MODEL

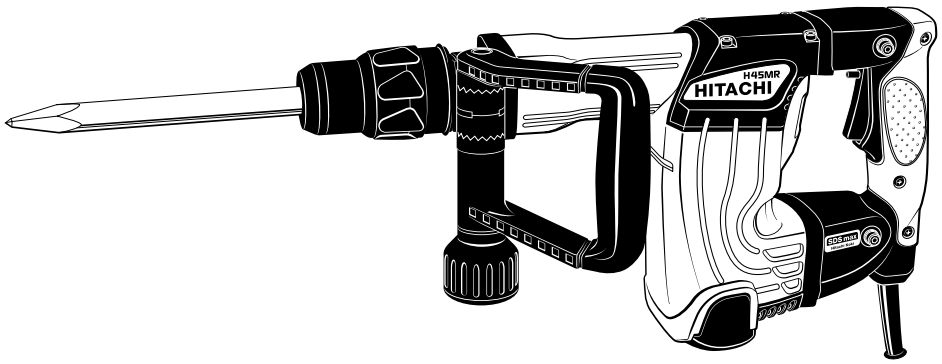
# H 45MR

# HITACHI
## POWER TOOLS

## HAMMER
## H 45MR

TECHNICAL DATA
AND
SERVICE MANUAL

H




LIST No. E463

MAY 2002

REMARK:

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 |
| C | MAKITA | HM1100C |
| B | BOSCH | GSH5E |
| | | |

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Assembly Diagram for H 45MR

## 1. PRODUCT NAME

Hitachi Electric Hammer, Model H 45MR

## 2. MARKETING OBJECTIVE

The Model H 45MR is an upgraded version of the current Model H 45MA, which features the use of maker B's SDS-max shank tools. The performance, durability and operability are greatly improved. With this competitive Model H 45MR, we aim to enhance the share of the SDS-max type hammers.

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-insertion 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

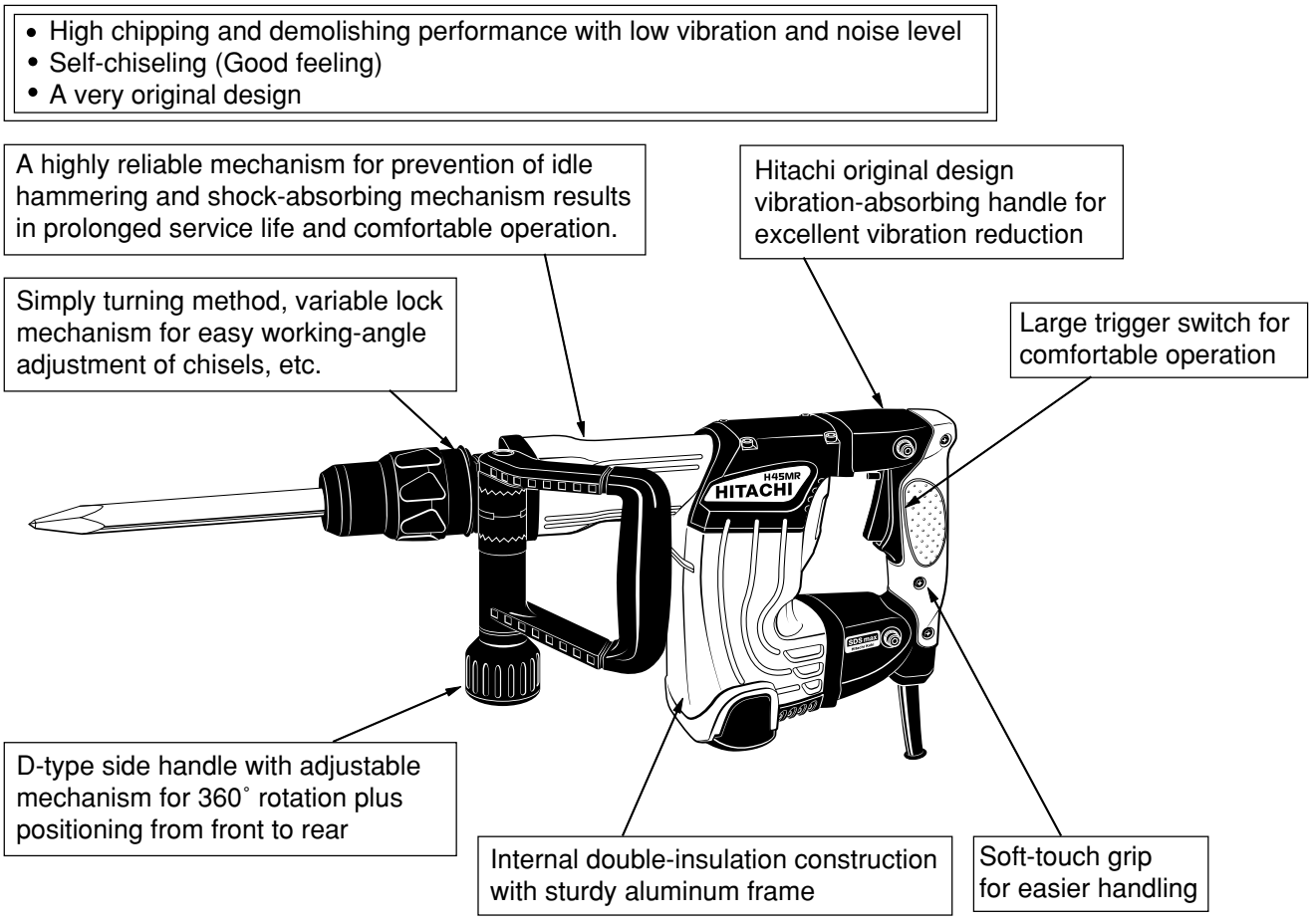
(7) Simply turning method, variable lock mechanism for easy working-angle adjustment of chisels, etc.

(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



## 4-1. Selling Point Descriptions

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

Demolition performance is 1.2 to 1.5 times higher than that of similar products thanks to the 12.5 J impact energy and efficient striking. The chipping performance is 1.2 to 1.5 times higher than that of similar products. Even so, the Model H 45MR produces equivalent or lower vibration and sound levels than those of similar products.

| Maker • Model | | HITACHI H 45MR | HITACHI H 45MA | C | B |
|---|---|---|---|---|---|
| Ratio of demolished weight | % | 100 | 66 | 67 | 86 |
| Full-load vibration level | dB (VL) | 119.0 | 119.5 | 119.5 | 122.0 |
| Full-load noise level | dB (A) | 95.9 | 95.6 | 94.7 | 95.3 |
| No-load noise level | dB (A) | 82.5 | 86.7 | *82.7 | *85.4 |

* C and B: Equipped with constant speed control

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

Thanks to the computer-simulated optimum striking characteristics, the quantity of body jumping is less than that of the current Model H 45MA and the working tool smoothly penetrates into the workpiece with a light pressing force. The Model H 45MR realizes quicker self-chiseling with better impact feeling.

| | |
|---|---|
| Impact energy | 40% up (9.0 J to 12.5 J) |
| Maximum compressed air force (piston force) | About 30% down |
| Quantity of body jumping | About 45% 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 45MR is heavy-duty and the service life of the carbon brush is greatly prolonged (3 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 45MR 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 mechanisms 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 45MR is prolonged and hammering works requiring much attention not to break the surroundings can be efficiently performed with the Model H 45MR. 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 45MR 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. Simply turning method, variable lock mechanism for easy working-angle adjustment of chisels, etc.**

The tool swivel angle can be easily changed in 12 steps by pushing out grip (B) ahead and then turning grip (A).

**4-1-8. Original design vibration-absorbing handle (Vibration-absorbing is significantly improved)**

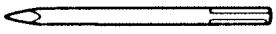
Hitachi's original design vibration-absorbing handle minimizes vibration through the rolling and compression of four cylindrical rubber cushions on inclined surfaces. The spring constant factor is as low as that of the Models H 45SB2, H 41SC, H 45SR, H 60KA, H 60MA and H 60MB, and the cushioning structure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

## 5. SPECIFICATIONS

| | | |
|---|---|---|
| Power source | Single-phase AC 50/60 Hz | |
| Voltage | 110 V, 120 V, 220 V, 230 V, 240 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 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 | For Europe, Australia, U.S.A. | For Asia, etc. |
| | 9.1 A (110 V), 8.3 A (120 V),<br>4.4 A (230 V), 4.2 A (240 V) | 5.0 A (220 V) |
| Power input | 950 W | 1,050 W |
| Striking speed | No-load : 4,000 $min^{-1}$<br>Full-load : 3,000 $min^{-1}$ | |
| Weight | Product : 5.9 kg (13.0 lbs.); excluding cord and side handle<br>Packed : 10.2 kg (22.5 lbs.) | |
| Packaging | Corrugated cardboard box with plastic tool case | |
| Standard accessories | • Bull point 280 mm (11-1/32") ····· 1 pc.<br>• Side handle ····· 1 pc.<br>• Hex. bar wrench (for M6) ····· 1 pc.<br>• Hex. bar wrench (for M5) ····· 1 pc.<br>• Hex. bar wrench (for M4) ····· 1 pc.<br>• Plastic tool case ····· 1 pc. | |

**5-1. Optional Accessories**

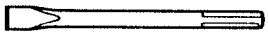
(1) Demolition work



(1) Bull point (SDS max shank type)

| Overall length | Code No. |
|---|---|
| 280 mm (11-1/32") | 313471 |
| 400 mm (15-3/4") | 313472 |

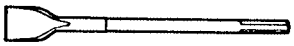
(2) Grooving and chiseling work



(1) Cold chisel (SDS max shank type)

| Overall length | Code No. |
|---|---|
| 280 mm (11-1/32") | 313473 |
| 400 mm (15-3/4") | 313474 |

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



(1) Cutter (SDS max shank type)

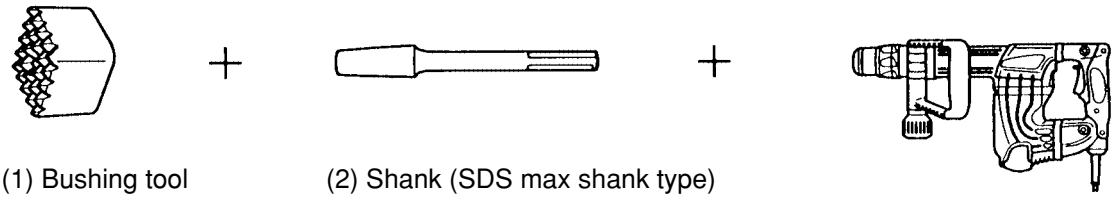
| Width | Overall length | Code No. |
|---|---|---|
| 50 mm (2") | 400 mm (15-3/4") | 313475 |

(4) Digging (substitute pick-ax)

(1) Scoop (SDS max shank type)

| Overall length | Code No. |
|---|---|
| 400 mm (15-3/4") | 313476 |

(5) Roughing surface work



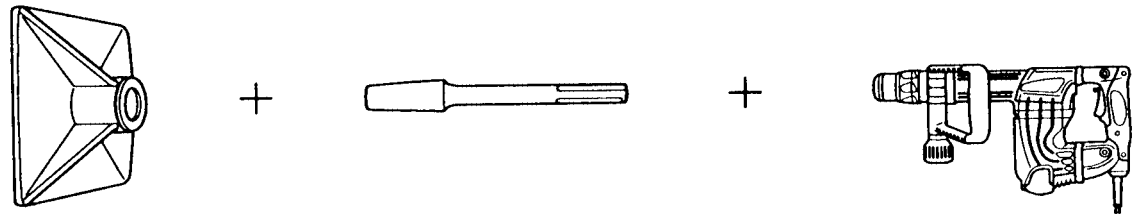
(1) Bushing tool

| Code No. |
|---|
| 313477 |

(2) Shank (SDS max shank type)

| Overall length | Code No. |
|---|---|
| 220 mm (8-21/32") | 313479 |

(6) Tamping work



(1) Rammer

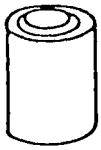
| Code No. |
|---|
| 313478 |

150 mm x 150 mm

(2) Shank (SDS max shank type)

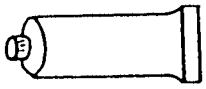
| Overall length | Code No. |
|---|---|
| 220 mm (8-21/32") | 313479 |

(7) Grease for impact drill



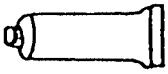
500 g (1.1 lbs.) Can

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 Comparison

| Maker | | | HITACHI | | | C | B |
|---|---|---|---|---|---|---|---|
| Model name | | | H 45MR | | H 45MA | | |
| | | | For Europe, Australia, U.S.A. | For Asia etc. | | | |
| Power input | | W | 950 | 1,050 | 870 | 1,050 | 1,100 |
| Striking energy per stroke | | J | 12.5 | | 9.0 | 4.7 – 9.6 | 2.0 – 12.0 |
| Full-load impact rate | | $min^{-1}$ | 3,000 | | 3,000 | 1,300 – 2,650 | 2,900 |
| Full-load vibration level | | dB(VL) | 119.0 | | 119.5 | 119.5 | 122.0 |
| Full-load noise level | | dB(A) | 95.9 | | 95.6 | 94.7 | 95.3 |
| No-load noise level | | dB(A) | 82.5 | | 86.7 | 82.7 | 85.4 |
| Dimensions | Length | mm | 454 (17-7/8") | | 445 (17-33/64") | 524 (20-5/8") | 450 (17-23/32") |
| | Height | mm | 230 (9-1/16") | | 210 (8-9/32") | 224 (8-13/16") | 230 (9-1/16") |
| | Width | mm | 106 (4-11/64") | | 106 (4-11/64") | 98 (3-55/64") | 102 (4-1/64") |
| Weight (without cord and side handle) | | kg | 5.9 (13.0 lbs.) | | 5.4 (11.9 lbs.) | 6.1 (13.5 lbs.) | 5.4 (11.9 lbs.) |
| Insulation structure | | — | Double insulation | | Double insulation | Double insulation | Double insulation |

### 6-2. Demolition Performance Comparison

The data shown in Fig. 1 are obtained in actual factory tests, and are for reference only. Demolished amount may vary in accordance with operating conditions, operator skill, etc.

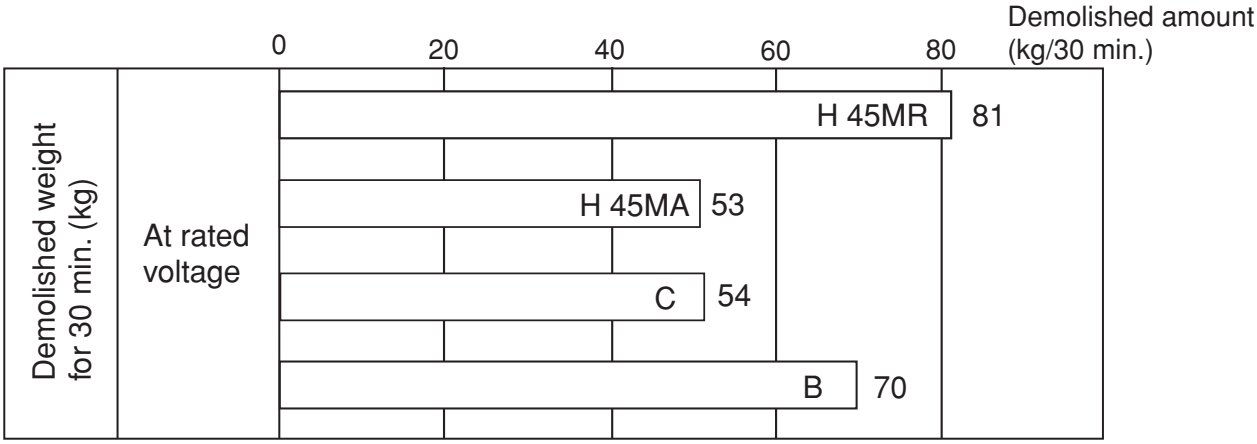
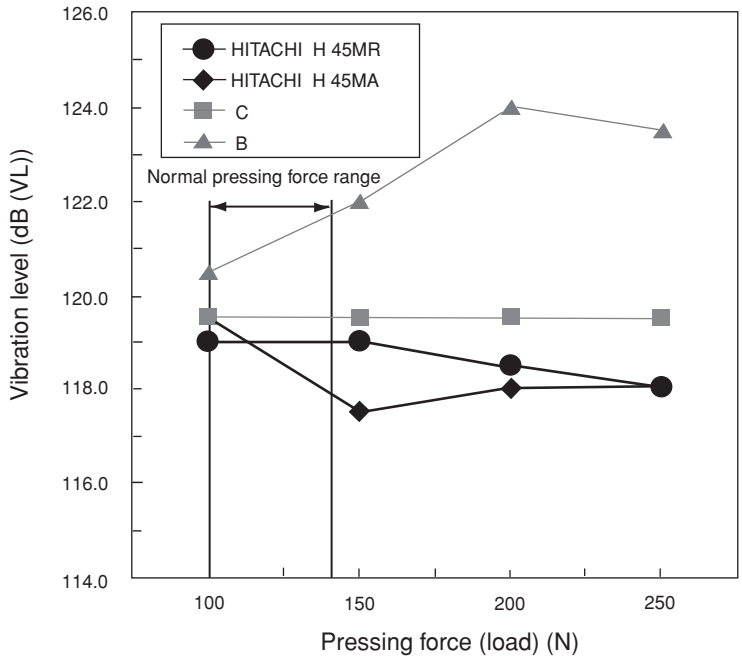



**Fig. 1**

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

The graph shown in Fig. 2 illustrates the relationship between handle pressing force and handle vibration level in the Z direction.



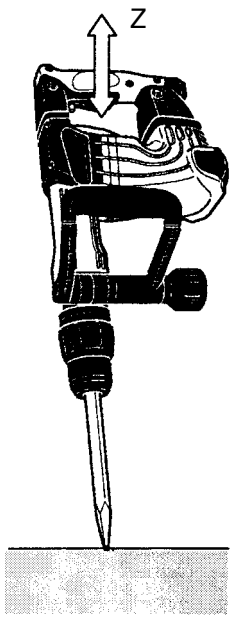




**Fig. 2**

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

The graph shown in Fig. 3 illustrates the relationship between ratio of quantity of working tool penetration and 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.

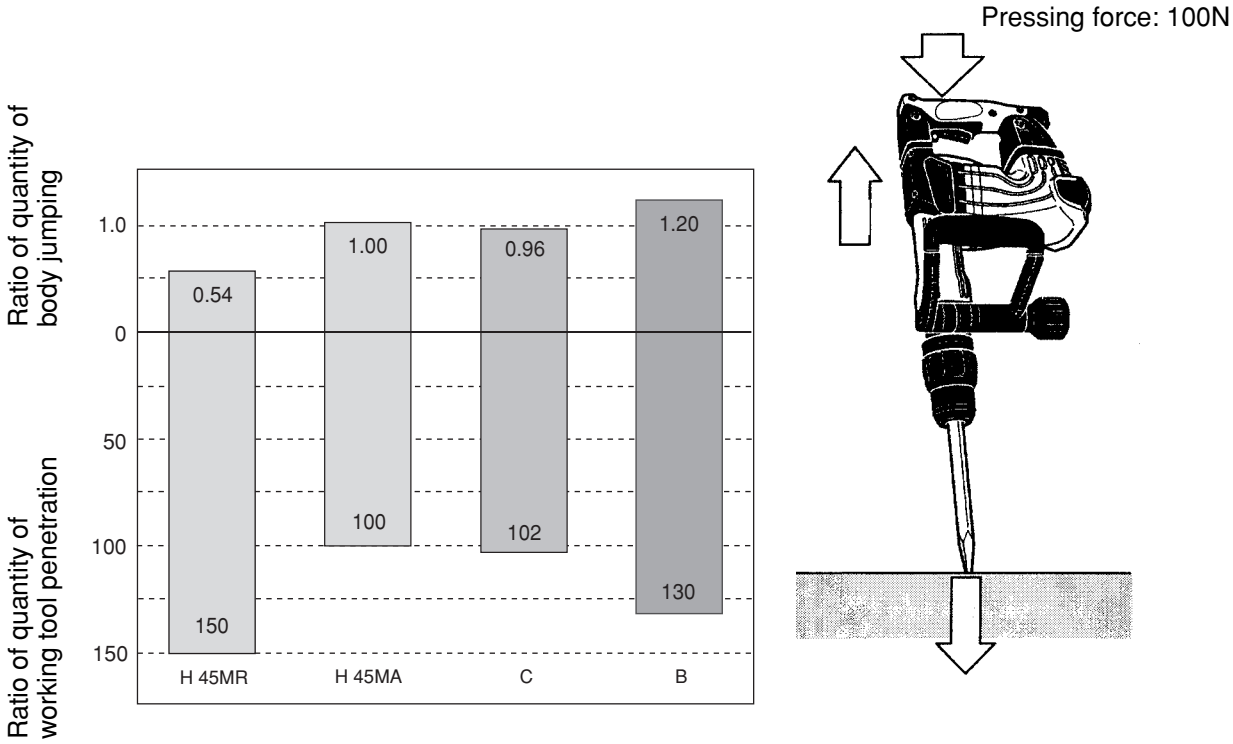



**Fig. 3**

## 7. PRECAUTIONS IN SALES PROMOTION

In the interest of promoting the safest and most efficient use of the Model H 45MR Electric 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

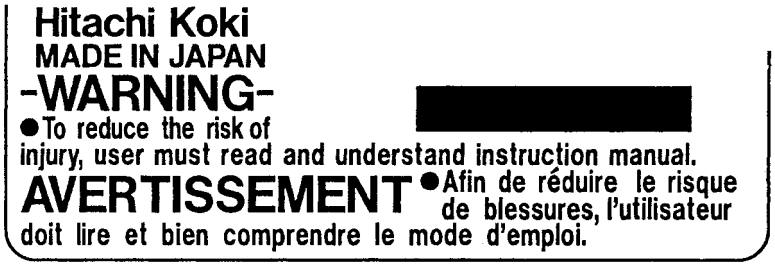
Although every effort is made in each step of design, manufacture and inspection to provide protection against safety hazards, the dangers inherent in the use of any electric tool cannot be completely eliminated. Accordingly, general precautions and suggestions for the use of electric power tools, and specific precautions and suggestions for the use of the Electric 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 45MR 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 Australia


For the U.S.A. and Canada




### 7-3. Grease Replacement

The striking portion and the speed reduction portion of the Model H 45MR respectively use different types of grease. Grease replacement is required if the unit is disassembled for maintenance of 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 53 g (1.9 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:

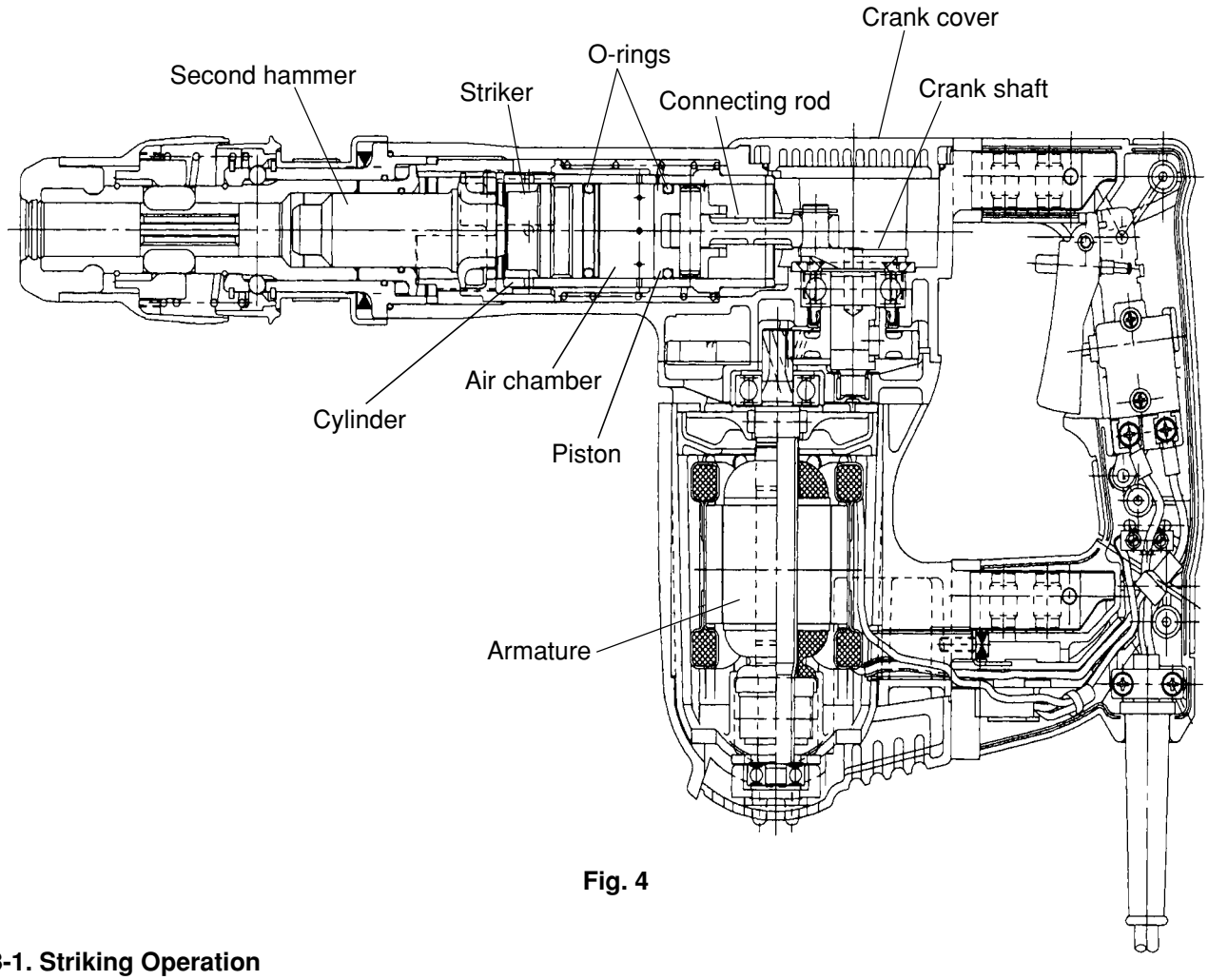



**Fig. 4**

### 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 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. 5 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.

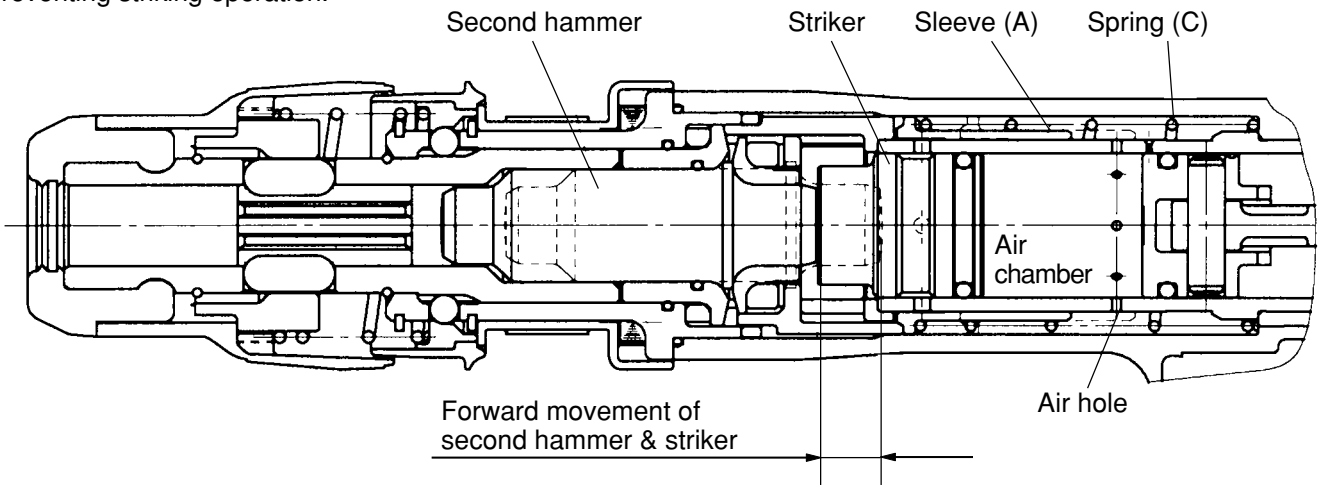



**Fig. 5**

**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) 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 45MR is increased greatly because the second hammer does not strike the tool retainer directly.

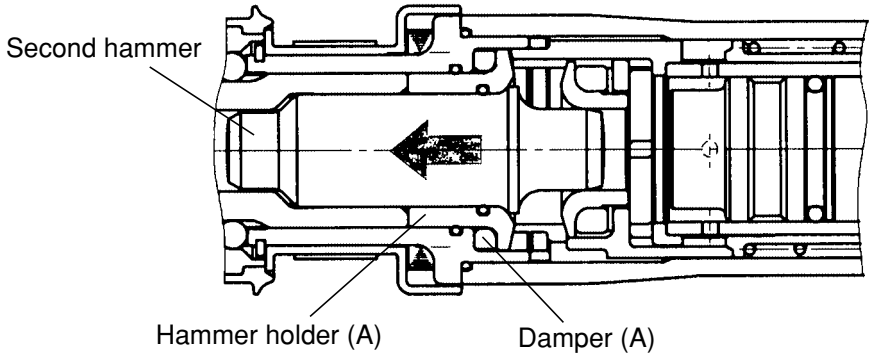



**Fig. 6**

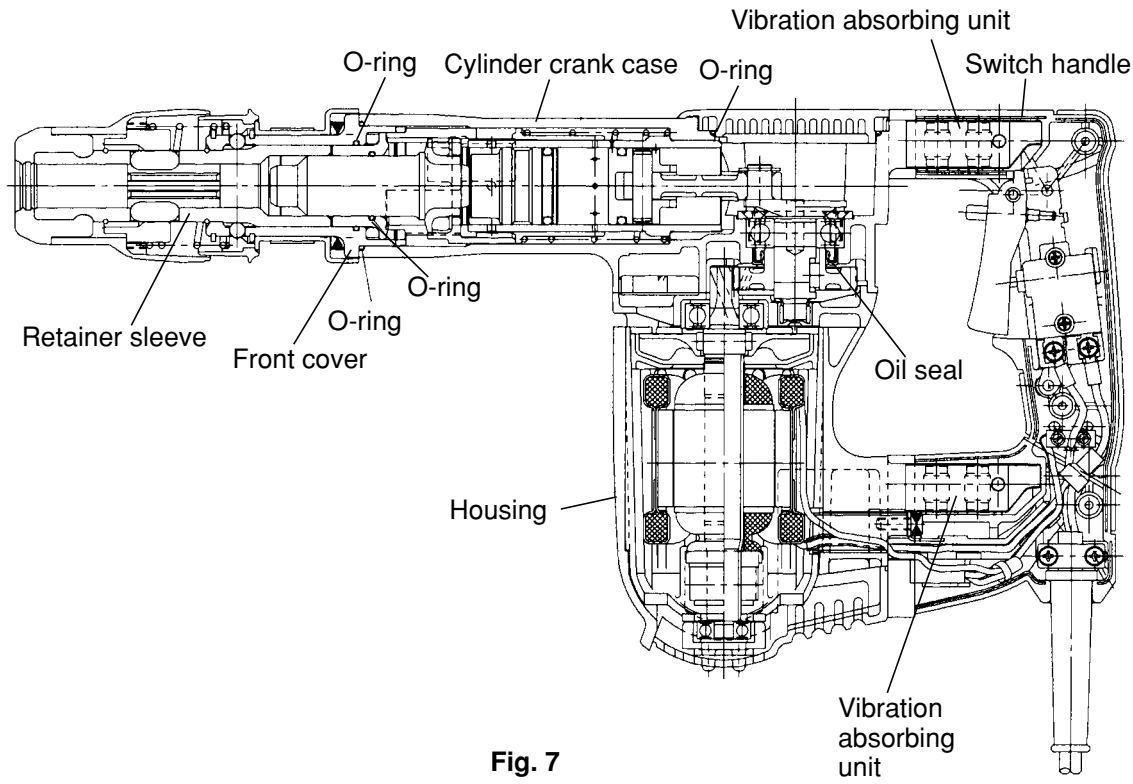



**Fig. 7**

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

The cylinder crank case is 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.

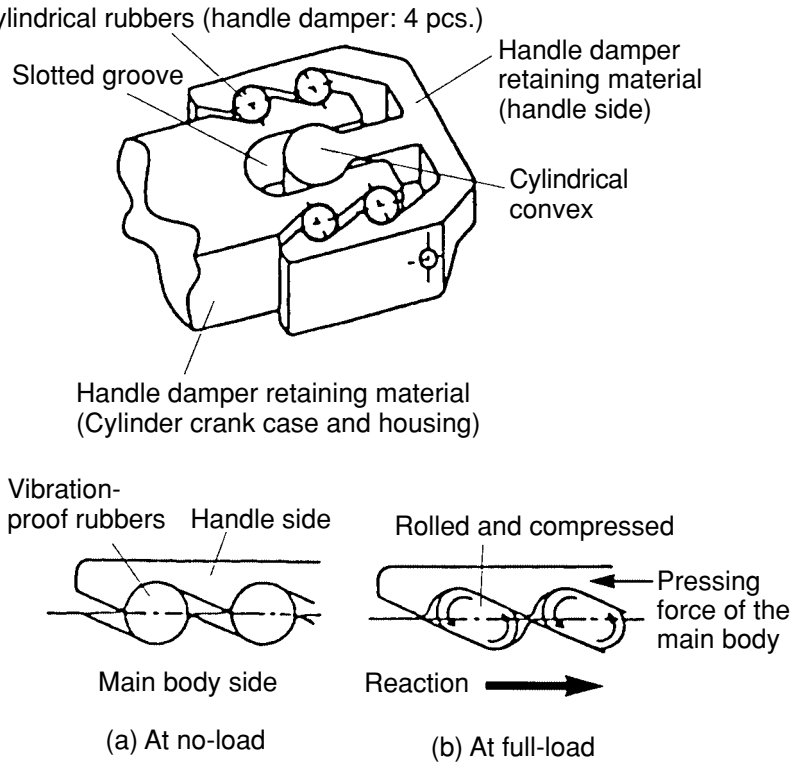



**Fig. 8**

**8-6. Tool Retainer**

The Model H 45MR is equipped with a slide-type tool retainer. Tools can be attached and detached just by pulling grip (A). While pulling grip (A) in Ⓐ direction, insert the tool in the hole of the front cap (Fig. 9). Adjust the groove position by turning the tool and push it in to the end. Lock the tool by returning grip (A) back to the original position.

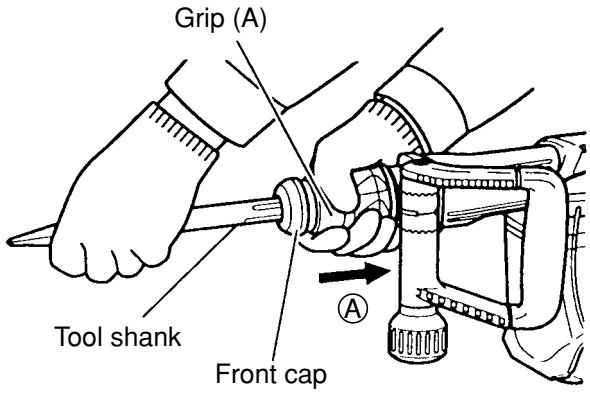



**Fig. 9**

**8-7. Adjusting Mechanism for the Tool Swivel Angle**

The tool swivel angle can be easily changed in 12 steps. The tool swivel angle can be set freely to the desired position by pushing out grip (B) ahead in Ⓐ direction and then turning grip (A) in Ⓑ or Ⓒ direction. (Fig. 10)

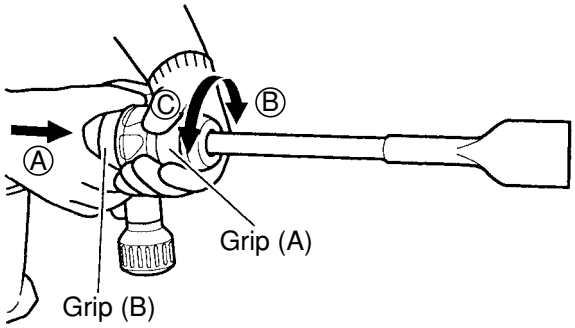



**Fig. 10**

**8-8. 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 Ⓐ direction and adjust the handle to a convenient position. Turn the grip in Ⓑ direction to fix the side handle. (Fig. 11)

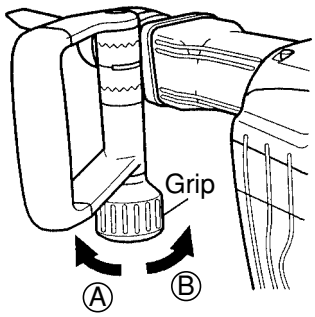



**Fig. 11**

## 9. REPAIR GUIDE

### 9-1. Precautions and Suggestions for Disassembly and Reassembly of the 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 (See Figs. 12 and 13.)
  Pull Grip (A) **[2]** fully in the arrow direction as shown in Fig. 12 and remove the Front Cap **[1]** (since the Front Cap **[1]** is made of rubber and engaged firmly with the Retainer Sleeve **[16]**, pull it strongly to remove). This allows Grip (A) **[2]** to be separated from the Retainer Sleeve **[16]**.

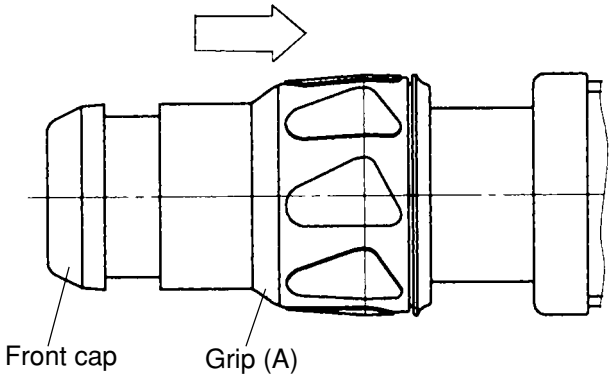



**Fig. 12**

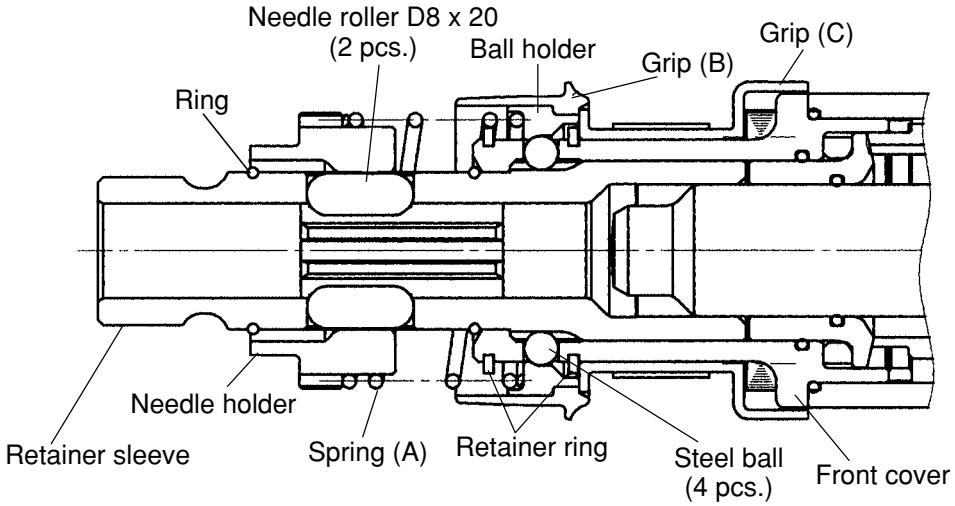



**Fig. 13**

Remove the Ring **[3]** by means of a snap ring remover, then the Needle Holder **[4]**, the two Needle Rollers D8 x 20 **[5]** and Spring (A) **[6]** can be removed from the Retainer Sleeve **[16]**. Remove the Retaining Ring D42 **[7]** by means of a snap ring remover, then the Ball Holder **[8]**, Grip (B) **[9]** and the four Steel Balls D6.35 **[11]** can be removed from the Front Cover **[13]**. Furthermore, remove the Retaining Ring D42 **[7]** by means of a snap ring remover, then Grip (C) **[10]** can be removed from the Front Cover **[13]**. (Fig. 13)

- Piston and striker disassembly
  Remove the Seal Lock Hex. Socket Hd. Bolts M6 x 25 **[12]** fixing the Front Cover **[13]**, then the Retainer Sleeve **[16]** and the Front Cover **[13]**, Hammer Holder (A) **[18]**, Damper (A) **[17]**, Second Hammer **[20]**, Hammer Holder (B) **[22]**, Damper (B) **[23]**, Washer **[24]**, Hammer Holder (C) **[25]**, Damper (C) **[21]**, Cylinder Holder **[28]**, Cylinder **[31]**, Sleeve (A) **[29]** and Spring (C) **[30]** can be removed from the Cylinder Crank Case **[48]**. The Striker **[26]** can be removed by tapping the Cylinder **[31]** lightly with a plastic hammer. As the Piston **[33]** remains in the Cylinder Crank Case **[48]** side, remove the Seal Lock Hex. Socket Hd. Bolts M4 x 12 **[36]** fixing the Crank Cover **[38]**, then the Crank Cover **[38]** can be removed from the Cylinder Crank Case **[48]**, and remove the Retaining Ring for D10 Shaft **[41]** to remove the Connecting Rod **[34]** from the Crank Shaft **[42]**.

- First gear and crank shaft disassembly

  Remove the grease from the Connecting Rod **[34]** side and the First Gear **[53]** side of the Cylinder Crank Case **[48]**. Remove the two Seal Lock Hex. Socket Flat Hd. Bolts M5 x 12 **[44]** fixing Bearing Cover (A) **[45]**. Then place the Connecting Rod **[34]** side of the Cylinder Crank Case **[48]** downward on a workbench and apply pressure on the end surface of the Crank Shaft **[42]** with a hand press to remove the First Gear **[53]** and the Crank Shaft **[42]** (Fig. 14). Before removing them, make sure that the two Seal Lock Hex. Socket Flat Hd. Bolts M5 x 12 **[44]** fixing Bearing Cover (A) **[45]** are removed.

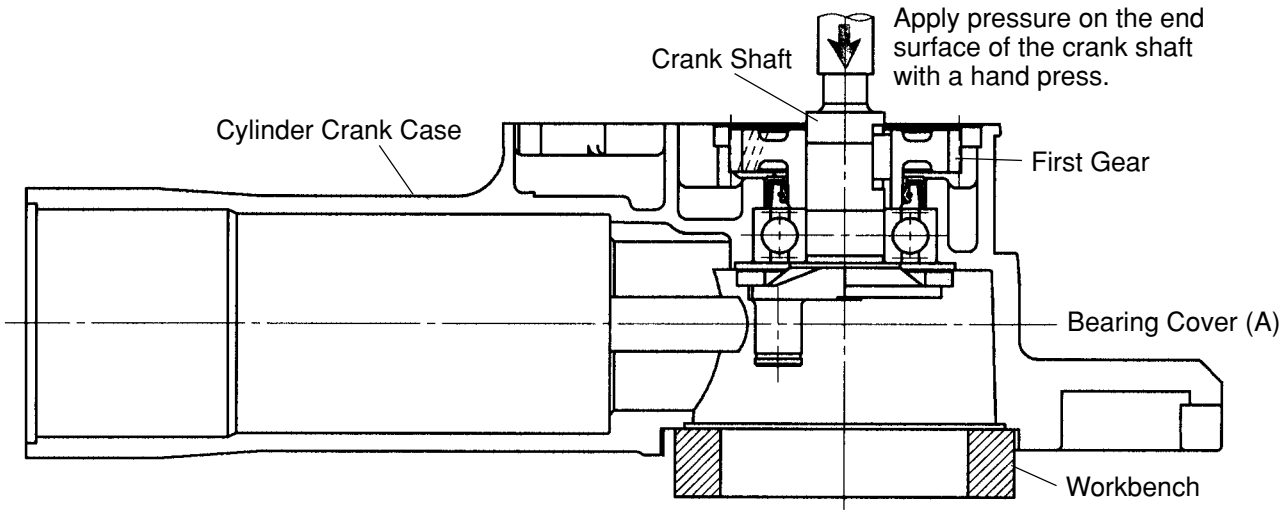



**Fig. 14**

**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 6203DDCMPS2L **[46]** in the Cylinder Crank Case **[48]** and fix Bearing Cover (A) **[45]** with the two Seal Lock Hex. Socket Flat Hd. Bolts M5 x 12 **[44]**. Press-fit the Crank Shaft **[42]**. Then mount the Oil Seal **[47]**. Put the Feather Key 4 x 4x 10 **[43]** into the groove of the Crank Shaft **[42]** and press-fit the First Gear **[53]** with a suitable tool while holding the flat portion of the Crank Shaft **[42]** with a steel bar. Before press-fitting, make sure that the Feather Key 4 x 4 x 10 **[43]** fits in the key groove of the First Gear **[53]**. (Fig. 15)

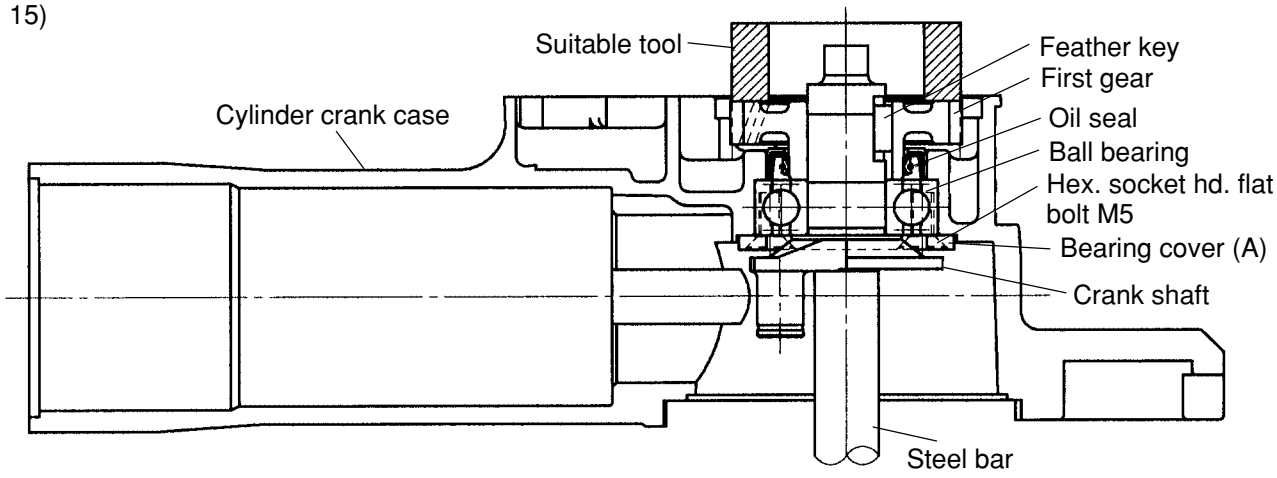



**Fig. 15**

- Piston reassembly

Insert the Piston Pin **[32]** into the D8 hole (marked) of the Piston **[33]** and the Connecting Rod **[34]** then press-fit it. Be careful not to protrude the Piston Pin **[32]** from the outside diameter of the Piston **[33]**. Move the crank pin of the Crank Shaft **[42]** to the bottom dead center and insert the piston ass'y into the Crank Shaft **[42]** from the cylinder case of the Cylinder Crank Case **[48]**. Mount the Retaining Ring for D10 Shaft **[41]** using a retaining ring puller.

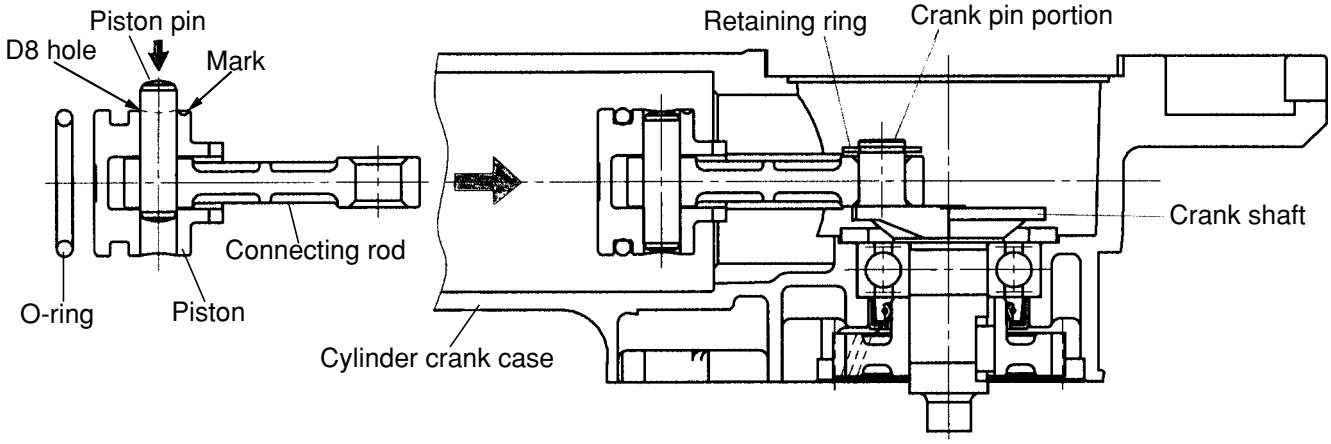



**Fig. 16**

- Cylinder reassembly

Move the crank pin of the Crank Shaft **[42]** then move the Piston **[33]** to the top dead center. Insert the Cylinder **[31]** into the Cylinder Crank Case **[48]**.

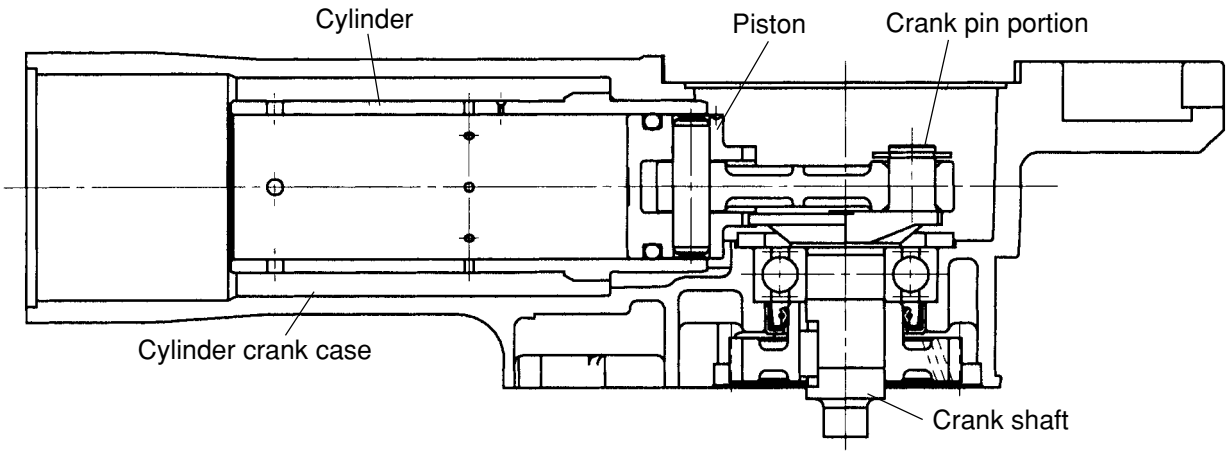



**Fig. 17**

- Lubrication

Apply special grease (grease for electric impact drills) to the inner circumference of the Connecting Rod **[34]**, the O-rings **[27]** in the Striker **[26]** and in the Piston **[33]**, the outer circumference of the Retainer Sleeve **[16]**, the sliding portion of the Second Hammer **[20]**, the Oil Seal **[47]**, Damper (A) **[17]**, Damper (B) **[23]**, Damper (C) **[21]**, the inner circumference of Sleeve (A) **[29]**, Hammer Holder (B) **[22]**, Hammer Holder (C) **[25]**, and the end surface of Spring (A) **[6]**. Seal 53 g of the special grease into the Cylinder Crank Case **[48]** (the Connecting Rod **[34]** side).

Apply Hitachi Motor Grease No. 29 to the Needle Bearing (M661) **[54]**, the pinion portion of the Armature **[70]**, the Needle Roller D8 x 20 **[5]** and the Steel Ball D6.35 **[11]**. Seal 20 g of the Hitachi Motor Grease No. 29 into the Cylinder Crank Case **[48]** (the First Gear **[53]** side).

- Oil seals

  Be very careful not to damage the O-ring (1AS-50) **[15]** on the Front Cover **[13]**, the O-ring (S-34) **[14]** in the Front Cover **[13]**, the O-ring (S-25) **[19]** in Hammer Holder (A) **[18]**, the O-ring (1AS-60) **[40]** in the Crank Cover **[38]**, the O-rings **[27]** in the Striker **[26]** and in the Piston **[33]**, and the Oil Seal **[47]** in the Cylinder Crank Case **[48]**.

#### 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 (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) (Hex. socket hd. flat bolts M5 x 12) | 4.41 ± 0.49 N•m (45 ± 5 kgf•cm, 39.1 ± 4.3 in-lbs.) |
| (3) Tapping screws D5 | 2.94 ± 0.49 N•m (30 ± 5 kgf•cm, 26.0 ± 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 (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 (Hex. socket hd. bolts M4 x 12) | 4.41 ± 0.49 N•m (45 ± 5 kgf•cm, 39.1 ± 4.3 in-lbs.) |
| (7) Tapping screws D4 | 1.96 ± 0.49 N•m (20 ± 5 kgf•cm, 17.4 ± 4.3 in-lbs.) |
| (8) Attached bolts of handle (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 (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. Internal wiring

• Wiring diagram for products with noise suppressor

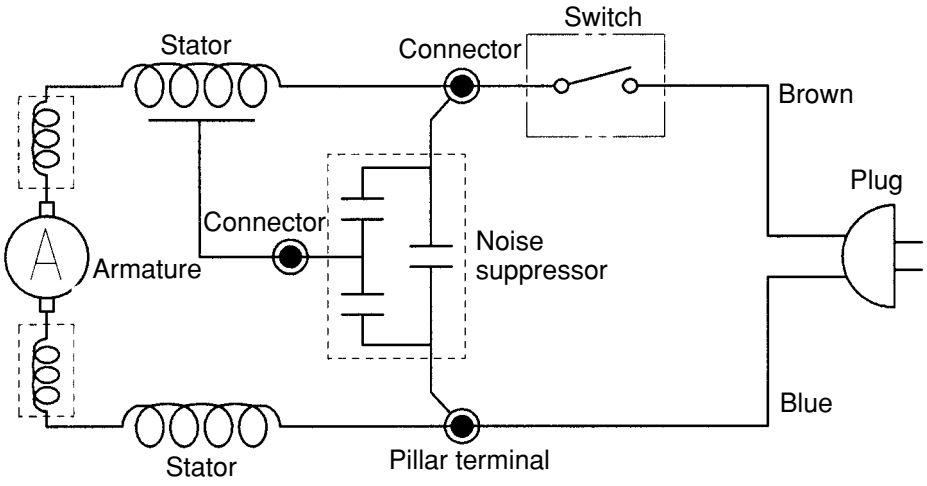



**Fig. 18**

• Wiring diagram for products without noise suppressor

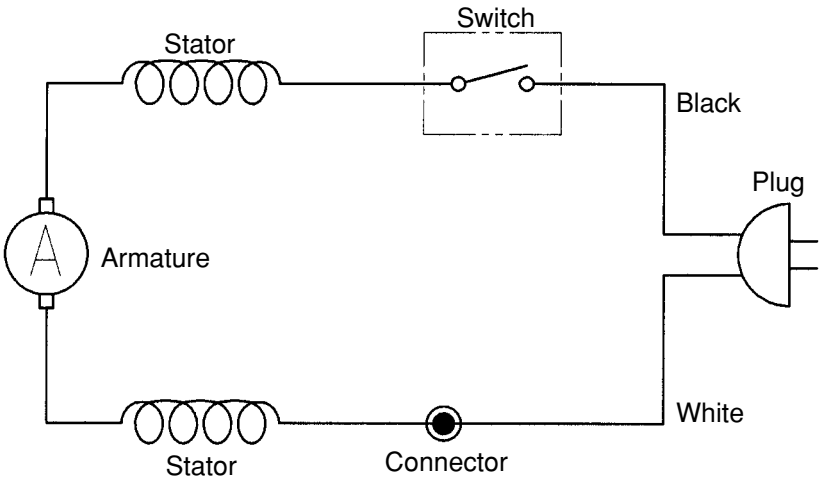



**Fig. 19**

### 9-1-6. Insulation tests

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

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

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

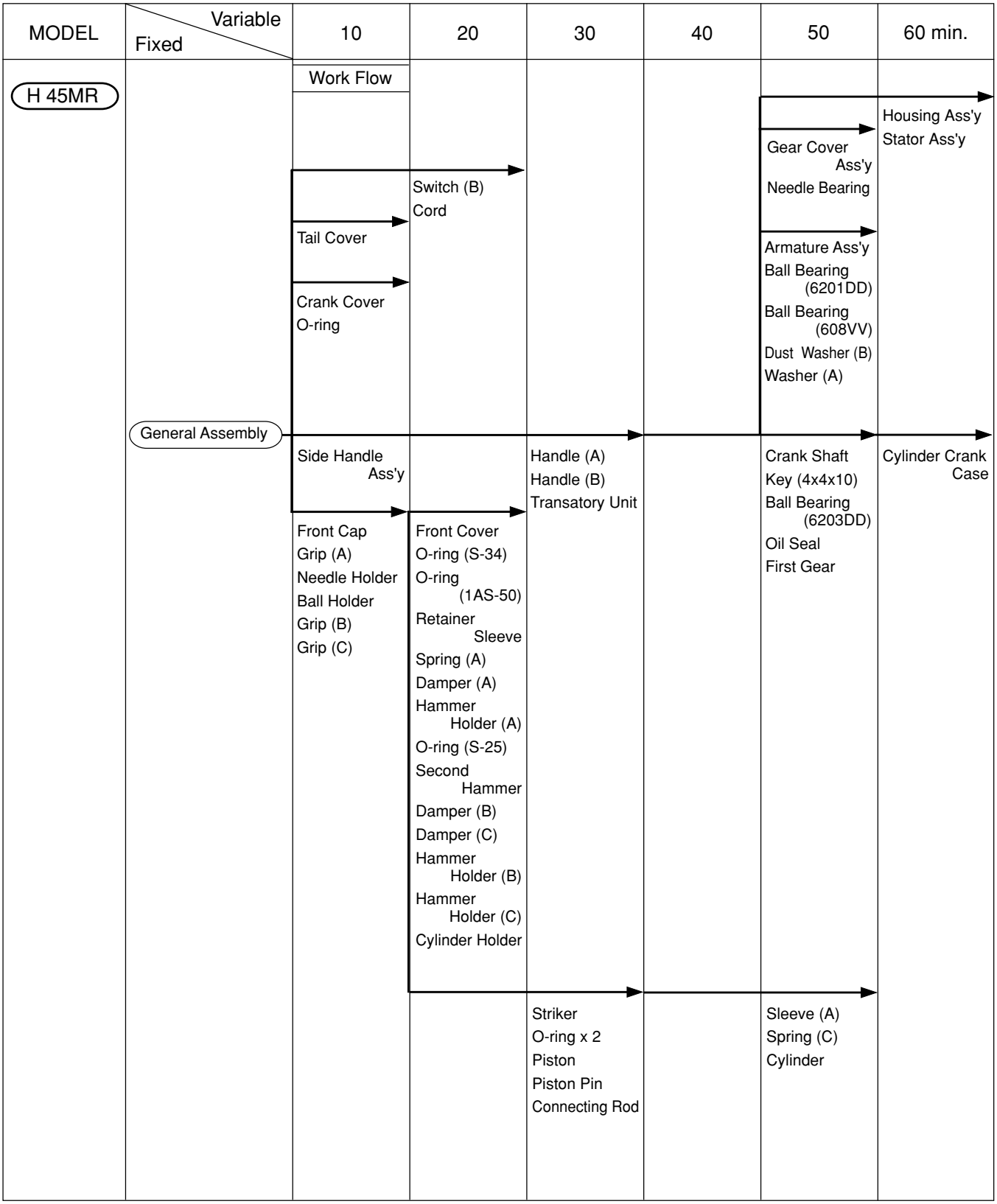
AC 2,500 V/1 minute, with no abnormalities ··· 110 V – 127 V
(except U.K. products)

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

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.) | 3.8 | 3.5 | 2.2 | 2.1 | 2.0 |

## 10. STANDARD REPAIR TIME (UNIT) SCHEDULES



HITACHI

LIST NO. E463

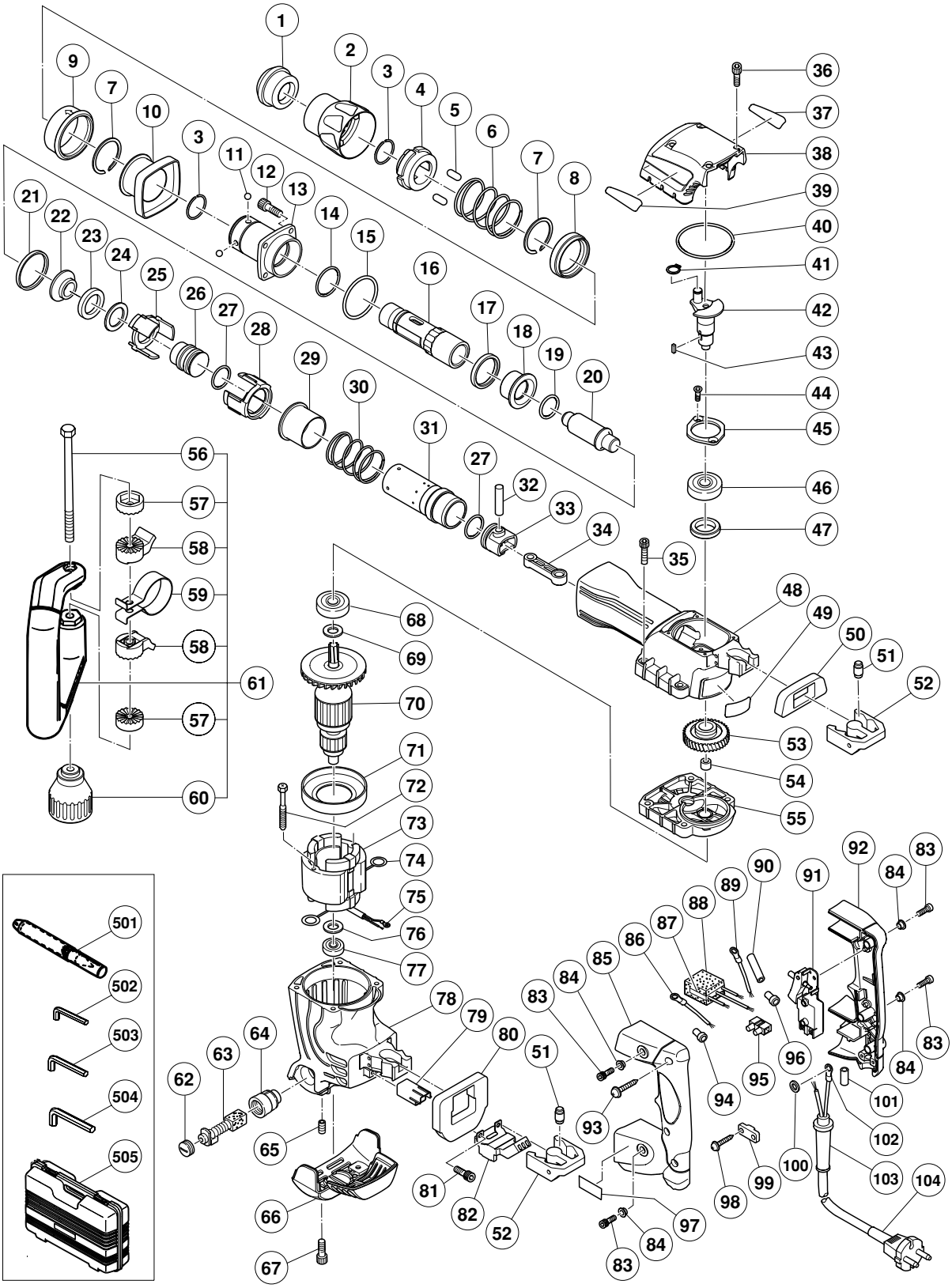
# ELECTRIC TOOL PARTS LIST

## ■ HAMMER

**2002 · 5 · 30**

## Model H 45MR

**(E1)**



| ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|
| 1 | 315-529 | FRONT CAP | 1 | | |
| 2 | 320-802 | GRIP (A) | 1 | | |
| 3 | 320-803 | RING | 2 | | |
| 4 | 320-804 | NEEDLE HOLDER | 1 | | |
| 5 | 313-421 | NEEDLE ROLLER D8X20 | 2 | | |
| 6 | 320-806 | SPRING (A) | 1 | | |
| 7 | 317-088 | RETAINING RING D42 | 2 | | |
| 8 | 320-810 | BALL HOLDER | 1 | | |
| 9 | 320-807 | GRIP (B) | 1 | | |
| 10 | 320-808 | GRIP (C) | 1 | | |
| 11 | 959-150 | STEEL BALL D6.35 (10 PCS.) | 4 | | |
| 12 | 981-942 | SEAL LOCK HEX. SOCKET HD. BOLT M6X25 | 4 | | |
| 13 | 320-809 | FRONT COVER | 1 | | |
| 14 | 980-879 | O-RING (S-34) | 1 | | |
| 15 | 990-067 | O-RING (1AS-50) | 1 | | |
| 16 | 320-805 | RETAINER SLEEVE | 1 | | |
| 17 | 320-812 | DAMPER (A) | 1 | | |
| 18 | 320-811 | HAMMER HOLDER (A) | 1 | | |
| 19 | 319-572 | O-RING (S-25) | 1 | | |
| 20 | 320-813 | SECOND HAMMER | 1 | | |
| 21 | 320-817 | DAMPER (C) | 1 | | |
| 22 | 320-814 | HAMMER HOLDER (B) | 1 | | |
| 23 | 320-815 | DAMPER (B) | 1 | | |
| 24 | 320-835 | WASHER | 1 | | |
| 25 | 320-816 | HAMMER HOLDER (C) | 1 | | |
| 26 | 320-822 | STRIKER | 1 | | |
| 27 | 320-823 | O-RING | 2 | | |
| 28 | 320-818 | CYLINDER HOLDER | 1 | | |
| 29 | 320-820 | SLEEVE (A) | 1 | | |
| 30 | 320-821 | SPRING (C) | 1 | | |
| 31 | 320-819 | CYLINDER | 1 | | |
| 32 | 320-826 | PISTON PIN | 1 | | |
| 33 | 320-824 | PISTON | 1 | | |
| 34 | 320-825 | CONNECTING ROD | 1 | | |
| 35 | 986-940 | SEAL LOCK HEX. SOCKET HD. BOLT M6X45 | 4 | | |
| 36 | 983-162 | SEAL LOCK HEX. SOCKET HD. BOLT M4X12 | 4 | | |
| 37 | | HITACHI LABEL | 1 | | |
| 38 | 320-831 | CRANK COVER | 1 | | |
| 39 | | HITACHI LABEL | 1 | | |
| 40 | 956-996 | O-RING (1AS-60) | 1 | | |
| 41 | 939-540 | RETAINING RING FOR D10 SHAFT (10 PCS.) | 1 | | |
| 42 | 320-829 | CRANK SHAFT | 1 | | |
| 43 | 930-511 | FEATHER KEY 4X4X10 | 1 | | |
| 44 | 980-760 | SEAL LOCK HEX.SOCKET FLAT HD. BOLT M5X12 | 2 | | |
| 45 | 980-761 | BEARING COVER (A) | 1 | | |
| 46 | 620-3DD | BALL BEARING 6203DDCMPS2L | 1 | | |
| 47 | 310-119 | OIL SEAL | 1 | | |
| 48 | 320-828 | CYLINDER CRANK CASE | 1 | | |
| * 49 | | NAME PLATE | 1 | | |
| 50 | 320-837 | HANDLE PACKING (A) | 1 | | |
| 51 | 310-124 | HANDLE DAMPER | 8 | | |

| | ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|---|
| | 52 | 310-123 | TRANSATORY UNIT | 2 | | |
| | 53 | 320-830 | FIRST GEAR | 1 | | |
| | 54 | 939-299 | NEEDLE BEARING (M661) | 1 | | |
| | 55 | 320-841 | GEAR COVER ASS'Y | 1 | INCLUD.54 | |
| | 56 | 317-107 | BOLT M8 | 1 | | |
| | 57 | 317-106 | HANDLE HOLDER (B) | 2 | | |
| | 58 | 317-105 | HANDLE HOLDER (A) | 2 | | |
| | 59 | 320-635 | BAND | 1 | | |
| | 60 | 317-108 | GRIP | 1 | | |
| | 61 | 317-103 | SIDE HANDLE ASS'Y | 1 | INCLUD.56-60 | |
| | 62 | 935-829 | BRUSH CAP | 2 | | |
| | 63 | 999-073 | CARBON BRUSH (AUTO STOP TYPE) (1 PAIR) | 2 | | |
| | 64 | 971-001 | BRUSH HOLDER | 2 | | |
| | 65 | 938-477 | HEX. SOCKET SET SCREW M5X8 | 2 | | |
| | 66 | 320-834 | TAIL COVER | 1 | | |
| | 67 | 877-839 | SEAL LOCK HEX. SOCKET HD. BOLT M5X10 | 2 | | |
| | 68 | 620-1DD | BALL BEARING 6201DDCMPS2L | 1 | | |
| | 69 | 302-429 | DUST WASHER (B) | 1 | | |
| * | 70 | 360-571C | ARMATURE 110V | 1 | | |
| * | 70 | 360-571U | ARMATURE ASS'Y 120V | 1 | INCLUD.68,69,76,77 | |
| * | 70 | 360-571E | ARMATURE 220V-230V | 1 | | |
| * | 70 | 360-571F | ARMATURE 240V | 1 | | |
| | 71 | 320-832 | FAN GUIDE | 1 | | |
| | 72 | 953-174 | HEX. HD. TAPPING SCREW D5X55 | 2 | | |
| * | 73 | 340-519C | STATOR ASS'Y 110V | 1 | INCLUD.74 | |
| * | 73 | 340-519G | STATOR ASS'Y 120V | 1 | INCLUD.74,75 | |
| * | 73 | 340-519H | STATOR ASS'Y 220V-230V | 1 | INCLUD.74,75 | |
| * | 73 | 340-519E | STATOR ASS'Y 220V-230V | 1 | INCLUD.74 FOR GBR (230V),EUROPE,NOR, | |
| | | | | | SWE,DEN,FIN,SUI | |
| * | 73 | 340-519F | STATOR ASS'Y 240V | 1 | INCLUD.74 | |
| | 74 | 930-703 | BRUSH TERMINAL | 2 | | |
| * | 75 | 930-804 | TERMINAL M4.0 (10 PCS.) | 1 | EXCEPT FOR AUS,GBR,EUROPE,NOR,SWE, | |
| | | | | | DEN,FIN,SUI | |
| | 76 | 982-631 | WASHER (A) | 1 | | |
| | 77 | 608-VVM | BALL BEARING 608VVC2PS2L | 1 | | |
| | 78 | 320-833 | HOUSING ASS'Y | 1 | INCLUD.64,65 | |
| | 79 | 320-836 | SLEEVE (B) | 1 | | |
| | 80 | 320-838 | HANDLE PACKING (B) | 1 | | |
| | 81 | 984-509 | SEAL LOCK HEX. SOCKET HD. BOLT M5X14 | 2 | | |
| * | 82 | 980-754 | INTERNAL WIRE HOLDER | 1 | | |
| * | 82 | 310-424 | INTERNAL WIRE HOLDER | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI | |
| | 83 | 991-690 | SEAL LOCK HEX. SOCKET HD. BOLT M5X12 | 4 | | |
| | 84 | 991-711 | DISTANCE PIECE (B) | 4 | | |
| | 85 | 320-839 | HANDLE (A) | 1 | | |
| * | 86 | 990-861 | INTERNAL WIRE | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI | |
| * | 87 | 994-273 | NOISE SUPPRESSOR | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI | |
| * | 88 | 317-492 | SUPPORT (B) | 1 | FOR NOISE SUPPRESSOR | |
| * | 89 | 981-974 | INTERNAL WIRE | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI | |
| * | 90 | | VINYL TUBE | 2 | FOR USA,CAN | |
| | 91 | 306-143 | SWITCH (B) (1P SCREW TYPE) W/LOCK | 1 | | |
| | 92 | 320-840 | HANDLE (B) | 1 | | |

## PARTS

| | ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|---|
| | 93 | 307-028 | TAPPING SCREW (W/FLANGE) D4X25 (BLACK) | 3 | | |
| * | 94 | 959-140 | CONNECTOR 50091 (10 PCS.) | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI | |
| * | 95 | 938-307 | PILLAR TERMINAL | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI, | |
| | | | | | USA,CAN | |
| * | 96 | 959-141 | CONNECTOR 50092 (10 PCS.) | 1 | EXCEPT FOR USA,CAN | |
| | 97 | | SDS MAX LABEL | 1 | | |
| | 98 | 984-750 | TAPPING SCREW (W/FLANGE) D4X16 | 2 | | |
| * | 99 | 960-266 | CORD CLIP | 1 | | |
| * | 99 | 981-987Z | CORD CLIP | 1 | FOR SUI | |
| * | 100 | 949-423 | WASHER M4 (10 PCS.) | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI | |
| * | 101 | 981-373 | TUBE (D) | 2 | FOR CORD | |
| * | 102 | 980-063 | TERMINAL | 1 | FOR AUS,GBR (110V),EUROPE,NOR,SWE,DEN,FIN,SUI | |
| * | 102 | 992-810 | TERMINAL | 1 | FOR GBR (230V) | |
| * | 102 | 930-804 | TERMINAL M4.0 (10 PCS.) | 1 | FOR USA,CAN | |
| * | 103 | 953-327 | CORD ARMOR D8.8 | 1 | | |
| * | 103 | 938-051 | CORD ARMOR D10.1 | 1 | | |
| * | 104 | 500-394Z | CORD | 1 | (CORD ARMOR D10.1) | |
| * | 104 | 500-408Z | CORD | 1 | (CORD ARMOR D8.8) FOR AUS | |
| * | 104 | 500-446Z | CORD | 1 | (CORD ARMOR D8.8) FOR GBR (230V) | |
| * | 104 | 500-454Z | CORD | 1 | (CORD ARMOR D8.8) FOR GBR (110V) | |
| * | 104 | 500-390Z | CORD | 1 | (CORD ARMOR D8.8) FOR EUROPE,NOR,SWE,DEN,FIN | |
| * | 104 | 500-391Z | CORD | 1 | (CORD ARMOR D8.8) FOR SUI | |
| * | 104 | 500-434Z | CORD | 1 | (CORD ARMOR D8.8) FOR USA,CAN | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

## STANDARD ACCESSORIES

| | ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|---|
| | 501 | 313-471 | BULL POINT (SDS MAX) 280L | 1 | | |
| * | 502 | 943-277 | HEX. BAR WRENCH 3MM | 1 | FOR AUS,GBR,EUROPE,NOR,SWE,DEN,FIN,SUI | |
| | 503 | 944-458 | HEX. BAR WRENCH 4MM | 1 | | |
| | 504 | 944-459 | HEX. BAR WRENCH 5MM | 1 | | |
| | 505 | 320-842 | CASE | 1 | | |

## OPTIONAL ACCESSORIES

| | ITEM NO. | CODE NO. | DESCRIPTION | NO. USED | REMARKS | |
|---|---|---|---|---|---|---|
| | 601 | 313-472 | BULL POINT (SDS MAX) 400L | 1 | | |
| | 602 | 313-473 | COLD CHISEL (SDS MAX) 280MM | 1 | | |
| | 603 | 313-474 | COLD CHISEL (SDS MAX) 400MM | 1 | | |
| | 604 | 313-475 | CUTTER (SDS MAX) W50X400L | 1 | | |
| | 605 | 313-476 | SCOOP (SDS MAX) 400L | 1 | | |
| | 606 | 313-478 | RAMMER (SDS MAX) 150MM X 150MM | 1 | | |
| | 607 | 313-479 | SHANK (SDS MAX)FOR RAMMER,BUSHING TOOL | 1 | | |
| | 608 | 981-840 | GREASE (A) FOR HAMMER.HAMMER DRILL (30G) | 1 | | |
| | 609 | 308-471 | GREASE FOR HAMMER.HAMMER DRILL (70G) | 1 | | |
| * | 610 | 980-927 | GREASE FOR HAMMER.HAMMER DRILL (500G) | 1 | EXCEPT FOR USA,CAN | |

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