MODEL

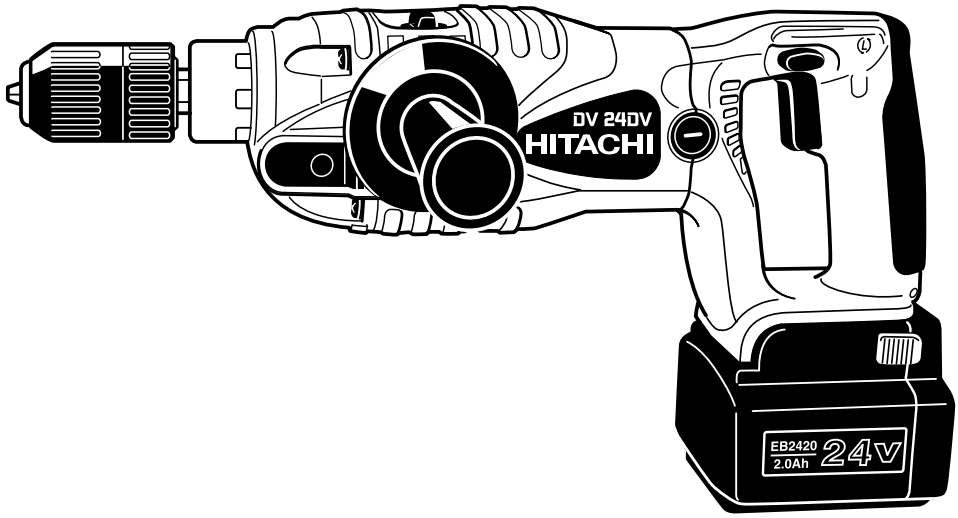
DV 24DV

HITACHI
POWER TOOLS

D

TECHNICAL DATA
AND
SERVICE MANUAL

CORDLESS IMPACT DRILL
DV 24DV



LIST No. F848

May 2001

Notice for use

Specifications and parts are subject to change for improvement.

Refer to Hitachi Power Tool Technical News for further information.

REMARK:

Throughout this TECHNICAL DATA AND SERVICE MANUAL, a symbol(s) is(are) used in the place of company name(s) and model name(s) of our competitor(s). The symbol(s) utilized here is(are) as follows:

Symbol Utilized	Competitor	
	Company Name	Model Name
T	DEWALT	DW006K

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1. PRODUCT NAME

Hitachi 24 V Cordless Impact Drill, Model DV 24DV

2. MARKETING OBJECTIVE

Recently the market demand has been shifted to high-voltage cordless power tools. In addition, there is a strong demand for a high-torque drill in the North American markets. To meet these market demands, we bring out the new cordless driver drill Model DV 24DV that features 2-mode selection (drill or impact drill) and the class-top torque.

3. APPLICATIONS

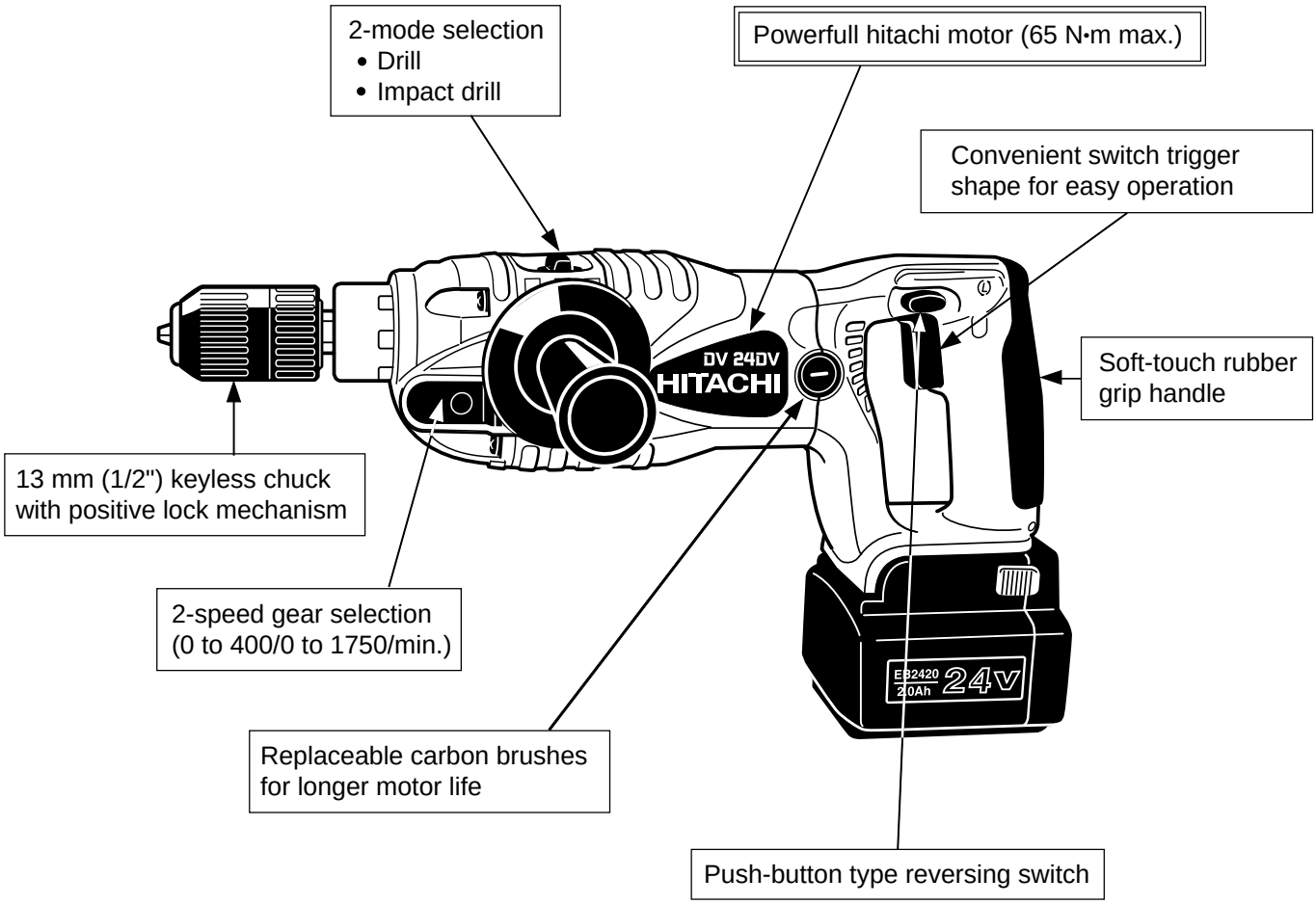
(1) Rotation and impact function

Drilling into concrete, brick and tile

(2) Rotation only function

Drilling into steel, wood and plastics

4. SELLING POINTS



4-1. Selling Point Descriptions

(1) Powerful Hitachi motor (65 N•m max.)

The powerful Hitachi motor is most powerful in the class and various materials can be efficiently drilled.

(2) Replaceable carbon brushes for longer motor life

The carbon brush can be replaced from the outside to increase the motor life and to enhance the maintainability. The carbon brush can be easily removed from the motor with a flat-blade screwdriver as shown in Fig. 2, and can also be easily and securely mounted to the motor by hooking the claw of the carbon brush on the connecting portion on the outside of the brush tube.

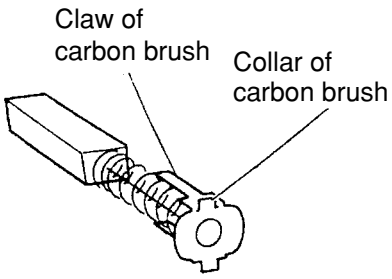


Fig. 1

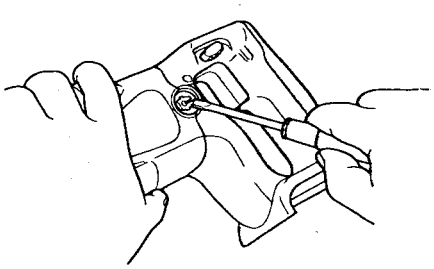


Fig. 2

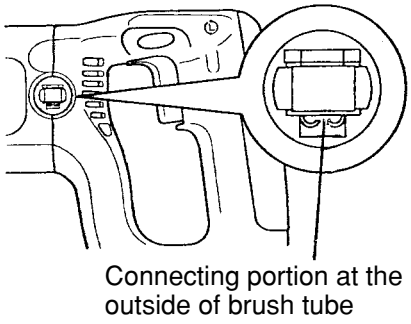


Fig. 3

(3) 13 mm (1/2") keyless chuck with positive lock mechanism

The keyless chuck makes replacement of bits easier. Replace the drill bit by simply turning the sleeve with one hand while holding the ring with the other. (See Fig. 4.)

A lock mechanism is provided to prevent loosening of the chuck during operation.

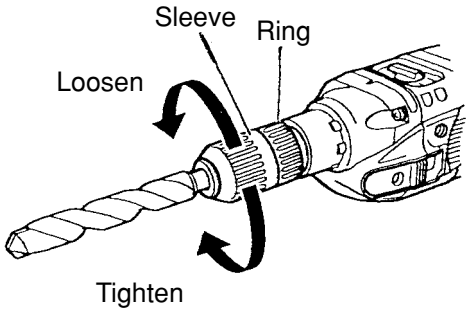


Fig. 4

(4) Convenient switch trigger shape for easy operation

The switch trigger is large enough to operate with two fingers for ease of operation.

5. SPECIFICATIONS

5-1. Specifications

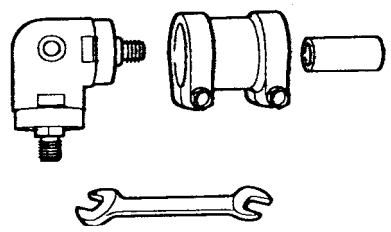
Speed change			1: Low	2: High
Rotation speed (No-load)			0 — 400/min.	0 — 1750/min.
Impact rate (No-load)			0 — 7200/min.	0 — 31500/min.
Capacity	Concrete		20 mm (3/4")	10 mm (3/8")
	Wood	Auger bit	38 mm (1−1/2")	20 mm (3/4")
		Flat spade bit		32 mm (1-1/4")
		Self feed bit	65 mm (2−9/16")	32 mm (1-1/4")
	Steel	Twist bit	13 mm (1/2")	8 mm (5/16")
		Hole saw	38 mm (1-1/2")	
Max. torque			65 N•m (663 kgf•cm, 576 in-lbs.)	14 N•m (142 kgf•cm, 123 in-lbs.)
Keyless chuck			Mount type ..... Screw-on (UNF 1/2" — 20) Capacity ..... 2 — 13 mm (5/64" — 1/2")	
Type of motor			DC magnet motor Max. output: 560 W	
Type of switch			Trigger switch with push button for forward and reverse rotation changeover (with stopper)	
Enclosure			Housing ..... Glassfiber reinforced polycarbonate resin Handle ..... Polycarbonate resin Grip cover ..... Polycarbonate resin + elastomer Gear cover and inner cover ... Aluminum alloy die casting Storage battery ..... Glassfiber reinforced polyamide resin Charger ..... ABS resin	
Handle shape			D-type handle	
Weight			Main body 4.0 kg (8.8 lbs.) (with battery) Battery EB 2420 1.3 kg (2.87 lbs.) EB 2430HA 1.4 kg (3.09 lbs.) Charger UC 24YFB 0.6 kg (1.3 lbs.)	
Battery (Type EB 2420)			Sealed cylindrical nickel cadmium storage battery Nominal voltage: DC 24 V Nominal life: Charging/discharging approximately 1,000 cycles (in case of Model UC 24YFB) Nominal capacity: 2.0 Ah	
Battery (Type EB 2430HA)			Sealed cylindrical nickel-metal hydride storage battery Nominal voltage: DC 24 V Nominal life: Charging/discharging approximately 500 cycles (in case of Model UC 24YFB) Nominal capacity: 3.0 Ah	
Charger (Model UC 24YFB)			Sealed power source: Single-phase AC, 50/60 Hz Voltage: Depending on the order specification Power input: 90 W Charging system: Constant current charge with full wave phase control Overcharge protection system: (1) Battery voltage detection ($\triangle^2$V system) for EB 2420 battery Ni-MH battery temperature detection (dT/dt system) for EB 2430HA battery (2) Battery surface temperature detection (thermistor) (3) 120 minutes timer Output voltage: DC 24V Output current: 2.5 A Charging time: Approx. 50 minutes (for EB 2420 at 20˚C (68˚F)) Approx. 70 minutes (for EB 2430HA at 20˚C (68˚F)) Operable ambient temperature range: 0 ˚C — 40˚C (32˚F — 104˚F) The maximum allowable temperature of the Model 2420 battery is 60˚C (140˚F) and the Model EB 2430HA battery is 45˚C (113˚F).	

Pilot lamp indications (UC 24YFB)

Red pilot lamp remains lit or flashes.	Prior to charging	Blinks 0.5 sec. ON, 0.5 sec. OFF	
	During charging	Lit Stays ON constantly	
	Charging completed	Blinks 0.5 sec. ON, 0.5 sec. OFF	
	Charging not possible	Flickers 0.1 sec. ON, 0.1 sec. OFF	Storage battery or charger is faulty.
Green pilot lamp is lit.	High battery temperature	Lit Stays ON constantly	Charging not possible because storage battery temperature is too high.

5-2. Optional Accessories

(1) Angle attachment ass'y (Code No. 319528)



Used extensively for drilling between joints, studding, in tight corners or in close quarters on machinery and equipment. Provides two additional drilling speed.

- Chuck transferred from drill to LOW spindle of angle unit, the drilling speed is decreased to about 70 % and the drilling torque increased to about 150 %.
- Chuck transferred to HIGH spindle of angle unit, the drilling speed is increased to about 150 % and the drilling torque decreased to about 70 %.

The table below shows the drilling capacities when attaching the angle attachment ass'y.

Speed of DV 24DV		1: Low		2: High	
Speed of angle unit		Low (270/min)	High (580/min)	Low (1200/min)	High (2560/min)
Wood	Auger bit	38 mm (1-1/2")	25 mm (1")	20 mm (3/4")	
	Flat spade bit		38 mm (1-1/2")	32 mm (1-1/4")	20 mm (3/4")
	Self feed bit	65 mm (2-9/16")	38 mm (1-1/2")	32 mm (1-1/4")	
Steel	Twist bit	13 mm (1/2")	13 mm (1/2")	10 mm (3/8")	6.4 mm (1/4")
	Hole saw	38 mm (1-1/2")	35 mm (1-3/8")		

(2) Drill bit for concrete and brick

Bit dia. x Length (mm)	Code No.
3.2 x 65 [1/8" x 2-9/16"]	939875
4.8 x 85 [3/16" x 3-3/8"]	939879
5.5 x 100 [7/32" x 4"]	939882
6.4 x 100 [1/4" x 4"]	939884
8 x 100 [5/16" x 4"]	931852
10 x 120 [3/8" x 4-3/4"]	931854
12 x 120 [15/32" x 4-3/4"]	971704
13 x 160 [1/2" x 6-5/16"]	931855
14.3 x 160 [9/16" x 6-5/16"]	931776
16 x 160 [5/8" x 6-5/16"]	931670
20 x 170 [3/4" x 6-5/8"]	959615

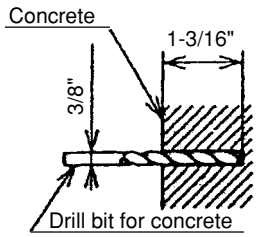
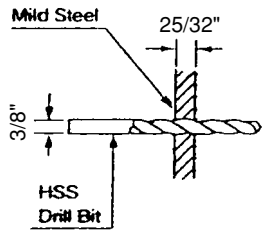
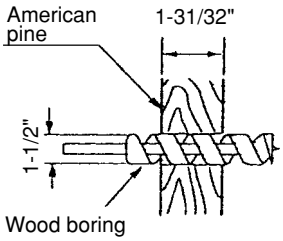
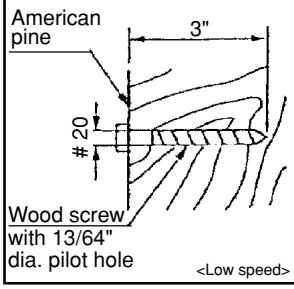
6. COMPARISONS WITH SIMILAR PRODUCTS

Maker			HITACHI	T
Model			DV 24DV	
Max. capacity	Concrete		20 mm (3/4")	13 mm (1/2")
	Steel (twist bit)		13 mm (1/2")	13 mm (1/2")
	Wood (Self-feed bit)		65 mm (2-9/16")	65 mm (2-9/16")
Rotation speed (/min.)		Low	0 – 400	0 – 450
		High	0 – 1,750	0 – 2,000
Impact rate (/min.)		Low	0 – 7,200	0 – 7,650
		High	0 – 31,500	0 – 34,000
Max. torque			65 N•m (663kgf•cm) (576 in-lbs.)	65 N•m (663 kgf•cm) (550 in-lbs.)
Battery	Nominal capacity		2.0/3.0 Ah	1.7/2.4 Ah
	Nominal voltage		24 V	24 V
	Charging time*		50/70 minutes	60/80 minutes
Drill chuck	Capacity		13 mm (1/2")	13 mm (1/2")
	Type		Keyless	Keyless
	Positive lock		Equipped	Equipped
Switch	Feedback circuit		Equipped	Not indicated
	Electric brake		Equipped	Equipped
Reversing switch			Push-button	Push-button
Handle configuraton			D-type	T-type
Dimensions		Overall length	408 mm (16-3/32")	316 mm (12-7/16")
		Overall height	220 mm (8-21/32")	293 mm (11-17/32")
Tool weight			4.0 kg (8.8 lbs.)	3.4 kg (8.4 lbs.)

Remarks* ····· Charging time may vary depending on charger to be used and ambient temperature.

7. WORKING PERFORMANCE PER SINGLE CHARGE

Drilling and fastening performance comparison per charge

Test conditions	Maker Model name	Working capacity (*1) 40 80 120 160 200	Working speed (sec./pc.)
 <High speed>	HITACHI DV 24DV	50	7.0
	T	40	8.0
 <Low speed>	HITACHI DV 24DV	50	19.2
	T	45	21.2
 <Low speed>	HITACHI DV 24DV	20	6.6
	T	20	7.3
 <Low speed>	HITACHI DV 24DV	50	5.2
	T	50	5.2

Remarks*1 Number of holes or fasteners per charge
The above table shows an example of test data obtained by using a 2.0 Ah battery.
As actually measured values listed in the above table may vary depending on the sharpness of the drill bit, workpiece hardness (particularly in wood materials), moisture content of wood, charging condition, operator skill, etc. This data should be used as a comparative guide only.

8. PRECAUTIONS IN SALES PROMOTION

8-1. Safety Instructions

In the interest of promoting the safest and most efficient use of the Model DV 24DV Cordless Impact Drill by all of 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 and Name Plate attached to each tool.

A. Handling instructions

Salespersons must be thoroughly familiar with the contents of the Handling Instructions in order to give pertinent advice to the customer. In particular, they must have a thorough understanding of the precautions for use of the cordless tools which are different from those of ordinary electric power tools.

(1) Before use, ensure that the unit is fully charged.
New units are not fully charged. Even if the units were fully charged at the factory, long periods of inactivity, such as during shipping, cause the storage battery to lose its charge. Customers must be instructed to fully charge the unit prior to use.

(2) When charging storage batteries, use only the exclusive Model UC 24YFB Charger provided with the tool.
Because of the designed rapid-charging feature (about one hour), use of other battery chargers is hazardous.

(3) Connect the Charger to an AC power outlet only.
Use of any other power source (DC outlet, fuel powered generator, etc.) will cause the Charger to overheat and burn out.

(4) Do not use any voltage increasing equipment (transformer, etc.) between the power source and the Charger.
If the Charger is used with voltage higher than that indicated on the unit, it will not function properly.

(5) Conduct battery charging at an ambient temperature range of 0 ˚C – 40 ˚C (32 ˚F – 104 ˚F).
Special temperature sensitive devices are employed in the Charger to permit rapid charging. Ensure that customers are instructed to use the Charger at the indicated ambient temperature range. At temperature over 40 ˚C (104 ˚F), the storage battery cannot be sufficiently charged. The optimum temperature range is 20 ˚C – 25 ˚C (68 ˚F – 77 ˚F).

(6) The battery charger should not be used continuously.
At high ambient temperature, if over three storage batteries are charged in succession, the temperature of the coils on the transformer will rise. After charging one battery, please wait about 15 minutes before charging the next battery.

(7) Do not insert foreign objects into the air vents on the Charger
The Charger case is equipped with air vents to protect the internal electronic components from overheating. Caution the customer not to allow foreign materials, such as metallic or flammable objects, to be dropped or inserted into the air vents. This could cause electrical shock, fire, or other serious hazards.

(8) Do not attempt to disassemble the Storage Battery or the Charger.

Special devices, such as a thermistor, are built into the storage battery and charger to permit rapid charging. Incorrect parts replacement and/or wiring will cause malfunctions which could result in fire or other hazards. Instruct the customer to bring these units to an authorized service center in the event repair or replacement is necessary.

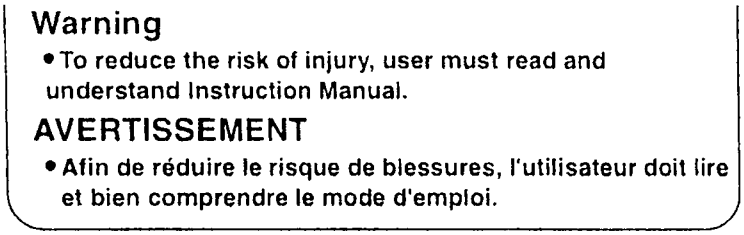
(9) Disposal of the Type EB 2420 or EB 2430HA Storage Battery

Ensure that all customers understand that Type EB 2420, EB 2430HA Storage Batteries should be returned to the Hitachi power tool sales outlet or the authorized service center when they are no longer capable of being recharged or repaired. If thrown into a fire, the batteries may explode, or, if discarded indiscriminately, leakage of the cadmium compound contained in the battery may cause environmental pollution.

B. Caution plates

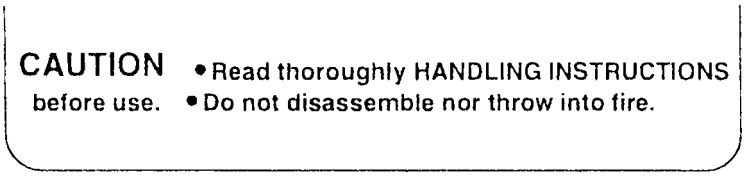
(1) The following cautions are listed on the Name Plate attached to the main body of each tool.

For the U.S.A. and Canada

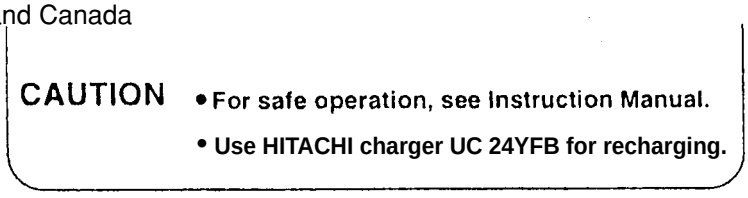


(2) The following cautions are listed on the Name Plate attached to each Type EB 2420, EB 2430HA Storate Battery.

For Europe

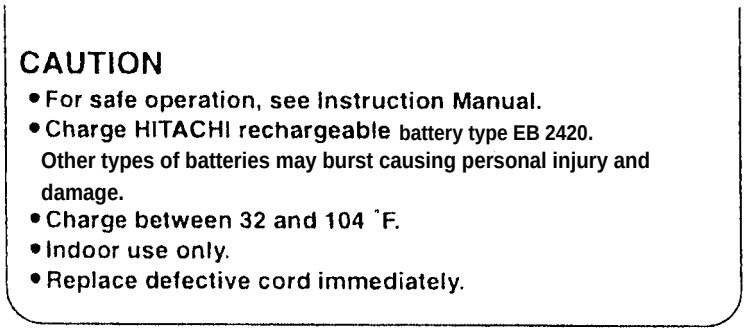


For the U.S.A. and Canada



(3) The following caution is listed on the Name Plate attached to the Model UC 24YFB Charger.

For the U.S.A and Canada



8-2. Inherent Drawbacks of Cordless Impact Drills Requiring Particular Attention During Sales Promotion

The cordless impact drill offers many advantages; it can be used in places where no power source is available, the absence of a cord allows easy use, etc. However, any cordless tool has certain inherent drawbacks. Salespersons must be thoroughly familiar with these drawbacks in order to properly advise the customer in the most efficient use of the tool.

A. Suggestions and precautions for the efficient use of the tool

(1) Use the Cordless Impact Drill for comparatively light work.

Because it is battery driven, the output of the motor in cordless impact drills is rather low in comparison with conventional electric power tools. Accordingly, they are not suitable for continuous drilling of many holes in succession, or for drilling into particularly hard materials which creates a heavy load. Salespersons should recommend conventional electric power tools for such heavy work.

(2) Drilling of large diameter holes should be conducted at low speed.

Instruct the customer that drilling of large diameter holes or other work which requires particularly strong torque should be done at low speed. Because there is less torque at high speed, attempting such work at high speed will not improve working efficiency.

(3) Do not insert a foreign object into body vent holes.

The body of this tool has vent holes for improving the cooling efficiency. As a fan is built into the motor, a foreign object inserted through a vent hole may cause a failure. Please instruct customers to never insert a foreign object into the vent hole.

(4) Avoid "Locking" of the motor.

Locking of the motor will cause an overload current that could result in burning of the motor and/or rapid deterioration of the battery. Salespersons should advise the customer to immediately release the switch and stop operation if the motor becomes locked. (A jammed drill bit can be disengaged from the workpiece material by setting the switch to reverse rotation, or by manually turning the main body of the tool.)

(5) Variation in amount of work possible per charge

Although the nominal chargeable capacity of the storage batteries used with the Model DV 24DV is 2.0 Ah or 3.0 Ah, the actual capacity may vary within 10% of that value depending on the ambient temperature during use and charging, and the number of times the batteries have been recharged. It should be noted that other factors which may have a bearing on the amount of work possible per charge are the working conditions (ambient temperature, type and moisture content of the workpiece, sharpness of the drill bit, etc.) and the operational skill of the user.

(6) Precautions in the use of HSS Drill Bits

Although the Model DV 24DV is designed for drilling capacities of 38 mm (1-1/2") Auger bit in wood, and 13 mm (1/2") in aluminum and steel, this capability is not as efficient as conventional electric power tools. In particular, when drilling through aluminum material with a 13 mm (1/2") drill bit, the drill tends to become locked when the drill bit penetrates through the material. For this reason, the customer should be cautioned to reduce the thrust on the main body of the drill when drilling completely through the material to avoid locking the tool. Repeated locking of the drill causes excessive current flow from the batteries which not only decreases the amount of work possible per charge, but could also result in burning of the motor.

B. Suggestions and precautions for the efficient use of the charger and storage batteries

If any of the storage batteries Types EB 2420 and EB 2430HA are exposed to direct sunlight for an extended period or if the temperature of the battery is high immediately after it has been used in the tool, the pilot lamp (red) may not be turned on when the battery is connected to the charger. Chargeable temperature ranges of each type of battery are specified as follows.

Type EB 2420: from -5˚C to 60˚C (from 23˚F to 140˚F)

Type EB 2430HA: from 0˚C to 45˚C (from 32˚F to 113˚F)

In such a case, the customer should be advised to place the battery in a shaded area with a good airflow, and allow sufficient cooling before recharging. This phenomenon is common to all existing batteries that employ a thermistor. The cooling time required before charging varies from a few minutes to about 30 minutes, depending on the load, duration of use, and ambient temperature.

9. REFERENCE MATERIALS

9-1. Speed Control Mechanism

Spindle rotation speed of the Model DV 24DV can be controlled by simply varying the amount by which the trigger switch is depressed. The relationship between the amount the trigger switch is depressed (in millimeters) and the rotation speed is illustrated in Fig. 5.

Note: The gradient and values illustrated in Fig. 5 are intended for reference only, and will vary slightly due to differences in the discharge condition of the battery, the ambient temperature, and individual speed-control element accuracy.

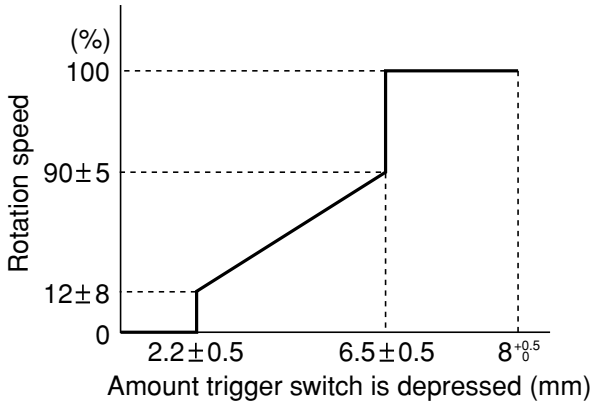


Fig. 5

10. REPAIR GUIDE

Be sure to remove the storage batteries from the main body before servicing. Inadvertent triggering of the switch with the storage battery connected will result in a danger of accidental turning of the motor.

The **[Bold]** numbers in the description below correspond to the item numbers in the Parts List and exploded assembly diagram for the Model DV 24DV.

10-1. Precautions in Disassembly

10-1-1. Disassembly of the motor section

(1) Removal of the Gear Cover **[10]**, Inner Cover **[16]** and Housing **[28]**

Remove the Brush Cap **[32]** and the Carbon Brush **[33]**. Remove the Tapping Screw (W/Flange) D5 x 65 (Black) **[18]** then the Gear Cover **[10]**, Inner Cover **[16]** (together with the Armature Ass'y **[24]**), Housing **[28]** and Fan Guide **[25]** can be removed.

(2) Removal of the armature from the inner cover

As illustrated in Fig. 6, support the Inner Cover **[16]** with a tubular jig, and push down on the top of the pinion of the Armature Ass'y **[24]**. Be careful not to lose the Needle D 2.5 x 25.8 **[17]** at this time

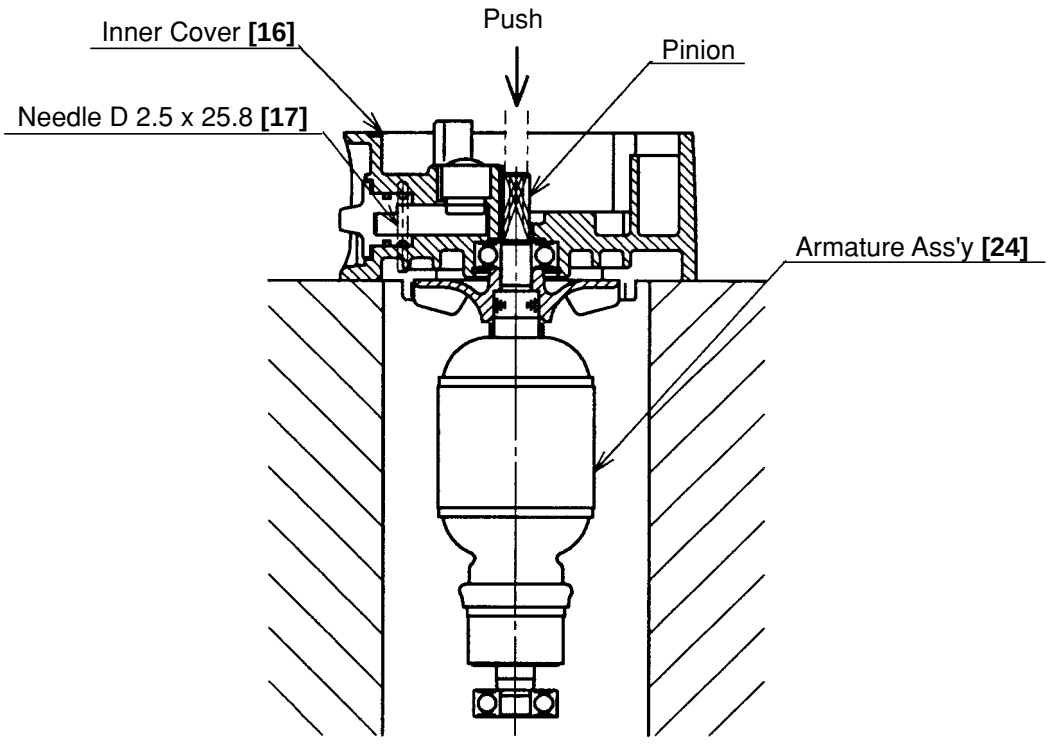


Fig. 6

10-1-2. Disassembly of the inner cover

(1) Removal of the change lever

Remove the Needle D2.5 x 25.8 **[17]** and the Change Lever **[14]**. The Needle D2.5 x 25.8 **[17]** is just inserted in the hole without press-fitting. If it is difficult to remove the needle, utilize the magnetic attraction of a magnet bit or the like.

10-1-3. Disassembly of the speed change-over section

(1) Removal of the shift plate

Loosen the Seal Lock Flat Hd. Screw M4 x 14 (Black) **[19]**. Since this screw is secured with a bonding agent, it cannot be easily loosened except by heating the overall gear cover section. After loosening the screw, the Shift Plate **[20]** can be removed.

(2) Extraction of the gears

By using a wooden hammer, gently tap the connecting portion of the Gear Cover **[10]**, and the Second Pinion **[13]**, Gear **[11]**, Shift Arm **[22]** and Seal Plate **[21]** can be removed from the gear cover interior.

10-1-4. Disassembly of the hammering section

(1) Removal of the Drill Chuck **[2]** (See Fig. 7.)

Remove the Drill Chuck **[2]** of the fully assembled main body in accordance with the following procedures.

(a) Fully open the jaws of the Drill Chuck **[2]**, and turn the Flat Hd. Screw (A) (Left Hand) M6 x 25 **[1]** clockwise and remove it. Take care that it is left-hand threaded.

(b) Fix the hexagonal bar wrench M10 into the Drill Chuck **[2]** as indicated in Fig. 7. Next, apply a wrench 17 mm to the hexagon bolt on the spindle to hold it steadily, and remove it by turning counterclockwise. If it is difficult to loosen, use a pipe extension or similar tool.

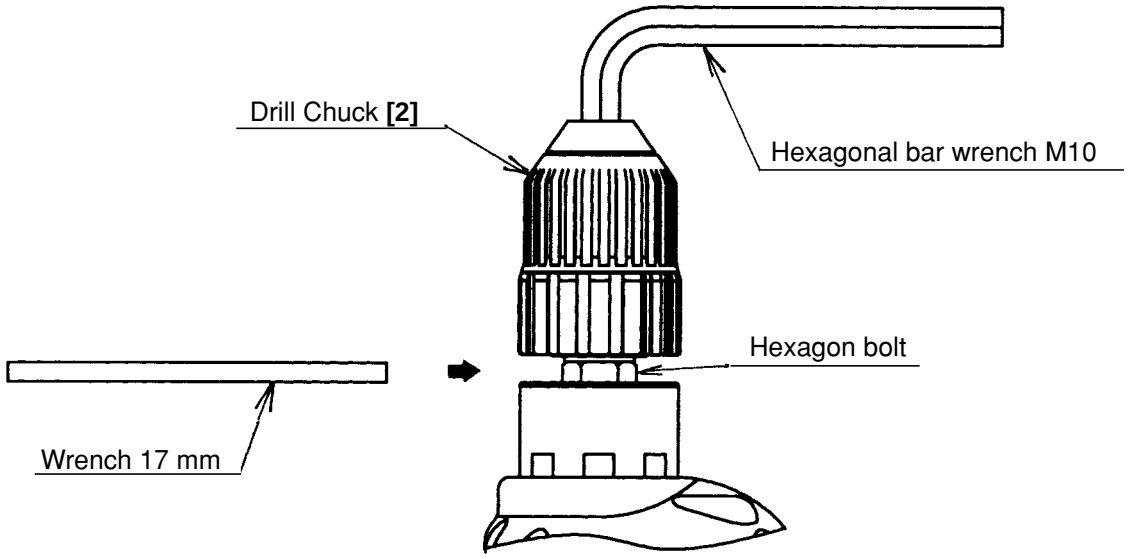


Fig. 7

(2) Extraction of the spindle

Remove the Retaining Ring for D32 Hole **[5]** which supports the Washer **[6]**. By using a wooden hammer, tap the inner cover side end of the Spindle **[3]** gently, then the Washer **[6]**, Spring (A) **[9]** and the Spindle **[3]** can be removed. Both the Ball Bearing **[7]** and Rachet (A) **[8]** are mounted on the spindle.

(3) Removal of Ratchet (A) **[8]**

Remove Ratchet (A) **[8]** by using a jig shown in Fig. 8. Ratchet (A) **[8]** is securely press-fitted to the Spindle **[3]**, so a considerable amount of force is required to remove Ratchet (A) **[8]**. Do not reuse the removed Ratchet (A) **[8]** because the press-fitting force between Ratchet (A) **[8]** and the Spindle **[3]** will be too low for proper operation.

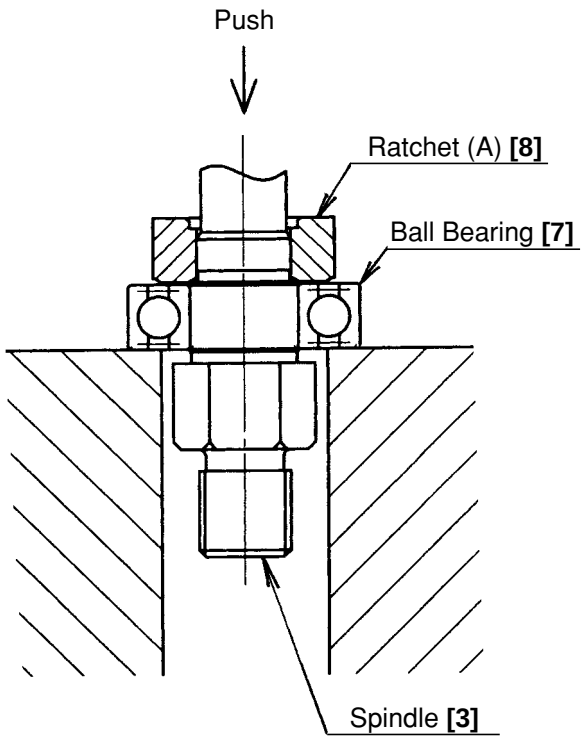


Fig. 8

10-1-5. Disassembly of the handle section

Remove the two Tapping Screws (W/Flange) D4 x 25 (Black) **[42]** and pull the Grip Cover **[41]** backward to remove it. Remove four Tapping Screws (W/Flange) D4 x 30 (Black) **[40]** and remove Handle (A).(B) Set **[37]**. Then the Pushing Button **[38]** and the power supply unit (an assembly of the DC-speed Control Switch **[39]**, Brush Holder (A) **[34]**, Brush Holder (B) **[35]** and Terminal Support **[45]**) can be removed.

10-1-6. Disassembly of the Housing [28] and the power supply unit

Disconnect the internal wires from the Housing **[28]** and pull Brush Holder (A) **[34]** and Brush Holder (B) **[35]** backward to remove them.

10-1-7. Disassembly of the Housing [28]

Remove the two Hex. Hd. Tapping Screws D4 x 60 **[26]** and remove the Magnet **[30]**.

10-1-8. Angle attachment ass'y (optional accessory) disassembly

(1) Removal of the drill chuck from the angle unit

The drill chuck can be removed from angle unit in the same manner it was removed from the impact drill; however, always remove angle unit from the impact drill before attempting to remove the drill chuck.

This will prevent damage of impact drill's gear. Use the Wrench **[614]** (open-end) provided to hold the angle unit spindle before attempting to remove the drill chuck. (Fig. 9)

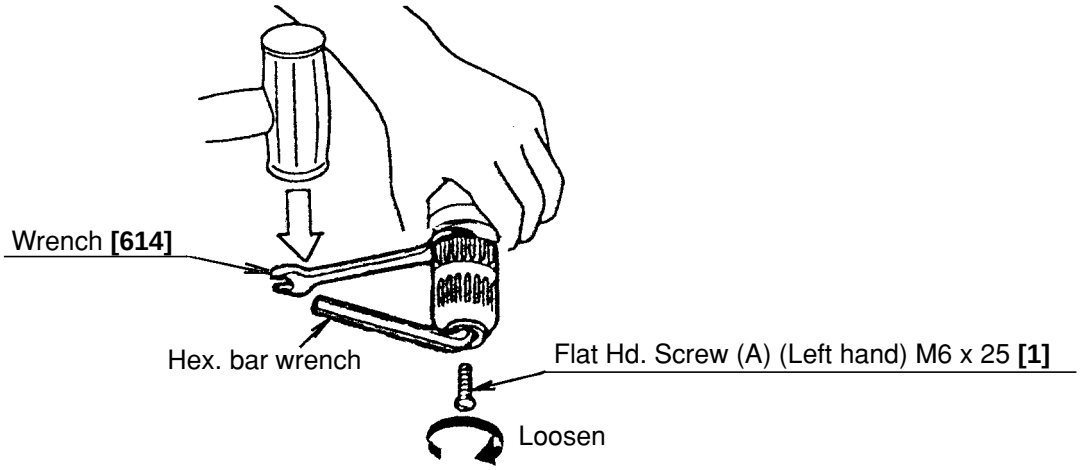


Fig. 9

If the drill chuck cannot be removed by striking the hex. bar wrench, do not strike the hex. bar wrench forcibly. Remove the drill chuck according to the procedure specified in section 10-1-4.

(2) Removal of gears and spindles from the angle unit

Remove the Retaining Rings **[605]**, then tap the end of the Angle Head Ass'y **[612]** to take out the spindle pinion ass'y and the Spindle and Gear Set **[613]**.

To remove the Pinion **[603]** and the Ball Bearing **[604]** from the Spindle **[607]**, place the end surface of the Ball Bearing **[604]** on a tubular jig and press down on the Spindle **[607]** with a hand press. (Fig. 10)

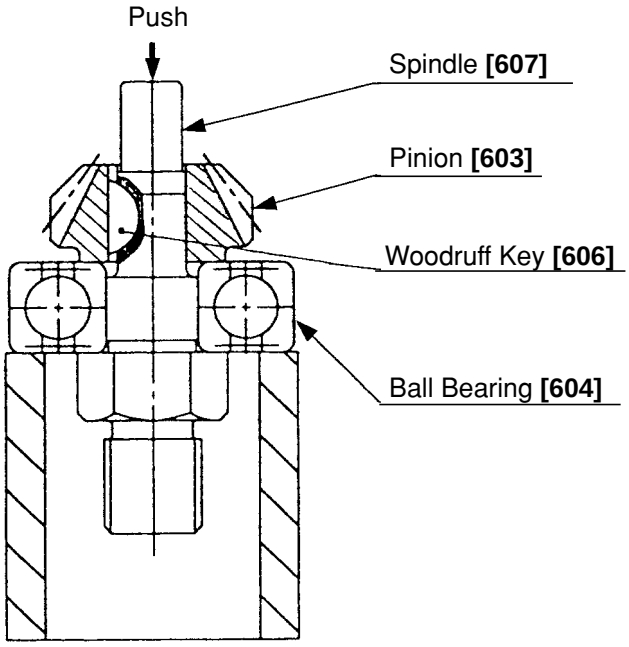


Fig. 10

10-2. Precautions in Reassembly

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

10-2-1. Reassembly of the speed change-over section

(1) Insert the Seal Plate **[21]** into the sliding portion of the Shift Arm **[22]** within the Gear Cover **[10]**.
Follow the instructions shown in the Fig. 11 for the seal plate inserting direction and the sponge surface direction.

(2) Insert the Gear **[11]** through the Spindle **[3]** while supporting it between both arms of the Shift Arm **[22]**. In other words, the Shift Arm **[22]** is inserted into the shift arm sliding portion, along with the Seal Plate **[21]**. (When inserting it, the sponge is pressed flat.) Be careful of the difference in the arm length of the Shift Arm **[22]**.

3) Insert the Shift Plate **[20]** into the shift plate sliding portion provided outside the Gear Cover **[10]**. After aligning the through hole for the shift plate screw and the shift arm screw hole, secure the Shift Plate **[20]** with the Seal Lock Flat Hd. Screw M4 x 14 (Black) **[19]**. In this reassembling process, be careful not to pinch the Seal Plate **[21]** between the Shift Plate **[20]** and the Shift Arm **[22]**.
Apply screw locking agent (Three Bond TB1401) to the Seal Lock Flat Hd. Screw M4 x 14 (Black) **[19]**.
Be careful of the volume of bonding agent used. Do not apply the bonding agent excessively. If the excessive bonding agent overflows into the sliding portions, it results in inferior sliding movement. After completion of tightening, attempt to slide the Shift Plate **[20]** several times to confirm that the nails of the Shift Plate **[20]** are hooked onto the groove of the Gear Cover **[10]**.

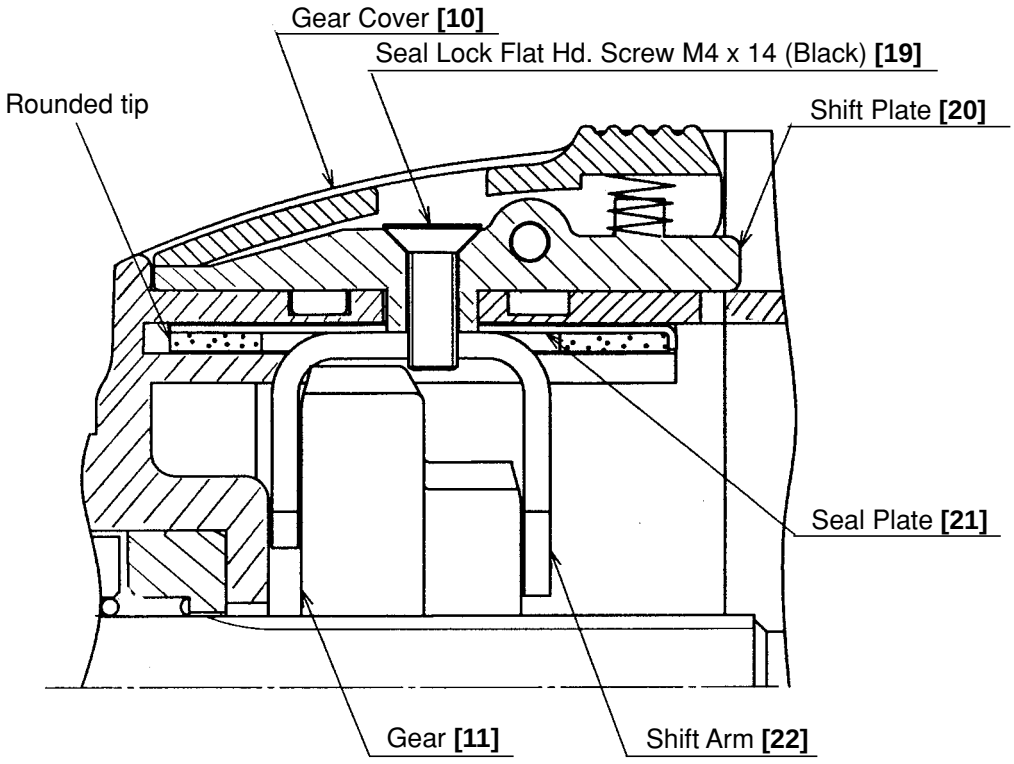


Fig. 11

10-2-2. Reassembly of the Magnet [30]

Mount the Magnet **[30]** to the Housing **[28]** aligning the notch of the Magnet **[30]** with the protrusion of the Housing **[28]**.

10-2-3. Reassembly of Handle (A).(B) Set [37]

Be careful not to catch the internal wires in Handle (A).(B) Set **[37]** when mounting the Handle (A).(B) Set **[37]** to the Housing **[28]**.

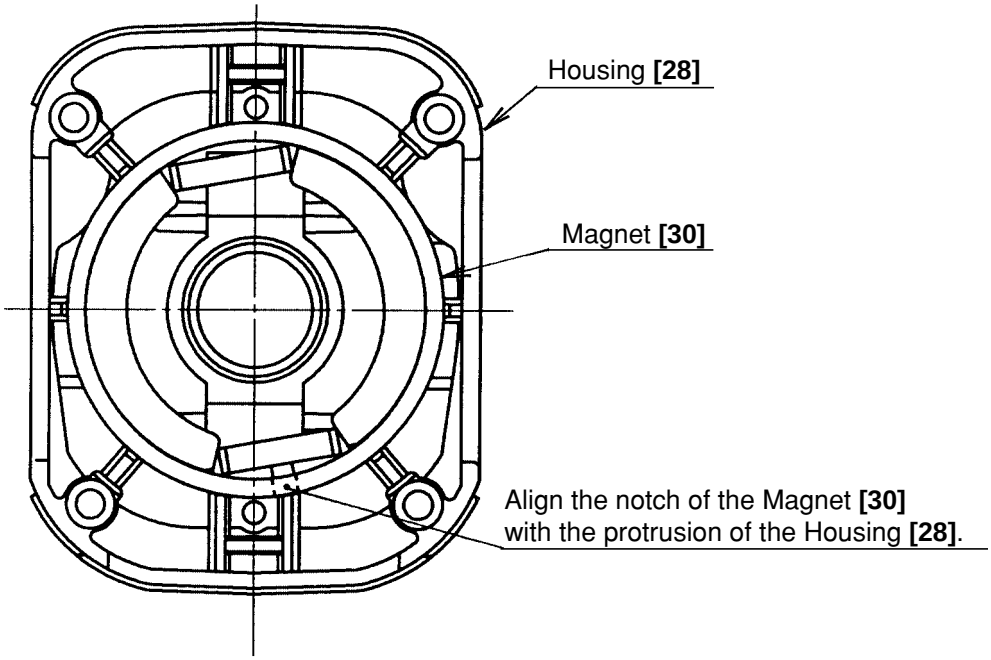


Fig. 12

10-2-4. Lubrication

(1) Apply NPC SEP-3A (Code No. 930035) to the following.

- Inside of the Gear Cover **[10]** (20 g)
- Teeth portion of the ratchet in the Gear Cover **[10]**
- Pinion of the Armature Ass'y **[24]**
- Teeth portion of the Gear **[11]** and the gear of the Second Pinion **[13]**
- Inner circumference of the Metal **[12]**
- Inner circumference of the metals of the Inner Cover **[16]**
- Spline portion of the Spindle **[3]**
- Teeth portion of Ratchet (A) **[8]**
- On the Change Lever **[14]**
- Dia. 8 mm outer circumference portion

10-2-5. Tightening Torque

Flat hd. screw (A) (left hand) M6 x 25 ..... 4.9 ± 0.5 N•m (50 ± 5 kgf•cm)
Tapping screw D5 x 65 ..... 2.9 ± 0.5 N•m (30 ± 5 kgf•cm)
Tapping screw D4 x 30 ..... 2.0 ± 0.5 N•m (20 ± 5 kgf•cm)
Tapping screw D4 x 25 ..... 2.0 ± 0.5 N•m (20 ± 5 kgf•cm)
Seal lock flat hd. screw M4 x 14 ..... 2.0 ± 0.5 N•m (20 ± 5 kgf•cm)
Hex. hd. tapping screw D4 x 60 ..... 2.9 ± 0.5 N•m (30 ± 5 kgf•cm)
Machine screw M3 x 12 ..... 0.5 to 0.8 N•m (5 to 8 kgf•cm)

10-2-6. Wiring Diagrams

(1) Be sure to perform wiring connections as indicated in Figs. 13, 14, 15 and 16.

(2) Mount the DC-Speed Control Switch **[39]** to Handle (A). (B) Set **[37]** so that the projection of the forwarding/reversing lever at the top of the switch is inserted into the U-shaped groove of the Pushing Button **[38]**. Secure the Heat Sink **[43]** to the FET of the DC-Speed Control Switch **[39]** with the Machine Screw (W/Washers) M3 x 12 **[44]**.

10-3. Precautions in Disassembly and Reassembly of Battery Charger

Please refer to the Technical Data and Service Manual for precautions in disassembly and reassembly of the Battery Charger UC 24YFB.

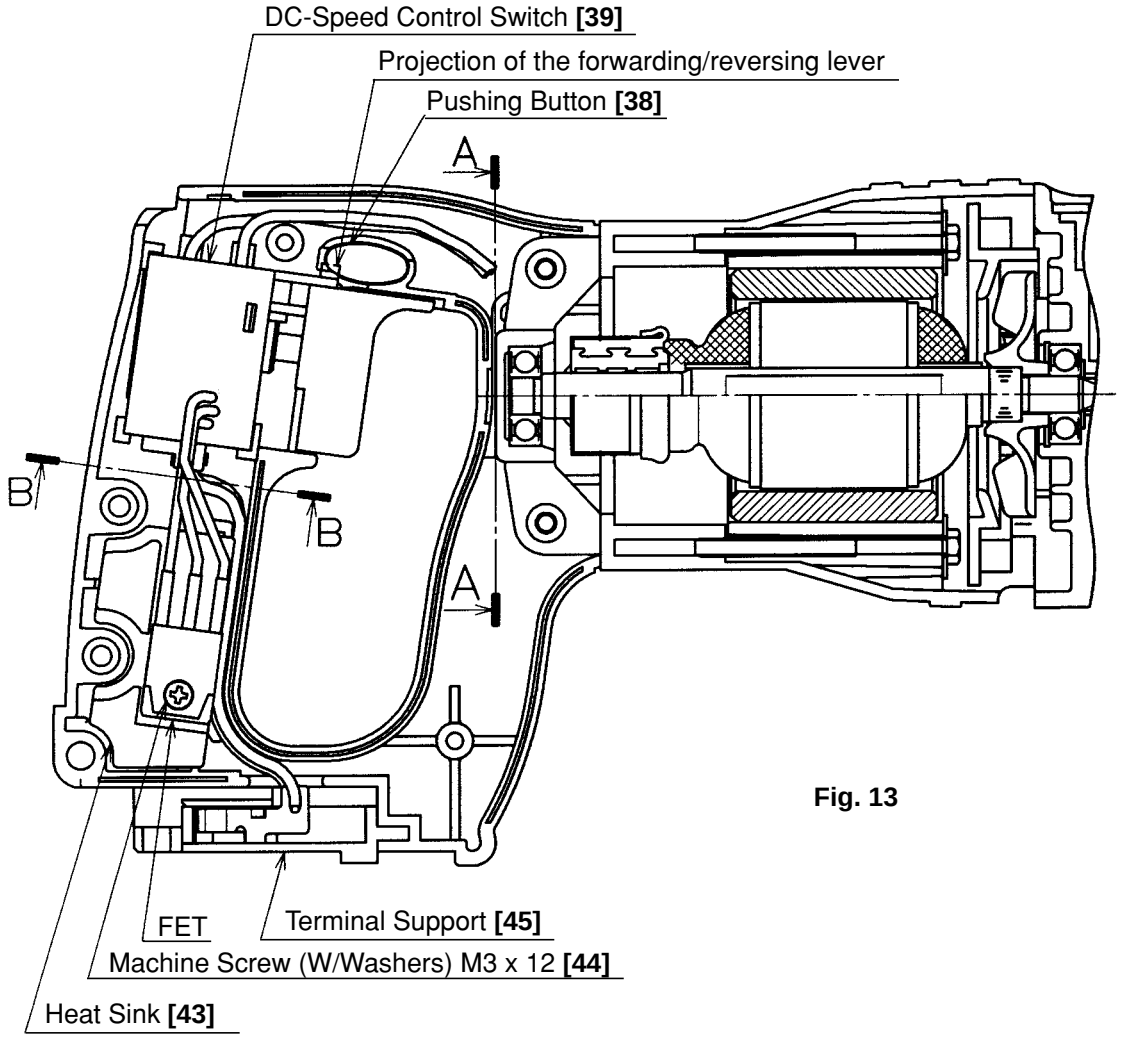


Fig. 13

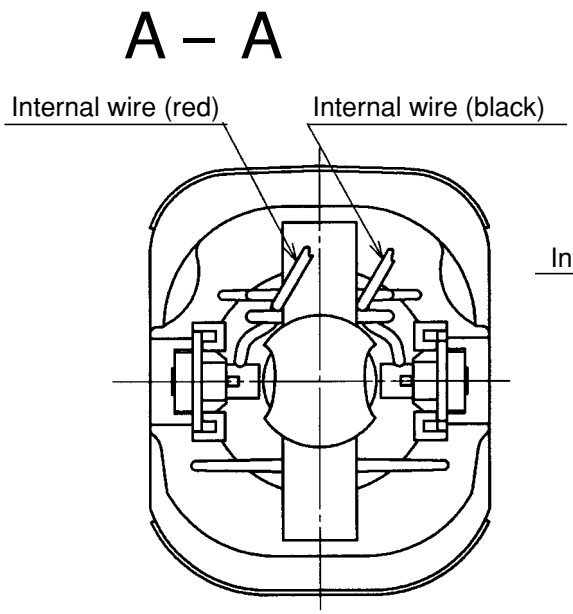


Fig. 14

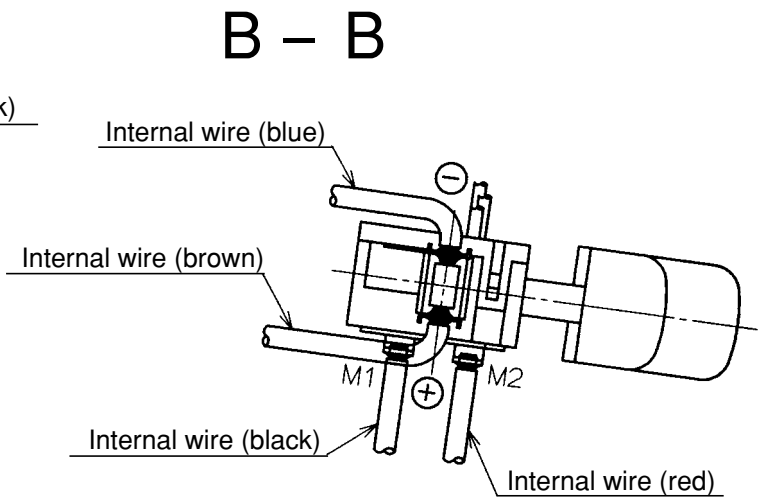
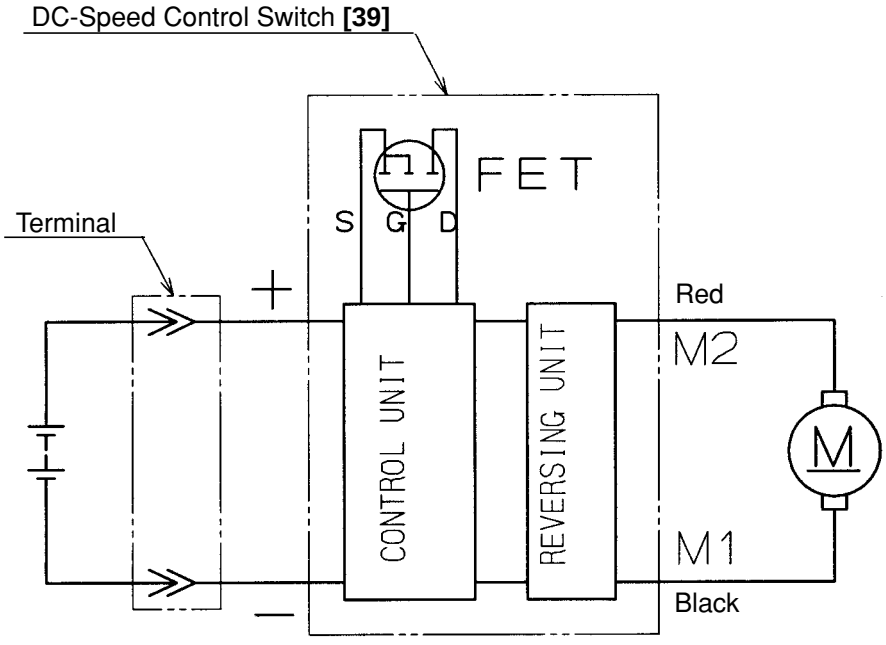


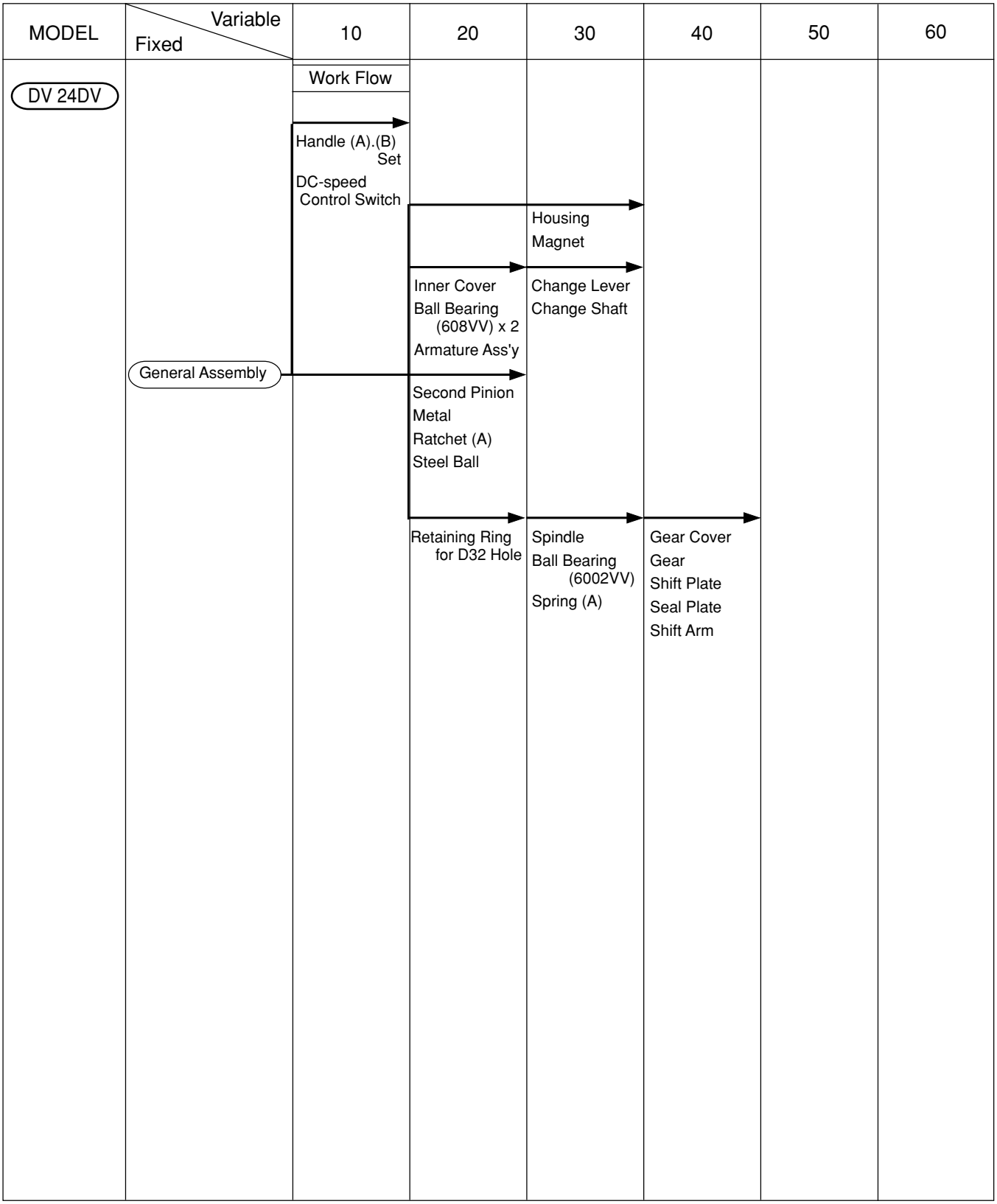
Fig. 15



Wiring Diagram

Fig. 16

11. STANDARD REPAIR TIME (UNIT) SCHEDULES



HITACHI

LIST NO. F848

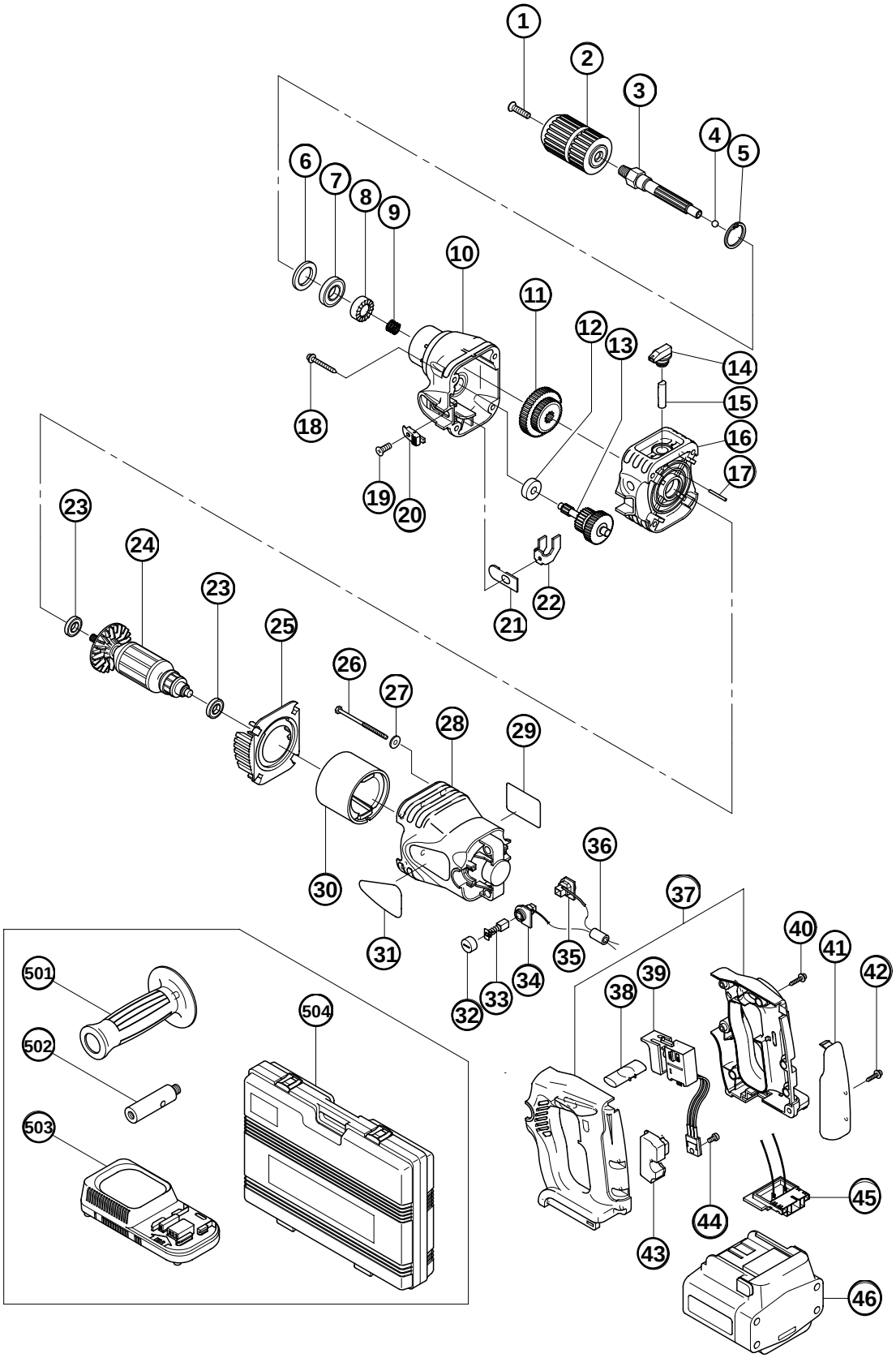
ELECTRIC TOOL PARTS LIST

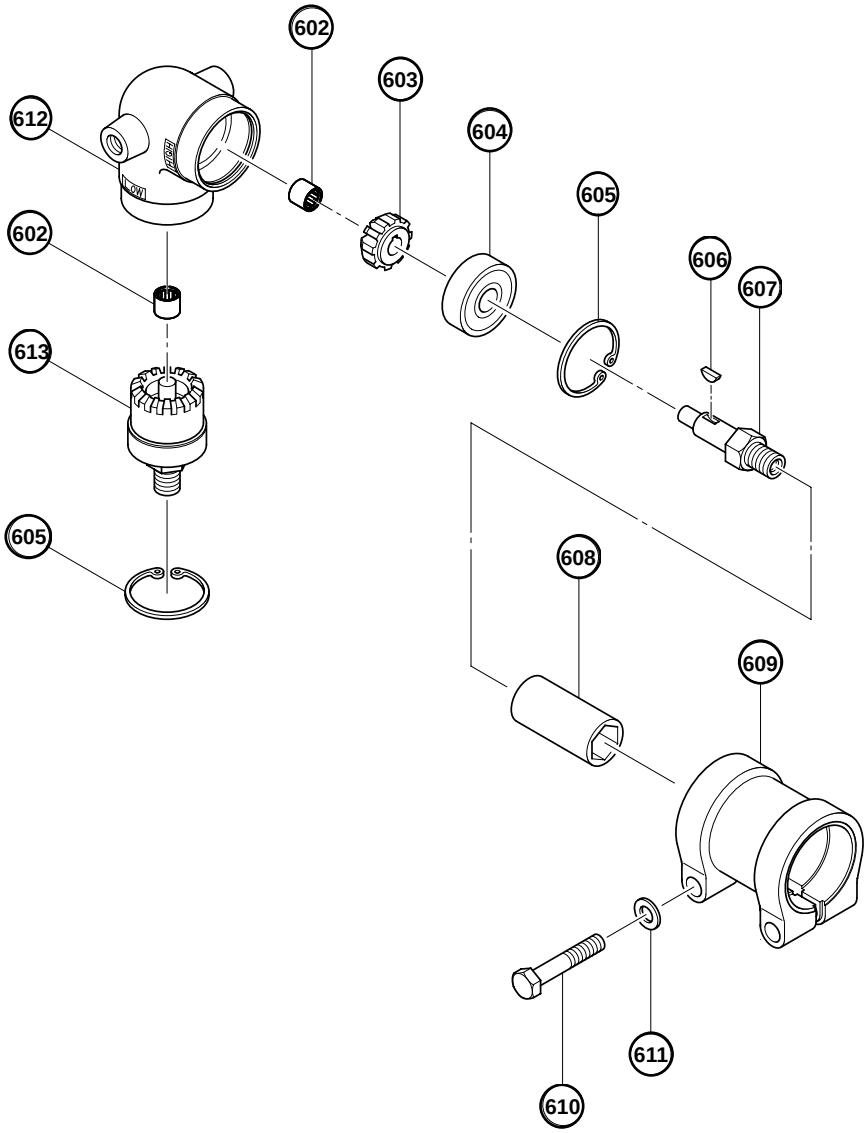
■ CORDLESS IMPACT DRILL

2001· 3 · 5

Model DV 24DV

(E1)

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PARTS

DV 24DV

	ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
	1	995-344	FLAT HD. SCREW (A) (LEFT HAND) M6X25	1		
	2	315-966	DRILL CHUCK 13VLRC-N (W/O CHUCK WRENCH)	1		
	3	319-792	SPINDLE	1		
	4	959-150	STEEL BALL D6.35 (10 PCS.)	1		
	5	948-001	RETAINING RING FOR D32 HOLE	1		
	6	319-794	WASHER	1		
	7	600-2VV	BALL BEARING 6002VVCMPS2L	1		
	8	319-795	RATCHET (A)	1		
	9	984-101	SPRING (A)	1		
	10	319-793	GEAR COVER	1		
	11	319-796	GEAR	1		
	12	935-522	METAL	1		
	13	319-797	SECOND PINION	1		
	14	319-801	CHANGE LEVER	1		
	15	319-802	CHANGE SHAFT	1		
	16	319-787	INNER COVER	1		
	17	316-271	NEEDLE D2.5X25.8	1		
	18	319-803	TAPPING SCREW (W/FLANGE) D5X65 (BLACK)	4		
	19	319-955	SEAL LOCK FLAT HD. SCREW M4X14 (BLACK)	1		
	20	319-799	SHIFT PLATE	1		
	21	319-800	SEAL PLATE	1		
	22	319-798	SHIFT ARM	1		
	23	608-VVM	BALL BEARING 608VVC2PS2L	2		
	24	360-553	ARMATURE ASS'Y DC 24V	1	INCLUD.23	
	25	319-788	FAN GUIDE	1		
	26	960-108	HEX. HD. TAPPING SCREW D4X60	2		
	27	319-956	WASHER (B)	2		
	28	319-808	HOUSING	1		
	29		NAME PLATE	1		
	30	319-846	MAGNET	1		
	31		HITACHI LABEL	1		
	32	319-847	BRUSH CAP	2		
	33	999-058	CARBON BRUSH (1 PAIR)	2		
	34	319-813	BRUSH HOLDER (A)	1		
	35	319-814	BRUSH HOLDER (B)	1		
*	36	318-247	FERRITE CORE	1	FOR EUROPE	
	37	319-809	HANDLE (A).(B) SET	1		
	38	319-760	PUSHING BUTTON	1		
	39	319-811	DC-SPEED CONTROL SWITCH	1		
	40	305-490	TAPPING SCREW (W/FLANGE) D4X30 (BLACK)	4		
	41	319-790	GRIP COVER	1		
	42	304-035	TAPPING SCREW (W/FLANGE) D4X25 (BLACK)	2		
	43	319-812	HEAT SINK	1		
	44	993-963	MACHINE SCREW (W/WASHERS) M3X12	1		
	45	319-894	TERMINAL SUPPORT	1		
*	46	319-805	BATTERY EB 2420 (W/ENGLISH N.P.)	1		
*	46	319-806	BATTERY EB 2420 (W/ENGLISH N.P.)	1	FOR USA	
*	46	319-807	BATTERY EB 2430HA (W/ENGLISH N.P.)	1	FOR NOR,SWE,DEN	

* ALTERNATIVE PARTS

STANDARD ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
501	981-205	SIDE HANDLE FOR M10	1		
502	319-791	HANDLE JOINT	1		
503		CHARGER (MODEL UC 24YFB)	1		
504	319-815	CASE (PLASTIC)	1		

OPTIONAL ACCESSORIES

ITEM NO.	CODE NO.	DESCRIPTION	NO. USED	REMARKS	
601	319-528	ANGLE ATTACHMENT ASS'Y	1	INCLUD.603-614	
602	670-714	NEEDLE BEARING (HK0810)	2		
603	986-149	PINION	1		
604	630-1VV	BALL BEARING 6301VVCMPS2L	1		
605	986-147	RETAINING RING FOR D37 HOLE	2		
606	932-819	WOODRUFF KEY 3X10	1		
607	986-146	SPINDLE	1		
608	986-143	COUPLING	1		
609	986-142	JOINT SLEEVE	1		
610	949-632	BOLT M8X45 (10 PCS.)	2		
611	949-426	WASHER M8 (10 PCS.)	2		
612	986-144	ANGLE HEAD ASS'Y	1	INCLUD.602	
613	986-156	SPINDLE AND GEAR SET	1		
614	949-168	WRENCH 13/17MM	1		
615	931-851	DRILL BIT (B) D6.5X100	1		
616	931-852	DRILL BIT (B) D8.0X100	1		
617	931-853	DRILL BIT (B) D9.5X120	1		
618	931-854	DRILL BIT (B) D10.0X120	1		
619	971-704	DRILL BIT (B) D12.0X160	1		
620	931-855	DRILL BIT (B) D13.0X160	1		
621	931-776	DRILL BIT (B) D14.3X160	1		
622	971-670	DRILL BIT (B) D16.0X160	1		
623	931-856	DRILL BIT (B) D19.0X160	1		
624	930-035	GREASE (SEP-3A) (100G)	1		

* ALTERNATIVE PARTS

Hitachi Koki Co., Ltd.

Tokyo Japan