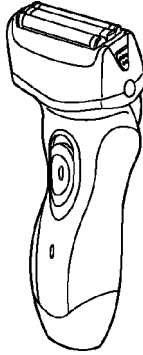


Service Manual

AC/Rechargeable Shaver



ES6013-A3

ES6016-A3

SPECIFICATIONS

Model	ES6013	ES6016
Power source	AC220V, 50-60Hz AC110V, 50-60Hz (only for TAIWAN)	AC 100-240V, 50-60Hz (Automatic voltage conversion)
Power consumption (during charge)	Approximately 3.0W	Approximately 8.0W
Motor voltage	2.4V DC	
Charging time	8 Hours	1 Hour
Shaves per charge	14 times (3 minutes shave)	
Measurement	(H)15.3 x (W)6.0 x (D)4.6 cm	
Weight	200g	
Supplied accessories	Soft case, Cleaning brush	

⚠ 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.

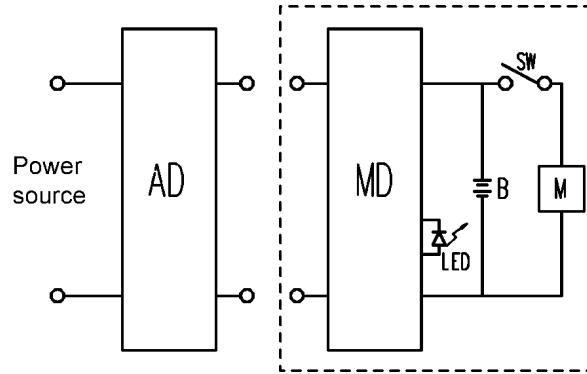
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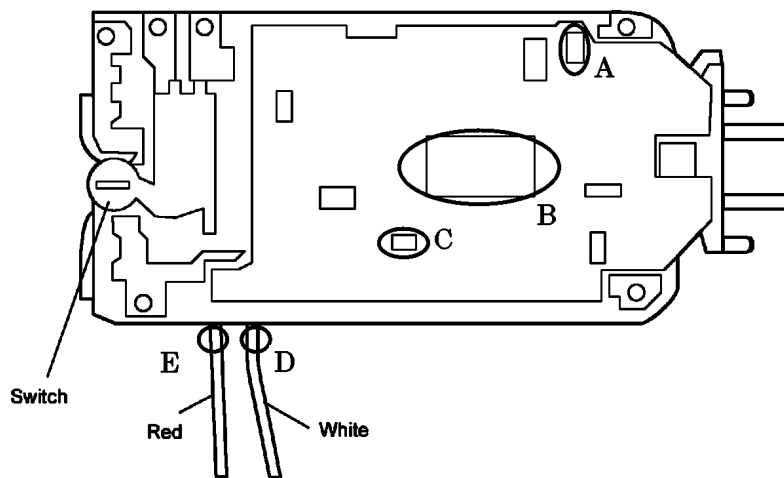
Panasonic

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1 SCHEMATIC DIAGRAM



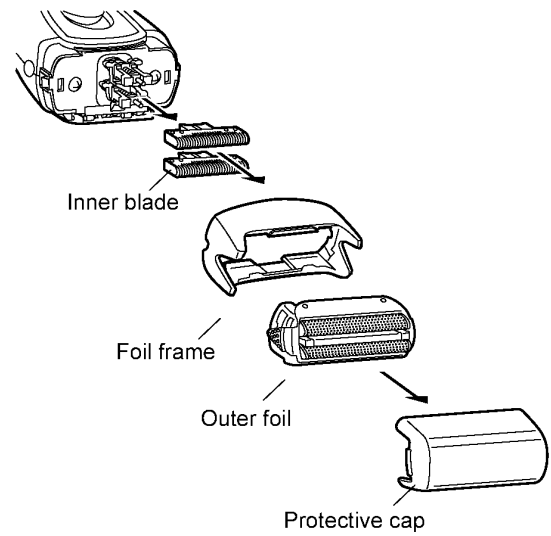
2 WIRING CONNECTION DIAGRAM



3 DISASSEMBLY INSTRUCTION

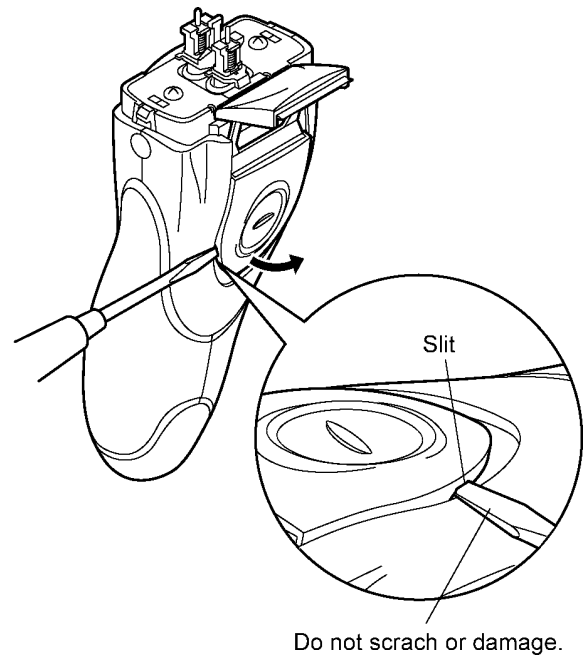
Follow the procedure below to disassemble the main unit.

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

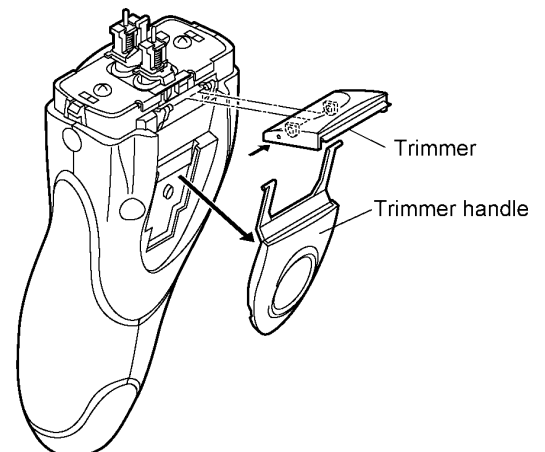


2. Slide the trimmer handle up to open the trimmer and unhook the trimmer handle by inserting something like a slotted screwdriver or plastic spatula into a slit.

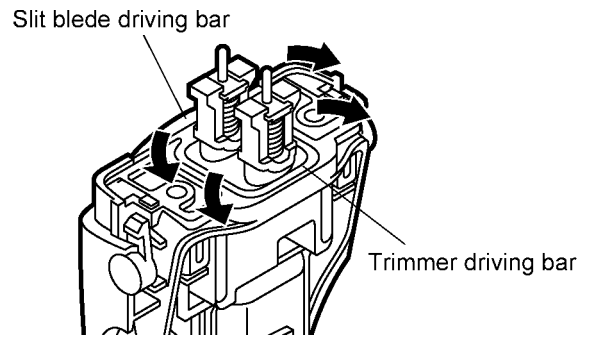
NOTE: Make sure not to scratch or damage on the housing.



3. Remove trimmer and trimmer handle.

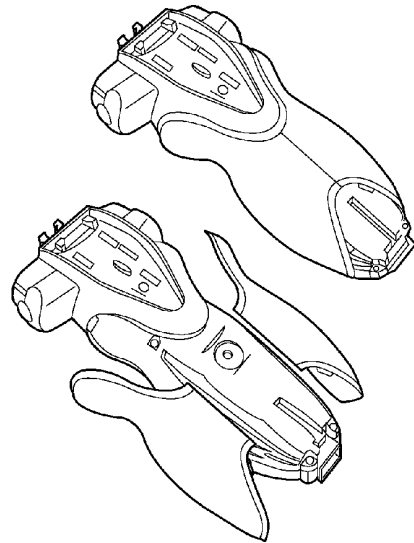
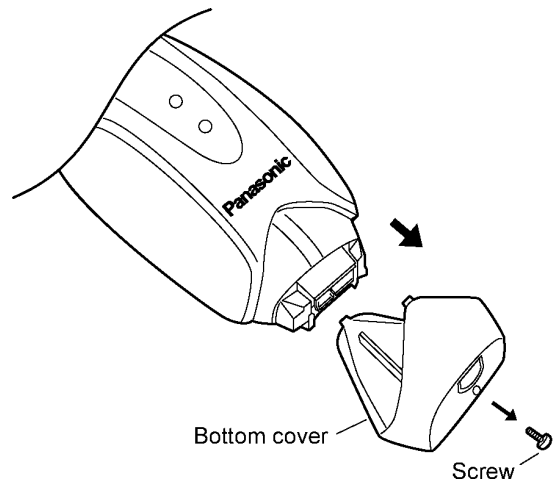


4. To remove the trimmer driving bar or the slit blade driving bar, press bars outward.

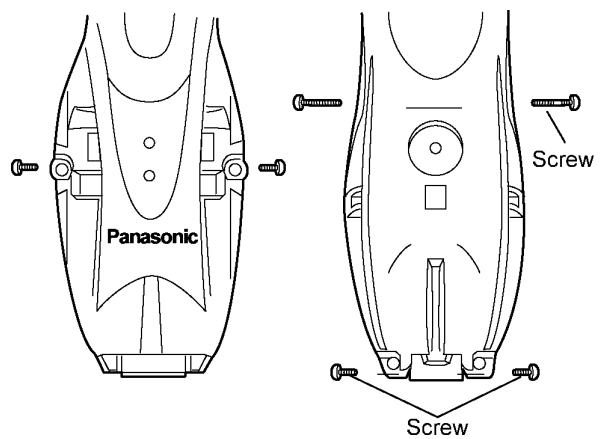


5. Loosen a screw and remove the bottom cover.

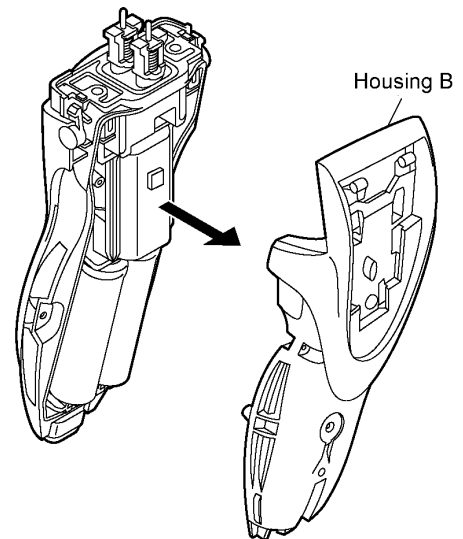
6. Slide down the side panels for both sides.



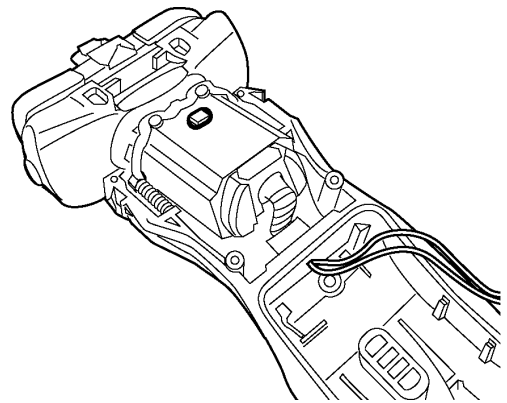
7. Loosen two screws on front and four screws on the back side.



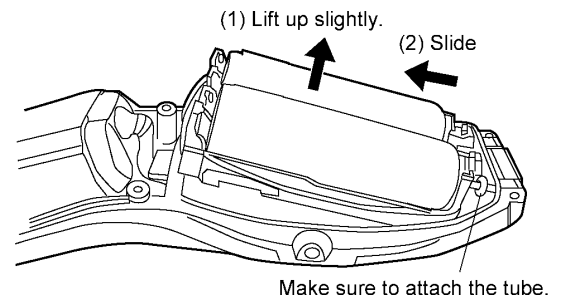
8. Take out the housing B.



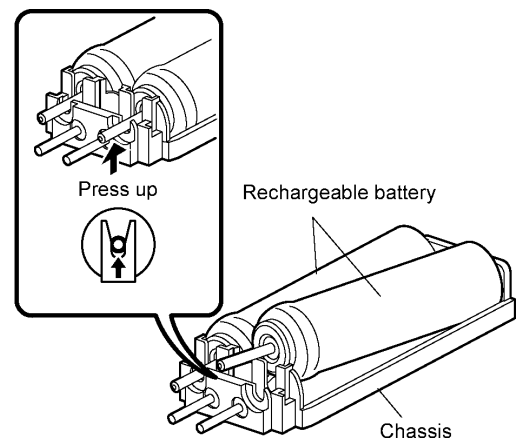
9. Remove the motor assembly and tube holder.



10. And take out the battery assembly from housing A.



11. Remove the battery o-ring and washer in each battery.
Take out the rechargeable batteries from the chassis.

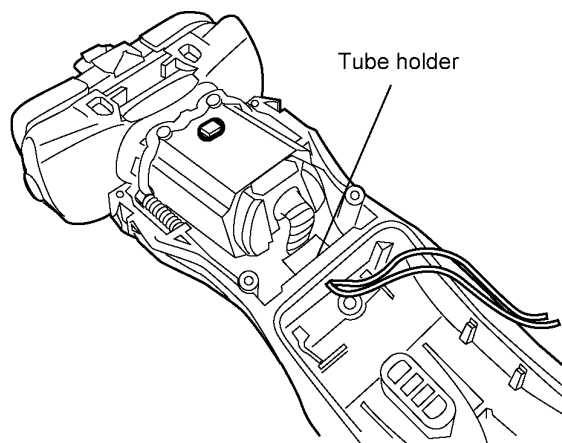


4 CAUTION IN ASSEMBLY

NOTE: When reassembling, replace the new waterproof rubber. Make sure whether there is **NO** foreign substance sticking around a part covered with water seal.

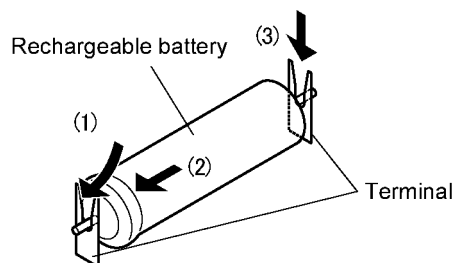
4.1. Motor

Insert the motor and press fit the waterproof tube neatly under the tube holder. And put the float spring properly.



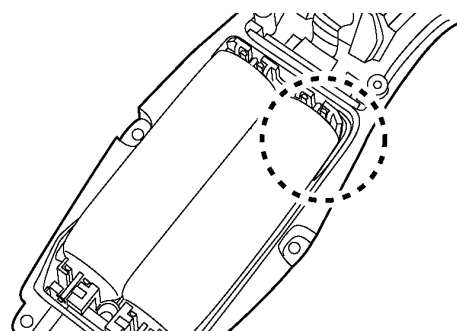
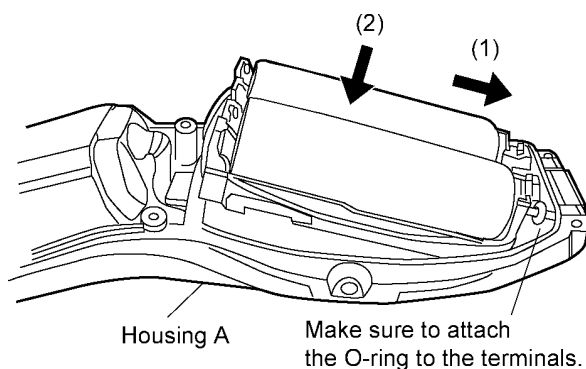
4.2. Rechargeable batteries

Insert the rechargeable batteries into chassis. Attach the battery o-ring and washer to the battery.



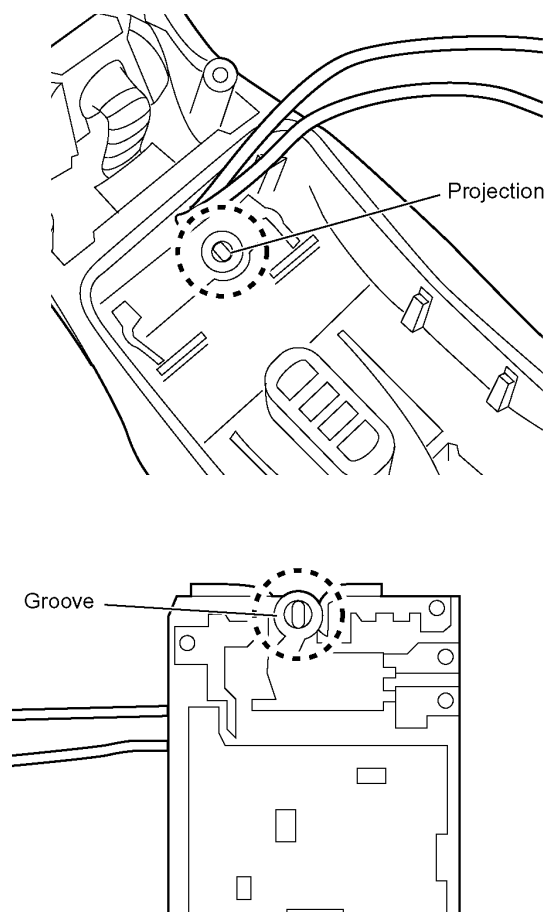
Put the battery assembly from the battery terminal side into housing A, and insert the motor side into housing A.

NOTE: Press fit the lead wire neatly in order to prevent pinching.



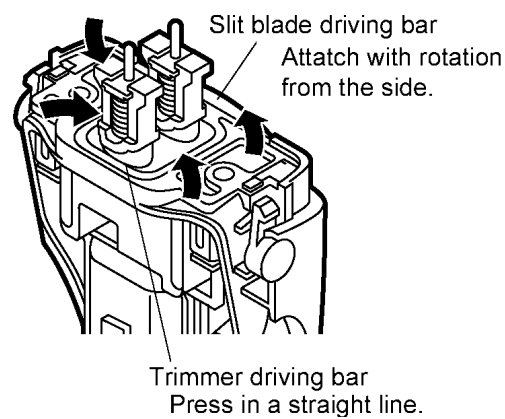
4.3. Module

Align the projection of switch select button on housing A with the groove of switch plate on module.



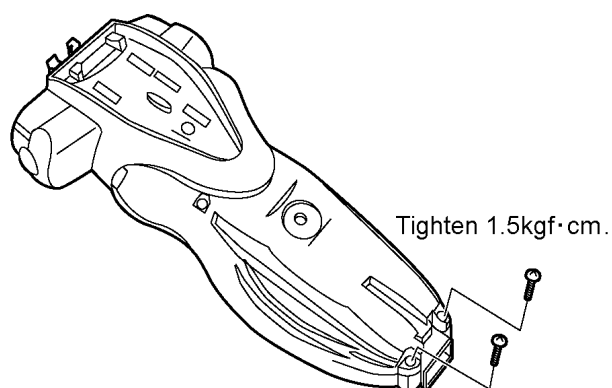
4.4. Driving bars

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



4.5. Screw

Tighten two screws with 1.5kgf-cm in order to prevent the breakage of housing or making a crevice in the housing.
Other screws are tightened with 2.5kgf-cm.

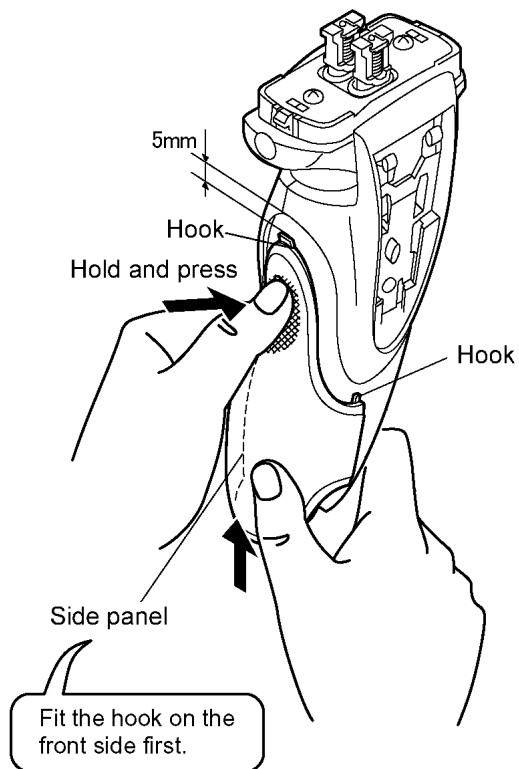


4.6. Side panel

Set the side panel on the body and slide it up until clicking the hook of panel at three locations.

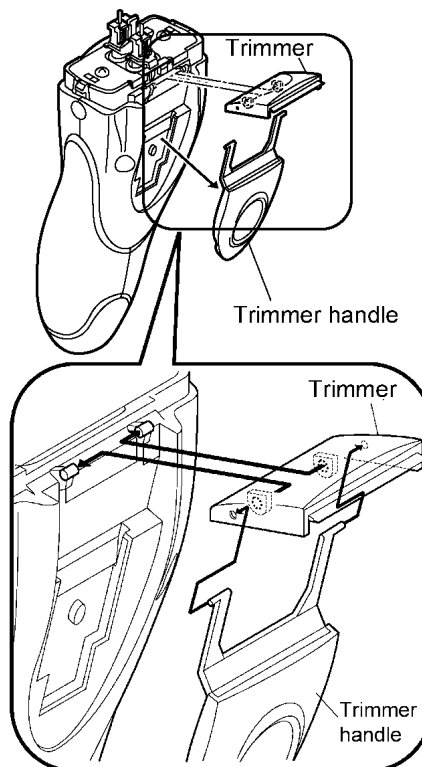
NOTE: Make sure that the left and right side panels are firmly fitted on both rear and front side.

Fit the front side of hook first, then on top and rear side.



4.7. Trimmer

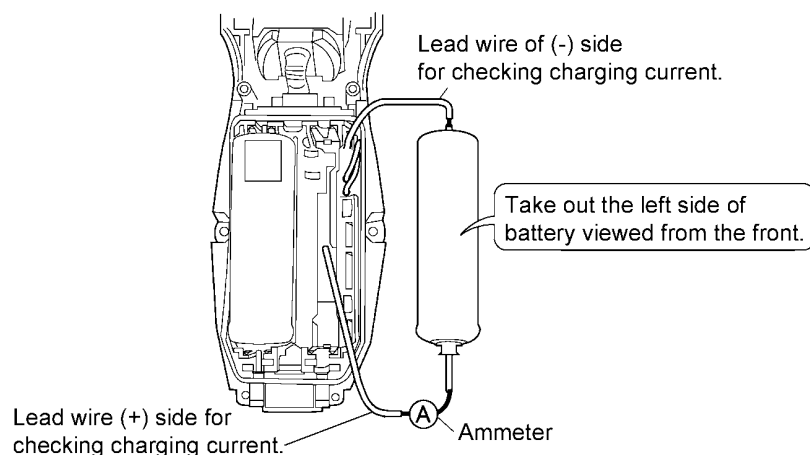
1. Make sure if the bosses of handle arm insert into the holes of trimmer.
2. Align the bosses of housing with the holes of trimmer, and hook the trimmer handle.
3. Confirm its operation or smooth movement of trimmer.



5 TROUBLESHOOTING GUIDE

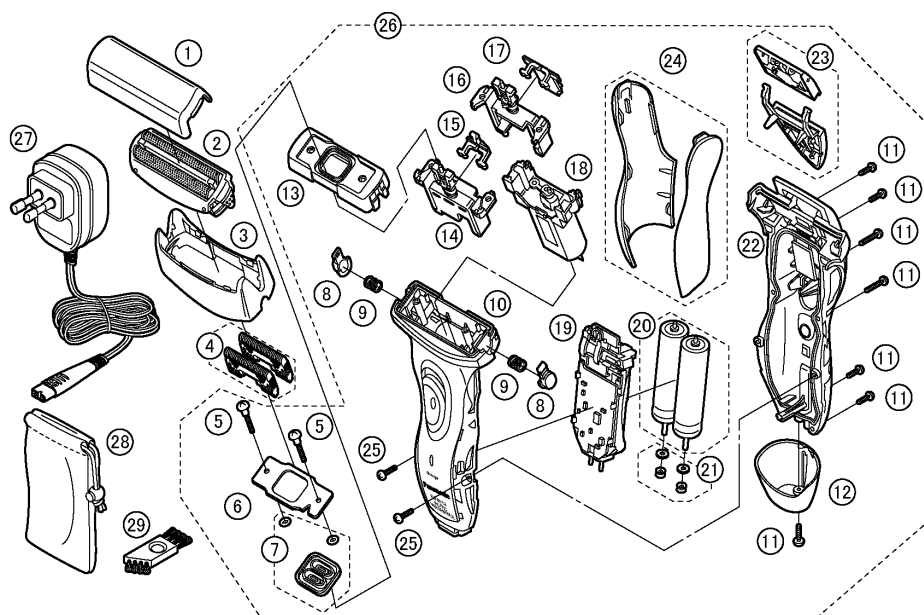
(Refer to WIRING CONNECTION DIAGRAM)

<TROUBLE>	<CHECK.>	<REMEDY>	
Motor does not rotate. Does not charge. Functions for a moment and stops. Does not operate by AC power source.	<p align="center"><CHECK CHARGING ADAPTOR.></p> Connect the rated voltage to the normal main unit by the charging adaptor. Check if the charge status lamp of main unit is lit. Supply the rated voltage to the adaptor and measure the voltage. OK if it is approxi. DC 5.8V for ES6013 or DC4V for ES6016 between the terminals of the plug with no-load operation.	NO → Replace charging adaptor.	
↓ OK			
<p align="center"><CHECK RECHARGEABLE BATTERIES.></p> Okay if the voltage of rechargeable batteries is more than approximately 1.2V DC between (+) and (-) terminals. (Replace two rechargeable batteries at the same time even though one battery is defective due to series connection.)			NO → Replace both rechargeable batteries at the same time.
↓ OK			
<p align="center"><CHECK SWITCH CONTACT.></p> Okay if there is a continuity and no deformation of switch terminals.			NO → Repair contact or replace housing A.
↓ OK			
<p align="center"><CHECK MOTOR.></p> Okay if motor rotates when DC2.4V is applied to (+) and (-) terminals.			NO → Replace motor.
↓ OK			
<p align="center"><CHECK MODULE.></p> Wire the main unit returned from a customer refer with the following figure, and connect the rated voltage to it by the charging adaptor. Take out the left battery (viewed from the front). Connect the chassis and (-) terminal of battery with the lead wire. Check charging current with the wire between chassis and (+) terminal of battery. Check charging current, if it is in between 700mA to 880mA for ES6016 or 70mA to 120mA for ES6013.			NO → Replace module.
↓ OK (remove the wire and reassemble the unit and attach the blades and foil frame with outer foils.)			
<p align="center"><CHECK MODULE.></p> Connect the rated voltage to the main unit with empty charge capacity by the charging adaptor. Check if the motor rotates more than one minutes by AC power source when turning on the switch.			NO → Check the soldering points from (A) to (E) ↓ OK Replace module.



6 EXPLODED VIEW & REPLACEMENT PARTS LIST

6.1. ES6013



NOTE:

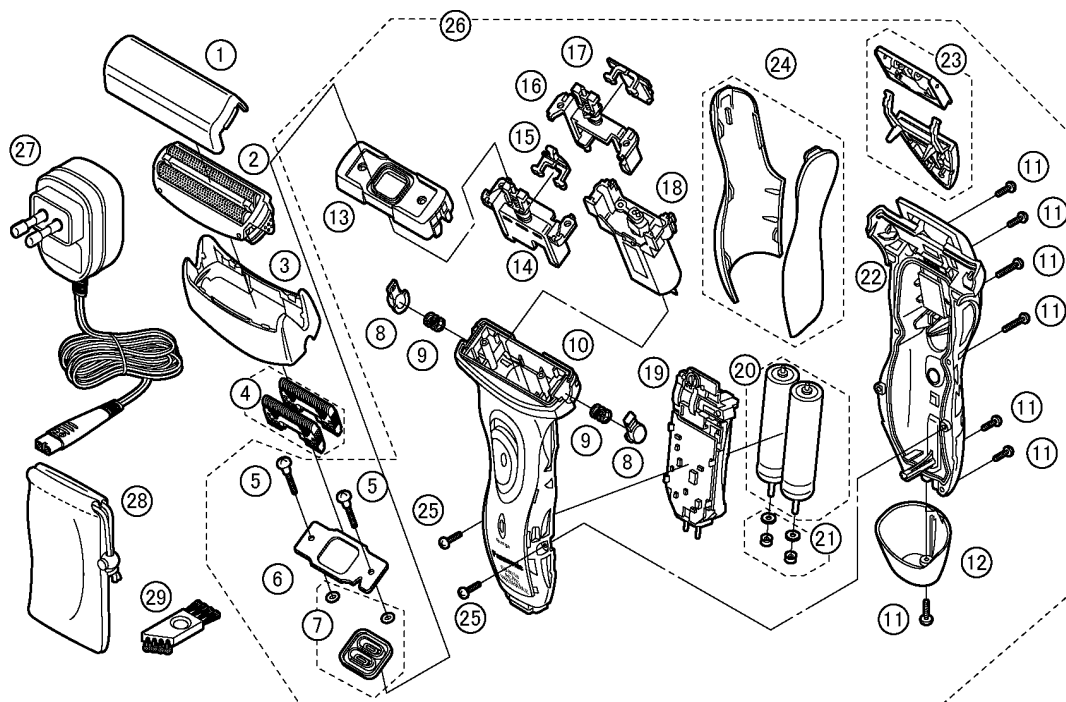
*A=available as an optional accessory

*B=only available as set

*C=available individually

Ref. No.	Part No.	Part Name & Description	Remarks	Per Unit
1	WES7043X7158	PROTECTIVE CAP		(BG) 1
2	WES9085E	OUTER FOIL		1
3	WES7046S0047	OUTER FOIL FRAME		(BG) 1
4	WES9064EP	INNER BLADE	*B	1ST
5	WES701S9707	SCREW	*C M12x12.5	2
6	WES6013L0207	RETAINING PLATE		(BG) 1
7	WES6013L0327	WATERPROOF RUBBER		(BG) 1
8	WES6013H3267	FOIL FRAME RELEASE BUTTON	*B (2PCS/PK)	(BG) 2
9	WES6013L0177	SPRING FOR RELEASE BUTTON	*B (2PCS/PK)	(BG) 2
10	WES6013S3058	HOUSING A		(BG) 1
11	WES6002S6058	TAPPING SCREW	*C K2*8	(BG) 7
12	WES6013A3848	BOTTOM COVER	without printing country of origin	(BG) 1
12	WES6013A3849	BOTTOM COVER		(BG) 1
12	WES6013A3840	BOTTOM COVER	only for Taiwan	(BG) 1
13	WES6013H0007	BLADE MOUNTING BASE		(BG) 1
14	WES6002L1248	DRIVING HEAD A		(BG) 1
15	WES7046L1077	SLIT BLADE DRIVING BAR		(BG) 1
16	WES6002L1258	DRIVING HEAD B		(BG) 1
17	WES7046L1087	TRIMMER DRIVING BAR		(BG) 1
18	WES6002L1008	MOTOR		(BG) 1
19	WES6013L2128	MODULE		(BG) 1
20	WES6013L2508	RECHARGEABLE BATTERY	*B Ni-Cd Type (2PCS/PK)	(BG) 2
21	WES7025L0977	WASHER & O-RING SET	*B (2PCS/PK)	(BG) 2
22	WES6013S3068	HOUSING B		(BG) 1
23	WES6003A1508	TRIMMER		(BG) 1
24	WES6013A3368	SIDE PANEL		(BG) 1
25	WES6002S6008	TAPPING SCREW	*C K2*12	(BG) 2
26	WES6013S3038	BODY BLOCK	without printing country of origin	(BG) 1
26	WES6013S3039	BODY BLOCK		(BG) 1
26	WES6013S3030	BODY BLOCK	only for Taiwan	(BG) 1
27	WES7043K7671	CHARGING ADAPTOR	KS Plug	(BG) 1
27	WES6013K7662	CHARGING ADAPTOR	A-2 Plug	(BG) 1
27	WES6013K7663	CHARGING ADAPTOR	C-2 Plug	(BG) 1
28	WES4025K7007	SOFT CASE		1
29	WES8093H7057	CLEANING BRUSH		1
-	WES6013S8008	INDIVIDUAL BOX		(BG) 1
-	WES6013S8009	INDIVIDUAL BOX	without printing country of origin	(BG) 1
-	WES6013S8108	OPERATING INSTRUCTIONS		(BG) 1

6.2. ES6016



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	WES7043X7158	PROTECTIVE CAP		(BG) 1
2	WES9085E	OUTER FOIL		1
3	WES7046S0047	OUTER FOIL FRAME		(BG) 1
4	WES9064EP	INNER BLADE	*B	1ST
5	WES701S9707	SCREW	*C	M12x12.5 2
6	WES6013L0207	RETAINING PLATE		(BG) 1
7	WES6013L0327	WATERPROOF RUBBER		(BG) 1
8	WES6013H3267	FOIL FRAME RELEASE BUTTON	*B (2PCS/PK)	(BG) 2
9	WES6013L0177	SPRING FOR RELEASE BUTTON	*B (2PCS/PK)	(BG) 2
10	WES6016S3058	HOUSING A	ES6016	(BG) 1
11	WES6002S6058	TAPPING SCREW	*C	K2*8 (BG) 7
12	WES6016H3848	BOTTOM COVER		without printing country of origin (BG) 1
12	WES6016H3849	BOTTOM COVER		(BG) 1
12	WES6016H3840	BOTTOM COVER		only for Taiwan (BG) 1
13	WES6013H0007	BLADE MOUNTING BASE		(BG) 1
14	WES6002L1248	DRIVING HEAD A		(BG) 1
15	WES7046L1077	SLIT BLADE DRIVING BAR		(BG) 1
16	WES6002L1258	DRIVING HEAD B		(BG) 1
17	WES7046L1087	TRIMMER DRIVING BAR		(BG) 1
18	WES6002L1008	MOTOR		(BG) 1
19	WES6016L2128	MODULE		(BG) 1
20	WES7043L2508	RECHARGEABLE BATTERY	*B	Ni-Mh Type (2PCS/PK) (BG) 2
21	WES7025L0977	WASHER & O-RING SET	*B	(2PCS/PK) (BG) 2
22	WES6016S3068	HOUSING B		(BG) 1
23	WES6016H1508	TRIMMER		(BG) 1
24	WES6016S3368	SIDE PANEL		(BG) 1
25	WES6002S6008	TAPPING SCREW	*C	K2*12 (BG) 2
26	WES6016H3038	BODY BLOCK		without printing country of origin (BG) 1
26	WES6016H3039	BODY BLOCK		(BG) 1
26	WES6016H3030	BODY BLOCK		only for Taiwan (BG) 1
27	WES7046K7671	CHARGING ADAPTOR		KS Plug (BG) 1
27	WES6016K7662	CHARGING ADAPTOR		A-2 Plug (BG) 1
27	WES7046K7663	CHARGING ADAPTOR		C-2 Plug (BG) 1
28	WES4025K7007	SOFT CASE		1
29	WES8093H7057	CLEANING BRUSH		1
-	WES6016H8008	INDIVIDUAL BOX		(BG) 1
-	WES6016H8009	INDIVIDUAL BOX		without printing country of origin (BG) 1
-	WES6013S8108	OPERATING INSTRUCTIONS		(BG) 1