

Hitachi Power Tools

SERVICE MANUAL

LIST No.
WR 16SE: E727
Sep. 2014

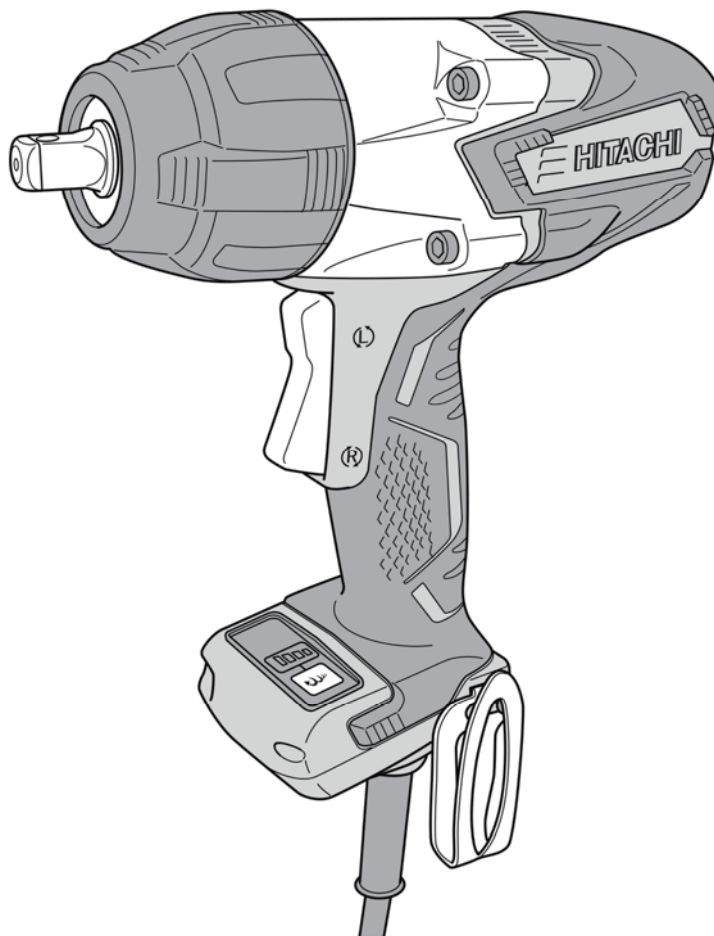
PRODUCT NAME

Hitachi Impact Wrench

Model WR 16SE

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HITACHI

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

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REPAIR GUIDE

Before attempting disassembly or reassembly, always remember to turn off the power switch and disconnect the plug from the power source outlet.

1. Precautions on disassembly and reassembly

[Bold] numbers in the descriptions below correspond to the numbers in the Parts List and exploded assembly diagram for the Model WR 16SE.

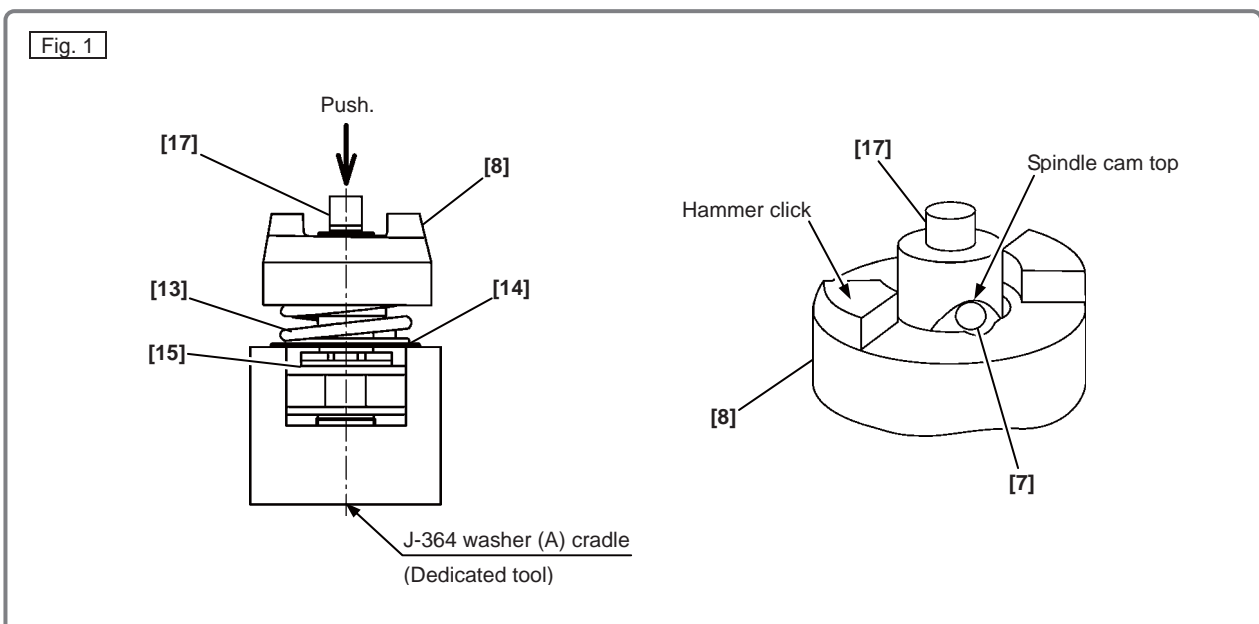
Disassembly

1. Removal of the hammer case ass'y

- (1) Insert a flat-blade screwdriver into a gap between Bumper (A) [1] and the Hammer Case Ass'y [3], and then remove Bumper (A) [1].
- (2) Remove the four Bolts M5 x 35 [2]. Remove the Hammer Case Ass'y [3], Anvil (L) [6], the hammer ass'y, and Ring Gear [19] from Housing (A).(B) Set [29].
If the Hammer Case Ass'y [3] proves difficult to remove, tap the tip of Anvil (L) [6] with a wooden hammer to remove the Hammer Case Ass'y [3].

2. Disassembly of the impact mechanism

- (1) Remove Washer (C) [20] from the hammer ass'y.
- (2) Set the hammer ass'y on the J-364 washer (A) cradle (dedicated tool, Code No.334413). Press down the tip of Spindle (A) [17] with a hand press or similar tool to compress Hammer Spring (A) [13]. During this compression, use a small flat-blade screwdriver or similar tool to take out Stopper (A) [15], and then release the hand press.
- (3) Remove the hammer ass'y from the J-364 washer (A) cradle. Then hold the end of Spindle (A) [17] and press the tip pawl portion of Hammer (A) [8] with a hand press or similar tool to compress Hammer Spring (A) [13]. During this compression, use a small flat-blade screwdriver or similar tool to remove the two Steel Balls D6.35 [7] from the cam grooves of Spindle (A) [17] and Hammer (A) [8], and through the steel ball insertion groove.
- (4) Loosen the hand press, hold Hammer (A) [8] and Washer (A) [14] together, and then pull both out from Spindle (A) [17]. You can now take out Hammer Spring (A) [13]. Be careful not to allow any of the twenty-nine Steel Balls D3.97 [9] to fall from the remote portion of Hammer Spring (A) [13].

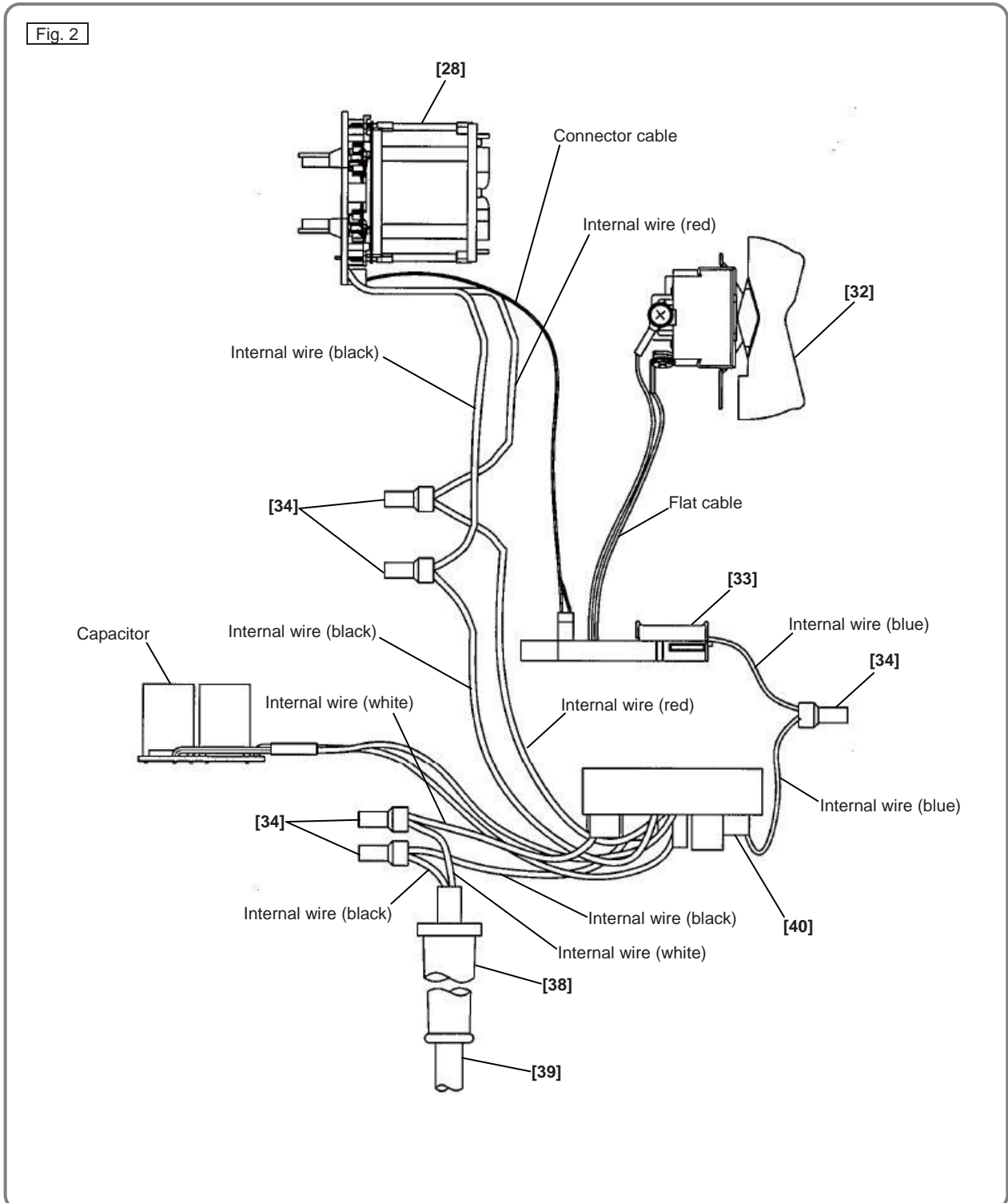


3. Removal of housing (A).(B) set

- (1) Remove the eight Tapping Screws D4 x 20 [42]. You can now remove housing (B) of Housing (A).(B) Set [29].
- (2) Remove the two Tapping Screws D4 x 16 [37] and the Cord Clip [36]. You can now remove Inner Cover (A) [23], Rotor Ass'y [25], Stator IGBT PCB [28], Controller (A) [33], Controller (B) [40], Switch [32], and Cord [39] together.

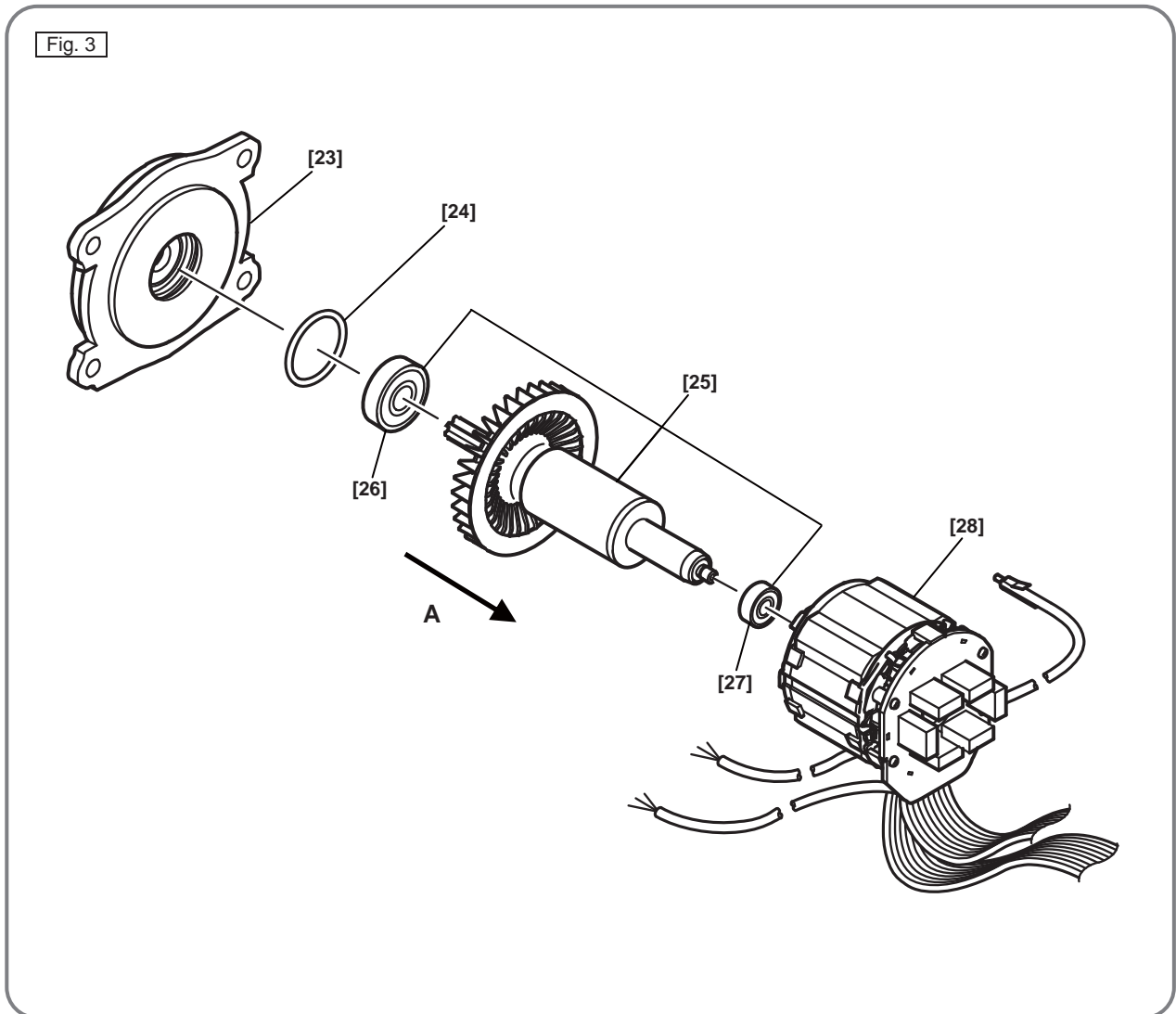
4. Disassembly of the power supply portion

- (1) Remove the four screws from the Switch [32].
- (2) Use a flat-blade screwdriver or similar tool to remove silicon from the connector of the connector cable, and then hold the connector and slowly pull it out.



5. Disassembly of the stator IGBT PCB, inner cover (A), and rotor

- (1) Firmly hold Inner Cover (A) [23] so as not to be attracted by the magnetic force of the Rotor Ass'y [25], and then pull out the stator of the Stator IGBT PCB [28] in direction "A" as shown below.
- (2) Keep Inner Cover (A) [23] away from the fan of the Rotor Ass'y [25], use a hand press or similar tool to press the end of the pinion of the Rotor Ass'y [25], and then remove Inner Cover (A) [23] from the Rotor Ass'y [25].
- (3) Use a small flat-blade screwdriver to remove the O-ring [24] from Inner Cover (A) [23].



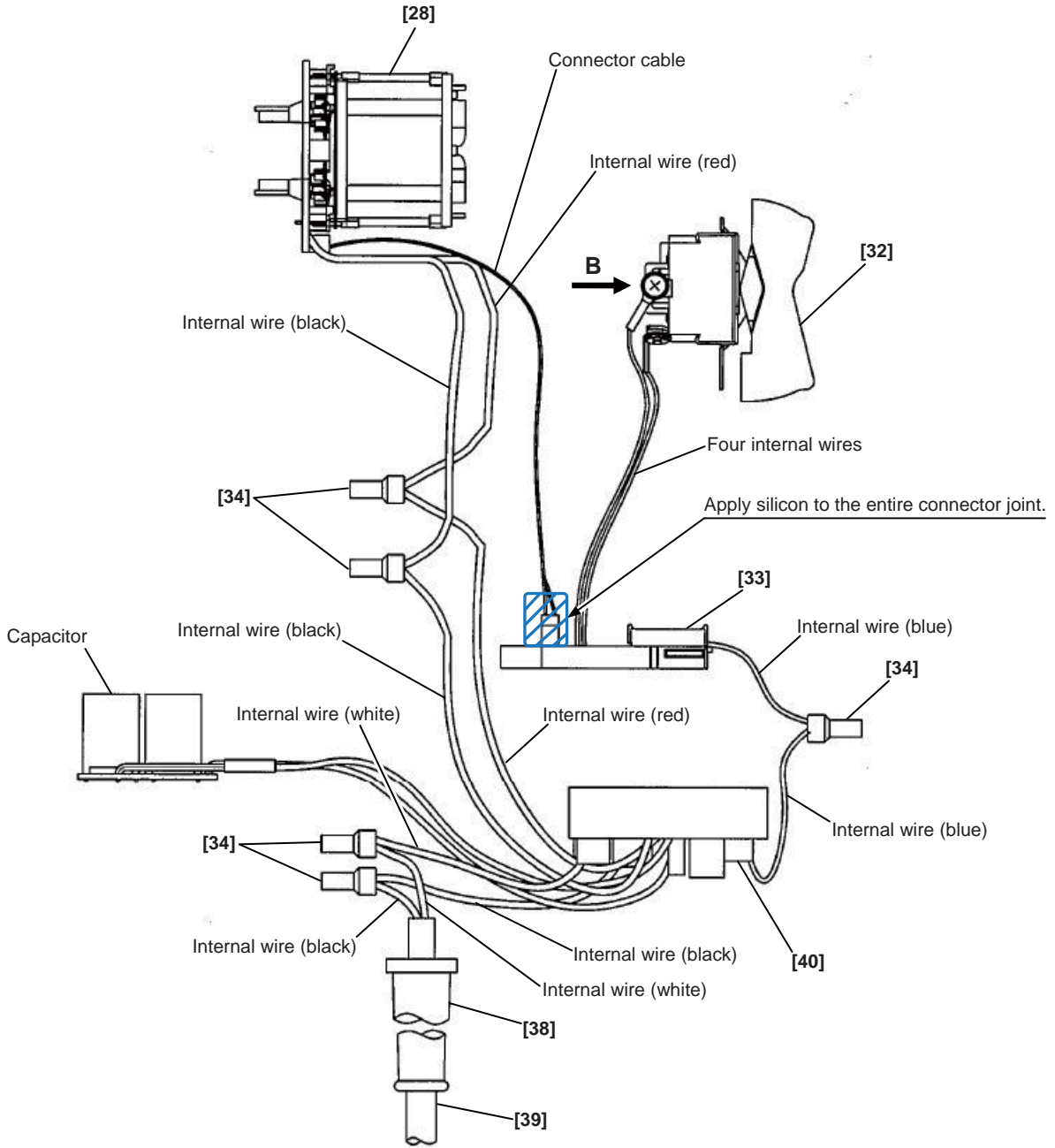
Reassembly

Reverse the disassembly procedures above to reassemble the impact wrench. However, when reassembling the impact wrench, pay particular attention to the following items.

1. Reassembly of the power supply portion and its vicinity

- (1) For replacement of the Switch **[32]**, Controller (A) **[33]**, Controller (B) **[40]**, and the Stator IGBT PCB **[28]**, connect these parts correctly with wires according to the wiring diagram.
- (2) Connect the internal wires of Controller (A) **[33]** to the Switch **[32]** paying attention to the colors of the internal wires. Then secure them with four screws as shown in Fig. 4.
- (3) Note the following when connecting the connector cable to the connector of Controller (A) **[33]**.
 - Firmly connect the connector cable to the connector until it is fully seated.
 - After connecting the connector cable to the connector, apply silicon adhesive (ThreeBond TB1211, Code No. 306927) to the entire connector joint.
- (4) Fully fit the internal wire and connector cable of the Stator IGBT PCB **[28]** into the wiring groove for internal wires of housing (A), so that neither gets pinched.
- (5) Be careful not to pinch the internal wires of Controller (A) **[33]**.
- (6) Insert the earth terminal of the Stator IGBT PCB **[28]** into a gap between the housing rib, screw boss, and Stator IGBT PCB **[28]** as shown in Fig. 5. Be careful not to pinch the earth terminal.

Fig. 4



View from B

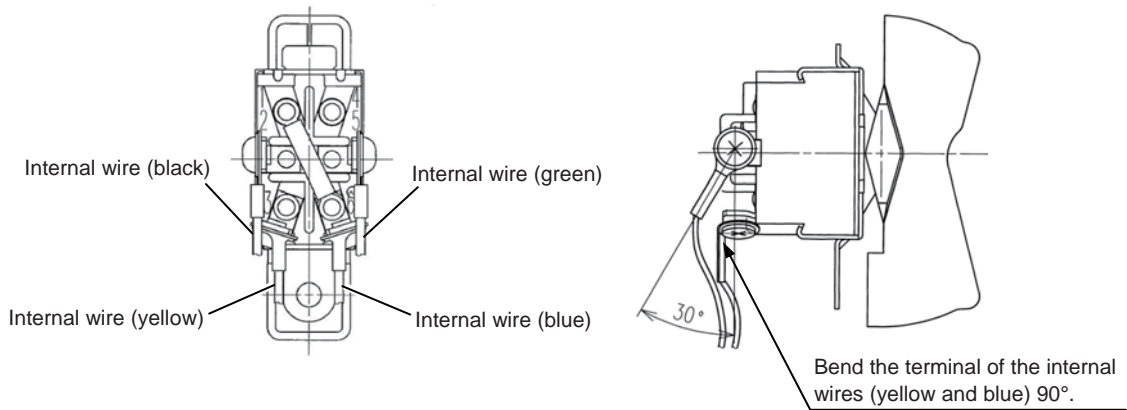
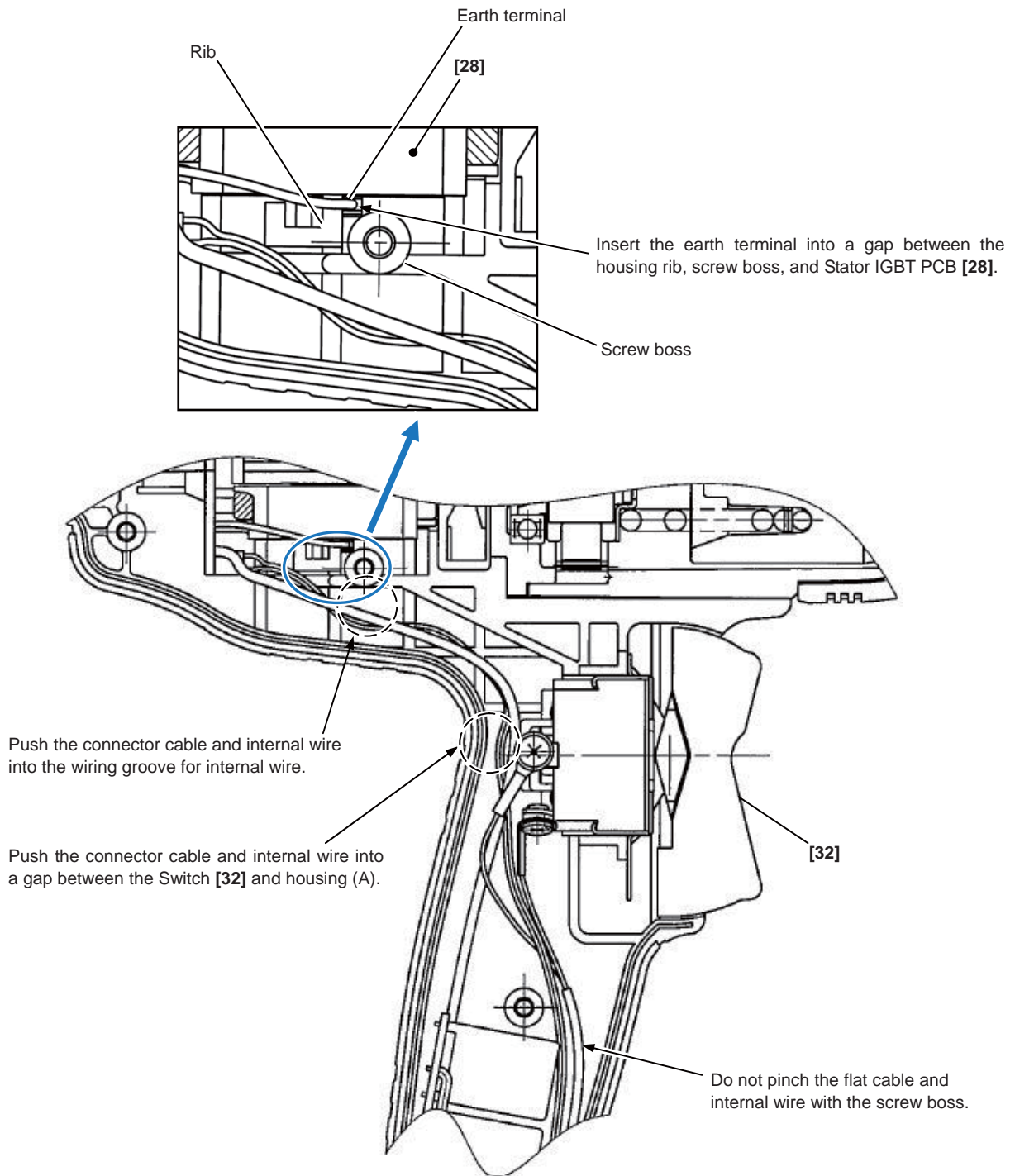


Fig. 5

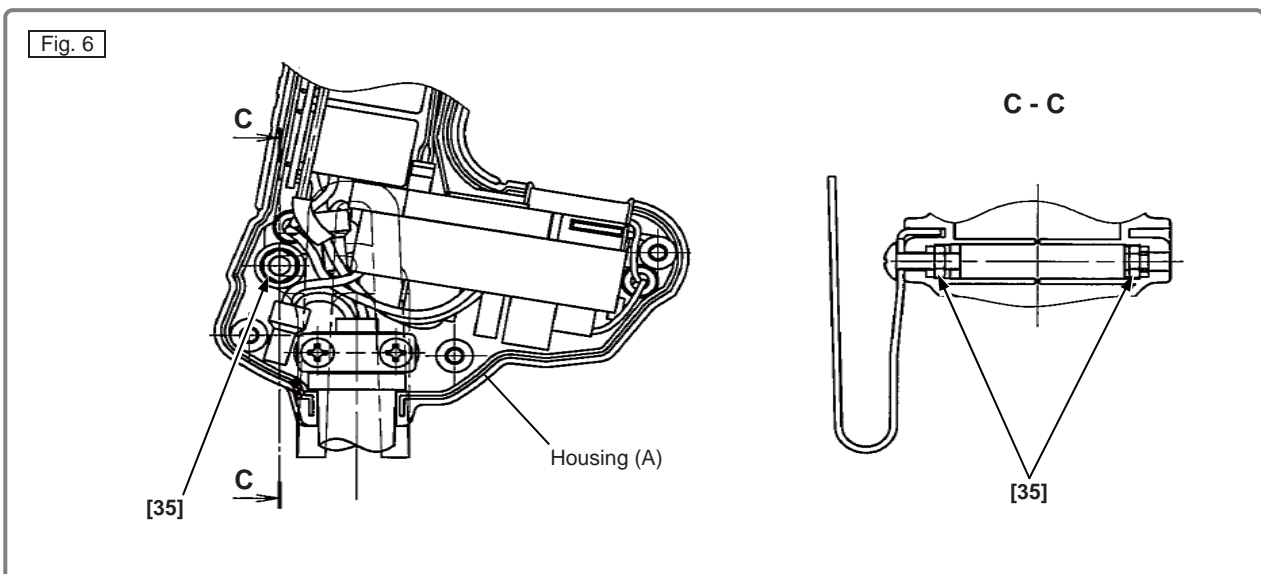


2. Reassembly of the impact mechanism components

- (1) Mount two Washers (B) [12], Hammer Spring (A) [13], Washer (A) [14], and Spindle (A) [17] in this order on Hammer (A) [8], which contains the twentieth-nine Steel Balls D3.97 [9].
- (2) Match the peak of the cam groove of Spindle (A) [17] with the steel ball insertion groove of Hammer (A) [8]. Use a hand press or similar tool to press the end pawl portion of Hammer (A) [8] so as to compress Hammer Spring (A) [13] until it contacts Spindle (A) [17], and then hold it there.
- (3) Put the two Steel Balls D6.35 [7] in the steel ball insertion groove. Confirm that Steel Balls D6.35 [7] are in the cam groove, and then release the hand press.
- (4) Set the hammer ass'y on the J-364 washer (A) cradle (dedicated tool, Code No. 334413), use a hand press or similar tool to press the end of Spindle (A) [17] so as to compress Hammer Spring (A) [13], fit Stopper (A) [15] to the spindle shaft, and then release the hand press.
- (5) Mount the Idle Gear Set (2 pcs.) [18] and the two Needle Rollers [16] on Spindle (A) [17].

3. Reassembly of the body

- (1) Mount a set comprised of Inner Cover (A) [23] (including the Rotor Ass'y [25]) and the power supply portion to housing (A).
- (2) Mount the Cord Clip [36] with its protrusion facing the cord, and then secure it with the two Tapping Screws D4 x 16 [37].
- (3) Insert Lock Nut M4 [35] into Housing (A).(B) Set [29], mount housing (B), and then tighten the eight Tapping Screws D4 x 20 [42].
- (4) Mount the hammer ass'y (reassembled in "2. Reassembly of the impact mechanism components" above) to Housing (A).(B) Set [29], while paying attention to the engagement of the Idle Gear Set (2 pcs.) [18], Ring Gear [19], and pinion of the Rotor Ass'y [25]. At this time, the protrusion of the Ring Gear [19] must contact the Hammer Case Ass'y [3]. Confirm that Washer (C) [20] is fitted to Spindle (A) [17]. After reassembly, confirm that the Rotor Ass'y [25] rotates smoothly. If not, the gears may not be properly engaged. Check and correct the gear engagement.
- (5) Insert Anvil (L) [6] into the end of Spindle (A) [17] of the hammer ass'y, and then place the Hammer Case Ass'y [3] over it. Tighten the four Bolts M5 x 35 [2]. Confirm that Packing (A) [22] is inserted between the Hammer Case Ass'y [3] and Inner Cover (A) [23].
- (6) Place Bumper (A) [1] over the Hammer Case Ass'y [3].



Application of lubricant

(1) Apply Nippeco SEP-3A grease to the following:

- Pinion tooth flanks of the Rotor Ass'y [25]
- Tooth flanks of the Ring Gear [19]
- Tooth flanks and inner circumference of the Idle Gear Set (2 pcs.) [18]
- Needle Roller [16]

(2) Apply Doubrex 251 grease to the following:

- Φ 10 hole of Anvil (L) [6], metal sliding portion, and top of the pawl portion
- Steel Ball D6.35 [7]
- Metal oil groove of Hammer Case Ass'y [3]
- Hammer (A) [8] cam groove and pawl portions
- Spindle (A) [17] cam groove, sliding portion, and fitting joint with Anvil (L) [6]
- Steel Balls D3.97 [9] (29 pcs.)
- Both sides of Washer (A) [14]

Screw tightening torque

- Seal Lock Hex. Socket Hd. Bolt M5 x 35 [2] ----- 8.82 \pm 1.0 N•m (90 \pm 10 kgf•cm)
- Tapping Screw (W/Flange) D4 x 20 (Black) [42]----- 2.45 \pm 0.5 N•m (25 \pm 5 kgf•cm)
- Truss Hd. Screw M4 (Black) [30] ----- 1.76 \pm 0.4 N•m (18 \pm 4 kgf•cm)
- Tapping Screw (W/Flange) D4 x 16 [37] ----- 1.96 \pm 0.49 N•m (20 \pm 5 kgf•cm)

Checking after reassembly

Check the following after reassembly:

- (1) Operate the Switch [32] and make sure that the switch moves smoothly and the switch operations (ON, OFF, forward and reverse) are normal.
- (2) Push the mode switch and confirm that the impact rate changes in four modes.
- (3) Make sure the rotational direction of Anvil (L) [6] matches the direction of rotation made when you press the Switch [32]. (When the Switch [32] is set to the (R) position, Anvil (L) [6] must rotate clockwise as viewed from the rear (opposite to Anvil (L) [6].)

Insulation test

Upon completing disassembly and repair, measure the insulation resistance and conduct an insulation test (dielectric strength test).

Insulation resistance: 7 M Ω or more with 500 V DC megohm tester

Dielectric strength: AC 2,500 V for 1 minute, with no abnormalities ----- 110 to 120 V

AC 4,000 V for 1 minute, with no abnormalities ----- 220 to 240 V

No-load current

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

Voltage	110 V	120 V	220 V	230 V	240 V
Current max.	1.5 A	1.5 A	0.7 A	0.7 A	0.7 A

Wiring diagram

Carefully ensure that wiring is accomplished as illustrated below, because incorrect wiring will result in inadequate or reverse rotation.

Fig. 7 • Wiring diagram

Stator IGBT PCB [28]

Insert the earth terminal here among the housing rib, screw boss, and Stator IGBT PCB [28].

Push the connector cable and internal wire into the wiring groove for internal wires.

Push the connector cable and internal wire into a gap between the Switch [32] and housing (A).

Housing (A)

Switch [32]

Be careful not to pinch the connector cable and internal wire with the screw boss.

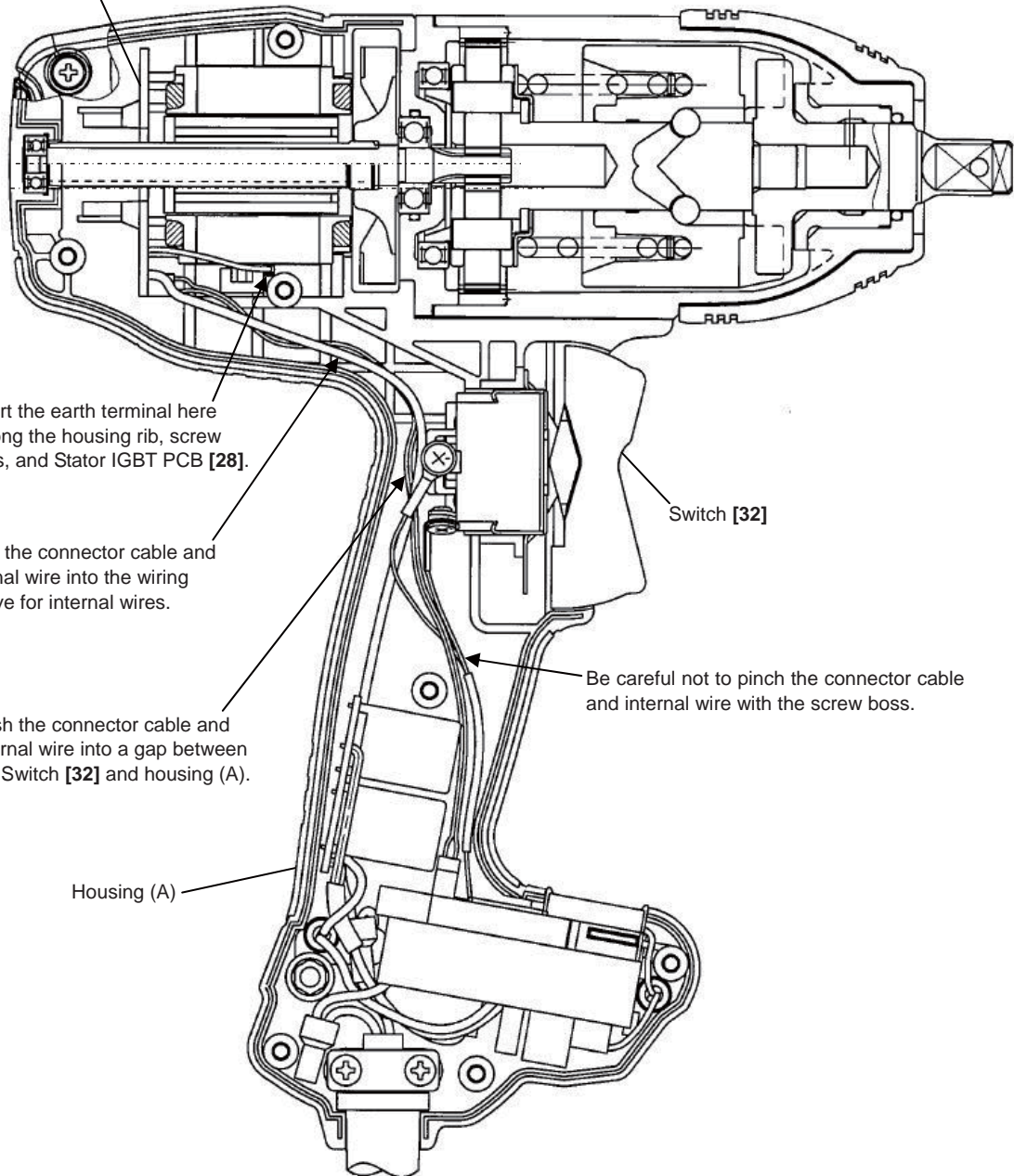
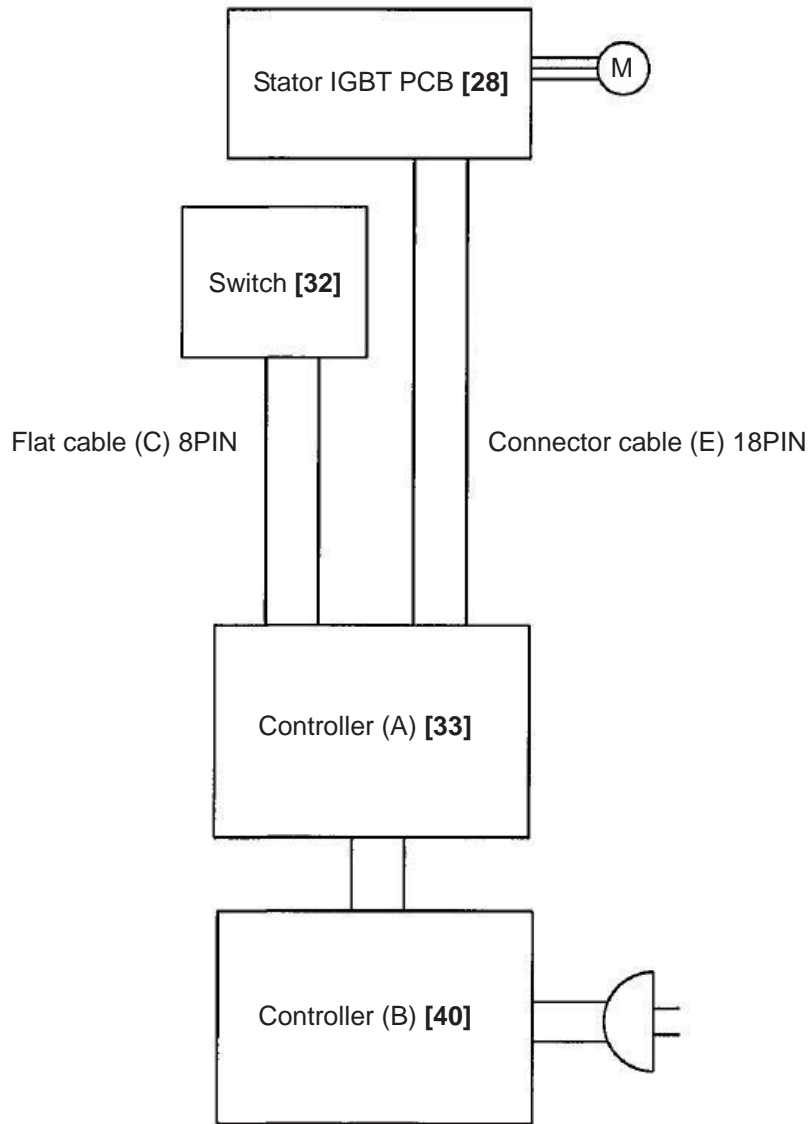


Fig. 8 • Connecting diagram



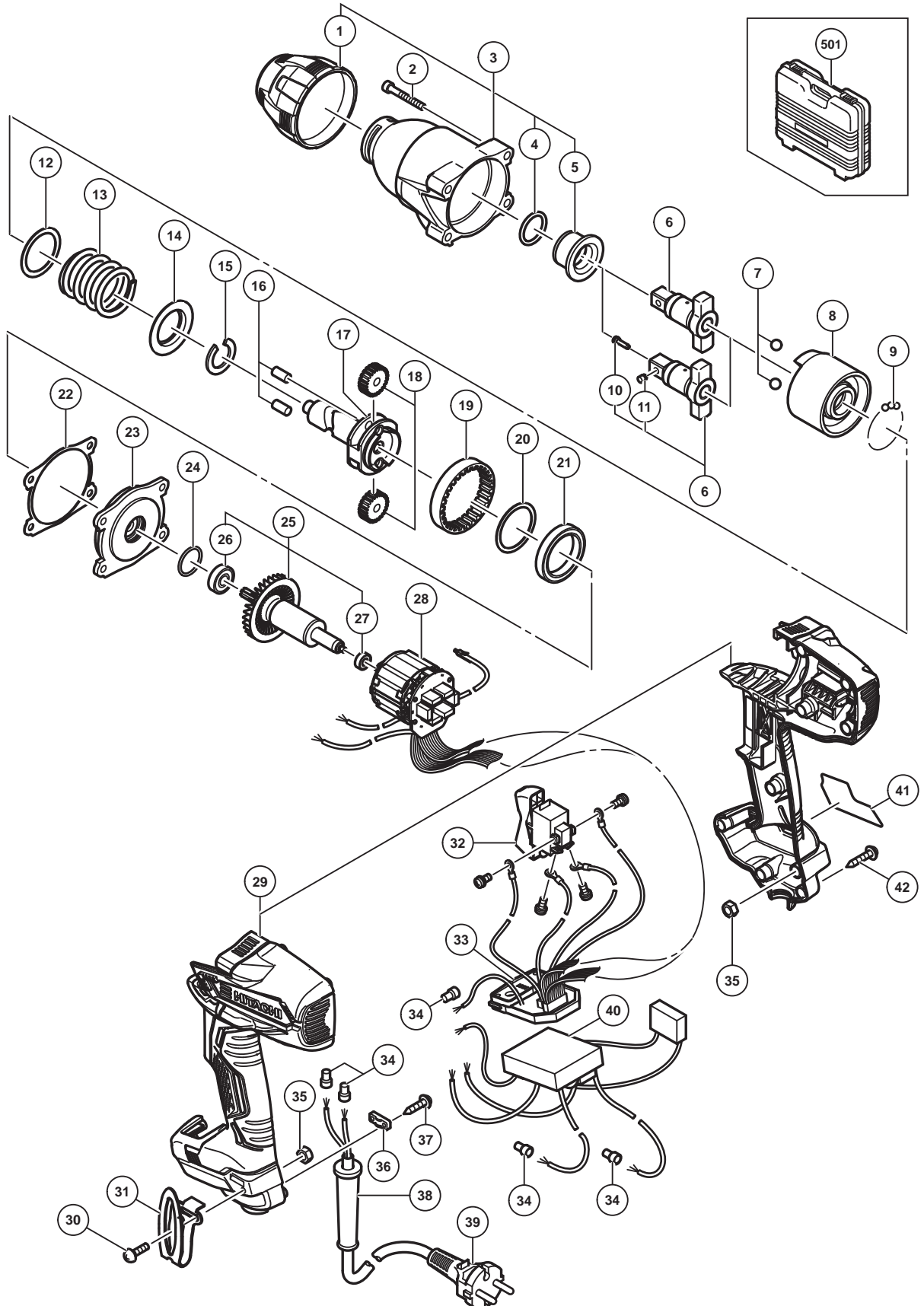
STANDARD REPAIR TIME (UNIT) SCHEDULE

MODEL	Variable		10	20	30	40	50	60 min.
	Fixed							
WR 16SE		Work Flow						
				Switch Controller (A) Controller (B) Cord Cord Armor	Rotor Ass'y Ball Bearing (608DD) Ball Bearing (624DD) Inner Cover (A) Ball Bearing (6807)	Housing (A).(B) Set Stator IGBT PCB		
	General Assembly				Hammer (A) Steel Ball D6.35 Steel Ball D3.97 Hammer Spring (A) Stopper (A)	Spindle (A) Idle Gear Set Needle Roller		
					Hammer Case Ass'y O-ring (M) Anvil (L) Ring Gear			

ELECTRIC TOOL PARTS LIST

■ **IMPACT WRENCH**
Model WR 16SE

2014-9-10
(E1)



PARTS

WR 16SE

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
1	337721	BUMPER (A)	1	
2	323753	SEAL LOCK HEX. SOCKET HD. BOLT M5 X 35	4	
3	337195	HAMMER CASE ASS'Y	1	INCLUD.1,4,5
4	318704	O-RING (M)	1	
5	323766	METAL	1	
* 6	334341	ANVIL (L)	1	TYPE FOR W/O PLUNGER(A),PIN RETAINER(A)
* 6	334342	ANVIL (L) ASS'Y	1	INCLUD.10,11 TYPE FOR W/PLUNGER (A), PIN RETAINER (A)
7	959150	STEEL BALL D6.35 (10 PCS.)	2	
8	337197	HAMMER (A)	1	
9	959155	STEEL BALL D3.97 (10 PCS.)	29	
* 10	323542	PIN RETAINER (A)	1	FOR FRA,FRG,ESP,ITA,RUS,USA,CAN
* 11	323541	PLUNGER (A)	1	FOR FRA,FRG,ESP,ITA,RUS,USA,CAN
12	317525	WASHER (B)	1	
13	337198	HAMMER SPRING (A)	1	
14	317521	WASHER (A)	1	
15	337201	STOPPER (A)	1	
16	985169	NEEDLE ROLLER	2	
17	337196	SPINDLE (A)	1	
18	323785	IDLE GEAR SET (2 PCS.)	2	
19	323786	RING GEAR	1	
20	337199	WASHER (C)	1	
21	337733	BALL BEARING 6807	1	
22	337698	PACKING (A)	1	
23	337200	INNER COVER (A)	1	
24	887302	O-RING (I.D 21.5)	1	
25	337203	ROTOR ASS'Y	1	INCLUD.26,27
26	608DDM	BALL BEARING 608DDC2PS2L	1	
27	333784	BALL BEARING 624DD	1	
* 28	340881	STATOR IGBT PCB 100V-120V	1	
* 28	340882	STATOR IGBT PCB 220V-240V	1	
29	337734	HOUSING (A).(B) SET	1	
30	327001	TRUSS HD. SCREW M4 (BLACK)	1	
31	335724	HOOK	1	
32	337202	SWITCH	1	
* 33	337700	CONTROLLER (A) 110V	1	
* 33	337701	CONTROLLER (A) 120V	1	
* 33	337702	CONTROLLER (A) 220V-230V	1	
* 33	337703	CONTROLLER (A) 240V	1	
34	959140	CONNECTOR 50091 (10 PCS.)	5	
35	327002	LOCK NUT M4 (BLACK)	2	
36	937631	CORD CLIP	1	
37	984750	TAPPING SCREW (W/FLANGE) D4 X 16	2	
* 38	953327	CORD ARMOR D8.8	1	
* 38	938051	CORD ARMOR D10.1	1	
* 39	500247Z	CORD	1	(CORD ARMOR D8.8)
* 39	500439Z	CORD	1	(CORD ARMOR D8.8) FOR AUS,NZL
* 39	500240Z	CORD	1	(CORD ARMOR D8.8) FOR USA,CAN
* 39	500450Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (230V)
* 39	500461Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (110V)

PARTS

WR 16SE

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
* 39	500423Z	CORD	1	(CORD ARMOR D8.8) FOR UAE (230V-240V)	
* 39	500470Z	CORD	1	(CORD ARMOR D8.8) FOR UAE (110V)	
* 39	500201Z	CORD	1	(CORD ARMOR D10.1) FOR THA	
* 39	500234Z	CORD	1	(CORD ARMOR D8.8) FOR VIE	
* 39	500456Z	CORD	1	(CORD ARMOR D8.8) FOR CHN	
* 39	500435Z	CORD	1	(CORD ARMOR D8.8) FOR HKG	
* 40	337205	CONTROLLER (B) 100V-120V	1		
* 40	337206	CONTROLLER (B) 220V-240V	1		
41		NAME PLATE	1		
42	301653	TAPPING SCREW (W/FLANGE) D4 X 20 (BLACK)	8		

STANDARD ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501	337704	CASE	1		

OPTIONAL ACCESSORIES

WR 16SE

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS
601		CORNER ATTACHMENT EW-14R	1	INCLUD.602-618
602	955300	HOUSING	1	
603	955301	METAL	3	
604	955302	SPINDLE	1	
605	945251	HITACHI LABEL	1	
606	955303	BEARING RACE	2	
607	955304	NEEDLE THRUST BEARING (NTA-1413)	2	
608	955305	COVER	1	
609	955306	NEEDLE BEARING (NTN BK1012)	1	
610	948227	RETAINING RING FOR D47 HOLE	1	
611	955307	PINION	1	
612	955308	SLEEVE	1	
613	955309	WASHER	1	
614	955310	SOCKET COVER	1	
615	955311	SOCKET	1	
616	303247	SEAL LOCK HEX. SOCKET HD. BOLT M5 X 25	6	
617	873537	SOCKET PIN	1	
618	873187	O-RING (J1SW1516)	1	
619	986062	UNIVERSAL JOINT ASS'Y	1	INCLUD.620,621
620	873537	SOCKET PIN	1	
621	873187	O-RING (J1SW1516)	1	
622	873536	HEX. SOCKET ASS'Y 17MM X 32L	1	INCLUD.620,621
623	873624	HEX. SOCKET ASS'Y 19MM X 34L	1	INCLUD.620,621
624	873626	HEX. SOCKET ASS'Y 21MM X 36L	1	INCLUD.620,621
625	873627	HEX. SOCKET ASS'Y 22MM X 40L	1	INCLUD.620,621
626	873628	HEX. SOCKET ASS'Y 23MM X 40L	1	INCLUD.620,621
627	873629	HEX. SOCKET ASS'Y 24MM X 40L	1	INCLUD.620,621
628	873630	HEX. SOCKET ASS'Y 26MM X 40L	1	INCLUD.620,621
629	985195	HEX. SOCKET ASS'Y 27MM X 40L	1	INCLUD.620,621
630	985196	HEX. SOCKET ASS'Y 30MM X 50L	1	INCLUD.620,621
631	873633	EXTENSION BAR ASS'Y (SQUARE) 12.7MM X 100L	1	INCLUD.620,621
632	955138	HEX. SOCKET ASS'Y (LONG) 12MM X 52L	1	INCLUD.620,621
633	955139	HEX. SOCKET ASS'Y (LONG) 13MM X 52L	1	INCLUD.620,621
634	955140	HEX. SOCKET ASS'Y (LONG) 14MM X 52L	1	INCLUD.620,621
635	955141	HEX. SOCKET ASS'Y (LONG) 17MM X 52L	1	INCLUD.620,621
636	955142	HEX. SOCKET ASS'Y (LONG) 19MM X 52L	1	INCLUD.620,621
637	955143	HEX. SOCKET ASS'Y (LONG) 21MM X 52L	1	INCLUD.620,621
638	955144	HEX. SOCKET ASS'Y (LONG) 22MM X 52L	1	INCLUD.620,621
639	955146	HEX. SOCKET ASS'Y (LONG) 24MM X 52L	1	INCLUD.620,621
640	955149	HEX. SOCKET ASS'Y (LONG) 17MM X 75L	1	INCLUD.620,621
641	955150	HEX. SOCKET ASS'Y (LONG) 19MM X 75L	1	INCLUD.620,621
642	955151	HEX. SOCKET ASS'Y (LONG) 21MM X 75L	1	INCLUD.620,621
643	955147	HEX. SOCKET ASS'Y (LONG) 26MM X 75L	1	INCLUD.620,621
644	985197	HEX. SOCKET ASS'Y (LONG) 30MM X 75L	1	INCLUD.620,621
645	955153	UNIVERSAL JOINT PIN	1	