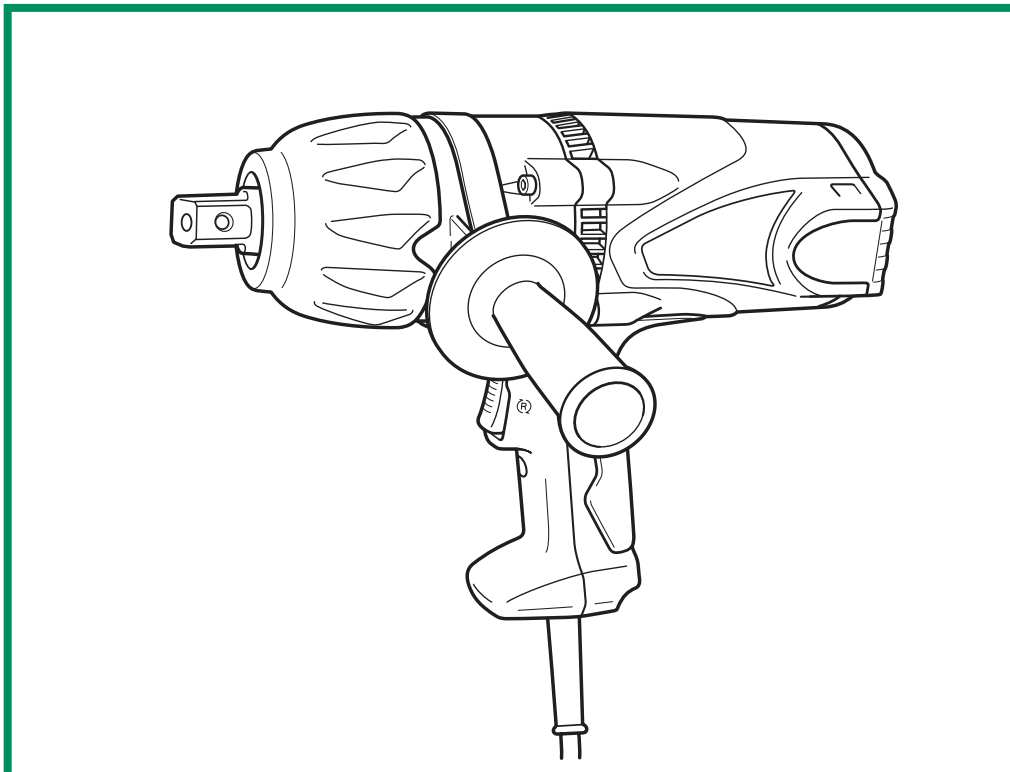
MODEL

WR 22SA

Hitachi
Power Tools

IMPACT WRENCH
WR 22SA

TECHNICAL DATA
AND
SERVICE MANUAL



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LIST No. E707

Mar. 2005

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, symbols are used in the place of company names and model names of our competitors. The symbols utilized here are as follows:

Symbol Utilized	Competitor	
	Company Name	Model Name
C	MAKITA	6906
B	BOSCH	GDS24

CONTENTS

Page

1. PRODUCT NAME

Hitachi Impact Wrench, Model WR 22SA

2. MARKETING OBJECTIVE

The new impact wrench Model WR 22SA is the upgraded version of the Model WH 22, featuring the class-top tightening torque by the computer-analyzed optimum impacting operation, compact and lightweight body.
In addition, the Model WR 22SA has the more durable motor that is contained in the highly strong aluminum die-cast body and the handle-integrated plastic cylinder. The Model WR 22SA is powerful and novel thanks to the 3-D CAD engineering as well as the double-layer molding, improved handle grip and large bumper to plainly differentiate it from the competitors. Please expand our market share with this Model WR 22SA.

3. APPLICATIONS

○ Tightening/loosening of bolts, nuts, etc.
○ Tightening of screw washers (anchor nuts)

[Applicable Markets]

○ Wooden construction industry: Tightening of bolts, screw washers, etc.
○ Construction industry: Tightening/loosening of bolts in steel structure works for construction of buildings etc.
○ Manufacturing industry: Tightening/loosening of bolts for automobiles, rolling stock, shipbuilding, agricultural machinery and tools, construction machinery, etc.
○ Utility industry: Assembly and installation of electric equipment, plumbing facilities, sanitary fixtures and various other facilities
○ Others: Tightening/loosening of bolts in steel structure works for construction of bridges and railways

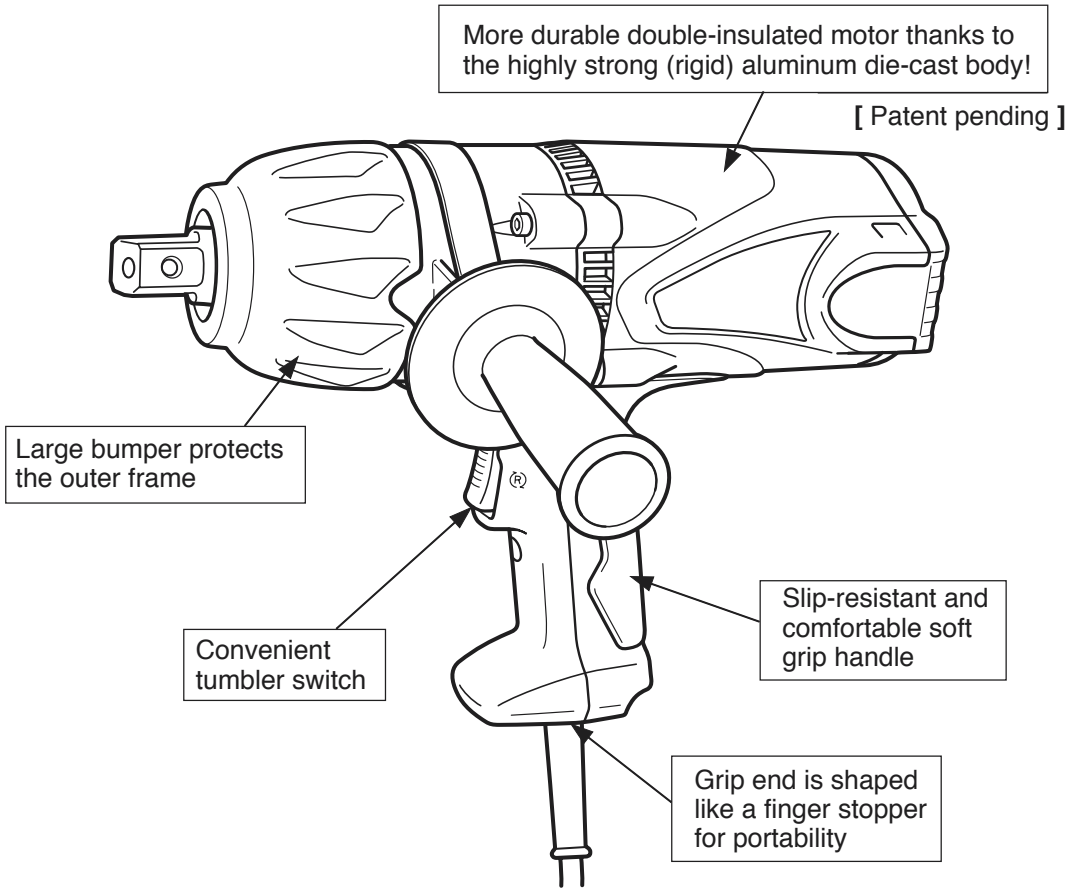
4. SELLING POINTS

Powerful motor

Class-top tightening torque

Novel design thanks to the optimally balanced design

Most compact and lightweight in the class



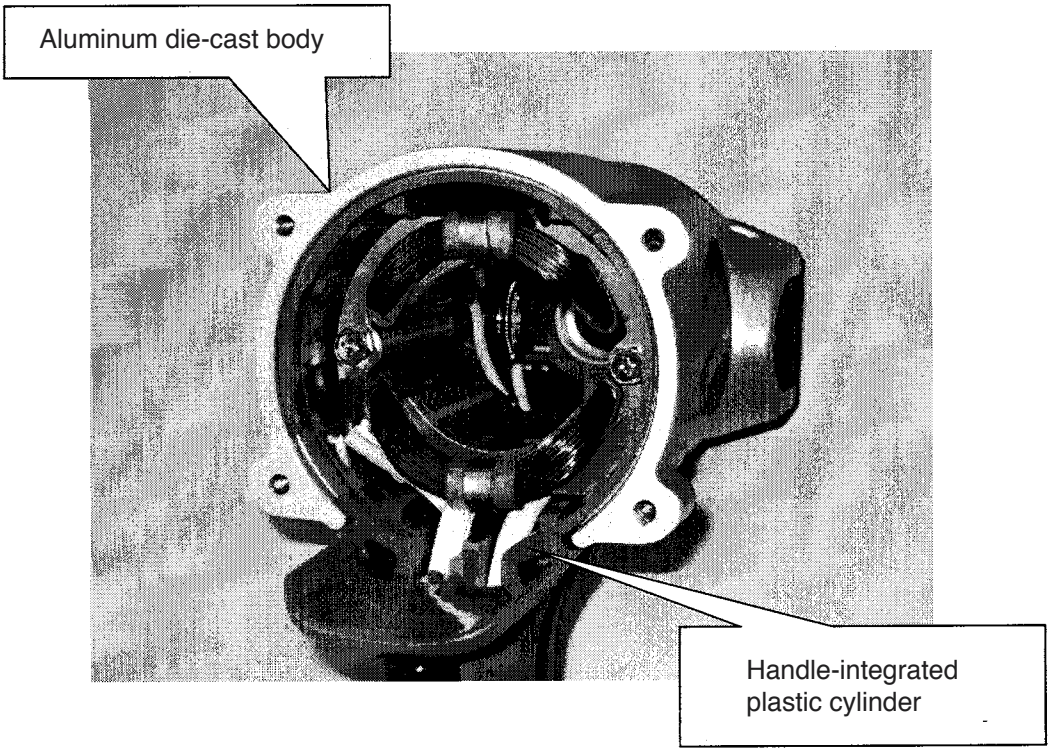
4-1. Selling Point Descriptions

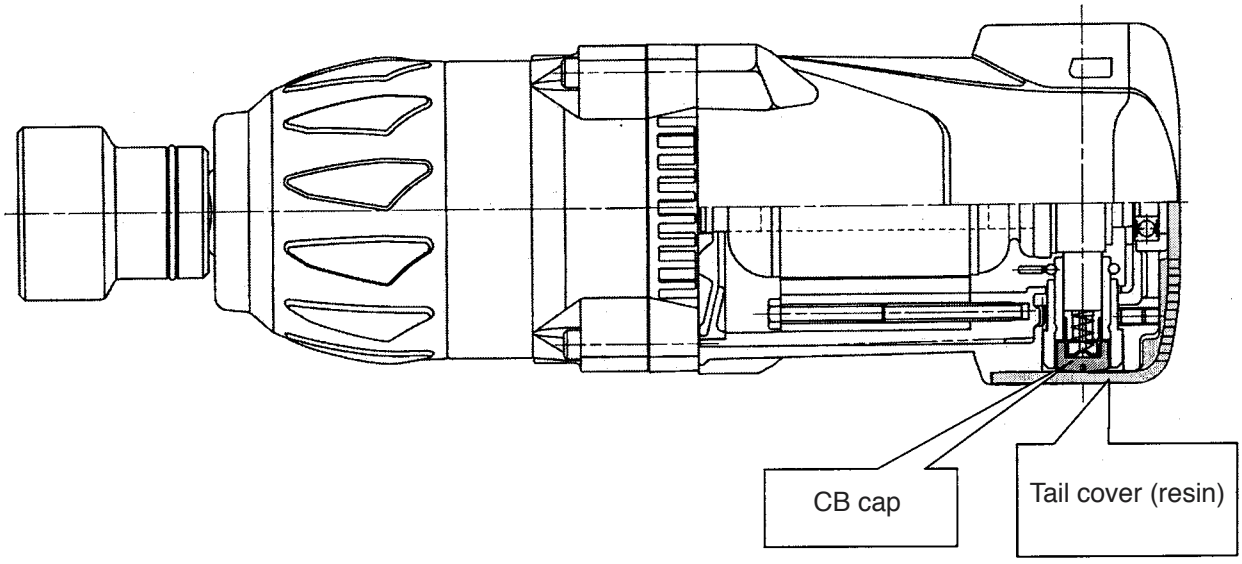
(1) Class-top tightening torque

With the powerful motor and the computer analysis for optimum impact at tightening, the tightening torque of the Model WR 22SA is 610 N·m, which is the highest level in this class.

(2) More durable double-insulated motor thanks to the highly strong (rigid) aluminum die-cast body

The motor is contained in the highly rigid aluminum die-cast body and the handle-integrated plastic cylinder doubly for higher rigidity of the housing. Thanks to this double-insulation structure, the durability of the motor is remarkably increased. In addition, the rear portion of the main body is covered with resin tail cover for higher durability. The resin tail cover also prevents the CB cap from loosening.





(3) Slip-resistant and comfortable soft grip handle

The grip of the Model WR 22SA is soft, slip-resistant and comfortable thanks to the soft material (elastomer resin) covered on the handle. The Model WR 22SA gives minimum fatigue to the operator's hand even if it is operated for a long time.

(4) Large bumper protects the outer frame

- Prevention of damaging and staining workpieces

  The Model WR 22SA minimizes damaging workpieces even if it contacts the workpiece.
- The hammer case is not hot when touched during continuous operation.

  The hammer case is covered with a large bumper. Because the bumper is resistant to transmitting heat, the bumper is not hot even if held by hand during operation.

(5) Grip end is shaped like a finger stopper for portability

The grip end is thickened to make it as a finger stopper for portability.

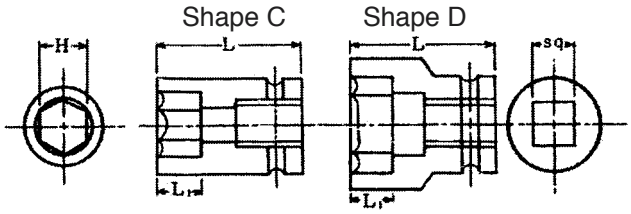
5. SPECIFICATIONS

5-1. Specifications

Item \ Model		WR 22SA
Capacity		Ordinary bolt M14 (9/16") – M24 (15/16") High tension bolt M16 (5/8") – M22 (7/8")
Tightening torque		610 N·m {62.2 kgf·cm} (5,390 in-lbs.)
Tip condition		19 mm (3/4") (Width across flat of the socket mounting portion)
Type of motor		Single phase AC commutator motor
Power requirement		Single phase AC 50/60 Hz
Insulation method		Double insulation
Enclosure		Aluminum die casting + Polyamide resin + Elastomer ····· Housing Polyamide resin ····· Handle cover, tail cover Aluminum die casting ····· Hammer case, inner cover Rubber ····· Bumper
Type of switch		Tumbler switch with forward/reverse changeover pushing button
Handle configuration		T-type
Power consumption		800 W (China) 850 W (Europe, U.S.A., Korea, Taiwan, Australia and New Zealand) 1140 W (Other Asian countries)
Full-load current		8.1 A (110 V), 7.5 A (120 V), 5.5 A (220 V), 4.1 A (220 V) (Korea), 3.8 A (220 V) (China), 5.2 A (230 V), 3.9 A (230 V) (Europe and New Zealand), 5.0 A (240 V), 3.7 A (240 V) (Australia)
No-load rotation speed		1,800/min
Impact rate		2,000/min
Weight	Main body	4.8 kg (10.6 lbs.) (Excludes cord, socket and side handle)
	Packaged	7.3 kg (16.1 lbs.)
Overall length x height		303 mm x 236 mm (11-15/16" x 9-9/32")
Center height		43 mm (1-11/16")
Package		Plastic case
Cord	Type	2-core cabtire cable
	Nominal cross-sectional area	1.0 mm^2
	Outside diameter	8.0 mm
	Length	2.5 m
Standard accessory		Side handle and plastic case

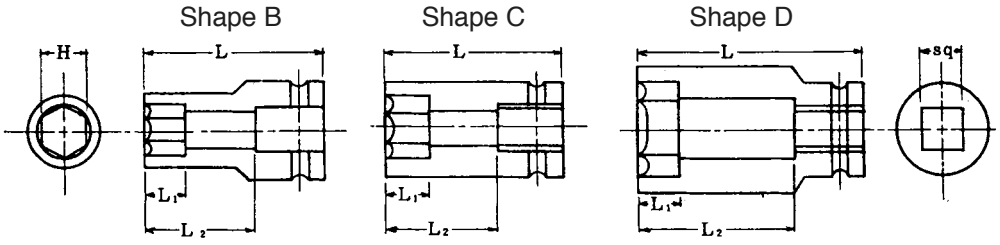
5-2. Optional Accessories

(1) Dimensions of each hexagon socket and applicable bolts



Square drive dimension Sq (mm)	Part name		Code No.	Nominal diameter of applicable bolts				Dihedral width H (mm)	Shape	Socket primary dimensions (mm)	
				High-tension	ISO (Ordinary)	ISO (Small type)	Inch screw			L	L_1
19.0 mm (3/4")	Hexagon socket	23 mm	874-527				W 9/16"	23	C	55	15
		24 mm	874-528		M 16	M 18		24	D	55	15
		26 mm	874-529				W 5/8"	26	D	55	16
		27 mm	874-530	M 16	M 18	M 20		27	D	55	16
		30 mm	874-532		M 20	M 22		30	D	55	19
		32 mm	874-523	M 20	M 22	M 24	W 3/4"	32	D	55	19
		35 mm	874-533				W 7/8"	35	D	55	19
		36 mm	874-534	M 22	M 24	M 27		36	D	55	19

(2) Dimensions of each long hexagon socket and applicable bolts



Square drive dimension Sq (mm)	Part name		Code No.	Nominal diameter of applicable bolts				Dihedral width H (mm)	Shape	Socket primary dimensions (mm)		
				High-tension	ISO (Ordinary)	ISO (Small type)	Inch screw			L	L_1	L_2
19.0 mm (3/4")	Hexagon socket	22 mm	955-031	M 12	M 14	M 16		22	B	60	23	32
		24 mm	955-033		M16	M 18		24	B	60	23	32
		26 mm	955-034				W 5/8"	26	C	85	25	57
		27 mm	955-035	M 16	M 18	M 20		27	D	85	26	57
		30 mm	955-037		M 20	M 22		30	D	85	26	57
		32 mm	955-038	M 20	M 22	M 24	W 3/4"	32	D	100	26	72
		36 mm	955-092	M 22	M 24	M 27		36	D	100	26	72

(3) Extension bar (Code No. 874535)

(4) Universal joint (Code No. 955088)

6. COMPARISONS WITH SIMILAR PRODUCTS

6-1. Specification Comparisons

<Table 1>

Item \ Maker · Model			HITACHI WR 22SA	HITACHI WH 22	C	B
Capacity	Ordinary bolt		M 14 – M 24	M 14 – M 24	M 16 – M 22	M 24
	High-tension bolt		M 16 – M 22	M 16 – M 22	M 16 – M 20	—
Max. tightening torque		N·m	610	588	588	600
		kgf·cm	62.2	60.0	60.0	61.2
		in·lbs	5,400	5,210	5,210	5,310
Square drive dimension		mm	19 (3/4")	19 (3/4")	19 (3/4")	19 (3/4")
No-load rotation speed		/min	1,800	1,600	1,700	1,260
Impact rate		/min	2,000	1,800	1,600	950
Overall length x height		mm	303 x 236 (11-15/16" x 9-9/32")	328 x 224 (12-29/32" x 8-13/16")	325 x 240 (12-25/32" x 9-7/16")	416 x 236 (16-3/8" x 9-9/32")
Center height		mm	43 (1-11/16")	43 (1-11/16")	45 (1-25/32")	46 (1-13/16")
Main body weight Note 1)		kg	4.8 (10.6 lbs.)	5.0 (11.0 lbs.)	5.0 (11.0 lbs.)	5.7 (12.6 lbs.)
Motor specifications			Single phase AC commutator motor	Single phase AC commutator motor	Single phase AC commutator motor	Single phase AC commutator motor
Motor characteristics	Voltage	V	230	230	230	230
	No-load rotation speed	/min	19,000	18,000	17,500	23,000
	Lock current	A	17	19	—	—
	Input	W	850	850	620	800
	Rated current	A	3.9	3.9	2.8	3.9
	Max. efficiency	%	57	55	—	—
Type of switch			Tumbler switch with forward/reverse changeover pushing button	Tumbler switch with forward/reverse changeover pushing button	Tumbler switch with forward/reverse changeover pushing button	Variable-speed trigger switch with forward/ reverse changeover pushing button (stepless)
Insulation method			Double insulation	Double insulation	Double insulation	Double insulation
Carbon brush			Mounted outside	Mounted outside	Mounted outside	Mounted inside
Cord length		m	2.5 (8.2 ft)	2.5 (8.2 ft)	2.5 (8.2 ft)	2.5 (8.2 ft)
Soft handle			Provided	Not provided	Not provided	Not provided

Note 1) The cord, socket and side handle are excluded.

6-2. Tightening Torque

Figure 1 shows a comparison of tightening torque with the Model WH 22, C and B.

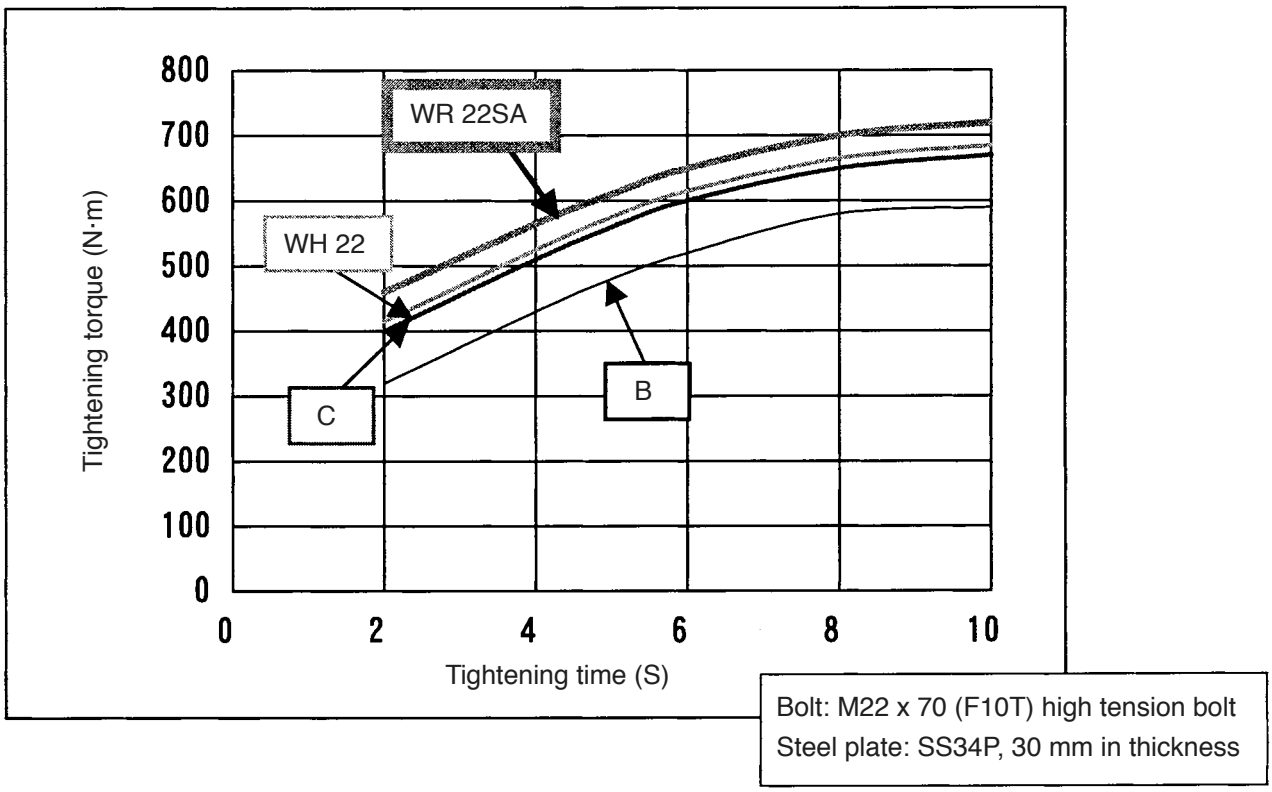


Fig. 1

6-3. Appropriate Tightening Torque for Bolts

Generally speaking, the appropriate tightening torque for a bolt can be determined by the strength grade of the bolt or the material tightened. Tables 2, 3 and 4 below list data relative to the strength grade of various bolts and the appropriate tightening torque. For further reference, appropriate tightening torque is calculated with the following formula. Study and use this formula for accurate selection of tightening torque.

$T = k \cdot d \cdot p$

T: Tightening torque (kgf·cm)

d: Nominal diameter for the bolt (cm)

p: Recommended axial tightening force to be applied to the bolt (kg)

p=rated axial stress (kg·mm^2) x 0.8 x effective sectional area of the bolt (mm^2)

k: Torque coefficient (0.17)

○ Strength grade and rated axial stress of bolts

<Table 2>

Strength grade	4.8	6.8	8.8	10.9	12.9
Rated axial stress (kgf·mm^2)	29.1	43.7	58.2	79.2	95
Material	Carbon steel such as SS and SC		Special alloy steel such as SNC, SCM and SNCM		
Heat treatment	Not treated		Treated ···· Hard material		

○ Diameters and effective sectional areas of bolts

<Table 3>

Nominal diameter of bolt	M14 x 2.0	M16 x 2.0	M18 x 2.5	M20 x 2.5	M22 x 2.5	M24 x 3.0
Effective sectional area of bolt (mm^2)	115.0	157.0	192.0	245.0	303.0	353.0

Tightening torque according to strength grade of bolts

kgf-cm <Table 4>

Strength grade / Nominal diameter of bolt	4.8	6.8	8.8	10.9	12.9
M14 x 2.0	640	960	1,280	1,735	2,075
M16 x 2.0	994	1,493	1,990	2,700	3,240
M18 x 2.5	1,370	2,054	2,740	3,720	4,455
M20 x 2.5	1,940	2,912	3,880	5,280	6,340
M22 x 2.5	2,640	3,960	5,276	7,180	8,613
M24 x 3.0	3,353	5,035	6,705	9,125	10,945

6-4. Tightening Torque Characteristics when Using an Extension Cord

Figure 2 shows relationship between the tightening time and the tightening torque when using an extension cord. While the data are useful for handy reference, actual tightening torque will vary depending on tightening conditions.

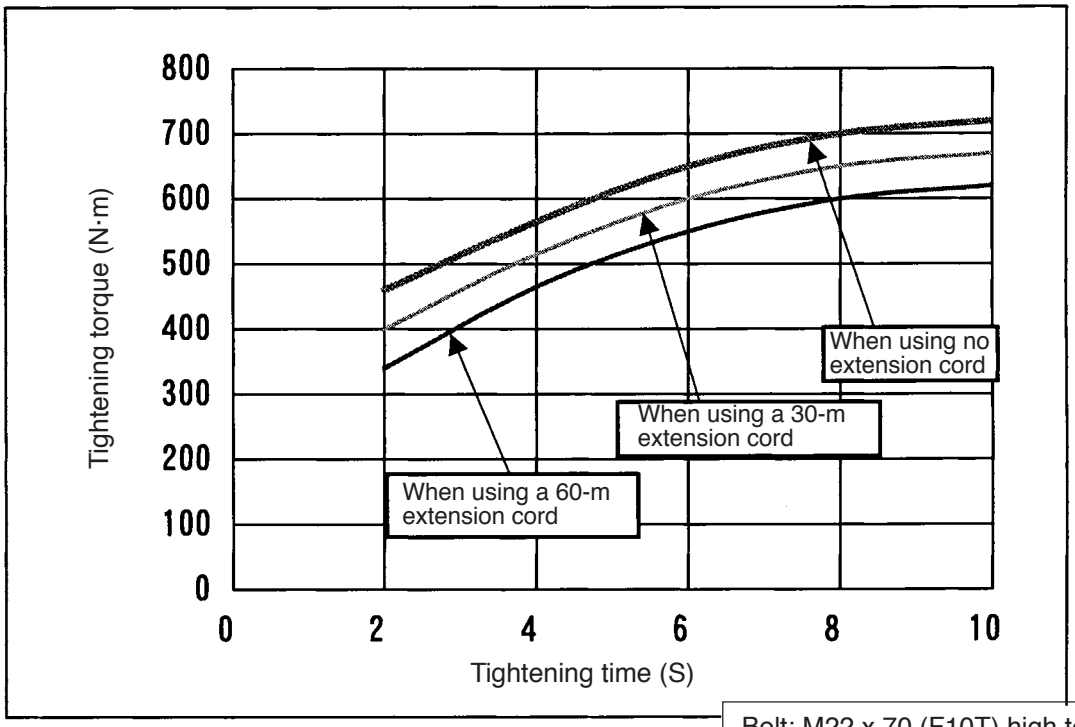


Fig. 2

7. PRECAUTIONS IN SALES PROMOTION

7-1. Safety Instructions

In the interest of promoting the safest and most efficient use of the Model WR 22SA by all our customers, it is very important that at the time of sale the salesperson carefully ensures that the buyer seriously recognizes the importance of the contents of the Handling Instructions, and fully understands the meaning of the precautions listed on the Caution Plate attached to each tool.

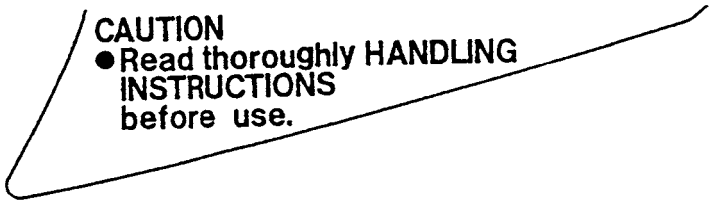
7-1-1. Handling Instructions

Salespersons must be thoroughly familiar with the contents of the Handling Instructions in order to give pertinent advice to the customer.

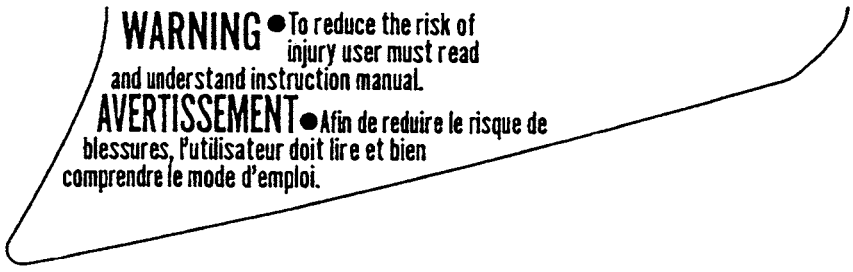
7-1-2. Caution Plates

(1) The following precautions are listed on the Caution Plate attached to the main body of each tool.

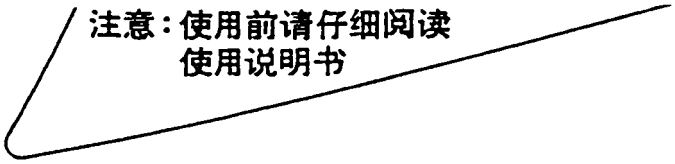
- For Australia and New Zealand



- For U.S.A. and Canada



- For China



7-2. Tightening Torque Inspection Prior to Operation

The output tightening torque of the Model WR 22SA is higher than the rated tightening torque of certain bolts. Accordingly, if the tightening time is prolonged for such bolts, it could cause damage to their threads or, in the worst case, cause them to be sheared off. (This phenomenon is common to all existing impact wrenches.)
The customer should be advised to carry out several bolt tightening operations and adjust the tightening time as necessary by measuring the tightening torque before commencing continuous operation.

7-3. Tightening Torque Variation

The tightening torque of an impact wrench may vary slightly in accordance with the factors described below. Salespersons are requested to advise the customer to confirm that appropriate tightening torque is obtained by measuring the torque at the beginning of the tightening operations, and as necessary during tightening operations. In addition, the torque values shown in Para. 6-2, 6-3 and 6-4 above are useful as a handy reference, and may be utilized as tentative standards.

(1) Voltage

The tightening torque of an impact wrench is influenced by voltage. For example, the tightening torque will be reduced to about 90% if the Model WR 22SA is operated with 90% of the rated voltage. The line voltage may be reduced by the use of a long extension cord depending on the work sites. Take the following countermeasures against voltage reduction caused by the resistance of an extension cord and the load current.

○ Decrease the resistance of an extension cord.

Use an extension cord which is as short as possible and has a thick core.

○ Compensate for reduction of the voltage by using a step up transformer.

At this time, prevent the plug voltage of the main body from exceeding the rated voltage.

Advise the customer to use an extension cord which is as thick as possible (cross sectional area of the core of the extension cord: 1.25 mm^2 or larger) if it is unavoidable to use a long extension cord on a building site. In addition, recommend the customer to use a step up transformer to step up the voltage by the amount of reduction previously.

(2) Effects of low ambient temperatures

The tightening torque required may be reduced at low ambient temperatures or under the influence of grease and different torque coefficients (dependent on manufacturing and finishing processes, and specified by bolt manufacturers).

(3) Different bolt diameter

Required levels of tightening torque may vary according to the bolt diameters. Generally speaking, the higher tightening torque is required for the larger diameter bolt.

(4) Different materials being tightened

When a bolt is tightened into a soft material such as aluminum, plastic, wood, etc., the tightening torque becomes considerably lower than when the bolt is tightened into a hard material such as steel.

(5) Different tightening conditions

The tightening torque may vary in accordance with bolt torque coefficient (dependent on manufacturing processes, and specified by bolt manufacturers), bolt grade and bolt length, even though the diameters of the bolts are the same. Tightening torque may also vary depending on the surface finishing state of tightening materials (steel, aluminum, etc.) and materials to be tightened. In addition, if there is a seal packing or a clearance between tightening materials, the tightening torque is decreased.

(6) Wear and looseness of the socket

With extended use, the hexagonal portion of the socket which is fitted to the head of the bolt and the hexagonal portion which is fitted onto the anvil in the main body will become worn and loose. Wear and looseness will cause a proportionate loss of tightening torque. In addition, use of an incorrect size socket will also result in decreased torque.

(7) Bolt and nut rotate together

Tightening torque that can be achieved will be considerably decreased if the bolt and the nut rotate together during the tightening operation. The customer should be advised to carefully observe the operation and ensure this does not occur.

7-4. Temperature Rise

If the Model WR 22SA is used for tightening bolts which require long time to be tightened continuously, it will cause temperature rise of the motor and burnout subsequently. Advise the customer to perform no-load operation for several minutes to cool the motor if the outer frame of the main body becomes hot.

8. OTHER PRECAUTIONS

(1) Check for cracks or other damage on the socket

Cracks or any other faults on the socket are very hazardous and decrease the tightening torque. Advise the customer to ensure that there are no abnormalities on the socket before operation.

(2) Socket dimensions

Without fail, utilize an appropriate socket which matches the bolt size. If the clearance between the socket and the nut is large, it will not only cause insufficient tightening torque but also cause damage to the socket easily. Please refer to Para. 5-2 for appropriate socket dimensions.

(3) Hammering section lubrication

Grease (Doubrex 251, optional accessory) is applied to the hammering section. Frequent or continuous use of the tool will cause excessive temperature rise of the hammering section, resulting in depletion of grease and subsequent increased wear of components which will, in turn, cause loss of tightening efficiency. Accordingly, it is necessary to periodically replenish grease in the hammering section to ensure proper lubrication of moving and sliding components.

9. REPAIR GUIDE

The procedures and the precautions in disassembly and reassembly are described below.

The **[bold]** numbers correspond to the item numbers in the Parts List and the exploded assembly diagram of the Model WR 22SA.

9-1. Disassembly

(1) Hammer Case Ass'y **[3]**

(a) Removal of the Hammer Case Ass'y **[3]**

Remove the four Seal Lock Hex. Socket Hd. Bolts M5 x 45 **[2]**. Supporting the Hammer Case Ass'y **[3]**, tap the tip of the Anvil **[6]** with a wooden hammer to remove the Hammer Case Ass'y **[3]**. Remove Packing (B) **[22]** from between the Hammer Case Ass'y **[3]** and the Inner Cover **[23]**.

(b) Removal of the Anvil **[6]**

Remove the Hammer Case Ass'y **[3]**. Then the Anvil **[6]** can be removed from the bearing portion of the Hammer Case Ass'y **[3]**.

(c) Removal of the Ring Gear **[20]** and the Needle Roller **[19]**

Tap the end surface of the Hammer Case Ass'y **[3]** with a wooden hammer to remove the Ring Gear **[20]** and the Needle Roller **[19]**. If the Ring Gear **[20]** and the Needle Roller **[19]** cannot be removed, warm up the Hammer Case Ass'y **[3]** then tap it with a wooden hammer to remove them.

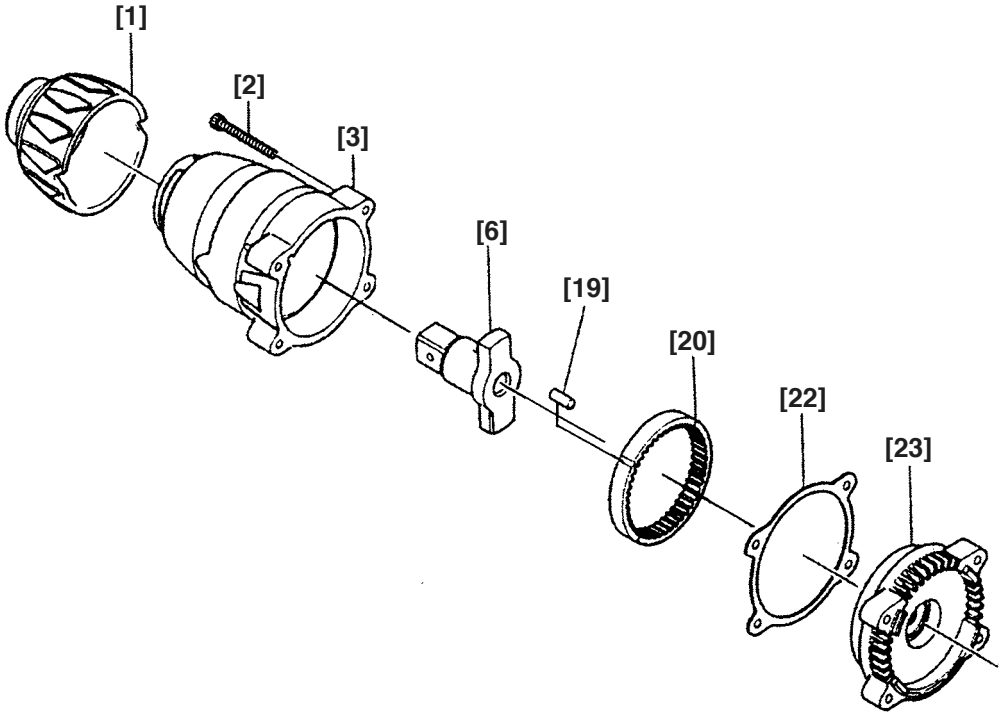


Fig. 3

(2) Removal of the Spring **[11]**

Push the click of the Hammer **[8]** with a hand press and keep it at the position where the Spring **[11]** is compressed fully. Remove the two Steel Balls D7.14 **[7]** from the steel ball guide at the cam portion of the Spindle **[17]** and the Hammer **[8]** with a flat-blade screwdriver. Then release the hand press and remove the Hammer **[8]** from the Spindle **[17]** to remove the Spring **[11]**. Be careful not to lose the thirty-eight Steel Balls D3.97 **[9]** and the Hammer Washer **[10]** mounted between the Hammer **[8]** and the Spring **[11]** during disassembly.

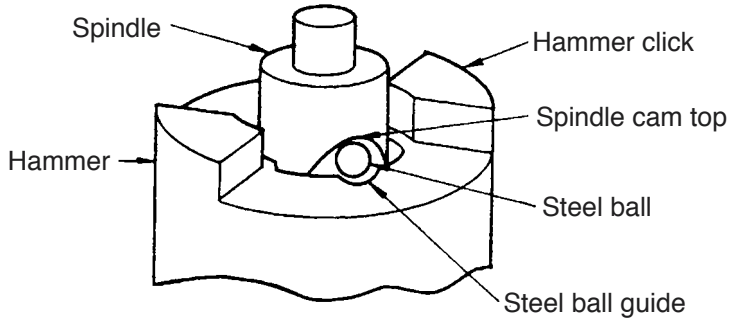


Fig. 4

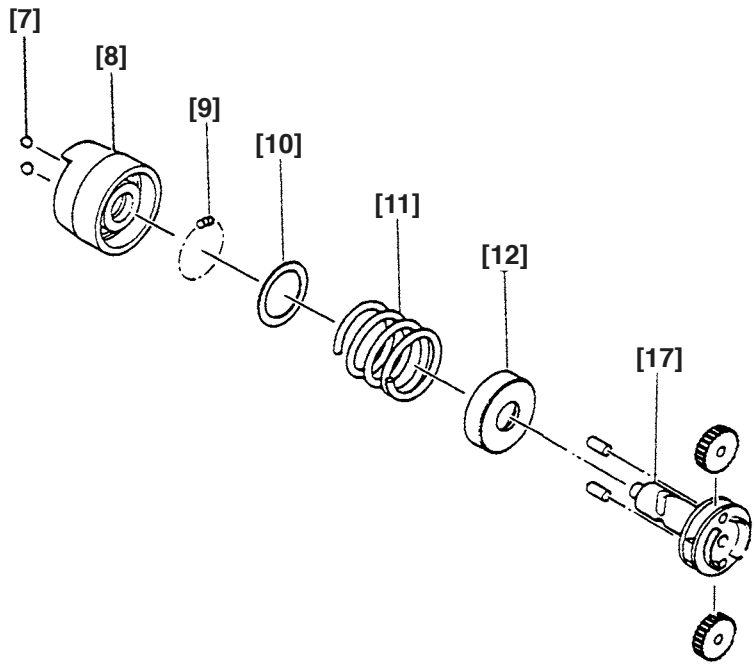


Fig. 5

(3) Removal of the Armature **[27]**

Remove the Seal Lock Hex. Socket Hd. Bolt M5 x 10 **[47]** from the Tail Cover **[46]** and remove the Tail Cover **[46]**. Remove the Brush Cap **[53]** and the Carbon Brushes **[54]**. Then the Armature **[27]** can be removed together with the Inner Cover **[23]** from the Housing Ass'y **[56]**. Be careful not to lose the Felt Packing **[24]** and the Packing Washer **[25]** when removing the Armature **[27]** from the Inner Cover **[23]**.

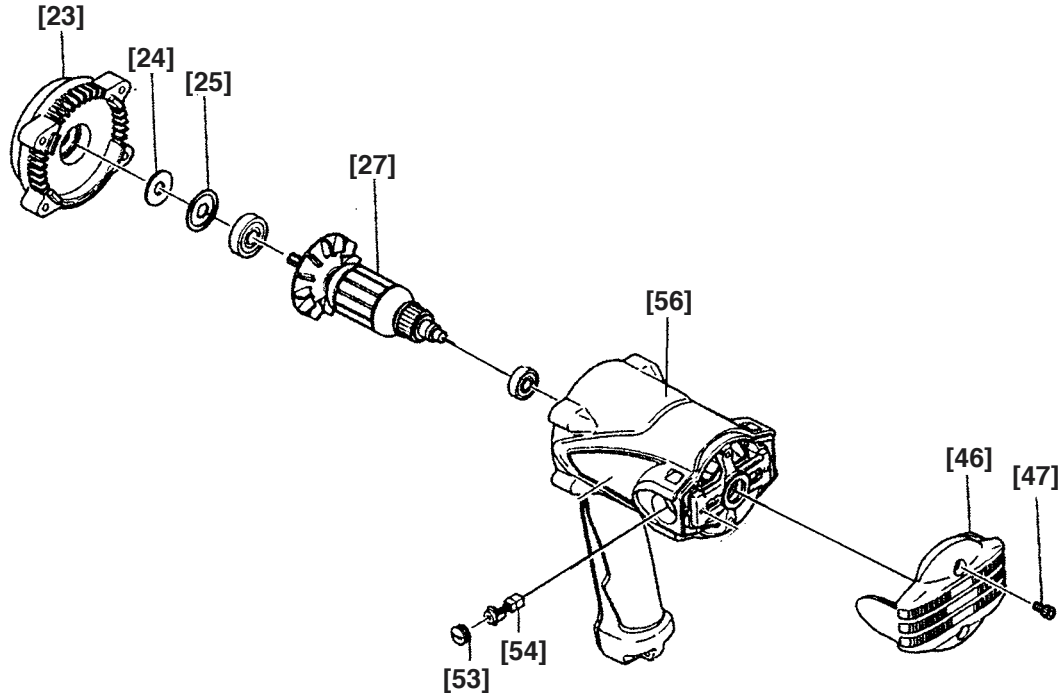


Fig. 6

(4) Removal of the Switch **[36]**

Remove the Tapping Screw (W/Flange) D4 x 35 (Black) **[34]** from the Handle Cover **[35]** and remove the Handle Cover **[35]**. Remove the screw from the Switch **[36]** and remove the Switch Adapter **[37]**. Then the Switch **[36]** can be removed.

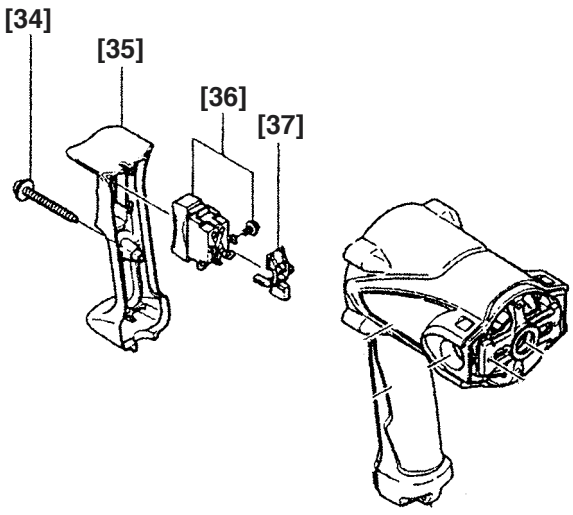


Fig. 7

9-2. Reassembly

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

(1) Housing ass'y

Mounting the switch

Pay attention to the relationship between the terminal numbers of the Switch **[36]** and the colors of the internal wires.

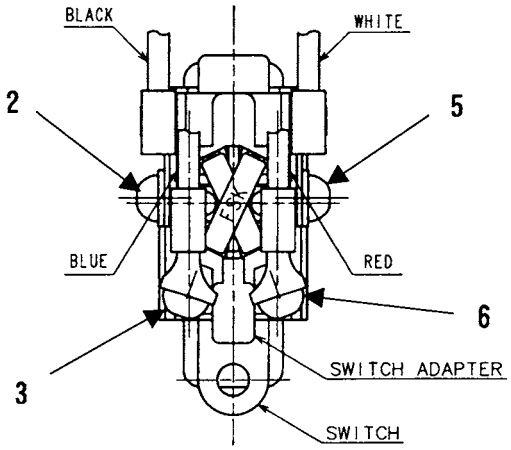
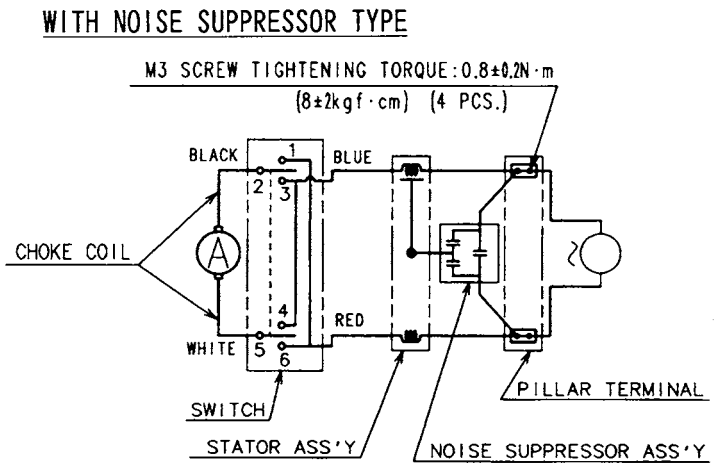


Fig. 8



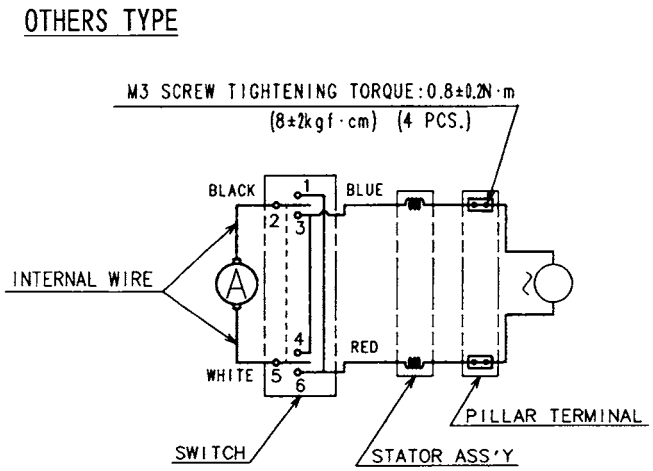


Fig. 9 Wiring diagram

(2) Hammer Case Ass'y **[3]**

Mounting the hammer

(a) Put the thirty-eight Steel Balls D3.97 **[9]** in between the Hammer **[8]** and the Hammer Washer **[10]**.

(b) Mount the Spring **[11]** and the Spring Seat **[12]** to the Hammer **[8]** then insert the Spindle **[17]** into it. Push the click of the Hammer **[8]** with a hand press and keep it at the position where the Spring **[11]** is compressed fully. Push the Hammer **[8]** so that the Spindle **[17]** cam top is aligned with the steel ball guide at the Hammer **[8]**.

(c) Put the two Steel Balls D7.14 **[7]** in the steel ball guide. Check that these Steel Balls D7.14 **[7]** are in the cam groove. Then release the hand press.

(3) Mounting direction of the Packing Washer **[25]**

Insert the Packing Washer **[25]** into the Inner Cover **[23]** in the proper direction together with the Felt Packing **[24]** when mounting the Armature **[27]** to the Inner Cover **[23]**.

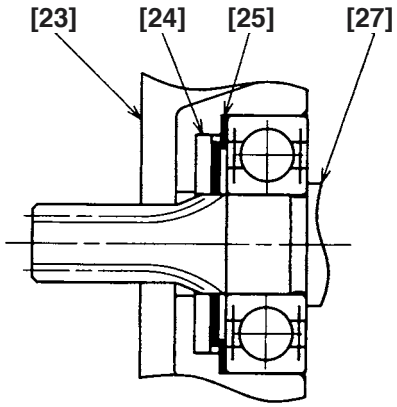


Fig. 10

(4) Mounting the cord clip

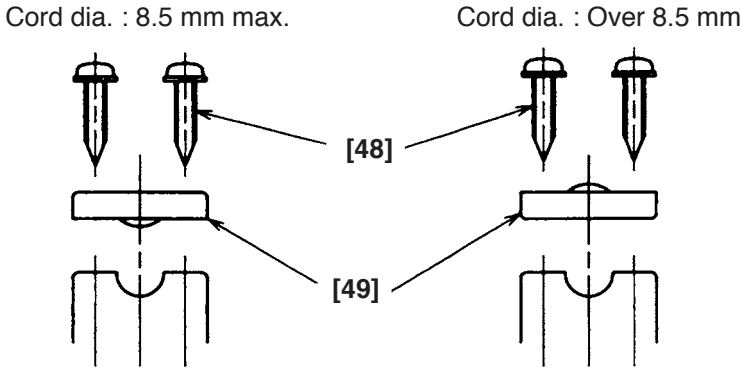


Fig. 11

(5) Grease

Greasing locations

(a) Apply grease (Doubrex 251) to the following locations.

- Spindle **[17]**: Cam groove, sliding section and engaged portion with the Anvil **[6]**
- Hammer **[8]**: Cam groove, sliding section and the click
- Steel Balls D7.14 **[7]**
- Steel Balls D3.97 **[9]**
- Hammer Washer **[10]**
- Sliding section of the Spring Seat **[12]**
- Inner circumference of the metal in the Hammer Case Ass'y **[3]**

(b) Apply grease (Nippeco SEP-3A) to the following locations.

- Pinion tooth flanks of the Armature **[27]**
- Tooth flanks of the Ring Gear **[20]**
- Tooth flanks and inner circumference of the Gear Shaft **[16]** and the Idle Gear Set **[18]**

(6) Screw tightening torque

- Seal Lock Hex. Socket Hd. Bolt M5 x 45 **[2]** ..... 7.8 ± 1.5 N·m (80 ± 15 kgf·cm)
- Seal Lock Hex. Socket Hd. Bolt M5 x 10 **[47]** ..... 3.9 ± 1.5 N·m (40 ± 5 kgf·cm)
- Tapping Screw (W/Flange) D4 **[34] [48]** ..... 2.0 ± 0.5 N·m (20 ± 5 kgf·cm)
- Brush Cap **[53]** ..... $1.0^{+0.5}_{0}$ N·m (10^{+5}_{0} kgf·cm)
- Machine screw M3 (at the Switch **[36]**) ..... 0.8 ± 0.2 N·m (8 ± 2 kgf·cm)
- Hex. Hd. Tapping Screw D5 x 70 **[29]** ..... 2.9 ± 0.5 N·m (30 ± 5 kgf·cm)

9-3. Insulation Tests

On completion of disassembly and repair, measure the insulation resistance and conduct a dielectric strength test. Be sure to perform the insulation resistance measurement and the dielectric strength test between the plug pins and the outside metallic parts such as the anvil.

Insulation resistance: 7 M Ω or more

Dielectric strength: 2,500 V/1 minute .... 110 V to 120 V

4,000 V/1 minute .... 220 V to 240 V

9-4. No-load Current Value

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

110 V .... 4.0 A or lower

120 V .... 3.8 A or lower

220 V .... 2.0 A or lower

230 V .... 2.1 A or lower

240 V .... 2.0 A or lower

10. STANDARD REPAIR TIME (UNIT) SCHEDULES

MODEL	Variable / Fixed	10	20	30	40	50	60 min.
WR 22SA	General Assembly	Work Flow					
		Handle Cover Switch Adapter Cord Armor	Switch Cord	Armature Ball Bearing (6200DD) Ball Bearing (608VV) Inner Cover Ball Bearing (6908ZZ)	Housing Ass'y Stator		
		Tail Cover		Hammer Steel Ball D7.14 x 2 Steel Ball D3.97 x 38 Spring Spring Seat	Spindle Idle Gear Set Gear Shaft x 2		
				Hammer Case Ass'y O-ring Anvil Ring Gear			

Hitachi Power Tools

LIST NO. E707

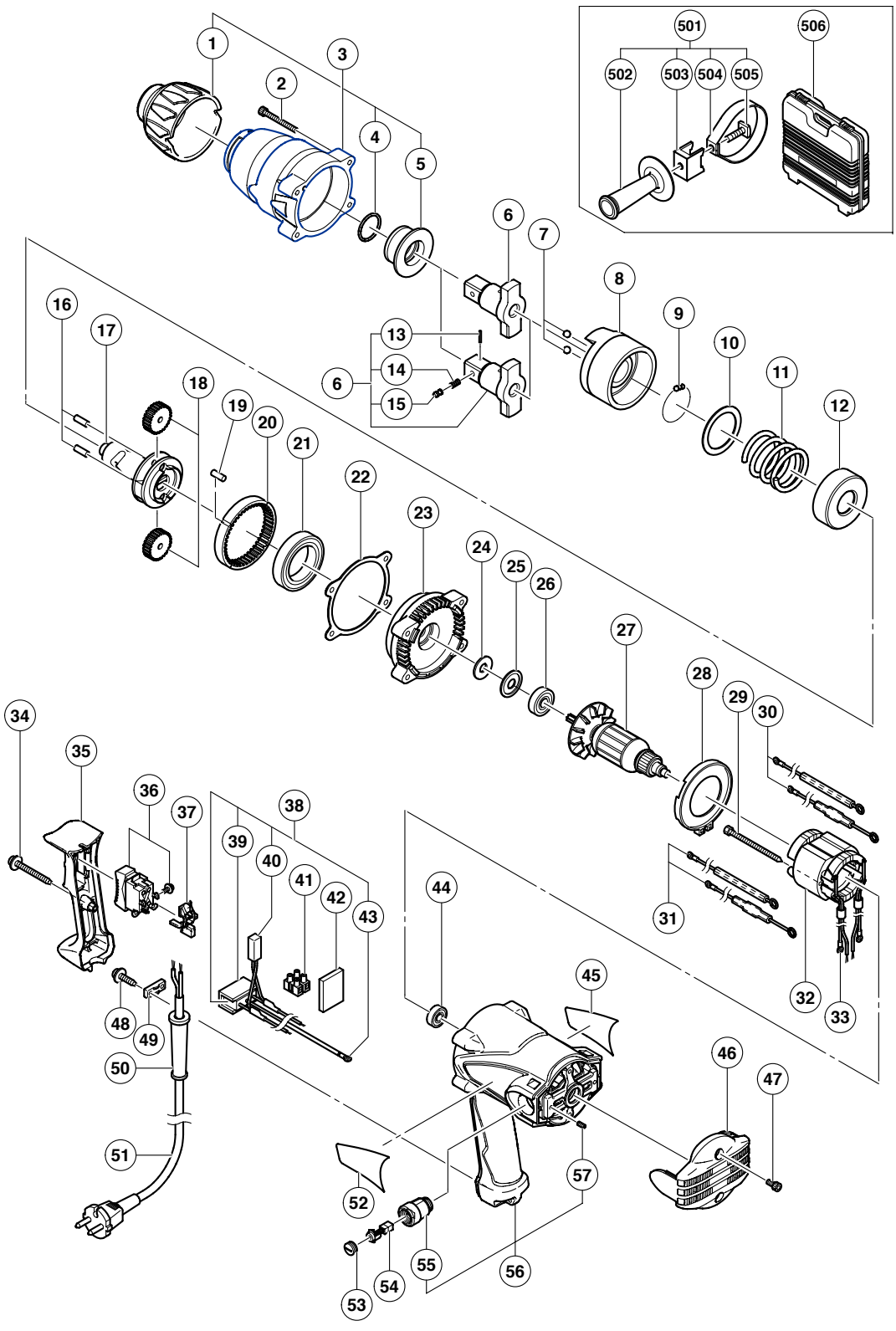
ELECTRIC TOOL PARTS LIST

■ IMPACT WRENCH

2005 · 3 · 30

Model WR 22SA

(E1)



	ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
	1	324-008	BUMPER	1		
	2	323-994	SEAL LOCK HEX. SOCKET HD. BOLT M5X45	4		
	3	324-006	HAMMER CASE ASS'Y	1	INCLUD. 1, 4, 5	
	4	971-028	O-RING (P-28)	1		
	5	324-007	METAL	1		
*	6	324-013	ANVIL (A)	1		
*	6	324-021	ANVIL (B) ASS'Y	1	INCLUD. 13-15 FOR USA, CAN, AUS	
	7	959-151	STEEL BALL D7.14 (10 PCS.)	2		
	8	324-005	HAMMER	1		
	9	959-155	STEEL BALL D3.97 (10 PCS.)	38		
	10	324-004	HAMMER WASHER	1		
	11	324-002	SPRING	1		
	12	324-001	SPRING SEAT	1		
*	13	949-507	ROLL PIN D2X14 (10 PCS.)	1	FOR USA, CAN, AUS	
*	14	992-571	SPRING	1	FOR USA, CAN, AUS	
*	15	992-572	PLUNGER	1	FOR USA, CAN, AUS	
	16	971-016	GEAR SHAFT	2		
	17	324-003	SPINDLE	1		
	18	318-448	IDLE GEAR SET (2 PCS.)	2		
	19	991-449	NEEDLE ROLLER	1		
	20	985-303	RING GEAR	1		
	21	690-8ZN	BALL BEARING 6908ZZ-N	1		
	22	323-995	PACKING (B)	1		
	23	323-999	INNER COVER	1		
	24	323-996	FELT PACKING	1		
	25	971-012	PACKING WASHER	1		
	26	620-0DD	BALL BEARING 6200DDCMPS2L	1		
*	27	360-700U	ARMATURE ASS'Y 110V-120V	1	INCLUD. 26, 44	
*	27	360-700E	ARMATURE 220V-230V	1		
*	27	360-700F	ARMATURE 240V	1		
	28	323-998	FAN GUIDE	1		
	29	961-400	HEX. HD. TAPPING SCREW D5X70	2		
*	30	324-017	INTERNAL WIRE (WHITE)	1		
*	30	324-009	INTERNAL WIRE (WHITE)	1	FOR USA, CAN, VEN, INA, SYR, KUW, HKG, SIN	
*	31	324-018	INTERNAL WIRE (BLACK)	1		
*	31	324-010	INTERNAL WIRE (BLACK)	1	FOR USA, CAN, VEN, INA, SYR, KUW, HKG, SIN	
*	32	340-620C	STATOR 110V-120V	1		
*	32	340-620E	STATOR 220V-230V	1		
*	32	340-620F	STATOR 240V	1		
	33	960-356	TERMINAL (A) M3.5 (10 PCS.)	2		
	34	303-694	TAPPING SCREW (W/FLANGE) D4X35 (BLACK)	1		
	35	324-020	HANDLE COVER	1		
*	36	985-103	SWITCH (2P SCREW TYPE)	1		
*	36	320-528	SWITCH (2P SCREW TYPE)	1	FOR AUT ,GBR, FRA, FRG, ITA, HOL, BEL, ESP, FIN	
	37	323-768	SWITCH ADAPTER	1		
*	38	324-319	NOISE SUPPRESSOR ASS'Y (W/RESISTOR)	1	INCLUD. 39, 40, 43 EXCEPT FOR USA,	
					CAN, VEN, INA, SYR, KUW, HKG, SIN	
*	39	930-153	SUPPORT (B)	1	EXCEPT FOR USA, CAN, VEN, INA, SYR,	
					KUW, HKG, SIN	
*	40	316-186	SUPPORT (B)	1	EXCEPT FOR USA, CAN, VEN, INA, SYR,	
					KUW, HKG, SIN	

	ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
	41	958-308Z	PILLAR TERMINAL (A)	1		
	42	324-023	SUPPORT (B)	1		
*	43	961-419Z	TERMINAL	1	EXCEPT FOR USA, CAN, VEN, INA, SYR,	
					KUW, HKG, SIN	
	44	608-VVM	BALL BEARING 608VVC2PS2L	1		
	45		NAME PLATE	1		
	46	323-997	TAIL COVER	1		
	47	877-839	SEAL LOCK HEX. SOCKET HD. BOLT M5X10	2		
	48	984-750	TAPPING SCREW (W/FLANGE) D4X16	2		
	49	937-631	CORD CLIP	1		
*	50	953-327	CORD ARMOR D8.8	1		
*	50	938-051	CORD ARMOR D10.1	1		
*	51	500-247Z	CORD	1	(CORD ARMOR D8.8)	
*	51	500-234Z	CORD	1	(CORD ARMOR D8.8) FOR INA, KOR	
*	51	500-450Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (230V)	
*	51	500-461Z	CORD	1	(CORD ARMOR D8.8) FOR GBR (110V)	
*	51	500-245Z	CORD	1	(CORD ARMOR D10.1) FOR SYR	
*	51	323-974	CORD	1	(CORD ARMOR D10.1) FOR VEN, TPE	
*	51	500-240Z	CORD	1	(CORD ARMOR D8.8) FOR USA, CAN	
*	51	500-439Z	CORD	1	(CORD ARMOR D8.8) FOR AUS, NZL	
*	51	500-423Z	CORD	1	(CORD ARMOR D8.8) FOR KUW, SIN	
*	51	500-435Z	CORD	1	(CORD ARMOR D8.8) FOR HKG	
*	51	500-456Z	CORD	1	(CORD ARMOR D8.8) FOR CHN	
	52		HITACHI LABEL	1		
	53	935-829	BRUSH CAP	2		
	54	999-043	CARBON BRUSH (1 PAIR)	2		
	55	957-774	BRUSH HOLDER	2		
	56	324-019	HOUSING ASS'Y	1	INCLUD. 55, 57	
	57	938-477	HEX. SOCKET SET SCREW M5X8	2		

STANDARD ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501	324-015	SIDE HANDLE ASS'Y	1	INCLUD. 502-505	
502	980-901	SIDE HANDLE	1		
503	323-775	HANDLE HOLDER	1		
504	324-016	HANDLE RING	1		
505	980-903	SQUARE BOLT M8	1		
506	324-014	CASE (B)	1		

OPTIONAL ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
601	874-535	EXTENSION BAR ASS'Y (SQUARE) 19.0MMX150L	1	INCLUD. 602, 603	
602	874-524	SOCKET RING	1		
603	874-525	SOCKET PIN	1		
604	955-088	UNIVERSAL JOINT ASS'Y	1	INCLUD. 602, 603	
605	955-091	UNIVERSAL JOINT PIN	1		
606	986-004	ADAPTER ASS'Y 12.7MM	1	INCLUD. 602, 603	
607	874-527	HEX. SOCKET ASS'Y 23MMX55L	1	INCLUD. 602, 603	
608	874-528	HEX. SOCKET ASS'Y 24MMX55L	1	INCLUD. 602, 603	
609	874-529	HEX. SOCKET ASS'Y 26MMX55L	1	INCLUD. 602, 603	
610	874-530	HEX. SOCKET ASS'Y 27MMX55L	1	INCLUD. 602, 603	
611	874-532	HEX. SOCKET ASS'Y 30MMX55L	1	INCLUD. 602, 603	
612	874-523	HEX. SOCKET ASS'Y 32MMX55L	1	INCLUD. 602, 603	
613	874-533	HEX. SOCKET ASS'Y 35MMX55L	1	INCLUD. 602, 603	
614	874-534	HEX. SOCKET ASS'Y 36MMX55L	1	INCLUD. 602, 603	
615	955-028	HEX. SOCKET ASS'Y (LONG) 17MMX60L	1	INCLUD. 602, 603	
616	955-029	HEX. SOCKET ASS'Y (LONG) 19MMX60L	1	INCLUD. 602, 603	
617	955-030	HEX. SOCKET ASS'Y (LONG) 21MMX60L	1	INCLUD. 602, 603	
618	955-031	HEX. SOCKET ASS'Y (LONG) 22MMX60L	1	INCLUD. 602, 603	
619	955-033	HEX. SOCKET ASS'Y (LONG) 24MMX60L	1	INCLUD. 602, 603	
620	955-034	HEX. SOCKET ASS'Y (LONG) 26MMX85L	1	INCLUD. 602, 603	
621	955-035	HEX. SOCKET ASS'Y (LONG) 27MMX85L	1	INCLUD. 602, 603	
622	955-037	HEX. SOCKET ASS'Y (LONG) 30MMX85L	1	INCLUD. 602, 603	
623	955-038	HEX. SOCKET ASS'Y (LONG) 32MMX100L	1	INCLUD. 602, 603	
624	955-092	HEX. SOCKET ASS'Y (LONG) 36MMX100L	1	INCLUD. 602, 603	

* ALTERNATIVE PARTS

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