

# Service Manual

Wet/Dry Rechargeable Shaver

ES8224-U1

ES8228-U1



## SPECIFICATIONS

Power source	AC 100-240V, 50-60Hz (Automatic voltage conversion)
Power consumption	Approx. 6W
Charging time	1 Hour
Shaves per charge	14 times (3 minutes shave)
Measurement	(H)15.3 x (W)6.2 x (D)4.6 cm
Weight	170g (without protective cap)
Supplied accessories	Self-cleaning recharger (ES8228 only) Soft case

### **⚠ WARNING**

This service information is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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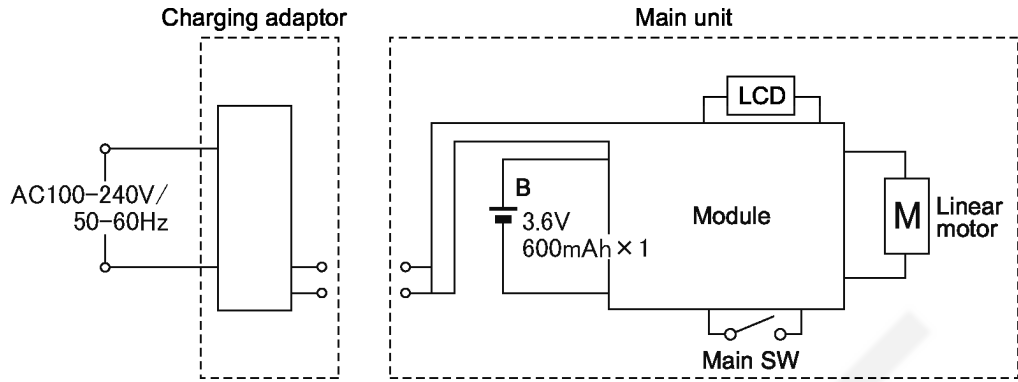
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**Panasonic®**

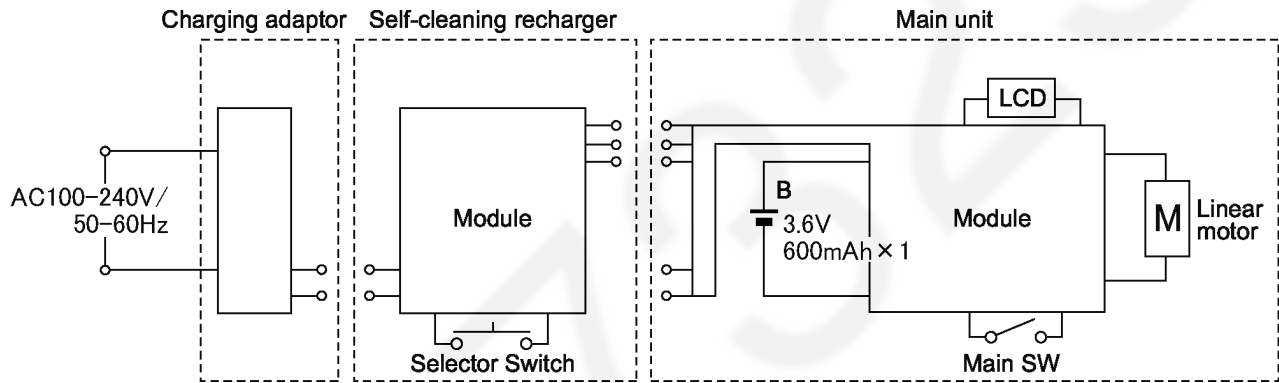
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# 1 SCHEMATIC DIAGRAM

## 1.1. ES8224



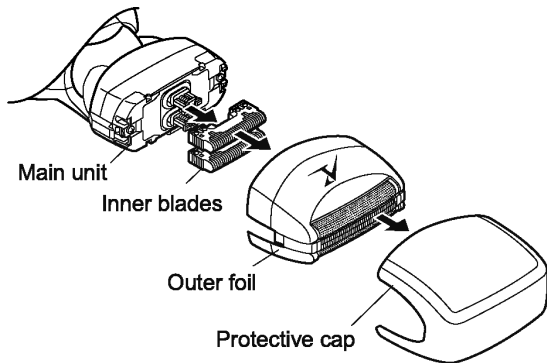
## 1.2. ES8228



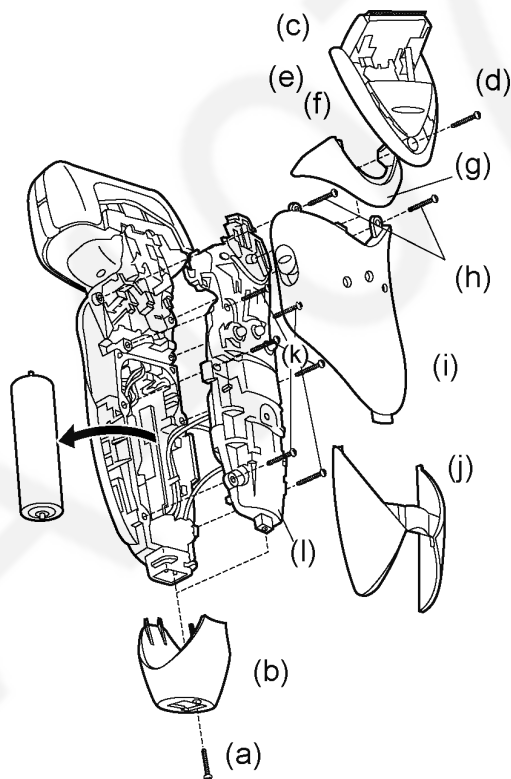
## 2 DISASSEMBLY INSTRUCTIONS

Follow the procedure below to disassemble the main unit.

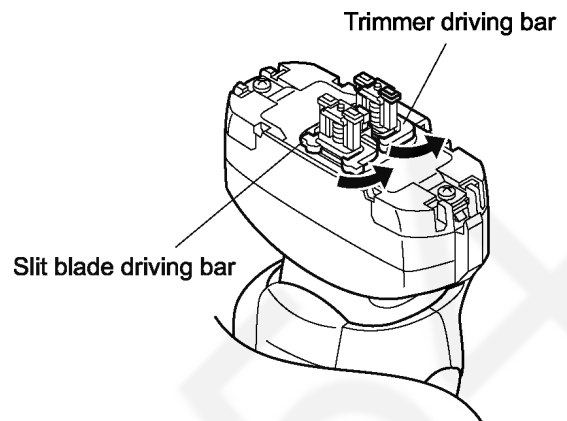
1. Remove the cap, the outer foil and the inner blade.



2. How to assemble the housing A and B.
  - a. Loosen a screw.
  - b. Remove the bottom cover.
  - c. Slide the trimmer handle up.
  - d. Loosen a screw.
  - e. Slide the trimmer handle down.
  - f. Remove the trimmer sliding downward.
  - g. Remove the upper rear panel.
  - h. Loosen two screws.
  - i. Remove the rear panel.
  - j. Remove the lower rear panel.
  - k. Loosen six screws.
  - l. Remove the housing B.



3. To remove the trimmer driving bar or the slit blade driving bar, press bars outward.



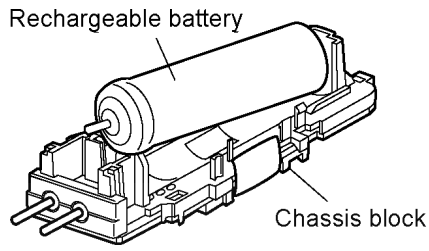
4. Pull up the battery and chassis block from the linear motor side first. Then, slide it upward and take it out from the housing A.

**NOTE:**

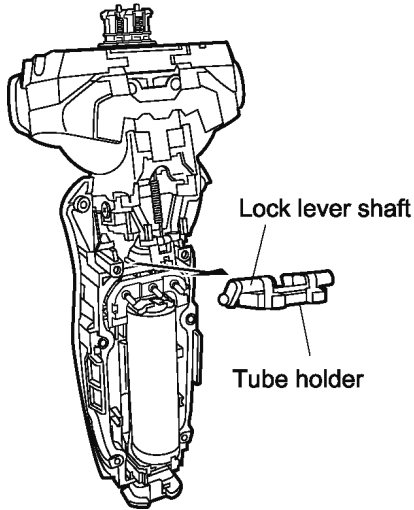
Do not pull the battery and chassis block forcefully due to connecting the linear motor by the lead wires.



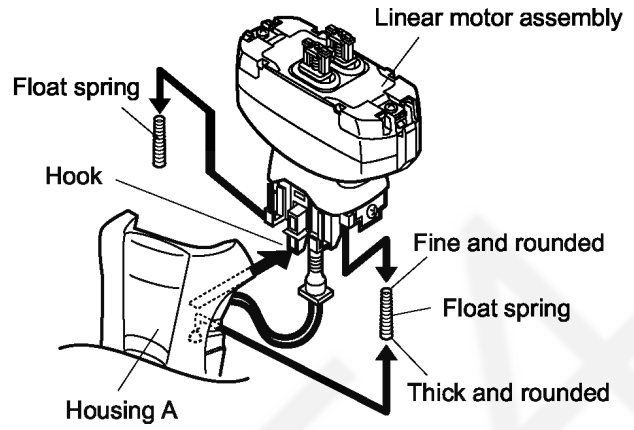
5. Take out the battery from the chassis.



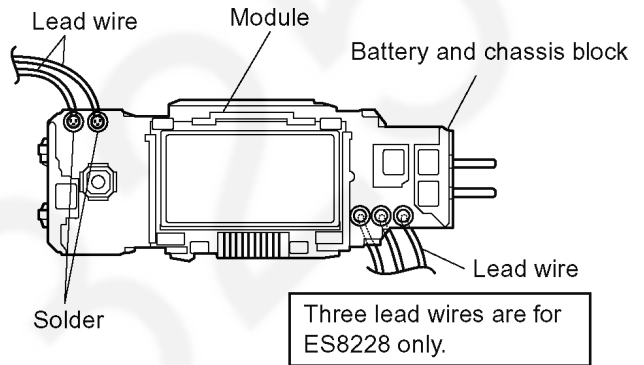
6. Take out the tube holder.



7. Move gently the linear motor assembly down and unhook it and remove the float springs from housing A.



8. Unsolder the lead wires from the module.



### 3 CAUTION IN ASSEMBLY

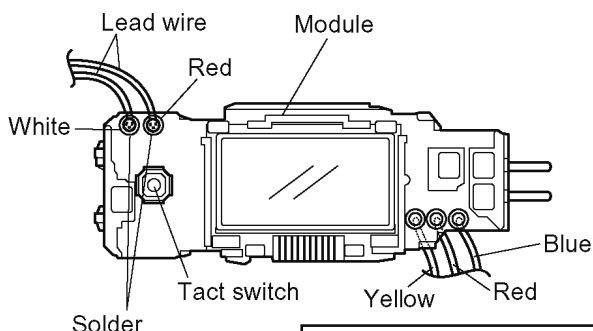
**NOTE:** When reassembling, replace the new waterproof seal.

**Make sure whether there is NO foreign substance sticking around a part covered with waterproof seal.**

1. Solder the lead wires with the module.

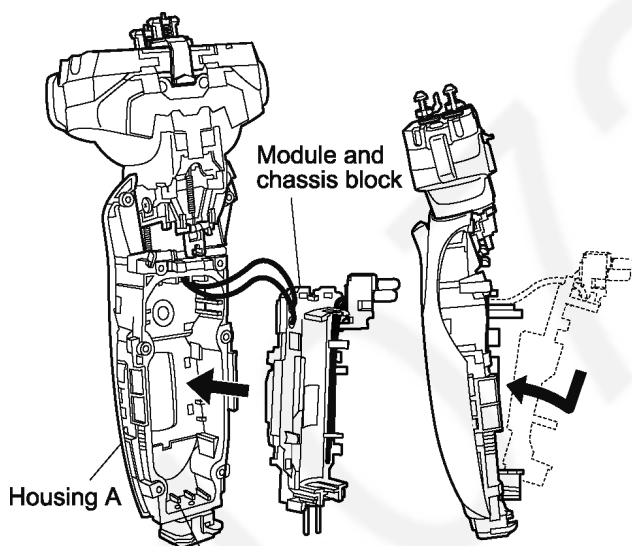
**NOTE:**

Make sure of the color of lead wires.



Three lead wires are for ES8228 only.

2. When inserting the module and chassis block into the housing A, confirm if the module does not get any damage or deformation.



Do not hitch on this area.

3. Make sure that the lead wires set in position to avoid abnormal noise. Install (+) terminal of battery into the terminal plate at the bottom cover side and firmly set the battery sliding the direction of arrow. Attach (-) terminal of battery.

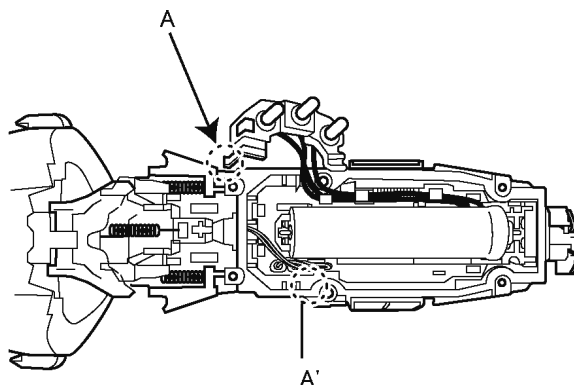
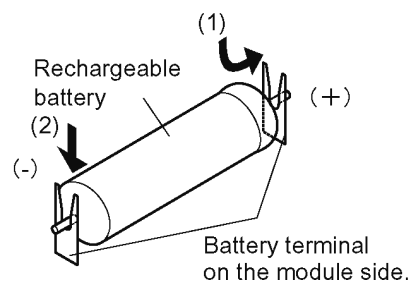
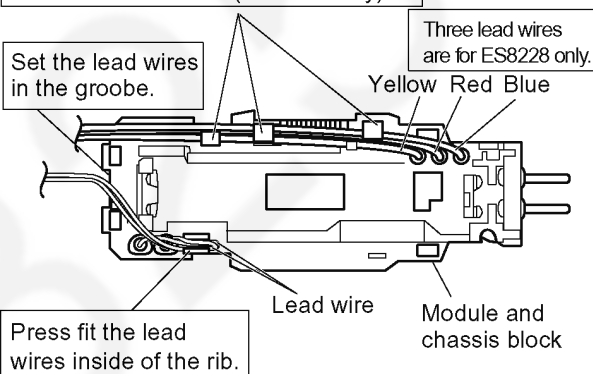
**NOTE:**

Once taking the battery out, the shaver is RESET. The shaver must be charged for several seconds first.

**NOTE:**

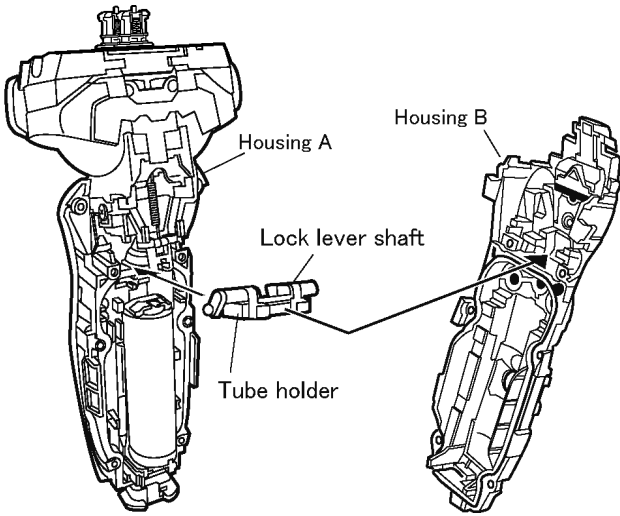
Completely discharge and then fully charge before returning the shaver to the customer.

Press fit the yellow, red and blue lead wires in order and confirm to hook them at three hooks. (ES8228 only)

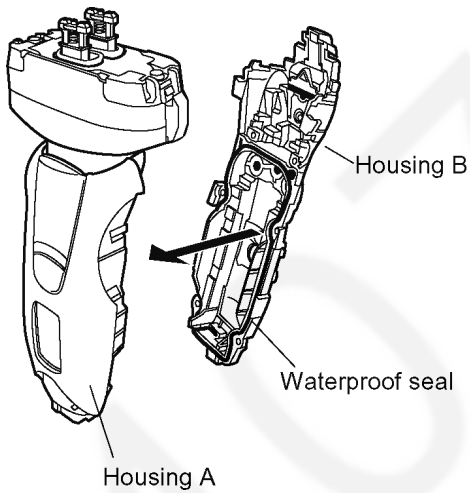


**NOTE:** The projection A should be set into the place A' (ES8228 only).

4. Set the linear motor assembly on the housing A and sliding it upward to hook. Confirm that the lead wire tube fits to the housing A firmly and no foreign substance sticking around. Attach the tube holder with the lock lever shaft to housing A with care of the direction.



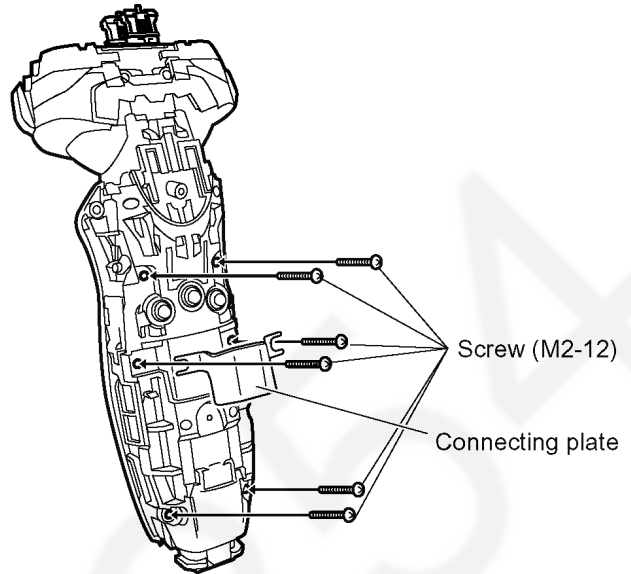
5. When putting the housing A and the housing B together, make sure if the waterproof seal must be fitted properly and no foreign substance sticking around.



6. Tighten the six screws.

**NOTE:**

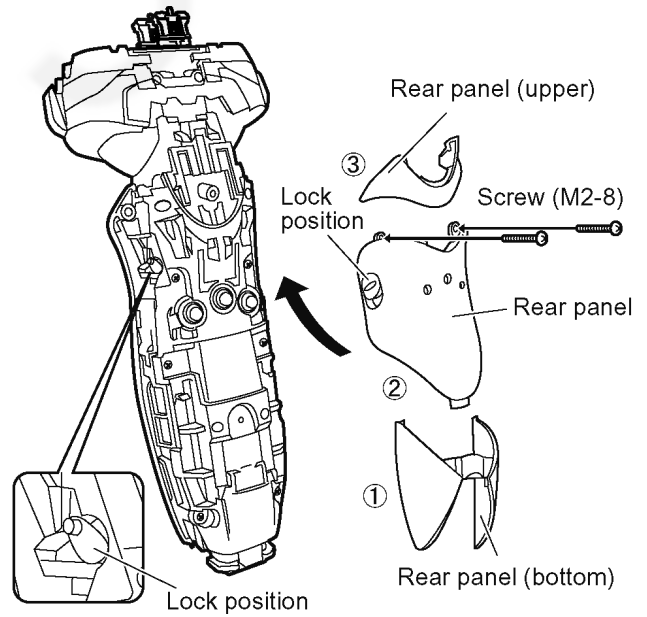
Make sure to attach the connecting plate.



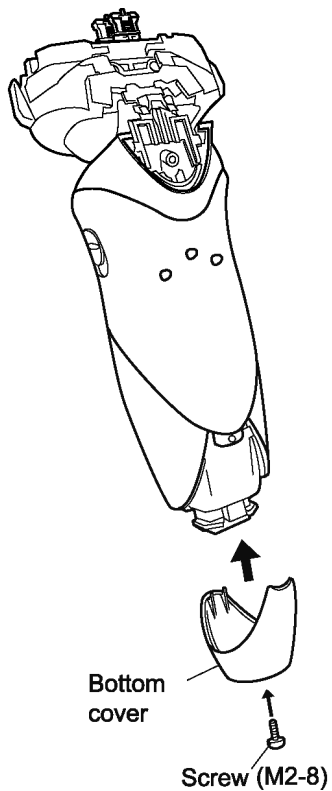
7. Attach "rear panel (bottom)", "rear panel" and "rear panel (upper)" in order. Set the rear panel with the position "LOCK".

**NOTE:**

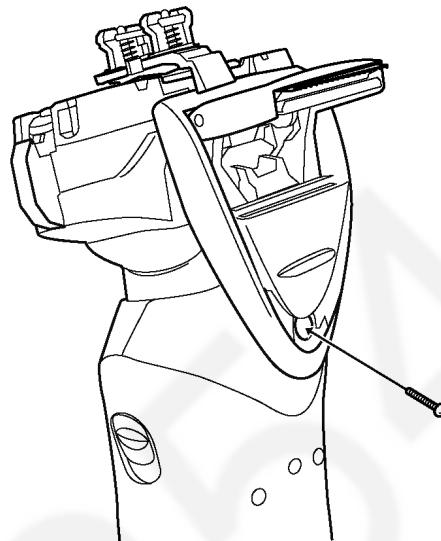
Make sure of the smooth movement of the lock lever shaft.



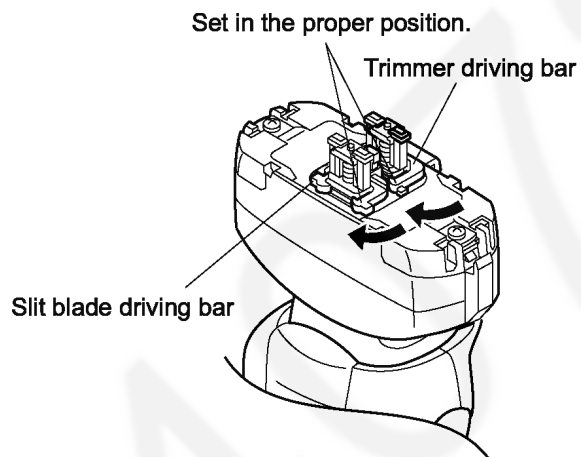
8. Attach the bottom cover and tighten a screw.



10. Set the trimmer where removing it and click hooked. Slide the trimmer up and tighten a screw. If the position is not properly, it makes the deformation of the hook.



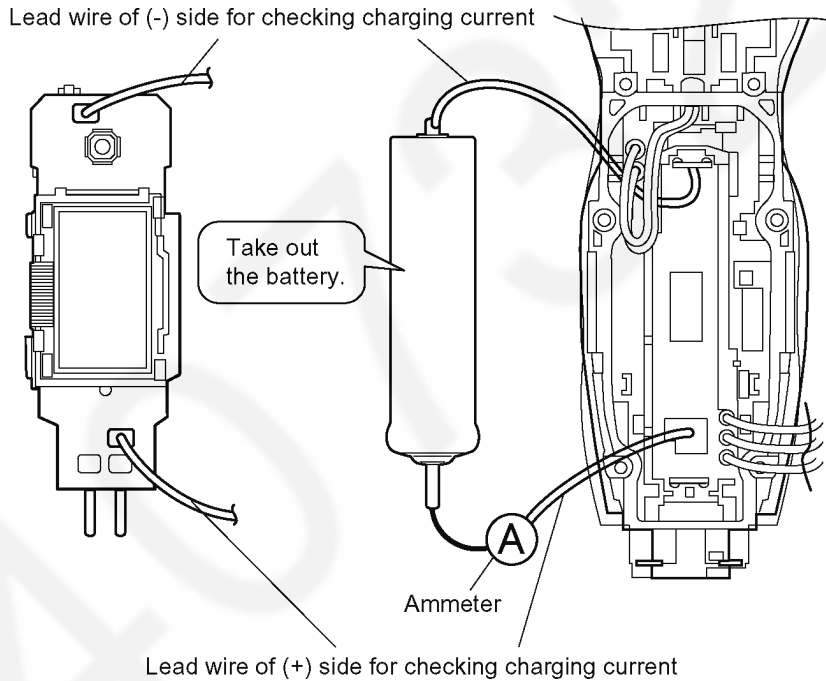
9. Set the trimmer driving bar and the slit blade driving bar.



# 4 TROUBLESHOOTING GUIDE

## 4.1. Main unit and charging adaptor

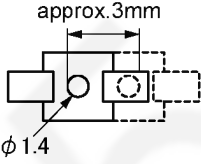
<TROUBLE>	<CHECK>	<REMEDY>
Motor does not rotate. Does not charge. Functions for a moment and stops.	<CHECK CHARGING ADAPTOR.> Supply the rated voltage to the adaptor. And confirm the continuity. OK if it is approx. DC6V between the terminals of the plug at the no-load operation.	NO → Replace charging adaptor.
↓ OK		
	<CHECK RECHARGEABLE BATTERY.> Okay if the voltage of rechargeable battery is more than approximately 3.6V DC between (+) and (-) terminal.	NO → Replace rechargeable battery.
↓ OK		
	<CHECK MODULE.> Wire the main unit returned from a customer refer with the following figure, and connect the rated voltage to it by the normal adaptor. When switching ON and OFF, check if motor rotates and back light of LCD is lid. Discharge the battery completely and check charging current, if it is more than 600mA when connecting AC power source.	NO → Check the soldering points. ↓ OK Replace module. ↓ OK Replace linear motor assembly.



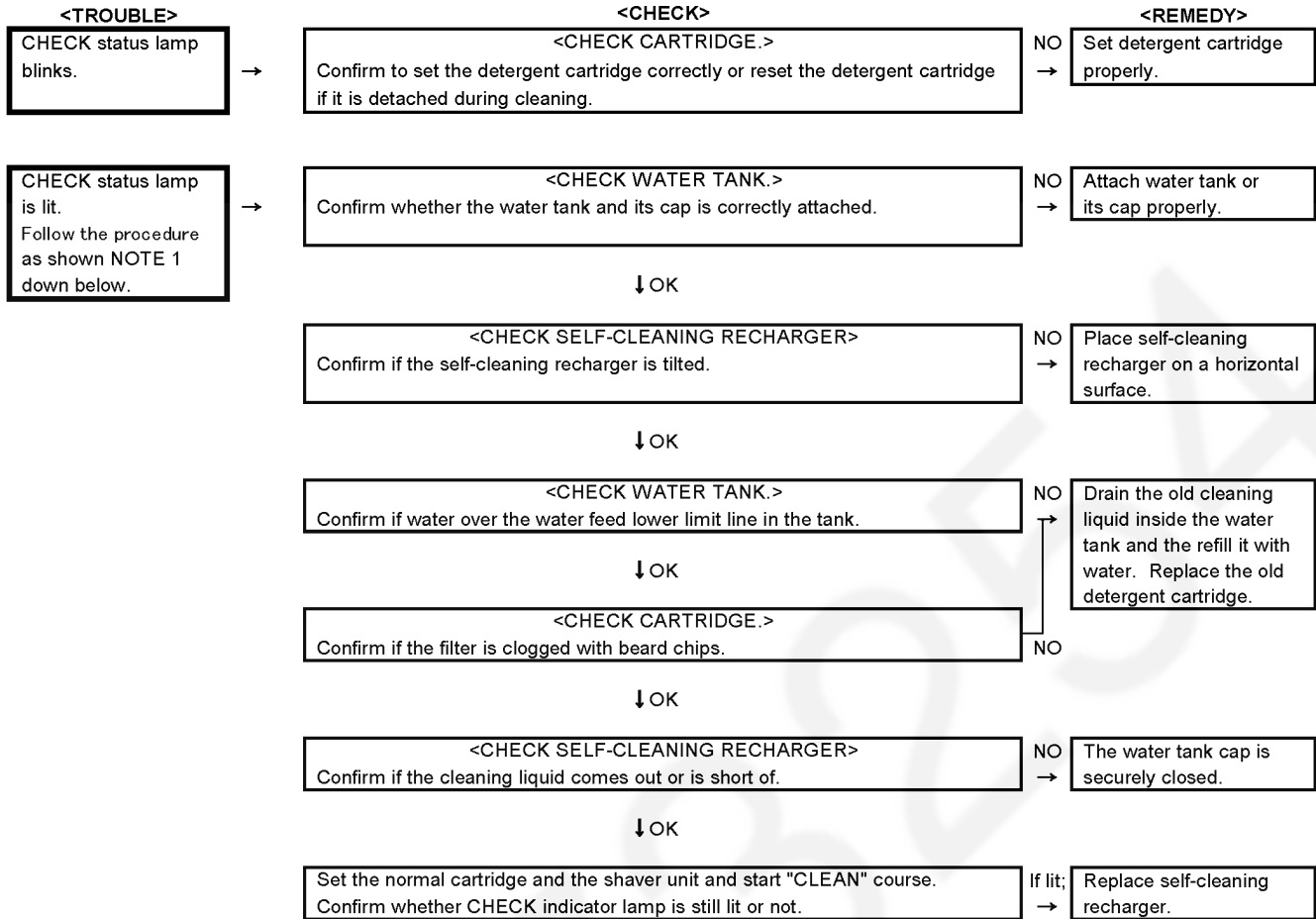
**NOTE:** Once taking the battery out, the shaver is RESET. The shaver must be charged for several seconds first.

**NOTE:** Completely discharge and then fully charge before returning the shaver to the customer.



<TROUBLE>	<CHECK>	<REMEDY>
Noise is too loud. Amplitude is too small.	→ Check if there any deformation with the outer foil.  ↓ OK	NO → Replace outer foil or oiling a drop on the foil.
	↓ OK <CHECK DRIVING BARS.> Check if there is any deformation with trimmer driving bar and slit blade driving bar or these are set firmly.	NO → Replace trimmer driving bar or slit blade driving bar.
	↓ OK <CHECK DRIVING HEAD AMPLITUDE.> Turn the switch ON, and measure the amplitude by checking a pin of driving head. (See the figure shown below.)	NO → Replace linear motor assembly or module.
	↓ OK	 <p>(when viewed from the top)</p>
	↓ OK <CHECK TREMBLE LINEAR MOTOR.> Confirm 9 housing screws (M2-12 X 6 screws for Housing B, M2-8 X 2 screws for Rear panel, and M2-5 X 1 screw for Trimmer) whether they are tightened firmly and no tremble on the driving head or suspension.	NO → Tighten screws.
	↓ OK <CHECK TREMBLE LINEAR MOTOR.> Check the wear condition in each part, Housing A, Linear motor assembly or Float springs.	NO → Replace housing A or float springs.
Does not move pivot action selector or does not float the head smoothly.	→ <CHECK FLOAT SUSPENSION.> Confirm if the float springs are assembled properly. Confirm if the beard chips collect around the linear motor assembly.	NO → Repair float springs or clean.
Shaver head does not fix even changing pivot action selector.	→ <CHECK PIVOT ACTION SELECTOR.> Confirm the smooth movement of the lock lever shaft after removing the rear panel.	NO → Confirm the deformation of lock lever shaft. Replace linear motor assembly.
	↓ OK <CHECK PIVOT ACTION SELECTOR.> Confirm the action selector fixture is set properly after assembling the rear panel. Confirm both lock lever shaft and pivot action selector handle are set on LOCK position.	NO → Replace rear panel.

## 4.2. Self-cleaning recharger (ES8228 only)



NOTE 1: Hold down the SELECT button for approximately two seconds to extinguish the CHECK indicator lamp.

The course will be aborted if the power is cut off during cleaning.

(Phenomenon)

The cleaning liquid remains the tray even the course is completed normally.

(Action)

Try to re-operate the course once again to exhaust the cleaning liquid on the cartridge tray.

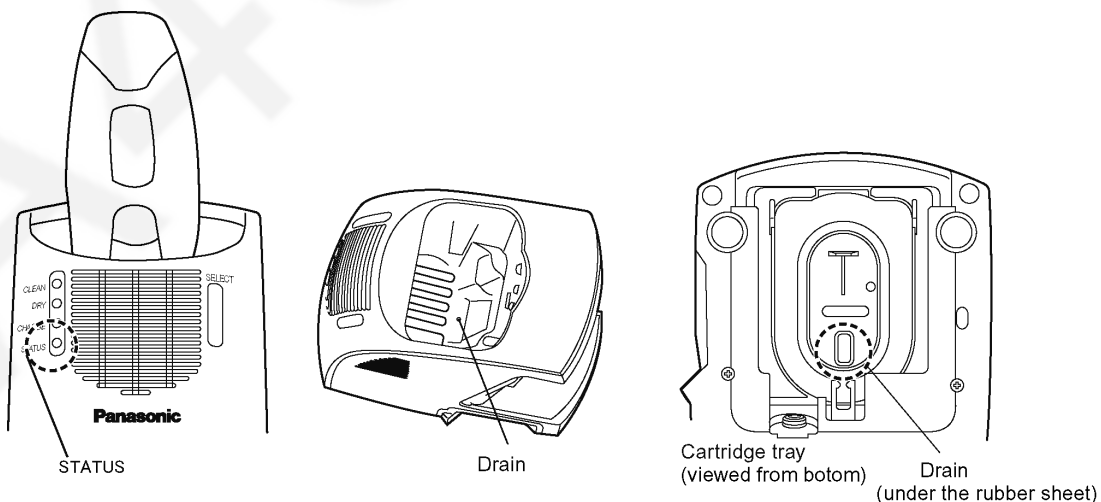
Too much cleaning liquid remains the tray.

(Phenomenon)

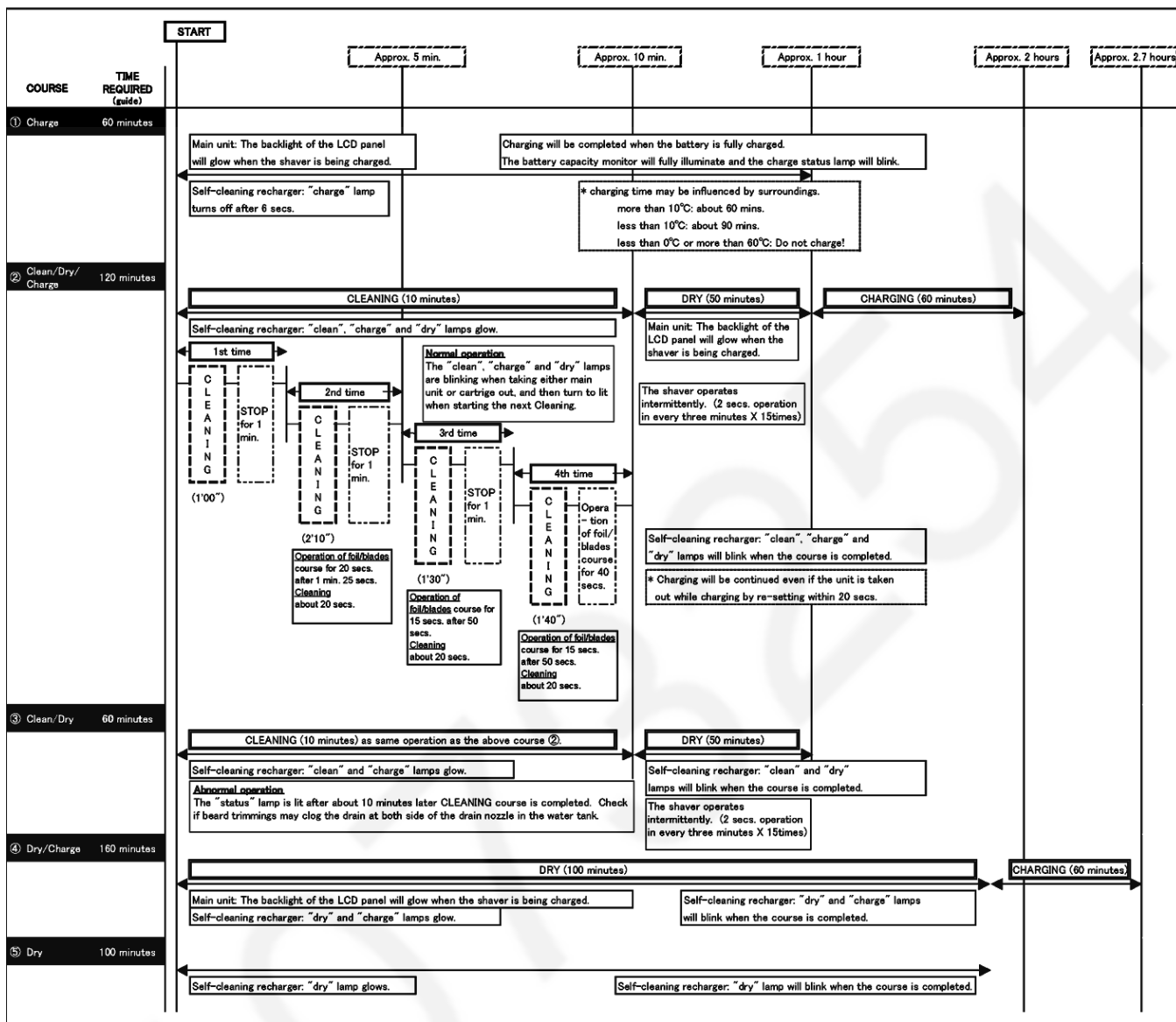
The cleaning liquid remains the tray even the course is completed normally.

(Action)

Clean the drain holes as pointed with the circule down below.



# 5 OPERATION OF SELF-CLEANING RECHARGER (ES8228 only)



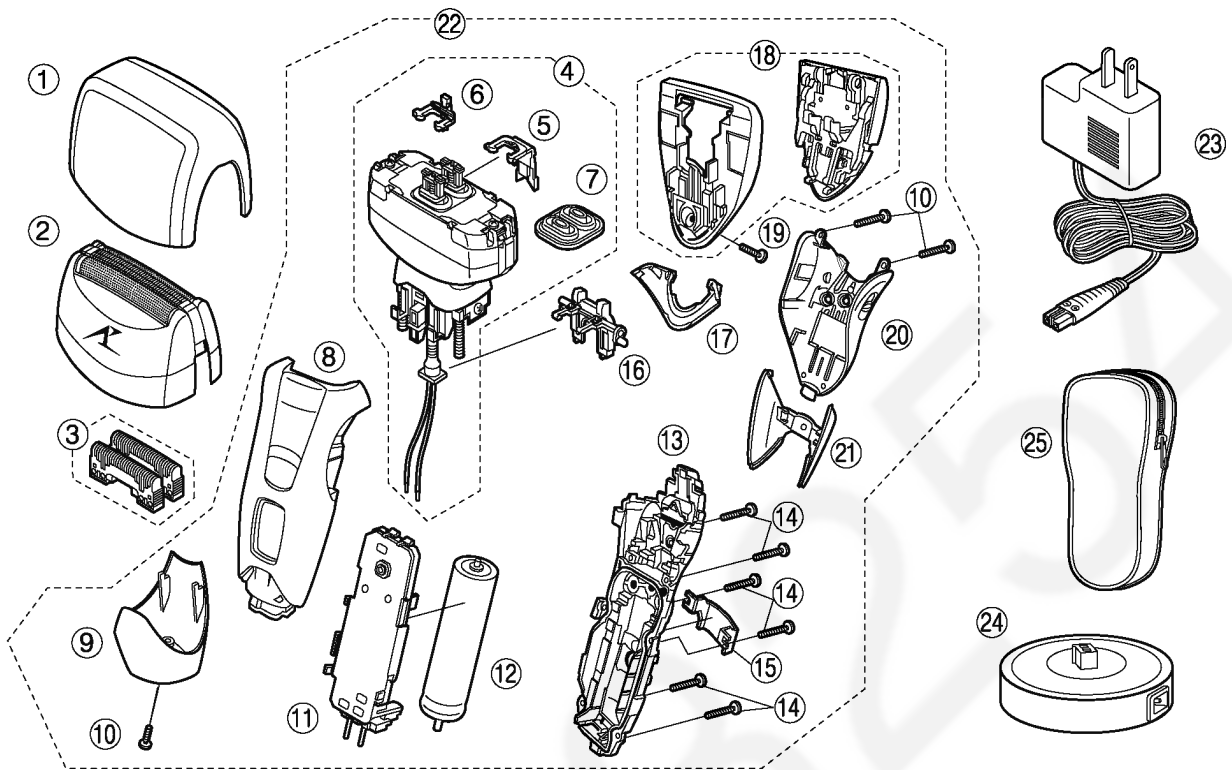
**NOTE:** When the shaver is set on the self-cleaning recharger, ① "Charge" course is selected automatically. Press the select button within six seconds to choose a difference course starting from ①⇒②⇒③⇒④⇒⑤⇒①.....

Course	Course selection indications				▶	Course completion summary				
	On recharger			Changeable course halfway through		On recharger			On shaver	Time required (guide) [In the low temperature]
	clean	dry	charge			clean	dry	charge	Backlight	
① Charge	○	○	●*	②③④⑤	▶	○	○	○	Blinks	1 hour
② Clean/Dry/Charge	●	●	●	③	▶	☀	☀	○	Blinks	2 hours [+30 min]
③ Clean/Dry	●	●	○	②	▶	☀	☀	○	—	1 hour [+30min]
④ Dry/Charge	○	●	●	②③⑤	▶	○	☀	○	Blinks	2 h 40 min
⑤ Dry	○	●	○	②③④	▶	○	☀	○	—	1 h 40 min

\*The lamp goes out in 6 seconds.

# 6 EXPLODED VIEW & REPLACEMENT PARTS LIST

## 6.1. ES8224

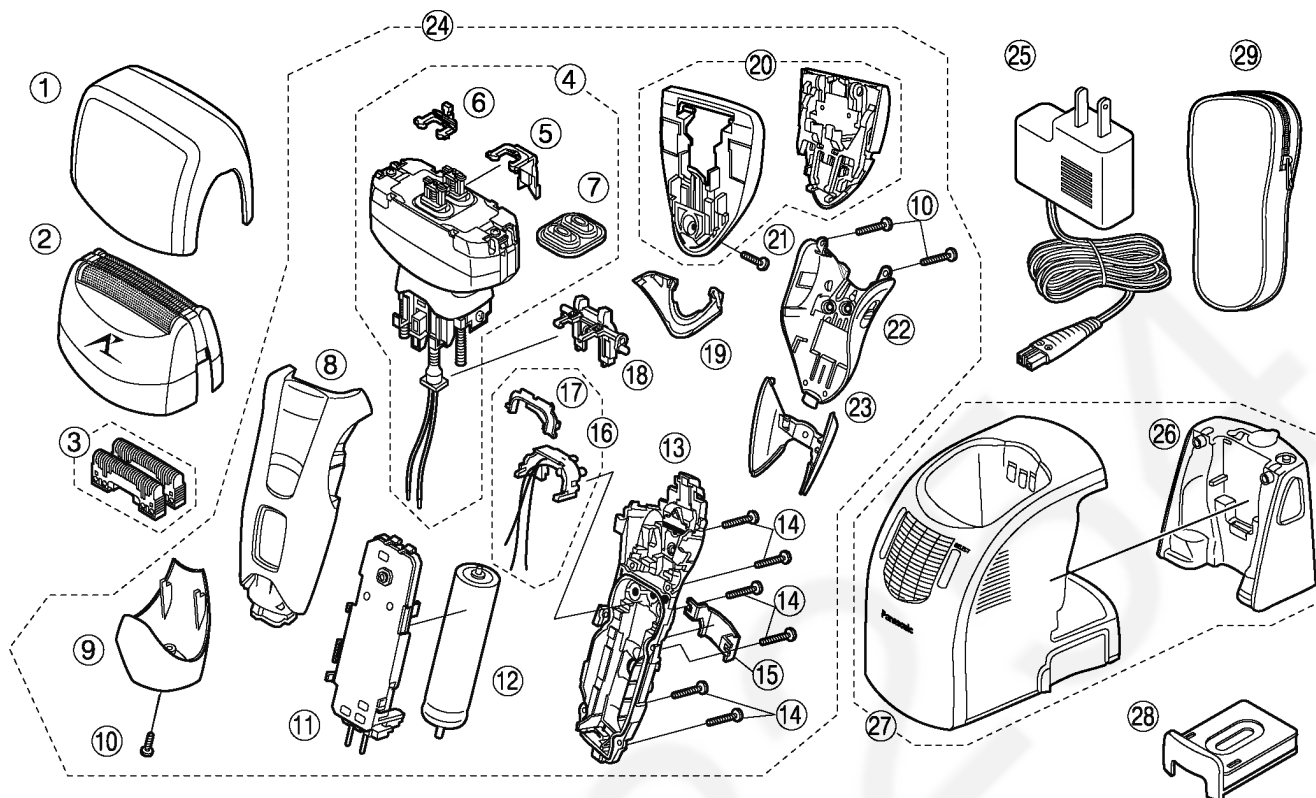


**NOTE:**

- \*A=available as an optional accessory
- \*B=only available as set
- \*C=available individually

Ref. No.	Part No.	Part Name & Description	Remarks	Per Unit
1	WES8228X7158	PROTECTIVE CAP		1
2	WES9067PC	OUTER FOIL		1
3	WES9068PC	INNER BLADE	*B (2PCS/PK)	1ST
4	WES8238L1007	LINEAR MOTOR ASSEMBLY		1
5	WES8238L1087	TRIMMER DRIVING BAR		1
6	WES8176L1077	SLIT BLADE DRIVING BAR		1
7	WES8196L0328	WATERPROOF RUBBER		1
8	WES8224K3058	HOUSING A		1
9	WES8224K3128	BOTTOM COVER		1
10	WES8176L6057	TAPPING SCREW	*C M2-8	3
11	WES8224L2128	MODULE		1
12	WES8163L2509	RECHARGEABLE BATTERY	LITHIUM-ION TYPE	1
13	WES8232K3067	HOUSING B		1
14	WES8176L6007	P TIGHT SCREW	*C M2-12	6
15	WES8238L0487	CONNECTING PLATE		1
16	WES8238W0537	TUBE HOLDER		1
17	WES8224K3858	REAR PANEL (UPPER)		1
18	WES8232K1507	TRIMMER		1
19	WES8238L6007	P TIGHT SCREW	M2-6	1
20	WES8224K3368	REAR PANEL		1
21	WES8224K3868	REAR PANEL (BOTTOM)		1
22	WES8224K3038	BODY BLOCK		1
23	WES8228K7658	CHARGING ADAPTOR	A-2 PLUG	1
24	WES8224K7668	CHARGING STAND		1
25	WES8176K7017	SOFT CASE		1
-	WES8224K8008	INDIVIDUAL BOX		1
-	WES8224K8108	OPERATING INSTRUCTIONS		1

## 6.2. ES8228



## NOTE:

\*A=available as an optional accessory

\*B=only available as set

\*C=available individually

Ref. No.	Part No.	Part Name & Description	Remarks		Per Unit
1	WES8228X7158	PROTECTIVE CAP			1
2	WES9067PC	OUTER FOIL			1
3	WES9068PC	INNER BLADE	*B	(2PCS/PK)	1ST
4	WES8238L1007	LINEAR MOTOR ASSEMBLY			1
5	WES8238L1087	TRIMMER DRIVING BAR			1
6	WES8176L1077	SLIT BLADE DRIVING BAR			1
7	WES8196L0328	WATERPROOF RUBBER			1
8	WES8228S3058	HOUSING A			1
9	WES8228S3128	BOTTOM COVER			1
10	WES8176L6057	TAPPING SCREW	*C	M2-8	3
11	WES8228L2128	MODULE			1
12	WES8163L2509	RECHARGEABLE BATTERY		LITHIUM-ION TYPE	1
13	WES8238S3067	HOUSING B			1
14	WES8176L6007	P TIGHT SCREW	*C	M2-12	6
15	WES8238L0487	CONNECTING PLATE			1
16	WES8238L0497	TERMINAL BASE			1
17	WES8238H0527	TERMINAL COVER			1
18	WES8238W0537	TUBE HOLDER			1
19	WES8238S3857	REAR PANEL (UPPER)			1
20	WES8238S1507	TRIMMER			1
21	WES8238L6007	P TIGHT SCREW		M2-6	1
22	WES8238M3367	REAR PANEL			1
23	WES8228S3868	REAR PANEL (BOTTOM)			1
24	WES8228S3038	BODY BLOCK			1
25	WES8228K7658	CHARGING ADAPTOR		A-2 PLUG	1
26	WES8238A7357	WATER TANK			1
27	WES8228K4218	SELF-CLEANING RECHARGER			1
28	WES035K7770	DETERGENT CARTRIDGE	*B	(3PACKS/BOX)	1
29	WES8176K7017	SOFT CASE			1
-	WES8228S8008	INDIVIDUAL BOX			1
-	WES8228S8108	OPERATING INSTRUCTIONS			1