SANYO

FILE No.

SERVICE MANUAL

Massage chair

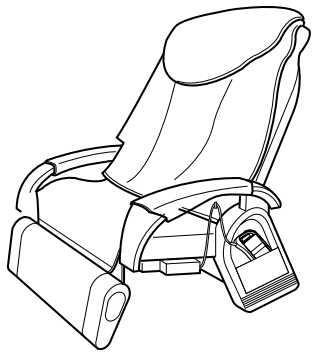
HEC-DR21 (TAIWAN)

MODEL	HEC-DR21
Power source	AC 110 V 60Hz
Power consumption	165 W
Rated time	30 minutes
Personal sensor course	Recovery / Relax
Automatic course	Four (neck / shoulders, upper torso, lower back, legs)
Kneading rate	Approx. 16,22,30 pulses/min. (3 speeds)
Tap rate	Approx. 300,480,600 times/min. (3 positions)
Tap range	Approx. 70,100,130mm (3 positions)
Back stretch settings	Approx. 70,100,130mm (3 positions)
Vertical motion rate	Approx. 30sec./up-and-down cycle
Massage sphere vertical reach	Approx. 635mm (straight line)
Reclining angle	Back: approx. 120-170 degrees, Leg: approx. 0-100 degrees
Leg massage	Rotating roller (Manual course: approx. 15 min., Automatic course: approx. 12 min.)
Roller rotation	Higher speed: 100 times/min., Lower speed: 70 times/min.
Timer	Approx. 13 min. (Automatic Sensor course) Approx. 12 min. (Automatic course) Approx. 15 min. (Manual course)
Dimensions (W x D x H)	Approx. 670 x 1,000 x 1,050 mm (When footrest is stored) Approx. 670 x 1,550 x 550 mm (When footrest is in horizontal position) Approx. 670 x 1,700 x 550 mm (When footrest is fully opened)
Weight	Approx. 55 kg

PRODUCT CODE NO.

1 - 383 206 51 (K)

1 - 383 206 52 (H)



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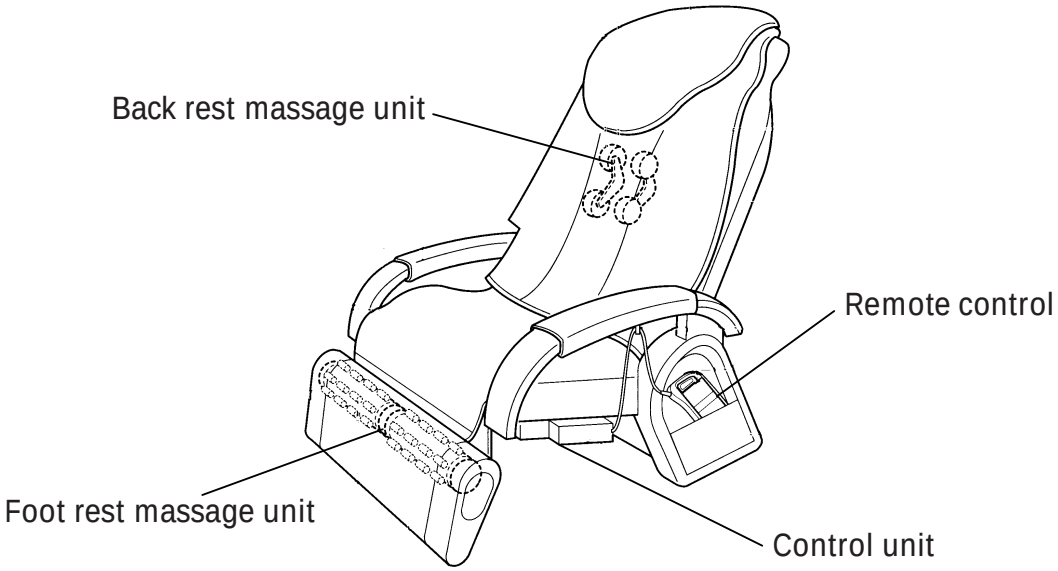
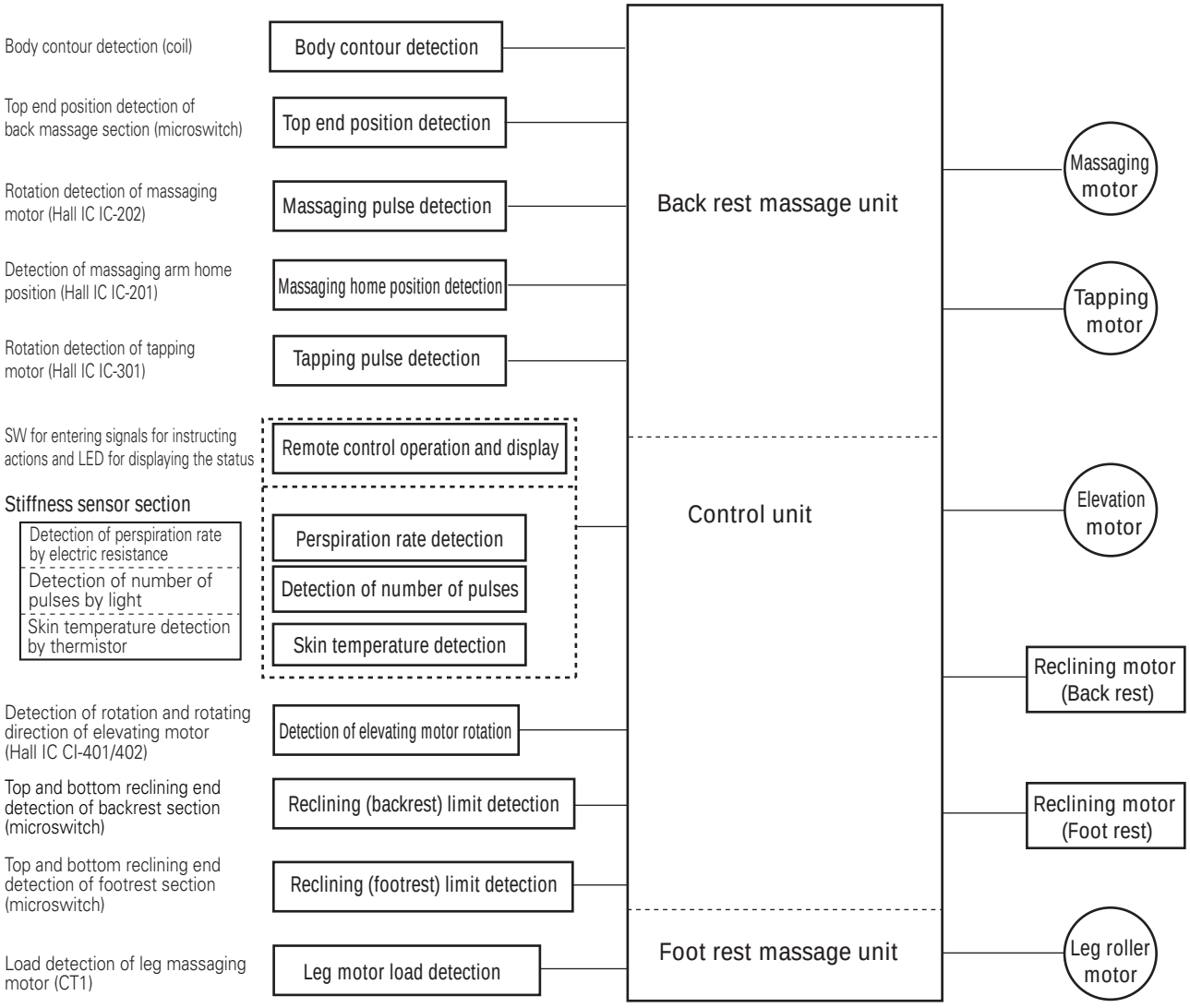
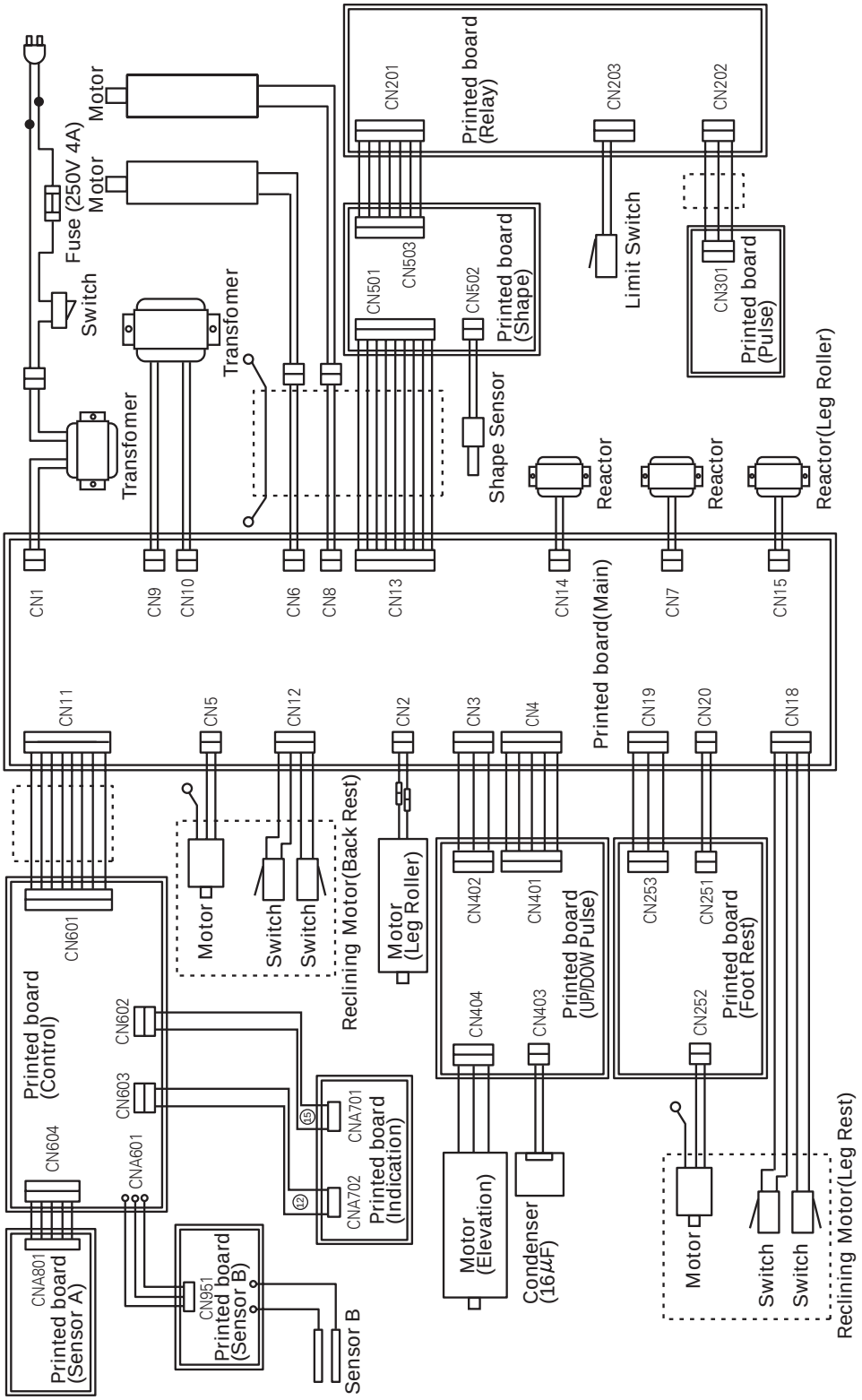
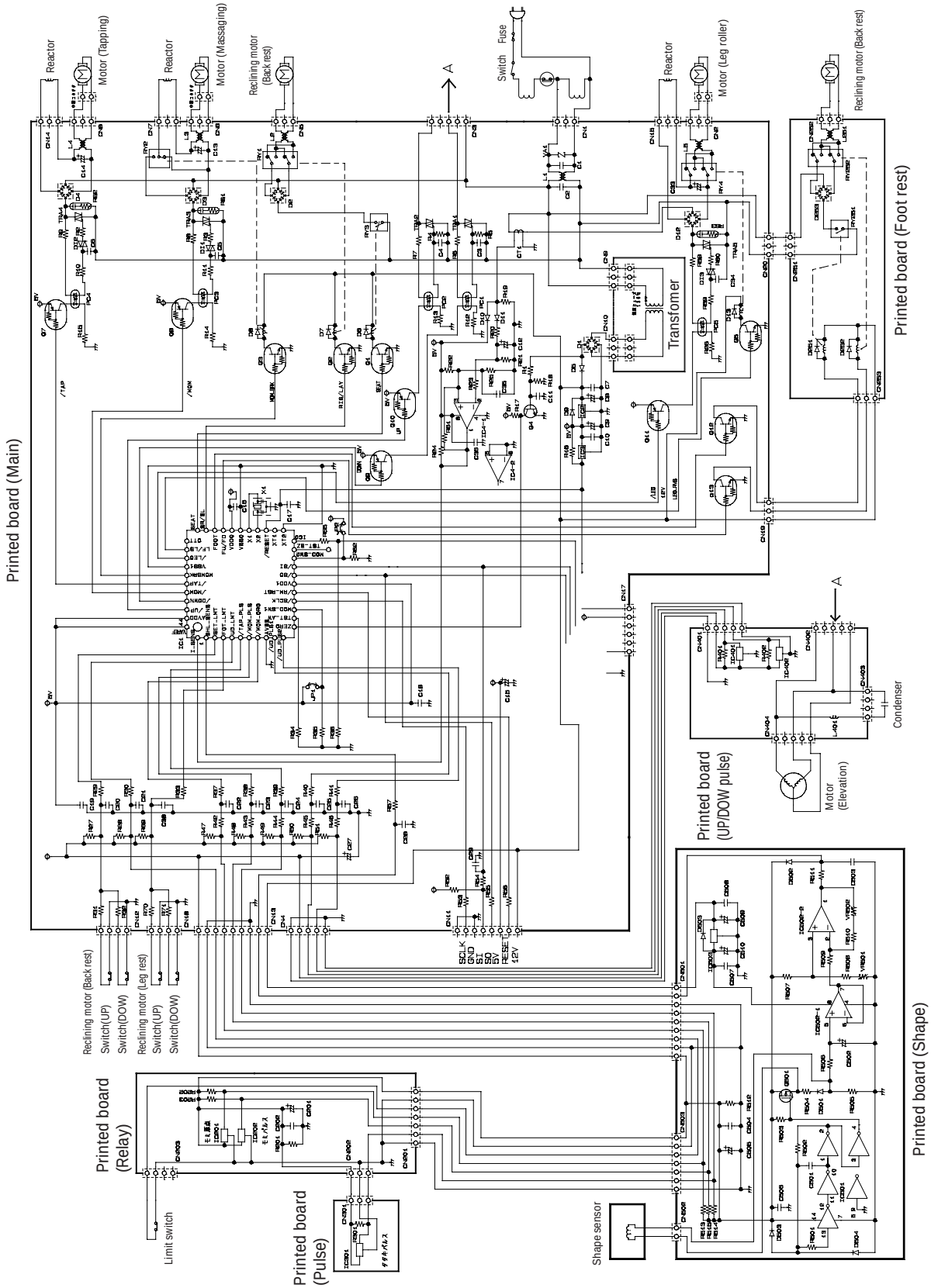
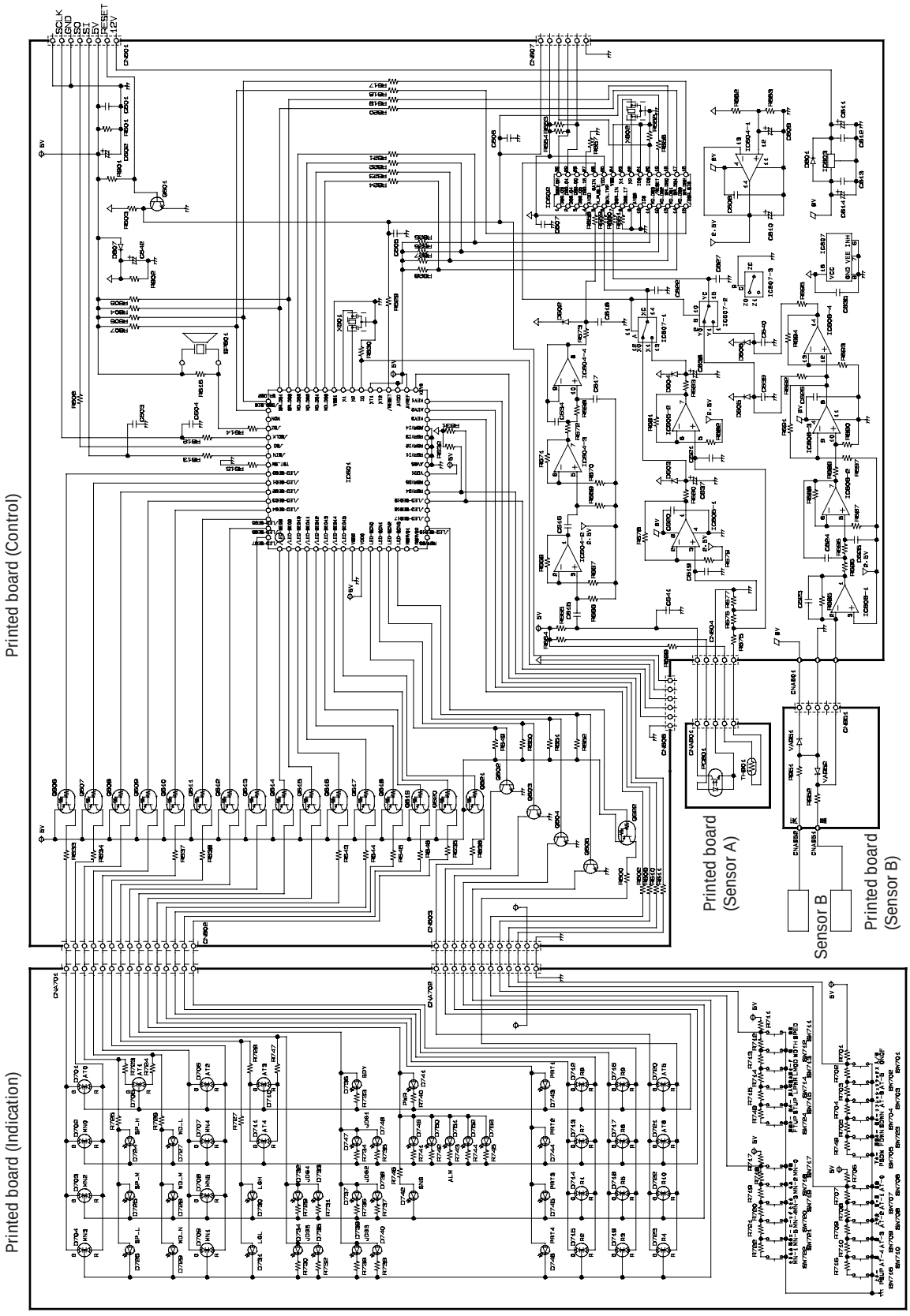

Back rest massage unit
Remote control
Foot rest massage unit
Control unit

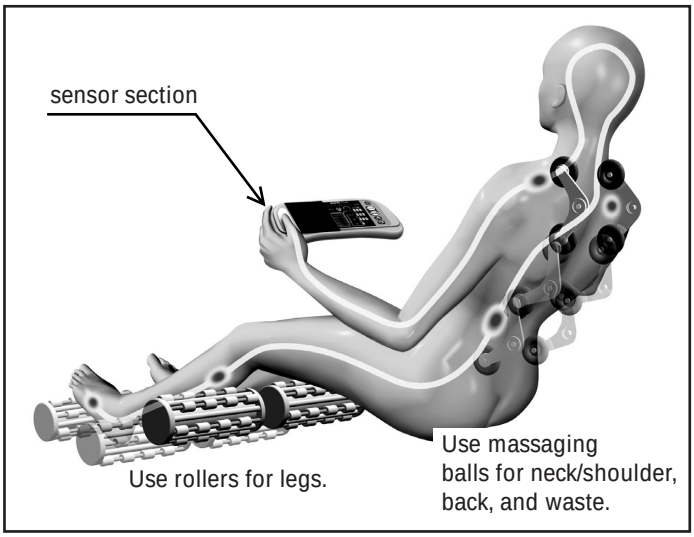

Body contour detection (coil)
Body contour detection
Top end position detection of back massage section (microswitch)
Top end position detection
Rotation detection of massaging motor (Hall IC IC-202)
Massaging pulse detection
Detection of massaging arm home position (Hall IC IC-201)
Massaging home position detection
Rotation detection of tapping motor (Hall IC IC-301)
Tapping pulse detection
SW for entering signals for instructing actions and LED for displaying the status
Remote control operation and display
Stiffness sensor section
Detection of perspiration rate by electric resistance
Detection of number of pulses by light
Skin temperature detection by thermistor
Perspiration rate detection
Detection of number of pulses
Skin temperature detection
Detection of rotation and rotating direction of elevating motor (Hall IC CI-401/402)
Detection of elevating motor rotation
Top and bottom reclining end detection of backrest section (microswitch)
Reclining (backrest) limit detection
Top and bottom reclining end detection of footrest section (microswitch)
Reclining (footrest) limit detection
Load detection of leg massaging motor (CT1)
Leg motor load detection
Back rest massage unit
Control unit
Foot rest massage unit
Massaging motor
Tapping motor
Elevation motor
Reclining motor (Back rest)
Reclining motor (Foot rest)
Leg roller motor

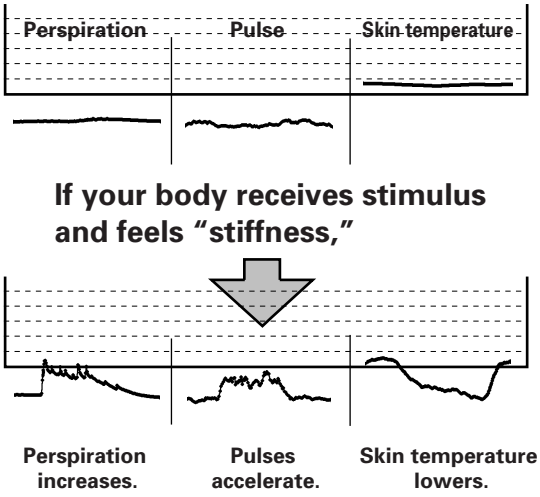

Printed board (Relay)
CN201
CN203
CN202
Limit Switch
Printed board (Pulse)
CN301
Printed board (Shape)
CN501
CN503
CN502
Shape Sensor
Motor
Fuse (250V 4A)
Motor
Switch
Transfomer
Transfomer
Reactor
Reactor
Reactor(Leg Roller)
CN1
CN9
CN10
CN6
CN8
CN13
CN14
CN7
CN15
Printed board(Main)
CN11
CN5
CN12
CN2
CN3
CN4
CN19
CN20
CN18
Motor
Switch
Switch
Reclining Motor(Back Rest)
Motor (Leg Roller)
CN402
CN401
Printed board (UP/DOW Pulse)
CN253
CN251
Printed board (Foot Rest)
CN404
CN403
CN252
Printed board (Control)
CN601
CN602
CN603
CN604
CNA601
CNA701
CNA702
Printed board (Indication)
Motor (Elevation)
Condenser (16μF)
Motor
Switch
Switch
Reclining Motor(Leg Rest)
CNA801
Printed board (Sensor A)
CN951
Printed board (Sensor B)
Sensor B


Printed board (Main)
Printed board (Foot rest)
Printed board (Shape)
Printed board (UP/DOW pulse)
Printed board (Relay)
Printed board (Pulse)
Transformer
Reactor
Motor (Tapping)
Motor (Massaging)
Reclining motor (Back rest)
Switch
Fuse
Motor (Leg roller)
Condenser
Motor (Elevation)
Limit switch
Shape sensor
Reclining motor (Back rest)
Switch(UP)
Switch(DOW)
Reclining motor (Leg rest)
Switch(UP)
Switch(DOW)
SCLK
GND
SI
SO
5V
HESE
12V


Printed board (Control)
Printed board (Indication)
Printed board (Sensor A)
Printed board (Sensor B)
Sensor B

To the remote controller sensor section, three kinds of sensors (skin electric resistance, photo sensor, thermistor) are assembled, and measure three kinds of physiological amounts (perspiration, pulse, skin temperature).
When stiff portions are subject to massage stimulus of detection massage, changes are observed in the perspiration rate, number of pulses, and skin temperature.
These three kinds of displacements are measured.





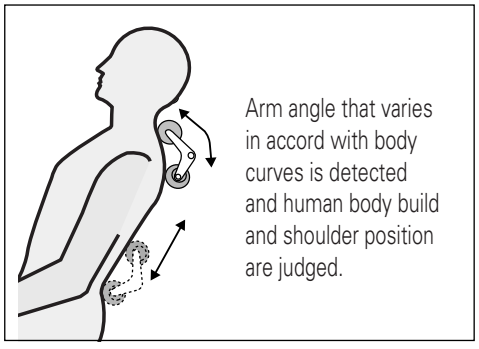
Stiffness feeling is judged by combinations of perspiration rate, number of pulses, and skin temperature and are classified into four stages (relax, normal, stiffness feeling, pains).

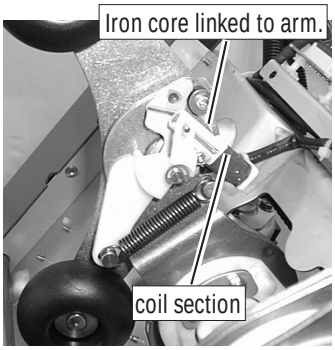
1. In the case of relax, perspiration rate tends to lower.
2. In the case of normal, change of each physiological amount is small.
3. In the case of stiffness feeling, perspiration rate and number of pulses tend to increase.
4. In the case of pains, perspiration rate greatly increases and number of pulses tends to increase.

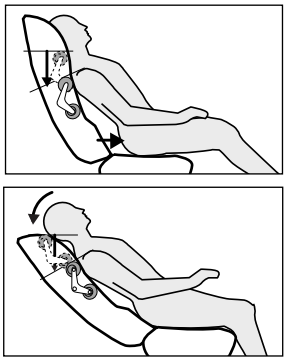
Stiffness feeling is indicated by three colors: green (relax), orange (normal), red (stiffness feeling/pains).

Operation of Body Contour Sensor

The body contour sensor judges the body contour (shoulder position) by changes of angles of massage arms.
Sensors consist of coils and iron cores, detect displacement of reactance, and convert into angular changes.







Even if body position is deviated during massage, the shoulder position is automatically corrected.

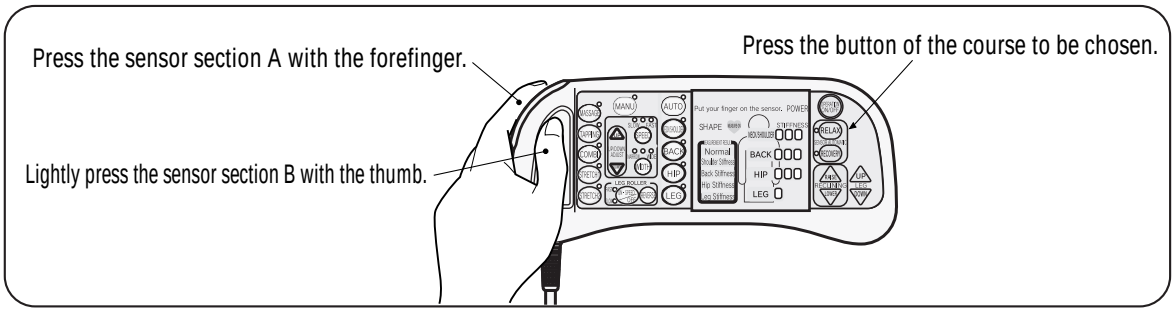
Sensor-automated massage judges stiffness feeling by measuring changes of physiological amounts of perspiration, pulses, skin temperature during detection massage, displays the degree of stiffness feeling in three colors, and carries out massage suited for stiffness feeling.

Method and action of sensor-automated massage

1. Place fingers at two places of sensor section of the remote controller.
2. Press "ON/OFF" operation button.
3. Choose "Relax" or "Recovery from fatigue" and press button.

※ LED lamp of the course chosen is lighted red.

Relax course: (Gently massages in such a manner as to relax the whole body.)
Recovery from fatigue course: (Steadily massages with special emphasis placed on portions with stiffness feeling.)



4. Detection massage begins (about 3 minutes).

Neck/shoulder, back, waist, and legs are tapped, massaged, and tap-massaged, and stiffness feeling is judged in four stages and indicated in three colors
(leg sections are massaged with rollers only).

※If fingers are released from sensor sections during detection massage, no accurate measurement can be made. When accurate judgment is unable to be made, indicator lamps for stiffness feeling judgment do not go on and standard massaging operation takes place.

5. Upon completion of detection massage, a buzzer comes on and massage of the course chosen takes place.
6. Based on stiffness feeling judged in four stages by detection massage, massage suited for stiffness feeling is carried out for about 10minutes by varying speed and time with respect to standard action of each course.

When “Relax” course is chosen:

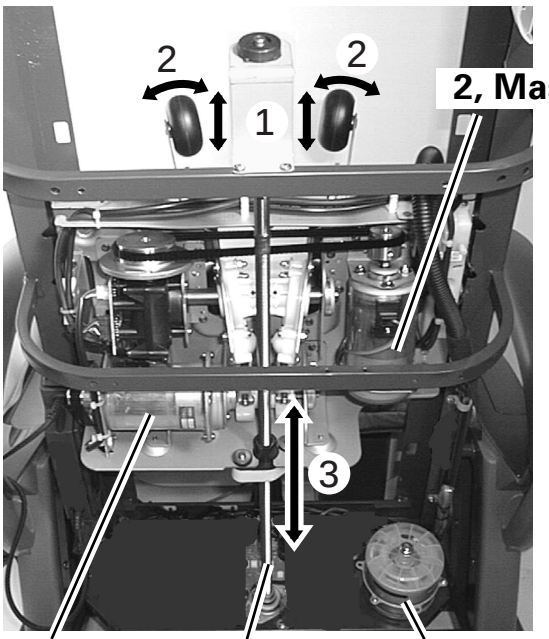
Each massage at portions with stiffness feeling is carried out at slower speed and in shorter time.
Each massage at relaxed portions is carried out at standard speed and in longer time.
In the case of normal portions, each massage takes place at standard speed and time.

When “Recovery from fatigue“ course is chosen:

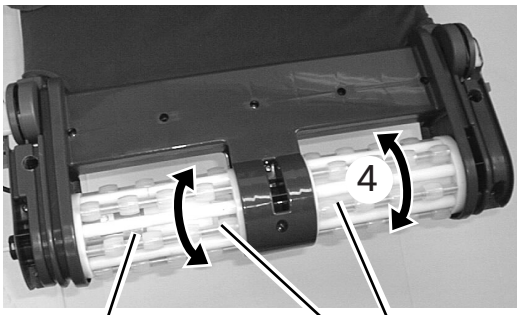
Each massage at portions with stiffness feeling is carried out at standard speed and in longer time.
Each massage at relaxed portions is carried out at faster speed and in shorter time
n the case of normal portions, each massage takes place at standard speed and time.

If "Pains" judgment is obtained by detection massage, massage speed is decreased and time is also decreased for both courses.
(When it is judged that the back aches, massage of the back is omitted.)

※If courses are changed after detection massage, massage is carried out from the very beginning of the course changed.



2, Massage motor



4, Leg massage motor

roller

1, Tapping motor

3, Elevation motor

Screw bar

1, Tapping motor

This motor rotates to move the massage balls upward and downward alternately via the driving belt coupled to the motor.
(The motor revolutions is adjustable in three steps so that the patting frequency can be changed over to approximately 360, 480 and 600 cycles/minute.)

2, Massage motor

This motor rotates to move the massage balls crosswise via the driving belt and gear box coupled to the motor.
(The motor revolutions is adjustable in three steps so that the massaging frequency can be changed over to approximately 20, 25 and 30 cycles/minute.)
(When patting and stretching the backbone line, the massage ball position (ball moving range) can be changed over in three steps after starting the patting motor.)

3, Elevation motor

This motor rotates to transmit its rotating torque to the threaded rod via the driving belt, whereby the massage unit is moved upward and downward.
(This motor rotates clockwise and counterclockwise to thereby move the massage unit upward and downward.)

Tapping-massaging

You can enjoy the good comfort that you can not do by hand tapping-massage, by starting both the tapping motor and the massage motor simultaneously.

I-shaped tapping - Z-shaped massaging

Massaging same portion can be prevented by moving minutely the massage balls upward and downward by starting the elevation motor while running the tapping motor for tapping operation or the massage motor for massaging operation.

4, Leg massage motor

The leg motor rotation is transmitted to the outside roller through gear box.
Motor rotating speed is changed over between normal/reverse.
In addition, the rotating speed is adjusted in two stages and changed over to about 100 or 70 revolutions/min.

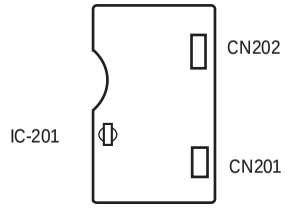
Troubled portion	MANU LED	SPEED LED	WIDTH LED	Troubled phenomenon	Check item	Counteraction method
POWER	○○○○○	○●○	○○○	Nothing is displayed after the power ON.	1. Check the current fuse for fusion. 2. Check the Printed board (Main) CN1 output (AC100V). 3. Check the Printed board (Main) CN9 output (AC100V). 4. Check the power transformer output CN10 (approx. 12V). 5. Check the Printed board (main) CN11 for connector come-off. 6. Check the Printed board (remote control) CN601 for connector come-off. 7. Check the remote control cable for disconnection or shorting.	• Replace the current fuse. • Check the power switch and power cord and transfomer for normal conductivity and replace them if necessary upon check. • Replace the Printed board (main). • Replace the power transformer. Insert the connector. • Replace the remote control cable.
REMOTE CONTROL	●●●●●	○○○	○○○	Trouble described is displayed immediately or 3 seconds after the power switch is turned ON.	1. Check the Printed board (main) CN11 for connector come-off. 2. Check the Printed board (remote control) CN601 for connector come-off. 3. Check the remote control cable for disconnection or shorting.	Insert the connector. • Replace the remote control cable.
MASSAGE MOTOR	●●●●●	○○○	○●○	The rubdown motor doesn't move. It displays 15 seconds later after rubdown choice. Massaging mode remains unchanged.	1. The connection confirmation of Printed board (main) CN6 and the junction connector. 2. Check the Printed board (main) CN6 output (approx. DC60 - 100V). 3. The connection confirmation of Printed board (main) CN13 and Printed board (relay) CN201. 4. The connection confirmation of Printed board (Shape) CN501 and CN503. 5. Check the Printed board (UP/DOW Pulse) IC201 and IC202 for inclination. 6. The magnet check for the MOMI detection.	Insert the connector. If output Replace the massage motor. If no output Replace the Printed board (main). Insert the connector. Insert the connector. Correct the tilted condition or replace the Printed board (relay). The magnet position correction for the detection.
TAPPING MOTOR	●●●●●	○○○	○●○	The tapping motor doesn't move. It displays 15 seconds later after rubdown choice. Tapping mode remains unchanged.	1. The connection confirmation of Printed board (main) CN8 and the junction connector. 2. Check the Printed board (main) CN8 output (approx. DC60 - 100V). 3. Check the belt (TATAKI) for dislocation and cut-off. 4. The connection confirmation of Printed board (main) CN13 and Printed board (relay) CN201 and CN202. 5. The connection confirmation of Printed board (pulse) CN301. 6. Check the Printed board (pulse) IC301 for inclination. 7. The magnet check for the TATAKI detection.	Insert the connector. If output Replace the tapping motor. If no output Replace the Printed board (main). The tapping motor belt correction, the exchange. Insert the connector. Insert the connector. Correct the tilted condition or replace the Printed board (Pulse). The magnet position correction for the detection.

Troubled portion	MANU LED	SPEED LED	WIDTH LED	Troubled phenomenon	Check item	Counteraction method
ELEVATION MOTOR	●●●●●	○●○	○○○	・The elevation motion doesn't move.	・The connection confirmation of Printed board (main) CN3 and CN4. ・The connection confirmation of Printed board (UP/DOW Pulse) CN401～CN404.	・Each connector insertion. ・Each connector insertion.
				・Trouble described left is displayed 3 or 30 seconds later after elevation	・Pull out CN404 on the Printed board (UP/DOW Pulse). and check for the red pin to gray pin output and blue pin to gray pin output of the Printed board side CN404 (to be approx. AC100V respectively). *For checking after power ON,keep either vertical adjust button "UP" or "DOWN" as pressed.	・If output from the both.---Replace the elevation motor. If no output, Replace the Printed board (main) or the elevation motor.
				・Trouble described left is displayed 3 seconds later after the power ON	・The connection confirmation of Printed board (Relay) CN203. Check turning on confirmation main harness. ・Check limit switches motion. < Under normal condition > Stop at the highest position(limit switch ON) CN203 connector open (∞) ・Check the Printed board (UP/DOW Pulse) IC401 and IC402 for tilt. ・Check the elevation magnet for the mounting direction or fall- down. ・Check the belt (ROLLING) for dislocation and cut- off.	・Each connector insertion. ・Replace the limit switch. ・Correct the tilted condition. ・Replace the Printed board (UP/DOW Pulse). ・Mount the magnet in normal condition. ・Mount or replace the belt.
RECLINING MOTOR BACK REST	●●●●●	○●○	○●○	・The back rest reclining motion doesn't move.	・The connection confirmation of Printed board (main) CN5. ・Check the CN5 output (to be approx. DC100V).	・Connector insertion. ・If output, Replace the Motor (Elevation). If no output,---Replace the Printed board (main)
				・Trouble described left is displayed 3 seconds later after the power ON	・The connection confirmation of Printed board (main) CN12. ・Pull out the CN12 connector. and check turning on confirmation of the motorized recliner side No1 to No2 pin and No3 to No4 pin.	・Connector insertion. ・When the both are ∞ (open); Replace the Motor (Elevation).
RECLINING MOTOR FOOT REST	●●●●●	●○○	●○○	・The foot rest reclining motion doesn't move.	・The connection confirmation of Printed board (Foot Rest) CN251 and CN252 and CN253. ・Check the CN252 output (to be approx. DC100V).	・Each connector insertion. ・If output, Replace the reclining motor(Leg Rest). If no output, Check the CN251 output (to be approx. AC100V). The relay (RY251) The operation confirmation. If extraordinary and not being. Replace the Printed board (Foot Rest) If being extraordinarily. Replace the Printed board (main)
				・Trouble described left is displayed 3 seconds later after the power ON	・The connection confirmation of Printed board (main) CN18. ・Pull out the CN18 connector. and check turning on confirmation of the motor side No1 to No2 pin and No3 to No4 pin.	・When the both are ∞ (open) Replace the reclining motor(Leg Rest).

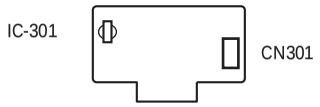
Troubled portion	MANU LED	SPEED LED	WIDTH LED	Troubled phenomenon	Check item	Counteraction method
LEG ROLLER MOTOR	●●●●○	●●●○	○○○	• Leg roller motor overcurrent	• Make sure roller cover, etc. are not caught in.	• If no trouble is found, reset by turning OFF power supply. ✻ Carry out operation check of body contour sensor of the following section.
SHAPE SENSOR	●●●●○	○○●○	○○○	• Body contour sensor trouble	• Check sensor operation. • Make sure substrate (main) CN13 and substrate (body contour sensor) CN501/502 are connected. • Pull out CN502 and check continuity between coils.	• Insert connector. • If no continuity is found, replace coil section. ✻ Carry out operation check of body contour sensor of the following section. • Check connections of substrate (perspiration sensor) CN951 and electrode cord.
SFIFFNESS SENSOR	●●●●○	○○○	○○●	• Stiffness detecting sensor measurement disabled.	Check operation of each sensor. • When perspiration sensor malfunctions. • When skin temperature sensor malfunctions. • When pulse sensor malfunctions.	• Replace substrate (perspiration sensor)/(remote control main). • Check connection of substrate (remote control main) CN604. • Replace substrate (pulse and temperature sensors).
VARIOUS	●●●●○	●○●○	○○○	• Trouble indicated after Power is turned "ON."	• Substrate (main) failure	• Replace substrate (main).

Printed board for the detecfion of rotating

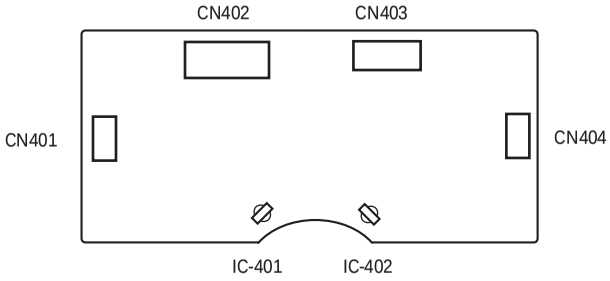
Substrate (relay) - massage rotation detected.



Substrate (tapping pulse) - tap rotation detected.

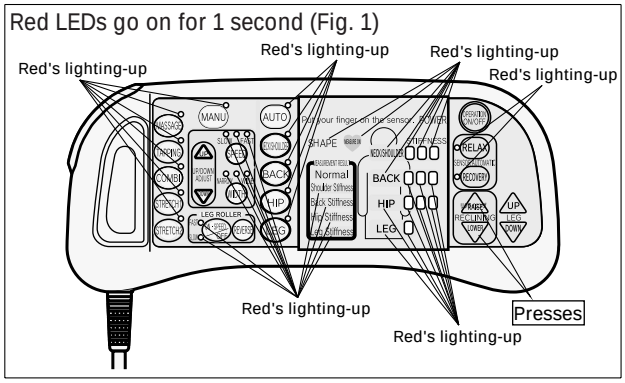


Substrate (elevating motor) elevate rotation detected



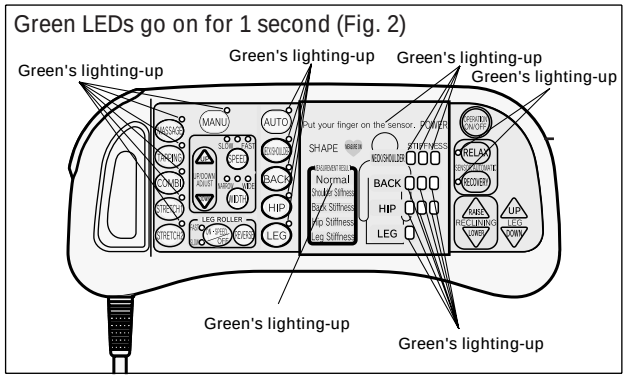
1. With reclining "ERECT" and "RECLINE" on remote controller held depressed, turn ON power supply switch.
2. Red LEDs (41 places) go on for 1 second (Fig. 1).

Red LEDs go on for 1 second (Fig. 1)



3. Green LEDs (25 places) go on for 1 second (Fig. 2).

Green LEDs go on for 1 second (Fig. 2)



4. Red LEDs at five places in the massage mode go on and operation of each sensor can be checked (Fig. 3).

Operation Check of Each Sensor

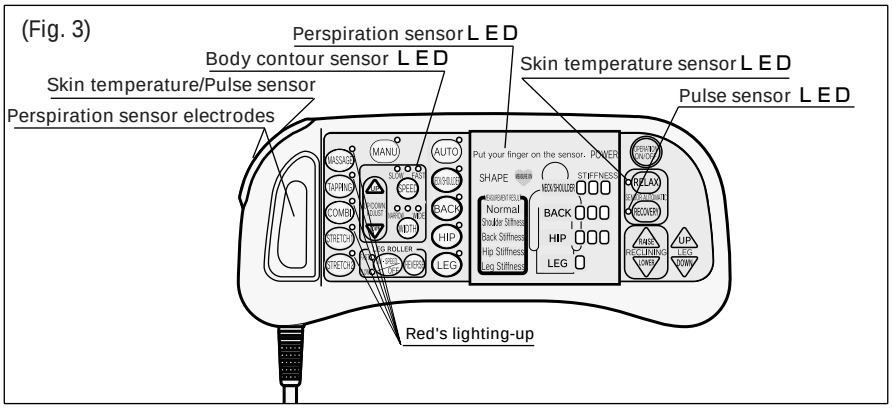
Body contour sensor Press in the upper part of massaging arm.
Speed "FAST" LED which is lighted goes out.

Perspiration sensor When a finger is placed between two electrodes,
LED "Put your finger on the sensor" which is lighted goes out.

Skin temperature sensor
When temperature is about 17℃ or lower, LED "Ease" goes on.
When temperature is over about 17℃ , LED "Ease" goes out.

Pulse sensor Attach a finger to sensor by the side.
LED "Recovery from fatigue" blinks.

(Fig. 3)



(1) Replacement of PRINTED BOAD ASS'Y (MAIN)

1, Remove one case set screw and detach CASE (SWITCH BOX).
Take care not to apply unnecessarily strong force more than required to pull the case because connector is connected. Photo.1

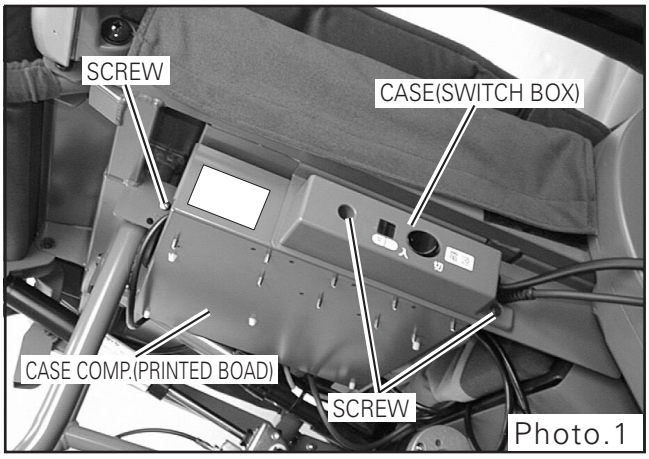


Photo.1

2, Remove all the cord treatments.
3, Pull out all the connectors connected to PRINTED BOAD ASS'Y (MAIN) and detach PRINTED BOAD ASS'Y (MAIN). Photo.2
4, Unscrew 2 TRANS FORMER ASS'Y set screws and remove TRANS FORMER ASS'Y.
Photo.2
5, Unscrew 2 pieces each of REACTOR (3 pieces) set screws and remove REACTOR.
Photo.2

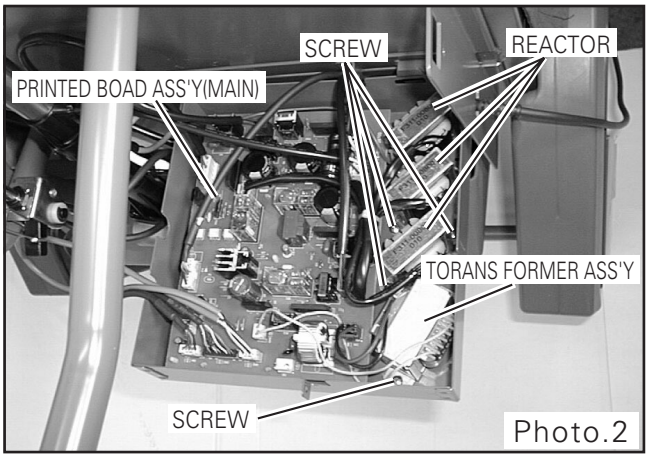


Photo.2

(2) Replacement of substrate (electrically-operated foot)

1, Remove connections of three connectors connected to PRINTED BOAD ASS'Y (FOOTREST). Photo.3
2, Detach PRINTED BOAD ASS'Y (FOOTREST).
Photo.3

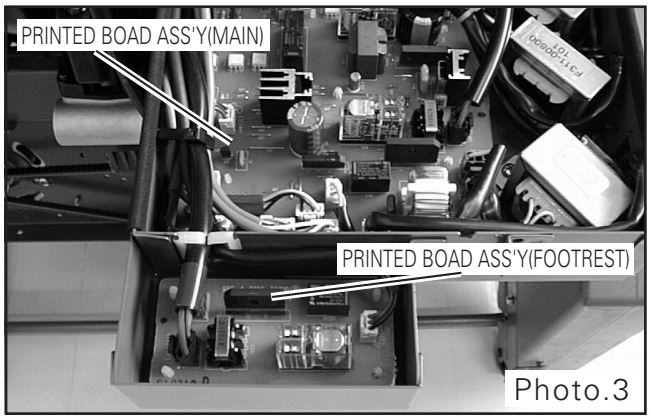


Photo.3

(3) Replacement of power switch section

1, Disconnect connector CN1 connected to PRINTED BOAD ASS'Y (MAIN). Photo.2
2, Unscrew two CASE (SWITCH BOX) set screws and detach power supply switch section.
Photo.1
3, Open fuse case of current fuses and take out current fuses. Photo.4
4, Unscrew two switch holder set screws and detach switch holder. Photo.4
5, Unscrew one POWER SWITCH fixing screw and detach POWER SWITCH. Photo.4

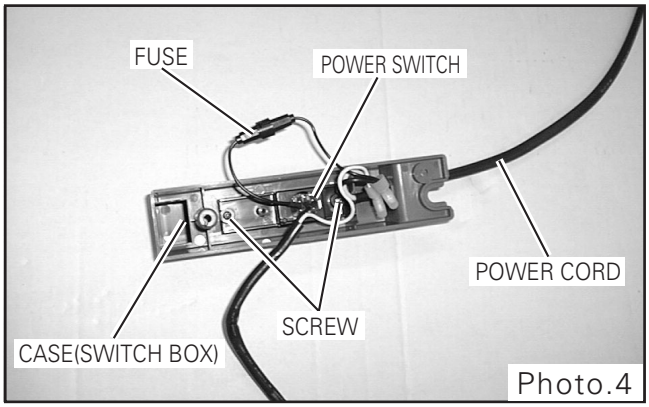


Photo.4

(4) Replacement of POWER CORD

1, Disconnect POWER CORD and remove CORD BUSHING of POWER CORD.
Photo.4

(5) Replacement of remote control section

1, Disconnect connector CN11 connected to PRINTED BOAD ASS'Y (MAIN).

2, Detach bushing of remote control cord and remove remote control section.

3, Unscrew five remote control case set screws and open remote control case vertically.

Photo.5

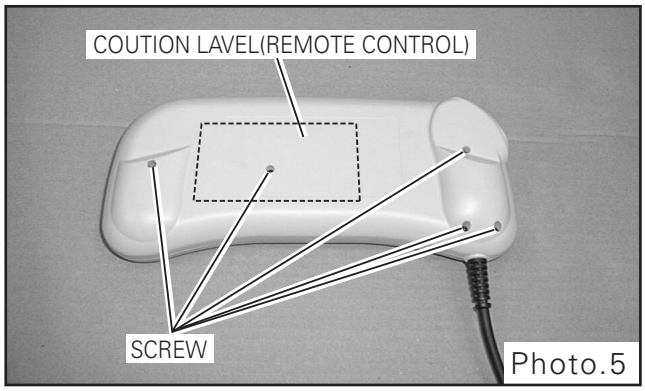


Photo.5

4, Unscrew one PRINTED BOAD ASS'Y (REMOTE CONTORL) set screw and disconnect connector of CONNECTOR ASS'Y. Photo.6

5, Unscrew all the sensor set screws and remove PRINTED BOAD ASS'Y (SENSOR A)(SENSOR B).

Photo.6

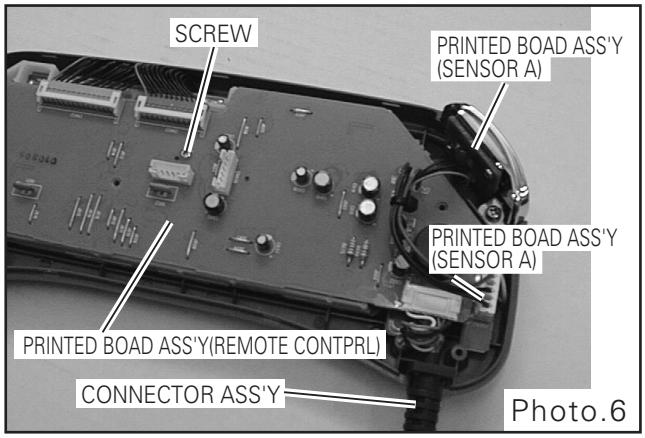


Photo.6

(6) How to detach COVER (BACK COVER)

1, Unscrew four COVER (BACK COVER) set screws and remove COVER (BACK COVER).

Photo.7

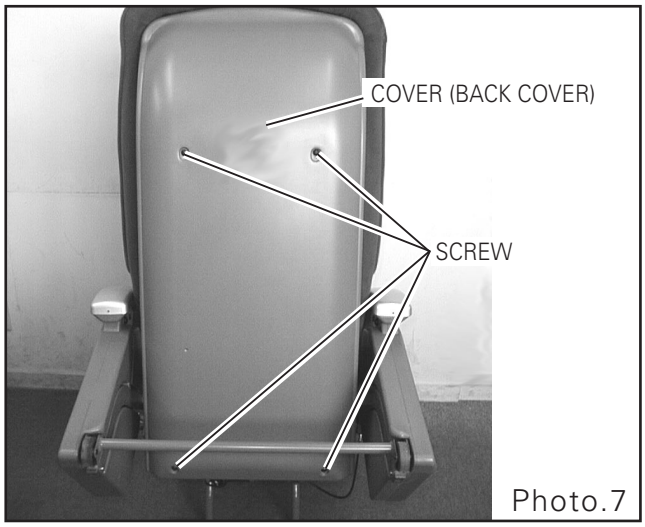


Photo.7

(7) Replacement of PRINTED BOAD ASS'Y (UP/DOW PULSE)

1, Unscrew two cover set screws and remove cover.

2, Pull out four connectors connected to PRINTED BOAD ASS'Y (UP/DOW PULSE) and remove PRINTED BOAD. Photo.8

3, Unscrew one CONDENSER ASS'Y set screw and remove CONDENSER ASS'Y.

Photo.8

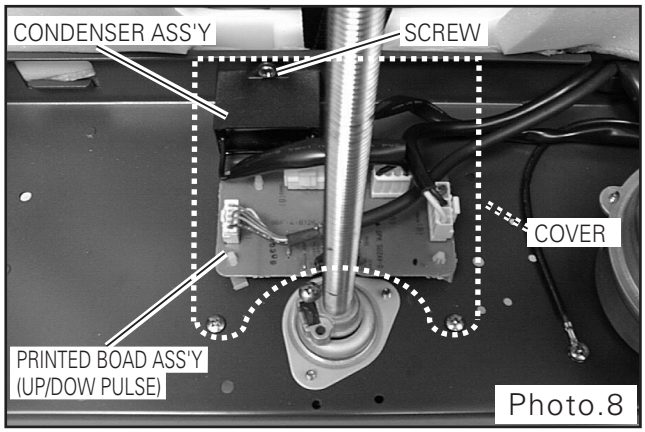


Photo.8

(8) Replacement of elevating motor section

1, Disconnect elevating motor lead wires (CN404).
2, Detach BELT (ROLLING). Photo.9
3, Detach PULLEY (SM) from elevating motor shaft, and unscrew four elevating motor set screws. Photo.9

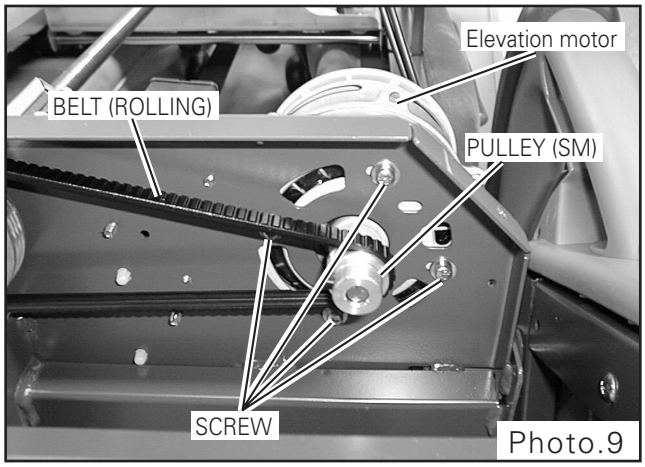


Photo.9

Precautions for Assembly

Install belt over pulley, adjust tension in reference to photo 10, and securely fix with four set screws. Photo.10

Adjust and mount PULLEY (SM) so that grooves of PULLEY (S) and PULLEY (SM) are aligned in a straight line. Photo.10

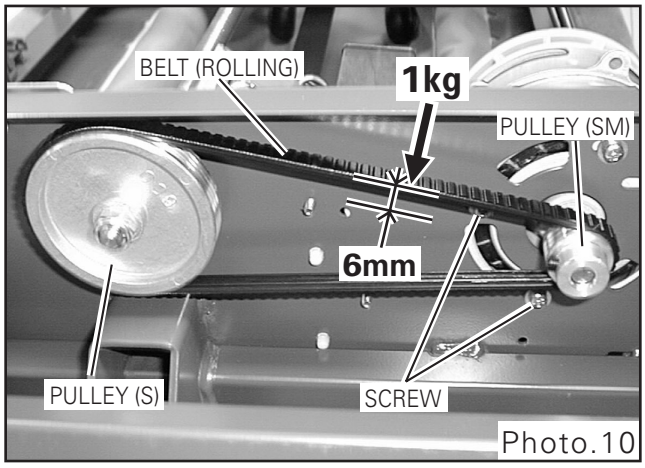


Photo.10

Take care to prevent grease from adhering to driven sections such as belt, etc. (bad operation occurs due to slip).

(9) Replacement of tapping motor section

1, Disconnect connectors of tapping motor.
2, Detach BELT (TATAKI). Photo.11
3, Unscrew 1 motor fixing screw. Photo.11
4, Unscrew two STAY A (MOTOR T) set screws and remove tapping motor section. Photo.11
5, Remove PULLEY (TM) from tapping motor shaft and unscrew three tapping motor set screws. Photo.11

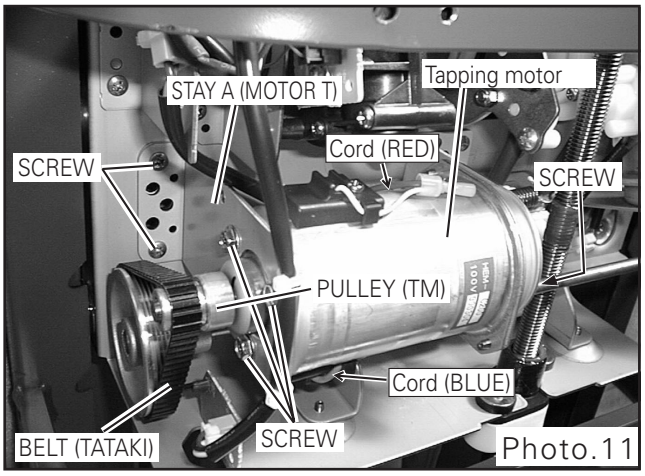


Photo.11

Precautions for Assembly

Securely fix STAY A with two STAY A set screws so that holes of frame coincide with those of STAY A (MOTOR T) (see round section of Photo 12). Photo.12

Adjust and mount PULLEY (TM) so that grooves of PULLEY (T) and PULLEY (TM) are aligned in a straight line. Photo.12

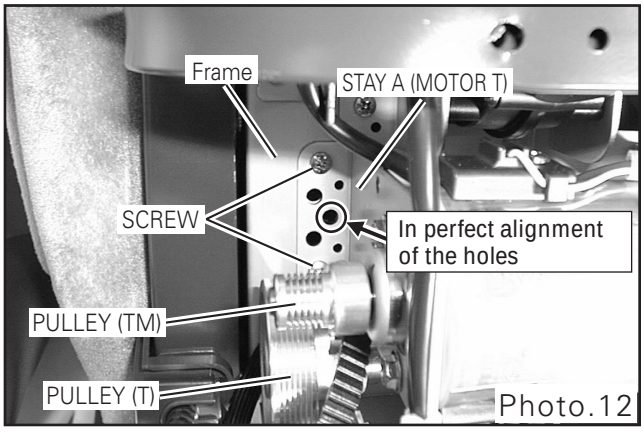


Photo.12

Take care to prevent grease from adhering to driven sections such as belt, etc. (bad operation occurs due to slip).

(10) Replacement of massaging motor section

1, Disconnect connectors of massaging motor cord.
2, Detach BELT (MOMI). Photo.13
3, Unscrew one motor fixing screw. Photo.13
4, Unscrew two STAY A (MOTOR M) set screws and detach massaging motor section. Photo.13
5, Detach PULLEY (MM) from massaging motor shaft and unscrew three massaging motor set screws. Photo.13

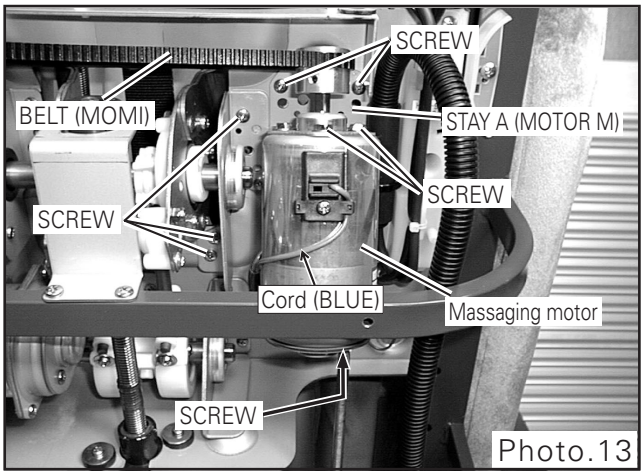


Photo.13

Precautions for Assembly

Securely fix STAY A with two STAY A set screws so that holes of frame coincide with those of STAY A (MOTOR M) (see round section of Photo 14). Photo.14

Adjust and mount PULLEY (MM) so that grooves of PULLEY (M) and PULLEY (MM) are aligned in a straight line. Photo.14

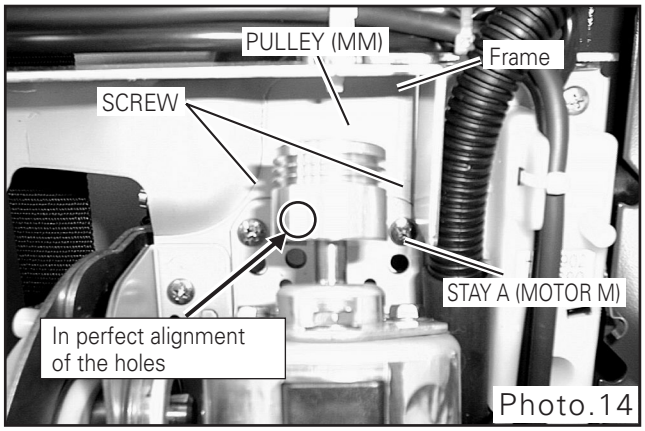


Photo.14

Take care to prevent grease from adhering to driven sections such as belt, etc. (bad operation occurs due to slip).

(11) Replacement of gear box section

1, Detach massaging belt. Photo.15
2, Unscrew two STAY (HARNESS) set screw and remove STAY (HARNESS). Photo.15
3, Unscrew one HOLDER (MAGNET WIDTH) set screw and detach HOLDER (MAGNET WIDTH) from shaft. Photo.15
4, Remove RING C 13 from shaft. Photo.15

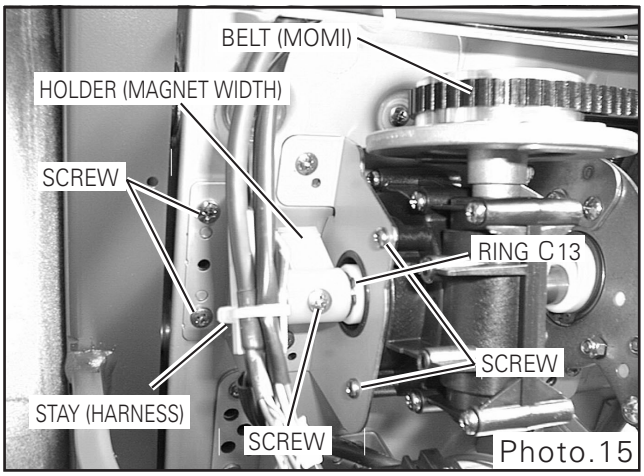


Photo.15

5, Slightly unscrew four SAHFT M set screws on the right. Photo.13
6, Unscrew four GEAR BOX ASS'Y section fixing screws and detach GEAR BOX ASS'Y section from shaft. Photo.16
7, Detach PULLEY (M) from GEAR BOX ASS'Y. Photo.16
8, Unscrew two pieces each of stay set screw on both sides of GEAR BOX ASS'Y and remove STAY (GEARCASE R and GEARCASE L). Photo.15

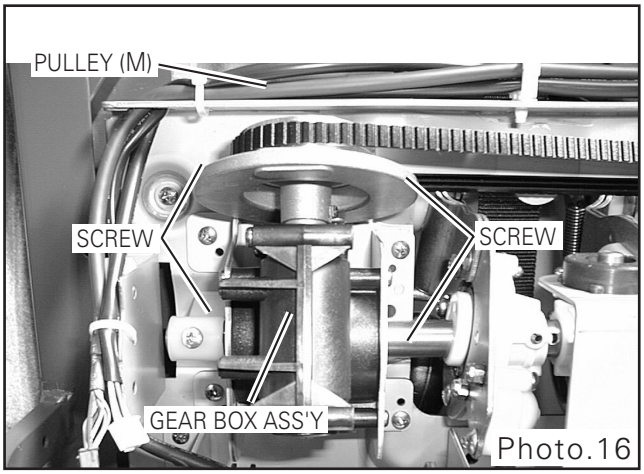


Photo.16

(12) Replacement of PRINTED BOAD ASS'Y (RELAY)(PULSE)

1, Disconnect three connectors connected to PRINTED BOAD ASS'Y (RELAY). Photo.17

2, Unscrew two PRINTED BOAD ASS'Y (RELAY) set screws and detach PRINTED BOAD ASS'Y (RELAY). Photo.17

3, Disconnect one connector connected to PRINTED BOAD ASS'Y (PULSE). Photo.17

4, Unscrew one PRINTED BOAD ASS'Y (PULSE) set screw and detach PRINTED BOAD ASS'Y (PULSE). Photo.17

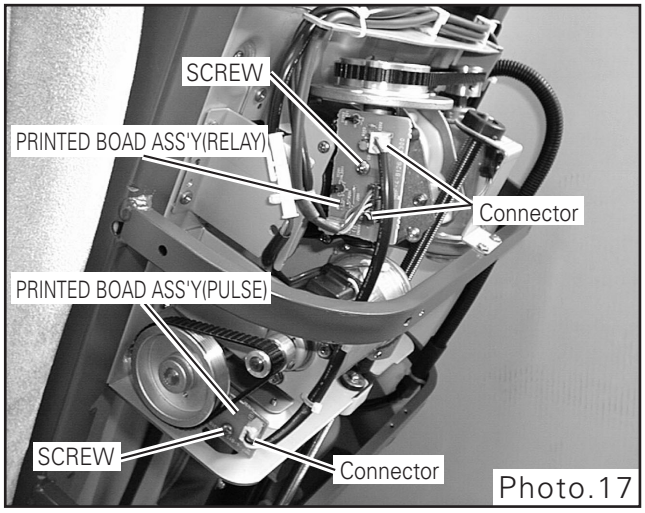


Photo.17

(13) Replacement of MICRO SWITCH

1, Unscrew three SWITCH HOLDER (MICRO SW) set screws. Photo.18

2, Unscrew one switch set screw, unsolder switch terminal, and detach switch. Photo.18

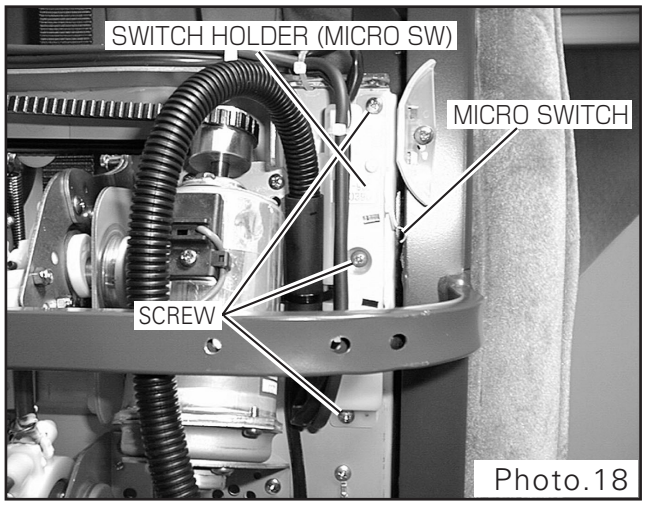


Photo.18

(14) How to remove backrest section

1, Turn off power switch of main body with massage unit moved to the position of Photo 19 by adjusting UP/DOWN by the use of remote control.

2, Unscrew five BACK REST ASS'Y set screws and remove BACK REST ASS'Y. Photo.19

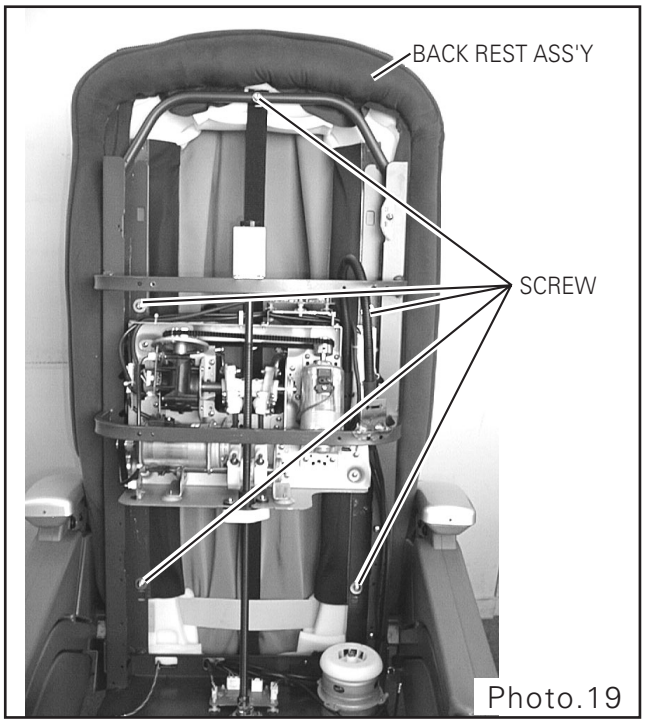


Photo.19

(15) Replacement of right and left arm section

1, Remove arm HELICAL SPRING. Photo.20

2, Unscrew right arm fixing nut and detach right arm. Photo.20

(Detach left arm in the same manner.)

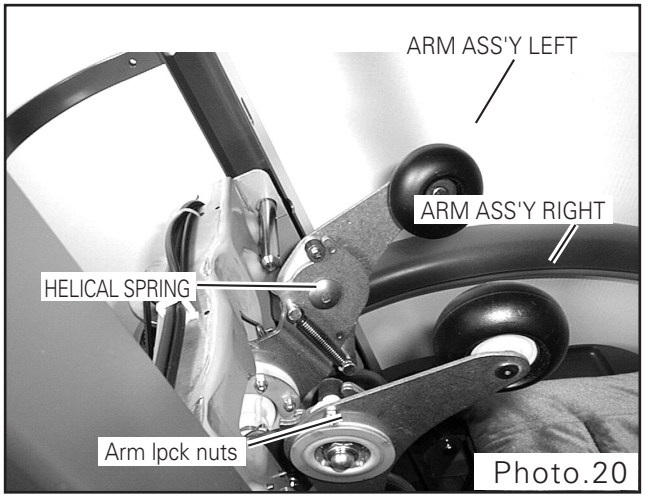


Photo.20

(16) Replacement of PRINTED BOAD ASS'Y (SAHPE)

1, Disconnect three connectors connected to PRINTED BOAD ASS'Y (SHAPE). Photo.21

2, Unscrew 2 substrate holder set screws and remove PRINTED BOAD ASS'Y (SHAPE). Photo.21

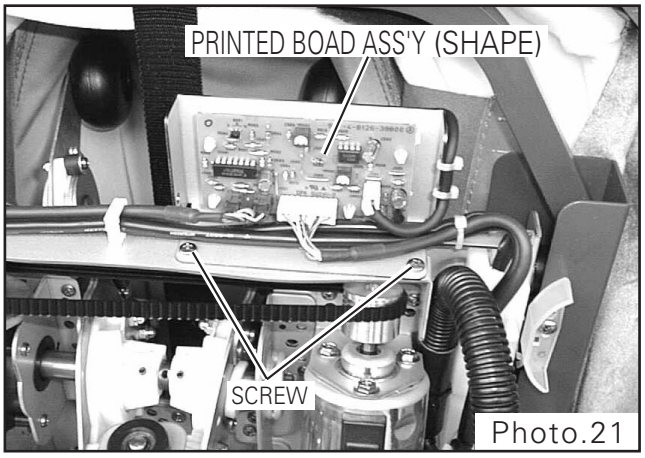


Photo.21

(17) Replacement of body contour sensor

1, Remove right arm helical spring. Photo.22

2, Remove SHAFT ASS'Y (SHAPE SENSOR) fixing RENG E 5 and remove SHAFT ASS'Y (SHAPE SENSOR). Photo.22

3, Unscrew two COILBOBINN ASS'Y set screws and remove COILBOBINN ASS'Y. Photo.22

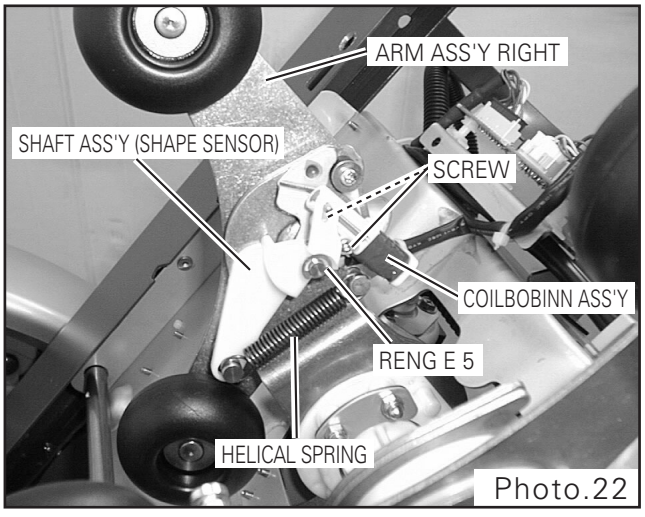


Photo.22

(18) Replacement of SHAFT ASS'Y section

1, Unscrew two NUT (PLASTIC NUT) set screws. Photo.23

2, Unscrew two HOLDER (ROLLING SHAFT UP) set screws, remove HOLDER (ROLLING SHAFT UP), and remove the massaging section upwards. Photo.23

3, Fix magnetic section with pliers, etc., unscrew PULLEY (S) fixing nut on the back, and remove PULLEY (S) from SHAFT ASS'Y. Photo.23

4, Unscrew two elevating ball fixing holder set screws from the rear side.

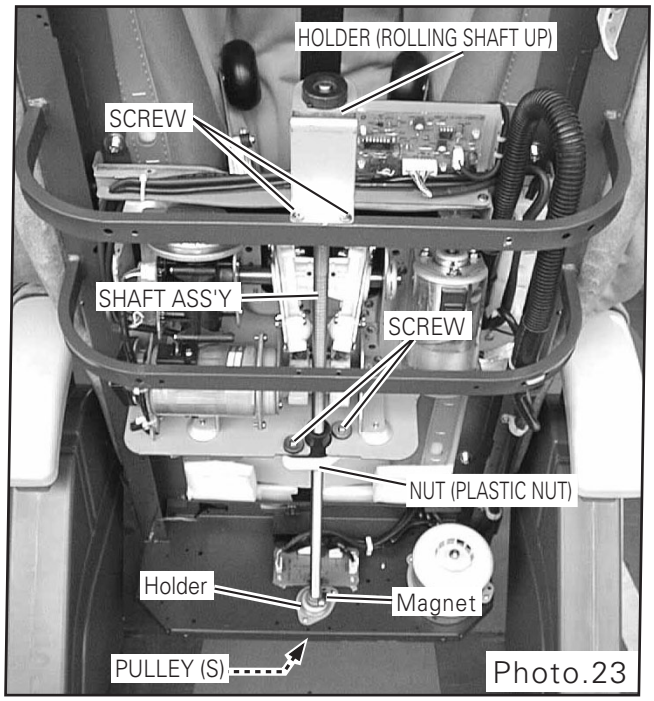


Photo.23

(19) Replacement of reclining section

1, Disconnect lead wires of each LINEAR ACTUATOR ASS'Y.

2, Since each LINEAR ACTUATOR ASS'Y is fixed at two placed on both sides, detach fixing RING E 6 on both sides and pull out JOINT PIN (A). Photo.24

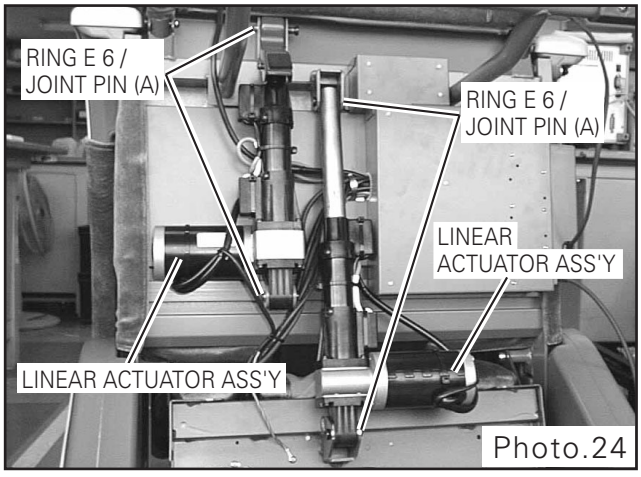
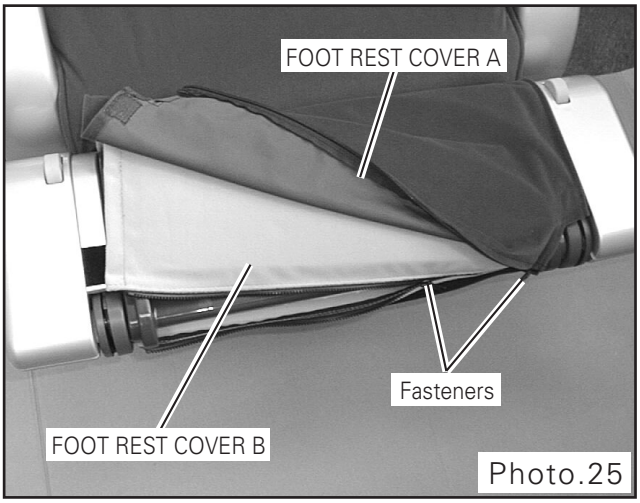


Photo.24

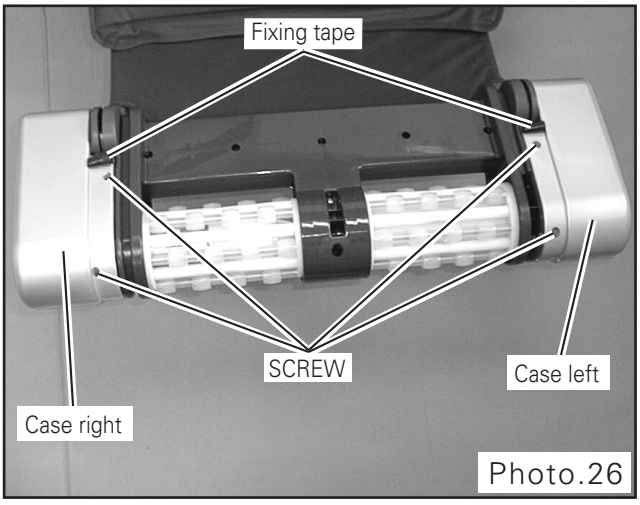
(20) Replacement of leg roller motor

1, Open fasteners of FOOT REST COVER A / B, and remove FOOT REST COVER A / B.
Photo.25



2, With leg roller section extended, unscrew two each of case right / left set screw and remove each case right / left upwards and downwards, respectively. Photo.26

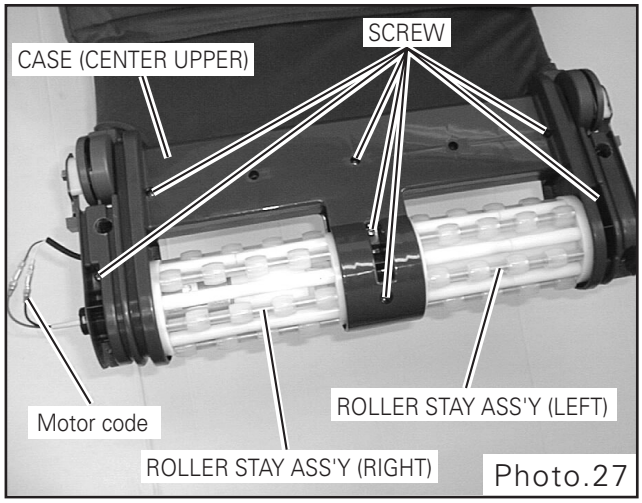
There is one each screw located below fixing tape. Peel off fixing tape and unscrew screws.
Photo.26



3, Unscrew seven foot case set screws and remove CASE (CENTER UPPER). Photo.27

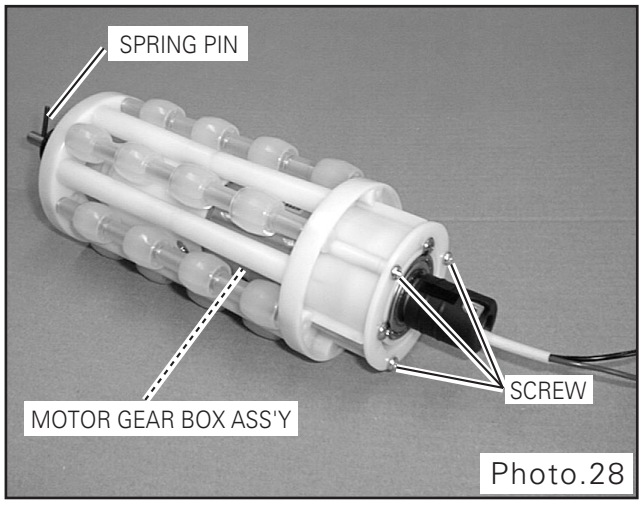
4, Disconnect cords of MOTOR GEAR BOX ASS'Y.
Photo.27

5, With ROLLER STAY ASS'Y (RIGHT)(LEFT) suspended en block, remove ROLLER STAY ASS'Y (LEFT) from shaft of ROLLER STAY ASS'Y (LEFT). Photo.27



6, Pull out SPRING PIN of MOTOR GEAR BOX ASS'Y shaft. Photo.28

7, Unscrew three MOTOR GEAR BOX ASS'Y set screws and remove MOTOR GEAR BOX ASS'Y.
Photo.28



(21) Replacement of transfomer

1. Unscrew three fixing screws to remove the transformer cover. Photo.28

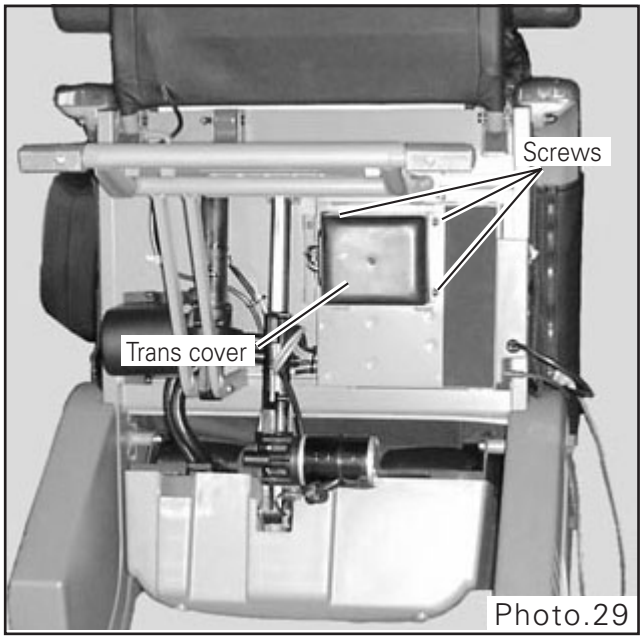


Photo.29

2. Unscrew fixing screws to remove the folder and pull out a connector.
3. Unscrew fixing screws to remove the transformer. Photo.30

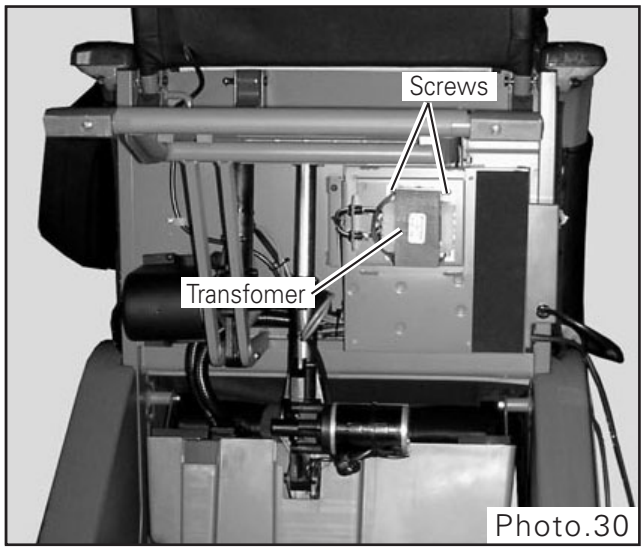


Photo.30

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