

MODEL

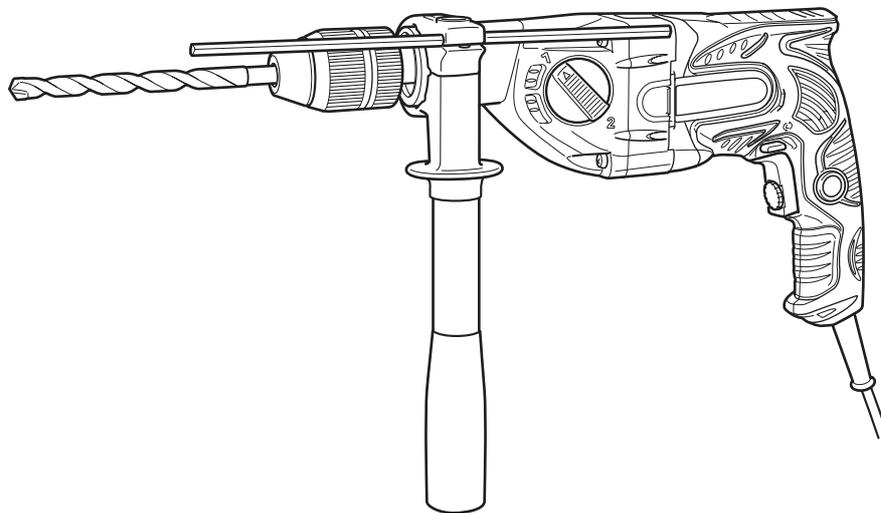
**DM 20V**

**Hitachi**  
**Power Tools**

**20 mm (3/4") MASONRY DRILL**  
**DM 20V**

**TECHNICAL DATA**  
**AND**  
**SERVICE MANUAL**

**D**



LIST No. E109

Dec. 2005

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

REMARK:

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

Model DM 20V

| Symbols Utilized | Competitors  |            |
|------------------|--------------|------------|
|                  | Company Name | Model Name |
| B                | BOSCH        | GSB20-2RE  |
| C1               | MAKITA       | HP2051     |
| C2               | MAKITA       | HP2041     |
| H                | METABO       | SBE750     |



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## 1. PRODUCT NAME

Hitachi 20 mm (3/4") Masonry Drill, Model DM 20V

## 2. MARKETING OBJECTIVE

The new Model DM 20V has been developed as a low operating noise and low vibration model to reduce operators' fatigue.

Features and benefits:

- Low operation vibration and low operation noise
- Powerful motor
- Durable aluminum gear cover and inner cover
- Soft grip handle
- Shortest chuck offset

## 3. APPLICATIONS

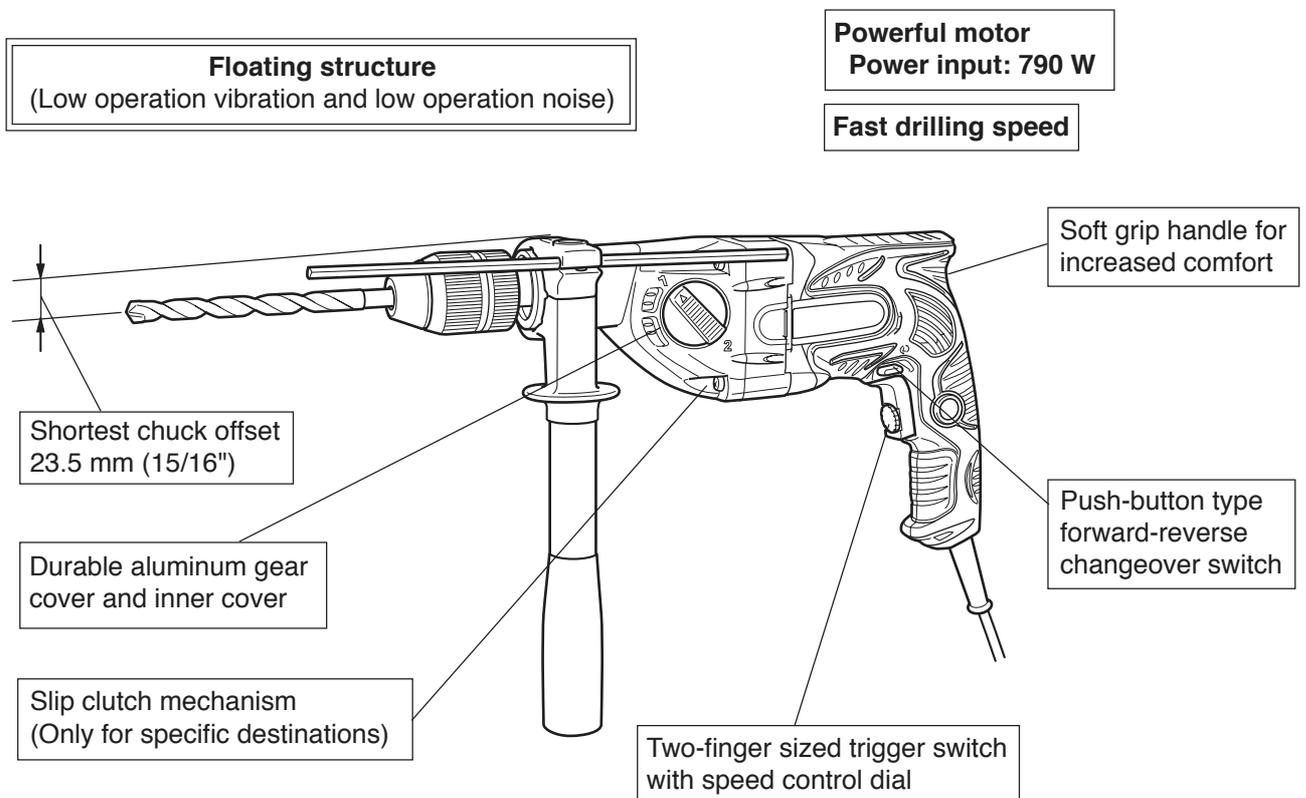
(1) Rotation and impacting function

Drilling into concrete, brick, ceramic tile, marble, granite and other stone materials

(2) Rotation only function

Drilling into metal, wood and plastics

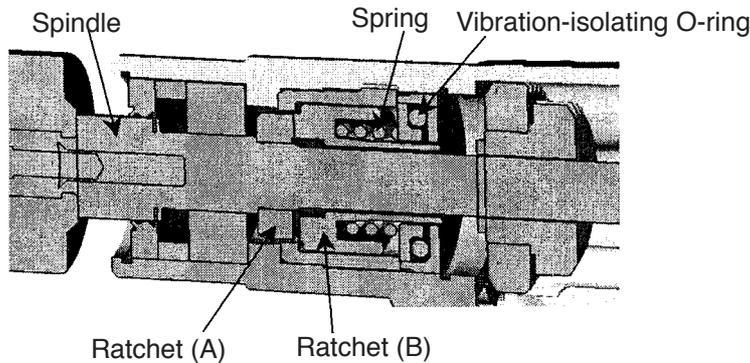
## 4. SELLING POINTS



#### 4-1. Selling Point Descriptions

- (1) Floating structure (low operation vibration and low operation noise) for less operator fatigue

Operating vibration and noise can be effectively reduced thanks to the spring and the vibration-isolating O-ring provided behind the hammering portion.



- (2) Fast drilling speed

Thanks to the powerful motor (rated power consumption: 790 W), the Model DM 20V can drill at the class-top speed. Powerful motor also provides high performance for heavy-duty applications.

- (3) Easy-to-operate 2-finger sized trigger switch with speed control dial

The pulling amount of the trigger can be adjusted on the dial. It is convenient for operation keeping at a desired speed. The large variable speed control dial and the 2-finger sized trigger switch are easy to operate.

- (4) Reliable and convenient push-button type forward/reverse changeover switch

The Model DM 20V is equipped with the push-button type forward/reverse changeover switch that is more convenient and reliable than the lever-type switch. In addition, this switch is properly shaped and located not to make the pushbutton an obstacle at drilling.

- (5) Durable aluminum die-casting inner cover and gear cover

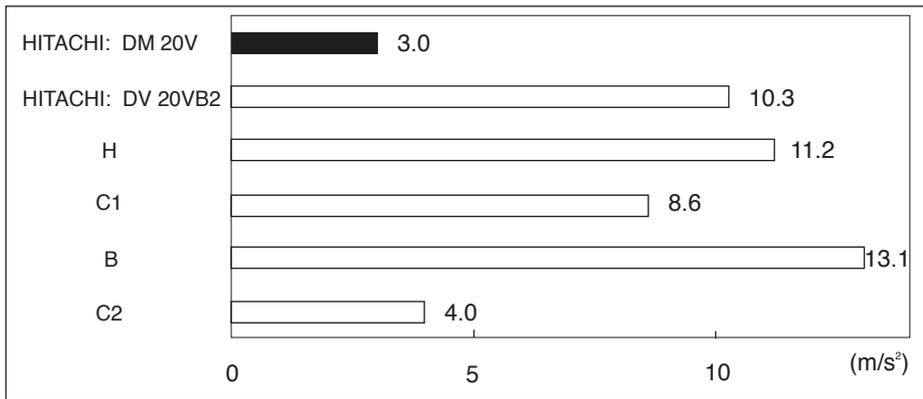
The Model DM 20V is equipped with the aluminum die-casting inner cover and gear cover for increased durability.

- (6) Slip clutch mechanism (Depends on market)

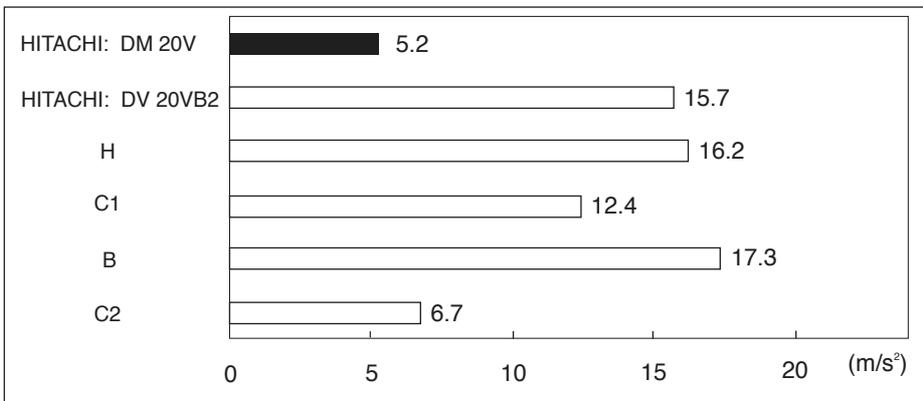
The Model DM 20V for specific destinations is equipped with the slip clutch mechanism to avoid direct and strong reaction force caused by application of a sudden and heavy load by slipping the transmission portion between the motor and the drill bit.

(1) Full load vibration

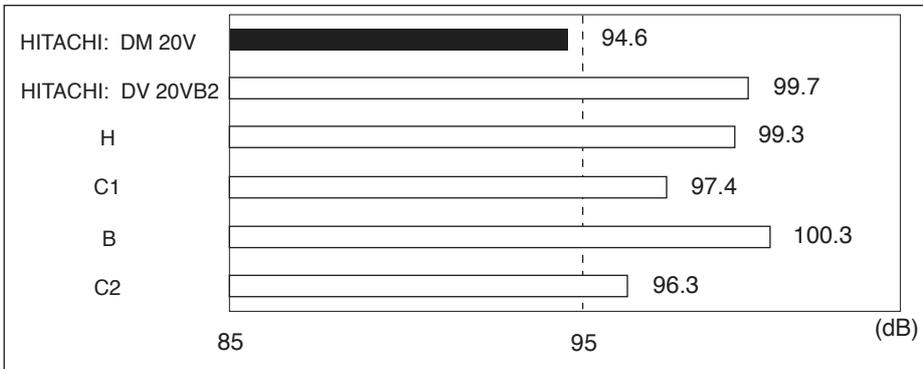
① Z axis (Material: Mortar, Drill bit: 8 mm dia.)



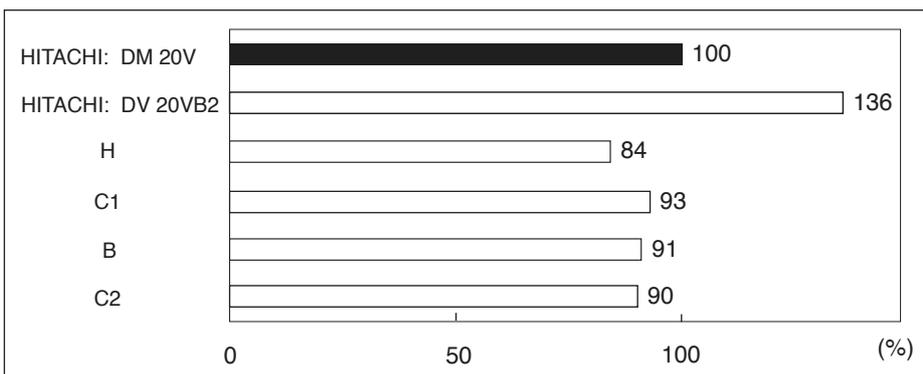
② 3 axis (Material: Mortar, Drill bit: 8 mm dia.)



(2) Full load sound pressure level (Material: Mortar, Drill bit: 8 mm dia.)



(3) Drilling speed (Material: Mortar, Drill dia.: 13 mm, Pushing force: 150 N)



## 5. SPECIFICATIONS

### 5-1. Specifications

|                       |             |                                                                             |
|-----------------------|-------------|-----------------------------------------------------------------------------|
| Capacities            | Concrete    | Low speed: 20 mm (3/4") / High speed: 13 mm (1/2")                          |
|                       | Steel       | Low speed: 13 mm (1/2") / High speed: 8 mm (5/16")                          |
|                       | Wood        | Low speed: 40 mm (1-9/16") / High speed: 25 mm (1")                         |
| Drill chuck           |             | Mount type: UNF 1/2" – 20<br>Capacity: 13 mm (1/2")                         |
| Type of motor         |             | AC single phase commutator motor                                            |
| Enclosure             | Housing     | Glassfiber reinforced polycarbonate + elastomer                             |
|                       | Handle      |                                                                             |
|                       | Inner cover | Aluminum alloy die casting                                                  |
|                       | Gear cover  |                                                                             |
| Type of switch        |             | Variable speed control trigger switch with reversing switch                 |
| Power source          |             | AC single phase 50/60 Hz                                                    |
| Rated voltage         |             | (110 V, 230 V)                                                              |
| Rated current         |             | 110 V: 7.6 A 230 V: 3.6 A                                                   |
| Power input           |             | 790 W                                                                       |
| Cord                  |             | 2-core cabtire cord 2.5 m (8.3 ft.)                                         |
| No-load speed         |             | 0 – 1000/3000/min                                                           |
| Full-load impact rate |             | 7650/18000/min                                                              |
| Full-load output      |             | 440 W                                                                       |
| Weight                | Net*1       | 2.5 kg (5.5 lbs.)                                                           |
|                       | Gross       | 4.5 kg (9.9 lbs.)                                                           |
| Packaging             |             | Plastic carrying case                                                       |
| Standard accessories  |             | Side handle ..... 1<br>Depth gauge ..... 1<br>Plastic carrying case ..... 1 |
| Optional accessories  |             | Drill bit for concrete                                                      |

\*1 : Without cord

## 6. COMPARISONS WITH SIMILAR PRODUCTS

### 6-1. Specification Comparisons

| Product                  |          |          | Masonry drill             | Impact drill                                   |                    |                       |                    |                   |
|--------------------------|----------|----------|---------------------------|------------------------------------------------|--------------------|-----------------------|--------------------|-------------------|
| Maker                    |          |          | HITACHI                   | HITACHI                                        | H                  | C1                    | C2<br>(Reference)  | B<br>(Reference)  |
| Model                    |          |          | DM 20V                    | DV 20VB2                                       |                    |                       |                    |                   |
| Capacities               | Concrete | mm (in.) | 20 (3/4")                 | 20 (3/4")                                      | 20 (3/4")          | 20 (3/4")             | 20 (3/4")          | 20 (3/4")         |
|                          | Steel    | mm (in.) | 13 (1/2")                 | 13 (1/2")                                      | 13 (1/2")          | 13 (1/2")             | 13 (1/2")          | 13 (1/2")         |
|                          | Wood     | mm (in.) | 40 (1-9/16")              | 40 (1-9/16")                                   | 40 (1-9/16")       | 40 (1-9/16")          | 40 (1-9/16")       | 40 (1-9/16")      |
| Rated power input        |          | W        | 790                       | 790<br>(120 V: 8.3 A)                          | 750                | 720<br>(120 V: 6.6 A) | 650                | 800               |
| No-load speed            | Low      | /min.    | 0 – 1,000                 | 0 – 1,000                                      | 0 – 1,000          | 0 – 1,200             | 0 – 950            | 0 – 1,100         |
|                          | High     | /min.    | 0 – 3,000                 | 0 – 3,000                                      | 0 – 3,000          | 0 – 2,900             | 0 – 2,900          | 0 – 3,000         |
| No-load impact rate      | Low      | /min.    | 0 – 9,000                 | 0 – 13,000                                     | 0 – 19,000         | 0 – 24,000            | 0 – 12,350         | 0 – 17,600        |
|                          | High     | /min.    | 0 – 27,000                | 0 – 39,000                                     | 0 – 57,000         | 0 – 58,000            | 0 – 35,700         | 0 – 48,000        |
| Max. torque              | Low      | N-m      | 49.3 (28.6)* <sup>1</sup> | 54.1 (29.5)* <sup>1</sup>                      |                    |                       | 43.4               |                   |
|                          | High     | N-m      | 20.9 (12.1)* <sup>1</sup> | 19.6 (10.7)* <sup>1</sup>                      |                    |                       | 14.2               |                   |
| No-load noise level      |          | dB       | 78                        | 79                                             | 79                 | 81                    | 78                 | 87                |
| Housing structure        |          | —        | Cylindrical               | Cylindrical                                    | Cylindrical        | Cylindrical           | Two halves         | Cylindrical       |
| Gear cover material      |          | —        | Aluminum                  | Aluminum                                       | Aluminum           | Aluminum              | Plastic            | Aluminum          |
| Safety clutch            |          | —        | ○/× * <sup>2</sup>        | ○/× * <sup>2</sup>                             | ○                  | ○                     | ×                  | ○                 |
| Soft grip handle         |          | —        | ○                         | ○                                              | ×                  | ○                     | ×                  | ○                 |
| Speed control dial       |          | —        | ○                         | ○                                              | ○                  | ○                     | ○                  | ○                 |
| Type of reversing switch |          | —        | Pushing button            | Pushing button                                 | Brush shift        | Lever                 | Pushing button     | Brush shift       |
| Overall length           |          | mm (in.) | 390<br>(15-23/64")        | 339(13-11/32")* <sup>3</sup><br>/333 (13-1/8") | 368<br>(14-31/64") | 360<br>(14-3/16")     | 364<br>(14-21/64") | 356<br>(14-1/64") |
| Chuck offset             |          | mm (in.) | 23.5 (15/16")             | 23.5 (15/16")                                  | 27.5 (1-3/32")     | 24.5 (31/32")         | 29.0 (1-1/64")     | 30.0 (1-3/16")    |
| Weight                   |          | kg (lbs) | 2.5 (5.5 lbs)             | 2.2 (4.9 lbs)                                  | 2.3 (5.1 lbs)      | 2.3 (5.1 lbs)         | 2.0 (4.4 lbs)      | 2.6 (5.7 lbs)     |

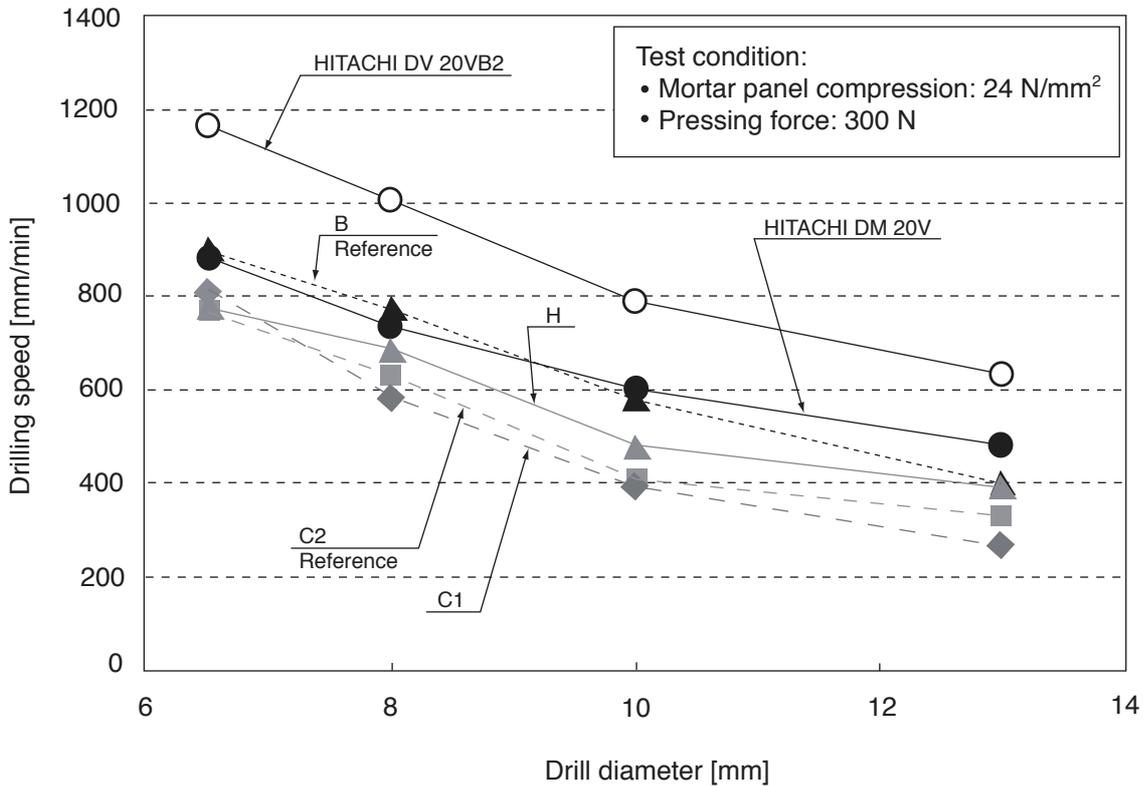
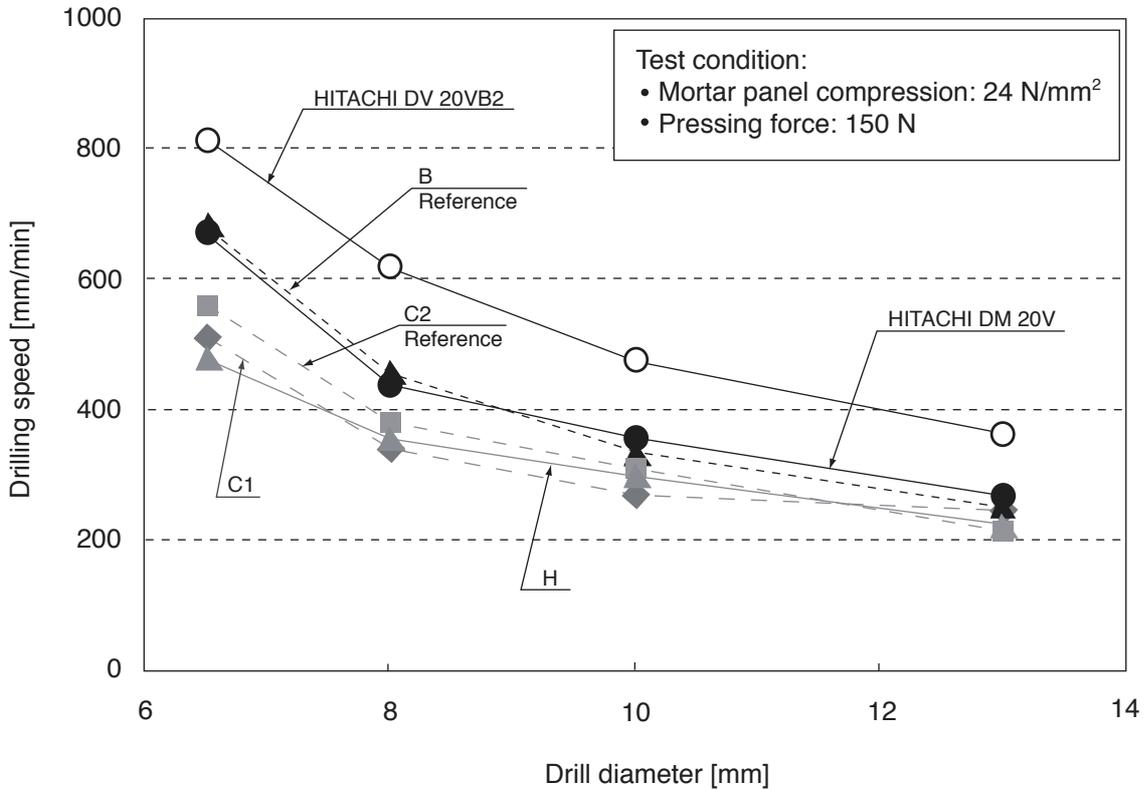
\*<sup>1</sup>: With safety clutch

\*<sup>2</sup>: Depends on market

\*<sup>3</sup>: With safety clutch

## 6-2. Drilling Speed Comparisons

Drilling speed depends on the operating conditions. The test results are based on actual factory tests, and should be used as a reference only.



## 7. PRECAUTIONS IN SALES PROMOTION

In the interest of promoting the safest and most efficient use of the Model DM 20V Masonry Drill by all of our customers, it is very important that at the time of sales 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 attached to each tool.

### 7-1. Handling Instructions

Although every effort is made in each step of design, manufacture and inspection to provide protection against safety hazards, the dangers inherent in the use of any electric power tool cannot be completely eliminated. Accordingly, general precautions and suggestions for the use of electric power tools, and specific precautions and suggestions for the use of the Masonry Drill are listed in the Handling Instructions to enhance the safe, efficient use of the tool by the customer. Salespersons must be thoroughly familiar with the contents of the Handling Instructions to be able to offer appropriate guidance to the customer during sales promotion.

### 7-2. Precautions on Usage

#### (1) IMPACT to ROTATION changeover

Shift the change lever between the right and left positions to switch easily between IMPACT (rotation and impact) and ROTATION (rotation only), respectively.

To bore holes in hard materials such as concrete, stone and tiles, shift the change lever to the right-hand position (as indicated by the  $\text{T}$  mark).

The drill bit operates by the combined actions of impact and rotation.

To bore holes in metal, wood and plastic, shift the change lever to the left-hand position (as indicated by the  $\text{D}$  mark). The drill bit operates by rotational action only, as in the case of a conventional electric drill.

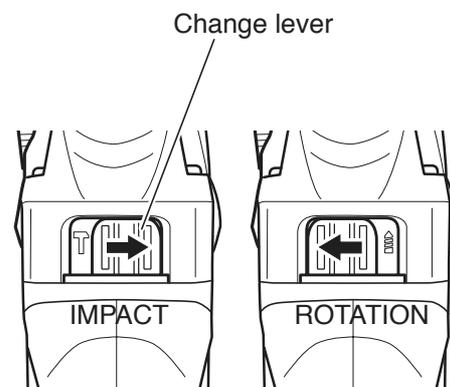


Fig. 1

#### **⚠ CAUTION:**

- Do not use the hammer drill in the IMPACT function if the material can be bored by rotation only. Such action will not only reduce drill efficiency, but may also damage the drill tip.
- Operating the hammer drill with the change lever in mid-position may result in damage. When switching, make sure that you shift the change lever to the correct position.

#### **NOTE:**

The change lever may not shift smoothly when changing from hammer drill mode to drill mode. In this case, switch ON and operate the machine for few seconds. The spindle shaft will then be pushed forward, and the change lever can be moved smoothly.

(2) High-speed/low-speed changeover

Prior to changing speed, ensure that the switch is in the OFF position, and the drill has come to a complete stop.

To change speed, rotate the gear shift dial as indicated by the arrow in Fig. 2. The numeral "1" engraved on the drill body denotes low speed, the numeral "2" denotes high speed.

If it is hard to turn the gear shift dial, turn the chuck slightly in either direction and then turn the gear shift dial again.

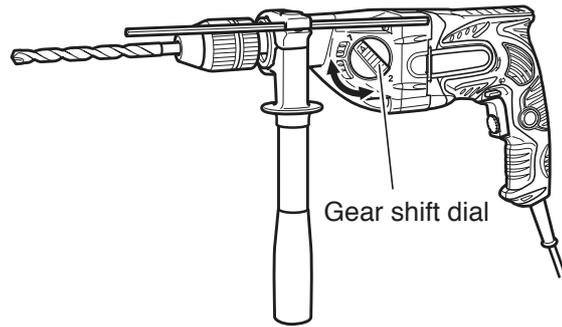


Fig. 2

(3) Check the rotational direction

The bit rotates clockwise (viewed from the rear side) by pushing the R-side of the pushing button.

The L-side of the pushing button is pushed to turn the bit counterclockwise.

(The (L) and (R) marks are provided on the body.)

**⚠ CAUTION: Always use the hammer drill with clockwise rotation, when using it as an hammer drill.**

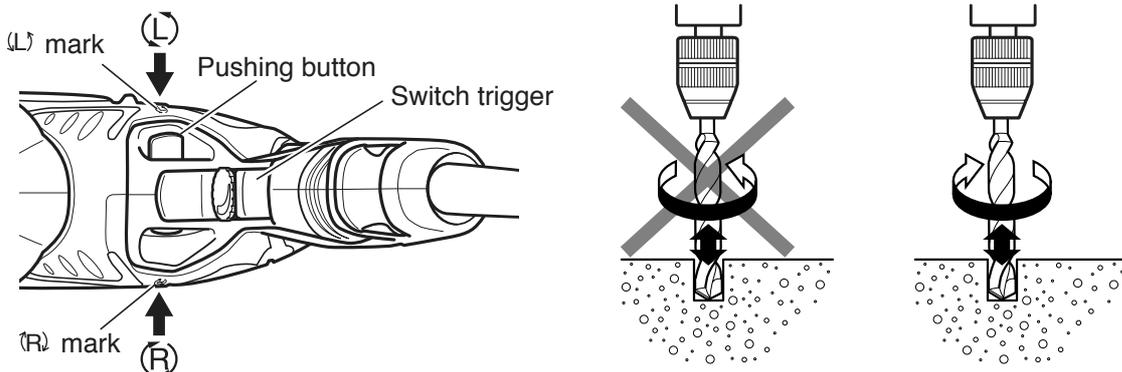


Fig. 3

(4) Switch operation

- When the trigger switch is depressed, the tool rotates. When the trigger is released, the tool stops.
- The rotational speed of the drill can be controlled by varying the amount that the trigger switch is pulled. Speed is low when the trigger switch is pulled slightly and increases as the trigger switch is pulled more.
- The desired rotation speed can be preselected with the speed control dial. Turn the speed control dial clockwise for higher speed and counterclockwise for lower speed.

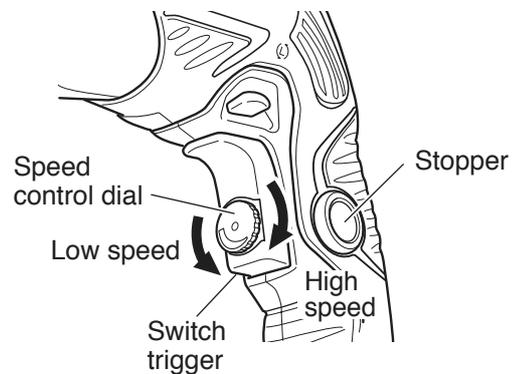


Fig. 4

- Pulling the trigger and pushing the stopper, it keeps the switched-on condition which is convenient for continuous running. When switching off, the stopper can be disconnected by pulling the trigger again.

**NOTE: If the L-side of the pushing button is pressed for reverse bit rotation, the stopper cannot be used.**

(5) Drilling

- When drilling, start the drill slowly, and gradually increasing speed as you drill.
- Always apply pressure in a straight line with the bit. Use enough pressure to keep drilling, but do not push hard enough to stall the motor or deflect the bit.
- To minimize stalling or breaking through the material, reduce pressure on drill and ease the bit through the last part of the hole.
- If the drill stalls, release the trigger immediately, remove the bit from the work and start again. Do not click the trigger on and off in an attempt to start a stalled drill. This can damage the drill.

**⚠ WARNING: The larger the drill bit diameter, the larger the reactive force on your arm. Be careful not to lose control of the drill because of this reactive force. To maintain firm control, establish a good foothold, use the side handle, hold the drill tightly with both hands, and ensure that the drill is vertical to the material being drilled.**

(6) Slip clutch mechanism (Depends on market)

The Model DM 20V is equipped with the slip clutch mechanism to avoid direct and strong reaction force caused by application of a sudden and heavy load by slipping the transmission portion between the motor and the drill bit.

**⚠ CAUTION:**

- Turn off the switch immediately if the rotation of the drill bit is stopped by the slip clutch. Be careful not to actuate the slip clutch frequently.
- The spindle shaft torque and the reaction force applied to the side handle when the slip clutch actuates are shown in the table below. In the case of the low gear, the reaction force applied to the side handle may be 141.6 N {14.4 kgf} at the maximum. Instruct the customers to use the side handle without fail and securely hold the Model DM 20V with both hands standing on a good foothold, not to be affected by the reaction force.

|           |         | Spindle shaft torque |       | Reaction force applied to the side handle |      |
|-----------|---------|----------------------|-------|-------------------------------------------|------|
|           |         | N·m                  | kgf·m | N                                         | kgf  |
| High gear | Minimum | 6.9                  | 0.7   | 34.2                                      | 3.5  |
|           | Maximum | 12.1                 | 1.2   | 59.9                                      | 6.1  |
| Low gear  | Minimum | 16.2                 | 1.7   | 80.2                                      | 8.2  |
|           | Maximum | 28.6                 | 2.9   | 141.6                                     | 14.4 |

## 8. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

The numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram.

### 8-1. Disassembly

#### 8-1-1. Motor section disassembly

##### (1) Removal of the handle cover

Loosen the Tapping Screws (W/Flange) D4 x 20 (Black) [56] and remove the Handle Cover [55].

##### (2) Removal of the carbon brushes

With a small flat-blade screwdriver, slightly lift the Brush Holders [51]. Then, while pushing the Carbon Brushes (1 Pair) [50] to the bottom of the brush holders, gently pull out and disconnect the internal wire terminals. (See Figs. 5 and 6.)

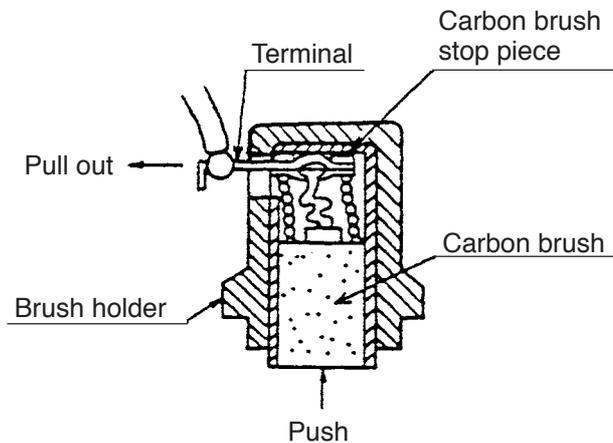


Fig. 5

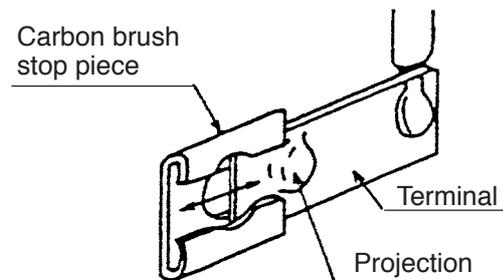


Fig. 6

##### (3) Removal of the gear cover from the housing

Loosen the Tapping Screws D5 x 55 [10] and separate the Gear Cover [11] from the Housing [44]. Then, remove the Inner Cover [17] together with the Armature [37] from the Housing [44].

(4) Removal of the armature from the inner cover

As illustrated in Fig. 7, support the Inner Cover [17] with a tubular jig, and push down on the top of the pinion of the Armature [37].

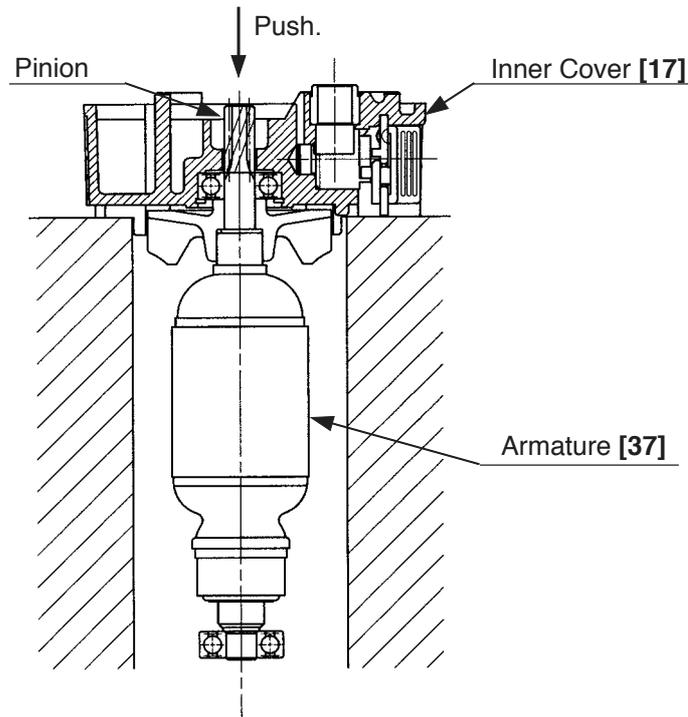


Fig. 7

(5) Removal of the stator from the housing

First, disconnect the internal wires from the Switch (1P Pillar Type) [46]. To disconnect the internal wires from the switch, insert a small flat-blade screwdriver into the windows near the terminals and pull out the internal wires. Remove the Hex. Hd. Tapping Screws D4 x 50 [39] and tap the end surface of the Housing [44] slightly with a wooden hammer. Then the stator can be removed from the housing.

**8-1-2. Inner cover ass'y disassembly**

Removal of the change lever

Remove the Change Cover [15] and the Change Lever [14].

### 8-1-3. Removal of the drill chuck

The Drill Chuck [2] is secured to the Spindle [3] with 1/2"-20 UNF (right hand) and Flat Hd. Screw (A) (Left Hand) M6 x 25 [1]. At first, open the chuck jaw as far as possible and loosen Flat Hd. Screw (A) (Left Hand) M6 x 25 [1] by turning it clockwise.

a. Hold the drill so that only the Drill Chuck [2] rests firmly and squarely on the edge of a solid bench.

Install the hex. bar wrench into the drill chuck. Turn the drill chuck until the wrench is at about a 30° angle to the bench top and strike the wrench sharply with a hammer so the drill chuck turns in the counterclockwise direction. (Fig. 8)

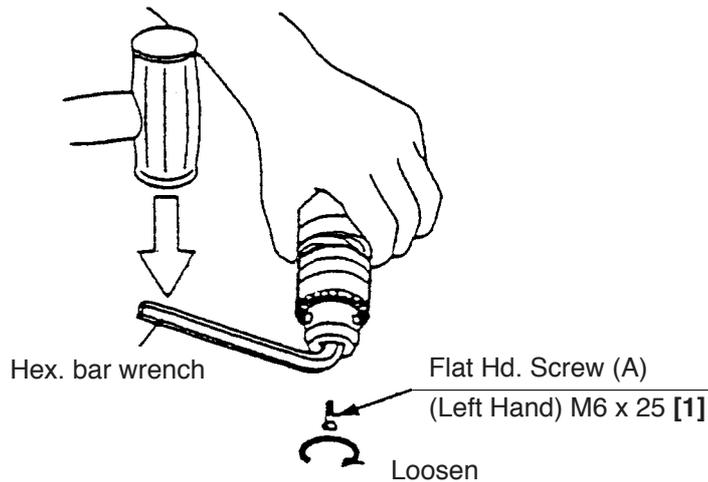


Fig. 8

If the drill chuck cannot be removed by striking the wrench, do not strike the wrench forcibly and try another way as follows.

b. Hold the Spindle [3] with the open-end wrench secured to the vise as shown in Fig. 9.

Mount the pipe to the hex. bar wrench. Turn the hex. bar wrench counterclockwise to loosen the drill chuck. (Fig. 9)

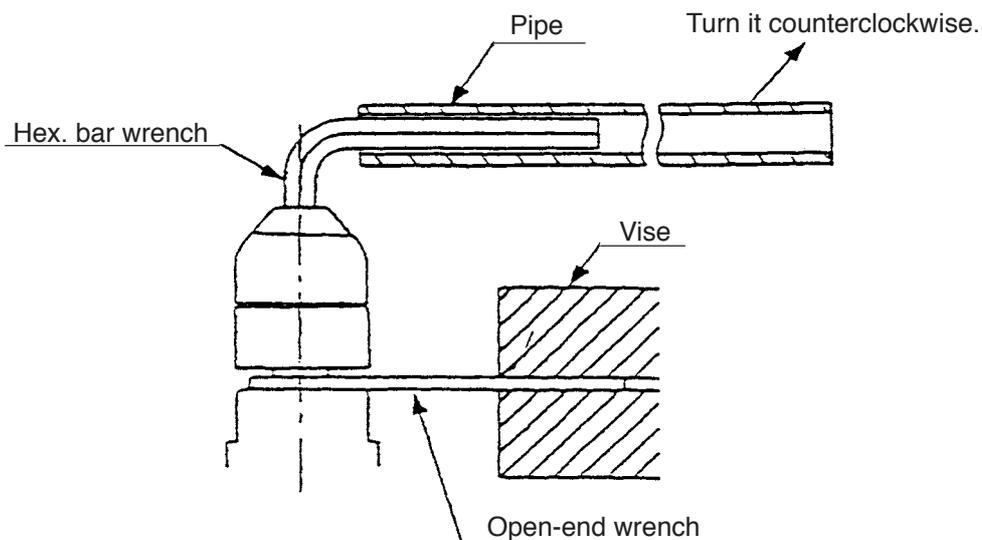


Fig. 9

#### 8-1-4. Gear cover section disassembly

##### (1) Removal of the spindle

Remove the Retaining Ring For D35 Hole [4].

Support the tip of the Gear Cover [11] with a cylindrical jig of inside diameter 35 mm or more, and push the rear portion of the Spindle [3] lightly. Then the spindle can be removed together with Oil Seal (A) [5], Distance Ring [6], Ball Bearing 6202DDCMPS2L [7] and Spring (A) [9]. (Fig. 10)

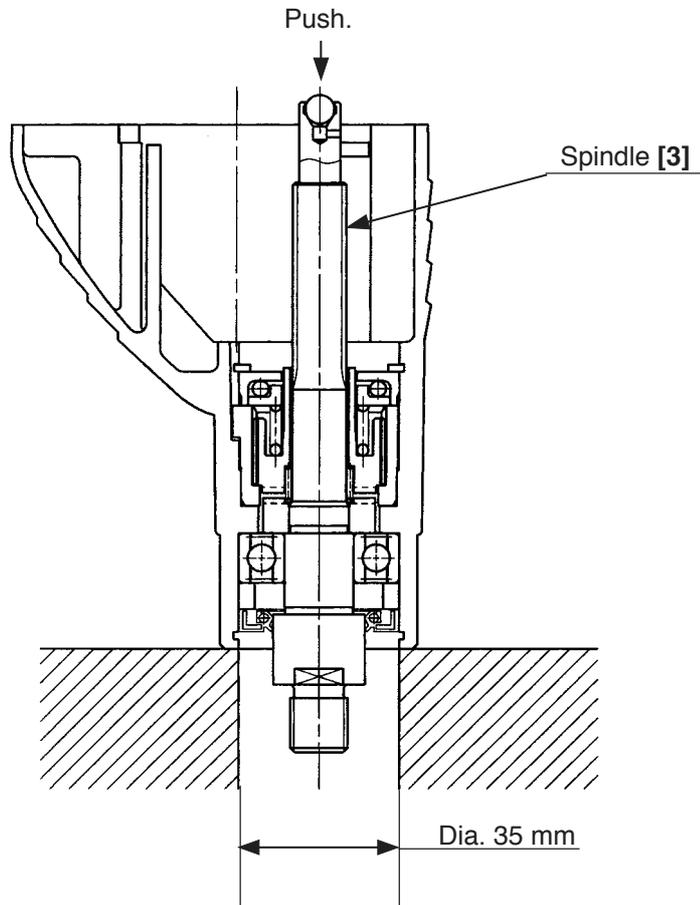


Fig. 10

(2) Removal of ratchet (B)

Removal of the Retaining Ring for D35 Hole [4]

As illustrated in Fig. 11, support the Gear Cover [11] with a cylindrical jig of outside diameter 24 mm, and push down on the top of the cylindrical jig, then Ratchet (B) [25] can be removed together with the Spring [26], Sleeve (A) [27], O-ring [28] and Sleeve (B) [29].

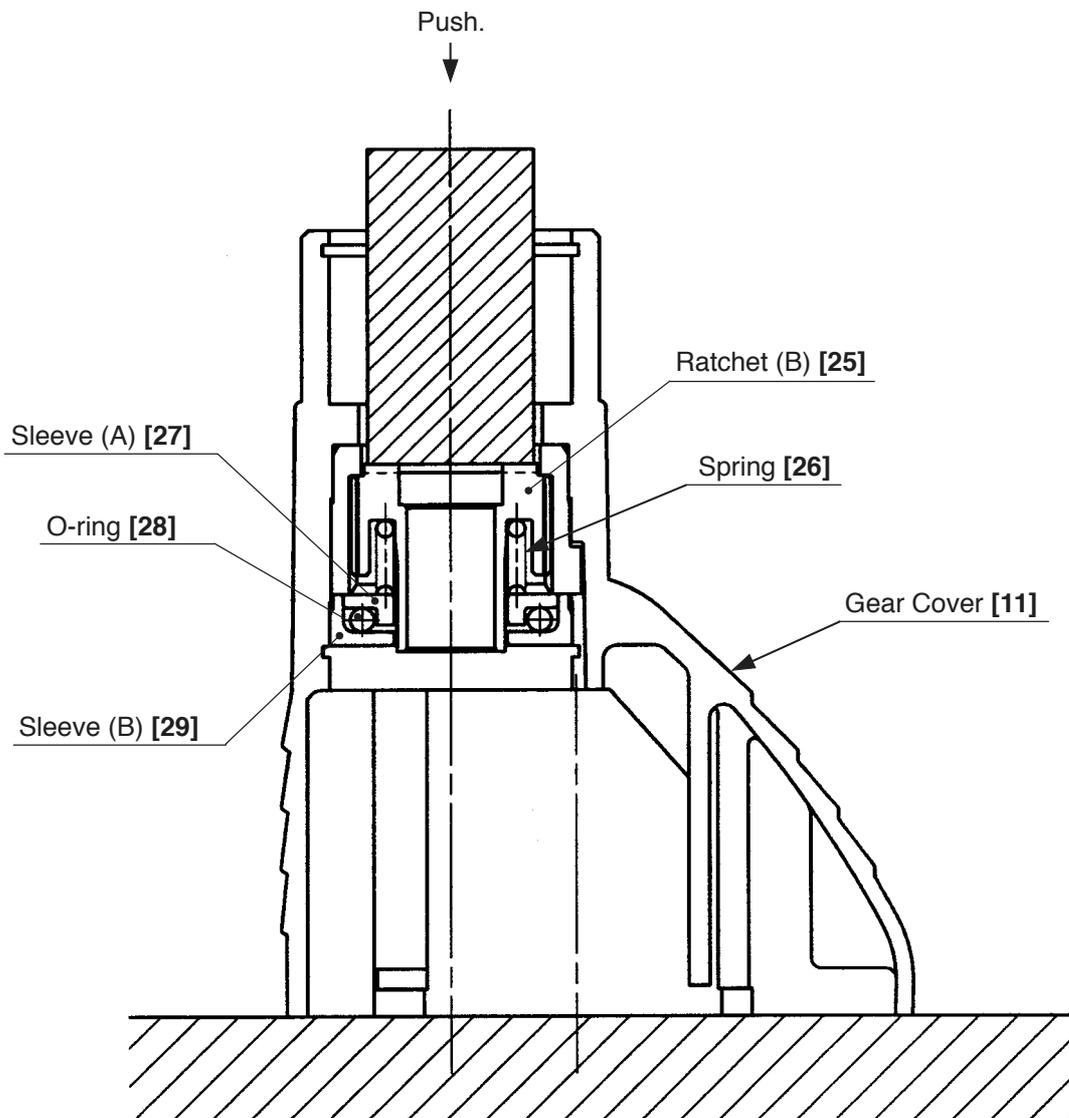


Fig. 11

(3) Removal of the shift lever

Position the Shift Lever Ass'y [18] as shown in Fig. 12. Push both ends of the Retaining Ring (E-type) for D15 Shaft [24] with a pair of long-nose pliers until a clearance about 1 to 2 mm is made. Keeping the clearance, turn the Shift Lever Ass'y [18] by 180 degrees together with the Retaining Ring (E-type) for D15 Shaft [24]. Insert a flat-blade screwdriver into the clearance and pry the Retaining Ring (E-type) for D15 Shaft [24] off upward.

**⚠ CAUTION:**

**If the Retaining Ring (E-type) for D15 Shaft [24] is pushed excessively, the Shift Lever Ass'y [18] cannot be turned due to a wide clearance.**

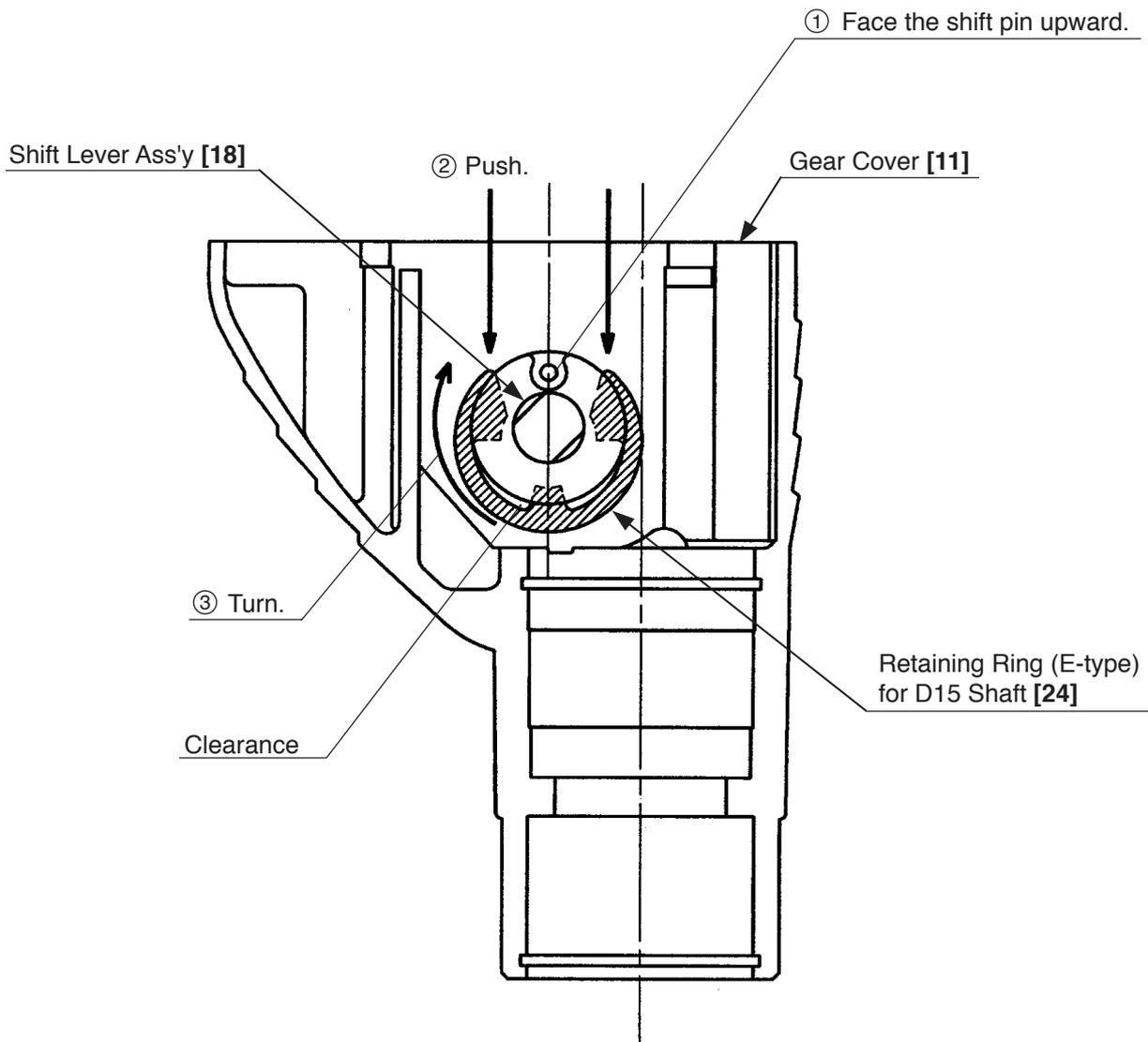


Fig. 12

## 8-2. Reassembly

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

### 8-2-1. Internal wire arrangement

- (1) Arrange the internal wires according to "8-4. Internal Wire Arrangement and Wiring Work".
- (2) Be careful not to catch the internal wires when mounting the handle cover.

### 8-2-2. Lubrication

- (1) Apply ATTOLUB MS No. 2 Grease to the following parts.
  - Teeth of the Second Pinion and Gear Set **[13]** and the Gear **[32]**
  - On the Spindle **[3]**  
Ground portion for fitting the Ball Bearing 6202DDCMPS2L **[7]**, splined portion and hole of rear side
  - On the Shift Lever Ass'y **[18]**.  
Outer circumference portion of the Shift Pin **[20]**, the O-ring (S-22) **[19]**
  - On the Change Shaft **[16]**  
Outer circumference portion
  - Lip portion of Oil Seal (A) **[5]**
  - On the Inner Cover **[17]**  
Metal portion
  - Inside of Gear Cover **[11]**: 5 g

### 8-2-3. Tightening torque

- (1) Flat Hd. Screw (A) (Left Hand) M6 x 25 **[1]** ..... 4.0 to 5.0 N·m (39.0 to 47.8 in-lbs.)
- (2) Tapping Screw (W/Flange) D4 x 20 (Black) **[56]** ..... 1.5 to 2.5 N·m (13.3 to 22.1 in-lbs.)
- (3) Tapping Screw D5 x 55 **[10]** ..... 2.4 to 3.4 N·m (21.3 to 30.1 in-lbs.)
- (4) Drill Chuck **[2]** ..... 29.4 to 39.2 N·m (260 to 347 in-lbs.)

#### 8-2-4. Reassembly of the gear cover section

Figure 13 shows the assembly drawing. Reassemble the gear cover section according to the following figure.

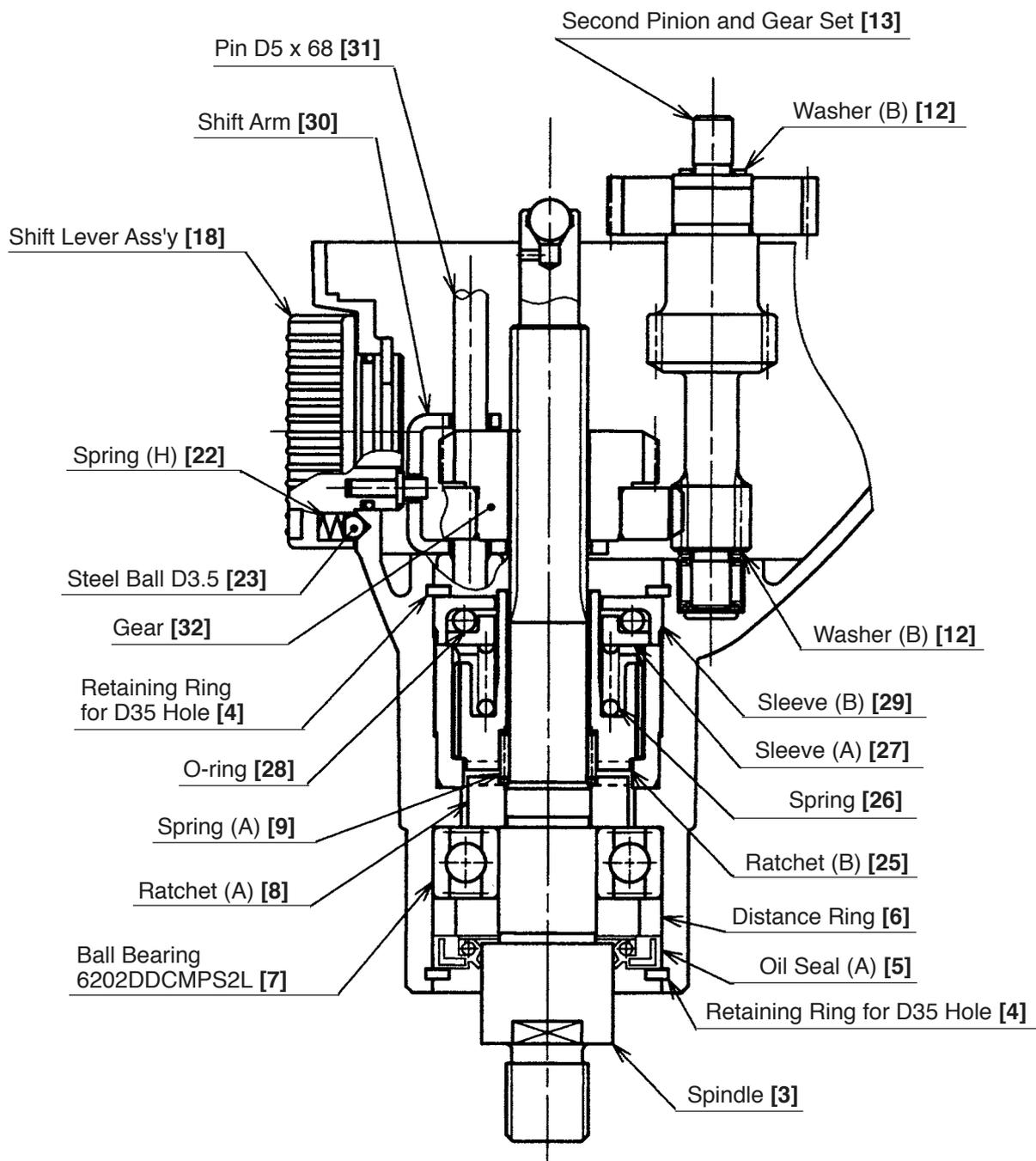


Fig. 13

#### ⚠ CAUTION:

- Be sure to replace Ratchet (A) [8] with a new one. Never reuse Ratchet (A) [8] previously removed from the Spindle [3]. If reused, the tightening torque between Ratchet (A) [8] and the Spindle [3] will be far too low and the Spindle [3] may run idle in the IMPACT mode.
- Mounting directions of the Shift Arm [30] and the Gear [32] are specified. Mount these parts in the specified direction as shown in the above figure.

(With slip clutch)

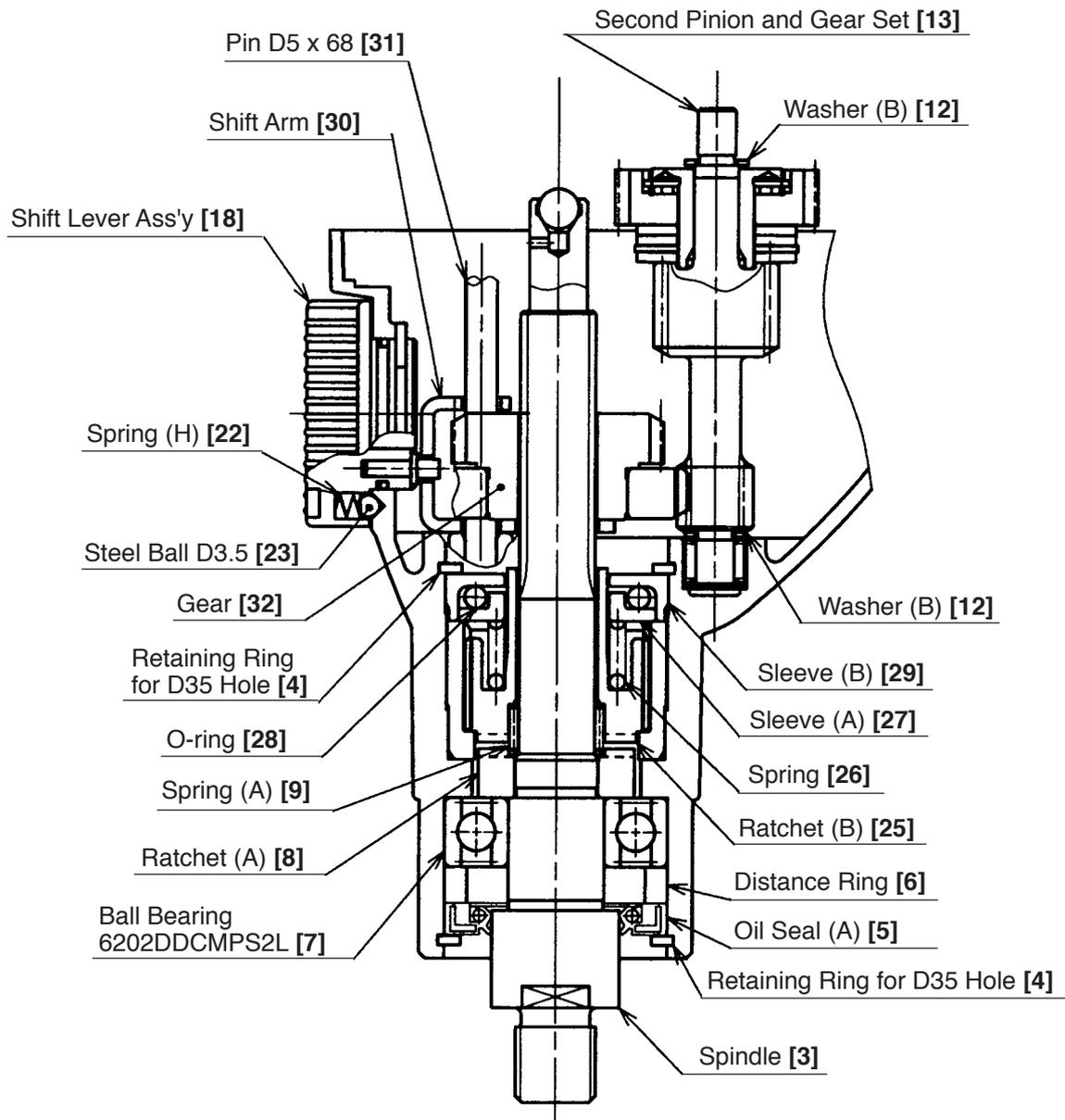


Fig. 14

**⚠ CAUTION:**

- Be sure to replace Ratchet (A) [8] with a new one. Never reuse Ratchet (A) [8] previously removed from the Spindle [3]. If reused, the tightening torque between Ratchet (A) [8] and the Spindle [3] will be far too low and the Spindle [4] may run idle in the IMPACT mode.
- Mounting directions of the Shift Arm [30] and the Gear [32] are specified. Mount these parts in the specified direction as shown in the above figure.

### 8-3. Wiring Diagram

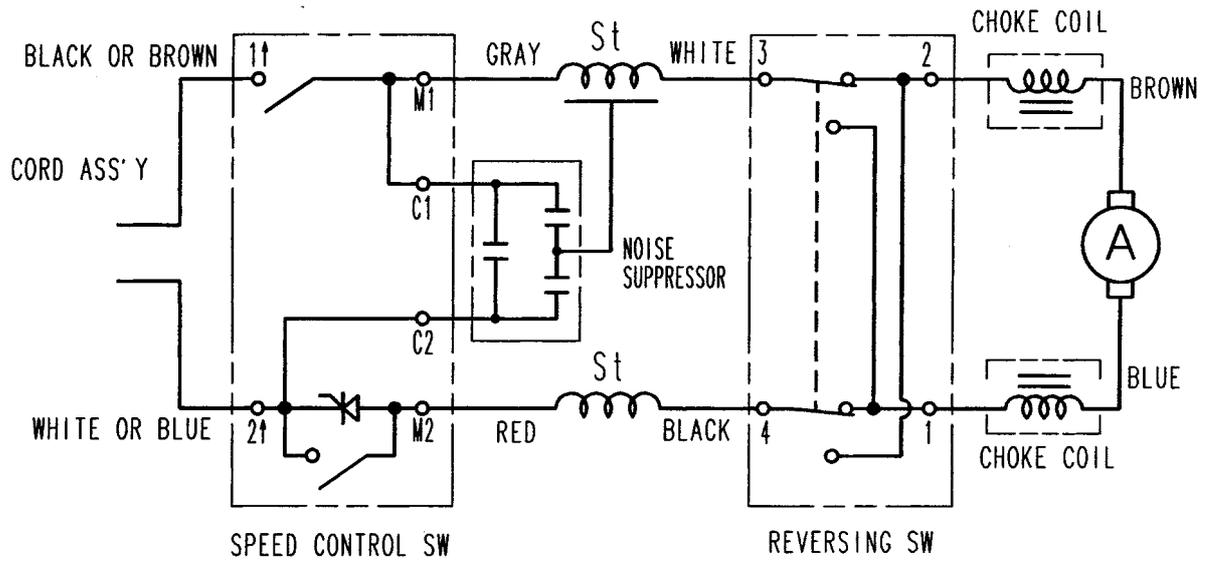


Fig. 15

## 8-4. Internal Wire Arrangement and Wiring Work

### A. Internal wire arrangement

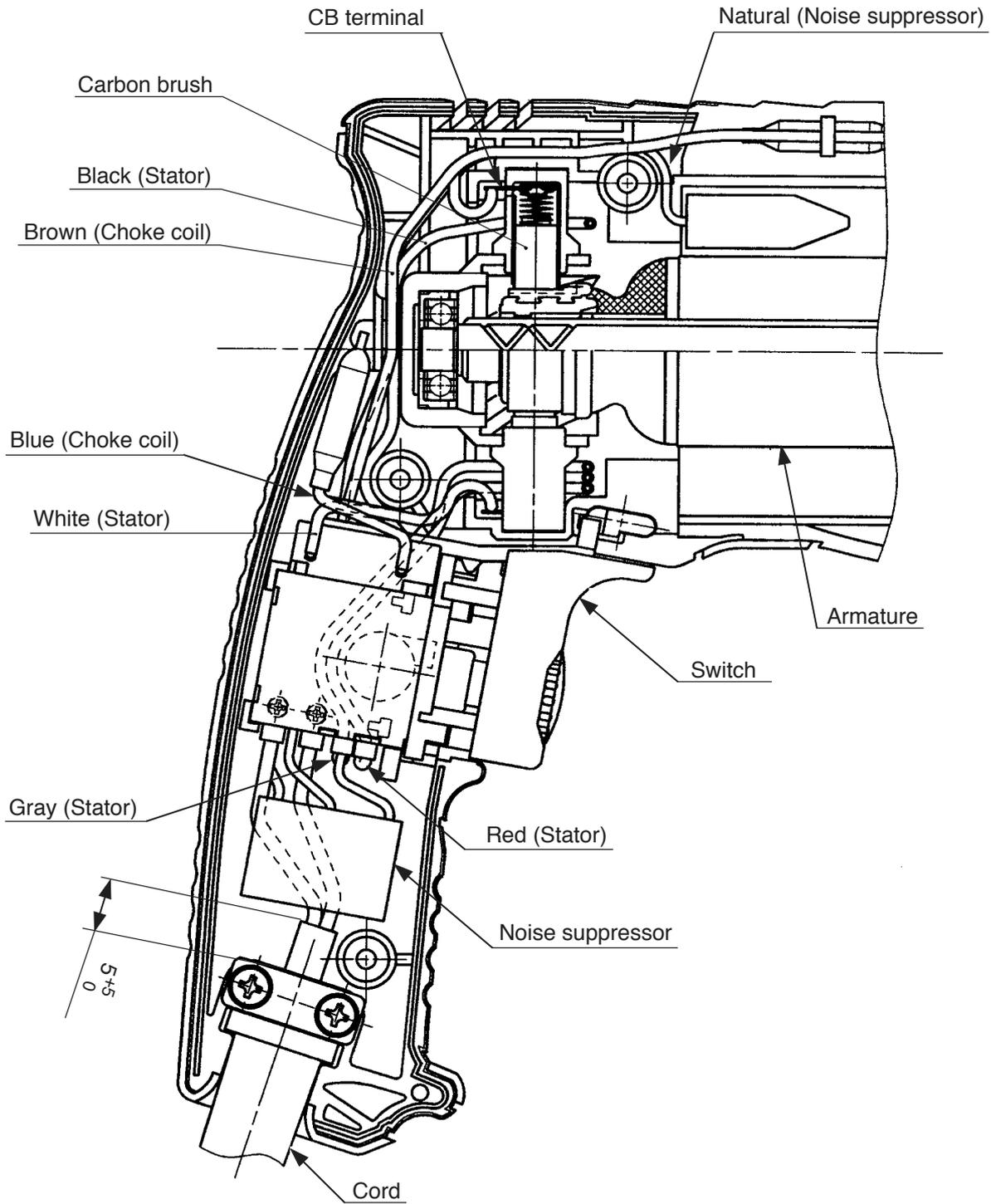


Fig. 16

B. Switch connection

(1) Wiring of reversing switch

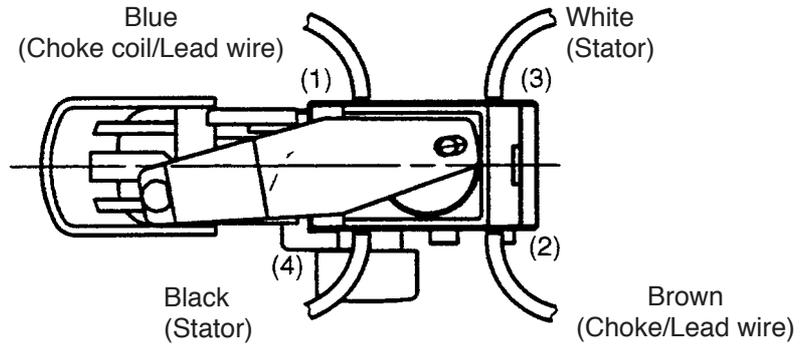


Fig. 17

(2) Wiring of speed control switch

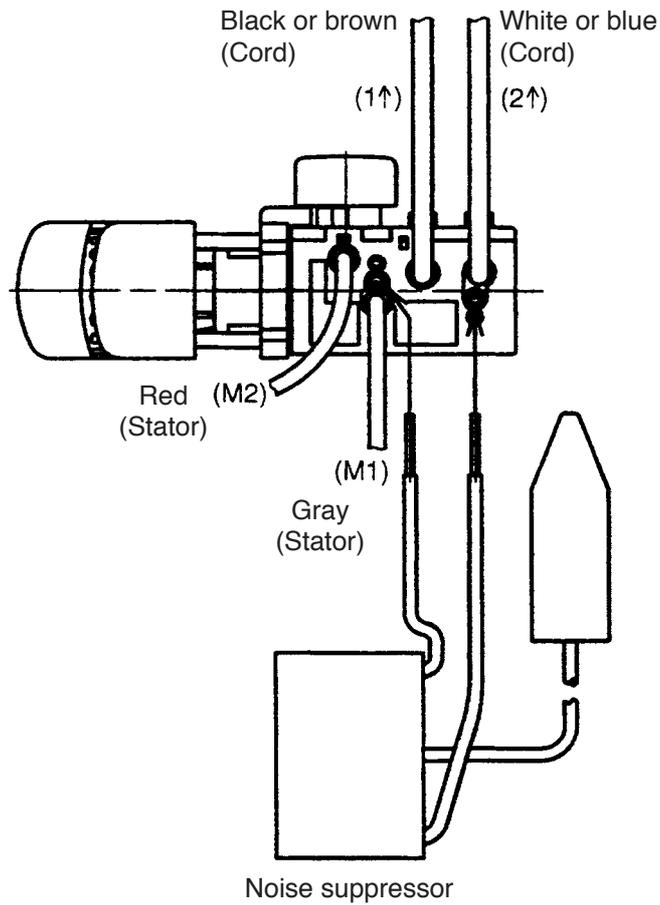


Fig. 18

### 8-5. Insulation Tests

On completion of reassembly after repair, measure the insulation resistance and conduct the dielectric strength test.

Insulation resistance: 7 M  $\Omega$  or more with DC 500 V megohm tester

Dielectric strength: AC 4,000 V/1 minute, with no abnormalities 220 V – 240 V (and 110 V for U.K. products)

AC 2,500 V/1 minute, with no abnormalities 110 V – 127 V (except U.K. products)

### 8-6. No-Load Current Value

After no-load operation for 30 minutes, the no-load current value should be as follows.

|                  |     |     |
|------------------|-----|-----|
| Voltage (V)      | 110 | 230 |
| Current (A) Max. | 3.5 | 1.6 |

**9. STANDARD REPAIR TIME (UNIT) SCHEDULES**

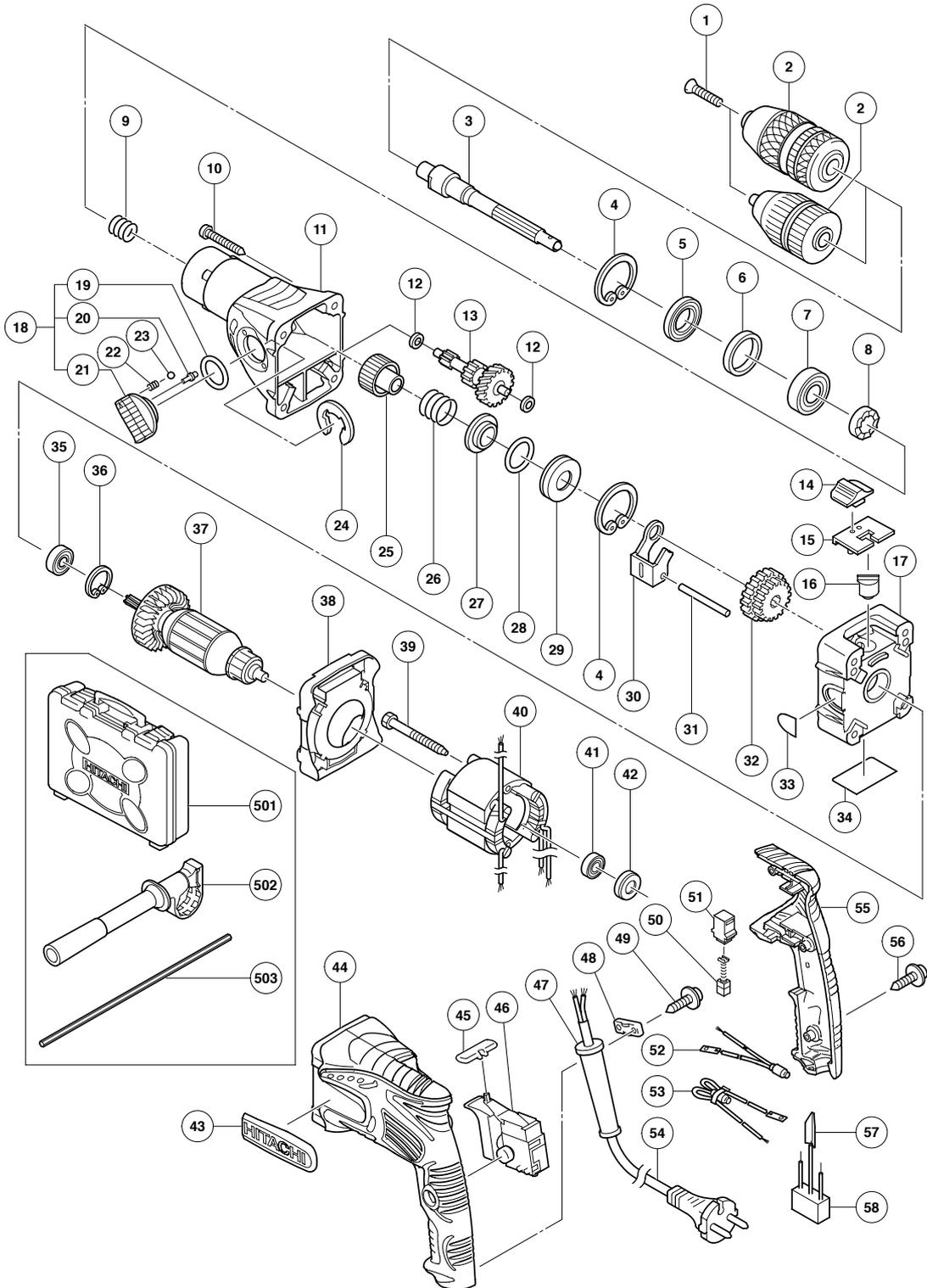
| MODEL  | Variable |           | 10 | 20 | 30 | 40 | 50 | 60 min. |
|--------|----------|-----------|----|----|----|----|----|---------|
|        | Fixed    | Work Flow |    |    |    |    |    |         |
| DM 20V |          |           |    |    |    |    |    |         |
|        |          |           |    |    |    |    |    |         |

## ELECTRIC TOOL PARTS LIST

### MASONRY DRILL Model DM 20V

2005 · 12 · 15

(E1)



**PARTS**

DM 20V

| ITEM NO. | CODE NO. | DESCRIPTION                             | NO. USED | REMARKS         |
|----------|----------|-----------------------------------------|----------|-----------------|
| * 1      | 995-344  | FLAT HD. SCREW (A) (LEFT HAND) M6X25    | 1        | EXCEPT FOR GBR  |
| * 2      | 319-546  | DRILL CHUCK 13VLRE-N (W/O CHUCK WRENCH) | 1        |                 |
| * 2      | 316-280  | DRILL CHUCK 13VLN (W/O CHUCK WRENCH)    | 1        | FOR GBR         |
| 3        | 325-319  | SPINDLE                                 | 1        |                 |
| 4        | 939-556  | RETAINING RING FOR D35 HOLE (10 PCS.)   | 2        |                 |
| 5        | 971-745  | OIL SEAL (A)                            | 1        |                 |
| 6        | 325-335  | DISTANCE RING                           | 1        |                 |
| 7        | 620-2DD  | BALL BEARING 6202DDCMPS2L               | 1        |                 |
| 8        | 325-330  | RATCHET (A)                             | 1        |                 |
| 9        | 984-101  | SPRING (A)                              | 1        |                 |
| 10       | 325-336  | TAPPING SCREW D5X55                     | 4        |                 |
| 11       | 325-326  | GEAR COVER                              | 1        |                 |
| 12       | 322-852  | WASHER (B)                              | 2        |                 |
| * 13     | 325-339  | SECOND PINION AND GEAR SET              | 1        |                 |
| * 13     | 325-340  | SECOND PINION AND GEAR SET              | 1        | FOR SLIP CLUTCH |
| 14       | 325-323  | CHANGE LEVER                            | 1        |                 |
| 15       | 325-324  | CHANGE COVER                            | 1        |                 |
| 16       | 325-322  | CHANGE SHAFT                            | 1        |                 |
| 17       | 325-320  | INNER COVER                             | 1        |                 |
| 18       | 322-847  | SHIFT LEVER ASS'Y                       | 1        | INCLUD. 19-21   |
| 19       | 306-353  | O-RING (S-22)                           | 1        |                 |
| 20       | 322-848  | SHIFT PIN                               | 1        |                 |
| 21       |          | SHIFT LEVER                             | 1        |                 |
| 22       | 981-328  | SPRING (H)                              | 1        |                 |
| 23       | 319-535  | STEEL BALL D3.5 (10 PCS.)               | 1        |                 |
| 24       | 323-048  | RETAINING RING (E-TYPE) FOR D15 SHAFT   | 1        |                 |
| 25       | 325-331  | RATCHET (B)                             | 1        |                 |
| 26       | 325-332  | SPRING                                  | 1        |                 |
| 27       | 325-333  | SLEEVE (A)                              | 1        |                 |
| 28       | 884-909  | O-RING                                  | 1        |                 |
| 29       | 325-334  | SLEEVE (B)                              | 1        |                 |
| 30       | 322-849  | SHIFT ARM                               | 1        |                 |
| 31       | 325-321  | PIN D5X68                               | 1        |                 |
| 32       | 325-327  | GEAR                                    | 1        |                 |
| 33       |          | HITACHI LABEL                           | 1        |                 |
| 34       |          | NAME PLATE                              | 1        |                 |
| 35       | 608-DDM  | BALL BEARING 608DDC2PS2L                | 1        |                 |
| 36       | 939-553  | RETAINING RING FOR D22 HOLE (10 PCS.)   | 1        |                 |
| * 37     | 360-652C | ARMATURE 110V                           | 1        |                 |
| * 37     | 360-652E | ARMATURE 230V                           | 1        |                 |
| 38       | 325-325  | FAN GUIDE                               | 1        |                 |
| 39       | 961-672  | HEX. HD. TAPPING SCREW D4X50            | 2        |                 |
| * 40     | 340-650C | STATOR 110V                             | 1        |                 |
| * 40     | 340-650E | STATOR 230V                             | 1        |                 |
| 41       | 698-T1X  | BALL BEARING 698T1XZZ1MC2E NS7L         | 1        |                 |
| 42       | 309-929  | RUBBER BUSHING                          | 1        |                 |
| 43       | 325-338  | HITACHI PLATE                           | 1        |                 |
| 44       | 324-553  | HOUSING                                 | 1        |                 |
| 45       | 322-853  | PUSHING BUTTON                          | 1        |                 |
| 46       | 325-337  | SWITCH (1P PILLAR TYPE)                 | 1        |                 |
| 47       | 953-327  | CORD ARMOR D8.8                         | 1        |                 |





