




MODEL CL 10D

1. REPAIR GUIDE:

Prior to attempting maintenance or repair, confirm without fail that the storage battery is removed from the main body. Should the switch be pulled inadvertently while the storage battery is installed, the motor will rotate and could cause serious injury.

- (1) Precautions on Disassembly and Reassembly of the Main Body:
The circled numbers in the descriptions below correspond to the item numbers in the Model CL 10D parts List.
- (2) Before Starting Disassembly (See Fig. 2) :
Before starting disassembly, with the battery installed, set the Push Button ③ to the  position, pull the switch to set Bracket (A) ④③ to maximum cutting depth, and stop it there.
- (3) On completion of the above preparations, be sure to disconnect and remove the battery. Remove the W3/8 Bolt ④⑨, loose the Spring Washer M10 ④⑧, and take off the Stud Guide ④⑦. (Fig. 1)

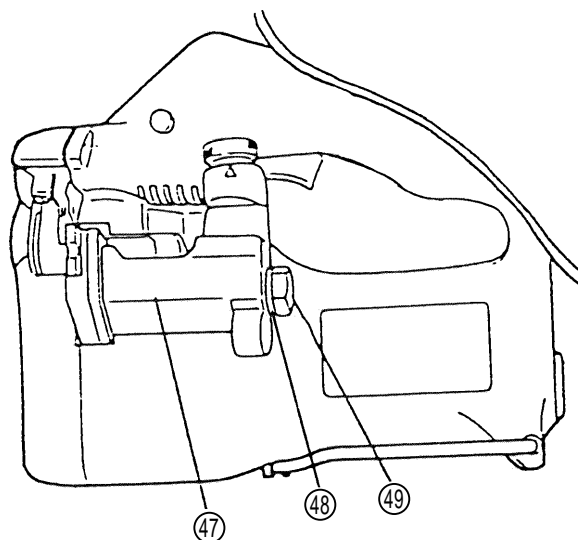


Fig. 1

1-1. Disassembly:

- (1) Disassembly of the Cam Mechanism and Related Parts:
 - (a) Remove the Cover ③⑨. (See Fig. 2)
Remove the two black M4 x 20 Machine Screws w/Washers ③⑧ that fasten the Cover ③⑨, and take off the Cover ③⑨.
 - (b) Remove the Gear Cover ②①. (See Fig. 3)
Remove the four black D5 x 25 Tapping Screws w/Flanges ①⑧, and the two D5 x 35 Tapping Screws ①⑧.
Next, holding Bracket (B) ④⑤ and Bracket (A) ④③, gently remove them while carefully ensuring that Bracket (A) ④③ does not move. Then, the Second Gear ②③ and Third Pinion can be removed. (See Fig. 4)

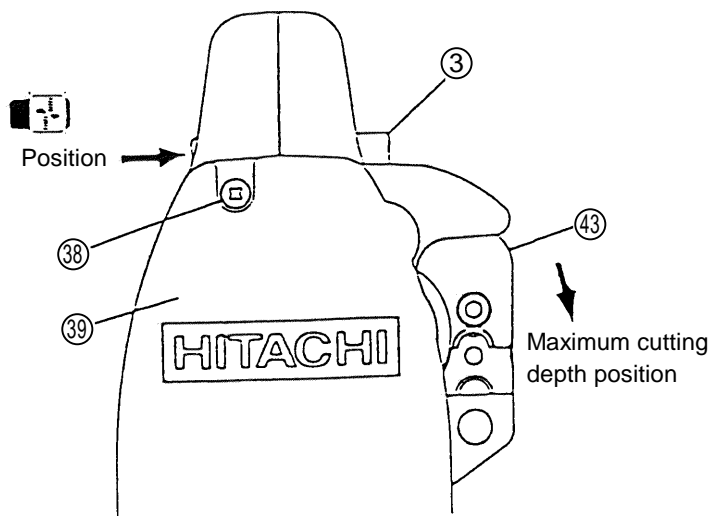


Fig. 2

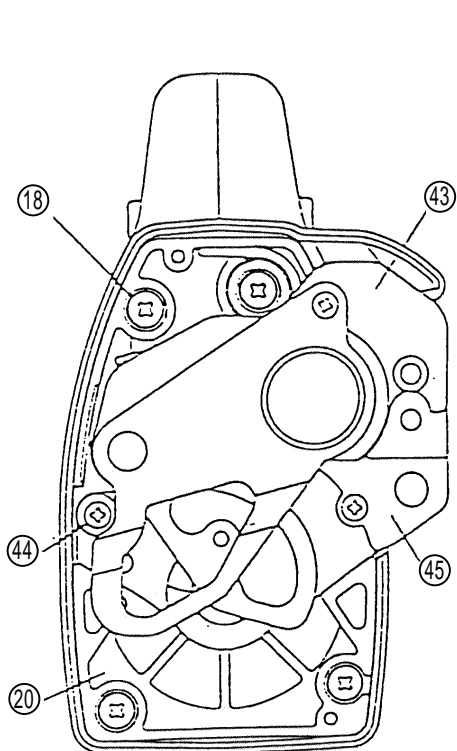


Fig. 3

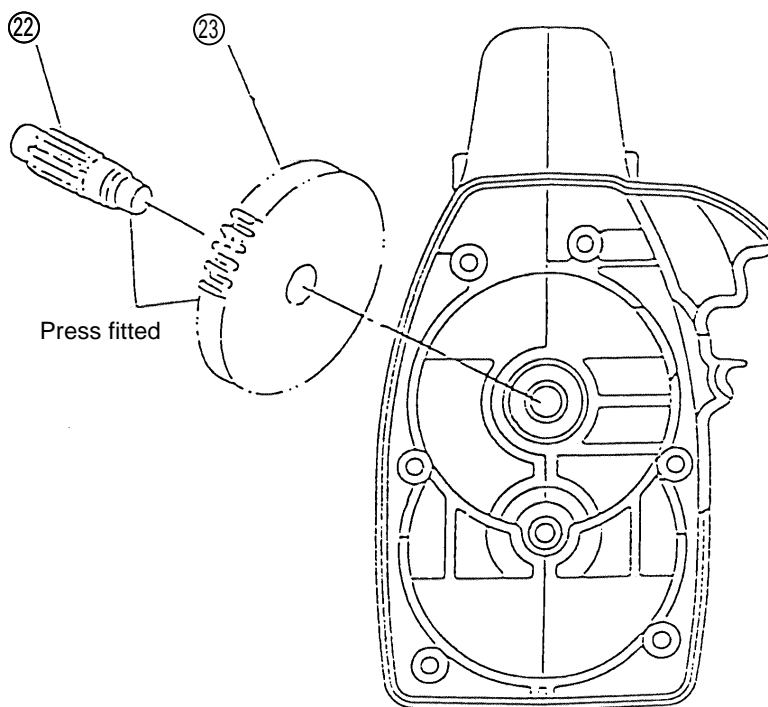


Fig. 4

(c) Remove the Final Gear (37). (See Fig. 5)

With stop-ring pliers, remove the C-Type Retaining Ring for 15 mm shaft (26) that secures the Final Gear (37) and Cam Shaft (57), and remove the Final Gear (37), the two 5 x 5 x 8 Keys (58), and Washer (B) (36).

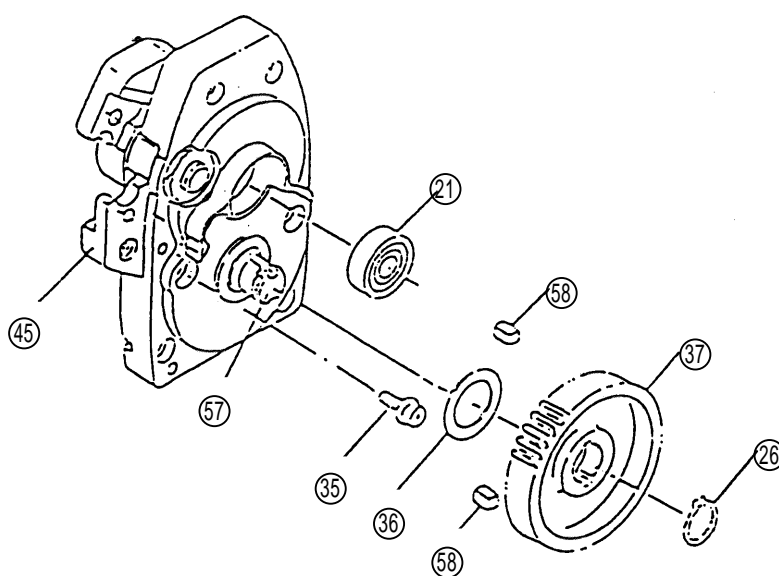


Fig. 5

(d) Remove the Cam Mechanism Section. (See Fig. 5 and Fig. 6)

With the standard accessory 4mm Hexagon Bar Wrench (13), remove the three M5 x 12 Hexagon Socket Hd. Bolts (35) that fasten Bracket (B) (45).

Next, rotate the Cam Shaft (57) to set Bracket (A) (43) to the free position. Then, holding Bracket (A) (43) and Bracket (B) (45), remove the Cam Mechanism Section while being careful to prevent the Return Spring (19) from flying out unexpectedly.

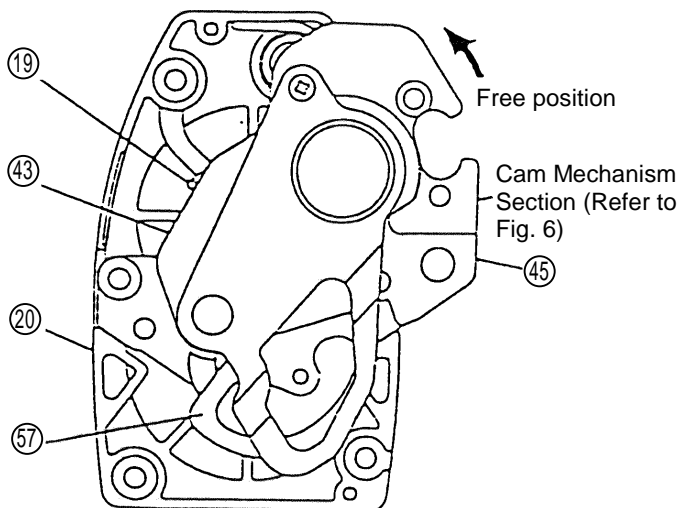


Fig. 6

(e) Disassembly of the Cam Mechanism:

(i) Remove Bolt (A) (41). (See Fig. 7 and Fig. 8)

Bolt (A) (41) - connecting Bracket (A) (43), Bracket (B) (45), and the Return Plate (42) - is press fitted into Bracket (B) (45) and secured with an M12 Lock Nut (46). To disassemble the unit, secure Bracket (B) (45) in a vise, and loosen and remove the M12 Lock Nut (46) with a wrench (loosening torque is approx. 350 kg-cm). (See Fig. 7) Then, being very careful not to deform the Return Plate (42), place a cylindrical jig with an inner diameter large enough to receive the head of Bolt (A) (41) below the unit, as illustrated in Fig. 8, and press down on the threaded end of Bolt (A) (41) with a hand press to remove it. Bracket (A) (43), Bracket (B) (45), and the Cam Shaft (57) can then be disassembled. (See Fig. 8)

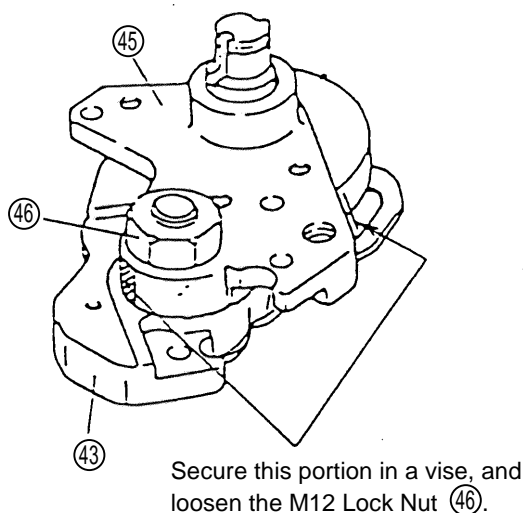


Fig. 7

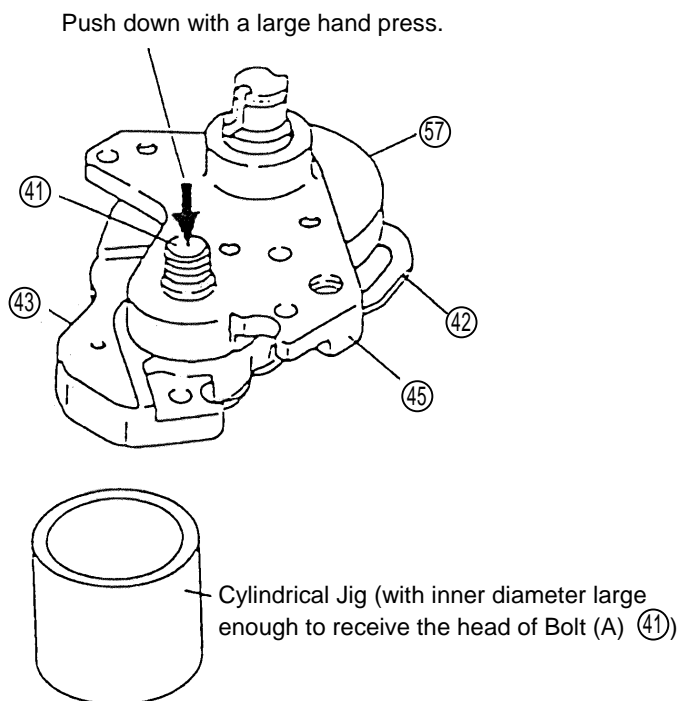


Fig. 8

- (ii) Remove the Return Plate (42). (See Fig. 9)
Remove the single M4 x 12 machine Screw w/Seal Lock Spring Washer (40) that fastens the Return Plate (42). The Return Plate (42) can then be removed.
- (iii) Remove Roller (A) (55). (See Fig. 9)
the Roller Pin (54) that retains Roller (A) (55) is press fitted into Bracket (A) (53) and can be removed with a hand press. (The Roller Pin (54) can be pressed out in either direction.)

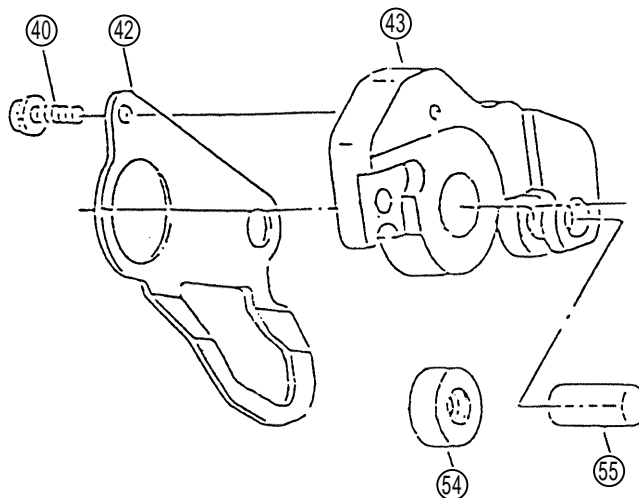


Fig. 9

- (1) Disassembly of the Housing and Related parts:
 - (a) Remove the Hook (6). (See Fig. 10)
With a slendor screwdriver or similar device, remove the E-Type Retaining Ring for 4mm shaft (11) that retains the Hook (6). The Hook (6) and M5 Washer (12) can then be removed.
 - (b) Remove Housing (B) (2).
Remove the nine black D4 x 20 Tapping Screws w/Flanges (9) that fasten Housing (A) (2) and Housing (B) (2). Then, gripping either the portion of Housing (A) (2) that contains the Gear Cover (20) or the portion that contains the storage battery, remove Housing (B) (2) from Housing (A) (2).

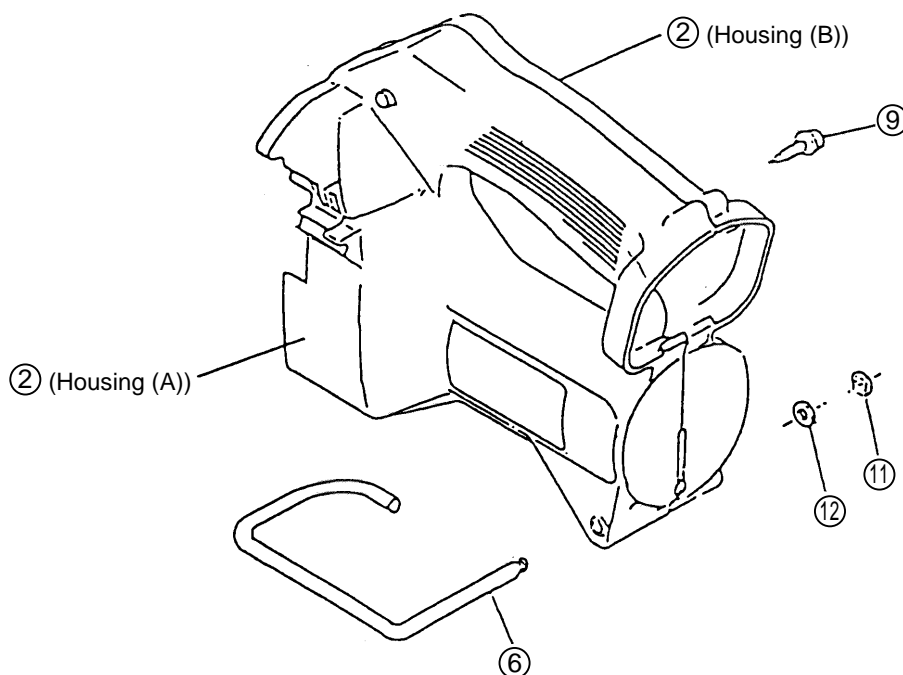


Fig. 10

- (c) After Housing (B) ② has been removed, the components inside Housing (A) ② can be taken out either separately or in assembled units. (See Fig. 11)
 First, grasp the Push Button ③ and Spring ④, and remove them while gently lifting up on the Switch ⑧.
 Next, lift up the heat sink of the Switch ⑧, and remove the Terminal Support ⑮. Then, grasp the heat sink and Switch ⑨, and remove them from Housing (A) ②.
 Finally, grasp the Motor ③④ and Second Pinion ②⑨, and remove them from Housing (A) ②.

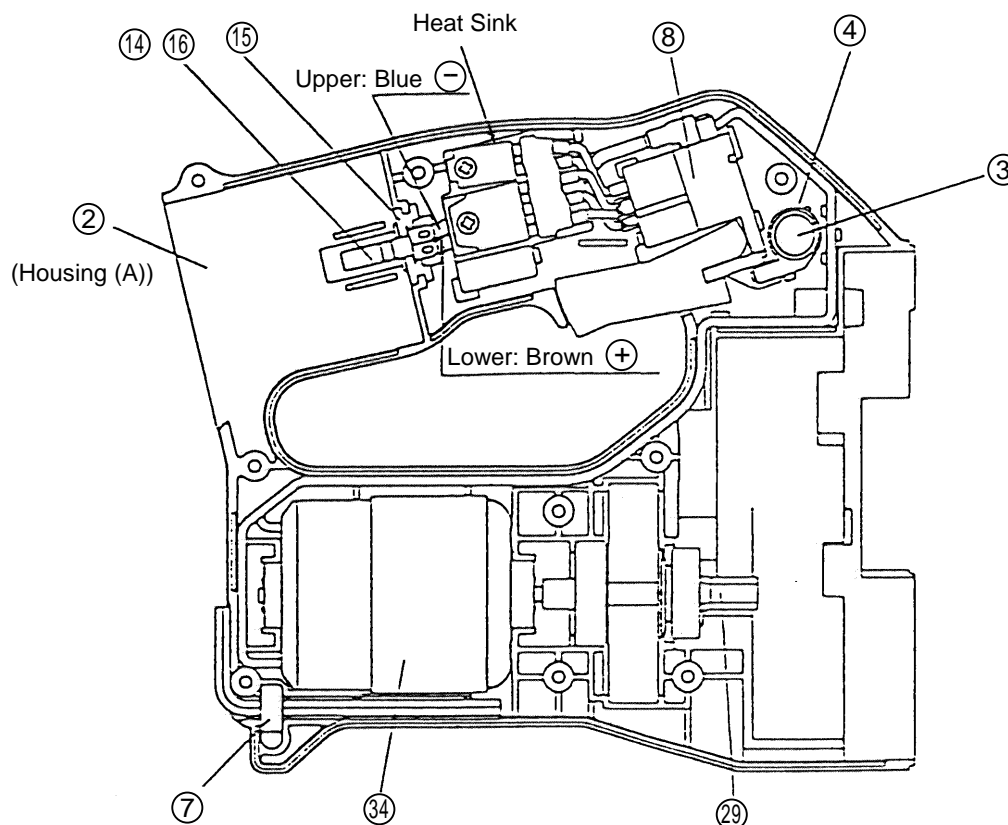


Fig. 11

- (3) Disassembly of the Power Supply Unit and Related Parts:
 (NOTE) The five leadwires of the FET and diode are soldered to the Switch ⑧, and should not be disassembled.
 Also, do not disassemble the screws (brass M3 x 8 Machine Screws) that fasten the FET and diode, and their connected parts.
 With a soldering iron, remove the leadwires of the Motor ③④ and Terminal Assemblies ⑭ ⑯ - which were removed as described in Para. (2) - (c), above - from the Switch ⑧.
 (NOTE) When removing the leadwires from the Switch ⑧ with the soldering iron, do not apply the soldering iron for an excessive amount of time. Too much heat from the soldering iron could cause failure of the electronic circuits in the Switch.
- (4) Disassembly of the Second Pinion and Related parts. (See Fig. 12)
 With a bearing puller, remove the 6001VVCMP2S2L Ball Bearing ③③ that is press-fitted onto the Second Pinion ②⑨. The Washer ③④ can then be removed.
 Similarly, when the 609VVM2CPS2S Ball Bearing ②⑤ is removed, and the C-Type Retaining Ring for 15 mm shaft ②⑥ is extracted with stop ring pliers, the Washer ②⑦ can be removed.
 Finally, extract the Needle ③②, and remove the Idle Gears ③①.

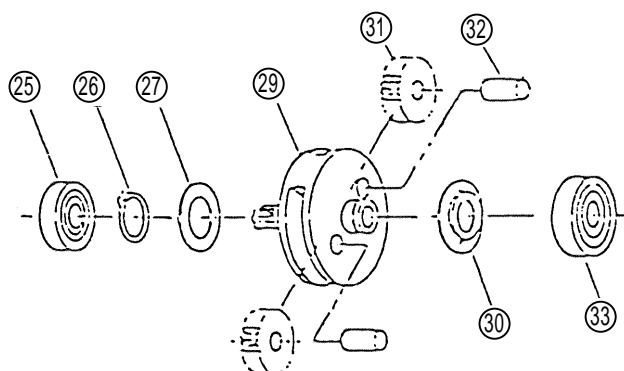


Fig. 12

1-2. Reassembly:

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

(1) Reassembly of the Power Supply Unit and Related Parts:

Ensure without fail that wiring is connected in accordance with the wiring diagram (Fig. 13).

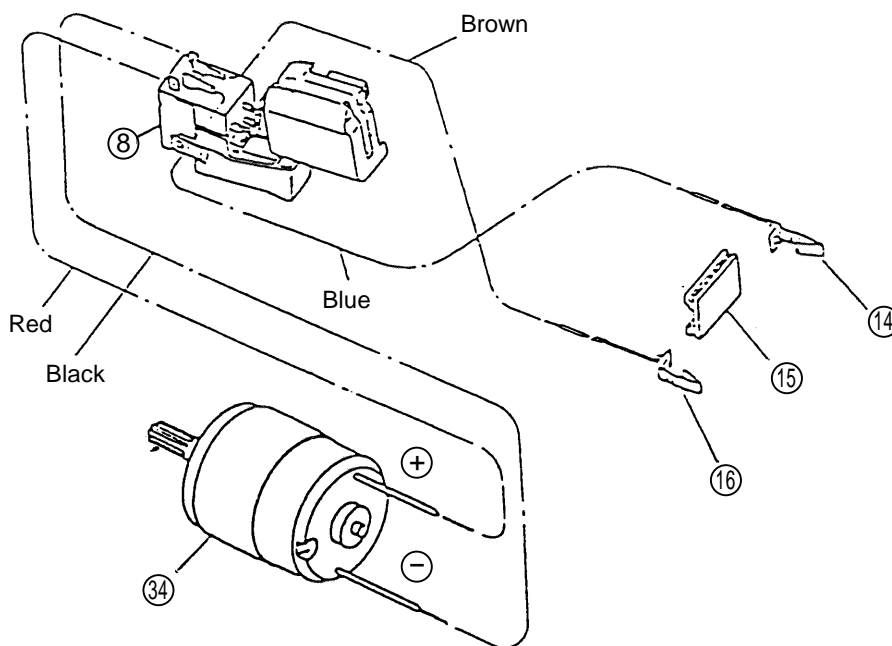


Fig. 13

(NOTE) Be careful not to forcibly pull or bend the leadwires of the FET and diode that are attached to the Switch (8).

(2) Reassembly of the Housing and Related parts:

(a) Second Pinion (29) and Related Parts. (See Fig. 14)

Prior to inserting the Needle (32) into the Second Pinion (29), apply grease (Hitachi Motor Grease Code No. 930035, is recommended) to the inner peripheries of the two Idle Gears (31).

In addition, ensure that the Washer (30) is mounted in the proper direction. The small-diameter side must be facing toward the 6001VVCMP2S2L Ball Bearing (33).

Next, mount the Washer (27), and clip on the C-Type Retaining Ring for 15mm shaft (26) with stop ring pliers. Finally, press fit the 6001VVCMP2S2L Ball Bearing (33) and the 609VVCMP2PS2S Ball Bearing (25).

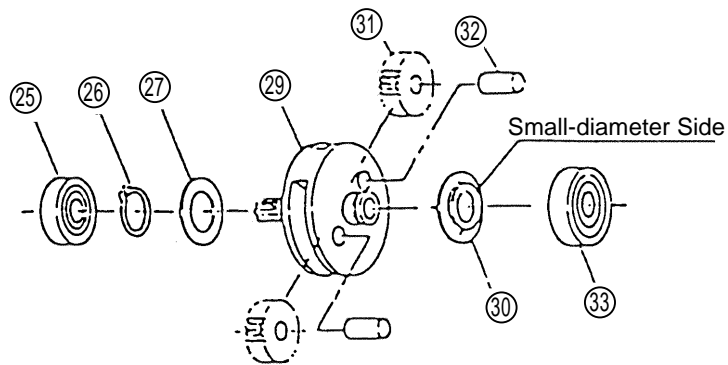


Fig. 14

(b) Reassembly of the Planet Gear and Related parts:

First, apply grease (Hitachi Motor Grease, Code No. 930035, is recommended) to the inner periphery of the Ring Gear (28).

Next, after inserting the pinion of the Motor (34) into the Second Pinion (29) which was reassembled as described in para. (a), above, insert the Ring Gear (28).

When inserting the completed assembly into Housing (A) (2), fit the notched portion of the Motor (34) onto the matching protruding boss of Housing (A) (2) and ensure that the protruding boss of the Ring Gear (28) is properly aligned with the matching grooved portion of Housing (A) (2) (See Fig. 15).

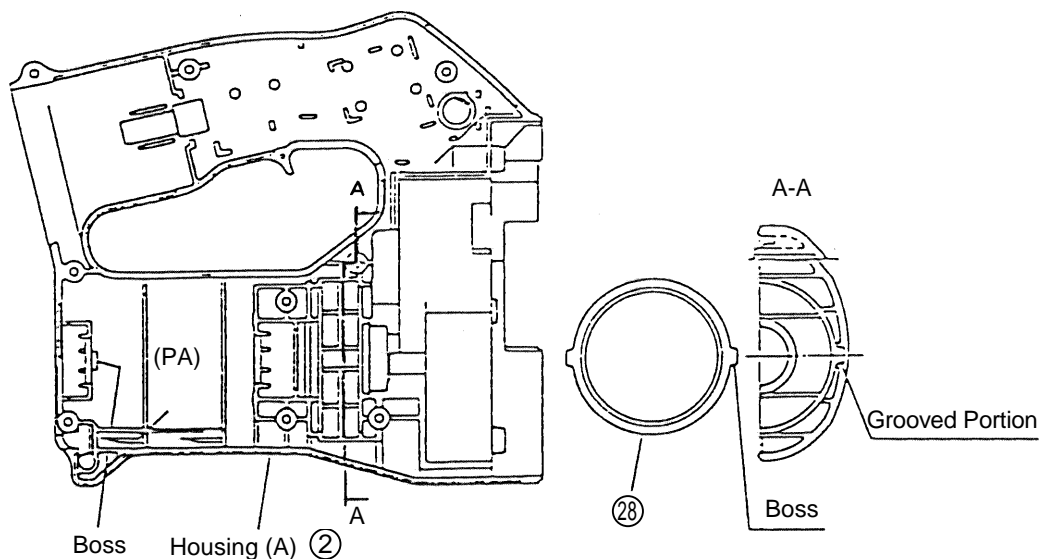


Fig. 15

(c) Installation of the power Supply Unit. (See Fig. 11)

When installing the Power Supply Unit-assembled as described in Para. (1) above-into Housing (A) (2), carefully install the Switch (8) and heat sink while pressing down with a finger on the FET and diode leadwires of the Switch (8) where they contact the heat sink, being very careful not to apply excessive force on the leadwires.

Pass the leadwires of the Terminal Assemblies (14) (16) through the grooved portion of the heat sink, and install the Terminal Support (15) with the blue-colored leadwire upward. (Housing (A) (2) and Housing (B) (2) are marked + and -, respectively. Be sure to install the brown leadwire on the + side, and the blue leadwire on the - side. Particular care is required, as incorrect installation will cause damage to the Switch (8).)

- (d) Install the Push Button ③ so that it is properly aligned with the grooved portion and the lever of the Switch ⑧. (See Fig. 16)
- (e) Install the Spring ④ into the Push Button ③. (See Fig. 11)
- (f) Install the Spanner Holder ⑦ into Housing (A) ②. (See Fig. 11)
- (g) Arrange the leadwires in the proper places in Housing (A) ② and, while being very careful not to pinch any of the leadwires between the two parts, attach Housing (B) ② to Housing (A) ② with the nine black D4 x 20 Tapping Screws w/Flanges ⑨.
- (h) Mount the Hook ⑥, ensuring it is mounted in the proper direction, and attach the M5 Washer ⑫ and E-Type Retaining Ring for 4 mm shaft ⑪. (See Fig. 17)

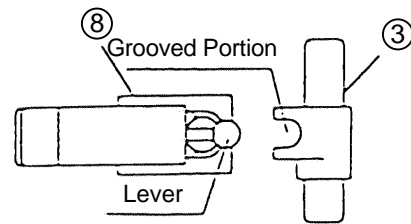


Fig. 16

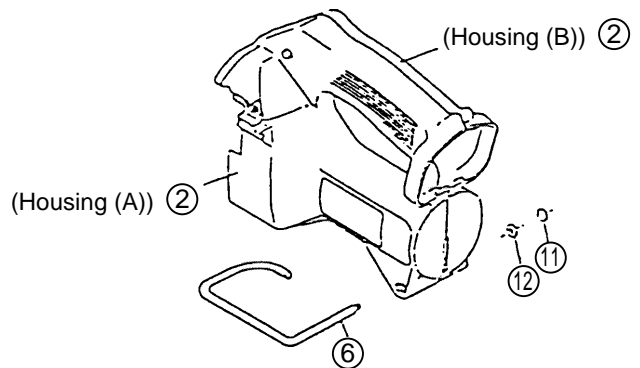


Fig. 17

(3) Reassembly of the Cam Mechanism and Related parts:

- (a) Application of Grease: (See Fig. 18)
As there is heavy load applied to the contacting portions and rotating parts of Bracket (A) ④③, Bracket (B) ④⑤, Roller (A) ⑤④, the Cam Shaft ⑤⑦ and Bolt (A) ④①, it is very important to lubricate them liberally with grease prior to reassembly.

Also, apply grease to the inner periphery of the punched out surface of the Return Plate ④②, as well as the sliding portions of the Return Spring ①⑨ and Bracket (A) ④③, to ensure they are properly lubricated.

Apply Molub Alloy #771-1 grease to the shaft, holes, and both side surfaces (portions marked by hatching and broken-dot lines) shown in Fig. 18. In particular, liberally apply grease to the grooves on the inner periphery of the hole in Roller (A) ⑤④.

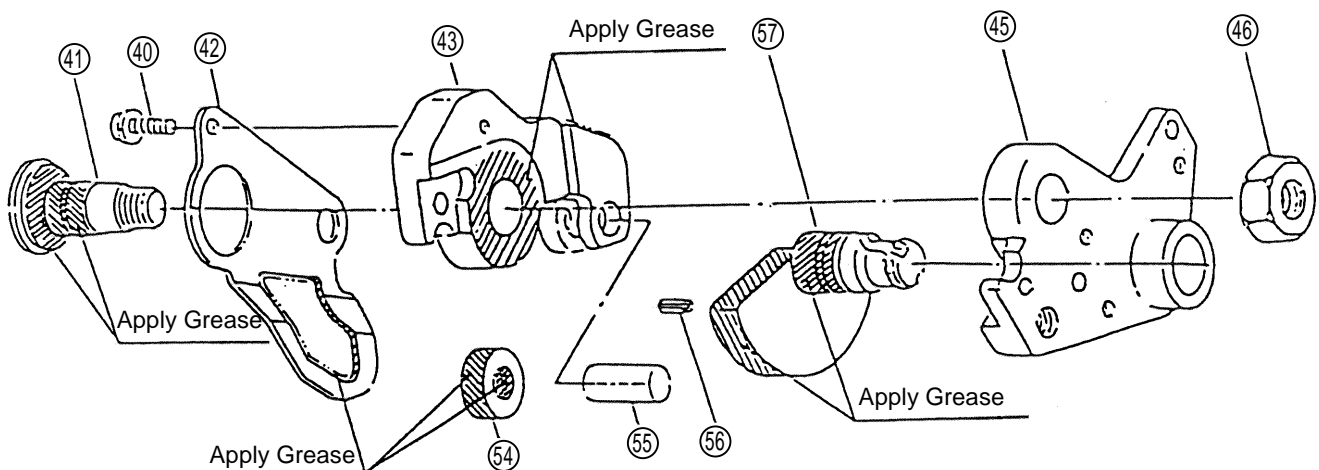


Fig. 18 Cam Mechanism Section

- (b) Press Fitting of Bolt (A) ④①:
- When press-fitting Bolt (A) ④① into Bracket (B) ④⑤, be very careful to ensure correct assembly procedures.
- Press fit the D4 x 14 Roll Pin ⑤⑥ into the Cam Shaft ⑤⑦, ensuring that it contacts the innermost part of its retaining hole. (See Fig. 18)
 - Fasten the Return Plate ④② to Bracket (A) ④③ with the single M4 x 12 Machine Screw w/Seal Lock Spring Washer ④④. (See Fig. 18)
 - Insert the Cam Shaft ⑤⑦ - assembled as described in Para. (i) above-into Bracket (B) ④⑤. (See Fig. 18)
 - Insert the assembled components described in Para (ii), above, so that the D4 x 14 Roll Pin ⑤⑥ of the Cam Shaft ⑤⑦ fits into the hole of the Return Plate ④②. (See Fig. 19)
 - Press fit Bolt (A) ④① fully into Bracket (B) ④⑤ (See Fig. 18). At this time, there should be clearance between Bracket (A) ④③ and Bracket (B) ④⑤, and between the Return Plate ④② and Bolt (A) ④① to accommodate dimensional tolerance. (0.03 - 0.25 mm between Bracket (A) ④③ and Bracket (B) ④⑤; 0.025 - 0.050 mm between the Return Plate ④② and Bolt (A) ④①).
- (c) As the strength of the M12 Lock Nut ④⑥ is very important, particular attention should be given to ensure correct tightening torque.
- (d) Reassembly of the Cam Mechanism and Related parts:
- Install the Return Spring ①⑨ into the Gear Cover ②⑩. (See Fig. 19)
 - When installing the Cam Mechanism assembled as described in para. (b) and (c) into the Gear Cover ②⑩, connect the Return Spring ①⑨ to Bracket (A) ④③. (See Fig. 19)

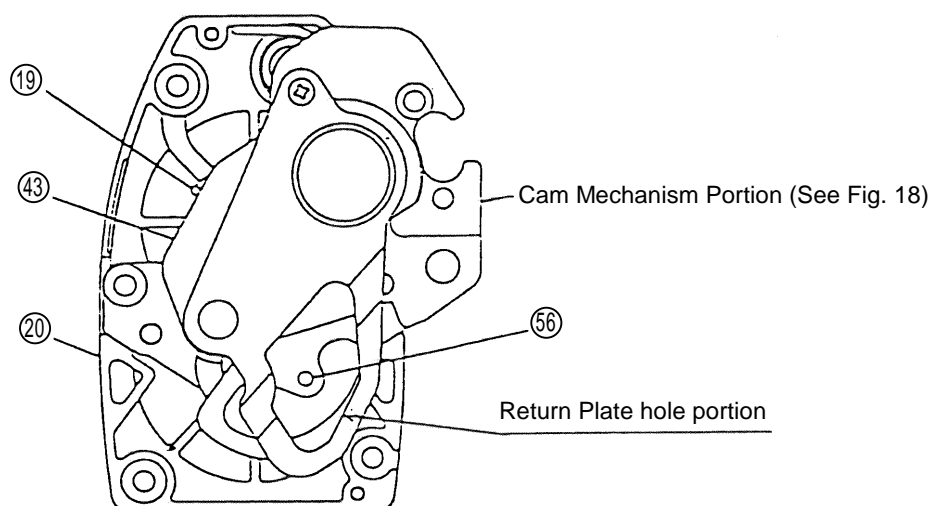


Fig. 19

- As the strength of the three M5 x 12 Hexagon Socket Hd. Bolts ③⑤ that fasten Bracket (B) ④⑤ is very important, particular attention should be given to ensure correct tightening torque. Tighten these bolts with the standard accessory 4 mm Hexagon Bar Wrench ①③. (See Fig. 20)
- Install the 629VVMC2EPS2L Ball Bearing ②① into the Gear Cover ②⑩. (See Fig. 20)
- Assemble Washer (B) ③⑥ and the two 5 x 5 x 8 Keys ⑤⑧ onto the Cam Shaft ⑤⑦, and install the Final Gear ③⑦ while being careful to ensure it is mounted in the proper direction. Then, attach the C-Type Retaining Ring for 15 mm shaft ②⑥ with stop ring pliers. (See Fig. 20) Be sure to apply grease (Hitachi Motor Grease, Code No. 930035, is recommended) to the outer periphery of the Final Gear ③⑦.

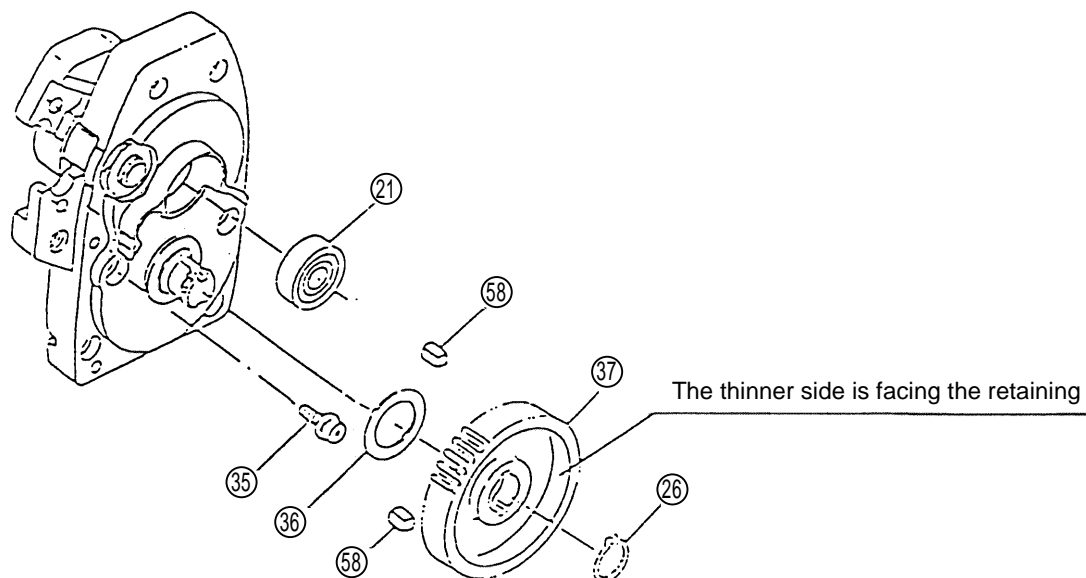


Fig. 20

(e) Installation to the Main Body:

- (i) Insert the 608VVMC2EPS2L Ball Bearing into the bearing chamber of Housing (A) (2). (See Fig. 21)
- (ii) Press fit the Third Pinion (22) into the Second Gear (23), being very careful of the mounting direction, and install them into the 629VVM2EPS2L Ball Bearing (21) of the Gear Cover (20) (See Fig. 21). At this time, apply grease (Hitachi Motor Grease Code No. 930035, is recommended) to the outer periphery of the Second Gear (23).
- (iii) When installing the Gear Cover (20) into the housing, hold Bracket (A) (43) at its maximum cutting depth position (being careful about the pressure applied to the spring), in the same manner as during disassembly. (See Fig. 22)
- (iv) Tighten the four black D5 x 25 Tapping Screws w/Flanges (18) and the two D5 x 35 Tapping Screws (44). (See Fig. 22)

As the surface of the Cam and Roller are especially important in the mechanism, check them carefully for flaws, dust, or other foreign matter.

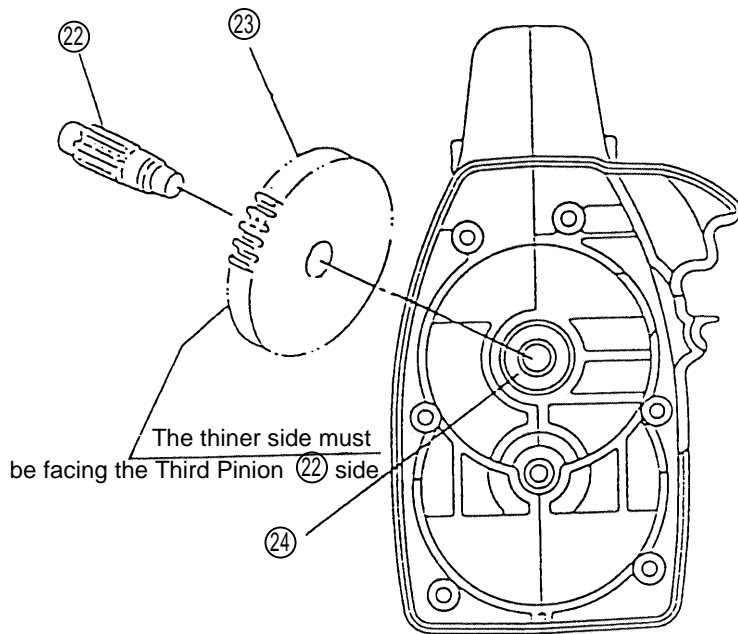


Fig. 21

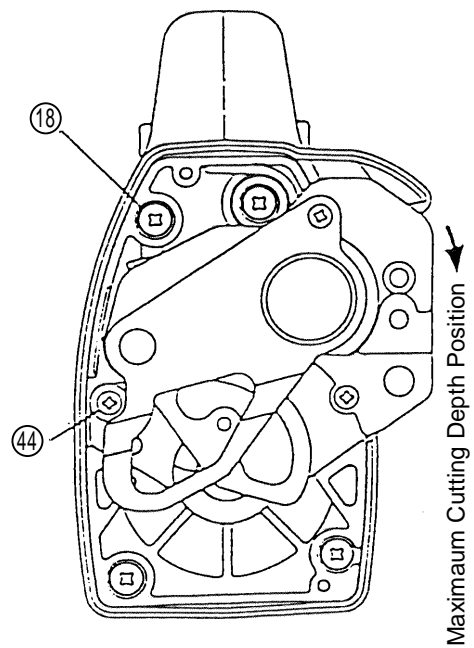






Fig. 22

(f) Operation Inspection:

Before mounting the Cover (39), attach the storage battery and make the following checks.

- (i) Set the Push Button (3) to the  position, and ensure that the Cam Shaft (57) rotates to the right (clockwise), as shown in Fig. 23.
- (ii) Set the Push Button (3) to the  position, and ensure the motor does not rotate even when the switch is pulled.
- (iii) Pull the switch while pushing the Push Button (3) to the  position, and ensure the Cam Shaft (57) rotates to the left (counterclockwise), opposite to the direction indicated in Fig. 23.
- (iv) Ensure the Push Button (3) automatically returns to the  position when it is released.

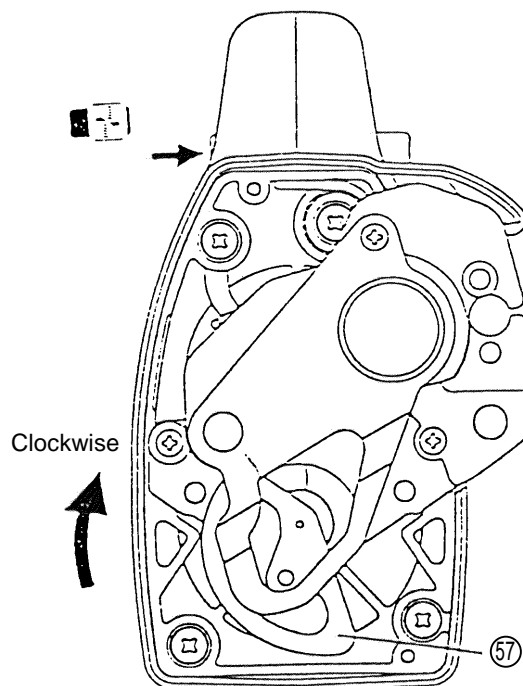


Fig. 23 Direction of Cam Shaft (57) Rotation at the  Position

(g) Mounting the Cover (39) and the W3/8 Cutters (53):

Remove the storage battery, and fasten the Cover (39) with the two black M4 x 20 Machine Screws w/Washers (38).

The W3/8 Cutters (53) must be mounted in the proper directions. As shown in Fig. 24, they must be mounted so that if the groove in the side of one cutter is present (Yes), the groove in the side of the outer cutter is not present (No). After mounting direction has been confirmed, fasten the cutters with the two M5 x 9 Special Bolt (51)

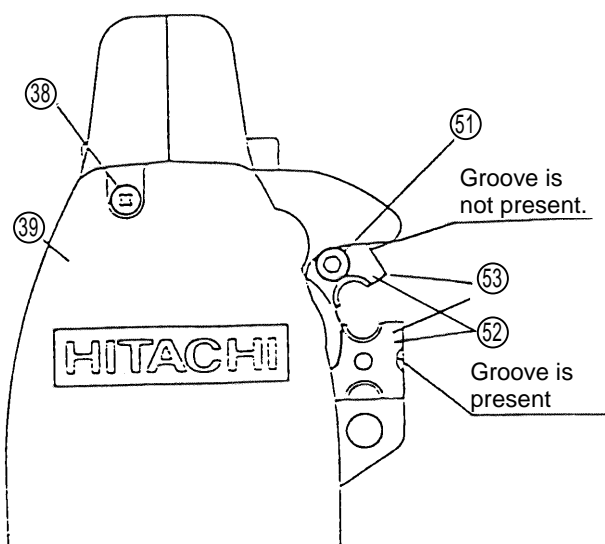


Fig. 24

Size	Attachment
M10	
M8	
M6	
W3/8	

(h) Fasten the Stud Guide (47) with the W3/8 Bolt (49), and Spring Washer (48), as shown in Fig. 1.

(i) Tightening Torques are as follows:

⊕ Black Phillips-Hd. D4 x 20 Tapping Screws w/Flanges (9)	20 ± 5 kg·cm
⊕ Black Phillips-Hd. M4 x 20 Machine Screws w/Washers (38)	18 ± 5 kg·cm
⊕ Phillips-Hd. M4 x 12 Machine Screw w/Seal Lock Spring (40)	18 ± 5 kg·cm
⊕ Black Phillips-Hd. D5 x 25 Tapping Screws w/Flanges (18)	35 ± 5 kg·cm
⊕ D5 x 35 Tapping Screws (44)	35 ± 5 kg·cm
M5 x 12 Hexagon Socket Hd. Bolts (35)	60 ± 15 kg·cm
M5 x 9 Special Bolts (51).	60 ± 15 kg·cm
M12 Lock Nut (46)	350 ± 75 kg·cm
W3/8 Bolt (49)	160 ± 40 kg·cm

1-3. Precautions on Disassembly and Reassembly of the Model UC 12Y Charger:

For details concerning the disassembly, reassembly and precautions in use of the Model UC 12Y Charger, please refer to the Technical Data and Service Manual (No. E830) for the Model UC 12Y Charger.

STANDARD REPAIR TIME (UNIT) SCHEDULES:

MODEL	Variable Fixed	10	20	30	40	50	60 min.
CL 10D		Work Flow					
		Hook E Type Re- taining Ring Washer		Second pinion BB (6001 VVCN) Washer x 2 BB (609 VVC2) C Type Re- taining Ring Ring Gear Needle x 2 Idle Gear x 2			
				Push Button Spring Terminal Support Switch Terminal x 2 Housing (S x B) Set Motor			
	Repair Operation	Cover	Final Gear Key (5 x 5 x 8) x 2 Washer (B)	Gear Cover Return plate	Bolt (A) Lock Nut M12 Bracket (B) Cam Shaft		
	Fix Time Switch Handle (A), (B) Cover Hook Others	Min. 0 0 0 0 20	Second Gear Third Pinion BB (629 VVMC) BB (608VVMC)		Return Plate Bracket (A) Roller (A) Roller Pin		