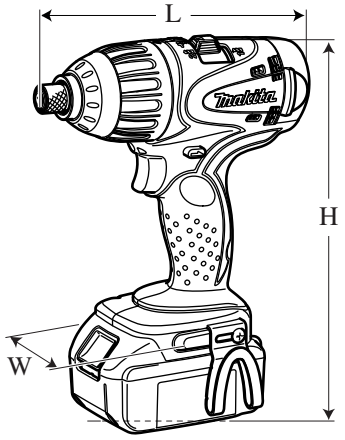
TECHNICAL INFORMATION

MAKSTAR makita PRODUCT

Models No. ► BTP140

Description ► Cordless 4 Mode Impact Driver



Dimensions: mm (")	
Length (L)	186 (7-3/8)
Width (W)	79 (3-1/8)
Height (H)	246 (9-11/16)

CONCEPT AND MAIN APPLICATIONS

Model BTP140 has been developed as the 18V sister tool to Model BTP130.
Uses BL1830, 18V slide-on type Li-ion battery as a power unit,
and features the same high performance and versatility as Model BTP130.

This new product is available in the following variations.

Model No.	Battery		Charger	Plastic carrying case
	type	quantity		
BTP140SFE BTP140*	BL1830	2	DC18SC	Yes
BTP140RFE	BL1830	2	DC18RA	Yes
BTP140Z	No		No	No

*Model name for USA, Canada, Mexico, Panama

► Specification

Battery	Voltage: V			18
	Capacity: Ah			3.0
	Cell			Li-ion
	Charging time: min.			approx. 45 with DC18SC approx. 22 with DC18RA
Max. fastening torque: N.m (in.lbs)	Impact-driver mode			140 (1,240)
	Drill mode		Soft joint	10 (88.5)
			Hard joint	50 (443)
			Lock torque	10 (88.5)
No load speed: min-1=rpm	Impact-driver mode			0 - 2,300
	Drill mode		Low	0 - 700
			High	0 - 2,300
	Screwdriver mode			0 - 2,300
Impacts per minute: min-1=ipm	Impact-driver mode			0 - 3,200
	Percussion-drill mode			0 - 27,600
Torque setting on clutch (screwdriver) mode				16
Clutch torque range: N.m (in.lbs)				0.5 - 2.0 (4.4 - 17.7)
Capacity	Drilling: mm (")	Drill mode	Wood	21 (13/16)
			Steel	10 (3/8)
		Percussion-drill mode	Masonry	8 (5/16)
	Fastening	Screwdriver mode	Small screw	M4
		Impact-driver mode	Small screw	M4 - M8
			Standard bolt	M5 - M14
			High tensile bolt	M5 - M12
			Coarse-thread	22 - 125mm
Net weight: kg (lbs) [with BL1830]				1.8 (3.9)

► Standard equipment

Belt clip 1
Plastic carrying case 1
Keyless chuck ..... 1 (for North American countries only)

Note: The standard equipment for the tool shown above may differ by country.

► Optional accessories

Assorted bits, Assorted drill chucks, Adjustable locator, Keyless chuck, Bit piece
Charger DC18SC, Charger DC18RA, Charger DC24SA, Charger DC24SC, Li-ion battery BL1830
Shoulder belt for plastic carrying case

► Repair

CAUTION: Remove the saw blade from the machine for safety before repair/ maintenance !

[1] NECESSARY REPAIRING TOOLS

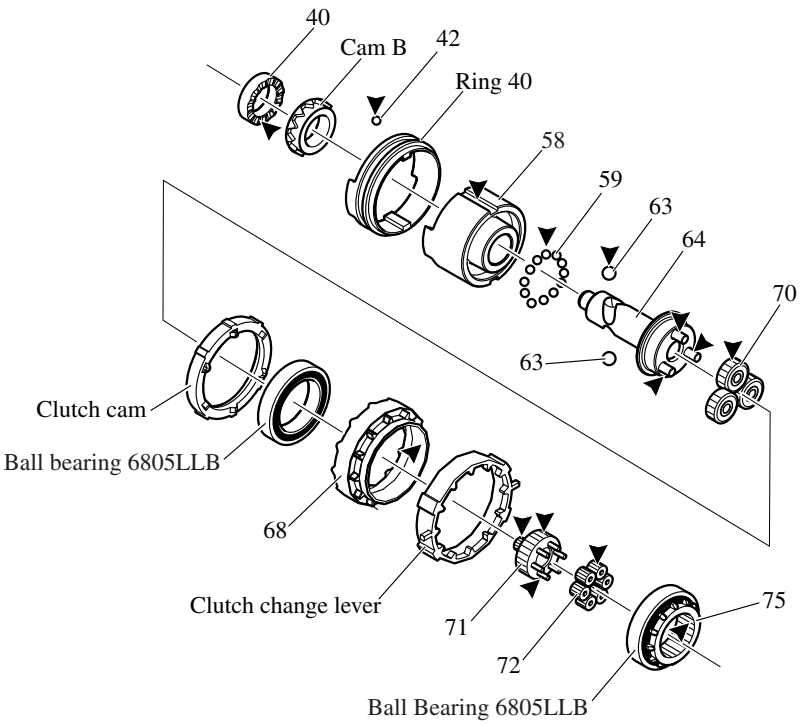
Code No.	Description	Use for
1R003	Retaining ring pliers for shaft	Removing/attaching Retaining ring from/to Shaft
1R045	Gear extractor (large)	Disassembling Hammer section
1R212	Tip for retaining ring pliers	Modular use with 1R003
1R282	Round bar for arbor 8-50	Modular use with 1R045
1R288	Screwdriver magnetizer	Magnetizing screwdriver with which Steel balls are removed.
1R291	Retaining ring S and R pliers	Disassembling Bit holder section
1R346	Center attachment for 1R045	Modular use with 1R045
1R351	Anvil holding jig	Removing Anvil from Gear case
1R357	Cam A setting jig	Assembling Cam A

[2] LUBRICATION

Apply Makita grease N. No.2 to the following portions designated with the black triangle to protect parts and product from unusual abrasion.

Item No.	Description	Portion to lubricate
40	Cam A	Surface that contacts Cam B
42	Steel ball 3.5 (16 pcs)	Whole surface
58	Hammer	Groove that contacts Ring 40
59	Steel ball 3.5 (23 pcs)	Whole surface
63	Steel ball 5.6 (2 pcs)	Whole surface
64	Spindle complete	Three axes for (70) Spur gear 22
68	Internal gear 50	Inside surface that contacts (70) Spur gear 22
70	Spur gear 22 (3 pcs)	Teeth portion
71	Spur gear 7 complete	Teeth portion and six axes for (72) Spur gear 10
72	Spur gear 10 (6 pcs)	Teeth portion
75	Internal gear 38	Teeth portion

Fig. 1



Repair

[3] DISASSEMBLY/ASSEMBLY

[3] -1. Impact Assembly

DISASSEMBLING

1) Remove Rear cover by unscrewing two 3x16 Tapping screws and Housing R by unscrewing nine 3x16 Tapping screws. The machine can now be disassembled as illustrated in **Fig. 2**.
2) Remove Ring spring 11 from the groove on Anvil. Component parts of Chuck section can now be removed from Anvil. (**Fig. 3**)
3) Remove Bumper and two M4x16 Pan head screws. Hammer case can now be removed together with Ball bearing 6802LLB and Retaining ring R-24. (**Fig. 4**)

Fig. 2

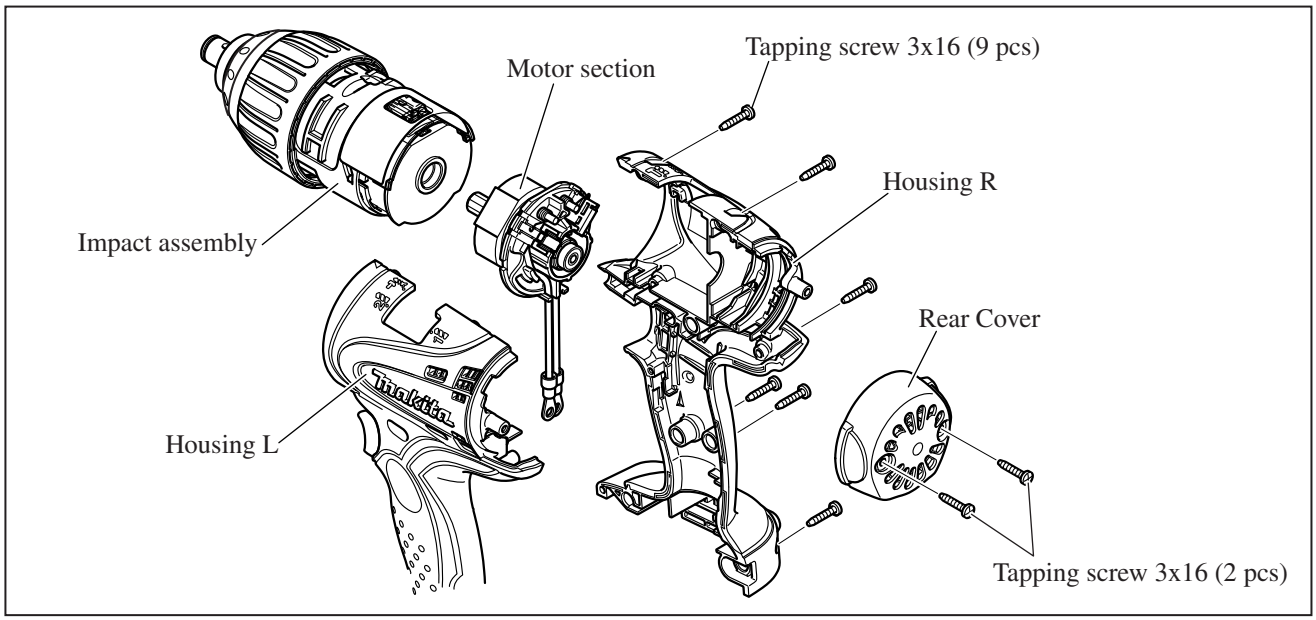


Fig. 3

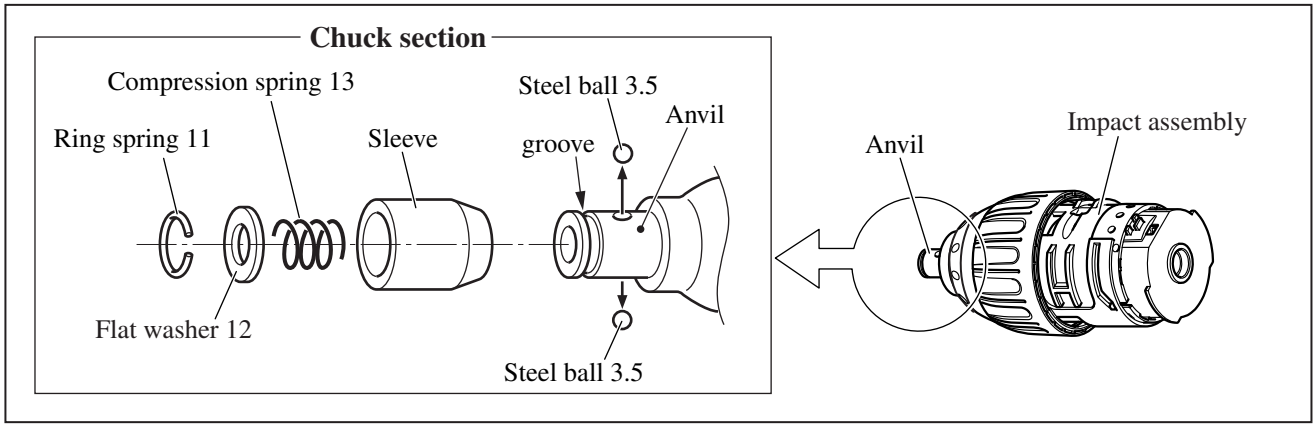
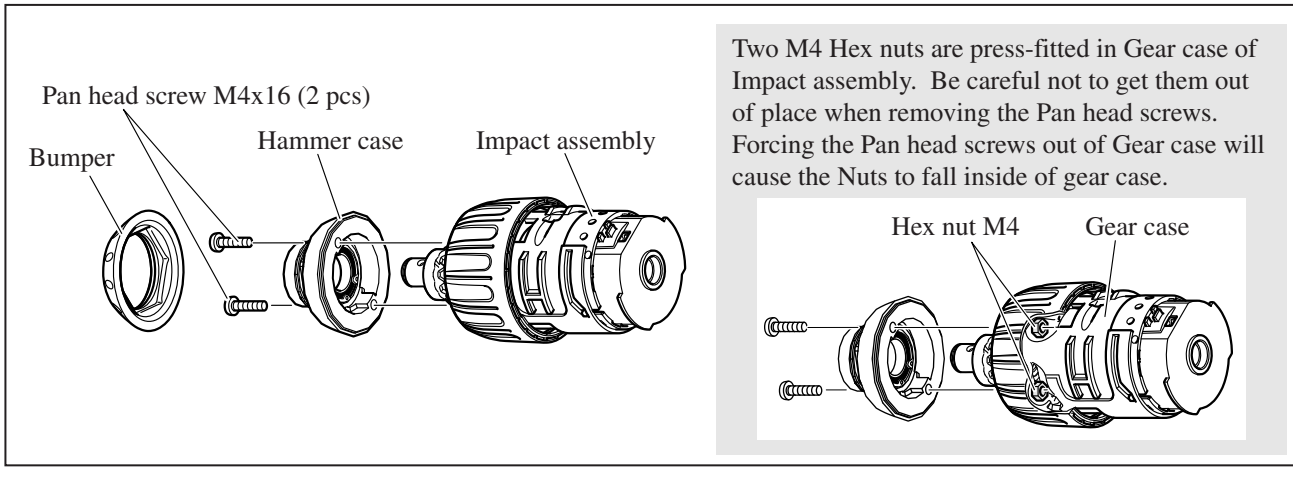


Fig. 4



Repair

[3] -1. Impact Assembly (cont.)

DISASSEMBLING

4) Remove Leaf spring from the space between Gear case and Change ring. Remove Change ring from Gear case while turning clockwise. **(Fig. 5)**
5) Remove Pusher U from Gear case, and Pusher L from Change case. Remove two assemblies of Guide and Shoulder pin-3-6. **(Fig. 6)**
6) Remove Change case from Gear case. Remove two Plate A's from Change case. **(Fig. 7)**

Fig. 5

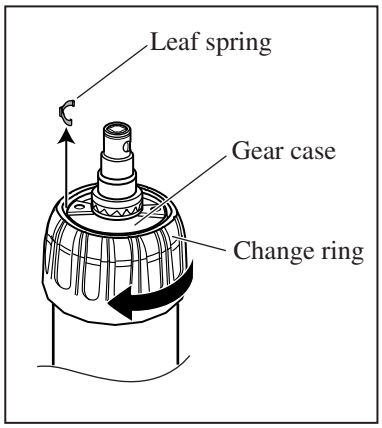


Fig. 6

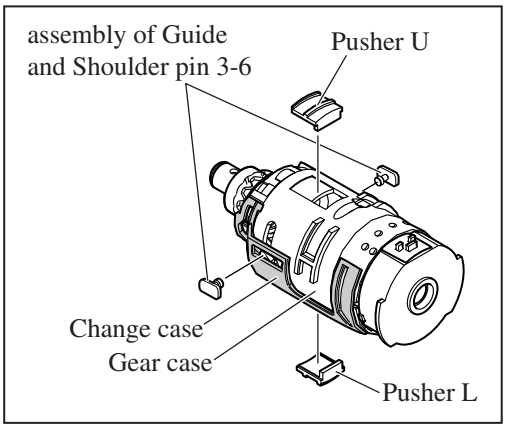
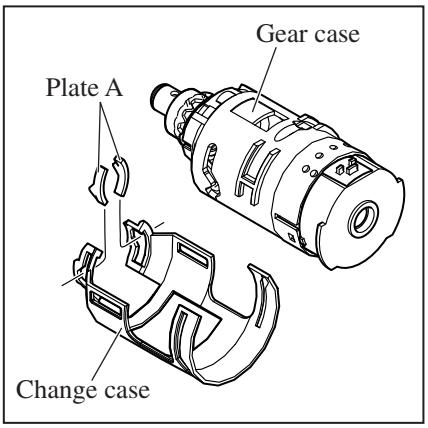


Fig. 7



7) Pull off Motor bracket from Gear case by turning a little bit counterclockwise. **(Fig. 8)**
8) Impact assembly can now be disassembled as illustrated in **Fig. 9**.

Fig. 8

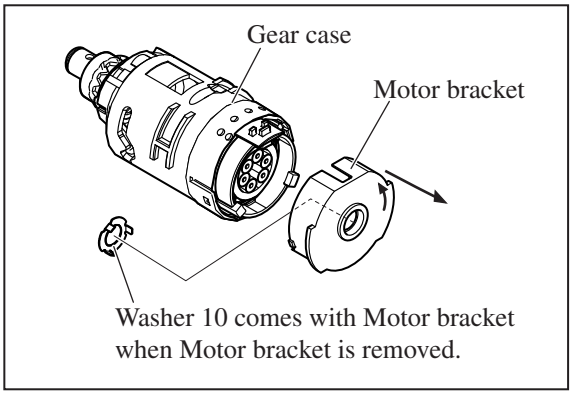
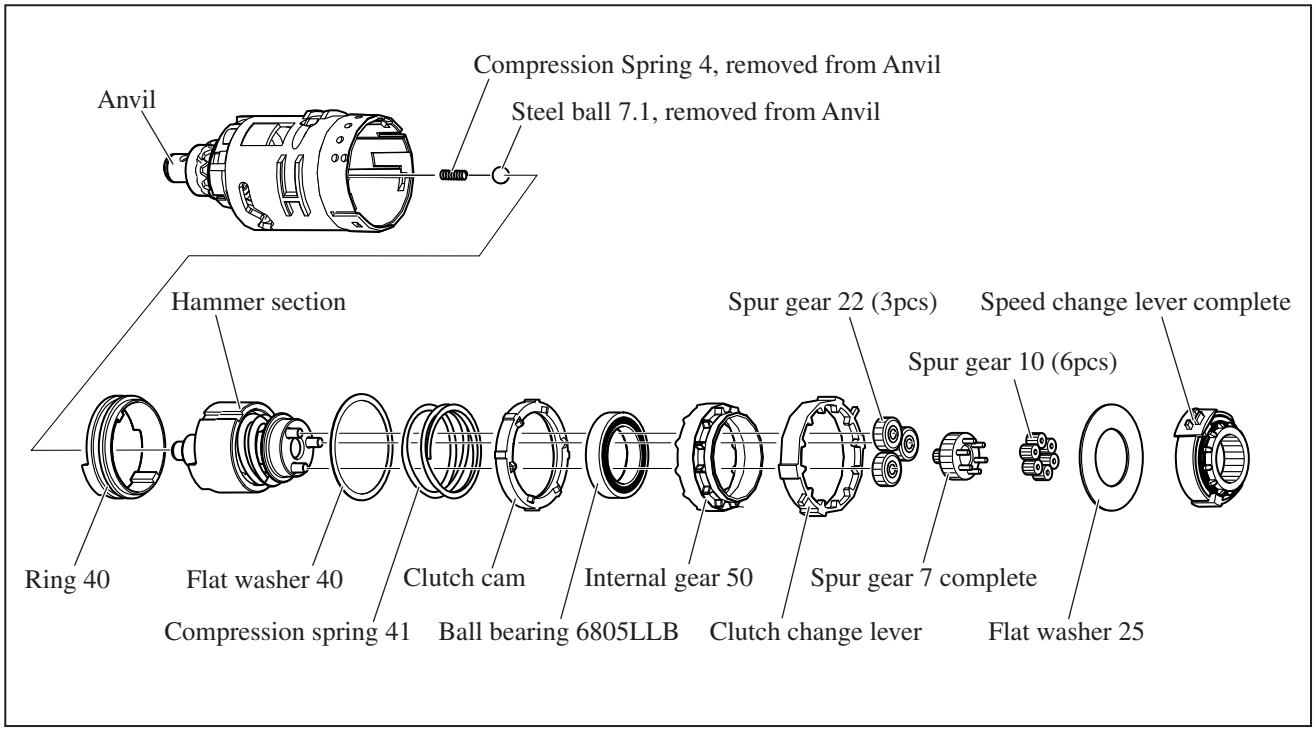


Fig. 9



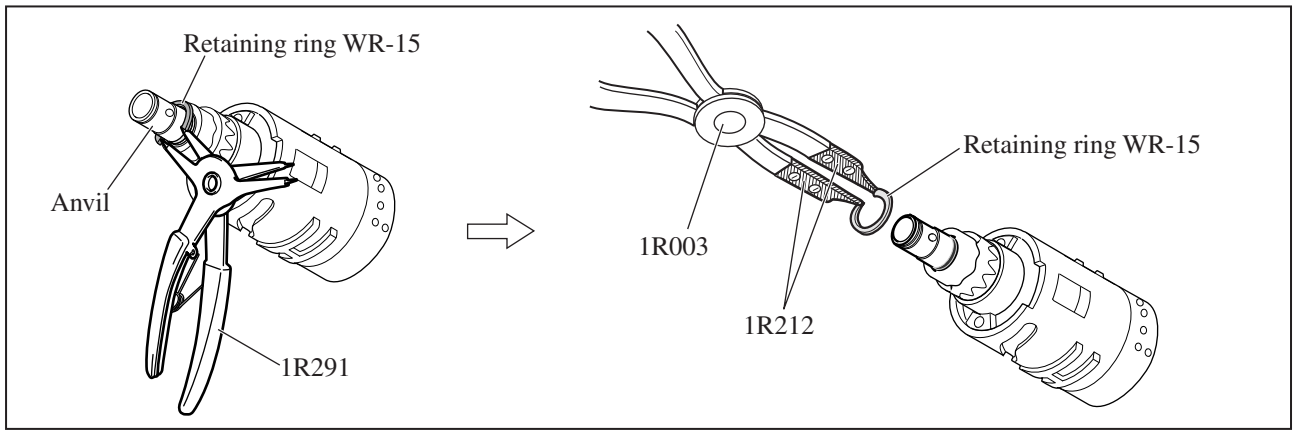
► Repair

[3] -1. Impact Assembly (cont.)

DISASSEMBLING

9) Slide Retaining ring WR-15 a little out of the groove on Anvil using 1R291.
Then remove Retaining ring WR-15 from Anvil using 1R003 to which 2pcs of 1R212 are attached. (**Fig. 10**)
Note: Retaining ring WR-5 cannot be removed if it is stuck under Cam A.
If so, see **Press-fitting Cam A in place on Anvil** in page 5.

Fig. 10



10) Fit the T-shaped end of Anvil in the deep notch in 1R351. (**Fig. 11**)
11) Remove Anvil from Gear case by pressing down using arbor press. (**Fig. 12**)
12) The parts around Anvil can now be removed as illustrated in **Fig. 13**. Two M4 Hex nuts can also removed in this step.
Note: Be careful not to lose small parts such as Steel ball 3.5.

Fig. 11

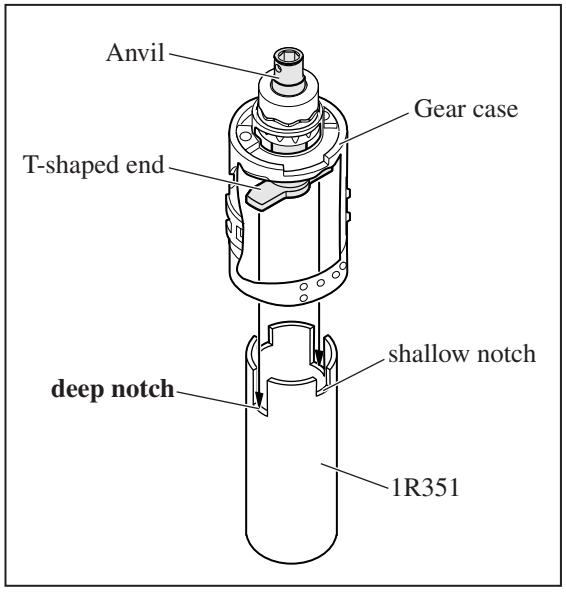


Fig. 12

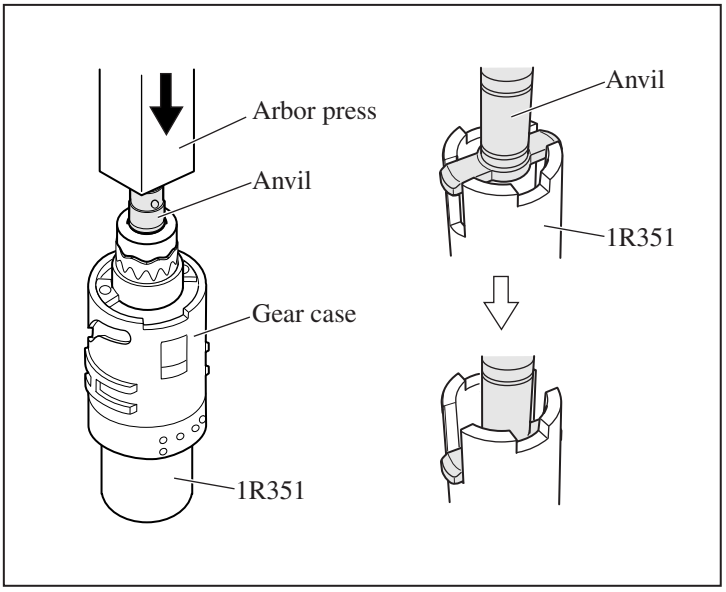
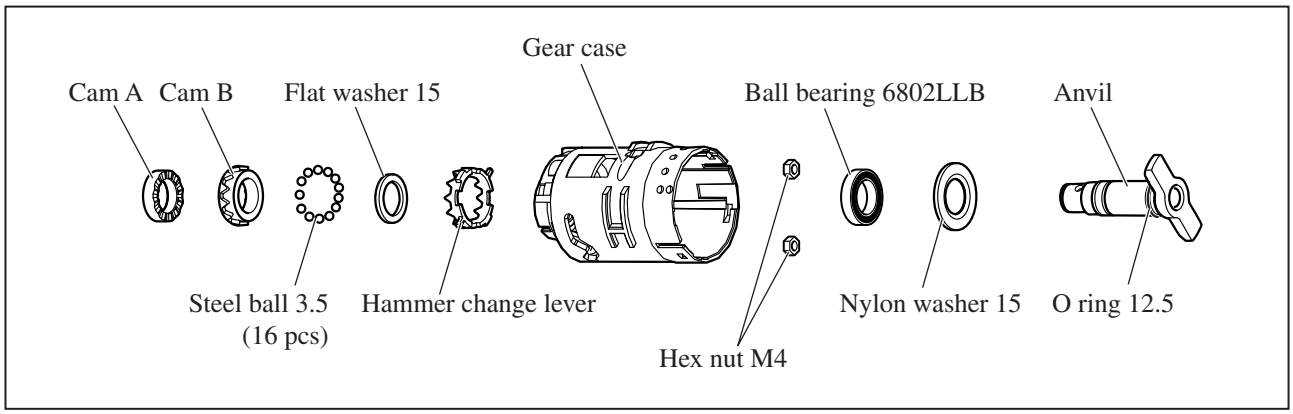


Fig. 13



Repair

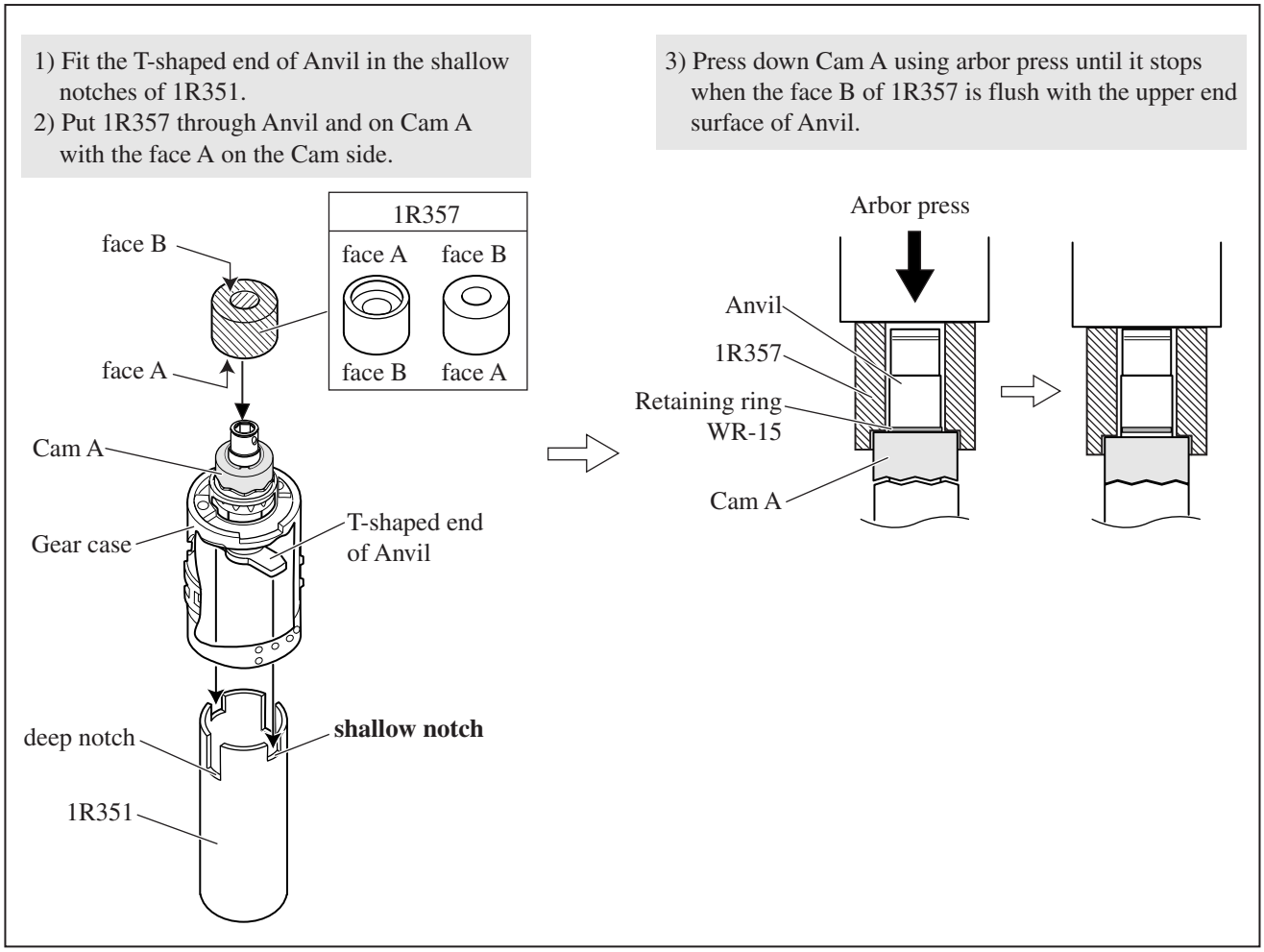
[3] -1. Impact Assembly (cont.)

DISASSEMBLING

Press-fitting Cam A in place on Anvil

Retaining ring WR-5 cannot be removed if it is stuck under Cam A. If so, put off Cam A from Retaining ring WR-5 by press-fitting Cam A in place using 1R351, 1R357 and arbor press. (**Fig. 14**)

Fig. 14



ASSEMBLING

1) Mount Ball bearing 6802LLB, Nylon washer 15 and two M4 Hex nuts to Gear case. (**Fig. 15**)
2) Fit O Ring 12.5 in the groove on Anvil, and set the T-shaped end of Anvil in the shallow notch of 1R351. (**Fig. 16**)
3) Put Gear case through Anvil on 1R351. (**Fig. 17**)

Fig. 15

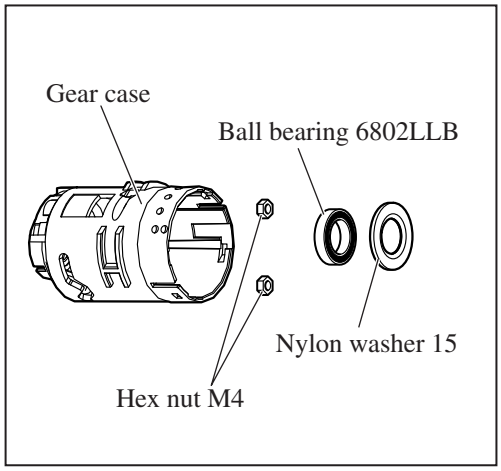


Fig. 16

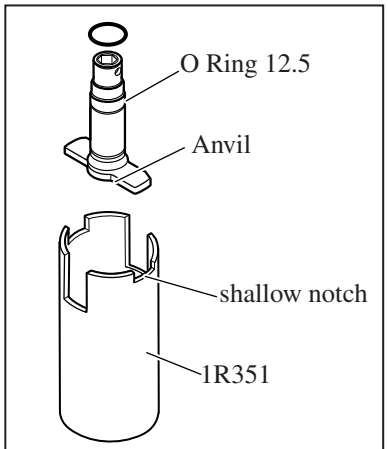
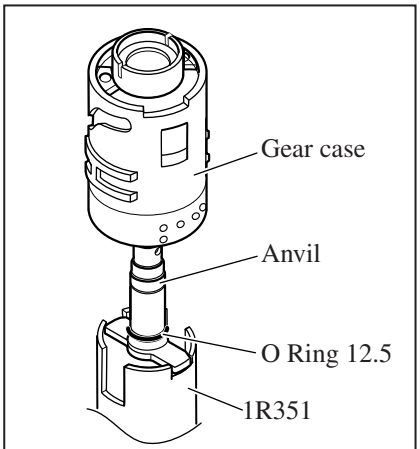


Fig. 17



Repair

[3] -1. Impact Assembly (cont.)

ASSEMBLING

4) Fitting the projection of Hammer in the slit of Gear case, assemble Hammer change lever to Gear case. (**Fig. 18**)
5) Put Flat washer 15 through Anvil and into Gear case. (**Fig. 19**)
6) Put sixteen 3.5 Steel balls in the space between Anvil and Hammer change lever, and put Cam B through Anvil and on Hammer change lever. (**Fig. 20**)
Note: Cam B is not reversible when assembled to Hammer change lever. Be sure to place as illustrated in **Fig. 21**.

Fig. 18

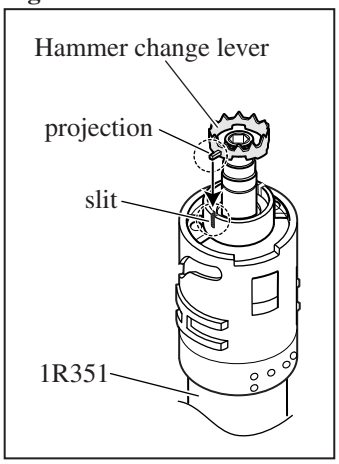


Fig. 19

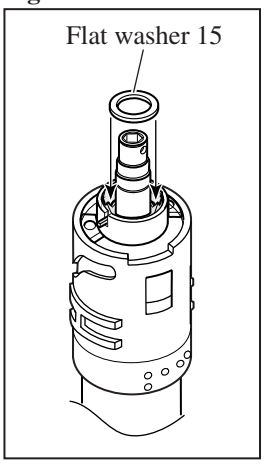


Fig. 20

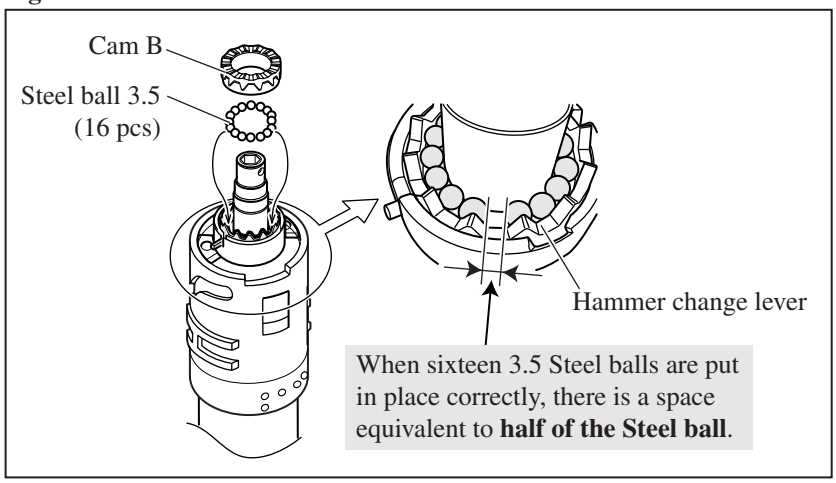
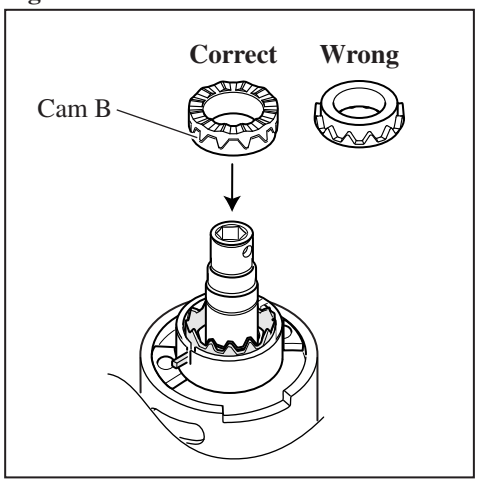


Fig. 21



7) See **Fig. 22**. Put Cam A through Anvil and on Cam B. Put 1R357 on Cam A with the face B on the Cam side. Press down Cam A using arbor press until it stops when the face A of 1R357 is flush with the upper end surface of Anvil. Remove 1R357 from Anvil.
8) Fit Retaining ring WR-15 in the groove on Anvil while expanding Retaining ring WR-15 using 1R291 and 1R003 to which 2pcs of 1R212 are attached. (**Fig. 23**)

Fig. 22

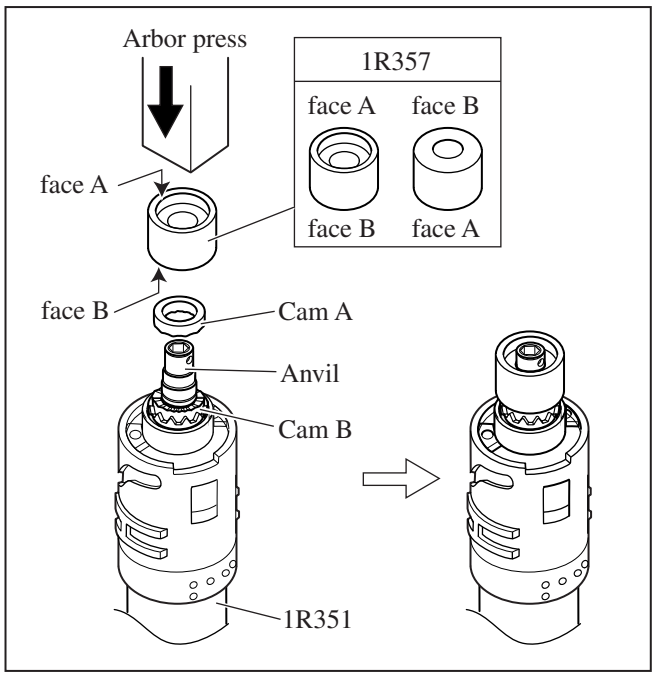
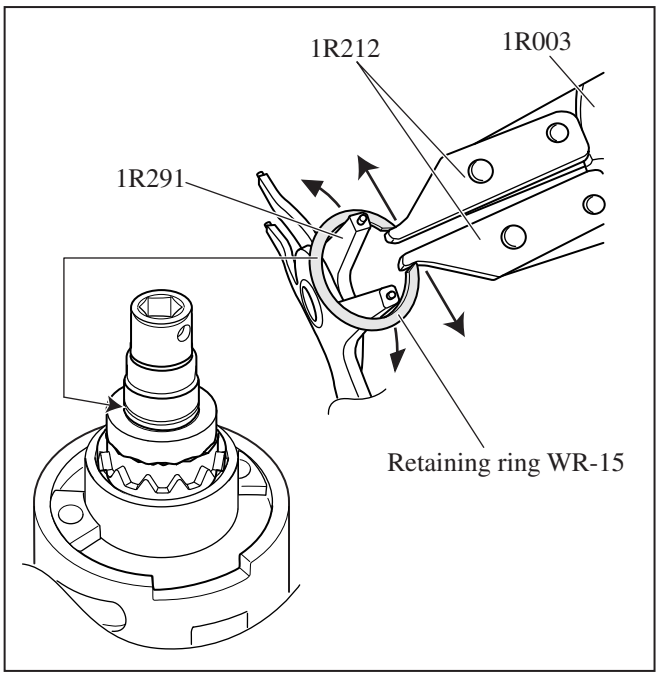


Fig. 23



Repair

[3] -1. Impact Assembly (cont.)

ASSEMBLING

9) See **Fig. 24**. Assemble two Plate A's to Change case by sliding in the direction of the black arrows until they stop.
10) Assemble Change case to Gear case by fitting the two projections of Hammer change lever in the space on each side of Change case. (**Fig. 25**)

Fig. 24

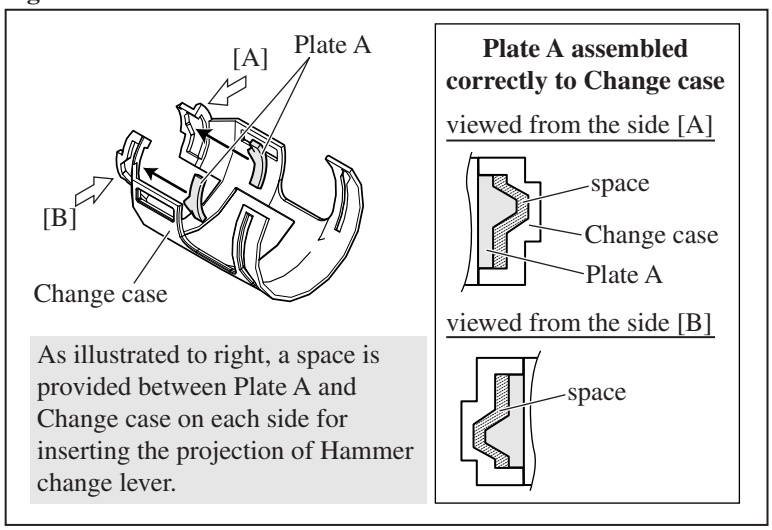
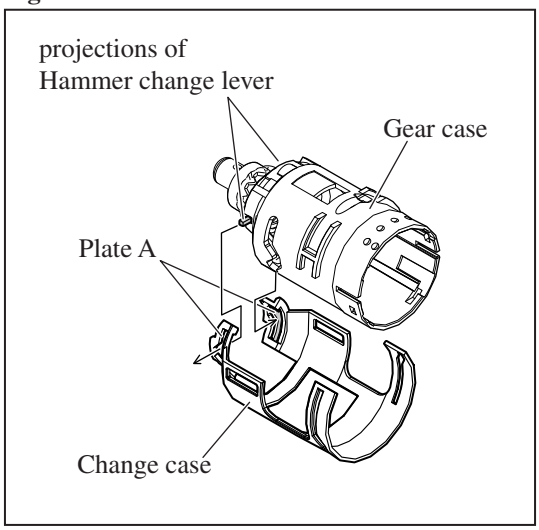


Fig. 25



11) Hold Gear case with the bit holding side down, and put Ring 40 into Gear case so that the cam portions of Ring 40 is engaged with the T-shaped end of Anvil. (**Fig. 26**)
12) Fit Pusher U and Pusher L to Gear case in the openings on Gear case as illustrated in **Fig. 27**.
Note: Be careful not to confuse Pusher R and Pusher L. A letter "U" is marked on the back of Pusher U while there is no mark of identification on Pusher L.

Fig. 26

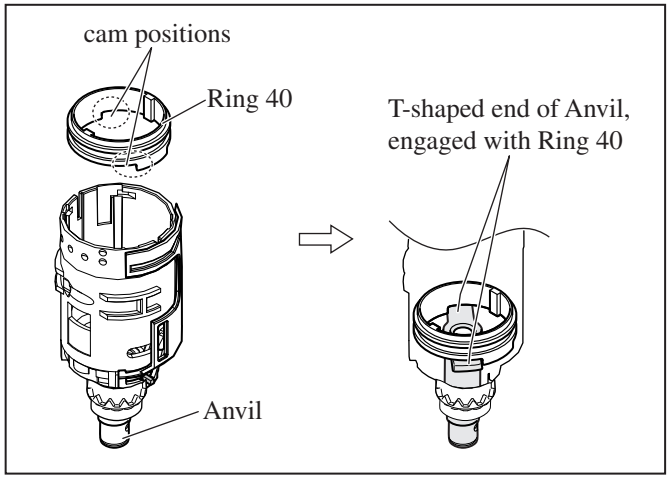
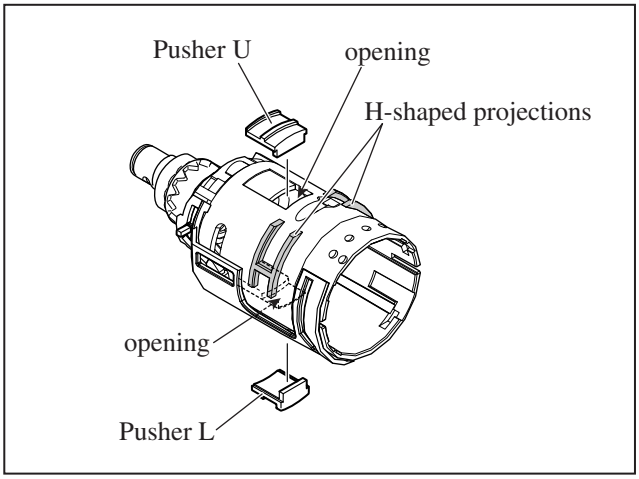
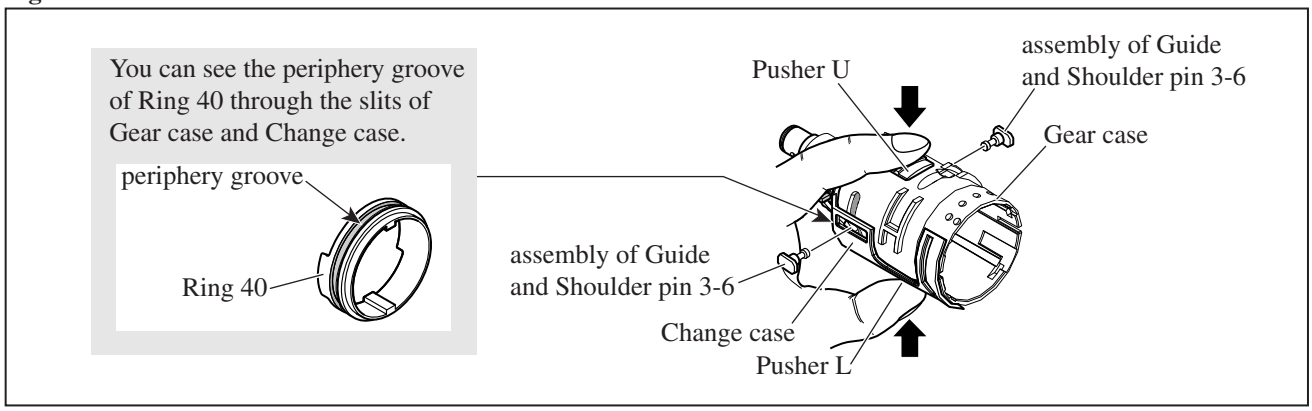


Fig. 27



13) While pressing Pusher U and Pusher L with fingers, mount two assemblies of Guide pin and Shoulder pin 3-6 to Ring 40 which is mounted in Gear case in **Fig. 25**, by inserting the two Shoulder pins into the periphery groove of Ring 40 through the slits of Gear case and Change case. (**Fig. 28**)

Fig. 28



Repair

[3] -1. Impact Assembly (cont.)

ASSEMBLING

14) While pressing Pusher U and Pusher L with fingers, fit the female threads on the inside of Change ring to the male threads on Pusher U and Pusher L. Turn Change ring counterclockwise until it stops. (**Fig. 29**)
Note: If Change ring cannot be turned, check whether or not the Pushers are correctly mounted as illustrated in **Fig. 28** on page 7.

15) Put Leaf spring in place between Gear case and Change ring. (**Fig. 30**)

Fig. 29

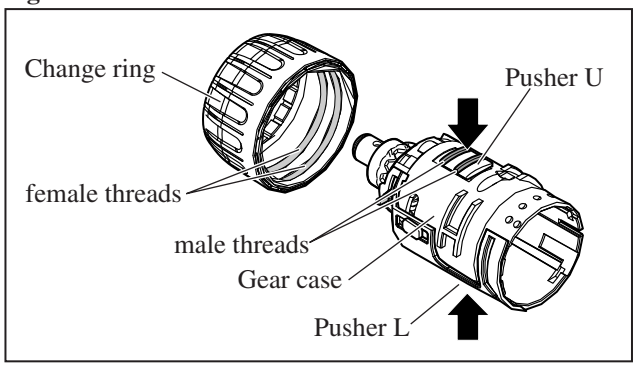
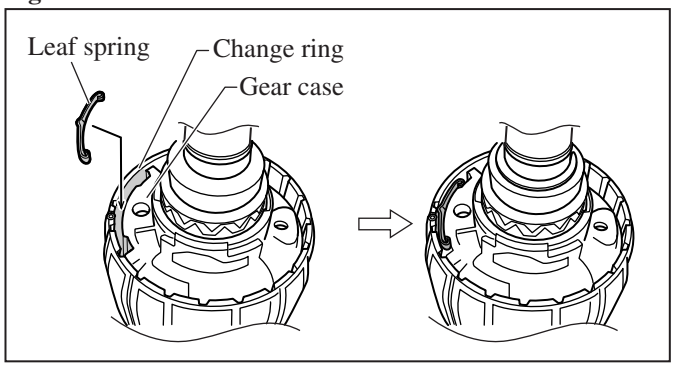


Fig. 30



16) Assemble Ball bearing 6802LLB and Retaining ring R-24 to Hammer case, and secure Hammer case to gear case with two M4x16 Pan head screws. Put Compression spring 4, then Steel ball 7.1 into the hole of Spindle. (**Fig. 31**)
Note: Be careful not to get two M4 Hex nuts out of place when tightening the Pan head screws. (**Fig. 4** in page 2)

17) Grasping the pins on Spindle complete with pliers, assemble Hammer section to Gear case with the raised portions fitting in the groove on Hammer. (**Fig. 32**)

Fig. 31

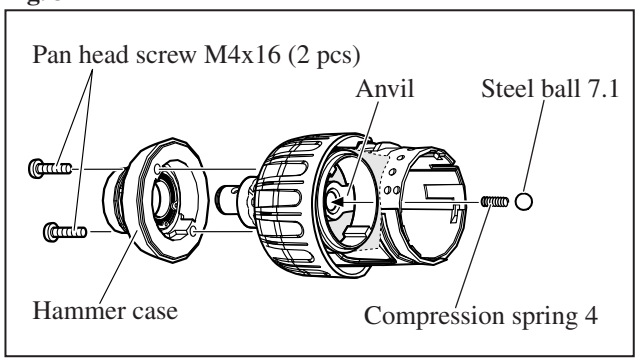
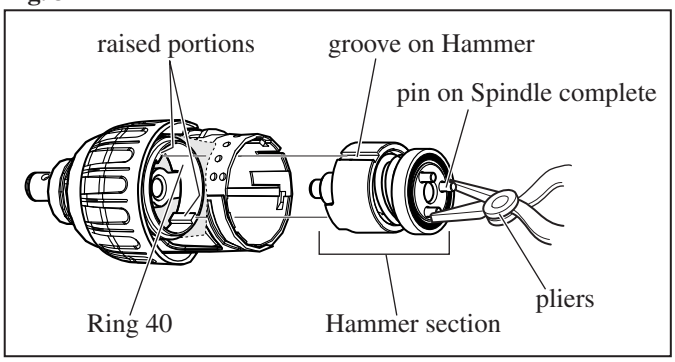


Fig. 32



18) Put Flat washer 40 and Compression spring 41 into Gear case. Then insert Clutch cam with the six raised portions on the Clutch cam's periphery fitting in the corresponding grooves on the inside surface of Gear case.
Put Internal gear 50 into Gear case. (**Fig. 33**)
Note: Clutch cam is not reversible when assembled to Gear case. Be sure to place so that the cam side faces towards Internal gear 50. (**Fig. 33**)

19) Assemble Clutch change lever to Gear case as illustrated in **Fig. 34**.

Fig. 33

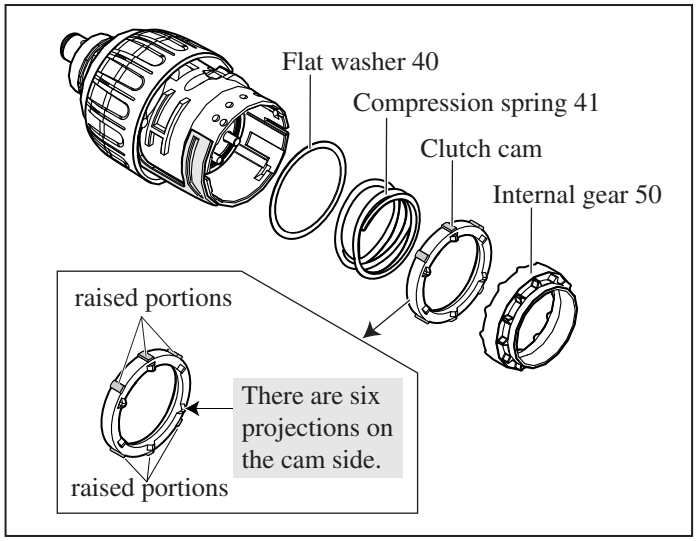
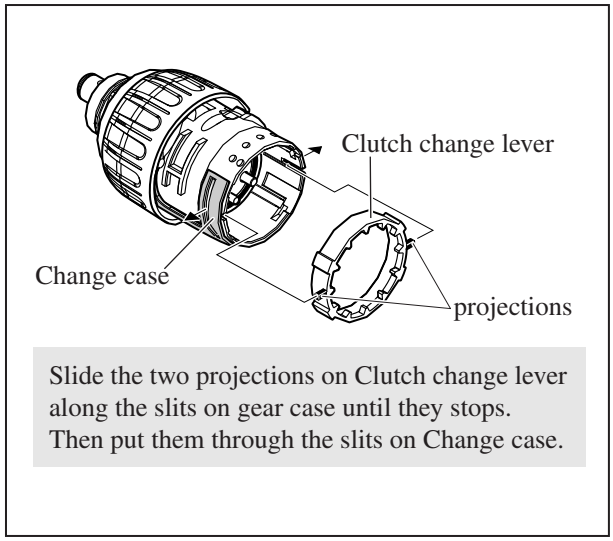


Fig. 34



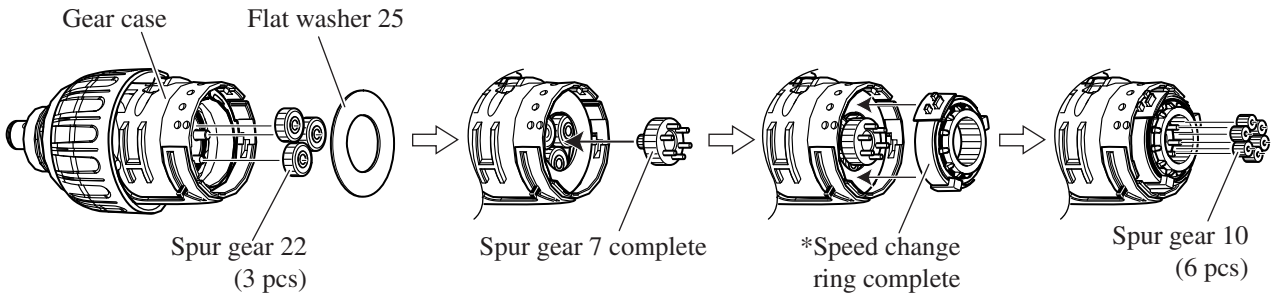
Repair

[3] -1. Impact Assembly (cont.)

ASSEMBLING

20) See **Fig. 35**.
Put three 22 Spur gears through the pins on Spindle complete. Put Flat washer 25 on Internal gear 50.
Engage Spur gear 7 complete with three 22 Spur gears.
Mount Speed change ring complete to Gear case.
Put six 10 Spur gears through the six pins on Spur gear 7 complete.
Note: Be sure that every gear is engaged with adjacent gear(s).

Fig. 35



*includes Ball bearing 6805LLB and Internal gear 38

21) Insert the notch on Motor bracket through the projection on Gear case until Motor bracket is set a little bit apart from Gear case. (**Fig. 36**)
22) By turning Motor bracket, fit the projection on Motor bracket to the groove on gear case. Insert Motor bracket into Gear case until it stops. Then secure Motor bracket to Gear case by turning clockwise. (**Fig. 37**)

Fig. 36

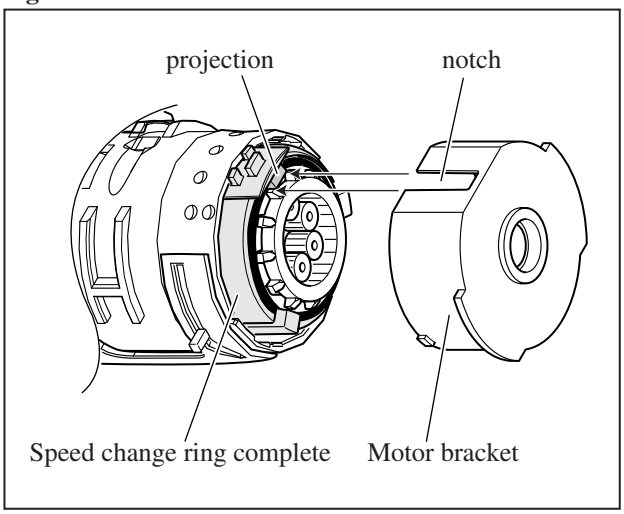
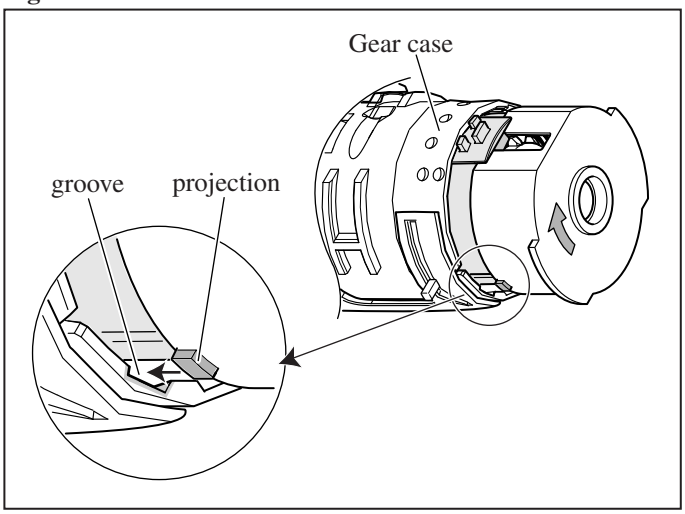


Fig. 37



Repair

[3] -2. Hammer Section

DISASSEMBLING

1) Take out Hammer section from the machine. (See **Figs. 2** to **9**.)
2) Install the following repair tools on Hammer section as illustrated in **Fig. 38**: 1R045; 1R346; 1R282
3) Hold Hammer section as illustrated in **Fig. 39**. Press down Hammer to the full by turning the handle of 1R045 in the direction of the black arrow. Then adjust the opening for Steel ball insertion to the top of cam groove on Spindle by turning the handle in the opposite direction. Two 5.6 Steel balls can now be removed from Spindle using tweezers or a slotted screwdriver magnetized with 1R288.
4) Hold Hammer section as illustrated in **Fig. 38**, and release 1R045 from Hammer section by turning the handle.
Caution: Do not hold gear extractor as illustrated in **Fig. 39** when releasing the Hammer section.
Failure to follow this instruction could cause most of twenty-four 3.5 steel balls to fall out of Hammer.

Fig. 38

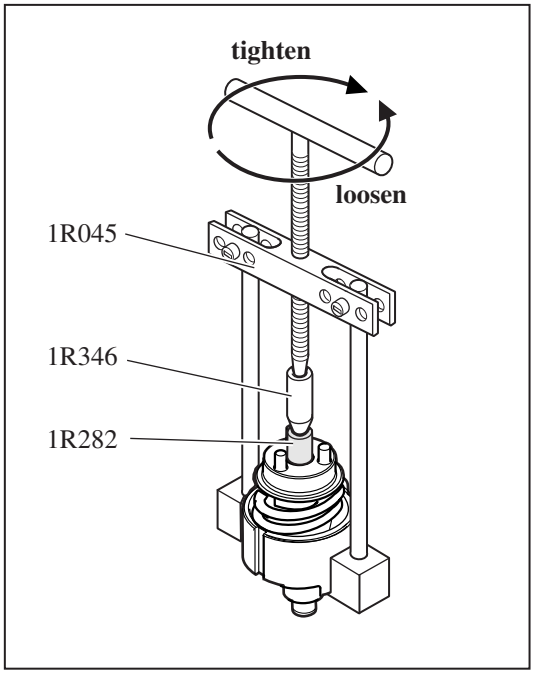
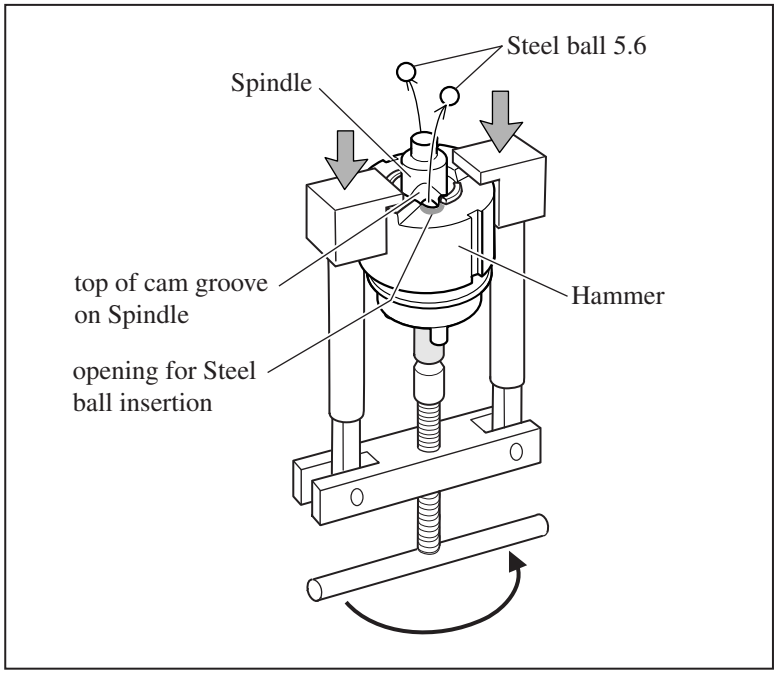


Fig. 39



5) Remove Spindle complete, Cup washer 24 and Compression spring 24 from Hammer. (**Fig. 40**)
6) Remove Flat washer 24 and twenty-three 3.5 Steel balls from Hammer. (**Fig. 41**)

Fig. 40

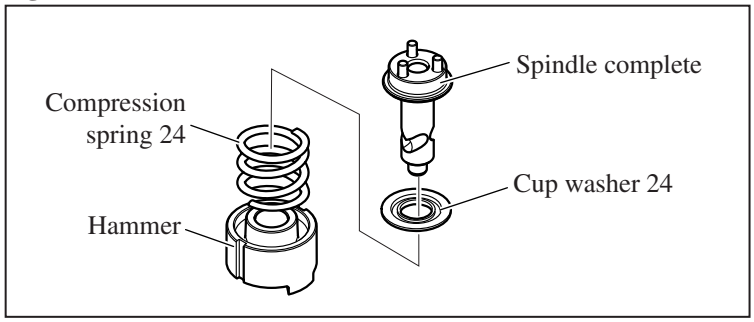
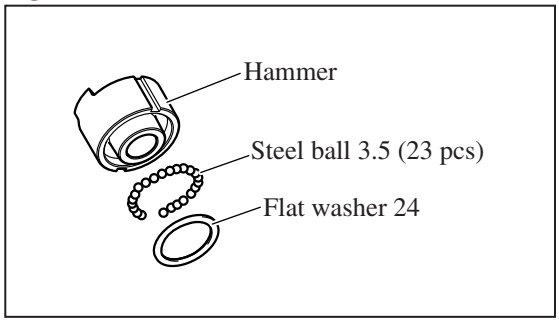


Fig. 41

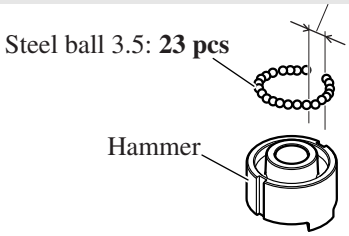


ASSEMBLING

Do the reverse of the disassembling steps.
(Refer to **Figs. 41**, **40**, **39**.)
Note: Make sure that twenty-three 3.5 Steel balls are prepared before mounting. (**Fig. 42**)

Fig. 42

There is a space equivalent to two 3.5 Steel balls in Hammer when twenty-three 3.5 Steel balls are correctly mounted.



Repair

[3] -3. Motor Section

DISASSEMBLING

1) Take out Motor section by disassembling the the product as illustrated in **Fig. 2** on page 2.
2) Shift the tail of Torsion spring from Carbon brush onto the notch on Brush holder to remove the suppressing force of Torsion spring. And disconnect Carbon brush from Commutator by pulling them off halfway. (**Fig. 43**)
   It is not necessary to remove Carbon brush completely.
3) Separate Armature-Yoke unit assembly from Brush holder complete. (**Fig. 44**)
4) Remove Armature from Yoke unit. (**Fig. 45**)

Fig. 43

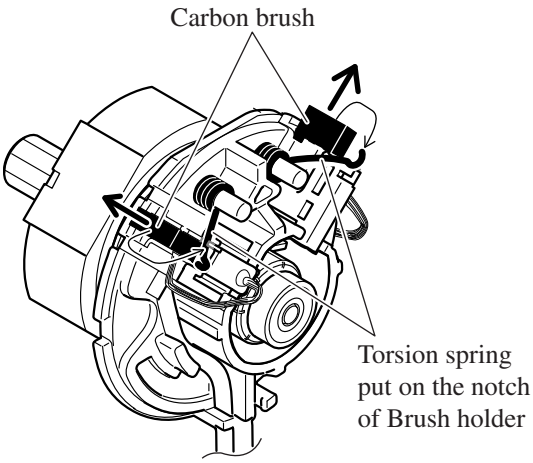


Fig. 44

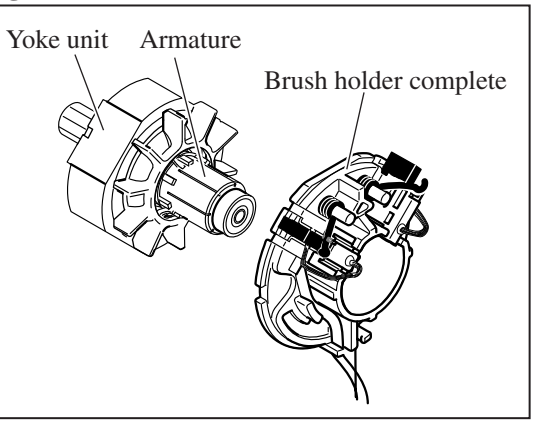
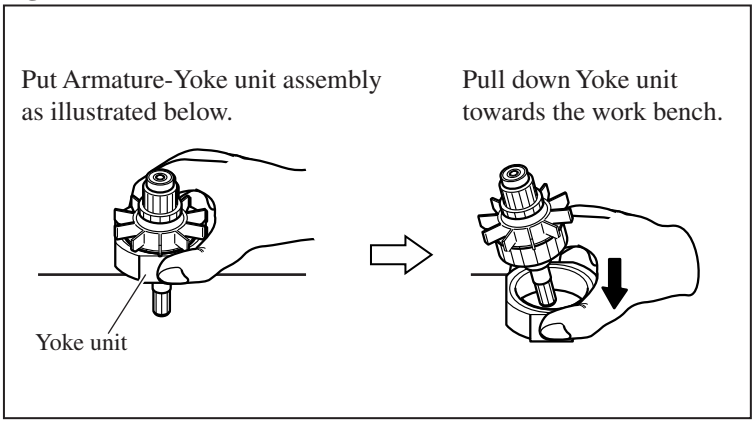


Fig. 45



ASSEMBLING

1) Assemble Motor section.
   Note 1:
   Yoke unit is not reversible when assembled to Armature. Be sure to assemble with the notch of Yoke unit on the drive-end of Armature. (**Fig. 46**) If assembled wrong, Motor section could not be assembled to Housing (L).
   Note 2:
   Yoke unit is a strong magnet. When assembling Armature to Yoke unit, be sure to hold the commutator portion as illustrated to **left in Fig. 47**. If you hold the Armature core as illustrated to right, your fingers could be pinched between Yoke unit and the fan of Armature that is pulled strongly by the magnet force.

Fig. 46

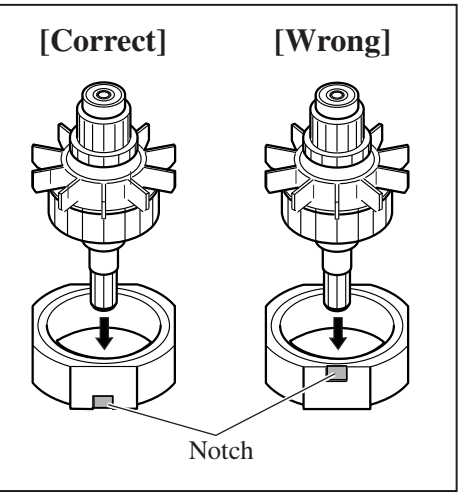
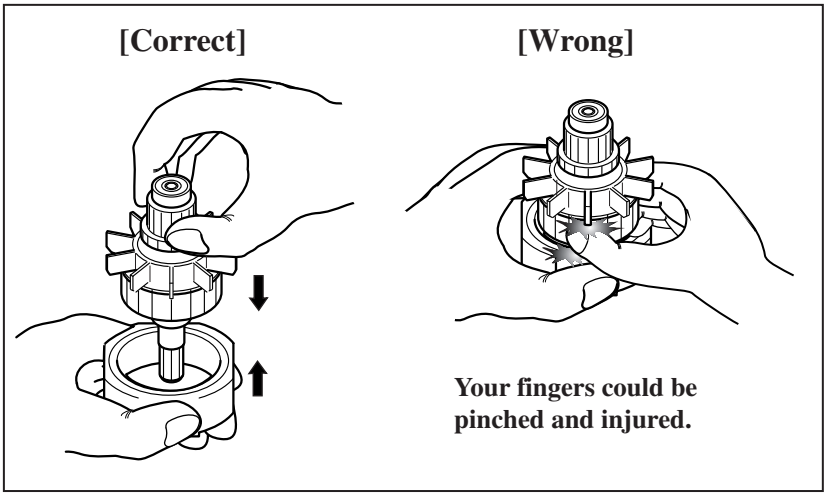


Fig. 47



Repair

[3] -3. Motor Section (cont.)

ASSEMBLING

2) Assemble Armature-Yoke unit assembly to Brush holder complete as illustrated in **Fig. 48**.
3) Assemble Motor section to Impact assembly. (**Fig. 49**)
Note: Make sure that the gear on Armature is engaged with six 10 Spur gears in Impact assembly.
4) Slide Plate C of Mode change lever assembly towards Lever until it stops. (**Fig. 50**)

Fig. 48

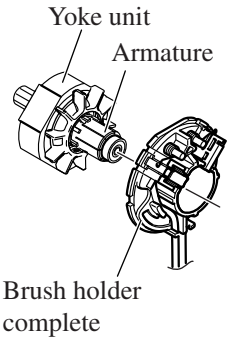


Fig. 49

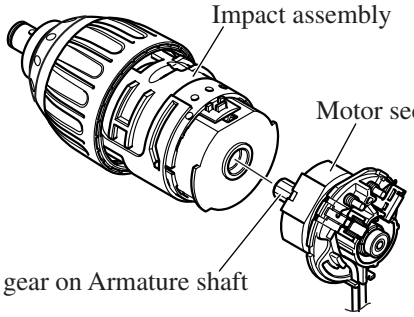
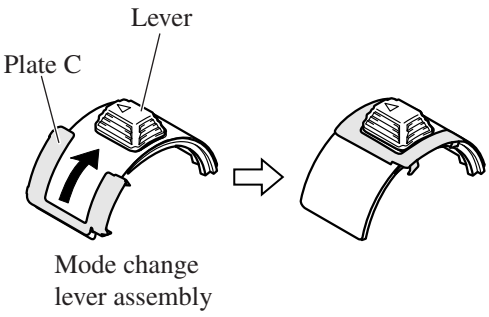


Fig. 50



5) Set Impact assembly to drill mode by turning Change case as illustrated in **Fig. 51**.
Note: Be careful not to put the projection of Clutch change lever out of the slit of Change case when turning Change case.
6) Assemble Mode change lever assembly (including Plate B and Plate C) to Impact assembly as illustrated in **Fig. 52**.

Fig. 51

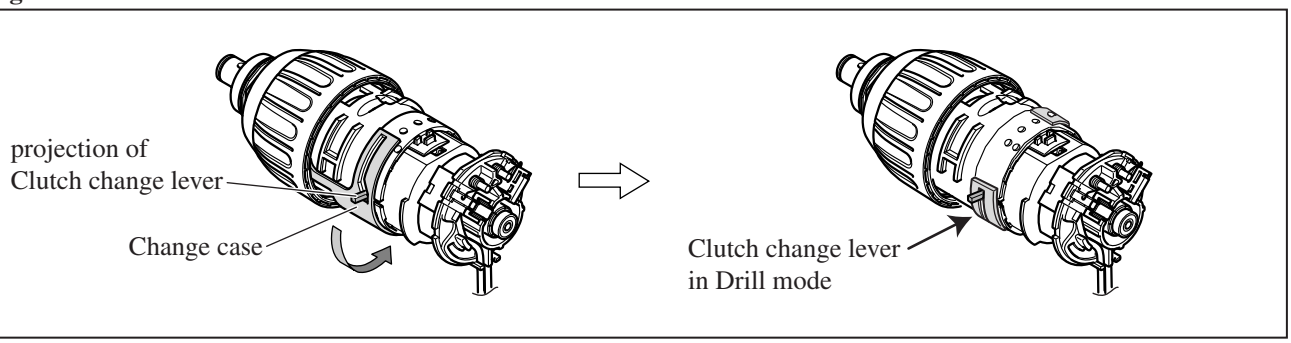
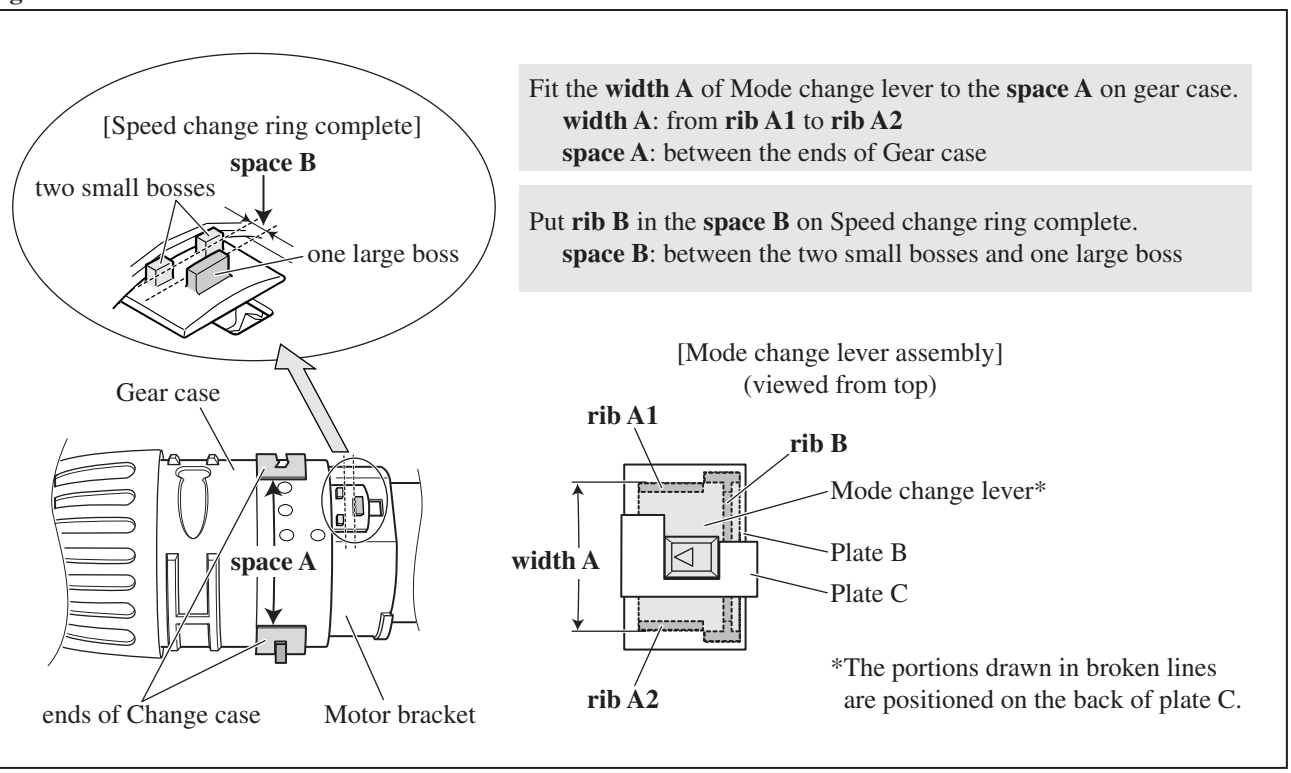


Fig. 52



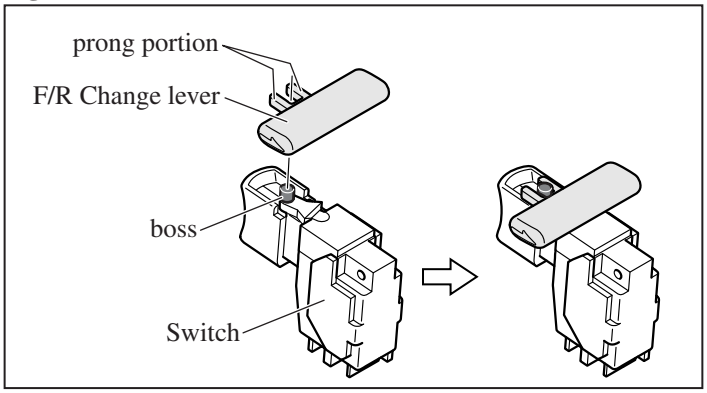
Repair

[3] -4. Switch Section

ASSEMBLING

Mount F/R Change lever to Switch by fitting the prong portion of F/R Change lever to the boss on Switch as illustrated in **Fig. 53**., and assemble them to Housing L.

Fig. 53



[3] -6. Inner Section (Motor Section and Impact Assembly)

ASSEMBLING

1) While holding Mode change lever assembly so that it does not fall off Gear case, mount Inner Section (Motor section and Impact assembly) to Housing L by fitting the notch of Yoke unit to the projection of Housing L. (**Fig. 54**)
2) See **Fig. 55**.
   After installation of Inner section, make sure that;
   A) The flat portion of Brush holder complete is at 90 degrees to the surface of Housing L.
   B) Yoke unit is put in four ribs on Housing L.
   C) The top of the projection of Gear case faces towards Switch.

Fig. 54

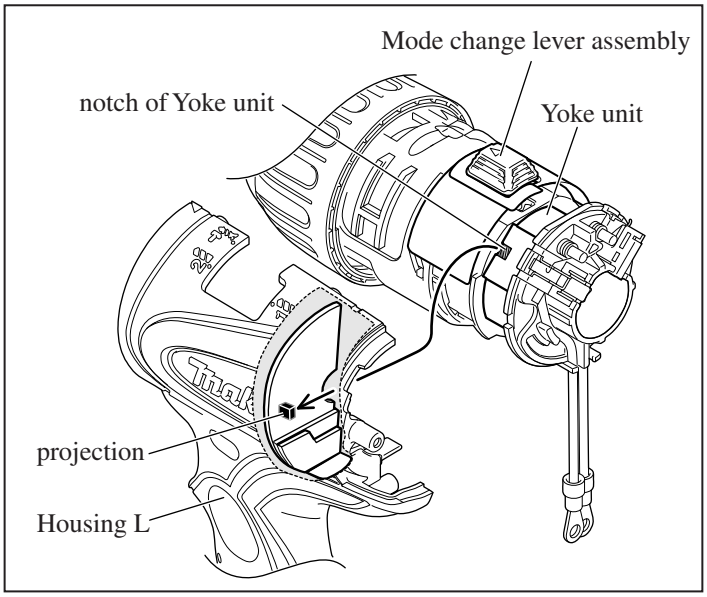
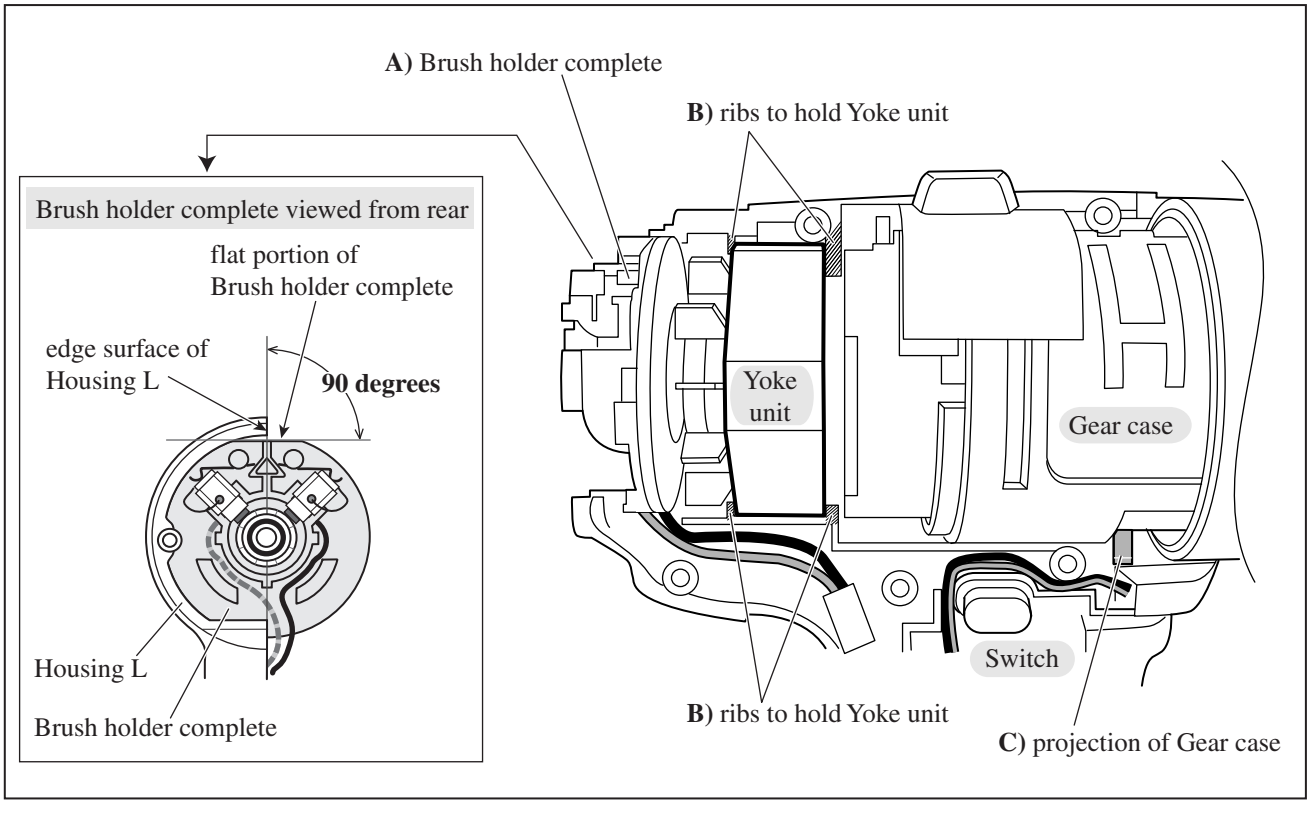


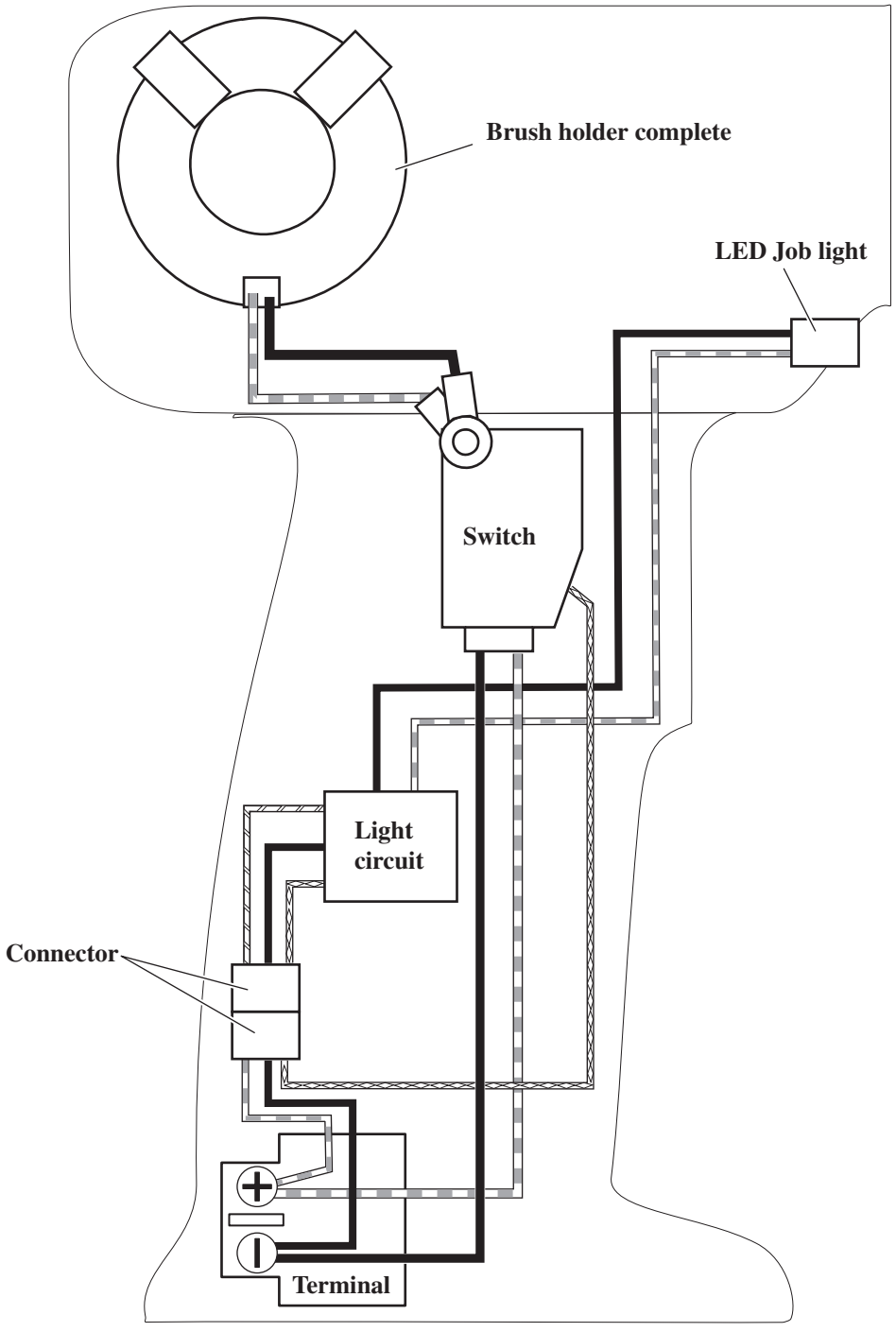
Fig. 55



Circuit diagram

Fig. 56

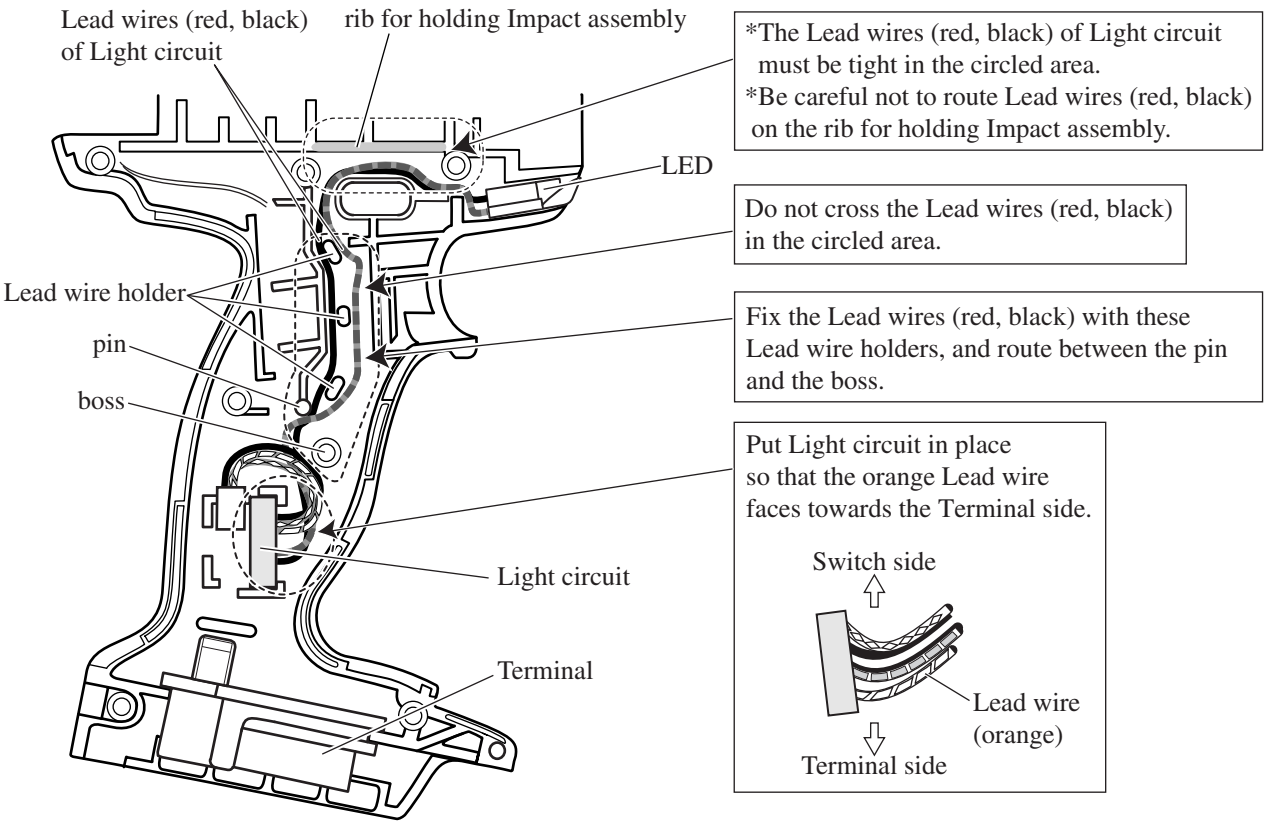
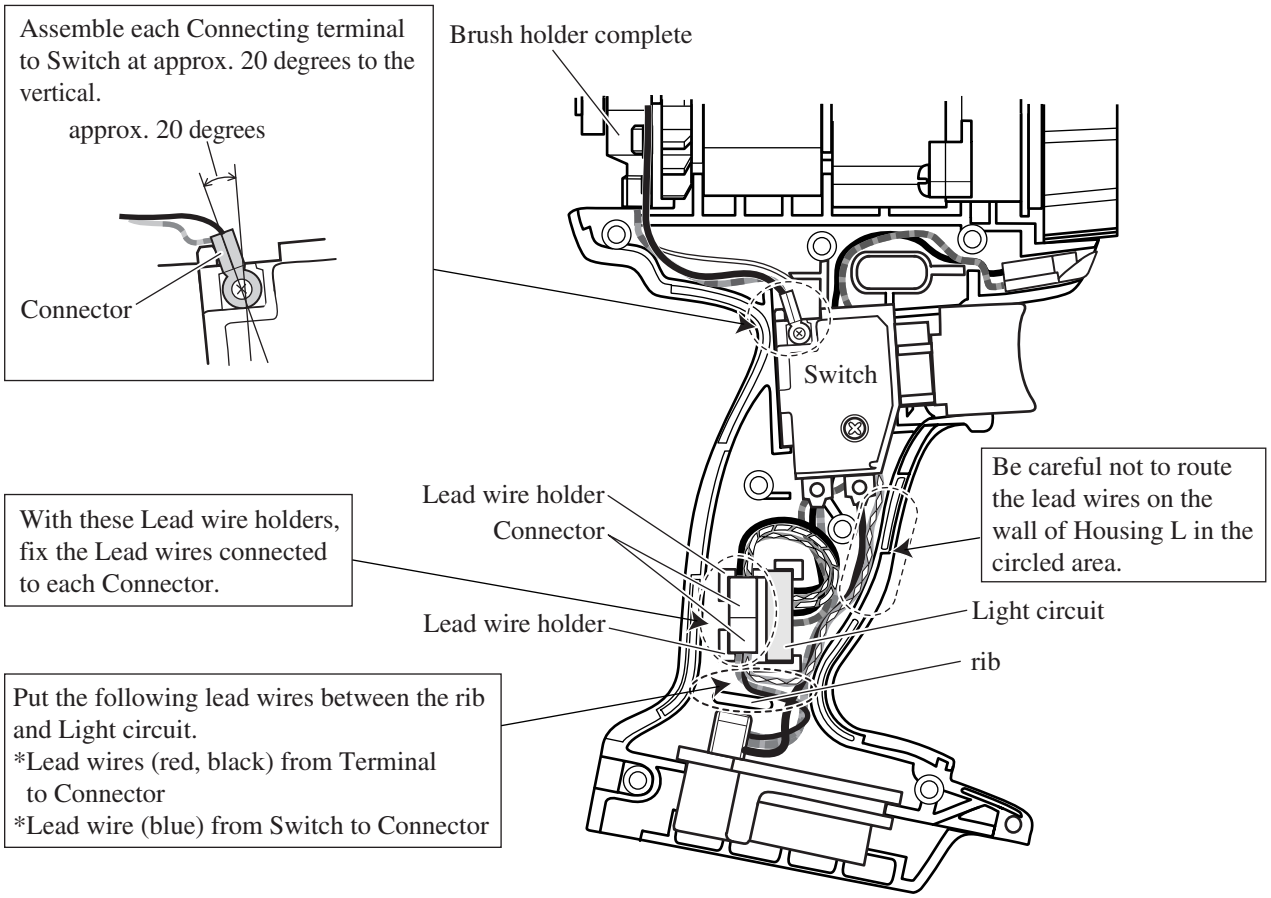
Color index of lead wires' sheath	
Black	
Red	
Orange	
Blue	



Wiring diagram

Fig. 57

Wiring of Lead Wires of Light Circuit



Wiring of Lead Wires of Switch and Brush Holder Complete