

MODELS

WH 9DM2

WR 9DM2

Hitachi Power Tools

CORDLESS IMPACT DRIVER
WH 9DM2
CORDLESS IMPACT WRENCH
WR 9DM2

TECHNICAL DATA
AND
SERVICE MANUAL



WH 9DM2



WR 9DM2

LIST Nos. WH 9DM2: G801
WR 9DM2: G802

Mar. 2004

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 9DM2

| Symbol Utilized | Competitor | |
|-----------------|--------------|------------|
| | Company Name | Model Name |
| C | MAKITA | BTD061 |
| | | |
| | | |

WR 9DM2

| Symbol Utilized | Competitor | |
|-----------------|--------------|------------|
| | Company Name | Model Name |
| C | MAKITA | 6991D |
| | | |
| | | |

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1. PRODUCT NAME

Hitachi Cordless Impact Driver, Model WH 9DM2

Hitachi Cordless Impact Wrench, Model WR 9DM2

2. MARKETING OBJECTIVE

The new cordless impact driver Model WH 9DM2 ("Super Impact 9") and the new cordless impact wrench Model WR 9DM2 ("Super Wrench 9") are brought out as DC 9.6 V products of the Super Impact series. They are upgraded versions of the current Models WH 9DM and WR 9DM, developed to expand the market share and the sales.

The new Model WH 9DM2 provides the lower maximum tightening torque 80 N·m than that of the current Model WH 9DM (95 N·m). This is to realize a lightweight and compact driver (overall length 20 mm, product weight 200 g). The Model WH 9DM2 is very convenient for tightening small screws such as sash screws requiring less tightening torque.

The new Model WR 9DM2 provides the class-top tightening torque 120 N·m that is 40% higher than the current Model WR 9DM.

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 Model WH 9DM2

The shortest overall length in the class

147 mm

- Convenient for work in narrow places



Lightweight 1.2 kg

- Easy to operate for a long time
- Easily portable

Selling points common to the Model WH 12DM2

- New design
- Elastomer is new titanium silver color.
- Protector is standard.
- Convenient light equipped hook
- High durability, dust resistance and long service life
- Advanced case (excellent accommodation)

30% lower striking start torque

- Optimum for light-duty works such as tightening sash screws, plastic screws and Teks screws

(2) Cordless impact wrench Model WR 9DM2

9.5 mm (3/8")
(Reference) WR 12DM2: 12.7 mm (1/2")

Class-top tightening torque

120 N·m {1220 kgf·cm}

- C: 100 N·m

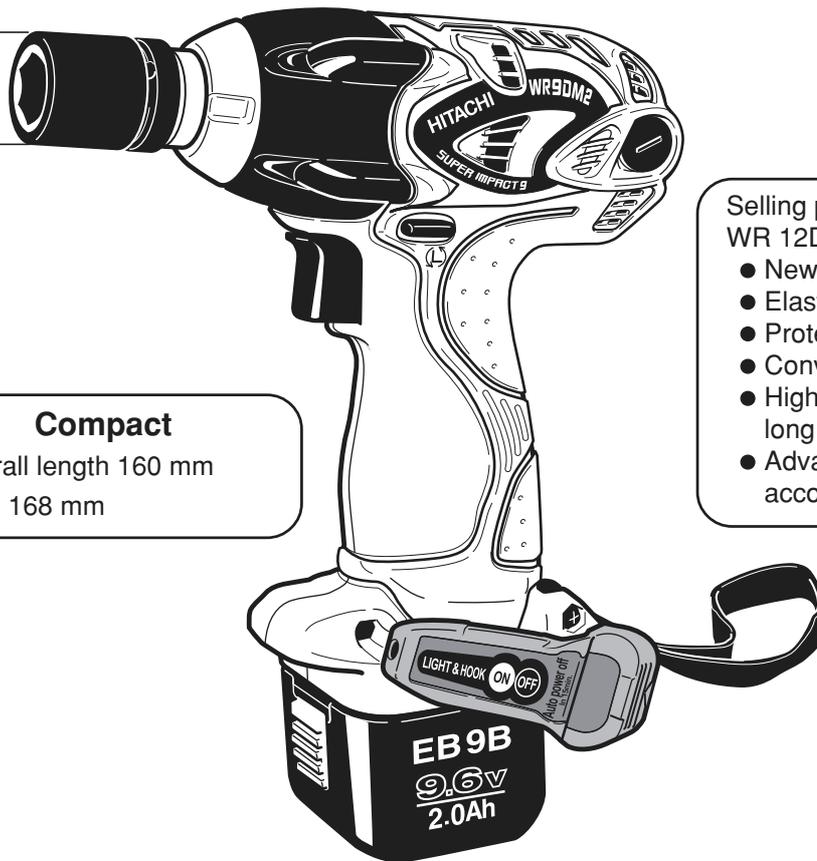
Compact

Overall length 160 mm

- C: 168 mm

Selling points common to the Model WR 12DM2

- New design
- Elastomer is new titanium silver color.
- Protector is standard.
- Convenient light equipped hook
- High durability, dust resistance and long service life
- Advanced case (excellent accommodation)



4-1. Selling Point Descriptions

Refer to pages 4 through 10 of Technical Data Service Manual for the Models WH 12DM2/WR 12DM2 for common selling points.

- Model WH 9DM2

(1) The shortest overall length in the class 147 mm / light weight 1.2 kg

To realize a lightweight and compact driver, the Model WH 9DM2 provides the lower maximum tightening torque 80 N·m than that of the current Model WH 9DM (95 N·m).

① Equipped with a new rare-earth magnet motor having 1.2 times greater magnetic force (Same as the Model WH 12DM2)

The Model WH 9DM2 is equipped with a new rare-earth magnet motor that is smaller than the Model WH 9DM by 30% while providing higher power.

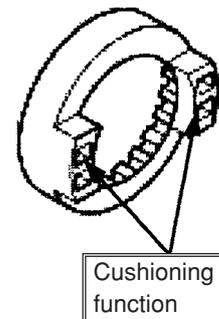
- Comparison of the armature

| Product | Unit | Hitachi WH 9DM2 | Hitachi WH 9DM | C |
|----------------|------|-----------------|-----------------|----------------|
| Thickness | mm | 12 (15/32") | 17 (43/64") | 12.5 (1/2") |
| Overall length | mm | 79 (7/64") | 86 (25/64") | 74 (29/32") |
| Weight | g | 92 (0.2 lbs.) | 111 (0.25 lbs.) | 75 (0.17 lbs.) |



② Equipped with a reinforced plastic gear for the decelerating unit

The gear is made of heat-resistant nylon resin reinforced with fiberglass. It is lightweight and strong. In addition, the gear is uniquely shaped so that the gear itself has the cushioning function. The Model WH 9DM2 is lightweight thanks to deletion of the damper (a cushioning part) that is used in the Model WH 12DM2.



- Comparison of the decelerating unit

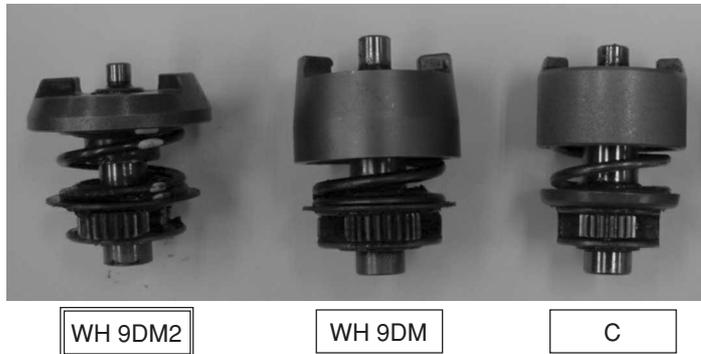
| Product | Unit | Hitachi WH 9DM2 | Hitachi WH 9DM | C |
|----------------|------|-----------------|-----------------|-----------------|
| Overall length | mm | 22.6 (57/64") | 25.2 (63/64") | 25.5 (1") |
| Weight | g | 30 (0.066 lbs.) | 53 (0.117 lbs.) | 44 (0.097 lbs.) |

③ Compact and lightweight hammer assembly

The hammer assembly is newly designed according to the maximum tightening torque 80 N·m.

- Comparison of the hammer assembly

| Product | Unit | Hitachi WH 9DM2 | Hitachi WH 9DM | C |
|----------------|------|-----------------|-----------------|-----------------|
| Overall length | mm | 48.6 (1-29/32") | 57.6 (2-17/64") | 57.0 (2-15/64") |
| Weight | g | 160 (0.35 lbs.) | 214 (0.47 lbs.) | 175 (0.39 lbs.) |



④ Appearance and dimensions

Cordless impact driver: Model WH 9DM2

| Product | Unit | Hitachi WH 9DM2 | Hitachi WH 9DM | C | |
|----------------|----------------|-----------------|----------------|----------------|----------------|
| Overall length | mm | 147 (5-25/32") | 167 (6-37/64") | 164 (6-29/64") | |
| Center height | mm | 26.5 (1-3/64") | 26 (1-1/64") | 25 (1-63/64") | |
| Height | mm | 223 (8-25/32") | 221 (8-45/64") | 236 (9-5/16") | |
| Weight | Catalog value | kg | 1.2 (2.6 lbs) | 1.4 (3 lbs) | 1.1 (2.4 lbs) |
| | Measured value | kg | 1.29 (2.8 lbs) | 1.46 (3.2 lbs) | 1.13 (2.5 lbs) |

(2) 30% lower striking start torque

The Model WH 9DM2 has lower striking start torque 0.68 Nm {6.9 kgf·cm, 6.0 in-lbs} than the current Model WH 9DM (0.95 Nm {9.7 kgf·cm, 8.4 in-lbs}) to minimize damage to the screws. Thanks to the lower striking start torque, the Model WH 9DM2 is optimum for light-duty works such as tightening sash screws, plastic screws and Teks screws because it gives less damage to the small screws and the workpieces.

Table 1 shows a comparison of number of trigger switch operations when tightening a tapping screw D4 x 25 in a workpiece of nylon resin (prepared hole diameter 3.5 mm) until each driver idles. The Model WH 9DM2 has the highest resistance to idling because the number of adjustments is most frequent. (The switch is turned off immediately after striking is started. The higher the striking start torque, the longer tightening time is required and the driver is apt to idle.)

Table 1

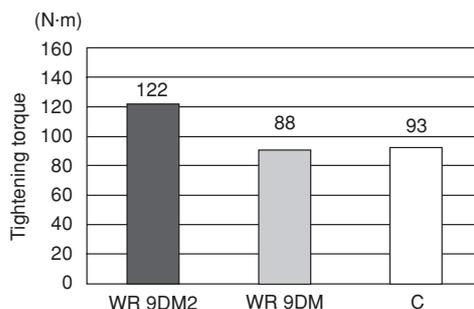
| Model | Number of trigger switch depressing | Striking start torque |
|----------------------|-------------------------------------|--------------------------------------|
| WH 9DM2 | 8.6 times | 0.68 N·m {6.9 kgf·cm, 6.0 in-lbs.} |
| WH 9DM | 5.0 times | 0.95 N·m {9.7 kgf·cm, 8.4 in-lbs.} |
| C | 7.4 times | 0.71 N·m {7.2 kgf·cm, 6.2 in-lbs.} |
| (Reference) WH 12DM2 | 2.0 times | 1.26 N·m {12.8 kgf·cm, 11.1 in-lbs.} |

* The data above are intended for reference purpose only because actual number of trigger switch depressing may vary depending on tightening conditions.

- Model WR 9DM2

(1) Class-top tightening torque 120 N·m (1220 kgf·cm, 1060 in-lbs.)

The right graph shows a comparison of tightening torque when tightening an M12 high-strength bolt with a hexagonal socket (overall length 33 mm) for 3 seconds. The Model WR 9DM2 provides the class-top tightening torque that is 40% higher than the current Model WR 9DM and 30% higher than C.



(2) Compact

The overall length of the Model WR 9DM2 is 7 mm shorter than the current Model WR 9DM and 8 mm shorter than C. It is convenient for work in narrow places.

Cordless impact wrench: Model WR 9DM2

| Product | | Unit | Hitachi WR 9DM2 | Hitachi WR 9DM | C |
|----------------|----------------|------|-----------------|-----------------|-----------------|
| Overall length | | mm | 160 (6-19/64") | 167 (6-37/64") | 168 (6-39/64") |
| Center height | | mm | 26.5 (1-3/64") | 26 (1-1/64") | 26 (1-1/64") |
| Height | | mm | 223 (8-25/32") | 221 (8-45/64") | 231 (9-3/32") |
| Weight | Catalog value | kg | 1.4 (3 lbs.) | 1.4 (3 lbs.) | 1.4 (3 lbs.) |
| | Measured value | kg | 1.43 (3.1 lbs.) | 1.46 (3.2 lbs.) | 1.49 (3.3 lbs.) |

5. SPECIFICATIONS

5-1. Specifications

| Item | Model | Cordless impact driver WH 9DM2 | Cordless impact wrench WR 9DM2 |
|--------------------------|-----------|--|--|
| Capacity | | Small screw M4 – M8 (5/32" – 5/16")* ¹ 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 | | 80 N·m (820 kgf·cm, 710 in-lbs.)* ² | 120 N·m (1220 kgf·cm, 1060 in-lbs.)* ³ |
| 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 – 2,800 /min | 0 – 2,600 /min |
| Impact rate | | 0 – 3,200 /min | |
| Weight | Main body | 1.2 kg (2.6 lbs.) | 1.4 kg (3.0 lbs.) |
| | Battery | 0.55 kg (1.2 lbs.) | |
| Overall length x height | | 147 mm (5-25/32") x 223 mm (8-25/32") | 160 mm (6-37/64") x 223 mm (8-25/32") |
| Center height | | 26.5 mm (1-3/64") | |
| Battery (Type EB 9B) | | Sealed cylindrical nickel-cadmium batteries Nominal voltage: DC 9.6V Nominal life: Charging/discharging approximately 1,000 cycles (in the case of Model UC 14YF2, UC 14YFA) 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 the case of Model UC 14YF2, UC 14YFA) 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 (Δ^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. | |

| | |
|------------------------|--|
| Charger (For UC 14YFA) | <p>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 (Δ^2V system) Battery temperature detection (dT/dt system) for Ni-MH battery (2) Battery surface temperature detection (thermistor) (3) 120-minute timer</p> <p>Output voltage: 7.2 V – 14.4 V Output current: 2.6 A Charging time: Approx. 50 minutes (for B-type storage battery at 20 °C) Approx. 70 minutes (for H-type storage battery at 20 °C) Product weight: 0.6 kg Operable ambient temperature range: 0 °C – 40 °C The maximum allowable temperature of the EB 9B type battery is 55 °C and the EB 930H type battery is 45 °C.</p> |
|------------------------|--|

*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 M12 (15/32") bolt (strength grade: 12.9) for 3 seconds with a hexagonal socket.

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

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

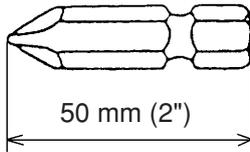
Pilot lamp indications (Models UC 14YF2 and UC 14YFA)

| | | | | |
|--|--------------------------|----------|---|--|
| 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. |

5-2. Optional Accessories

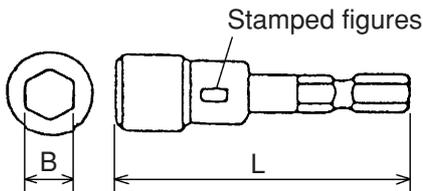
(1) Optional accessories for the Model WH 9DM2

- Plus driver bit



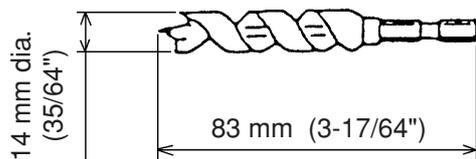
| Bit No. | Code No. |
|---------|----------|
| No. 2 | 992671 |
| No. 3 | 992672 |

- Hexagon socket



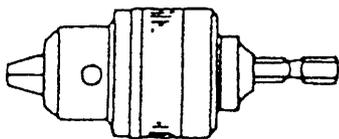
| Part name | Stamped figures | L (mm) | B (mm) | Code No. |
|-----------------------------------|-----------------|----------------|-------------|----------|
| 5 mm Hexagon socket | 8 | 65 (2-9/16") | 8 (5/16") | 996177 |
| 6 mm Hexagon socket | 10 | 65 (2-9/16") | 10 (3/8") | 985329 |
| 5/16" Hexagon 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)



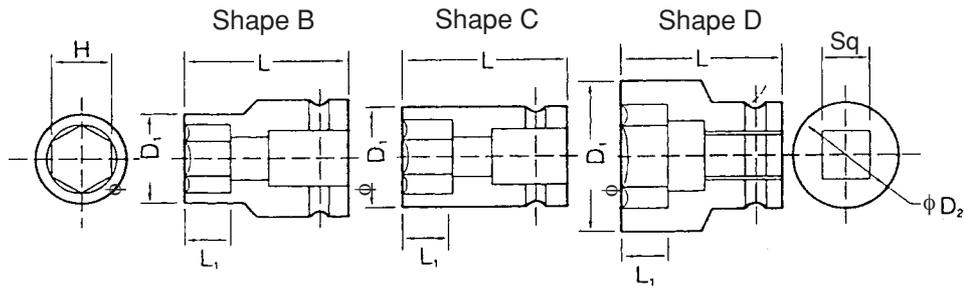
- Drill chuck adaptor set (Code No. 996195)

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



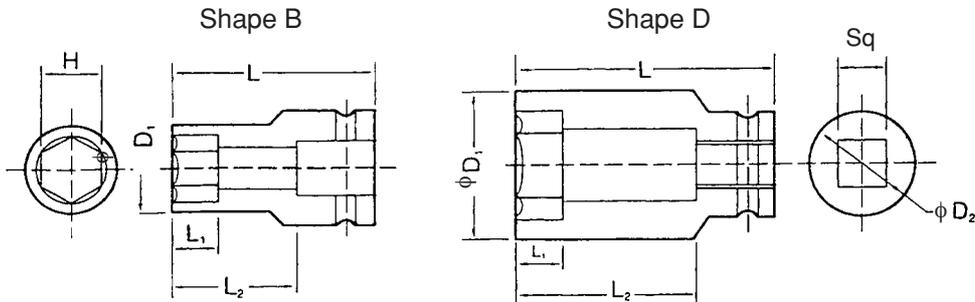
(2) Optional accessories for the Model WR 9DM2

- 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 ₁ | φ D ₁ | φ D ₂ | | |
| 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 |

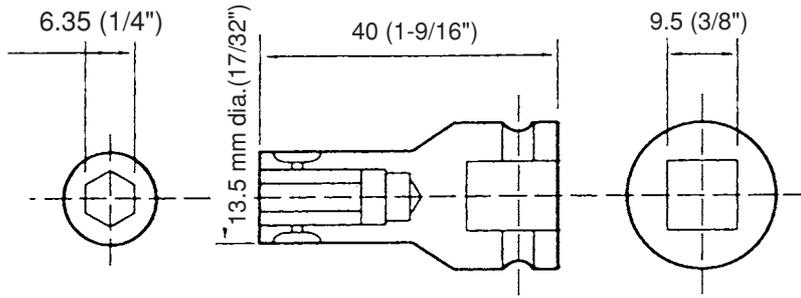
- Primary dimensions and applicable bolts for accessory long sockets:



| 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 ₁ | L ₂ | φ D ₁ | | φ D ₂ | |
| 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 9DM2 | WH 9DM | |
| Catalog specifications | Capacity | Small screw | | M 4 – M 8 (5/32" – 5/16")* ¹ | M 4 – M 8 (5/32" – 5/16")* ¹ | 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* ² | | N·m | 80 (820 kgf·cm, 710 in-lbs.) | 95 (970 kgf·cm, 840 in-lbs.) | 65 (663 kgf·cm, 575 in-lbs.) |
| | No-load rotation speed | | /min | 0 – 2,800 | 0 – 2,300 | 0 – 2,500 |
| | Impact rate | | /min | 0 – 3,200 | 0 – 3,000 | 0 – 3,000 |
| | Main body weight* ³ | | kg | 1.2 (2.6 lbs) | 1.4 (3.0 lbs) | 1.1 (2.4 lbs) |
| Measured figures | Max. tightening torque* ² | | N·m | 82 (835 kgf·cm, 725 in-lbs.) | 99 (1010 kgf·cm, 877 in-lbs.) | 65 (663 kgf·cm, 575 in-lbs.) |
| | No-load rotation speed | | /min | 0 – 2,570 | 0 – 2,360 | 0 – 2,640 |
| | Impact rate | | /min | 0 – 3,190 | 0 – 2,870 | 0 – 2,850 |
| | Overall length x height | | mm | 147 x 223 (5-25/32" x 8-25/32") | 167 x 221 (6-37/64" x 8-45/64") | 164 x 236 (6-29/64" x 9-5/16") |
| | Center height | | mm | 26.5 (1-3/64") | 26 (1-1/64") | 25 (1-63/64") |
| | Main body weight* ³ | | kg | 1.29 (2.8 lbs) | 1.46 (3.2 lbs) | 1.13 (2.5 lbs) |
| | No-load sound pressure level | | dB(A) | 70 | 69 | 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 | 21 | | 24 | 15 |
| Battery | Type | | EB 9B or EB 930H | | EB 9B or EB 930H | BH9020 |
| | Nominal capacity | Ah | EB 9B: 2.0 EB 930H: 3.0 | | EB 9B: 2.0 EB 930H: 3.0 | BH9020: 2.0 |
| | Nominal voltage | V | 9.6 | | 9.6 | 9.6 |
| | Ambient temperature | °C | 0 – 40 | | 0 – 40 | — |
| Charger | Model | | UC 14YF2 or UC 14YFA | | UC 14YF2 | DC 14RA |
| | Power input capacity | VA | 44 or 56 | | 44 | — |
| | Recharging voltage | V | 7.2 – 14.4 | | 7.2 – 14.4 | 7.2 – 14.4 |
| Standard accessories | | | <ul style="list-style-type: none"> • Plastic tool case • Charger (UC 14YF2 or UC 14YFA) | | <ul style="list-style-type: none"> • Plastic tool case • Charger (UC 14YF2) | <ul style="list-style-type: none"> • Plastic tool case • Charger (DC14RA) |

*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 M12 (5/32") bolt (strength grade: 12.9) for 3 seconds with a hexagon socket.

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

6-2. Specification Comparisons (Cordless Impact Wrench)

| Item | | Maker | | HITACHI | | C |
|--------------------------------|--------------------------------------|--------------------|---|---|---|-------------------------------|
| | | Model | | WR 9DM2 | WR 9DM | |
| Catalog specifications | Capacity | Ordinary bolt | | M 6 – M 14 (1/4" – 9/16") | M 6 – M 14 (1/4" – 9/16") | M 8 – M 14 (5/16" – 9/16") |
| | | High-strength bolt | | M 6 – M 10 (1/4" – 3/8") | M 6 – M 10 (1/4" – 3/8") | M 6 – M 10 (1/4" – 3/8") |
| | Max. tightening torque ^{*1} | N·m | 120 (1220 kgf·cm, 1060 in-lbs.) | 88.2 (900 kgf·cm, 780 in-lbs.) | 100 (1020 kgf·cm, 885 in-lbs.) | |
| | No-load rotation speed | /min | 0 – 2,600 | 0 – 2,300 | 0 – 2,300 | |
| | Impact rate | /min | 0 – 3,200 | 0 – 3,000 | 0 – 3,000 | |
| Main body weight ^{*2} | | kg | 1.4 (3.0 lbs.) | 1.4 (3.0 lbs.) | 1.4 (3.0 lbs.) | |
| Measured figures | Max. tightening torque ^{*1} | N·m | 122 (1240 kgf·cm, 1076 in-lbs.) | 88.2 (900 kgf·cm, 780 in-lbs.) | 93 (950 kgf·cm, 825 in-lbs.) | |
| | No-load rotation speed | /min | 0 – 2,460 | 0 – 2,360 | 0 – 2,300 | |
| | Impact rate | /min | 0 – 3,230 | 0 – 3,185 | 0 – 2,885 | |
| | Overall length x height | mm | 160 x 223 (6-19/64" x 8-25/32") | 167 x 221 (6-37/64" x 8-45/64") | 168 x 231 (6-39/64" x 9-3/32") | |
| | Center height | mm | 26.5 (1-3/64") | 26 (1-1/64") | 26 (1-1/64") | |
| | Main body weight ^{*2} | kg | 1.43 (3.1 lbs.) | 1.46 (3.2 lbs.) | 1.49 (3.3 lbs.) | |
| | No-load sound pressure level | dB(A) | 70 | 69 | 69 | |
| Tip condition | | | 9.5 mm (3/8") square drive | 9.5 mm (3/8") square drive | 9.5 mm (3/8") square drive | |
| Tool tip mounting system | | | Retaining ring | Plunger | Retaining ring | |
| 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 | 24 | 22 | |
| Battery | Type | | EB 9B or EB 930H | EB 9B or EB 930H | 9122 | |
| | Nominal capacity | Ah | EB 9B: 2.0 EB 930H: 3.0 | EB 9B: 2.0 EB 930H: 3.0 | 2.0 | |
| | Nominal voltage | V | 9.6 | 9.6 | 9.6 | |
| | Ambient temperature | °C | 0 – 40 | 0 – 40 | – | |
| Charger | Model | | UC 14YF2 or UC 14YFA | UC 14YF2 | DC1411 | |
| | Power input capacity | VA | 44 or 56 | 44 | – | |
| | Recharging voltage | V | 7.2 – 14.4 | 7.2 – 14.4 | 7.2 – 14.4 | |
| Standard accessories | | | <ul style="list-style-type: none"> Plastic tool case Charger (UC 14YF2 or UC 14YFA) | <ul style="list-style-type: none"> Plastic tool case Charger (UC 14YF2) | <ul style="list-style-type: none"> Plastic tool case Charger (DC1411) | |

*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.

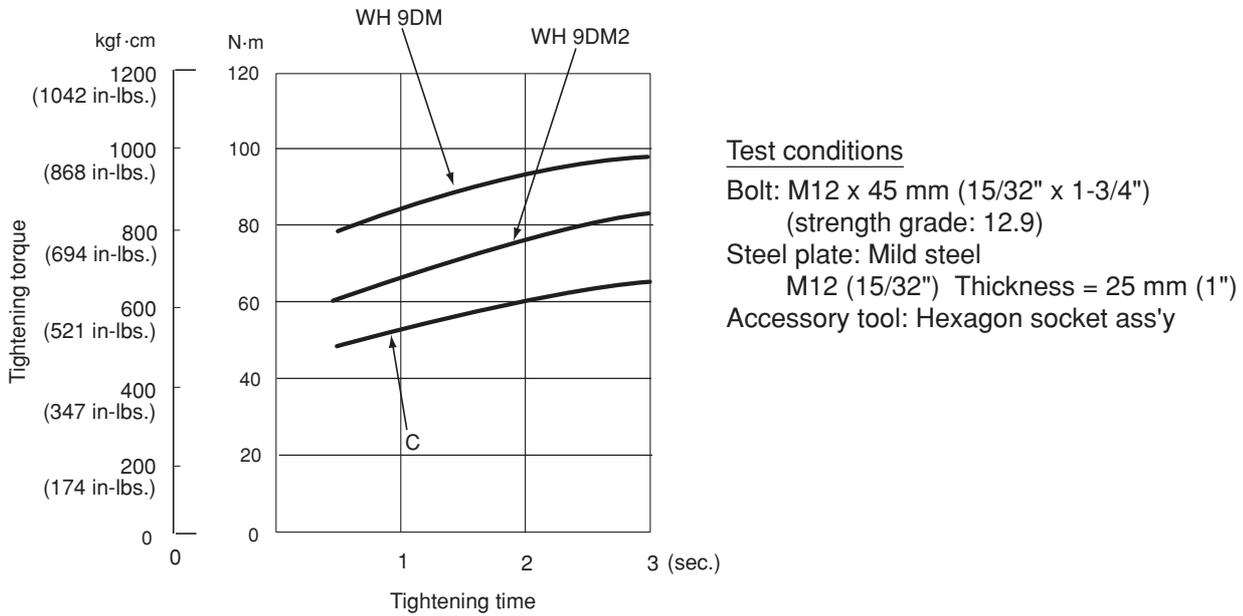


Fig. 1-1

(2) Impact wrench

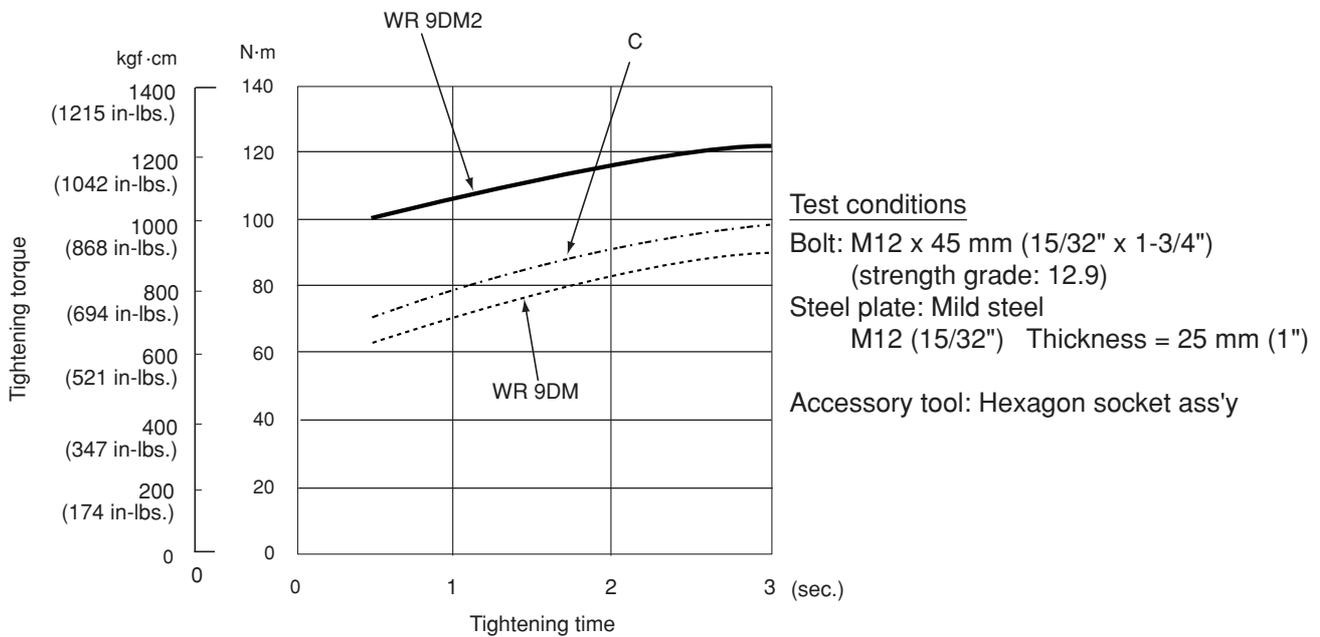


Fig. 1-2

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 ²) | 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 ²) | 14.2 | 20.1 | 36.6 | 58.0 | 84.3 | 115 |

- Thread diameter and appropriate tightening torque

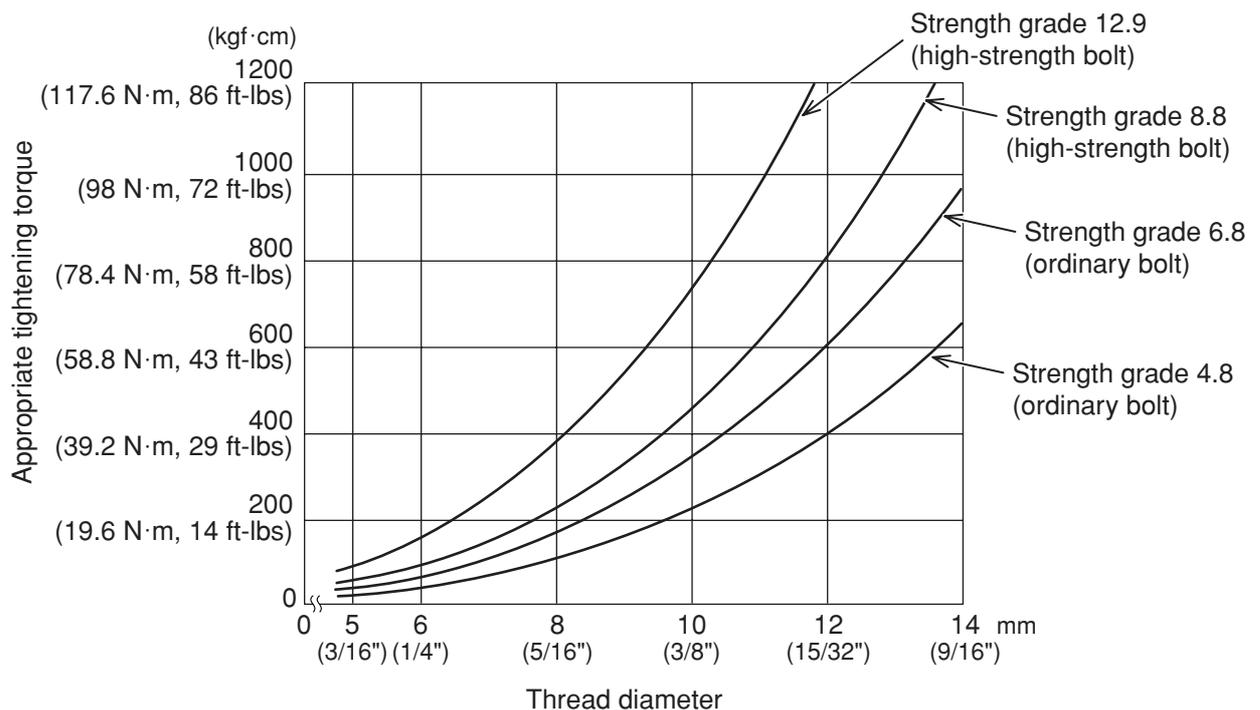


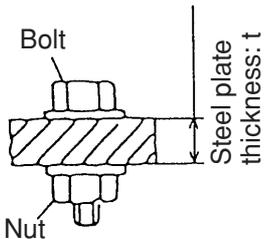
Fig. 2

6-3-3. Bolt tightening torque characteristics

Figures 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 9DM2

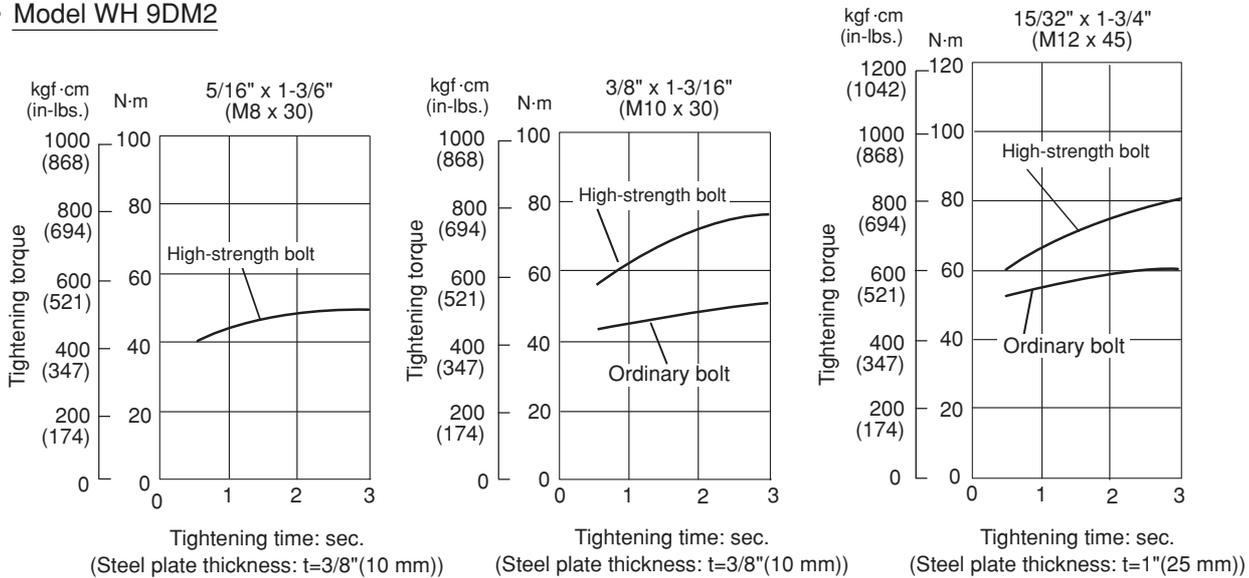


Fig. 3-1

• Model WR 9DM2

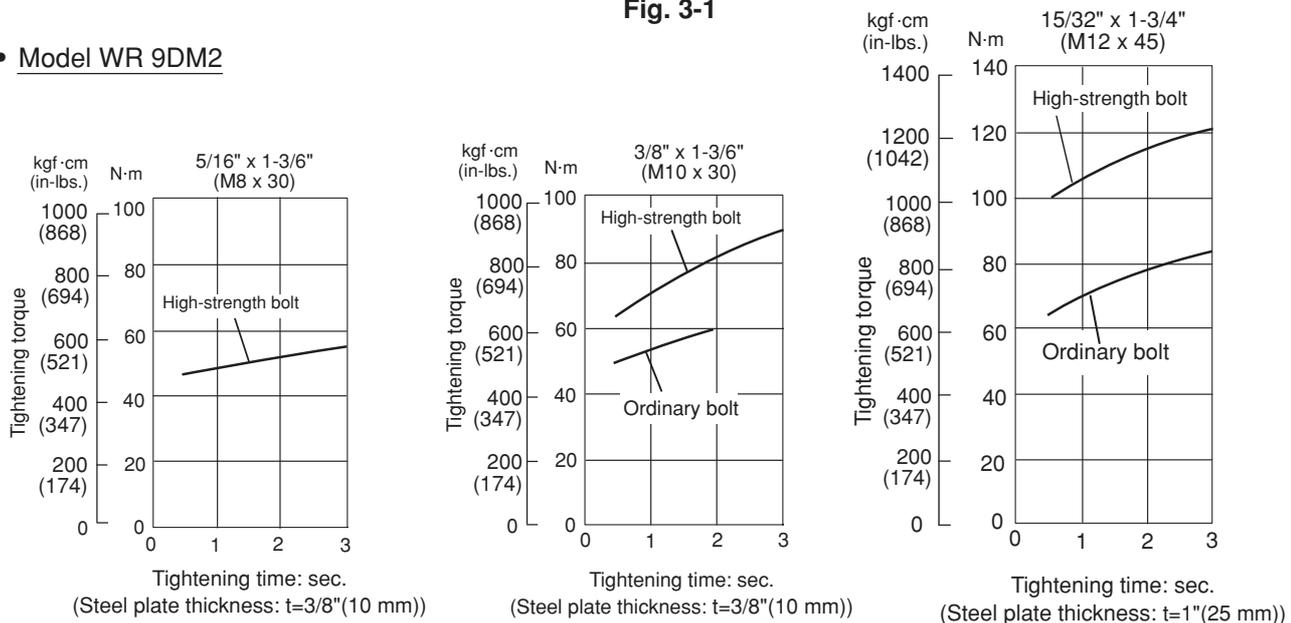


Fig. 3-2

6-4. Tightening Speed

Tightening speed comparison is shown below. The data below are intended for general reference only because actual tightening speed may vary depending on ambient temperature, characteristics of battery, etc.

① Wood screw 4.0 mm dia., 50 mm length, lauan

| Model | ← Fast | | | | | Slow → | | | | | sec. |
|-----------------|--------|---|---|---|---|--------|---|---|---|----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| HITACHI WH 9DM2 | | | | | | | | | | | 1.5 sec. |
| HITACHI WH 9DM | | | | | | | | | | | 1.3 sec. |
| C | | | | | | | | | | | 2.0 sec. |

② Wood screw 4.2 mm dia., 75 mm length, lauan

| Model | ← Fast | | | | | Slow → | | | | | sec. |
|-----------------|--------|---|---|---|---|--------|---|---|---|----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| HITACHI WH 9DM2 | | | | | | | | | | | 2.7 sec. |
| HITACHI WH 9DM | | | | | | | | | | | 2.3 sec. |
| C | | | | | | | | | | | 3.5 sec. |

③ Wood screw 4.5 mm dia., 90 mm length, lauan

| Model | ← Fast | | | | | Slow → | | | | | sec. |
|-----------------|--------|---|---|---|---|--------|---|---|---|----|----------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | |
| HITACHI WH 9DM2 | | | | | | | | | | | 4.6 sec. |
| HITACHI WH 9DM | | | | | | | | | | | 4.0 sec. |
| C | | | | | | | | | | | 6.3 sec. |

④ Wood screw 5.3 mm dia., 120 mm length, lauan

| Model | ← Fast | | | | | Slow → | | | | | sec. |
|-----------------|--------|---|---|---|----|--------|----|----|----|----|-----------|
| | 2 | 4 | 6 | 8 | 10 | 12 | 14 | 16 | 18 | 20 | |
| HITACHI WH 9DM2 | | | | | | | | | | | 10.0 sec. |
| HITACHI WH 9DM | | | | | | | | | | | 9.2 sec. |
| C | | | | | | | | | | | 15.0 sec. |

6-5. Number of Screws or Bolts Driven

Comparison data on the number of screws which can be tightened per battery charge are shown in the table below. Please note that the data below are intended for general reference only as the number of screws which can be tightened per charge may vary depending on tightening conditions, screw sizes, ambient temperature, characteristics of battery, etc.

(1) Screws (Cordless impact driver: Model WH 9DM2)

| Tightening condition \ Model | | HITACHI WH 9DM2 | HITACHI WH 9DM | C |
|--|--|---------------------------------------|---------------------------------------|-------------------------------------|
| Battery | | EB 930H (Battery capacity: 3.0 Ah) | EB 930H (Battery capacity: 3.0 Ah) | B9017 (Battery capacity: 1.7 Ah) |
| Wood screw 4.0 mm dia. and 50 mm length Workpiece: Cedar, no prepared hole | | 350 | 390 | 295 |
| Machine screw M8 x 16L | | 1,130 | 1,030 | 1,410 |

(2) Ordinary bolts (Cordless impact wrench: Model WR 9DM2)

Comparison data on the number of bolts which can be tightened per battery charge are shown in the table below. Please note that the data below are intended for general reference only as the number of bolts which can be tightened per charge may vary depending on tightening conditions, bolt sizes, ambient temperature, characteristics of battery, etc.

| Tightening condition \ Model | | HITACHI WR 9DM2 | HITACHI WR 9DM | C |
|--|-----------------|---------------------------------------|---------------------------------------|------------------------------------|
| Battery | | EB 930H (Battery capacity: 3.0 Ah) | EB 930H (Battery capacity: 3.0 Ah) | 9135 (Battery capacity: 3.0 Ah) |
| Coach bolt 9 x 90 Prepared hole 6.5 mm dia. and 90 mm depth | Number of bolts | 29 | 25 | 22 |
| | Time (sec.) | 13.4 | 17.3 | 22.5 |

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 or UC 14YFA Charger provided with the tool. Because of the designed rapid-charging feature (UC 14YF2: Approx. 60 min., UC 14YFA: Approx. 50 min.), 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 or UC 14YFA 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 or UC 14YFA 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 9DM2 and WR 9DM2 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 9DM2

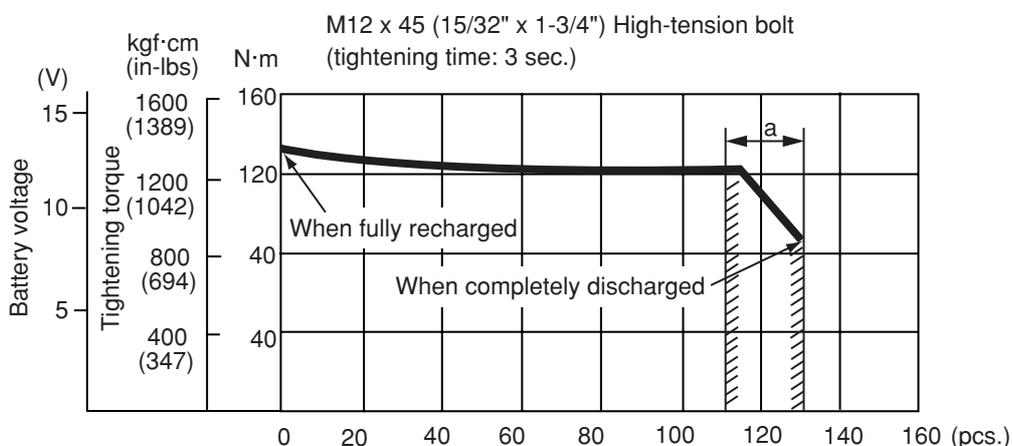


Fig. 4 Number of bolts driven per charge (EB 930H battery)

(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 or UC 14YFA 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 (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.

(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.

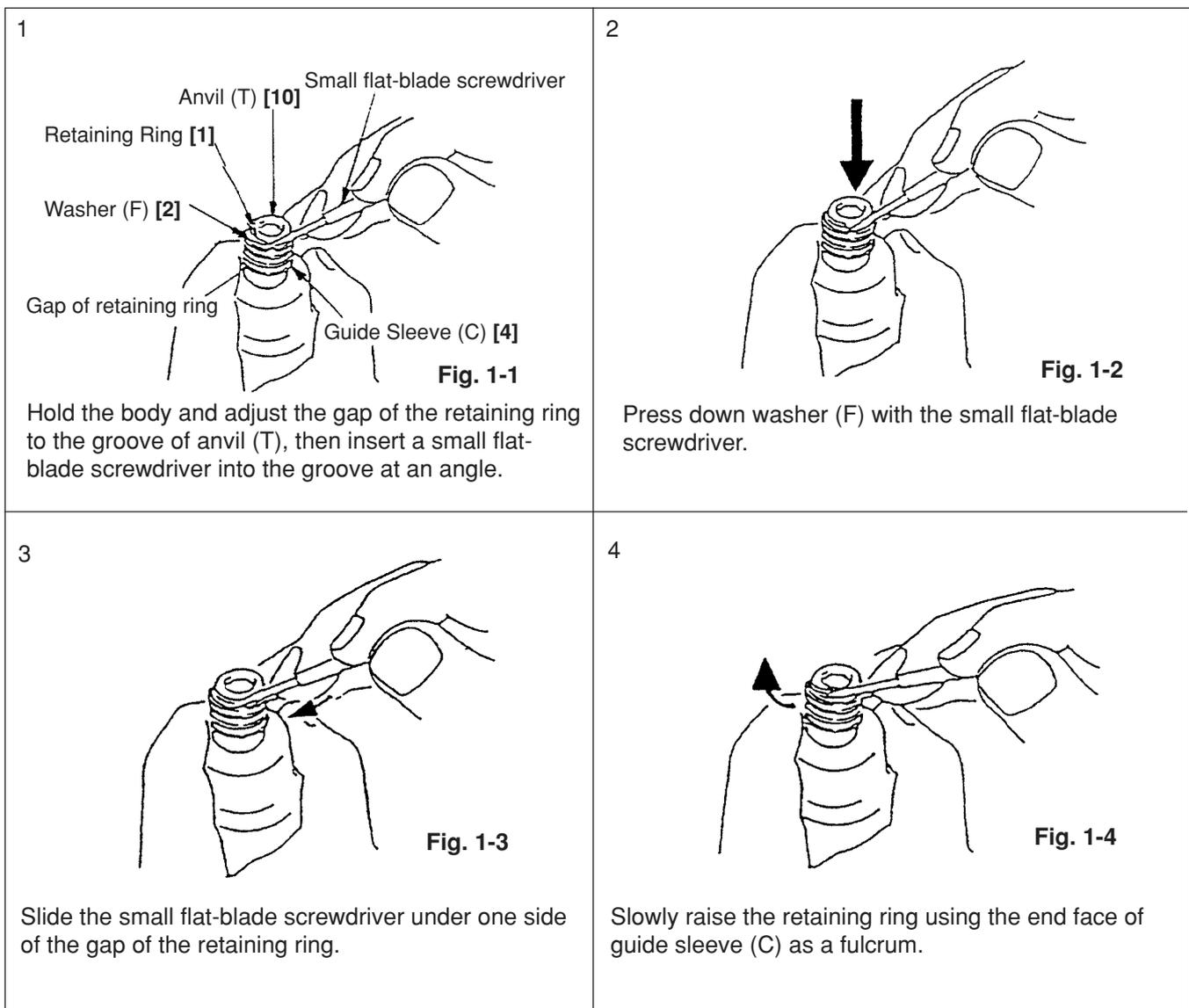
9-1. Precautions in Disassembly and Reassembly

The **[bold]** and **<bold>** numbers correspond to the item numbers in the Parts List and the exploded assembly diagram. ([]: WH 9DM2, < >: WR 9DM2)

9-1-1. Disassembly

(1) Removal of Guide Sleeve (C) **[4]** (Model WH 9DM2 only)

Remove the Retaining Ring **[1]**, Washer (F) **[2]**, Guide Spring (C) **[3]** and Guide Sleeve (C) **[4]** in order by following the procedure shown in Figs. 1-1 to 1-4. Be sure not to lose the two Steel Balls D 3.175 **[9]** in Anvil (T) **[10]**.



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 Front Cap (A) [5] <1> and Protector (B) [6] (A) <2>

Insert a small flat-blade screwdriver between Front Cap (A) [5] <1> and Protector (B) [6] (A) <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> to Housing (A). (B) Set [34] <30> and remove the Hammer Case [8] <4> and the hammer assembly from Housing (A). (B) Set [34] <30>.

(4) Disassembly of the hammer assembly

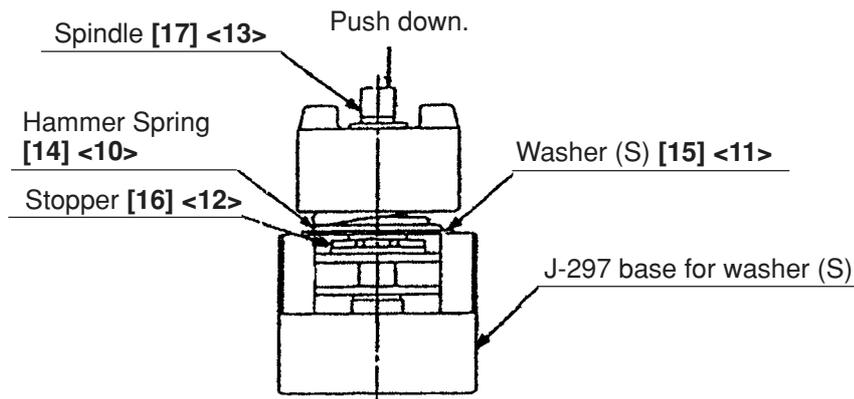


Fig. 2

Mount the hammer assembly onto the J-297 base for washer (S). With a hand press, push down the top of the Spindle [17] <13> to compress the Hammer Spring [14] <10>. In this position, remove the Stopper [16] <12> with a small flat-blade screwdriver, then release the hand press. (See Fig. 2).

Remove the hammer assembly from the J-297 base for washer (S) and support the end surface of the Spindle [17] <13>. With a hand press, push down either of the raised faces of the Hammer [12] <7> to compress Hammer Spring [14] <10>. In this position, extract the two Steel Balls D 5.556 [11] <6> from the cam grooves of the Spindle [17] <13> and the Hammer [12] <7> with a small flat-blade screwdriver and remove them from the steel ball guide groove. Then, slowly release the hand press and lift the Hammer [12] <7> and Washer (S) [15] <11> together to extract them from the Spindle [17] <13>. Hammer Spring [14] <10> can then be removed.

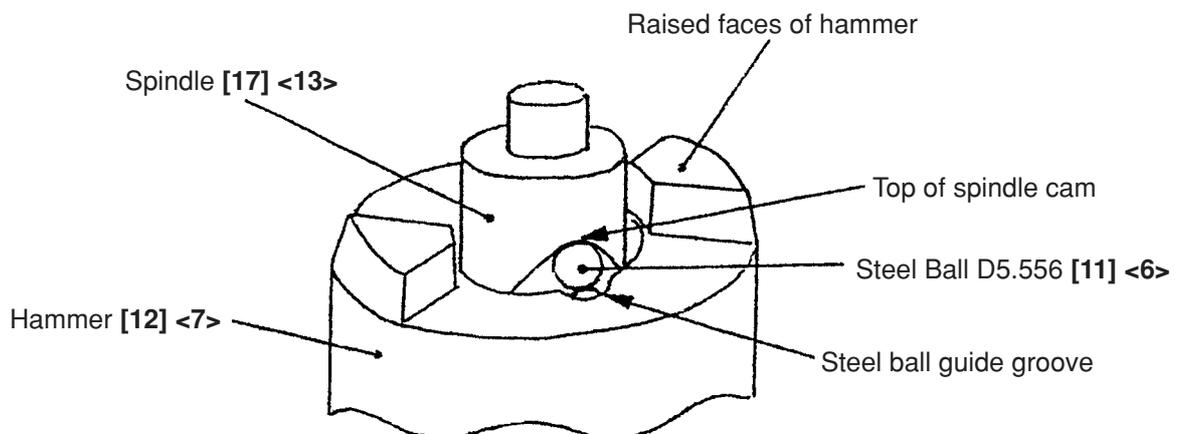


Fig. 3

(5) Removal of the Hook Ass'y [41] <37>

Remove the Special Screw M5 [48] <44> with a flat-blade screwdriver or a coin and remove the Hook Ass'y [41] <37> and the Hook Spring [47] <43>.

(6) Removal of the Carbon Brushes [30] <26>

Remove the two Brush Caps [31] <27>. Catch the flanges of the Carbon Brushes [30] <26> with a small flat-blade screwdriver and remove the Carbon Brushes [30] <26> at both sides.

(7) Removal of housing (B)

Remove the seven Tapping Screws (W/Flange) D4 x 20 (Black) [32] <28> and the Machine Screw (W/Washers) M4 x 25 [46] <42> from the main body. The Strap [44] <40> and Sleeve (A) [45] <41> can be removed by removing the Machine Screw (W/Washers) M4 x 25 [46] <42>. Before removing housing (B), be sure to remove the Brush Caps [31] <27> because housing (B) cannot be removed if the Brush Caps [31] <27> are mounted.

(8) Removal of the switch

The FET of the DC-Speed Control Switch [37] <33> is firmly inserted in the housing. Insert a small flat-blade screwdriver between the FET and housing (B) to raise and remove the FET. Be careful not to break the three legs coming from the FET to avoid malfunction of the switch. Then, Inner Cover (A) [23] <20>, Armature Ass'y [24] <21>, Magnet (D) [26] <23>, Magnet Spacer [27] (Model WH 9DM2 only), Brush Block [29] <25> and DC-Speed Control Switch [37] <33> can be removed in a piece. Pushing Button (A) [38] <34> 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] <32> that secure the flag terminal and then disconnect the internal wires (red and black) of the Brush Block [29] <25> from the DC-Speed Control Switch [37] <33>.

(Note) Do not disconnect the three FET internal wires soldered to the DC-Speed Control Switch [37] <33>.

(10) Removal of Magnet (D) [26] <23>, Dust Guard Fin (A) [28] <24>, Side Yoke [25] <22> and Magnet Spacer [27] (Model WH 9DM2 only)

Magnet (D) [26] <23> has a strong magnetism. Pull Magnet (D) [26] <23> in the "B" direction (see Fig. 4) holding Inner Cover (A) [23] <20> securely to remove it. Dust Guard Fin (A) [28] <24> and the Side Yoke [25] <22> can be easily removed from Magnet (D) [26] <23> by holding Magnet (D) [26] <23> securely and pulling them in the direction of diameter because they are mounted to Magnet (D) [26] <23> magnetically.

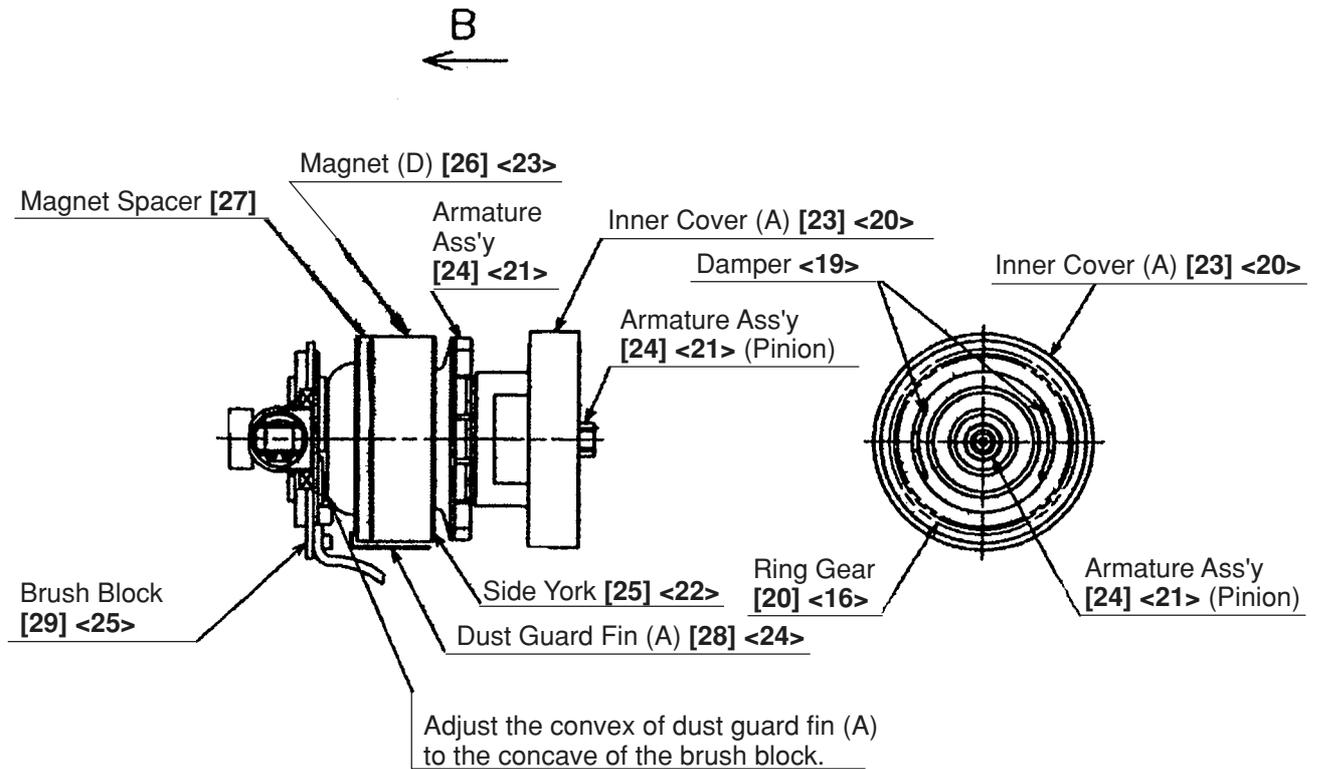


Fig. 4

(11) Removal of the Armature Ass'y [24] <21>

Support Inner Cover (A) [23] <20> so that it does not contact the fan of the Armature Ass'y [24] <21>. With a hand press, push down the tip portion of the Armature Ass'y [24] <21> (pinion) to remove it.

(12) Removal of the Ring Gear [20] <16> and the Damper <19>

(Model WR 9DM2 only)

Remove the Ring Gear [20] <16> from Inner Cover (A) [23] <20> and remove the Damper <19> with a small flat-blade screwdriver. The Ring Gear [20] <16> is firmly inserted in Inner Cover (A) [23] <20>. Insert a small flat-blade screwdriver between the Ring Gear [20] <16> and Inner Cover (A) [23] <20> to remove the Ring Gear [20] <16>. Remove the Damper <19> with a small flat-blade screwdriver (Model WR 9DM2 only).

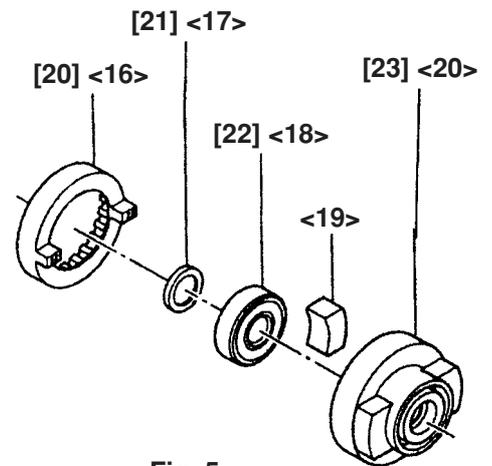


Fig. 5

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. 6) for proper wiring.
- (b) When connecting the internal wires of the Brush Block [29] <25> to the DC-Speed Control Switch [37] <33>, fasten them with the Machine Screws (W/Sp. Washer) M3 x 5 [36] <32> paying attention to the direction of the flag terminal (Fig. 6).

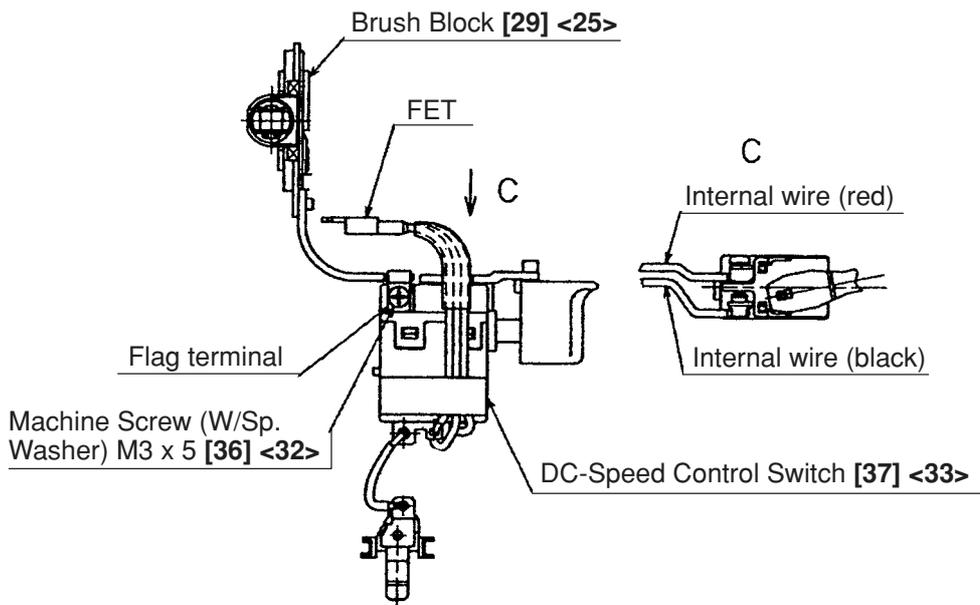


Fig. 6

- (c) Before mounting the parts to housing (A), apply silicone rubber (ThreeBond 1211) to the area illustrated in Fig. 7.

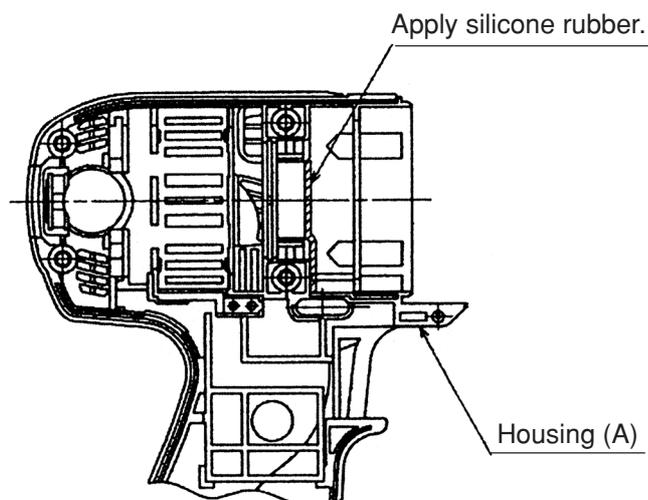
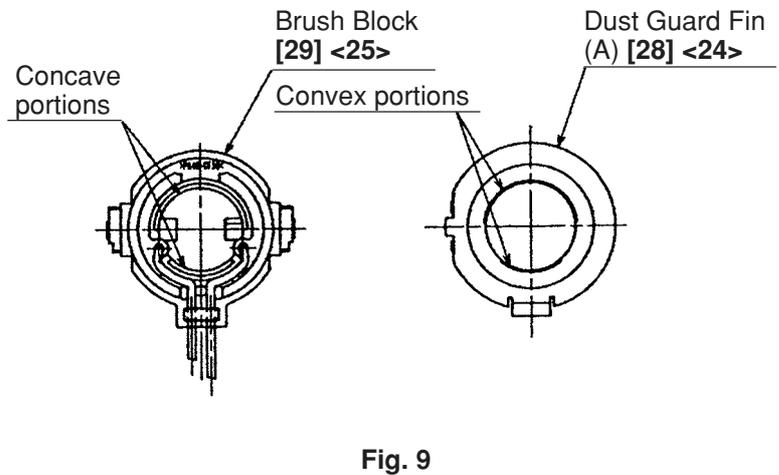
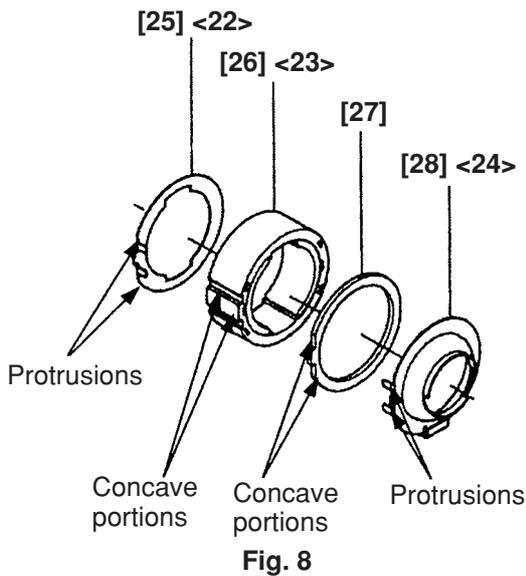


Fig. 7

(d) Mount a unit of Inner Cover (A) [23] <20> (including the Armature Ass'y [24] <21>), Magnet (D) [26] <23> (including Dust Guard Fin (A) [28] <24>, Magnet Spacer [27] (Model WH 9DM2 only) and Side Yoke [25] <22>) and Brush Block [29] <25> into housing (A) (see Fig. 11). Pay attention to the following items.

- Adjust the protrusions of Dust Guard Fin (A) [28] <24> to the concave portions of Magnet (D) [26] <23> and the Magnet Spacer [27] (Model WH 9DM2 only) and also adjust the outside diameter of Dust Guard Fin (A) [28] <24> to the outside diameters of Magnet (D) [26] <23> and the Magnet Spacer [27] (Model WH 9DM2 only) when mounting Dust Guard Fin (A) [28] <24> and the Magnet Spacer [27] (Model WH 9DM2 only) to Magnet (D) [26] <23> (see Fig. 8).
- Insert the two Dampers <19> so that they fit into Inner Cover (A) <20>. Fit the locking rib of Ring Gear (C) <16> to the concave portion of Damper <19>. Press-fit the Armature Ass'y <21> into Inner Cover (A) <20> (Model WR 9DM2 only).
- Fit the locking rib of Ring Gear (D) [20] to the concave portion of Inner Cover (A) [23]. Press-fit the Armature Ass'y [24] into Inner Cover (A) [23] (Model WH 9DM2 only).
- Adjust the convex portion of Dust Guard Fin (A) [28] <24> to the concave portion of the Brush Block [29] <25> (see Fig. 9).
- Adjust the concave portions (for locking) of Magnet (D) [26] <23> and the Magnet Spacer [27] (Model WH 9DM2 only) to the protrusions of housing (A) (see Figs. 8 and 10).



Align the protrusions of housing (A) to the concave portions (for locking) of Magnet (D) [26] <23> and the Magnet Spacer [27] (Model WH 9DM2 only).

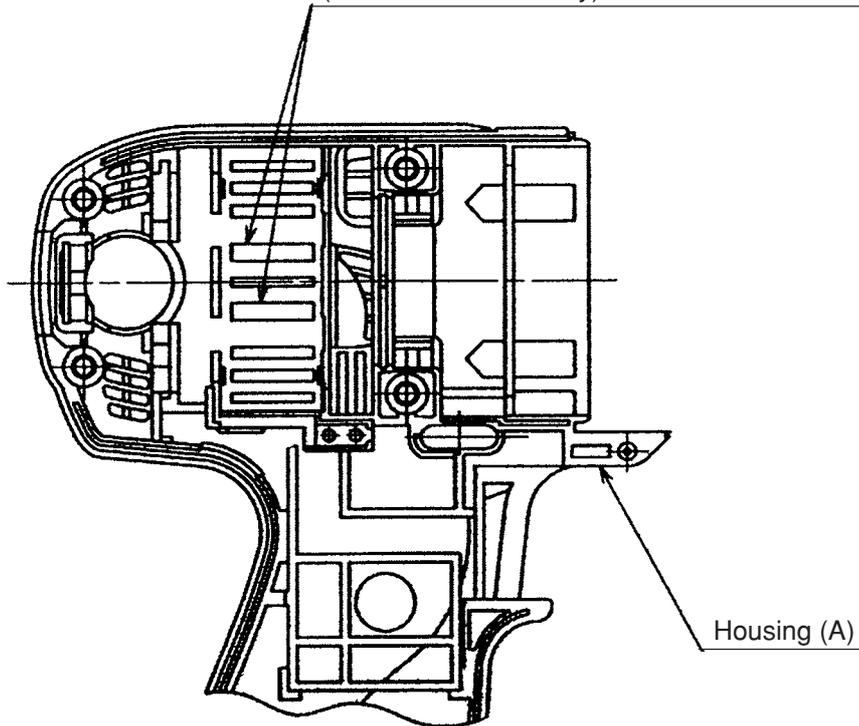


Fig. 10

(e) Mount the DC-Speed Control Switch [37] <33> 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] <34>. Apply silicone grease (KS609, Shin-Etsu Chemical Co., Ltd.) to the contacting surfaces of the FET of the DC-Speed Control Switch [37] <33> and Dust Guard Fin (A) [28] <24> then mount them to housing (A).

(Note) The temperature of the FET can be high if the silicone grease is not applied. Make sure that the three internal wires from the FET are bent as shown in Fig. 11 and passed above the DC-Speed Control Switch [37] <33> to keep from contact with Pushing Button (A) [38] <34> (see Fig. 11).

(2) Apply silicone rubber (ThreeBond 1211) to housing (A) and Inner Cover (A) [23] <20> as shown in Fig. 11. Mount housing (B) and secure them with seven Tapping Screws (W/Flange) D4 x 20 (Black) [32] <28>. Wipe the silicone rubber coming out of the housing with a cloth. Insert Sleeve (A) [45] <41> into the Strap [44] <40> and tighten the Machine Screw (W/Washers) M4 x 25 [46] <42>.

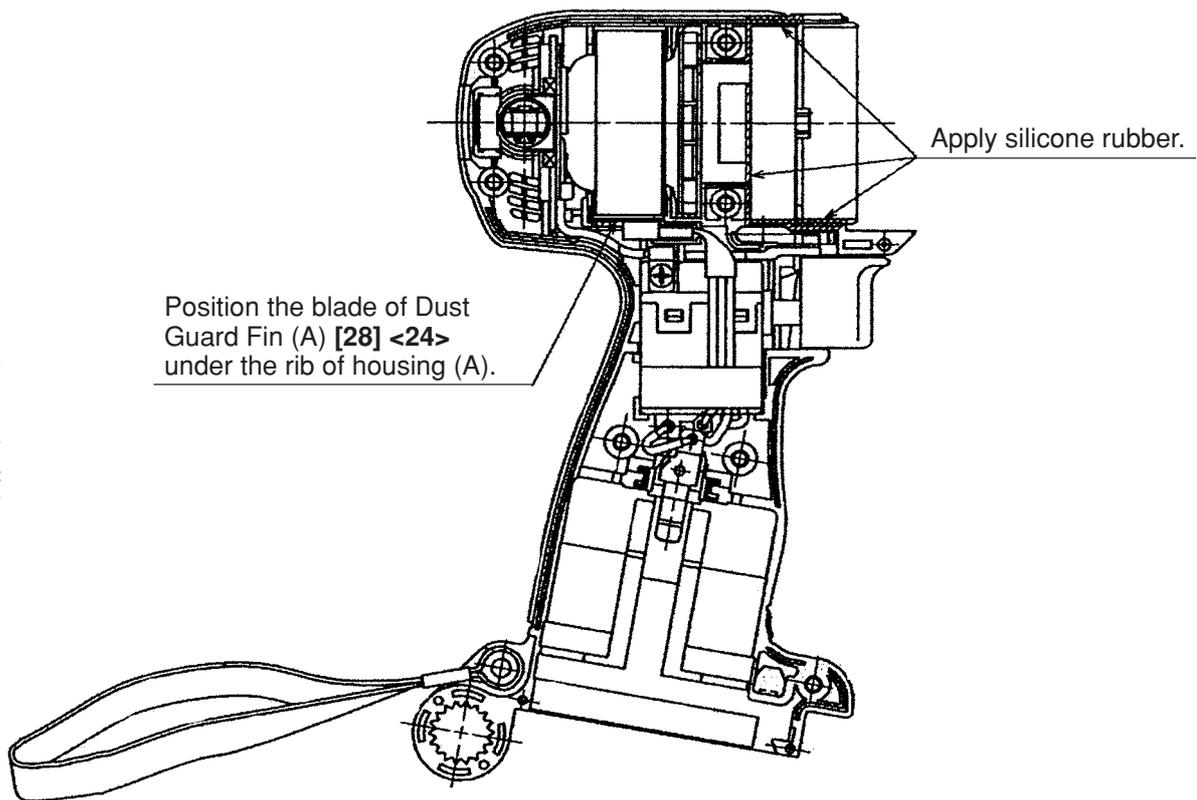


Fig. 11

(3) Mounting the mechanical parts

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

(b) Align the top of the cam groove on the Spindle [17] <13> with the steel ball guide groove on the Hammer [12] <7> as illustrated in Fig. 3. Press down either of the raised faces of the Hammer [12] <7> with a hand press to compress the Hammer Spring [14] <10> until the end surface of the Hammer [12] <7> contacts the Spindle [17] <13>.

(c) Insert the two Steel Balls D 5.556 [11] <6> 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] <13> to compress the Hammer Spring [14] <10>. On this condition, mount the Stopper [16] <12> 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] <14> of the hammer assembly (check that Washer (E) [21] <17> is mounted on the Spindle [17] <13>) and the Ring Gear [20] <16>. 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 (T) [10] or Anvil (U) <5> on the Spindle [17] <13>. Cover it with the Hammer Case [8] <4> and secure them with the four Tapping Screws (W/Sp. Washer) D4 x 25 (Black) [7] <3>.

(6) Mounting Guide Sleeve (C) [4] (Model WH 9DM2 only)

Insert the two Steel Balls D 3.175 [9] into the hole of Anvil (T) [10]. Mount Guide Sleeve (C) [4], Guide Spring (C) [3] and Washer (F) [2] in sequence. Mount the Retaining Ring [1] into the groove of anvil using the J339 jigs (E) and (F) for retaining ring as illustrated in Fig. 12.

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

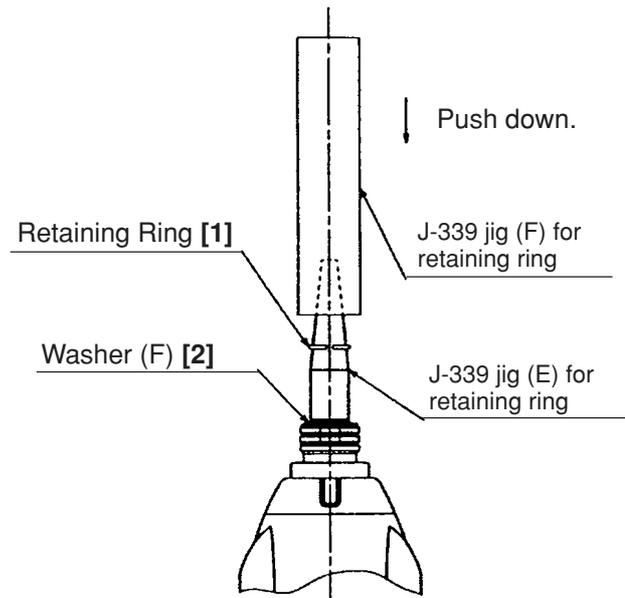


Fig. 12

(7) Reassembly of the hook

Check that the V-Lock Nut M5 [42] <38> is mounted into the Hook Ass'y [41] <37>. Mount the Hook Spring [47] <43> and secure it with the Special Screw M5 [48] <44>. (Make sure to mount the Hook Spring [47] <43> with its larger diameter side pointing inward the housing.)

(8) Checking the direction of rotation

Check whether the direction of rotation of Anvil (T) [10] or Anvil (U) <5> coincides with the directional markings on the push-on side of Pushing Button (A) [38] <34>. When Pushing Button (A) [38] <34> is turned to (R) side, the direction of rotation of Anvil (T) [10] or Anvil (U) <5> should be clockwise, as viewed from behind.

(9) Lubrication

(a) ATTOLUB MS No. 2

- Pinion tooth flanks of the Armature Ass'y [24] <21>, tooth flanks of the Ring Gear [20] <16>, teeth of the Idle Gear Set (2 pcs.) [18] <14>
- Twenty-eight Steel Balls D3.175 [9] <8>

(b) HITACHI MOTOR GREASE No. 29 (Model WH 9DM2 only)

- Two Steel Balls D3.175 [9]
- Sliding section between Anvil (T) [10] and Guide Sleeve (C) [4]

(c) MOLUB ALLOY 777-1

- 6 mm diameter hole of Anvil (T) [10], 8 mm diameter hole of Anvil (U) <5>, sliding section between Anvil (T) [10] or Anvil (U) <5> and the metal, and upper surface of the claw
- Two Steel Balls D 5.556 [11] <6>
- Metal oil groove of the Hammer Case [8] <4>
- Cam groove and oil groove of the Hammer [12] <7>
- Cam groove and sliding section of the Spindle [17] <13>
- 5 mm diameter hole of the Idle Gear Set (2 pcs.) [18] <14>
- All around the Needle Roller [19] <15>

(10) Screw tightening torque

- Tapping Screw (W/Sp. Washer) D4 x 25 (Black) [7] <3> ... 1.96 ± 0.49 N·m (20 ± 5 kgf·cm)
- Tapping Screw (W/Flange) D4 x 20 (Black) [32] <28> 1.96 ± 0.49 N·m (20 ± 5 kgf·cm)
- Machine Screw (W/Washers) M4 x 25 [46] <42> 1.27 ± 1.96 N·m (13 – 20 kgf·cm)
- Machine Screw (W/Sp. Washer) M3 x 5 [36] <32> 0.29 – 0.39 N·m (3 – 4 kgf·cm)
- Special Screw M5 [48] <44> 1.96 ± 0.49 N·m (20 ± 5 kgf·cm)
- Brush Caps [31] <27> 0.78 ± 0.10 N·m (8 ± 1 kgf·cm)

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

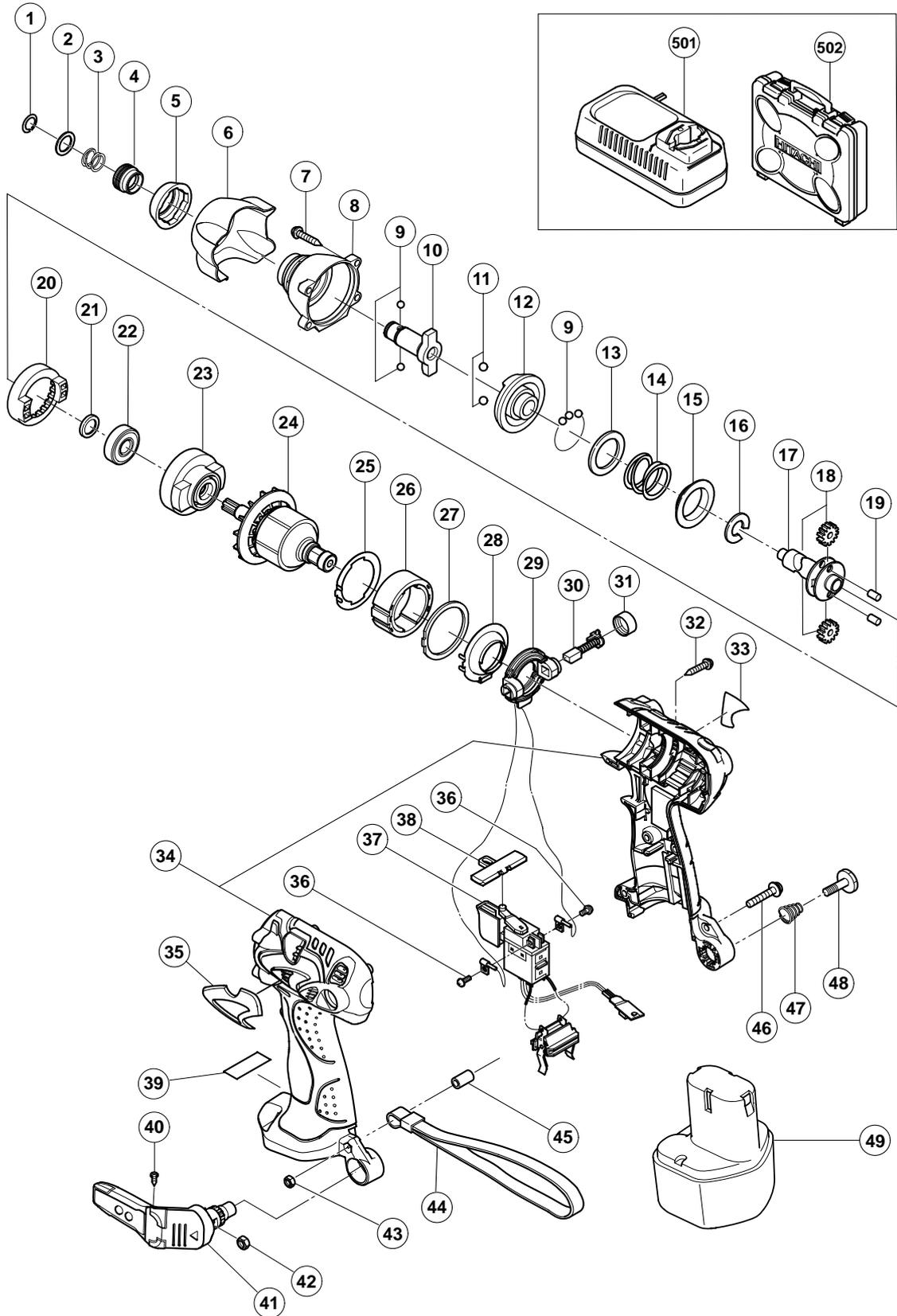
| MODEL | Variable | | 10 | 20 | 30 | 40 | 50 | 60 min. |
|---------|------------------|------------------|----|--|---|----|----|---------|
| | Fixed | | | | | | | |
| WH 9DM2 | | Work Flow | | | | | | |
| | | | | | | | | |
| | | Hook Ass'y | | DC-Speed Control Switch | | | | |
| | | | | | Housing (A).(B) Set | | | |
| | | | | Inner Cover (A) Armature Magnet (D) Brush Block | | | | |
| | General Assembly | Guide Sleeve (C) | | Hammer Case Anvil (T) Ring Gear (D) | Hammer (E) Steel Ball Hammer Spring (E) Spindle (E) Idle Gear Set Needle Roller Ball Bearing (6901VV) | | | |

| MODEL | Variable | | 10 | 20 | 30 | 40 | 50 | 60 min. |
|---------|----------|------------------|--|---|---|----|----|---------|
| | Fixed | | | | | | | |
| WR 9DM2 | | Work Flow | | | | | | |
| | | | Hook Ass'y | DC-Speed Control Switch | Housing (A).(B) Set | | | |
| | | General Assembly | Inner Cover (A) Armature Magnet (D) Brush Block | Hammer Case Anvil (U) Ring Gear (C) | Hammer (F) Steel Ball Hammer Spring (A) Spindle (D) Idle Gear Set Needle Roller Ball Bearing (6901VV) | | | |

ELECTRIC TOOL PARTS LIST

CORDLESS IMPACT DRIVER
Model WH 9DM2

2004 • 3 • 25
(E1)



PARTS

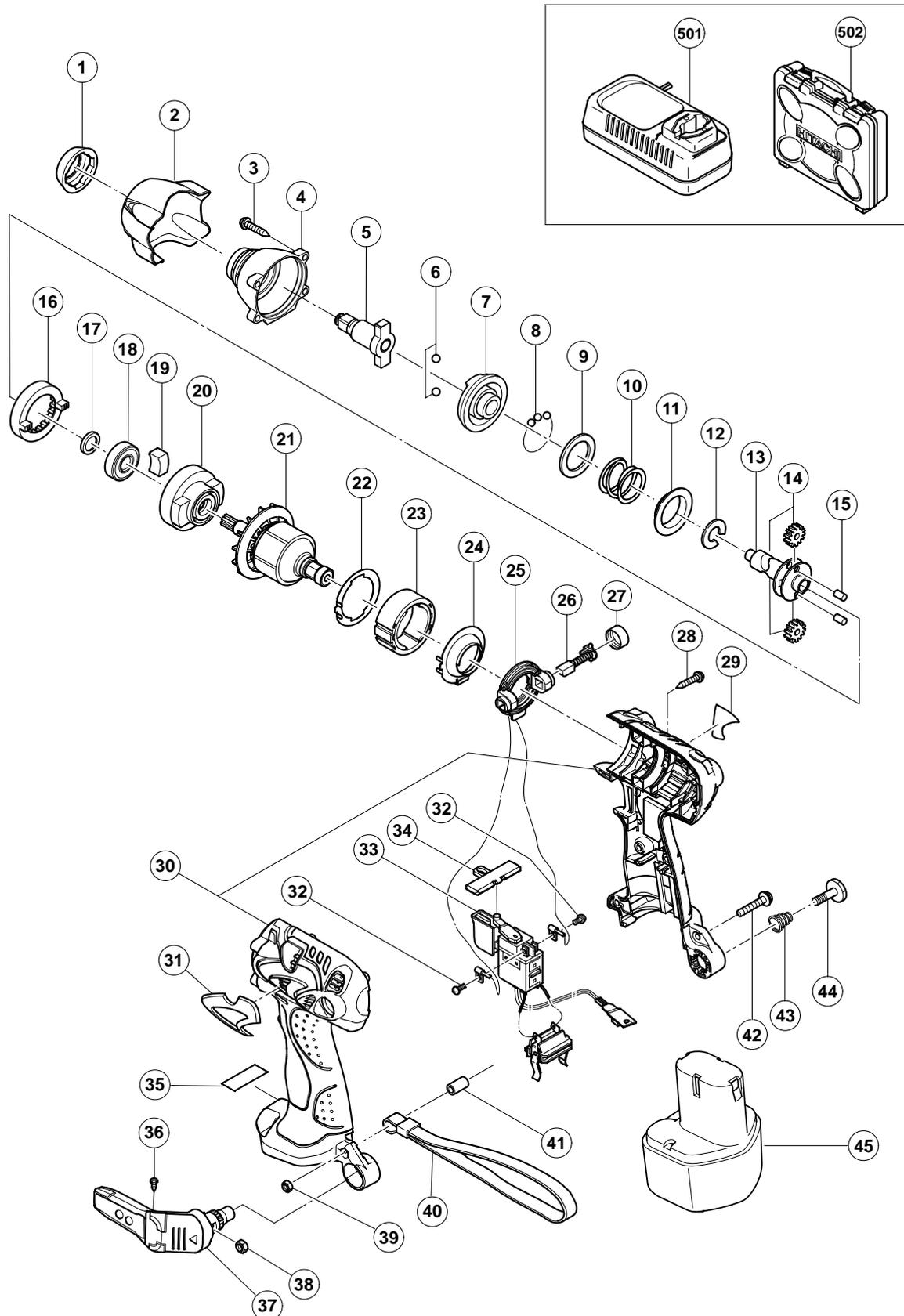
WH 9DM2

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS |
|----------|----------|--|----------|-------------------|
| 1 | 995-933 | RETAINING RING | 1 | |
| 2 | 322-739 | WASHER (F) | 1 | |
| 3 | 322-737 | GUIDE SPRING (C) | 1 | |
| 4 | 322-738 | GUIDE SLEEVE (C) | 1 | |
| 5 | 322-249 | FRONT CAP (A) (GREEN) | 1 | |
| 6 | 322-749 | PROTECTOR (B) | 1 | |
| 7 | 319-917 | TAPPING SCREW (W/SP. WASHER) D4X25 (BLACK) | 4 | |
| 8 | 322-748 | HAMMER CASE | 1 | |
| 9 | 959-148 | STEEL BALL D3.175 (10 PCS.) | 30 | |
| 10 | 322-750 | ANVIL (T) | 1 | |
| 11 | 959-154 | STEEL BALL D5.556 (10 PCS.) | 2 | |
| 12 | 322-735 | HAMMER (E) | 1 | |
| 13 | 315-978 | WASHER (J) | 1 | |
| 14 | 322-741 | HAMMER SPRING (E) | 1 | |
| 15 | 316-172 | WASHER (S) | 1 | |
| 16 | 322-740 | STOPPER (A) | 1 | |
| 17 | 322-742 | SPINDLE (E) | 1 | |
| 18 | 318-444 | IDLE GEAR SET (2 PCS.) | 2 | |
| 19 | 319-914 | NEEDLE ROLLER | 2 | |
| 20 | 322-746 | RING GEAR (D) | 1 | |
| 21 | 319-911 | WASHER (E) | 1 | |
| 22 | 690-1VV | BALL BEARING 6901VVCMP2L | 1 | |
| 23 | 321-664 | INNER COVER (A) | 1 | |
| 24 | 360-643 | ARMATURE ASS'Y (W/BALL BEARING) DC 9.6V | 1 | |
| 25 | 321-659 | SIDE YOKE | 1 | |
| 26 | 322-744 | MAGNET (D) | 1 | |
| 27 | 322-736 | MAGNET SPACER | 1 | |
| 28 | 321-663 | DUST GUARD FIN (A) | 1 | |
| 29 | 321-662 | BRUSH BLOCK | 1 | |
| 30 | 999-054 | CARBON BRUSH 5X6X11.5 (1 PAIR) | 2 | |
| 31 | 319-918 | BRUSH CAP | 2 | |
| 32 | 302-086 | TAPPING SCREW (W/FLANGE) D4X20 (BLACK) | 7 | |
| 33 | | NAME PLATE | 1 | |
| 34 | 322-751 | HOUSING (A).(B) SET | 1 | |
| 35 | 322-743 | HITACHI PLATE | 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 | | CAUTION PLATE (A) | 1 | FOR USA, CAN |
| 40 | 321-672 | TAPPING SCREW D2X6 | 2 | |
| 41 | 321-918 | HOOK ASS'Y (W/LIGHT) | 1 | INCLUD. 40, 42 |
| 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 | 310-377 | BATTERY EB 9B (W/ENGLISH N.P.) | 2 | |
| * 49 | 310-451 | BATTERY EB 9B (W/ENGLISH N.P.) | 2 | FOR USA, CAN |
| * 49 | 318-368 | BATTERY EB 930H (W/ENGLISH N.P.) | 2 | FOR NOR, SWE, DEN |

ELECTRIC TOOL PARTS LIST

CORDLESS IMPACT WRENCH
Model WR 9DM2

2004 • 3 • 25
(E1)



PARTS

WR 9DM2

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS |
|----------|----------|--|----------|-------------------|
| 1 | 322-243 | FRONT CAP (A) (BLACK) | 1 | |
| 2 | 322-731 | PROTECTOR (A) | 1 | |
| 3 | 319-917 | TAPPING SCREW (W/SP. WASHER) D4X25 (BLACK) | 4 | |
| 4 | 322-172 | HAMMER CASE | 1 | |
| 5 | 322-732 | ANVIL (U) | 1 | |
| 6 | 959-154 | STEEL BALL D5.556 (10 PCS.) | 2 | |
| 7 | 322-730 | HAMMER (F) | 1 | |
| 8 | 959-148 | STEEL BALL D3.175 (10 PCS.) | 28 | |
| 9 | 315-978 | WASHER (J) | 1 | |
| 10 | 320-407 | HAMMER SPRING (A) | 1 | |
| 11 | 316-172 | WASHER (S) | 1 | |
| 12 | 316-171 | STOPPER | 1 | |
| 13 | 321-666 | SPINDLE (D) | 1 | |
| 14 | 321-667 | IDLE GEAR SET (2 PCS.) | 2 | |
| 15 | 319-914 | NEEDLE ROLLER | 2 | |
| 16 | 320-877 | RING GEAR (C) | 1 | |
| 17 | 319-911 | WASHER (E) | 1 | |
| 18 | 690-1VV | BALL BEARING 6901VVCMP2L | 1 | |
| 19 | 319-909 | DAMPER | 2 | |
| 20 | 321-664 | INNER COVER (A) | 1 | |
| 21 | 360-642 | ARMATURE ASS'Y DC 9.6V | 1 | |
| 22 | 321-659 | SIDE YOKE | 1 | |
| 23 | 321-668 | MAGNET (D) | 1 | |
| 24 | 321-663 | DUST GUARD FIN (A) | 1 | |
| 25 | 321-662 | BRUSH BLOCK | 1 | |
| 26 | 999-054 | CARBON BRUSH 5X6X11.5 (1 PAIR) | 2 | |
| 27 | 319-918 | BRUSH CAP | 2 | |
| 28 | 302-086 | TAPPING SCREW (W/FLANGE) D4X20 (BLACK) | 7 | |
| 29 | | NAME PLATE | 1 | |
| 30 | 322-751 | HOUSING (A).(B) SET | 1 | |
| 31 | 322-753 | HITACHI LABEL | 1 | |
| 32 | 994-532 | MACHINE SCREW (W/SP. WASHER) M3X5 | 2 | |
| 33 | 319-906 | DC-SPEED CONTROL SWITCH | 1 | |
| 34 | 321-661 | PUSHING BUTTON (A) | 1 | |
| 35 | | CAUTION PLATE (A) | 1 | |
| 36 | 321-672 | TAPPING SCREW D2X6 | 2 | |
| 37 | 321-918 | HOOK ASS'Y (W/LIGHT) | 1 | INCLUD. 36, 38 |
| 38 | 320-288 | V-LOCK NUT M5 | 1 | |
| 39 | 949-565 | LOCK NUT M4 (10 PCS.) | 1 | |
| 40 | 306-952 | STRAP (BLACK) | 1 | |
| 41 | 322-718 | SLEEVE (A) | 1 | |
| 42 | 676-386 | MACHINE SCREW (W/WASHERS) M4X25 | 1 | |
| 43 | 319-926 | HOOK SPRING | 1 | |
| 44 | 319-927 | SPECIAL SCREW M5 | 1 | |
| * 45 | 310-377 | BATTERY EB 9B (W/ENGLISH N.P.) | 2 | |
| * 45 | 310-451 | BATTERY EB 9B (W/ENGLISH N.P.) | 2 | FOR USA, CAN |
| * 45 | 318-368 | BATTERY EB 930H (W/ENGLISH N.P.) | 2 | FOR NOR, SWE, DEN |
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