

MODELS D 10VF
D 10VG
D 13VF
D 13VG

HITACHI

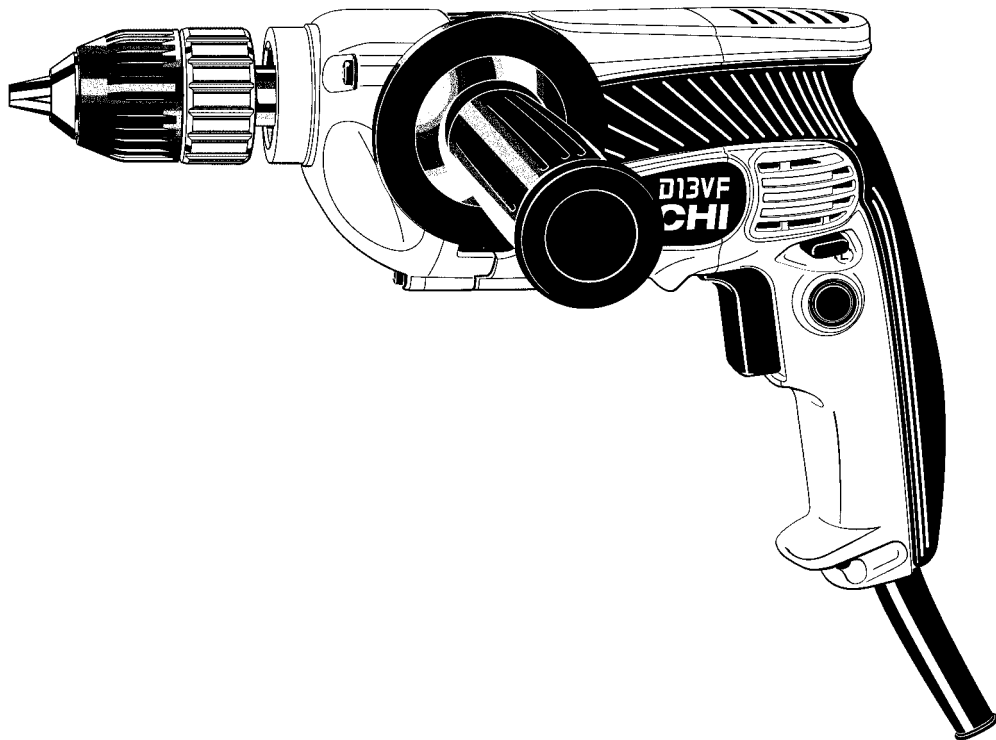
POWER TOOLS

10 mm DRILLS D 10VF
D 10VG
13 mm DRILLS D 13VF
D 13VG

Except USA and Canada

TECHNICAL DATA
AND
SERVICE MANUAL

D



LIST Nos. 0194, 0195, 0196, 0197

Aug. 2001

Notice for use

Specifications and parts are subject to change for improvement.

Refer to Hitachi Power Tool Technical News for further information.



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1. PRODUCT NAME

Hitachi 3/8" (10 mm) Drills, Model D 10VF

Model D 10VG

Hitachi 1/2" (13 mm) Drills, Model D 13VF

Model D 13VG

2. MARKETING OBJECTIVE

The new drill series Models D 10VF, D 10VG, D 13VF and D 13VG have the high torque, powerful motor and attractive ergonomic-design as its main design concept.

This drill series is divided into two groups according to the drill chuck capacities. The Models D 10VF and D 10VG have the drill chuck capacity of 3/8" (10 mm) and the Models D 13VF and D 13VG have the drill chuck capacity of 1/2" (13 mm). Each drill is provided with the function to select switch the drilling speed between HIGH and LOW, and is selectable either keyless chuck type or keyed chuck type to meet various market demands.

The outstanding features are as follows:

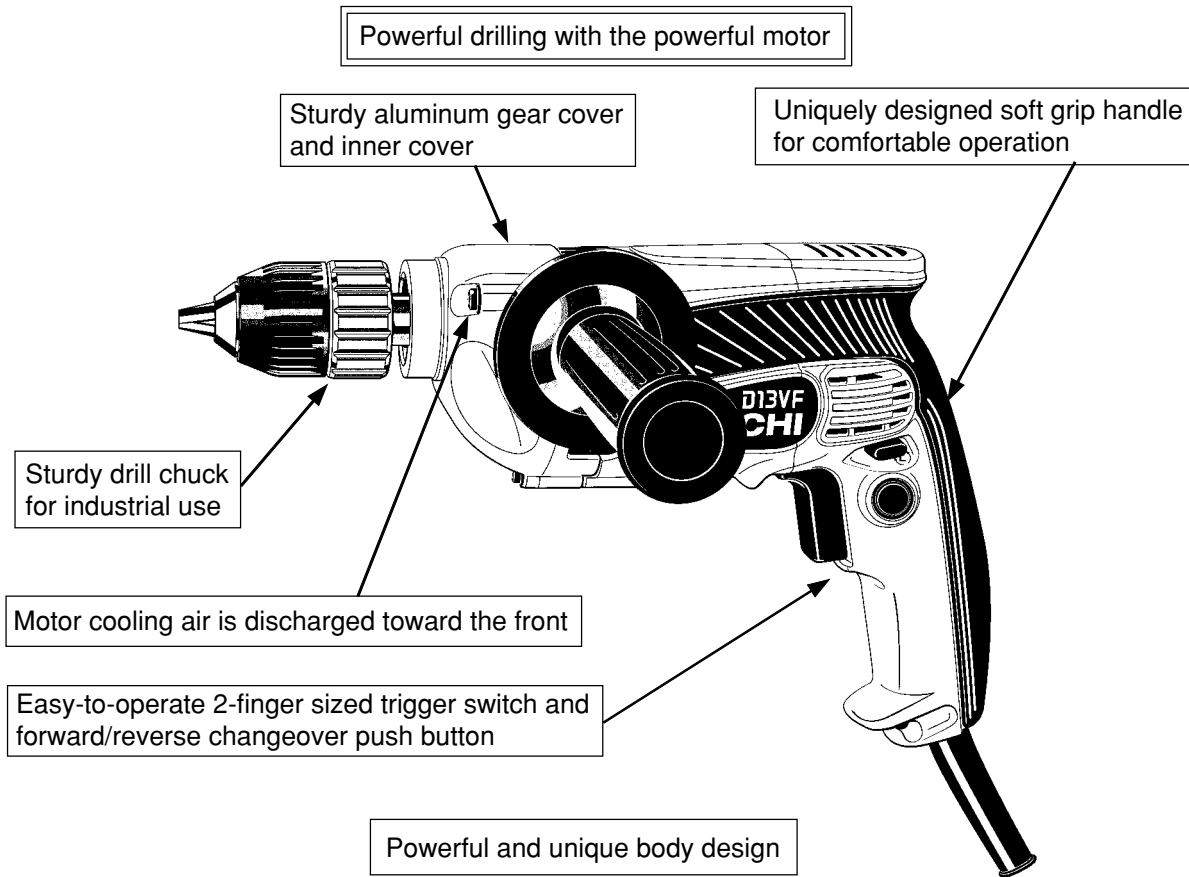
- (1) Powerful high performance motor
- (2) Uniquely designed soft grip handle
- (3) Sturdy aluminum gear cover and inner cover
- (4) Large 2-finger sized trigger switch

Hook (A) and the angle attachment ass'y (D 13VF and D 13VG only) are available as optional accessories.

3. APPLICATIONS

Drilling into metal, wood and plastic

4. SELLING POINTS



4-1. Selling Point Descriptions

(1) Powerful drilling

The rated input of the motor is 710 W, and its maximum output is 750 W. This motor is one of the most powerful in the class and various materials can be efficiently drilled by its power.

(2) Uniquely designed soft grip handle

Most drills featuring a soft grip handle are covered with soft materials at the handle portion only. These models, however, are widely covered with soft materials from the handle to the housing to ensure a non-slip grip of the handle even if it is held in various ways.

(3) Motor cooling air is discharged toward the front

These models are so constructed that the motor cooling air is discharged toward the front using the newly designed fan guide. Operators can perform drilling work without concern for the discharged air.

5. SPECIFICATIONS

5-1. Specifications

Model			D 10VF	D 10VG	D 13VF	D 13VG
Capacities	Steel	Twist bit	10 mm (3/8")	10 mm (3/8")	13 mm (1/2")	13 mm (1/2")
		Hole saw	NA	38 mm (1-1/2")	51 mm (2")	70 mm (2-3/4")
	Wood	Flat spade bit	25 mm (1")	32 mm (1-1/4")	40 mm (1-9/16")	40 mm (1-9/16")
		Auger bit	NA	NA	32 mm (1-1/4")	38 mm (1-1/2")
		Hole saw	29 mm (1-1/8")	70 mm (2-3/4")	102 mm (4")	114 mm (4-1/2")
Drill chuck		Mount type	UNF 1/2" - 20			
		Capacity	0.8 mm – 10 mm (1/32" – 3/8")		1.5 mm – 13 mm (1/16" – 1/2")	
Type of motor			AC single phase series commutator motor			
Enclosure			Housing and handle: Glassfiber reinforced polyamide resin Grip cover: Glassfiber reinforced polypropylene resin + elastomer Gear cover and inner cover: Aluminum alloy die casting			
Type of switch			Variable speed control trigger switch with reversing switch			
Power source			AC single phase 50/60 Hz			
Rated voltage (by areas)			(110, 220, 230, 240 V)			
Power input			710 W*1			
Power output		Full-load	380 W			
		Max.	750 W			
Speed	No-load		0 – 3,000/min.	0 – 1,200/min.	0 – 850/min.	0 – 600/min.
	Full-load		1,840/min.	790/min.	620/min.	380/min.
Weight	with keyed chuck	Net (without cord)	1.8 kg	1.9 kg	2.1 kg	2.1 kg
		Gross	3.4 kg	3.5 kg	3.7 kg	3.7 kg
	with keyless chuck	Net (without cord)	1.8 kg	1.9 kg	2.0 kg	2.0 kg
		Gross	3.4 kg	3.5 kg	3.6 kg	3.6 kg
Packaging			Plastic case (in corrugated cardboard sleeve)			
Cord			2-core cabtire cord 2.5 m			
Standard accessories			Chuck wrench ... 1*2	Side handle ... 1	Side handle ... 1	Side handle ... 1
			Plastic case ... 1	Chuck wrench ... 1*2	Chuck wrench ... 1*2	Handle joint ... 1
				Plastic case ... 1	Plastic case ... 1	Chuck wrench ... 1*2
						Plastic case ... 1

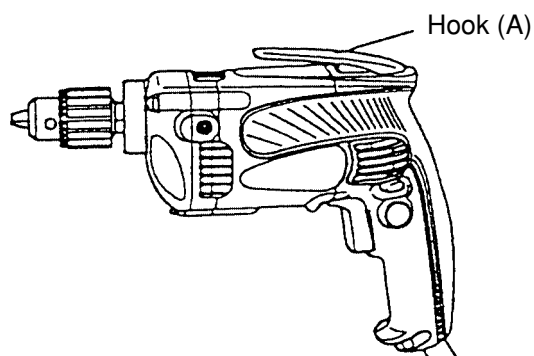
*1 Power input is subject to change by areas.

*2 Spec. only for the keyed chuck.

5-2. Optional Accessories

<For all models>

- Hook (A) (Code No. 317676)



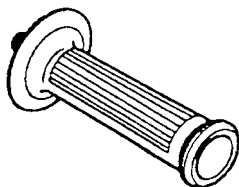
* To attach Hook (A), it is necessary to disassemble the handle portion which covered the tool's electrical system.

For customers continued safety and electrical shock protection, installing Hook (A) on this drill should ONLY be performed by a HITACHI AUTHORIZED SERVICE CENTER.

For attaching procedure of Hook (A), refer to "7-4. Attaching Hook (A)" in this manual.

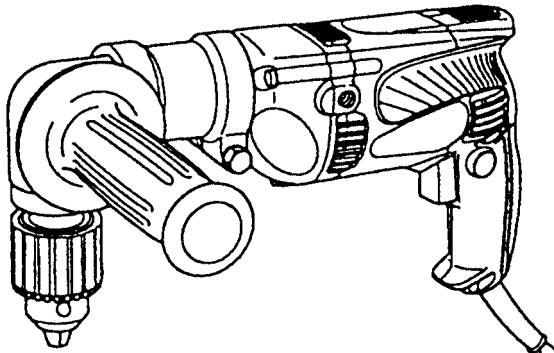
<For D 10VF>

- Side handle (Code No.981205)



<For D 13VF and D 13VG>

- Angle attachment ass'y (Code No. 319528)



Used extensively for drilling between joints, studding, in tight corners or in close quarters on machinery and equipment. Provides two additional drilling speeds.

- Chuck transferred from drill to LOW spindle of angle unit, the drilling speed is decreased to about 70% and the drilling torque increased to about 150%.
- Chuck transferred to HIGH spindle of angle unit, the drilling speed is increased to about 150% and the drilling torque decreased to about 70%.

The table below shows the drilling capacities when attaching the angle attachment ass'y.

Model			D 13VF		D 13VG	
Speed of angle unit			LOW (650/min.)	HIGH (1350/min.)	LOW (400/min.)	HIGH (900/min.)
Capacities	Steel	Twist bit	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")	13 mm (1/2")
		Hole saw	64 mm (2-1/2")	32 mm(1-1/4")	70 mm (2-3/4")	51 mm (2")
	Wood	Flat spade bit	40 mm (1-9/16")	32 mm (1-1/4")	40 mm (1-9/16")	40 mm (1-9/16")
		Auger bit	38 mm(1-1/2")	29 mm (1-1/8")	38 mm(1-1/2")	32 mm (1-1/4")
		Hole saw	114 mm(4-1/2")	64 mm (2-1/2")	114 mm (4-1/2")	102 mm (4")

For attaching procedure of the angle attachment ass'y, refer to "7-5. Attaching Angle Attachment Ass'y" in this manual.

6. COMPARISONS WITH SIMILAR PRODUCTS

6-1. Specification Comparisons

< D 10VF >

				HITACHI	BOSCH	MAKITA	METABO	DEWALT
				D 10VF	GBM10RE	6480	BE560	DW221
Capacities	Steel	Twist bit	mm (in.)	10 (3/8")	10	10	10	10
		Hole saw		NR				
	Wood	Flat spade bit	mm (in.)	25 (1")	25	25	20	25
		Auger bit		NR				
Hole saw		70 (2-3/4")						
Rated power input			W	710* ¹	450	480	560	701
No-load speed			/min.	0 - 3000	0 - 2200	0 - 2500	0 - 2800	0 - 2500
Max. power output			W	750	—	—	—	—
Max. torque			N·m	16.8	6.0	—	—	13.8
No-load sound pressure level			dB	78.0	—	—	—	—
Gear train				Single	Single	Single	Single	Double
Material of gear cover				Aluminum	Plastic	Plastic	Plastic	Aluminum
Soft grip handle				○	×	×	×	○
Two-finger trigger				○	○	○	○	○
Side handle				Optional	Optional	×	Optional	×
Type of drill chuck				Keyed	Keyless	Keyless	Keyless	Keyless
Spindle lock				—	×	×	×	○
Overall length			mm	263	265	279	261	—
Net weight			kg	1.8	1.8	1.4	1.4	1.7

*¹ Power input is subject to change by areas.

*² Factory test result

< D 10VG >

				HITACHI		BOSCH	MAKITA		DEWALT
				D 10VG		GBM10-2RE	DP3002	DP3003	DW226
Capacities	Steel	Twist bit	mm (in.)	10 (3/8")		10/6	10		10
		Hole saw		38 (1-1/2")					
	Wood	Flat spade bit	mm (in.)	32 (1-1/4")		25/15	32		30
		Auger bit		NR					
Hole saw		29 (1-1/8")							
Rated power input			W	710* ¹		500	710		701
No-load speed			/min.	0 - 1200		0 - 1150/0 - 2100	0 - 1200		0 - 1200
Max. power output			W	750		—	670* ²		—
Max. torque			N·m	38.9		9.5/5.0	36.0		27.1
No-load sound pressure level			dB	78.0		80.4* ²	78.3* ²		—
Gear train				Double		Double (2-speed)	Double		Double
Material of gear cover				Aluminum		Plastic	Aluminum		Aluminum
Soft grip handle				○		×	○		○
Two-finger trigger				○		○	○		○
Side handle				○		○	○		○
Type of drill chuck				Keyed	Keyless	Keyless	Keyed	Keyless	Keyless
Spindle lock				—	×	×	—	×	○
Overall length			mm	276	278	309	304	296	—
Net weight			kg	1.9	1.9	1.8	2.0	1.8	1.9

*¹ Power input is subject to change by areas.

*² Factory test result

< D 13VF >

				HITACHI	BOSCH	MAKITA		METABO	DEWALT
				D 13VF	GBM13-2RE	DP4000	DP4001	BE532S-R+L	DW236
Capacities	Steel	Twist bit	mm (in.)	13 (1/2")	13/8	13		13	13
		Hole saw		51 (2")					
	Wood	Flat spade bit	mm (in.)	40 (1-9/16")	32/20	38		30	30
		Auger bit		32 (1-1/4")					
Hole saw	102 (4")								
Rated power input			W	710* ¹	550	750		520	701
No-load speed			/min.	0 - 850	0 - 1000/0 - 1900	0 - 900		0 - 1000	0 - 850
Max. power output			W	750	—	750* ²		—	—
Max. torque			N·m	50.0	11.5/6.0	51.0		—	35.8
No-load sound pressure level			dB	78.0	81.9* ²	78.9* ²		78.4* ²	83.5* ²
Gear train				Double	Double (2-speed)	Triple		Double	Double
Material of gear cover				Aluminum	Plastic	Aluminum		Aluminum	Aluminum
Soft grip handle				○	×	○		×	○
Two-finger trigger				○	○	○		○	○
Side handle				○	○	○		○	○
Type of drill chuck				Keyed	Keyless	Keyless	Keyed	Keyless	Keyless
Spindle lock				—	×	×	—	×	○
Overall length			mm	287	290	332	304	308	294
Net weight			kg	2.1	2.0	2.0	2.2	2.0	1.7

*1 Power input is subject to change by areas.

*2 Factory test result

< D 13VG >

				HITACHI	BOSCH	MAKITA		METABO	DEWALT
				D 13VG	GBM13HRE	DP4002	DP4003	BE622S-R+L	DW246
Capacities	Steel	Twist bit	mm (in.)	13 (1/2")	13	13		16	13
		Hole saw		70 (2-3/4")					
	Wood	Flat spade bit	mm (in.)	40 (1-9/16")	40	38		40	30
		Auger bit		38 (1-1/2")					
Hole saw	114 (4-1/2")								
Rated power input			W	710* ¹	550	750		620	701
No-load speed			/min.	0 - 600	0 - 550	0 - 600		0 - 550	0 - 600
Max. power output			W	750	—	750* ²		—	—
Max. torque			N·m	78.7	40.0	73.0		—	57.3
No-load sound pressure level			dB	78.0	81.9* ²	78.9* ²		79.6* ²	—
Gear train				Double	Triple	Triple		Triple	Triple
Material of gear cover				Aluminum	Plastic	Aluminum		Aluminum	Aluminum
Soft grip handle				○	×	○		×	○
Two-finger trigger				○	○	○		○	○
Side handle				○	○	○		○	○
Type of drill chuck				Keyed	Keyless	Keyed	Keyed	Keyless	Keyed
Spindle lock				—	×	—	—	×	○
Overall length			mm	287	290	295	304	308	291
Net weight			kg	2.1	2.0	2.1	2.2	2.0	2.1

*1 Power input is subject to change by areas.

*2 Factory test result

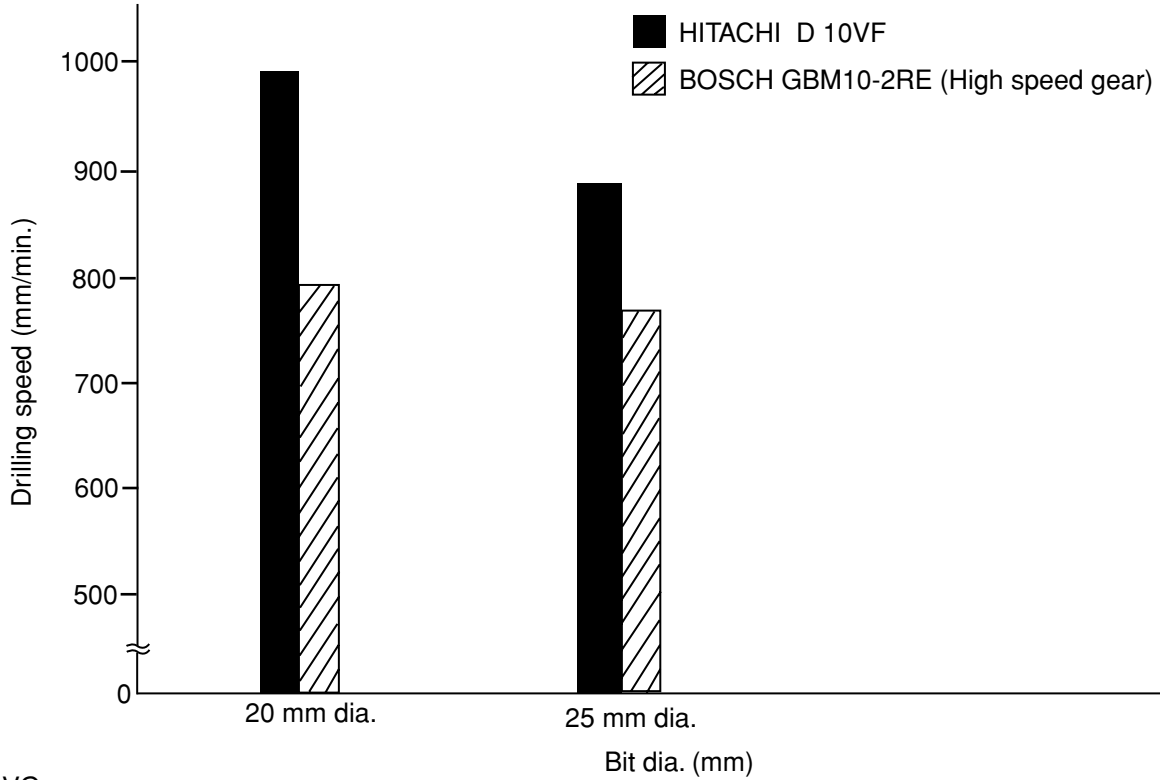
6-2. Drilling Speed Comparisons

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

< D 10VF >

- Flat spade bit

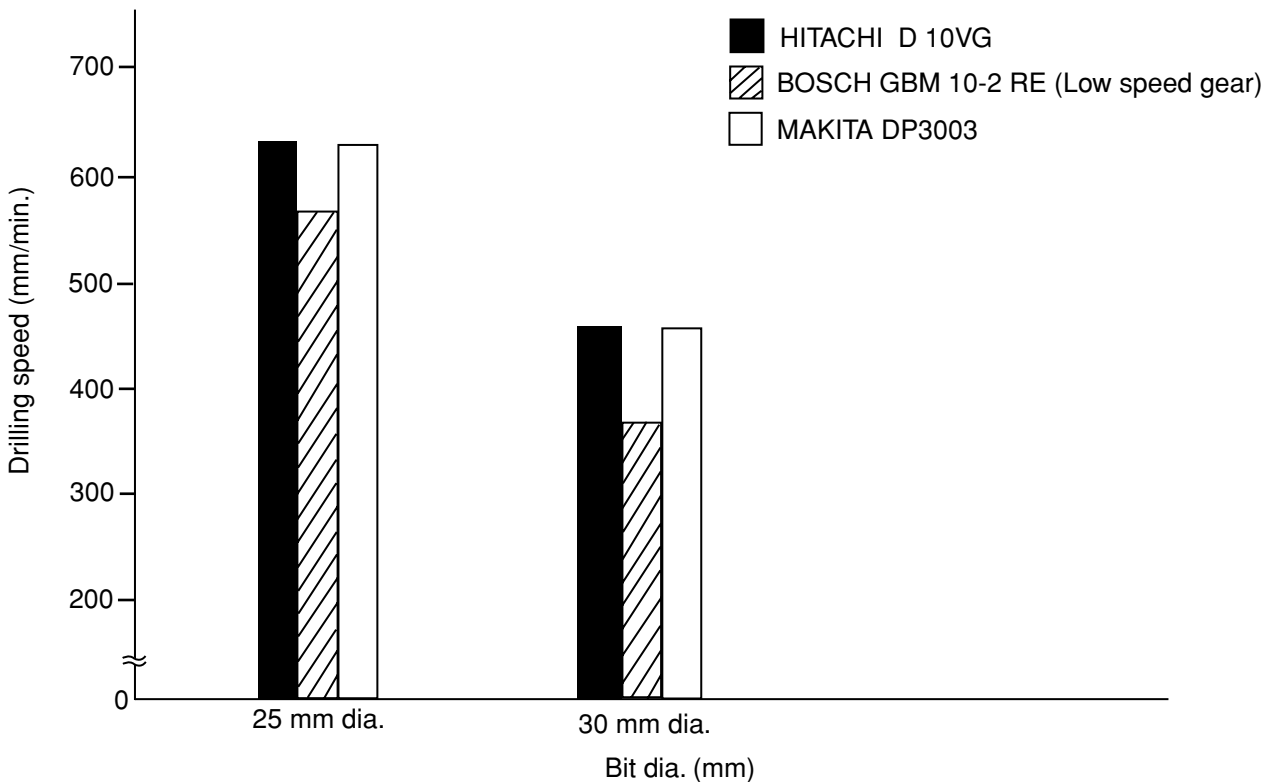
Test material: Western hemlock Thrust: 196 N



< D 10VG >

- Flat spade bit

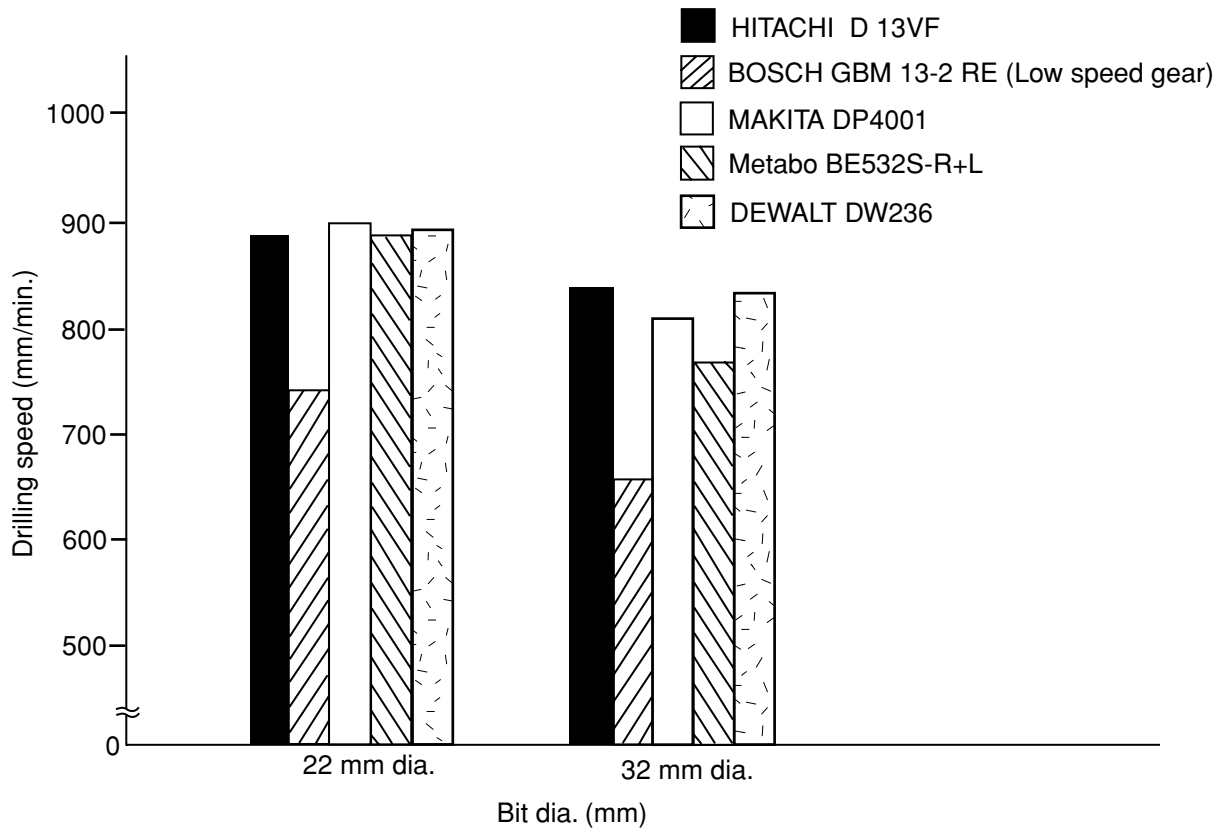
Test material: Western hemlock Thrust: 196 N



< D 13VF >

- Auger bit

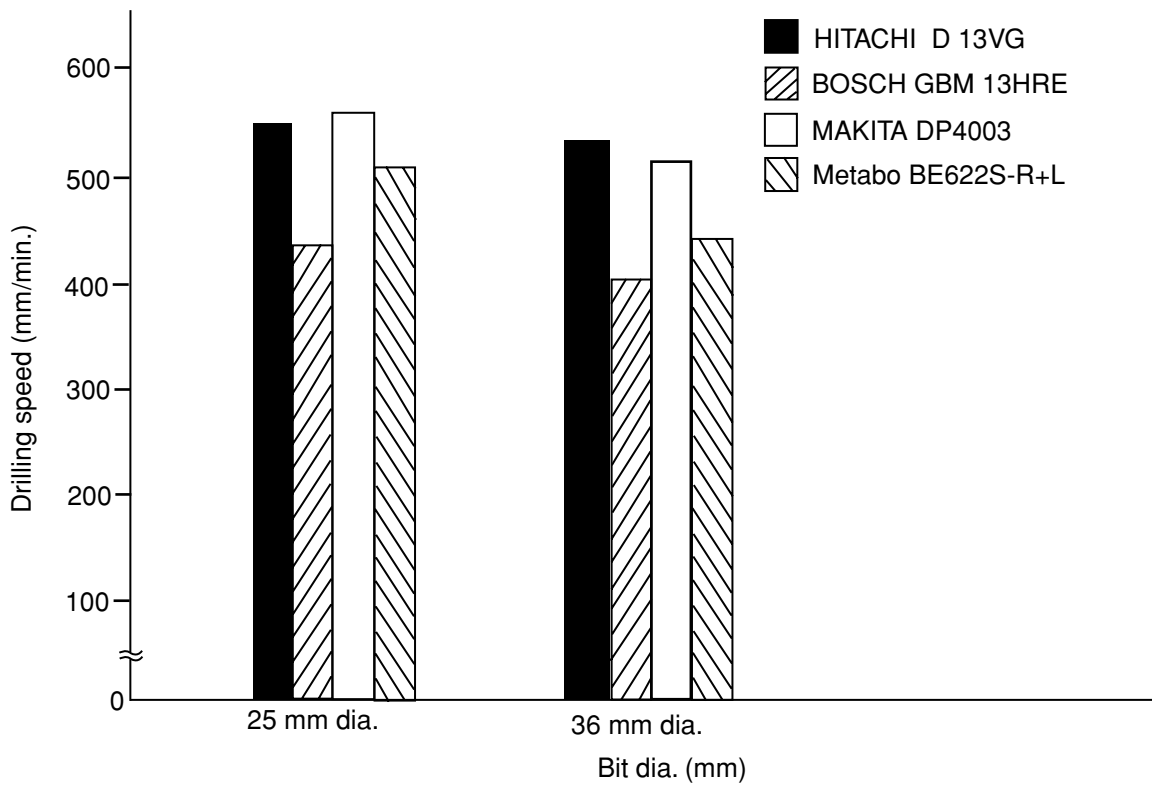
Test material: Western hemlock



< D 13VG >

- Auger bit

Test material: Western hemlock



7. PRECAUTIONS IN SALES PROMOTION

In the interest of promoting the safest and most efficient use of the Models D 10VF, D 10VG, D 13VF and D 13VG Drills 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 Drills 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. Caution Plate

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

CAUTION

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

These precautions are not listed on the Name Plates of the products destined for Europe.

7-3. Precautions on Usage

(1) Keyless chuck

① Mounting of the bit

- Open the chuck jaws, and insert the bit into the chuck. To open the chuck jaws, hold the ring while turning the sleeve in the counterclockwise direction (viewed from the front side).
- Firmly grasp the ring and turn the sleeve in the clockwise direction. Tighten securely. (Fig. 1)

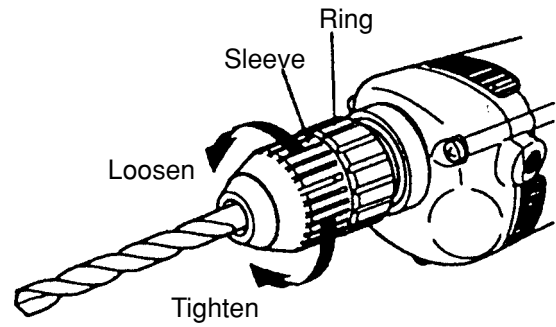


Fig. 1

② Dismounting of the bit

- To remove the bit, firmly grasp the ring and turn the sleeve in the counterclockwise direction. (Fig. 1)
- If it is hard to loosen the sleeve, fix the spindle using the open-end wrench, hold the sleeve firmly, and turn it in the loosening direction (counterclockwise when viewed from the front). (Fig. 2)

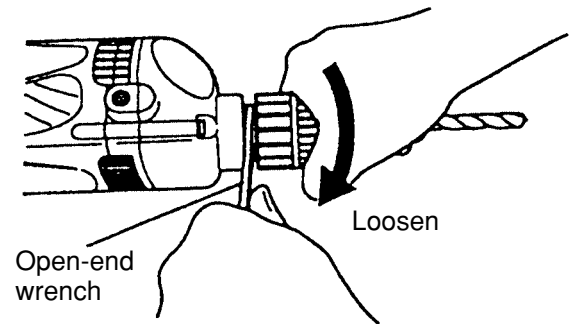


Fig. 2

(2) Side handle

For D 10VG and D 13VF

A side handle is supplied with drill.

It can be installed on either side of the tool for right or left handed use.

To install the side handle, thread it into the socket on the desired side of the tool and tighten it securely.

(Fig. 3)

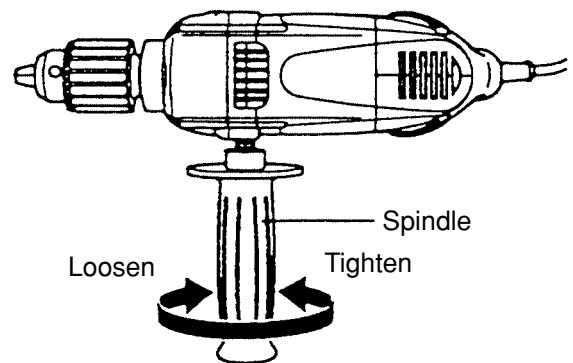


Fig. 3

For D 13VG

A side handle and a handle joint are supplied with drill.

The large torque of the motor for this drill can result in considerable reaction to your arms during drilling work.

Accordingly, make absolutely sure before use that the side handle and the handle joint are completely installed.

(Fig. 4)

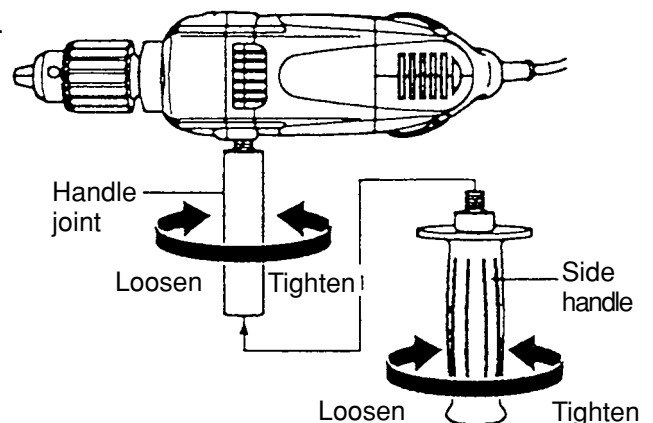


Fig. 4

7-4. Attaching Hook (A)

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 D 10VF, the **[Bold]** numbers for the Model D 10VG, the **[Bold]** numbers for the Model D 13VF, and the **<Bold>** numbers for the Model D 13VG.

- (1) Loosen the Screws (Plastic Tie) D4 x 25 **(27)** **[31]** **[31]** **<31>**, and remove the Grip Cover **(26)** **[30]** **[30]** **<30>**.
- (2) Loosen the Tapping Screws (W/Flange) D4 x 35 **(24)** **[28]** **[28]** **<28>**, Tapping Screw (W/Flange) D4 x 20 (Black) **(25)** **[29]** **[29]** **<29>**, and remove Handle (A) **(29)** **[33]** **[33]** **<33>**.
- (3) Insert the mounting foot of Hook (A) into the air vent of Handle (B) **(23)** **[27]** **[27]** **<27>** as shown in Figs. 6 and 7.
- (4) Mount Handle (A) **(29)** **[33]** **[33]** **<33>** and the Grip Cover **(26)** **[30]** **[30]** **<30>**.

Refer to "8-2-3. Tightening torque" for tightening torque of each screw. Be careful not to catch the internal wires when mounting Handle (A).

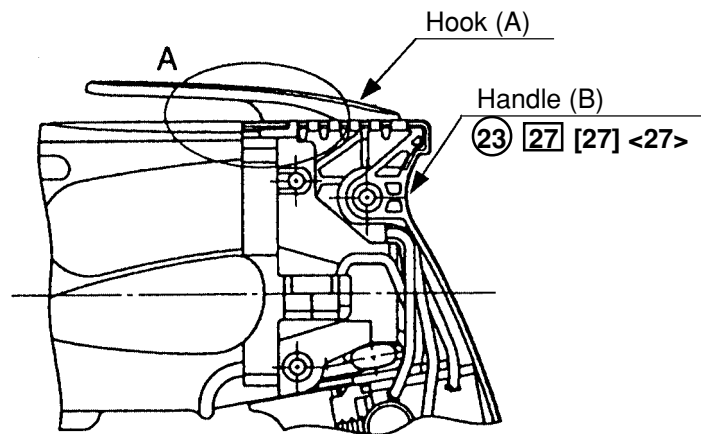


Fig. 5

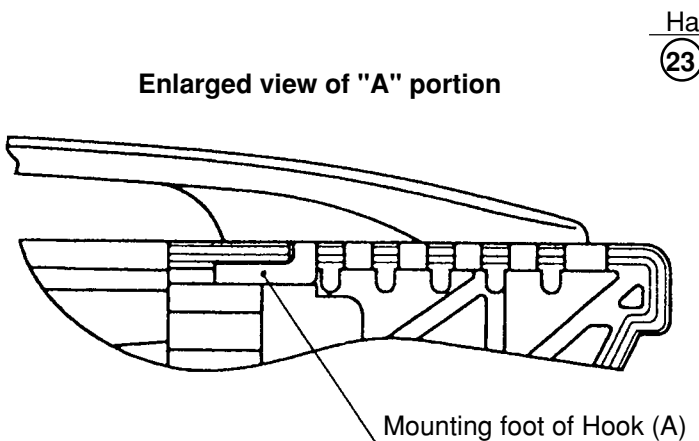


Fig. 6

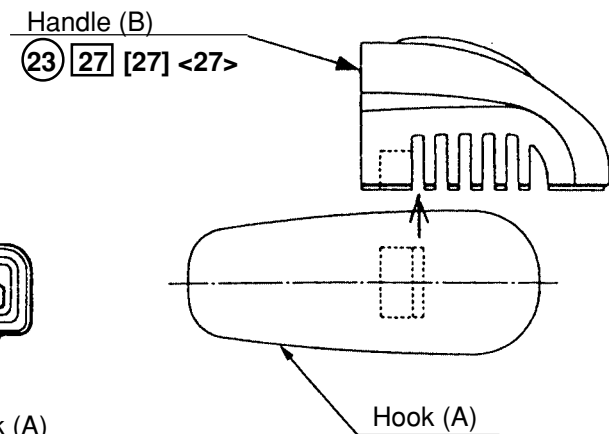


Fig. 7

7-5. Attaching Angle Attachment Ass'y

(1) Removing the drill chuck from drill (Refer to section 8-1-2.)

(2) Attaching the angle unit

- After removing the chuck, engage the coupling to the drill spindle. Fit the joint sleeve to the gear cover, attach the angle unit to the other end of the joint sleeve, and turn the angle unit slightly in either direction so the hex. hole in the coupling engages the hex. portion of the angle unit spindle. Adjust the direction of the angle unit and tighten the joint sleeve by clamping bolts.

Tighten two clamping bolts equally and gradually in turn with a torque of 6.86—7.84 N·m (extent of force which can be subjected by only a wrist with the open end wrench provided to tighten clamping bolts). (Fig. 8)

- To operate the angle unit at low speed, attach the chuck to the angle unit spindle at the side marked "LOW" and secure the locking screw. At this setting, the drilling speed is decreased to about 70% and the drilling torque increased to about 150%. (Fig. 9)

- To operate the angle unit at high speed, attach the chuck to the angle unit spindle at the side marked "HIGH" and secure the locking screw. At this setting, the drilling speed is increased to about 150% and the drilling torque decreased to about 70%. (Fig. 10)

(3) Installing the side handle (Fig. 11)

The side handle can be installed on either side of the angle unit for right or left handed use. To install the side handle, thread it into the socket on the desired side of the angle unit and tighten it securely.

Refer to section 8-1-4 for removal of the drill chuck from the angle unit.

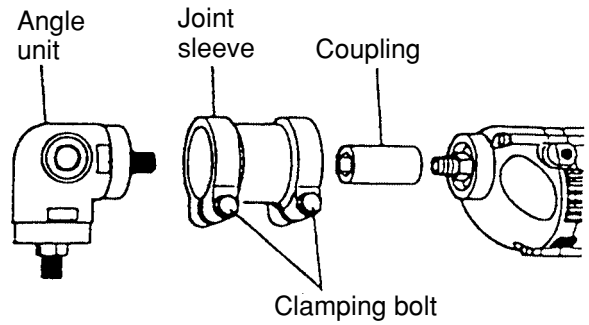


Fig. 8

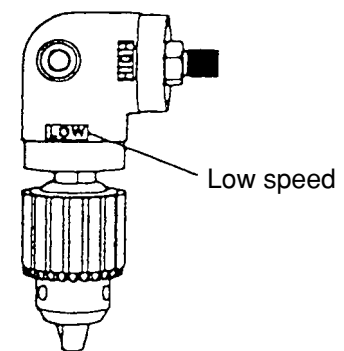


Fig. 9

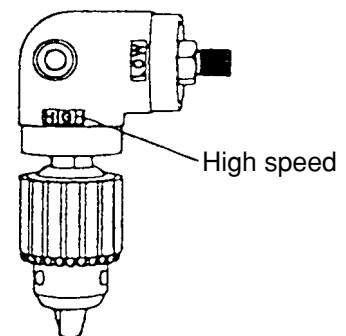


Fig. 10

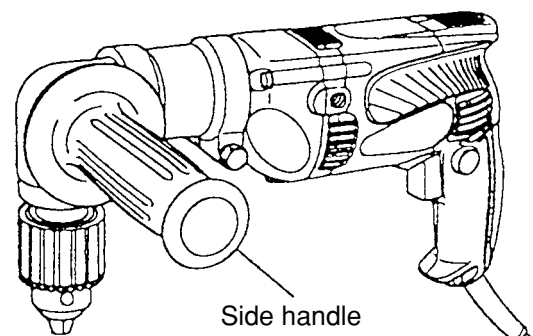


Fig. 11

8. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

The numbers in the descriptions below correspond to the item numbers in the Parts List and exploded assembly diagram. The **(26)** numbers are for the Model D 10VF, the **[26]** numbers for the Model D 10VG, the **[26]** numbers for the Model D 13VF, and the **<26>** numbers for the Model D 13VG.

8-1. Disassembly

8-1-1. Motor section disassembly

(1) Removal of the grip cover

Loosen the Screws (Plastic Tie) D4x25 **(27)** **[31]** **[31]** **<31>**, and remove the Grip Cover **(26)** **[30]** **[30]** **<30>**.

(2) Removal of the handle

Loosen the Tapping Screws (W/Flange) D4 x 35 **(24)** **[28]** **[28]** **<28>** and the Tapping Screw (W/Flange) D4 x 20 (Black) **(25)** **[29]** **[29]** **<29>**, and remove Handle (A) **(29)** **[33]** **[33]** **<33>** and Handle (B) **(23)** **[27]** **[27]** **<27>**.

(3) Removal of the carbon brushes

Using a small-diameter bar, push the Brush Holders **(30)** **[34]** **[34]** **<34>** out of the hole at the lower portion of the Housing **(21)** **[25]** **[25]** **<25>**. (Fig. 12)

Then, while pushing the Carbon Brushes **(32)** **[36]** **[36]** **<36>** to the bottom of the Brush Holders, gently pull out and disconnect the internal wire terminals.

(See Figs. 13 and 14.)

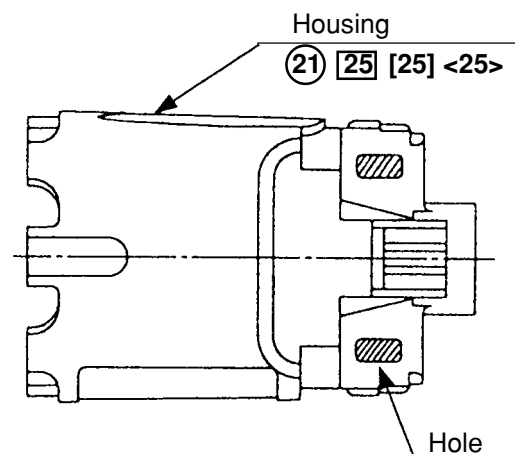


Fig. 12

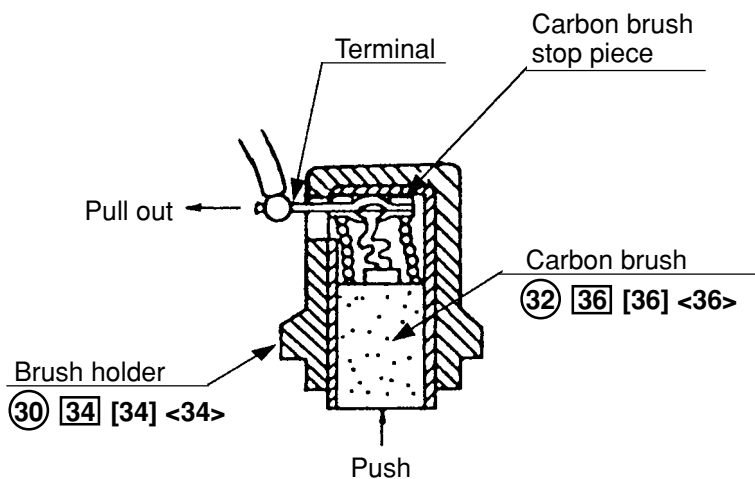


Fig. 13

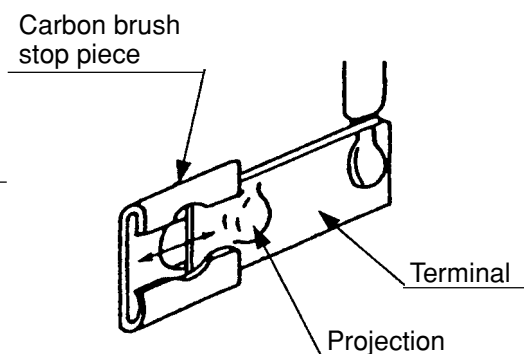


Fig. 14

8-1-2. Removal of the drill chuck

The Drill Chuck (4) [4] [4] <4> is secured to the Spindle (5) [5] [5] <5> with 1/2"-20UNF (Right Hand) and the Special Screw (Left Hand) M6 x 23 (1) [1] [1] <1>. At first, open the chuck jaw as far as possible and loosen the Special Screw by turning it clockwise.

- a. Hold the drill so that only the Drill Chuck (4) [4] [4] <4> rest 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. 15)

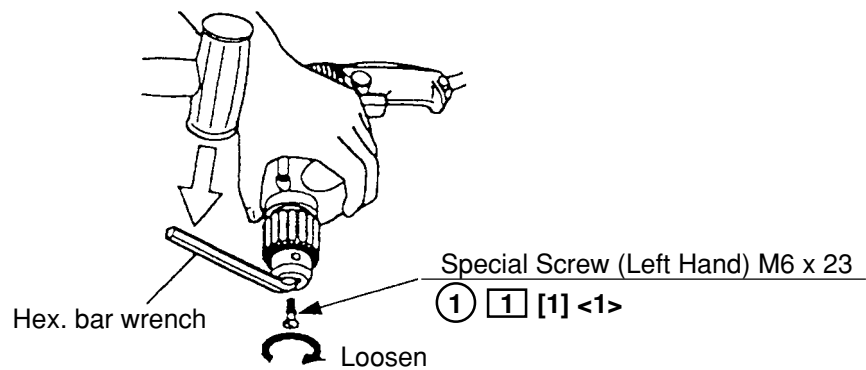


Fig. 15

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 (5) [5] [5] <5> with the open-end wrench secured to the vise as shown in Fig. 16. Mount the pipe to the hex. bar wrench. Turn the hex. bar wrench counterclockwise to loosen the drill chuck. (Fig. 16)

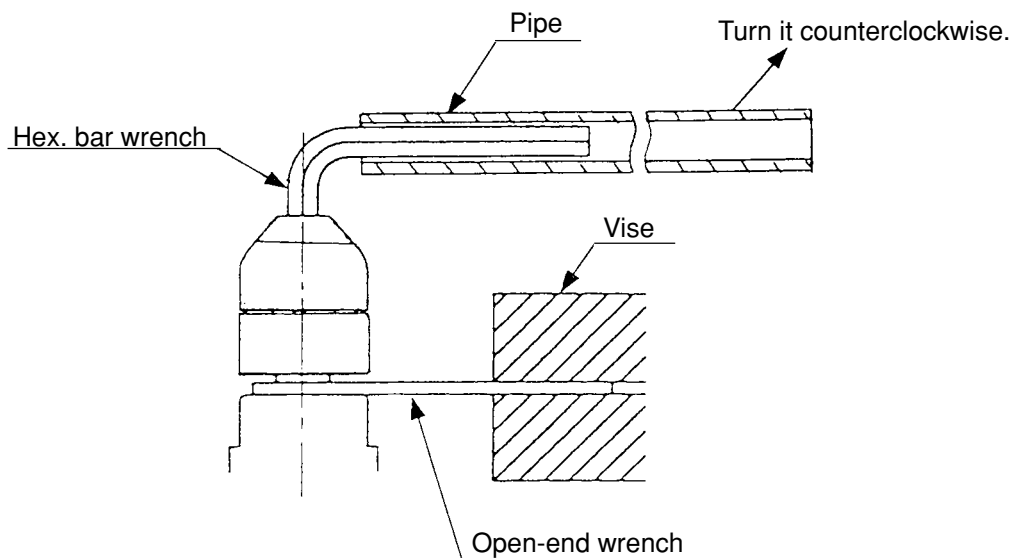


Fig. 16

c. (For keyed chuck only)

Secure the drill chuck with a disassembly tool: Ring Ass'y and Ring (for 10 mm drill chuck: J-90, ring Code No. 970833, ring ass'y Code No. 970832) (for 13 mm drill chuck: J-78, ring Code No. 970818, ring ass'y Code No. 970817) to the drill chuck, which in proper sequence should be secured with a vise. Then fit a disassembly tool: Wrench Ass'y (J-140, Code No. 970921) to the spindle, and turn it counterclockwise to loosen the drill chuck. (Fig. 17)

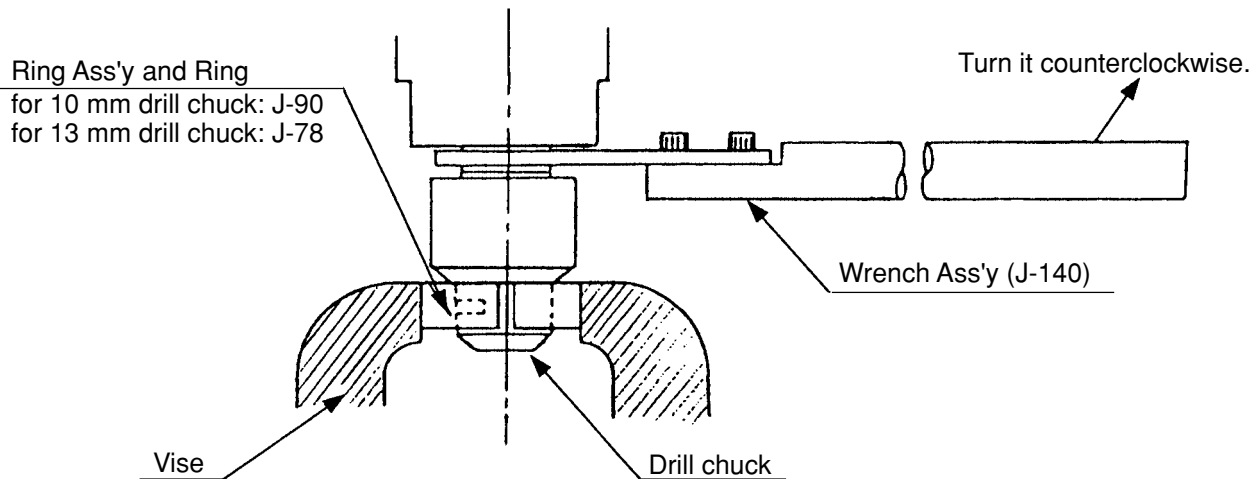


Fig. 17

8-1-3. Gear cover section disassembly

(1) Removal of the second pinion (except the Model D 10VF)

Second Pinion [13] [13] <13> can be removed by tapping the end of Gear Cover (A) [10] [10] <10>.

(2) Disassembly of the second pinion

Place the end surface of the First Gear [14] [14] <14> on a tubular jig and press down on the Second Pinion [13] [13] <13> with a hand press. (Fig. 18)

< CAUTION > Be sure to replace both the second pinion and the first gear with new ones.

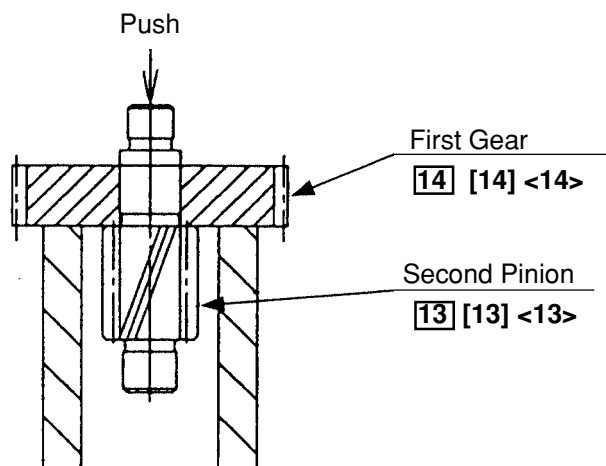


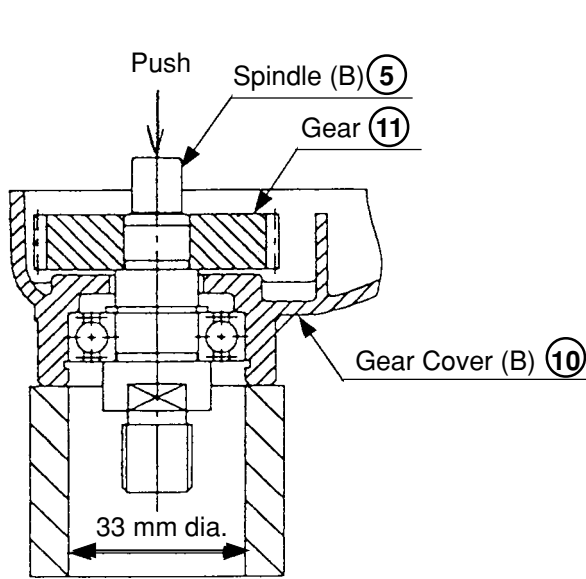
Fig. 18

(3) Removal of the spindle

Remove the Retaining Ring (6) [6] [6] <6>. Place the end surface of the Gear Cover (10) [10] [10] <10> on the cylindrical jig and press down on the Spindle (5) [5] [5] <5> with a hand press. Then the Spindle can be removed together with the Ball Bearing 6002VVCMP2L (7) [7] [7] <7> and the Retaining Ring (8) [8] [8] <8>. The Gear (11) or the Final Gear (12) [12] [12] <12> can be removed from the Spindle.

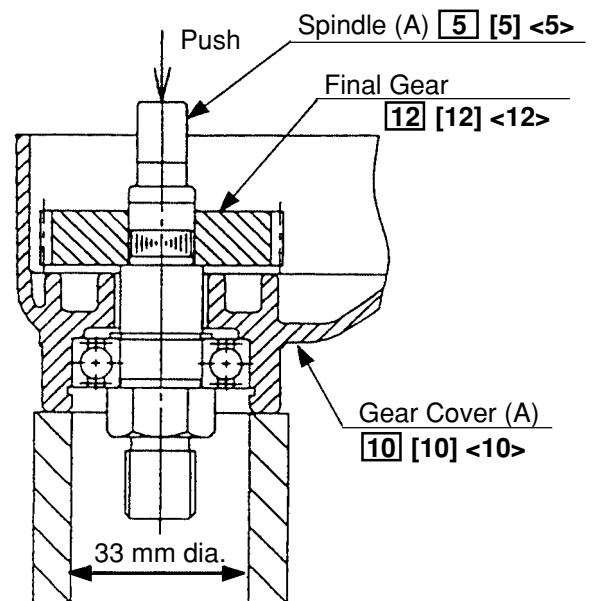
(Figs. 19 and 20)

<CAUTION> Be sure to replace both the spindle and the gear or the final gear with new ones.



Model D 10VF

Fig. 19



Models D 10VG, D 13VF and D 13VG

Fig. 20

(4) Removal of the gear cover and the inner cover from the housing

Loosen the Tapping Screws D5 (9) [9] [9] <9>, (12) [16] [16] <16> and separate the Gear Cover (10) [10] [10] <10>. Then, remove the Inner Cover (13) [17] [17] <17> together with the Armature Ass'y (15) [19] [19] <19> from the Housing (21) [25] [25] <25>.

(5) Removal of the armature ass'y from the inner cover

As illustrated in Fig. 21, support the Inner Cover (13) (17) [17] <17> with a tubular jig, and push down on the top of the pinion of the Armature Ass'y (15) (19) [19] <19>.

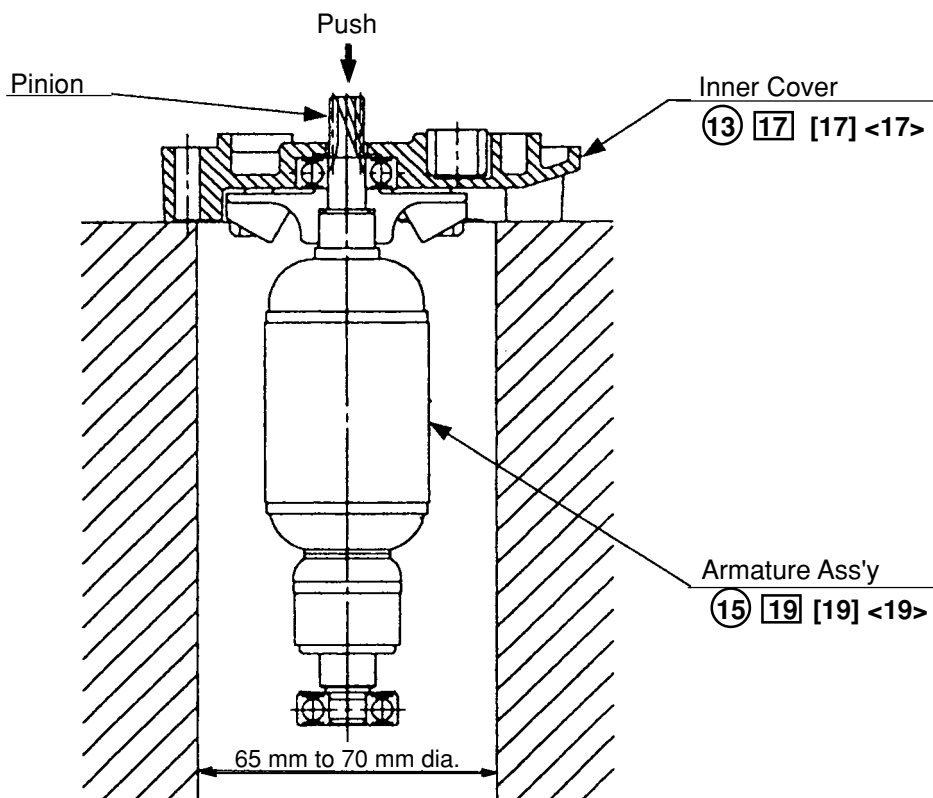


Fig. 21

(6) Removal of the stator from the housing

First, disconnect the internal wires from the Switch (35) (39) [39] <39>. To disconnect the internal wires from 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 55 (17) (21) [21] <21> and tap the end surface of the Housing (21) (25) [25] <25> slightly with a wooden hammer. Then the stator can be removed from the housing.

8-1-4. Angle attachment ass'y (optional accessory) disassembly

(1) Removal of the drill chuck from the angle unit

The drill chuck can be removed from angle unit in the same manner it was removed from the drill; however, always remove angle unit from the drill before attempting to remove the drill chuck. This will prevent damage of drills gear. Use the Wrench [614] <614> (open-end) provided to hold the angle unit spindle before attempting to remove the drill chuck. (Fig. 22)

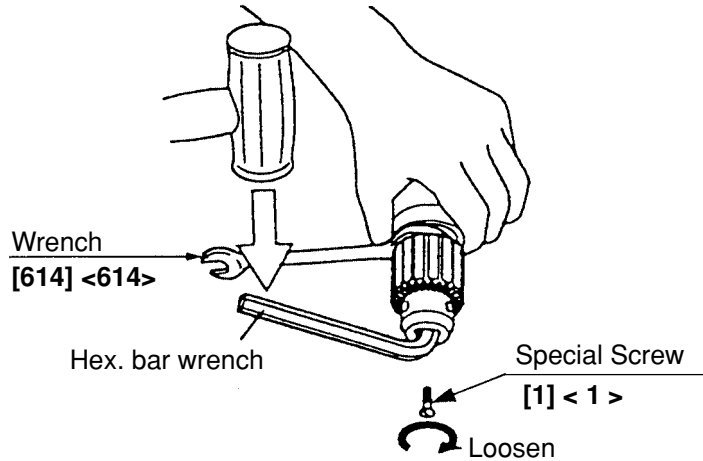


Fig. 22

If the drill chuck cannot be removed by striking the hex. bar wrench, do not strike the hex. bar wrench forcibly. Remove the drill chuck according to the procedure specified in section 8-1-2.

(2) Removal of gears and spindles from the angle unit

Remove the Retaining Rings [605] <605>, then tap the end of the Angle Head Ass'y [612] <612> to take out the spindle pinion ass'y and the Spindle and Gear Set [613] <613>.

To remove the Pinion [603] <603> and the Ball Bearing [604] <604> from the Spindle [607] <607>, place the end surface of the Ball Bearing [604] <604> on a tubular jig and press down on the Spindle [607] <607> with a hand press. (Fig. 23)

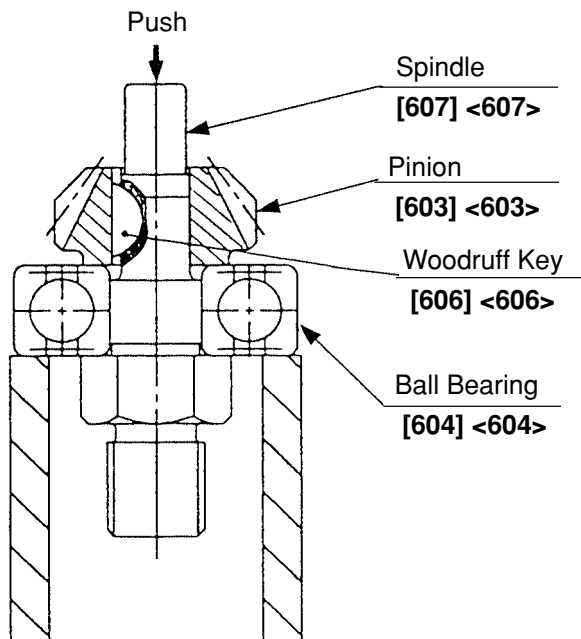


Fig. 23

8-2. Reassembly

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

8-2-1. Internal wire arrangement

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

8-2-2. Lubrication

- (1) Apply SEP-3A Grease to the following portions.

< For Model D 10VF >

- Teeth of the Armature Ass'y (15) (with a brush)
- Teeth of the Gear (11)
- Metal portion of the Inner Cover (13)
- Inside of Gear Cover (B) (10) : 5 g

< For Models D 10VG, D 13VF and D 13VG >

- Teeth of the Armature Ass'y (19) [19] <19>
- Teeth of the First Gear (14) [14] <14>
- Second Pinion (13) [13] <13>
- Final Gear (12) [12] <12>
- Metal portion of the Inner Cover (17) [17] <17>
- Inside of Gear Cover (A) (10) [10] <10> : 15 g

- (2) For the angle attachment ass'y ... Optional accessory

Apply Motor Grease No. 29 to the following portions.

- Inside of the Angle Head Ass'y [612] <612> : 15 g

8-2-3. Tightening torque

- (1) Special Screw (Left Hand) M6 (1) (1) [1] <1> 3.92 to 5.88 N·m
- (2) Tapping Screw D4 (24) (25) (36) [28] [29] [40]
 [28] [29] [40] <28> <29> <40> 1.47 to 2.45 N·m
- (3) Screw (Plastic Tie) D4 (27) (31) [31] <31> 1.47 to 2.45 N·m
- (4) Tapping Screw D5 (9) (12) (9) (16) [9] [16] <9> <16> 2.45 to 3.43 N·m
- (5) Drill Chuck (4) (4) [4] <4> 29.4 to 39.2 N·m
- (6) Machine Screw M3 (Switch) (35) (39) [39] <39> 0.39 to 0.78 N·m
- (7) Bolt M8 [610] <610> 6.86 to 7.84 N·m
 (For the Angle Attachment Ass'y Optional accessory)

8-3. Wiring Diagram

Models D 10VF, D 10VG, D 13VF and D 13VG

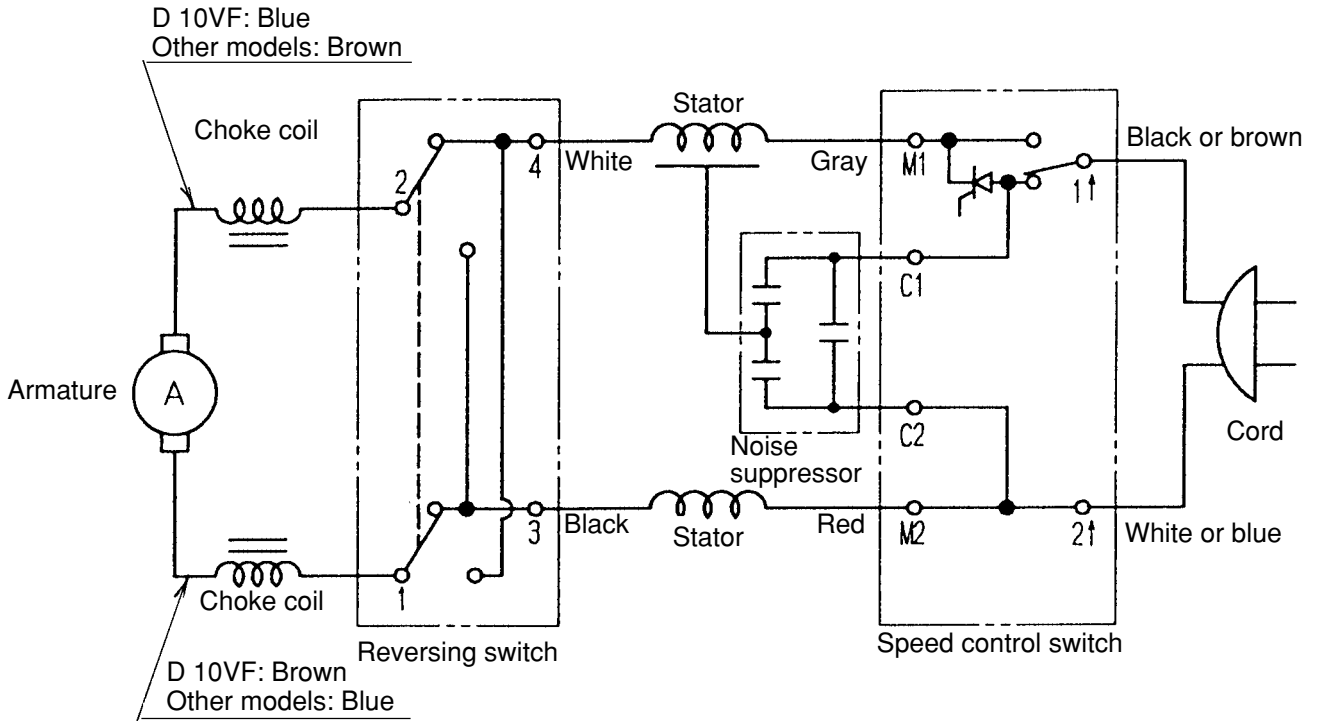


Fig. 24

8-4. Internal Wire Arrangement and Wiring Work

A. Internal wire arrangement

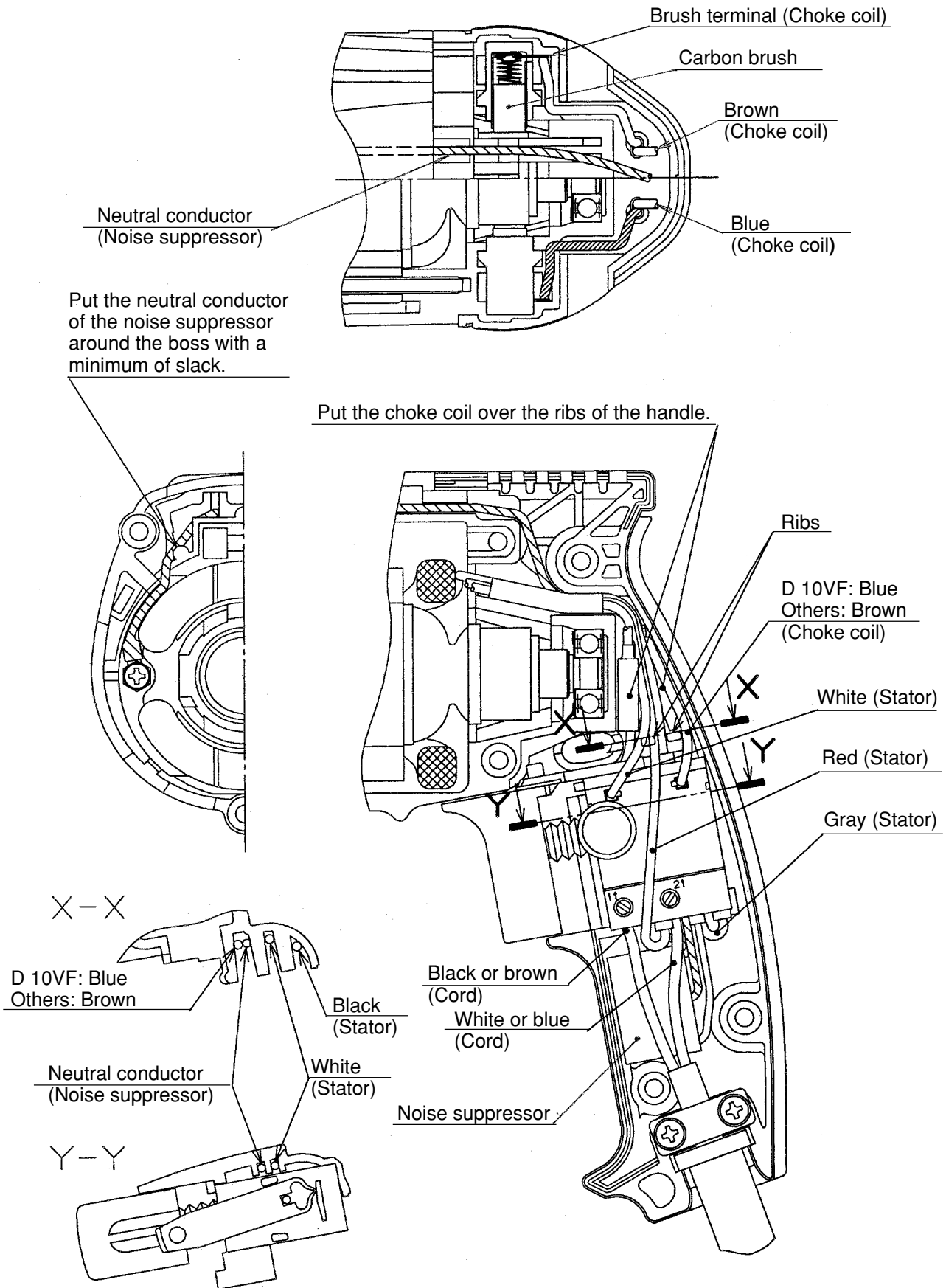


Fig. 25

B. Switch connection

(1) Wiring of reversing switch

<D 10VF>

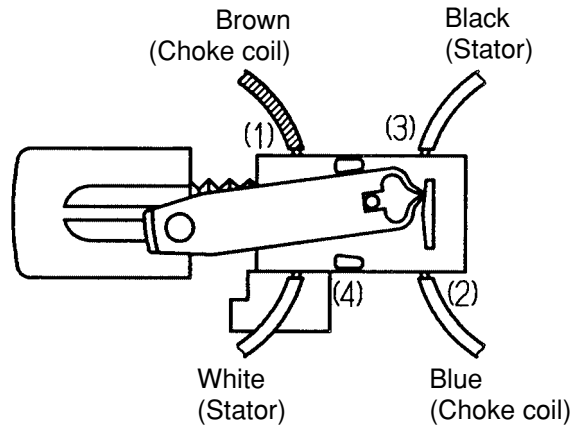


Fig. 26

<D 10VG, D 13VF, D 13VG>

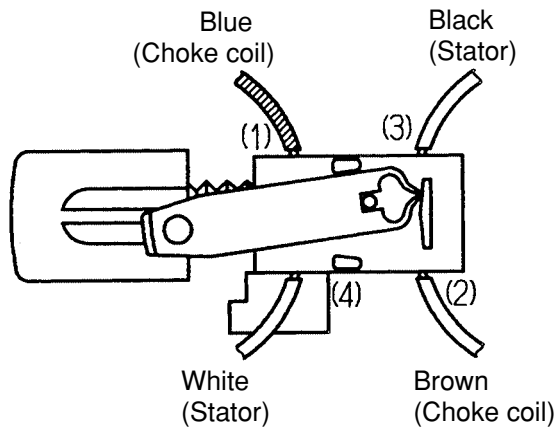


Fig. 27

(2) Wiring of speed control switch

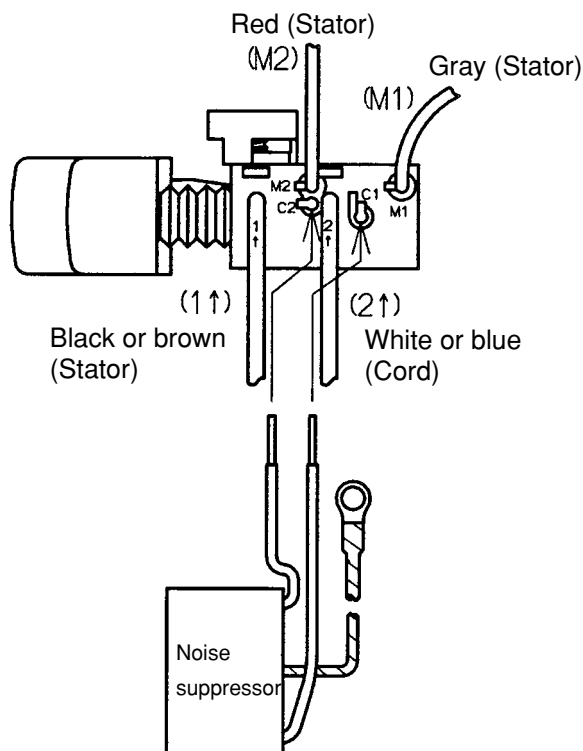


Fig. 28

8-5. Insulation Tests

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

Insulation resistance: 7 MΩ or more with DC 500 V Megohm Tester

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

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

8-6. No-Load Current Value

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

Voltage (V)	110	220	230	240
Current (A) Max.	3.0	2.0	2.0	2.0

9. STANDARD REPAIR TIME (UNIT) SCHEDULES

For Model D 10VF

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
D 10VF		Work Flow						
		Handle (A) Handle (B) Switch Cord Pushing Button Carbon Brush x 2 pcs.			Housing Stator			
	General Assembly			Armature Ass'y Ball Bearing (608VV) Ball Bearing (608DD) Inner Cover				
				Gear Cover (B) Gear Spindle (B) Ball Bearing (6002VV)				

For Models D 10VG, D 13VF and D 13VG

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
<p>D 10VG</p> <p>D 13VF</p> <p>D 13VG</p>		Work Flow						
			Handle (A) Handle (B) Switch Cord Pushing Button Carbon Brush x 2 pcs.					
		General Assembly		Armature Ass'y Ball Bearing (608VV) Ball Bearing (608DD) Inner Cover Second Pinion First Gear Ball Bearing (627VV) Ball Bearing (606ZZ) Gear Cover (A) Final Gear Spindle (A) Ball Bearing (6002VV)				
					Housing Stator			

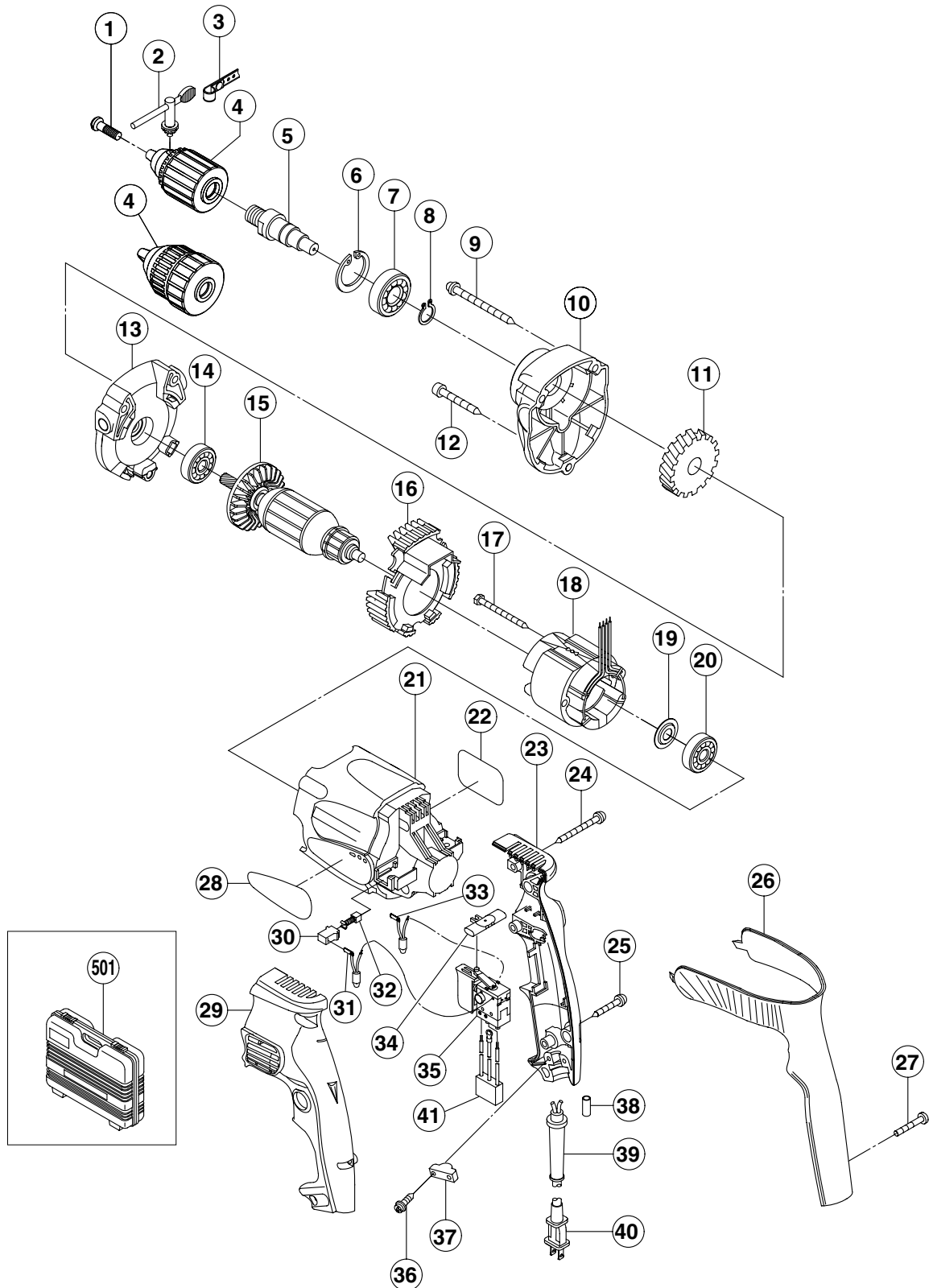
ELECTRIC TOOL PARTS LIST

■ DRILL

2001·8·21

Model D 10VF

(E2)



PARTS

D 10VF

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
1	311-959	SPECIAL SCREW (LEFT HAND) M6X23	1		
2	319-529	CHUCK WRENCH 10VLR-J	1		
3	950-288	VINYL BAND	1		
*	4	319-342	DRILL CHUCK 10VLR-J	1	INCLUD.2
*	4	319-343	DRILL CHUCK 10VLRD-N (W/O CHUCK WRENCH)	1	
5	319-335	SPINDLE (B)	1		
6	948-001	RETAINING RING FOR D32 HOLE	1		
7	600-2VV	BALL BEARING 6002VVCMP2L	1		
8	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1		
9	317-449	TAPPING SCREW (W/FLANGE) D5X50	2		
10	319-334	GEAR COVER (B)	1		
11	319-336	GEAR	1		
12	316-458	TAPPING SCREW D5X40 (BLACK)	1		
13	319-333	INNER COVER	1		
14	608-DDM	BALL BEARING 608DDC2PS2L	1		
*	15	360-542U	ARMATURE ASS'Y 110V-120V	1	INCLUD.14,19,20
*	15	360-542E	ARMATURE 220V-230V	1	
16	319-329	FAN GUIDE	1		
17	981-421	HEX. HD. TAPPING SCREW D4X55	2		
*	18	340-486C	STATOR 120V	1	
*	18	340-486D	STATOR 110V	1	
*	18	340-504E	STATOR 230V-240V	1	
19	982-631	WASHER (A)	1		
20	608-VVM	BALL BEARING 608VVC2PS2L	1		
21	319-328	HOUSING	1		
22		NAME PLATE	1		
23	319-331	HANDLE (B)	1		
24	303-694	TAPPING SCREW (W/FLANGE) D4X35	2		
25	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	1		
26	319-332	GRIP COVER	1		
27	319-337	SCREW (PLASTIC TIE) D4X25	2		
28		HITACHI LABEL	1		
29	319-330	HANDLE (A)	1		
30	955-203	BRUSH HOLDER	2		
*	31	319-638	INTERNAL WIRE (BLUE) 72L	1	FOR USA,CAN
*	31	320-204	CHOKE COIL (BLUE) 110V	1	FOR GBR (110V)
*	31	320-197	CHOKE COIL (BLUE) 220V-240V	1	FOR NZL,EUROPE
32	999-041	CARBON BRUSH (1 PAIR)	2		
*	33	319-637	INTERNAL WIRE (BROWN) 72L	1	FOR USA,CAN
*	33	320-203	CHOKE COIL (BROWN) 110V	1	FOR GBR (110V)
*	33	320-196	CHOKE COIL (BROWN) 220V-240V	1	FOR NZL,EUROPE
34	316-166	PUSHING BUTTON	1		
*	35	319-339	SWITCH (1P SCREW TYPE) W/LOCK	1	FOR USA,CAN,GBR (110V)
*	35	320-195	SWITCH (1P SCREW TYPE) W/LOCK	1	FOR NZL,EUROPE
36	984-750	TAPPING SCREW (W/FLANGE) D4X16	2		
37	937-631	CORD CLIP	1		
38	981-373	TUBE (D)	2		
39	953-327	CORD ARMOR D8.8	1		
*	40	500-240Z	CORD	1	(CORD ARMOR D8.8) FOR USA,CAN
*	40	500-439Z	CORD	1	(CORD ARMOR D8.8) FOR NZL
*	40	500-461Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (110V)

* ALTERNATIVE PARTS

8-01

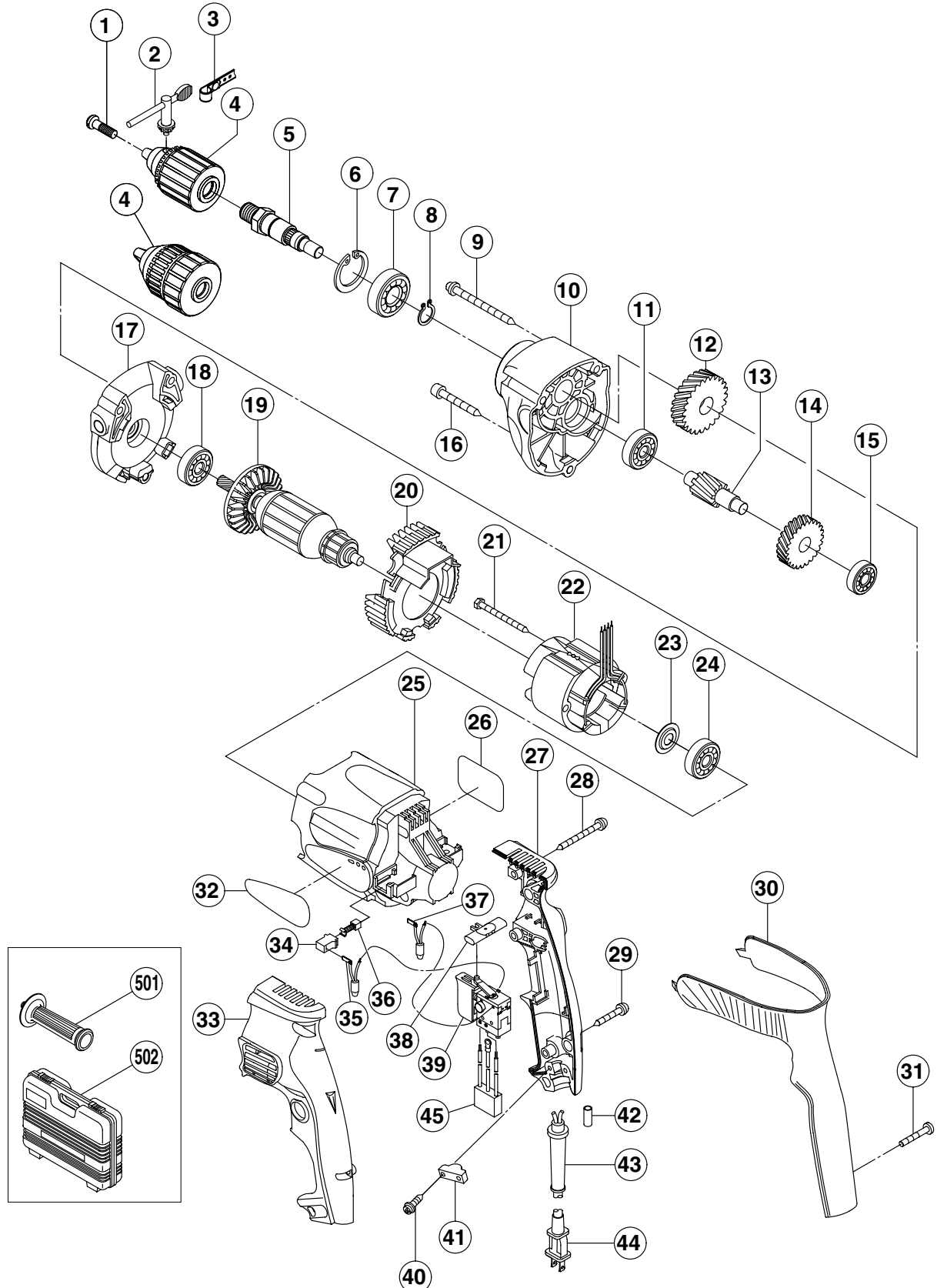
ELECTRIC TOOL PARTS LIST

■ DRILL

2001·8·21

Model D 10VG

(E2)



PARTS

D 10VG

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	311-959	SPECIAL SCREW (LEFT HAND) M6X23	1	
2	319-529	CHUCK WRENCH 10VLR-J	1	
3	950-288	VINYL BAND	1	
* 4	319-342	DRILL CHUCK 10VLR-J	1	INCLUD.2
* 4	319-343	DRILL CHUCK 10VLRD-N (W/O CHUCK WRENCH)	1	
5	319-346	SPINDLE (A)	1	
6	948-001	RETAINING RING FOR D32 HOLE	1	
7	600-2VV	BALL BEARING 6002VVCMP2L	1	
8	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1	
9	305-701	TAPPING SCREW (W/FLANGE) D5X60	2	
10	319-345	GEAR COVER (A)	1	
11	627-VVM	BALL BEARING 627VVC2PS2L	1	
12	319-347	FINAL GEAR (A)	1	
13	319-545	SECOND PINION (A)	1	
14	319-544	FIRST GEAR	1	
15	606-ZZM	BALL BEARING 606ZZC2PS2L	1	
16	316-458	TAPPING SCREW D5X40 (BLACK)	1	
17	319-344	INNER COVER	1	
18	608-DDM	BALL BEARING 608DDC2PS2L	1	
* 19	360-543U	ARMATURE ASS'Y 110V-120V	1	INCLUD.18,23,24
* 19	360-543E	ARMATURE 220V-230V	1	
20	319-329	FAN GUIDE	1	
21	981-421	HEX. HD. TAPPING SCREW D4X55	2	
* 22	340-486C	STATOR 120V	1	
* 22	340-486D	STATOR 110V	1	
* 22	340-504E	STATOR 230V-240V	1	
23	982-631	WASHER (A)	1	
24	608-VVM	BALL BEARING 608VVC2PS2L	1	
25	319-328	HOUSING	1	
26		NAME PLATE	1	
27	319-331	HANDLE (B)	1	
28	303-694	TAPPING SCREW (W/FLANGE) D4X35	2	
29	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	1	
30	319-332	GRIP COVER	1	
31	319-337	SCREW (PLASTIC TIE) D4X25	2	
32		HITACHI LABEL	1	
33	319-330	HANDLE (A)	1	
34	955-203	BRUSH HOLDER	2	
* 35	319-341	INTERNAL WIRE (BLUE) 86L	1	FOR USA,CAN
* 35	320-204	CHOKE COIL (BLUE) 110V	1	FOR GBR (110V)
* 35	320-197	CHOKE COIL (BLUE) 220V-240V	1	FOR EUROPE
36	999-041	CARBON BRUSH (1 PAIR)	2	
* 37	319-340	INTERNAL WIRE (BROWN) 86L	1	FOR USA,CAN
* 37	320-203	CHOKE COIL (BROWN) 110V	1	FOR GBR (110V)
* 37	320-196	CHOKE COIL (BROWN) 220V-240V	1	FOR EUROPE
38	316-166	PUSHING BUTTON	1	
* 39	319-339	SWITCH (1P SCREW TYPE) W/LOCK	1	FOR USA,CAN,GBR (110V)
* 39	320-195	SWITCH (1P SCREW TYPE) W/LOCK	1	FOR EUROPE
40	984-750	TAPPING SCREW (W/FLANGE) D4X16	2	
41	937-631	CORD CLIP	1	
42	981-373	TUBE (D)	2	

* ALTERNATIVE PARTS

8 - 01

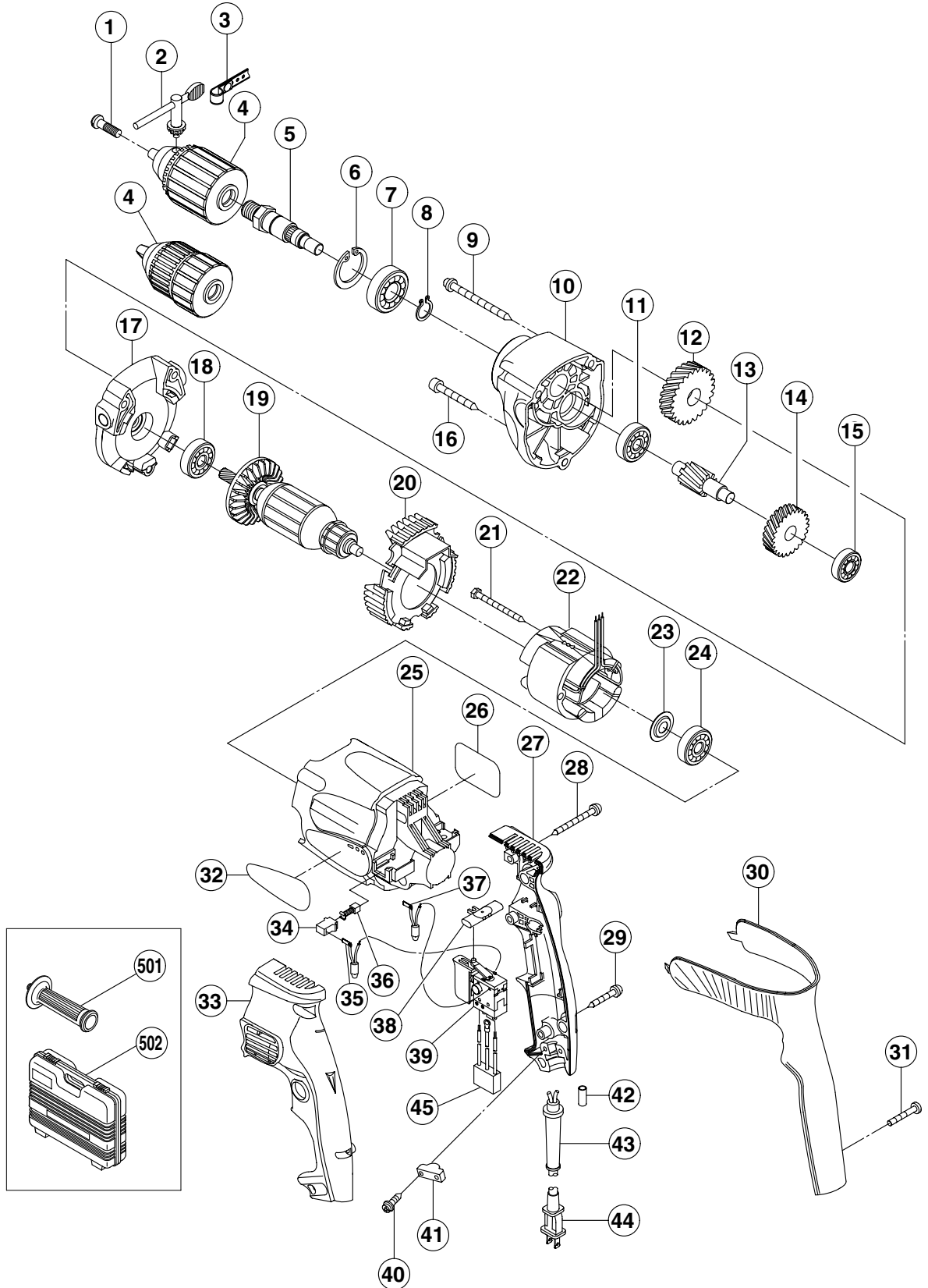
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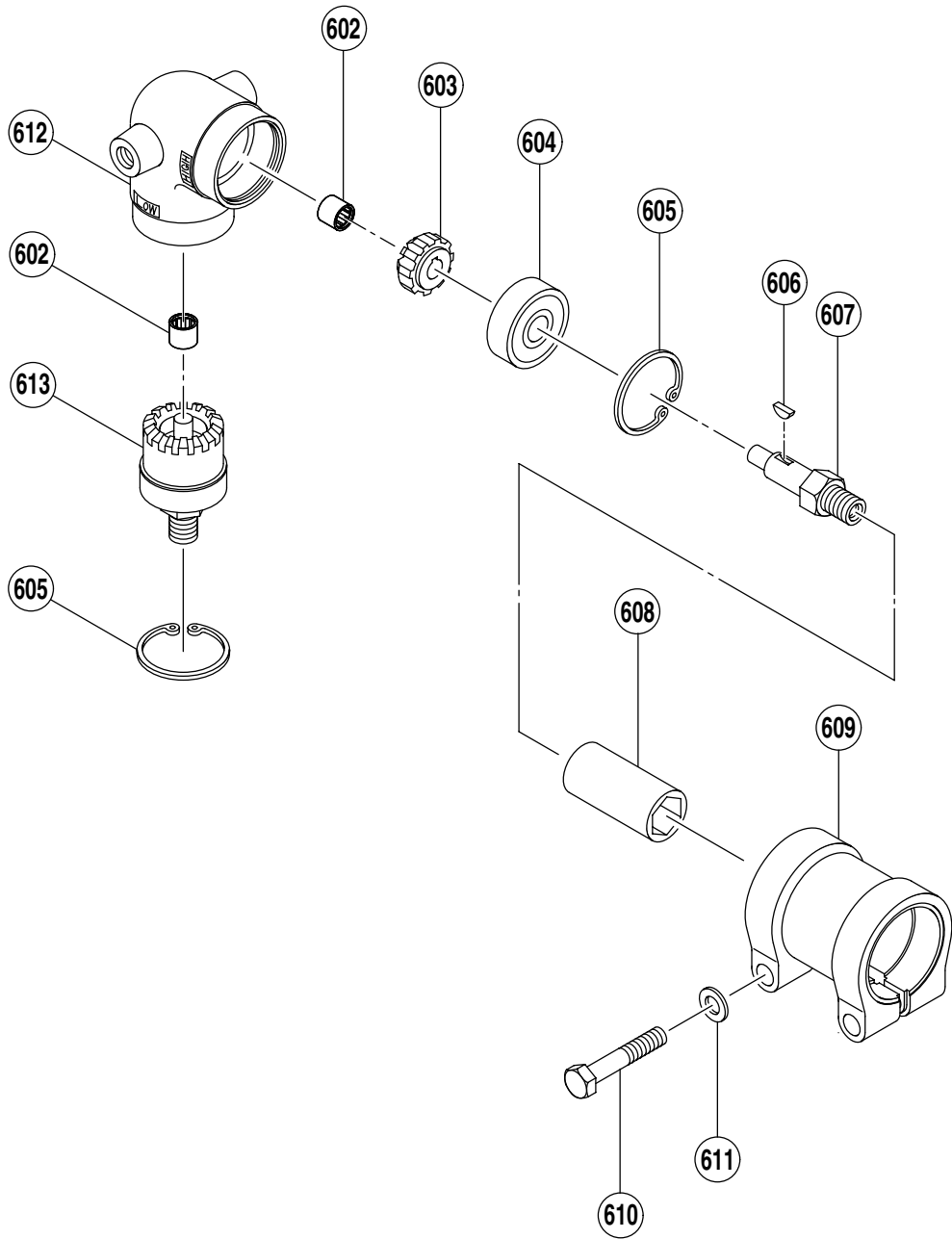
■ DRILL

2001·8·21

Model D 13VF

(E2)





PARTS

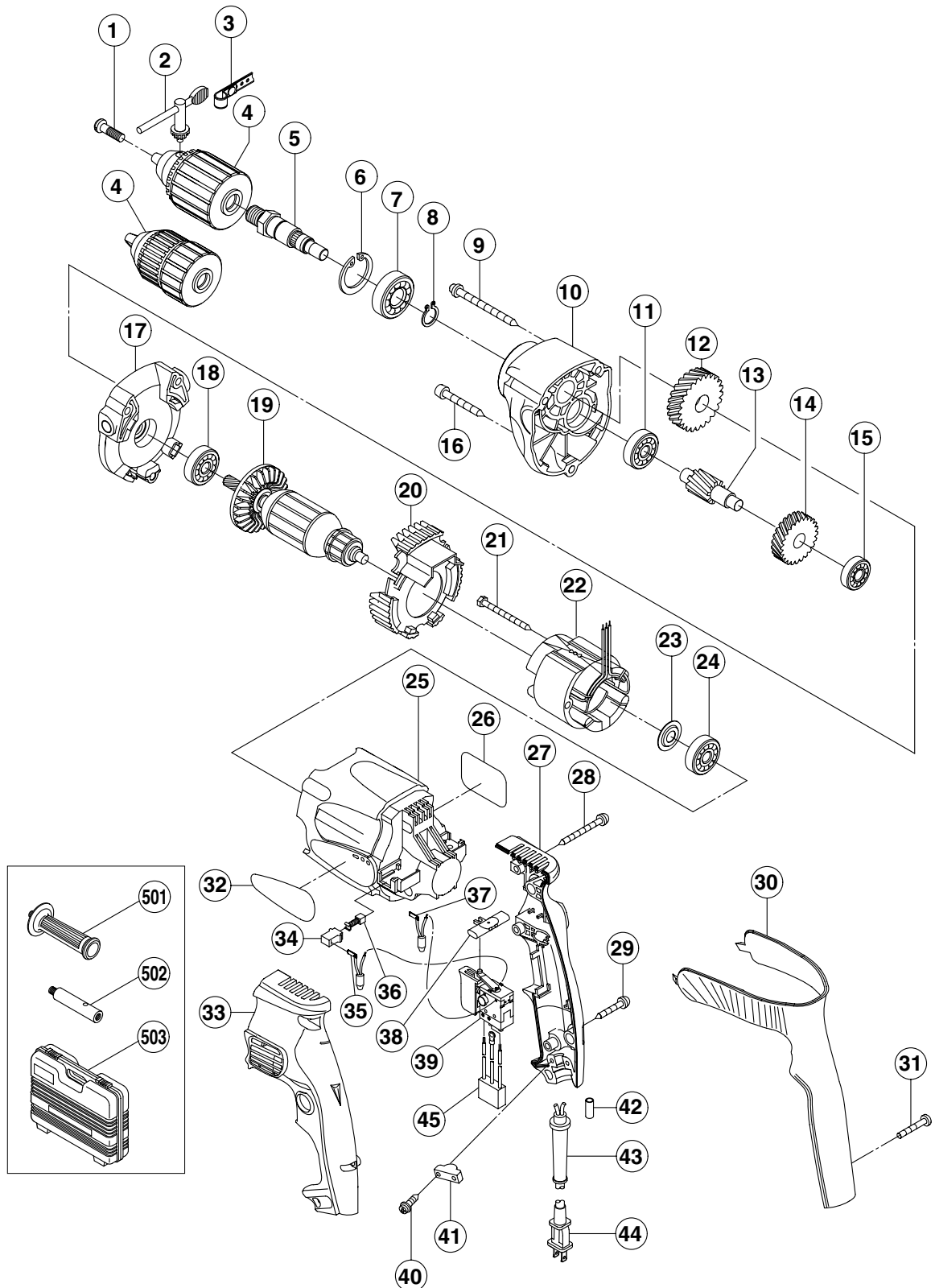
D 13VF

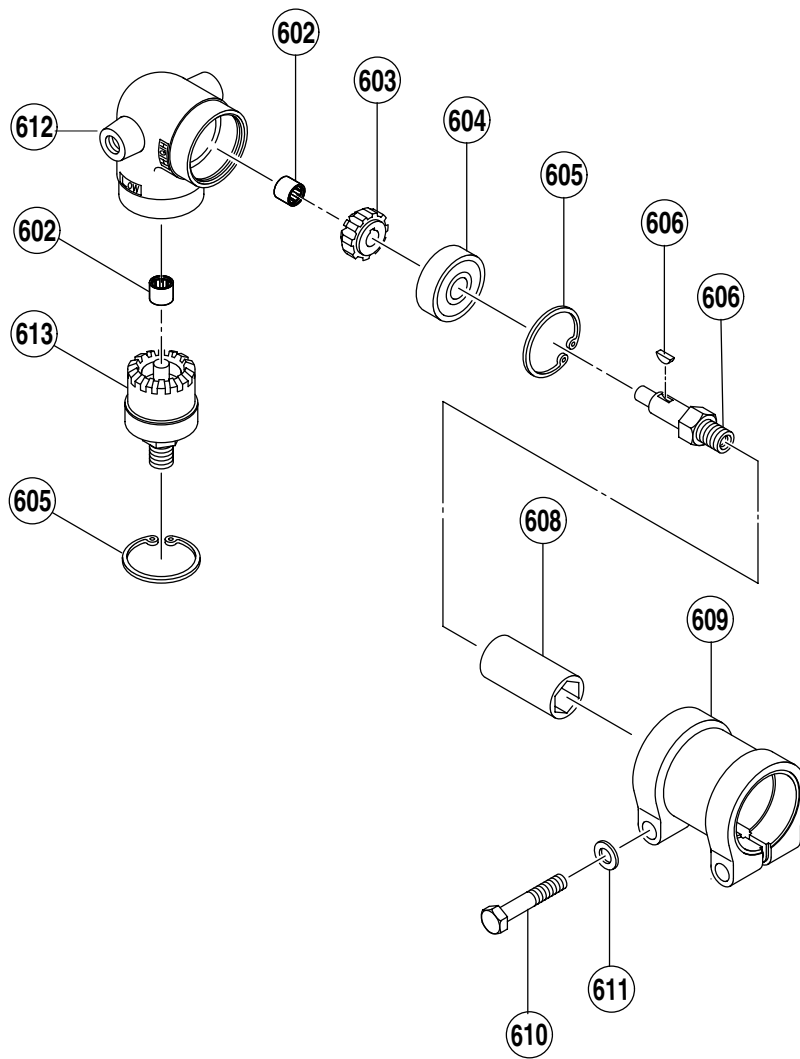
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1	311-959	SPECIAL SCREW (LEFT HAND) M6X23	1	
2	319-527	CHUCK WRENCH 13VLR-J	1	
3	950-288	VINYL BAND	1	
*	4	319-303	DRILL CHUCK 13VLR-J	1 INCLUD.2
*	4	319-304	DRILL CHUCK 13VLRD-N (W/O CHUCK WRENCH)	1
5	319-346	SPINDLE (A)	1	
6	948-001	RETAINING RING FOR D32 HOLE	1	
7	600-2VV	BALL BEARING 6002VVCMP2L	1	
8	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1	
9	305-701	TAPPING SCREW (W/FLANGE) D5X60	2	
10	319-345	GEAR COVER (A)	1	
11	627-VVM	BALL BEARING 627VVC2PS2L	1	
12	319-299	FINAL GEAR	1	
13	319-547	SECOND PINION (B)	1	
14	319-544	FIRST GEAR	1	
15	606-ZZM	BALL BEARING 606ZZC2PS2L	1	
16	316-458	TAPPING SCREW D5X40 (BLACK)	1	
17	319-344	INNER COVER	1	
18	608-DDM	BALL BEARING 608DDC2PS2L	1	
*	19	360-543U	ARMATURE ASS'Y 110V-120V	1 INCLUD.18,23,24
*	19	360-543E	ARMATURE 220V-230V	1
*	19	360-543F	ARMATURE 240V	1
20	319-329	FAN GUIDE	1	
21	981-421	HEX. HD. TAPPING SCREW D4X55	2	
*	22	340-494C	STATOR 120V	1
*	22	340-486D	STATOR 110V	1
*	22	340-504E	STATOR 230V-240V	1
23	982-631	WASHER (A)	1	
24	608-VVM	BALL BEARING 608VVC2PS2L	1	
25	319-328	HOUSING	1	
26		NAME PLATE	1	
27	319-331	HANDLE (B)	1	
28	303-694	TAPPING SCREW (W/FLANGE) D4X35	2	
29	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	1	
30	319-332	GRIP COVER	1	
31	319-337	SCREW (PLASTIC TIE) D4X25	2	
32		HITACHI LABEL	1	
33	319-330	HANDLE (A)	1	
34	955-203	BRUSH HOLDER	2	
*	35	319-341	INTERNAL WIRE (BLUE) 86L	1 FOR USA,CAN
*	35	320-204	CHOKE COIL (BLUE) 110V	1 FOR GBR (110V)
*	35	320-197	CHOKE COIL (BLUE) 220V-240V	1 FOR AUS,NZL,EUROPE
36	999-041	CARBON BRUSH (1 PAIR)	2	
*	37	319-340	INTERNAL WIRE (BROWN) 86L	1 FOR USA,CAN
*	37	320-203	CHOKE COIL (BROWN) 110V	1 FOR GBR (110V)
*	37	320-196	CHOKE COIL (BROWN) 220V-240V	1 FOR AUS,NZL,EUROPE
38	316-166	PUSHING BUTTON	1	
*	39	319-302	SWITCH (1P SCREW TYPE) W/LOCK	1 FOR USA,CAN
*	39	319-339	SWITCH (1P SCREW TYPE) W/LOCK	1 FOR GBR (110V)
*	39	320-195	SWITCH (1P SCREW TYPE) W/LOCK	1 FOR AUS,NZL,EUROPE
40	984-750	TAPPING SCREW (W/FLANGE) D4X16	2	

ELECTRIC TOOL PARTS LIST

DRILL

2001·8·21

Model D 13VG**(E2)**



PARTS

D 13VG

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	311-959	SPECIAL SCREW (LEFT HAND) M6X23	1	
2	319-527	CHUCK WRENCH 13VLR-J	1	
3	950-288	VINYL BAND	1	
* 4	319-303	DRILL CHUCK 13VLR-J	1	INCLUD.2
* 4	319-304	DRILL CHUCK 13VLRD-N (W/O CHUCK WRENCH)	1	
5	319-346	SPINDLE (A)	1	
6	948-001	RETAINING RING FOR D32 HOLE	1	
7	600-2VV	BALL BEARING 6002VVCMP2L	1	
8	939-544	RETAINING RING FOR D15 SHAFT (10 PCS.)	1	
9	305-701	TAPPING SCREW (W/FLANGE) D5X60	2	
10	319-345	GEAR COVER (A)	1	
11	627-VVM	BALL BEARING 627VVC2PS2L	1	
12	319-305	FINAL GEAR (C)	1	
13	319-548	SECOND PINION (C)	1	
14	319-544	FIRST GEAR	1	
15	606-ZZM	BALL BEARING 606ZZC2PS2L	1	
16	316-458	TAPPING SCREW D5X40 (BLACK)	1	
17	319-344	INNER COVER	1	
18	608-DDM	BALL BEARING 608DDC2PS2L	1	
* 19	360-543U	ARMATURE ASS'Y 110V-120V	1	INCLUD.18,23,24
* 19	360-543E	ARMATURE 220V-230V	1	
* 19	360-543F	ARMATURE 240V	1	
20	319-329	FAN GUIDE	1	
21	981-421	HEX. HD. TAPPING SCREW D4X55	2	
* 22	340-494C	STATOR 120V	1	
* 22	340-504E	STATOR 230V-240V	1	
23	982-631	WASHER (A)	1	
24	608-VVM	BALL BEARING 608VVC2PS2L	1	
25	319-328	HOUSING	1	
26		NAME PLATE	1	
27	319-331	HANDLE (B)	1	
28	303-694	TAPPING SCREW (W/FLANGE) D4X35	2	
29	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	1	
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31	319-337	SCREW (PLASTIC TIE) D4X25	2	
32		HITACHI LABEL	1	
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* 37	320-196	CHOKE COIL (BROWN) 220V-240V	1	FOR AUS,NZL,EUROPE
38	316-166	PUSHING BUTTON	1	
* 39	319-302	SWITCH (1P SCREW TYPE) W/LOCK	1	FOR USA,CAN
* 39	320-195	SWITCH (1P SCREW TYPE) W/LOCK	1	FOR AUS,NZL,EUROPE
40	984-750	TAPPING SCREW (W/FLANGE) D4X16	2	
41	937-631	CORD CLIP	1	
42	981-373	TUBE (D)	2	FOR CORD
43	953-327	CORD ARMOR D8.8	1	FOR CORD
* 44	500-240Z	CORD	1	(CORD ARMOR D8.8) FOR USA,CAN

