

MODELS

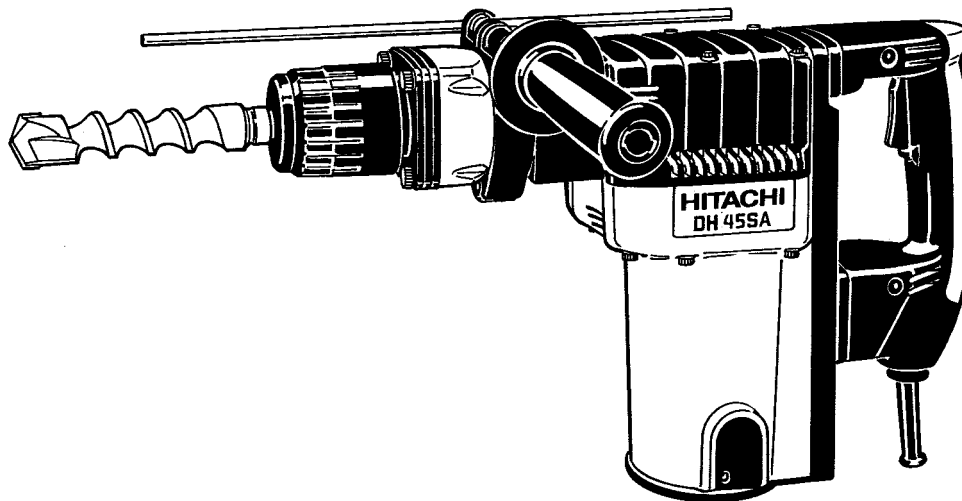
**DH 45SA**

**HITACHI**  
**POWER TOOLS**

**HAMMER DRILL**  
**DH 45SA**

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

**D**



LIST No. E457

Apr. 2000

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

**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 Hammer Drill, Model DH 45SA

## 2. MARKETING OBJECTIVE

There are four shank types in the 40 – 50 mm market.

(1) Hexagon (13 mm ), (2) Hexagon (19 mm-Kango-), (3) SDS max, (4) Spline

The market tendency shows growth of the SDS max shank share, however, the hexagon (13 mm) shank retains its No. 1 share in many markets because of economical accessory prices and compatibility with customer's existing tools and accessories. Recently, demand for bigger dia. hole drilling is increasing year by year for computer cable wiring and anchoring for earthquake-proof reinforcement work.

To meet market demand for a powerful, larger capacity Hammer Drill with hexagon (13 mm) shank, the Model DH 45SA was developed as an advanced version of Model DH 40SA/YB.

The key features are as follows:

- ① High performance, fast drilling speed: 80 % faster (at maximum) than DH 40SA/YB
- ② Less fatigue, comfortable operation using the soft-grip & shock-absorbing handle

Other features (grease-packed lubrication, ergonomic exterior design)

## 3. APPLICATIONS

- Concrete drilling
- Drilling anchor bolt holes
- Crushing, chiseling, grooving, edging, cutting, stripping, compacting/tamping and roughing concrete surfaces

[Applicable examples]

- Air conditioning ..... Installation of air conditioners and water coolers
- Piping and wiring ..... Electric, gas and water supply work
- Electric fixtures ..... Installation of electrical and lighting fixtures
- Sanitary facilities..... Sanitary plumbing
- Interior finishing ..... Installation of seats, display counters, ducts and interior decoration
- Other building, construction and repair work

#### 4. SELLING POINTS

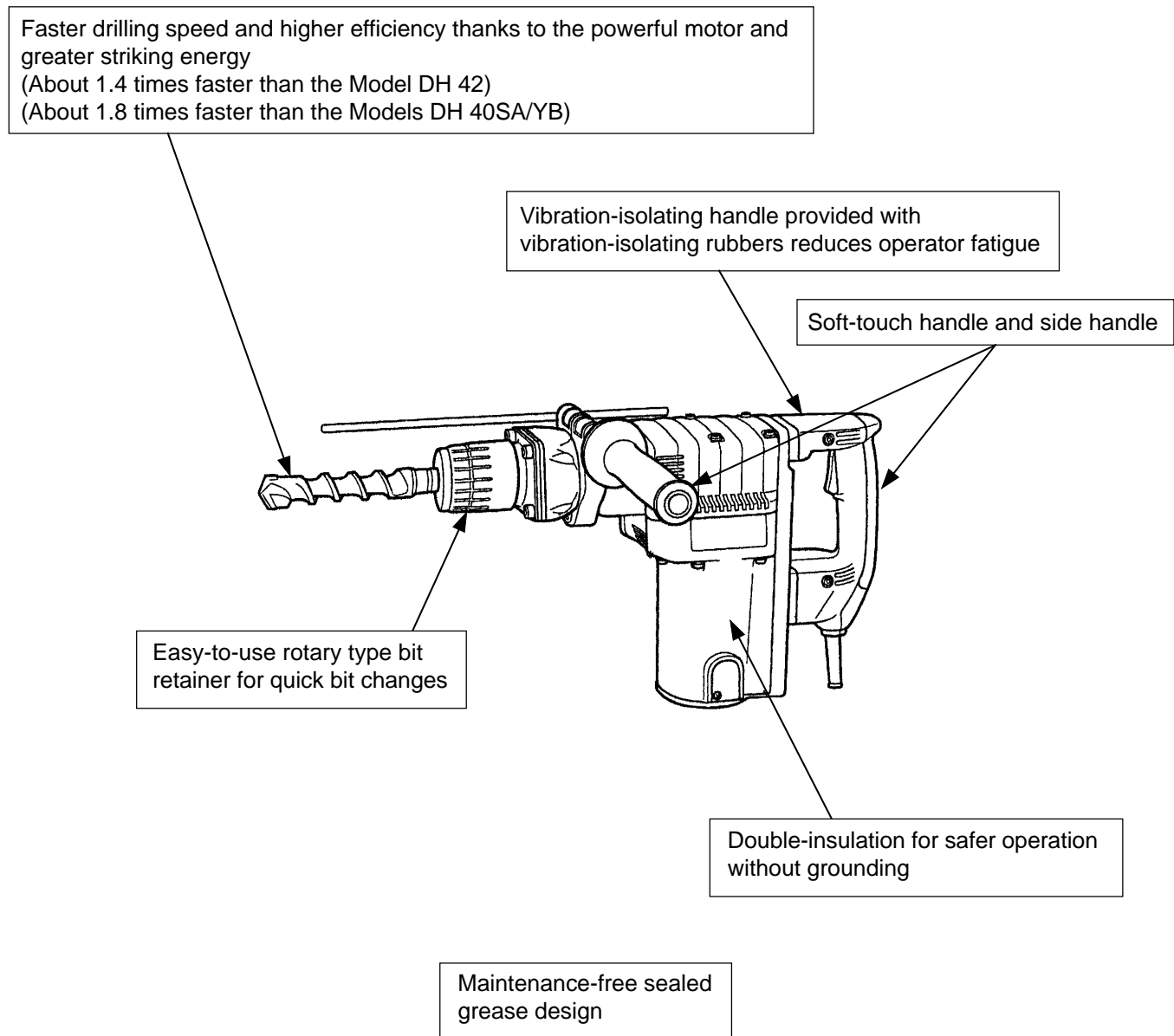


Fig. 1

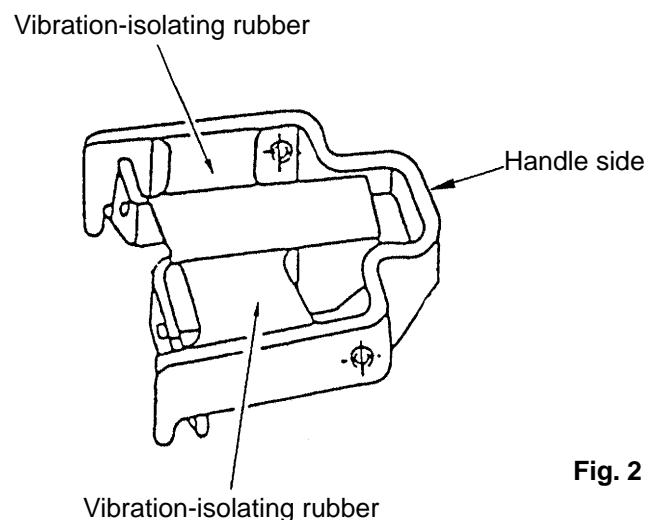
## 4-1. Selling Point Descriptions

### 4-1-1. Faster drilling speed

The drilling speed is 40 % faster than that of the Model DH 42, as the Model DH 45SA has greater striking energy owing to the powerful motor and the total optimization of the rotation speed, striking frequency and the weight of the striker.

### 4-1-2. Vibration-isolating handle reduces operator fatigue

The two vibration-isolating rubbers provided between the handle and the crank case, and also between the handle and the housing efficiently absorb the vibration transmitted from the tool main body to minimize transmission of vibration to the operator's arms.



**Fig. 2**

### 4-1-3. Soft-touch handle and side handle

The double-layer molded handle and side handle consist of a plastic resin base covered with a soft plastic layer to ensure a soft touch and easy grip of the handles.

### 4-1-4. Easy-to-use tool holder

The easy-to-grip tool holder allows the tool to be attached or removed simply by turning the grip.

### 4-1-5. Needle-pin type slip clutch

The Model DH 45SA is equipped with a needle-pin type slip clutch to ensure higher accuracy slip torque and enhanced safety.

## 5. SPECIFICATIONS

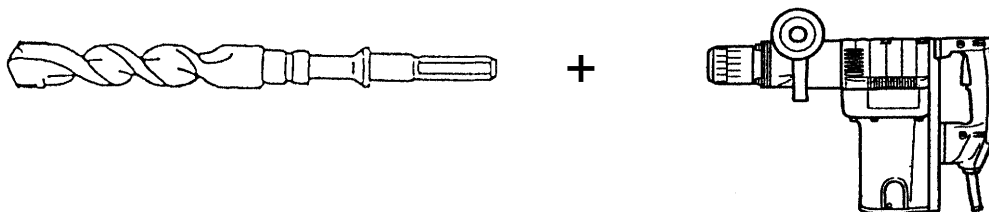
### 5-1. Specifications

Capacity		Drill bit (max. dia.): 45 mm (1-3/4"), core bit (max.dia.): 120 mm (4-3/4")																										
Power source		AC single phase 50 Hz or 60 Hz																										
Voltage, current, input		<table><tr><td>Voltage (V)</td><td>110</td><td>115</td><td>127</td><td>220</td><td>230</td><td>240</td></tr><tr><td>Current (A)</td><td>13.4</td><td>12.8</td><td>11.6</td><td>6.6</td><td>6.4</td><td>6.2</td></tr><tr><td>Input (W)</td><td colspan="6">1400</td></tr></table>						Voltage (V)	110	115	127	220	230	240	Current (A)	13.4	12.8	11.6	6.6	6.4	6.2	Input (W)	1400					
		Voltage (V)	110	115	127	220	230	240																				
		Current (A)	13.4	12.8	11.6	6.6	6.4	6.2																				
Input (W)	1400																											
Rotation speed	No-load	300/min.																										
	Full-load	250/min.																										
Full-load blow		2,500/min.																										
Type of motor		AC single phase commutator motor																										
Type of switch		Trigger switch																										
Type of handle		D-type handle and side handle																										
Insulation structure		Double insulation																										
Enclosure		Material Housing ... Glassfiber reinforced polyamide resin (green) Handle Handle cover } ... Glassfiber reinforced polyamide resin (black, gray) Crank case cover }																										
Dimensions		478 mm x 293 mm x 120 mm (Length x Height x Width) (18-13/16" x 11-9/16" x 4-3/4")																										
Plastic case color		Off-black green																										
Weight	Net*	10.3 kg (22.7 lbs.)																										
	Gross	15.2 kg (33.4 lbs.)																										
Packaging		Corrugated cardboard box																										
Standard accessories		Plastic case ..... 1																										
		Side handle ..... 1																										
		Hex. bar wrench 5 mm ..... 1																										
		Hex. bar wrench 6 mm ..... 1																										
		Hex. bar wrench 8 mm ..... 1																										
		Stopper ..... 1																										
		Grease (A) ..... 1																										
		Dust cap ..... 1																										

\* Net weight excludes cord and side handle.

## 5-2. Optional Accessories

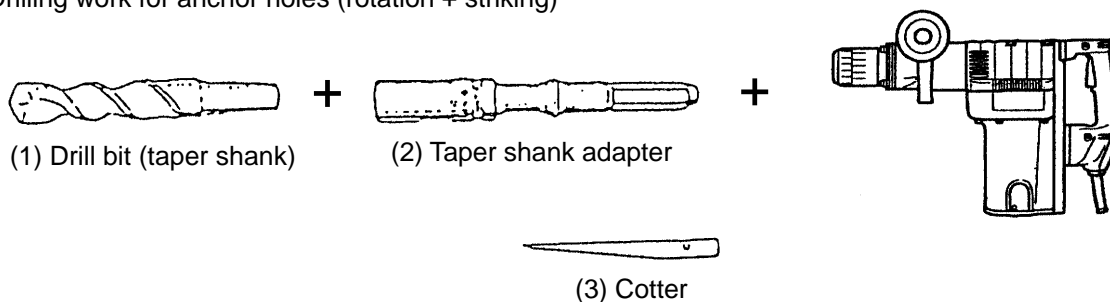
### 1. Drilling work for through-holes (rotation + striking)



#### (1) Drill bit (hexagon shaft)

Overall length (mm) Outer diameter (mm)	280 (11")	400 (15-3/4")	505 (19-7/8")	550 (21-5/8")
	Code No.	Code No.	Code No.	Code No.
16 (5/8")	985721	985720	985722	991330
18 (11/16")	—	—	—	991331
19 (3/4")	985724	985723	985725	991332
20 (25/32")	—	—	991334	991333
22 (7/8")	985727	985726	985728	991335
25 (31/32")	985730	985729	985731	991336
28 (1-7/64")	985733	985732	985734	991337
30 (1-3/16")	—	—	—	991338
32 (1-1/4")	985736	985735	985737	991339
35 (1-3/8")	—	—	—	991340
38 (1-1/2")	985739	985738	985740	991341
40 (1-9/16")	313322	—	—	—

### 2. Drilling work for anchor holes (rotation + striking)

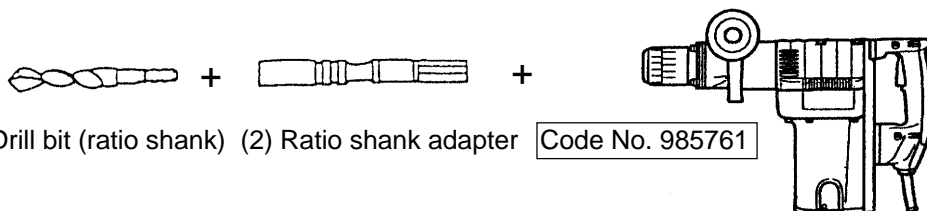


(1) Drill bit (taper shank)		(2) Taper shank adapter		(3) Cotter
Outer diameter (mm)	Code No.	Taper dimension	Code No.	Code No.
11 (7/16")	944460	Morse taper No.1	985750	944477
12.3 (15/32")	944461			
12.7 (1/2")	993038			
14.3 (9/16")	944462			
14.5 (9/16")	944500			
17.5 (11/16")	944463	Morse taper No.2	985751	
21.5 (27/32")	944464			

A-taper	9.7 mm (3/8") x 1/20 Taper (A)	985754	Taper shank adapters for A-taper or B-taper shanks are provided as optional accessories. Taper shank drill bits are not provided.
B-taper	12.9 mm (1/2") x 1/20 Taper (B)	985755	

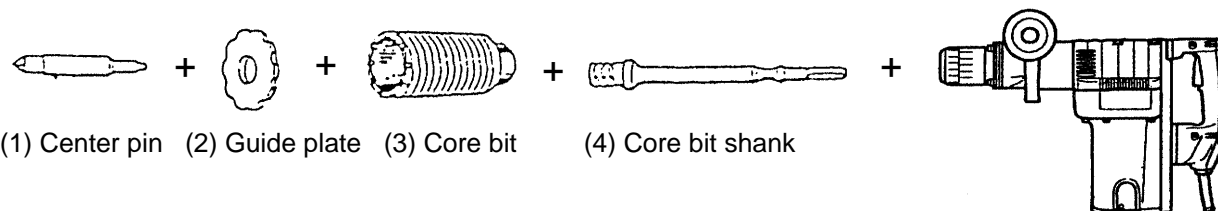
For Australia

K-taper shank adapter	992813
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A ratio shank adapter is provided as an optional accessory, but corresponding drill bits are not provided.

### 3. Boring work for large-dia. holes (rotation + striking)



#### (1) Center pin

- Code No. 956009 for core bits with outer diameter of 32, 35 mm (1-1/4", 1-3/8")
- Code No. 955165 for core bits with outer diameter of 38, 45, 54, 64, 79, 94, 105, 120 mm (1-1/2", 1-25/32", 2-1/8", 2-17/32", 3-1/8", 3-11/16", 4-1/8", 4-3/4")

[Center pin is not used with core bits of 25 mm (31/32") and 29 mm (1-5/32")]

#### (2) Guide plate

Core bits with outer diameter of 32, 35, 38, 45, 54, 64, 79, 105, 120 mm (1-1/4", 1-3/8", 1-1/2", 1-25/32", 2-1/8", 2-17/32", 3-1/8", 3-11/16", 4-1/8", 4-3/4")

[Guide plate is not used with core bits with outer diameter of 25 mm (31/32") and 29 mm (1-5/32")]

#### (3) Core bit

Outer diameter (in.)	Code No.	Outer diameter (in.)	Code No.
25 mm (31/32")	955994	54 mm (2-1/8")	955155
29 mm (1-5/32")	955995	64 mm (2-17/32")	956002
32 mm (1-1/4")	955996	79 mm (3-1/8")	955157
35 mm (1-3/8")	955998	94 mm (3-11/16")	956004
38 mm (1-1/2")	956000	105 mm (4-1/8")	955159
45 mm (1-25/32")	955154	120 mm (4-3/4")	956006

#### (4) Core bit shank

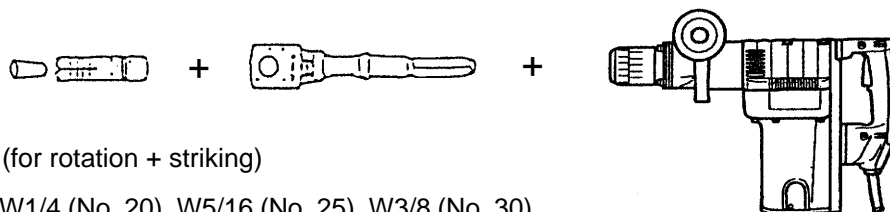
- Code No. 956008 for core bits with outer diameter of 25, 29, 32 and 35 mm (31/32", 1-5/32", 1-1/4" and 1-3/8")
- Code No. 955163 for core bits with outer diameter of 38, 45, 54, 64, 79, 94, 105, 120 mm (1-1/2", 1-25/32", 1-1/8", 1-17/32", 3-11/16", 4-1/8", 4-3/4")



(5) Core bit for efficient drilling

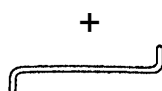
Center pin (C)	Core bit (with guide plate)		Core bit shank
Code No.	Outer diameter (in.)	Code No.	Code No.
903901	65 mm (2-9/16")	992814	992819
	80 mm (3-5/32")	992815	
	90 mm (3-1/2")	992816	
	100 mm (3-15/16")	992817	
	105 mm (4-1/8")	992818	

4. Anchor work for self-drilling anchors (rotation + striking)



(1) Anchor adapter (for rotation + striking)

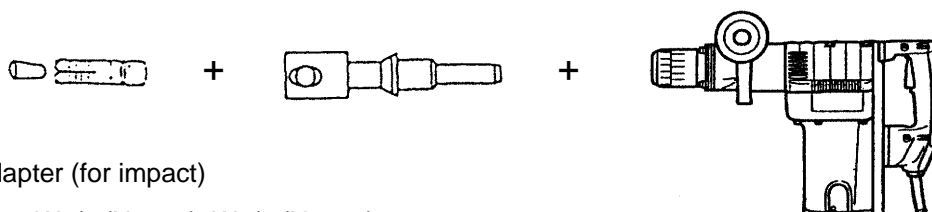
Anchor size W1/4 (No. 20), W5/16 (No. 25), W3/8 (No. 30),  
W1/2 (No. 40), W5/8 (No. 50)



(1) Anchor size	Code No.
W 1/4 (No. 20)	985756
W 5/16 (No. 25)	985757
W 3/8 (No. 30)	985758
W 1/2 (No. 40)	985759
W 5/8 (No. 50)	985760

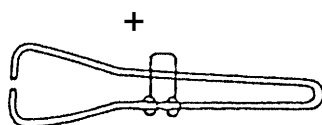
(2) Drift key (Code No. 944574)

5. Anchor work for self-drilling anchors (striking)



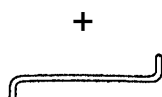
(1) Anchor adapter (for impact)

Anchor size: W3/8 (No. 30), W1/2 (No. 40)  
W5/8 (No.50)



(1) Anchor size	Code No.
W 3/8 (No. 30)	981929
W 1/2 (No. 40)	981930
W 5/8 (No. 50)	981931

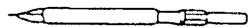
(2) Turning handle (Code No. 944573)



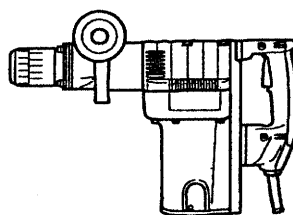
(3) Drift key (Code No. 944574)

## 6. Demolition work (striking)

### (1) Bull point



+

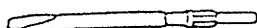


Overall length: 280 mm (11"), 450 mm (17-3/4")

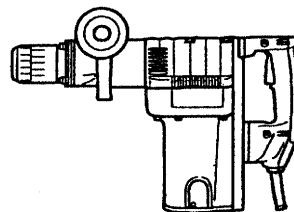
Overall length	Code No.
280 mm	981922
450 mm	981923

## 7. Grooving and edging work (striking)

### (1) Cold chisel



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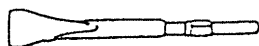


Overall length: 280 mm (11"), 450 mm (17-3/4")

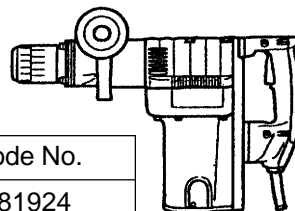
Overall length	Code No.
280 mm	981925
450 mm	981926

## 8. Cutting and stripping work (asphalt cutting, etc.) (striking)

### (1) Cutter



+



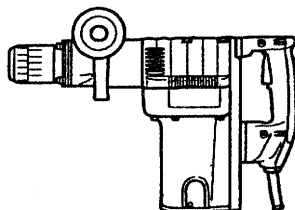
Width	Overall length	Code No.
45 mm (2")	280 mm (11")	981924

## 9. Digging work (substitute pick-ax) (striking)

### (1) Scoop



+



Overall length	Code No.
405 mm (16")	956126

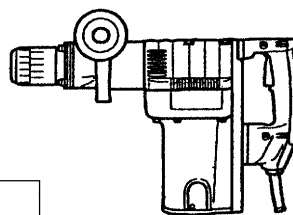
#### 10. Roughing surface work (striking)



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(1) Bushing tool

Code No. 955183

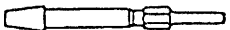
(2) Shank

Overall length	Code No.
250 mm (10")	955186

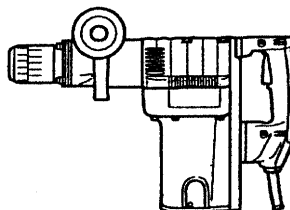
#### 11. Tamping work (striking)



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(1) Rammer

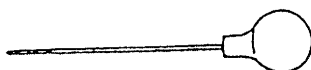
Code No. 955181

O.D. 140 mm (5-33/64")

(2) Shank

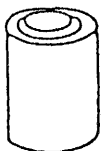
Overall length	Code No.
250 mm (10")	955186

#### 12. Syringe (for chip removal)



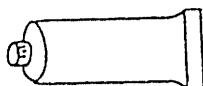
Code No. 944575

#### 13. Impact drill grease



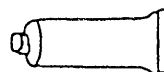
500 g Can

Code No. 980927



70 g Tube

Code No. 308471



30 g Tube

Code No. 981840

Note: Code numbers listed above are subject to change without notice. Please refer to periodic Technical News Bulletins for updates.

## 6. COMPARISONS WITH SIMILAR PRODUCTS

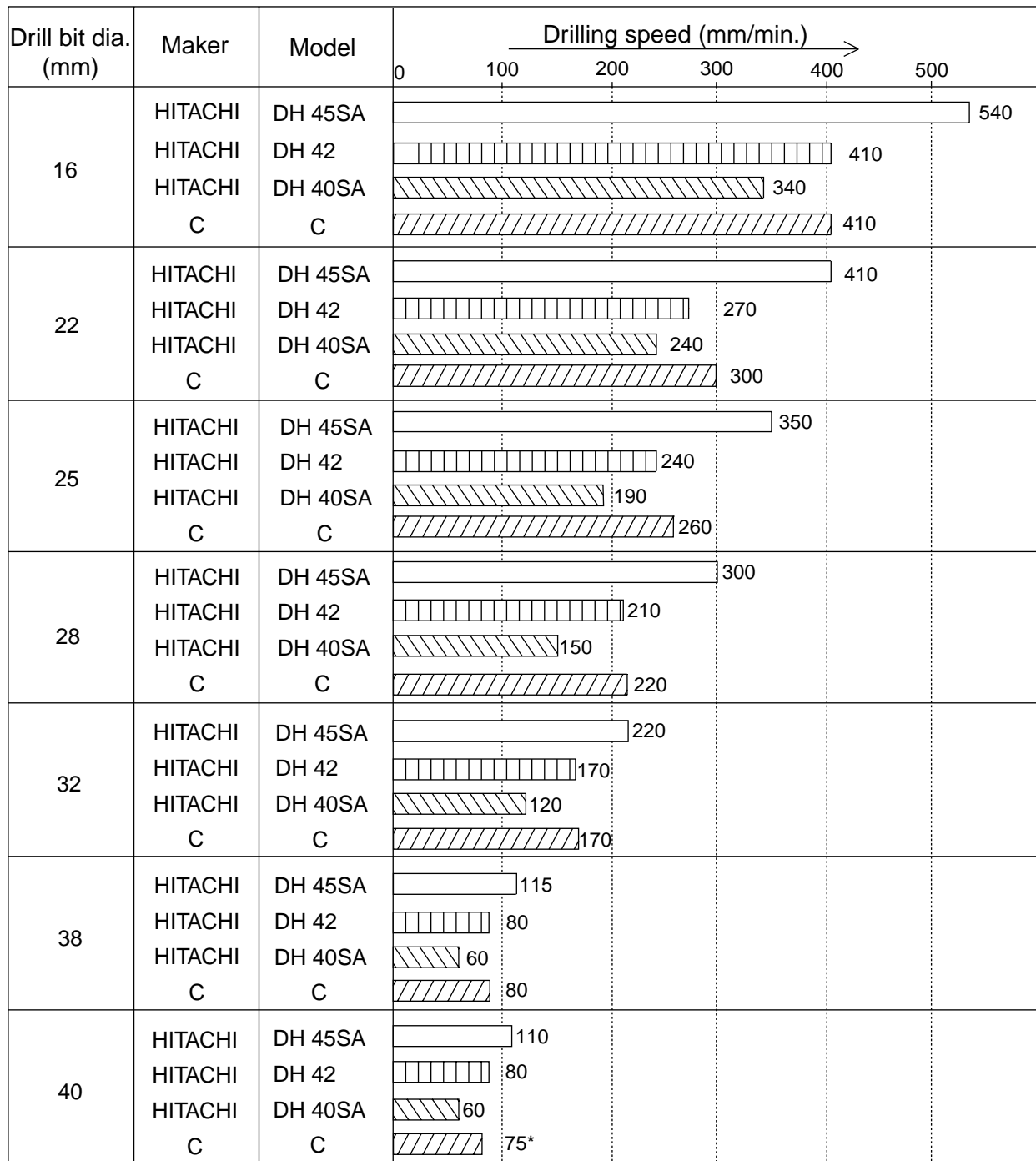
### 6-1. Specification Comparisons

Item		Maker Model	HITACHI DH 45SA	HITACHI DH 42	HITACHI DH 40SA	C
Capacity	Drill bit dia. (mm)		45 (1-3/4")	40 (1-9/16")	40 (1-9/16")	38 (1-1/2")
	Core bit dia. (mm)		120 (4-3/4")	120 (4-3/4")	105 (4-1/8")	120 (4-3/4")
Input (W)			1400	1140	950	1150
Rotation speed	No-load (/min.)		300	370	360	360
	Full-load (/min.)		250	290	300	260
Full-load blow (/min.)			2500	3100	2800	2750
Weight listed on the catalog (kg)*			9.8 (21.6 lbs.)	8 (17.6 lbs.)	6.5 (14.3 lbs.)	8 (17.6 lbs.)
Actual weight (kg)*			10.3 (22.7 lbs.)	8 (17.6 lbs.)	6.9 (15.2 lbs.)	8 (17.6 lbs.)
Dimensions	Overall length (mm)		478 (18-13/16")	415 (16-11/32")	425 (16-3/4")	480 (18-29/32")
	Height (mm)		293 (11-9/16")	255 (10-1/32")	252 (9-15/16")	260 (10-1/4")
	Width (mm)		120 (4-3/4")	102 (4-1/32")	103 (4-1/16")	115 (4-17/32")
Insulation structure			Double insulation	Single insulation	Double insulation	Double insulation
Full-load vibration level (dB)			121	119	118	118
No-load sound pressure level (dB/A)			87	88	87	88

\*Weight excludes cord and side handle.

## 6-2. Drilling Speed Comparison

Drilling speed varies considerably depending on the work conditions. Use the factory test results shown in Fig. 3 as a reference, for comparison purposes only.



\*: Note that the data marked with asterisk is the test result using a drill bit which is beyond the tool's rated capacity. Use the above data as a reference, for comparison purposes only.

**Fig.3**

[Test conditions]

Posture : Downward drilling

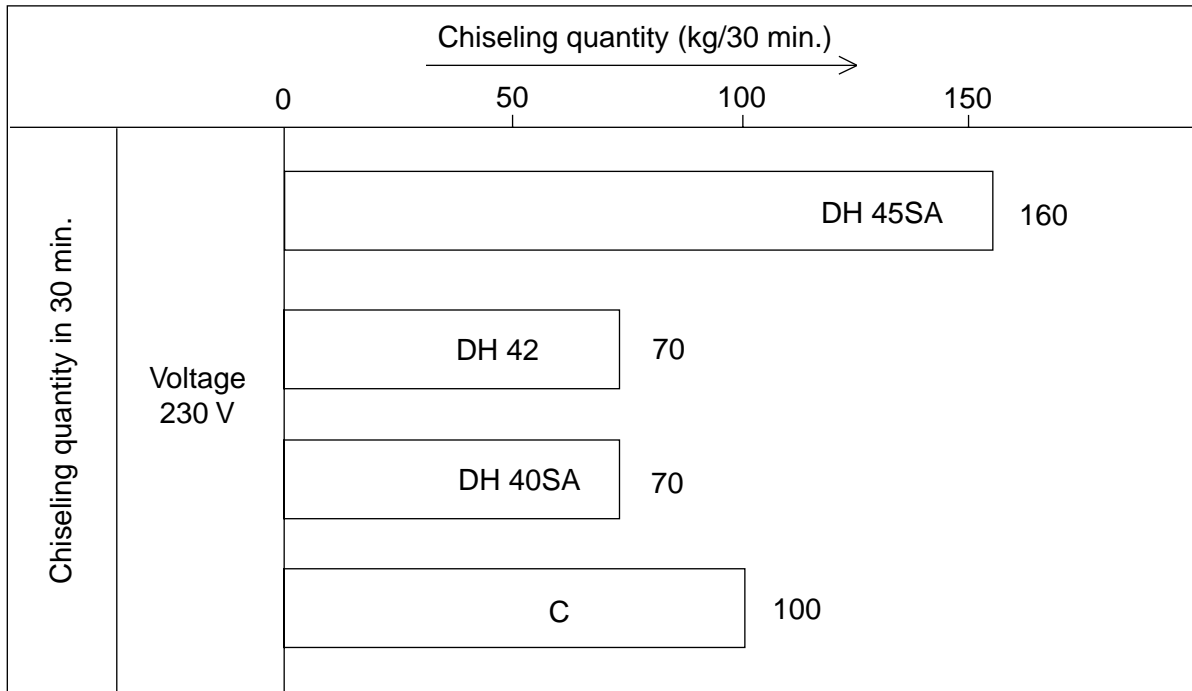
Pressure force : 98 N (10 kgf)

Test material : Concrete panel with a compression strength of  $23.5 \times 10^6 \text{ N/m}^2$  (240 kgf/cm<sup>2</sup>)

Drill bit size : 13 mm hexagon shank bit

### 6-3. Chiseling Performance

Chiseling performance varies considerably depending on the work conditions. Use these factory test results shown in Fig. 4 as a reference, for comparison purposes only.



**Fig. 4**

[Test conditions]

Posture : Downward chiseling

Test material : Concrete panel with a compression strength of  $23.5 \times 10^6 \text{ N/m}^2$  (240 kgf/cm<sup>2</sup>)

Bull point size : Bull point of 280 mm

## **7. PRECAUTIONS IN SALES PROMOTION**

In the interest of promoting the safest and most efficient use of the Model DH 45SA Hammer Drill by all of our customers, it is very important that at the time of sale 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 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 Hammer Drill are listed in the Handling Instructions to enhance the safe, efficient use of the tool by the customer. Salespersons must be thoroughly familiar with the contents of the Handling Instructions to be able to offer appropriate guidance to the customer during sales promotion.

## **8. REFERENCES**

### **8-1. Grease Replacement Procedures**

The electro-pneumatic hammering section and gear change section each use different kinds of grease. It is not necessary to replenish the grease unless the tool is disassembled for repair or there is grease leakage due to a damaged seal.

A special grease is used for the hammering section. To change the grease in the hammering section (cylinder case and crank case), carefully wipe the old grease off the parts, and re-lube with 30 g in the cylinder case and 75 g in the crank case (on the connecting rod side). Take care not to overfill with grease as an excessive amount of grease can cause hammering failure.

The gear change section (in the gear cover) uses grease No. 29 for power tools. Apply 40 g to the gear cover and the gear portion in the crank case, and 20 g between the washer (A) of the slip clutch and the crank case. Do not use the special grease used for the hammering section, or it will leak to the motor parts resulting in failure of the tool.

### **8-2. O-Ring Replacement**

The O-ring (attached to the striker and piston) plays an important role to ensure air tightness. Despite its prolonged service life due to a special rubber material, it will inevitably wear out. Early replacement, preferably once every six months, is recommended.

### 8-3. Structure of the DH 45SA Hammer Drill

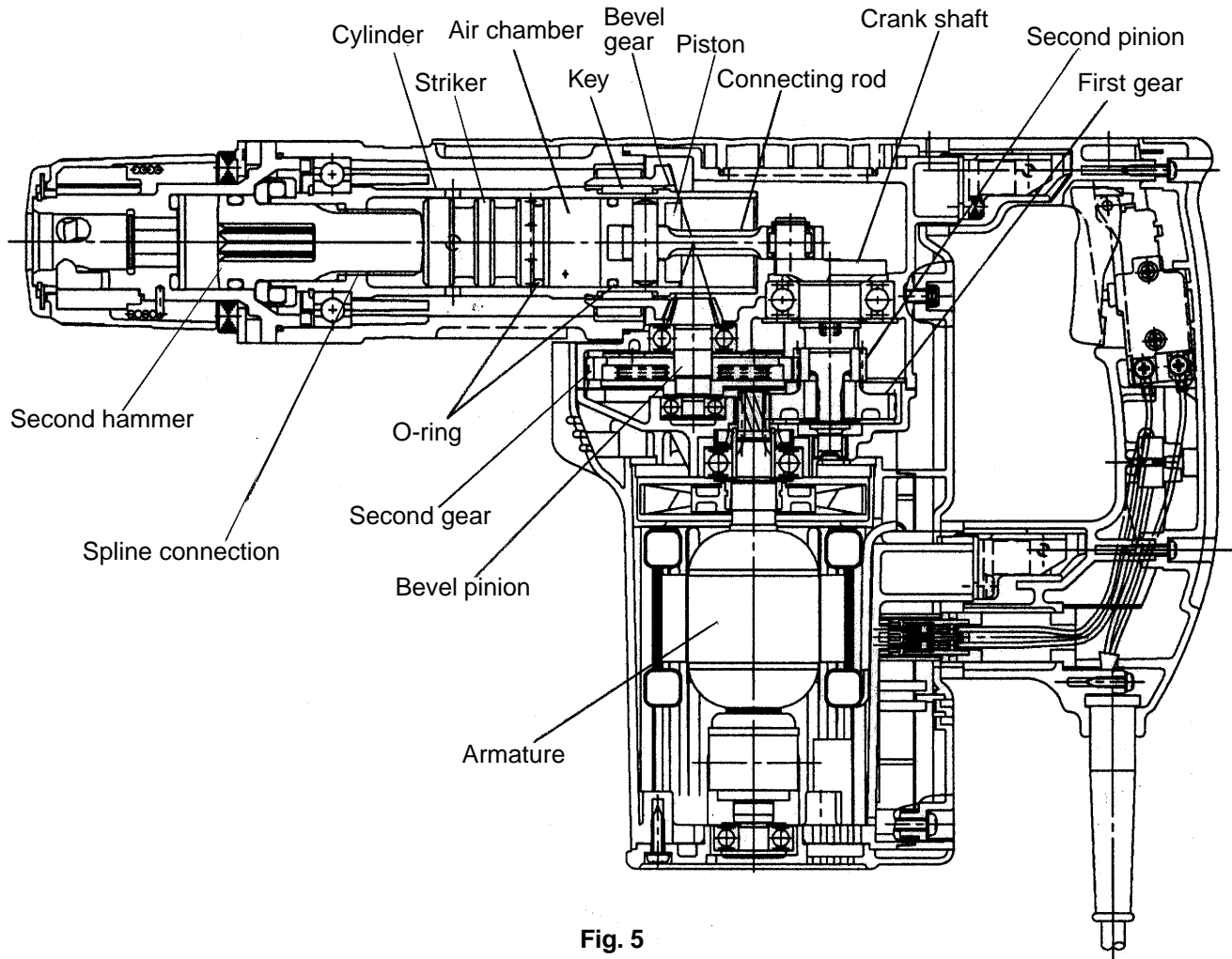


Fig. 5

- Rotation transmission

Rotation transmission is described with reference to Fig. 5. The gear arrangement of the DH 45SA has the armature shaft positioned between the crank shaft and the bevel pinion shaft. Rotation of the armature shaft is transmitted to the second gear through the first gear of the crank shaft and the second pinion. Then the rotation is transmitted from the second gear through the slip mechanism disposed between the second gear and the bevel pinion shaft to turn the bevel gear. The latter is keyed to the cylinder to rotate together. Cylinder rotation is transmitted through the spline connection to the second hammer. Rotation is then transmitted to the drill bit which is fitted into the hexagonal hole of the second hammer.

- Hammering action

Armature rotation is transmitted to the crank and the connecting rod to reciprocally move the piston within the cylinder. Air pressure developed between the piston and the striker changes as the piston moves. This causes the striker to continuously hit the end face of the second hammer. Since the striker is moved under air pressure, a certain air cushioning effect absorbs the striking shock.

If there is any leakage from the air chamber, the air cushioning effect becomes insufficient, resulting in an incomplete shock absorbing effect. This is why the O-rings (attached to the striker and piston) for air tightness are so important.



- Arrangement against idle hammering

The DH 45SA is provided with an arrangement against idle hammering similar to that of the previous DH 40SA. When the drill bit or bull point is moved off the concrete material, the second hammer is shifted forward as indicated in Fig. 6 to change the striking position of the striker. This causes the air hole to open so that air pressure within the air chamber no longer changes even with movement of the piston, bringing the hammering action to a stop.

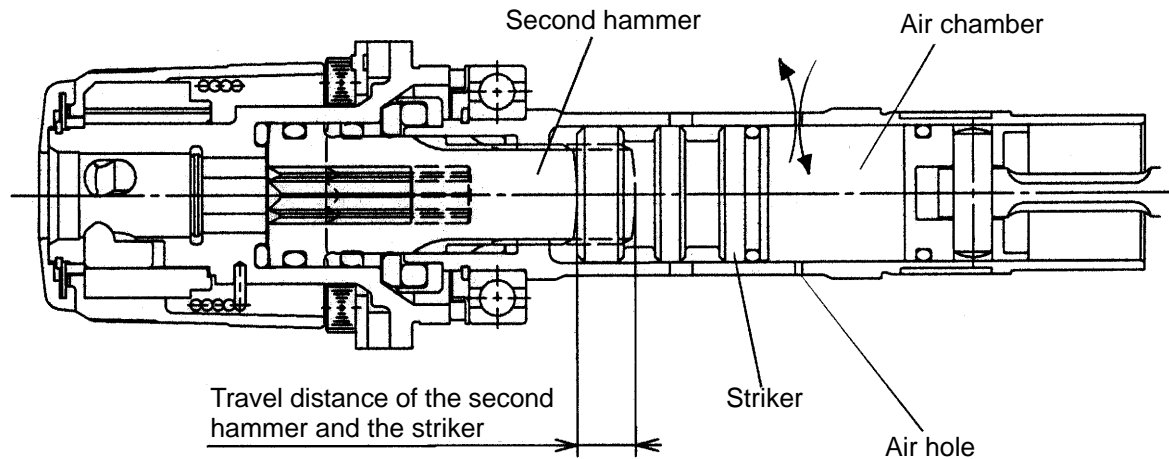


Fig. 6

- Slip mechanism

The slip mechanism structure is described below with reference to Fig. 7. The bevel pinion and the gear holder are coupled together by the key and press-fitting. Spring (C) and needle pins are housed in elongated grooves of the gear holder. The needle pin is pressed against the inner face of the second gear by spring (C) to allow idle rotation of the second gear relative to the gear holder. When an excess torque is exerted on the bevel pinion shaft, the needle pin is raised upon the projection of the second gear against the load of spring (C) to allow idle rotation of the second gear. With this arrangement, the clutch slips when a violent torque is applied to the tool as with the drill bit contacting steel wire within the concrete, protecting the operator from jerking or being violently thrown around.

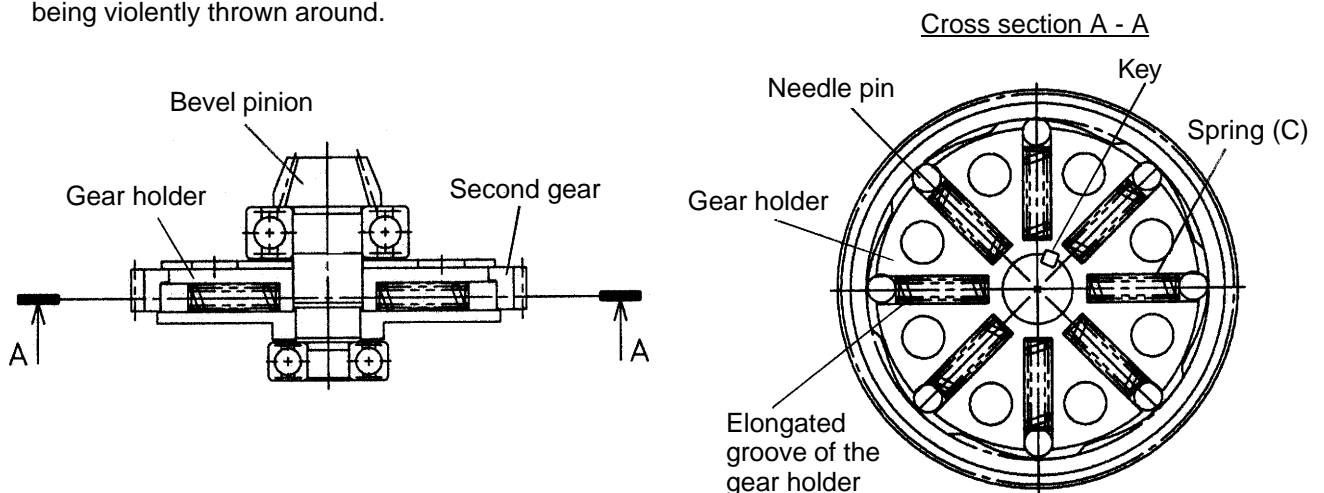
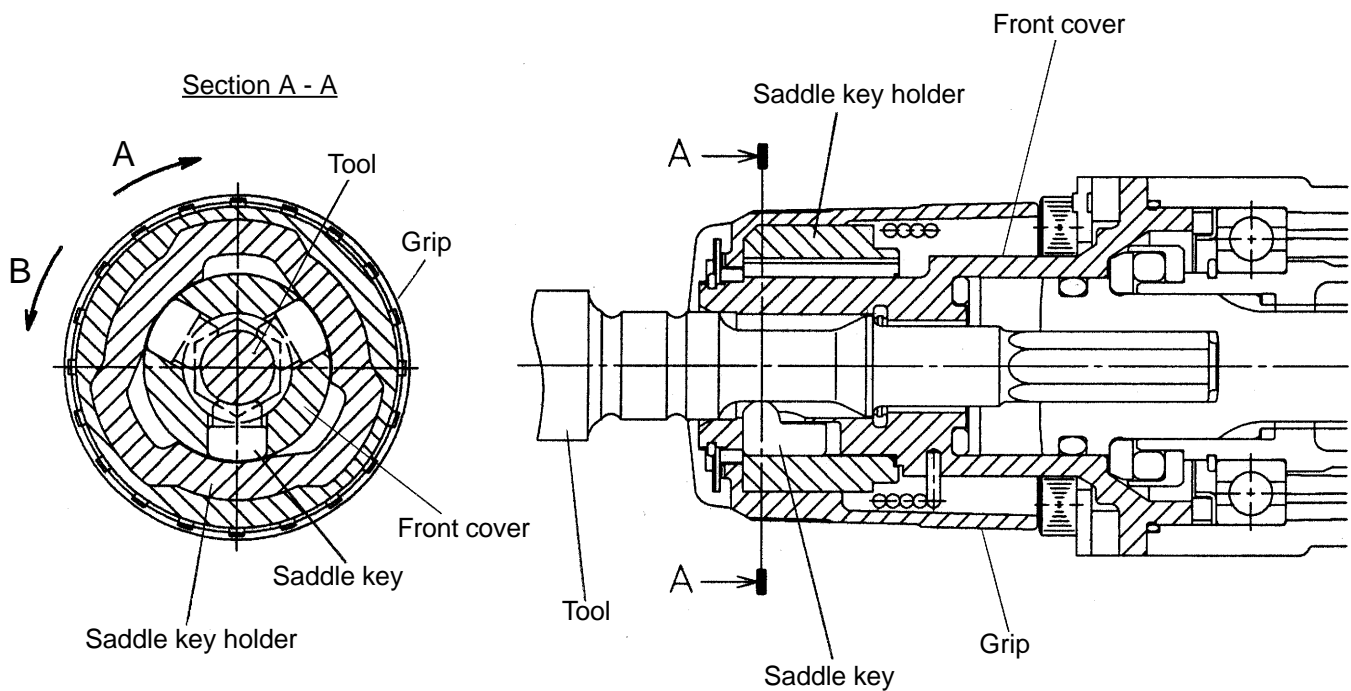


Fig. 7

- Tool holder

The tool holder is described below with reference to Fig. 8. As shown, three saddle keys are received in the three respective elongated holes equidistantly located at the front cover. The cross sectional view A-A illustrates the mode in which an end attachment tool is held in position. With the grip turned in direction A, the saddle keys are shifted out of the holes to unlock the attachment tool from the tool body.

When fitting the attachment tool, turn the grip fully in the A direction, insert the tool shank deeply until it hits against the hole end. Then, turning the grip fully in B direction causes the attachment tool to be securely held in position. In contrast to the previous knob-retaining structure, the DH 45SA uses three saddle keys locked by turning the grip, which are able to securely hold the tool with a minimized deflection of the drill bit or other attachment tool.



**Fig. 8**

- Wiring connections

The wiring connections are shown in Fig. 9. The Model DH 45SA adopts a plug-in module type wiring system consisting of plug (A) ass'y and plug (B) ass'y. The plug (A) ass'y connected with the internal wires of the stator is fitted into the housing. The plug (B) ass'y is fitted into the handle section through the plug holder and is connected with the switch terminal and cord. Wiring connection is completed when the housing section, the handle and handle cover section are all assembled and then fastened together with screws. With such a wiring structure, assembling and disassembling procedures associated with wiring connection have been largely simplified over previous models.

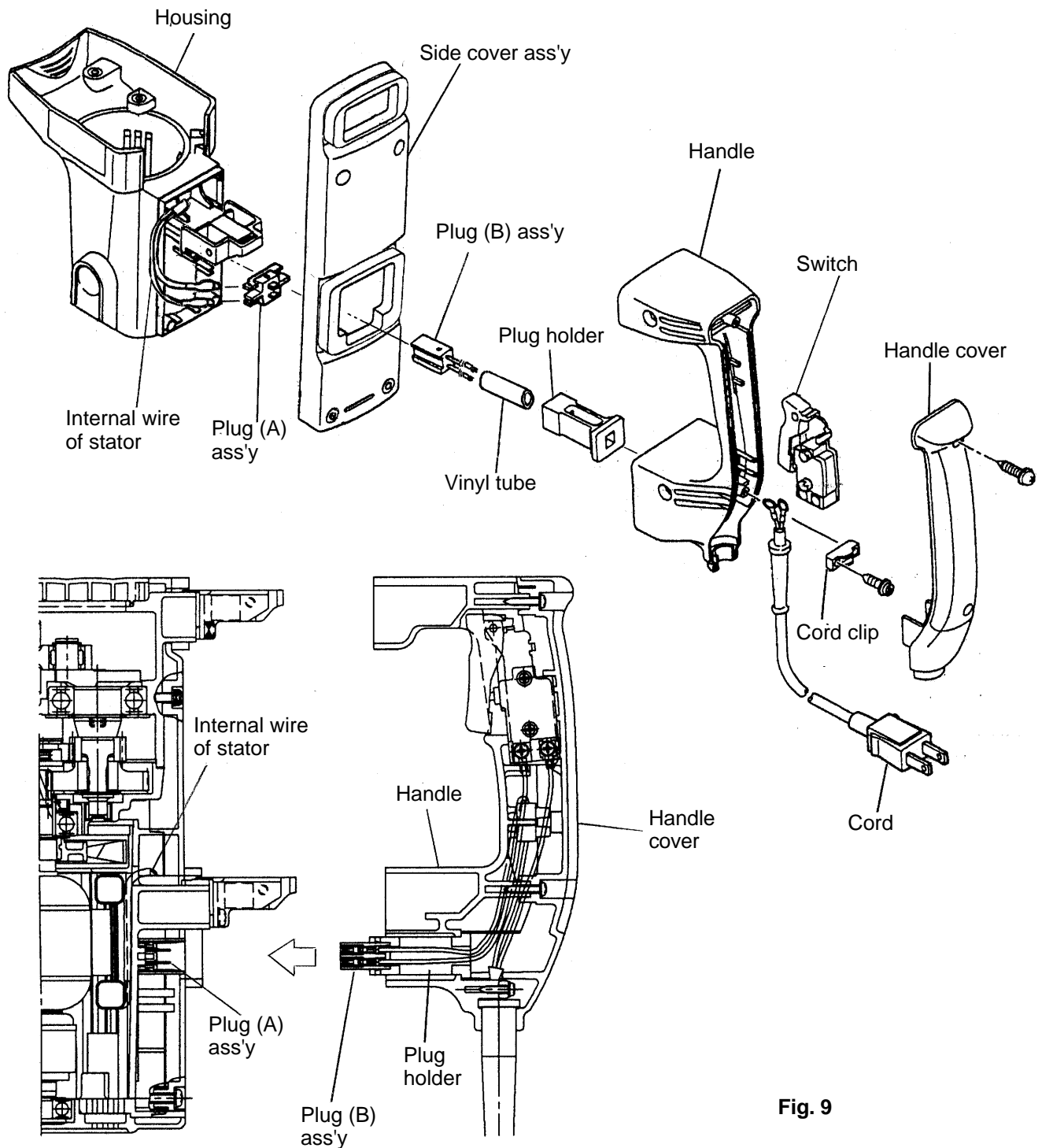


Fig. 9

- Handle and side handle

The double-layer handle structure consists of a plastic base reinforced with glass fiber and an outer layer of soft resin molded together with the base.

The side handle consists of a steel nut in the base and a hard plastic and a soft resin outer cover molded together to form the handle. The DH 45SA thus uses the newly designed soft-touch handle and side handle for easier handling of the tool.

- Fluid-tight, dust-proof structure

The crank case and cylinder case are tightly sealed with three O-rings, an oil seal and a rubber seal as indicated in Fig. 10. This prevents grease from leaking from inside as well as dust particles from getting inside the tool.

The tool holder is also protected from dust with a rubber front cap and a dust cover.

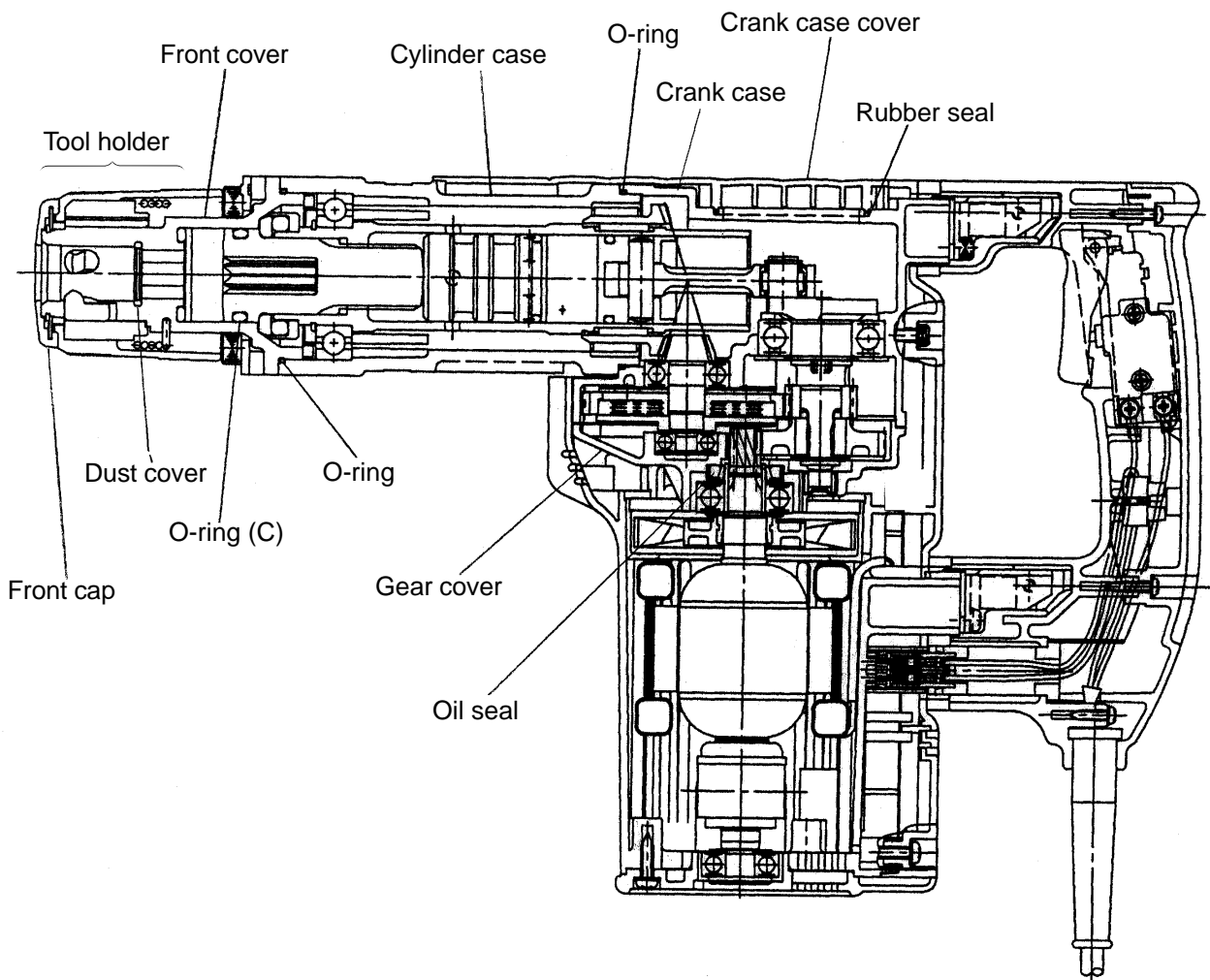


Fig. 10

## 9. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

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

### 9-1. Disassembly

#### (1) Piston and striker

Remove the four Nylock Bolts (W/Flange) M5 x 16 **[33]** at the Crank Case Cover Ass'y **[35]**, and remove the latter. Remove the four Nylock Bolt (W/Flange) M6 x 35 **[61]** at the Cylinder Case **[60]** and pull the cylinder case out of the Crank Case **[37]**. Remove the Retaining Ring for D12 Shaft **[41]** and remove the Connecting Rod Ass'y **[70]** from the Crank Shaft **[42]**. Pull out the Piston Pin **[72]** and remove the Piston **[69]**.

Pull out the Striker **[67]** by hammering the cylinder case with a plastic hammer. If it is difficult to pull out the striker, push the removed piston together with the connecting rod ass'y into the Cylinder **[65]** and quickly pull them out, and the striker will jump out together with the piston.

#### (2) Gear in the crank case

Remove the Retaining Ring for D17 Shaft **[49]** and the Thrust Washer **[48]** from the Crank Shaft **[42]**. Pull out the First Gear **[47]** with a bearing puller. Remove the Feather Key 5 x 5 x 15 **[31]**. Remove the Slip Clutch Ass'y **[30]** by hammering the end surface of the Crank Case **[37]** from the Gear Cover **[52]** side with a plastic hammer. Remove the two Nylock Hex. Socket Hd. Bolts M5 x 16 **[40]** from the Bearing Cover **[45]** and pull out the Crank Shaft **[42]** from the gear cover side.

The slip clutch ass'y can be removed in the following procedure. First pull out the Ball Bearing 629VVC2PS2L **[29]** with a bearing puller, support Washer (A) **[23]** on a sleeve as shown in Fig. 11 and release the Bevel Pinion **[19]** from the press-fitting by pushing it from the Spacer **[28]** side using a hand press. When removing the Gear Holder **[24]** from the Second Gear **[27]**, it is recommended to keep them inside a plastic bag during disassembly to prevent Springs (C) **[25]** and Needle Pins D6 x 6 **[26]** from scattering.

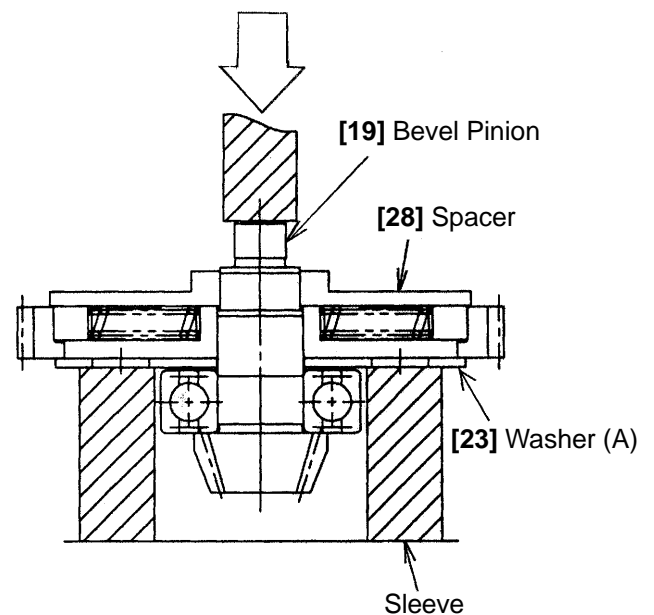


Fig. 11

#### (3) Tool holder

Remove the Front Cap **[1]** from Front Washer (A) **[3]** and remove the Retaining Ring D35 **[2]**. Then, Front Washer (A) **[3]**, Damper Ring **[4]**, Grip **[5]**, Saddle Key Holder **[7]**, Retainer Spring **[8]** and three Saddle Keys **[6]** can be removed. Remove the Dust Cover **[13]** from the Front Cover **[14]** using the spring hook J-201 (Code No. 970977).

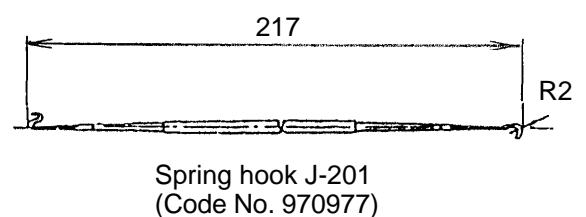


Fig. 12

## 9-2. Reassembly

Perform reassembly generally in reverse order of disassembly, following the precautions given below.

### (1) Lubrication

Apply special grease (for hammer and hammer drill) to the following portions.

- Inner circumference of the Connecting Rod Ass'y [70]
- O-Ring (FPM710) [68] attached to the Striker [67] and the Piston [69]
- Inner lip portion of the Oil Seal (FPM707) [77]

Fill 75 g of special grease in the Crank Case [37] of the connecting rod side and 30 g in the cylinder case.

Apply power tool grease No. 29 to the following portions.

- Needle Bearing (M661) [51]
- Armature pinion

Fill 40 g of power tool grease No. 29 in the gear section of the gear cover and the crank case, and 20 g between the slip clutch (washer (A) side) and the crank case.

### (2) Oil seal and others

Handle with care not to damage the Rubber Seal [36] of the crank case, O-Rings (FPM 710) [68] in the piston and the striker, Oil Seal (FPM 707) [77] in the Gear Cover [52], O-Ring (D) [62] in the cylinder case, O-Ring [17] in the second hammer and the O-Ring (1AS-60) [16] in the Front Cover [14].

### (3) Slip clutch ass'y

Press-fit the Ball Bearing 6202DDCMPS2L [21] to the Bevel Pinion [19] and insert the Washer [22] and then Washer (A) [23] to the bevel pinion. After mounting the Feather Key 3 x 3 x 8 [20] in the bevel pinion, press-fit the Gear Holder [24] to the bevel pinion. Then, apply power tool grease No. 29 to the inner circumference of the Second Gear [27] and mount it on the outer circumference of the gear holder. Place the Needle Pin D6 x 6 [26] without inclination as shown in Fig. 13, then press in Spring (C) [25]. Then press-fit the Spacer [28] and then Ball Bearing 629VVC2PS2L [29] to the bevel pinion.

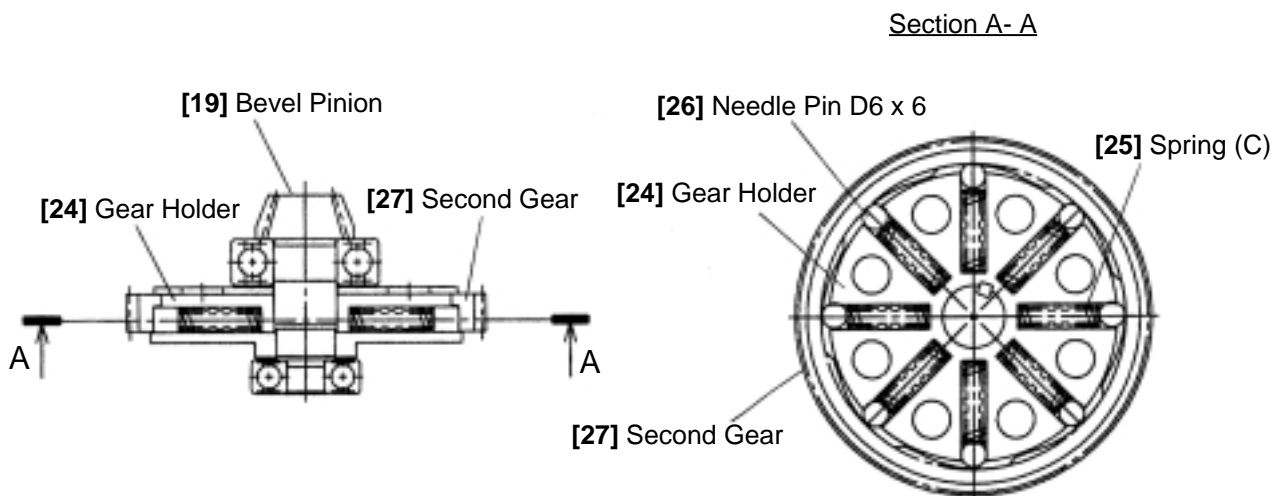


Fig. 13

#### (4) Tool holder

Insert the bent portion of the Retainer Spring [8] into the 3-mm dia. side hole of the Front Cover [14]. Apply power tool grease No.29 to the three slots of the front cover and insert the three Saddle Keys [6] into the slots each. Insert the other bent portion of the retainer spring into the 3-mm dia. hole of the Saddle Key Holder [7] and mount the Grip [5] to the saddle key holder aligning the alignment mark as shown below. Turn the grip about 60° clockwise, viewing from the tip, and push it in. The claws of the front cover are then engaged with the claws of the saddle key holder and the tool holder is in a tool secured status. Hold the grip securely to prevent the grip from moving upward. Mount the Damper Ring [4] and then Front Washer (A) [3] to the front cover. Mount the Retaining Ring D35 [2] to the front cover and then mount the Front Cap [1] to Front Washer (A) [3] to complete reassembly. Check that the tool holder turns smoothly and the mark on the grip is always positioned in the place shown in "Tool-secured status" below.

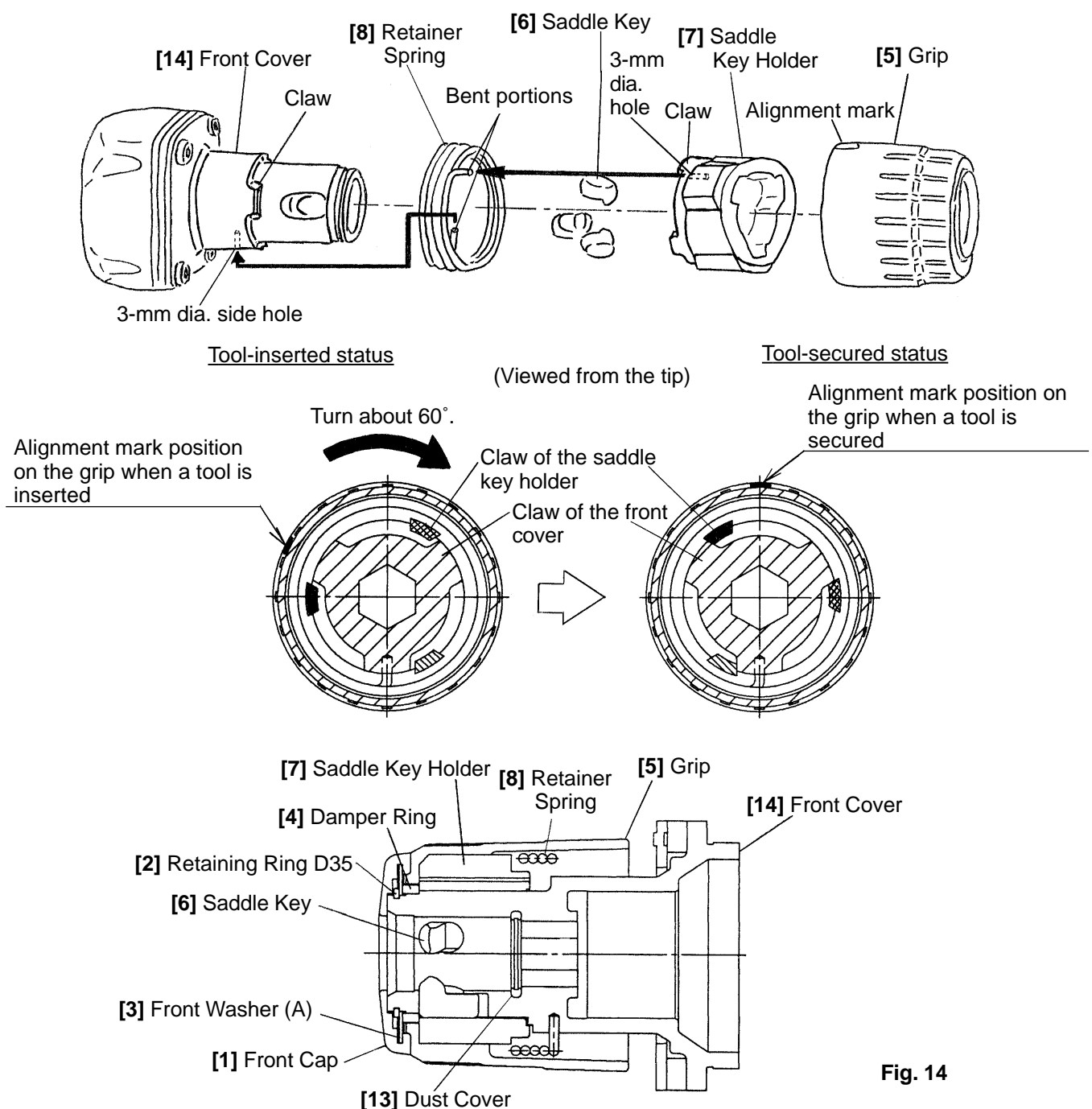
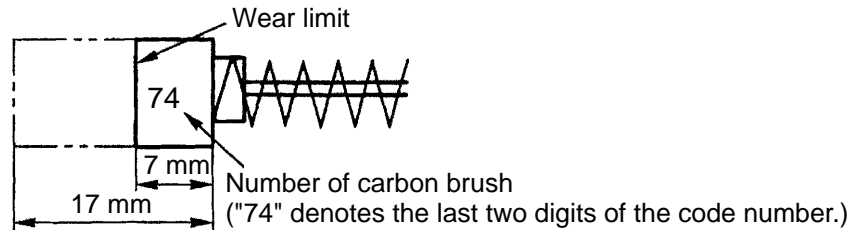


Fig. 14

#### (5) Carbon brush inspection

The motor employs auto-stop carbon brushes. When the carbon brushes near their wear limit, the current to the motor is automatically interrupted and the motor stops. At that time, replace both carbon brushes with new ones which have the same carbon brush number "74" as shown in Fig. 15. In addition, always keep the carbon brushes clean and ensure that they slide freely within the brush holders.



**Fig. 15**

#### 9-3. Screw Lock TB 1401

Apply thread lock compound to all the M5 hexagon socket head bolts (except for M8 for front cover mounting and M6 hexagon socket head bolts for cylinder case mounting, which are special bolts to be treated as service parts).

(Note) Be sure to apply thread lock compound to the threads during reassembly, as the bolts loosened with vibrations may cause damage to the tool body.

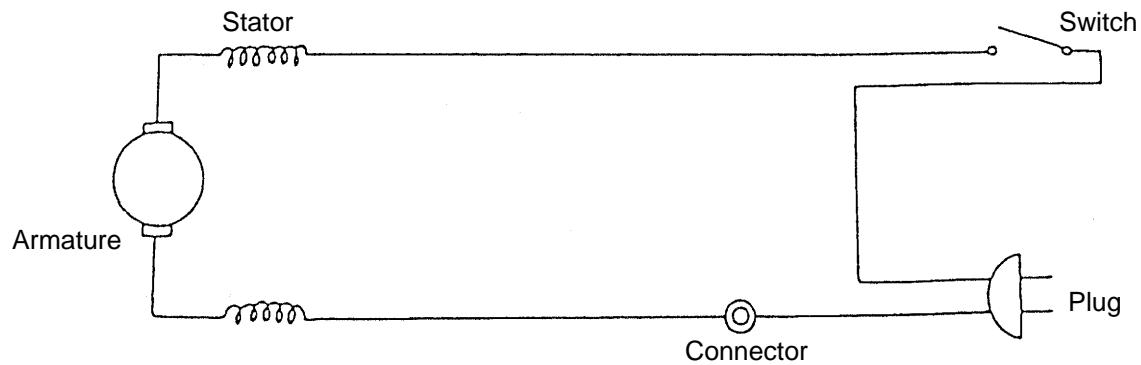
#### 9-4. Tightening Torque

M5 hexagon socket head bolt .....	$7.9^{+2.0}_0 \text{ N}\cdot\text{m}$ ( $80^{+20}_0 \text{ kgf}\cdot\text{cm}$ , $69.4^{+17.4}_0 \text{ in}\cdot\text{lbs.}$ )
D4 tapping screw .....	$2.0 \pm 0.5 \text{ N}\cdot\text{m}$ ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ , $17.4 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
D5 tapping screw .....	$2.9 \pm 0.5 \text{ N}\cdot\text{m}$ ( $30 \pm 5 \text{ kgf}\cdot\text{cm}$ , $26.0 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
Side cover mounting bolt .....	$3.9 \pm 0.5 \text{ N}\cdot\text{m}$ ( $40 \pm 5 \text{ kgf}\cdot\text{cm}$ , $34.7 \pm 4.3 \text{ in}\cdot\text{lbs.}$ )
(Nylock bolt (W/Flange) M5 x 16)	
Crank case cover mounting bolt .....	$4.9 \pm 1.0 \text{ N}\cdot\text{m}$ ( $50 \pm 10 \text{ kgf}\cdot\text{cm}$ , $43.4 \pm 8.7 \text{ in}\cdot\text{lbs.}$ )
(Nylock bolt (W/Flange) M5 x 16)	
Housing mounting bolt.....	$4.9^{+2.0}_0 \text{ N}\cdot\text{m}$ ( $50^{+20}_0 \text{ kgf}\cdot\text{cm}$ , $43.4^{+17.4}_0 \text{ in}\cdot\text{lbs.}$ )
(Nylock bolt (W/Flange) M6 x 40)	
Front cover mounting bolt .....	$29.4^{+1.0}_0 \text{ N}\cdot\text{m}$ ( $300^{+10}_0 \text{ kgf}\cdot\text{cm}$ , $260^{+8.7}_0 \text{ in}\cdot\text{lbs.}$ )
(Nylock High Tension Bolt M8 x 30)	
Cylinder case mounting bolt.....	$9.8^{+2.0}_0 \text{ N}\cdot\text{m}$ ( $100^{+20}_0 \text{ kgf}\cdot\text{cm}$ , $86.8^{+17.4}_0 \text{ in}\cdot\text{lbs.}$ )
(Nylock bolt (W/Flange) M6 x 35)	



## 9-5. Wiring Diagrams

- For products without noise suppressor



- For products with noise suppressor

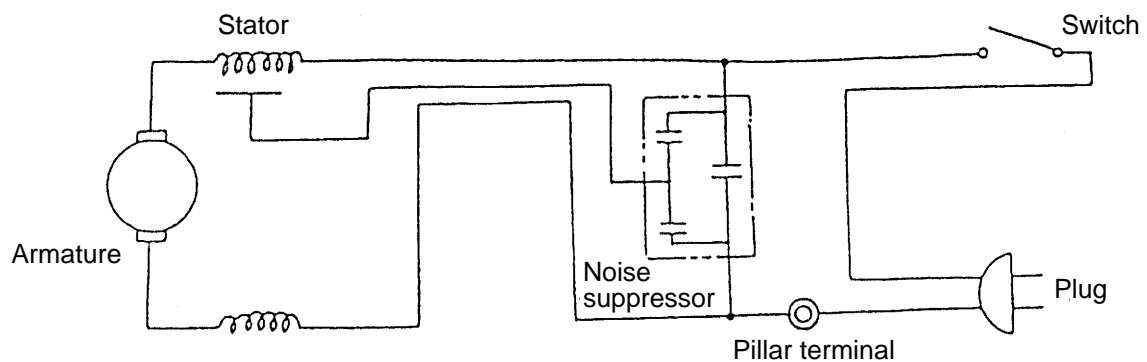


Fig. 16

## 9-6. Insulation Tests

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

Insulation resistance: 7 M $\Omega$  or more with DC 500 V Megohm Tester

Dielectric strength : AC 4,000 V/1 minute, with no abnormalities ..... 220 V – 240 V

AC 2,500 V/1 minute, with no abnormalities ..... 110 V – 127 V

## 9-7. No-load Current Values

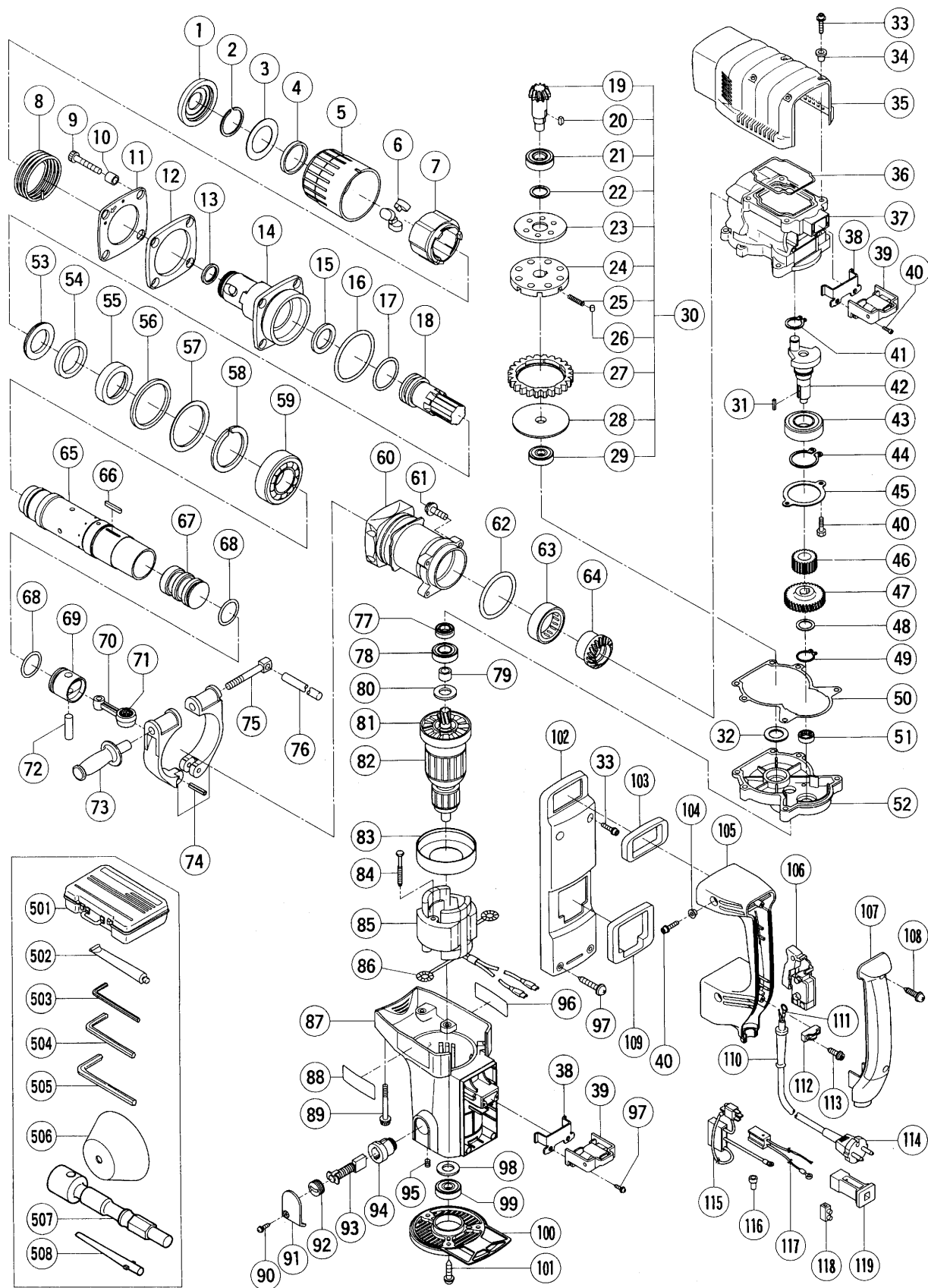
After no-load operation for 30 minutes, the no-load current values should be as follows.

Voltage	110 V	115 V	127 V	220 V	230 V	240 V
Current (A) Max.	6.8 A	6.5 A	5.9 A	3.4 A	3.3 A	3.2 A

## 10. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
DH 45SA	General Assembly	Work Flow						
								Housing Ass'y Stator Ass'y
		Handle Cover Switch (C) Cord Cord Armor					Seal Packing Gear Cover Needle Bearing	
		Tail Cover Ball Bearing (6201VV)					Armature Ass'y Ball Bearing (6203VV) Dust Washer Oil Seal Sleeve (B)	
		Crank Case Cover Ass'y Rubber Seal						
				Handle Plug (A) Plug (B) Side Cover Ass'y		Crank Shaft Feather Key (5x5x15) Ball Bearing (6205) Bearing Cover First Gear Second Pinion	Crank Case	
		Front Cap Grip Saddle Key x 3 Retainer Spring Saddle Key Holder	Front Cover O-Ring x 2 Front Washer Urethane Ring Ball Bearing (6008CM) Damper Damper Holder Urethane Ring Holder Front Damper Damper (B) Damper Washer Second Hammer			Bevel Pinion Feather Key (3x3x8) Ball Bearing (6202) Washer (A) Gear Holder Spring (C) Needle Pin Second Gear Spacer Ball Bearing (629VV)		
				Connecting Rod Ass'y Needle Bearing Piston Piston Pin Striker O-Ring		Cylinder O-Ring (D) Feather Key (3x3x20) Cylinder Case Needle Bearing Bevel Gear		

# Assembly Diagram for DH 45SA



# PARTS

DH 45SA

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	318-758	FRONT CAP	1	
2	318-757	RETAINING RING D35	1	
3	318-756	FRONT WASHER (A)	1	
4	318-755	DAMPER RING	1	
5	318-754	GRIP	1	
6	313-069	SADDLE KEY	3	
7	318-752	SADDLE KEY HOLDER	1	
8	318-753	RETAINER SPRING	1	
9	306-437	NYLOCK HEX. SOCKET HD. BOLT M8X30	4	
10	986-892	COLLAR	4	
11	319-075	FRONT WASHER	1	
12	319-074	FRONT DAMPER	1	
13	318-759	DUST COVER	1	
14	318-751	FRONT COVER	1	
15	318-762	DAMPER (B)	1	
16	956-996	O-RING (1AS-60)	1	
17	986-882	O-RING	1	
18	318-743	SECOND HAMMER	1	
19	318-551	BEVEL PINION	1	
20	944-109	FEATHER KEY 3X3X8	1	
21	620-2DD	BALL BEARING 6202DDCMPS2L	1	
22	313-058	WASHER	1	
23	318-552	WASHER (A)	1	
24	318-554	GEAR HOLDER	1	
25	318-555	SPRING (C)	8	
26	313-057	NEEDLE PIN D6X6	8	
27	318-553	SECOND GEAR	1	
28	318-556	SPACER	1	
29	629-VVM	BALL BEARING 629VVC2PS2L	1	
30	318-550	SLIP CLUTCH ASS'Y	1	INCLUD.19-29
31	945-072	FEATHER KEY 5X5X15	2	
32	944-525	BEARING WASHER (C)	1	
33	313-082	NYLOCK BOLT (W/FLANGE) M5X16	6	
34	991-711	DISTANCE PIECE (B)	4	
35	318-584	CRANK CASE COVER ASS'Y	1	INCLUD.34
36	313-084	RUBBER SEAL	1	
37	318-543	CRANK CASE	1	
38	980-750	GUIDE PLATE	2	
39	980-727	HANDLE RUBBER	2	
40	878-181	NYLOCK HEX. SOCKET HD. BOLT M5X16	8	
41	939-542	RETAINING RING FOR D12 SHAFT (10 PCS.)	1	
42	318-544	CRANK SHAFT	1	
43	620-5DD	BALL BEARING 6205DDCMPS2L	1	
44	965-469	RETAINING RING FOR D25 SHAFT	1	
45	318-548	BEARING COVER	1	
46	318-545	SECOND PINION	1	
47	318-546	FIRST GEAR	1	
48	318-547	THRUST WASHER	1	
49	967-261	RETAINING RING FOR D17 SHAFT	1	
50	318-549	SEAL PACKING	1	
51	939-299	NEEDLE BEARING (M661)	1	

\* : ALTERNATIVE PARTS

3 - 00

# PARTS

DH 45SA

ITEM No.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
52	318-595	GEAR COVER	1		
53	993-235	DAMPER WASHER	1		
54	318-745	DAMPER	1		
55	318-746	DAMPER HOLDER	1		
56	318-748	URETHANE RING	1		
57	318-747	URETHANE RING HOLDER	1		
58	318-582	RETAINING RING D40	1		
59	600-8CM	BALL BEARING 6008CM	1		
60	318-749	CYLINDER CASE	1		
61	318-451	NYLOCK BOLT (W/FLANGE) M6X35	4		
62	985-779	O-RING (D)	1		
63	985-782	NEEDLE BEARING (M526320)	1		
64	318-741	BEVEL GEAR	1		
65	318-740	CYLINDER	1		
66	971-750	FEATHER KEY 3X3X20	2		
67	318-742	STRIKER	1		
68	318-917	O-RING (FPM 710)	2		
69	985-772	PISTON	1		
70	318-557	CONNECTING ROD ASS'Y	1	INCLUD.71	
71	980-756	NEEDLE BEARING (NSK AJ50 1203)	1		
72	955-593	PISTON PIN	1		
73	318-574	SIDE HANDLE	1		
74	318-575	HANDLE HOLDER	1		
75	318-576	HANDLE BOLT	1		
76	971-786	STOPPER ROD	1		
77	318-596	OIL SEAL (FPM 707)	1		
78	620-3VV	BALL BEARING 6203VVCMP52L	1		
79	318-597	SLEEVE (B)	1		
80	318-594	DUST WASHER	1		
81	318-918	FAN	1		
*	82	360-526C	ARMATURE ASS'Y 110V-115V	1	INCLUD.81
*	82	360-526D	ARMATURE ASS'Y 127V	1	INCLUD.81
*	82	360-526E	ARMATURE ASS'Y 220V-230V	1	INCLUD.81
*	82	360-526F	ARMATURE ASS'Y 240V	1	INCLUD.81
	83	318-633	FAN GUIDE	1	
	84	953-121	HEX. HD. TAPPING SCREW D5X50	2	
*	85	340-467C	STATOR ASS'Y 110V-115V	1	INCLUD.86
*	85	340-467D	STATOR ASS'Y 127V	1	INCLUD.86
*	85	340-467E	STATOR ASS'Y 220V-230V	1	INCLUD.86
*	85	340-467F	STATOR ASS'Y 240V	1	INCLUD.86
	86	958-032	BRUSH TERMINAL	2	
	87	318-764	HOUSING ASS'Y	1	INCLUD.94,95
	88		HITACHI LABEL	1	
	89	318-570	NYLOCK BOLT (W/FLANGE) M6X40	6	
	90	307-811	TAPPING SCREW (W/FLANGE) D4X16 (BLACK)	2	
	91	318-599	BRUSH CAP COVER	2	
	92	940-540	BRUSH CAP	2	
	93	999-074	CARBON BRUSH (AUTO STOP TYPE) (1 PAIR)	2	
	94	980-487	BRUSH HOLDER	2	
	95	938-477	HEX. SOCKET SET SCREW M5X8	2	
	96		NAME PLATE	1	

## PARTS

DH 45SA

ITEM No.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
97	305-558	TAPPING SCREW (W/FLANGE) D5X25 (BLACK)	4		
98	944-954	BEARING WASHER	1		
99	620-1VV	BALL BEARING 6201VVCMP2L	1		
100	318-598	TAIL COVER	1		
101	303-273	TAPPING SCREW (W/FLANGE) D5X16	3		
102	318-750	SIDE COVER ASS'Y	1	INCLUD.103,109	
103	318-572	HANDLE PACKING (A)	1		
104	991-711	DISTANCE PIECE (B)	4		
105	318-601	HANDLE	1		
106	313-093	SWITCH (C) (2P SCREW TYPE W/O LOCK)	1		
107	318-602	HANDLE COVER	1		
108	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	2		
109	318-573	HANDLE PACKING (B)	1		
* 110	958-049	CORD ARMOR D8.2	1		
* 110	940-778	CORD ARMOR D10.7	1		
* 111	992-810	TERMINAL	1	FOR GBR(230V)	
* 111	980-063	TERMINAL	1	FOR SAF,AUS	
* 112	960-266	CORD CLIP	1		
* 112	981-987Z	CORD CLIP	1	FOR SUI	
113	984-750	TAPPING SCREW (W/FLANGE) D4X16	2		
* 114	500-390Z	CORD	1	(CORD ARMOR D10.7)	
* 114	500-394Z	CORD	1	(CORD ARMOR D10.7) FOR SYR	
* 114	500-454Z	CORD	1	(CORD ARMOR D10.7) FOR SAF	
* 114	500-408Z	CORD	1	(CORD ARMOR D8.2) FOR AUS	
* 114	500-460Z	CORD	1	(CORD ARMOR D10.7) FOR GBR(110V)	
* 114	500-446Z	CORD	1	(CORD ARMOR D10.7) FOR GBR(230V)	
* 114	500-391Z	CORD	1	(CORD ARMOR D10.7) FOR SUI	
* 115	313-142	PLUG (A)	1	FOR AUS,SAF,EUROPE	
* 115	313-092	PLUG (A)	1		
* 116	959-141	CONNECTOR 50092 (10 PCS.)	1	FOR TPE,ECU,SUR,THA,SRI,INA,CHN,SYR, SIN,KUW,NGU,AUS	
* 117	318-648	PLUG (B)	1		
* 117	318-600	PLUG (B)	1	FOR AUS	
118	938-307	PILLAR TERMINAL	1		
119	318-603	PLUG HOLDER	1		

## STANDARD ACCESSORIES

ITEM No.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501	318-646	CASE (PLASTIC)	1		
502	981-840	GREASE (A) FOR HAMMER.HAMMER DRILL (30G)	1		
503	944-458	HEX. BAR WRENCH 4MM	1		
504	944-459	HEX. BAR WRENCH 5MM	1		
505	872-422	HEX. BAR WRENCH 6MM	1		
506	315-871	DUST CAP	1		
* 507	992-813	K-TAPER SHANK ADAPTER	1	FOR AUS	
* 508	944-477	COTTER	1	FOR AUS	

\* : ALTERNATIVE PARTS

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# OPTIONAL ACCESSORIES

DH 45SA

ITEM No.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
601	985-721	DRILL BIT D16.0X280 (HEX. SHANK TYPE)	1		
602	985-720	DRILL BIT D16.0X400 (HEX. SHANK TYPE)	1		
603	985-722	DRILL BIT D16.0X505 (HEX. SHANK TYPE)	1		
604	991-330	DRILL BIT D16.0X550 (HEX. SHANK TYPE)	1		
605	991-331	DRILL BIT D18.0X550 (HEX. SHANK TYPE)	1		
606	985-724	DRILL BIT D19.0X280 (HEX. SHANK TYPE)	1		
607	985-723	DRILL BIT D19.0X400 (HEX. SHANK TYPE)	1		
608	985-725	DRILL BIT D19.0X505 (HEX. SHANK TYPE)	1		
609	991-332	DRILL BIT D19.0X550 (HEX. SHANK TYPE)	1		
610	991-334	DRILL BIT D20.0X505 (HEX. SHANK TYPE)	1		
611	991-333	DRILL BIT D20.0X550 (HEX. SHANK TYPE)	1		
612	985-727	DRILL BIT D22.0X280 (HEX. SHANK TYPE)	1		
613	985-726	DRILL BIT D22.0X400 (HEX. SHANK TYPE)	1		
614	985-728	DRILL BIT D22.0X505 (HEX. SHANK TYPE)	1		
615	991-335	DRILL BIT D22.0X550 (HEX. SHANK TYPE)	1		
616	985-730	DRILL BIT D25.0X280 (HEX. SHANK TYPE)	1		
617	985-729	DRILL BIT D25.0X400 (HEX. SHANK TYPE)	1		
618	985-731	DRILL BIT D25.0X505 (HEX. SHANK TYPE)	1		
619	991-336	DRILL BIT D25.0X550 (HEX. SHANK TYPE)	1		
620	985-733	DRILL BIT D28.0X280 (HEX. SHANK TYPE)	1		
621	985-732	DRILL BIT D28.0X400 (HEX. SHANK TYPE)	1		
622	985-734	DRILL BIT D28.0X505 (HEX. SHANK TYPE)	1		
623	991-337	DRILL BIT D28.0X550 (HEX. SHANK TYPE)	1		
624	991-338	DRILL BIT D30.0X550 (HEX. SHANK TYPE)	1		
625	985-736	DRILL BIT D32.0X280 (HEX. SHANK TYPE)	1		
626	985-735	DRILL BIT D32.0X400 (HEX. SHANK TYPE)	1		
627	985-737	DRILL BIT D32.0X505 (HEX. SHANK TYPE)	1		
628	991-339	DRILL BIT D32.0X550 (HEX. SHANK TYPE)	1		
629	991-340	DRILL BIT D35.0X550 (HEX. SHANK TYPE)	1		
630	985-739	DRILL BIT D38.0X280 (HEX. SHANK TYPE)	1		
631	985-738	DRILL BIT D38.0X400 (HEX. SHANK TYPE)	1		
632	985-740	DRILL BIT D38.0X505 (HEX. SHANK TYPE)	1		
633	991-341	DRILL BIT D38.0X550 (HEX. SHANK TYPE)	1		
634	944-460	TAPER SHANK DRILL BIT D11X100	1		
635	944-461	TAPER SHANK DRILL BIT D12.3X110	1		
636	993-038	TAPER SHANK DRILL BIT D12.7X110	1		
637	944-462	TAPER SHANK DRILL BIT D14.3X110	1		
638	944-500	TAPER SHANK DRILL BIT D14.5X110	1		
639	944-463	TAPER SHANK DRILL BIT D17.5X120	1		
640	944-464	TAPER SHANK DRILL BIT D21.5X140	1		
641	985-752	TAPER SHANK ADAPTER NO.1	1	INCLUD.643	
642	985-753	TAPER SHANK ADAPTER NO.2	1	INCLUD.643	
643	944-477	COTTER	1		
644	985-754	A-TAPER SHANK ADAPTER (D11.0-17.5)	1		
645	985-755	B-TAPER SHANK ADAPTER (D21.5)	1		
646	992-813	K-TAPER SHANK ADAPTER	1		
647	985-750	DRILL ADAPTER NO.1 (D11.0-17.5)	1		
648	985-751	DRILL ADAPTER NO.2 (D21.5)	1		
649	955-994	CORE BIT 25MM	1		
650	955-995	CORE BIT 29MM	1		
651	955-996	CORE BIT 32MM	1	INCLUD.652	

# OPTIONAL ACCESSORIES

DH 45SA

ITEM No.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
652	955-997	GUIDE PLATE (FOR CORE BIT 32MM)	1		
653	955-998	CORE BIT 35MM	1	INCLUD.654	
654	955-999	GUIDE PLATE (FOR CORE BIT 35MM)	1		
655	956-000	CORE BIT 38MM	1	INCLUD.656	
656	956-001	GUIDE PLATE (FOR CORE BIT 38MM)	1		
657	955-154	CORE BIT 45MM	1	INCLUD.658	
658	955-166	GUIDE PLATE (FOR CORE BIT 45MM)	1		
659	955-155	CORE BIT 54MM	1	INCLUD.660	
660	955-167	GUIDE PLATE (FOR CORE BIT 54MM)	1		
661	956-002	CORE BIT 64MM	1	INCLUD.662	
662	956-003	GUIDE PLATE (FOR CORE BIT 64MM)	1		
663	955-157	CORE BIT 79MM	1	INCLUD.664	
664	955-168	GUIDE PLATE (FOR CORE BIT 79MM)	1		
665	956-004	CORE BIT 94MM	1	INCLUD.666	
666	956-005	GUIDE PLATE (FOR CORE BIT 94MM)	1		
667	955-159	CORE BIT 105MM	1	INCLUD.668	
668	955-169	GUIDE PLATE (FOR CORE BIT 105MM)	1		
669	956-008	CORE BIT SHANK (B) 300L (FOR D25-35)	1	ROUND SHAFT TYPE	
670	955-163	CORE BIT SHANK (A) 300L (FOR D38-120)	1		
671	956-009	CENTER PIN (B) 147L FOR CORE BIT D32-35	1		
672	955-165	CENTER PIN (A) 133L FOR CORE BIT D38-150	1		
673	992-814	CORE BIT 65MM	1		
674	992-815	CORE BIT 80MM	1		
675	992-816	CORE BIT 90MM	1		
676	992-817	CORE BIT 100MM	1		
677	992-818	CORE BIT 105MM	1		
678	992-819	CORE BIT SHANK (C)	1		
679	903-901	CENTER PIN (C)	1		
680	985-756	ANCHOR ADAPTER NO.20 W1/4"(FOR ROTATION)	1		
681	985-757	ANCHOR ADAPTER NO.25 W5/16"(FOR ROTATION)	1		
682	985-758	ANCHOR ADAPTER NO.30 W3/8"(FOR ROTATION)	1		
683	985-759	ANCHOR ADAPTER NO.40 W1/2"(FOR ROTATION)	1		
684	985-760	ANCHOR ADAPTER NO.50 W5/8"(FOR ROTATION)	1		
685	981-929	ANCHOR ADAPTER NO.30	1		
686	981-930	ANCHOR ADAPTER NO.40	1		
687	981-931	ANCHOR ADAPTER NO.50	1		
688	985-761	RATIO SHANK ADAPTER	1		
689	944-574	DRIFT KEY	1		
690	981-922	BULL POINT 280MM (ROUND SHANK TYPE)	1		
691	981-923	BULL POINT 450MM (ROUND SHANK TYPE)	1		
692	981-925	COLD CHISEL 280MM (ROUND SHANK TYPE)	1		
693	981-926	COLD CHISEL 450MM (ROUND SHANK TYPE)	1		
694	981-924	CUTTER W45X280L (ROUND SHANK TYPE)	1		
695	956-126	SCOOP 405L (ROUND SHANK TYPE)	1		
696	955-181	RAMMER 140MM	1		
697	955-183	BUSHING TOOL	1		
698	955-186	SHANK 250L (FOR RAMMER AND BUSHING TOOL)	1		
699	944-575	SYRINGE	1		
700	318-085	SYRINGE (BELLOWS TYPE)	1		
701	308-471	GREASE FOR HAMMER.HAMMER DRILL (70G)	1		
702	980-927	GREASE FOR HAMMER.HAMMER DRILL (500G)	1		