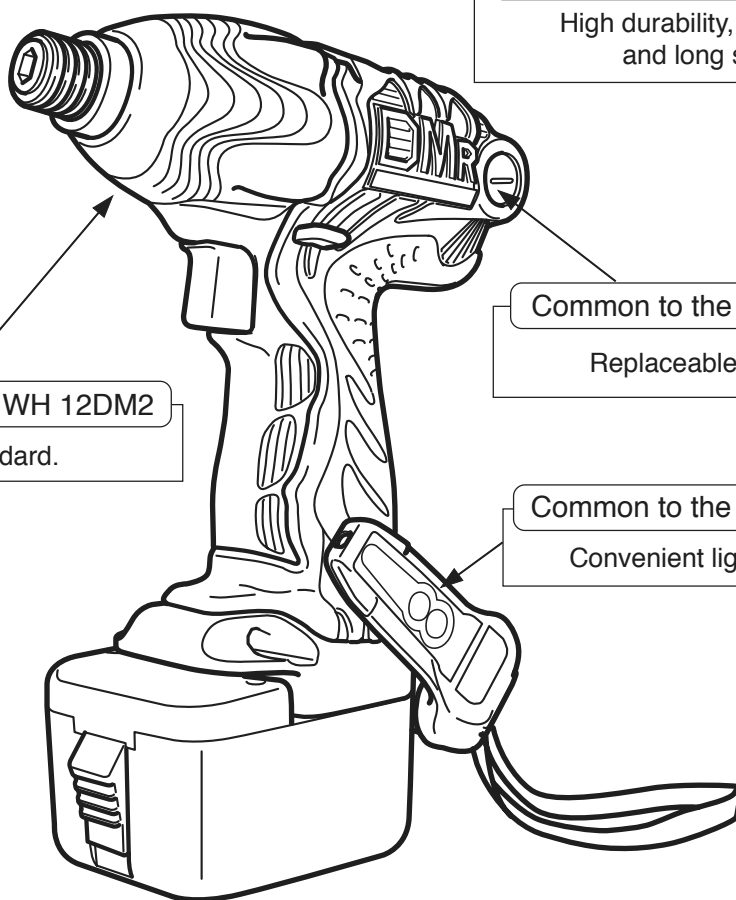
Protector is standard.

Common to the Model WH 12DM2

Convenient light equipped hook

Common to the Model WH 12DM2

Advanced case



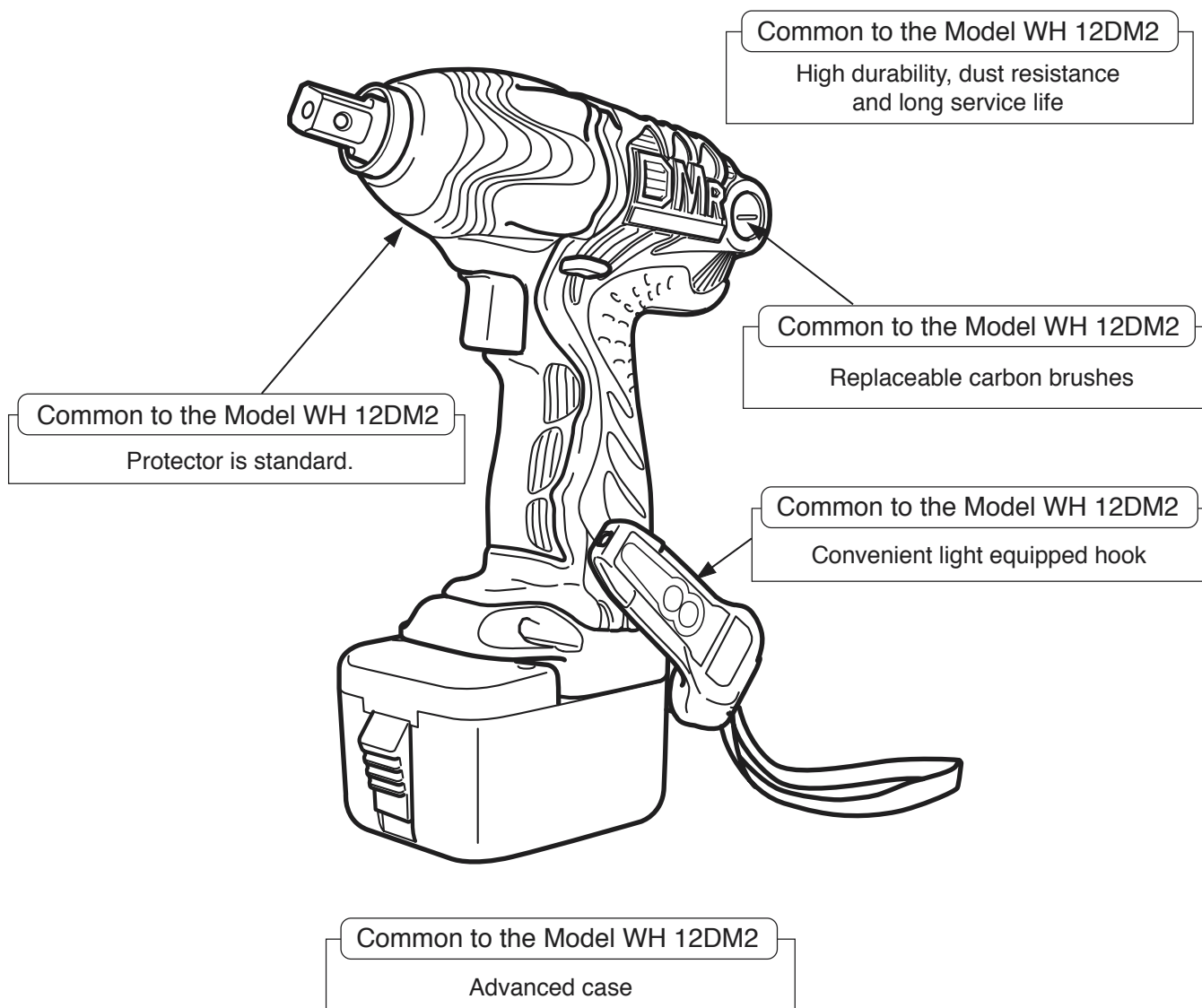
(2) Cordless impact wrench Model WR 12DMR

**Class-top short body 162 mm and lightweight 1.6 kg**

● P: 168 mm, 1.7 kg

**Class-top tightening torque 160 N·m**

● P: 158 N·m



## 5-1. Selling Point Descriptions

Common selling points (Models WH 12DMR and WR 12DMR)

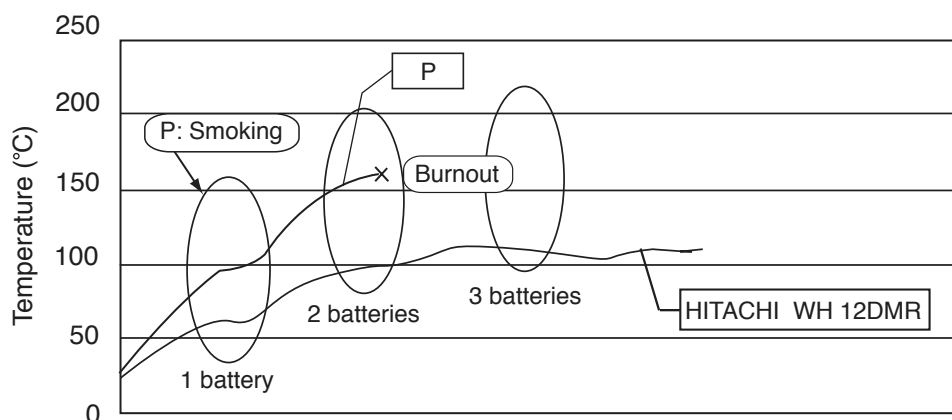
### (1) High durability

Owing to the shift of demand from nails to screws and increased demand for long screws, impact drivers having high heat resistance in continuous operation are much sought after. However, there are problems such as heavy noise or vibration of the ball bearings and decrease in power if the impact drivers are used harshly in dusty environments. In addition, higher strength and longer service life are required to continuously tighten and loosen bolts in scaffolding and demolishing works. The Models WH 12DMR/WR 12DMR have high durability, dust resistance and long service life in continuous operation as described below.

#### ① Enhanced heat resistance of the motor

Example: When tightening M12 bolts continuously (Cycle of operation: 5-second impacting and 10-second stopping, 3.0 Ah battery used)

The heat resistance comparison between the Models WH 12DMR/WR 12DMR and P is shown below. The cooling efficiency is improved thanks to the powerful full-fledged large radial fan and the computer-analyzed air ducts. Thus the Models WH 12DMR/WR 12DMR are protected from burnout due to long-time continuous use and decrease in speed due to temperature rise.



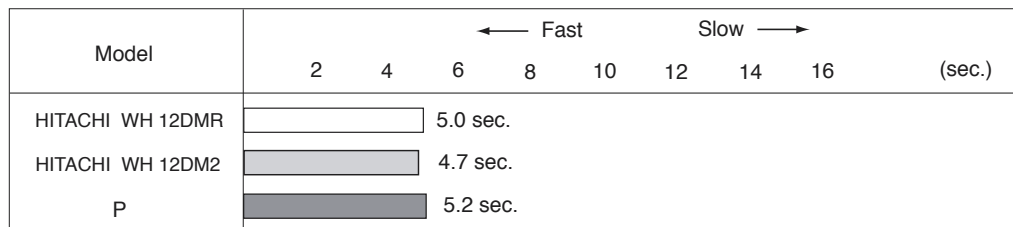
Selling points of the Model WH 12DMR

- Top-class tightening speed and torque 130 N·m (1320 kgf·cm, 1150 in-lbs.)

Although the Model WH 12DMR is equipped with an anisotropic bonded magnet that is cheaper than that of the Model WH 12DM2, the performance is almost equivalent to the Model WH 12DM2 thanks to the large hammer and the optimized impact timing. Comparison of measured data with the Model WH 12DM2 and competitors is shown below.

#### ① Tightening time comparison

Figure 1 shows the time required for tightening a wood screw (5.3 mm dia. x 120 mm length) into a lauan workpiece. (5 % higher than the Model WH 12DM2 and 5 % lower than P).

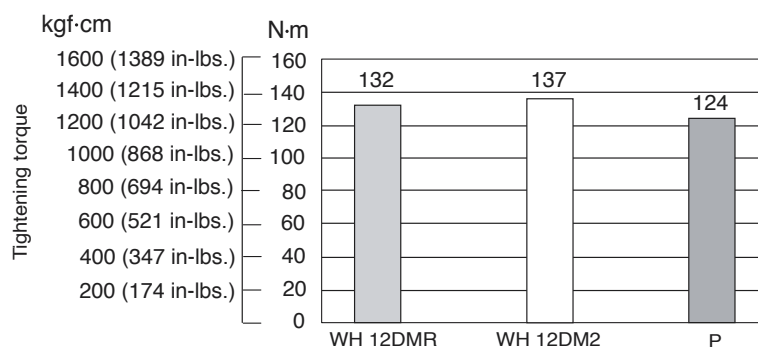


**Fig. 1 Tightening time comparison**

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

② Tightening torque comparison

Figure 2 shows the torque required for tightening an M14 high-strength tension bolt in 3 seconds with a hexagon socket (40 mm long) (6% higher than P).



**Fig. 2 Tightening torque comparison**

**Selling points of the Model WR 12DMR**

- Powerful tightening torque 160 N·m {1630 kgf-cm, 1420 in-lbs.}

Although the Model WR 12DMR is equipped with an anisotropic bonded magnet that is cheaper than that of the Model WR 12DM2, the performance is almost equivalent to the Model WR 12DM2 thanks to the large hammer and the optimized impact timing. Comparison of measured data with the Model WR 12DM2 and competitors is shown below.

- The tightening torque is 5 % lower than the previous 12-V product Model WR 12DM2 and 5 % higher than P1.
- The tightening torque is equivalent to P2.

The Model WR 12DMR is also mechanically strong thanks to the strong components to realize powerful operation. Thus, the service life is 2 or 3 times longer than the competitors in spite of the compact body. Comparison of measured data with the previous models and competitors is shown below.



(1) Tightening torque comparison

Figure 3 shows the torque required for tightening an M16 F10T bolt in 3 seconds with a hexagon socket (40 mm long). The tightening torque of the Model WR 12DMR is substantially lower than the previous model (12 V) and equivalent to or more than P2.

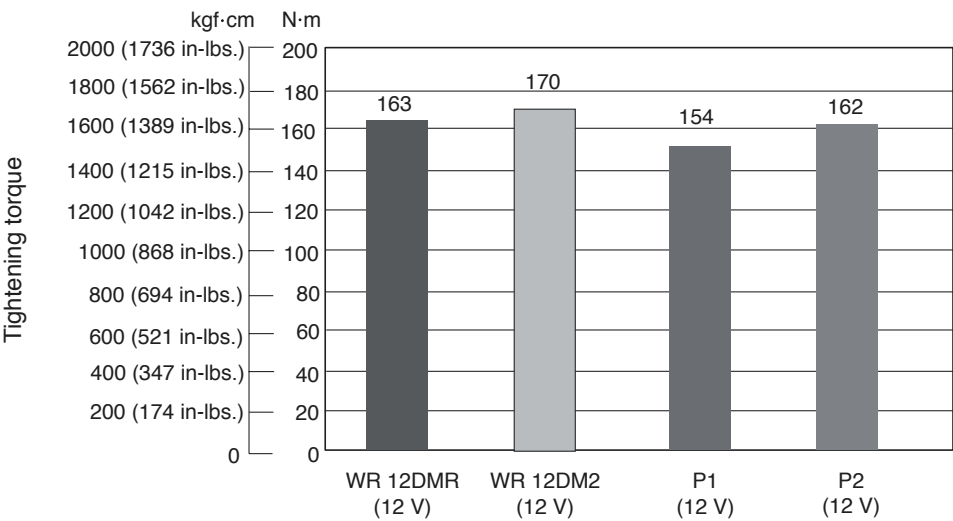


Fig. 3

\* The data above are intended for reference purposes only because actual tightening torque will vary depending on tightening conditions.

To describe the merit of high tightening torque, the comparison data are shown in Figure 4. Figure 4 shows the time required for sinking a square washer into a wood workpiece.

(3) Sinking time comparison (square washers)

Figure 4 shows the time required for tightening an M12 bolt into a pine laminated lumber of 105 mm square until the square washers at both sides are sunk into the lumber by 1.3 mm respectively. The Model WR 12DMR can tighten strap bolts and corner bracings (used in Japanese wooden buildings) speedily as it can sink washers into a workpiece quickly.

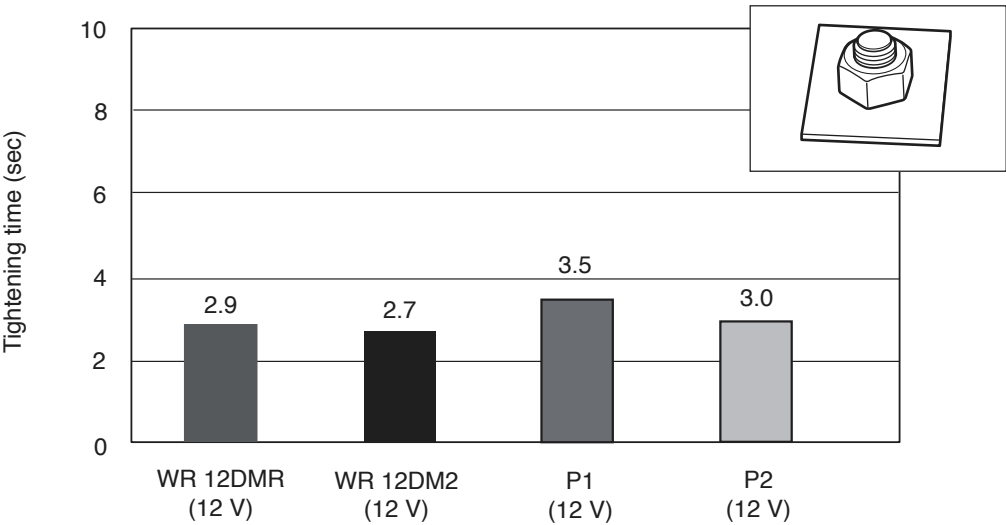


Fig. 4

\*The data above are intended for reference purposes only because actual time required for sinking washers will vary depending on tightening conditions.

## 6. SPECIFICATIONS

### 6-1. Specifications

Model		Cordless Impact Driver WH 12DMR	Cordless Impact Wrench WR 12DMR
Item			
Capacity		Small screw M4 – M8 (5/32" – 5/16")* <sup>1</sup> Ordinary bolt M5 – M12 (3/16" – 15/32") High-strength bolt M5 – M10 (3/16" – 25/64")	Ordinary bolt M6 – M16 (1/4" – 5/8") High-strength bolt M6 – M12 (1/4" – 15/32")
Tightening torque		130 N·m (1320 kgf·cm, 1150 in-lbs.)* <sup>2</sup>	160 N·m (1630 kgf·cm, 1420 in-lbs.)* <sup>3</sup>
Tip condition		6.35 mm (1/4") Bit holder	12.7 mm (1/2") Square drive 9.5 mm (3/8") Square drive
Type of motor		Fan cooled rare-earth magnet motor	
Enclosure		Main body: Polyamide resin + elastomer ..... Housing Aluminum alloy die casting ..... Hammer case Elastomer ..... Protector Storage battery: ABS resin (black) Charger: ABS resin (black)	
Type of switch		Trigger switch with forward/reverse changeover pushing button (with brake)	
Handle configuration		T-type	
No-load rotational speed		0 – 2,600 /min	
Impact rate		0 – 3,200 /min	
Weight	Main body	1.6 kg (3.5 lbs.) (Includes battery)* <sup>4</sup>	
	Battery	0.68 kg (1.5 lbs.)	
Overall length x height		155 mm (6-7/64") x 226 mm (8-29/32")	12.7 mm (1/2") square drive ..... 162 mm (6-3/8") x 226 mm (8-29/32") 9.5 mm (3/8") square drive ..... 159 mm (6-1/4") x 226 mm (8-29/32")
Center height		26.5 mm (1-3/64")	
Battery (Type EB 1220BL)		Sealed cylindrical nickel-cadmium batteries Nominal voltage: DC 12V Nominal life: Charging/discharging approximately 300 cycles (in the case of Model UC 18YG) Nominal capacity: 2.0 Ah	
Battery (Type EB 1226HL/ EB 1230HL)		Sealed cylindrical nickel-metal hydride batteries Nominal voltage: DC 12V Nominal life: Charging/discharging approximately 500 cycles (in the case of Model UC 14YFA) Nominal capacity: 2.6 Ah/3.0 Ah	
Charger (Model UC 14YFA)		Charger power source: single-phase AC, 50/60 Hz Voltage: Depending on the order specification Power input: 56 W Charging system: Constant current charge with feedback control Overcharge protection system: (1) Battery voltage detection ( $\Delta^2V$ system) Battery temperature detection (dT/dt system) for Ni-MH battery (2) Battery surface temperature detection (thermistor) (3) 120-minute timer  Output voltage: 7.2 V – 14.4 V Output current: 2.6 A Charging time: Approx. 50 minutes (for type EB 1220BL battery at 20 °C) Approx. 60 minutes (for type EB 1226HL battery at 20 °C) Approx. 70 minutes (for type EB 1230HL battery at 20 °C)  Product weight: 0.6 kg Operable ambient temperature range: 0 °C – 40 °C The maximum allowable temperature of the EB 1220BL type battery is 55 °C and the EB 1226HL or EB 1230HL type battery is 45 °C.	

<b>Charger</b> <b>(Model UC 18YG)</b> NOTE: The Model UC 18YG charger is exclusive to NiCad batteries.	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Output capacity: 70 W</li> <li>• Indication method: Pilot lamp indicator of battery charging</li> <li>• Function: On..... During charging Off..... Charging completed</li> </ul>
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\*1: In the case of tapping screws and wood screws, a minimum of M3 (1/8") is possible.

\*2: This torque is based on tightening an M14 (9/16") bolt (strength grade: 12.9) for 3 seconds with a hexagonal socket.

\*3: This torque is based on tightening an M16 (5/8") bolt (F10T) for 3 seconds with a hexagonal socket.

\*4: Main body does not include accessory tools and hook (hexagonal bit etc.).

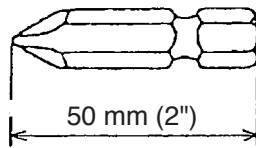
#### Pilot lamp indications (Model UC 14YFA)

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.

## 6-2. Optional Accessories

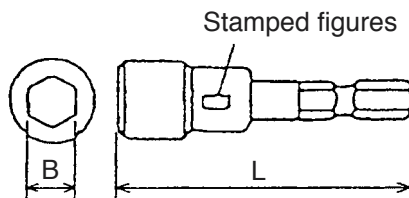
(1) Optional accessories for the Model WH 12DMR

- Plus driver bit



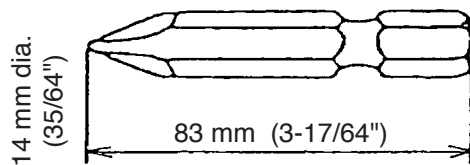
Bit No.	Code No.
No. 2	992671
No. 3	992672

- Hexagon socket



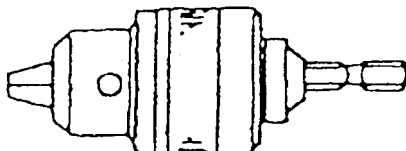
Part name	Stamped figures	L (mm)	B (mm)	Code No.
5 mm Hexagon socket	8	65 (2-9/16")	8 (5/16")	996177
6 mm Hexagon socket	10	65 (2-9/16")	10 (3/8")	985329
5/16" Hexagon socket	12	65 (2-9/16")	12 (15/32")	996178
8 mm Hexagon socket	13	65 (2-9/16")	13 (1/2")	996179
10 mm Hexagon socket (small type)	14	65 (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)



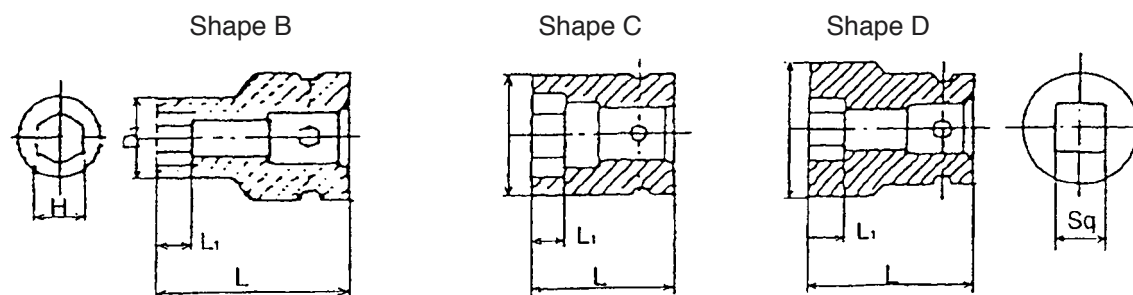
- Drill chuck adaptor set (Code No. 996195)

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



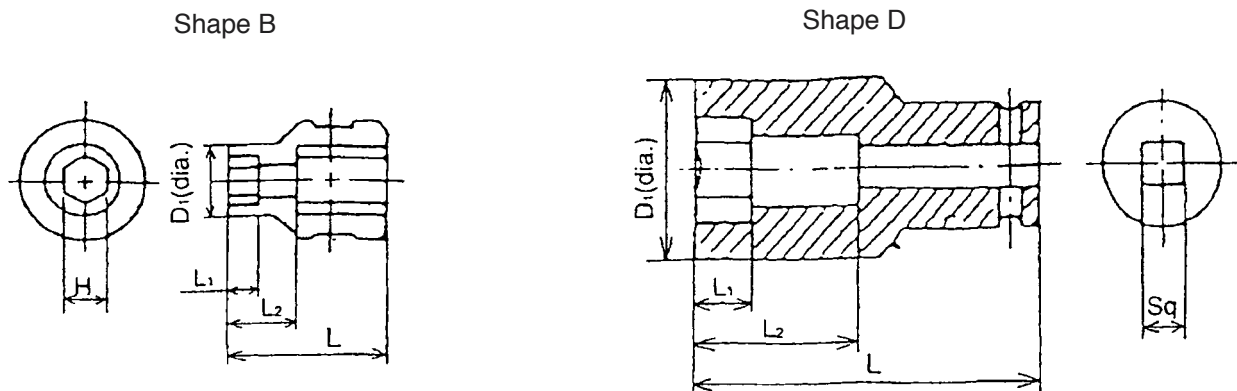
(2) Optional accessories for the Model WR 12DMR

- Each dimension and applicable bolt for each hexagon socket



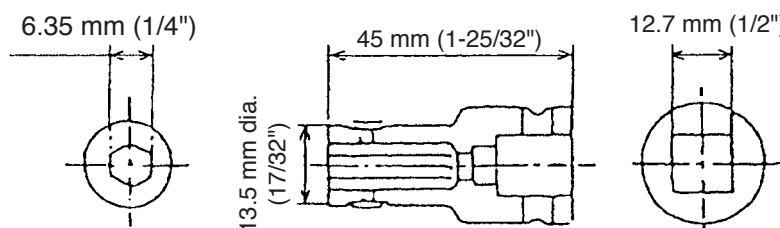
Square drive dimension Sq	Part name	Code No.	Nominal diameter of applicable bolts				Dihedral width H (mm)	Shape	Socket primary dimensions (mm)		
			ISO (High-strength)	ISO (Ordinary)	ISO (Small type)	Inch screw			L	L <sub>1</sub>	D <sub>i</sub>
12.7 mm (1/2")	Hexagon socket	10 mm 944291	—	M 6 (1/4")	—	—	10 (3/8")	B	40 (1-9/16")	8 (5/16")	18 (23/32")
		12 mm 873632	—	—	M 8 (5/16")	W 5/16"	12 (15/32")	B	40 (1-9/16")	8 (5/16")	20 (25/32")
		13 mm 873539	—	M 8 (5/16")	—	—	13 (1/2")	B	40 (1-9/16")	9 (11/32")	25 (1")
		14 mm 873540	—	—	M 10 (3/8")	—	14 (9/16")	B	40 (1-9/16")	9 (11/32")	25 (1")
		17 mm 873536	—	M 10 (3/8")	M 12 (15/32")	W 3/8"	17 (21/32")	C	32 (1-1/4")	8 (5/16")	28 (1-3/32")
		19 mm 873624	—	M 12 (15/32")	M 14 (9/16")	W 7/16"	19 (23/32")	C	34 (1-11/32")	9 (11/32")	28 (1-3/32")
		21 mm 873626	—	—	—	W 1/2"	21 (53/64")	D	36 (1-13/32")	10 (3/8")	32 (1-1/4")
		22 mm 873627	M 12 (15/32")	M 14 (9/16")	M 16 (5/8")	—	22 (7/8")	D	40 (1-9/16")	14 (9/16")	35 (1-3/8")
		24 mm 873629	—	M 16 (5/8")	M 18 (23/32")	—	24 (15/16")	D	40 (1-9/16")	15 (9/16")	38 (1-1/2")

- Each dimension and applicable bolt for each long socket



Square drive dimension Sq	Part name	Code No.	Nominal diameter of applicable bolts				Dihedral width H (mm)	Shape	Socket primary dimensions (mm)			
			ISO (High-strength)	ISO (Ordinary)	ISO (Small type)	Inch screw			L	L <sub>1</sub>	L <sub>2</sub>	D <sub>1</sub>
12.7 mm (1/2")	Long socket	12 mm 955138	—	—	M 8 (5/16")	W 5/16"	12 (15/32")	B	52 (2-3/64")	20 (25/32")	34 (1-11/32")	20 (25/32")
		13 mm 955139	—	M 8 (5/16")	—	—	13 (1/2")	B	52 (2-3/64")	20 (25/32")	34 (1-11/32")	21.5 (53/64")
		14 mm 955140	—	—	M 10 (3/8")	—	14 (9/16")	B	52 (2-3/64")	20 (25/32")	34 (1-11/32")	22 (7/8")
		17 mm 955141	—	M 10 (3/8")	M 12 (15/32")	W 3/8"	17 (21/32")	B	52 (2-3/64")	24 (15/16")	34 (1-11/32")	25 (1")
		17 mm 955149	—	M 10 (3/8")	M 12 (15/32")	W 3/8"	17 (21/32")	B	75 (2-15/16")	24 (15/16")	57 (2-1/4")	25 (1")
		19 mm 955142	—	M 12 (15/32")	M 14 (9/6")	W 7/16"	19 (23/32")	B	52 (2-3/64")	24 (15/16")	34 (1-11/32")	28 (1-3/32")
		19 mm 955150	—	M 12 (15/32")	M 14 (9/6")	W 7/16"	19 (23/32")	B	75 (2-15/16")	24 (15/16")	57 (2-1/4")	28 (1-3/32")
		21 mm 955143	—	—	—	W 1/2"	21 (53/64")	D	52 (2-3/64")	24 (15/16")	34 (1-11/32")	31 (1-7/32")
		21 mm 955151	—	—	—	W 1/2"	21 (53/64")	D	75 (2-15/16")	24 (15/16")	57 (2-1/4")	31 (1-7/32")
		21 mm 991480	—	—	—	W 1/2"	21 (53/64")	D	125 (4-47/51")	24 (15/16")	107 (4-7/32")	31 (1-7/32")
		22 mm 955144	M 12 (15/32")	M 14 (9/16")	M 16 (5/8")	—	22 (7/8")	D	52 (2-3/64")	24 (15/16")	34 (1-11/32")	32.5 (1-9/32")
		24 mm 955146	—	M 16 (5/8")	M 18 (23/32")	—	24 (15/16")	D	52 (2-3/64")	25 (63/64")	34 (1-11/32")	34 (1-11/32")

• Bit adaptor (Code No. 991476)



Part name	Overall length (mm)	Code No.
Plus hd. driver bit No. 2	45 (1-25/32")	955229
	70 (2-3/4")	955654
Plus hd. driver bit No. 3	45 (1-25/32")	955230
	70 (2-3/4")	955655

- Extension bar [Overall length 100 mm (3-15/16") ] (Code No. 873633)
- Universal joint (Code No. 992610)
- Socket ass'y for duct

Dihedral width of applicable bolts	Code No.
12 (15/32")	993658
13 (1/2")	992613
14 (9/16")	992615

- EW-14R corner attachment (Code No. 9329-9001)

## 7. COMPARISONS WITH SIMILAR PRODUCTS

### 7-1. Specification Comparisons (Cordless Impact Driver)

Item			Maker	HITACHI		P
			Model	WH 12DMR	WH 12DM2	
Catalog specifications	Capacity	Small screw		M 4 – M 8 (5/32" – 5/16") *1	M 4 – M 8 (5/32" – 5/16") *1	—
		Ordinary bolt		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")	—
	Max. tightening torque*2		N·m	130 (1320 kgf·cm, 1150 in-lbs.)	135 (1375 kgf·cm, 1190 in-lbs.)	112.6 (1150 kgf·cm, 1000 in-lbs.)
	No-load rotation speed		/min	0 – 2,600	0 – 2,600	0 – 2,400
	Impact rate		/min	0 – 3,200	0 – 3,200	0 – 3,000
	Main body weight*3		kg	1.6 (3.5 lbs.)	1.6 (3.5 lbs.)	1.7 (3.75 lbs.)
Measured figures	Max. tightening torque*4		N·m	132 (1340 kgf·cm, 1170 in-lbs.)	137 (1400 kgf·cm, 1220 in-lbs.)	124 (1265 kgf·cm, 1095 in-lbs.)
	No-load rotation speed		/min	0 – 2,480	0 – 2,600	0 – 2,410
	Impact rate		/min	0 – 2,680	0 – 2,920	0 – 2,810
	Overall length x height		mm	155 x 226 (6-7/64" x 8-29/32")	155 x 226 (6-7/64" x 8-29/32")	165 x 233 (6-1/2" x 9-11/64")
	Center height		mm	26.5 (1-3/64")	26.5 (1-3/64")	29 (1-9/64")
	Main body weight*3		kg	1.69 (3.7 lbs.)	1.67 (3.7 lbs.)	1.7 (3.75 lbs.)
	No-load sound pressure level		dB(A)	70	70	76
Tool tip mounting system				Driver chuck	Driver chuck	Driver chuck
Type of switch				Variable speed switch with forward/reverse changeover lever	Variable speed switch with forward/reverse changeover lever	Variable speed switch with forward/reverse changeover lever
Type of motor				DC magnet	DC magnet	DC magnet
Voltage		V		12	12	12
Current		A		28	31	29
Battery	Type			EB 1220BL, EB 1230HL or EB 1226HL	EB 1220BL or EB 1230HL	DW9071
	Nominal capacity	Ah		EB 1220BL: 2.0 EB 1226HL: 2.6 EB 1230HL: 3.0	EB 1220BL: 2.0 EB 1230HL: 3.0	1.7
	Nominal voltage	V		12	12	12
	Ambient temperature	°C		0 – 40	0 – 40	—
Charger	Model			UC 14YFA or UC 18YG	UC 14YF2 or UC 14YFA	DW9107
	Power input capacity	VA		UC 14YFA: 56 UC 18YG: 70	UC 14YF2: 44 UC 14YFA: 56	—
	Recharging voltage	V		UC 14YFA: 7.2 – 14.4 UC 18YG: 7.2 – 18	7.2 – 14.4	7.2 – 14.4
Standard accessories				• Plastic tool case • Charger (UC 14YFA or UC 18YG)	• Plastic tool case • Charger (UC 14YF2 or UC 14YFA)	• Plastic tool case • Charger

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

\*2: Max. tightening torque is based on tightening an M14 (9/16") bolt (strength grade: 12.9) for 3 seconds with a hexagon socket.

\*3: Main body weight does not include accessory tools and hook (hexagon bit etc.).

\*4: Max. tightening torque is based on tightening an M14 (9/16") bolt (strength grade: 12.9) for 3 seconds with a hexagon socket.

## 7-2. Specification Comparisons (Cordless Impact Wrench)

Item			Maker	HITACHI		P1	P2
			Model	WR 12DMR	WR 12DM2		
Catalog specifications	Capacity	Ordinary bolt		M 6 – M 16 (1/4" – 5/8")	M 6 – M 16 (1/4" – 5/8")	—	—
		High-strength bolt		M 6 – M 12 (1/4" – 15/32")	M 6 – M 12 (1/4" – 15/32")	—	—
	Max. tightening torque	N·m		160 <sup>*1</sup> (1630 kgf·cm, 1420 in-lbs.)	165 <sup>*1</sup> (1685 kgf·cm, 1460 in-lbs.)	135.6 <sup>*2</sup> (1380 kgf·cm, 1200 in-lbs.)	158.7 (1610 kgf·cm, 1400 in-lbs.)
	No-load rotation speed	/min		0 – 2,600	0 – 2,600	0 – 2,400	0 – 2,400
	Impact rate	/min		0 – 3,200	0 – 3,200	0 – 3,000	0 – 3,000
	Main body weight	kg		1.6 (3.5 lbs.)	1.6 (3.5 lbs.)	1.68 (3.7 lbs.)	1.7 (3.75 lbs.)
Measured figures	Max. tightening torque <sup>*1</sup>	N·m		163 (1660 kgf·cm, 1440 in-lbs.)	170 (1735 kgf·cm, 1500 in-lbs.)	154 (1570 kgf·cm, 1360 in-lbs.)	162 (1653 kgf·cm, 1429 in-lbs.)
	No-load rotation speed	/min		0 – 2,480	0 – 2,600	0 – 2,410	0 – 2,410
	Impact rate	/min		0 – 2,680	0 – 3,240	0 – 2,810	0 – 3,120
	Overall length x height	mm		9.5 mm (3/8"): 160 x 226 (6-19/64" x 8-29/32") 12.7 mm (1/2"): 162 x 226 (6-3/8" x 8-29/32")	162 x 226 (6-3/8" x 8-29/32")	168 x 233 (6-39/64" x 9-11/64")	168 x 233 (6-39/64" x 9-11/64")
	Center height	mm		26.5 (1-1/64")	26.5 (1-1/64")	29 (1-9/64")	29 (1-9/64")
	Main body weight <sup>*3</sup>	kg		1.69 (3.7 lbs.)	1.68 (3.7 lbs.)	1.73 (3.8 lbs.)	1.75 (3.9 lbs.)
	No-load sound pressure level	dB(A)		70	70	76	76
Tip condition				9.5 mm (3/8") square drive or 12.7 mm (1/2") square drive	12.7 mm (1/2") square drive	9.5 mm (3/8") square drive	12.7 mm (1/2") square drive
Tool tip mounting system				9.5 mm (3/8") ... Retaining ring 12.7 mm (1/2") ... Plunger	Plunger	Hog ring	Plunger
Type of switch				Variable speed switch with forward/reverse changeover lever	Variable speed switch with forward/reverse changeover lever	Variable speed switch with forward/reverse changeover lever	Variable speed switch with forward/reverse changeover lever
Type of motor				DC magnet	DC magnet	DC magnet	DC magnet
Voltage		V		12	12	12	12
Current		A		28	31	22	29
Battery	Type			EB 1220BL, EB 1230HL or EB 1226HL	EB 1220BL or EB 1230HL	1222	DW9071
	Nominal capacity	Ah		EB 1220BL: 2.0 EB 1226HL: 2.6 EB 1230HL: 3.0	EB 1220BL: 2.0 EB 1230HL: 3.0	2.0	2.0
	Nominal voltage	V		12	12	12	12
	Ambient temperature	°C		5 – 40	5 – 40	—	—
Charger	Model			UC 14YFA or UC 18YG	UC 14YF2 or UC 14YFA	DC1411	DW9107
	Power input capacity	VA		UC 14YFA: 56 UC 18YG: 70	UC 14YF2: 44 UC 14YFA: 56	—	—
	Recharging voltage	V		UC 14YFA: 7.2 – 14.4 UC 18YG: 7.2 – 18	7.2 – 14.4	7.2 – 14.4	7.2 – 14.4
Standard accessories				• Plastic tool case • Charger (UC 14YFA or UC 18YG)	• Plastic tool case • Charger (UC 14YF2 or UC 14YFA)	• Plastic tool case • Charger	• Plastic tool case • Charger

<sup>\*1</sup>: Max. tightening torque is based on tightening an M16 (5/8") bolt (F10T) for 3 seconds with a hexagon socket.

<sup>\*2</sup>: Max. tightening torque is based on tightening an M14 (9/16") bolt (strength grade: 12.9) for 3 seconds with a hexagon socket.

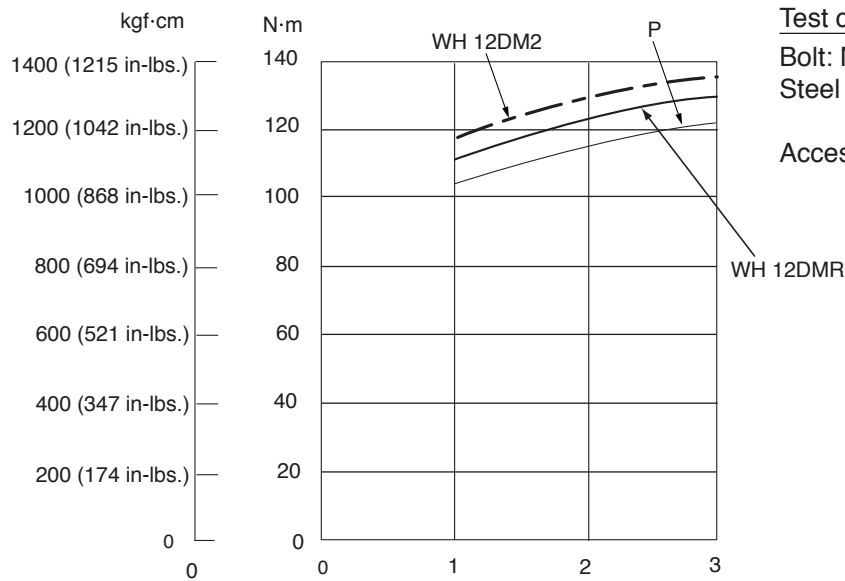
<sup>\*3</sup>: Main body weight does not include accessory tools and hook (hexagon bit etc.).



7-3. Tightening Torque

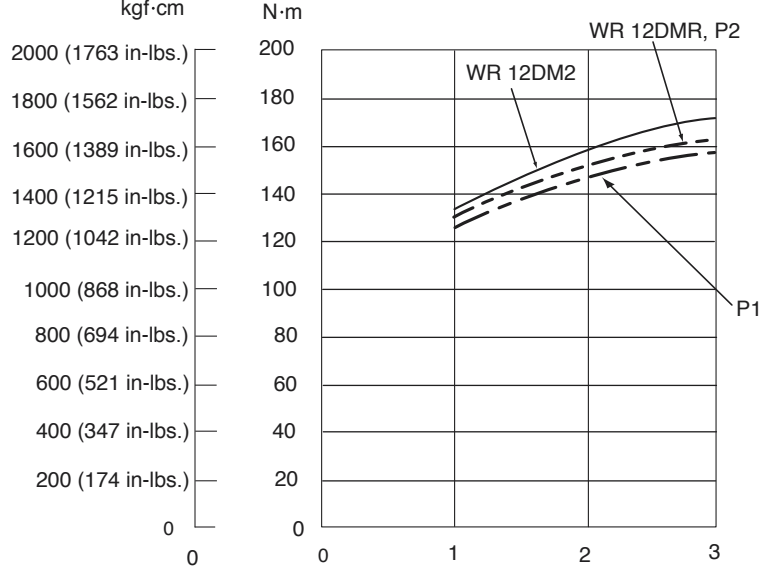
7-3-1. Tightening torque characteristic comparisons

(1) Impact driver



Test conditions  
Bolt: M14 x 50 mm, high-strength bolt  
Steel plate: SS34P  
Thickness 25 mm  
Accessory tool: Hexagon socket  
(length: 40 mm,  
width across flat: 19 mm)

(2) Impact wrench



Test conditions  
Bolt: M16 x 55 mm (5/8" x 2-5/32") (F10T)  
Steel plate: Mild steel  
Thickness 25 mm  
Accessory tool: Hexagon socket ass'y

### 7-3-2. 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. 5 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)

d: Nominal diameter for the screw (mm)

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

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

k: Torque coefficient (0.17)

- Strength grade and rated axial stress of threads

**Table 1**

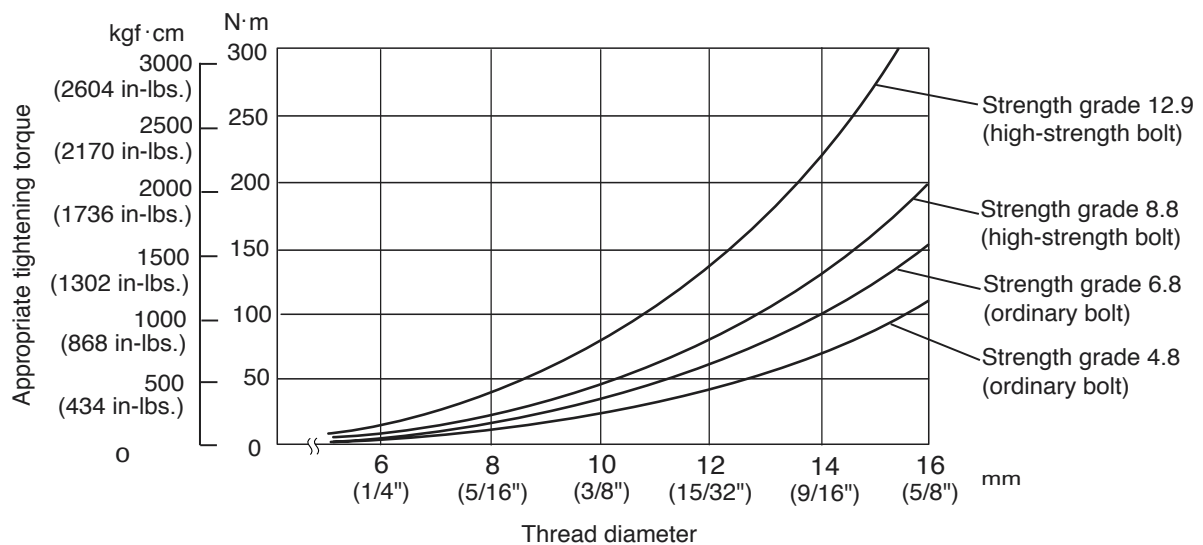
Strength grade	4.8	6.8	8.8	12.9
Rated axial stress (kgf/mm <sup>2</sup> )	29.1	43.7	58.2	95
Material	Mild steel		Alloy steel including Ni, Mn, Cr, etc.	
Heat treatment	None		Processed-hard material	

- 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")	M16 x 2 mm (5/8")
Effective sectional area of thread (mm <sup>2</sup> )	14.2	20.1	36.6	58.0	84.3	115	157

- Thread diameter and appropriate tightening torque



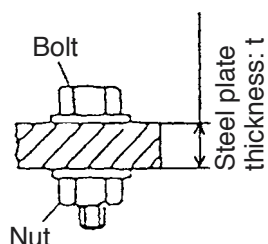
**Fig. 5**

### 7-3-3. Bolt tightening torque characteristics

Figures. 6-1 and 6-2 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. 8-3, "Tightening Torque Variation".

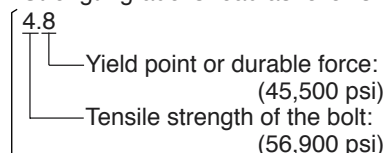
#### NOTE

- 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:



#### • Model WH 12DMR

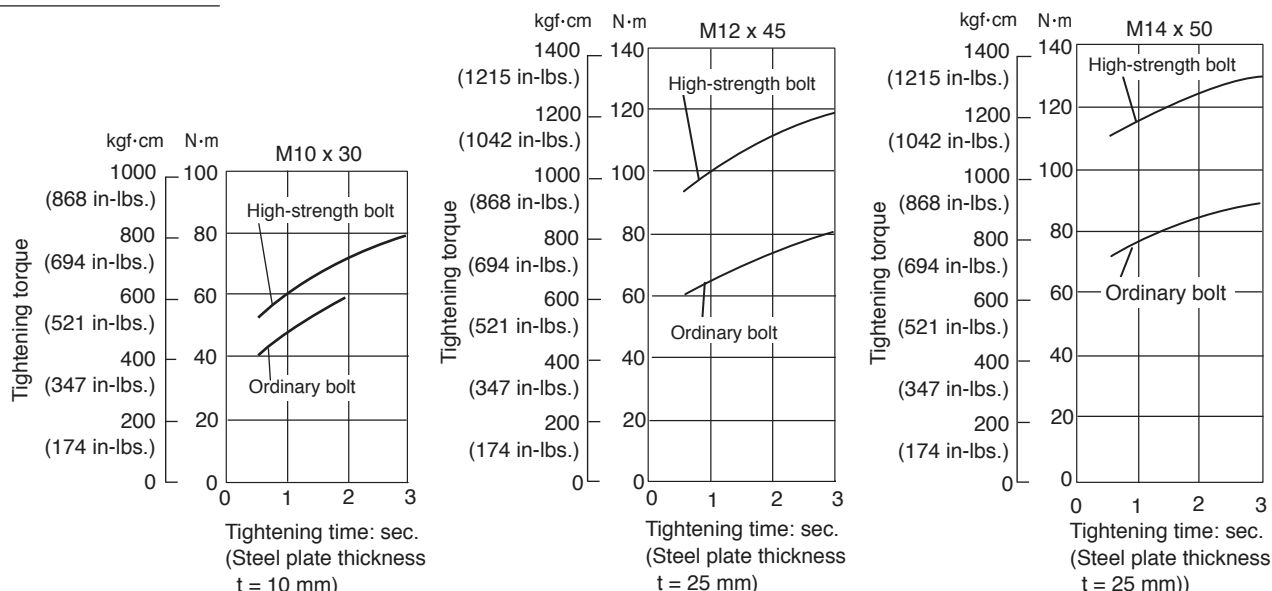


Fig. 6-1

#### • Model WR 12DMR

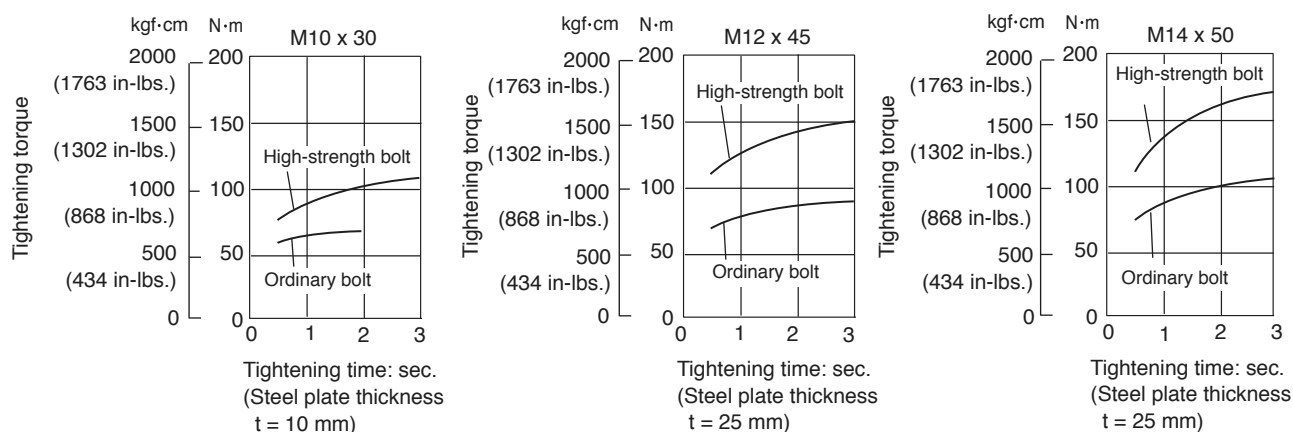

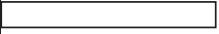



Fig. 6-2


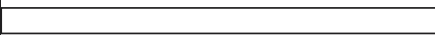

#### 7-4. Tightening Time

The tightening speed is almost equivalent to the Model WH 12DM2 that is fastest in the class. Tightening time comparison is shown below. The data below are intended for reference purposes only because actual tightening time may vary depending on hardness of the workpiece, ambient temperature, characteristics of the battery, etc.

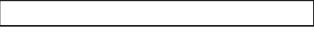


##### ① Wood screw 5.3 mm dia. x 120 mm length, lauan

Model	← Fast	Slow →	
	2	4	6 8 10 12 14 16 18 20 sec.
HITACHI WH 12DMR			
HITACHI WH 12DM2			
P			

##### ② Wood screw 4.5 mm dia. x 90 mm length, hemlock spruce

Model	← Fast	Slow →	
	1	2	3 4 5 sec.
HITACHI WH 12DMR			
HITACHI WH 12DM2			
P			

##### ③ Wood screw 4.2 mm dia. x 75 mm length, hemlock spruce

Model	← Fast	Slow →	
	1	2	3 4 5 sec.
HITACHI WH 12DMR			
HITACHI WH 12DM2			
P			

## 7-5. Number of Screws or Bolts Driven

### 7-5-1. 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.

Number of screws or bolts driven (Cordless impact driver)

Tightening condition	Model	HITACHI WH 12DMR	HITACHI WH 12DM2	C
	Battery	EB 1220BL (Nominal capacity: 2.0 Ah)	EB 1220BL (Nominal capacity: 2.0 Ah)	DW9071 (Nominal capacity: 1.7 Ah)
Wood screw 4.0 mm dia. x 50 mm (soft wood)		560	525	550
Wood screw 4.2 mm dia. x 90 mm (hard wood)		115	115	110
Wood screw 5.3 mm dia. x 120 mm (hard wood)		50	45	40
Machine screw (M8 x 16 mm)		1,240	1,165	1,225

## **8. PRECAUTIONS IN SALES PROMOTION**

### **8-1. 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 14YFA or UC 18YG Charger provided with the tool. Because of the designed rapid-charging feature, use of other battery chargers is hazardous.

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

First connect the storage battery to the 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 1220BL, EB 1226HL or EB 1230HL Storage Battery

Ensure that all customers understand that Type EB 1220BL, EB 1226HL or EB 1230HL 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 1220BL, EB 1226HL or EB 1230HL storage battery.

For Europe

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

For the U.S.A. and Canada

- CAUTION** • For safe operation, see Instruction Manual.  
• Use HITACHI charger recommended in instruction manual for recharging.

(3) The following caution is listed on the Name Plate attached to the Model UC 14YFA or UC 18YG Charger.

<UC 18YG>

For the U.S.A. and Canada

**CAUTION** • For safe operation, see instruction manual.

- Charge HITACHI rechargeable battery types EB 7, EB 9, EB 12, EB 14 and EB 18 series. Other types of batteries may burst causing personal injury and damage.
- Charge between 32°F and 104°F. Rest 15 minutes between the charging of batteries.
- Indoor use only. • Replace defective cord immediately.

<UC 14YFA>

For the U.S.A. and Canada

**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. Rest 15 minutes between the charging of batteries.
- Indoor use only.
- Replace defective cord immediately.



## 8-2. Tightening Torque Inspection Prior to Operation

As described and shown in Para. 7-3-3, the output tightening torque of which the Models WH 12DMR and WR 12DMR 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.

## 8-3. 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. 7-3-2 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 M16 x 55 mm (5/8" x 2-5/32") F10T bolts tightened is shown in Fig. 7 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 12DMR

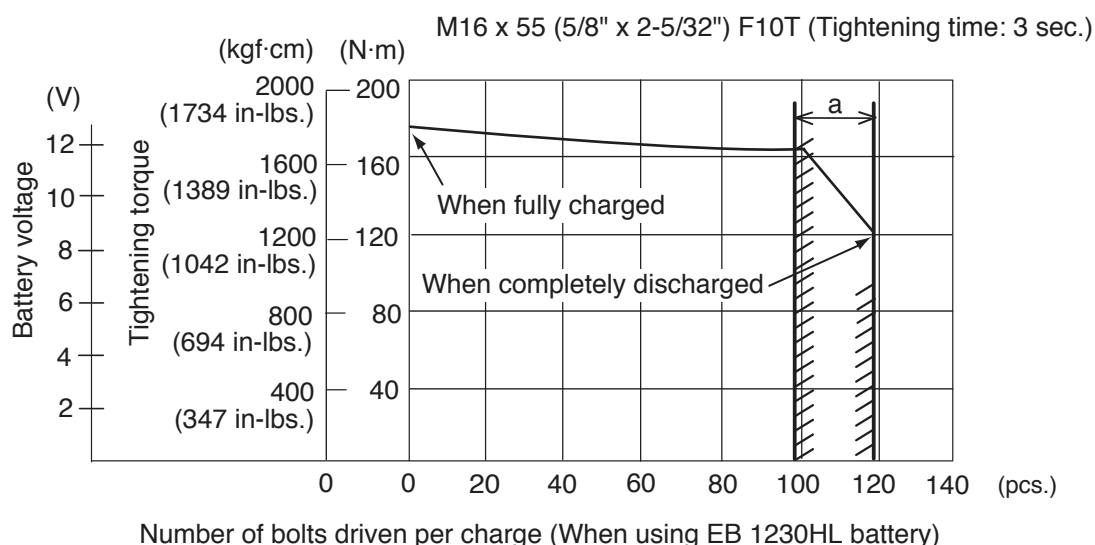


Fig. 7

(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 specified by bolt manufacturers), 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.

#### **8-4. Suggestions and Precautions for the Efficient Use of the Charger**

(1) Batteries may not be rechargeable immediately after use

If the 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 14YFA or UC 18YG 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 temperature.

## 9. 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. 6-2 for appropriate socket dimensions.

### (3) Hammering section lubrication

Grease (Molub-Alloy 777-1) 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.

## 10. REPAIR GUIDE

**WARNING:** Without fail, remove the 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.

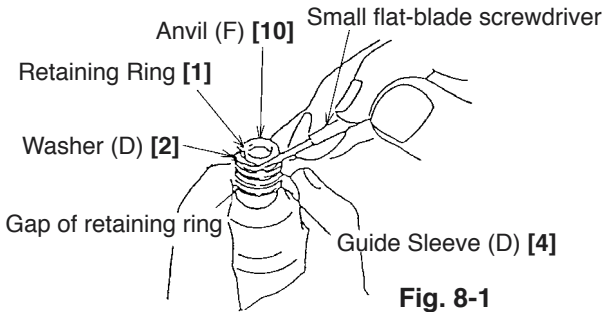
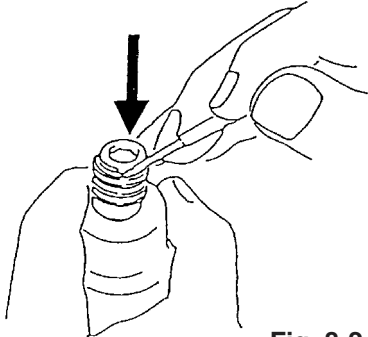
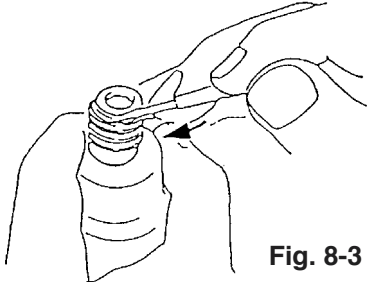
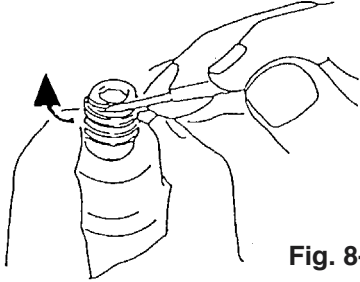
### 10-1. Precautions in Disassembly and Reassembly

The **[ ]** and **<bold>** numbers correspond to the item numbers in the Parts List and the exploded assembly diagram. ( **[ ]**: WH 12DMR, **<bold>**: WR 12DMR )

#### 10-1-1. Disassembly

##### (1) Removal of Guide Sleeve (D) **[4]** (Model WH 12DMR only)

Remove the Retaining Ring **[1]**, Washer (D) **[2]**, Guide Spring (B) **[3]** and Guide Sleeve (D) **[4]** in order by following the procedure shown in Figs. 8-1 to 8-4. Be sure not to lose the two Steel Balls D3.5 **[9]** in Anvil (F) **[10]**.

<p>1</p>  <p>Anvil (F) <b>[10]</b> Small flat-blade screwdriver Retaining Ring <b>[1]</b> Washer (D) <b>[2]</b> Gap of retaining ring Guide Sleeve (D) <b>[4]</b></p> <p><b>Fig. 8-1</b></p> <p>Hold the body and adjust the gap of the retaining ring to the groove of anvil (F), then insert a small flat-blade screwdriver into the groove at an angle.</p>	<p>2</p>  <p><b>Fig. 8-2</b></p> <p>Press down washer (D) with the small flat-blade screwdriver.</p>
<p>3</p>  <p><b>Fig. 8-3</b></p> <p>Slide the small flat-blade screwdriver under one side of the gap of the retaining ring.</p>	<p>4</p>  <p><b>Fig. 8-4</b></p> <p>Slowly raise the retaining ring using the end face of guide sleeve (B) as a fulcrum.</p>

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

(2) Removal of Front Cap (B) [5] <1> and Protector (C) [6] <2>

Insert a small flat-blade screwdriver between Front Cap (B) [5] <1> and Protector (C) [6] <2> and remove them from the Hammer Case [8] <4>.

(3) Removal of the Hammer Case [8] <4> and the hammer assembly

Remove the four Tapping Screws (W/Sp. Washer) D4 x 25 (Black) [7] <3> that connect the Hammer Case [8] <4> with Housing (A). (B) Set [35] <32> and remove the Hammer Case [8] <4> and the hammer assembly from Housing (A). (B) Set [35] <32>.

(4) Disassembly of the hammer assembly

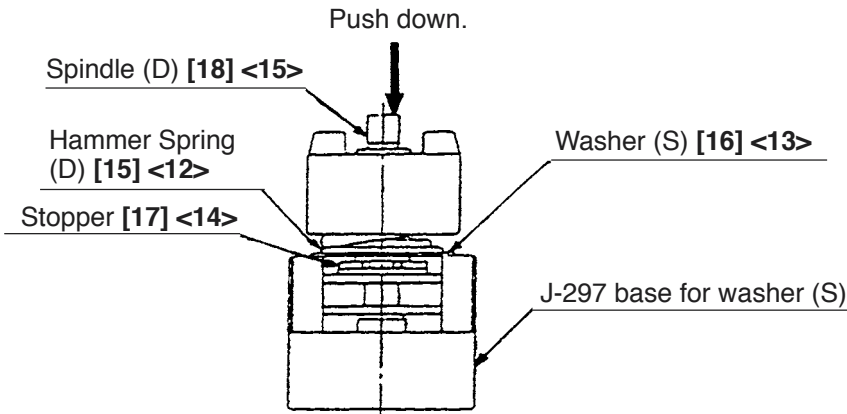


Fig. 9

Mount the hammer assembly onto the J-297 base for washer (S).

With a hand press, push down the top of Spindle (D) [18] <15> to compress Hammer Spring (D) [15] <12>. In this position, remove the Stopper [17] <14> with a small flat-blade screwdriver, then release the hand press. (See Fig. 9.)

Remove the hammer assembly from the J-297 base for washer (S) and support the end surface of Spindle (D) [18] <15>. With a hand press, push down either of the raised faces of Hammer (D) [12] <9> to compress Hammer Spring (D) [15] <12>. In this position, extract the two Steel Balls D5.556 [11] <8> from the cam grooves of Spindle (D) [18] <15> and Hammer (D) [12] <9> with a small flat-blade screwdriver. Then, slowly release the hand press and lift Hammer (D) [12] <9> and Washer (S) [16] <13> together to extract them from Spindle (D) [18] <15>. Hammer Spring (D) [15] <12> can then be removed.

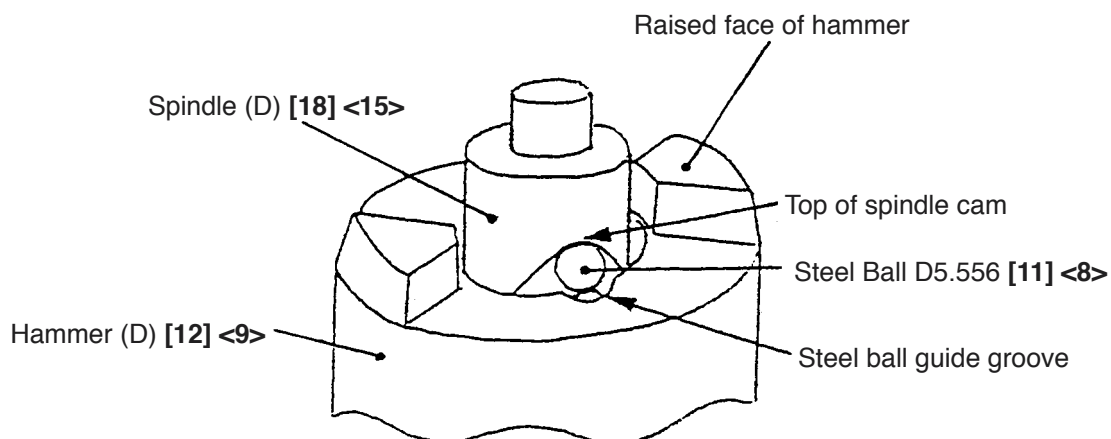


Fig. 10

(5) Removal of the Hook Ass'y [40] <38>

Remove the Special Screw M5 [48] <46> with a flat-blade screwdriver or a coin and remove the Hook Ass'y [40] <38> and the Hook Spring [47] <45>.

(6) Removal of the Carbon Brushes 5 x 6 x 11.5 [31] <28>

Remove the two Brush Caps [32] <29>. Catch the flanges of the Carbon Brushes 5 x 6 x 11.5 [31] <28> with a small flat-blade screwdriver and remove the Carbon Brushes 5 x 6 x 11.5 [31] <28> at both sides.

(7) Removal of housing (B)

Remove the seven Tapping Screws (W/Flange) D4 x 20 (Black) [33] <30> and Machine Screw (W/Washers) M4 x 25 [46] <44> from the main body. The Strap [44] <42> and Sleeve (A) [45] <43> can be removed by removing the Machine Screw (W/Washers) M4 x 25 [46] <44>. Before removing housing (B), be sure to remove the Brush Caps [32] <29> because housing (B) cannot be removed if the Brush Caps [32] <29> are mounted.

(8) Removal of the switch

The FET of the DC-Speed Control Switch [37] <34> is firmly inserted in the housing. Insert a small flat-blade screwdriver between the FET and housing (B) to raise and remove the FET. Then, Inner Cover (A) [25] <22>, Armature Ass'y DC 12V [26] <23>, Magnet (E) [28] <25>, Brush Block [30] <27> and DC-Speed Control Switch [37] <34> can be removed in a piece. Pushing Button (A) [38] <35> can also be removed.

**NOTE: Be careful not to break the three legs coming from the FET to avoid malfunction of the switch.**

(9) Removal of the switch assembly

Remove the two Machine Screws (W/Sp. Washer) M3 x 5 [36] <33> that secure the flag terminal and then disconnect the internal wires (red and black) of the Brush Block [30] <27> from the DC-Speed Control Switch [37] <34>.

**NOTE: Do not disconnect the three FET internal wires soldered to the DC-Speed Control Switch [37] <34>.**

(10) Removal of Magnet (E) [28] <25>, Dust Guard Fin (B) [29] <26> and Side Yoke [27] <24>

Remove Magnet (E) [28] <25> in the "B" direction (see Fig. 11) holding Inner Cover (A) [25] <22> securely because Magnet (E) [28] <25> has a strong magnetism. Dust Guard Fin (B) [29] <26> and Side Yoke [27] <24> can be easily removed from Magnet (E) [28] <25> by holding Magnet (E) [28] <25> securely and pulling them in the direction of diameter because they are mounted to Magnet (E) [28] <25> magnetically.

← B

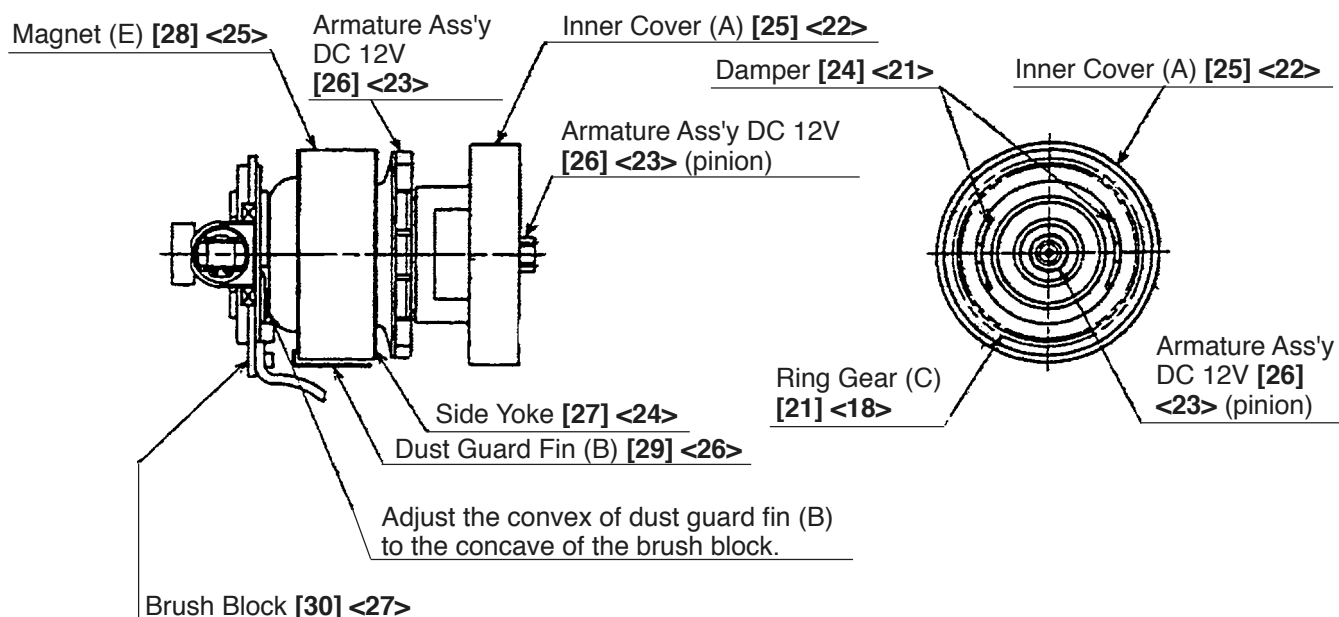


Fig. 11

(11) Removal of the Armature Ass'y DC 12V [26] <23>

Support Inner Cover (A) [25] <22> so that it does not contact the fan of the Armature Ass'y DC 12V [26] <23>. With a hand press, push down the tip portion of the Armature Ass'y DC 12 V [26] <23> (pinion) to remove it.

(12) Removal of Ring Gear (C) [21] <18> and the Damper [24] <21>

Remove Ring Gear (C) [21] <18> from Inner Cover (A) [25] <22> and remove the Damper [24] <21> with a small flat-blade screwdriver. Ring Gear (C) [21] <18> is firmly inserted in Inner Cover (A) [25] <22>. Insert a small flat-blade screwdriver between Ring Gear (C) [21] <18> and Inner Cover (A) [25] <22> to remove Ring Gear (C) [21] <18>. Remove the Damper [24] <21> with a small flat-blade screwdriver.

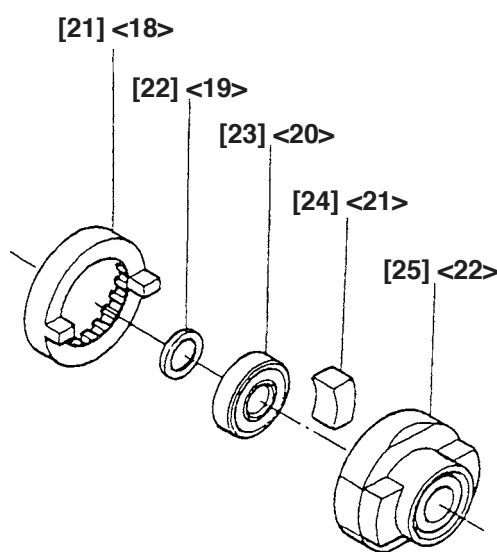


Fig. 12

### 10-1-2. 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. 13) for proper wiring.
- (b) When connecting the internal wires of the Brush Block [30] <27> to the DC-Speed Control Switch [37] <34>, fasten them with the Machine Screw (W/Sp. Washer) M3 x 5 [36] <33> paying attention to the direction of the flag terminal (Fig. 13).

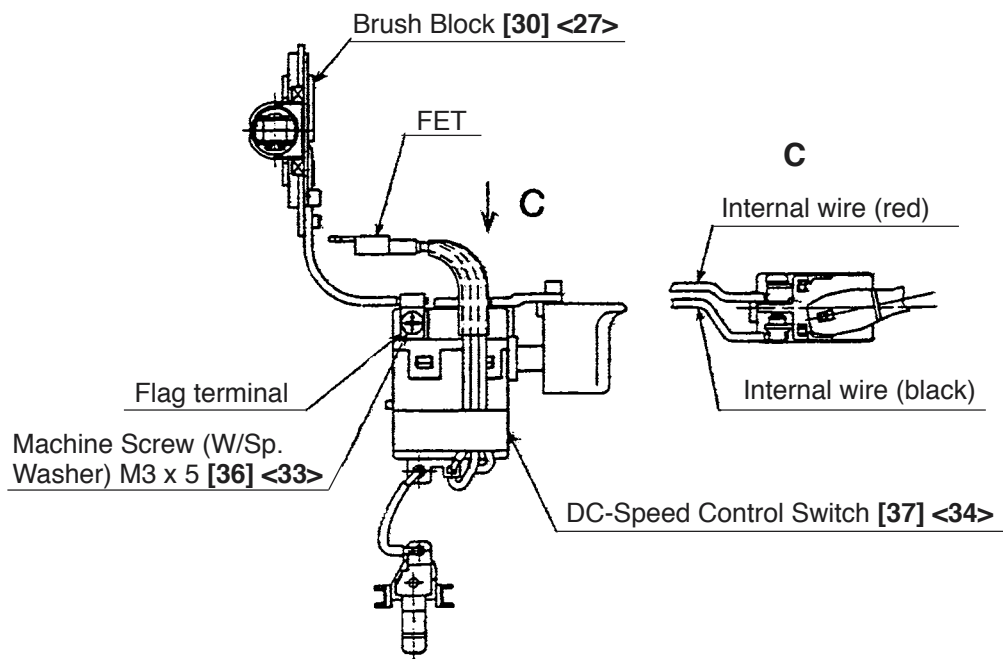


Fig. 13

- (c) Before mounting the parts to housing (A), apply silicone rubber (ThreeBond 1211) to the area illustrated in Fig. 14.

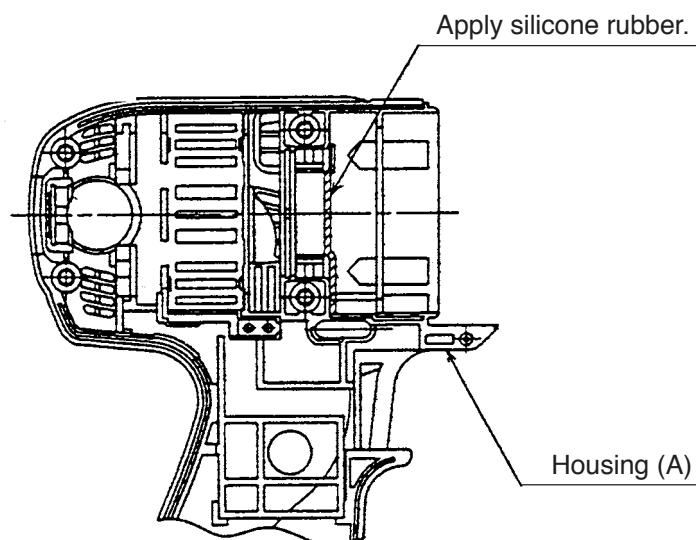


Fig. 14



(d) Mount a unit of Inner Cover (A) [25] <22> (including the Armature Ass'y DC 12 V [26] <23>), Magnet (E) [28] <25> (including Dust Guard Fin (B) [29] <26> and Side Yoke [27] <24>) and Brush Block [30] <27> into housing (A) (See Fig. 18). Pay attention to the following items.

- Adjust the protrusions of Dust Guard Fin (B) [29] <26> to the concave portions of Magnet (E) [28] <25> and also adjust the outside diameter of Dust Guard Fin (B) [29] <26> to the outside diameter of Magnet (E) [28] <25> when mounting Dust Guard Fin (B) [29] <26> to Magnet (E) [28] <25> (see Fig. 15).
- Adjust the protrusions of the Side Yoke [27] <24> to the concave portions of Magnet (E) [28] <25> and also adjust the outside diameter of the Side Yoke [27] <24> to the outside diameter of Magnet (E) [28] <25> when mounting the Side Yoke [27] <24> to Magnet (E) [28] <25> (see Fig. 15).
- Insert the two Dampers [24] <21> so that they fit into Inner Cover (A) [25] <22>. Fit the locking rib of Ring Gear (C) [21] <18> to the concave portion of Damper [24] <21>. Press-fit the Armature Ass'y DC 12V [26] <23> into Inner Cover (A) [25] <22>.
- Adjust the convex portion of Dust Guard Fin (B) [29] <26> to the concave portion of the Brush Block [30] <27> (see Fig. 16).
- Adjust the concave portions (for locking) of Magnet (E) [28] <25> to the protrusions of housing (A) (see Figs. 15 and 17).

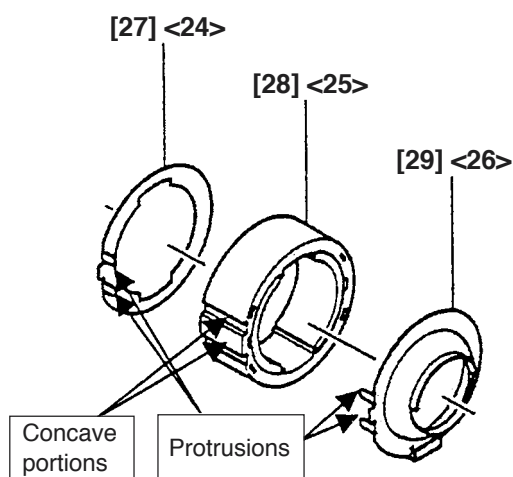


Fig. 15

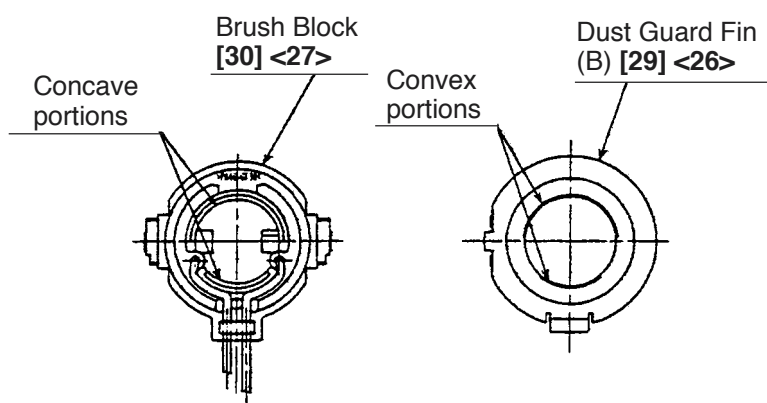


Fig. 16

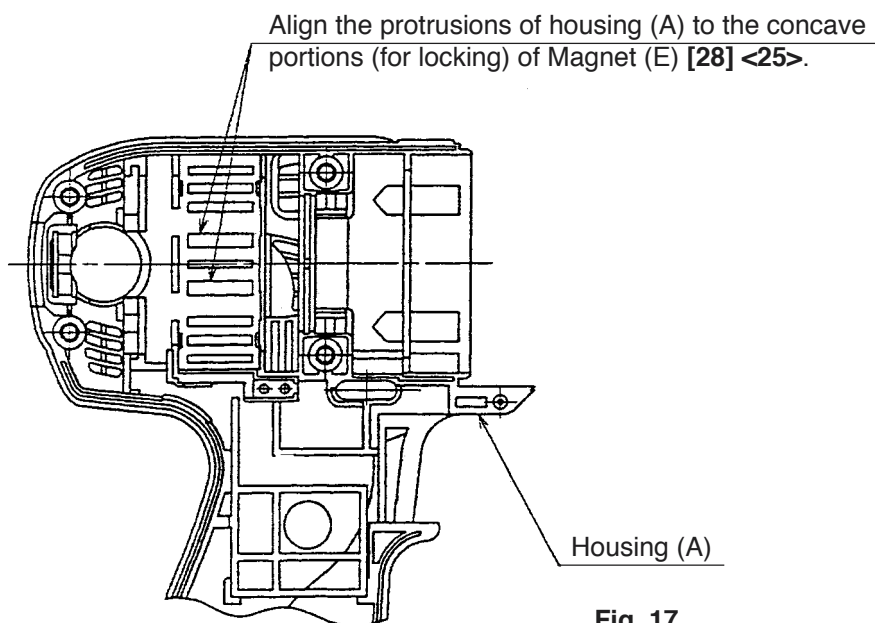


Fig. 17

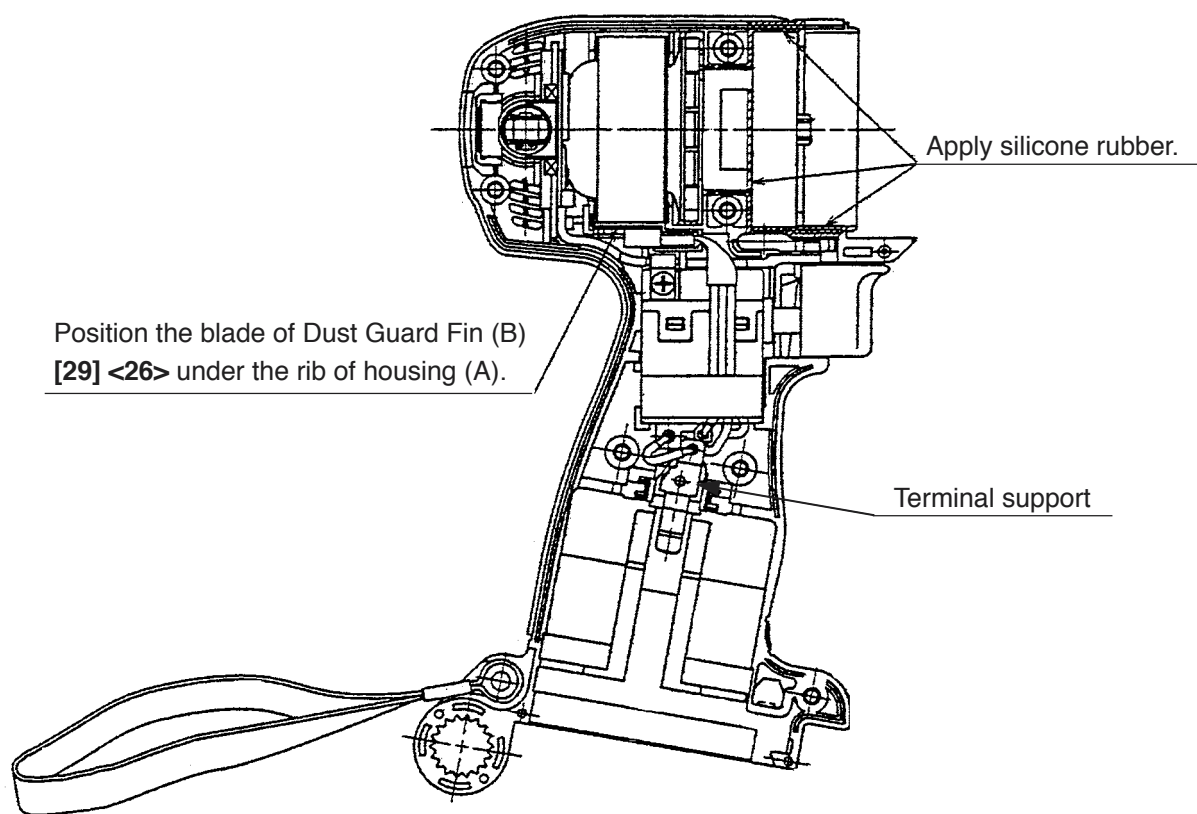
(e) Mount the DC-Speed Control Switch [37] <34> to housing (A) so that the protrusion of the forward/reverse lever at the top of the switch is inserted into the hole of Pushing Button (A) [38] <35>. Apply silicone grease (KS609, Shin-Etsu Chemical Co., Ltd.) to the contacting surfaces of the FET of the DC-Speed Control Switch [37] <34> and Dust Guard Fin (B) [29] <26> then mount them to housing (A).

**NOTE:**

(1) 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 [37] <34> (see Fig. 18.).

(2) If there is no plating and a black oxide is formed on the terminal support where the battery contacts, replace the terminal support with new one (Code No. 323710). Otherwise, heat is generated due to contact failure and the battery or the main body may be faulty.

(2) Apply silicone rubber (ThreeBond 1211) to housing (A) and Inner Cover (A) [25] <22> as shown in Fig. 18. Mount housing (B) and secure them with seven Tapping Screws (W/Flange) D4 x 20 (Black) [33] <30>. Wipe the silicone rubber coming out of the housing with a cloth. Insert Sleeve (A) [45] <43> into the Strap [44] <42> and tighten the Machine Screw (W/Washers) M4 x 25 [46] <44>.



**Fig. 18**

**(3) Mounting the mechanical parts**

(a) Mount Hammer (D) [12] <9> containing the twenty-eight Steel Balls D3.175 [13] <10>, Washer (J) [14] <11> and Hammer Spring (D) [15] <12> to Spindle (D) [18] <15>.

(b) Align the top of the cam groove on Spindle (D) [18] <15> with the steel ball guide groove on Hammer (D) [12] <9> as illustrated in Fig. 3. Press down either of the raised faces of Hammer (D) [12] <9> with a hand press to compress Hammer Spring (D) [15] <12> until the end surface of Hammer (D) [12] <9> contacts Spindle (D) [18] <15>.

- (c) Insert the two Steel Balls D5.556 [11] <8> 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 Spindle (D) [18] <15> to compress Hammer Spring (D) [15] <12>. On this condition, mount the Stopper [17] <14> 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 [19] <16> of the hammer assembly (check that Washer (E) [22] <19> is mounted on Spindle (D) [18] <15>) and Ring Gear (C) [21] <18>. 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 (F) [10] or Anvil (R) Ass'y <7> on Spindle (D) [18] <15>. Cover it with the Hammer Case [8] <4> and secure with the four Tapping Screws (W/Sp. Washer) D4 x 25 (Black) [7] <3>.

(6) Mounting Guide Sleeve (D) [4] (WH 12DMR only)

Insert the two Steel Balls D3.5 [9] into the hole of Anvil (F) [10]. Mount Guide Sleeve (D) [4], Guide Spring (B) [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. 19.

**NOTE: Be sure to replace the Retaining Ring [1] with new one because the Retaining Ring [1] may be deformed and Guide Sleeve (D) [4] may come off if the deformed Retaining Ring [1] is used again.**

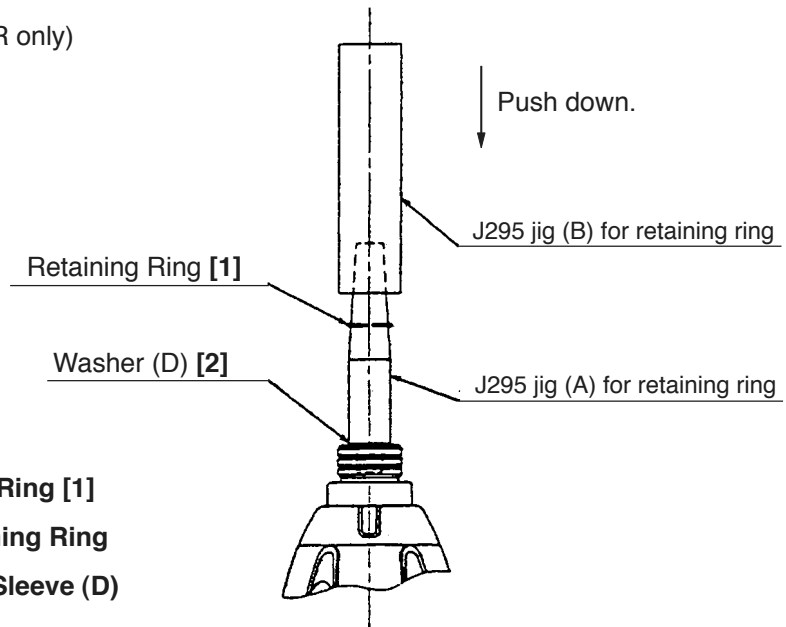


Fig. 19

(7) Reassembly of the hook

Check that the V-Lock Nut M5 [42] <40> is mounted into the Hook Ass'y (W/Light) [40] <38>. Mount the Hook Spring [47] <45> and secure it with the Special Screw M5 [48] <46>. (Make sure to mount the Hook Spring [47] <45> with its larger diameter side pointing inward the housing.)

(8) Checking the direction of rotation

Check whether the direction of rotation of Anvil (F) [10] or Anvil (R) Ass'y <7> coincides with the directional markings on the push-on side of Pushing Button (A) [38] <35>. When Pushing Button (A) [38] <35> is turned to (R) side, the direction of rotation of Anvil (F) [10] or Anvil (R) Ass'y <7> should be clockwise, as viewed from behind.

## (9) Lubrication

### (a) ATTOLUB MS No. 2

- Oil groove and claw of Hammer (D) [12] <9>
- 8 mm dia. hole of Anvil (F) [10] or Anvil (R) Ass'y <7>, sliding section between Anvil (F) [10] or Anvil (R) Ass'y <7> and the metal, and upper surface of the claw
- Two Steel Balls D5.556 [11] <8>
- Pinion tooth flanks of the Armature Ass'y DC 12V [26] <23>, tooth flanks of Ring Gear (C) [21] <18>, tooth flanks of the Idle Gear Set [19] <16>
- Metal oil groove of the Hammer Case [8] <4>

### (b) HITACHI MOTOR GREASE No. 29 (WH 12DMR only)

- Two Steel Balls D3.5 [9]
- Sliding section between Anvil (F) [10] and Guide Sleeve (D) [4]

### (c) MOLUB-ALLOY 777-1

- Cam groove and oil groove of Hammer (D) [12] <9>
- Cam groove and sliding section of Spindle (D) [18] <15>
- 5 mm diameter hole of Idle Gear Set [19] <16>
- All around the Needle Roller [20] <17>
- Twenty-eight Steel Balls D3.175 [13] <10>

## (10) Screw tightening torque

- Tapping Screw (W/Sp. Washer) D4 x 25 (Black) [7] <3> .....  $1.96 \pm 0.49 \text{ N}\cdot\text{m}$  ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ ,  $17.4 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
- Tapping Screw (W/Flange) D4 x 20 (Black) [33] <30> .....  $1.96 \pm 0.49 \text{ N}\cdot\text{m}$  ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ ,  $17.4 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
- Machine Screw (W/Washers) M4 x 25 [46] <44> .....  $1.27 \pm 1.96 \text{ N}\cdot\text{m}$  ( $13 \text{ to } 20 \text{ kgf}\cdot\text{cm}$ ,  $2.6 \text{ to } 3.5 \text{ in}\cdot\text{lbs.}$ )
- Machine Screw (W/Sp. Washer) M3 x 5 [36] <33> .....  $0.29 \text{ to } 0.39 \text{ N}\cdot\text{m}$  ( $3 \text{ to } 4 \text{ kgf}\cdot\text{cm}$ ,  $2.6 \text{ to } 3.5 \text{ in}\cdot\text{lbs.}$ )
- Special Screw M5 [48] <46> .....  $1.96 \pm 0.49 \text{ N}\cdot\text{m}$  ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ ,  $17.4 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
- Brush cap [32] <29> .....  $0.78 \pm 0.10 \text{ N}\cdot\text{m}$  ( $8 \pm 1 \text{ kgf}\cdot\text{cm}$ ,  $6.9 \pm 0.9 \text{ in}\cdot\text{lbs.}$ )

## 10-2. 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 14YFA or UC 18YG Battery Charger.

## 11. STANDARD REPAIR TIME (UNIT) SCHEDULES

For WH 12DMR

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed		Work Flow					
WH 12DMR								
			Hook Ass'y	DC-Speed Control Switch				
					Housing (A).(B) Set			
				Inner Cover (A) Armature Ass'y Magnet (E) Brush Block				
		General Assembly	Guide Sleeve (D)	Hammer Case Anvil (F) Ring Gear (C)	Hammer (D) Steel Ball D3.175 Hammer Spring (D) Spindle (D) Idle Gear Set Needle Roller Ball Bearing (6901VV)			

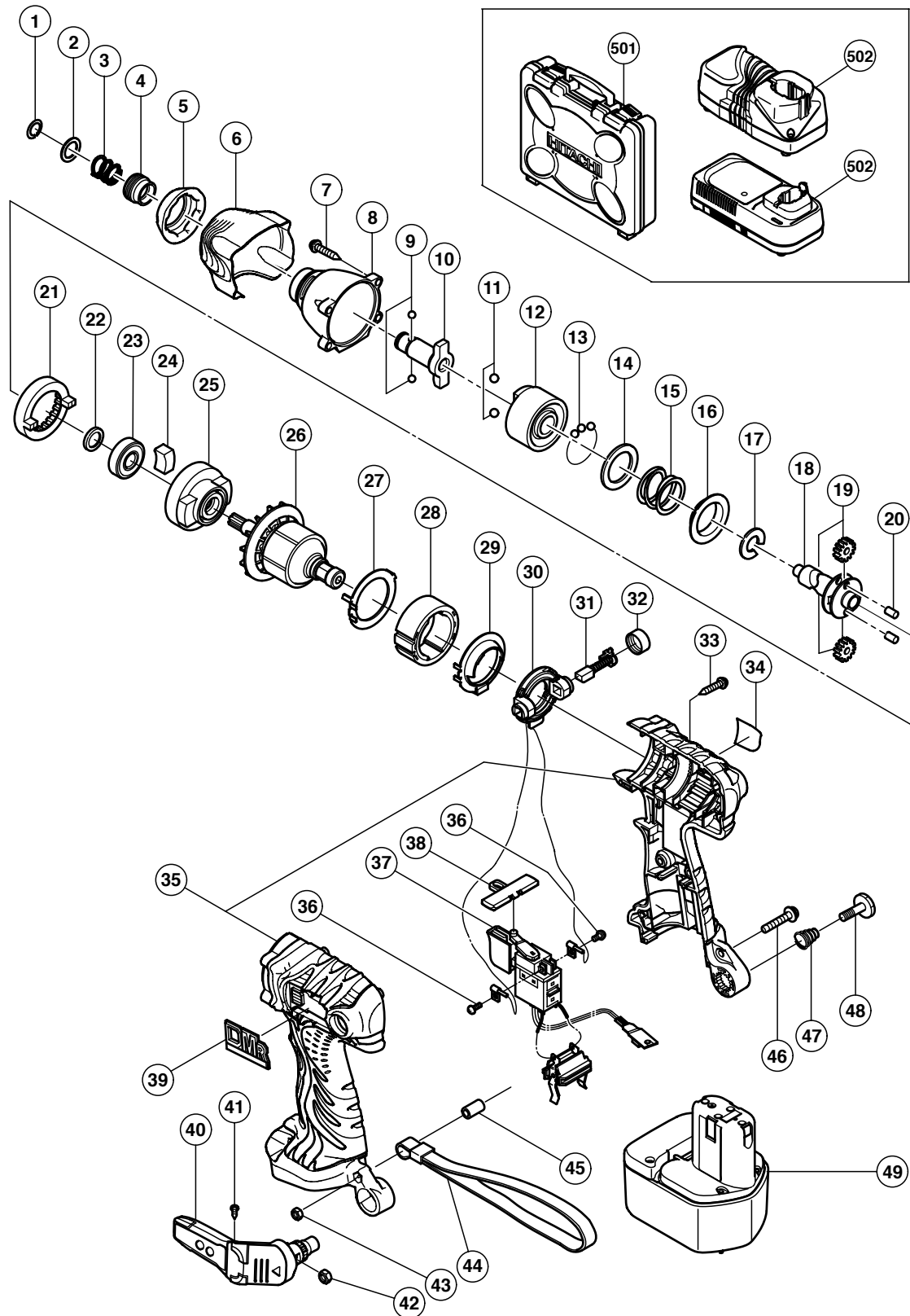
For WR 12DMR

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
WR 12DMR		Work Flow						
		Hook Ass'y		DC-Speed Control Switch				
					Housing (A).(B) Set			
				Inner Cover (A) Armature Ass'y Magnet (E) Brush Block				
		General Assembly						
				Hammer Case Anvil (R) Ass'y Ring Gear (C)	Hammer (D) Steel Ball Hammer Spring (D) Spindle (D) Idle Gear Set Needle Roller Ball Bearing (6901VV)			

## ELECTRIC TOOL PARTS LIST

### ■ CORDLESS IMPACT DRIVER Model WH 12DMR

2005 · 6 · 10  
(E2)



# PARTS

WH 12DMR

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	315-984	RETAINING RING	1		
2	315-983	WASHER (D)	1		
3	322-716	GUIDE SPRING (B)	1		
4	322-717	GUIDE SLEEVE (D)	1		
5	322-727	FRONT CAP (B)	1		
6	322-728	PROTECTOR (C)	1		
7	319-917	TAPPING SCREW (W/SP. WASHER) D4X25 (BLACK)	4		
8	321-674	HAMMER CASE	1		
9	319-535	STEEL BALL D3.5 (10 PCS.)	2		
10	322-248	ANVIL (F)	1		
11	959-154	STEEL BALL D5.556 (10 PCS.)	2		
12	321-656	HAMMER (D)	1		
13	959-148	STEEL BALL D3.175 (10 PCS.)	28		
14	315-978	WASHER (J)	1		
15	321-660	HAMMER SPRING (D)	1		
16	316-172	WASHER (S)	1		
17	316-171	STOPPER	1		
18	321-666	SPINDLE (D)	1		
19	321-667	IDLE GEAR SET (2 PCS.)	2		
20	319-914	NEEDLE ROLLER	2		
21	320-877	RING GEAR (C)	1		
22	319-911	WASHER (E)	1		
23	690-1VV	BALL BEARING 6901VVCMP2L	1		
24	319-909	DAMPER	2		
25	321-664	INNER COVER (A)	1		
26	360-641	ARMATURE ASS'Y DC 12V	1		
27	322-719	SIDE YOKE	1		
28	322-723	MAGNET (E)	1		
29	322-720	DUST GUARD FIN (B)	1		
30	321-662	BRUSH BLOCK	1		
31	999-054	CARBON BRUSH 5X6X11.5 (1 PAIR)	2		
32	319-918	BRUSH CAP	2		
33	302-086	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	7		
34		NAME PLATE	1		
* 35	323-019	HOUSING (A).(B) SET (RED)	1		
* 35	322-725	HOUSING (A).(B) SET (GREEN)	1		
* 35	323-020	HOUSING (A).(B) SET (GOLD)	1		
36	994-532	MACHINE SCREW (W/SP. WASHER) M3X5	2		
37	319-906	DC-SPEED CONTROL SWITCH	1		
38	321-661	PUSHING BUTTON (A)	1		
39	323-021	HITACHI PLATE	1		
40	321-918	HOOK ASS'Y (W/LIGHT)	1	INCLUD. 41, 42	
41	321-672	TAPPING SCREW D2X6	2		
42	320-288	V-LOCK NUT M5	1		
43	949-565	LOCK NUT M4 (10 PCS.)	1		
44	306-952	STRAP (BLACK)	1		
45	322-718	SLEEVE (A)	1		
46	676-386	MACHINE SCREW (W/WASHERS) M4X25	1		
47	319-926	HOOK SPRING	1		
48	319-927	SPECIAL SCREW M5	1		
* 49	320-387	BATTERY EB 1220BL (W/ENGLISH N.P.)	2		



## PARTS

**WH 12DMR**

[illegible]

## STANDARD ACCESSORIES

**WH 12DMR**

[illegible]

## OPTIONAL ACCESSORIES

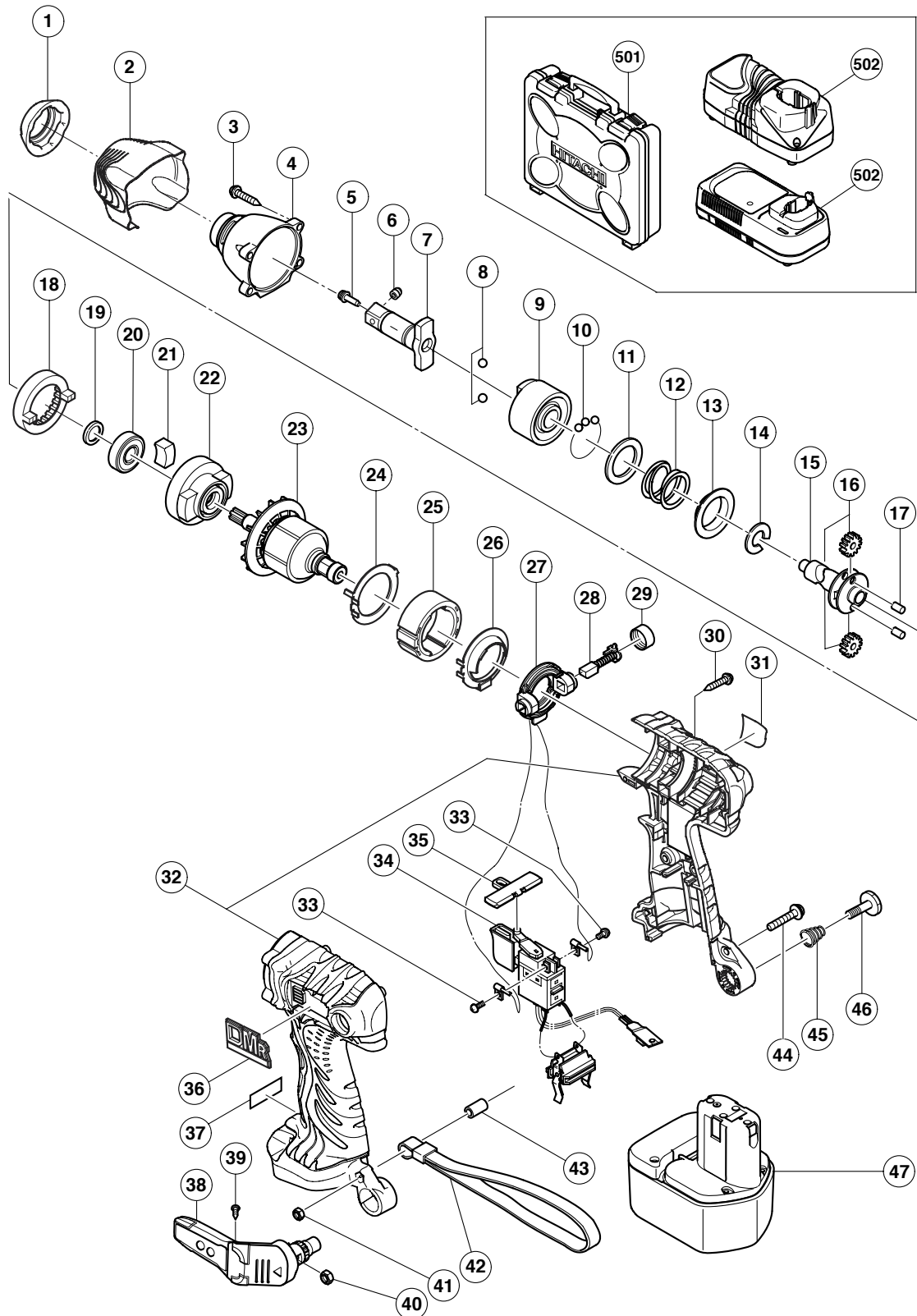
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## ELECTRIC TOOL PARTS LIST

### ■ CORDLESS IMPACT WRENCH Model WR 12DMR

2005 · 4 · 1

(E1)



# PARTS

WR 12DMR

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	322-727	FRONT CAP (B)	1		
2	322-728	PROTECTOR (C)	1		
3	319-917	TAPPING SCREW (W/SP. WASHER) D4X25 (BLACK)	4		
4	322-172	HAMMER CASE	1		
* 5	323-542	PIN RETAINER (A)	1		
* 6	323-541	PLUNGER (A)	1		
* 7	322-173	ANVIL (R) ASS'Y	1	INCLUD. 5, 6 TYPE FOR W/PLUNGER (A), PIN RETAINER (A)	
* 7	322-732	ANVIL (U)	1	TYPE FOR W/O PLUNGER (A), PIN RETAINER (A)	
8	959-154	STEEL BALL D5.556 (10 PCS.)	2		
9	321-656	HAMMER (D)	1		
10	959-148	STEEL BALL D3.175 (10 PCS.)	28		
11	315-978	WASHER (J)	1		
12	321-660	HAMMER SPRING (D)	1		
13	316-172	WASHER (S)	1		
14	316-171	STOPPER	1		
15	321-666	SPINDLE (D)	1		
16	321-667	IDLE GEAR SET (2 PCS.)	2		
17	319-914	NEEDLE ROLLER	2		
18	320-877	RING GEAR (C)	1		
19	319-911	WASHER (E)	1		
20	690-1VV	BALL BEARING 6901VVCMP52L	1		
21	319-909	DAMPER	2		
22	321-664	INNER COVER (A)	1		
23	360-641	ARMATURE ASS'Y DC 12V	1		
24	322-719	SIDE YOKE	1		
25	322-723	MAGNET (E)	1		
26	322-720	DUST GUARD FIN (B)	1		
27	321-662	BRUSH BLOCK	1		
28	999-054	CARBON BRUSH 5X6X11.5 (1 PAIR)	2		
29	319-918	BRUSH CAP	2		
30	302-086	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	7		
31		NAME PLATE	1		
32	324-282	HOUSING (A). (B) SET	1		
33	994-532	MACHINE SCREW (W/SP. WASHER) M3X5	2		
34	319-906	DC-SPEED CONTROL SWITCH	1		
35	321-661	PUSHING BUTTON (A)	1		
36	324-280	HITACHI PLATE	1		
* 37		CAUTION PLATE (A)	1	FOR USA, CAN	
38	321-918	HOOK ASS'Y (W/LIGHT)	1	INCLUD. 39, 40	
39	321-672	TAPPING SCREW D2X6	2		
40	320-288	V-LOCK NUT M5	1		
41	949-565	LOCK NUT M4 (10 PCS.)	1		
42	306-952	STRAP (BLACK)	1		
43	322-718	SLEEVE (A)	1		
44	324-278	MACHINE SCREW (W/WASHERS) M4X25 (BLACK)	1		
45	319-926	HOOK SPRING	1		
46	319-927	SPECIAL SCREW M5	1		
* 47	320-388	BATTERY EB 1230HL (W/ENGLISH N.P.)	2		
* 47	323-226	BATTERY EB 1226HL (W/ENGLISH N.P.)	2		
* 47	320-387	BATTERY EB 1220BL (W/ENGLISH N.P.)	2		

## PARTS

WR 12DMR

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
* 47	320-386	BATTERY EB 1220BL (W/ENGLISH N.P.)	2	FOR USA, CAN	
* 47	324-279	BATTERY EB 1220BL (W/ENGLISH N.P.)	2	FOR TPE	

## STANDARD ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501	322-070	CASE	1		
* 502		CHARGER (MODEL UC 14YFA)	1		
* 502		CHARGER (MODEL UC 18YG)	1		

## OPTIONAL ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
* 601	310-378	BATTERY EB 12B (W/ENGLISH N.P.)	1		
* 601	310-452	BATTERY EB 12B (W/ENGLISH N.P.)	1	FOR NZL, AUS	
* 601	310-453	BATTERY EB 12B (W/ENGLISH N.P.)	1	FOR USA, CAN	
602		CORNER ATTACHMENT ASS'Y	1	INCLUD. 603-619	
603	955-300	HOUSING	1		
604	955-301	METAL	3		
605	955-302	SPINDLE	1		
606		HITACHI LABEL	1		
607	955-303	BEARING RACE	2		
608	955-304	NEEDLE THRUST BEARING (NTA-1413)	2		
609	955-305	COVER	1		
610	955-306	NEEDLE BEARING (NTN BK1012)	1		
611	948-227	RETAINING RING FOR D47 HOLE	1		
612	955-307	PINION	1		
613	955-308	SLEEVE	1		
614	955-309	WASHER	1		
615	955-310	SOCKET COVER	1		
616	955-311	SOCKET	1		
617	303-247	SEAL LOCK HEX. SOCKET HD. BOLT M5X25	6		
618	873-537	SOCKET PIN	1		
619	873-187	O-RING (J1SW1516)	1		
620	991-481	FORM TIE SOCKET ASS'Y 11.3MMX95L	1	INCLUD. 618, 619	
621	992-610	UNIVERSAL JOINT ASS'Y	1	INCLUD. 618, 619	
622	955-153	UNIVERSAL JOINT PIN	1		
623	991-476	BIT ADAPTER ASS'Y	1	INCLUD. 618, 619	
624	944-291	HEX. SOCKET ASS'Y 10MMX40L	1	INCLUD. 618, 619	
625	873-632	HEX. SOCKET ASS'Y 12MMX40L	1	INCLUD. 618, 619	
626	873-539	HEX. SOCKET ASS'Y 13MMX40L	1	INCLUD. 618, 619	
627	873-540	HEX. SOCKET ASS'Y 14MMX40L	1	INCLUD. 618, 619	
628	873-536	HEX. SOCKET ASS'Y 17MMX32L	1	INCLUD. 618, 619	
629	873-624	HEX. SOCKET ASS'Y 19MMX34L	1	INCLUD. 618, 619	

## OPTIONAL ACCESSORIES

WR 12DMR

[illegible]

