

MODEL

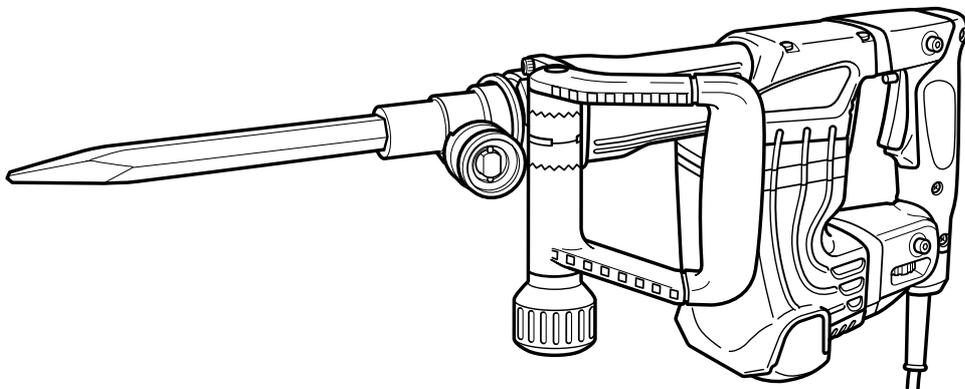
**H 45FRV**

**Hitachi**  
**Power Tools**

**DEMOLITION HAMMER**  
**H 45FRV**

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

**H**



LIST No. E473

Dec. 2003

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, a symbol is used in the place of company name and model name of our competitor.

The symbol utilized here is as follows:

| Symbol Utilized | Competitor   |            |
|-----------------|--------------|------------|
|                 | Company Name | Model Name |
| B               | BOSCH        | 11387      |
|                 |              |            |
|                 |              |            |



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## **1. PRODUCT NAME**

Hitachi Demolition Hammer, Model H 45FRV

## **2. MARKETING OBJECTIVE**

The Model H 45FRV is an upgraded version of the current Model H 45SB2 Hitachi demolition hammer. The performance, durability and operability are greatly improved. The main specifications are as follows:

- (1) High chipping and demolishing performance with low vibration and noise level.
- (2) Self-chiseling (good feeling)
- (3) Internal double-insulation construction with sturdy aluminum frame
- (4) A highly reliable mechanism for prevention of idle hammering and shock-absorbing mechanism results in prolonged service life and comfortable operation
- (5) D-type side handle with adjustable mechanism for 360° rotation plus positioning from front to rear
- (6) Soft-touch grip for easier handling
- (7) Variable speed control
- (8) A very original design

## **3. APPLICATIONS**

- Demolishing and chiseling of concrete
- Edging, gravel road digging, compacting and tamping, grooving, cutting, stripping and roughing, etc.

## 4. SELLING POINTS

- High chipping and demolishing performance with low vibration and noise level
- Self-chiseling (good feeling)
- Variable speed control
- A very original design

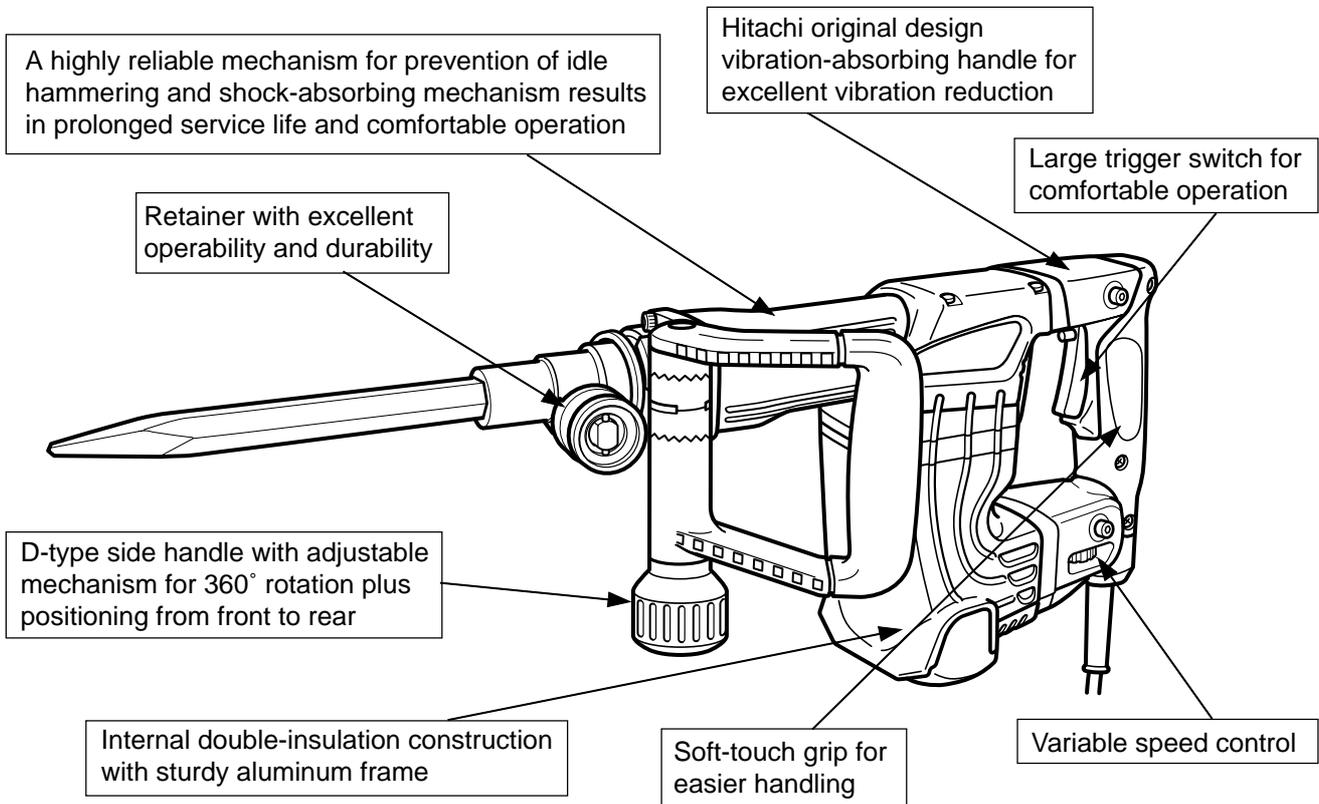


Fig. 1

### 4-1. Selling Point Descriptions

#### 4-1-1. High chipping and demolishing performance with low vibration and noise level

Demolition performance is 5 to 12 % higher than that of similar products thanks to the 12.5 J impact energy and efficient striking. In addition, the chipping performance is about 5 to 12 % higher than that of similar products. Even so, the Model H 45FRV produces equivalent or lower vibration and sound levels than those of similar products.

| Maker • Model              |         | HITACHI<br>*H 45FRV | HITACHI<br>H 45SB2 | * B  |
|----------------------------|---------|---------------------|--------------------|------|
| Ratio of demolished weight | %       | 100                 | 95                 | 88   |
| Full-load vibration level  | dB (VL) | 118                 | 124                | 122  |
| Full-load noise level      | dB (A)  | 99.0                | 99.3               | 97.1 |
| No-load noise level        | dB (A)  | 82.4                | 86.7               | 85.4 |

\*: These are values when the maximum striking speed is selected.

#### 4-1-2. Self-chiseling (good feeling)

The quantity of body jumping is less than that of the current Model H 45SB2 and the working tool smoothly penetrates into the workpiece with a light pressing force. The Model H 45FRV realizes quicker self-chiseling with better impact feeling.

|                          |                         |
|--------------------------|-------------------------|
| Impact energy            | 40% up (9.0 J → 12.5 J) |
| Quantity of body jumping | About 40% down          |

#### 4-1-3. Internal double-insulation construction with sturdy aluminum frame

The aluminum die-cast outer frame is very sturdy (highly rigid). In addition, a plastic internal S holder is adopted to realize double-insulation construction. Thus the housing has greater rigidity and the double-insulated motor has greater durability. The Model H 45FRV is heavy-duty and the service life of the carbon brushes is greatly prolonged (2 times longer than the conventional one) minimizing disconnection of the armature, deviation of the core and grease leakage.

#### 4-1-4. A highly reliable mechanism for prevention of idle hammering and shock-absorbing mechanism results in prolonged service life and comfortable operation

Conventional mechanism for prevention of idle hammering is to open and close the air holes according to the movement of the striker. The Model H 45FRV has air holes located at the position unaffected by the rebound of the striker at no load. The air holes are opened and closed by the movement of sleeve (A) provided around the cylinder that interlocks with the tool and the second hammer to prevent idle hammering. This mechanism securely prevents idle hammering even in wall hammering works or even if a tool that can cause great rebound on the striker such as a cutter is used. Thanks to the highly reliable mechanism for prevention of idle hammering, the service life of the Model H 45FRV is prolonged and hammering works requiring much attention not to break the surroundings can be efficiently performed with the Model H 45FRV. At the instance of releasing the bull point from the concrete by moving the main body up, the second hammer contacts hammer holder (A) then the cushion (damper (A)) provided between hammer holder (A) and the front cover absorbs the striking force of the second hammer. Thus the Model H 45FRV has greater durability than the similar products.

#### 4-1-5. D-type side handle with adjustable mechanism for 360° rotation plus positioning from front to rear

The D-type side handle can be adjusted by 360° rotation and also allows convenient operation from front to rear. This side handle has a two-layer plastic construction (integral molding) made of nylon resin as the base and soft resin around it for a comfortable cushion grip.

#### 4-1-6. Soft-touch grip for easier handling

The double-layer molded handle consists of a nylon resin base covered with a soft plastic layer to ensure a soft touch and firm, non-slip grip of the handles.

#### 4-1-7. Original design vibration-absorbing handle (Vibration-absorbing is significantly improved)

Hitachi original design vibration-absorbing handle minimizes vibration through the rolling and compression of four cylindrical rubber cushions on inclined surfaces. The spring constant factor is as low as that of the Models H 45SB2, H 41SC, H 45SR, H 45MR, H 60KA, H 60MA and H 60MB, and the cushioning structure greatly reduces vibration.

#### 4-1-8. Variable speed control

The Model H 45FRV is equipped with an electronic control circuit for stepless adjustment of striking speed. The striking speed can be adjusted between 1600 to 3000 times per minute by turning the dial according to the operation (chipping or demolishing) and the workpiece (Fig. 2). The table below shows striking speed per minute of each dial setting.

| Dial setting | Striking speed (min <sup>-1</sup> ) |
|--------------|-------------------------------------|
| 5            | 3000                                |
| 4            | 2800                                |
| 3            | 2400                                |
| 2            | 2000                                |
| 1            | 1600                                |

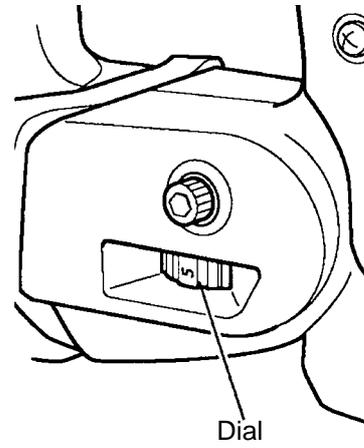


Fig. 2

## 5. SPECIFICATIONS

|                      |   |
|----------------------|---|
| Power source         | Single-phase AC 60 Hz   |
| Voltage              | 120 V   |
| Motor type           | AC single-phase series commutator motor   |
| Insulation structure | Double insulation   |
| Enclosure            | Materials : Aluminum alloy die casting<br>Nylon resin (Handle, tail cover, band holder and crank cover)<br>Paint : Silver green metallic, black   |
| Switch               | Trigger switch (with stopper)   |
| Type of handles      | D-shaped handle and side handle   |
| Full-load current    | 8.3 A (120 V)   |
| Power input          | 950 W   |
| Striking speed       | No-load : 4,000 min <sup>-1</sup><br>Full-load : 3,000 min <sup>-1</sup>  |
| Weight               | Product : 5.9 kg (13.0 lbs.); excluding cord and side handle<br>Packed : 9.3 kg (20.5 lbs.)   |
| Packaging            | Corrugated cardboard box with plastic tool case   |
| Standard accessories | <ul style="list-style-type: none"> <li>• Sidel handle ..... 1</li> <li>• Hex. bar wrench (for M6) ..... 1</li> <li>• Hex. bar wrench (for M5) ..... 1</li> <li>• Plastic tool case ..... 1</li> </ul> |

### 5-1. Optional Accessories

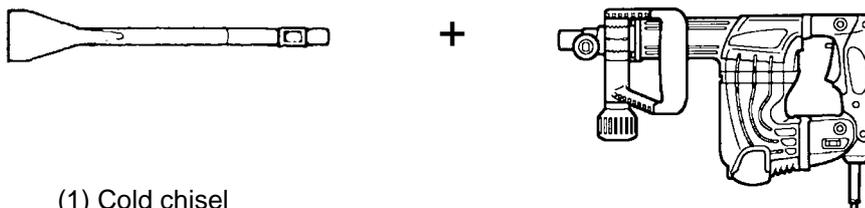
#### (1) Demolition work



(1) Bull point

| Overall length | Code No. |
|----------------|----------|
| 300 mm (12")   | 985383   |

#### (2) Grooving and chiseling work



(1) Cold chisel

| Overall length | Code No. |
|----------------|----------|
| 300 mm (12")   | 985381   |
| 460 mm (18")   | 985382   |

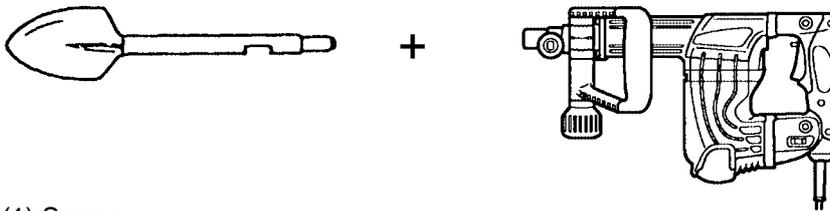
(3) Cutting and stripping work (asphalt cutting etc.)



(1) Cutter

| Width          | Overall length | Code No. |
|----------------|----------------|----------|
| 38 mm (1-1/2") | 300 mm (12")   | 985384   |
| 50 mm (2")     | 300 mm (12")   | 985385   |

(4) Digging work (substitute pick-ax)



(1) Scoop

| Width           | Overall length | Code No. |
|-----------------|----------------|----------|
| 115 mm (4-1/2") | 455 mm (18")   | 985386   |

(5) Grease for hammer



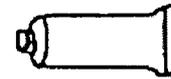
500 g (1.1 lbs.) Can

Code No. 980927



70 g (2.5 oz) Tube

Code No. 308471



30 g (1 oz) Tube

Code No. 981840

(Note)

Code numbers listed above are subject to change without notice.

Please refer to periodic Technical News Bulletins.

## 6. COMPARISONS WITH SIMILAR PRODUCTS

### 6-1. Specification Comparisons

| Maker                                    |                   |    | HITACHI            |                    | B                  |
|--|-------------------|----|--------------------|--------------------|--------------------|
| Model name                               |                   |    | H 45FRV            | H 45SB2            |                    |
| Power input                              | W                 |    | 950                | 870                | 1,100              |
| Striking energy per stroke               | J                 |    | 12.5               | 7.5                | 8.0                |
| Full-load impact rate                    | min <sup>-1</sup> |    | 3,000              | 3,000              | 2,800              |
| Full-load vibration level                | dB (VL)           |    | 118.0              | 124                | 122                |
| Full-load noise level                    | dB (A)            |    | 99.0               | 99.3               | 97.1               |
| No-load noise level                      | dB (A)            |    | 82.4               | 86.7               | 85.4               |
| Dimensions                               | Length            | mm | 427<br>(16-13/16") | 383<br>(15-3/32")  | 445<br>(17-33/64") |
|  | Height            | mm | 230<br>(9-1/16")   | 210<br>(8-9/32")   | 255<br>(10-1/32")  |
|  | Width             | mm | 106<br>(4-11/64")  | 103<br>(4-1/16")   | 103<br>(4-1/16")   |
| Weight<br>(without cord and side handle) | kg                |    | 5.9<br>(13.0 lbs.) | 4.8<br>(10.6 lbs.) | 5.5<br>(12.1 lbs.) |
| Insulation structure                     | —                 |    | Double insulation  | Double insulation  | Double insulation  |

### 6-2. Demolition Performance Comparison

The data shown in Fig. 3 are obtained in actual factory tests, and are for reference only. Demolished amount may vary in accordance with operating conditions, operator skill, etc.

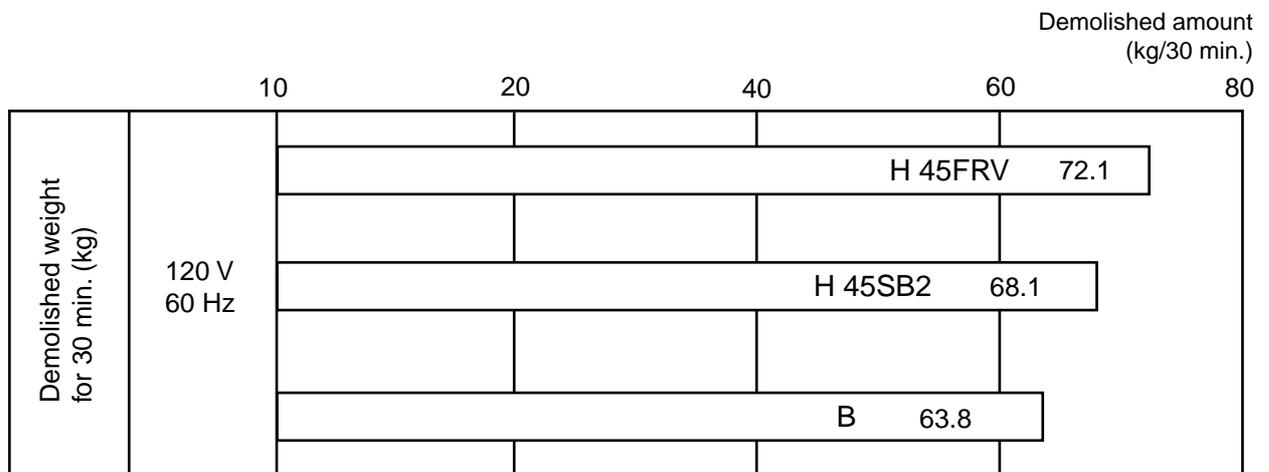


Fig. 3

### 6-3. Full-load Vibration Level Comparison

The graph shown in Fig. 4 illustrates the relationship between the handle pressing force and the handle vibration level in the Z direction.

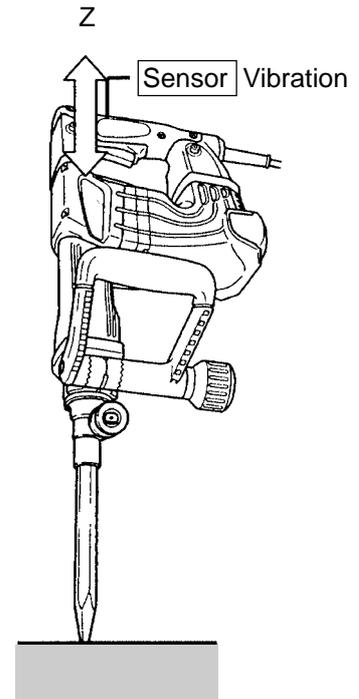
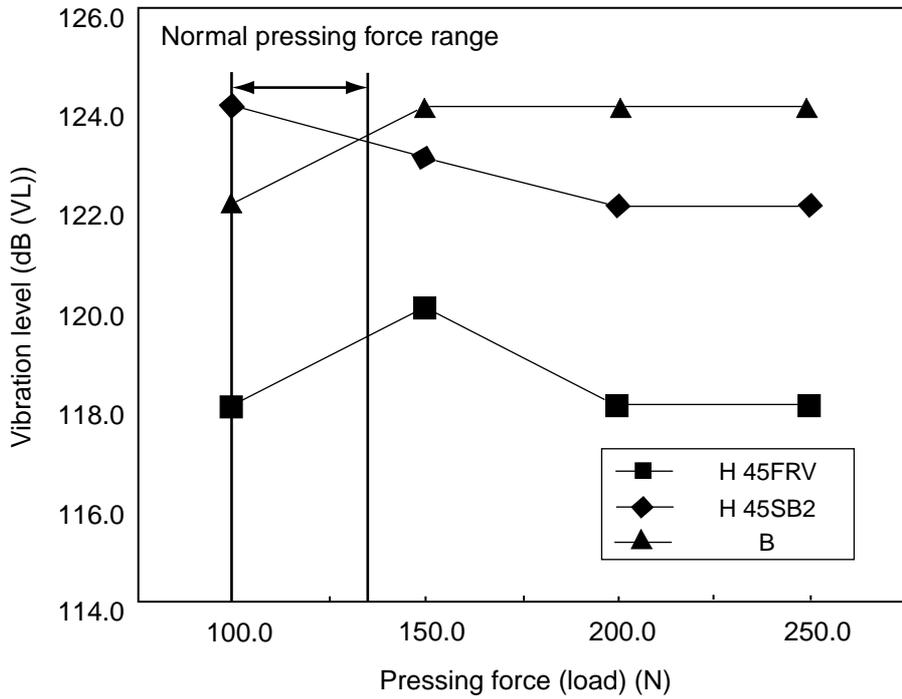


Fig. 4

### 6-4. Quantity of Working Tool Penetration and Quantity of Body Jumping

The graph shown in Fig. 5 illustrates the relationship between the ratio of quantity of working tool penetration and the ratio of quantity of body jumping. The quantity of body jumping is less than the similar products and the working tool quickly penetrates into the workpiece.

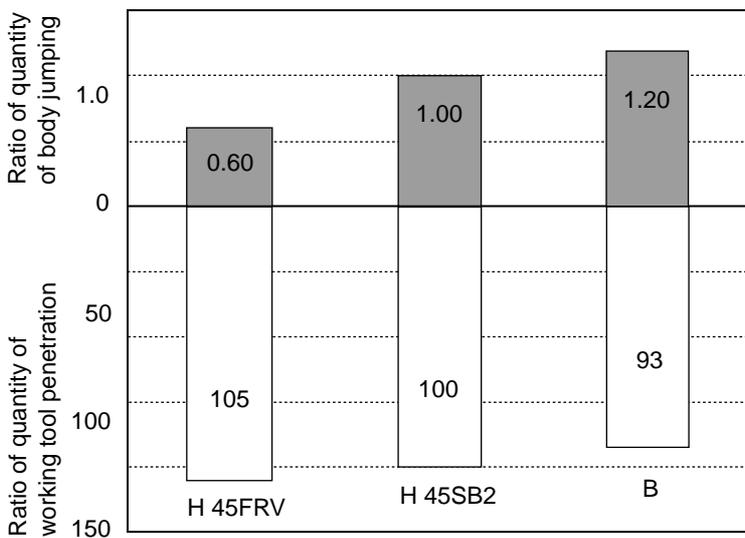
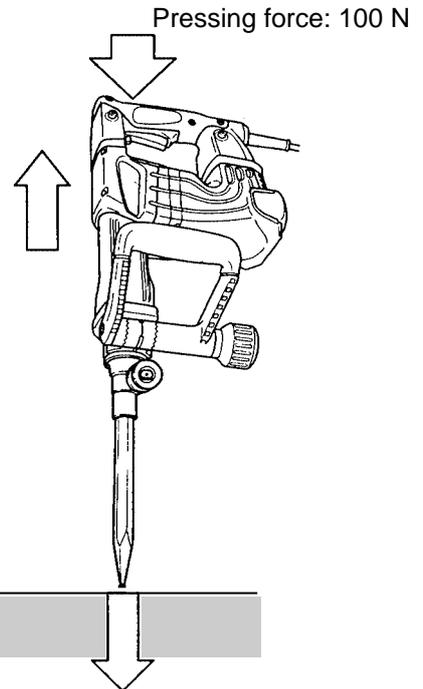


Fig. 5

## 7. PRECAUTIONS IN SALES PROMOTION

In the interest of promoting the safest and most efficient use of the Model H 45FRV Demolition 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 attached to each tool.

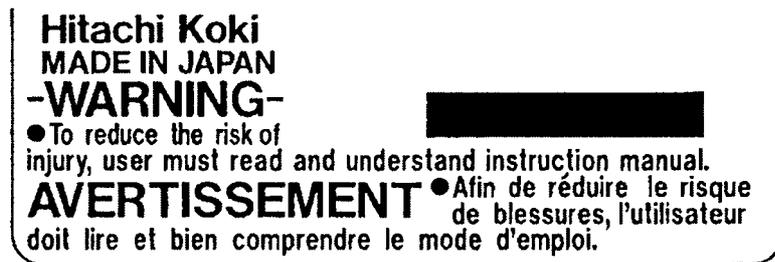
### 7-1. Handling Instructions

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 Demolition 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.

### 7-2. Caution Plate

The Model H 45FRV 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 the tool.

For the U. S. A. and Canada



### 7-3. Grease Replacement

The striking portion and the speed reduction portion of the Model H 45FRV respectively use different types of grease. Grease replacement is required if the unit is disassembled for maintenance or O-rings become damaged and worn as described in 7-4. The striking portion uses special grease. If the striking portion (inside the cylinder crank case) is disassembled, thoroughly remove all of the old grease from each part. On reassembly, insert 37.5 g (1.3 oz) of new grease into the cylinder crank case (connecting rod side). Do not exceed the designated amount of grease. Excessive grease insertion may cause reduced striking performance. The speed reduction portion (inside the gear cover) uses Hitachi Motor Grease No. 29 (Code No. 930035). The proper supply volume is 20 g (0.7 oz). Never use the striking portion special grease in the speed reduction portion. Special grease would leak into the motor portion and cause subsequent trouble.

### 7-4. O-Ring Replacement

The O-rings (mounted on the striker and piston) are extremely important to ensure adequate sealing of the air pressure. Although the O-rings are made of special rubber to give them a long service life, they do nonetheless become worn, and should be replaced by new ones periodically depending on frequency of use of the tool. With average use, it is recommended that the O-rings be replaced at least every six months to ensure maximum effectiveness.

## 8. REFERENCE INFORMATION

Structure:

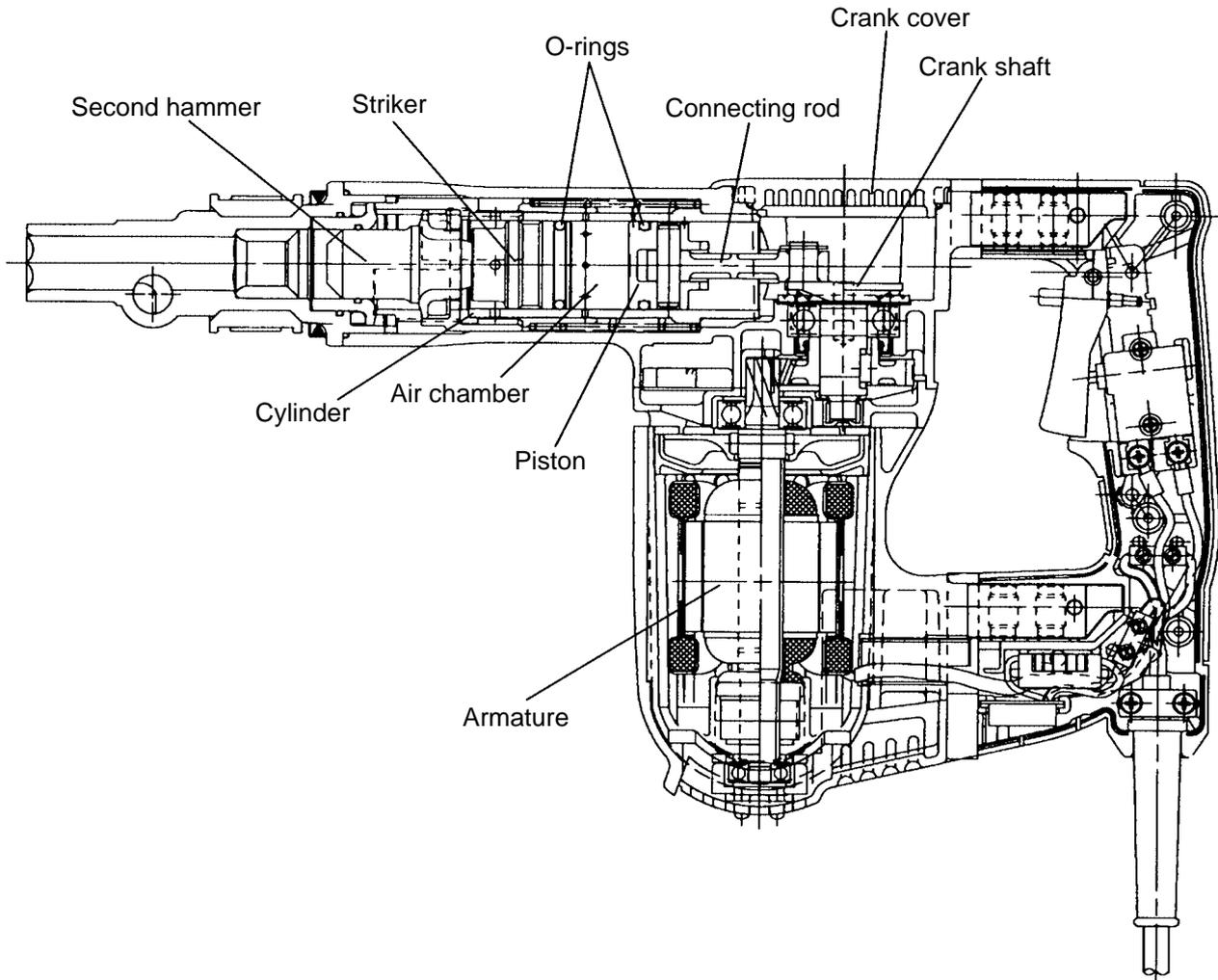


Fig. 6

### 8-1. Striking Operation

The rotation of the armature is transferred to the crank shaft and connecting rod, which in turn cause the piston to reciprocate inside the cylinder. As the piston reciprocates, the changing air pressure inside the air chamber between the piston and the striker causes the striker to continuously strike against the end of the second hammer. At the same time, the air-cushion effect within the air chamber absorbs the impact of the striker. Should the air escape from the air chamber, the air-cushion effect would cease, and the impact energy would not be absorbed. Accordingly, the O-rings mounted on the striker and the piston play an extremely important role in sealing the air within the air chamber.

### 8-2. Idling-proof Mechanism

When the bull point is released from the concrete surface, sleeve (A) and the second hammer are forcibly moved to the position illustrated in Fig. 7 by spring (C), and the striker moves out of striking position. When this occurs, the air holes located at the position unaffected by the rebound of the striker at no load are opened and the pressure within the air chamber remains unchanged even though the piston continues to reciprocate, thereby preventing striking operation.

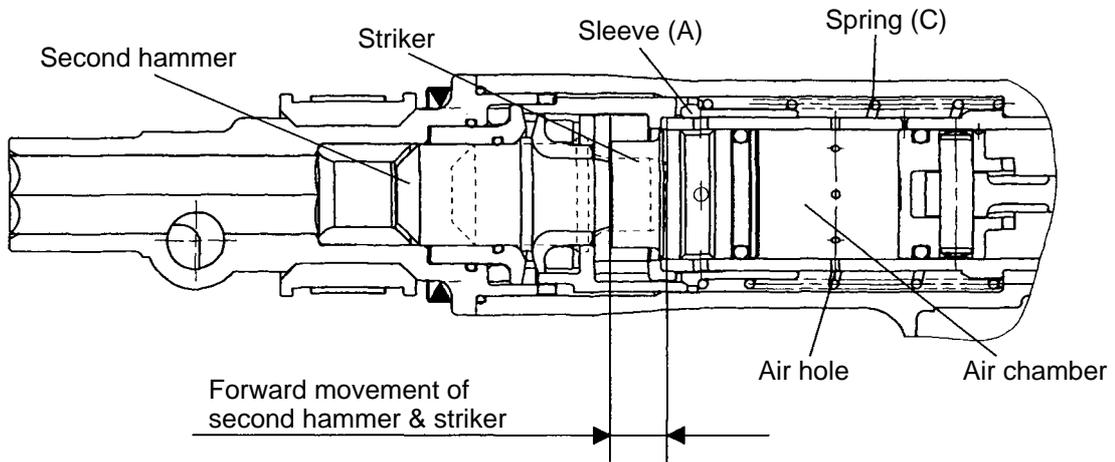


Fig. 7

### 8-3. Shock-absorbing Mechanism

At the instance of releasing the bull point from the concrete by moving the main body up, the second hammer contacts hammer holder (A) as shown in Fig. 8 then the cushion (damper (A)) provided between hammer holder (A) and the front cover absorbs the striking force of the second hammer. Thus the durability of the Model H 45FRV is greatly increased because the second hammer does not strike the tool retainer directly.

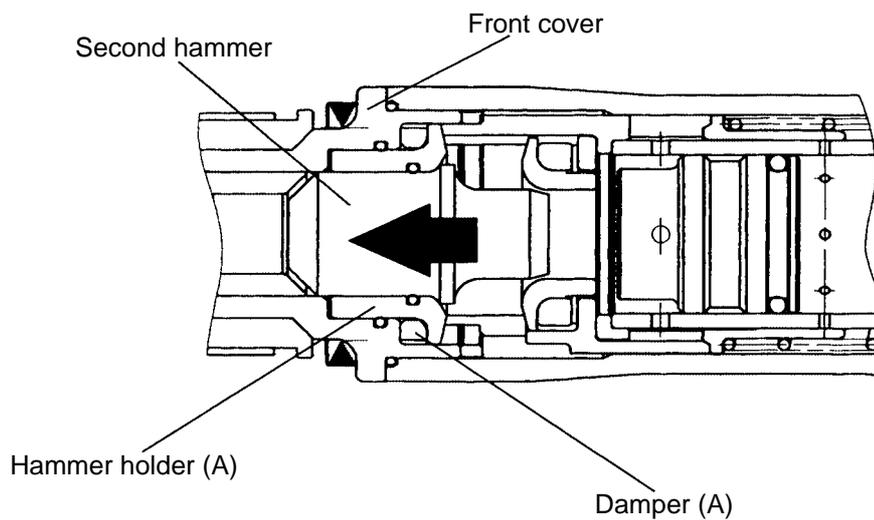
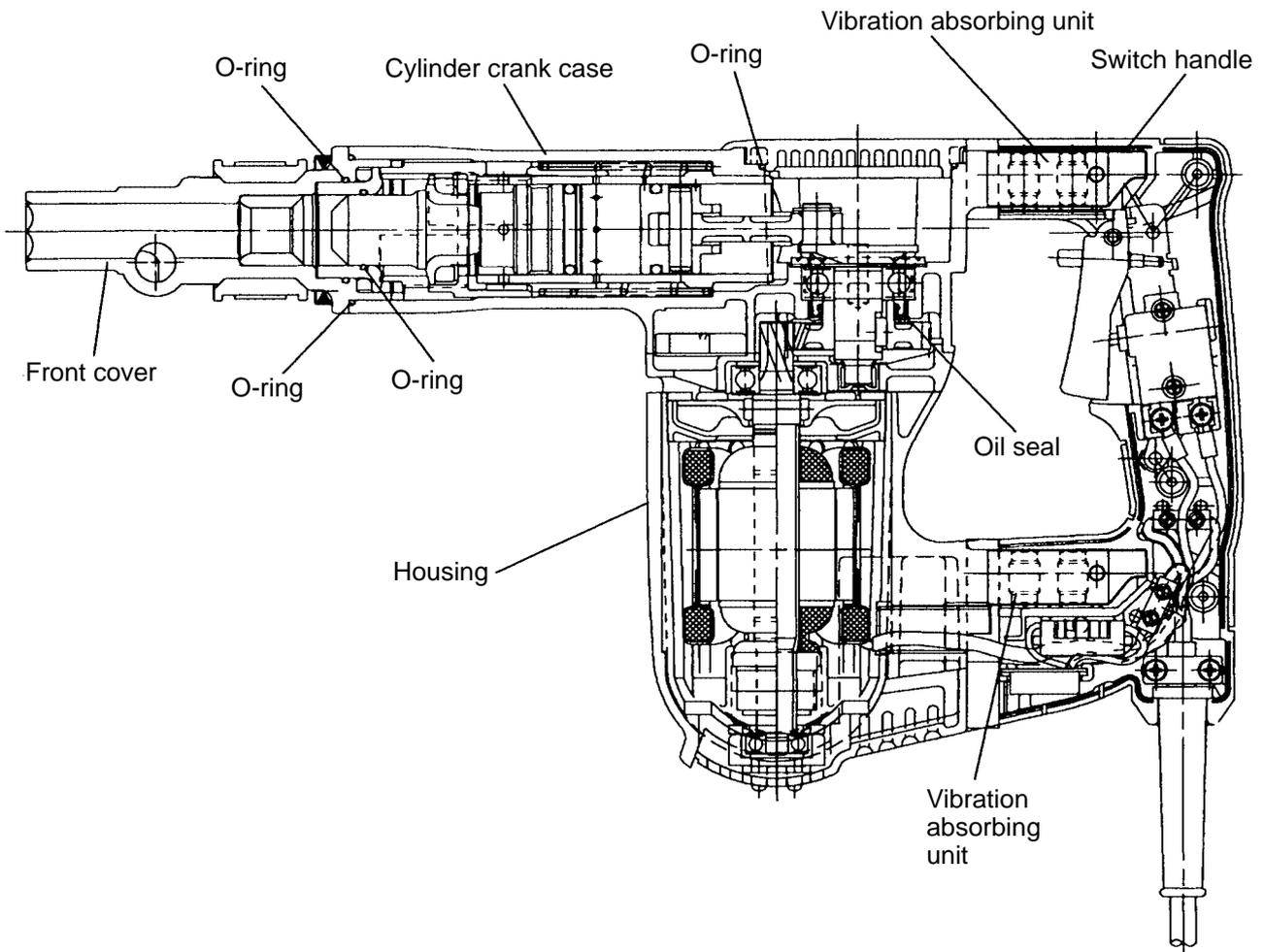


Fig. 8



**Fig. 9**

#### **8-4. Sealed and Dustproof Construction**

The cylinder crank case are sealed by four O-rings and an oil seal which serve to prevent leakage of the grease, as well as to prevent dust and dirt from entering the mechanism.

### 8-5. Vibration Absorbing Construction

Hitachi original, innovative units which absorb vibration are installed between the switch handle and the cylinder crank case and between the switch handle and the housing. As a result, the amount of vibration transmitted from the main body to the arms of the operator is considerably less in comparison with conventional hammers.

Construction of vibration absorbing unit:

The main body (cylinder crank case and housing) and the handle are connected through four cylindrical rubbers (handle dampers). Vibration is absorbed by the rolling and compression of the four rubbers on inclined surfaces. Because the vibration absorbing unit has non-linear spring characteristics, its spring constant factor is lower than that of the conventional shearing rubber type vibration-absorbing construction, and it provides significantly higher efficiency in minimizing vibration. In addition, the interlocking slotted groove and cylindrical convex portions at the center prevent the handle from being disconnected by twisting or pulling, a common problem with conventional hammers.

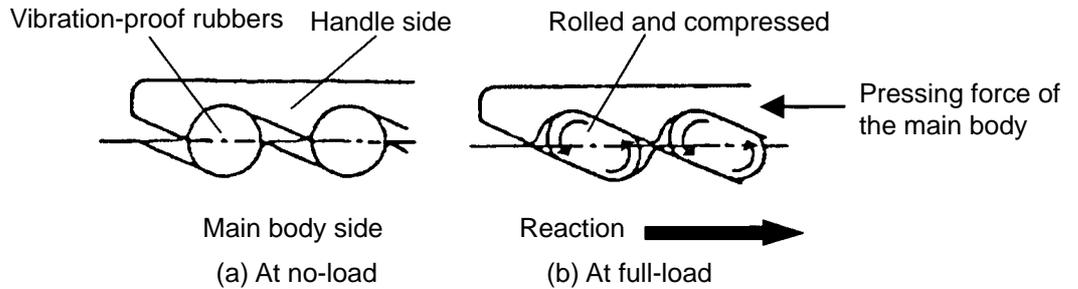
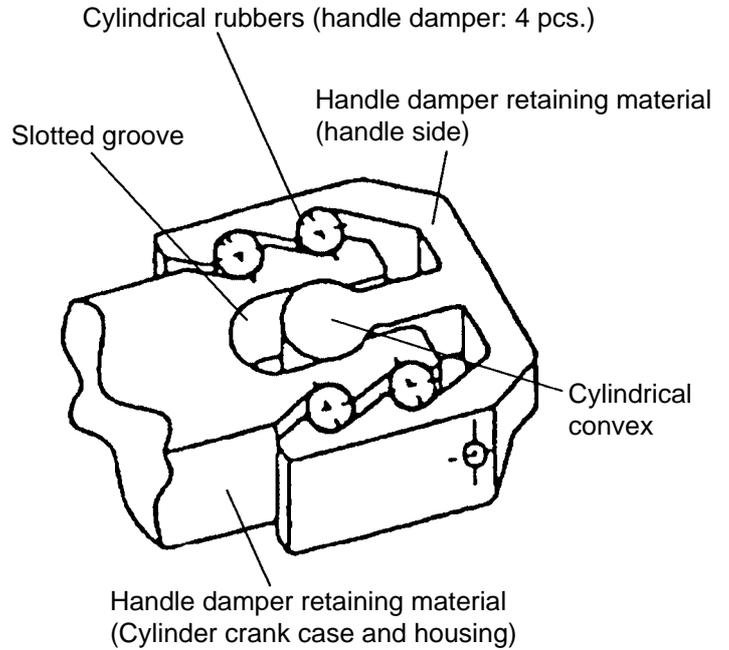


Fig. 10

### 8-6. Tool Retainer

A lever-type retainer is employed to permit easy one-touch mounting and removal of bull points etc. As illustrated in Fig. 11, pull the knob in the direction indicated by arrow (A), and turn it 90° counterclockwise (arrow (B) direction) to align it with the alignment mark on the front cover. Insert the tool shank fully into the hexagonal hole in the front cover, and return the knob to its original position. The tool is then securely attached.

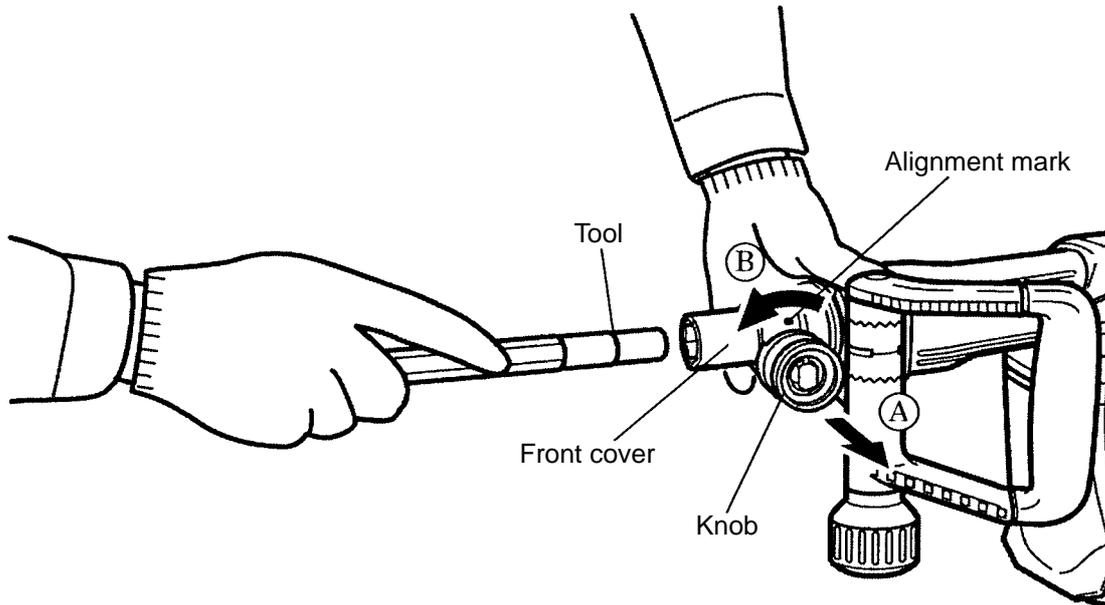


Fig. 11

### 8-7. Side Handle

The side handle can be adjusted by 360° rotation and also allows operation from front to rear. Loosen the handle by turning the grip in (A) direction and adjust the handle to a convenient position. Turn the grip in (B) direction to fix the side handle. (Fig. 12)

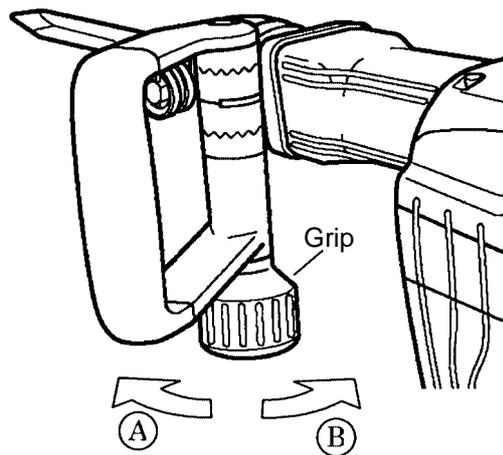


Fig. 12

## 9. REPAIR GUIDE

### 9-1. Precautions and Suggestions for Disassembly and Reassembly of Main Body

The numbers in **[Bold]** correspond to the item numbers in the Parts List and exploded assembly diagrams.

#### 9-1-1. Disassembly

##### ● Retainer disassembly

Pull Knob (A) **[3]** in the direction indicated by the arrow, turn it slightly, and release it against the collar end of the Front Cover **[8]**. Then, push in the Stop Washer **[1]** with a flat-blade screwdriver or the like to compress the Stopper Spring **[2]**, and insert a thin (less than 3 mm dia.) steel bar into the knob hole to push out the Needle Roller D4 x 20 **[4]**. The Stop Lever **[6]** and Stopper Spring **[2]** can then be removed. (Fig. 13)

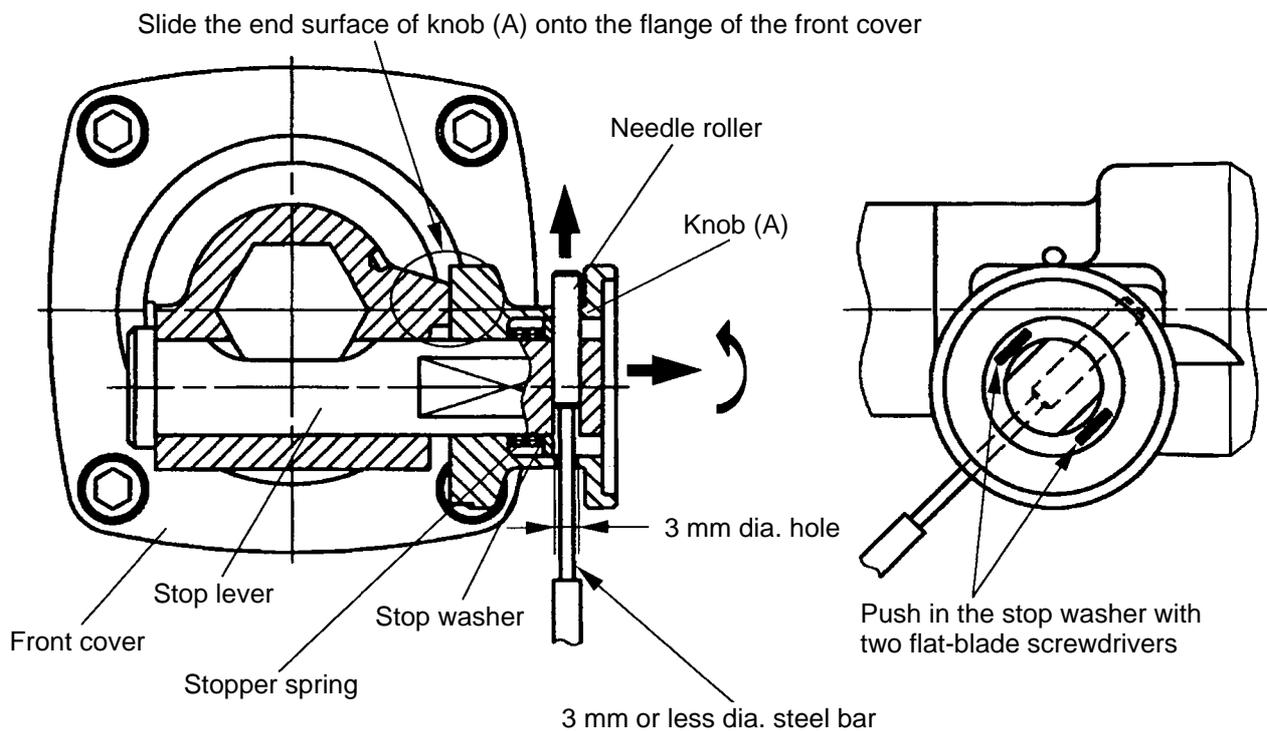


Fig. 13

##### ● Piston and striker disassembly

Remove the Seal Lock Hex. Socket Hd. Bolt M6 x 25 **[5]** fixing the Front Cover Ass'y **[8]**, then the Front Cover Ass'y **[8]** and Hammer Holder (A) **[13]**, Damper (A) **[12]**, Second Hammer **[15]**, Hammer Holder (B) **[17]**, Damper (B) **[18]**, Washer **[19]**, Hammer Holder (C) **[20]**, Damper (C) **[16]**, Cylinder Holder **[23]**, Cylinder **[26]**, Sleeve (A) **[24]** and Spring (C) **[25]** can be removed from the Cylinder Crank Case **[45]**. The Striker **[21]** can be removed by tapping the Cylinder **[26]** lightly with a plastic hammer. As the Piston **[28]** remains in the Cylinder Crank Case **[45]** side, remove the Seal Lock Hex. Socket Hd. Bolts M4 x 12 **[32]** fixing the Crank Cover **[34]**, then the Crank Cover **[34]** can be removed from the Cylinder Crank Case **[45]**, and remove the Retaining Ring for D10 Shaft **[37]** to remove the Connecting Rod **[29]** from the Crank Shaft **[38]**.

- First gear and crank shaft disassembly

Remove the grease from the Connecting Rod [29] side and the First Gear [50] side of the Cylinder Crank Case [45]. Remove the two Seal Lock Hex. Socket Flat Hd. Bolts M5 x 12 [40] fixing Bearing Cover (A) [41] and the Seal Packing [42]. Then place the Connecting Rod [29] side of the Cylinder Crank Case [45] downward on a workbench and apply pressure on the end surface of the Crank Shaft [38] with a hand press to remove the First Gear [50] and the Crank Shaft [38] (Fig. 14). Before removing them, make sure that the two Seal Lock Hex. Socket Flat Hd. Bolts M5 x 12 [40] fixing Bearing Cover (A) [41] and the Seal Packing [42] are removed.

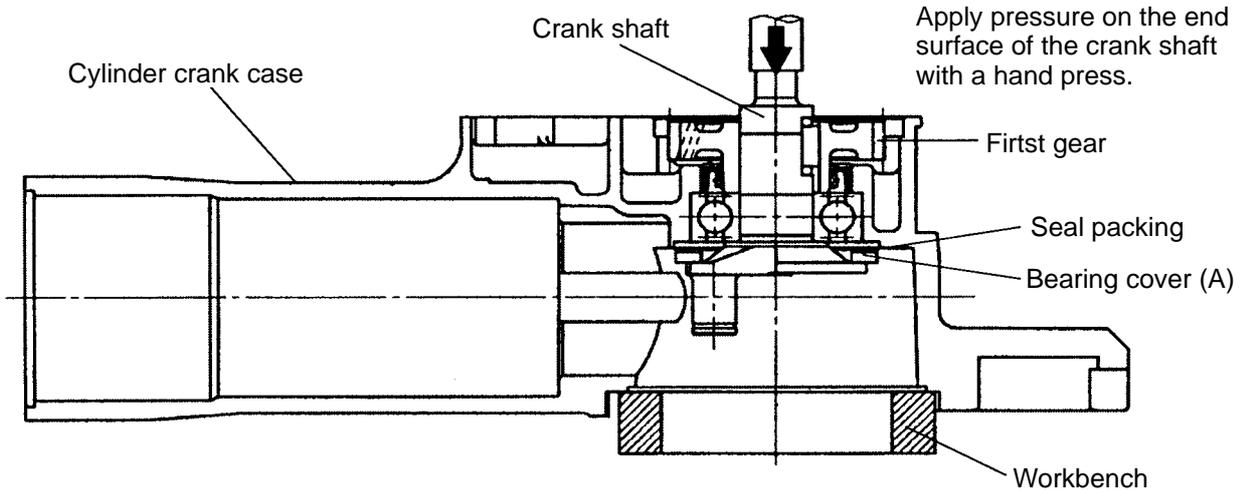


Fig. 14

### 9-1-2. Reassembly

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

- First gear and crank shaft reassembly

Press-fit the Ball Bearing [43] in the Cylinder Crank Case [45] and fix Bearing Cover (A) [41] and Seal Packing [42] with the two Seal Lock Hex. Socket Flat Hd. Bolts M5 x 12 [40]. Press-fit the Crank Shaft [38]. Then mount the Oil Seal [44]. Put the Feather Key [39] into the groove of the Crank Shaft [38] and press-fit the First Gear [50] with a suitable tool while holding the flat portion of the Crank Shaft [38] with a steel bar. Before press-fitting, make sure that the Feather Key [39] fits in the key groove of the First Gear [50] (Fig. 15).

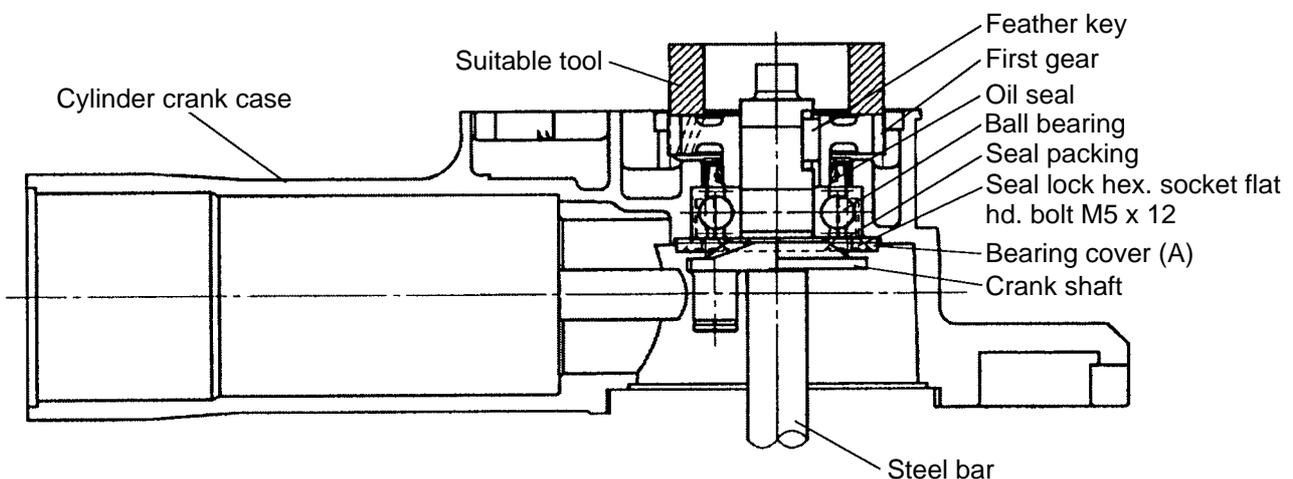


Fig. 15

● Piston reassembly

Insert the Piston Pin [27] into the D8 hole (marked) of the Piston [28] and the Connecting Rod [29] then press-fit it. Mount the O-ring [22] to the Piston [28]. Be careful not to protrude the Piston Pin [27] from the outside diameter of the Piston [28]. Move the crank pin of the Crank Shaft [38] to the bottom dead center and insert the piston ass'y into the Crank Shaft [38] from the cylinder case of the Cylinder Crank Case [45]. Mount the Retaining Ring for D10 Shaft [37] using a retaining ring puller (Fig. 16).

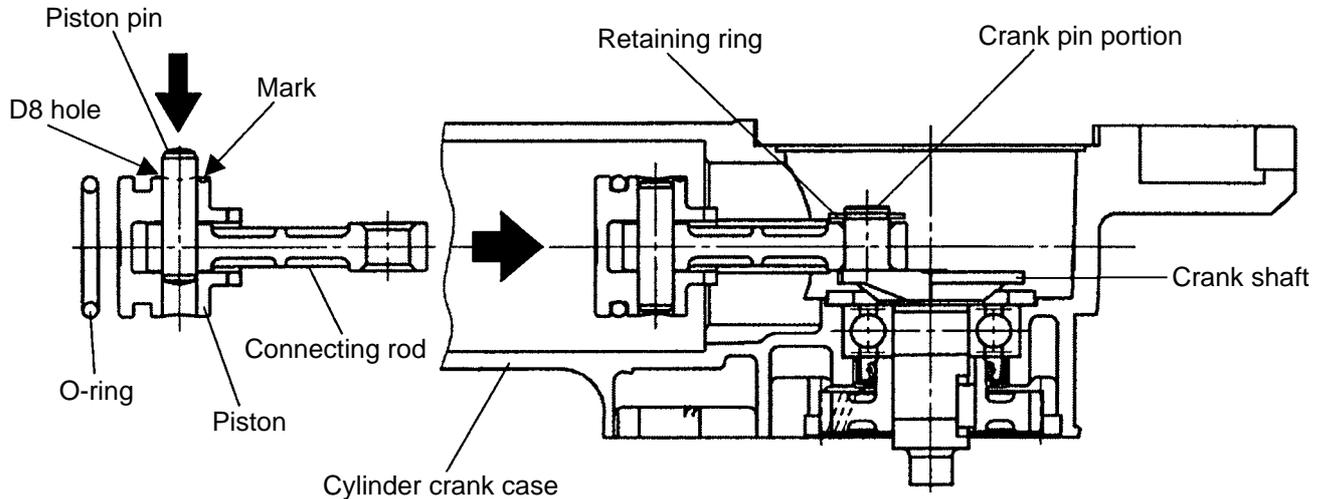


Fig. 16

● Cylinder reassembly

Move the crank pin of the Crank Shaft [38] then move the Piston [28] to the top dead center. Insert the Cylinder [26] into the D38 hole of the Cylinder Crank Case [45] (Fig. 17).

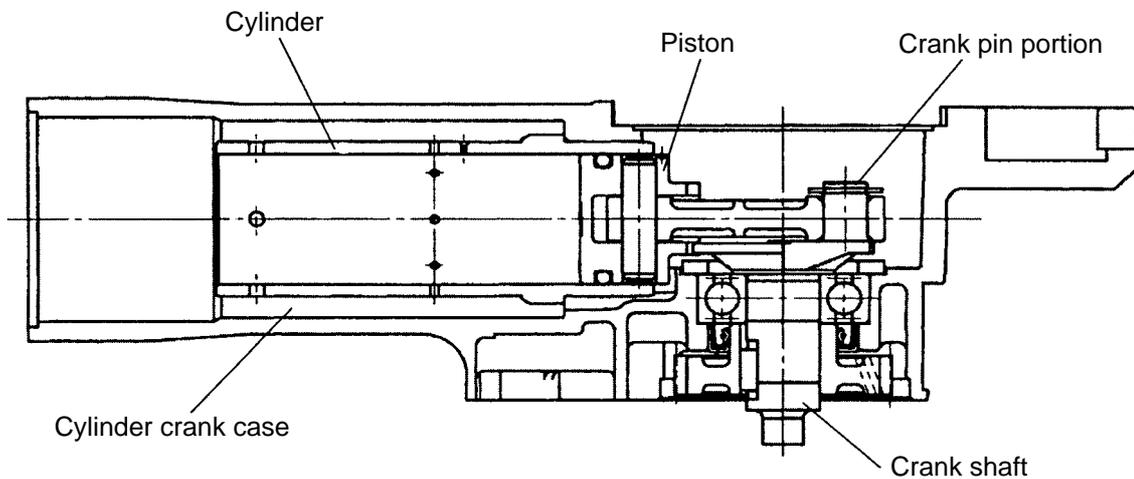


Fig. 17

● Reassembly of tool holder

As illustrated in Fig. 13, ensure that the notched portions of the Stop Lever [6] and Knob (A) [3] are properly aligned during reassembly. If not properly aligned and assembled, the tool (bull point etc.) cannot be properly inserted into the retainer.

● Lubrication

Apply special grease (grease for hammer) to the inner circumference of the Connecting Rod [29], O-rings [22] in the Striker [21] and in the Piston [28], sliding portion of the Second Hammer [15], Oil Seal [44], Damper (A) [12], Damper (B) [18], Damper (C) [16], inner circumference of Sleeve (A) [24], Hammer Holder (B) [17], Hammer Holder (C) [20]. Seal 37.5 g of special grease into the Cylinder Crank Case [45] (the Connecting Rod [29] side).

Apply Hitachi Motor Grease No. 29 to the Needle Bearing [51], the pinion portion of the Armature Ass'y [68]. Seal 20 g of the Hitachi Motor Grease No. 29 into the Cylinder Crank Case [45] (the First Gear [50] side).

● Oil seals

Be very careful not to damage the O-ring [11] on the Front Cover Ass'y [8], O-ring [10] in the Front Cover Ass'y [8], O-ring [14] in Hammer Holder (A) [13], O-ring [36] in the Crank Cover [34], O-rings [22] in the Striker [21] and in the Piston [28], and Oil Seal [44] in the Cylinder Crank Case [45].

**9-1-3 Screw locking agent TB1401**

Apply screw locking agent TB1401 to all hex. socket hd. bolts M4, M5 and M6.

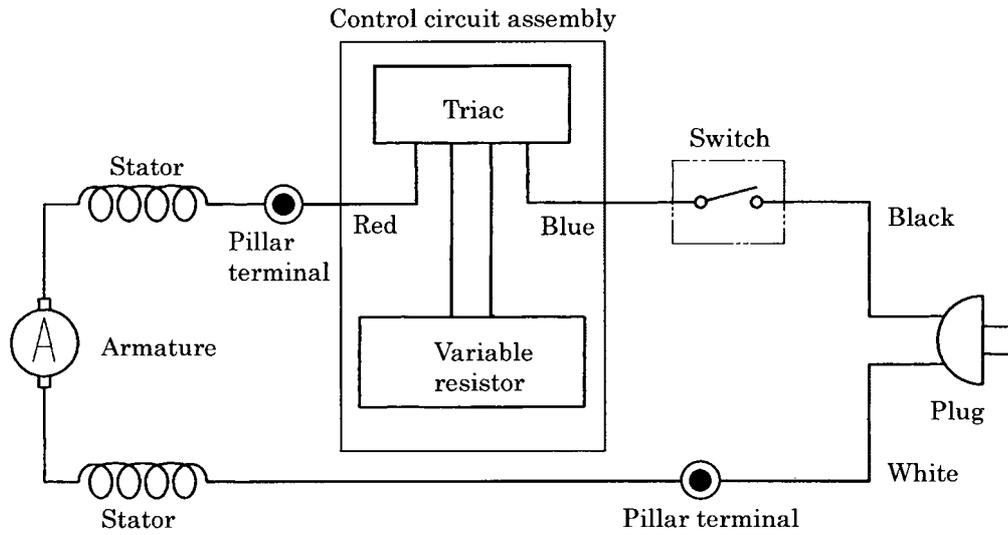
Caution: If bolts are loosened by vibration, it could cause damage to the hammer body. Ensure without fail that screw locking agent is applied to threaded portions prior to reassembly.

**9-1-4. Tightening torque**

|   |  |
|---|--|
| (1) Attached bolts of front cover<br>(Hex. socket hd. bolts M6 x 25)            | $13.7^{+0.98}_0$ N·m ( $140^{+10}_0$ kgf·cm, $121.5^{+8.7}_0$ in-lbs.) |
| (2) Attached bolts of bearing cover (A)<br>(Hex. socket flat hd. bolts M5 x 12) | $4.41 \pm 0.49$ N·m ( $45 \pm 5$ kgf·cm, $39.1 \pm 4.3$ in-lbs.)       |
| (3) Tapping screws D5   | $2.94 \pm 0.49$ N·m ( $30 \pm 5$ kgf·cm, $26.0 \pm 4.3$ in-lbs.)       |
| (4) Hex. socket hd. bolts M6 x 45   | $9.8^{+1.96}_0$ N·m ( $100^{+20}_0$ kgf·cm, $86.8^{+17.4}_0$ in-lbs.)  |
| (5) Attached bolts of tail cover<br>(Hex. socket hd. bolts M5 x 10)             | $4.9^{+1.96}_0$ N·m ( $50^{+20}_0$ kgf·cm, $43.4^{+17.4}_0$ in-lbs.)   |
| (6) Attached bolts of crank cover<br>(Hex. socket hd. bolts M4 x 12)            | $4.41 \pm 0.49$ N·m ( $45 \pm 5$ kgf·cm, $39.1 \pm 4.3$ in-lbs.)       |
| (7) Tapping screws D4   | $1.96 \pm 0.49$ N·m ( $20 \pm 5$ kgf·cm, $17.4 \pm 4.3$ in-lbs.)       |
| (8) Attached bolts of handle<br>(Hex. socket hd. bolts M5 x 12)                 | $4.9^{+1.96}_0$ N·m ( $50^{+20}_0$ kgf·cm, $43.4^{+17.4}_0$ in-lbs.)   |
| (9) Attached bolts of internal wire holder<br>(Hex. socket hd. bolts M5 x 14)   | $7.84^{+1.96}_0$ N·m ( $80^{+20}_0$ kgf·cm, $69.4^{+17.4}_0$ in-lbs.)  |

### 9-1-5. Wiring diagram

- Wiring diagram for products



### 9-1-6. Insulation Tests

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

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

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

### 9-1-7. No-load current value

After no-load operation for 30 minutes, the no-load current value should be 4.2 to 4.9 A at 120 V, 60 Hz.



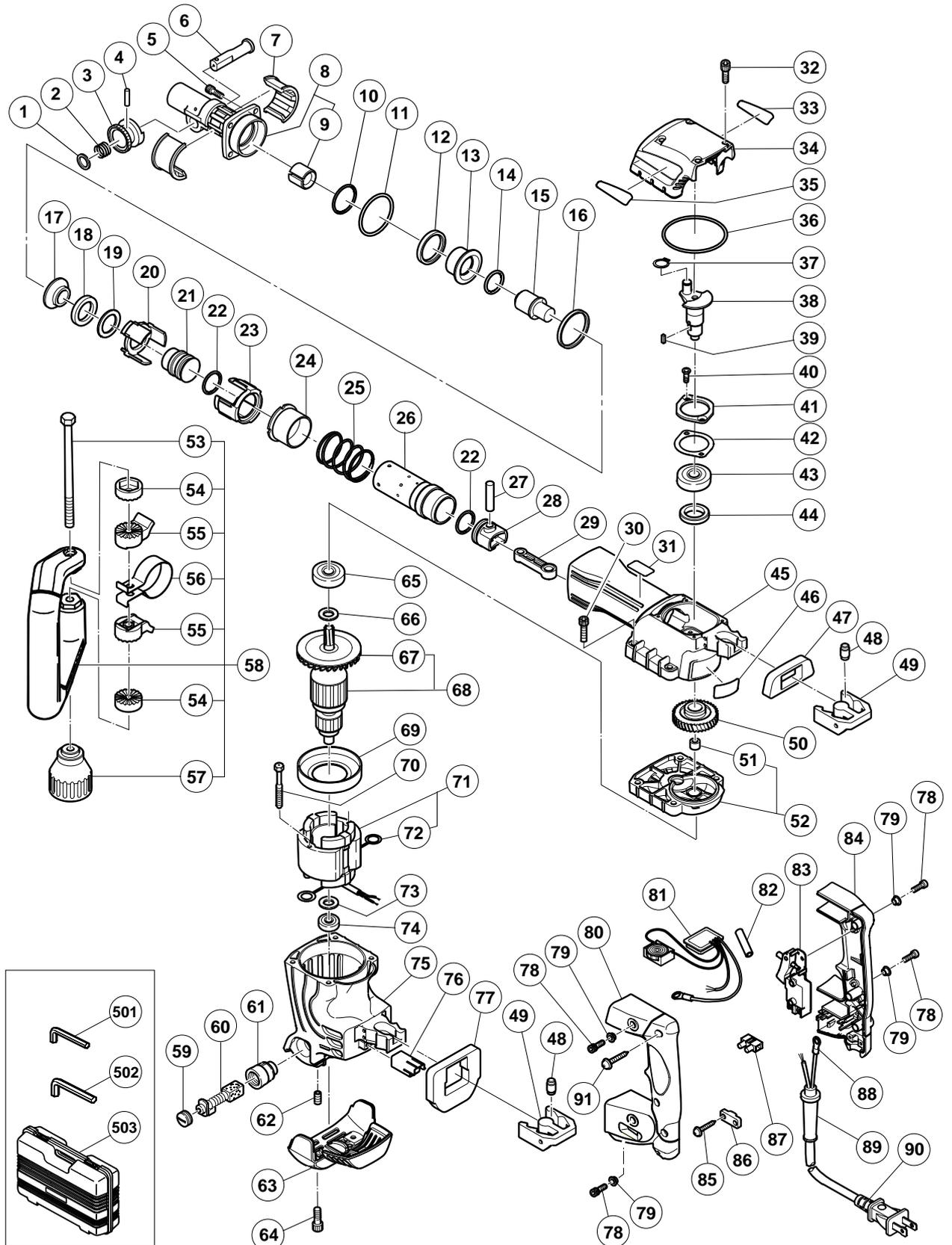
## ELECTRIC TOOL PARTS LIST

### HAMMER

2003 • 12 • 5

### Model H 45FRV

(E1)



**PARTS**

H 45FRV

| ITEM NO. | CODE NO. | DESCRIPTION                              | NO. USED | REMARKS   |
|----------|----------|--|----------|-----------|
| 1        | 983-277  | STOP WASHER                              | 1        |           |
| 2        | 981-937  | STOPPER SPRING                           | 1        |           |
| 3        | 983-241  | KNOB (A)                                 | 1        |           |
| 4        | 943-364  | NEEDLE ROLLER D4X20                      | 1        |           |
| 5        | 981-942  | SEAL LOCK HEX. SOCKET HD. BOLT M6X25     | 4        |           |
| 6        | 322-347  | STOP LEVER                               | 1        |           |
| 7        | 322-344  | BAND HOLDER                              | 2        |           |
| 8        | 322-345  | FRONT COVER ASS'Y                        | 1        | INCLUD. 9 |
| 9        | 322-346  | SLEEVE                                   | 1        |           |
| 10       | 980-879  | O-RING (S-34)                            | 1        |           |
| 11       | 990-067  | O-RING (1AS-50)                          | 1        |           |
| 12       | 322-528  | DAMPER (A)                               | 1        |           |
| 13       | 320-811  | HAMMER HOLDER (A)                        | 1        |           |
| 14       | 319-572  | O-RING (S-25)                            | 1        |           |
| 15       | 322-371  | SECOND HAMMER                            | 1        |           |
| 16       | 320-817  | DAMPER (C)                               | 1        |           |
| 17       | 320-814  | HAMMER HOLDER (B)                        | 1        |           |
| 18       | 320-815  | DAMPER (B)                               | 1        |           |
| 19       | 322-412  | WASHER                                   | 1        |           |
| 20       | 320-816  | HAMMER HOLDER (C)                        | 1        |           |
| 21       | 320-822  | STRIKER                                  | 1        |           |
| 22       | 320-823  | O-RING                                   | 2        |           |
| 23       | 320-818  | CYLINDER HOLDER                          | 1        |           |
| 24       | 322-372  | SLEEVE (A)                               | 1        |           |
| 25       | 320-821  | SPRING (C)                               | 1        |           |
| 26       | 322-336  | CYLINDER                                 | 1        |           |
| 27       | 320-826  | PISTON PIN                               | 1        |           |
| 28       | 320-824  | PISTON                                   | 1        |           |
| 29       | 320-825  | CONNECTING ROD                           | 1        |           |
| 30       | 986-940  | SEAL LOCK HEX. SOCKET HD. BOLT M6X45     | 4        |           |
| 31       |          | WARNING LABEL                            | 1        |           |
| 32       | 983-162  | SEAL LOCK HEX. SOCKET HD. BOLT M4X12     | 4        |           |
| 33       |          | HITACHI LABEL                            | 1        |           |
| 34       | 320-831  | CRANK COVER                              | 1        |           |
| 35       |          | HITACHI LABEL                            | 1        |           |
| 36       | 878-867  | O-RING (JASO2060)                        | 1        |           |
| 37       | 939-540  | RETAINING RING FOR D10 SHAFT (10 PCS.)   | 1        |           |
| 38       | 320-829  | CRANK SHAFT                              | 1        |           |
| 39       | 930-511  | FEATHER KEY 4X4X10                       | 1        |           |
| 40       | 980-760  | SEAL LOCK HEX.SOCKET FLAT HD. BOLT M5X12 | 2        |           |
| 41       | 980-761  | BEARING COVER (A)                        | 1        |           |
| 42       | 322-529  | SEAL PACKING                             | 1        |           |
| 43       | 620-3DD  | BALL BEARING 6203DDCMPS2L                | 1        |           |
| 44       | 310-119  | OIL SEAL                                 | 1        |           |
| 45       | 320-828  | CYLINDER CRANK CASE                      | 1        |           |
| 46       |          | NAME PLATE                               | 1        |           |
| 47       | 320-837  | HANDLE PACKING (A)                       | 1        |           |
| 48       | 310-124  | HANDLE DAMPER                            | 8        |           |
| 49       | 310-123  | TRANSATORY UNIT                          | 2        |           |
| 50       | 320-830  | FIRST GEAR                               | 1        |           |
| 51       | 939-299  | NEEDLE BEARING (M661)                    | 1        |           |





