

# Hitachi Power Tools

TECHNICAL DATA AND SERVICE MANUAL

LIST No. E497  
Aug. 2007

PRODUCT NAME .....

## Hitachi Rotary Hammer

Model **DH 22PG**

MARKETING OBJECTIVE .....

The new Model DH 22PG features the concrete drilling capability with the maximum drill bit diameter 22 mm and the use of SDS-plus shank tools. This is a professional-use and low-priced rotary hammer.

The main features of the Model DH 22PG are as follows:

- (1) Most compact and lightweight in its class: 289 mm in overall length and 1.9 kg in weight
- (2) The internal pressure adjustment mechanism prevents grease leakage.
- (3) The idle striking prevention mechanism prevents reciprocating motion during no-load operation to reduce noise.

APPLICATIONS .....

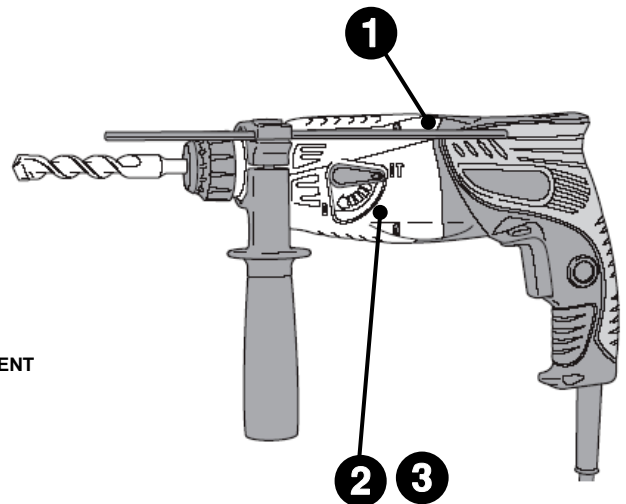
- Drilling holes in concrete, brick and stone
- Drilling holes in steel and wood
- Tightening and loosening machine screws and wood screws

SELLING POINTS .....

[ NEW FEATURES ]

- 1** Most compact and lightweight in its class for ease of operation
- 2** Hitachi's own internal pressure adjustment mechanism
- 3** Clutch-cut type idle striking prevention mechanism

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT



**HITACHI**

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

**REMARK:**

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

[http://www.hitachi-koki.com/manual\\_view\\_export/](http://www.hitachi-koki.com/manual_view_export/)

Throughout this TECHNICAL DATA AND SERVICE MANUAL, a symbol(s) is(are) used in the place of company name(s) and model name(s) of our competitor(s). The symbol(s) utilized here is(are) as follows:

| Symbols utilized | Competitors  |            |
|------------------|--------------|------------|
|                  | Company name | Model name |
| B                | BOSCH        | GBH2-22RE  |
| C                | MAKITA       | HR2020     |

# CONTENTS

|   | Page      |
|---|-----------|
| <b>SELLING POINT DESCRIPTIONS</b> -----                                 | <b>1</b>  |
| <b>SPECIFICATIONS</b> -----   | <b>2</b>  |
| 1. Specifications-----  | 2         |
| 2. Optional accessories-----  | 3         |
| <b>COMPARISONS WITH SIMILAR PRODUCTS</b> -----                          | <b>7</b>  |
| 1. Specifications comparisons-----                                      | 7         |
| 2. Drilling speed comparison-----                                       | 8         |
| <b>PRECAUTIONS IN SALES PROMOTION</b> -----                             | <b>9</b>  |
| Safety Instructions-----  | 9         |
| <b>REFERENCE MATERIALS</b> -----  | <b>10</b> |
| 1. Lubrication-----   | 10        |
| 2. Tool structure-----  | 10        |
| 3. Changeover between "Rotation only" and "Rotation and hammering"----- | 13        |
| 4. Precautions for use of "Rotation only" (no hammering) function-----  | 13        |
| 5. Drill bits-----  | 13        |
| 6. Tool retainer section-----   | 14        |
| 7. Dust collector (B)-----  | 15        |
| <b>REPAIR GUIDE</b> -----   | <b>16</b> |
| 1. Precautions in disassembly and reassembly-----                       | 16        |
| <b>STANDARD REPAIR TIME (UNIT) SCHEDULES</b> -----                      | <b>26</b> |
| Assembly diagram for DH 22PG  |           |

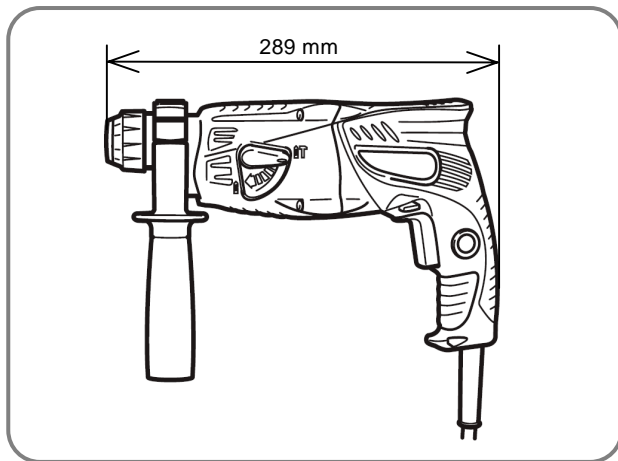
# SELLING POINT DESCRIPTIONS

## 1 Most compact and lightweight in its class\*

\* Based on our own research

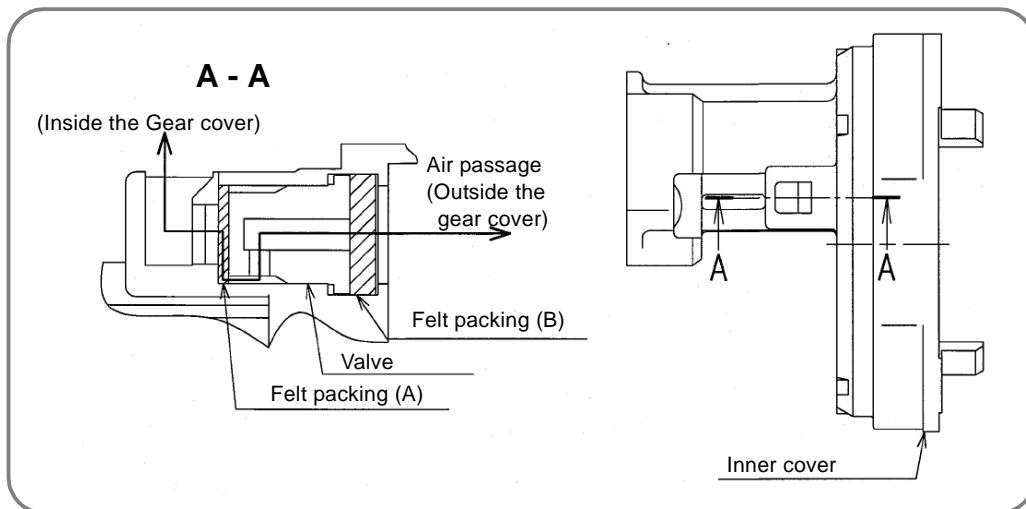
The Model DH 22PG is most compact and lightweight in its class thanks to the optimum striking mechanism.

| Maker Model    | HITACHI<br>DH 22PG | B      | C      |
|----------------|--------------------|--------|--------|
| Overall length | 289 mm             | 342 mm | 352 mm |
| Weight         | 1.9 kg             | 2.3 kg | 2.3 kg |



## 2 Internal pressure adjustment mechanism

An air passage is provided as shown below to let out air inside the gear cover and let outside air in the gear cover. This passage is sandwiched between felt packings to pass only air. Thus variations in the internal pressure are minimized for stable hammering operation and prevention of grease leakage.



## 3 Idle striking prevention mechanism

When the drill bit is lifted from the concrete surface, the reciprocating bearing that converts rotation into reciprocating motion stops to prevent idle striking. Thanks to this mechanism, vibration and noise during no-load operation are reduced.

# SPECIFICATIONS

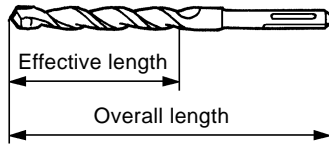
## 1. Specifications

|   |                   |             |
|---|-------------------|-------------|
| Capacity: Concrete                              | mm                | 22          |
|   | Inch              | 7/8         |
| Capacity: Steel/Wood                            | mm                | 13/24       |
|   | Inch              | 1/2" / 1"   |
| Input power                                     | W                 | 620         |
| Impact energy                                   | J                 | 1.4         |
| No-load rpm (Forward)                           | min <sup>-1</sup> | 0-1,500     |
| No-load rpm (Reverse)                           | min <sup>-1</sup> | 0-980       |
| Full-Load bpm                                   | min <sup>-1</sup> | 0-6,200     |
| Mode  | –                 | 2           |
| Variable speed                                  | –                 | YES         |
| Reverse switch type                             | –                 | Push button |
| Soft grip                                       | Handle            | No          |
|   | Gear cover        | No          |
| Overall length                                  | mm                | 289         |
|   | Inch              | 11-3/8"     |
| No load vibration level (Tri-axial, measured)   | m/s <sup>2</sup>  | 1.42        |
| Full load vibration level (Tri-axial, measured) | m/s <sup>2</sup>  | 8.75        |
| No load noise level (measured)                  | dB                | 83.7        |
| Full load noise level (measured)                | dB                | 89.2        |
| Weight  | kg                | 1.9         |
|   | lbs               | 4.2         |

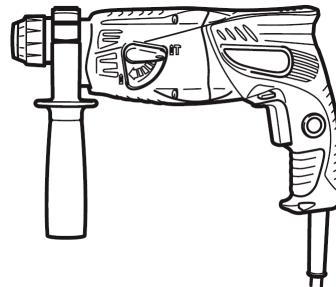
## 2. Optional accessories

### (1) Drilling anchor holes (rotation and hammering)

Drill bit (SDS-plus shank)

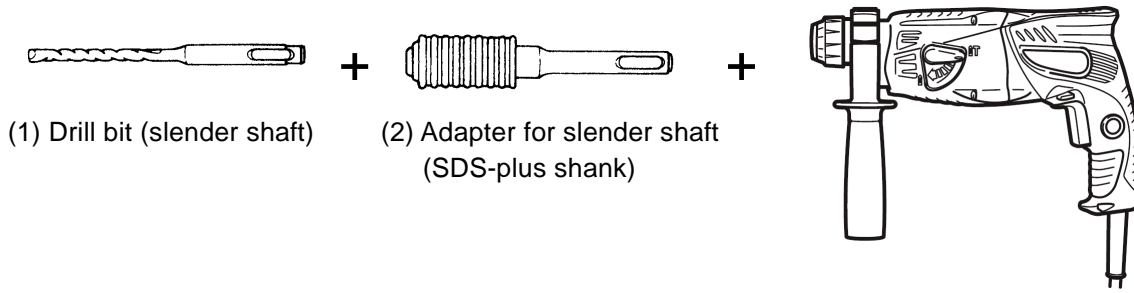


+



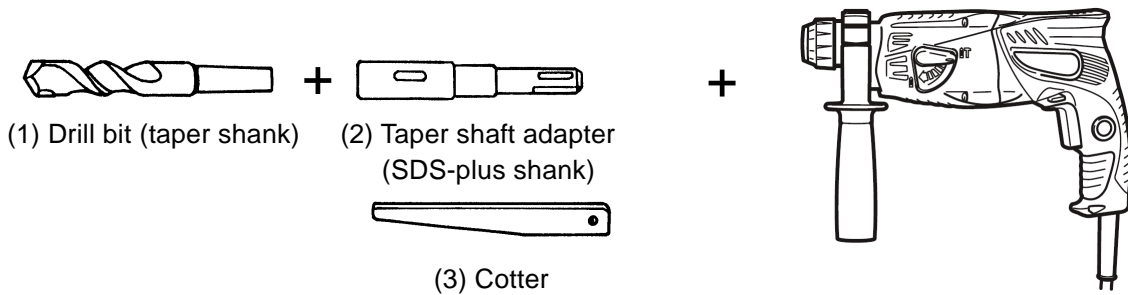
| Outer dia. (mm) | Overall length (mm) | Effective length (mm) | Code No. | Outer dia. (mm) | Overall length (mm) | Effective length (mm) | Code No. |
|-----------------|---------------------|-----------------------|----------|-----------------|---------------------|-----------------------|----------|
| 4.0             | 110                 | 50                    | 303571   | 12.5            | 166                 | 100                   | 303592   |
| 4.3             |                     |                       | 303572   | 12.5            | 260                 | 200                   | 303607   |
| 4.5             |                     |                       | 303573   | 12.7            | 166                 | 100                   | 303593   |
| 4.8             |                     |                       | 303574   | 12.7            | 260                 | 200                   | 303608   |
| 5.0             |                     |                       | 303575   | 13.0            | 166                 | 100                   | 303594   |
| 5.0             | 160                 | 100                   | 303578   | 14.0            |                     |                       | 303595   |
| 5.5             | 110                 | 50                    | 303576   | 14.3            | 260                 | 200                   | 303596   |
| 6.0             |                     |                       | 303577   | 14.3            |                     |                       | 303609   |
| 6.0             | 160                 | 100                   | 303579   | 14.5            | 166                 | 100                   | 303597   |
| 6.4             |                     |                       | 303580   | 14.5            | 260                 | 200                   | 303610   |
| 6.5             |                     |                       | 303581   | 15.0            | 166                 | 100                   | 303598   |
| 7.0             |                     |                       | 303582   | 16.0            |                     |                       | 303599   |
| 7.5             |                     |                       | 303583   | 16.0            | 260                 | 200                   | 303611   |
| 8.0             |                     |                       | 303584   | 16.5            | 166                 | 100                   | 303600   |
| 8.5             |                     |                       | 303585   | 17.0            |                     |                       | 303601   |
| 9.0             |                     |                       | 303586   | 17.0            | 260                 | 200                   | 308485   |
| 9.5             |                     |                       | 303587   | 17.5            | 166                 | 100                   | 303602   |
| 10.0            |                     |                       | 303588   | 17.5            | 260                 | 200                   | 303612   |
| 10.0            | 260                 | 200                   | 303604   | 18.0            | 166                 | 100                   | 303603   |
| 10.5            | 160                 | 100                   | 303589   | 19.0            | 260                 | 200                   | 303613   |
| 10.5            | 260                 | 200                   | 303605   | 20.0            | 250                 | 200                   | 303614   |
| 11.0            | 160                 | 100                   | 303590   | 22.0            |                     |                       | 303615   |
| 12.0            | 166                 | 100                   | 303591   |                 |                     |                       |          |
| 12.0            | 260                 | 200                   | 303606   |                 |                     |                       |          |

Slender bit and adapter for slender shaft (SDS-plus shank)



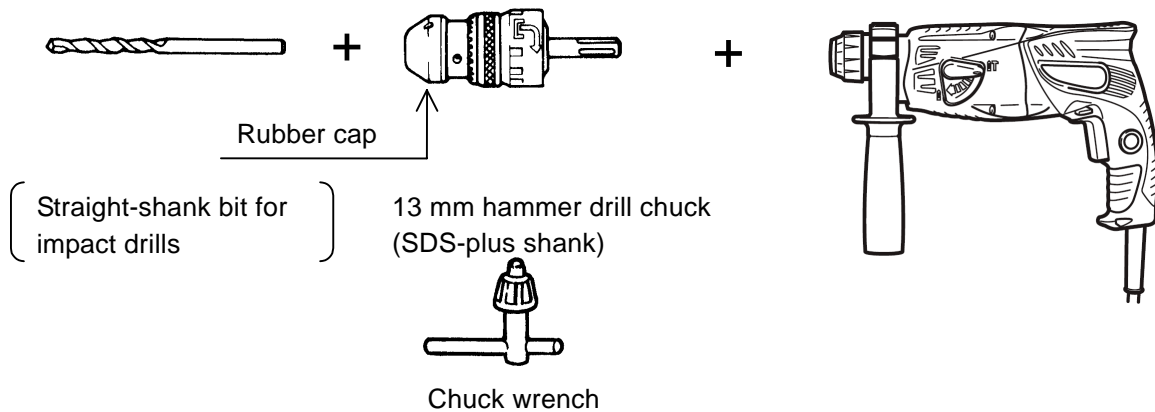
| (1) Drill bit (slender shaft) |                     |                       |          | (2) Adapter for slender shaft |
|-------------------------------|---------------------|-----------------------|----------|-------------------------------|
| Outer dia. (mm)               | Overall length (mm) | Effective length (mm) | Code No. | Code No.                      |
| 3.4                           | 90                  | 45                    | 306369   | 306370                        |
| 3.5                           |                     |                       | 306368   |                               |

Drill bit (taper shank)



| (1) Drill bit (taper shank) |          | (2) Taper shank adapter |          | (3) Cotter |
|-----------------------------|----------|-------------------------|----------|------------|
| Outer dia. (mm)             | Code No. | Type                    | Code No. | Code No.   |
| 11                          | 944460   | Morse taper No. 1       | 303617   | 944477     |
| 12.3                        | 944461   |                         |          |            |
| 12.7                        | 993038   |                         |          |            |
| 14.3                        | 944462   |                         |          |            |
| 14.5                        | 944500   |                         |          |            |
| 17.5                        | 944463   |                         |          |            |

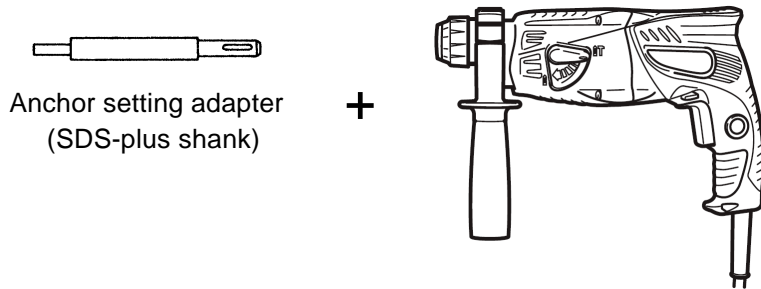
13 mm hammer drill chuck



| Part name  | Code No. |
|--|----------|
| 13 mm hammer drill chuck (including chuck wrench and rubber cap) | 303332   |
| Chuck wrench   | 303334   |
| Rubber cap   | 303335   |

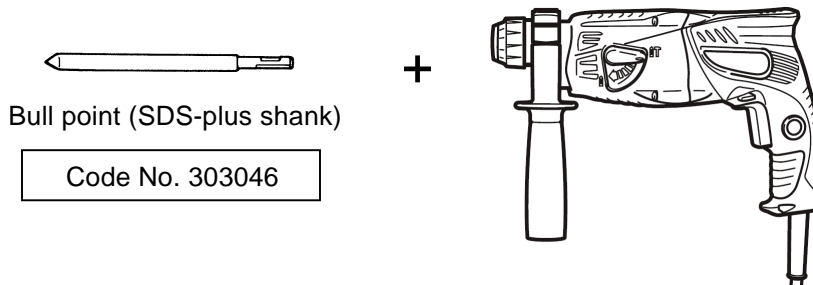
## (2) Anchor setting

Anchor setting bar

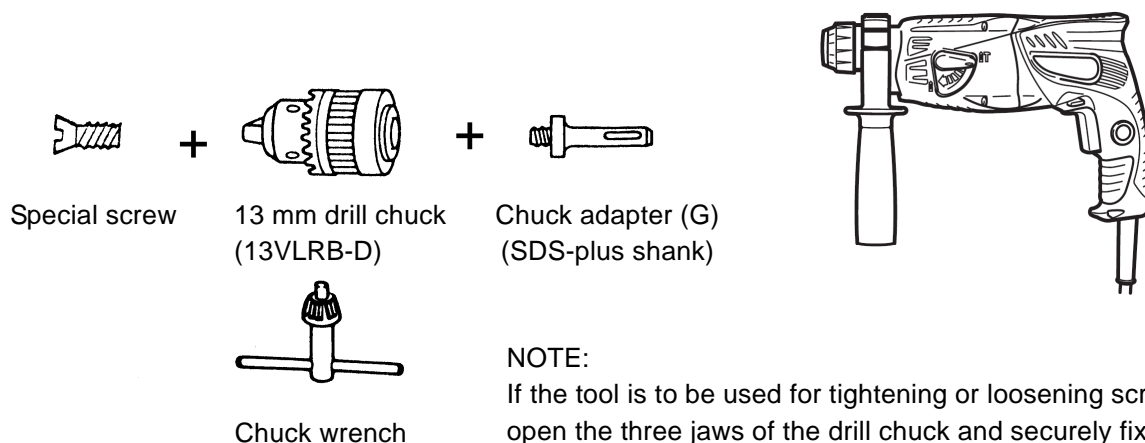


| Part name                       | Overall length (mm) | Code No. | Part name                       | Overall length (mm) | Code No. |
|---------------------------------|---------------------|----------|---------------------------------|---------------------|----------|
| W-1/4 Anchor setting adapter-A  | 260                 | 302976   | W-1/4 Anchor setting adapter-B  | 260                 | 302979   |
| W-5/16 Anchor setting adapter-A | 260                 | 302975   | W-5/16 Anchor setting adapter-B | 260                 | 302978   |
| W-3/8 Anchor setting adapter-A  | 160                 | 303621   | W-3/8 Anchor setting adapter-B  | 160                 | 303622   |
| W-3/8 Anchor setting adapter-A  | 260                 | 302974   | W-3/8 Anchor setting adapter-B  | 260                 | 302977   |
| Internal cone type              |                     |          | External cone type              |                     |          |

## (3) Crushing operation (rotation and hammering)



## (4) Drilling holes and driving screws (rotation only)



### NOTE:

If the tool is to be used for tightening or loosening screws, open the three jaws of the drill chuck and securely fix the drill chuck to chuck adapter (G) with the special screw (a left-hand threaded M6 screw) when mounting the drill chuck onto chuck adapter (G).



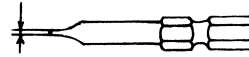
| Part name                             | Code No. |
|---------------------------------------|----------|
| Chuck adapter (G)                     | 303623   |
| 13 mm drill chuck (with chuck wrench) | 321814   |
| Special screw (M6 left-hand threaded) | 981122   |

(1) Cross-recessed head (Phillips) bit  
 [Overall length: 65 mm]  
 (For use with cross-recessed head (Phillips) screw)



Stamped bit No.

(2) Slotted-head (minus) bit  
 [Overall length: 70 mm]  
 (For use with slotted-head (minus) screw)



Tip thickness

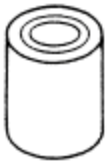
| Bit No. | Code No. | Applicable screw dia. (mm) |
|---------|----------|----------------------------|
| No. 2   | 983006   | 3 – 5                      |
| No. 3   | 983011   | 6 – 8*                     |

\* Temporary tightening

| Bit tip thickness | Code No. | Applicable screw dia. (mm) |
|-------------------|----------|----------------------------|
| 0.8               | 955659   | 4                          |
| 1                 | 955674   | 5 – 6                      |

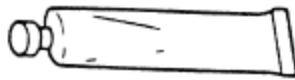
#### (5) Grease for hammer and hammer drill

Containing 500 g



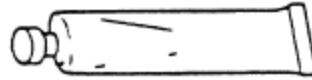
Code No. 980927

Containing 30 g



Code No. 981840

Containing 70 g



Code No. 308471

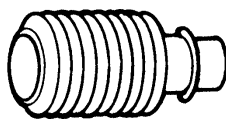
#### (6) Dust cup and dust collector (B)

Dust cup



Code No. 971787

Dust collector (B)



Code No. 306885

# COMPARISONS WITH SIMILAR PRODUCTS

(Superior specifications: )

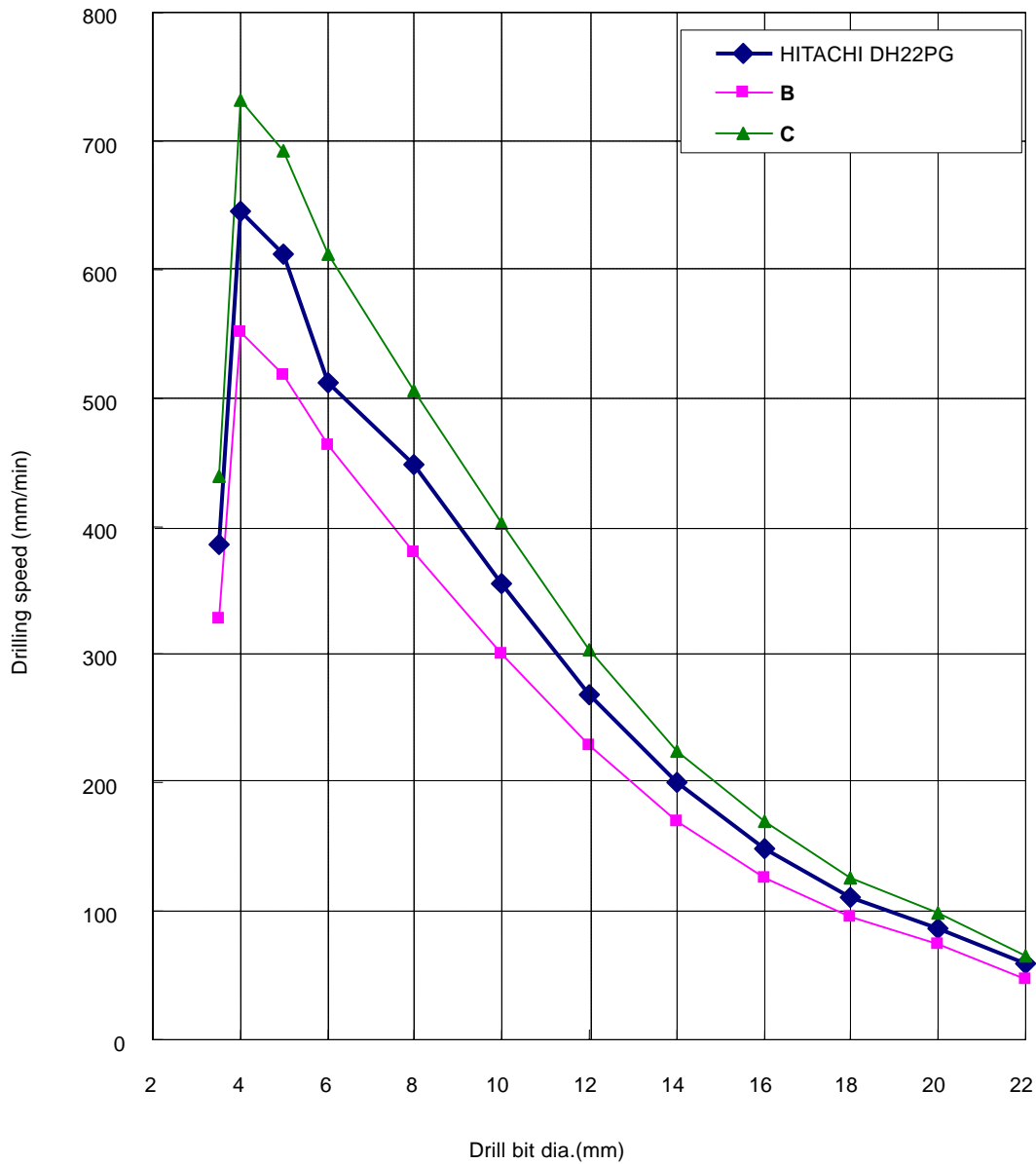
## 1. Specifications comparisons

| Maker   |                   | HITACHI     | B              | C             |
|---|-------------------|-------------|----------------|---------------|
| Model name  |                   | DH22PG      |                |               |
| Capacity: Concrete                                | mm                | 22          | 22             | 20            |
|   | Inch              | 7/8"        | 7/8"           | 13/16"        |
| Capacity: Steel/Wood                              | mm                | 13/24       | 13/30          | 13/32         |
|   | Inch              | 1/2" / 1"   | 1/2" / 1-3/16" | 1/2" / 1-1/4" |
| Input power                                       | W                 | 620         | 620            | 710           |
| Impact energy                                     | J                 | 1.4         | 2.2            | 2.2           |
| No-load rpm (Forward)                             | min <sup>-1</sup> | 0-1,500     | 0-1,000        | 0-1,050       |
| No-load rpm (Reverse)                             | min <sup>-1</sup> | 0-980       | 0-1,000        | 0-525         |
| Full-load bpm                                     | min <sup>-1</sup> | 0-6,200     | 0-4,400        | 0-4,050       |
| Mode  | -                 | 2           | 2              | 2             |
| Variable speed                                    | -                 | Yes         | Yes            | Yes           |
| Reverse switch type                               | -                 | Push button | CB holder      | Switch Lever  |
| Soft grip   | Handle            | No          | Yes            | No            |
|   | Gear cover        | No          | No             | No            |
| Overall length                                    | mm                | 289         | 342            | 352           |
|   | Inch              | 11-3/8"     | 11-15/32"      | 13-55/64"     |
| No-load vibration level (Tri-axial, measured)     | m/s <sup>2</sup>  | 1.42        | 12.4           | 8.7           |
| Full-I load vibration level (Tri-axial, measured) | m/s <sup>2</sup>  | 8.75        | 16.8           | 16.2          |
| No-I load noise level (measured)                  | dB                | 83.7        | 91.3           | 87.7          |
| Full-I Load noise level (measured)                | dB                | 89.2        | 87.1           | 85.0          |
| Weight  | kg                | 1.9         | 2.3            | 2.3           |
|   | lbs               | 4.2         | 5.1            | 5.1           |
| Internal pressure adjustment mechanism            | -                 | Yes         | No             | No            |
| No-load hammering prevention mechanism            | -                 | Yes         | No             | No            |

## 2. Drilling speed comparison

Drilling speed varies considerably depending on the work conditions. Use the factory test results shown in Fig. 1 for comparison purpose only.

Fig. 1



[Test conditions]

- Direction: Downward drilling
- Pushing force: 98 N (10 kgf)
- Test material: Concrete panel with a compression strength of 2,352 N/cm<sup>2</sup> (240 kgf/cm<sup>2</sup>)

# PRECAUTIONS IN SALES PROMOTION

## Safety Instructions

In the interest of promoting the safest and most efficient use of the Model DH 22PG Rotary hammer 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 and Name Plate attached to each tool.

### A. Handling Instructions

Although every effort is made in each step of design, manufacture and inspection to provide protection against safety hazards, the dangers inherent in 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 Rotary Hammer 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.


### B. Caution Plate

The Model DH22PG unit is provided with a Caution Plate (illustrated below) which lists basic safety precautions in use. Carefully ensure that the customer fully understands and follows these precautions before using tool.

[For Australia and New Zealand]

**CAUTION**  
● Read thoroughly **HANDLING INSTRUCTIONS** before use.

[ For the U.S.A. and Canada ]

**-WARNING-** ● To reduce the risk of injury, user must read and understand instruction manual.   
**AVERTISSEMENT** ● Afin de réduire le risque de blessures, l'utilisateur doit lire et bien comprendre le mode d'emploi.

[ For China ]

**注意：使用前请仔细阅读使用说明书**

[ For Mexico ]

**ADVERTENCIA**  
● Lea las instrucciones de manejo antes de usar.

[ For Taiwan ]

**注意**  
● 使用前請詳讀使用說明書

# REFERENCE MATERIALS

## 1. Lubrication

Replenish the grease lubricant when the tool is disassembled or there is grease leakage due to a defective seal. Changing grease is required once a year to extend the service life of the tool. Special grease is used in the striking section. Should the striking section (within the gear cover) be disassembled, remove the old grease from all parts completely and, on reassembly, replenish 30 g of new grease in the gear cover and 10 g in the groove of the inner cover. Be careful not to exceed the designated amount of grease. Excessive grease will reduce striking efficiency.

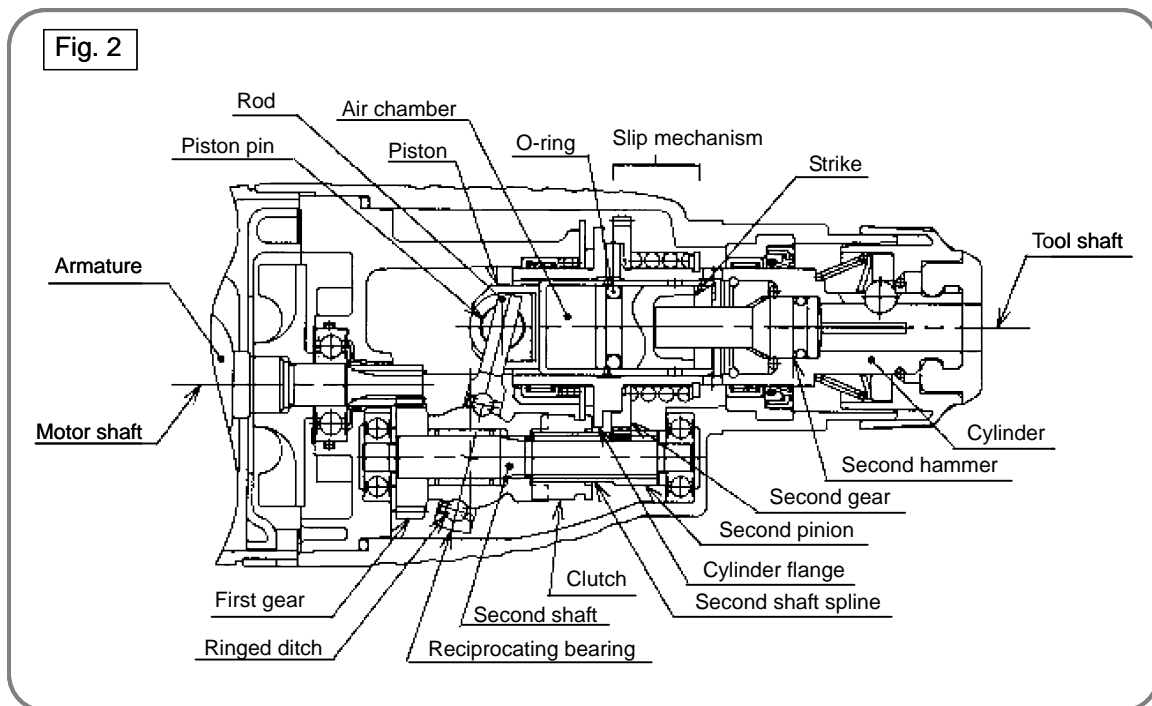
## 2. Tool structure

### ○ Transmission of rotation

See Fig. 2. The rotation of the armature is transmitted to the second shaft via the first gear, and causes it to rotate. The second shaft pinion mounted on the second shaft engages with the second gear mounted on the outer circumference of the cylinder. The cylinder is coupled to the second gear by means of a slip mechanism, and they rotate together. The end of the cylinder also functions as the drill bit retainer. The cylinder is key-connected to the inserted drill bit by means of two key rails and a steel ball, and transmits rotation to the drill bit.

### ○ Piston reciprocating mechanism

In the Model DH 22PG, through adoption of a spiral drive system (a mechanism using a reciprocating bearing), a more compact design has been achieved by arranging the motor shaft in parallel with the tool shaft. Figure 2 shows that the drill bit is pressed against the workpiece and the tool shaft is retracted. The rotation of the armature is transmitted to the second shaft via the first gear. The second shaft rotation is further transmitted through a spline to the clutch. The cylinder flange is pressed against the clutch by the retracted tool shaft and the clutch engages with the reciprocating bearing to transmit rotation to the reciprocating bearing. However, ring grooves on the inner race of the reciprocating bearing are positioned on an angle of inclination with relation to the second shaft.



The rotation of the inner race and the shaft causes that angle of inclination to change regularly forward and backward with relation to the second shaft, and produces a rocking motion to the outer race of the reciprocating bearing. Finally, a rod extending from the outer race of the reciprocating bearing is connected to the piston by the piston pin, and causes the reciprocating bearing motion of the piston.

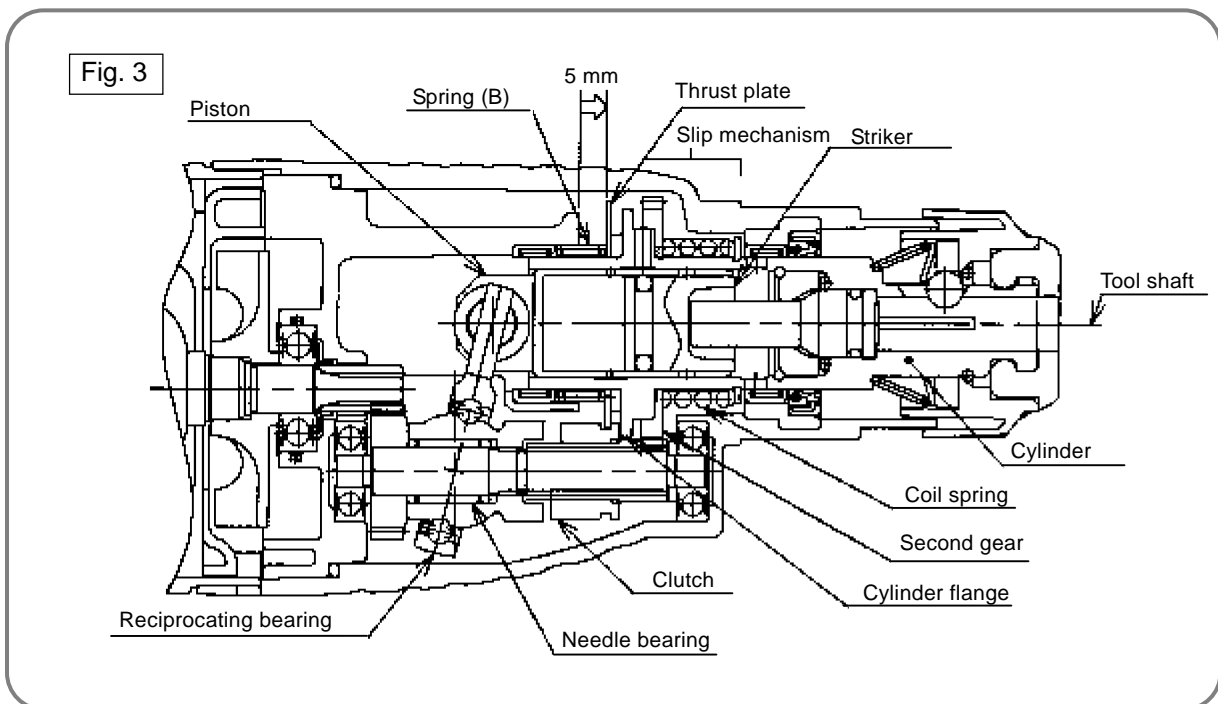
○ **Hammering function**

The piston reciprocates within the cylinder to move the striker in the same manner as in conventional hammer drills. As the piston reciprocates, the changing air pressure inside the air chamber between the piston and the striker causes the striker to move and continuously strike against the end of the second hammer. At the same time, the changing air pressure within the air chamber which moves the striker also provides an “air cushion” which absorbs the impact of the hammering action. As any air leakage from the air chamber would weaken the air-cushion effect and reduce impact absorption, the O-ring (mounted on the striker) is extremely important to seal the air. Although special rubber material is utilized in construction of the O-ring to make its effective service life as long as possible, wear cannot be fully avoided. Accordingly, it is recommended that the O-ring be replaced approximately once a year, depending on the frequency of usage of the tool.

○ **Idle striking prevention mechanism**

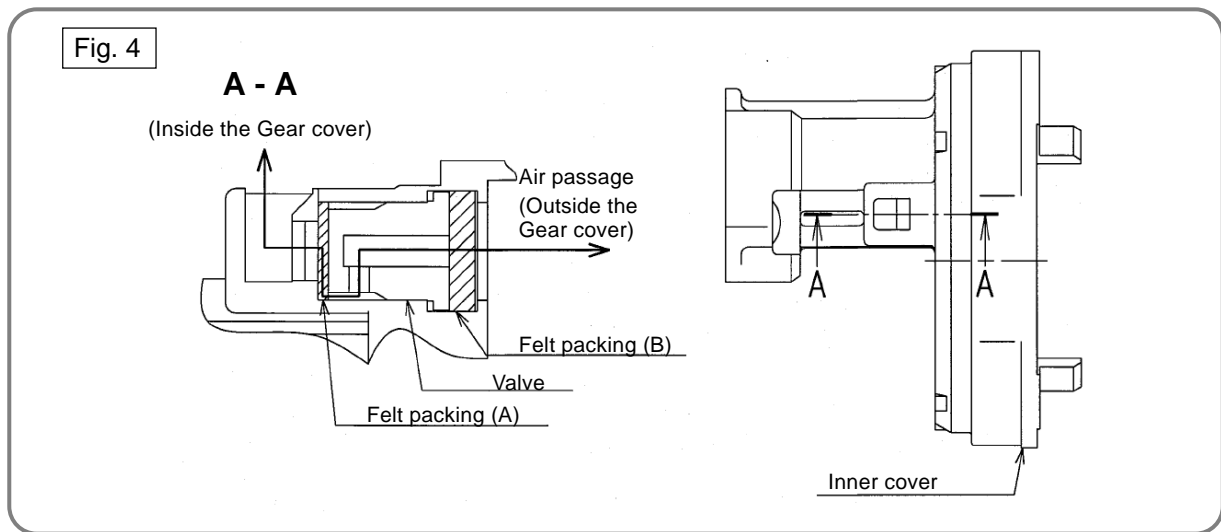
The idle striking prevention mechanism in the Model DH 22PG is different from those of conventional hammer drills in other classes. When the drill bit is lifted from the concrete surface on completion of drilling or during no-load operation, the reciprocating bearing that converts rotation into reciprocating motion stops to prevent idle striking.

Upon lifting the drill bit from the concrete surface, the tool shaft (cylinder) is moved forward about 5 mm by the force of spring (B) as shown in Fig. 3. Then the clutch is moved forward by the thrust plate that is connected to the cylinder to disengage the clutch from the reciprocating bearing. Thanks to the needle bearing on the second shaft, the reciprocating bearing can idle. Accordingly, rotation of the second shaft is not transmitted to the reciprocating bearing and the reciprocating bearing stops to stop the striking motion of the piston and the striker. The pressing force of spring (B) is as low as 1.0 kg to 2.0 kg in comparison with the conventional mouth system. The Model DH 22PG is also suitable for drilling in upward direction.



### ○ Internal pressure adjustment mechanism

An air passage is provided as shown in Fig. 4 to let out air inside the gear cover and let outside air in the gear cover. This passage is sandwiched between felt packings to pass only air (pressure). Thus variations in the internal pressure are minimized for stable hammering operation and prevention of grease leakage.



### ○ Slip mechanism

The slip mechanism in the Model DH 22PG consists of a coil spring which applies a pre-set amount of pressure to ensure the interlocking of three claws provided on the flange of the cylinder (the final rotating shaft) and three matching claws provided on the face of the second gear, by which rotation is transmitted to the cylinder. The second gear is fitted on the cylinder with a certain amount of play. If an excessively large torque is applied to the tool shaft (cylinder), the force of the torque will exceed the pressure of the coil spring and cause the claws on the second gear to disengage from and ride over the claws on the cylinder so that the second gear idles and does not transmit rotation. Even should the drill bit come in contact with a reinforcing bar within the concrete, causing sudden excessive torque, the slip mechanism functions to prevent damage to the gears, and possible loss of control of the tool by the operator (slip torque setting applied to the tool shaft: 1.7 to 2.2 kgm).

### ○ Sealed and dustproof construction

The gear cover is totally enclosed by oil seals, O-rings and other devices to prevent leakage of lubricating grease, and to keep dust and dirt out of the internal mechanisms. The drill bit chuck portion is protected by a rubber front cap to keep out dust and chips which could cause improper fitting of the drill bit and/or other faulty operation of the chuck portion. The speed control switch is also fully dustproof to prevent dust and chips from entering the handle section and causing possible operational trouble or a breakdown of the insulation.

### ○ Speed control

The Model DH 22PG is equipped with a variable speed control switch which permits free change of the rotation speed and hammering force. When drilling in fragile materials, pull the switch trigger gently for low rotation speed (hammering force) to achieve optimum results. Note that the switch trigger cannot be pulled to the full but up to the half in the reverse drilling, and the speed is about half of the forward drilling. In addition, the switch stopper cannot be used in the reverse drilling.

### 3. Changeover between “Rotation only” and “Rotation and hammering”

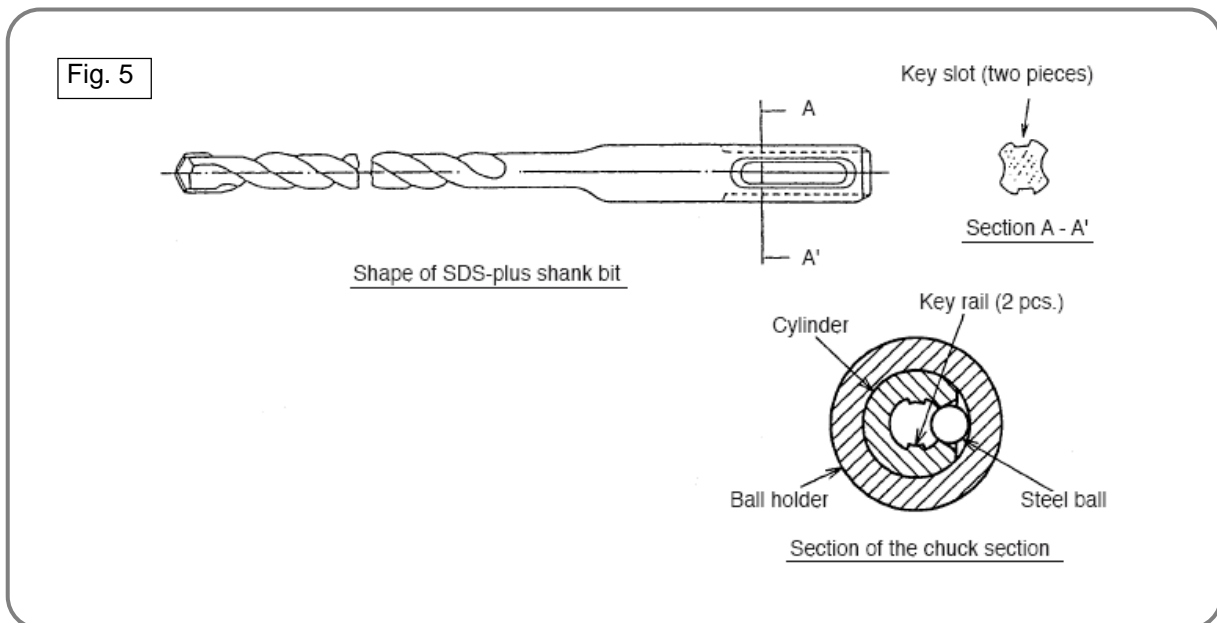
The change lever on the Model DH 22PG permits easy changeover between the “rotation only” and “rotation and hammering” functions. Set the change lever to “rotation and hammering” (T marks). Press the drill bit against the workpiece and pull the switch trigger. Then the armature starts rotating, and the rotation and the striking force are transmitted to the drill bit by the mechanism as described in page 10 “Piston reciprocating mechanism.” After drilling, take the drill bit away from the workpiece. Then the rotation of the reciprocating bearing and the hammering operation are stopped by the idle striking prevention mechanism as described in page 11. Set the change lever to “rotation only” (T mark). The stopper of the change lever contacts the rear surface of the thrust plate that is pushed forward by spring (B). Thus the cylinder cannot go back even if the main body is pressed, and the claws on the clutch cannot engage the matching claws on the reciprocating bearing. The reciprocating bearing idles on the second shaft and only the rotation is transmitted to the drill bit.

### 4. Precautions for use of “Rotation only” (no hammering) function

The Model DH 22PG is equipped with a change lever for changeover between “rotation only” and “rotation and hammering” functions. Be sure to set the change lever to “rotation only” for drilling into wood or metal materials or for driving screws by means of the optional chuck adapter or drill chuck. Should the change lever be set to “rotation and hammering” when such an optional tool is used for drilling or driving screws, the hammering action may cause the drill chuck or other optional tool to be broken or damaged. Salespersons should carefully ensure that the buyer is thoroughly advised on this point.

### 5. Drill bits

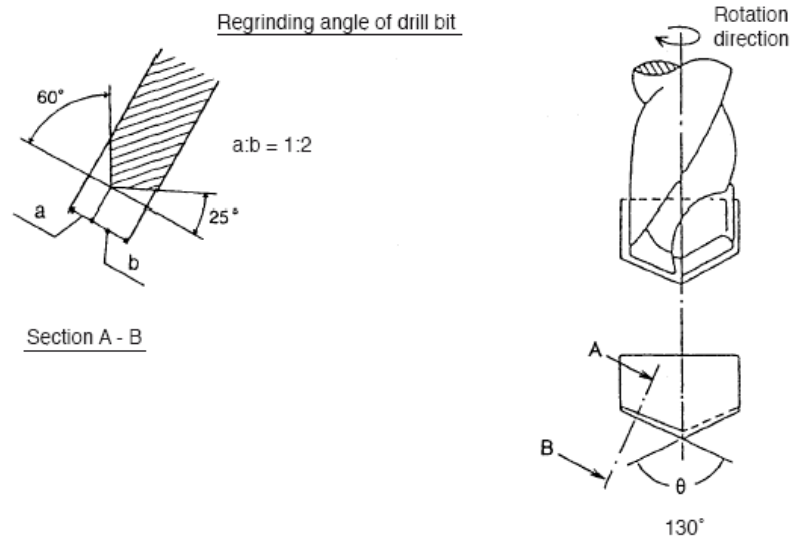
The chuck section is designed exclusively for the popular and widely available SDS-plus shank bits, as shown in Fig. 5. Rotating torque is transmitted to the drill bit by two key rails provided in the tool holding section. A steel ball is used to prevent the bit from falling out.



The service life of a drill bit with a diameter of 8 mm is approximately 300 holes when drilling into concrete with a depth of 30 mm. If reground before the end of its service life, the drill bit will continue to provide efficient drilling. Figure 6 shows the regrinding angle.



Fig. 6

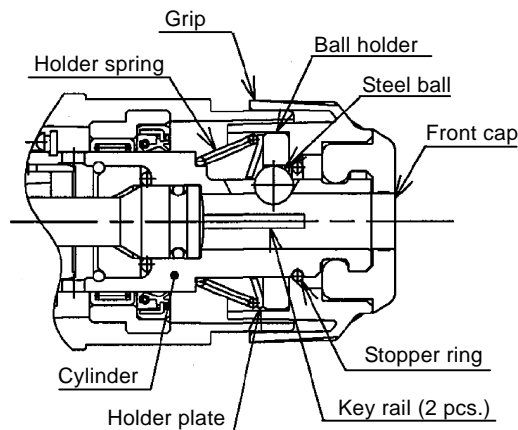


## 6. Tool retainer section

The tool retainer is structured as shown in Fig. 7.

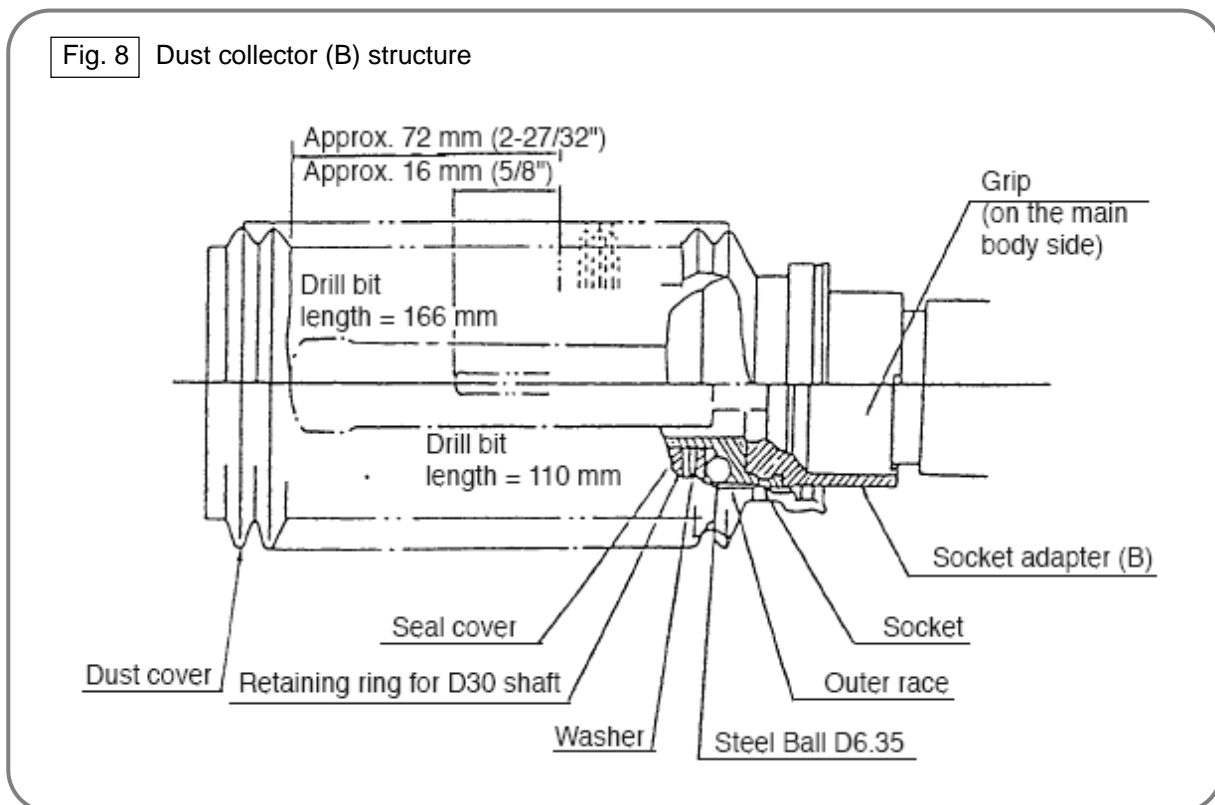
The tip of the tool retainer is covered with the front cap (made of rubber) to prevent dust and chips from getting inside. The steel ball falls into the round groove of the bit to prevent the tool from coming off and the two key rails transmit the rotation torque. To mount the bit, push the bit in the tool retainer as far as it will go. Pushing lightly, turn the bit until it is caught. At this position, push the bit in as far as it will go (sliding the grip is not required for mounting the bit). To remove the bit, slide the grip backward to the full and remove the bit.

Fig. 7



## 7. Dust collector (B)

When drilling holes overhead, dust collector (B) (optional accessory) can be mounted on the Model DH 22PG to prevent dust and chips from falling downward. Dust collector (B) is intended solely for use when drilling holes in concrete, and cannot be used for drilling holes in steel or wood. It is designed for use with drill bits with overall length of 166 mm, 160 mm and 110 mm, and cannot be used with any longer bits. When using a drill bit with an overall length of 166 mm with dust collector (B), drilling up to a depth of approximately 72 mm is possible. When using dust collector (B), ensure it is securely fastened to the grip on the main body with socket adapter (B). Although socket adapter (B) rotates together with the tool shank, there is a steel ball between the outer race and the socket which serves as a ball bearing. Should the dust cover be forced against the concrete surface, it will not rotate even though the tool shank continues to rotate. Should the tool be operated when the dust cover is not being held against a concrete surface, friction may cause dust collector (B) to become disconnected from the grip. Accordingly, caution the customer to press dust collector (B) and drill bit firmly against the concrete surface before turning on the switch to start drilling. When dust collector (B) is used, almost no dust and chips are scattered about. However, since the chips and dust remaining in the collector may scatter after completion of the drilling operation, the customer should be advised to always wear protective glasses. When dust collector (B) is disassembled for repair or maintenance, be very careful to prevent oil or grease from adhering to the steel balls. Grease or oil on the steel balls may cause concrete dust to enter the unit and cause defective rotation.



## REPAIR GUIDE

Be sure to disconnect the power cord plug from the wall outlet before repairing. Otherwise, the motor turns abruptly and it is very dangerous.

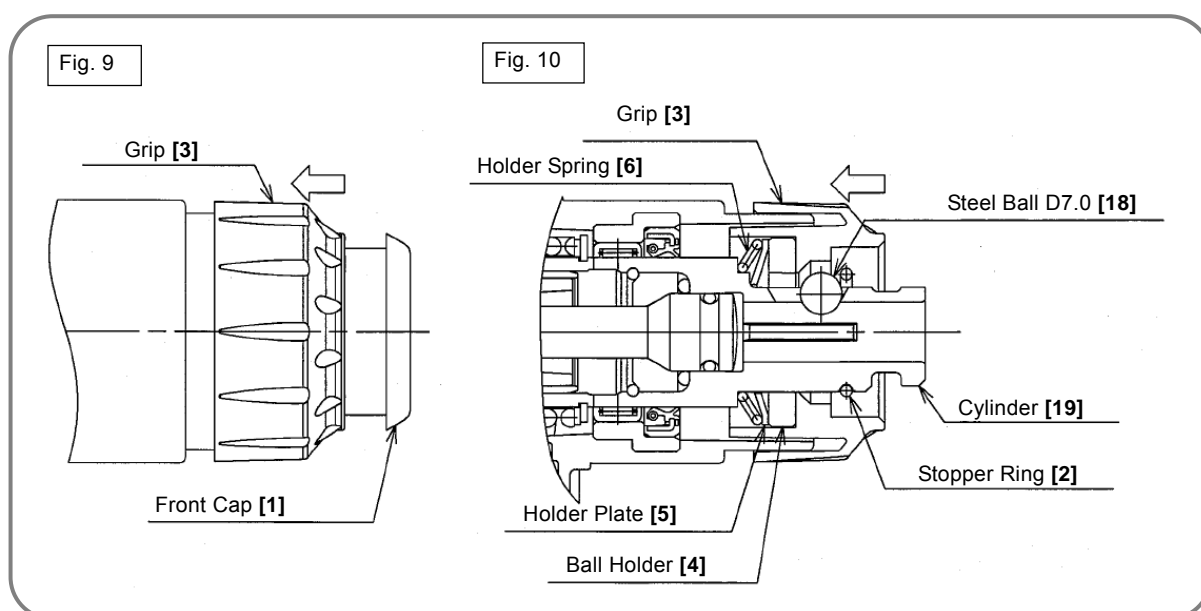
### 1. Precautions in disassembly and reassembly

The **[Bold]** numbers in the description below correspond to the item numbers in the Parts List and the exploded assembly diagram for the Model DH 22PG.

## Disassembly

### 1. Disassembly of the tool retainer

Slide the Grip **[3]** fully in the arrow direction as shown in Fig. 9 and remove the Front Cap **[1]**. Pulling the Grip **[3]** in the arrow direction as shown in Fig. 10, remove the Stopper Ring **[2]** with a retaining ring puller. Then the Grip **[3]**, Ball Holder **[4]**, Steel Ball D7.0 **[18]**, Holder Plate **[5]** and Holder Spring **[6]** can be removed from the Cylinder **[19]**.



### 2. Disassembly of the hammering mechanism

Set the Lever **[14]** to "rotation and hammering" (**T** marks). Remove the Tapping Screw (W/Flange) D4 x 30 (Black) **[8]** from the Gear Cover **[7]** to remove the Gear Cover **[7]**. At this time, check that the Spacer **[35]** at the tip of the Second Shaft **[36]** is not adhered to the ball bearing press-fitted into the Gear Cover **[7]**. Remove the Spacer **[35]** from the tip of the Second Shaft **[36]** and move the Piston **[30]** to the top dead center (Inner Cover Ass'y **[33]** side) by turning the Second Shaft **[36]**. Then the arm of the Reciprocating Bearing **[38]** can be removed from the Piston Pin **[34]** and the components mounted on the Second Shaft **[36]** can be removed from the Inner Cover Ass'y **[33]** as a unit.

Remove the First Gear **[40]** from the Second Shaft **[36]** with a bearing puller and remove the Reciprocating Bearing **[38]**, Needle Cage **[39]** and Clutch **[37]** from the Second Shaft **[36]**.

Note that the First Gear **[40]** is aligned with and press-fitted onto the 9 mm diameter end surface of the Second Shaft **[36]**.

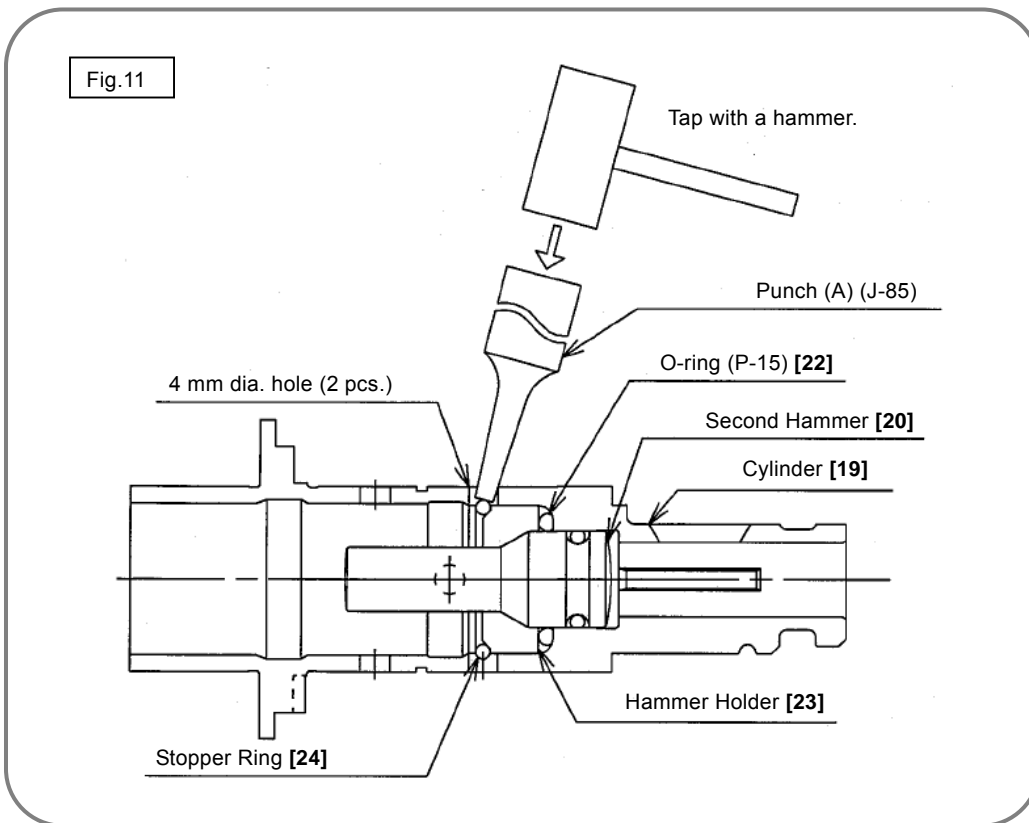
### 3. Removal of the Cylinder [19] and the Second Gear [17] (slip mechanism section)

Remove the Machine Screw M4 x 5 [15] securing the Lever [14] to the Stopper [12] from the inside of the Gear Cover [7]. Pull out the Lever [14] from the Gear Cover [7]. Then the Stopper [12] can be removed. Push the tip of the Cylinder [19] to remove the Cylinder [19] from the Gear Cover [7]. Remove the Retaining Ring for D25 Shaft [10] from the Cylinder [19] with a retaining ring puller. Then the Second Gear [17], Spring (A) [16] and Washer [11] can be removed from the Cylinder [19].

### 4. Removal of the Cylinder [19] and the Second Hammer [20]

Remove the Stopper Ring [24] from the inner circumference of the Cylinder [19]. Then the Hammer Holder [23], Second Hammer [20] and O-ring (P-15) [22] can be removed from the Cylinder [19].

As shown in Fig. 11, insert punch (A) [J-85] into the 4 mm dia. hole (2 pcs.) of the Cylinder [19] and tap the Stopper Ring [24] until the Stopper Ring [24] cannot be seen from the 4 mm dia. hole (2 pcs.) to remove the Stopper Ring [24] from the groove of the inner circumference of the Cylinder [19]. Then, pull out the Stopper Ring [24] from the inner circumference of the Cylinder [19] with a retaining ring puller (B) (J-341) being careful not to pop out the Stopper Ring [24]. At reassembly, replace the Stopper Ring [24] with new one as the removed Stopper Ring [24] is deformed.



# Reassembly

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

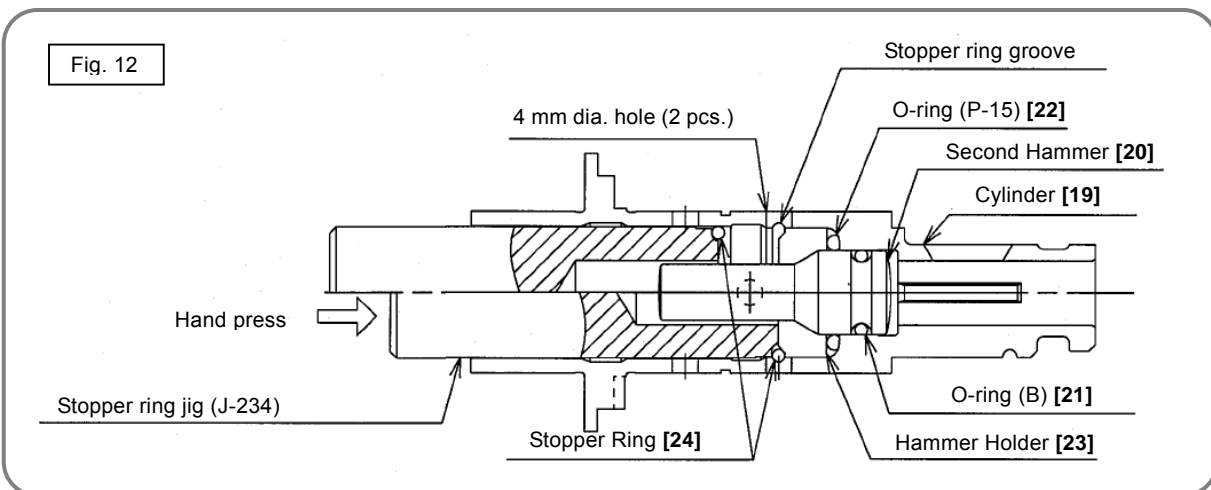
## 1. Application of lubricant

Apply special grease to the lip portion of the oil seal in the Gear Cover [7], inner circumference of the needle bearing, clutch claws of the Second Gear [17] and the Cylinder [19], inner circumference of the needle bearing in the Inner Cover Ass'y [33], O-ring (B) [21] of the Second Hammer [20], O-ring (P-15) [22], O-ring (A) [26] of the Striker [25], inner and outer circumference of the Piston [30], Washer [31], claw portion of the Clutch [37], claw portion, inner circumference and arm portion of the Reciprocating Bearing [38] and O-ring (1AP-10) [13] of the Lever [14].

Fill 30 g of special grease in the Gear Cover [7] and 10 g in the groove of the Inner Cover Ass'y [33]. Apply Hitachi Motor Grease No. 29 to the Steel Ball D7.0 [18].

## 2. Reassembly of the Cylinder [19] section

Mount the O-ring (P-15) [22], Second Hammer [20], O-ring (B) [21] and Hammer Holder [23] in the Cylinder [19] as shown in Fig. 12. Push the new Stopper Ring [24] in the Cylinder [19] at an angle and fit it in the groove with a hand press using the stopper ring jig [J-234]. Check that the Stopper Ring [24] is securely fitted in the groove of the Cylinder [19] viewing from the 4 mm dia. hole (2 pcs.) on the Cylinder [19].



## 3. Mounting the Lever [14]

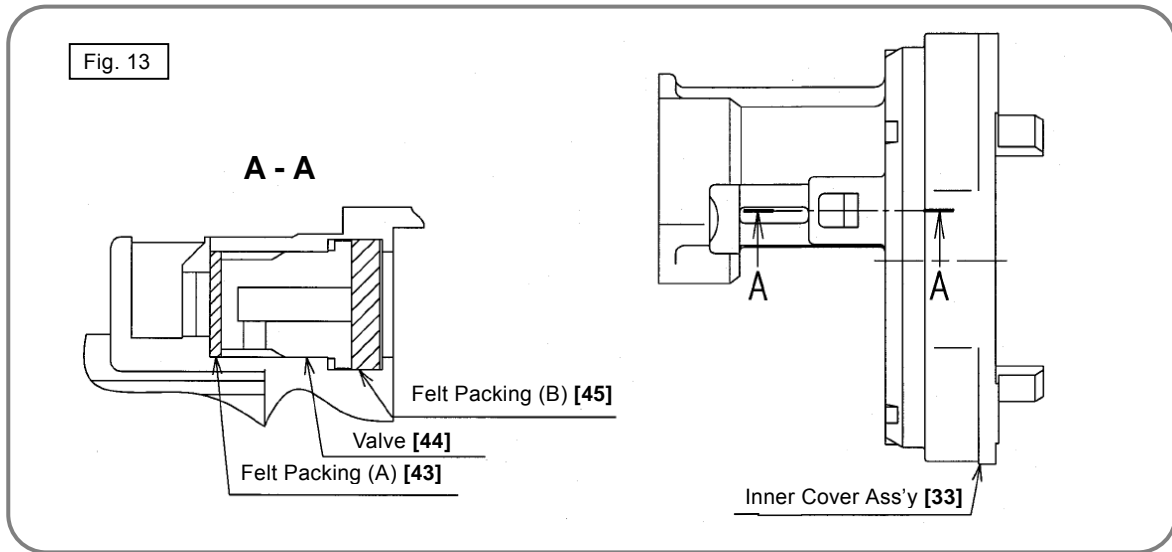
Mount the Second Gear [17], Spring (A) [16] and Washer [11] to the Cylinder [19] and secure them with the Retaining Ring for D25 Shaft [10]. Push this assembly in to the tip of the Gear Cover [7] and mount the Holder Spring [6], Holder Plate [5] and Steel Ball D7.0 [18] to the tip of the Cylinder [19]. Mount the Ball Holder [4], Grip [3], Stopper Ring [2] and Front cap [1]. Mount the Thrust Washer [27] to the Cylinder [19]. Show the Lever [14] in the Gear Cover [7] and fit the Stopper [14] in the groove of the Lever [14] then push the Lever [14] in the Gear Cover [7] hard. Secure the Lever [14] to the Gear Cover [7] with the Machine Screw M4 x 5 [15]. When assembling the component parts, be sure to set the Lever [14] to "rotation and hammering" (T marks).

## 4. Press-fitting the First Gear [40]

Press-fit the First Gear [40] aligning with the shaft end surface of the Second Shaft [36]. After press-fitting the First Gear [40], check that the inside ring of the Reciprocating Bearing [38] turns smoothly.

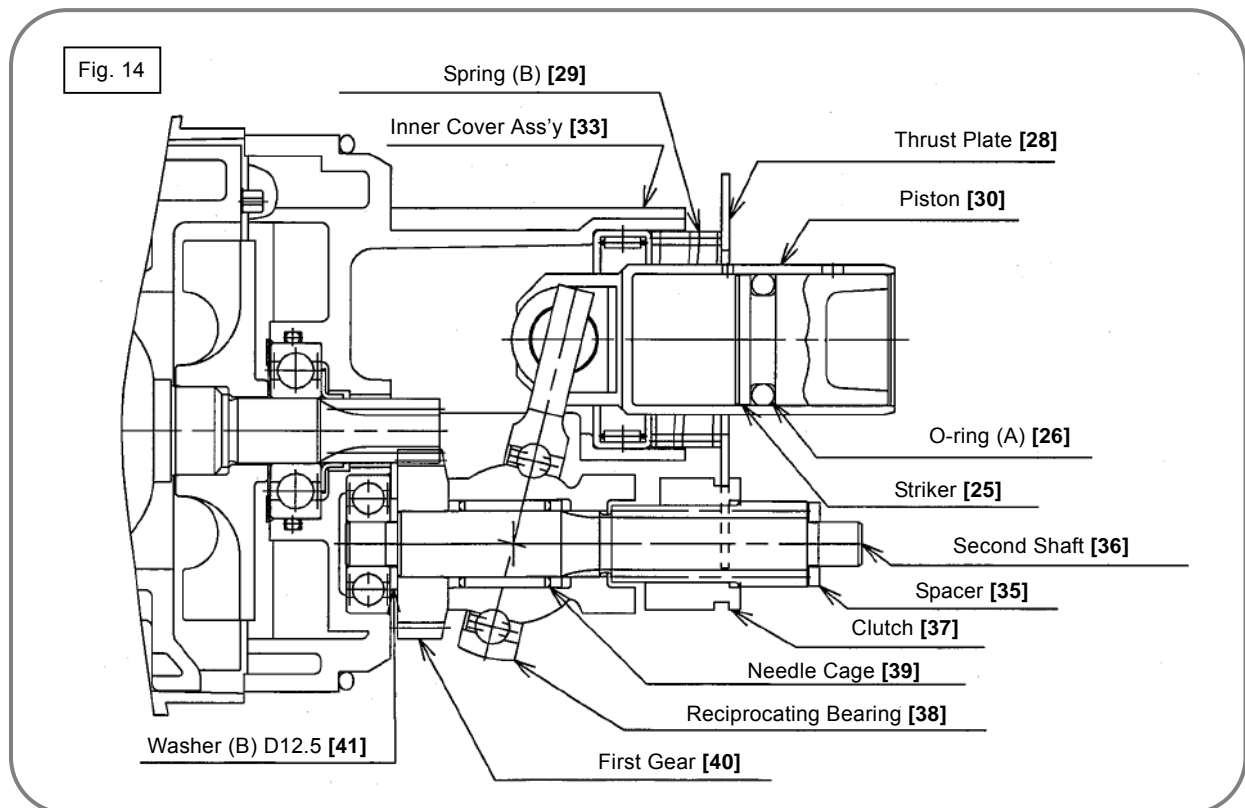
## 5. Reassembly of the internal pressure adjustment mechanism

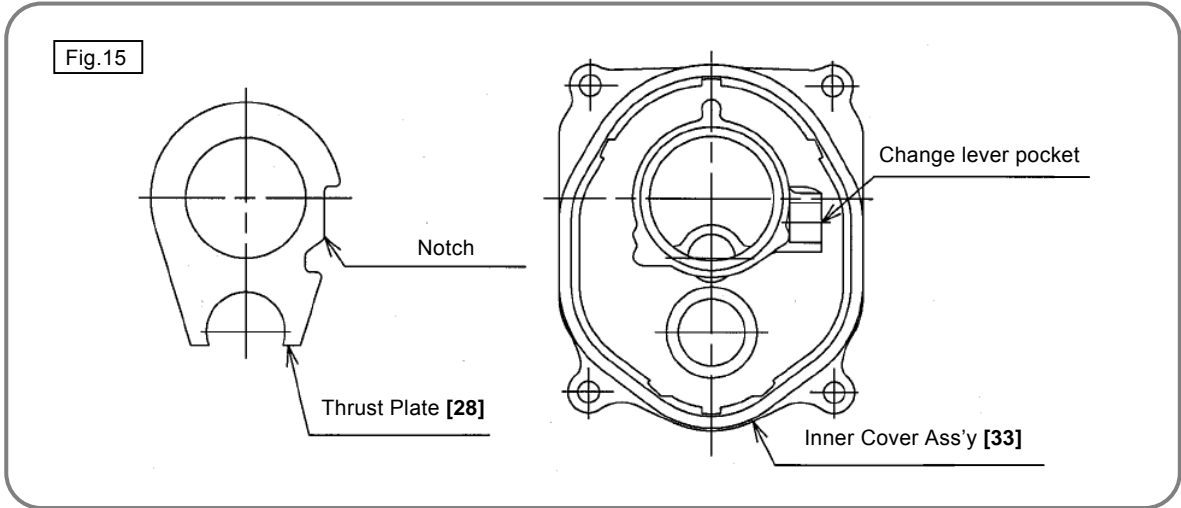
As shown in Fig.13, push Felt Packing (A) [43], Valve [44] and Felt Packing (B) [45] in the Inner Cover Ass'y [33] as far as they will go in this order.



## 6. Mounting the Piston [30]

Mount the Piston [30] as shown in Fig. 14. At this time, mount the Thrust Plate [28] aligning the change lever pocket of the Inner Cover Ass'y [33] with the notch of the Thrust Plate [28]. (See Fig. 15.)



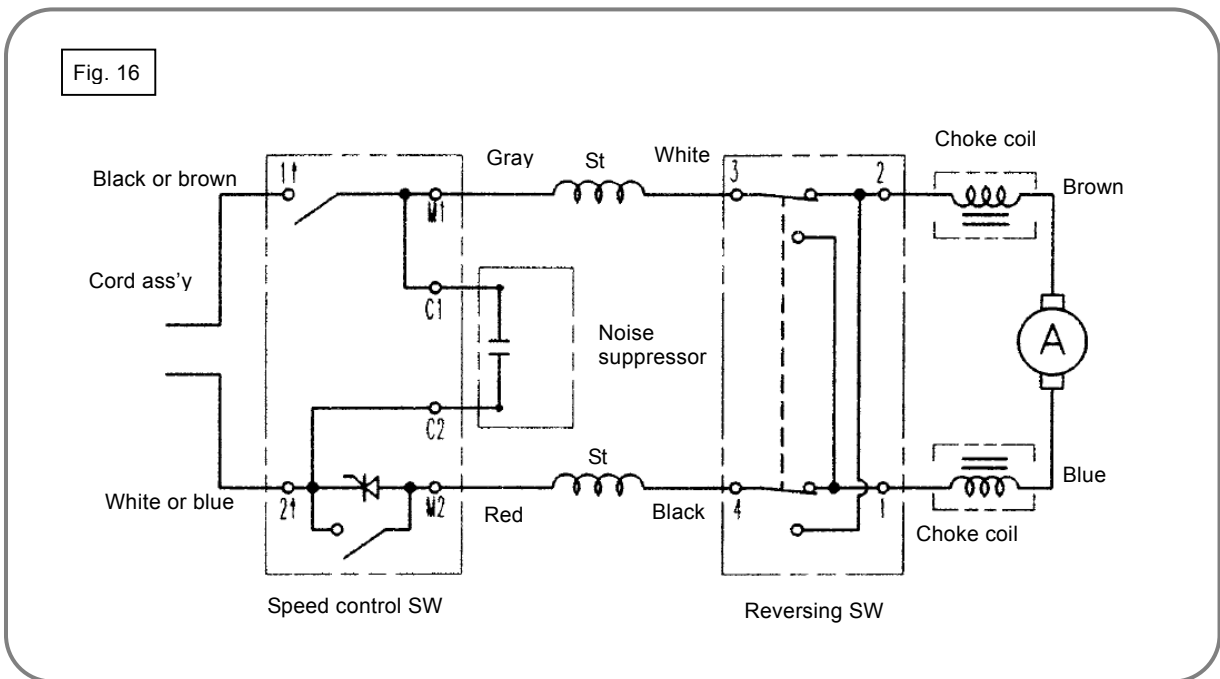


### 7. Tightening torque

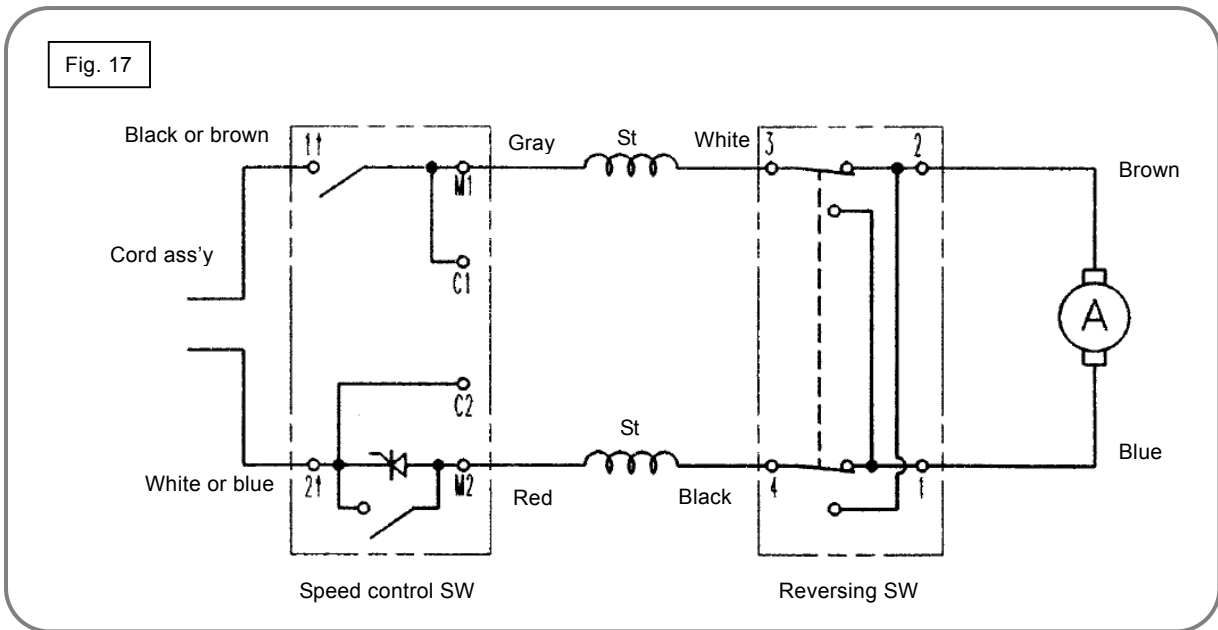
- o Tapping Screw D4 [8] [52] [69] [72] ----- 1.47 – 2.45 N•m (15 – 25 kgf•cm)
- o Machine Screw M4 x 5 [15]----- 0.39 – 0.78 N•m (4 – 8 kgf•cm)

### 8. Wiring diagrams

(1) Product with noise suppressor



(2) Product without noise suppressor

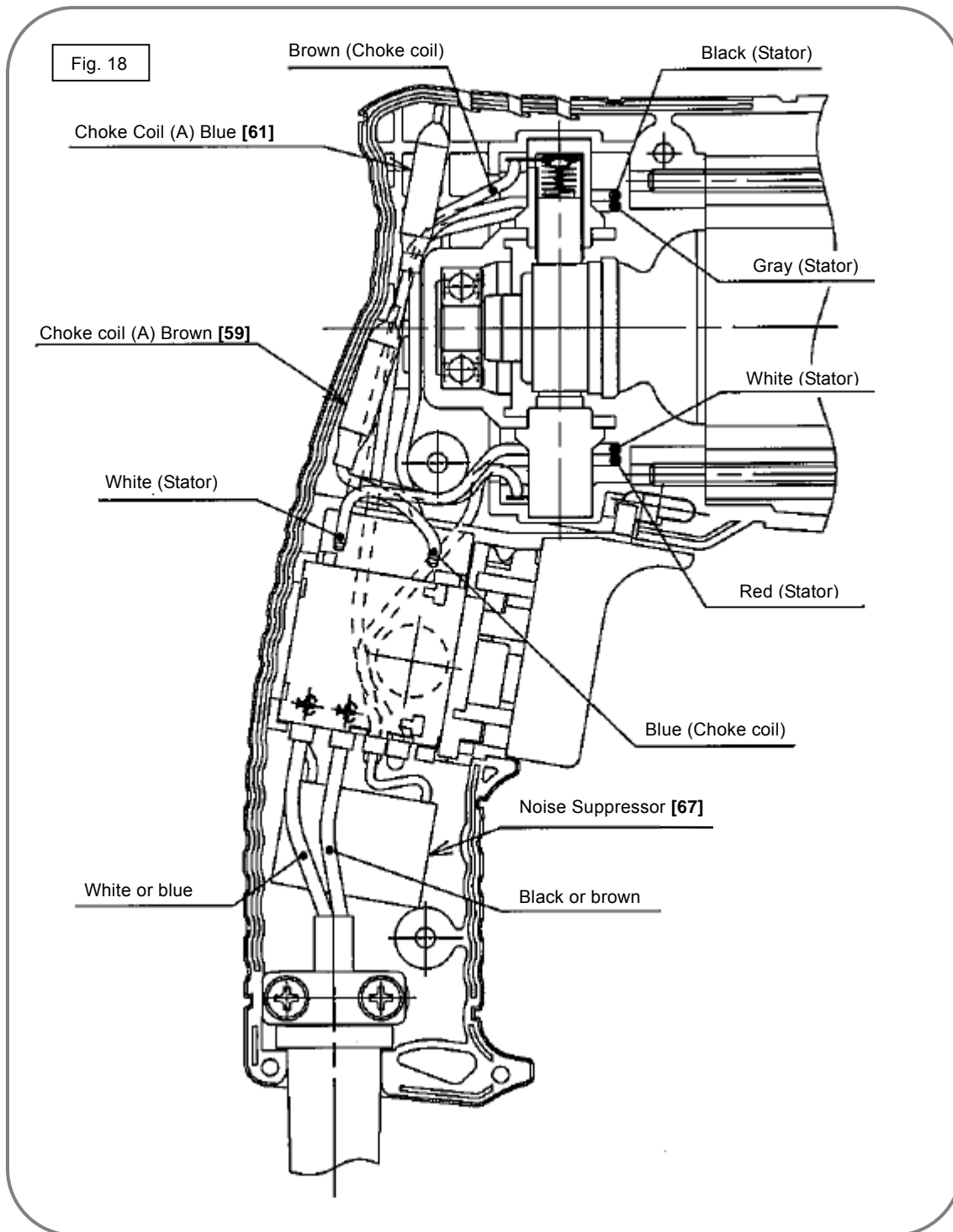




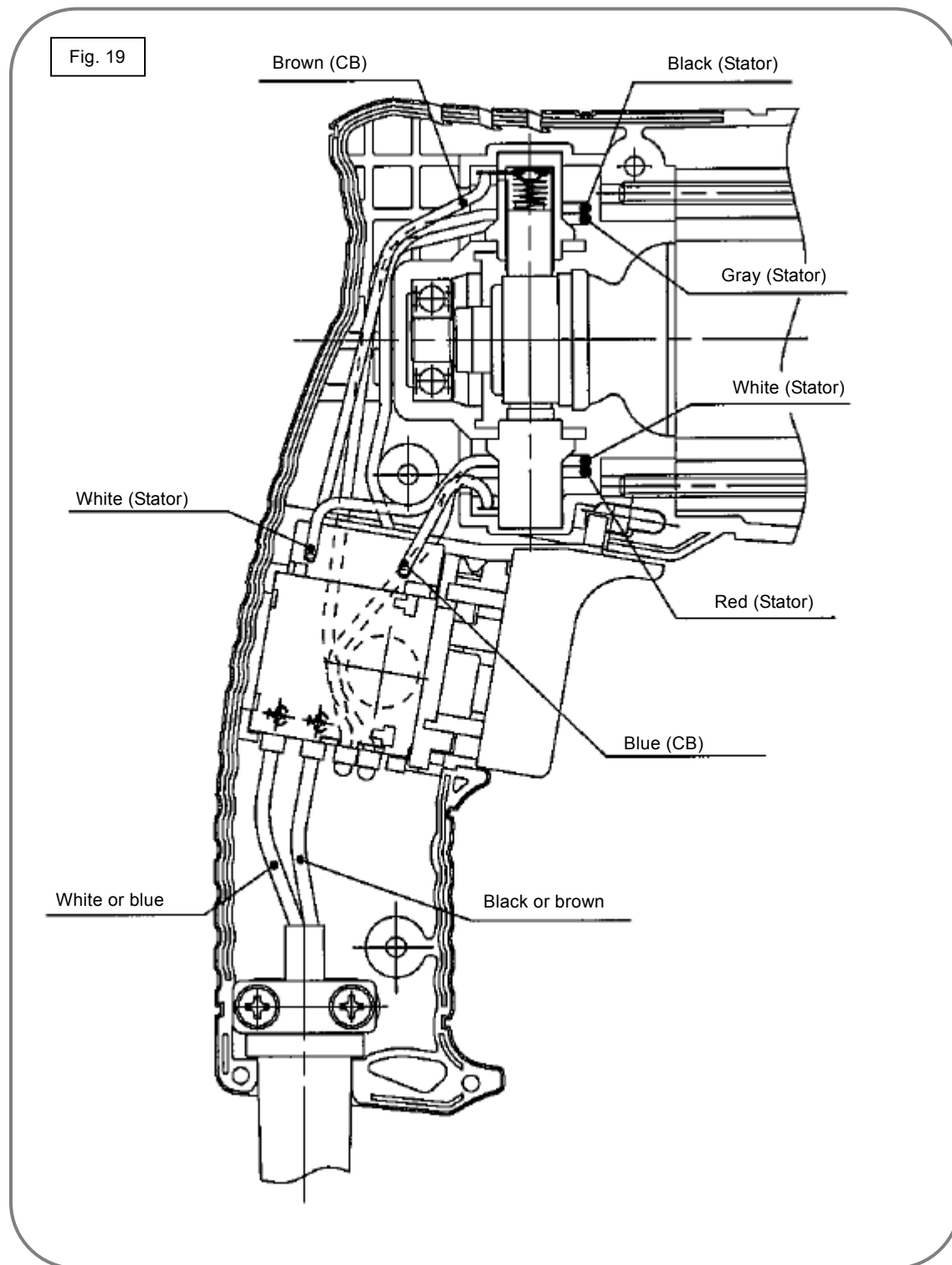
## 9. Internal wire arrangement and wiring work

### A. Internal wire arrangement

(1) Product with noise suppressor



(2) Product without noise suppressor

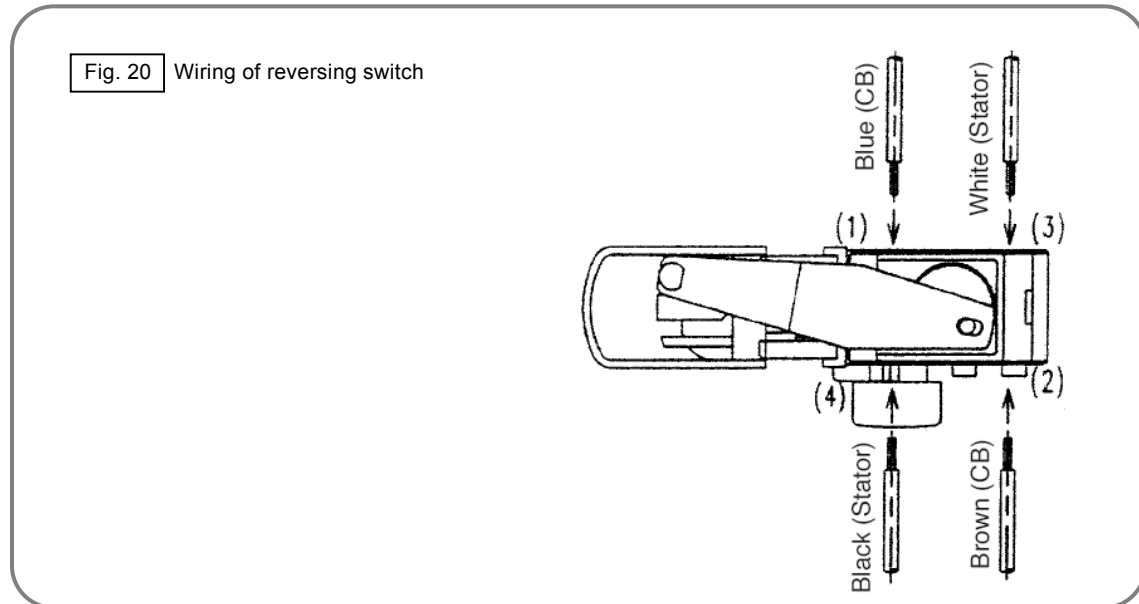


## B. Additional wiring work

General internal wiring can be accomplished by referring to paragraphs 8 and 9. The following are special instructions for switch connection.

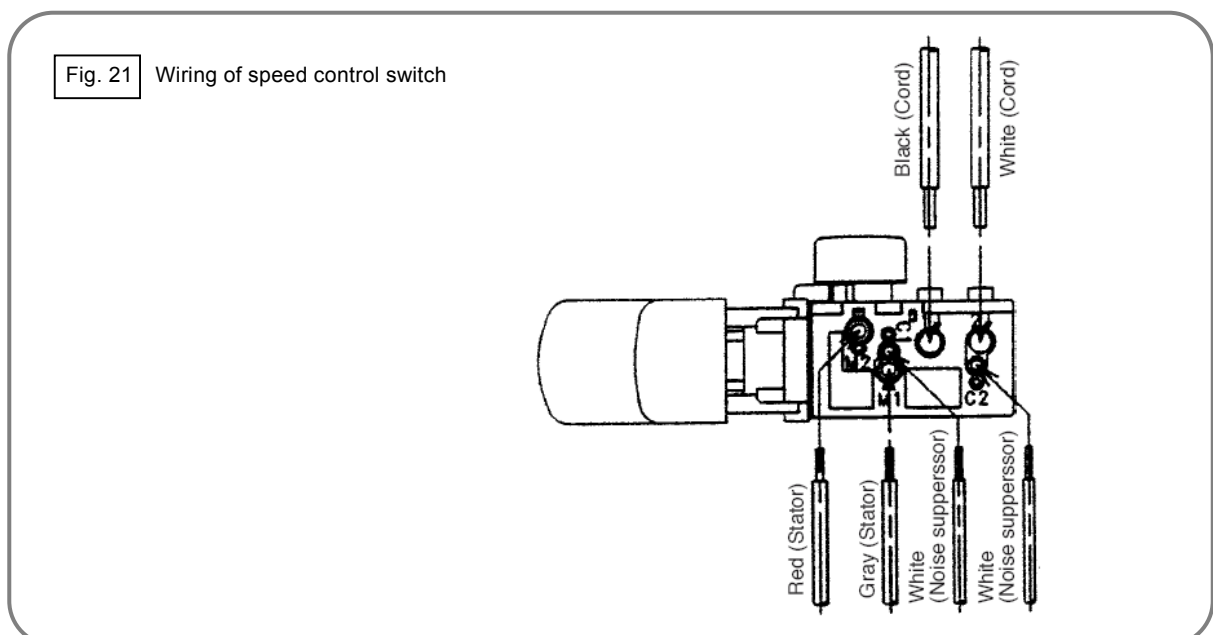
### (1) Wiring of reversing switch

Insert the lead wire (black) coming from the stator into the terminal (4) of the reversing switch, and the lead wire (white) into the terminal (3) as shown in Fig. 20. Insert the lead wire (brown) coming from the carbon brush or choke coil into the terminal (2) and the lead wire (blue) into the terminal (1). After the insertion, pull each lead wire slightly to check the lead wires do not come off. To disconnect the lead wires, insert a small flat-blade screwdriver into the windows near the terminals and pull out the lead wires.



### (2) Wiring of speed control switch

Insert each cord into the terminal (1 ↑) and terminal (2 ↑) of the speed control switch as shown in Fig. 21 and tighten the screw (tightening torque:  $0.6 \pm 0.2 \text{ N}\cdot\text{m}$  ( $6 \pm 2 \text{ kgf}\cdot\text{cm}$ ,  $5.2 \pm 1.7 \text{ in}\cdot\text{lbs.}$ )). Insert the lead wire (gray) coming from the stator into the terminal (M1) and the lead wire (red) into the terminal (M2). Insert each lead wire (white) coming from the noise suppressor into the terminal (C1) and (C2). After the insertion, pull each lead wire slightly to check the lead wires do not come off. To disconnect the lead wires, insert a small flat-blade screwdriver into the windows near the terminals and pull out the lead wires.



## 10. Insulation tests

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

Insulation resistance: 7 M  $\Omega$  or more with DC 500 V megohm tester

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

: AC 2,500 V/1minute, with no abnormalities 110 V – 120 V (except U.K. products)

## 11. No-load current values

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

|                  |     |     |     |     |     |
|------------------|-----|-----|-----|-----|-----|
| Voltage (V)      | 110 | 120 | 220 | 230 | 240 |
| Current (A) max. | 3.0 | 2.8 | 1.6 | 1.5 | 1.4 |

# STANDARD REPAIR TIME (UNIT) SCHEDULES

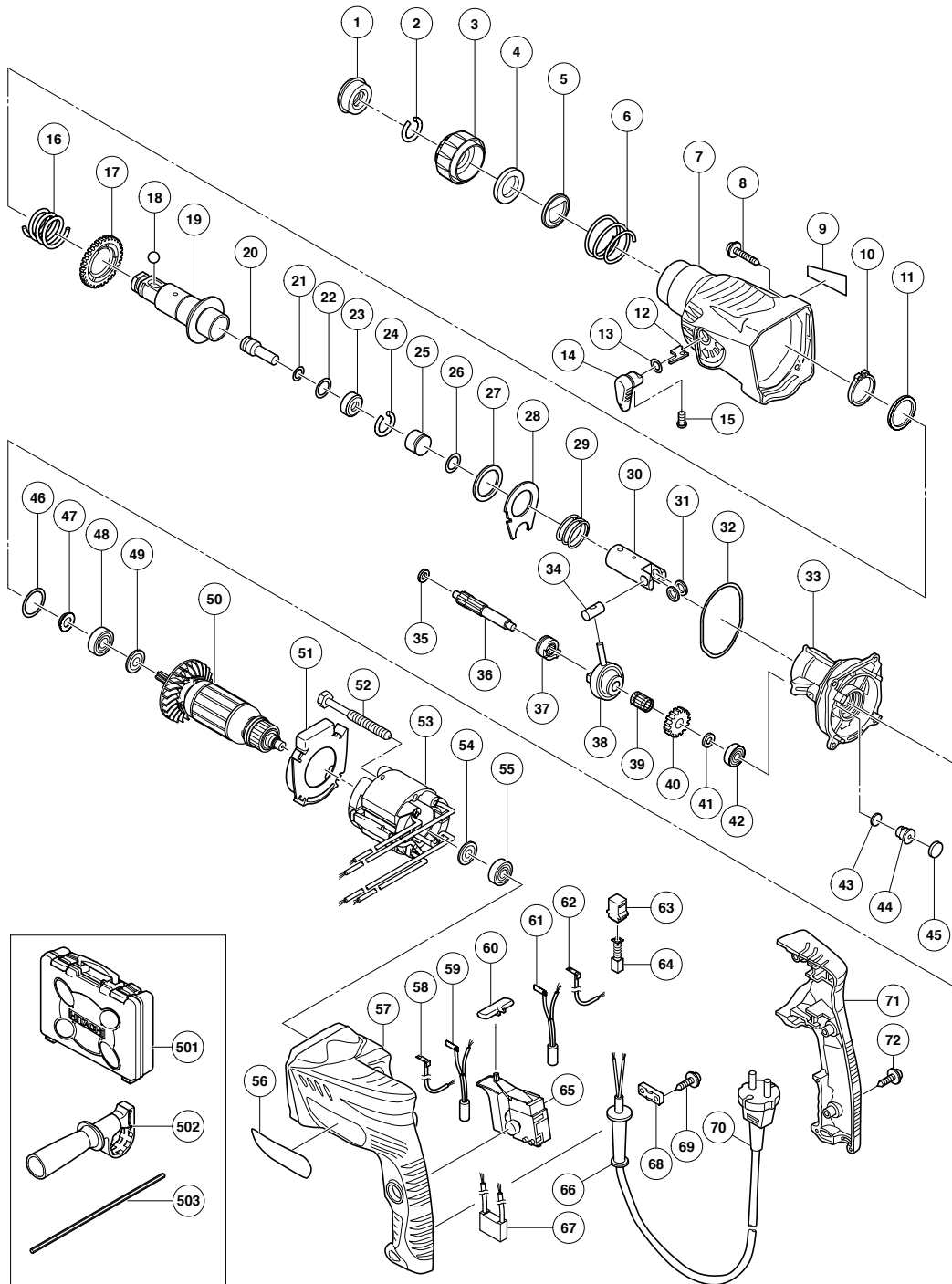
| MODEL  | Variable  |                  | 10   | 20   | 30   | 40  | 50                                    | 60 min. |
|--------|-----------|------------------|--|--|--|---|---------------------------------------|---------|
|        | Fixed     |                  |  |  |  |   |                                       |         |
| DH22PG | Work Flow |                  |  |  |  |   |                                       |         |
|        |           |                  | Handle Cover<br>Cord Armor   | Switch<br>Cord   |  |   |                                       |         |
|        |           |                  |  |  |  | Housing<br>Stator   |                                       |         |
|        |           |                  |  |  | Armature Ass'y<br>O-ring (S-24)<br>Ball Bearing<br>(609DD)<br>Ball Bearing<br>(608VV)  |   |                                       |         |
|        |           | General Assembly | Front Cap<br>Grip<br>Ball Holder<br>Holder Spring<br>Steel Ball D7.0 | Lever<br>O-ring (1AP-10)<br>Stopper  |  | Second Hammer<br>O-ring (B)<br>O-ring (P-15)<br>Hammer Holder | Cylinder<br>Second Gear<br>Spring (A) |         |
|        |           |                  |  |  |  | Gear Cover  |                                       |         |
|        |           |                  |  | Striker<br>O-ring (A)<br>Thrust Washer<br>Thrust Plate<br>Spring (B)<br>Piston<br>O-ring (A)<br>Piston Pin<br>Washer (A) | Inner Cover<br>Ass'y<br>Second Shaft<br>Clutch<br>Reciprocating<br>Bearing<br>Needle Cage<br>First Gear<br>Ball Bearing<br>(626VV) |   |                                       |         |
|        |           |                  |  |  |  |   |                                       |         |
|        |           |                  |  |  |  |   |                                       |         |
|        |           |                  |  |  |  |   |                                       |         |

## ELECTRIC TOOL PARTS LIST

### ■ ROTARY HAMMER Model DH 22PG

2007 · 6 · 4

(E1)



**PARTS**

| ITEM NO. | CODE NO. | DESCRIPTION                            | NO. USED | REMARKS               |
|----------|----------|--|----------|-----------------------|
| 1        | 306-345  | FRONT CAP                              | 1        |                       |
| 2        | 306-340  | STOPPER RING                           | 1        |                       |
| 3        | 325-597  | GRIP                                   | 1        |                       |
| 4        | 327-879  | BALL HOLDER                            | 1        |                       |
| 5        | 324-526  | HOLDER PLATE                           | 1        |                       |
| 6        | 322-812  | HOLDER SPRING                          | 1        |                       |
| 7        | 327-873  | GEAR COVER                             | 1        |                       |
| 8        | 305-490  | TAPPING SCREW (W/FLANGE) D4X30 (BLACK) | 4        |                       |
| 9        |          | NAME PLATE                             | 1        |                       |
| 10       | 965-469  | RETAINING RING FOR D25 SHAFT           | 1        |                       |
| 11       | 944-274  | WASHER                                 | 1        |                       |
| 12       | 327-875  | STOPPER                                | 1        |                       |
| 13       | 872-654  | O-RING (1AP-10)                        | 1        |                       |
| 14       | 325-594  | LEVER                                  | 1        |                       |
| 15       | 949-213  | MACHINE SCREW M4X5 (10 PCS.)           | 1        |                       |
| 16       | 306-334  | SPRING (A)                             | 1        |                       |
| 17       | 306-333  | SECOND GEAR                            | 1        |                       |
| 18       | 959-156  | STEEL BALL D7.0 (10 PCS.)              | 1        |                       |
| 19       | 327-876  | CYLINDER                               | 1        |                       |
| 20       | 327-877  | SECOND HAMMER                          | 1        |                       |
| 21       | 301-672  | O-RING (B)                             | 1        |                       |
| 22       | 311-814  | O-RING (P-15)                          | 1        |                       |
| 23       | 327-878  | HAMMER HOLDER                          | 1        |                       |
| 24       | 306-340  | STOPPER RING                           | 1        |                       |
| 25       | 325-601  | STRIKER                                | 1        |                       |
| 26       | 306-326  | O-RING (A)                             | 1        |                       |
| 27       | 327-880  | THRUST WASHER                          | 1        |                       |
| 28       | 325-588  | THRUST PLATE                           | 1        |                       |
| 29       | 306-976  | SPRING (B)                             | 1        |                       |
| 30       | 306-324  | PISTON                                 | 1        |                       |
| 31       | 328-660  | WASHER                                 | 2        |                       |
| 32       | 327-870  | O-RING (A)                             | 1        |                       |
| 33       | 327-869  | INNER COVER ASS'Y                      | 1        | INCLUD. 43-45         |
| 34       | 306-322  | PISTON PIN                             | 1        |                       |
| 35       | 325-587  | SPACER                                 | 1        |                       |
| 36       | 327-871  | SECOND SHAFT                           | 1        |                       |
| 37       | 325-584  | CLUTCH                                 | 1        |                       |
| 38       | 325-585  | RECIPROCATING BEARING                  | 1        |                       |
| 39       | 306-320  | NEEDLE CAGE                            | 1        |                       |
| 40       | 327-872  | FIRST GEAR                             | 1        |                       |
| 41       | 995-634  | WASHER (B) D12.5                       | 1        |                       |
| 42       | 626-VVM  | BALL BEARING 626VVC2PS2L               | 1        |                       |
| 43       | 324-543  | FELT PACKING (A)                       | 1        |                       |
| 44       | 324-545  | VALVE                                  | 1        |                       |
| 45       | 324-544  | FELT PACKING (B)                       | 1        |                       |
| 46       | 878-609  | O-RING (S-24)                          | 1        |                       |
| 47       | 306-312  | FRINGER                                | 1        |                       |
| 48       | 609-DDC  | BALL BEARING 609DDC3PS2-L              | 1        |                       |
| 49       | 958-915  | WASHER (A)                             | 1        |                       |
| * 50     | 360-798U | ARMATURE ASS'Y 110V-120V               | 1        | INCLUD. 47-49, 54, 55 |
| * 50     | 360-798E | ARMATURE 220V-230V                     | 1        |                       |

**PARTS**

| ITEM NO. | CODE NO. | DESCRIPTION                            | NO. USED | REMARKS  |
|----------|----------|--|----------|--|
| * 50     | 360-798F | ARMATURE 240V                          | 1        |  |
| 51       | 327-868  | FAN GUIDE                              | 1        |  |
| 52       | 981-824  | HEX. HD. TAPPING SCREW D4X45           | 2        |  |
| * 53     | 340-701C | STATOR 110V-120V                       | 1        |  |
| * 53     | 340-701E | STATOR 220V-230V                       | 1        |  |
| * 53     | 340-701F | STATOR 240V                            | 1        |  |
| 54       | 982-631  | WASHER (A)                             | 1        |  |
| 55       | 608-VVM  | BALL BEARING 608VVC2PS2L               | 1        |  |
| 56       |          | HITACHI LABEL                          | 1        |  |
| 57       | 327-881  | HOUSING                                | 1        |  |
| * 58     | 324-537  | INTERNAL WIRE (A) (BROWN)              | 1        | FOR VEN, THA, INA, SYR, SIN, HKG,<br>KUW, USA, CAN, IND        |
| * 59     | 324-549  | CHOKE COIL (A) BROWN                   | 1        | EXCEPT FOR VEN, THA, INA, SYR, SIN,<br>HKG, KUW, USA, CAN, IND |
| 60       | 322-853  | PUSHING BUTTON                         | 1        |  |
| * 61     | 324-551  | CHOKE COIL (A) BLUE                    | 1        | EXCEPT FOR VEN, THA, INA, SYR, SIN,<br>HKG, KUW, USA, CAN, IND |
| * 62     | 324-538  | INTERNAL WIRE (A) (BLUE)               | 1        | FOR VEN, THA, INA, SYR, SIN, HKG,<br>KUW, USA, CAN, IND        |
| 63       | 955-203  | BRUSH HOLDER                           | 2        |  |
| 64       | 999-041  | CARBON BRUSH (1 PAIR)                  | 2        |  |
| 65       | 324-536  | SWITCH (1P PILLAR TYPE)                | 1        |  |
| * 66     | 953-327  | CORD ARMOR D8.8                        | 1        |  |
| * 66     | 938-051  | CORD ARMOR D10.1                       | 1        |  |
| * 67     | 930-039  | NOISE SUPPRESSOR                       | 1        | EXCEPT FOR VEN, THA, INA, SYR, SIN,<br>HKG, KUW, USA, CAN, IND |
| 68       | 937-631  | CORD CLIP                              | 1        |  |
| 69       | 984-750  | TAPPING SCREW (W/FLANGE) D4X16         | 2        |  |
| * 70     | 500-390Z | CORD                                   | 1        | (CORD ARMOR D8.8)  |
| * 70     | 500-447Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR SYR                                      |
| * 70     | 500-424Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR SIN, KUW                                 |
| * 70     | 500-235Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR INA, IND                                 |
| * 70     | 500-239Z | CORD                                   | 1        | (CORD ARMOR D10.1) FOR THA                                     |
| * 70     | 930-055  | CORD                                   | 1        | (CORD ARMOR D10.1) FOR VEN                                     |
| * 70     | 500-408Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR NZL, AUS                                 |
| * 70     | 500-249Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR USA, CAN                                 |
| * 70     | 500-446Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR GBR (230V)                               |
| * 70     | 500-465Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR GBR (110V)                               |
| * 70     | 500-391Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR SUI                                      |
| * 70     | 500-440Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR HKG                                      |
| * 70     | 500-456Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR CHN                                      |
| * 70     | 323-974  | CORD                                   | 1        | (CORD ARMOR D10.1) FOR TPE                                     |
| * 70     | 500-475Z | CORD                                   | 1        | (CORD ARMOR D8.8) FOR KOR                                      |
| 71       | 327-882  | HANDLE COVER                           | 1        |  |
| 72       | 301-653  | TAPPING SCREW (W/FLANGE) D4X20 (BLACK) | 3        |  |
|          |          |  |          |  |
|          |          |  |          |  |
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## STANDARD ACCESSORIES

DH 22PG

| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS      |
|----------|----------|-------------|----------|--------------|
| 501      | 327-883  | CASE        | 1        |              |
| 502      | 324-548  | SIDE HANDLE | 1        |              |
| * 503    | 303-709  | DEPTH GAUGE | 1        |              |
| * 503    | 310-331  | DEPTH GAUGE | 1        | FOR USA, CAN |

## OPTIONAL ACCESSORIES

| ITEM NO. | CODE NO. | DESCRIPTION                                | NO. USED | REMARKS          |
|----------|----------|--|----------|------------------|
| 601      | 308-471  | GREASE FOR HAMMER.HAMMER DRILL (70G)       | 1        |                  |
| 602      | 980-927  | GREASE FOR HAMMER.HAMMER DRILL (500G)      | 1        |                  |
| 603      | 981-840  | GREASE (A) FOR HAMMER.HAMMER DRILL (30G)   | 1        |                  |
| 604      | 321-814  | DRILL CHUCK 13VLRB-D                       | 1        | INCLUD. 605      |
| 605      | 995-344  | FLAT HD. SCREW (A) (LEFT HAND) M6X25       | 1        |                  |
| 606      | 971-511Z | + DRIVER BIT (A) NO. 2 25L                 | 1        |                  |
| 607      | 971-512Z | + DRIVER BIT (A) NO. 3 25L                 | 1        |                  |
| 608      | 981-122  | SPECIAL SCREW M6X22                        | 1        |                  |
| 609      | 971-794  | ANCHOR SETTING ADAPTER A W1/4" (MANUAL)    | 1        |                  |
| 610      | 971-795  | ANCHOR SETTING ADAPTER A W5/16" (MANUAL)   | 1        |                  |
| 611      | 971-796  | ANCHOR SETTING ADAPTER A W3/8" (MANUAL)    | 1        |                  |
| 612      | 971-797  | ANCHOR SETTING ADAPTER A W1/2" (MANUAL)    | 1        |                  |
| 613      | 971-798  | ANCHOR SETTING ADAPTER A W5/8" (MANUAL)    | 1        |                  |
| 614      | 971-799  | ANCHOR SETTING ADAPTER B W1/4" (MANUAL)    | 1        |                  |
| 615      | 971-800  | ANCHOR SETTING ADAPTER B W5/16" (MANUAL)   | 1        |                  |
| 616      | 971-801  | ANCHOR SETTING ADAPTER B W3/8" (MANUAL)    | 1        |                  |
| 617      | 971-802  | ANCHOR SETTING ADAPTER B W1/2" (MANUAL)    | 1        |                  |
| 618      | 971-803  | ANCHOR SETTING ADAPTER B W5/8" (MANUAL)    | 1        |                  |
| 619      | 944-477  | COTTER                                     | 1        |                  |
| 620      | 303-046  | BULL POINT (SDS+) 250MM (ROUND SHANK TYPE) | 1        |                  |
| 621      | 302-976  | ANCHOR SETTING ADAPTER A (SDS+) W1/4X260L  | 1        |                  |
| 622      | 302-975  | ANCHOR SETTING ADAPTER A (SDS+) W5/16X260L | 1        |                  |
| 623      | 303-621  | ANCHOR SETTING ADAPTER A (SDS+) W3/8X160L  | 1        |                  |
| 624      | 302-974  | ANCHOR SETTING ADAPTER A (SDS+) W3/8X260L  | 1        |                  |
| 625      | 302-979  | ANCHOR SETTING ADAPTER B (SDS+) W1/4X260L  | 1        |                  |
| 626      | 302-978  | ANCHOR SETTING ADAPTER B (SDS+) W5/16X260L | 1        |                  |
| 627      | 303-622  | ANCHOR SETTING ADAPTER B (SDS+) W3/8X160L  | 1        |                  |
| 628      | 302-977  | ANCHOR SETTING ADAPTER B (SDS+) W3/8X260L  | 1        |                  |
| 629      | 303-334  | CHUCK HANDLE                               | 1        |                  |
| 630      | 930-515  | CHUCK WRENCH 10G                           | 1        |                  |
| 631      | 303-332  | HAMMER DRILL CHUCK SET 13MM                | 1        | INCLUD. 632, 633 |
| 632      | 303-334  | CHUCK HANDLE                               | 1        |                  |
| 633      | 303-335  | RUBBER CAP                                 | 1        |                  |
| 634      | 321-813  | DRILL CHUCK 13VLD-D                        | 1        |                  |
| 635      | 320-859  | SYRINGE (BLOW-OUT BULB TYPE)               | 1        |                  |
| 636      | 303-617  | TAPER SHANK ADAPTER (SDS PLUS) NO. 1       | 1        |                  |
| 637      | 303-618  | TAPER SHANK ADAPTER (SDS PLUS) NO. 2       | 1        |                  |
| 638      | 303-619  | A-TAPER SHANK ADAPTER (SDS PLUS)           | 1        |                  |
| 639      | 303-620  | B-TAPER SHANK ADAPTER (SDS PLUS)           | 1        |                  |
| 640      | 303-624  | CHUCK ADAPTER (D) (SDS PLUS)               | 1        |                  |
| 641      | 303-623  | CHUCK ADAPTER (G) (SDS PLUS)               | 1        |                  |



