

Hitachi Power Tools

SERVICE MANUAL

LIST Nos.
DV 20VB2: E475
DV 18V: E476
Oct. 2004

PRODUCT NAME

Hitachi 20 mm (3/4") Impact Drill

Model DV 20VB2

Hitachi 18 mm (11/16") Impact Drill

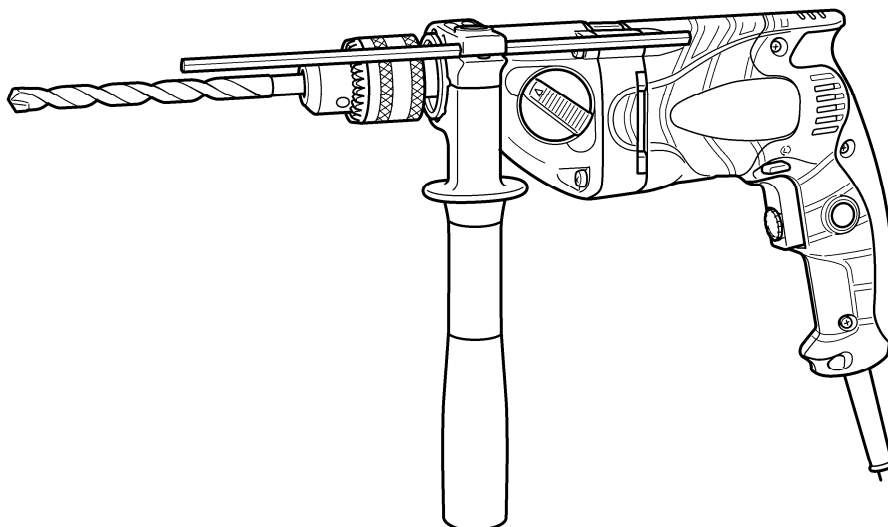
Model DV 18V

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CONTENTS

Page

PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY	1
1. Disassembly	1
2. Reassembly	6
3. Wiring Diagram	9
4. Internal Wire Arrangement and Wiring Work	10
5. Insulation Tests	13
6. No-Load Current Value	13
STANDARD REPAIR TIME (UNIT) SCHEDULES	14



HITACHI

 **Hitachi Koki Co., Ltd.**
International Sales Division

1. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

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

The **[Bold]** numbers are for the Model DV 20VB2, the **<Bold>** numbers for the Model DV 18V.

1-1. Disassembly

1-1-1. Motor section disassembly

(1) Removal of the handle cover

Loosen the Tapping Screws (W/Flange) D4 x 20 (Black) **[40]** **<39>**, and remove the Handle Cover **[41]** **<40>**.

(2) Removal of the carbon brushes

With a small flat-blade screwdriver, slightly lift the Brush Holders **[47]** **<46>**. Then, while pushing the Carbon Brushes (1 Pair) **[46]** **<45>** to the bottom of the brush holders, gently pull out and disconnect the internal wire terminals. (See Figs. 1 and 2.)

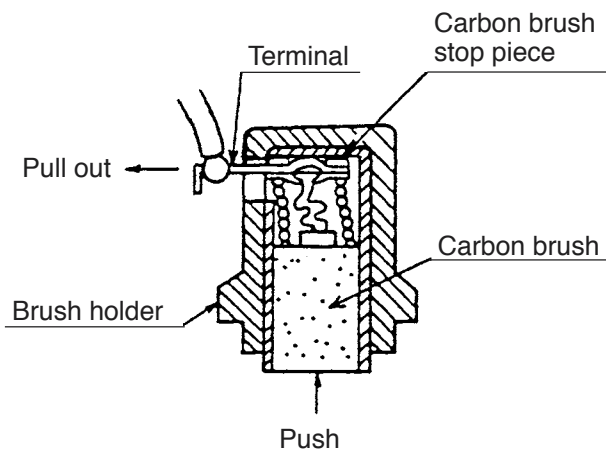


Fig. 1

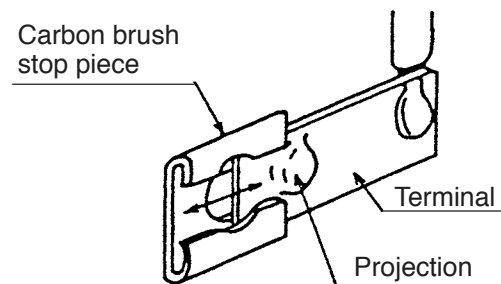


Fig. 2

(3) Removal of the gear cover from the housing

Loosen the Tapping Screws (W/Flange) D5 x 45 (D5 x 50: with clutch) **[12]** **<12>** and separate Gear Cover (A) Ass'y **[25]** **<25>** from the Housing **[38]** **<37>**. Then, remove the Inner Cover **[18]** **<18>** together with the Armature **[33]** **<32>** from the Housing **[38]** **<37>**.

(4) Removal of the armature from the inner cover

As illustrated in Fig. 3, support the Inner Cover [18] <18> with a tubular jig, and push down on the top of the pinion of the Armature [33] <32>.

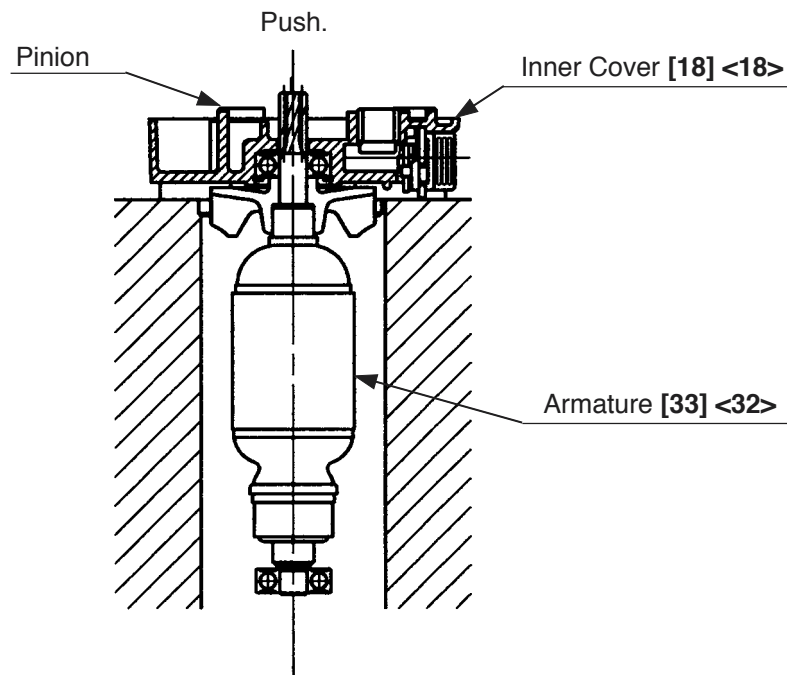


Fig. 3

(5) Removal of the stator from the housing

First, disconnect the internal wires from the Switch (1P Pillar Type) [43] <42>. 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 [35], D4 x 45 <34> and tap the end surface of the Housing [38] <37> slightly with a wooden hammer. Then the stator can be removed from the housing.

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

Removal of the change lever

Remove the Change Cover [16] <16> and the Change Lever [15] <15>.

1-1-3. Removal of the drill chuck

The Drill Chuck [3] <3> is secured to the Spindle [4] <4> with 1/2"-20 UNF (right hand) and Flat Hd. Screw (A) (Left Hand) M6 x 25 [1] <1>. At first, open the chuck jaw as far as possible and loosen Flat Hd. Screw (A) (Left Hand) M6 x 25 [1] <1> by turning it clockwise.

- a. Hold the drill so that only the Drill Chuck [3] <3> 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. 4)

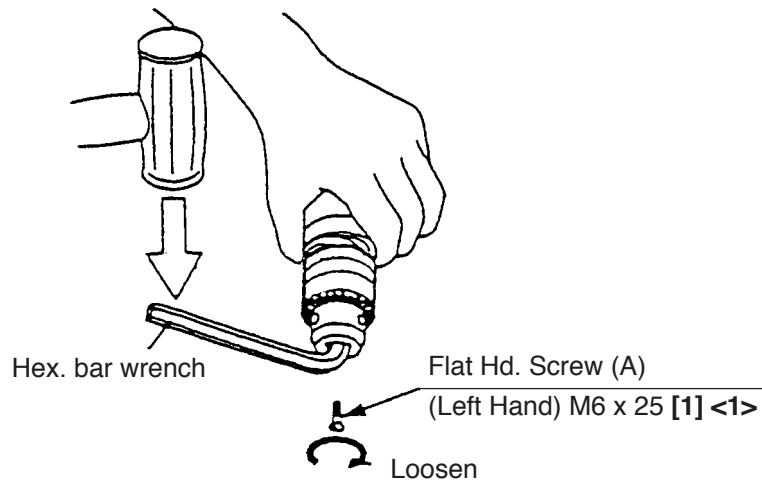


Fig. 4

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 [4] <4> with the open-end wrench secured to the vise as shown in Fig. 5. Mount the pipe to the hex. bar wrench. Turn the hex. bar wrench counterclockwise to loosen the drill chuck. (Fig. 5)

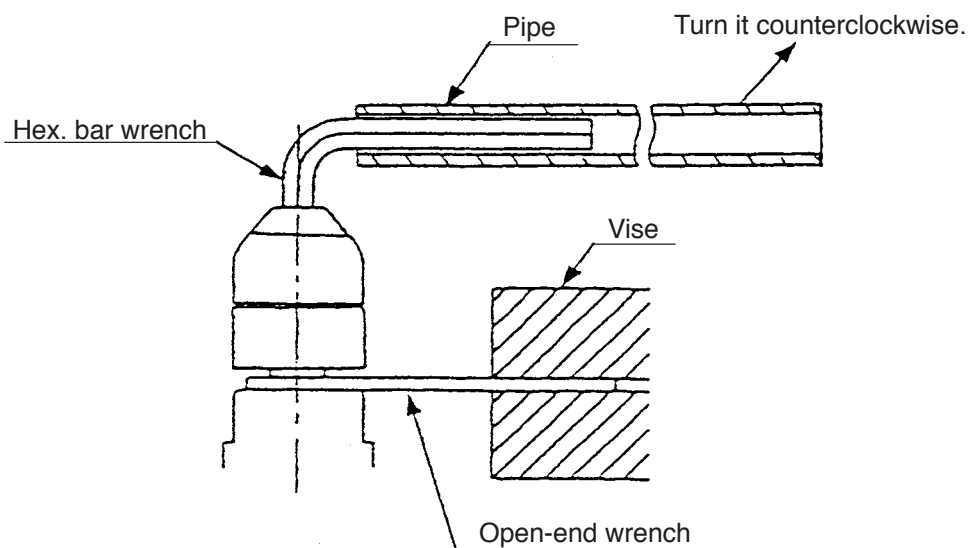


Fig. 5

c. (For keyed chuck only)

Secure the drill chuck with a disassembly tool: Ring (J-78) to the drill chuck, which in proper sequence should be secured with a vise. Then fit a disassembly tool: Wrench Ass'y (J-140) to the spindle, and turn it counterclockwise. (Fig. 6)

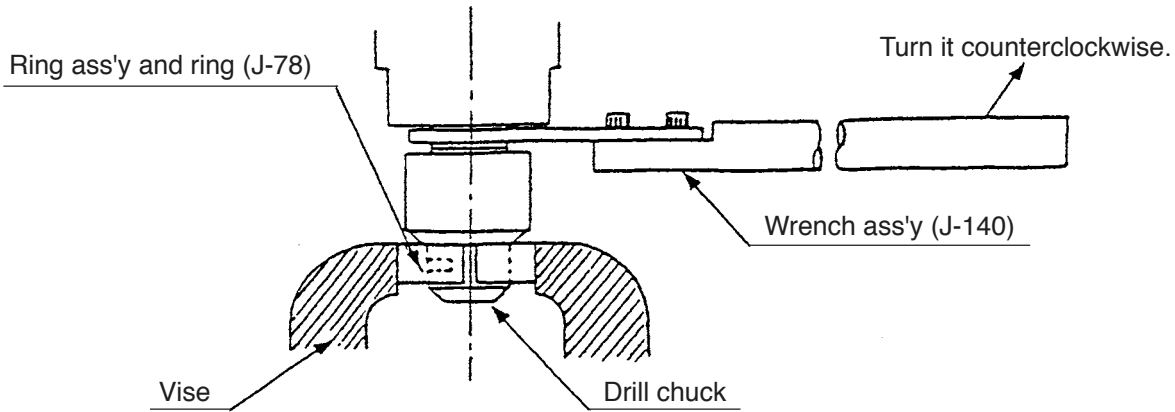


Fig. 6

1-1-4. Gear cover section disassembly

(1) Removal of the spindle

Remove the Retaining Ring For D35 Hole [5] <5> and the Dust Seal [6] <6>.

Support the tip of the Gear Cover (A) Ass'y [25] <25> with a cylindrical jig of inside diameter 35 mm or more, and push the rear portion of the Spindle [4] <4> lightly. Then the spindle can be removed together with the Ball Bearing 6202DDCMPS2L [7] <7> and Spring (A) [9] <9>. (Fig. 7)

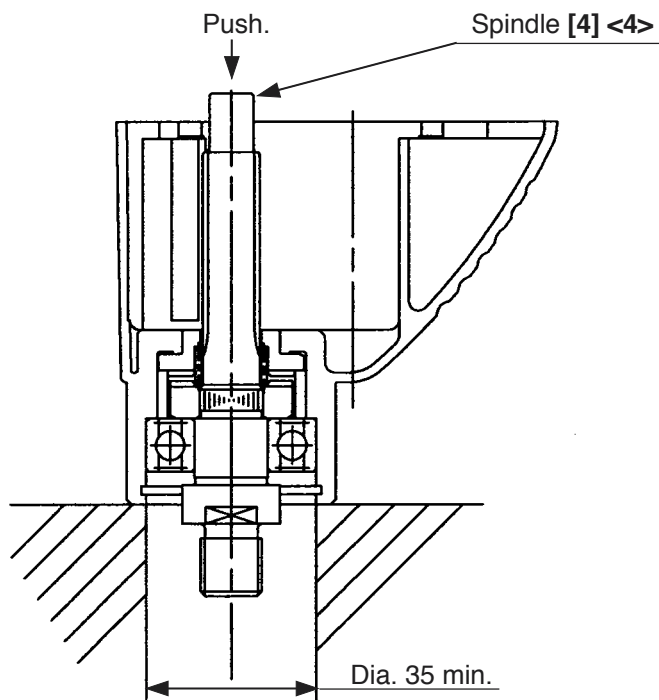


Fig. 7

(2) Removal of the shift lever

Position the Shift Lever Ass'y [19] <19> as shown in Fig. 8. Push both ends of the Retaining Ring (E-type) for D15 Shaft [26] <26> 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 [19] <19> by 180 degrees together with the Retaining Ring (E-type) for D15 Shaft [26] <26>. Insert a flat-blade screwdriver into the clearance and pry the Retaining Ring (E-type) for D15 Shaft [26] <26> off upward.

⚠ CAUTION:

If the Retaining Ring (E-type) for D15 Shaft [26] <26> is pushed excessively, the Shift Lever Ass'y [19] <19> cannot be turned due to a wide clearance.

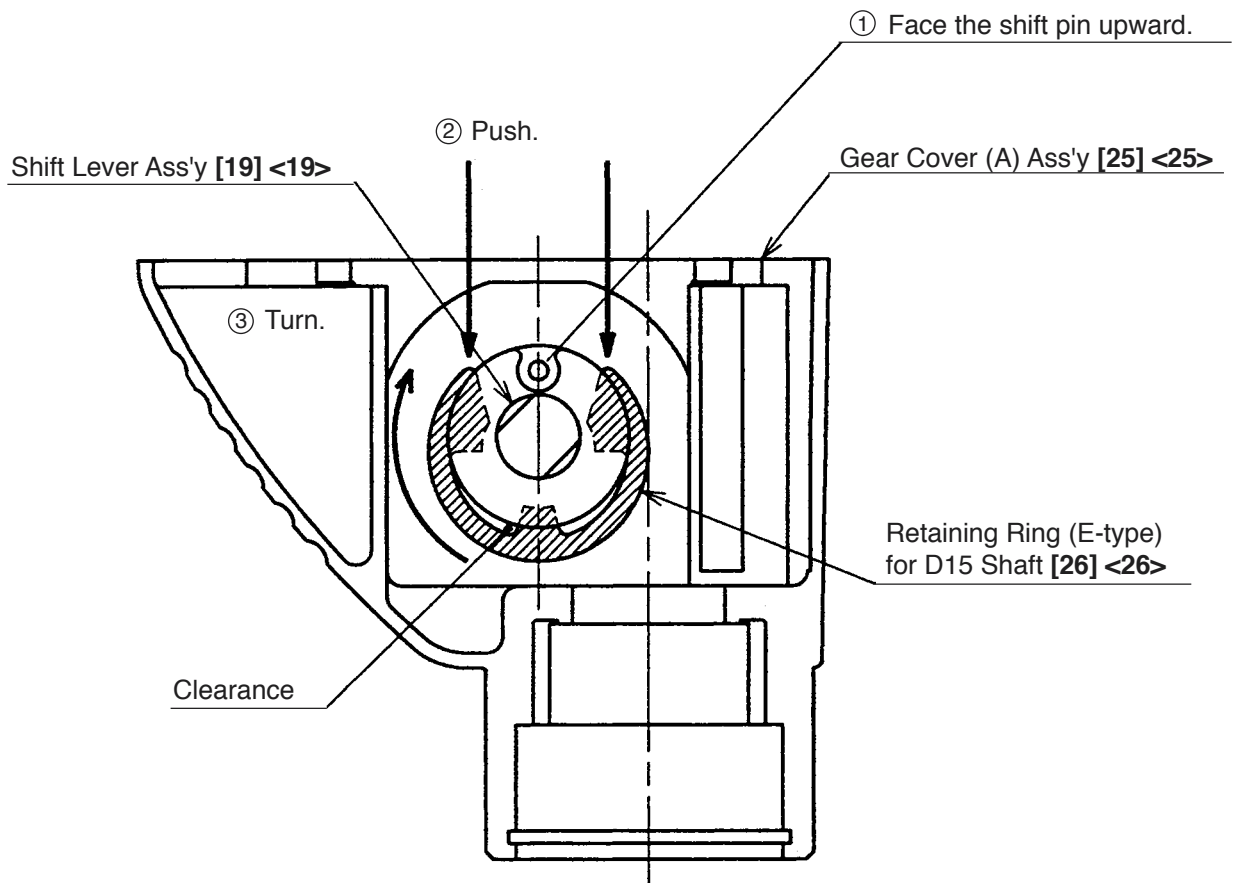


Fig. 8

1-2. Reassembly

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

1-2-1. 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.

1-2-2. Lubrication

(1) Apply ATTLUB MS No. 2 Grease to the following parts.

- Teeth of the Second Pinion and Gear Set [14] <14>, the Gear Set [29] <29>.
- On the Spindle [4] <4>.
Ground portion for fitting the Ball Bearing 6202DDCMPS2L [7] <7>, splined portion and hole of rear side.
- On the Shift Lever Ass'y [19] <19>.
Outer circumference portion of the Shift Pin [21] <21>, the O-ring (S-22) [22] <22>.
- On the Change Shaft [17] <17>.
Outer circumference portion.
- Lip portion of the Dust Seal [6] <6>.
- On the Inner Cover [18] <18>.
Metal portion.
- Inside of Gear Cover (A) Ass'y [25] <25>: 5 g

(2) Apply MORABUAROI 777-1 to the following parts.

- On Gear Cover (A) Ass'y [25] <25>.
Teeth of Ratchet (B) [11] <11>.
- Teeth of Ratchet (A) [8] <8>.

1-2-3. Tightening torque

- (1) Flat Hd. Scerw (A) (Left Hand) M6 x 25 [1] <1> 4.0 to 5.0 N·m (39.0 to 47.8 in-lbs.)
- (2) Tapping Screw (W/Flange) D4 x 20 (Black) [40] <39> 1.5 to 2.5 N·m (13.3 to 22.1 in-lbs.)
- (3) Tapping Screw (W/Flange) D5 x 45 [12] <12> 2.4 to 3.4 N·m (21.3 to 30.1 in-lbs.)
- (4) Drill Chuck [3] <3> 29.4 to 39.2 N·m (260 to 347 in-lbs.)

1-2-4. Reassembly of the gear cover section

Figure 9 shows the assembly drawing. Reassemble the gear cover section according to the following figure.

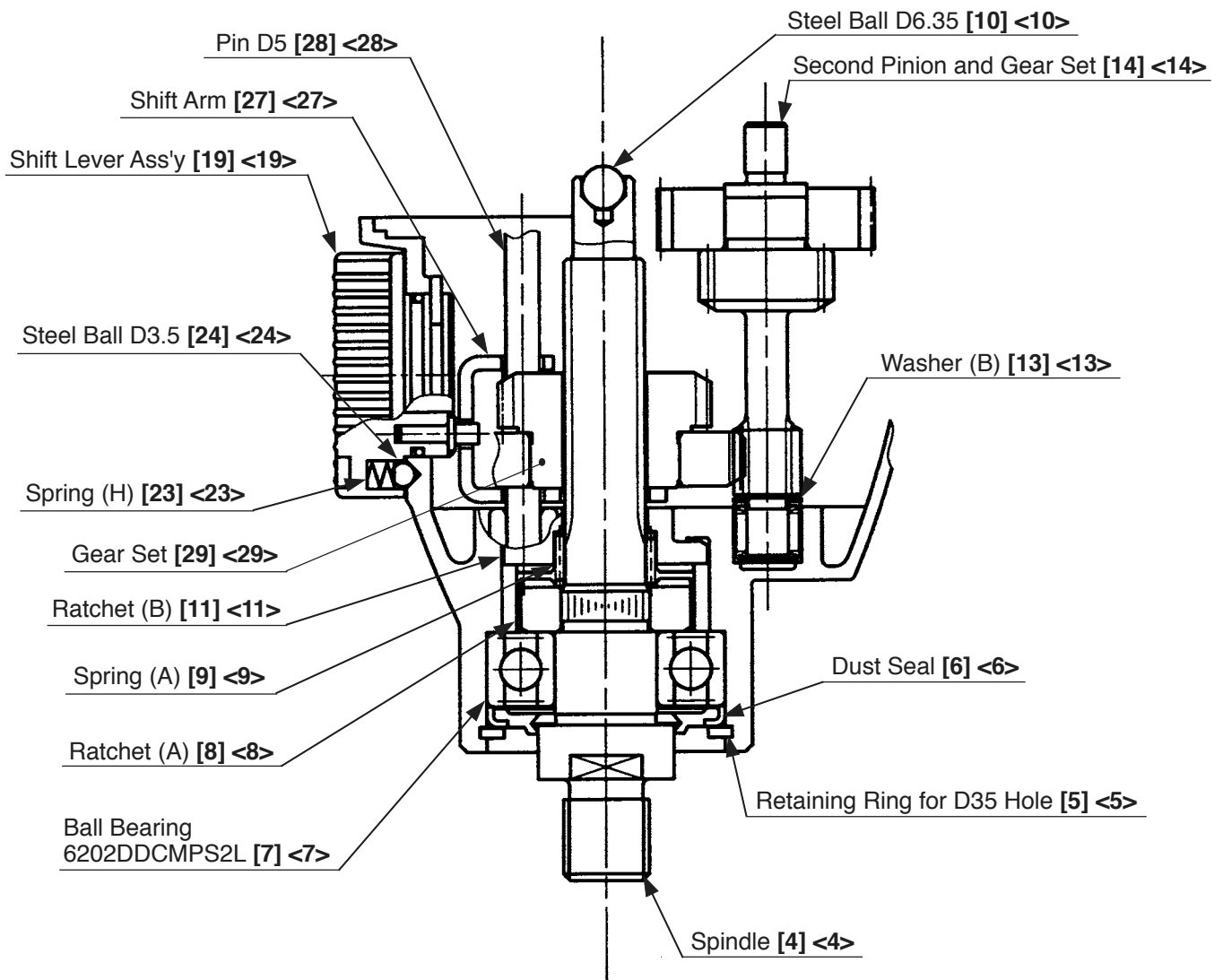


Fig. 9

⚠ CAUTION:

- Be sure to replace Ratchet (A) [8] <8> with a new one. Never reuse Ratchet (A) [8] <8> previously removed from the Spindle [4] <4>. If reused, the tightening torque between Ratchet (A) [8] <8> and the Spindle [4] <4> will be far too low and the Spindle [4] <4> may run idle in the IMPACT mode.
- Mounting directions of the Shift Arm [27] <27> and the Gear Set [29] <29> are specified. Mount these parts in the specified direction as shown in the above figure.

(With slip clutch)

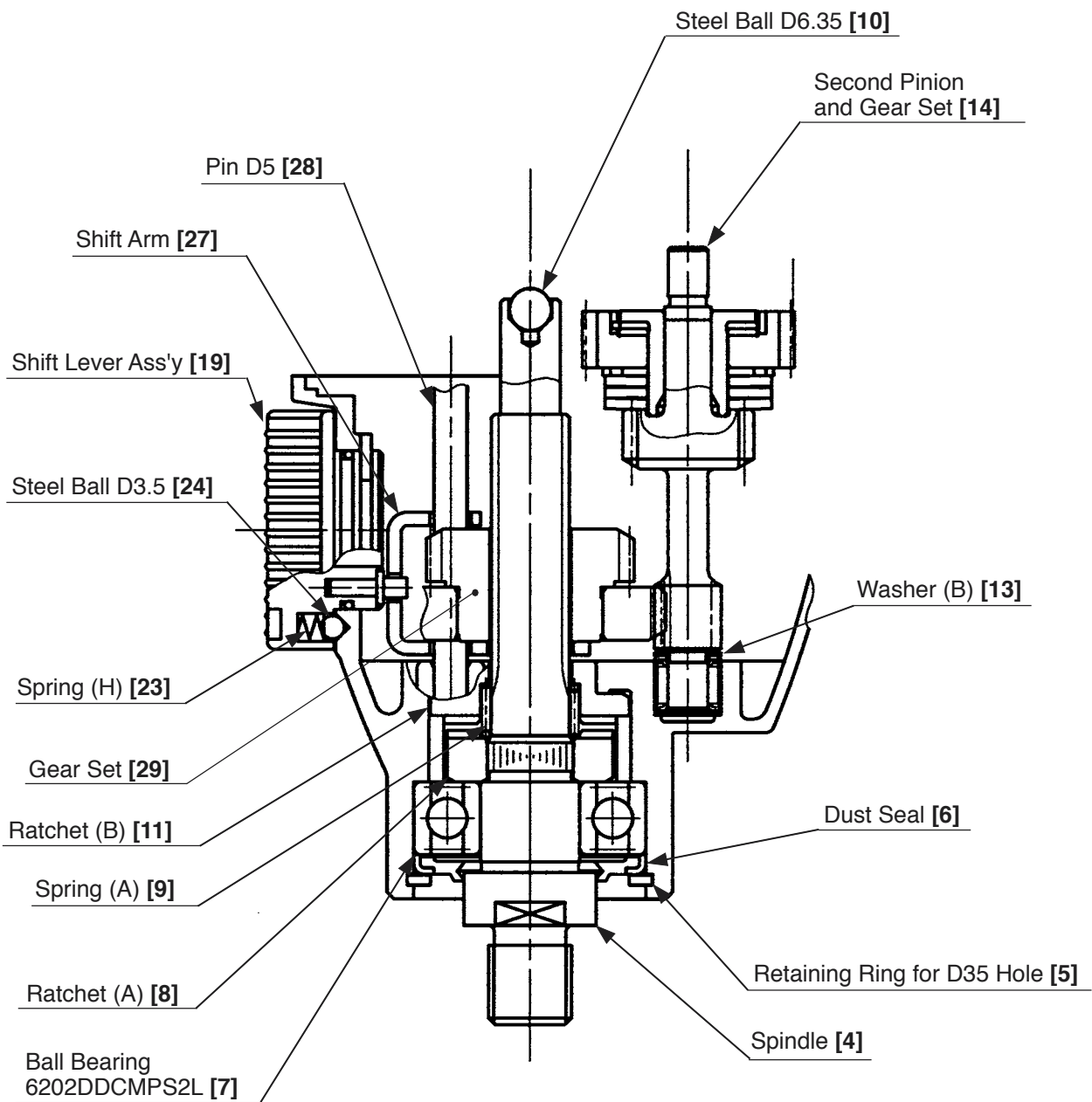


Fig. 10

⚠ CAUTION:

- Be sure to replace Ratchet (A) [8] with a new one. Never reuse Ratchet (A) [8] previously removed from the Spindle [4]. If reused, the tightening torque between Ratchet (A) [8] and the Spindle [4] will be far too low and the Spindle [4] may run idle in the IMPACT mode.
- Mounting directions of the Shift Arm [27], Gear Set [29] and Spring (A) [9] are specified. Mount these parts in the specified direction as shown in the above figure.

1-3. Wiring Diagrams

(1) For products with noise suppressor

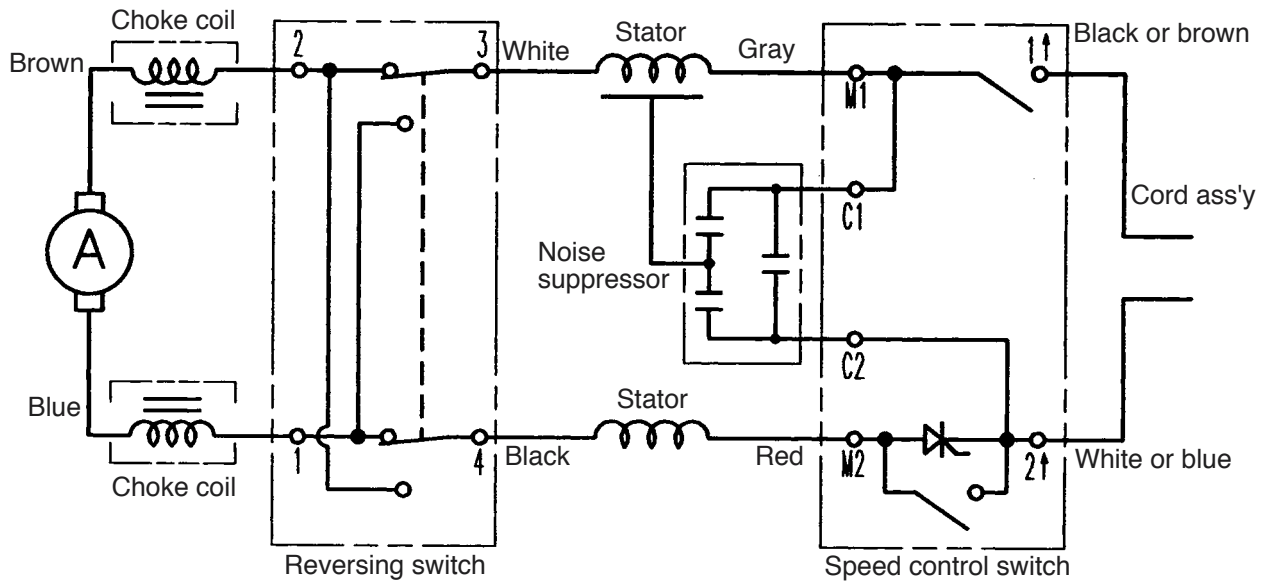


Fig. 11

(2) For products without noise suppressor

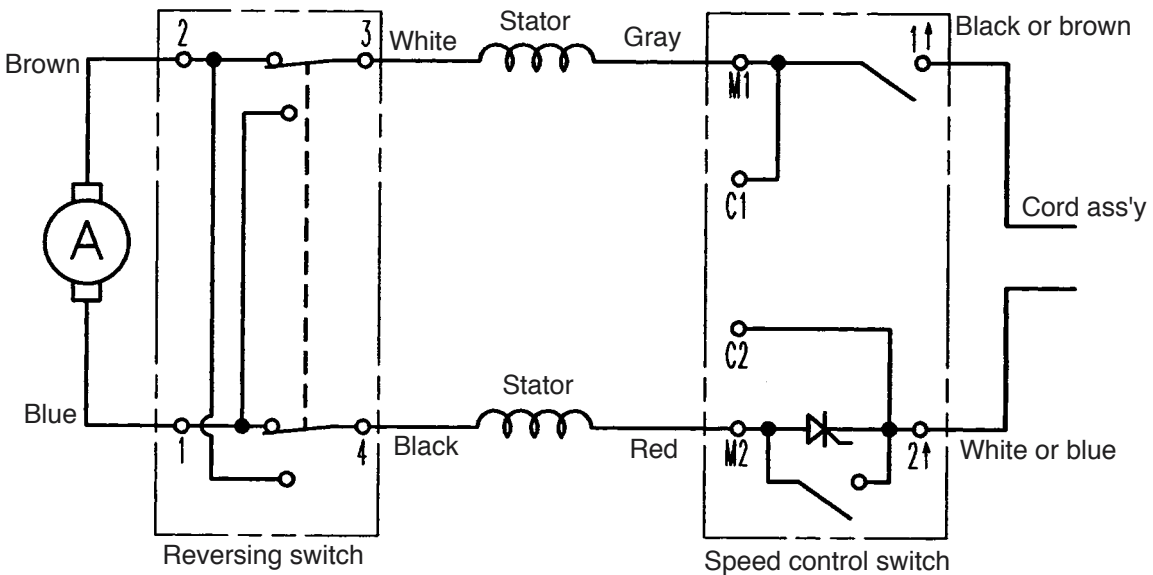


Fig. 12

1-4. Internal Wire Arrangement and Wiring Work

A. Internal wire arrangement

(1) For products with noise suppressor

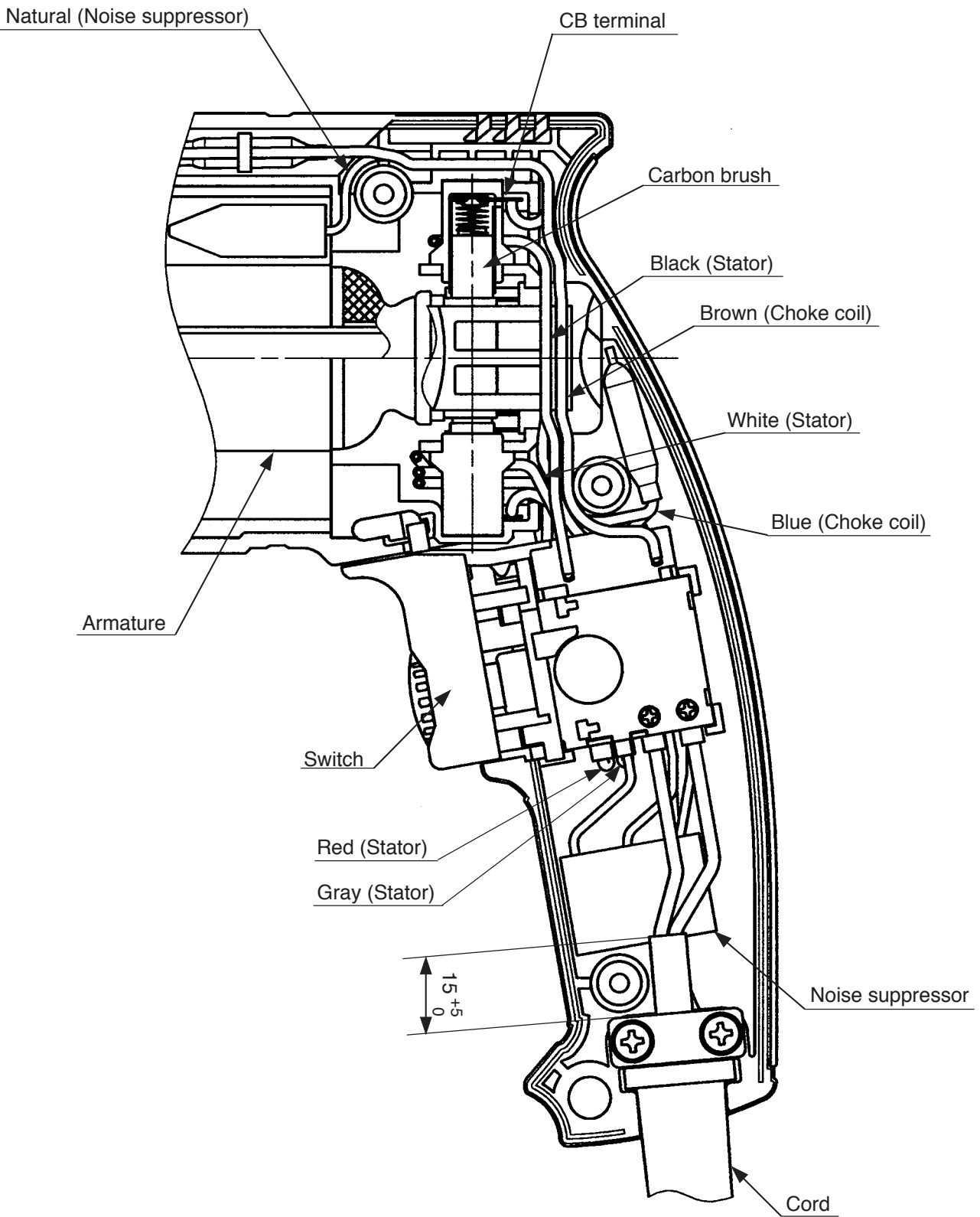


Fig. 13

(2) For products without noise suppressor

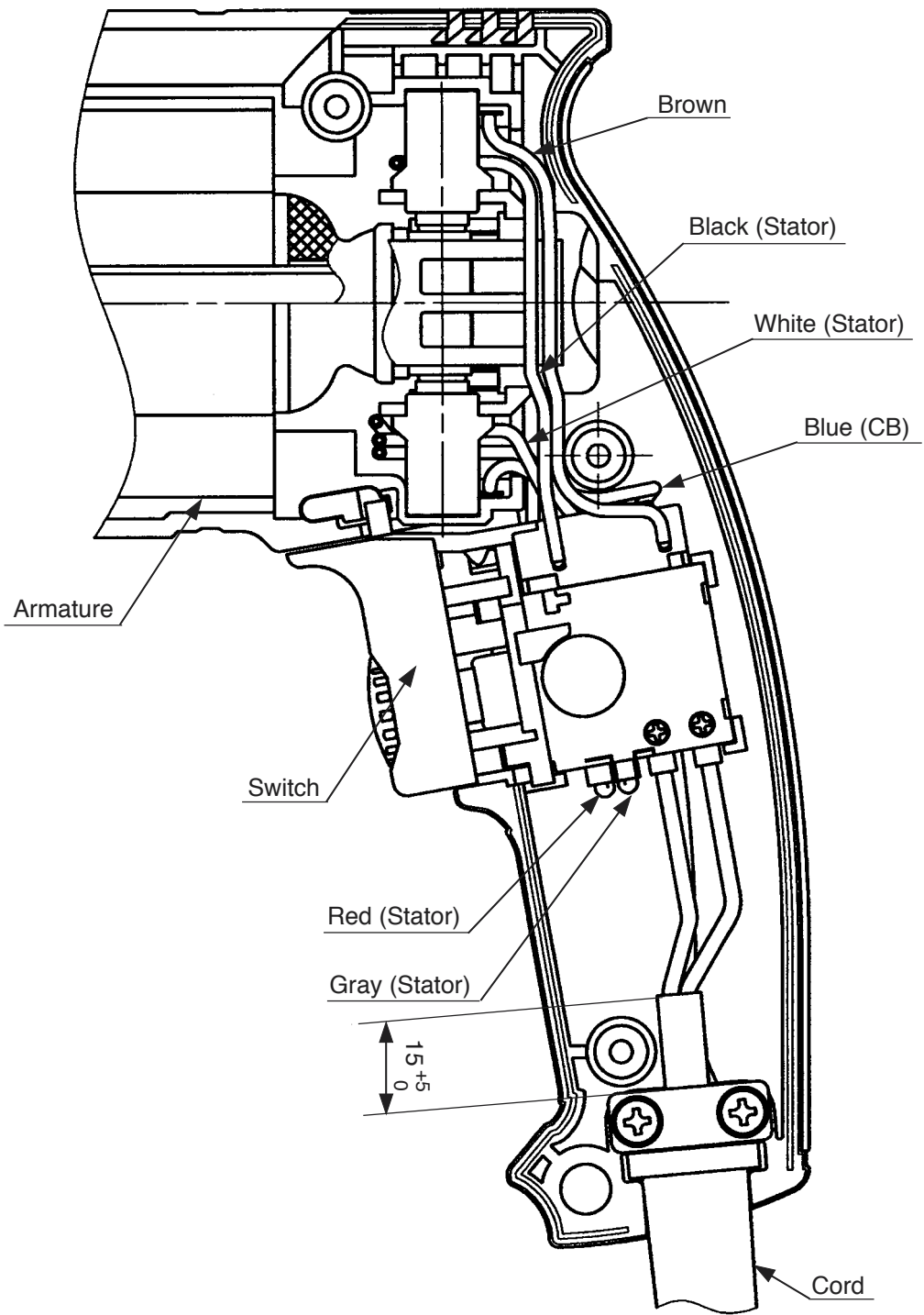


Fig. 14

B. Switch connection

(1) Wiring of reversing switch

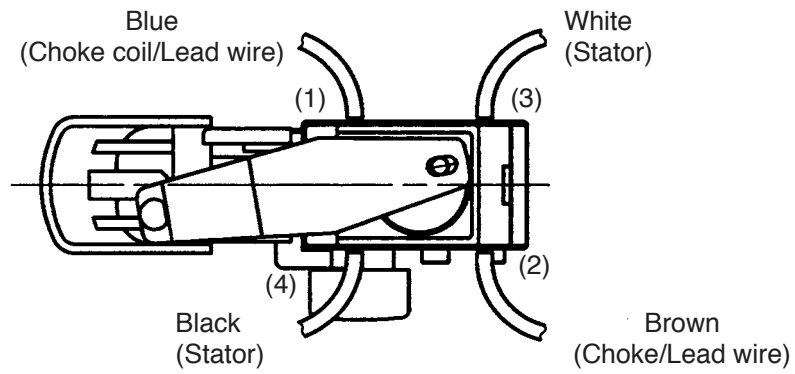


Fig. 15

(2) Wiring of speed control switch

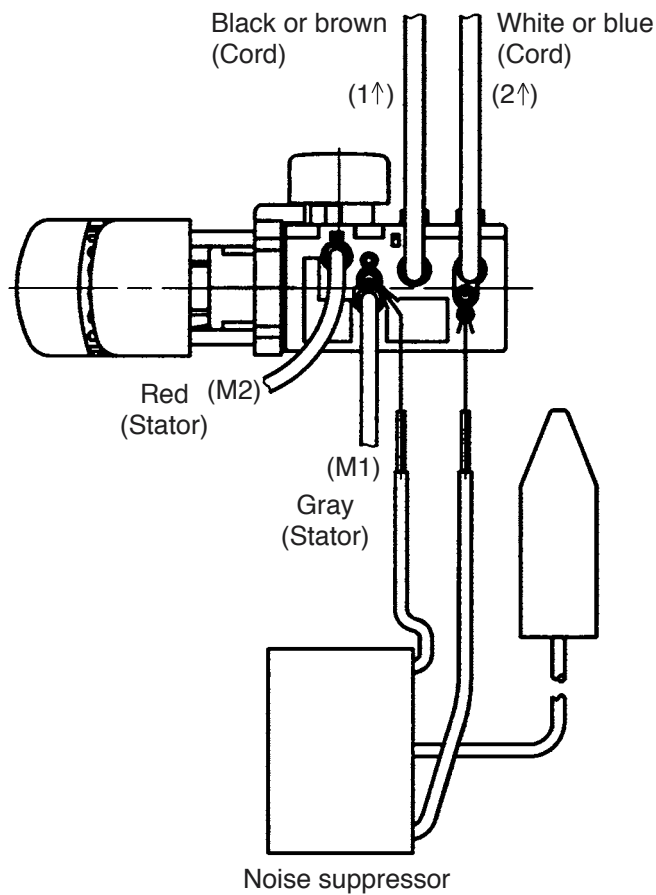


Fig. 16

1-5. Insulation Tests

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

Insulation resistance: 7 M Ω 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)

1-6. No-Load Current Value

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

Model DV 20VB2

Voltage (V)	110	120	230	240
Current (A) Max.	3.5	3.2	1.6	1.5

Model DV 18V

Voltage (V)	110	220	230	240
Current (A) Max.	3.5	1.7	1.6	1.5

2. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed	Work Flow						
DV 20VB2	General Assembly	Handle Cover Cord Armor		Switch Cord				
					Housing Stator			
			Armature Ball Bearing (608DD) Ball Bearing (608VV)	Inner Cover Second Pinion and Gear Set Change Lever Change Cover Change Shaft				
		Drill Chuck		Spindle Ball Bearing (6202DD) Ratchet (A) Spring (A)	Gear Cover (A) Ass'y Ratchet (B) Shift Lever Ass'y Spring (H) Shift Arm Gear Set			

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
DV 18V		Work Flow						
			Handle Cover Cord Armor	Switch Cord				
	General Assembly				Housing Stator			
			Armature Ball Bearing (608DD) Ball Bearing (608VV)	Inner Cover Second Pinion and Gear Set Change Lever Change Cover Change Shaft				
			Drill Chuck		Spindle (B) Ball Bearing (6202DD) Ratchet (A) Spring (A)	Gear Cover (A) Ass'y Ratchet (B) Shift Lever Ass'y Spring (H) Shift Arm Gear Set		

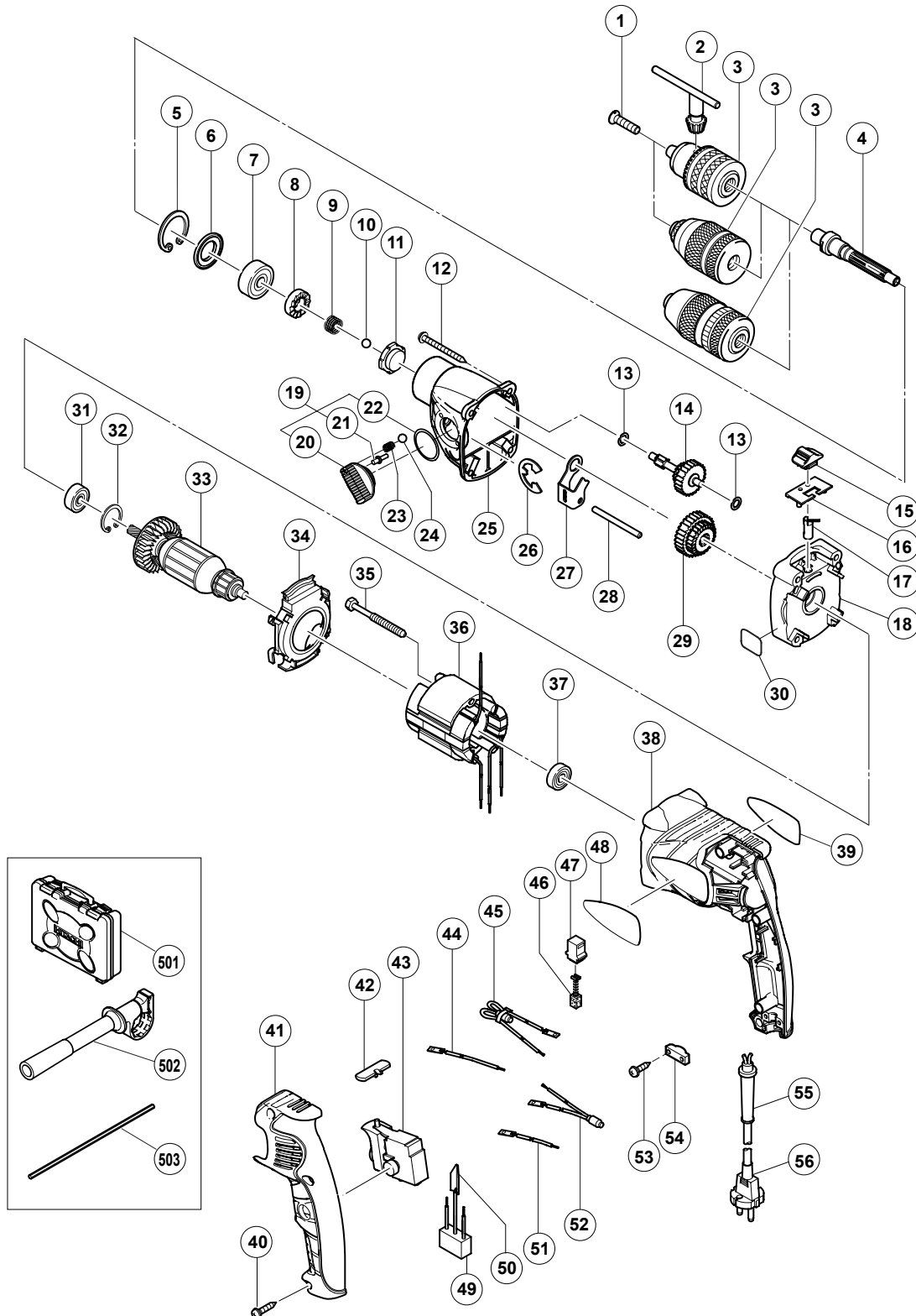
ELECTRIC TOOL PARTS LIST

■ IMPACT DRILL

2004 · 4 · 20

Model DV 20VB2

(E1)



PARTS

DV 20VB2

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
* 1	995-344	FLAT HD. SCREW (A) (LEFT HAND) M6X25	1	EXCEPT FOR DRILL CHUCK 13VLN
2	987-576	CHUCK WRENCH FOR 13VLB-D, 13VLR-D	1	
* 3	321-814	DRILL CHUCK 13VLRB-D	1	INCLUD. 1, 2
* 3	319-546	DRILL CHUCK 13VLRE-N (W/O CHUCK WRENCH)	1	
* 3	316-280	DRILL CHUCK 13VLN (W/O CHUCK WRENCH)	1	
* 4	322-857	SPINDLE (B)	1	
* 4	322-866	SPINDLE (A)	1	FOR SLIP CLUTCH
5	939-556	RETAINING RING FOR D35 HOLE (10 PCS.)	1	
6	322-851	DUST SEAL	1	
7	620-2DD	BALL BEARING 620DDCMPS2L	1	
8	322-850	RATCHET (A)	1	
9	984-101	SPRING (A)	1	
10	959-150	STEEL BALL D6.35 (10 PCS.)	1	
11	322-845	RATCHET (B)	1	
* 12	316-321	TAPPING SCREW (W/FLANGE) D5X45	4	
* 12	322-869	TAPPING SCREW (W/FLANGE) D5X50 (BLACK)	4	FOR SLIP CLUTCH
13	322-852	WASHER (B)	2	
* 14	322-858	SECOND PINION AND GEAR SET	1	
* 14	322-867	SECOND PINION AND GEAR SET	1	FOR SLIP CLUTCH
15	322-841	CHANGE LEVER	1	
16	322-842	CHANGE COVER	1	
17	322-840	CHANGE SHAFT	1	
* 18	322-859	INNER COVER (B)	1	
* 18	322-868	INNER COVER (A)	1	FOR SLIP CLUTCH
19	322-847	SHIFT LEVER ASS'Y	1	INCLUD. 20-22
20		SHIFT LEVER	1	
21	322-848	SHIFT PIN	1	
22	306-353	O-RING (S-22)	1	
23	981-328	SPRING (H)	1	
24	319-535	STEEL BALL D3.5 (10 PCS.)	1	
25	322-844	GEAR COVER (A) ASS'Y	1	INCLUD. 11
26	323-048	RETAINING RING (E-TYPE) FOR D15 SHAFT	1	
27	322-849	SHIFT ARM	1	
* 28	322-860	PIN D5	1	
* 28	984-104	PIN D5	1	FOR SLIP CLUTCH
29	322-846	GEAR SET	1	
* 30		LABEL (FOR SLIP CLUTCH)	1	FOR SLIP CLUTCH
31	608-DDM	BALL BEARING 608DDC2PS2L	1	
32	939-553	RETAINING RING FOR D22 HOLE (10 PCS.)	1	
* 33	360-652C	ARMATURE 110V	1	
* 33	360-652U	ARMATURE ASS'Y 120V	1	INCLUD. 31, 37
* 33	360-652E	ARMATURE 230V	1	
* 33	360-652F	ARMATURE 240V	1	
34	322-843	FAN GUIDE	1	
35	961-672	HEX. HD. TAPPING SCREW D4X50	2	
* 36	340-587C	STATOR 110V	1	
* 36	340-587D	STATOR 120V	1	
* 36	340-587E	STATOR 230V	1	
* 36	340-587F	STATOR 240V	1	
37	608-VVM	BALL BEARING 608VVC2PS2L	1	
38	322-861	HOUSING	1	

PARTS

DV 20VB2

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
39		NAME PLATE	1		
40	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	3		
41	322-862	HANDLE COVER	1		
42	322-853	PUSHING BUTTON	1		
43	322-854	SWITCH (1P PILLAR TYPE)	1		
*	44	321-630	INTERNAL WIRE (BROWN) 100L	1	FOR SIN, USA, CAN
*	45	322-517	CHOKER COIL (BROWN) 220V-240V	1	EXCEPT FOR SIN, USA, CAN
*	45	322-518	CHOKER COIL (BROWN) 110V	1	FOR GBR (110V)
	46	999-041	CARBON BRUSH (1 PAIR)	2	
	47	955-203	BRUSH HOLDER	2	
	48		HITACHI LABEL	1	
*	49	994-273	NOISE SUPPRESSOR	1	EXCEPT FOR SIN, USA, CAN
*	50	992-635	EARTH TERMINAL	1	EXCEPT FOR SIN, USA, CAN
*	51	321-631	INTERNAL WIRE (BLUE) 55L	1	FOR SIN, USA, CAN
*	52	321-634	CHOKER COIL (BLUE) 110V-240V	1	EXCEPT FOR SIN, USA, CAN
*	52	322-519	CHOKER COIL (BLUE) 110V	1	FOR GBR (110V)
	53	984-750	TAPPING SCREW (W/FLANGE) D4X16	2	
	54	937-631	CORD CLIP	1	
	55	953-327	CORD ARMOR D8.8	1	
*	56	500-409Z	CORD	1	(CORD ARMOR D8.8)
*	56	500-423Z	CORD	1	(CORD ARMOR D8.8) FOR SIN
*	56	500-439Z	CORD	1	(CORD ARMOR D8.8) FOR NZL, AUS
*	56	500-247Z	CORD	1	(CORD ARMOR D8.8) FOR NOR, FIN
*	56	500-240Z	CORD	1	(CORD ARMOR D8.8) FOR USA, CAN
*	56	500-461Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (110V)
*	56	500-435Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (230V)
*	56	500-447Z	CORD	1	(CORD ARMOR D8.8) FOR SUI

STANDARD ACCESSORIES

DV 20VB2

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501	322-706	CASE	1		
502	323-050	SIDE HANDLE	1		
503	303-709	DEPTH GAUGE	1		

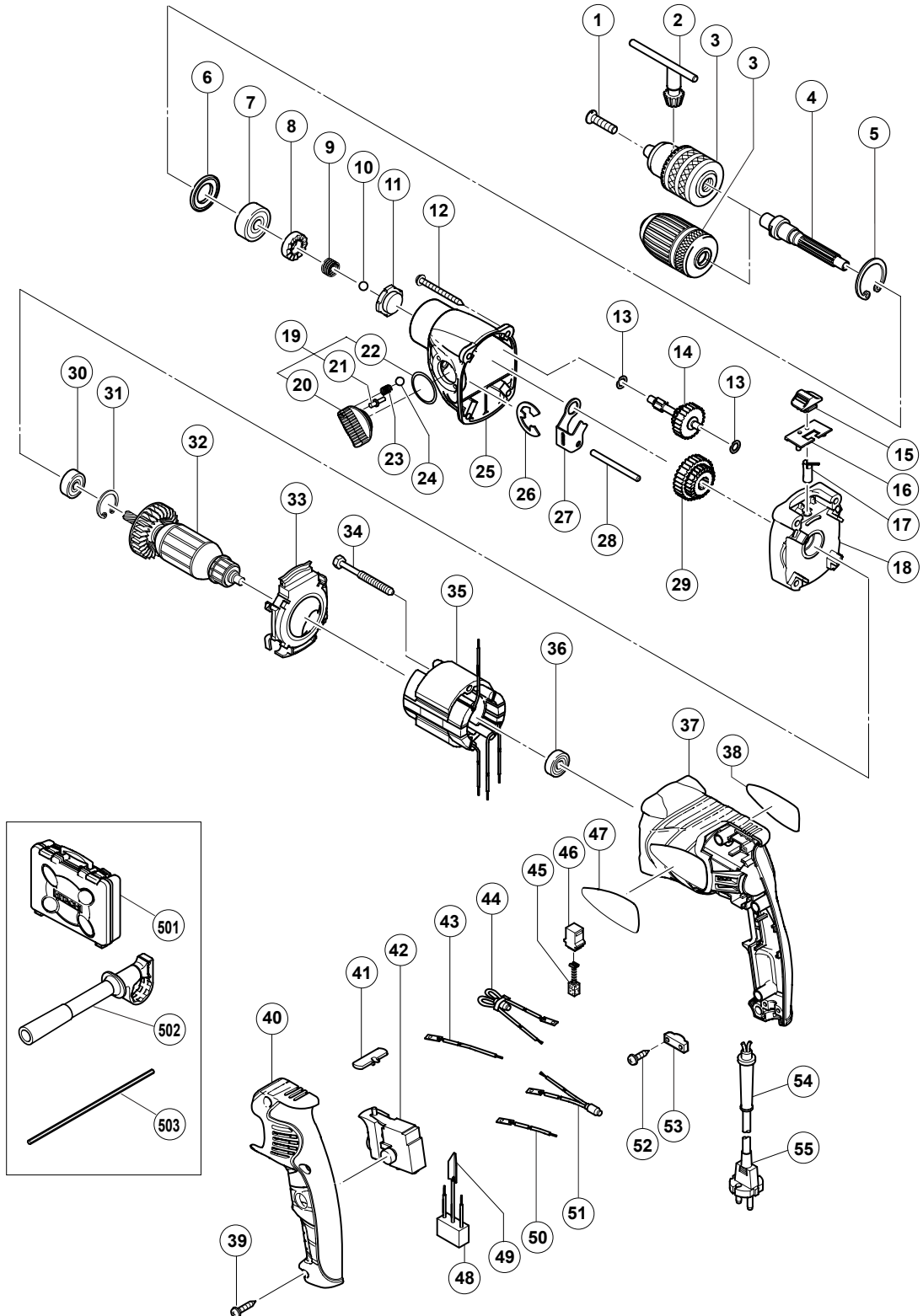
OPTIONAL ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
601	931-851	DRILL BIT (B) D6.5X100	1		
602	931-852	DRILL BIT (B) D8.0X100	1		
603	931-853	DRILL BIT (B) D9.5X120	1		
604	931-854	DRILL BIT (B) D10.0X120	1		
605	971-704	DRILL BIT (B) D12.0X160	1		
606	931-855	DRILL BIT (B) D13.0X160	1		
607	931-776	DRILL BIT (B) D14.3X160	1		
608	971-670	DRILL BIT (B) D16.0X160	1		
609	931-856	DRILL BIT (B) D19.0X160	1		

ELECTRIC TOOL PARTS LIST

■ **IMPACT DRILL**
Model DV 18V

2004 · 4 · 20
(E1)



PARTS

DV 18V

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	
* 3		DRILL CHUCK	1	INCLUD. 1, 2 SUPPLIED WITH ITEM NO. 601
* 3	322-357	DRILL CHUCK 13VLRH-N (W/O CHUCK WRENCH)	1	
4	322-857	SPINDLE (B)	1	
5	939-556	RETAINING RING FOR D35 HOLE (10 PCS.)	1	
6	322-851	DUST SEAL	1	
7	620-2DD	BALL BEARING 6202DDCMPS2L	1	
8	322-850	RATCHET (A)	1	
9	984-101	SPRING (A)	1	
10	959-150	STEEL BALL D6.35 (10 PCS.)	1	
11	322-845	RATCHET (B)	1	
12	316-321	TAPPING SCREW (W/FLANGE) D5X45	4	
13	322-852	WASHER (B)	2	
14	322-858	SECOND PINION AND GEAR SET	1	
15	322-841	CHANGE LEVER	1	
16	322-842	CHANGE COVER	1	
17	322-840	CHANGE SHAFT	1	
18	322-859	INNER COVER (B)	1	
19	322-847	SHIFT LEVER ASS'Y	1	INCLUD. 20-22
20		SHIFT LEVER	1	
21	322-848	SHIFT PIN	1	
22	306-353	O-RING (S-22)	1	
23	981-328	SPRING (H)	1	
24	319-535	STEEL BALL D3.5 (10 PCS.)	1	
25	322-844	GEAR COVER (A) ASS'Y	1	INCLUD. 11
26	323-048	RETAINING RING (E-TYPE) FOR D15 SHAFT	1	
27	322-849	SHIFT ARM	1	
28	322-860	PIN D5	1	
29	322-846	GEAR SET	1	
30	608-DDM	BALL BEARING 608DDC2PS2L	1	
31	939-553	RETAINING RING FOR D22 HOLE (10 PCS.)	1	
* 32	360-655C	ARMATURE 110V	1	
* 32	360-655E	ARMATURE 220V-230V	1	
* 32	360-655F	ARMATURE 240V	1	
33	322-843	FAN GUIDE	1	
34	981-824	HEX. HD. TAPPING SCREW D4X45	2	
* 35	340-589C	STATOR 110V	1	
* 35	340-589E	STATOR 220V-230V	1	
* 35	340-589F	STATOR 240V	1	
36	608-VVM	BALL BEARING 608VVC2PS2L	1	
37	322-861	HOUSING	1	
38		NAME PLATE	1	
39	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	3	
40	322-862	HANDLE COVER	1	
41	322-853	PUSHING BUTTON	1	
42	322-854	SWITCH (1P PILLAR TYPE)	1	
* 43	321-630	INTERNAL WIRE (BROWN) 100L	1	FOR SYR, THA, INA, KUW, IND, SIN, HKG
* 44	322-517	CHOKE COIL (BROWN) 220V-240V	1	FOR ITA, ESP, GBR (230V), NZL, AUS, AUT, SAF, CHN
* 44	322-518	CHOKE COIL (BROWN) 110V	1	FOR GBR (110V)

PARTS

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
45	999-041	CARBON BRUSH (1 PAIR)	2	
46	955-203	BRUSH HOLDER	2	
47		HITACHI LABEL	1	
* 48	994-273	NOISE SUPPRESSOR	1	FOR GBR (230V), NZL, AUS
* 49	992-635	EARTH TERMINAL	1	FOR GBR (230V), NZL, AUS
* 50	321-631	INTERNAL WIRE (BLUE) 55L	1	FOR SYR, THA, INA, KUW, IND, SIN, HKG
* 51	321-634	CHOKE COIL (BLUE) 110V-240V	1	FOR ITA, ESP, GBR (230V), NZL, AUS, AUT, SAF, CHN
* 51	322-519	CHOKE COIL (BLUE) 110V	1	FOR GBR (110V)
	52	984-750 TAPPING SCREW (W/FLANGE) D4X16	2	
	53	937-631 CORD CLIP	1	
	54	953-327 CORD ARMOR D8.8	1	
* 55	500-231Z	CORD	1	(CORD ARMOR D8.8)
* 55	500-447Z	CORD	1	(CORD ARMOR D8.8) FOR SYR
* 55	500-468Z	CORD	1	(CORD ARMOR D8.8) FOR THA
* 55	500-409Z	CORD	1	(CORD ARMOR D8.8) FOR INA
* 55	500-423Z	CORD	1	(CORD ARMOR D8.8) FOR KUW, SIN
* 55	500-435Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (230V), HKG
* 55	500-461Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (110V)
* 55	500-439Z	CORD	1	(CORD ARMOR D8.8) FOR NZL, AUS
* 55	500-468Z	CORD	1	(CORD ARMOR D8.8) FOR CHN
* 55	500-409Z	CORD	1	(CORD ARMOR D8.8) FOR IND

STANDARD ACCESSORIES

DV 18V

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
501	322-706	CASE	1	
502	323-050	SIDE HANDLE	1	
503	303-709	DEPTH GAUGE	1	

OPTIONAL ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
601	321-814	DRILL CHUCK 13VLRB-D	1	INCLUD. 602
602	930-515	CHUCK WRENCH 10G	1	
603	931-851	DRILL BIT (B) D6.5X100	1	
604	931-852	DRILL BIT (B) D8.0X100	1	
605	931-853	DRILL BIT (B) D9.5X120	1	
606	931-854	DRILL BIT (B) D10.0X120	1	
607	971-704	DRILL BIT (B) D12.0X160	1	
608	931-855	DRILL BIT (B) D13.0X160	1	
609	931-776	DRILL BIT (B) D14.3X160	1	
610	971-670	DRILL BIT (B) D16.0X160	1	
611	931-856	DRILL BIT (B) D19.0X160	1	