

PRODUCT NAMES

Hitachi 13 mm Impact Drill Models DV 13SS, DV 13VSS Hitachi 16 mm Impact Drill Models DV 16SS, DV 16VSS

D

MARKETING OBJECTIVE

The Models DV 13SS, DV 13VSS, DV 16SS and DV 16VSS are the low-price SS-series of 13 mm/16 mm impact drills equipped with a cylindrical housing.

- (1) Most lightweight in their class (Models DV 13SS/DV 13VSS: 1.4 kg (3.1 lbs.)),
(Models DV 16SS/DV 16VSS: 1.5 kg (3.3 lbs.))
- (2) Newly structured ratchet reduces the maintenance costs (patent pending).
- (3) Efficient operation thanks to the high-power motor (Models DV 13SS/DV 13VSS: 550 W (0.74 HP)),
(Models DV 16SS/DV 16VSS: 600 W (0.81 HP))
- (4) Available for various applications thanks to the variable speed control switch with the forward/reverse changeover switch (Models DV 13VSS and DV 16VSS only)
- (5) Durable cylindrical housing

We intend to expand our market share with the new impact drills Models DV 13SS, DV 13VSS, DV 16SS and DV 16VSS.

APPLICATIONS

- Rotation and impacting mode --- Drilling into mortar, concrete, blocks, bricks, etc.
- Rotation only mode ----- Drilling into metal, wood, plastic, etc.

SELLING POINTS

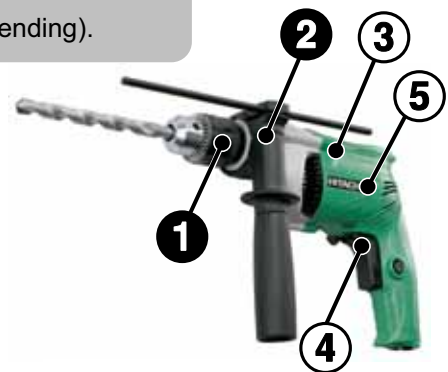
SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT.

<New features>

- ① Most lightweight in their class (Models DV 13SS/DV 13VSS: 1.4 kg (3.1 lbs.)),
(Models DV 16SS/DV 16VSS: 1.5 kg (3.3 lbs.))
- ② Newly structured ratchet reduces the maintenance costs (patent pending).

<Same features as the conventional models>

- ③ Efficient operation thanks to the high-power motor
(Models DV 13SS/DV 13VSS: 550 W (0.74 HP)),
(Models DV 16SS/DV 16VSS: 600 W (0.81 HP))
- ④ Available for various applications thanks to the variable speed control switch with the forward/reverse changeover switch (Models DV 13VSS and DV 16VSS only)
- ⑤ Durable cylindrical housing



DV16SS/DV16VSS

REMARK:

- For more information about HANDLING INSTRUCTIONS, visit our website at:

http://www.hitachi-koki.com/manual_view_export/

- 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:

Symbols utilized	Competitors	
	Company name	Model name
C1	MAKTEC	MT811
C2	MAKTEC	MT813
B1	BOSCH	GSB13RE
B2	BOSCH	GSB16RE

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SELLING POINT DESCRIPTIONS

1 Most lightweight in their class* *: Based on our own research

The table below compares product weight between the Models DV 13SS, DV 13VSS, DV 16SS, DV 16VSS and the competitive models.

Model			HITACHI		C1	C2	B1	B2	(Reference)	
			DV 13SS DV 13VSS	DV 16SS DV 16VSS					HITACHI	
								FDV 16VB2	DV 16V	
Product weight	Listed value	kg (lbs.)	1.4* (3.1)	1.5* (3.3)	1.6** (3.5)	2.0** (4.4)	1.8** (4.0)	1.9** (4.2)	1.6** (3.5)	1.5* (3.3)
	Measured value	kg (lbs.)	1.6** (3.5)	1.7** (3.7)	1.7** (3.7)	2.1** (4.6)	1.8** (4.0)	1.9** (4.2)	1.7** (3.7)	1.7** (3.7)

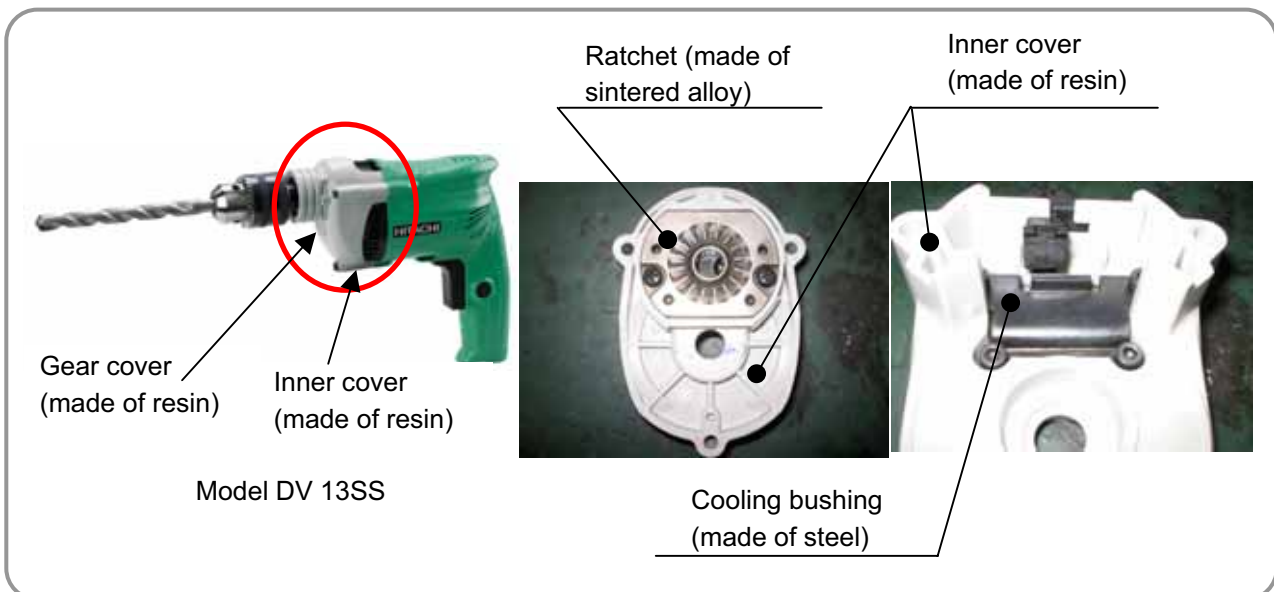
*: Excluding the drill chuck, cord, side handle and depth gauge

**: Excluding the cord, side handle and depth gauge

The Models DV 13SS, DV 13VSS, DV 16SS and DV 16VSS are the most lightweight in their class thanks to the newly structured ratchet. While the inner covers of both the conventional and competitive models are made of aluminum, the Models DV 13SS, DV 13VSS, DV 16SS and DV 16VSS are equipped with a lighter inner cover and gear cover made of resin thanks to the new structure.

2 Newly structured ratchet reduces the maintenance costs (patent pending).

To make the lightweight inner cover made of resin resistant to ratchet-generated heat, the ratchet's surface-to-volume ratio is increased, along with a cooling bushing provided behind the ratchet. As a result, the resin inner cover has heat resistance and durability equivalent to those of the aluminum inner cover (holder) (patent pending). In the conventional models, the entire inner cover (holder) must be replaced even when only the tooth portion of the ratchet reaches the end of its service life. The new structure enables replacement of only the ratchet, thereby reducing maintenance costs. We can provide the lower-priced impact drill equipped with the durable cylindrical housing thanks to this new structure.



**③ Efficient operation thanks to the high-power motor
(Models DV 13SS/DV 13VSS: 550 W (0.74 HP),
Models DV 16SS/DV 16VSS: 600 W (0.81 HP))**

The Models DV 13SS, DV 13VSS, DV 16SS and DV 16VSS are equipped with a high-power motor (550 W/600 W) to generate sufficiently high torque to cope with heavy-load operations such as drilling into metal and wood materials. These models can be operated efficiently without reducing torque thanks to the high-power motor.

Model		HITACHI		C1	C2	B1	B2	(Reference)	
		DV 13SS DV 13VSS	DV 16SS DV 16VSS					HITACHI	
								FDV 16VB2	DV 16V
Input	W (HP)	550 (0.74)	600 (0.81)	430 (0.58)	710 (0.95)	600 (0.81)	701 (0.94)	550 (0.74)	590 (0.80)
Maximum torque	N•m (in•lbs)	12.4 (110)	15.4 (136)	7.7 (68)	13.4 (119)	10.8 (96)	– (–)	9.6 (85)	12.6 (112)

**④ Available for various applications thanks to the variable speed control switch with the forward/reverse changeover switch
(Models DV 13VSS and DV 16VSS only)**

The Models DV 13VSS and DV 16VSS are equipped with a variable speed control switch with a forward/reverse changeover switch so that the direction of rotation and speed can be freely adjusted according to specific applications and materials.

⑤ Durable cylindrical housing

The Models DV 13SS, DV 13VSS, DV 16SS and DV 16VSS offer significantly improved durability thanks to the adoption of a durable cylindrical housing.

Model	HITACHI	C1 C2	B1 B2	(Reference)	
	DV 13SS/DV13 VSS DV 16SS/DV16 VSS			HITACHI	
				FDV 16VB2	DV 16V
Housing structure	Cylindrical (without elastomer)	Cylindrical (without elastomer)	Clamshell (with elastomer)	Clamshell (with elastomer)	Cylindrical (with elastomer)

SPECIFICATIONS

1. Specifications

Product name		13 mm impact drill		16 mm impact drill	
Model		DV 13SS	DV 13VSS	DV 16SS	DV 16VSS
Capacities	Concrete	13 mm (1/2")		16 mm (5/8")	
	Steel	13 mm (1/2")		13 mm (1/2")	
	Wood	20 mm (3/4")		25 mm (1")	
Drill chuck	Mount type	1/2"-20UNF			
	Capacity	1.5 to 13 mm (1/16" to 1/2")			
Power source	Frequency	AC single phase 50/60 Hz			
	Voltage	110V, 120V, 220V, 230V, 240V			
Type of motor		AC single-phase series commutator motor			
Enclosure		Glassfiber reinforced polyamide resin ----- Housing, handle cover, gear cover and inner cover			
Types of switches		DV 13SS,DV 16SS: ON-OFF trigger switch DV 13VSS,DV 16VSS: Variable speed control switch with forward/reverse changeover switch			
Full-load current		110V:5.4A, 120V:4.9A 220V:2.7A, 230V:2.6A, 240V:2.5A		110V:5.9A, 120V:5.4A 220V:2.9A, 230V:2.8A, 240V:2.7A	
Power input		550W (0.74HP)		600W (0.81HP)	
Speed	No load	2,900/min.	0 to 2,900/min.	2,900/min.	0 to 2,900/min.
	Full load	1,990/min.		1,940/min.	
Impact rate	No load	46,400/min.	0 to 46,400/min.	46,400/min.	0 to 46,400/min.
	Full load	31,840/min.		31,040/min.	
Full-load output		260 W (0.35HP)		315 W (0.42HP)	
Maximum output		545 W (0.73HP)		690 W (0.93HP)	
Maximum torque		12.4 N·m (110 in·lbs)		15.4 N·m (136 in·lbs)	
Weight	Listed value* ¹	1.4 kg (3.1lbs.)		1.5 kg (3.3lbs.)	
	Measured value* ²	1.6 kg (3.5lbs.)		1.7 kg (3.7lbs.)	
Overall length x width x overall height		270 x 67 x 186 mm (10-19/32 x 2-5/8 x 7-5/16")			
Standard accessories* ³		Specification for keyed chuck	Specification for keyed chuck	Specification for keyed chuck	Specification for keyed chuck
		•Chuck handle ---- 1	•Chuck handle ---- 1	•Chuck handle ---- 1 • Side handle ----- 1 • Depth gauge ---- 1	•Chuck handle ----1 • Side handle -----1 • Depth gauge -----1
			Specification for keyless chuck		Specification for keyless chuck
			• Side handle ----- 1 • Depth gauge ---- 1 • Case ----- 1		• Side handle -----1 • Depth gauge -----1 • Case -----1

*¹: Excluding the drill chuck, cord, side handle and depth gauge

*²: Excluding the cord, side handle and depth gauge

*³: Standard accessories may vary depending on the market areas.

2. Packaging

Model		Packaging	Packing weight	Packing dimensions (length x width x height)
DV 13SS	Specification for keyed chuck	Corrugated cardboard box	2.1 kg (4.6 lbs.)	275 x 255 x 75 mm (10-13/16 x 10 x 2-31/32")
DV 13VSS	Specification for keyed chuck	Corrugated cardboard box	2.1 kg (4.6 lbs.)	275 x 255 x 75 mm (10-13/16 x 10 x 2-31/32")
	Specification for keyless chuck	Case	3.1 kg (6.8 lbs.)	375 x 345 x 110 mm (14-13/16 x 13-19/32 x 4-11/32")
DV 16SS	Specification for keyed chuck	Corrugated cardboard box	2.4 kg (5.3 lbs.)	275 x 255 x 75 mm (10-13/16 x 10 x 2-31/32")
DV 16VSS	Specification for keyed chuck	Corrugated cardboard box	2.4 kg (5.3 lbs.)	275 x 255 x 75 mm (10-13/16 x 10 x 2-31/32")
	Specification for keyless chuck	Case	3.2 kg (7.1 lbs.)	375 x 345 x 110 mm (14-13/16 x 13-19/32 x 4-11/32")

COMPARISON WITH SIMILAR PRODUCTS

1. Comparison of Specifications (Superior specifications:)

[13 mm class]

Item		Maker • Model		HITACHI DV 13SS DV 13VSS	C1	B1	(Reference)	
							HITACHI	
							FDV 16VB2	DV 16V
Listed value	Capacities	Concrete	mm (in.)	13 (1/2")	13 (1/2")	13 (1/2")	16 (5/8")	16 (5/8")
		Steel	mm (in.)	13 (1/2")	13 (1/2")	10 (25/64")	13 (1/2")	13 (1/2")
		Wood	mm (in.)	20 (3/4")	18 (23/32")	20 (3/4")	25 (1")	25 (1")
	Drill chuck capacity	mm (in.)	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	
	Power input	W (HP)	550 (0.74)	430 (0.58)	600 (0.81)	550 (0.74)	590 (0.80)	
	No-load speed	/min.	DV 13SS: 2,900 DV 13VSS: 0 to 2,900	0 to 2,800	0 to 2,800	0 to 2,900	0 to 2,900	
	No-load impact rate	/min.	DV 13SS: 46,400 DV 13VSS: 0 to 46,400	0 to 30,800	0 to 44,800	0 to 46,400	0 to 46,400	
	Weight	kg (lbs.)	1.4*(3.1)	1.6**(3.5)	1.8**(4.0)	1.6**(3.5)	1.5*(3.3)	
Measured value	No-load speed	/min.	2,765	2,969	2,572	2,845	3,317	
	No-load noise level	dB	81.5	76.1	–	77.1	82.0	
	No-load vibration level	m/s ²	1.3	1.1	–	1.3	1.0	
	Actual noise level	dB	91.5	92.0	–	93.4	93.1	
	Actual vibration level	m/s ²	6.3	5.0	–	11.2	10.0	
	Maximum torque	N•m (In•lbs)	12.4 (110)	7.7 (68)	10.8 (96)	9.6 (85)	12.6 (112)	
	Dimensions	Overall length	mm (in.)	270 (10-19/32")	272 (10-45/64")	266 (10-1/2")	288 (11-5/16")	269 (10-39/64")
		Width	mm (in.)	67 (2-5/8")	71 (2-13/16")	– (–)	67 (2-41/64")	63 (2-31/64")
		Overall height	mm (in.)	186 (7-5/16")	194 (7-41/64")	180 (7-3/32")	199 (7-53/64")	181 (7-1/8")
		Center height	mm (in.)	28.2 (1-7/64")	28.0(1-3-32")	– (–)	27.5 (1-5/64")	27.0 (1-1/16")
Weight	kg (lbs.)	1.6**(3.5)	1.7**(3.7)	1.8**(4.0)	1.7**(3.7)	1.7**(3.7)		
Housing structure		Cylindrical	Cylindrical	Clamshell	Clamshell	Cylindrical		
Gear cover material		Resin	Resin	–	–	Aluminum		
Inner cover (holder) material		Resin	Aluminum (holder)	Aluminum (holder)	Aluminum (holder)	Aluminum		
Forward/reverse changeover switch		DV 16SS: Not provided DV 16VSS: Provided	Provided	Provided	Provided	Provided		
Switch fine adjustment dial		Not provided	Not provided	Provided	Provided	Provided		
Soft grip		Not provided	Not provided	Provided	Provided	Provided		

* : Excluding the drill chuck, cord, side handle and depth gauge

** : Excluding the cord, side handle and depth gauge

[16 mm class] (Superior specifications:)

Item			Maker • Model		HITACHI DV 16SS DV 16VSS	C2	B2	(Reference)	
								HITACHI	
								FDV 16VB2	DV 16V
Listed value	Capacities	Concrete	mm (in.)	16 (5/8")	16 (5/8")	16 (5/8")	16 (5/8")	16 (5/8")	
		Steel	mm (in.)	13 (1/2")	13 (1/2")	13 (1/2")	13 (1/2")	13 (1/2")	
		Wood	mm (in.)	25 (1")	30 (1-3/16")	30 (1-3/16")	25 (1")	25 (1")	
	Drill chuck capacity		mm (in.)	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	1.5 to 13 (1/16 to 1/2")	
	Power input		W (HP)	600 (0.81)	710 (0.95)	701 (0.94)	550 (0.74)	590 (0.80)	
	No-load speed		/min.	DV 16SS: 2,900 DV 16VSS: 0 to 2,900	0 to 3,000	0 to 2,600	0 to 2,900	0 to 2,900	
	No-load impact rate		/min.	DV 16SS: 46,400 DV 16VSS: 0 to 46,400	0 to 45,000	0 to 41,600	0 to 46,400	0 to 46,400	
	Weight		kg (lbs.)	1.5* (3.3)	2.0** (4.4)	1.9** (4.2)	1.6** (3.5)	1.5* (3.3)	
Measured value	No-load speed		/min.	2,682	3,112	2,600	2,845	3,317	
	No-load noise level		dB	81.4	–	–	77.1	82.0	
	No-load vibration level		m/s ²	1.3	–	–	1.3	1.0	
	Actual noise level		dB	91.8	–	–	93.4	93.1	
	Actual vibration level		m/s ²	7.1	–	–	11.2	10.0	
	Maximum torque		N•m (In•lbs)	15.4 (136)	13.4 (119)	– (–)	9.6 (85)	12.6 (112)	
	Dimensions	Overall length	mm (in.)	270 (10-19/32")	297 (11-23/32")	295 (11-39/64")	288 (11-5/16")	269 (10-39/64")	
		Width	mm (in.)	67 (2-5/8")	71 (2-13/16")	70 (2-49/64")	67 (2-41/64")	63 (2-31/64")	
		Overall height	mm (in.)	186 (7-5/16")	194 (7-41/64")	203 (8")	199 (7-53/64")	181 (7-1/8")	
		Center height	mm (in.)	28.2(1-7/64")	28.0 (1-7/64")	310 (12-13/64")	27.5 (1-5/64")	27.0 (1-1/16")	
Weight		kg (lbs.)	1.7** (3.7)	2.1** (4.6)	1.9** (4.2)	1.7** (3.7)	1.7** (3.7)		
Housing structure				Cylindrical	Cylindrical	Clamshell	Clamshell	Cylindrical	
Gear cover material				Resin	Resin	–	–	Aluminum	
Inner cover (holder) material				Resin	Aluminum (holder)	Aluminum (holder)	Aluminum (holder)	Aluminum	
Forward/reverse changeover switch				DV 16SS: Not provided DV 16VSS: Provided	Provided	Provided	Provided	Provided	
Switch fine adjustment dial				Not provided	Not provided	Provided	Provided	Provided	
Soft grip				Not provided	Not provided	Provided	Provided	Provided	

* : Excluding the drill chuck, cord, side handle and depth gauge

** : Excluding the cord, side handle and depth gauge

2. Comparison of Drilling Speed (reference) (superior specifications: ■)

The tables below compare drilling speed.

[13 mm class]

Condition			Maker • Model	HITACHI DV 13SS DV 13VSS	C1	(Reference)	
Mode	Workpiece	Drill				HITACHI	
						FDV 16VB2	DV 16V
Rotation only	SPF t39 mm	Ø 18 mm		1.1 s	1.2 s	1.1 s	0.9 s
	Douglas fir t38 mm	Ø 18 mm		1.0 s	1.3 s	1.2 s	1.0 s
	SPCC t3.2 mm	Ø 6.5 mm		4.5 s	5.0 s	5.4 s	3.6 s
		Ø 8.0 mm		6.7 s	8.6 s	6.8 s	5.2 s
Rotation and impacting	Mortar Depth: 50 mm Thrust: 196N	Ø 6.5 mm		5.5 s	6.6 s	5.5 s	4.9 s
		Ø 8.0 mm		7.3 s	8.6 s	8.0 s	6.9 s
		Ø 13.0 mm		12.3 s	15.7 s	12.2 s	11.1 s

NOTE: Since the actually measured values listed in the table above may vary depending on ambient temperature, sharpness of the drill, workpiece hardness, operating conditions, etc., this data should only be used as a comparative guide.

[16 mm class]

Condition			Maker • Model	HITACHI DV 16SS DV 16VSS	C2	B2	(Reference)	
Mode	Workpiece	Drill					HITACHI	
							FDV 16VB2	DV 16V
Rotation only	SPF t39 mm	Ø 18 mm		1.1 s	1.0 s	1.1 s	1.1 s	0.9 s
	Douglas fir t38 mm	Ø 18 mm		1.1 s	1.0 s	1.1 s	1.2 s	1.0 s
	SPCC t3.2 mm	Ø 6.5 mm		4.6 s	4.6 s	4.6 s	5.4 s	3.6 s
		Ø 8.0 mm		6.6 s	6.1 s	6.9 s	6.8 s	5.2 s
Rotation and impacting	Mortar Depth: 50 mm Thrust: 196N	Ø 6.5 mm		5.6 s	4.9 s	7.4 s	5.5 s	4.9 s
		Ø 8.0 mm		7.7 s	6.8 s	9.0 s	8.0 s	6.9 s
		Ø 13.0 mm		12.6 s	12.1 s	26.5 s	12.2 s	11.1 s
		Ø 16.0 mm		20.6 s	17.6 s	29.5 s	20.4 s	13.9 s

NOTE: Since the actually measured values listed in the table above may vary depending on ambient temperature, sharpness of the drill, workpiece hardness, operating conditions, etc., this data should only be used as a comparative guide.

PRECAUTIONS ON SALES PROMOTION

1. Safety Instructions

In the interest of promoting the safest and most efficient use of the Models DV 13SS, DV 13VSS, DV 16SS and DV 16VSS Impact Drills by all of our customers, it is very important when concluding a sale that the salesperson carefully ensure that the buyer seriously recognizes the importance of the Handling Instructions, and fully understands the precautions listed on the Nameplate or Caution Plate attached to each tool.

A. 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 using any electric power tool cannot be completely eliminated. Accordingly, the Handling Instructions list general precautions and suggestions on the use of electric power tools, and specific precautions and suggestions on the use of impact drills to enhance the safe and efficient use of the tool by the customer. Salespersons must be thoroughly familiar with the contents of the Handling Instructions in order to offer appropriate guidance to customers during sales promotion activities.

B. Caution on the name plate

Each tool is provided with a nameplate that gives the following basic safety precautions on using the tool.

(1) For the UK, Germany, Belgium, France, Netherlands, Austria, Russia, Poland, and the Czech Republic, Turkey, Hungary, Spain, Italy, Finland, Denmark, Norway, Israel, Oman



(2) For Australia and New Zealand

CAUTION

- Read thoroughly HANDLING INSTRUCTIONS before use.

(3) For the USA and 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.

(4) For Mexico

ADVERTENCIA

- Lea las instrucciones de manejo antes de usar.

(5) For Taiwan

注意：使用前請詳讀使用說明書

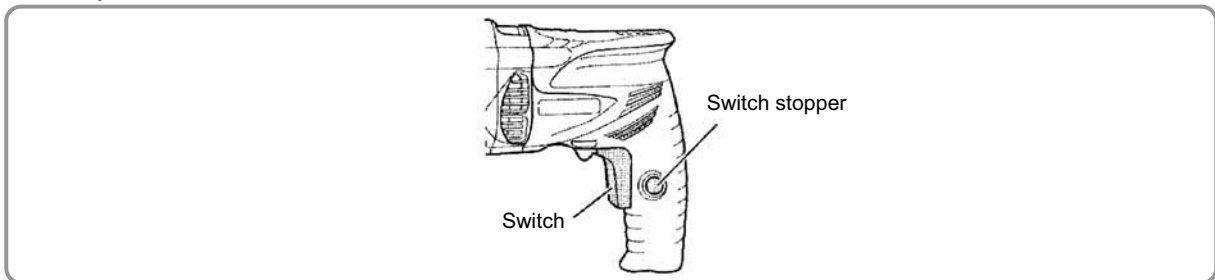
(6) For China

注意：使用前请仔细阅读使用说明书

C. Precautions on usage

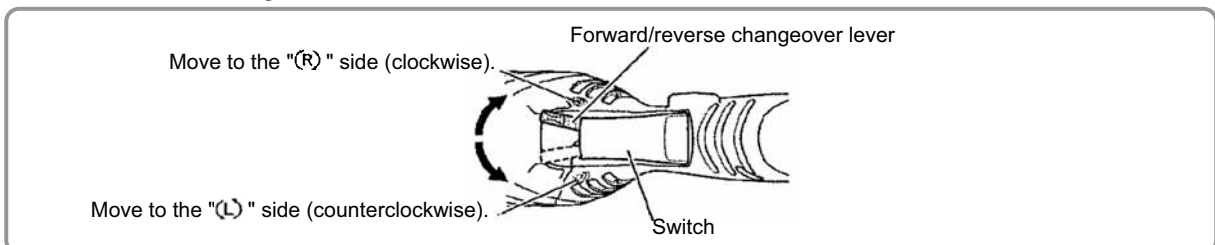
(1) Operating the switch

- 1) Pull the trigger and push the switch stopper to continuously activate the switch, even if you release your finger from the trigger. This is convenient for continuous operation. To turn off the switch, pull the trigger again and release your finger from the trigger. The switch stopper is then cancelled.
- 2) The speed varies depending on the extent to which the trigger is pulled on the Models DV 13VSS and DV 16VSS. When determining the center of a drilling hole, slightly pull the trigger and start operation slowly.



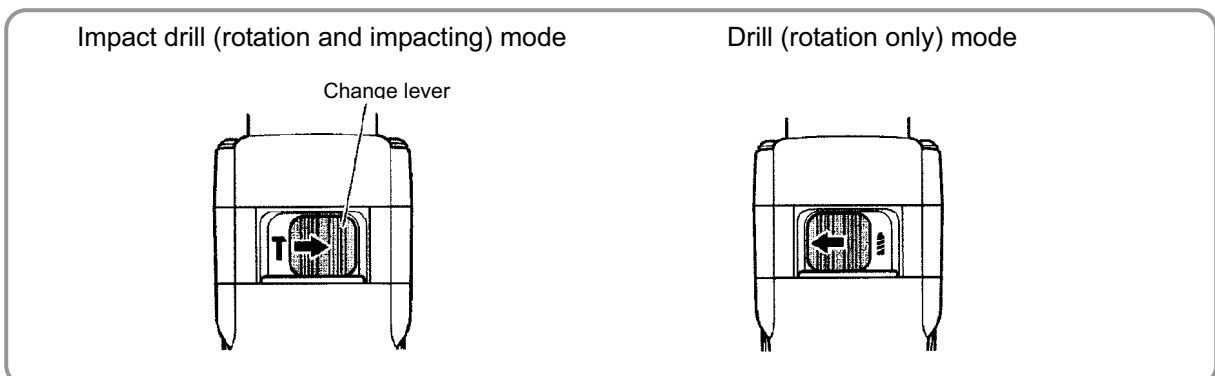
(2) Selecting the direction of rotation (Models DV 13VSS and DV 16VSS)

When the forward/reverse changeover lever is moved to the "(R)" side, the drill bit turns clockwise (forward) when viewed from behind. When the lever is moved to the "(L)" side, the drill bit turns counterclockwise (reverse). "(R)" and "(L)" are indicated on the enclosure as shown in the figure below. Note that it is impossible to change the forward/reverse changeover lever position during operation. Be sure to turn off the switch and wait until the motor stops completely before changing the position of the forward/reverse changeover lever.



(3) Selecting between rotation only mode and rotation and impacting mode

The "⚙️" mark and "T" mark are found on the top of the inner cover. The "⚙️" mark indicates drill (rotation only) mode and the "T" indicates impact drill (rotation and impacting) mode. Slide the change lever to the left so that the "⚙️" mark can be seen. The tool then enters drill (rotation only) mode. Slide the change lever to the right so that the "T" mark can be seen. The tool then enters impact drill (rotation and impacting) mode. Be sure to wait until the motor stops completely before changing the position of the change lever.



REPAIR GUIDE

1. Precautions on Disassembly and Reassembly

The **[Bold]** numbers in the descriptions below correspond to item numbers in the Parts List and exploded view assembly diagram for the Models DV 13SS and DV 16SS, and the **<Bold>** numbers to those in the Parts List and exploded view assembly diagram for Models DV 13VSS and DV 16VSS.

Disassembly

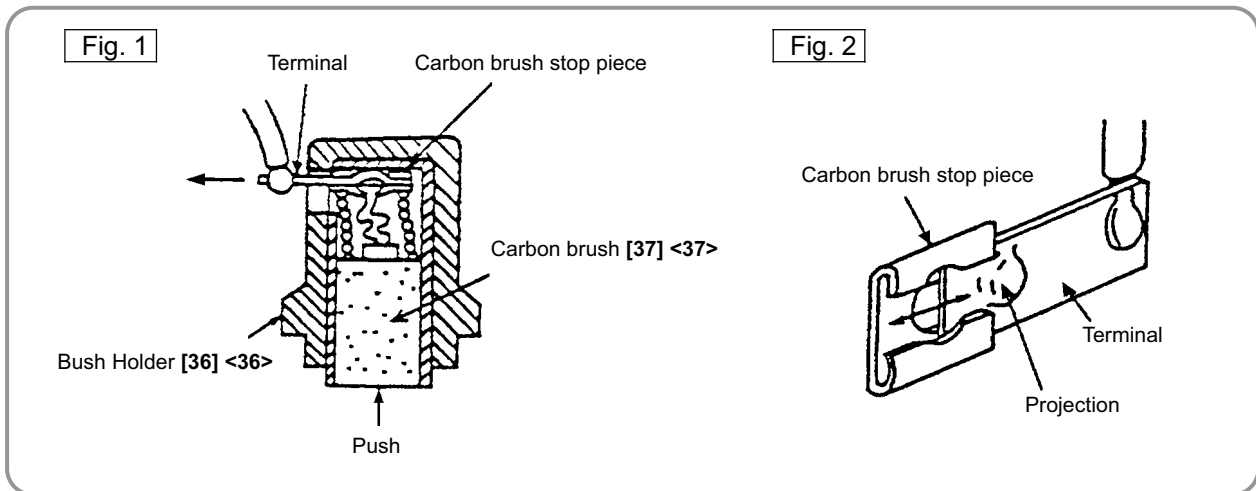
Note on disassembly: Before starting disassembly, be sure to disconnect the power plug from the power supply.

1. Removal of the handle cover

Loosen the Tapping Screw (W/Flange) D4 X 20 (Black) **[32] <32>** and remove the Handle Cover **[31] <31>**.

2. Removal of the carbon brush

Use a small flat-blade screwdriver to slightly lift the Brush Holders **[36] <36>**. Then, while pushing the Carbon Brush **[37] <37>** to the bottom of the Brush Holders **[36] <36>**, gently pull out and disconnect the internal wire terminals. (Figs. 1 and 2)

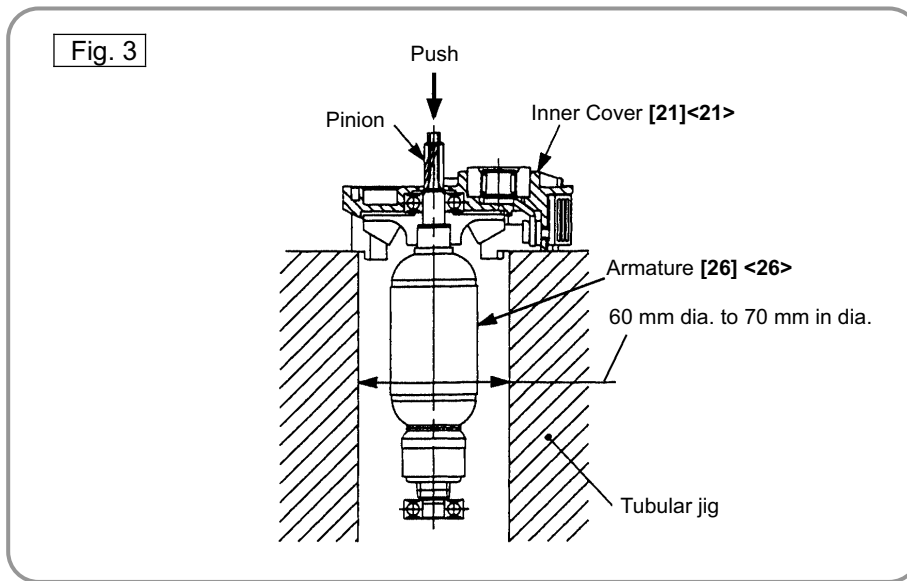


3. Removal of the gear cover from the housing

Loosen the Tapping Screw (W/Flange) D4 x 60 (Black) **[11] <11>** and Tapping Screw (W/Flange) D4 x 45 **[15] <15>**, and then separate the Gear Cover **[12] <12>** from the Housing **[34] <34>**. Then remove the Inner Cover **[21] <21>** together with the Armature **[26] <26>** from the Housing **[34] <34>**.

4. Removal of the armature ass'y from the inner cover

As illustrated in Fig. 3, support the Inner Cover [21] <21> with a tubular jig, and then push down on the top of the pinion of the Armature [26] <26>.



5. Removal of the stator from the housing

[For DV 13SS, DV 16SS]

First insert a flat-blade screwdriver into the longitudinal cut of a sponge at the rear end of the switch, loosen both of the upper two setscrews, and then remove the internal wires. Remove the Tapping Screws D4 x 45 [28], and then slightly tap the end surface of the Housing [34] with a wooden hammer. The stator [29] can then be removed from the Housing.

[For DV 13VSS, DV 16VSS]

First, disconnect the internal wires from the upper side of the Switch <41> by pulling the faston terminal. 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 Tapping Screws D4 x 45 <28> and slightly tap the end surface of the Housing <34> with a wooden hammer. The stator <29> can then be removed from the Housing <34>.

6. Removal of the drill chuck

[For DV 13SS, DV 16SS]

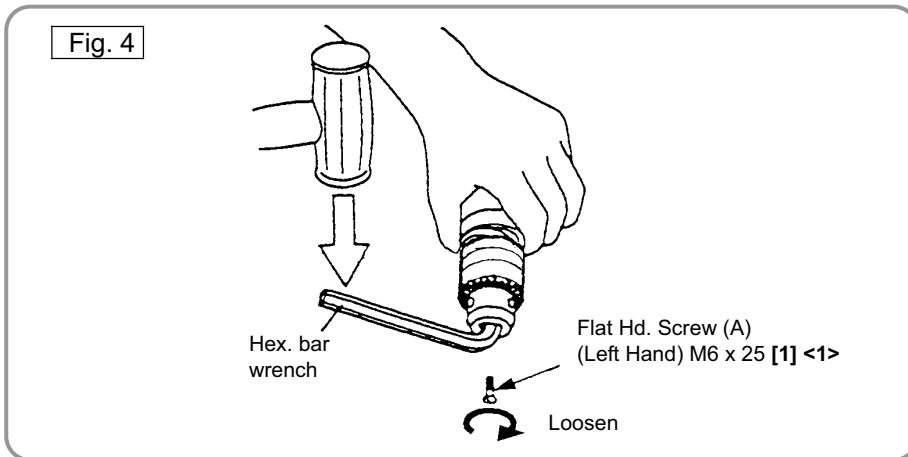
The Drill Chuck 13VLRC-D [3] is secured to the Spindle [6] with 1/2"-20 UNF (right hand) and Flat Hd. Screw (A) (Left Hand) M6 x 25 [1]. At first, open the chuck jaw as far as possible and loosen Flat Hd. Screw (A) (Left Hand) M6 x 25 [1] by turning it clockwise.

- (a) Hold the drill so that only the Drill Chuck 13VLRC-D [3] rests firmly and squarely on the edge of a solid bench. Insert 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 then sharply strike the wrench with a hammer so the drill chuck turns in the counterclockwise direction. (Fig. 4)

[For DV 13VSS, DV 16VSS]

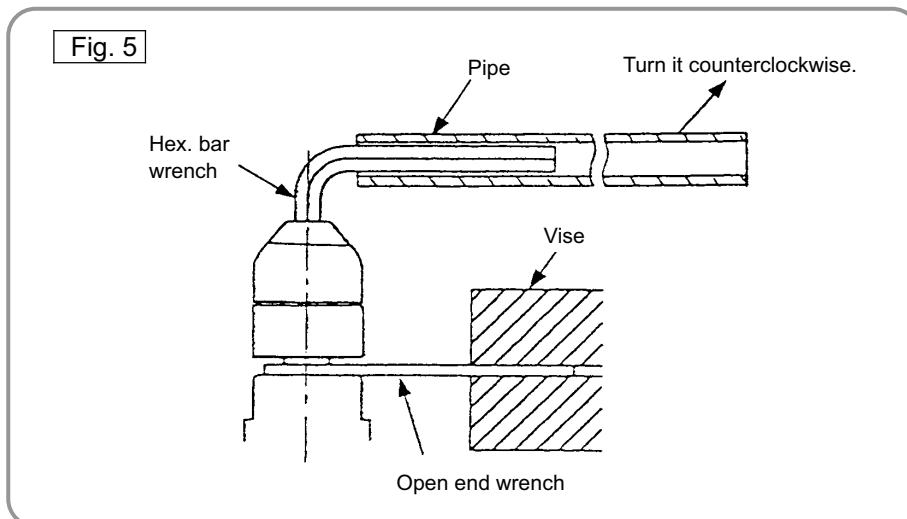
The Drill Chuck 13VLRC-D (or The Drill Chuck 13VLRJ-N (W/O Chuck Wrench)) <3> is secured to the Spindle <6> with 1/2"-20 UNF (right hand) and Flat Hd. Screw (A) (Left Hand) M6 x 25 <1>. First, open the chuck jaw as far as possible and loosen Flat Hd. Screw (A) (Left Hand) M6 x 25 <1> by turning it clockwise.

- (a) Hold the drill so that only the Drill Chuck 13VLRC-D (or The Drill Chuck 13VLRJ-N (W/O Chuck Wrench)) <3> rests firmly and squarely on the edge of a solid bench. Insert 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 then sharply strike the wrench with a hammer so the drill chuck turns in the counterclockwise direction. (Fig. 4)



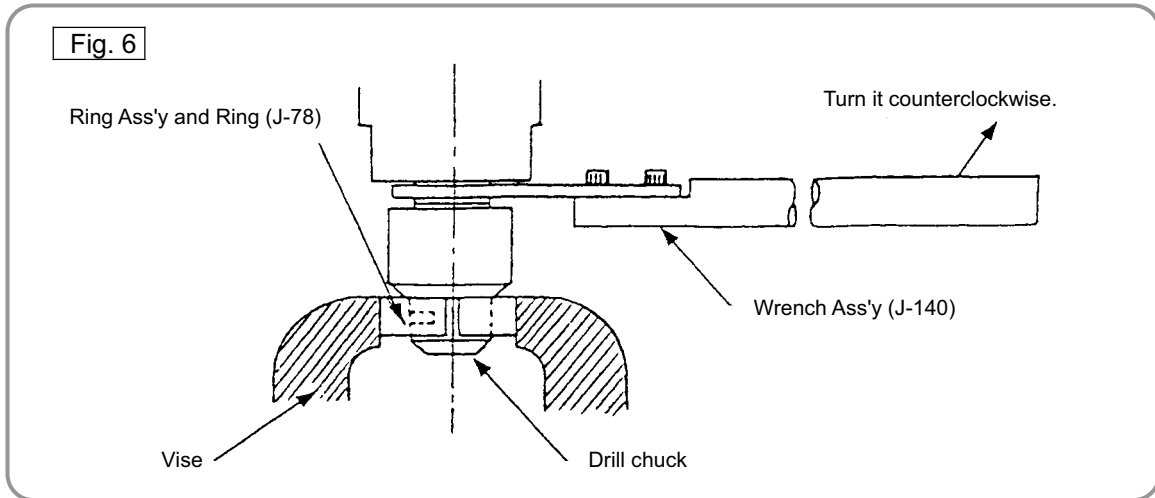
If the drill chuck cannot be removed by striking the wrench, do not forcibly strike the wrench forcibly and try another way as follows.

- (b) Hold the Spindle [6] <6> with an open end wrench secured to the vise as shown in Fig. 5. Mount the pipe onto the hex. bar wrench. Turn the hex. bar wrench counterclockwise to loosen the drill chuck. (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 to loosen the drill chuck. (Fig. 6)

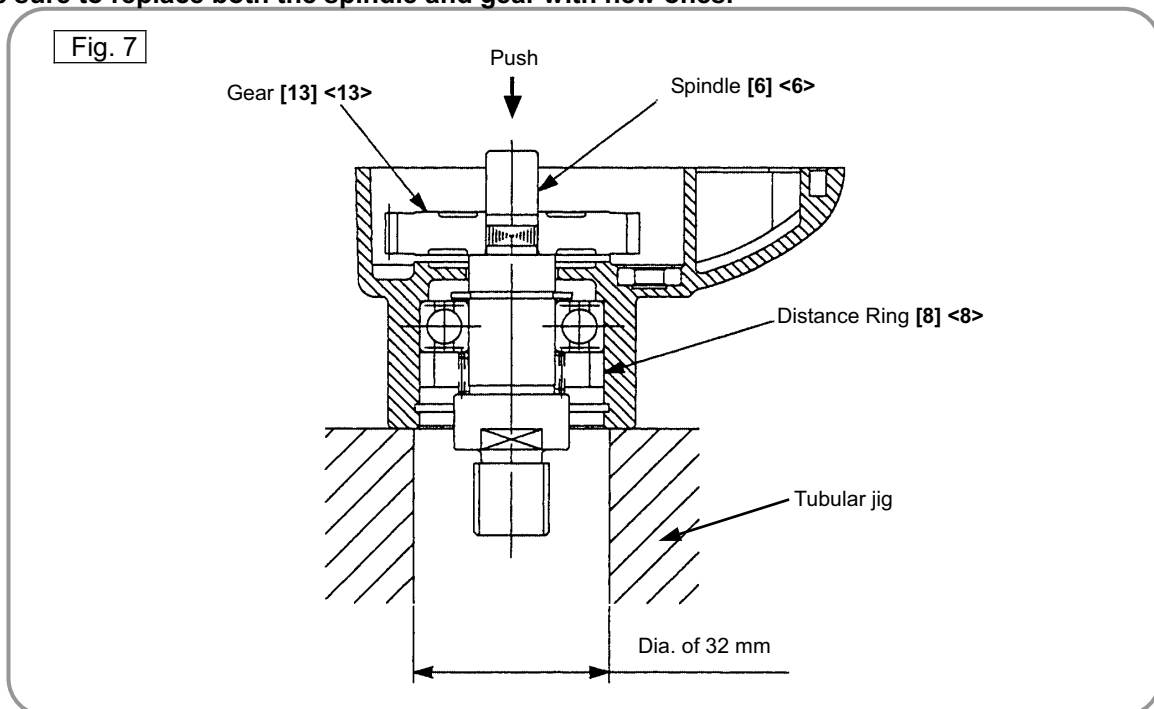


7. Removal of the spindle

Remove the Retaining Ring for D32 Hole [4] <4> and Dust Seal [5] <5>. Place the end surface of the Gear Cover [12] <12> on the tubular jig and press down on the Spindle [6] <6> with a hand press. The spindle can then be removed together with the Ball Bearing 6002VVCMP2L [9] <9>, Distance Ring [8] <8>, Spring [7] <7> and the Retaining Ring for D15 Shaft [10] <10>. The Gear [13] <13> can then be removed from the spindle. (Fig. 7)

CAUTION:

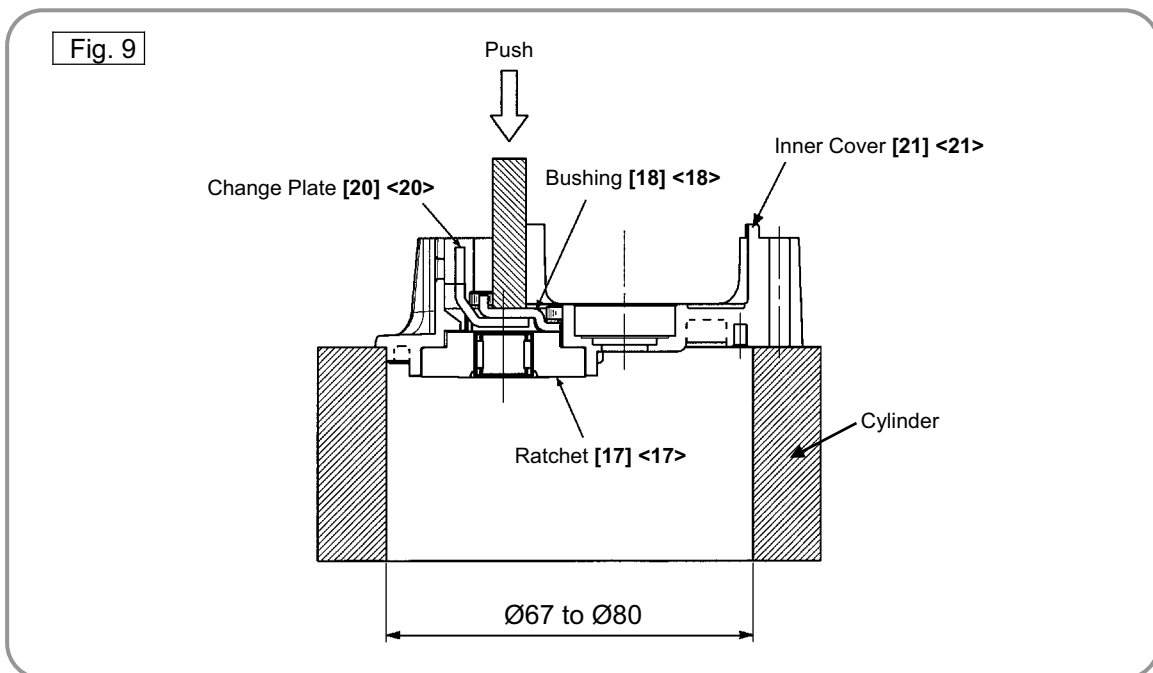
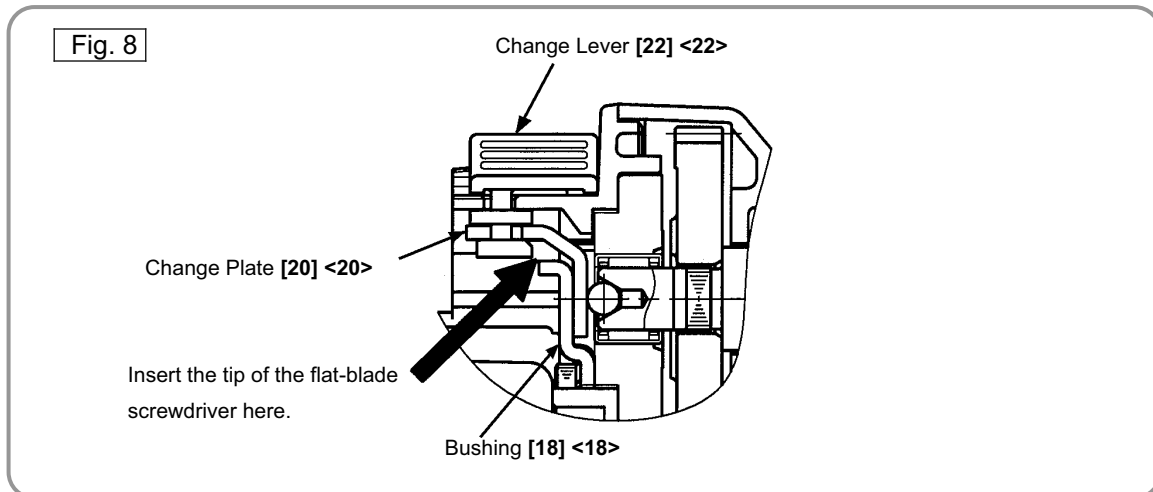
- Be sure to replace both the spindle and gear with new ones.



8. Removal of the ratchet

Insert the tip of a flat-blade screwdriver between the Ratchet [17] <17> and Change Lever [22] <22>, and then pry out the Change Lever [22] <22> to remove it. (Fig. 8) Remove the Tapping Screw (w/SP Washer) D4 X 20 [16] <16> that mounts the Ratchet [17] <17> on the Inner Cover [21] <21>.

Place the end of the Inner Cover [21] <21> on the cylinder and push the end of the Bushing [18] <18> on the rear of the ratchet with a hand press. The Ratchet [17] <17> then comes out together with the Change Plate [20] <20>. (Fig. 9)



Reassembly

Perform reassembly by reversing the order of the disassembly procedure. However, special attention should be given to the following items.

1. Internal wire arrangement

- (1) Arrange the internal wires according to "7. Internal Wire Arrangement and Wiring Work."
- (2) Be careful not to catch the internal wires when mounting the handle cover.

2. Lubrication

(1) Apply ATTOLUB MS No. 2 Grease (Code No. 309922) to the following parts:

- Teeth of the Armature [25] <25> and the Gear [13] <13> (with a brush)
- On the Spindle [6] <6>
Ground portion for fitting the Ball Bearing 6002VVCMP52L [9] <9>, splined portion and hole on the rear side
- Surface of Steel Ball D6.35 [14] <14>
- Lip portion of the Dust Seal [5] <5>
- On the Ratchet [17] <17>
Inside the Needle Bearing, teeth of ratchet
- Inside the Gear Cover [12] <12>: 5 g

3. Tightening torque

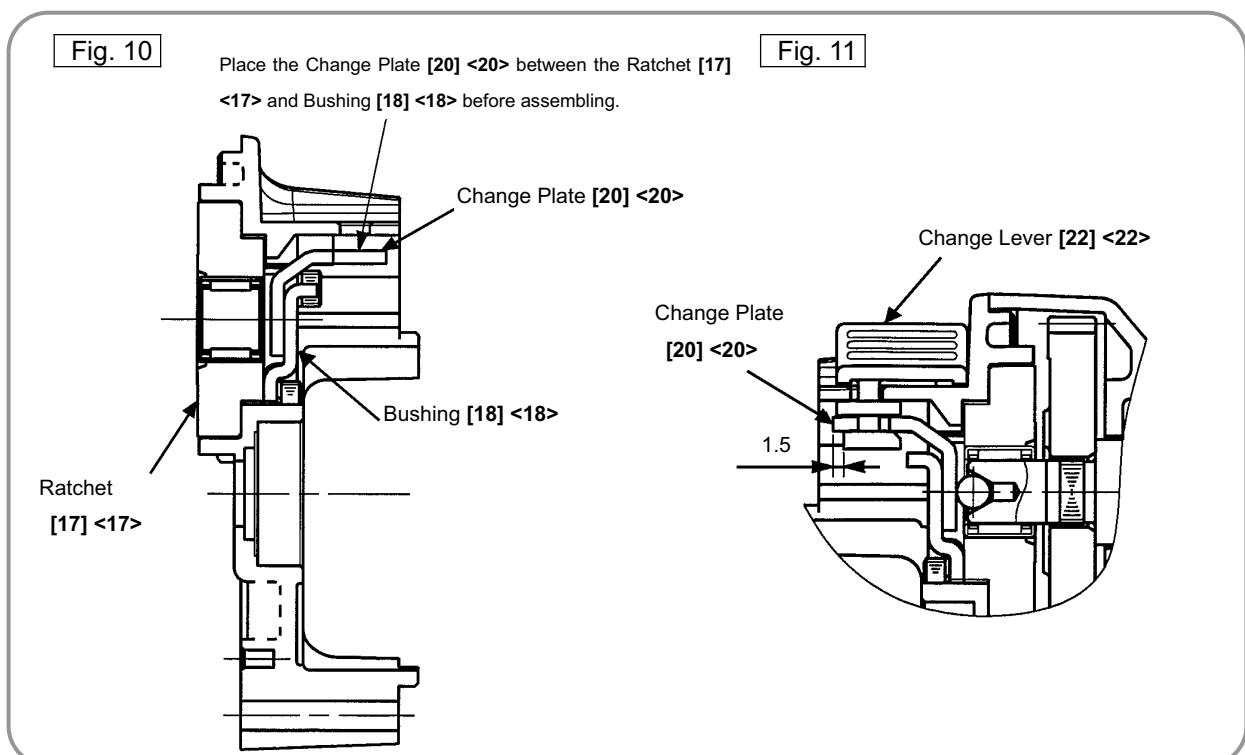
- (1) Tapping Screw D4 ----- 1.5 to 2.5 N•m (13.3 to 22.1 in-lbs.)
(2) Drill Chuck ----- 30 to 50 N•m (266 to 443 in-lbs.)
(3) Machine Screw M3 (Switch [41] <40>) ----- 0.4 to 0.8 N•m (3.5 to 7.1 in-lbs.)
(4) Flat HD. Screw (A) (Left Hand) M6 X 25 [1] <1> ----- 4.4 to 5.4 N•m (38.9 to 47.8 in-lbs.)
(5) Bolt M3 [19] <19> ----- 1.2 to 1.8 N•m (10.6 to 15.9 in-lbs.)

4. Change Plate

Place the Change Plate [20] <20> between the Ratchet [17] <17> and Bushing [18] <18> before assembling in the Inner Cover [21] <21>. (Fig. 10)

5. Change Lever

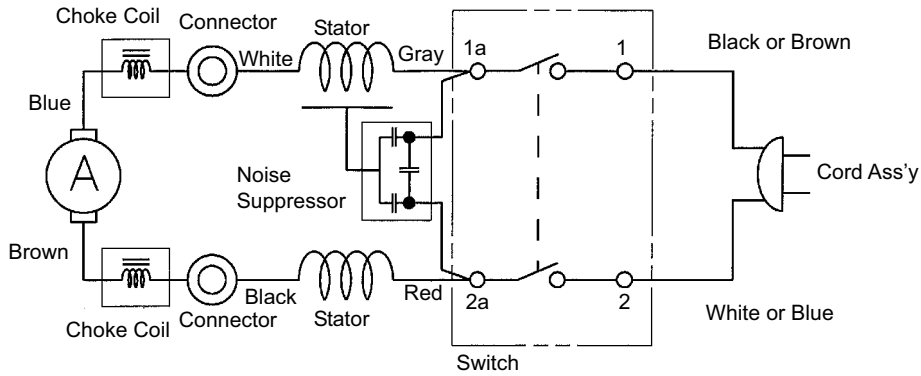
Push the Change Lever [22] <22> forward until the front end of the Change Plate [20] <20> protrudes about 1.5 mm. (Fig. 11)



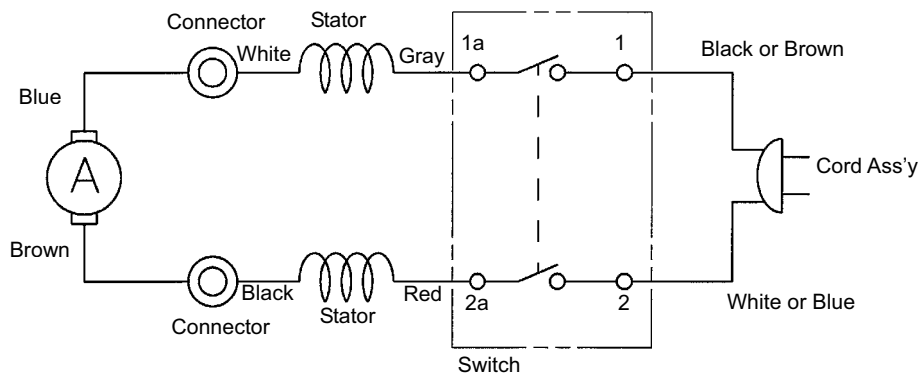
6. Wiring Diagrams

[For DV 13SS, DV 16SS]

(1) For products with noise suppressor

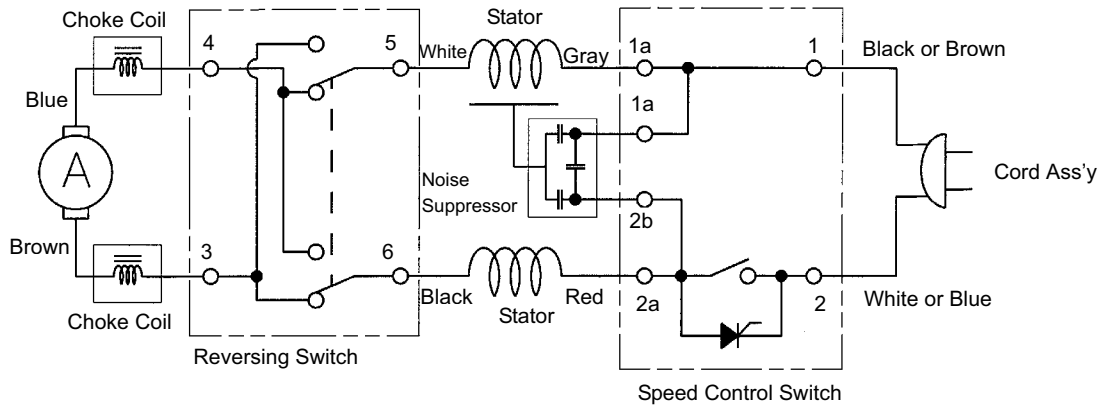


(2) For products without noise suppressor

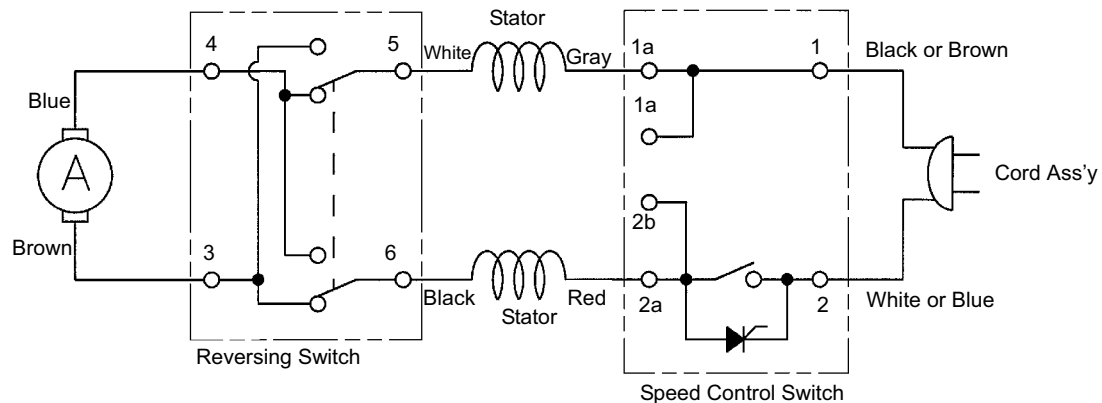


[For DV 13VSS, DV 16VSS]

(1) For products with noise suppressor



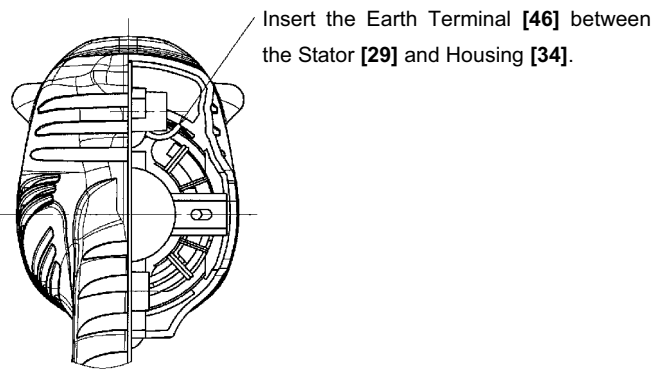
(2) For products without noise suppressor



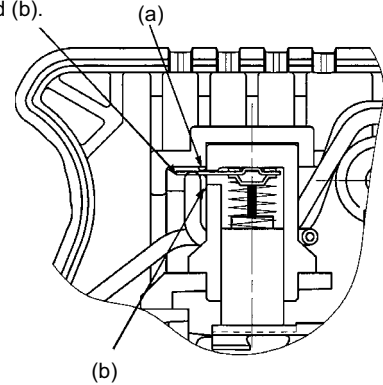
7. Internal Wire Arrangement and Wiring Work

A. Internal wire arrangement

[For DV 13SS, DV 16SS]

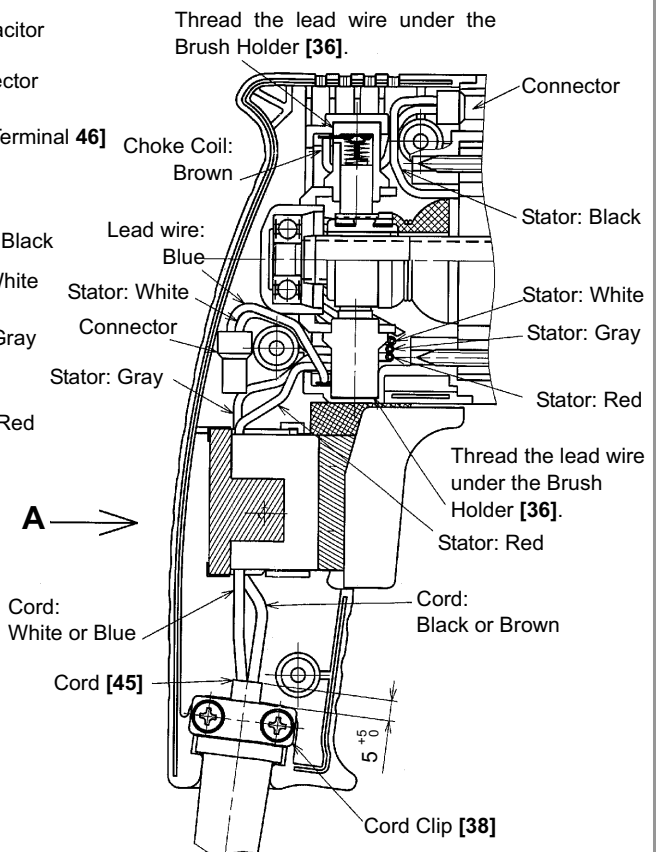
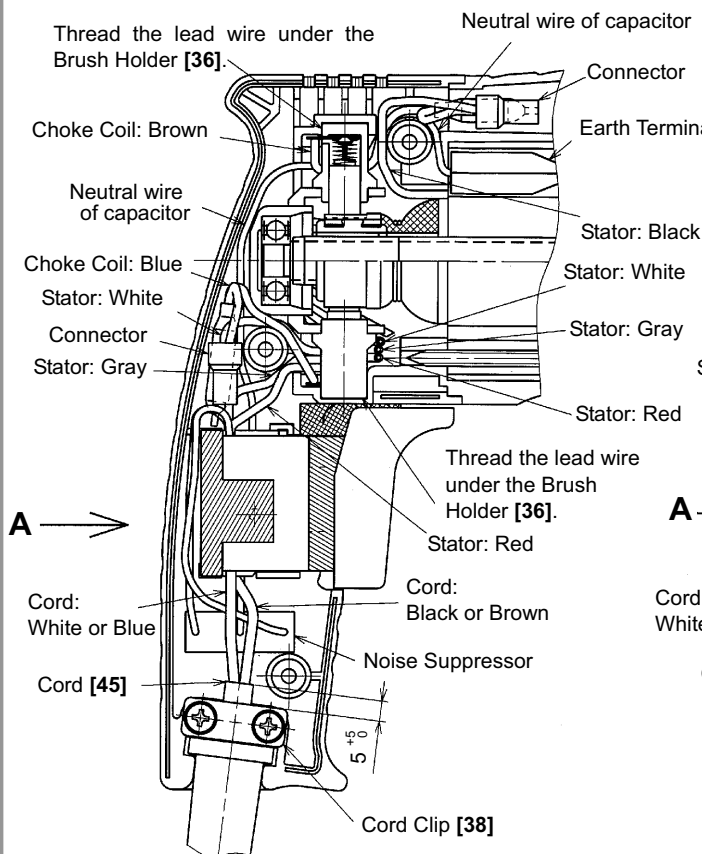


Put the carbon terminal between (a) and (b).

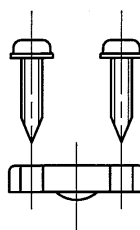


(1) For products with noise suppressor

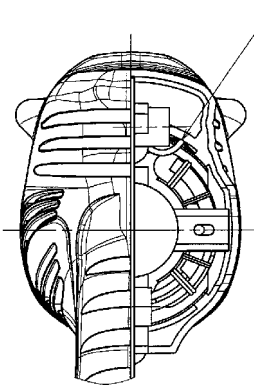
(2) For products without noise suppressor



Mounting the cord clip

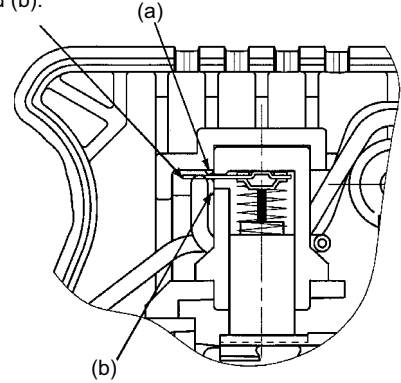


[For DV 13VSS, DV 16VSS]



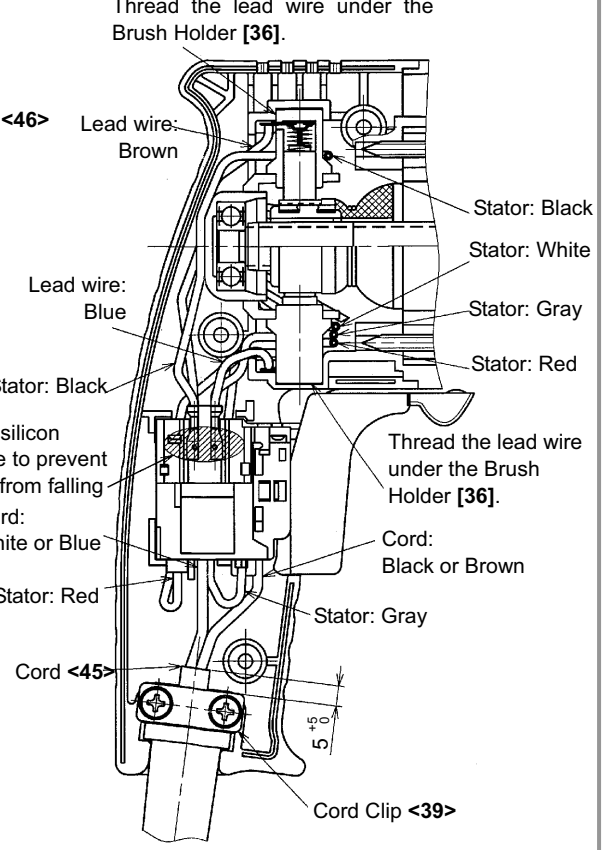
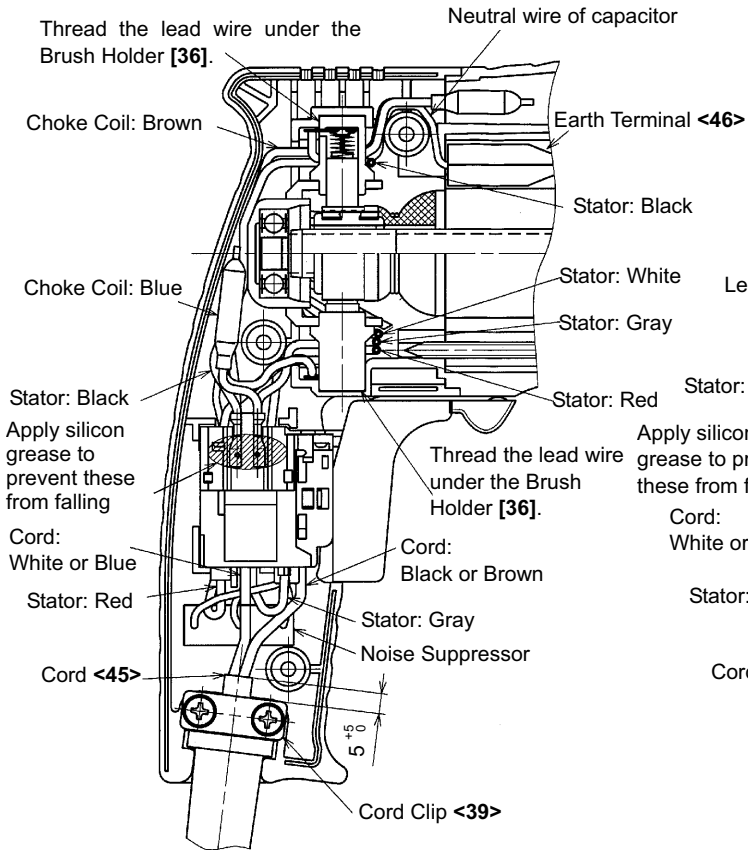
Insert the Earth Terminal <46> between the Stator <29> and Housing <34>.

Put the carbon terminal between (a) and (b).

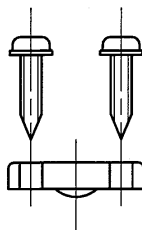


(1) For products with noise suppressor

(2) For products without noise suppressor



Mounting the cord clip



B. Switch Connection

[For DV 13SS, DV 16SS]

View from B

Lead wire of capacitor for
noise suppression
(for destination customer only)

Lead wire of capacitor for
noise suppression
(for destination customer only)

Stator: Gray

Stator: Red

Apply silicon grease to prevent the entry of dust.
(Shinetsu Silicon KE-45W or Three Bond 1215)

View from A

Lead wire of capacitor for
noise suppression

Stator: Gray

Stator: Red

Lead wire of capacitor for
noise suppression



Insert the flat-blade
screwdriver into the
longitudinal cut of the sponge
to tighten or loosen the four

Cord:
Black or Brown

Cord:
White or Blue

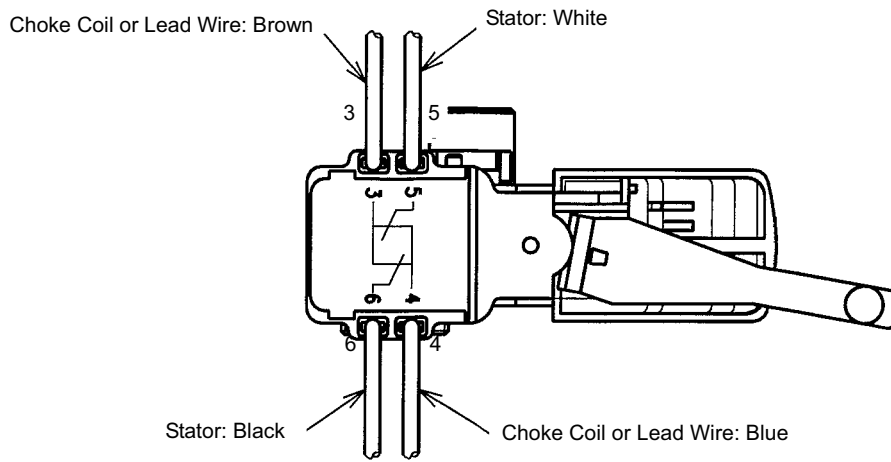
View from C

Cord:
Black or Brown

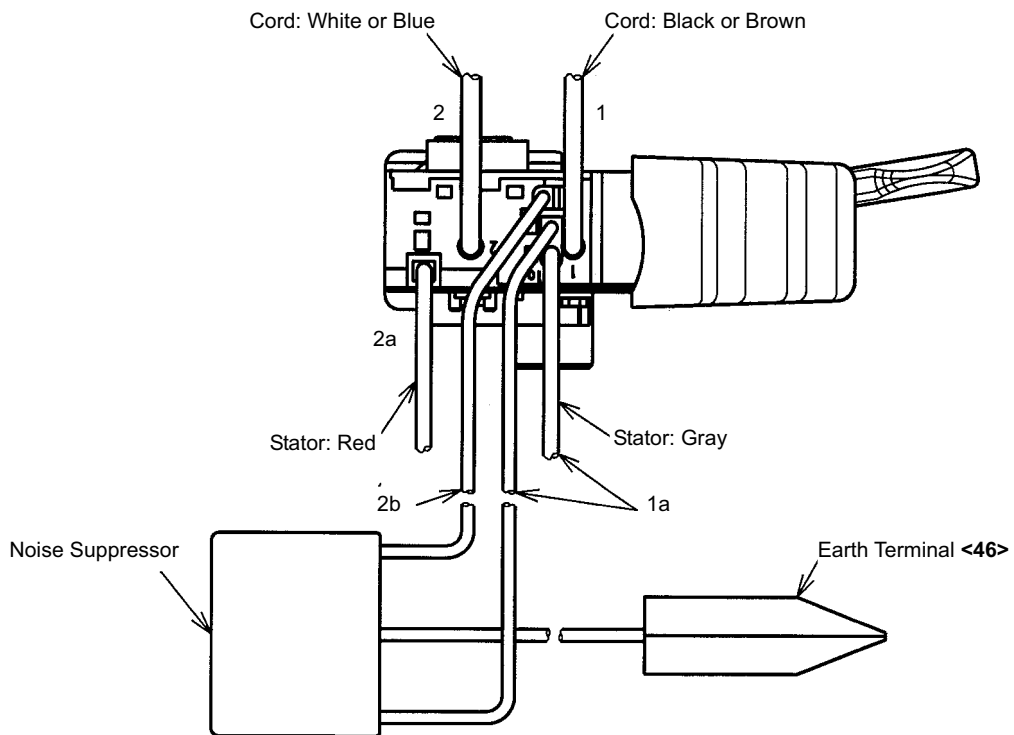
Cord:
White or Blue

Apply silicon grease to prevent the entry of dust.
(Shinetsu Silicon KE-45W or Three Bond 1215)

[For DV 13VSS, DV 16VSS]
(1) Wiring of reversing switch



(2) Wiring of speed control switch



8. Insulation Tests

Upon completing reassembly after repair, measure the insulation resistance and conduct a dielectric strength test.

Insulation resistance: 7 M Ω or more using a 500 VAC megohm tester

Dielectric strength: AC 4,000 VAC/minute, with no abnormalities 220 V to 240 V (110 V for UK products)

AC 2,500 VAC/minute, with no abnormalities 110 V to 127 V (except UK products)

9. No-Load Current Value

After no-load operation for 30 minutes, the no-load current values should be as follows:

[DV 13SS, DV 13VSS]

Voltage (V)	110	120	220	230	240
Current (A) Max.	2.9	2.7	1.5	1.4	1.3

[DV 16SS, DV 16VSS]

Voltage (V)	110	120	220	230	240
Current (A) Max.	3.0	2.8	1.5	1.4	1.3

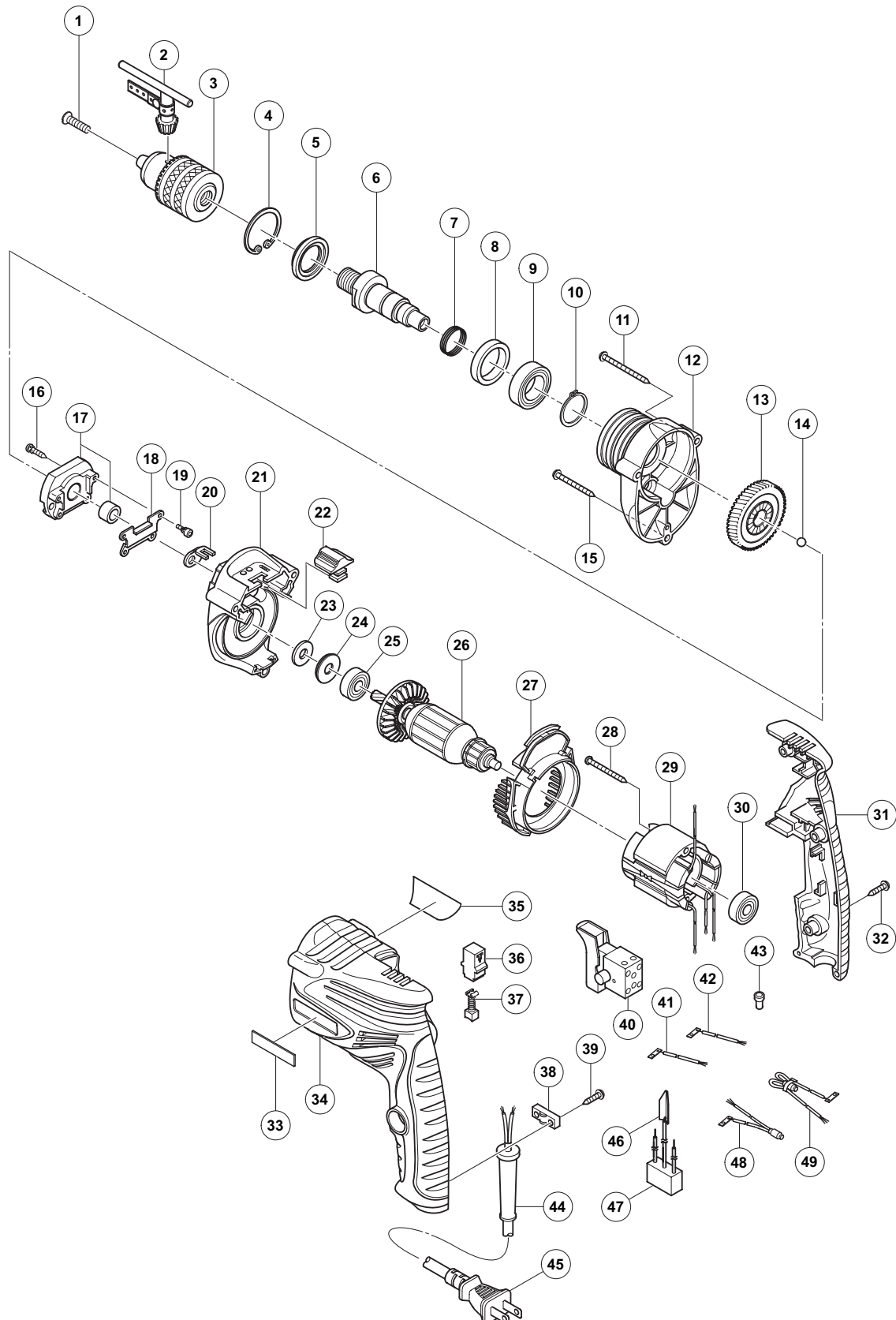
STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min	
	Fixed								
		Work Flow							
<div style="border: 1px solid black; padding: 2px; margin-bottom: 5px; display: inline-block;">DV 13SS</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px; display: inline-block;">DV 13VSS</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px; display: inline-block;">DV 16SS</div> <div style="border: 1px solid black; padding: 2px; margin-bottom: 5px; display: inline-block;">DV 16VSS</div>			Switch Handle Cover Cord Cord Armor	Armature Inner Cover Ratchet Ball Bearing (608DD) Change Lever Ball Bearing (608VV)	Spindle Dust Seal Ball Bearing (6002VV) Gear Cover Gear				
	General Assembly				Housing Stator				

ELECTRIC TOOL PARTS LIST

■ **IMPACT DRILL**
Model DV 13SS

2009·5·29
(E1)



PARTS

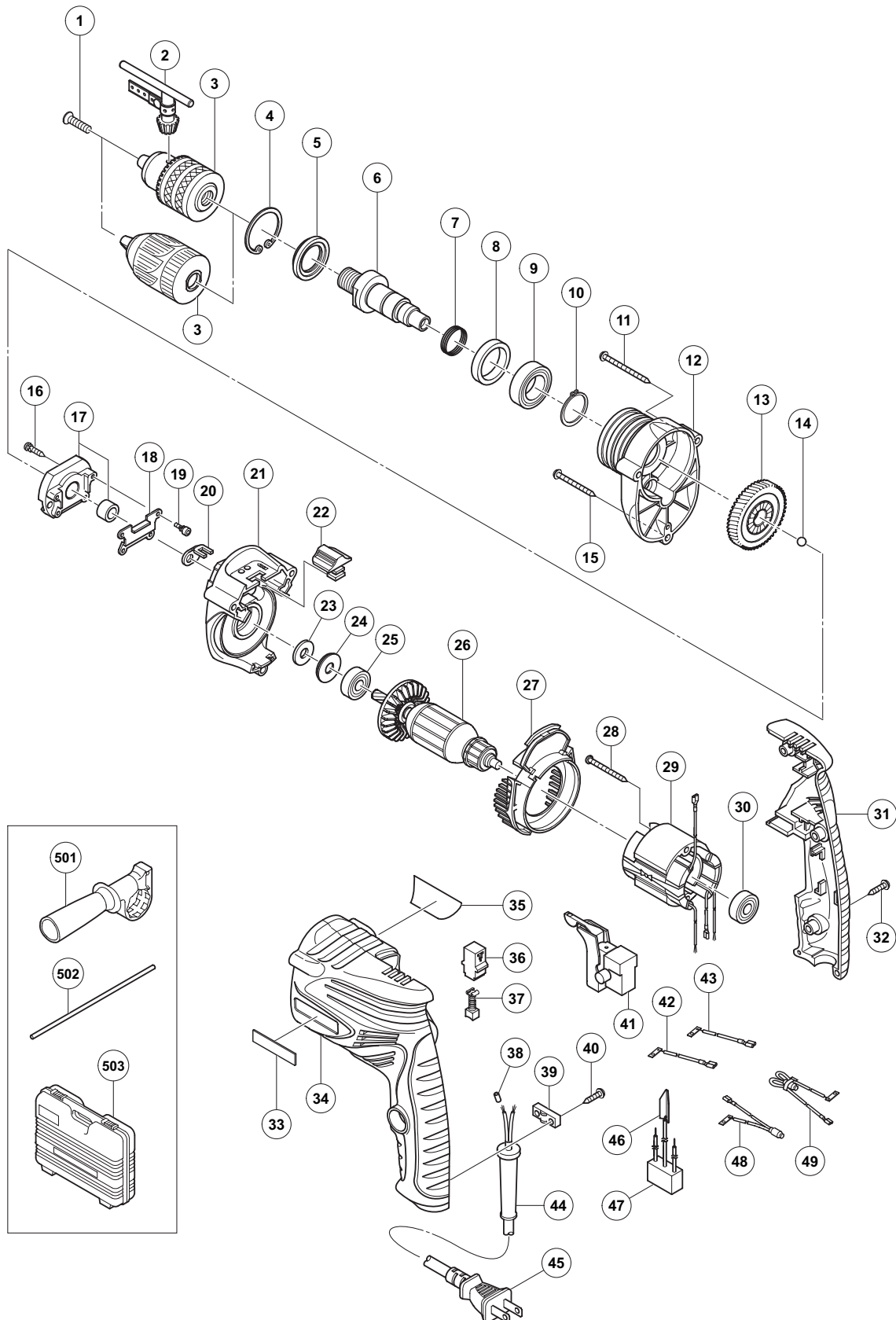
DV 13SS

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	995-344	FLAT HD. SCREW (A) (LEFT HAND) M6 X 25	1		
2	987-576	CHUCK WRENCH FOR 13VLB-D, 13VLR-D	1		
3		DRILL CHUCK 13VLRC-D	1	INCLUD.2 SUPPLIED WITH ITEM NO.601	
4	948-001	RETAINING RING FOR D32 HOLE	1		
5	971-654	DUST SEAL	1		
6	331-522	SPINDLE	1		
7	322-514	SPRING	1		
8	330-682	DISTANCE RING	1		
9	600-2VV	BALL BEARING 6002VVCMP2L	1		
10	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1		
11	322-657	TAPPING SCREW (W/FLANGE) D4 X 60 (BLACK)	2		
12	330-681	GEAR COVER	1		
13	330-683	GEAR	1		
14	959-150	STEEL BALL D6.35 (10 PCS.)	1		
15	301-815	TAPPING SCREW (W/FLANGE) D4 X 45	1		
16	330-680	TAPPING SCREW (W/SP. WASHER) D4 X 20	2		
17	330-677	RATCHET	1		
18	330-678	BUSHING	1		
19	330-679	BOLT M3	4		
20	330-676	CHANGE PLATE	1		
21	330-675	INNER COVER	1		
22	322-510	CHANGE LEVER	1		
23	323-096	FELT PACKING	1		
24	330-674	WASHER (A)	1		
25	608-DDM	BALL BEARING 608DDC2PS2L	1		
*	26	360-864C	ARMATURE 110V	1	
*	26	360-864U	ARMATURE ASS'Y 120V	1	INCLUD. 25, 30
*	26	360-864E	ARMATURE 220V	1	
*	26	360-864G	ARMATURE 230V-240V	1	
	27	330-673	FAN GUIDE	1	
	28	991-031	TAPPING SCREW D4 X 45	2	
*	29	340-745C	STATOR 110V	1	
*	29	340-745D	STATOR 120V	1	
*	29	340-745E	STATOR 220V	1	
*	29	340-745G	STATOR 230V-240V	1	
	30	608-VVM	BALL BEARING 608VVC2PS2L	1	
	31	330-721	HANDLE COVER	1	
	32	301-653	TAPPING SCREW (W/FLANGE) D4 X 20 (BLACK)	3	
	33	330-719	HITACHI LABEL	1	
	34	330-720	HOUSING	1	
	35		NAME PLATE	1	
	36	955-203	BRUSH HOLDER	2	
	37	999-041	CARBON BRUSH (1 PAIR)	2	
	38	937-631	CORD CLIP	1	
	39	984-750	TAPPING SCREW (W/FLANGE) D4 X 16	2	
	40	330-727	SWITCH	1	
*	41	330-724	INTERNAL WIRE (BROWN)	1	FOR USA, CAN, VEN, SYR, INA, HKG, IND, THA, SIN
*	42	330-725	INTERNAL WIRE (BLUE)	1	FOR USA, CAN, VEN, SYR, INA, HKG, IND, THA, SIN
	43	959-140	CONNECTOR 50091 (10 PCS.)	2	
	44	938-051	CORD ARMOR D10.1	1	

ELECTRIC TOOL PARTS LIST

IMPACT DRILL
Model DV 13VSS

2009·5·29
(E1)



PARTS

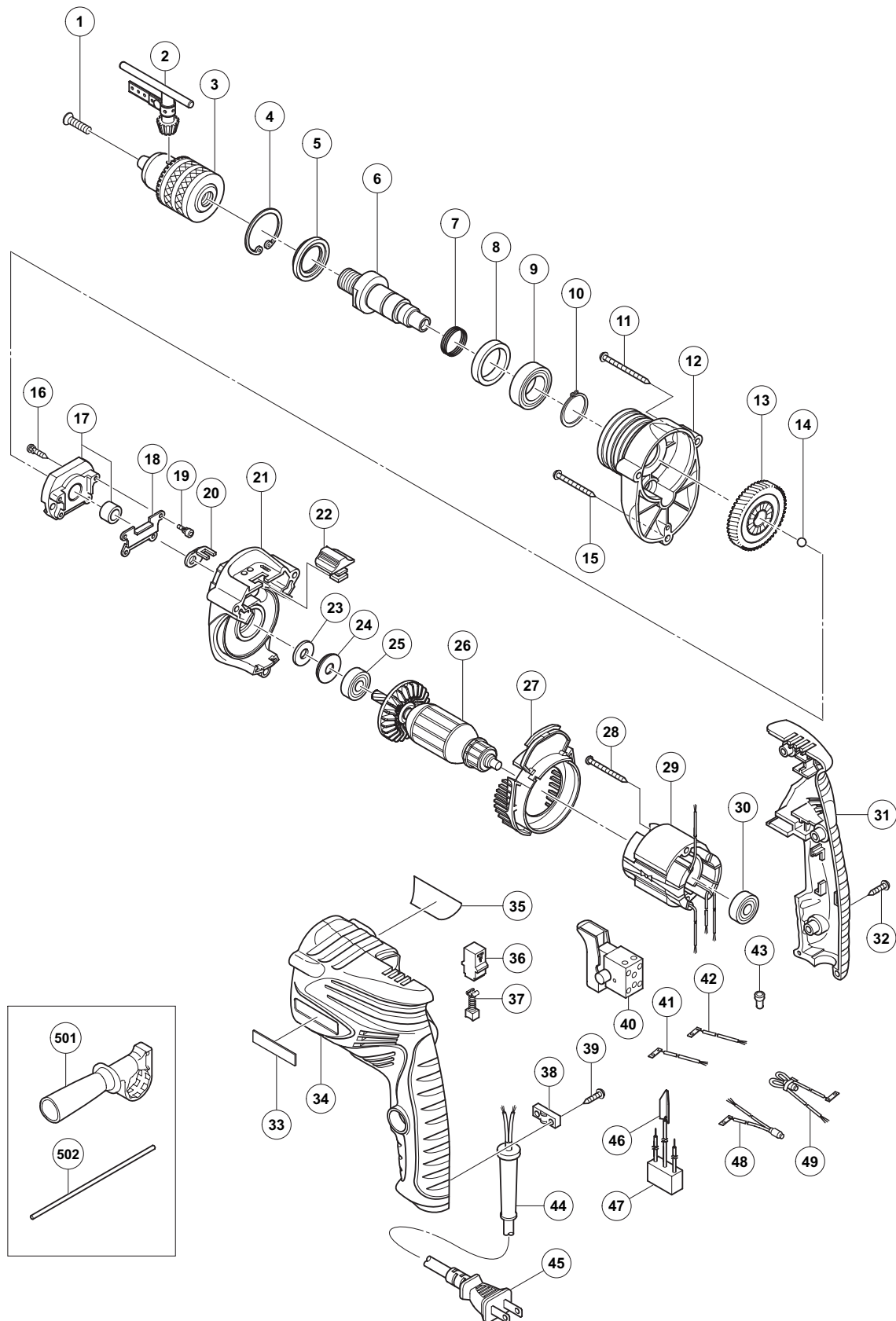
DV 13VSS

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	995-344	FLAT HD. SCREW (A) (LEFT HAND) M6 X 25	1		
*	2	987-576	CHUCK WRENCH FOR 13VLB-D, 13VLR-D	1	
*	3		DRILL CHUCK 13VLR-D	1	INCLUD. 2 SUPPLIED WITH ITEM NO.601
*	3	322-625	DRILL CHUCK 13VLRJ-N (W/O CHUCK WRENCH)	1	
	4	948-001	RETAINING RING FOR D32 HOLE	1	
	5	971-654	DUST SEAL	1	
	6	331-522	SPINDLE	1	
	7	322-514	SPRING	1	
	8	330-682	DISTANCE RING	1	
	9	600-2VV	BALL BEARING 6002VVCMP2L	1	
	10	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1	
	11	322-657	TAPPING SCREW (W/FLANGE) D4 X 60 (BLACK)	2	
	12	330-681	GEAR COVER	1	
	13	330-683	GEAR	1	
	14	959-150	STEEL BALL D6.35 (10 PCS.)	1	
	15	301-815	TAPPING SCREW (W/FLANGE) D4 X 45	1	
	16	330-680	TAPPING SCREW (W/SP. WASHER) D4 X 20	2	
	17	330-677	RATCHET	1	
	18	330-678	BUSHING	1	
	19	330-679	BOLT M3	4	
	20	330-676	CHANGE PLATE	1	
	21	330-675	INNER COVER	1	
	22	322-510	CHANGE LEVER	1	
	23	323-096	FELT PACKING	1	
	24	330-674	WASHER (A)	1	
	25	608-DDM	BALL BEARING 608DDC2PS2L	1	
*	26	360-864C	ARMATURE 110V	1	
*	26	360-864U	ARMATURE ASS'Y 120V	1	INCLUD. 25, 30
*	26	360-864E	ARMATURE 220V	1	
*	26	360-864G	ARMATURE 230V-240V	1	
	27	330-673	FAN GUIDE	1	
	28	991-031	TAPPING SCREW D4 X 45	2	
*	29	340-743C	STATOR 110V	1	
*	29	340-743D	STATOR 120V	1	
*	29	340-743E	STATOR 220V	1	
*	29	340-743G	STATOR 230V-240V	1	
	30	608-VVM	BALL BEARING 608VVC2PS2L	1	
	31	330-715	HANDLE COVER	1	
	32	301-653	TAPPING SCREW (W/FLANGE) D4 X 20 (BLACK)	3	
	33	330-719	HITACHI LABEL	1	
	34	330-714	HOUSING	1	
	35		NAME PLATE	1	
	36	955-203	BRUSH HOLDER	2	
	37	999-041	CARBON BRUSH (1 PAIR)	2	
*	38	981-373	TUBE (D)	2	FOR CORD
	39	937-631	CORD CLIP	1	
	40	984-750	TAPPING SCREW (W/FLANGE) D4 X 16	2	
*	41	330-716	SWITCH	1	
*	41	330-684	SWITCH	1	FOR GBR (110V), USA, CAN, MEX, VEN, TPE
*	42	330-717	INTERNAL WIRE (BROWN)	1	FOR USA, CAN, VEN, TPE, SYR, INA, HKG, KUW, IND, THA, SIN

ELECTRIC TOOL PARTS LIST

IMPACT DRILL
Model DV 16SS

2009·5·29
(E1)



PARTS

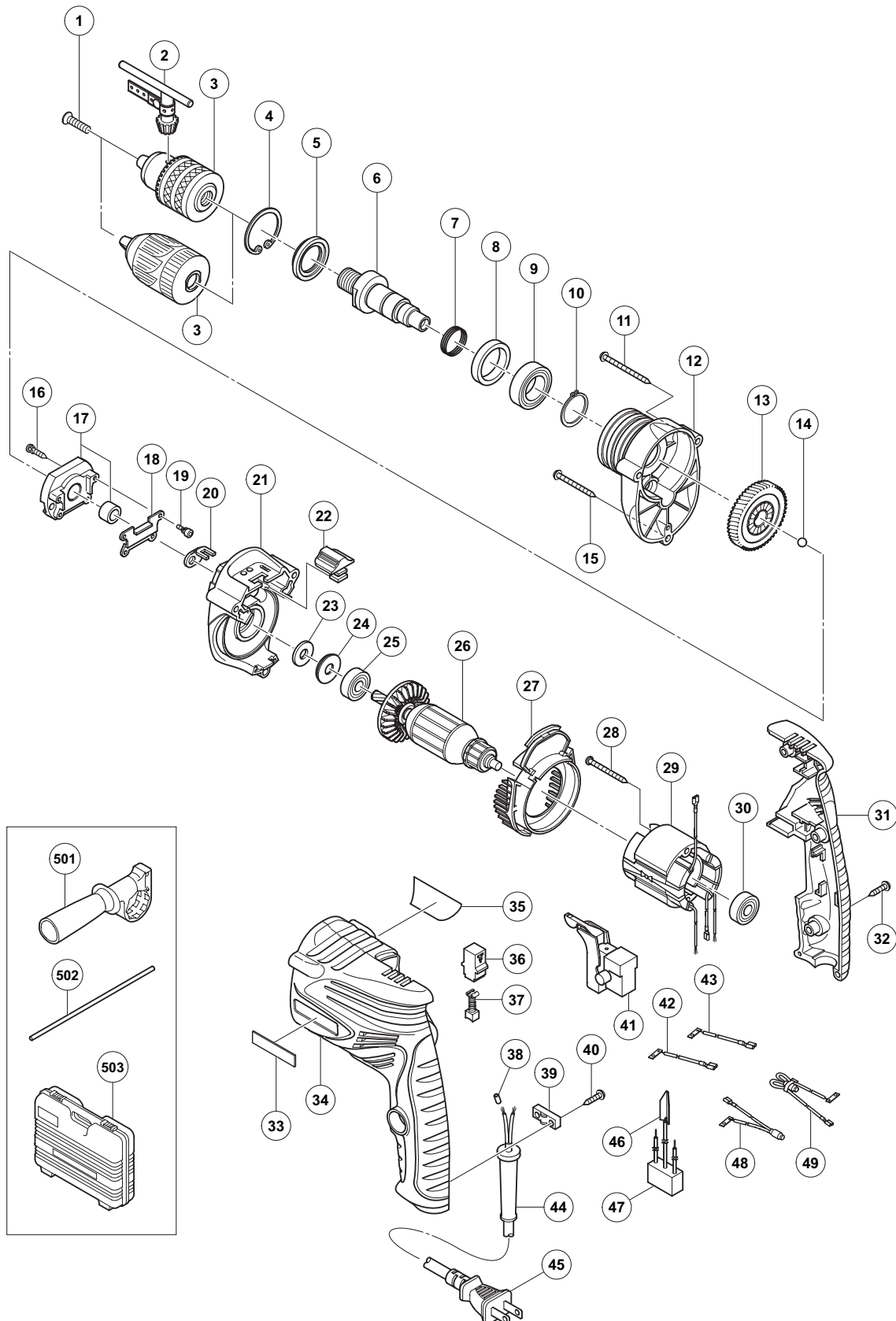
DV 16SS

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	995-344	FLAT HD. SCREW (A) (LEFT HAND) M6 X 25	1		
2	987-576	CHUCK WRENCH FOR 13VLB-D, 13VLR-D	1		
3		DRILL CHUCK 13VLRC-D	1	INCLUD. 2 SUPPLIED WITH ITEM NO. 601	
4	948-001	RETAINING RING FOR D32 HOLE	1		
5	971-654	DUST SEAL	1		
6	331-522	SPINDLE	1		
7	322-514	SPRING	1		
8	330-682	DISTANCE RING	1		
9	600-2VV	BALL BEARING 6002VVCMP2L	1		
10	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1		
11	322-657	TAPPING SCREW (W/FLANGE) D4 X 60 (BLACK)	2		
12	330-726	GEAR COVER	1		
13	330-683	GEAR	1		
14	959-150	STEEL BALL D6.35 (10 PCS.)	1		
15	301-815	TAPPING SCREW (W/FLANGE) D4 X 45	1		
16	330-680	TAPPING SCREW (W/SP. WASHER) D4 X 20	2		
17	330-677	RATCHET	1		
18	330-678	BUSHING	1		
19	330-679	BOLT M3	4		
20	330-676	CHANGE PLATE	1		
21	330-675	INNER COVER	1		
22	322-510	CHANGE LEVER	1		
23	323-096	FELT PACKING	1		
24	330-674	WASHER (A)	1		
25	608-DDM	BALL BEARING 608DDC2PS2L	1		
*	26	360-863C	ARMATURE 110V	1	
*	26	360-863U	ARMATURE ASS'Y 120V	1	INCLUD. 25, 30
*	26	360-863E	ARMATURE 220V	1	
*	26	360-863F	ARMATURE 230V-240V	1	
	27	330-673	FAN GUIDE	1	
	28	950-515	TAPPING SCREW D4 X 50	2	
*	29	340-744C	STATOR 110V	1	
*	29	340-744D	STATOR 120V	1	
*	29	340-744F	STATOR 220V-240V	1	
	30	608-VVM	BALL BEARING 608VVC2PS2L	1	
	31	330-721	HANDLE COVER	1	
	32	301-653	TAPPING SCREW (W/FLANGE) D4 X 20 (BLACK)	3	
	33	330-719	HITACHI LABEL	1	
	34	330-720	HOUSING	1	
	35		NAME PLATE	1	
	36	955-203	BRUSH HOLDER	2	
	37	999-041	CARBON BRUSH (1 PAIR)	2	
	38	937-631	CORD CLIP	1	
	39	984-750	TAPPING SCREW (W/FLANGE) D4 X 16	2	
	40	330-727	SWITCH	1	
*	41	330-724	INTERNAL WIRE (BROWN)	1	FOR USA, CAN, VEN, SYR, INA, HKG, IND, THA, SIN
*	42	330-725	INTERNAL WIRE (BLUE)	1	FOR USA, CAN, VEN, SYR, INA, HKG, IND, THA, SIN
	43	959-140	CONNECTOR 50091 (10 PCS.)	2	
	44	938-051	CORD ARMOR D10.1	1	
*	45	500-409Z	CORD	1	(CORD ARMOR D10.1)

ELECTRIC TOOL PARTS LIST

IMPACT DRILL
Model DV 16VSS

2009·5·29
(E1)



PARTS

DV 16VSS

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	995-344	FLAT HD. SCREW (A) (LEFT HAND) M6 X 25	1	
* 2	987-576	CHUCK WRENCH FOR 13VLB-D,13VLR-D	1	
* 3		DRILL CHUCK 13VLRC-D	1	INCLUD. 2 SUPPLIED WITH ITEM NO. 601
* 3	322-625	DRILL CHUCK 13VLRJ-N (W/O CHUCK WRENCH)	1	
4	948-001	RETAINING RING FOR D32 HOLE	1	
5	971-654	DUST SEAL	1	
6	331-522	SPINDLE	1	
7	322-514	SPRING	1	
8	330-682	DISTANCE RING	1	
9	600-2VV	BALL BEARING 6002VVCMP2L	1	
10	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1	
11	322-657	TAPPING SCREW (W/FLANGE) D4 X 60 (BLACK)	2	
12	330-726	GEAR COVER	1	
13	330-683	GEAR	1	
14	959-150	STEEL BALL D6.35 (10 PCS.)	1	
15	301-815	TAPPING SCREW (W/FLANGE) D4 X 45	1	
16	330-680	TAPPING SCREW (W/SP. WASHER) D4 X 20	2	
17	330-677	RATCHET	1	
18	330-678	BUSHING	1	
19	330-679	BOLT M3	4	
20	330-676	CHANGE PLATE	1	
21	330-675	INNER COVER	1	
22	322-510	CHANGE LEVER	1	
23	323-096	FELT PACKING	1	
24	330-674	WASHER (A)	1	
25	608-DDM	BALL BEARING 608DDC2PS2L	1	
* 26	360-863C	ARMATURE 110V	1	
* 26	360-863U	ARMATURE ASS'Y 120V	1	INCLUD. 25, 30
* 26	360-863E	ARMATURE 220V	1	
* 26	360-863F	ARMATURE 230V-240V	1	
27	330-673	FAN GUIDE	1	
28	950-515	TAPPING SCREW D4 X 50	2	
* 29	340-742C	STATOR 110V	1	
* 29	340-742D	STATOR 120V	1	
* 29	340-742F	STATOR 220V-240V	1	
30	608-VVM	BALL BEARING 608VVC2PS2L	1	
31	330-715	HANDLE COVER	1	
32	301-653	TAPPING SCREW (W/FLANGE) D4 X 20 (BLACK)	3	
33	330-719	HITACHI LABEL	1	
34	330-714	HOUSING	1	
35		NAME PLATE	1	
36	955-203	BRUSH HOLDER	2	
37	999-041	CARBON BRUSH (1 PAIR)	2	
* 38	981-373	TUBE (D)	2	FOR CORD
39	937-631	CORD CLIP	1	
40	984-750	TAPPING SCREW (W/FLANGE) D4 X 16	2	
* 41	330-716	SWITCH	1	
* 41	330-684	SWITCH	1	FOR GBR (110V), USA, CAN, MEX, VEN, TPE
* 42	330-717	INTERNAL WIRE (BROWN)	1	FOR USA, CAN, VEN, TPE, SYR, INA, HKG, KUW, IND, THA, SIN

