

MODEL

**FDV 20VB**

**HITACHI**  
**POWER TOOLS**

**IMPACT DRILL**  
**FDV 20VB**

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

**F**



LIST No. F847

Mar. 2001

**Notice for use**

Specifications and parts are subject to change for improvement.

Refer to Hitachi Power Tool Technical News for further information.

## CONTENTS



	Page
<b>1. PRODUCT NAME .....</b>	<b>1</b>
<b>2. MARKETING OBJECTIVE .....</b>	<b>1</b>
<b>3. APPLICATIONS .....</b>	<b>1</b>
<b>4. SELLING POINTS .....</b>	<b>1</b>
4-1. Selling Point Descriptions .....	2
<b>5. SPECIFICATIONS .....</b>	<b>3</b>
<b>6. COMPARISONS WITH SIMILAR PRODUCTS .....</b>	<b>4</b>
6-1. Specification Comparisons .....	4
6-2. Drilling Speed Comparisons .....	5
<b>7. PRECAUTIONS IN SALES PROMOTION .....</b>	<b>6</b>
7-1. Handling Instructions .....	6
7-2. Cautions on Name Plate .....	6
7-3. Precautions In Usage .....	7
<b>8. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY .....</b>	<b>9</b>
8-1. Disassembly .....	9
8-2. Reassembly .....	11
8-3. Lubrication .....	13
8-4. Tightening Torque .....	13
8-5. Wiring Diagrams and Internal Wire Arrangements .....	13
8-6. Insulation Tests .....	16
8-7. No-load Current Values .....	16
<b>9. STANDARD REPAIR TIME (UNIT) SCHEDULES .....</b>	<b>17</b>
Assembly Diagram for FDV 20VB	

# 1. PRODUCT NAME

Hitachi Impact Drill, Model FDV 20VB

# 2. MARKETING OBJECTIVE

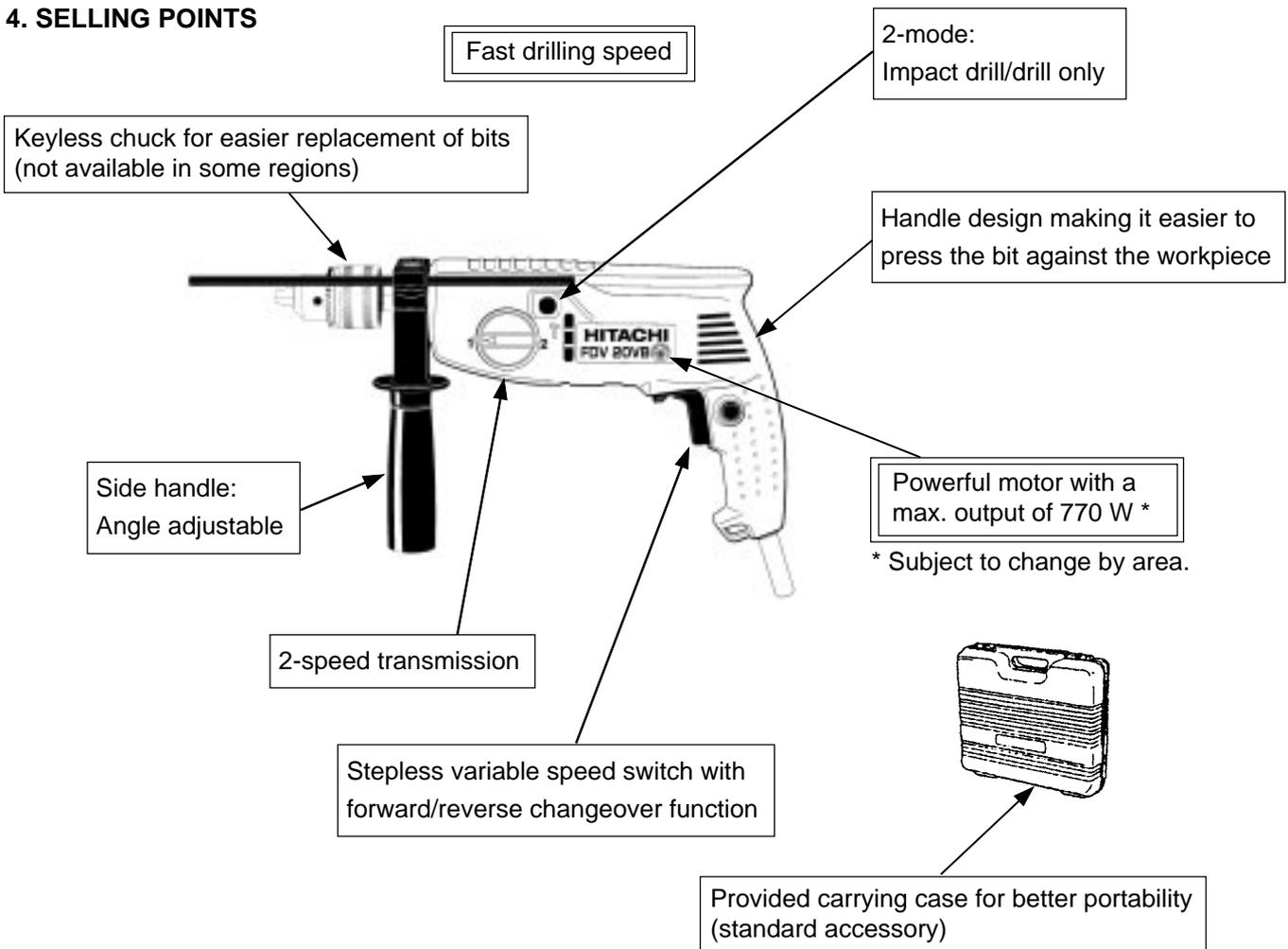
Model FDV 20VB is upgraded version of the current Model FDV 20VA. The outstanding improvements are as follows:

- (1) Fast drilling speed
- (2) Powerful motor, power input of 750 W (Subject to change by area)
- (3) Improved operability, new housing design
- (4) Standard plastic carrying case
- (5) Quick and easy handling, 13 mm keyless chuck (not available in some regions)

# 3. APPLICATIONS

- When set for "Rotation + Impact"
  - Drilling holes in brick, cement block, concrete, and similar materials
- When set for "Rotation Only"
- (1) Drilling holes in wood, metal, resin plate and similar materials
  - (2) Grinding, sanding and polishing of wood, metal and various other materials (with use of appropriate attachments)

# 4. SELLING POINTS



## 4-1. Selling Point Descriptions

### (1) Fast drilling speed

Since the Model FDV 20VB is targeted for major applications of impact drills; drilling 10 mm or less diameter holes, the Model FDV 20VB achieves the fastest speed in this class. Thanks to the powerful motor and the two-step gear shift mechanism, the Model FDV 20VB overwhelms the competitors in speed when drilling small diameter holes. (Refer to "6-2. Drilling Speed Comparisons".)

### (2) Powerful motor with a maximum output of 750 W

The Model FDV 20VB is equipped with the powerful motor that achieves fast drilling speed.

	FDV 20VB	FDV 20VA	B	C1/C2
Input	750 W *	710 W	750 W	650 W
Maximum output	770 W	620 W	570 W	610 W

\*: 720 W in 240 V areas

### (3) Variable speed control switch with forward/reverse changeover function

The rotation speed of the drill bit is variable depending on the depressing amount of the switch trigger. This is convenient for low-speed operations such as determining the positions of holes to be drilled.

### (4) Handle design making it easier to press the bit against the workpiece

Inheriting the aggressive and powerful styling from the Model FDV 16VB, the Model FDV 20VB has the conveniently angled and shaped handle to ensure operability in drilling and to reduce the operator's fatigue in a long time operation.

### (5) Provided carrying case for better portability (standard accessory)

The plastic case is a standard accessory of the Model FDV 20VB (FDV 20VA: optional accessory).

### (6) Keyless chuck for quick and easy replacement of drill bits (not available in some regions)

Adoption of a keyless chuck in place of a conventional chuck means that the bothersome chuck wrench is no longer necessary, and that mounting and replacement of drill bits is quicker and easier.

## 5. SPECIFICATIONS

Item		Model	FDV 20VB																				
Max. capacity	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																					
	Chucking dia.	1.5 – 13 mm																					
Power source		AC single phase 50/60 Hz																					
Voltage, current and input		<table border="1"> <thead> <tr> <th>Voltage (V)</th> <th>Current (A)</th> <th colspan="2">Power input (W)</th> </tr> </thead> <tbody> <tr> <td>110</td> <td>7.2</td> <td colspan="2" rowspan="4">750</td> </tr> <tr> <td>115</td> <td>6.9</td> </tr> <tr> <td>220</td> <td>3.6</td> </tr> <tr> <td>230</td> <td>3.5</td> </tr> <tr> <td>240</td> <td>3.1</td> <td colspan="2">720</td> </tr> </tbody> </table>				Voltage (V)	Current (A)	Power input (W)		110	7.2	750		115	6.9	220	3.6	230	3.5	240	3.1	720	
		Voltage (V)	Current (A)	Power input (W)																			
		110	7.2	750																			
		115	6.9																				
		220	3.6																				
		230	3.5																				
240	3.1	720																					
Type of motor		AC single phase series commutator motor																					
Speed	No-load	0 – 1,300/3,000/min																					
	Full-load	0 – 940/2,180/min																					
Impact rate	No-load	0 – 20,800/48,000/min																					
	Full-load	0 – 15,000/35,000/min																					
Type of switch		Trigger switch w/stopper (variable speed)																					
Type of handle		Pistol type																					
Enclosure		Polycarbonate resin																					
Cord		2-core cabtire cord Nominal sectional area: 0.75 mm <sup>2</sup> Length: 2.5 m (8.2 feet)																					
Weight	Net	2.2 kg																					
	Gross	3.9 kg																					
Packaging		Corrugated cardboard box with plastic case																					
Standard accessories		Chuck wrench* ..... 1 Side handle ass'y ..... 1 Depth stopper ..... 1 Plastic case ..... 1																					
Optional accessories		Item		Code No.																			
		TCT drill bit set (Dia. 4, 6, 8, 10) ..... 1 each		879344																			
		HSS drill bit set (Dia. 2, 3.2, 4.8, 6.5) ..... 1 each		879345																			

\* Ordinary drill chuck with chuck key

## 6. COMPARISONS WITH SIMILAR PRODUCTS

### 6-1. Specification Comparisons

Item		Maker	HITACHI		B	C1/C2	
		Model	FDV 20VB	FDV 20VA			
Catalog specifications	Capacity	Concrete	mm (")	20 (3/4)	20 (3/4)	20 (3/4)	20 (3/4)
		Steel	mm (")	13 (1/2)	13 (1/2)	13 (1/2)	13 (1/2)
		Wood	mm (")	40 (1-9/16)	40 (1-9/16)	40 (1-9/16)	40 (1-9/16)
	Power input		W	750 *1	710	750	650
	No-load speed		/min	0-1,300/3,000	0-1,300/3,000	0-1,000/3,000	0-950/2,900
	No-load impact rate		/min	0-20,800/48,000	0-26,000/60,000	0-16,000/48,000	0-12,400/37,700
	Overall length		mm (")	347 (13-5/8)	350 (13-25/32)	336 (13-7/32)	346 (13-5/8)
	Weight *2		kg (lbs)	2.2 (4.85)	2.2 (4.85)	2.2 (4.85)	2.3 (5.07)
Actual weight *2 (including drill chuck)		kg (lbs)	2.2 (4.85)	2.2 (4.85)	2.2 (4.85)	2.4 (5.29)	
Motor characteristics	Full-load output		W	430	330	385	360
	Max. output		W	770	620	570	610
	Max. torque		N•m	43.2	39.0	49.0	44.9
	No-load sound pressure level		dB (A)	86	86	84	78
Structure specifications	Number of ratchet teeth			16	20	16	13
	Gear ratio			9.71/22.5	9.72/20.95	9.49/27.84	8.94/27.31
	Two-step variable speed function			Provided	Provided	Provided	Provided
	Synchronized gear shift mechanism			None	None	Provided	None
	Stepless variable speed function			Provided	Provided	Provided	Provided
	Micro-adjust knob for speed control			None	Provided	Provided	None
	Forward/reverse changeover function			Provided	Provided	Provided	Provided
	Spindle auto lock			None	None	Provided	None
Vibration damper			None	None	Provided	None	
Standard accessories			1 Chuck wrench*3 1 Side handle 1 Depth stopper 1 Plastic case	1 Chuck wrench 1 Side handle 1 Depth stopper	1 Chuck wrench*3 1 Side handle 1 Depth stopper 1 Plastic case	1 Chuck wrench*3 1 Side handle 1 Depth stopper 1 Plastic case	

\*1 Subject to change by area.

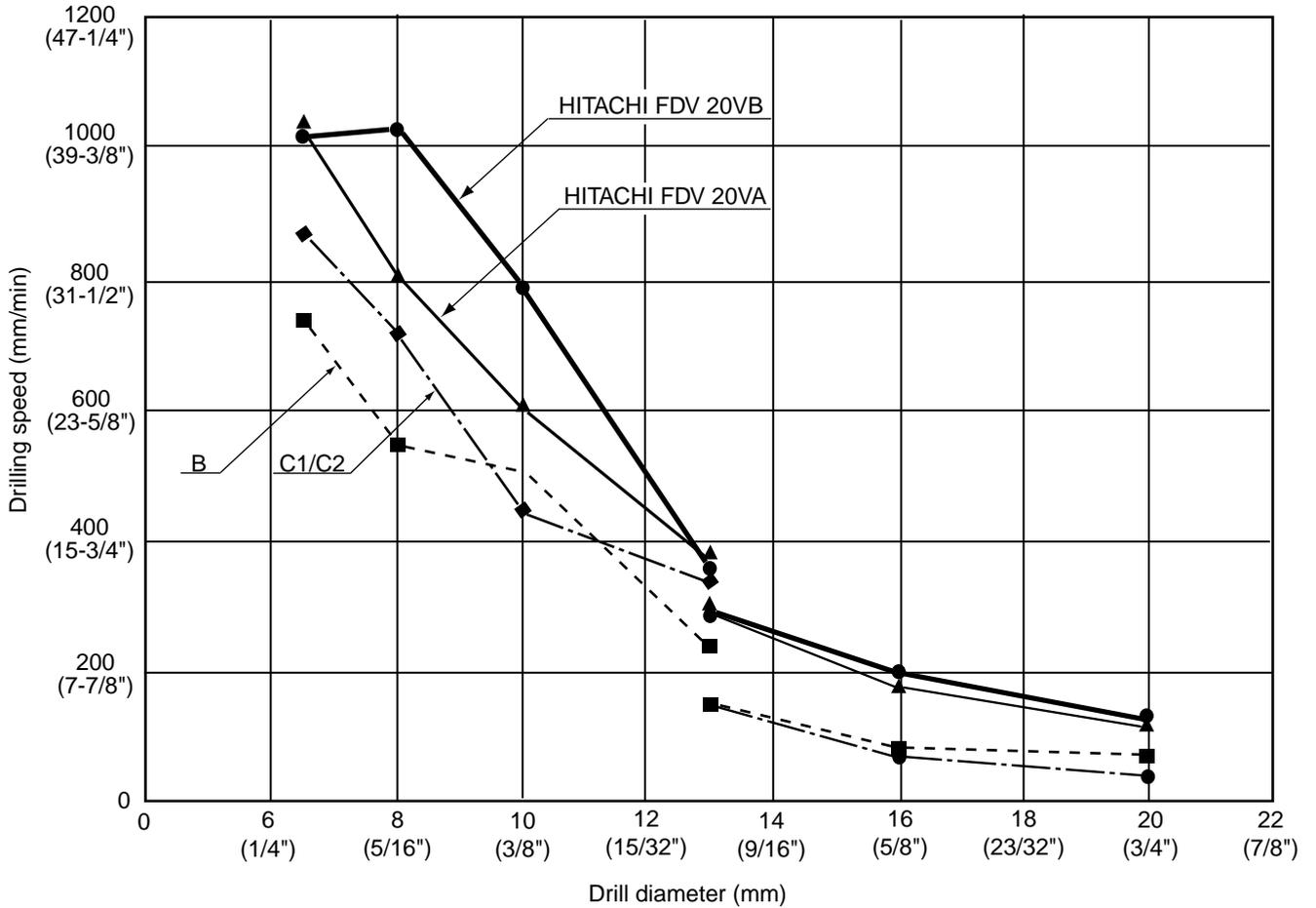
\*2 Weight and actual weight exclude cord.

\*3 Ordinary drill chuck with chuck key.

## 6-2. Drilling Speed Comparisons

The data shown below were obtained in actual factory tests, and are for reference only. Actual drilling speeds may vary in accordance with operating conditions, operator skill, etc.

Drilling in concrete



Test condition:

- Drill bit: Genuine parts
- Workpiece material: Concrete (compressive strength 240 kg/cm<sup>2</sup>)
- Drilling into concrete floor
- **Pressing force: 30 kgf**

## 7. PRECAUTIONS IN SALES PROMOTION

In the interest of promoting the safest and most efficient use of the Model FDV 20VB Impact 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 Impact 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. Cautions on Name Plate

The following basic safety precautions are listed on the Name Plate attached to the main body of each tool.

For Australia and China

**CAUTION**

- **Read thoroughly HANDLING INSTRUCTIONS before use.**

For the U.S.A. and Canada

**WARNING**

- **To reduce the risk of injury, user must read and understand the instruction manual.**

**AVERTISSEMENT**

- **Afin de reduire le risque de blessures, l'utilisateur doit lire et bien comprendre le mode d'emploi.**

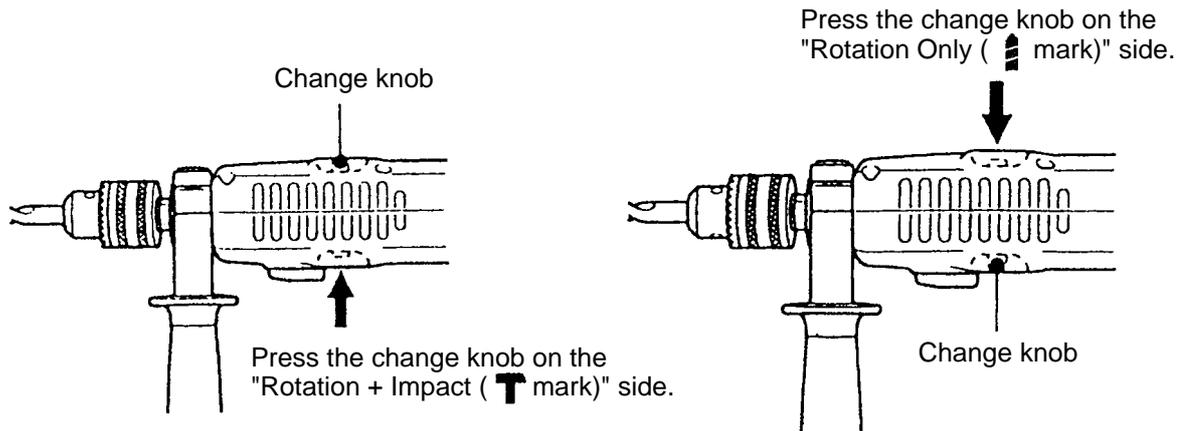
These precautions are not listed on the Name Plates of the products destined for the countries other than Australia, China, the U.S.A. and Canada.

### 7-3. Precautions In Usage

The Model FDV 20VB has three changeover mechanisms as described below. Adjust them according to the applications.

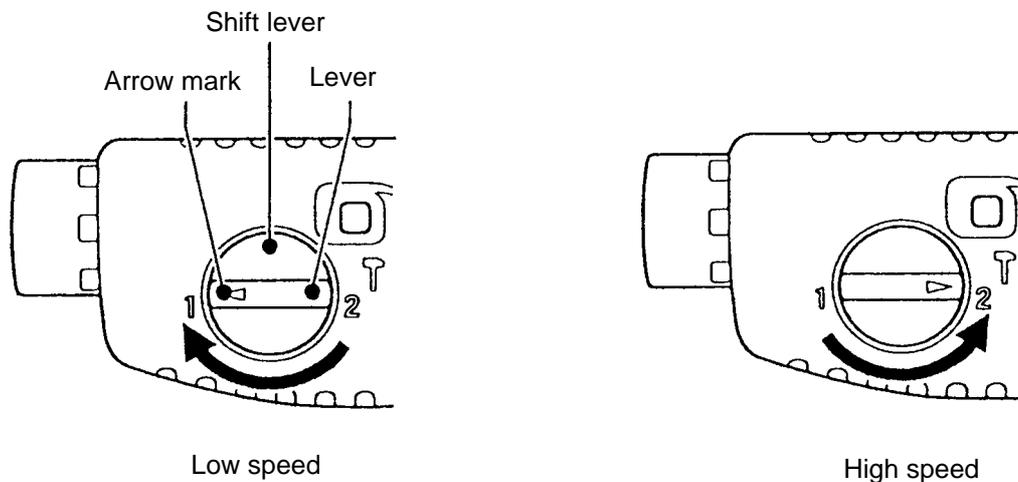
#### (1) "Rotation Only (drill)" and "Rotation + Impact (impact drill)" changeover mechanism

"T (hammer)" is marked on the side of housing (A) and "⚡ (drill)" is marked on the side of housing (B). The mark "T" means the impact drill function (Rotation + Impact) and the mark "⚡" means the drill function (Rotation Only). By pressing the change knob on the "T" mark side, the Model FDV 20VB works as an impact drill and by pressing the change knob on the "⚡" mark side, the Model FDV 20VB works as a drill.



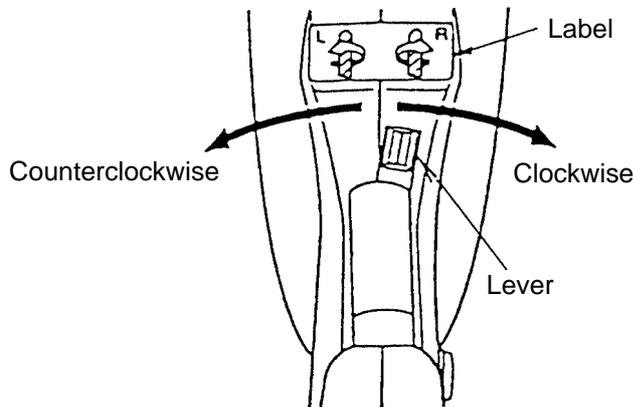
#### (2) Low speed and high speed changeover mechanism

The Model FDV 20VB turns to the "low speed" mode by turning the shift lever until the arrow mark on the lever points "1" horizontally. The Model FDV 20VB turns to the "high speed" mode by turning the shift lever until the arrow mark on the lever points "2" horizontally. If the shift lever moves jerkily, turn the drill chuck a little with a hand. Then the shift lever moves smoothly. Do not use the Model FDV 20VB with the shift lever positioned vertically. Otherwise the gear can be damaged or worn, or breakdown can be caused. Be sure to position the shift lever horizontally.



(3) Direction of rotation

The underside of the housing is labeled with "R" and "L". Viewed from the handle, the drill chuck rotates clockwise (right) with the switch-top lever set to "R" and counterclockwise (left) with the lever set to "L". Be sure the motor is brought to a complete stop before shifting the lever between "R" and "L".

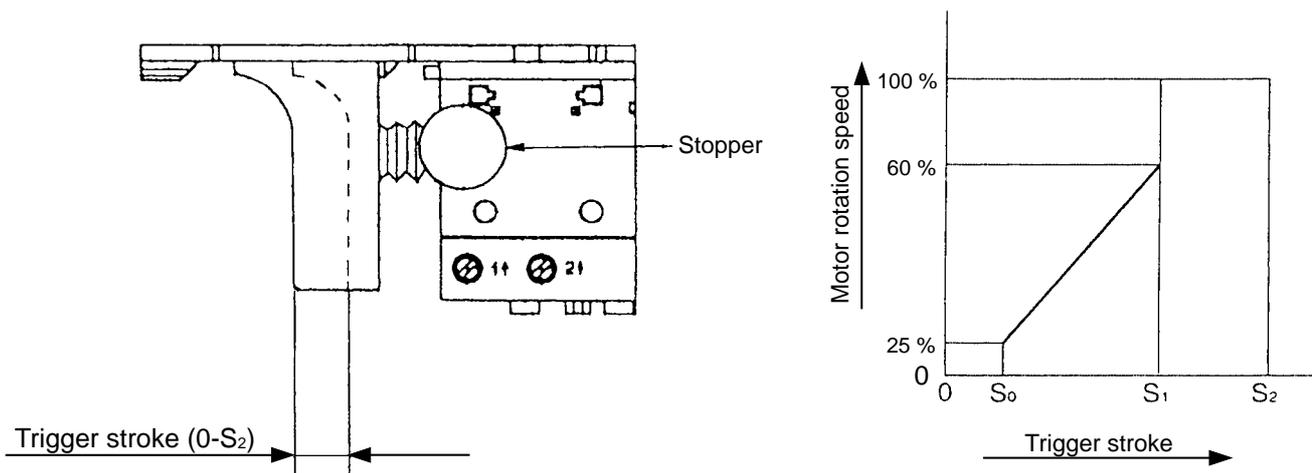


(4) Speed control switch

The FDV 20VB switch allows adjustment of the motor rotation within a range of about 25% to 60% of the full rotation speed by changing the trigger stroke.

The SCR incorporated in the switch for phase control of the power supply causes heat release to rise with increasing current.

When the switch is used at  $S_0 - S_1$  in the figure below, keeping the switch energized with the motor locked will gradually raise the heat release from the SCR eventually to a level high enough to break the SCR. To avoid this, release the switch immediately, whenever the motor becomes jammed.



Be sure to wait until the motor stops completely before performing the above changeovers from (1) to (3).

(5) Be sure to set the switch lever to "R" for grinding operations, for instance with the drill chuck holding the sanding set or the mounted wheel.

## 8. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

Please follow the precautions below for disassembly and reassembly procedures.

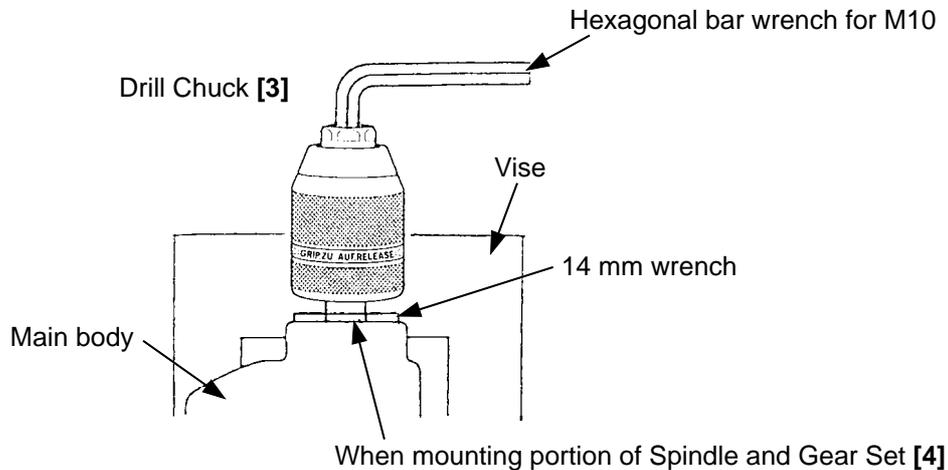
The **[Bold]** numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram.

### 8-1. Disassembly

#### 8-1-1. Removal of the Drill Chuck

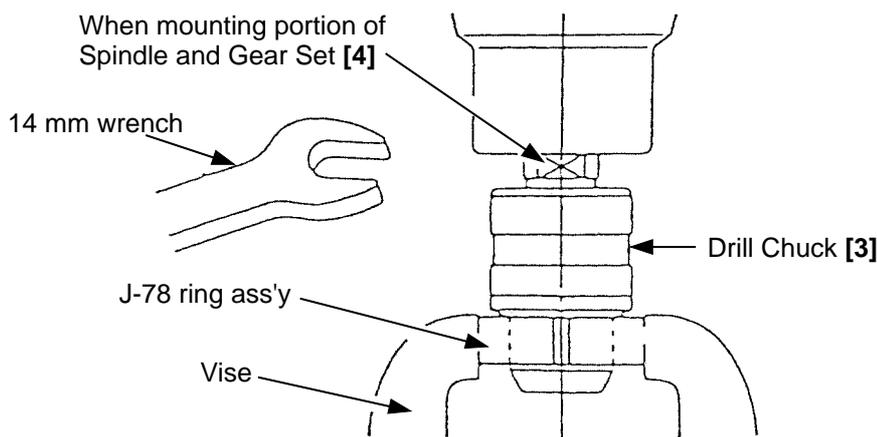
(1) For keyless chuck

The Drill Chuck **[3]** (keyless chuck) is fixed to the Spindle and Gear Set **[4]** with a UNF 1/2" - 20 right-hand thread and Flat Hd. Screw (A) (Left Hand) M6 x 25 **[1]**. First, open the jaws of the keyless chuck fully. Insert a 14 mm wrench into the wrench mounting portion of the Spindle and Gear Set **[4]** and turn the Flat Hd. Screw (A) (Left Hand) M6 x 25 **[1]** clockwise to remove it. Then, fit the hexagonal bar wrench for M10 into the keyless chuck and turn it counterclockwise to loosen and remove the keyless chuck.



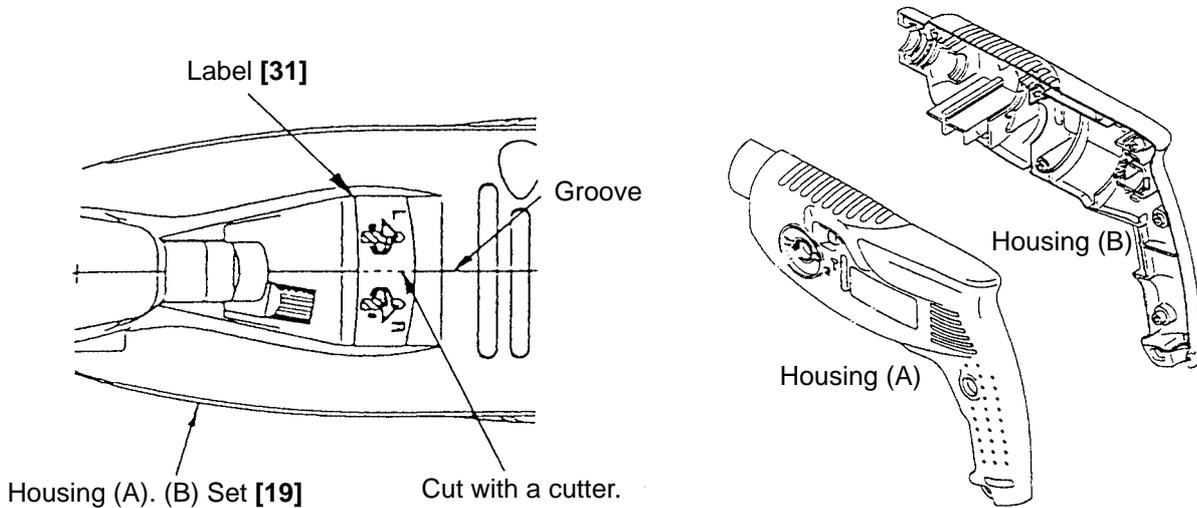
(2) For conventional chuck (with chuck wrench)

The Drill Chuck **[3]** is fixed to the Spindle and Gear Set **[4]** with a UNF 1/2" - 20 right-hand thread and Flat Hd. Screw (A) (Left Hand) M6 x 25 **[1]**. As shown in the figure below, fit a J-78 ring ass'y (special repair tools, Code No. 970817 and 970818 are recommended) onto the drill chuck body, and secure it in a vise. At this time, ensure that the pin of the ring ass'y is properly inserted into the chuck wrench mounting hole of the chuck. Open the jaws of the Drill Chuck **[3]** fully and turn Flat Hd. Screw (A) (Left Hand) M6 x 25 **[1]** clockwise with a flat-blade screwdriver to remove it. Then, fit a 14 mm wrench to the flat surfaces on the spindle, and rotate it counterclockwise to loosen and remove the drill chuck.



### 8-1-2. Removal of housing (B) of Housing (A). (B) Set [19]

- (1) Cut the Label [31] with a cutter along the groove between the assembled Housing (A). (B) Set [19].
- (2) Remove the seven Tapping Screws (W/Flange) D4 x 20 (Black) [21] and take off housing (B) of Housing (A). (B) Set [19].



### 8-1-3. Disassembly of the armature and the stator

- (1) Remove the two Brush Holders [24] by lifting them upward from housing (A) of Housing (A). (B) Set [19], and take out the two Carbon Brushes [23].
- (2) With the Change Plate [9], the Change Knob [7] and Spring (A) [8] installed, remove the Holder [10], the Armature [12], the Stator [14], the Spindle and Gear Set [4] and the Second Pinion [6] all together.
- (3) Pull out the Spindle and Gear Set [4] and the Second Pinion [6] from the Holder [10].
- (4) Place the Holder [10] on a cylindrical jig and press down on the armature pinion to remove the Armature [12] from the Holder [10].
- (5) Remove the Internal Wires [15] [16] [17] [18] from the Stator [14].

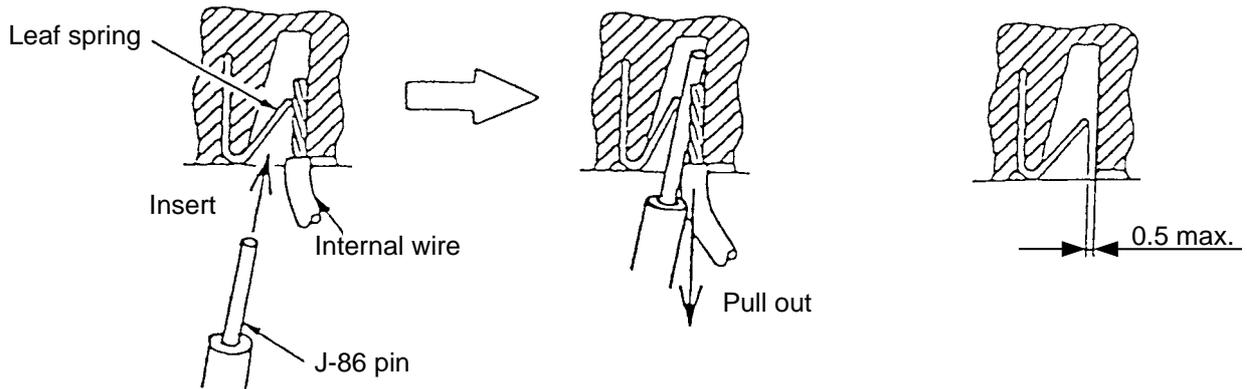
### 8-1-4. Disassembly of the holder

Remove the Change Plate [9], the Change Knob [7] and Spring (A) [8] from the Holder [10].

### 8-1-5. Disconnecting internal wires and electrical parts

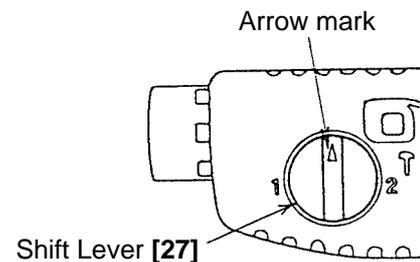
Disconnect the internal wires from the switch as follows.

Insert the J-86 pin into the hole for the internal wire of the Speed Control Switch (2P) [25]. Press the leaf spring so that the internal wire can be disconnected, then disconnect the Internal Wires [15] [16] [17] [18] [26] [39], and the Internal Wires of the Choke Coils [26] [39] and the Noise Suppressor [37]. (For the internal wire of the Cord [36], loosen and remove the terminal screw of the Speed Control Switch (2P) [25] with a slotted screwdriver.) If the leaf spring is pressed too much, the leaf spring may be set permanently and the contact pressure with the internal wire will be reduced. Replace such switch whose leaf spring has clearance of 0.5 mm or more with new one.



### 8-1-6. Removal of the shift lever

- (1) Remove the Shift Arm [22] and the Shift Pin [28] from housing (A).
- (2) Turn the Shift Lever [27] until the arrow points straight up and then remove the Shift Lever [27] from housing (A).



## 8-2. Reassembly

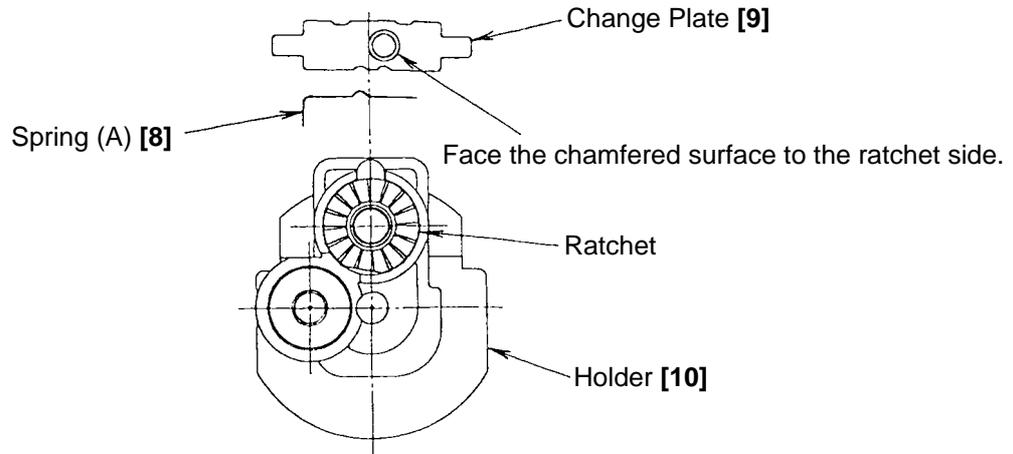
Reassembly can be accomplished by following the disassembly procedures in reverse. However, special attention should be given to the following items.

### 8-2-1. Reassembly of the armature and the stator

- (1) Press-fit the Ball Bearing 608DDC2PS2L [11], Dust Seal [13] and the Ball Bearing 608VVC2PS2L [5] into the Armature [12]. The Ball Bearing 608DDC2PS2L [11] must be press-fitted until it contacts the fan. At this time, be careful not to press-fit it forcibly. Otherwise the fan can be deformed or damaged. The Ball Bearing 608VVC2PS2L [5] must be press-fitted until the Dust Seal [13] contacts the stepped portion of the shaft.

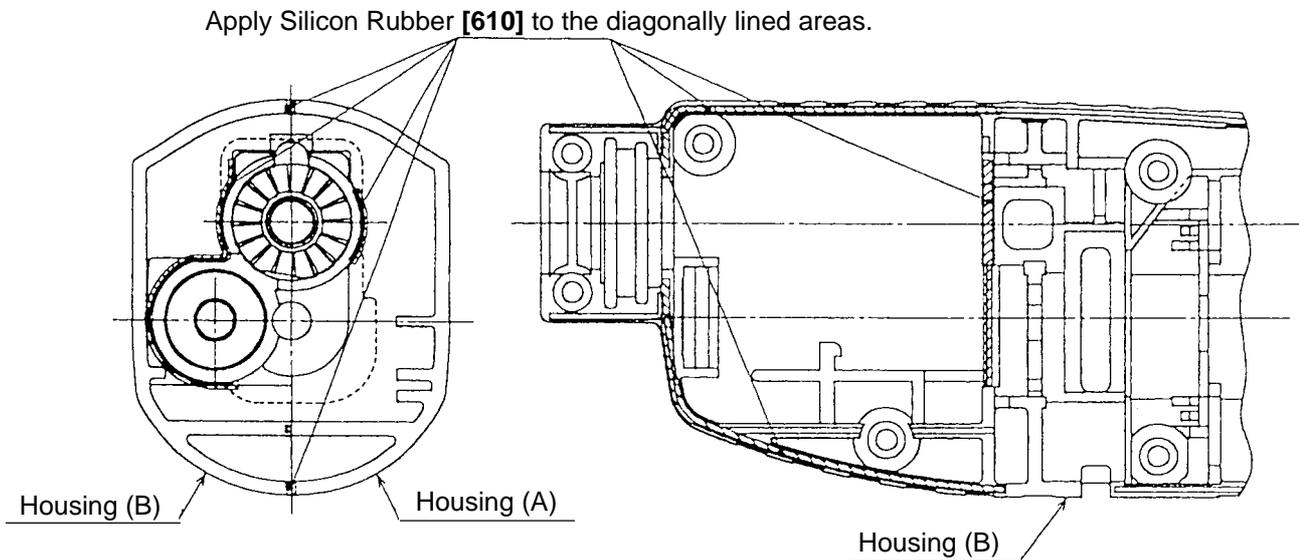
### 8-2-2. Reassembly of the holder

When installing the Change Plate [9] and Spring (A) [8] to the Holder [10], be careful of the direction of each part.



### 8-2-3. Application of silicon rubber

Apply the Silicon Rubber [610] (ThreeBond 1211) to housing (A) (1 place) and housing (B) (3 places) as shown below to seal the grease securely. After application of the Silicon Rubber [610], mount housing (B) within 90 minutes. After mounting housing (B), wipe the Silicon Rubber [610] off the surface.



### 8-3. Lubrication

#### 8-3-1. Application of lubricant

Apply Nippeco SEP-3A (Code No. 930035) to the following portions.

- (1) Ratchet teeth of the Holder **[10]**
- (2) Second gear teeth, ratchet teeth, metal contacting portion and spline portion of the Spindle and Gear Set **[4]**
- (3) Gear teeth and ball bearing contacting portion of the Second Pinion **[6]**
- (4) Pinion teeth of the Armature **[12]**
- (5) Shift Arm **[22]** contacting portion of housing (A)
- (6) Inner and outer circumferences of the O-ring (S-12) **[29]**

#### 8-3-2. Filling with lubricant

After mounting the components in housing (A), position the second gear of the Spindle and Gear Set **[4]** toward the Drill Chuck **[3]** and fill housing (A) with 65 to 70 g of Nippeco SEP-3A (Code No. 930035).

### 8-4. Tightening Torque

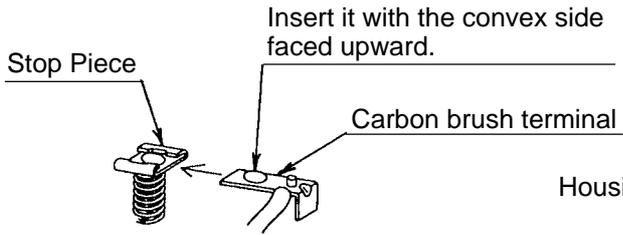
- (1) Drill Chuck **[3]** ..... 29.4 to 39.2 N•m (300 to 400 kgf•cm) (260 to 347 in-lbs)
- (2) Flat Hd. Screw (A) (Left Hand) M6 x 25 **[1]** ..... 3.9 to 4.9 N•m (40 to 50 kgf•cm) (34.7 to 43.3 in-lbs)
- (3) Tapping Screw (W/Flange) D4 x 20 (Black) **[21]** ... 1.5 to 2.5 N•m (15 to 25 kgf•cm) (13.1 to 21.7 in-lbs)
- (4) Tapping Screw (W/Flange) D4 x 16 (Black) **[35]** ... 1.5 to 2.5 N•m (15 to 25 kgf•cm) (13.1 to 21.7 in-lbs)
- (5) Machine Screw M3 x 6 for securing the Speed Control Switch (2P) **[25]**  
..... 0.3 to 0.5 N•m (3 to 5 kgf•cm) (2.6 to 4.3 in-lbs)

### 8-5. Wiring Diagrams and Internal Wire Arrangements

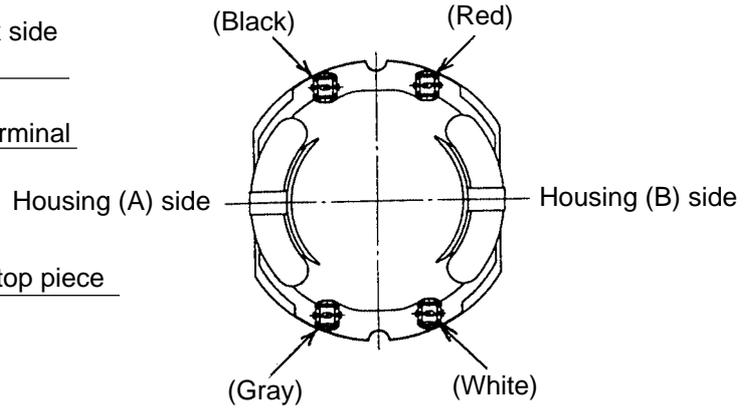
Conduct wiring in accordance with the diagrams and arrangements illustrated below.

**The symbols [1], [2], [3], [4], M1, M2, C1, C2, ↑1 and ↑2 in the diagrams correspond to switch terminal figures.**

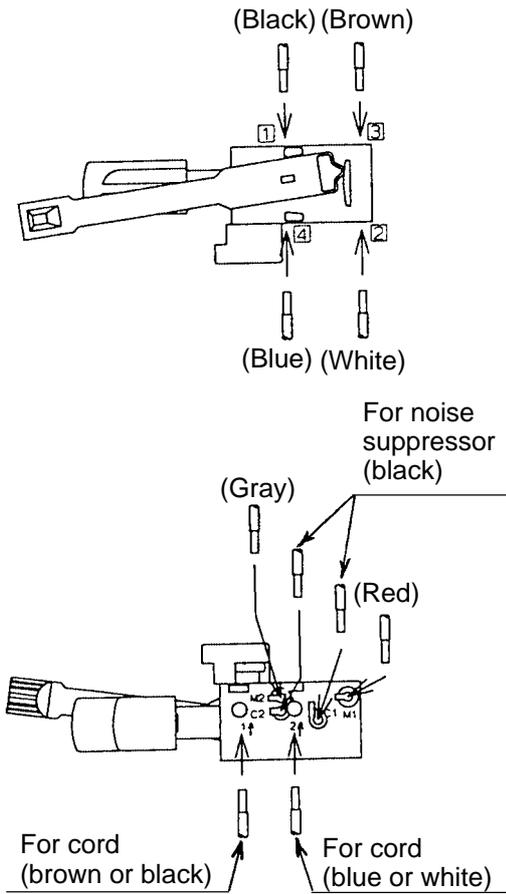
(1) For Models with noise suppressor and choke coils



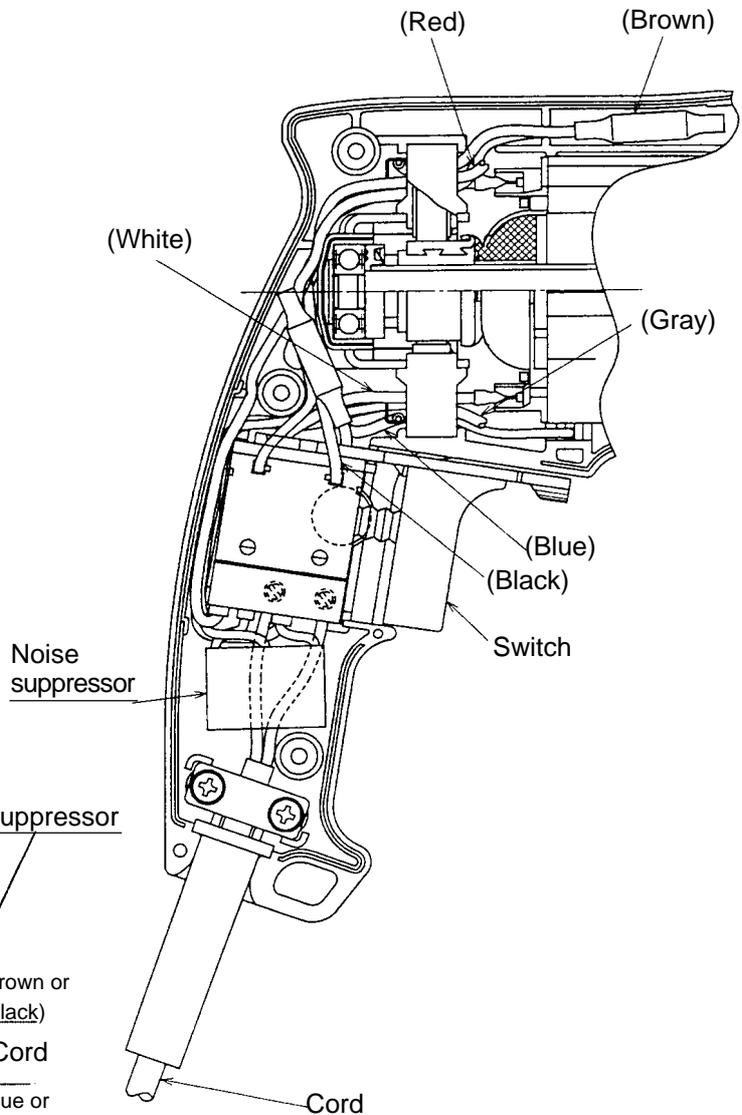
Connection of the carbon brush terminal and the stop piece



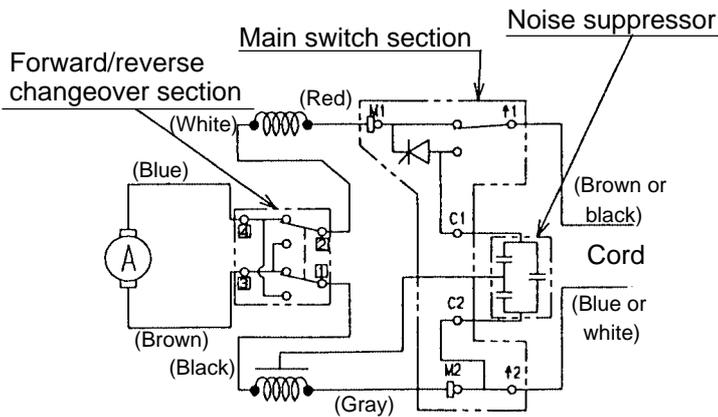
Connection of internal wires to the stator  
(viewed from the commutator side)



Connection of internal wires to the switch

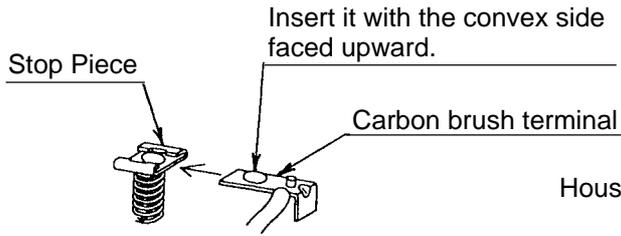


Wiring diagram

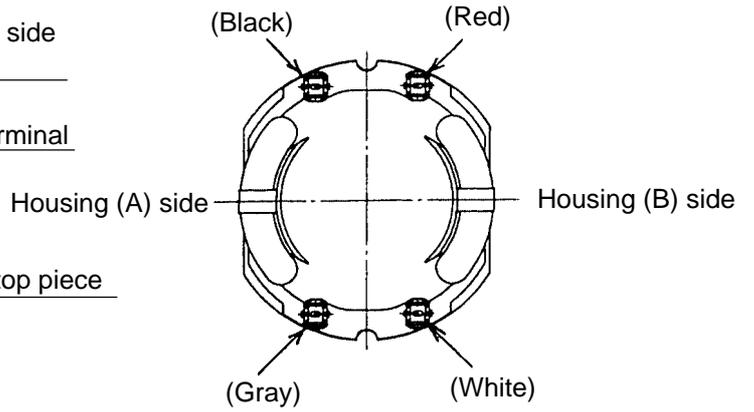


Wiring diagram

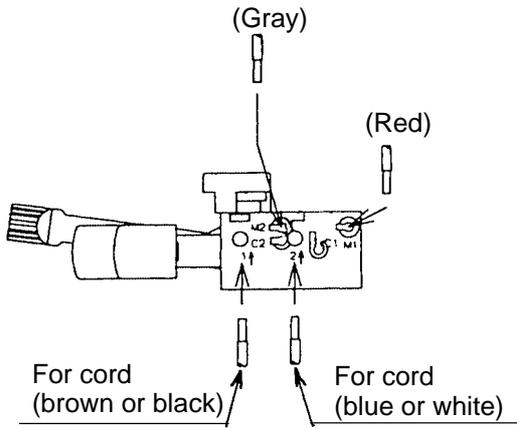
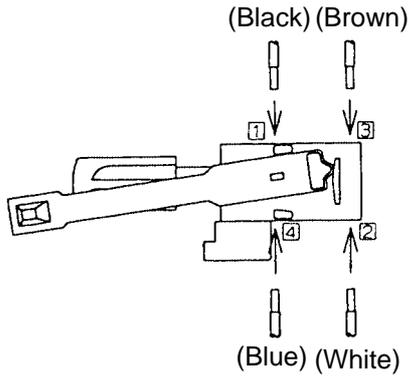
(2) For Models without noise suppressor and choke coils



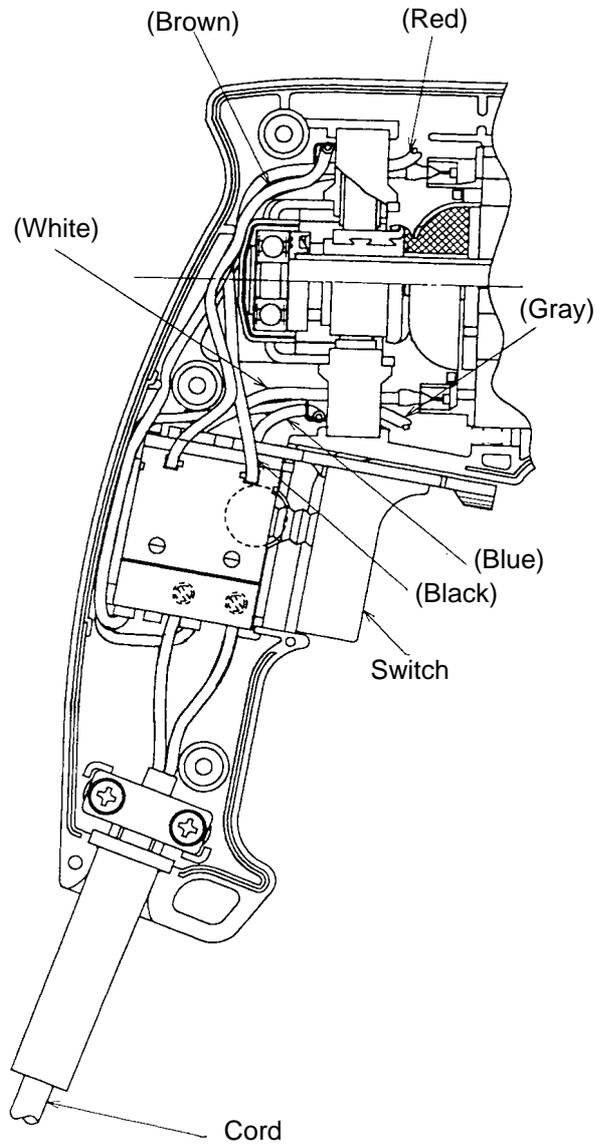
Connection of the carbon brush terminal and the stop piece



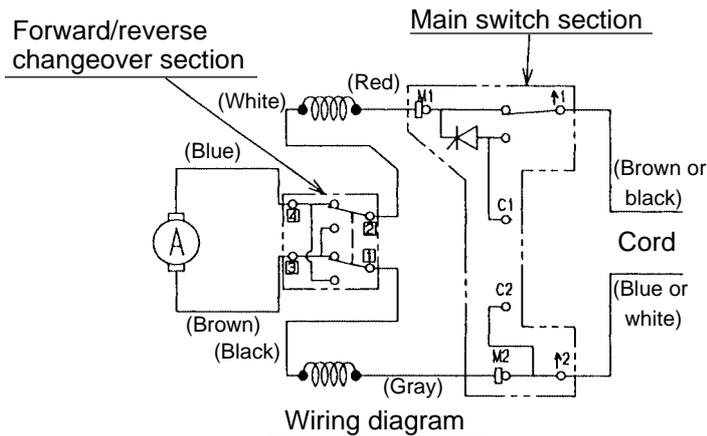
Connection of internal wires to the stator  
(viewed from the commutator side)



Connection of internal wires to the switch



Wiring diagram



Wiring diagram

### 8-6. Insulation Tests

On completion of disassembly and repair, measure the insulation resistance and dielectric strength.

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 — 115 V

### 8-7. No-load Current Values

After 30 minutes of no-load operation, current values should be as follows.

110 V and 115 V ..... Less than 3.0 A

220 V, 230 V and 240 V ..... Less than 1.5 A

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

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
FDV 20VB		Work Flow						
	General Assembly			Housing (A).(B) Set Ball Bearing (608DD) Spindle and Gear Set Stator Armature Second Pinion Holder Ball Bearing (608VV) x 2				
				Carbon Brush Speed Control Switch Cord				

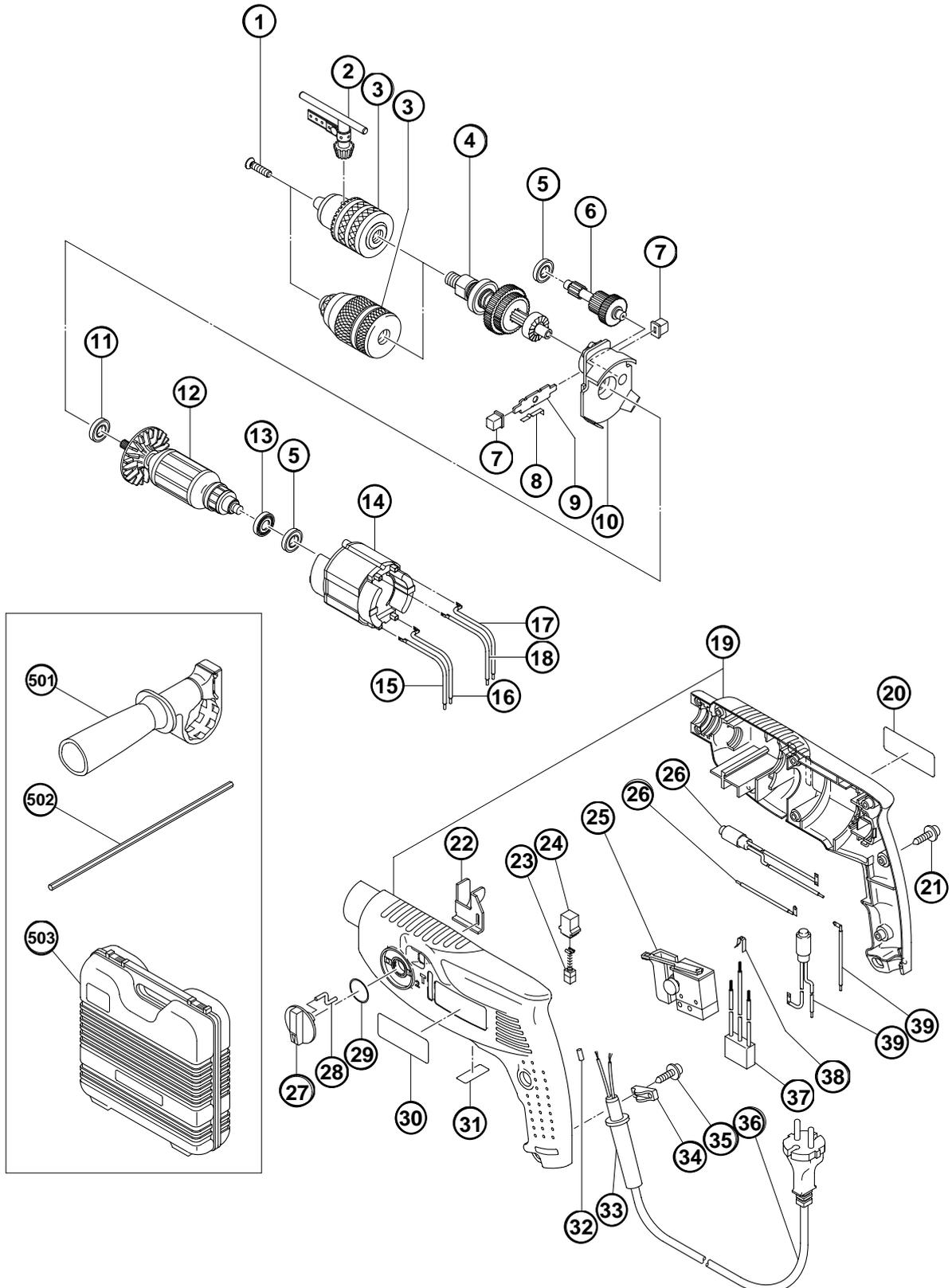
## ELECTRIC TOOL PARTS LIST

■ IMPACT DRILL

2001•2•20

Model FDV 20VB

(E1)



**PARTS**

FDV 20VB

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	995-344	FLAT HD. SCREW (A) (LEFT HAND) M6X25	1	
* 2	987-576	CHUCK WRENCH FOR 13VLB-D,13VLR-D	1	FOR 13VLRB-D
* 3		DRILL CHUCK 13VLRB-D	1	INCLUD.2
* 3	319-546	DRILL CHUCK 13VLR-N (W/O CHUCK WRENCH)	1	
4	319-601	SPINDLE AND GEAR SET	1	
5	608-VVM	BALL BEARING 608VVC2PS2L	2	
6	319-605	SECOND PINION	1	
7	319-604	CHANGE KNOB	2	
8	963-226	SPRING (A)	1	
9	319-603	CHANGE PLATE	1	
10	319-602	HOLDER	1	
11	608-DDM	BALL BEARING 608DDC2PS2L	1	
* 12	360-548U	ARMATURE ASS'Y 110V-115V	1	INCLUD.5,11,13
* 12	360-548E	ARMATURE 220V-230V	1	
* 12	360-548F	ARMATURE 240V	1	
13	319-609	DUST SEAL	1	
* 14	340-496C	STATOR 110V-115V	1	
* 14	340-496E	STATOR 220V-230V	1	
* 14	340-496F	STATOR 240V	1	
15	303-655	INTERNAL WIRE (B) (GRAY)	1	
16	319-612	INTERNAL WIRE (WHITE)	1	
17	319-611	INTERNAL WIRE (RED)	1	
18	303-656	INTERNAL WIRE (C) (BLACK)	1	
* 19	319-644	HOUSING (A).(B) SET (MOSS GREEN)	1	
* 19	319-615	HOUSING (A).(B) SET (OFF BLACK GREEN)	1	
* 20		NAME PLATE	1	
21	302-086	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	9	
22	319-607	SHIFT ARM	1	
23	999-041	CARBON BRUSH (1 PAIR)	2	
24	955-203	BRUSH HOLDER	2	
* 25	314-916	SPEED CONTROL SWITCH (2P) 100V-115V	1	
* 25	314-921	SPEED CONTROL SWITCH (2P) 220V-240V	1	
* 26	319-614	INTERNAL WIRE (BROWN)	1	
* 26	319-643	CHOKE COIL (BROWN)	1	FOR CHN,SAF,EUROPE,OCEANIA
27	319-606	SHIFT LEVER	1	
28	319-608	SHIFT PIN	1	
29	875-638	O-RING (S-12)	1	
* 30		HITACHI LABEL	1	
31		LABEL	1	
* 32	981-373	TUBE (D)	2	FOR CORD
* 33	307-217	CORD ARMOR D7.2	1	
* 33	303-662	CORD ARMOR D8.8	1	
34	960-266	CORD CLIP	1	
35	305-812	TAPPING SCREW (W/FLANGE) D4X16 (BLACK)	2	
* 36	303-667	CORD	1	
* 36	500-409Z	CORD	1	(CORD ARMOR D8.8) FOR CHN,SAF,EUROPE
* 36	500-423Z	CORD	1	(CORD ARMOR D8.8) FOR KUW
* 36	500-447Z	CORD	1	(CORD ARMOR D8.8) FOR SYR,CHI
* 36	500-439Z	CORD	1	(CORD ARMOR D8.8) FOR OCEANIA
* 36	500-436Z	CORD	1	(CORD ARMOR D7.2) FOR GBR
* 36	500-240Z	CORD	1	(CORD ARMOR D8.8) FOR USA,CAN





