Service Manual

< ROBOT >

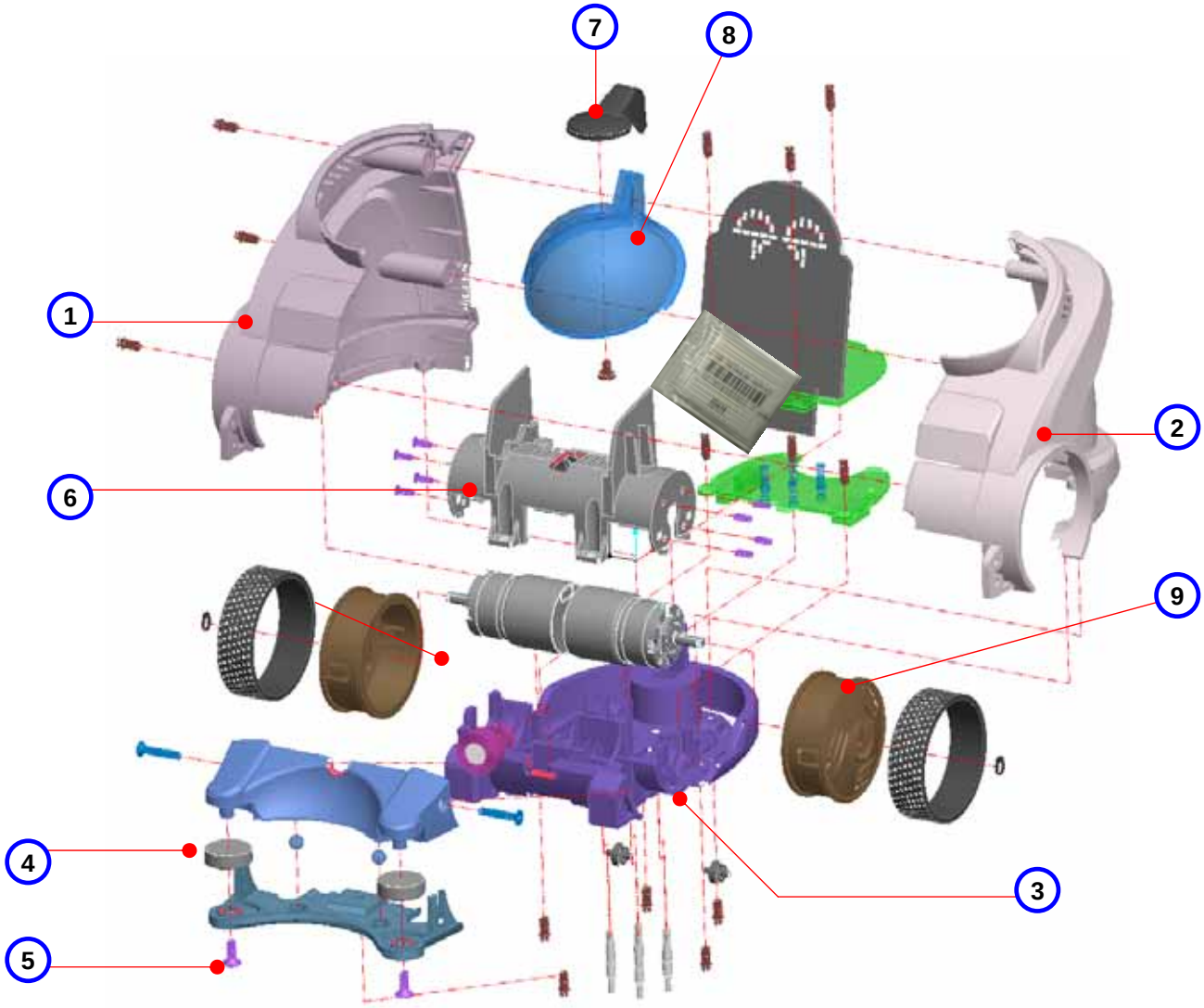
Marubot Football League

IMPORTANT

- **Please read the manual carefully and keep it in mind before repair the robot.**
- **Put this manual within touch of your reference in anytime.**

< CONTENTS >

1. PLASTIC PARTS



No	PARTS	DESCRIPTION	Q'Ty
1	BODY-LEFT	2 Colors (RED / WHITE)	1
2	BODY-RIGHT	2 Colors (RED / WHITE)	1
3	BASE		1
4	BUMPER-TOP	2 Colors (RED / WHITE)	1
5	BUMPER—BOTTOM	2 Colors (RED / WHITE)	1
6	MOTOR CAP	2 Colors (RED / WHITE)	1
7	HEAD		1
8	FACE	FACE WINDOW	1
9	WHEEL	Front Tire Wheel	2

1-1) PLASTIC COMPOSITION

7. HEAD

1. Body-Left

8. FACE

2. Body-Right

6. MOTOR CAP

9. WHEEL

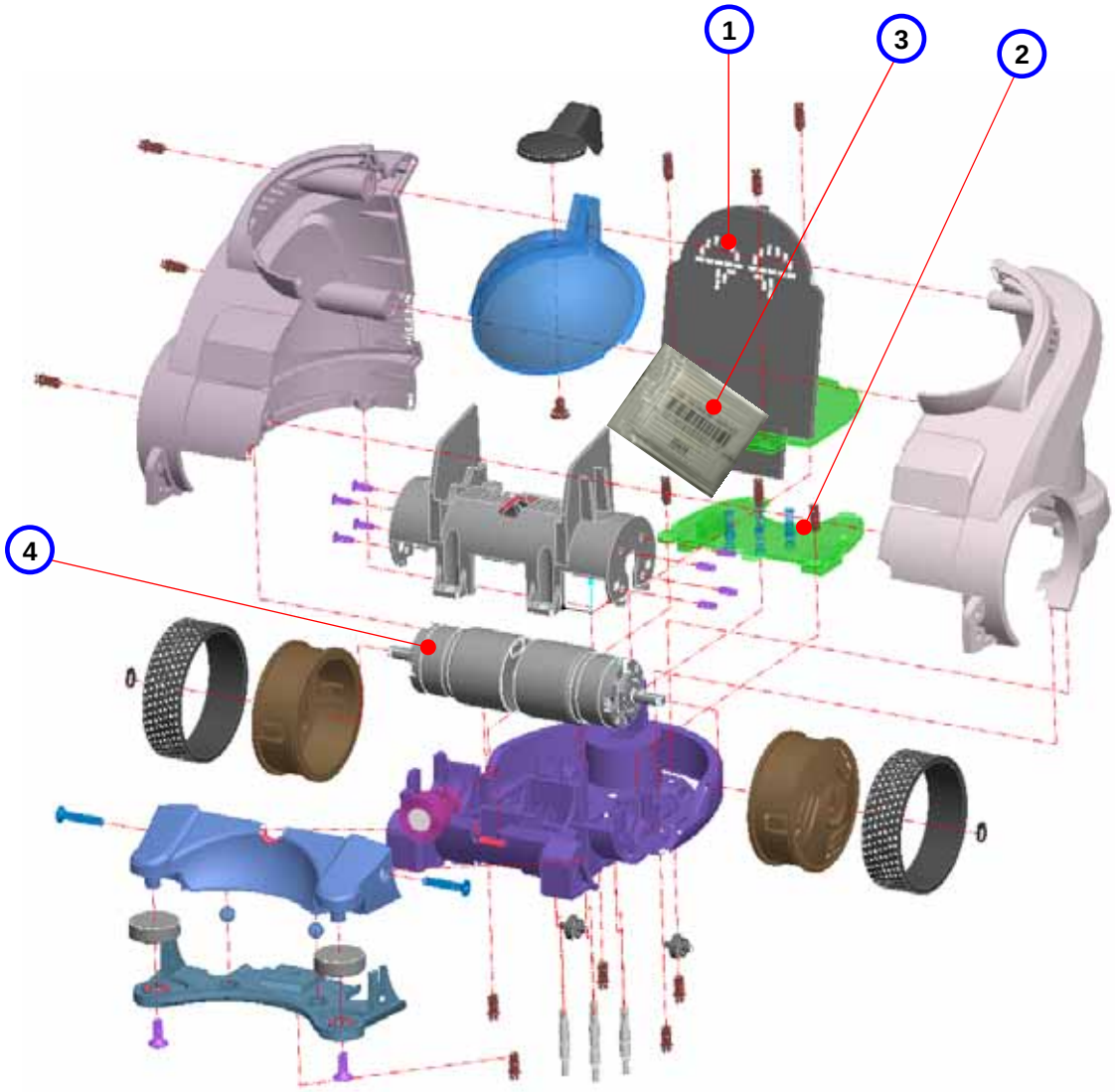
3. BASE

9. WHEEL

4. BUMPER-TOP

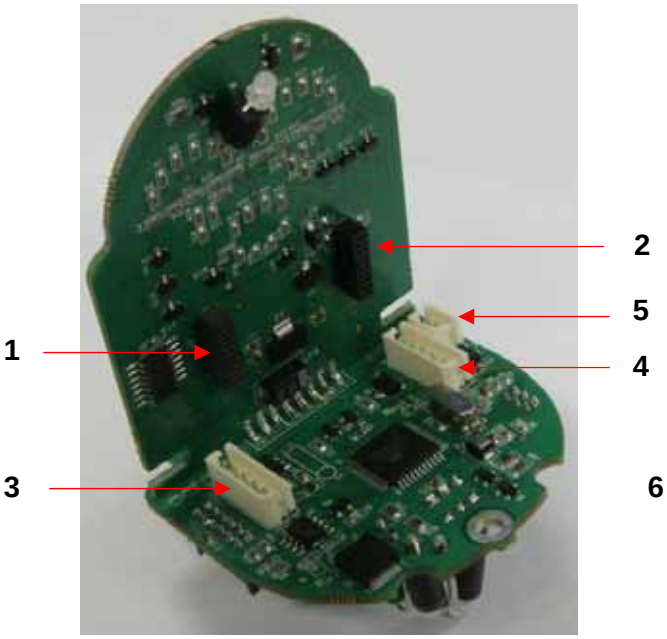
5. BUMPER-BOTTOM

2. CIRCUIT PARTS



No	PARTS	DESCRIPTION	Q'Ty
1	MAIN BOARD	Robot Controller + Face Expression	1
2	POWER BOARD	Power supply Board	1
3	BATTERY	Lithium Polymer (7.4V 1000mAH)	1
4	MOTOR	NIDEC (BL-DC Motor W/Gear)	2

2-1) MAIN BOARD



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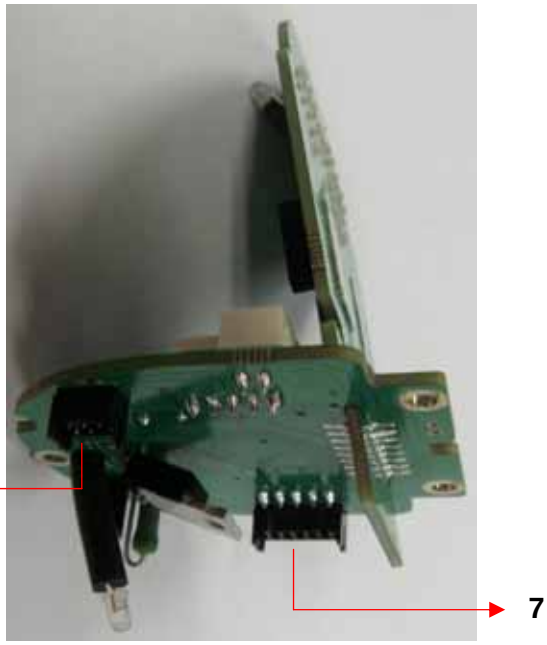
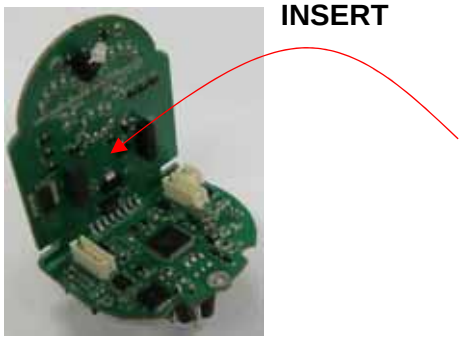


< BOTTOM >

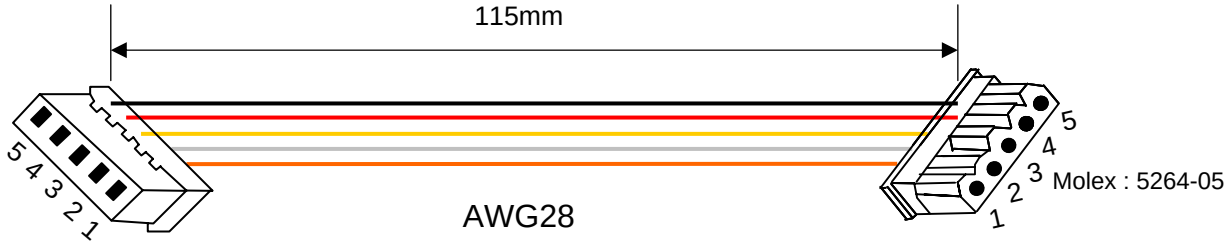
No	Reference No	Description	Remark
1	J1	Zigbee Module	
2	J2	Zigbee Module	
3	MOTOR L1	Motor Control (Left)	
4	MOTOR R1	Motor Control (Right)	
5	BATT1	Battery (Charge/Discharge)	
6	ISP	Download port (to Power Board)	
7	PCON1	DC Power In (to Power Board)	

• **Assembly (Zigbee Module)**



2-2) MAIN BOARD CABLE

2-2-1) MOTOR CABLE



MOTOR CON

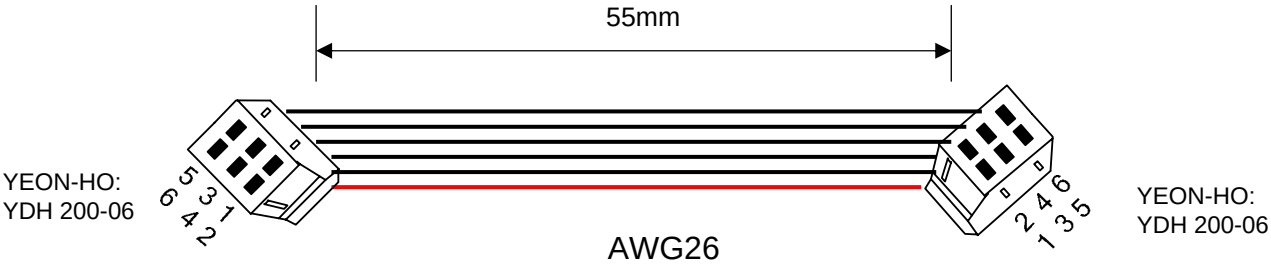
1 : ORANGE (DIR)
2 : WHITE (PWM)
3 : YELLOW(ENABLE)
4 : RED(12V)
5 : BLACK (GND)

MAIN BOARD
MOTOR L1 or MOTOR R1

1 : ORANGE (DIR)
2 : WHITE (PWM)
3 : YELLOW(ENABLE)
4 : RED(12V)
5 : BLACK (GND)

< MOTOR >

2-2-2) ISP CABLE



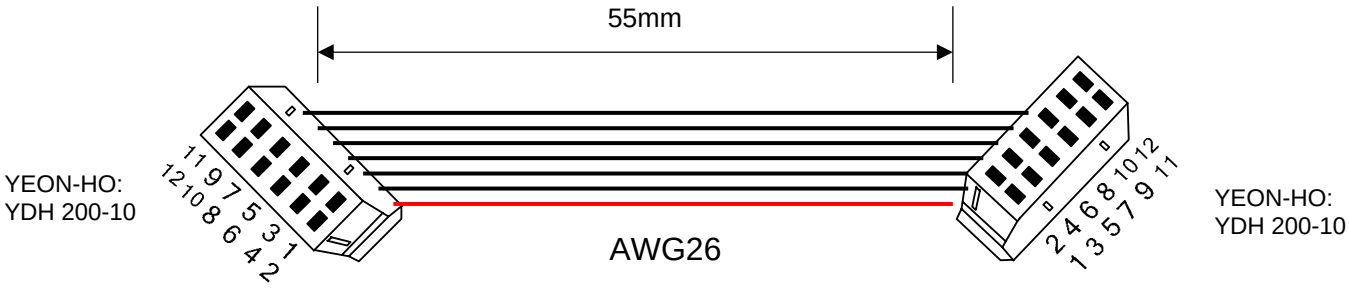
MAIN BOARD (ISP)

1 : RED (MISO)
2 : BLACK (MOSI)
3 : BLACK (SCK)
4 : BLACK (RST_CTL)
5 : BLACK (RST_FACE)
6 : BLACK (TP)

POWER BOARD (J3)

1 : RED (MISO)
2 : BLACK (MOSI)
3 : BLACK (SCK)
4 : BLACK (RST_CTL)
5 : BLACK (RST_FACE)
6 : BLACK (TP)

2-2-3) POWER CABLE



MAIN BOARD (PCON)

1 : RED (PB 12V)
2 : BLACK (PB 12V)
3,4: BLACK (PB GND)
5 : BLACK (5V)
6 : BLACK (VR)
7 : BLACK (DIP S/W 0)
8 : BLACK (DIP S/W 1)
9: BLACK (DIP S/W 2)
10 : BLACK (DIP S/W 3)
11,12 : BLACK (GND)

POWER BOARD (PCON)

1 : RED (PB 12V)
2 : BLACK (PB 12V)
3,4: BLACK (PB GND)
5 : BLACK (5V)
6 : BLACK (VR)
7 : BLACK (DIP S/W 0)
8 : BLACK (DIP S/W 1)
9: BLACK (DIP S/W 2)
10 : BLACK (DIP S/W 3)
11,12 : BLACK (GND)

2-3) POWER BOARD

< TOP >

< BOTTOM >

No	Reference No	Description	Remark
1	PCON	DC Power Out	
2	J3	Download port	
3	DATA	Robot Program Download Port	

2-4) BATTERY

No	Parts	Description	Remark
1	HOUSING	Molex 5264-02	
2	BATTERY	44(W)x35(L)x14.5(T)	(1)
3	WIRE	2P , 60mm (AWG 26)	

•Note

1) Battery Specification

- Lithium Polymer Battery (2 Cell)
- Capacity : 1,050mAh (Typ)
- Voltage : 7.4V (Normal)
- Charge Voltage : 8.4V

2-5) MOTOR

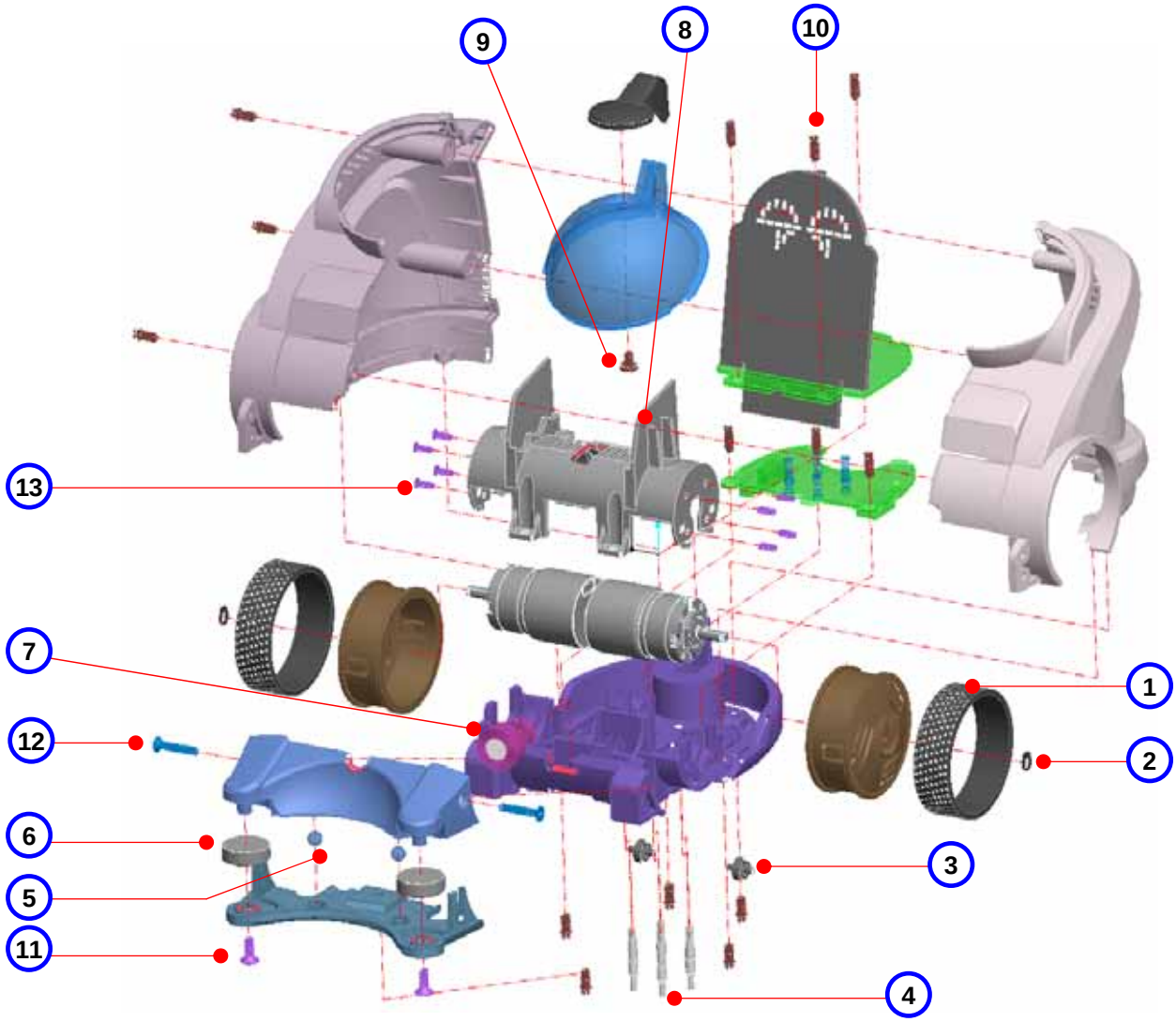
No	Parts	Description	Remark
1	GEAR	IG 22 (1/4)	
2	MOTOR	35(W)x25(L)x25(T)	(1)
3	CON	Motor Control (Connect the Main Board)	

•Note

1) Motor Specification

- BL-DC Motor (NIDEC 13H570)
- Operating Voltage : 12V (Normal)
- Operating Current : 0.5A (Max)
- Run Torque : 6.2mN m (Max)

3. ACCESSORY PARTS

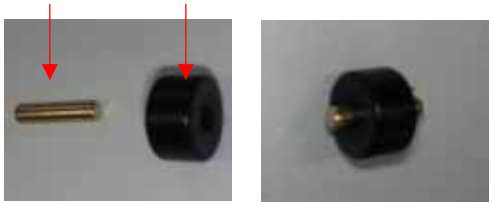


No	PARTS	DESCRIPTION	Q'Ty
1	FRONT TIRE	Rubber	2
2	SNAP RING		2
3	REAR TIRE SET	Acetal + Pin	1 Set
4	POWER SUPPLY PIN	PSP-280G-080 (2.5g)	6
5	IRON BALL	5Φ	2
6	BEARING	625 ZZ (5,16,5)	2
7	MAGNETIC HOLDER	Ball guide	1
8	SPONGE		1
9	SCREW #1	BH M3x4 Tapping	1
10	SCREW #2	PH M3x6 Tappping	14
11	SCREW #3	FH M3x8 Tapping	2
12	SCREW #4	FH M2.6x15 Tapping	2
13	SCREW #5	BH M2x6 Machine	8

3-1) ACCESSORY COMPOSITION

1. Front Tire

2. Snap Ring



3. Rear Tire Set

4. Power Supply Pin

5. Iron ball

6. Bearing

7. Magnetic Holder

8. Sponge

< Screws >

9. BH M3x4 Tapping

10. PH M3x6 Tapping

11. FH M3x8 Tapping

12. FH M2.6x15 Tapping

13. BH M2x6 Machine

4. STICKER PARTS

No	PARTS	DESCRIPTION	Q'Ty
1	FRONT STICKER	marubot	1
2	SIDE STICKER	MaruBot MaruBot	1 Set
3	TEAM STICKER	PLAYER A PLAYER B PLAYER 1 PLAYER 2 PLAYER 3 PLAYER 4	1

6. REPLACEMENT

***Turn off the Robot power switch before replacement parts.**

1) Disentangle the snap ring with a snap ring pliers or a pincette.

< A snap ring pliers >

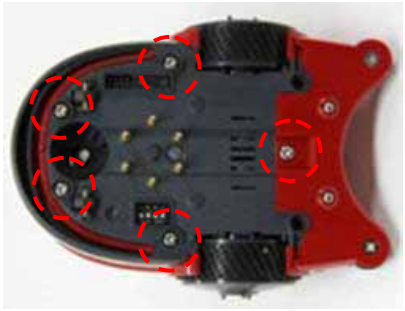
< Snap Ring >

< A pincette >

2) Pull out the front wheel.

Front Wheel and Tire Replacement

3) Releasing 5 screws on the robot bottom.

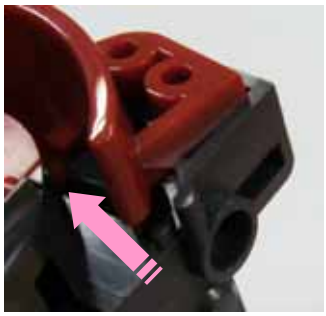


4) Releasing 2 screws on the bumper side.

5) Separate the Bumper Set.
Lift up the magnetic holder and pull it out to the front.

Bumper Set, Magnetic Holder Replacement

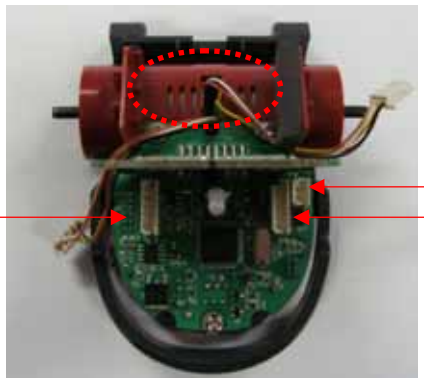
6) Lift up the front of Body case.



7) Hold the Body cover and Bottom case in hand.
Pull the Body cover out of the Bottom case.

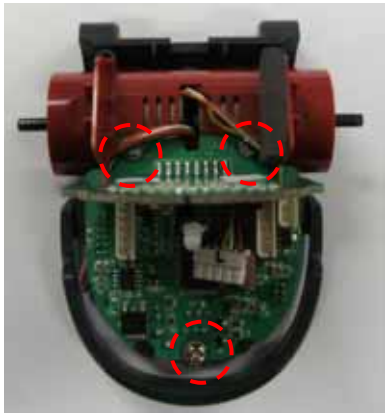
< Separation of Body cover >

8) Unplug the Motor(Left, Right) cable and Battery Cable.
Remove the Battery.

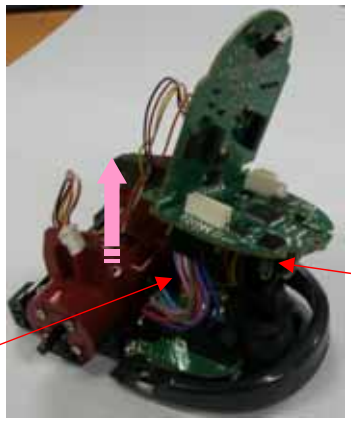


Battery Replacement

9) Release 3 screws on the Main board.



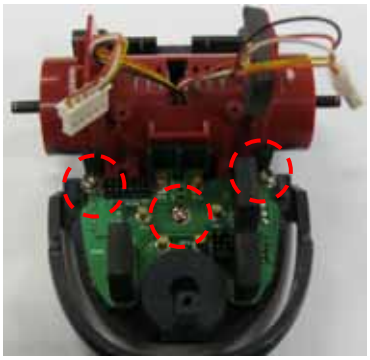
10) Lift up Main Board.
Unplug the ISP Cable and Power Cable on the Main Board.



< Separation of Main Board >

Main Board Replacement

11) Unplug the ISP Cable and Power Cable on the Power Board.
Releasing 3 screws on the Power Board.

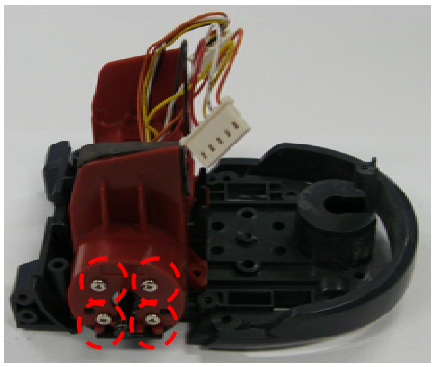


< Separation of Main Board >

Power Board Replacement

※ Check the Power supply pins before replacement Power Board.

12) Use small (+) Driver releasing 8 screws on the Motor cap.



13) Use small (-) Driver lift up the Motor Cap.
Uncover the Motor cap.

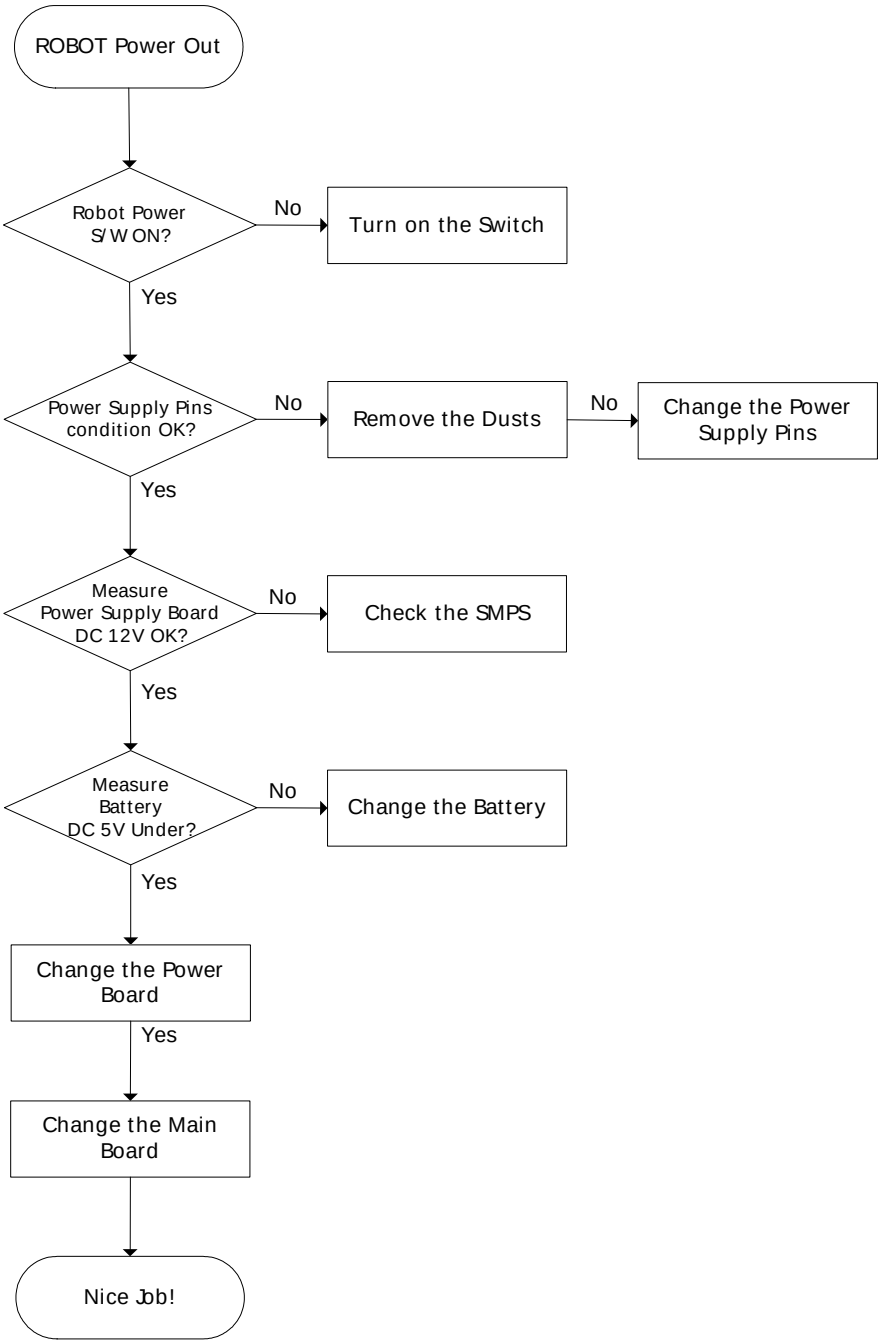
< Separation of Motor Cap >

Motor, Motor Cable Replacement

7. TROUBLE SHOOTING

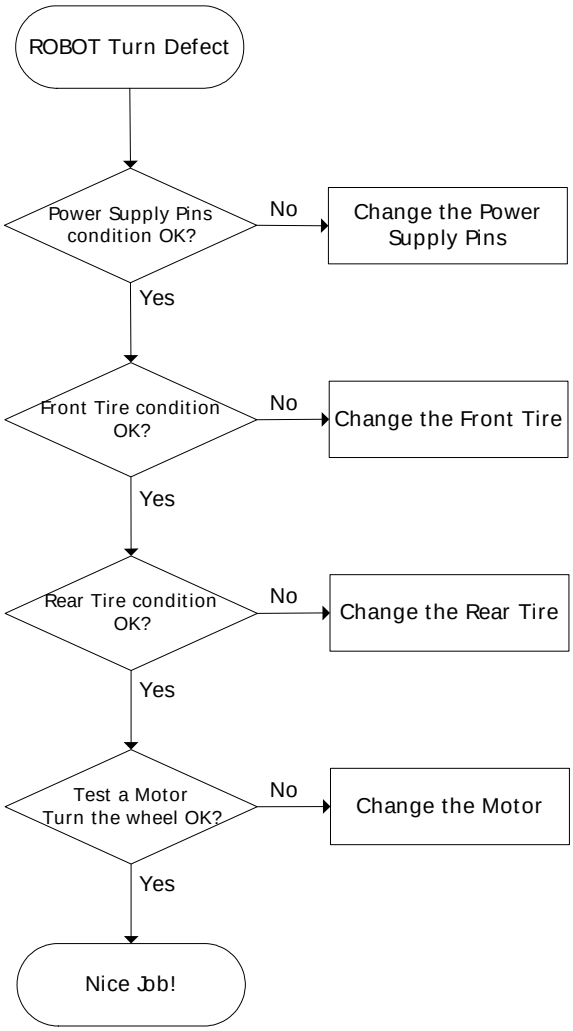
7-1) POWER OUT

※ Robot is not working. (Face LED OFF)
Check the Power Supply Pins. (Battery, Power Board)



7-2) TURN DEFECT

※ Robot turn (Left or Right) is not normal working.
Check the Power Supply Pins. (Motor, Tires)

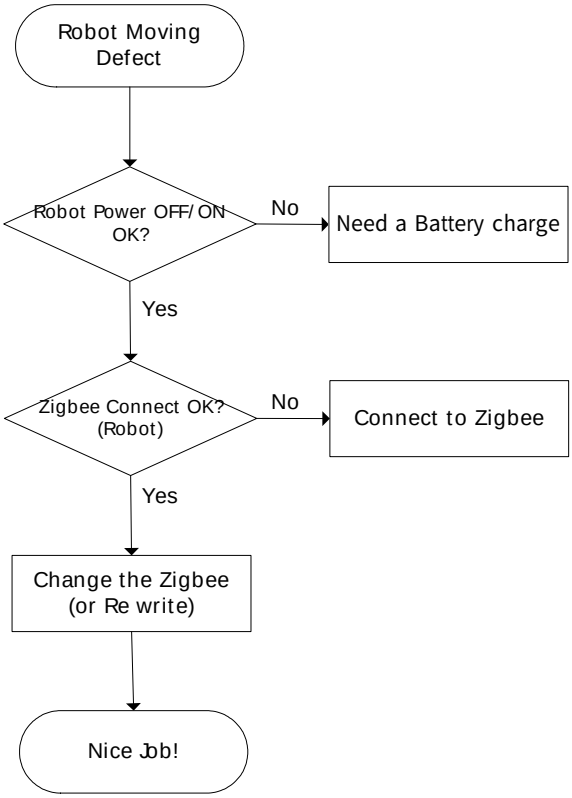


7-3) MOVING DEFECT

※ Robot is not working. (Face LED ON)
Check the Zigbee Module. (Robot Zigbee, User Board Zigbee, New Registration)

New registration Robot.

※ Robot is not working. (Face LED is not normal working.)
Check the Zigbee Module. (Robot Zigbee)



< Status of Face LED Off >

FCC Compliance Statement.

This device complies with part 15 of the FCC Rules.
Operation is subject to the following two conditions :
(1) This device may not cause harmful interference, and
(2) This device must accept any interference received, including interference that may cause undesired operation.

Do Not.

Any changes or modifications to the equipment not expressly approved by the party responsible for compliance could void user's authority to operate the equipment.