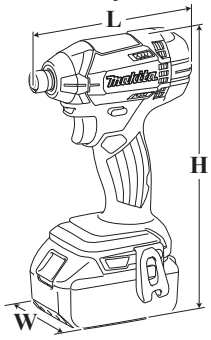
TECHNICAL INFORMATION

Model No. ► DTD152
Description ► Cordless Impact Driver



Dimensions: mm (")	
Length (L)	137 (5-3/8)
Width (W)	79 (3-1/8)
Height (H)	220 (8-5/8)*1
	238 (9-3/8)*2

*1 With Battery BL1815/ BL1815N/ BL1820
*2 With Battery BL1830/ BL1840/ BL1850

CONCEPT AND MAIN APPLICATIONS

Model DTD152 is a cordless impact driver powered by 18V Li-ion battery and developed for main applications such as tightening of self-drilling screws or light duty machine screws.
The main features and benefits are:
• High rotational speed: 2,900 rpm^{-1}
• Compact and lightweight design

This product is compatible with the following 18V Li-ion batteries:
BL1815 (1.3Ah)/ BL1815N (1.5Ah)/ BL1820 (2.0Ah)/
BL1830 (3.0Ah)/ BL1840 (4.0Ah)/ BL1850 (5.0Ah)

► Specification

Specification / Model		DTD152
Battery	Voltage: V	18
	Capacity: Ah	1.3, 1.5, 2.0, 3.0, 4.0, 5.0
	Energy capacity: Wh	24, 27, 36, 54, 72, 90
	Cell	Li-ion
	Charging time (approx): min	15, 15, 24, 22, 36, 45 with DC18RC
Max output (W)		240
Driving shank		6.35mm (1/4") Hex
Capacities	Machine screw	M4 - M8 (5/32 - 5/16")
	Standard bolt	M5 - M16 (3/16 - 5/8")
	High strength bolt	M5 - M12 (3/16 - 1/2")
	Coarse-thread	22 - 125mm (7/8 - 4-7/8")
Impacts per minute: min^{-1}= ipm		0 - 3,500
No load speed: min^{-1}= rpm		0 - 2,900
Max. tightening torque*3: N·m [kgf·cm] (in·lbs)		165 [1,680] (1,460)
Electric brake		Yes
Variable speed control by trigger		Yes
Reverse switch		Yes
LED job light		Yes
Weight according to EPTA-Procedure 01/2003: kg (lbs)		1.3 (2.8)*1 or 1.5 (3.3)*2

*3 Tightening torque at 3 seconds after seating, when tightening M14 (grade 10.9) high strength bolt.

► Standard equipment

Belt clip
Battery*4, Battery cover*5
Charger*4, Plastic carrying case*4,

*4 Battery, charger and plastic carrying case are not supplied with "Z" model.
*5 Supplied with the same quantity of extra Battery.
Note: The standard equipment may vary by country or model variation.

► Optional accessories

Socket bits
Drill chucks
Drill bits with 6.35mm Hex shank
Hole saws for impact driver
Bit piece
Stopper for impact driver
Hook set (Belt clip)
Battery protectors

Li-ion Battery BL1815
Li-ion Battery BL1815N
Li-ion Battery BL1820
Li-ion Battery BL1830
Li-ion Battery BL1840
Li-ion Battery BL1850

Charger DC18SD
Charger DC24SC
Fast charger DC18RC
Automotive charger DC18SE
Four Port Charger DC18SF
Two Port Fast charger DC18RD

CONTENTS

1. EXPLODED DIAGRAM

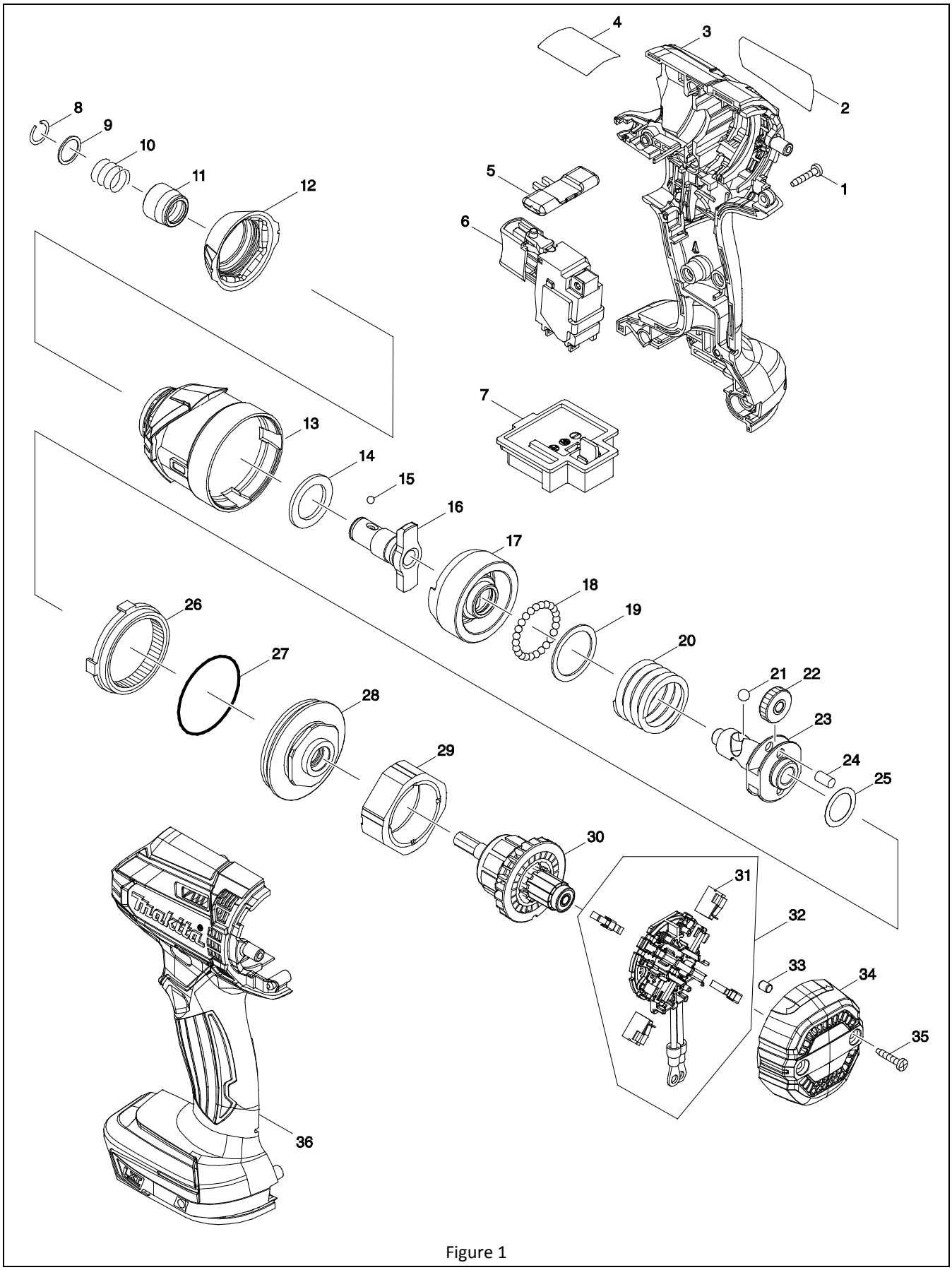


Figure 1

2. ABOUT THIS MANUAL

The number in the parenthesis () is the item number on the exploded diagram (*Figure 1*).

3. REPAIR

Repair the machine in accordance with “Instruction manual” or “Safety instructions”.

3.1. NECESSARY REPAIRING TOOLS

Code No.	Description	Use for
1R003	Retaining ring pliers ST-2N	removing Ring spring 11 (8)
1R040	Armature holder 50 set for use with Vise	removing / assembling Hammer case complete (13)
1R045	Gear extractor (large)	disassembling Hammer section (17-25)
1R212-A	Tip for retaining ring pliers	use with 1R003 in order to remove/ assemble Ring spring 11 (8)
1R212-B	Plate set (with screws)	
1R223	Torque wrench shaft 20-90N·m	assembling Hammer case complete (13)
1R224	Ratchet head 12.7	attaching to 1R223, when assembling Hammer case complete (13)
1R232	Pipe 30	removing Bit sleeve (11)
1R288	Screwdriver magnetizer	removing Steel balls
-	Socket 30-78	use with 1R223 and Extension bar in order to remove/ assemble Hammer case section (8-28)
-	Socket 32-50	removing/ assembling Hammer case section (8-28)
-	Extension bar (Square drive: 12.7 mm)	removing Hammer case section (8-28)

3.2. LUBRICANT AND ADHESIVE APPLICATION

Apply the following lubricants to protect parts and product from unusual abrasion.

Item No.	Description	Portion to lubricate	Lubricant		Amount
13	Hammer case complete	Inside of Sleeve 14 which touches Anvil (16)	Makita grease FA. No.2		a little
16	Anvil	Hole into which Spindle (23) top is inserted			
18	Steel ball 3.5 (24pcs.)	Whole portion			
21	Steel ball 5.6 (2pcs.)	Whole portion	Seal lubricant No.101		
23	Spindle	(a) Hole into which Armature's drive end is inserted to engage Spur gear 22 (22)	Makita grease FA. No.2		2g
		(b) Drum portion			a little

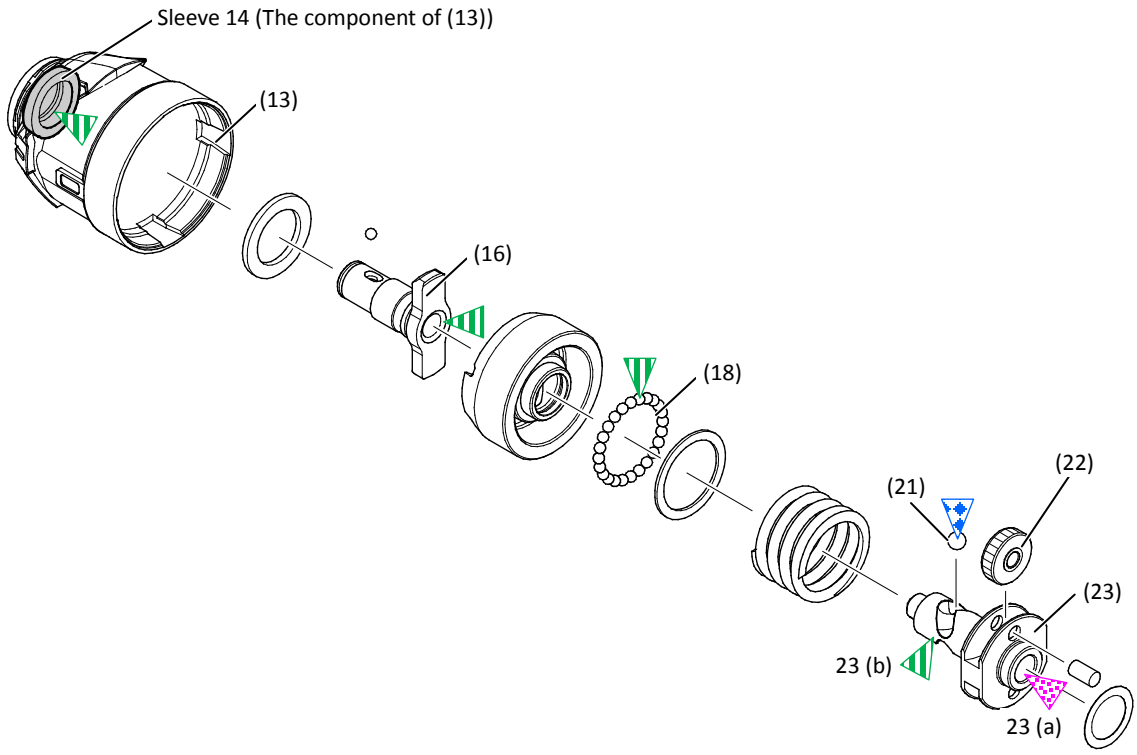


Figure 2

3.3. DISASSEMBLY/ASSEMBLY

3.3.1. HAMMER CASE COMPLETE

3.3.1.1. DISASSEMBLING

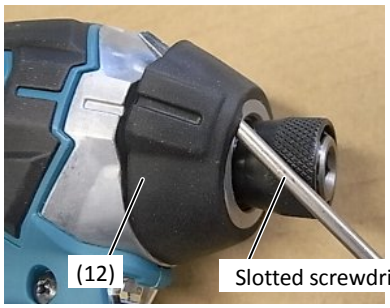


Figure 3

1. Remove Bumper (12) with a small slotted screwdriver.

Figure 4

2. Loosen ten 3x16 tapping screws (35) and remove Rear cover (34) and Housing R (36).

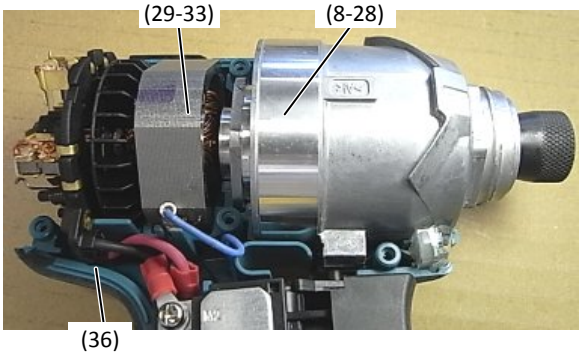


Figure 5

3. Remove Hammer case section (8-28) together with Motor section (29-33) from Housing L (36).

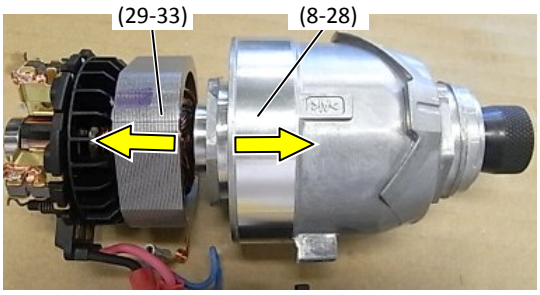


Figure 6

4. Remove Hammer case section (8-28) from Motor section (29-33).

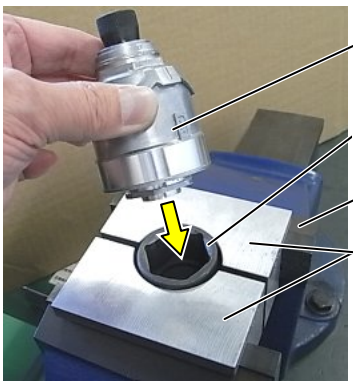


Figure 7

5. Fix Socket 32-50 with two 1R040 and Vise.
6. Set Hammer case section (8-28) to Socket 32-50.

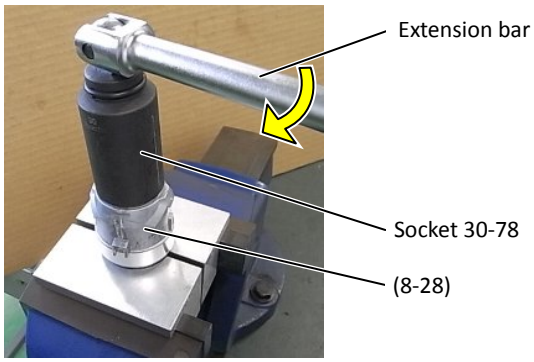


Figure 8

7. Turn clockwise Hammer case section (8-28) with Socket 30-78 and Extension bar to loosen it.

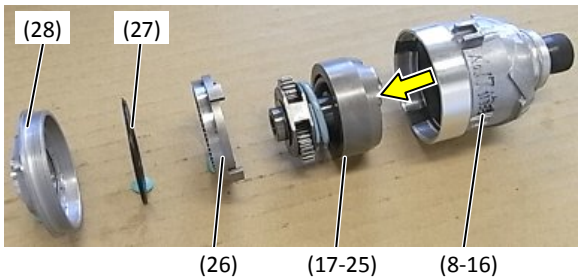


Figure 9

8. Hammer case complete can be disassembled as shown in the figure on the left:

- Bearing box complete (28)
- O ring 40 (27)
- Internal gear 51 (26)
- Hammer section (17-25)
- Hammer case complete section (8-16)

3.3.1.2. ASSEMBLING

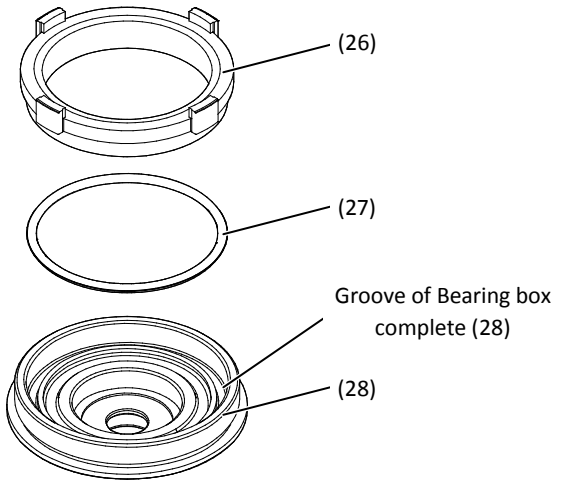


Figure 10

1. Put O ring 40 (27) into the groove of Bearing box complete (28).
2. Put the small diameter portion of Internal gear 51 (26) on O ring 40 (27) in Bearing box complete (28).

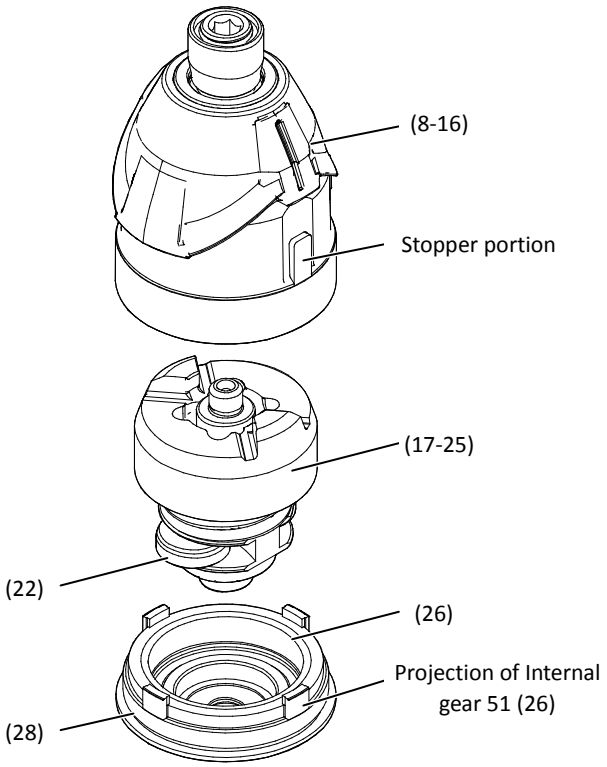


Figure 11

3. While engaging Spur gear 22 (22) with Internal gear 51 (26), set Hammer section (17-25) in place.
4. Align the stopper portion of Hammer case complete section (8-16) with either one of the 4 projections of Internal Gear 51 (26), then put Hammer case complete section (8-16) on Bearing box complete (28).

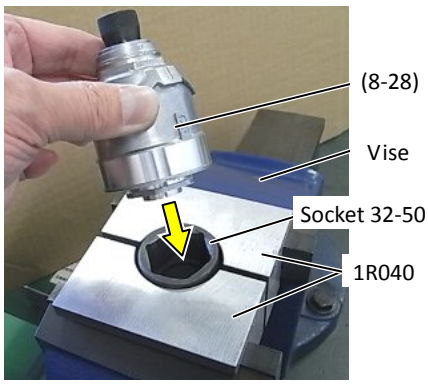


Figure 12

5. Fix Socket 32-50 with two 1R040 and Vise.
6. Set Hammer case section (8-28) to Socket 32-50.

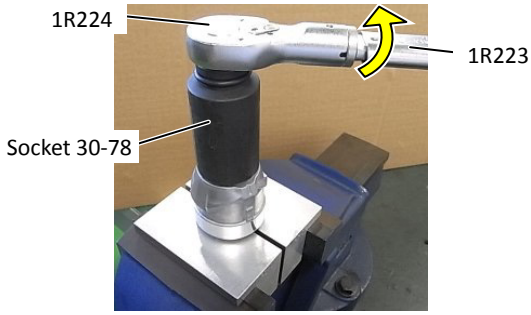


Figure 13

7. Turn 1R223 counterclockwise.

Note: The fastening torque must be 45 to 55 N·m. (460 ~ 560 kgf·cm)

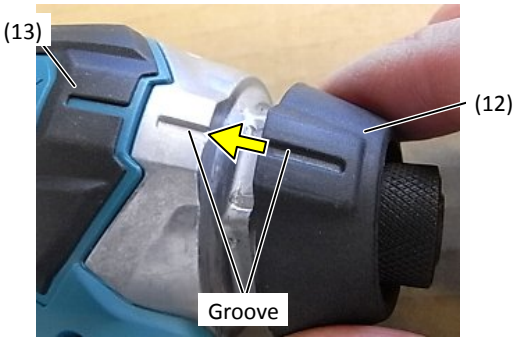


Figure 14

8. Assemble Bumper (12) to Hammer case complete (13) while aligning each groove.

3.3.2. ARMATURE

3.3.2.1. DISASSEMBLING

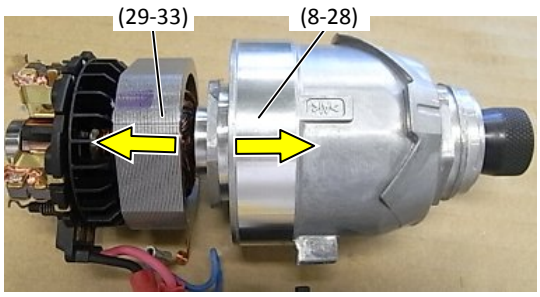


Figure 15

1. Remove Hammer case section (8-28) from Motor section (29-33). (See *Figure 15*)

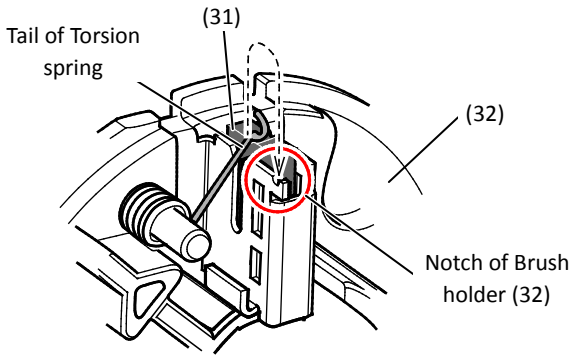


Figure 16

2. Shift the tail of Torsion spring from the top of Carbon brush (31) to the Notch of Brush holder complete (32). Carbon brush (31) gets free from the pressure of Torsion spring.

Note: When shifting Torsion spring's tail, hold Torsion spring not to fall off from Brush holder complete (32).

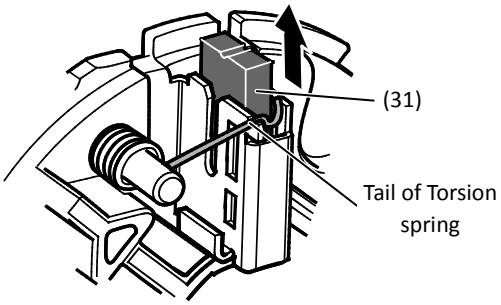


Figure 17

3. Disconnect Carbon brush (31) from the commutator of Armature (30) by pulling it up.

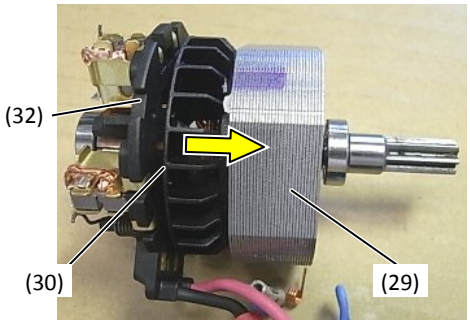


Figure 18

4. Disassemble Armature (30) and Yoke unit (29) from Brush holder complete (32).

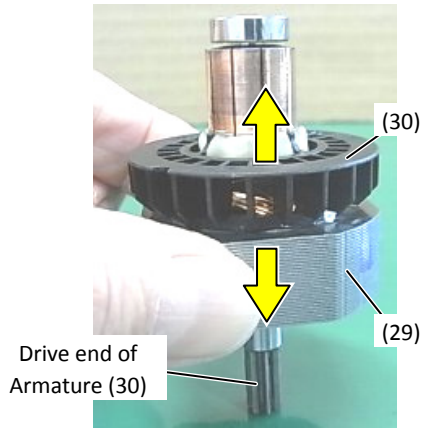


Figure 19

5. Press the drive end of Armature (30) to a workbench to separate Armature (30) from Yoke unit (29).

3.3.2.2. ASSEMBLING

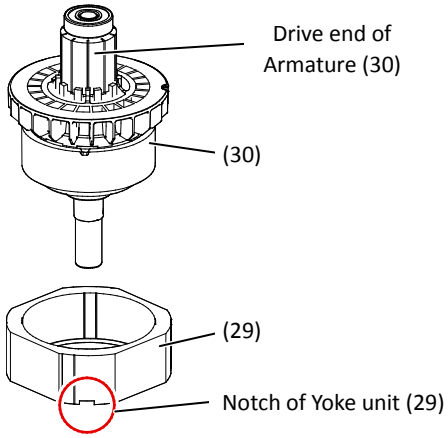


Figure 20

1. Face the notch of Yoke unit (29) to the drive-end side of Armature (30).

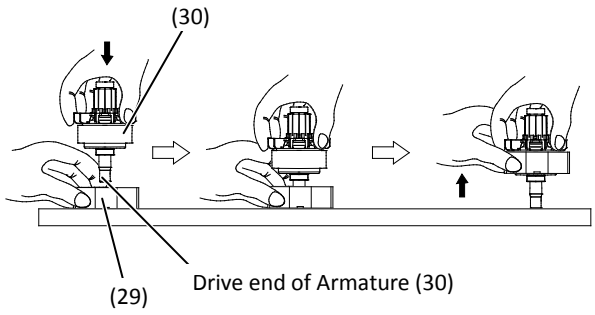


Figure 21

2. While holding Yoke unit (29) on a workbench, insert Armature (30) into Yoke unit (29) slowly until the drive end of Armature reaches workbench.
3. When the drive end of Armature (30) reaches a workbench, lift up Yoke unit (29) slowly.

Note:

- Do not pinch your finger between Armature fan and Yoke unit (29).
- Insert Armature (30) into Yoke unit (29) carefully so that its wire is not damaged.

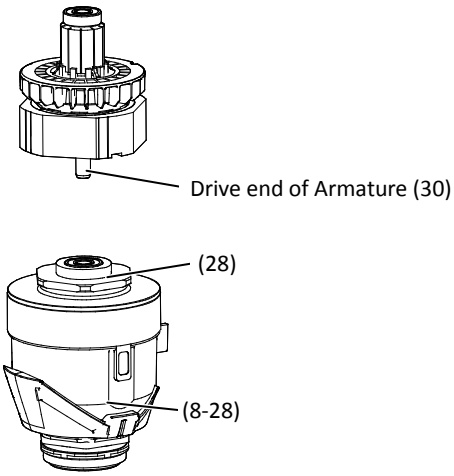


Figure 22

4. Insert the drive end of Armature (30) into Bearing box complete (28) while engaging the drive end of Armature (30) with Spur gears in Hammer case section (8-28) to rotate them smoothly.

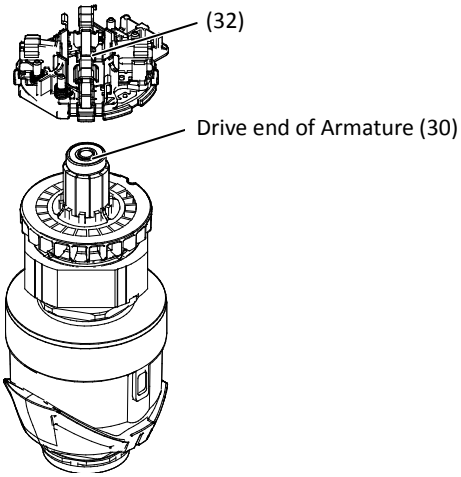


Figure 23

5. Assemble Brush holder complete (32) to the drive end of Armature (30).

Note:

(1) When assembling Brush holder complete (32) to the drive end of Armature (30), Carbon brush (31) must not be locked with the pressure of Torsion spring.
(See *Figure 17*)

(2) When assembling a new Brush holder complete, see *6. Assembly of Brush holder complete to Armature*.

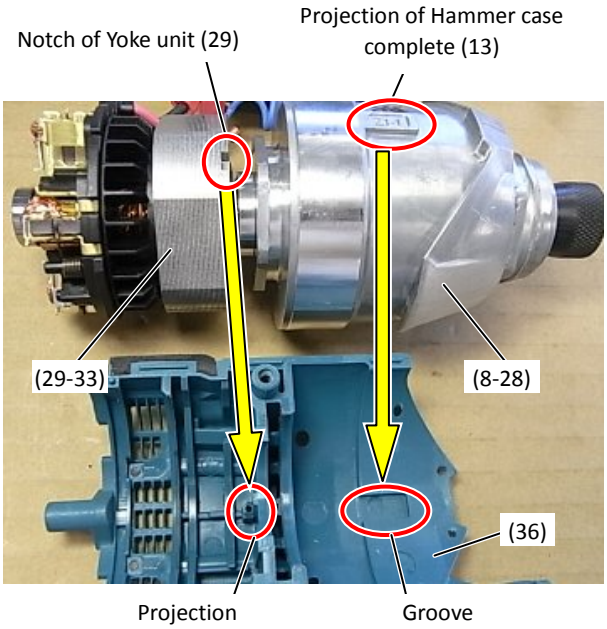


Figure 24

6. Mount Hammer case section (8-28) and Motor section (29-33) to Housing L (36) while checking the following points:

- align the notch of Yoke unit (29) with the projection of Housing L (36)
- align the projection of Hammer case complete (13) with the groove of Housing L (36)

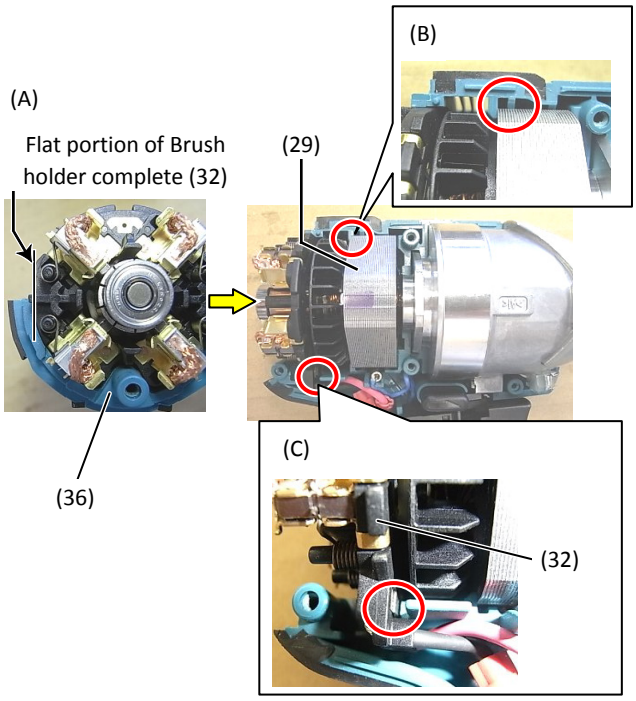


Figure 25

7. Check the followings to make sure that Brush holder complete (32) and Yoke unit (29) are properly mounted to Housing L (36):

(A) The flat portion of Brush holder complete (32) must be vertical against Housing L (36).

(B) After setting Yoke unit (29) to Housing L (36), fit the side of Yoke unit (29) to the rib of Housing L (36).

(C) After setting Yoke unit (29) to Housing L (36), fit the side of Brush holder complete (32) to the rib of Housing L (36).

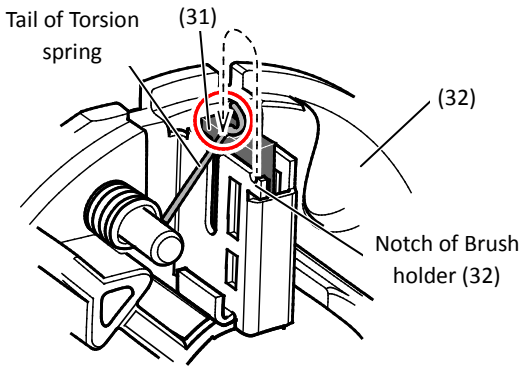


Figure 26

8. Insert Carbon brush (31) into Brush holder complete (32). Shift the tail of Torsion spring from the Notch of Brush holder complete (32) to the top of Carbon brush (31). Carbon brush (31) is locked with the pressure of Torsion spring.

Note: When shifting Torsion spring's tail, hold Torsion spring not to fall off from Brush holder complete (32).

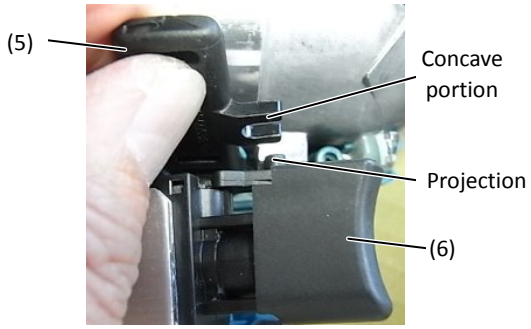


Figure 27

9. Fit the concave portion of F/R change lever (5) to the projection of Switch unit (6).

3.3.3. ANVIL

3.3.3.1. DISASSEMBLING

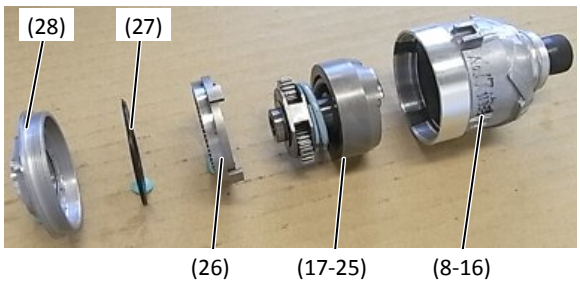


Figure 28

1. Remove Hammer case section (8-28) from Motor section (29-33). (See *Figure 6*)
2. Remove Bearing box complete (28), O ring 40 (27), Internal gear 51 (26), Hammer section (17-25) from Hammer case complete section (8-16). (See *Figure 7* to *Figure 9*)

Note: When repairing Bit holder section only, you need not to disassemble Hammer case section (8-28).

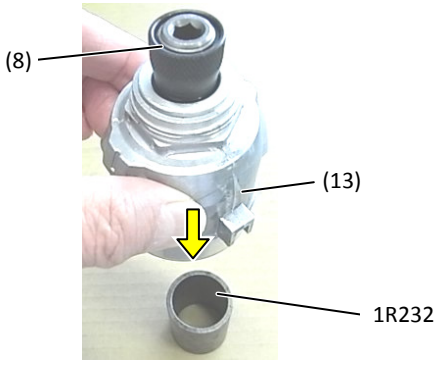


Figure 29

3. Use 1R232 for holding Anvil (16) inside of Hammer case complete (13) firmly for easy removal of Ring spring 11 (8).

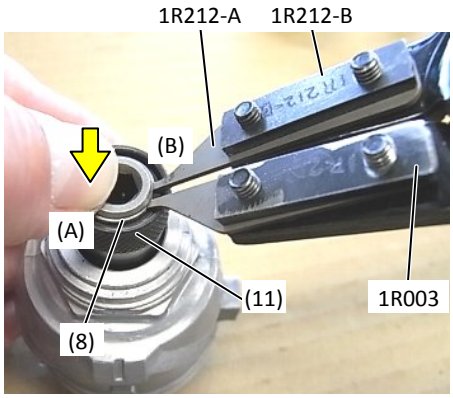


Figure 30

4. Remove Ring spring 11 (8) while checking the following points.

(A) Press the top of Bit sleeve (11) with a thumb so as not to pop out Compression spring 13 (10).

(B) Expand the end gap of Ring spring 11 (8) with 1R003, 1R212-B and 1R212-A.

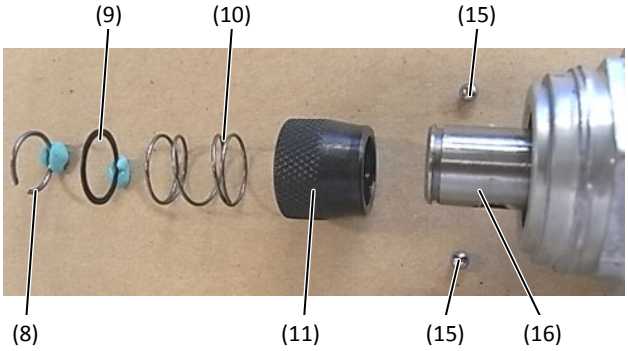


Figure 31

5. Bit holder section can be disassembled as shown in the figure on the left:

- Ring spring 11 (8)
- Flat washer 12 (9)
- Compression spring 13 (10)
- Bit sleeve (11)
- Steel ball 3.5 (15) x 2
- Anvil (16)

3.3.3.2. ASSEMBLING

Assemble by reversing the disassembly procedure. (See *Figure 31*, *Figure 30*, *Figure 29*, *Figure 28*, *Figure 9*, *Figure 8*, *Figure 7*, *Figure 6*)

3.3.4. HAMMER SECTION

3.3.4.1. DISASSEMBLING

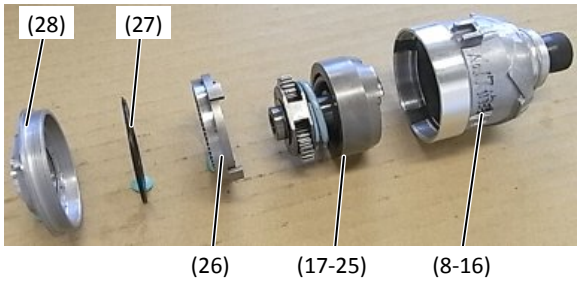


Figure 32

1. Remove Hammer case section (8-28) from Motor section (29-33). (See *Figure 32*)
2. Remove Bearing box complete (28), O ring 40 (27), Internal gear 51 (26), Hammer section (17-25), Hammer case complete section (8-16). (See *Figure 7* to *Figure 9*)

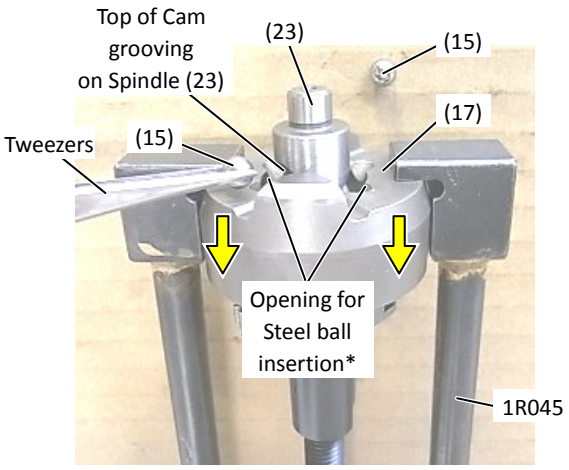


Figure 33

3. Set 1R045 to Hammer (17).
4. Pull Hammer (17) downward by turning 1R045 counterclockwise.
5. Align the opening for Steel ball insertion* with the top of Cam grooving on Spindle (23) by turning 1R045.
6. Remove two Steel balls 3.5 (15) with Tweezers or Magnetic screwdriver.
7. Turn 1R045 clockwise to release Hammer case section.

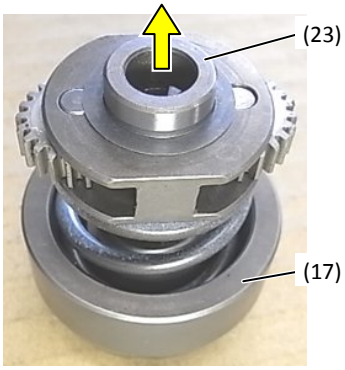


Figure 34

8. When removing Spindle (23) from Hammer (17), place Hammer (17) below so that Steel balls 3.5 (15) do not fall down.

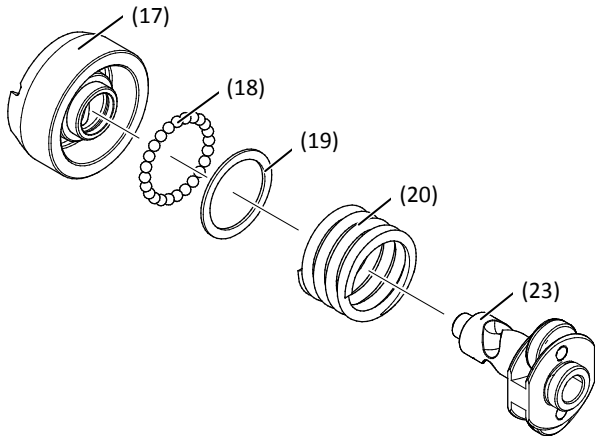


Figure 35

9. Hammer section (17-25) can be disassembled as shown in the figure on the left:
- Hammer (17)
- Steel ball 3.5 (18) (x24)
- Flat washer 24 (19)
- Compression spring 25 (20)
- Spindle (23)

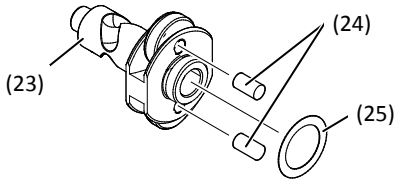


Figure 36

10. Remove Thin washer 15 (25) and two Pin 5 (24) from Spindle (23).

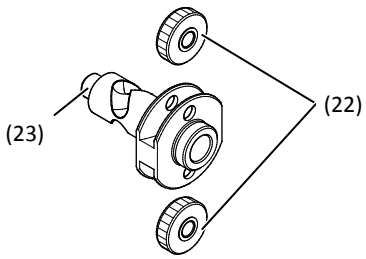


Figure 37

11. Remove two Spur gears 22 (22) from Spindle (23).

3.3.4.2. ASSEMBLING

Assemble by reversing the disassembly procedure. (See *Figure 37*, *Figure 36*, *Figure 35*, *Figure 34*, *Figure 33*, *Figure 32*)

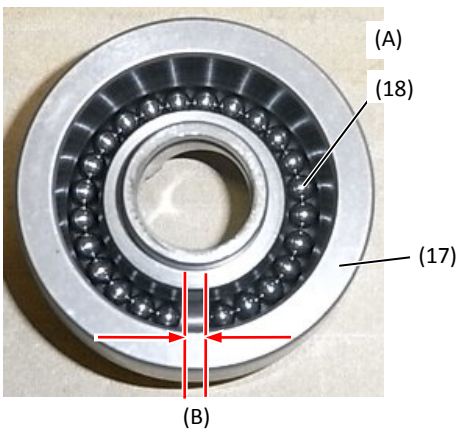


Figure 38

Note in Assembling:

Before assembling Steel balls 3.5 (18), check the following points:

(A) Twenty-four Steel balls 3.5 (18) are put in the groove of Hammer (17) as shown in the figure on the left.

(B) There is a gap equivalent to the size of one Steel ball 3.5 (18).

4. CIRCUIT DIAGRAM

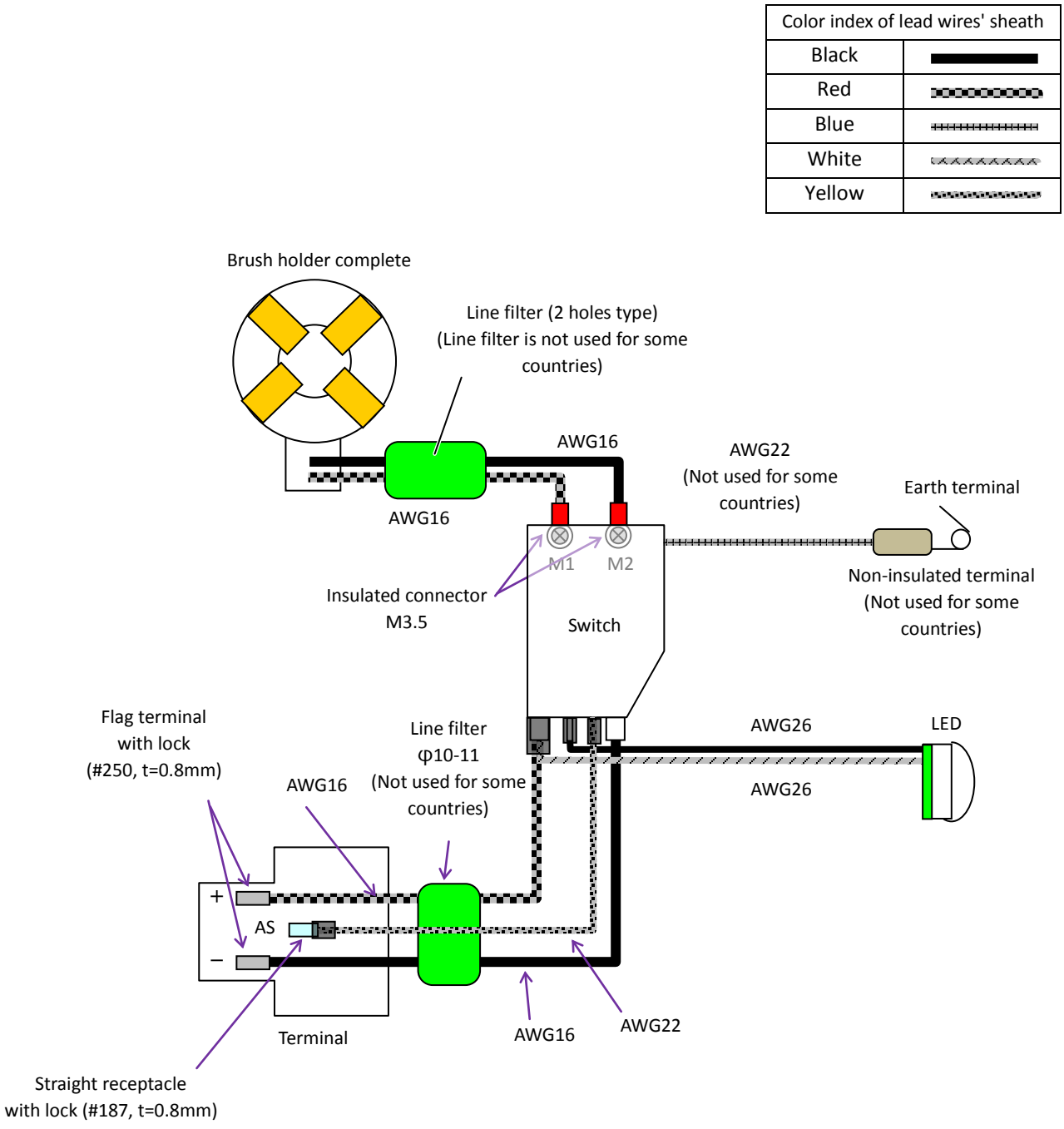


Figure 39

4.1. REPAIR OF LED CIRCUIT

- Use Non-insulated connector and Polyolefin tube (inner diameter: ø4.0mm) as shown below.

- When repairing, put terminals in the designated position shown in *Figure 48*. (Cut lead wires if necessary.)

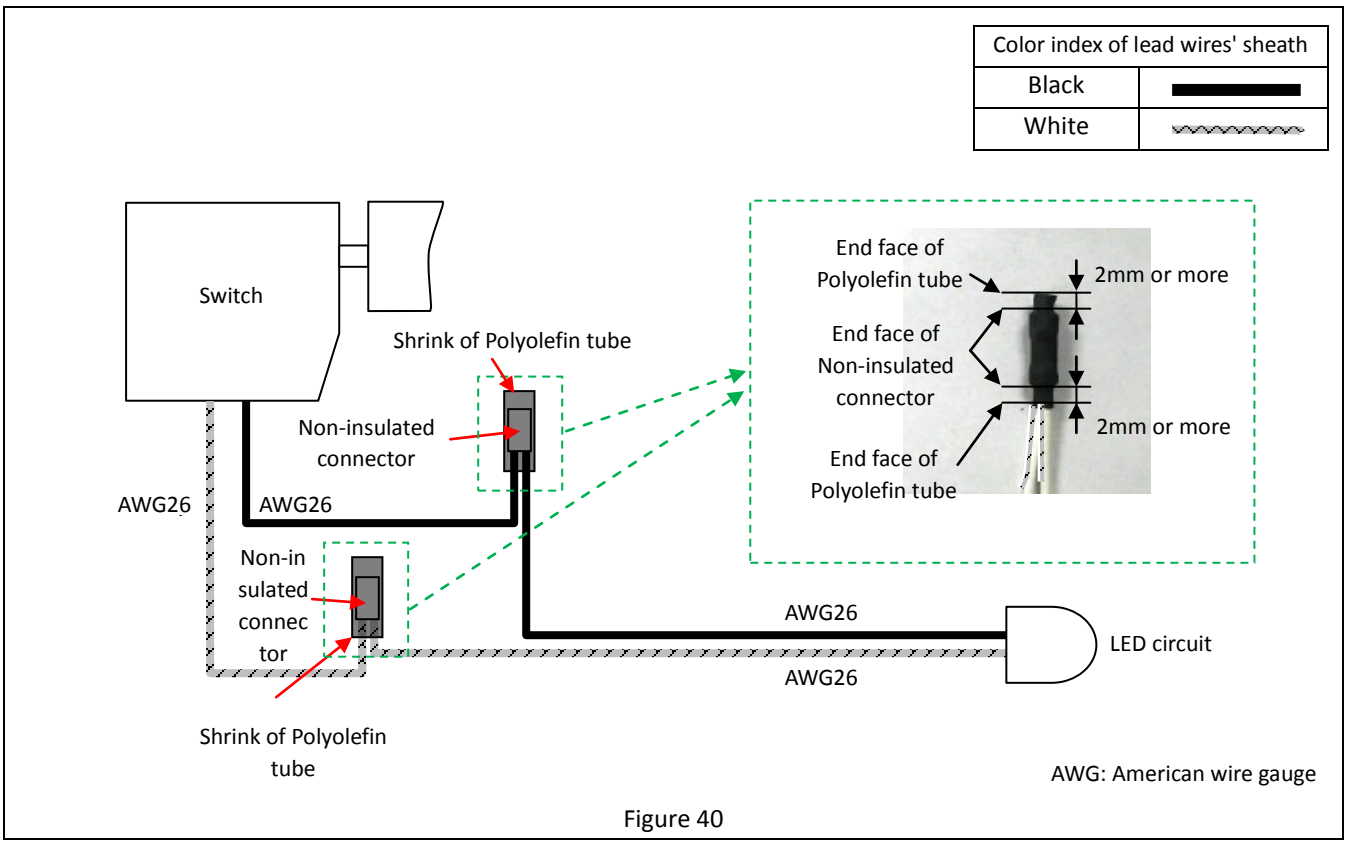


Figure 40

5. WIRING DIAGRAM

5.1. LED SECTION

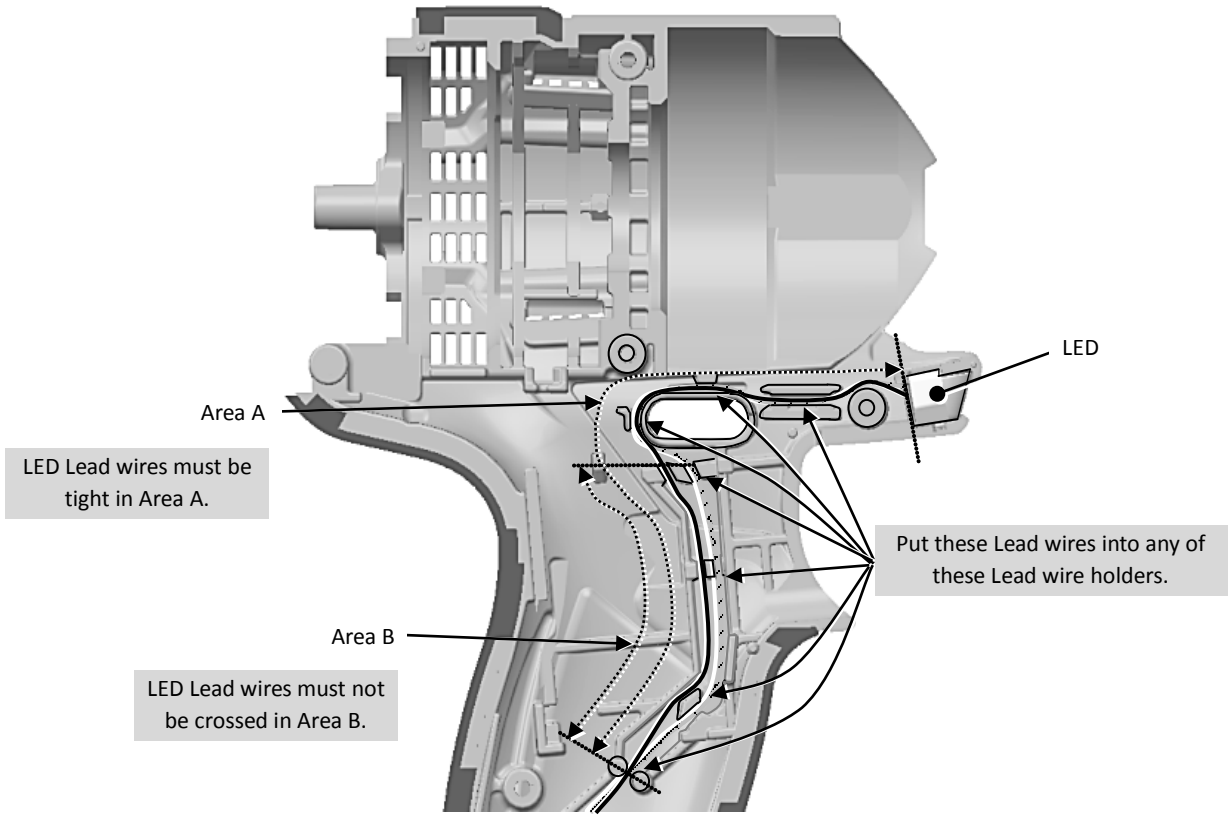


Figure 41

5.2. TERMINAL SECTION

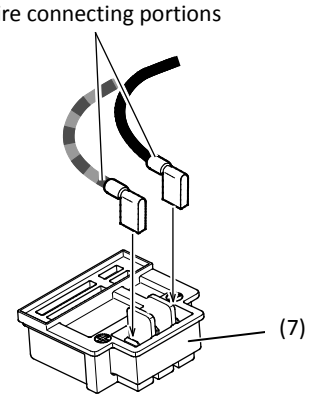


Figure 42

Connect Flag terminal so that the wire connecting portions face the center of Terminal (7).

5.3. SWITCH

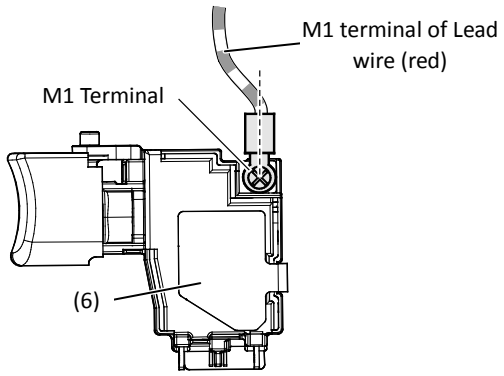


Figure 43

1. Connect M1 terminal of Lead wire (red) to Switch (6) vertically.

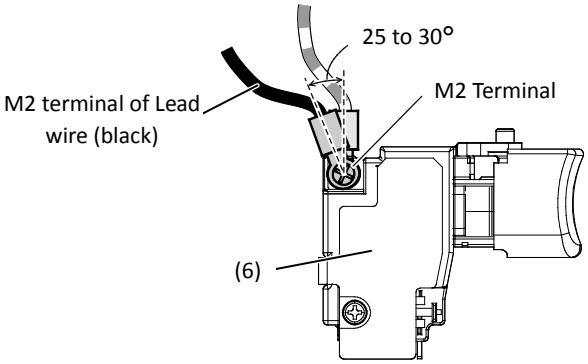


Figure 44

2. Connect M2 terminal of Lead wire (black) to Switch (6) with it tilted at 25 to 30° to the vertical as shown in the figure on the left.

Figure 45

3. M1 terminal must be connected to Switch as shown in the figure on the left.

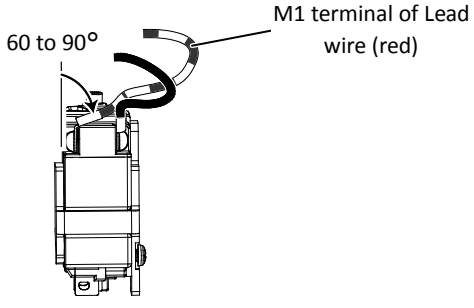


Figure 46

4. Bend M1 terminal of Lead wire (red) at the range of 60° to 90° as shown in the figure on the left.

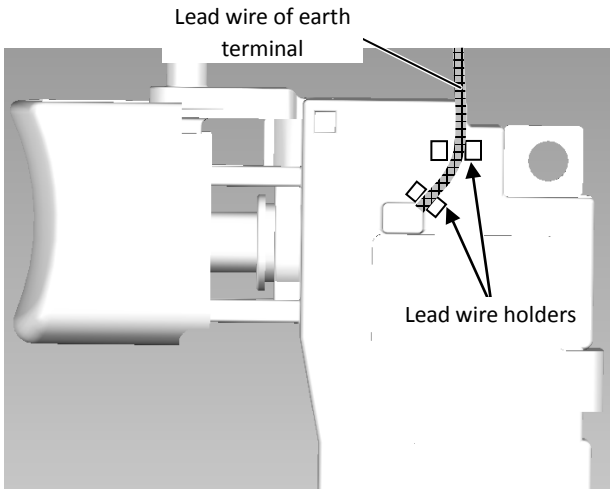


Figure 47

5. Put Lead wire of earth terminal (if used) into Lead wire holders.

5.4. HOUSING SECTION

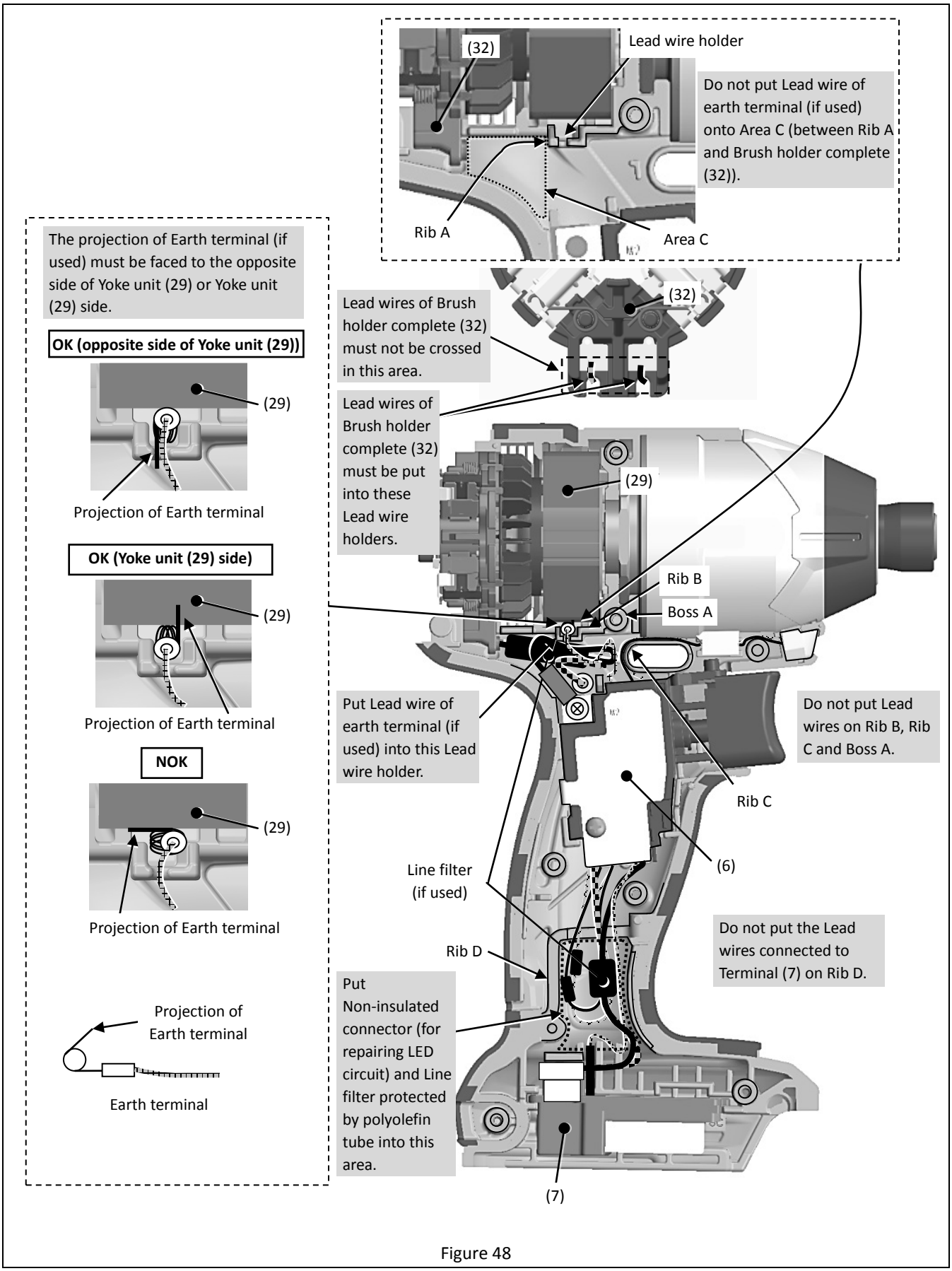


Figure 48

6. ASSEMBLY OF BRUSH HOLDER COMPLETE TO ARMATURE

6.1. OVERVIEW

This model's Brush holder complete (32) for repair has Spacer in its center part for easier repairing. (See *Figure 49*)

Follow the instructions below for assembling.

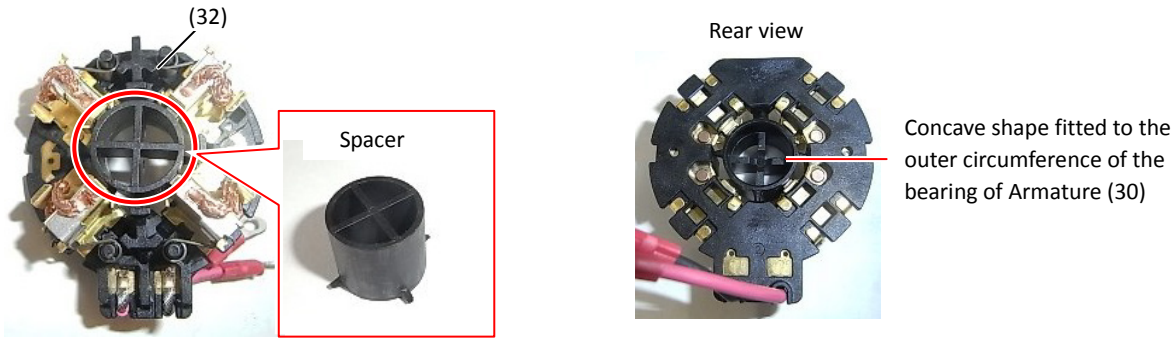


Figure 49

6.2. CAUTION

(1) If you remove Spacer before assembling Brush holder complete (32) to Armature (30), Carbon brush (31) comes out from Brush holder complete (32). This makes it difficult to assemble Armature (30). (See *Figure 50*)

(2) Carbon brushes may have breakage if they touch each other.

Figure 50

6.3. ASSEMBLING PROCEDURE

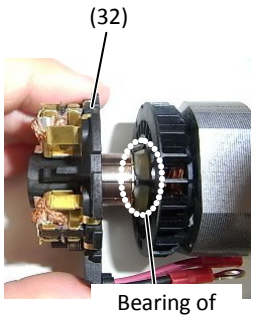


Figure 51

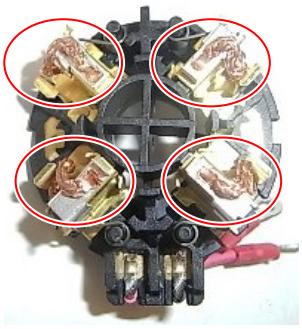


Figure 52

1. Insert the bearing of Armature (30) into the concave portion of Brush holder complete (32). (See *Figure 51*)

Note:

To prevent deformation of Metal portion, do not hold them while assembling. (See *Figure 52*)

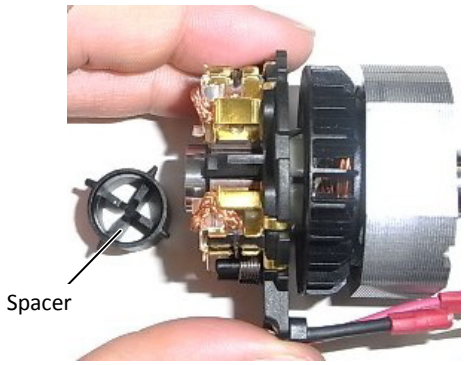


Figure 53

2. Spacer is removed by inserting Armature (30).

Note:

Dispose of the removed Spacer.

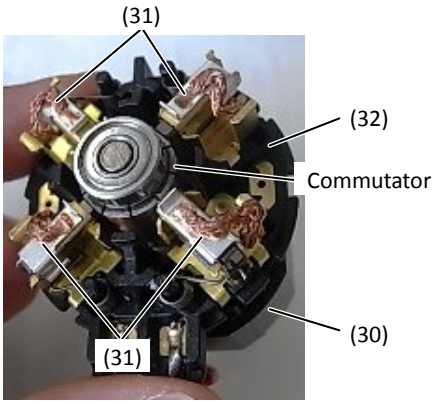


Figure 54

3. Armature (30) is assembled to Brush holder complete (32).

Note:

Make sure that each Carbon brush (31) touches Commutator.

7. ASSEMBLY OF CARBON BRUSH

Put Pigtail of Carbon brush in the area as shown below to avoid pinching.

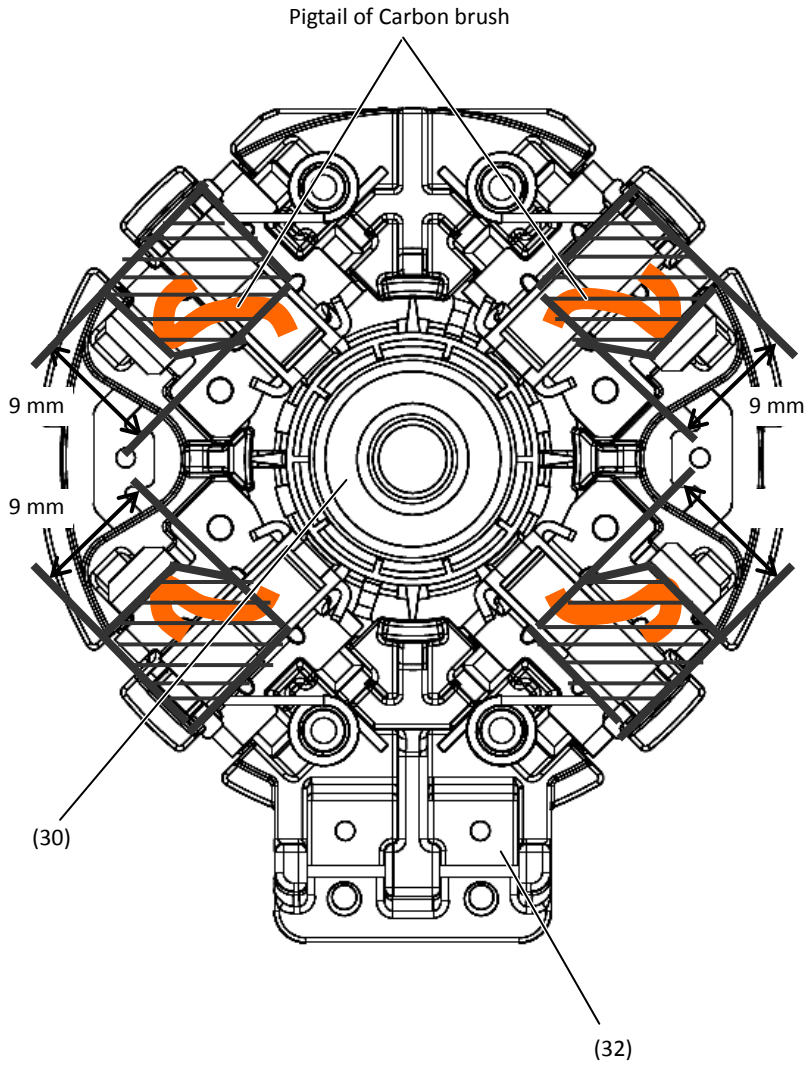


Figure 55