

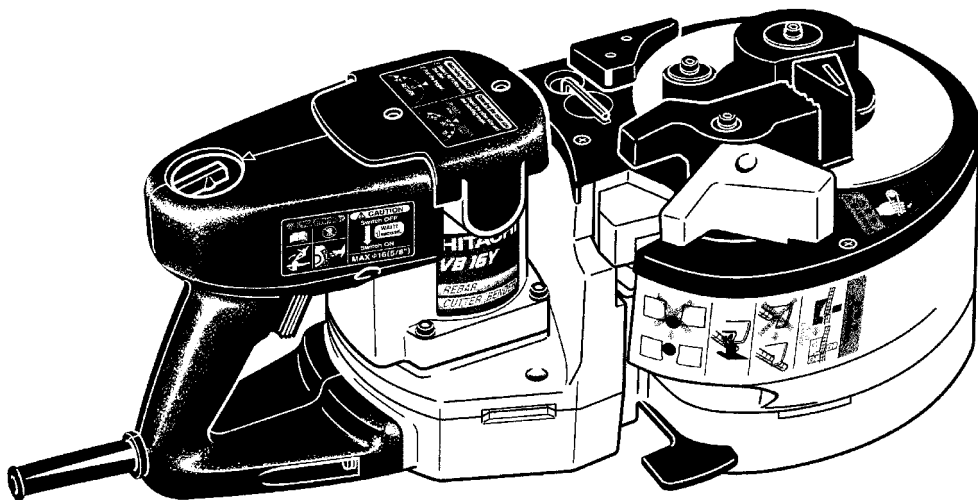
MODEL

**VB 16Y**

**HITACHI**  
**POWER TOOLS**

**PORTABLE REBAR CUTTER/BENDER**  
**VB 16Y**

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



LIST No. 0790

Sep. 2001

SPECIFICATIONS AND PARTS ARE SUBJECT TO CHANGE FOR IMPROVEMENT

V

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
P	JET	RCB-16



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## 1. PRODUCT NAME

Hitachi Portable Rebar Cutter/Bender, Model VB 16Y

## 2. MARKETING OBJECTIVE

A compact and lightweight power tool that reduces worker fatigue and enhances work efficiency.

## 3. APPLICATIONS

- Cutting and bending of rebars (concrete reinforcing rod) during construction of foundations and external structures.
- Cutting and bending of rebars for fitting building parts during construction of reinforced concrete buildings.

## 4. CAPACITY

- Rebar diameter: Max. 16 mm (5/8")

## 5. SELLING POINTS

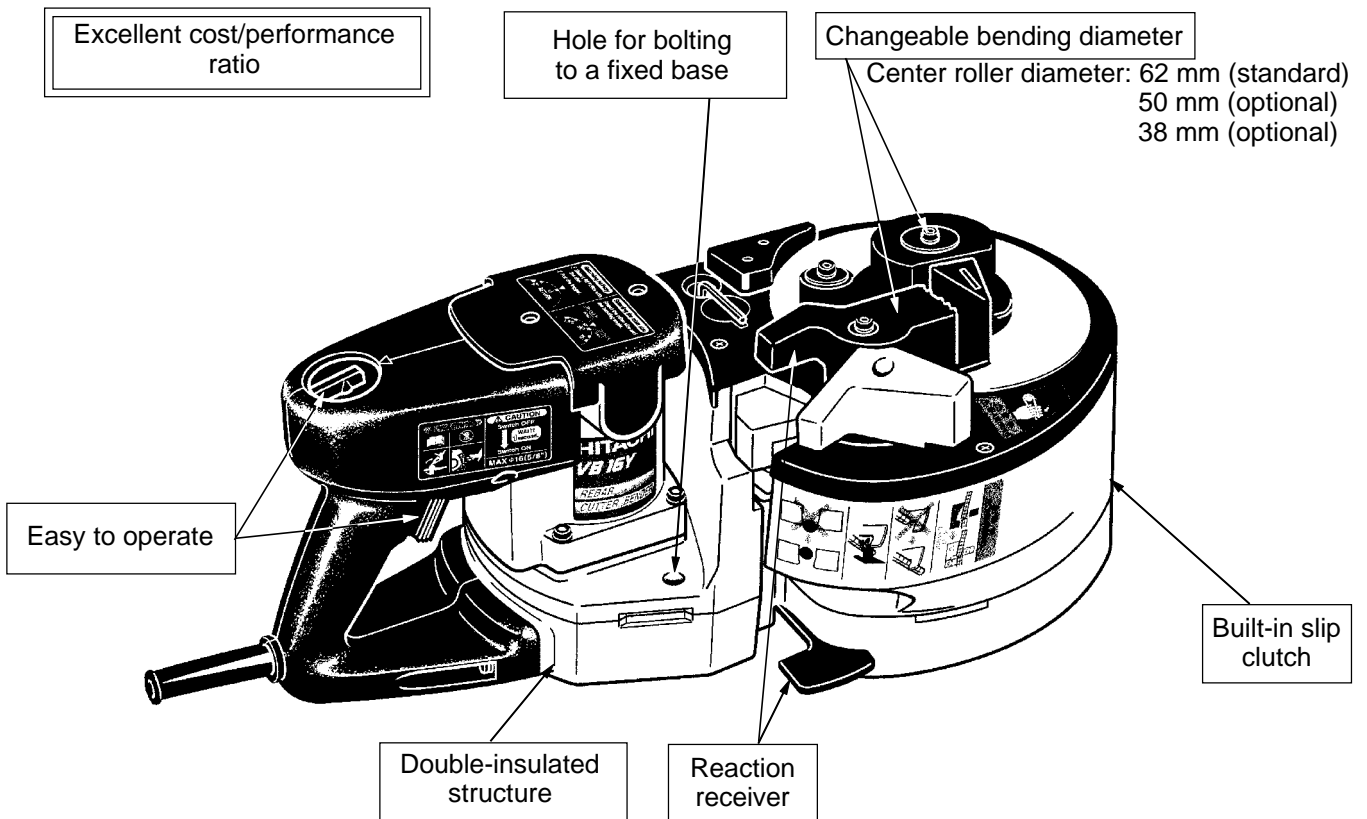


Fig. 1

## **5-1. Selling Point Descriptions**

### **5-1-1. Excellent cost/performance ratio**

The Model VB 16Y is about two-thirds the price of ordinary electric cutters or benders which have only single functions while the Model VB 16Y can perform both cutting and bending (16 mm (5/8") dia. rebar) with one unit. If comparisons are made with another maker's electro-hydraulic cutter/benders (capacity rebar dia. 16 mm (5/8")), the Model VB 16Y is about half the price of the electro-hydraulic cutter/bender and the cost/performance ratio is excellent. This is because the Model VB 16Y is equipped with a gear and a cam instead of a hydraulic system for cutting rebars, and an advanced microprocessor instead of an electromagnetic clutch for bending rebars.

### **5-1-2. Easy to operate**

Rebars can be easily cut or bent just by operating the setting dial and the trigger switch.

### **5-1-3. Changeable bending diameter**

The diameter of the standard center roller is 62 mm (2-29/64") {R31 mm (1-7/32")}. The bending diameter is changeable to 38 mm (1-1/2") {R19 mm (1-3/4")} or 50 mm (1-31/32") {R25 mm (63/64")} by using the optional center roller sets.

### **5-1-4. Double-insulated structure**

The Model VB 16Y has double-insulated structure for safety in use outdoors or below the ground.

### **5-1-5. Reaction receiver**

There is a need to prevent movement of the unit caused by cutting 5 m (197")-long rebars generally used in construction sites. The Model VB 16Y has two reaction receivers at the front and the rear for stable operation.

### **5-1-6. Hole for bolting to a fixed base**

A hole is provided at the center of the unit to fix and stabilize it. This hole comes in quite handy for bending operations because it allows the unit to be bolted to a suitable work bench (bolt size M10, less than W3/8).

### **5-1-7. Built-in slip clutch**

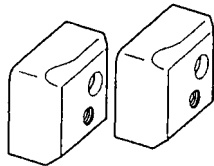
The Model VB 16Y is equipped with a slip clutch to protect the mechanism. The slip clutch functions if a rebar beyond the capacity of the Model VB 16Y is attempted to be bent or cut. When the slip clutch works, a big slip noise occurs but it is not a malfunction.

## 6. SPECIFICATIONS

Model		VB 16Y								
Capacities		(1) Material; Rebar: Yield strength 460N/mm <sup>2</sup> (47 kgf/mm <sup>2</sup> ) max. <ul style="list-style-type: none"> <li>• GRADE 460 (Great Britain)</li> <li>• BST 500 (Germany)</li> <li>• B 500 (Spain)</li> </ul> or equivalent grades (2) Max. rebar diameter: 16 mm (5/8")								
Number of pieces that can be processed at one time		<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%; text-align: center;">Cutting</th> <th style="width: 50%; text-align: center;">Bending</th> </tr> </thead> <tbody> <tr> <td>10 mm (3/8") max. .... 2 pieces</td> <td>10 mm (3/8") max. .... 3 pieces</td> </tr> <tr> <td>12 mm (1/2") max. .... 1 piece</td> <td>12 mm (1/2") max. .... 2 piece</td> </tr> <tr> <td>16 mm (5/8") max. .... 1 piece</td> <td>16 mm (5/8") max. .... 1 piece</td> </tr> </tbody> </table>	Cutting	Bending	10 mm (3/8") max. .... 2 pieces	10 mm (3/8") max. .... 3 pieces	12 mm (1/2") max. .... 1 piece	12 mm (1/2") max. .... 2 piece	16 mm (5/8") max. .... 1 piece	16 mm (5/8") max. .... 1 piece
Cutting	Bending									
10 mm (3/8") max. .... 2 pieces	10 mm (3/8") max. .... 3 pieces									
12 mm (1/2") max. .... 1 piece	12 mm (1/2") max. .... 2 piece									
16 mm (5/8") max. .... 1 piece	16 mm (5/8") max. .... 1 piece									
Motor type		AC single-phase series commutator motor								
Enclosure		Materials: Aluminum alloy die cast Glass-fiber reinforced resin (Housing, handle, tail cover) Painting: Silver, light green, black								
Insulation structure		Double insulation								
Switch		Trigger switch								
Power source		Single-phase AC 50 Hz								
Voltage and current		2.3 A (230 V)								
Power input		510 W								
Rotation speed		14.5 min <sup>-1</sup>								
Weight	Net	Product: 17.0 kg (37.5 lbs.); excluding cord								
	Gross	Packed: 19.7 kg (43.4 lbs.)								
Packaging		Corrugated cardboard box								
Cord	Type	Two-core cable								
	Overall length	2.5 m (8.2 ft.)								
Standard accessories		Allen key (for M5 hexagon socket bolt) ..... 1 pc. One set of cutters ..... 1 set.								

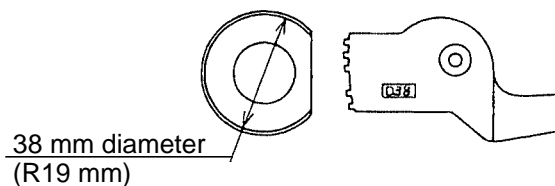
### 6.1 Optional Parts

#### 1. Cutter



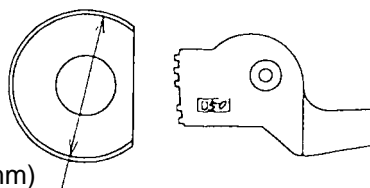
\* A set of two cutters  
Code No. 319706

#### 2. Center roller (D38) set



\* This is used when the bending diameter of a rebar is changed to 38 - 40 mm.  
Code No. 319712  
(The bending diameter of the standard center roller is 62 - 64 mm.)

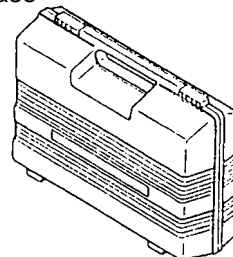
#### 3. Center roller (D50) set



50 mm diameter (R25 mm)

\* This is used when the bending diameter of a rebar is changed to 50 - 52 mm.  
Code No. 319713  
(The bending diameter of the standard center roller is 62 - 64 mm.)

#### 4. Case



\*Outer dimensions  
525 x 346 x 236 (mm)  
Code No. 314837

Fig. 2

## 7. COMPARISONS WITH SIMILAR PRODUCTS

### Specification Comparisons

Maker		HITACHI	HITACHI	P
Model name		VB16Y	VB13Y	
Power Input	W	510	285	————
Rotation Speed	min <sup>-1</sup>	14.5	16	————
Dimensions	Length	466 (18-11/32")	430 (16-15/16")	1,300 (51-3/16")
	Height	212 (8-11/32")	196 (7-3/4")	195 (7-43/64")
	Width	231 (9-3/32")	197 (7-3/4")	125 (4-59/64")
Insulation Structure		Double Insulation	Double Insulation	————
Full-load vibration level	dB (VL)	94	91.4	————
No-load noise level	dB (A)	80	79	————
Weight (excluding cord)	kg	17.0 (37.5 lbs.)	12.0 (26.5 lbs.)	16.1 (35.5 lbs.)

### 7-1. Working Efficiency Comparison

Maker		HITACHI	HITACHI	P
Model name		VB 16Y	VB 13Y	
Capacity Rebar Dia.	mm	16 (5/8")	13 (1/2")	16 (5/8")
Center roller diameter	mm	62 mm dia. (2-29/64") 38 mm dia. (1-1/2")*1 50 mm dia. (1-31/32")*1	38 mm dia. (1-1/2") 25 mm dia. (63/64")*1	36 mm dia. (1-27/64")
Number of pieces that can be cut at one time	10 mm (3/8") max.	2 pieces	2 pieces	2 pieces
	12 mm (1/2") max.	1 piece	1 piece	1 piece
	16 mm (5/8") max.	1 piece	————	1 piece
Number of pieces that can be bent at one time	10 mm (3/8") max.	3 pieces	2 pieces	1 piece
	12 mm (1/2") max.	2 pieces	1 piece	1 piece
	16 mm (5/8") max.	1 piece	————	1 piece
Overload protector		Provided (slip clutch).	Not provided.	————
Drive system		Motorized gear drive system	Motorized gear drive system	Manual
Cutting time*2	seconds/operation	3.1	3.2	15 (794N)*3
Bending time (180°)*2	seconds/operation	5.1	4	30 (569N)*3

\*1: These are values when using the optional accessories.

\*2: These are values when cutting or bending maximum capacity rebars (the time required from turning on the switch to completion of cutting or bending).

\*3: The values in parentheses mean the loads.

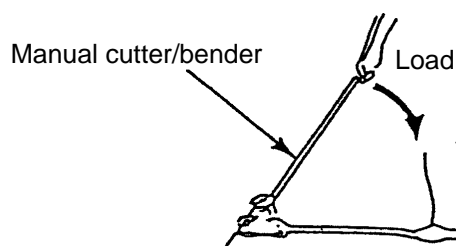
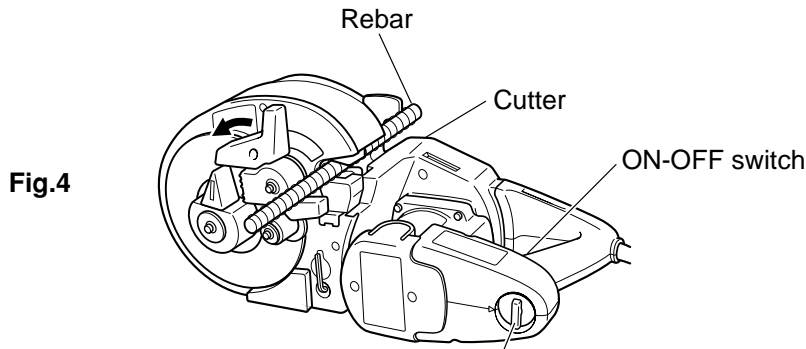


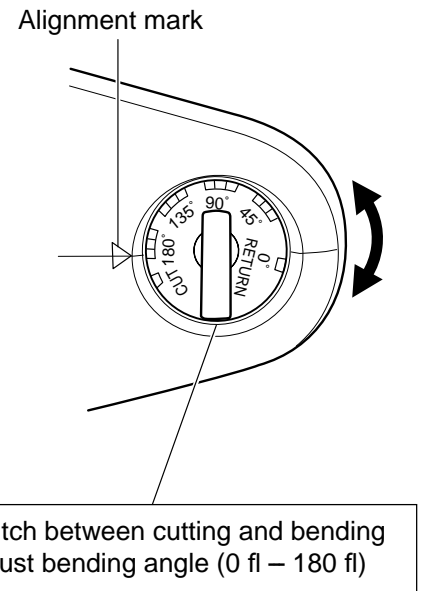
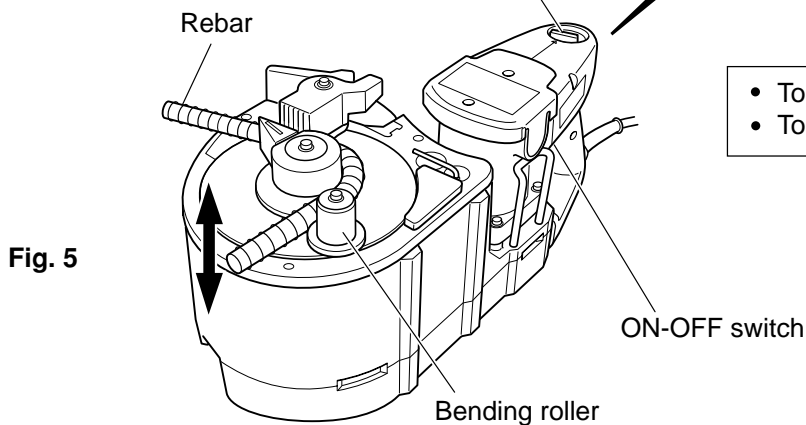
Fig. 3

## 8. HOW TO USE THIS UNIT

(1) Cutting work (Fig.4)



(2) Bending work (Fig. 5)



## 9. SERVICE LIFE OF CUTTER

Repeated cutting of the rebar can result in the "wear and tear", "deformation", "nicked edges", etc. Replace it with a new cutter after cutting about 8,000 pieces of rebar (a rough guide).

## 10. PRECAUTIONS IN SALES PROMOTION

In the interest of promoting the safest and most efficient use of the Model VB 16Y Portable Rebar Cutter/Bender 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.

### 10-1. Handling Instructions

Salespersons must be thoroughly familiar with the contents of the Handling Instructions in order to give pertinent advice to the customer. In particular, they must have a thorough understanding of the precautions for use of the portable rebar cutter/bender which is different from those of ordinary electric power tools.



## 11. SAFETY INSTRUCTIONS

Be particularly careful to ensure that the customer understands the following precautions which are listed on the Handling Instructions and Caution Plates attached to the main body of each tool.

### (1) Do not cut and/or bend any materials other than the rebars.

Avoid any work exceeding the maximum capacities of the unit described in the specifications. For example, cutting or bending a hard rebar made of PC steel will not only damage the cutter but also there will be a fear of the broken rebar fragments flying around. A slip clutch is built in the Model VB 16Y to protect the mechanism. If the material with the diameter or quality beyond the capacity is processed, the slip clutch can sometimes function. In such a case, stop processing immediately and check the material. When the slip clutch works, a big slip noise occurs, but it is not a malfunction.

### (2) Make absolutely sure that the cutter cover is closed when you do not carry out the cutting work.

If the cover is kept open, the cutter can jam on foreign objects and cause serious accidents.

### (3) Reserve an extra length of at least 200 mm (8") on the bending length of the rebar to be bent (Fig. 7).

If the extra length is not long enough, the rebar can come off during bending operation, or it can break into fragments and scatter dangerously.

### (4) Observe the specified number of rebars that can be bent or cut at one time.

<Bending>

Rebar of 10 mm (3/8") diameter: 3 pieces maximum

Rebar of 13 mm (1/2") diameter: 2 pieces maximum

Rebar of 16 mm (5/8") diameter: 1 piece

<Cutting>

Rebar of 10 mm (3/8") diameter: 2 pieces maximum

Rebar of 13 mm (1/2") diameter: 1 piece

Rebar of 16 mm (5/8") diameter: 1 piece

### (5) Setting bending angles by setting dial

Even at the same dial setting position, the bending angle can sometimes differ if the diameter or hardness of the rebar is different. Use the angle marks merely as a rough guide. (Refer to the Handling Instructions and Caution Plates attached to the main body of each tool for details.) When replacing with the optional center roller set, the bending angle may be slightly smaller than the set angle. Instruct the customers to set the bending angle about 5 - 15° larger than the desired angle when replacing with the optional center roller (D38) set or the center roller (D50) set.

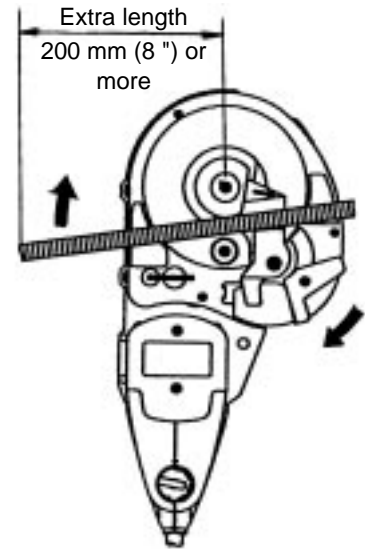


Fig. 7

## 11-1. Pictograph Illustration and Explanation

Read handling instructions before use.

Do not use this electric power tools in wet weather conditions.

If the switch is turned off and then immediately turned on again, the motor may not start. Wait for at least one full second before attempting to turn the motor on again after it has been switched off.

Begin operation only after ensuring that there are no people within the turning range of the material to be bent.

Never bring your hand close to the cutter during operation.

Avoid any work exceeding the maximum capacities. (Rebar diameter: 16 mm dia. (5/8"))

(Returning halfway)

- ① Select RETURN with the dial.
- ② Pull the trigger.

(Selecting the rebar size)

Select the rebar size and the bending angle.

If you bend the rebar with a large angle while placing your hand onto it, there is a fear of getting your hand caught in by the fold-back reaction of the rebar. Never place your hand onto the position where the rebar may fold back.

**WARNING**

- The cutter blade can get worn out by repeated rebar cutting. Continued use of a worn-out cutter can result in the damage and the broken pieces flying around. Replace it with a new cutter after approximately 8,000 times of cutting as a rough guide.
- The machine is so designed that the upper cutter and the grip rubber can support a rebar. If the grip rubber gets worn out, there is a fear that it cannot sufficiently hold the rebar and gets broken down with its parts flying around, etc. If the grip rubber cannot hold the rebar much longer, replace it with a new grip rubber.
- During cutting work, securely hook the rebar to the reaction stopper B. Furthermore, secure enough length of a rebar to be hooked to the reaction stopper B.
- Avoid bringing your hand near to the reaction stopper B during operation; otherwise, you may get your finger caught in or may run the hazard of other injuries.
- Set the rebar in the center or the recess of the cutter during cutting work. Any cutting work with the rebar set on corners or ends of the cutter can result in the pieces of broken rebar flying around or the damage to the cutter and the machine.

## 12. PRECAUTIONS IN DISASSEMBLY AND REASSEMBLY

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

### 12-1. Disassembly

#### (1) Disassembly of the handle (Fig. 9)

- (a) Remove the two Tapping Screws (W/Flange) D4 x 20 (Black) **[42]** and the Tail Cover **[101]**.
- (b) Remove the two Tapping Screws (W/Flange) D5 x 20 (Black) **[111]**, four Tapping Screws (W/Flange) D4 x 20 (Black) **[42]** and two Machine Screws (W/Washers) M5 x 20 (Black) **[122]** to remove the Handle (A).(B) Set **[113]**.

#### (2) Disassembly of the power supply unit (Fig. 8)

##### (a) Removal of the printed circuit board ass'y

Disconnect the connector by pulling the rubber bushing and the cable in the arrow direction.

\*1. Gently pull the cable by moving from side to side to disconnect the connector.

\*2. If the connector is remained in the gear cover due to yanking the cable, disassemble the gear cover referring to "(4) Disassembly of the gear cover" and remove the remained connector from the gear cover.

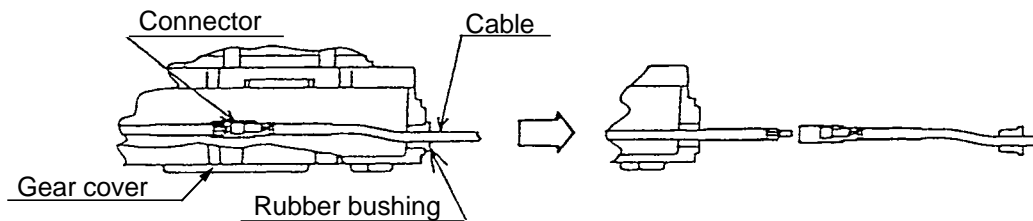


Fig. 8

Disconnect the Connector **[115]** that connects the Stator Ass'y **[98]** to the four internal wires.

##### (b) Disassembly of the housing (Fig. 9)

Remove the Brush Cap **[94]** and take out the Carbon Brush **[95]**. Remove the four Hex. Socket Hd. Bolts (W/Flange) M5 x 30 **[97]** from the Housing Ass'y **[105]**. The Housing Ass'y **[105]** can then be removed from the Inner Cover Ass'y **[13]**.

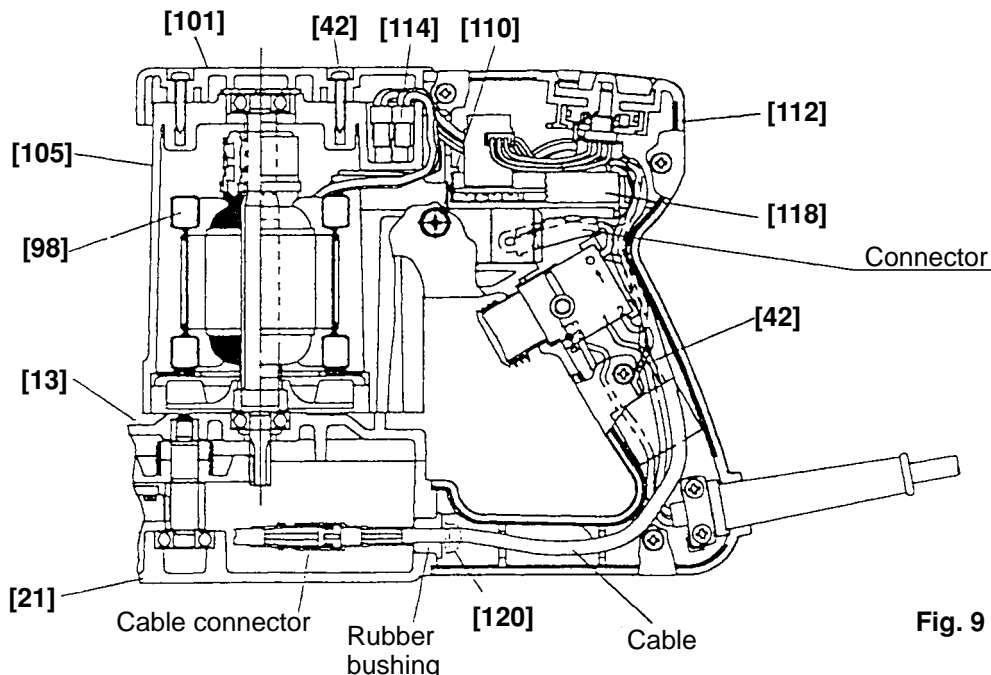


Fig. 9

(3) Disassembly of the bending unit (Fig. 10)

(a) Remove the Nylock Bolt (W/Flange) M5 x 16 [6], Washer (A) [34] and Center Roller (D62) Set [35].

Remove the O-ring [9] from the Cam Shaft [12] then remove the Needle Bearing (D22) [36].

(b) Remove the Nylock Bolt (W/Flange) M5 x 25 [37], Sleeve (G) [39], Spring (G) [40] and Guide (D62) [41].

The Center Plate [1] can then be removed.

(c) Remove the Tapping Screw (W/Flange) D4 x 20 (Black) [42] and Lever (B) [43].

(d) Remove the Turn Table [2], Washer [7] and Roller (B) [8].

(e) Remove the Turn Table [2], Hex. Bar Wrench 4 mm [33] and three Nylock Flat Hd. Screws M4 x 12 [3] to remove the Cam Cover [4].

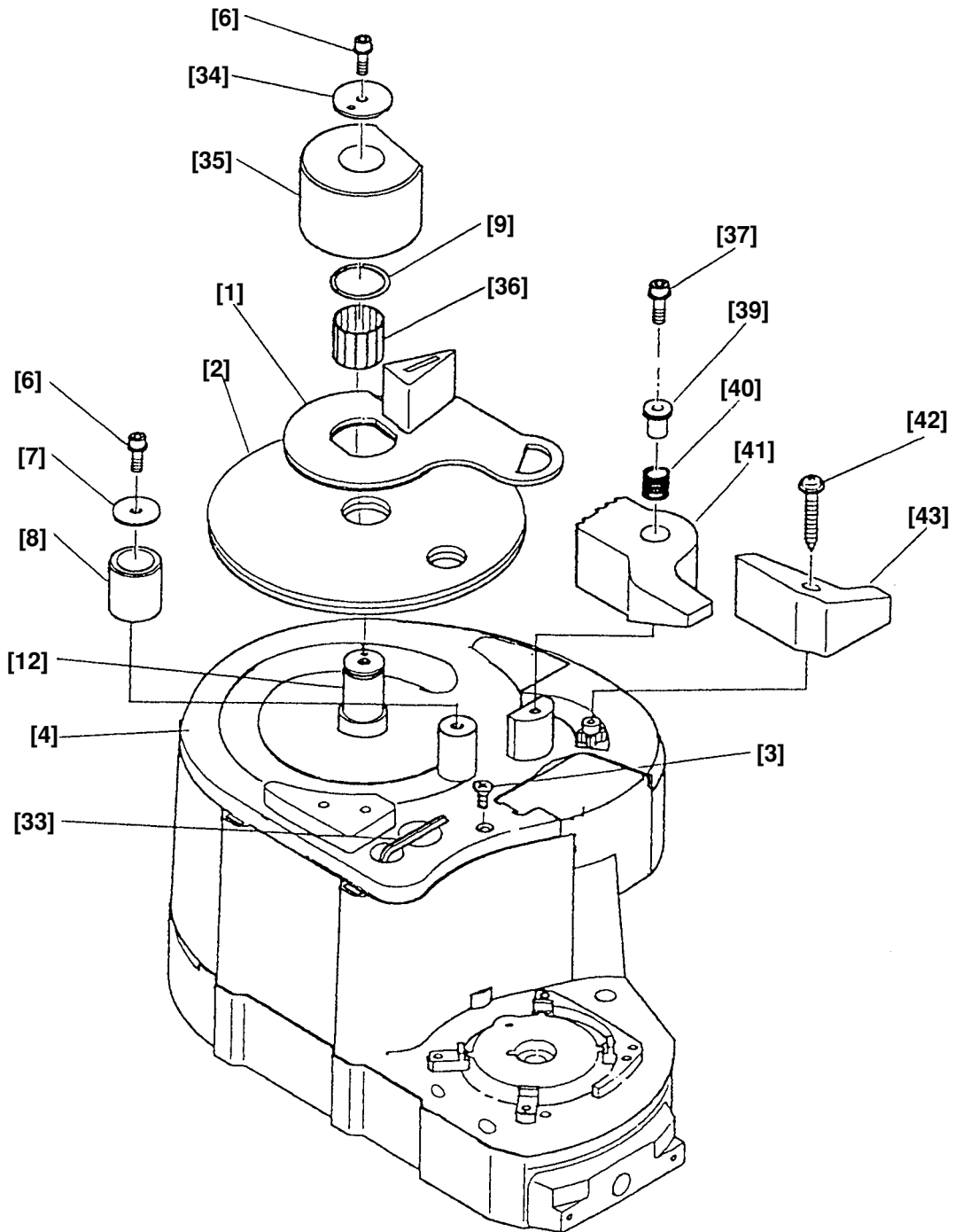


Fig. 10

(4) Disassembly of the gear cover (Fig. 11)

- (a) Remove the two Hex. Socket Hd. Bolts (W/Flange) M4 x 10 [55] from the bottom of the Gear Cover Ass'y [21] and remove the Sensor Cover [30] and the O-Ring [29].
  - (b) Mark the engagement point between the Sensor Gear [26] and the Sensor Gear [25] with a magic marker.
  - (c) Remove the Seal Lock Screw (W/SP. Washer) M4 x 12 [28] from the Sensor Gear [26] and remove the Sensor Gear [26] from the Cam Shaft [12]. Note that the Sensor Gear [25] of the sensor holder is adhered to the volume shaft and cannot be removed.
- \*3. The engagement of teeth between the Sensor Gear [25] and the Sensor Gear [26] is very important as it exerts an influence upon the bending angle. Pay special attention when disassembling and reassembling. Improper engagement will not only make the bending angle incorrect but also damage the volume shaft to which the Sensor Gear [25] is mounted (because the turning angle of the volume shaft is limited to 300°).
- \*4. Perform reassembly so that the mark on the Sensor Gear [25] is aligned to the mark of the Sensor Gear [26]. If marking is omitted before disassembly, adjust the sensor gears so that the number of teeth between the projection of the Sensor Gear [25] and the engagement point B is the same each other and then mount them.

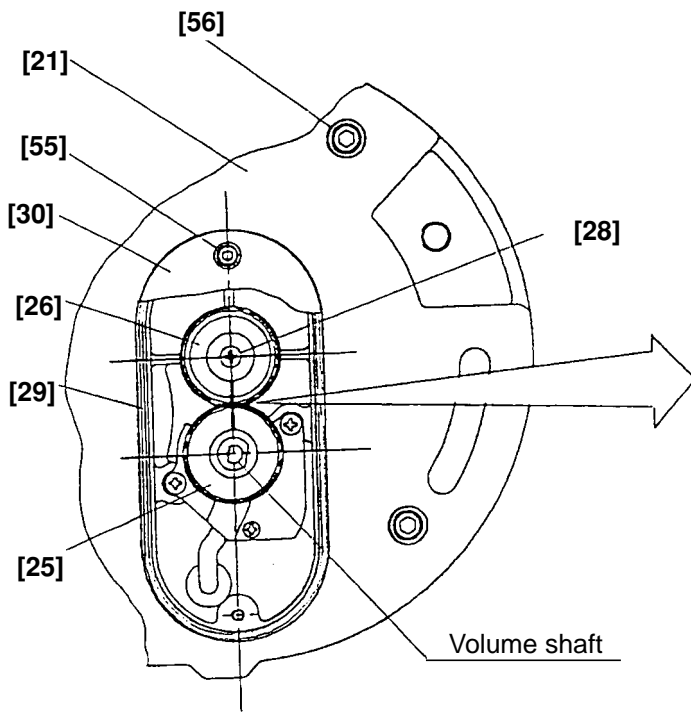


Fig. 11-a

Fig. 11-b Disassembly

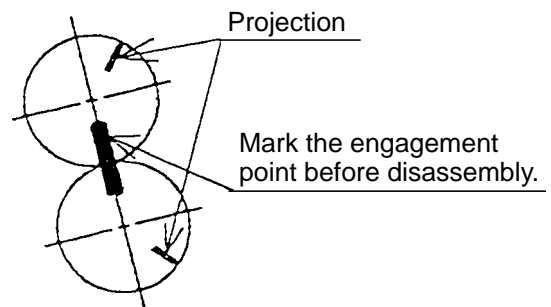
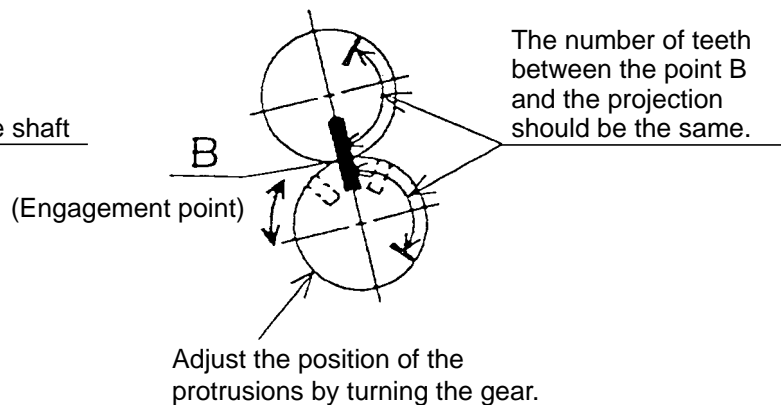


Fig. 11-c Reassembly



- (d) Remove the seven Nylock Bolts (W/Flange) M6 x 16 [56] to remove the Gear Cover Ass'y [21].

(5) Disassembly of the gear unit (Figs. 12, 13 and 14)

(a) Disassembly of the First Pinion Set [67] (Fig. 12)

Press Sleeve (F) [70] press-fitted in the First Pinion Set [67] with a hand press to remove it. Then remove Clutch Spring (F) [69] from the First Gear [68] applying a twist to Clutch Spring (F) [69].

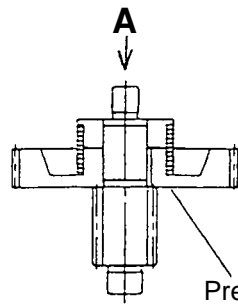


Fig. 12

Press Sleeve (F) [70] in A direction with a hand press supporting the surface of the First Gear [68].

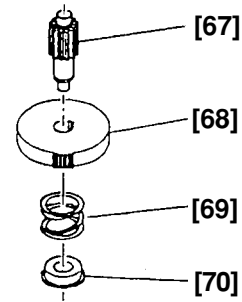


Fig. 12-a

(b) Disassembly of the Second Pinion Set [58] (Fig. 13)

Remove the Retaining Ring for D14 Shaft [64] and press Sleeve (E) [63] with a hand press to remove it from the Second Pinion Set [58].

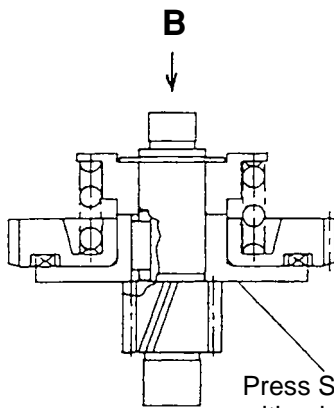


Fig. 13

Press Sleeve (E) [63] in B direction with a hand press supporting the surface of the Clutch Plate [60].

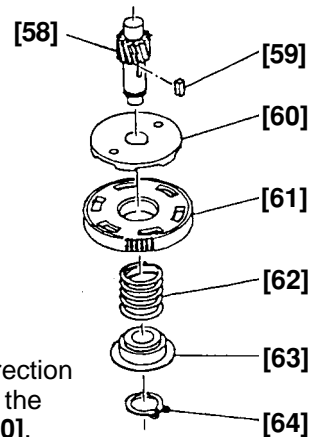


Fig. 13-a

(c) Disassembly of the Third Pinion [50] (Fig. 14)

Press the Third Gear [52] with a hand press to remove it from the Third Pinion [50].

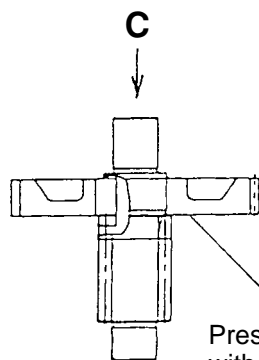


Fig. 14

Press Third Gear [52] in C direction with a hand press supporting the surface of the Third Gear [52].

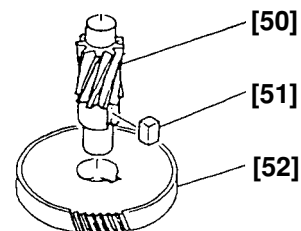


Fig. 14-a

(d) Removal of the Final Gear [17] (Fig. 15)

The Final Gear [17] is press-fitted in the Cam Shaft [12]. Remove the Final Gear [17] from the Cam Shaft [12] with the J-321 final gear puller by pressing the end surface of the cam shaft with a hand press as shown in Fig. 15.

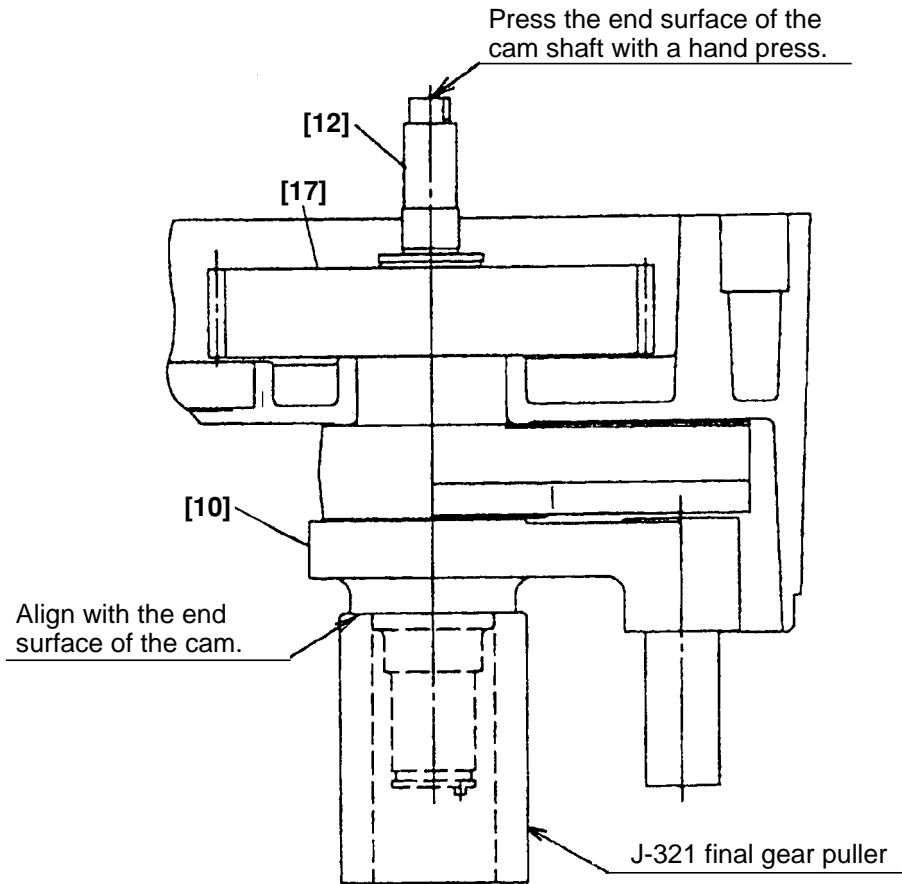


Fig. 15

(6) Removal of the cam shaft unit (Fig. 16)

Push up bracket (A) unit in the arrow direction with a flatblade screwdriver and remove the cam shaft unit and sleeve (B) unit.

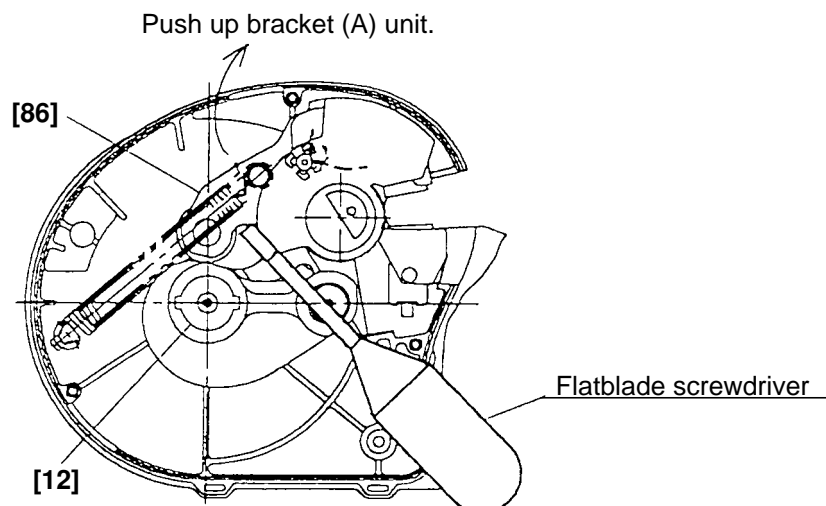


Fig. 16

(7) Removal of bracket (A) and (B) unit (Fig. 17)

(a) Bracket (A) and (B) unit is secured to the Inner Cover Ass'y [13] with two Hex. Socket Hd. Bolts (W/Flange) M8 x 25 [16]. Remove the two Hex. Socket Hd. Bolts (W/Flange) M8 x 25 [16]. Put a core metal whose diameter is the same as the shaft diameter (40 mm) of Bracket (B) [91] on the end surface of Bracket (B) [91] and tap it with a hammer. Then bracket (A) and (B) unit can be removed from the Inner Cover Ass'y [13], Cover [82] and Return Spring [48] in the arrow direction.

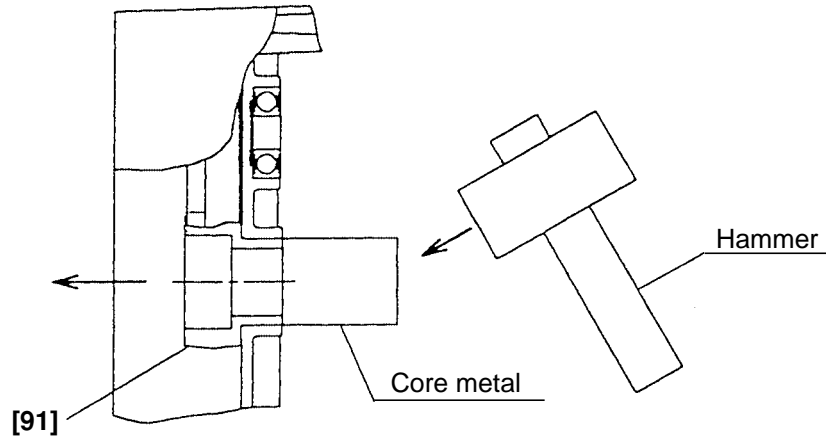


Fig. 17

(8) Disassembly of bracket (A) and (B) unit (Fig. 18)

(a) Bracket (A) and (B) unit is press-fitted to Shaft (A) [72] and secured with the Seal Lock Hex. Socket Hd. Bolt M12 x 20 [81]. Remove the Seal Lock Hex. Socket Hd. Bolt M12 x 20 [81], Belleville Spring (For M12) [80] and Spacer [79]. Press Shaft (A) [72] with a hand press to remove it from Bracket (A) [86] and Bracket (B) [91].

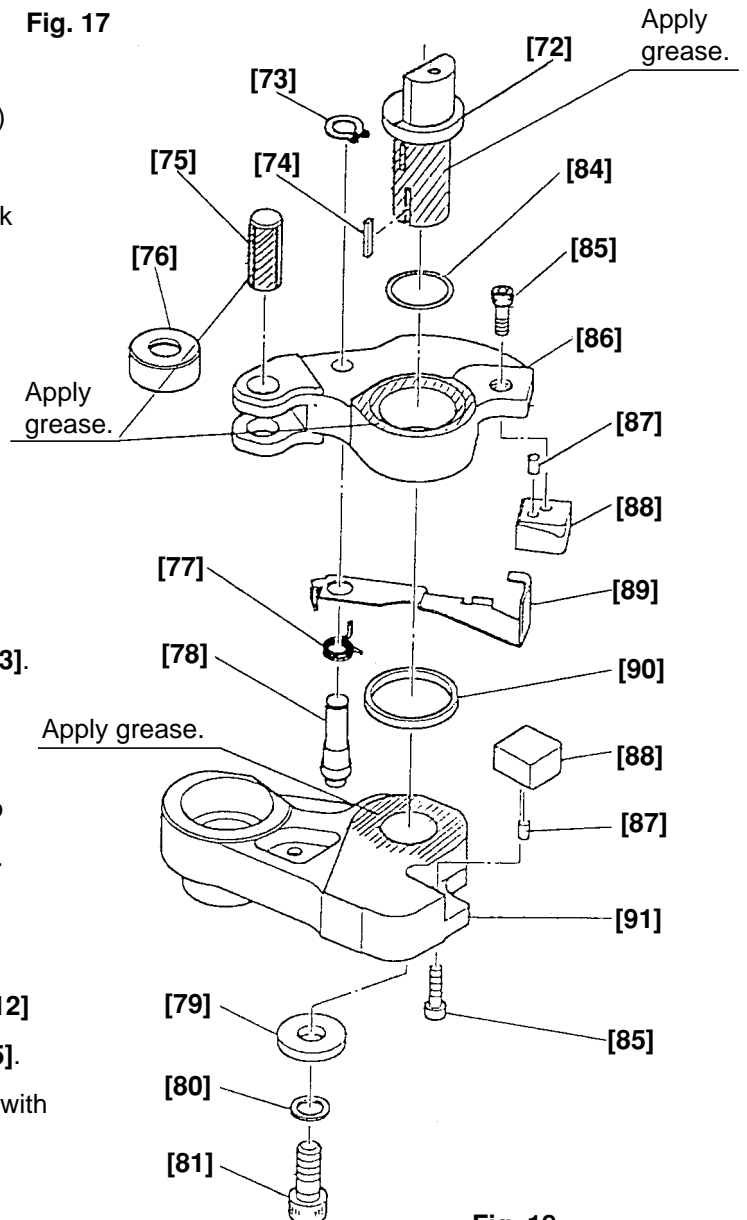


Fig. 18

(9) Disassembly of bracket (A) unit (Fig. 18)

(a) Remove the Retaining Ring for D10 Shaft [73]. Then the Pin for Spring [78], Spring (D) [77] and Cutter Guard [89] can be removed.  
 (b) Pull out the Needle [75] with a hand press to remove Roller (C) [76] from Bracket (A) [86].

(10) Disassembly of the cam shaft unit (Fig. 18)

The Cam [10] is press-fitted to the Cam Shaft [12] and secured with the Feather Key 7 x 7 x 22 [45]. Remove the Cam [10] from the Cam Shaft [12] with a hand press.



## 12-2. Reassembly

Reassembly can generally be carried out as the reverse of the disassembly procedure, with some items to be noted as follows.

### (1) Reassembly of the power supply unit (Figs. 19 and 20)

Be sure to perform wiring connections as indicated in the wiring diagrams.

- (a) Be sure to put the connectors in the specified position when connecting the connector of the Cord [125] to the connector of the Controller Circuit [119] (Fig. 8).
- (b) Before connecting each internal wire to the terminals of the Switch [121], check that the flat springs of each terminal are not deformed. After connecting, slightly pull the internal wires to ensure that they are not easily disconnected.

## 12-3. Wiring Diagram

Be sure to perform wiring connections as indicated in the wiring diagrams.

- For products without noise suppressor

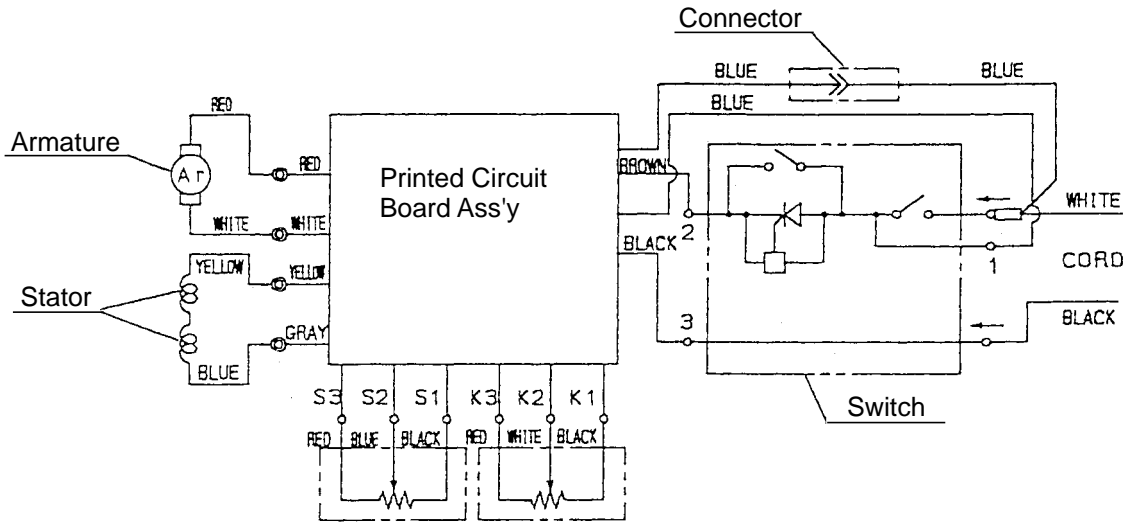


Fig. 19

- For products without noise suppressor

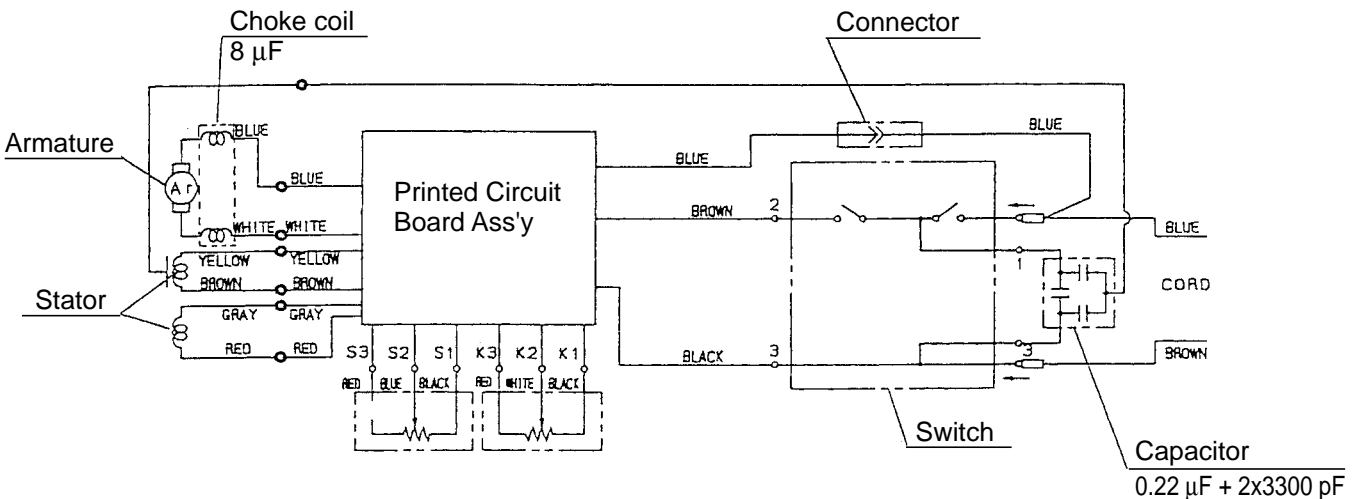


Fig. 20

(2) Reassembly of the cam shaft unit (Fig. 21)

Perform reassembly so that the chamfered portion of the Cam Shaft [12] is aligned with the pin of the Cam [10] in the same direction.

\* Otherwise, the Sensor Gear [26] cannot be mounted in the proper position and there will be a fear of damage to the volume and the gear.

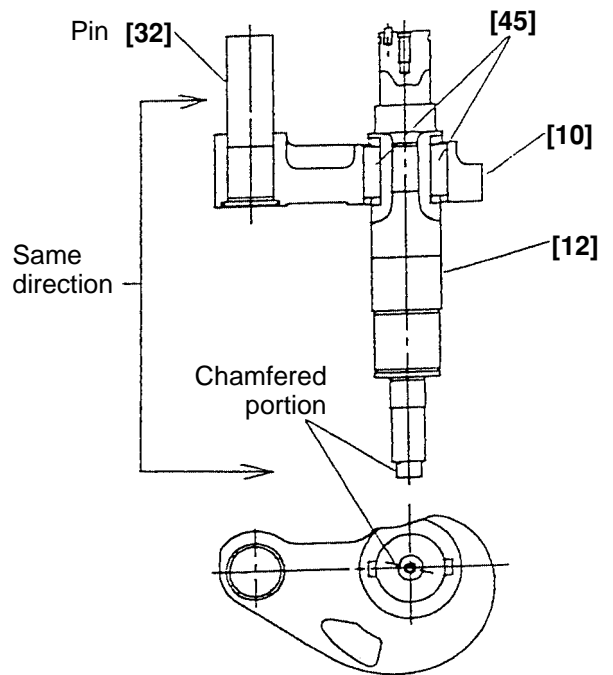


Fig. 21

(3) Reassembly of Roller (C) [76] (Fig. 22)

Press-fit the Needle [75] into Bracket (A) [86] so that the oil grooves of the Needle [75] are aligned with the engraved marks on Bracket (A) [86].

(4) Reassembly of bracket (A) unit (Fig. 23)

Mount Bracket (A) [96] to Spring (D) [77] so that the folded portion of Spring (D) [77] securely fits in the notch of the Cutter Guard [89].

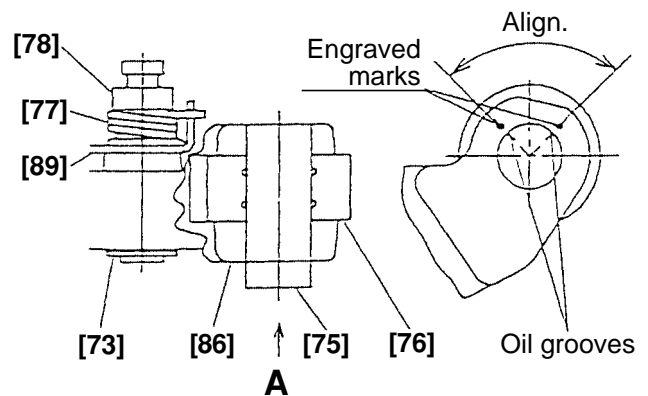


Fig. 22

Fig. 22-a

(5) Reassembly of bracket (A) and (B) unit

Apply grease (DOUBLEX 251) to the shaded areas shown in Fig. 18 adequately. Aligning the two Feather Keys 3 x 3 x 20 [74] of Shaft (A) [72] with the key grooves of Bracket (B) [91], press-fit Shaft (A) [72] into Bracket (B) [91] until it contacts the end surface of Bracket (B) [91].

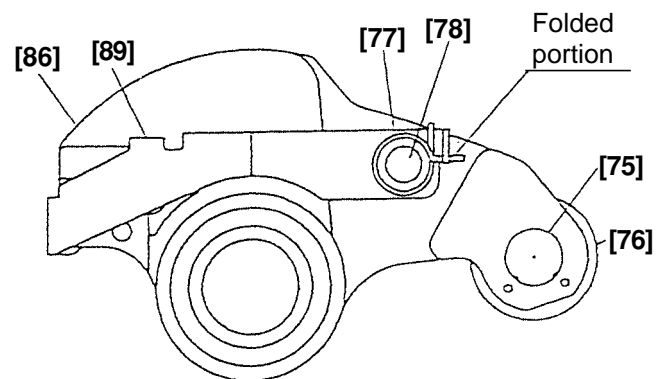


Fig. 23

(6) Installation of bracket (A) and (B) unit to the inner cover (Figs. 24 and 25)

Mount the Cover [82] and Spring (F) [83] to the Inner Cover Ass'y [13] first before mounting bracket (A) and (B) unit. Securely fit one end of Spring (F) [83] to the Cover [82] then the other end into the mounting hole of the Inner Cover Ass'y [13]. Keep the Cover [82] removed from the Inner Cover Ass'y [13].

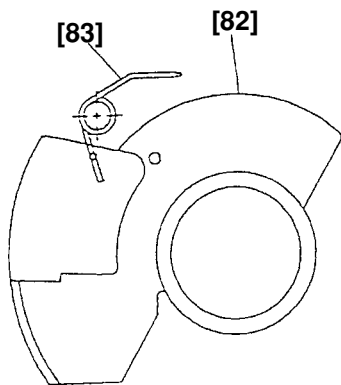


Fig. 24

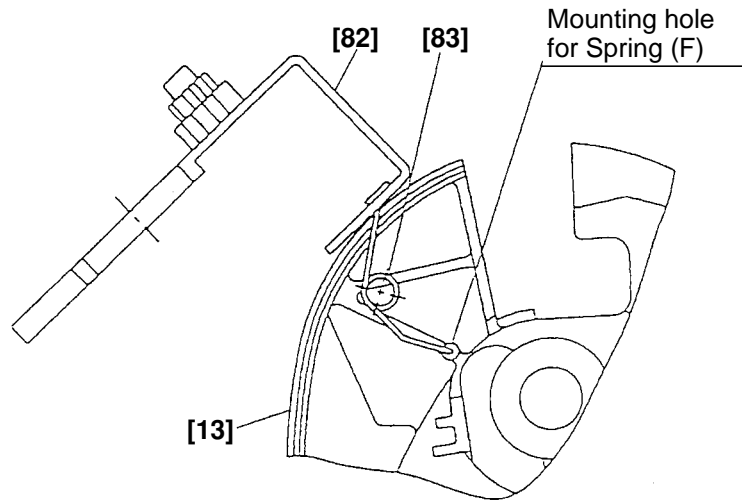


Fig. 25

(7) Installation of Return Spring [48] (Fig. 26)

Hook the long end of the Return Spring [48] on the Pin for Spring [78] of bracket (A) and (B) unit first then the short end on the mounting portion of the Inner Cover Ass'y [13] using a flatblade screwdriver.

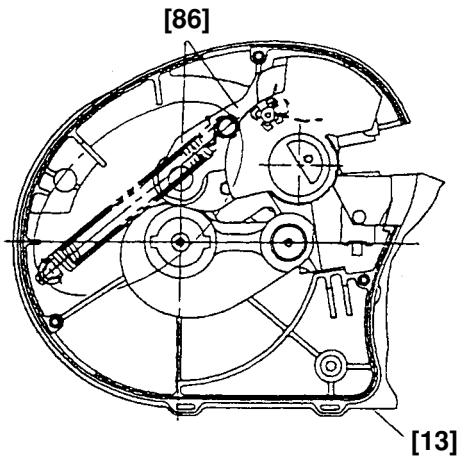


Fig. 26

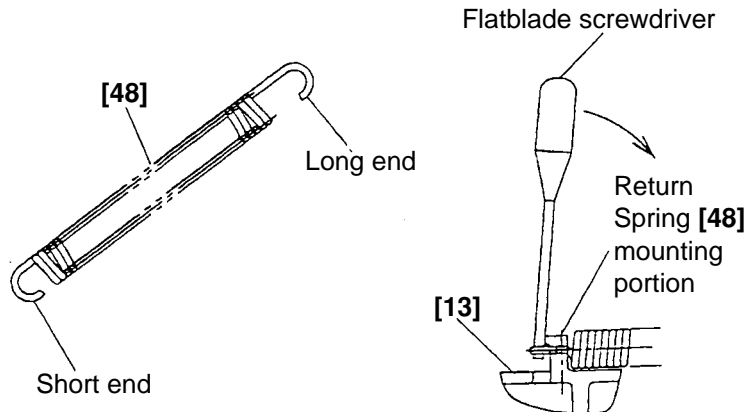


Fig. 26-a

Fig. 26-b

(8) Installation of the cam shaft unit (Fig. 27)

Mount sleeve (B) unit to the Cam Shaft [12] (Fig. 27).

Push up Bracket (A) [86] with a flatblade screwdriver and mount the cam shaft unit (Fig. 16).

\* Before mounting the cam shaft unit, apply grease (DOUBLEX 251) to the sliding surface of the cam and the outer circumference of Roller (C) [76] adequately.

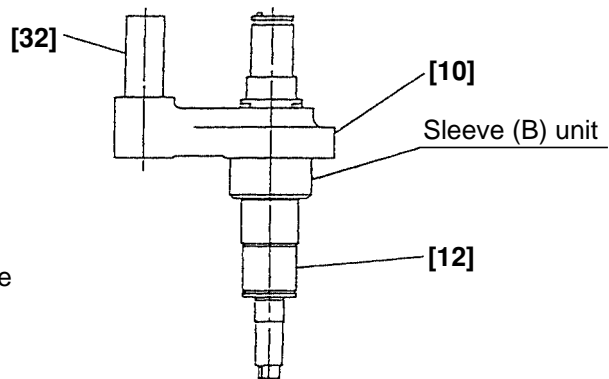


Fig. 27

(9) Installation of Final Gear [17] (Fig. 28)

Mount the two Feather Keys 7 x 7 x 25 [46] to the Cam Shaft [12] and gradually press-fit the Cam Shaft [12] into the Final Gear [17] supporting the end surface of the Cam Shaft [12]. After press-fitting, be sure to secure the Final Gear [17] with the Retaining Ring for D28 Shaft [18].

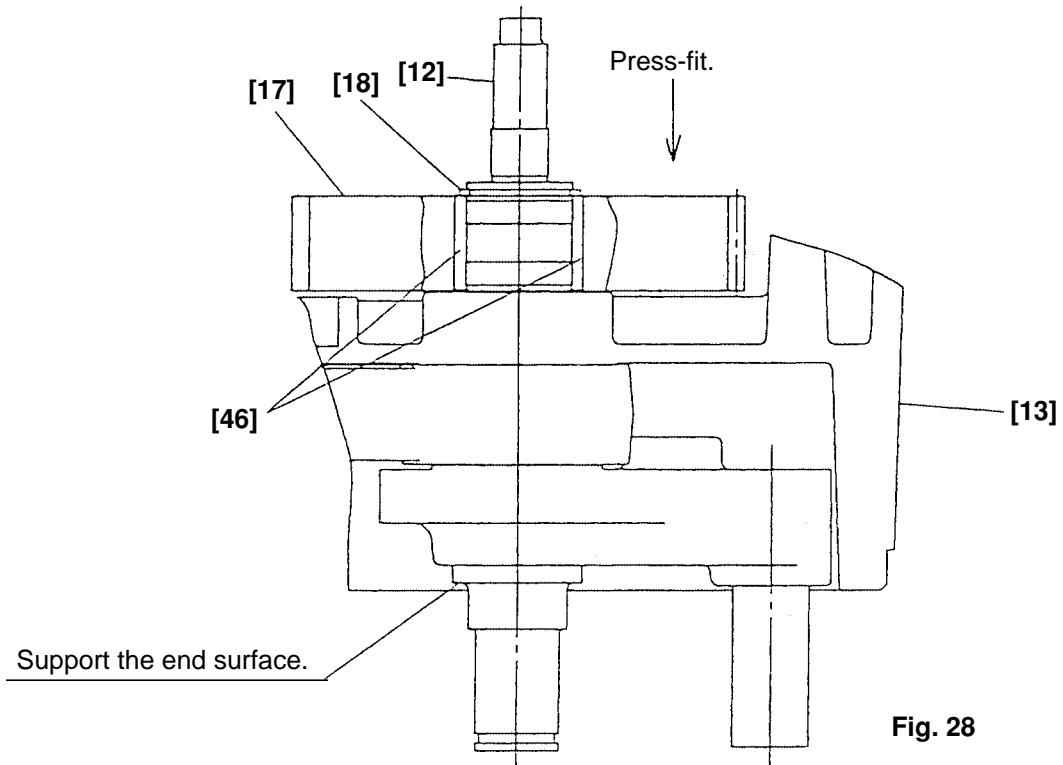


Fig. 28

(10) Installation of gears

Before mounting, apply grease (NPC SEP-3A) to the meshing portions of the gears adequately.

## 12-4. Confirmation after Reassembly

### 12-4-1. Adjustment of turning angle of Roller (B) [8]

After reassembly, adjust the turning angle of Roller (B) [8] with the J-322 angle gauge so that rebars can be accurately bent according to the setting of the set dial.

#### (1) Adhering the angle gauge (Fig. 29)

Put the angle gauge around Roller (B) [8] and adhere it to the Turn Table [2] aligning with the perimeter.

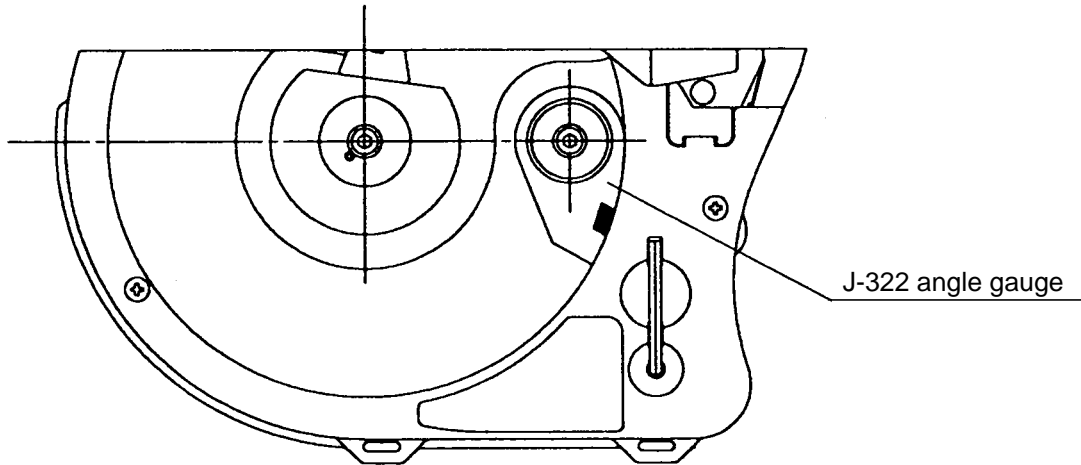


Fig. 29

#### (2) Checking (Fig. 30)

- (a) Turn the set dial fully clockwise to start the machine.
- (b) Check the position of the line "A" on the cam cover and the mark on the angle gauge when the machine switches from forward to reverse rotation.
- (c) It is all right if the line "A" on the cam cover is within the range of the angle gauge mark when the machine switches from forward to reverse rotation.

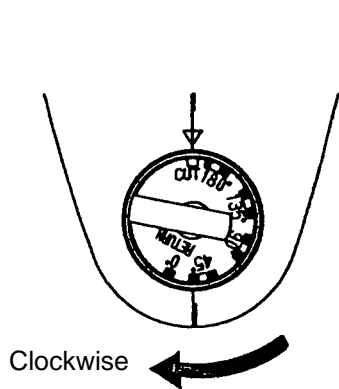


Fig. 30

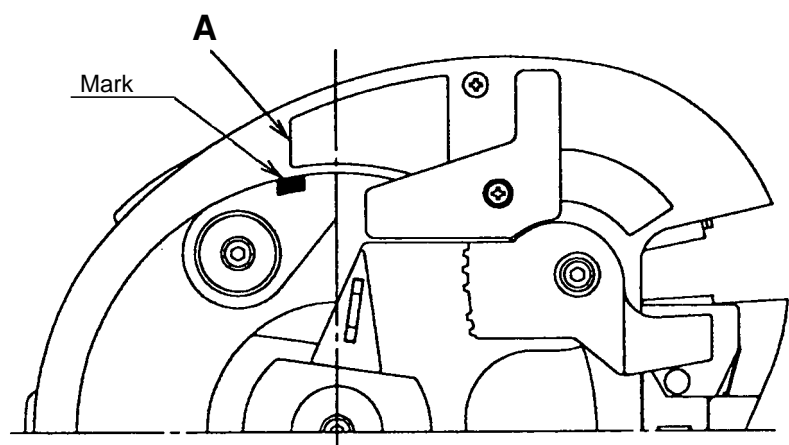


Fig. 30-a

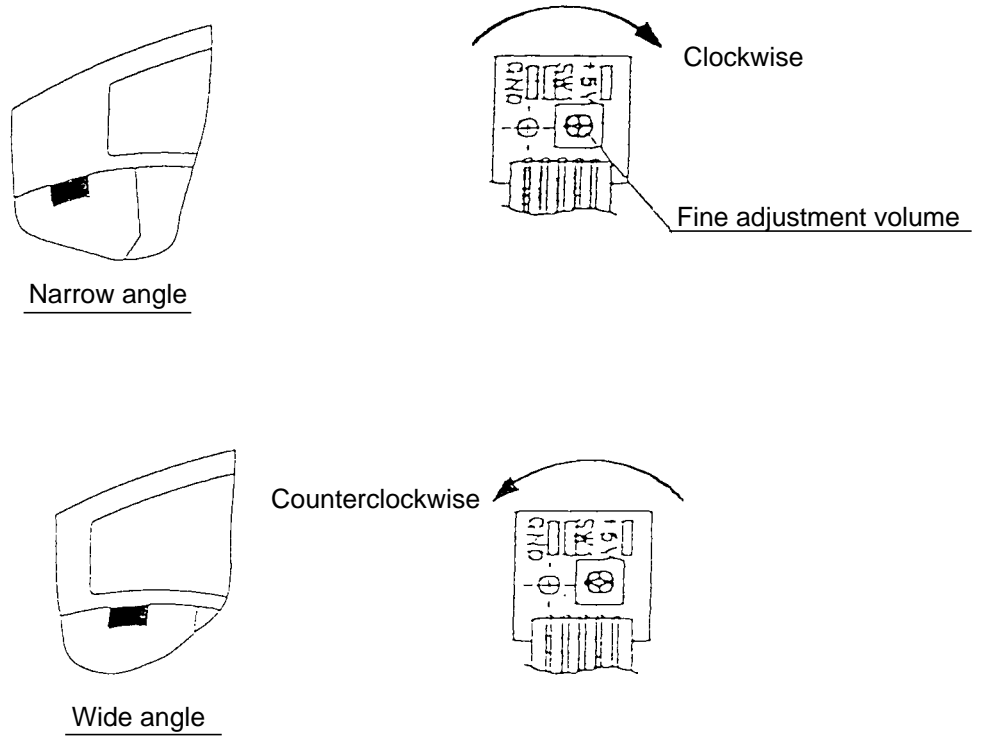
(3) If the line "A" on the cam cover is out of the range of the angle gauge mark, finely adjust the bending accuracy as follows (Fig. 31).

(a) Unplug the power cord from the receptacle.

(b) Remove the tail cover.

(c) Take out the printed circuit board for adjustment and slightly turn the fine adjustment volume clockwise if the bending angle is narrow and counterclockwise if the bending angle is wide.

(d) Plug the power cord in the receptacle and check the accuracy again with an angle gauge. Repeat the adjustment until the line "A" on the cam cover is within the range of the angle gauge mark.



**Fig. 31**

## 12-5. Tightening Torque

Tighten the screws and the bolts according to the following tightening torque.

	Size and length	Tightening torque
Tapping Screw (W/Flange)	D4 x 20 (Black) <b>[42]</b>	$2.0 \pm 0.5 \text{ N}\cdot\text{m}$ ( $20 \pm 5 \text{ kgf}\cdot\text{cm}$ )
Tapping Screw (W/Flange)	D5 x 20 (Black) <b>[111]</b>	$2.9 \pm 0.5 \text{ N}\cdot\text{m}$ ( $30 \pm 5 \text{ kgf}\cdot\text{cm}$ )
Hex. Hd. Tapping Screw	D5 x 20 (Black) <b>[108]</b>	$2.9 \pm 0.5 \text{ N}\cdot\text{m}$ ( $30 \pm 5 \text{ kgf}\cdot\text{cm}$ )
Seal Lock Screw (W/SP. Washer)	M4 x 12 (Black) <b>[28]</b>	$1.8 \pm 0.4 \text{ N}\cdot\text{m}$ ( $18 \pm 4 \text{ kgf}\cdot\text{cm}$ )
Tapping Screw	M4 x 8 <b>[24]</b>	$1 \pm 0.2 \text{ N}\cdot\text{m}$ ( $10 \pm 2 \text{ kgf}\cdot\text{cm}$ )
Machine Screw (W/Washers)	M5 x 20 (Black) <b>[122]</b>	$3.4 \pm 0.7 \text{ N}\cdot\text{m}$ ( $35 \pm 7 \text{ kgf}\cdot\text{cm}$ )
Nylock Flat Hd. Screw	M4 x 12 <b>[3]</b>	$2.2 \pm 0.4 \text{ N}\cdot\text{m}$ ( $22 \pm 4 \text{ kgf}\cdot\text{cm}$ )
Hex. Socket Hd. Bolt (W/Flange)	M4 x 10 <b>[55]</b>	$3.4 \pm 0.7 \text{ N}\cdot\text{m}$ ( $35 \pm 7 \text{ kgf}\cdot\text{cm}$ )
Nylock Bolt (W/Flange)	M5 x 16 <b>[6]</b>	$5.9 \begin{smallmatrix} +1.5 \\ 0 \end{smallmatrix} \text{ N}\cdot\text{m}$ ( $60 \begin{smallmatrix} +15 \\ 0 \end{smallmatrix} \text{ kgf}\cdot\text{cm}$ )
Nylock Bolt (W/Flange)	M5 x 25 <b>[37]</b>	$5.9 \begin{smallmatrix} +1.5 \\ 0 \end{smallmatrix} \text{ N}\cdot\text{m}$ ( $60 \begin{smallmatrix} +15 \\ 0 \end{smallmatrix} \text{ kgf}\cdot\text{cm}$ )
Hex. Socket Hd. Bolt (W/Flange)	M5 x 30 <b>[97]</b>	$5.9 \pm 1.5 \text{ N}\cdot\text{m}$ ( $60 \pm 15 \text{ kgf}\cdot\text{cm}$ )
Nylock Bolt (W/Flange)	M6 x 16 <b>[56]</b>	$9.8 \begin{smallmatrix} +2.0 \\ 0 \end{smallmatrix} \text{ N}\cdot\text{m}$ ( $100 \begin{smallmatrix} +20 \\ 0 \end{smallmatrix} \text{ kgf}\cdot\text{cm}$ )
Hex. Socket Hd. Bolt (W/Flange)	M8 x 25 <b>[16]</b>	$22.1 \pm 4.9 \text{ N}\cdot\text{m}$ ( $225 \pm 50 \text{ kgf}\cdot\text{cm}$ )
Seal Lock Hex. Socket Hd. Bolt	M12 x 20 <b>[81]</b>	$39.2 \pm 7.84 \text{ N}\cdot\text{m}$ ( $400 \pm 80 \text{ kgf}\cdot\text{cm}$ )

## 12-6. 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 4000 V/1 minute, with no abnormalities .... 230 V

## 12-7. No-load Current Value

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

Voltage	230 V
Current (Max.)	1.2

### 13. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable		10	20	30	40	50	60	70 min.
	Fixed								
VB 16Y	Work Flow								
		Tail Cover		Handle (A).(B) Set Controller Circuit O-Ring Volume Holder	Housing Ass'y Bearing Bushing (B) Ball Bearing (608VV) x 2 Stator Ass'y				
		Guide (B)		Switch Rubber Cover Switch Cord	Fan Guide Armature Ass'y				
	General Assembly	Sensor Cover O-Ring Sensor Gear x 2 Sensor Holder Ass'y	Gear Cover Ass'y	Final Gear Ball Bearing (6302VV)		Cam Shaft (B) Cam Shaft Feather Key (7 x 7 x 22) Feather Key (7 x 7 x 25)			Inner Cover Ass'y
			First Pinion Set						
		Center Plate Turn Table Cam Cover Plate (A) Roller (B) O-Ring (P-20) Lever (B) Cover Spring (F) Dust Guard	Ball Bearing (608ZZ) Metal				Return Spring Shaft (A) Feather Key (3 x 3 x 20) O-ring (S-26) Bracket (A) Cutter Guard Spring (D) Pin for Spring V-ring Bracket (B) Needle Roller (C)		
			Second Pinion Set						
			Ball Bearing (6000VV) Metal (B)						
			Third Pinion Feather Key (7 x 7 x 12) Third Gear Metal (B) Ball Bearing (6302VV)						

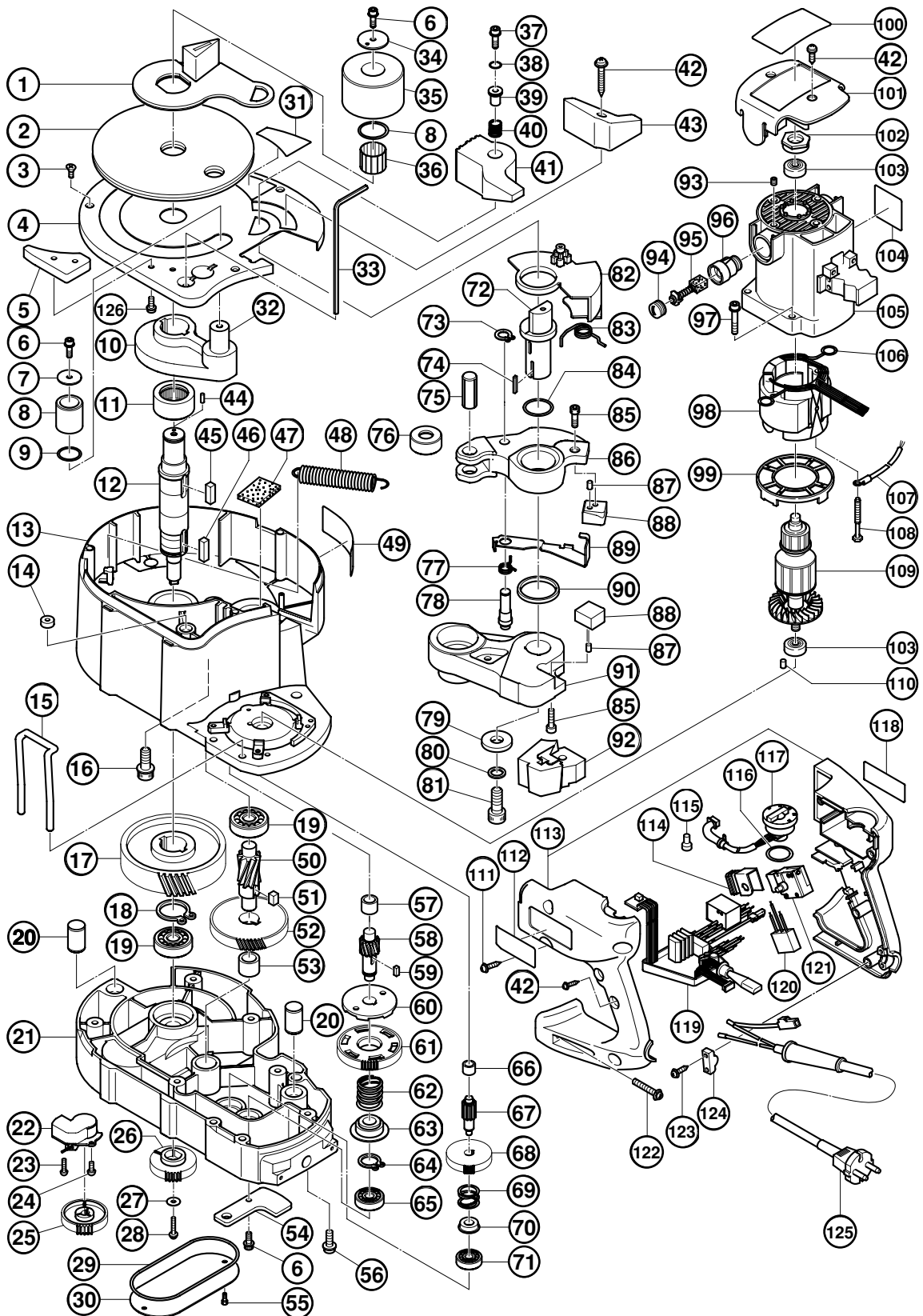


## ELECTRIC TOOL PARTS LIST

PORTABLE REBAR CUTTER/BENDER 2001·9·25

Model VB 16Y

(E1)



**PARTS**

VB 16Y

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	319-692	CENTER PLATE	1	
2	319-691	TURN TABLE	1	
3	320-264	NYLOCK FLAT HD. SCREW M4X12	3	
4	319-690	CAM COVER	1	
5	320-427	PLATE (A)	1	
6	313-082	NYLOCK BOLT (W/FLANGE) M5X16	3	
7	319-696	WASHER	1	
8	319-695	ROLLER (B)	1	
9	944-486	O-RING (1AP-20)	2	
10	319-678	CAM	1	
11	320-420	SLEEVE (B)	1	
12	319-679	CAM SHAFT	1	
13	319-675	INNER COVER ASS'Y	1	INCLUD.19,47,57,66
14	307-607	WRENCH HOLDER	1	
15	316-225	STAND	1	
16	319-676	HEX. SOCKET HD. BOLT (W/FLANGE) M8X25	2	
17	319-681	FINAL GEAR	1	
18	962-553	RETAINING RING FOR D28 SHAFT	1	
19	630-2VV	BALL BEARING 6302VVCMP2L	2	
20		PIN (B)	2	
21	319-660	GEAR COVER ASS'Y	1	INCLUD.19,20,53,65,71
22	316-213	SENSOR HOLDER ASS'Y	1	INCLUD.23,25
23	316-214	TAPPING SCREW D3X12	1	
24	949-215	MACHINE SCREW M4X8 (10 PCS.)	2	
25	316-212	SENSOR GEAR	1	
26	316-212	SENSOR GEAR	1	
27	962-569	WASHER (B)	1	
28	987-203	SEAL LOCK SCREW (W/SP. WASHER) M4X12	1	
29	319-685	O-RING	1	
30	319-686	SENSOR COVER	1	
31	319-704	WARNING LABEL(A)	1	
32	319-680	SHAFT (B)	1	
33	319-699	HEX. BAR WRENCH 4MM (LENGTH 45)	1	
34	319-694	WASHER (A)	1	
35	319-714	CENTER ROLLER (D62) SET	1	INCLUD.6,37,41
36	319-693	NEEDLE BEARING (D22)	1	
37	313-077	NYLOCK BOLT (W/FLANGE) M5X25	1	
38	875-638	O-RING (S-12)	1	
39	320-425	SLEEVE (G)	1	
40	320-426	SPRING (G)	1	
41		GUIDE (D62)	1	
42	301-653	TAPPING SCREW (W/FLANGE) D4X20 (BLACK)	7	
43	319-697	LEVER (B)	1	
44	949-749	ROLL PIN D3X8 (10 PCS.)	1	
45	967-124	FEATHER KEY 7X7X22	2	
46	948-081	FEATHER KEY 7X7X25	2	
47	316-186	SUPPORT (B)	1	
48	319-677	RETURN SPRING	1	
49	320-422	WARNING LABEL (C)	1	
50	319-682	THIRD PINION	1	
51	998-468	FEATHER KEY 7X7X12	1	

**PARTS**

VB 16Y

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
52	319-683	THIRD GEAR	1	
53	930-076	METAL (B)	1	
54	319-661	GUIDE (B)	1	
55	316-228	HEX. SOCKET HD. BOLT (W/FLANGE) M4X10	2	
56	880-474	NYLOCK BOLT (W/FLANGE) M6X16	7	
57	954-789	METAL (B)	1	
58	320-263	SECOND PINION SET	1	INCLUD.59-64
59		FEATHER KEY 4X4X10	1	
60		CLUTCH PLATE	1	
61		SECOND GEAR	1	
62		SPRING (E)	1	
63		SLEEVE (E)	1	
64		RETAINING RING FOR D14 SHAFT (10 PCS.)	1	
65	600-0VV	BALL BEARING 6000VVCMP2L	1	
66	316-185	METAL	1	
67	319-684	FIRST PINION SET	1	INCLUD.68-70
68		FIRST GEAR	1	
69		CLUTCH SPRING (F)	1	
70		SLEEVE (F)	1	
71	608-VVM	BALL BEARING 608VVC2PS2L	1	
72	319-668	SHAFT (A)	1	
73	939-540	RETAINING RING FOR D10 SHAFT (10 PCS.)	1	
74	971-750	FEATHER KEY 3X3X20	2	
75	319-664	NEEDLE	1	
76	319-663	ROLLER (C)	1	
77	319-666	SPRING (D)	1	
78	319-667	PIN FOR SPRING	1	
79	319-673	SPACER	1	
80	320-424	BELLEVILLE SPRING (FOR M12)	1	
81	319-674	SEAL LOCK HEX. SOCKET HD. BOLT M12X20	1	
82	319-688	COVER	1	
83	319-687	SPRING (F)	1	
84	872-470	O-RING (S-26)	1	
85	878-181	NYLOCK HEX. SOCKET HD. BOLT M5X16	2	
86	319-662	BRACKET (A)	1	
87	980-258	NEEDLE (C)	2	
88	319-706	CUTTER SET (1PAIR)	2	
89	319-665	CUTTER GUARD	1	
90	319-669	V-RING	1	
91	320-265	BRACKET (B)	1	
92	319-689	DUST GUARD	1	
93	938-477	HEX. SOCKET SET SCREW M5X8	2	
94	935-829	BRUSH CAP	2	
95	999-043	CARBON BRUSH (1 PAIR)	2	
96	971-001	BRUSH HOLDER	2	
97	313-585	HEX. SOCKET HD. BOLT (W/FLANGE) M5X30	4	
98	340-500E	STATOR ASS'Y 230V	1	INCLUD.106
99	980-931	FAN GUIDE	1	
100		CAUTION PLATE (B)	1	
101	316-227	TAIL COVER	1	
102	310-111	BEARING BUSHING (B)	1	

**PARTS**

VB 16Y

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
103	318-362	BALL BEARING (A)	2	
104		HITACHI LABEL (B)	1	
105	310-146	HOUSING ASS'Y	1	INCLUD.93,96
106	930-703	BRUSH TERMINAL	1	
107	990-861	INTERNAL WIRE	1	
108	953-121	HEX. HD. TAPPING SCREW D5X50	2	
109	360-552E	ARMATURE 230V	1	
110	931-701	BEARING LOCK	1	
111	302-089	TAPPING SCREW (W/FLANGE) D5X20 (BLACK)	2	
112		NAME PLATE	1	
113	319-705	HANDLE (A).(B) SET	1	
114	995-362	SWITCH RUBBER COVER	1	
115	959-140	CONNECTOR 50091 (10 PCS.)	7	
116	878-609	O-RING (S-24)	1	
117	319-718	VOLUME HOLDER	1	
118		CAUTION LABEL (B)	1	
119	319-719	CONTROLLER CIRCUIT	1	
120	994-273	NOISE SUPPRESSOR	1	
121	319-716	SWITCH (2P PLUG IN TYPE) W/LOCK	1	
122	316-229	MACHINE SCREW (W/WASHERS) M5X20 (BLACK)	2	
123	984-750	TAPPING SCREW (W/FLANGE) D4X16	2	
124	937-631	CORD CLIP	1	
* 125	320-428	CORD	1	
* 125	320-429	CORD	1	FOR GBR
* 125	320-430	CORD	1	FOR SUI
126	998-471	HEX. SOCKET HD. BOLT M5X12	2	

**OPTIONAL ACCESSORIES**

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
601	314-837	CASE	1	
602	319-712	CENTER ROLLER (D38) SET	1	
603	319-713	CENTER ROLLER (D50) SET	1	

