

**GLOBE
GROUP**

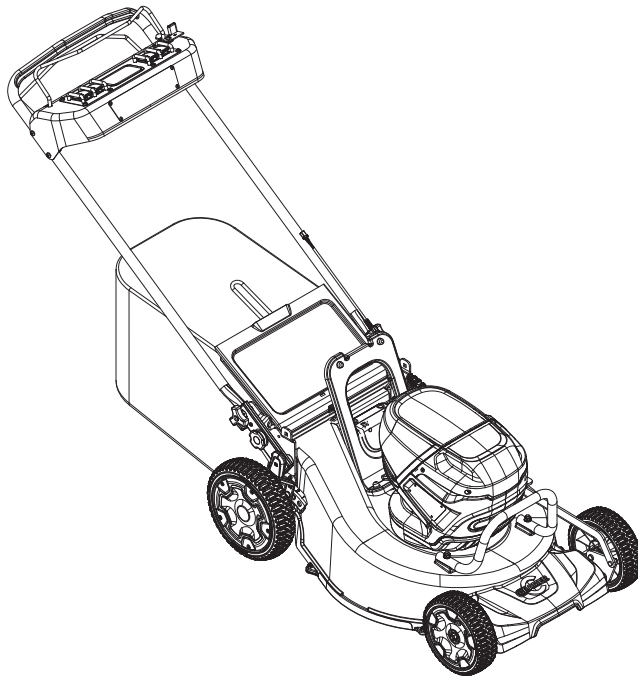
LEADING IN BATTERY
POWERED EQUIPMENT

Lawn Mower

LM221S/LM221S-82DP/82LM53S

(2545702/2551002/2504686)

Service and Repair Guide

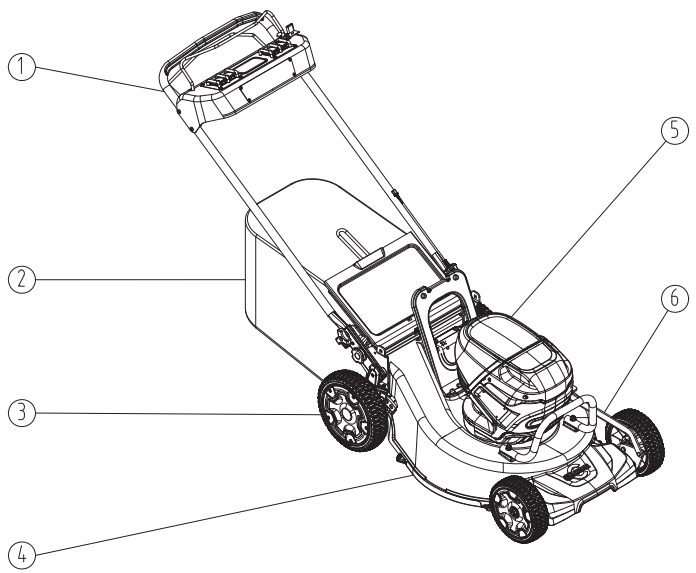


WARNING

Undertaking repairs to gardening tools can be hazardous. Use proper tools and safety devices noted in the guide and follow all the instructions. Do not proceed until you are confident that you understand all of the steps and are capable of completing the repair work. Some repairs should only be performed by a qualified technician.

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1 COMPONENTS LOCATION



- | | | | |
|---|-----------------------|---|----------------------------|
| 1 | Push handle assembly | 4 | Housing assembly |
| 2 | Grass bag assembly | 5 | Power head assembly |
| 3 | Self-propelled system | 6 | Height adjustment assembly |

2 PREPARATIONS

1. Hex wrench
2. Ratchet wrench
3. Socket wrench
4. Open-end wrench

2.1 FUNCTION TESTS

After service and repair always conduct the following function tests:

- Check that impeller runs freely;
- Check the motor ;
- Check all controls functionality.

3 WARNINGS

1. All disassembly, replacement, repair, and maintenance operations must be performed by professional operators who have read this manual.
2. For the ease of quick disassembly and maintenance, you are advised to: before disassembly, put the machine in a suitable work area; prepare the necessary disassembly tools beforehand; remove the bolts in an appropriate order; put the disassembled parts in a clean work area.
3. In addition to obeying the conventional procedures for most repairing processes, there are some other special reminders:
 - Before any maintenance work, take out of the battery, and if necessary, disconnect the main power supply of the mower.

- Do not put dangerous (flammable or explosive) items on the battery compartment.
- When replacing sharp and dangerous parts such as blades, protective gloves or other protective measures must be used.
- No operations shall be carried out before all the moving parts have come to a standstill.
- To avoid any personal injury or death, make sure that no one other than the maintenance operators is near the vehicle under repair or touches the mechanical parts by accident.

4 TROUBLESHOOTING

Problem	Possible cause	Solution
The product does not start.	The battery level is low.	Charge the battery.
The product cuts grass unevenly.	The blade height is too low.	Move the wheels to a higher position.
The product does not mulch correctly.	Wet grass clippings become tangled in the deck.	Wait until the grass dries before mowing.
	The mulch plug is missing.	Install the mulch plug.
The product is hard to push.	The grass is too tall, or the blade height is too low.	Increase the blade height.
	The grass catcher and the blade drags in thick grass.	Empty the grass clippings from the grass catcher.
There is a high vibration in the product.	The blade is unbalanced and worn.	Replace the blade.
	The motor shaft is bent.	<ol style="list-style-type: none"> 1. Stop the motor. 2. Remove the battery. 3. Inspect for damage. 4. Repair the product before you start it again.
The product stops during mowing.	The blade height is too low.	Increase the blade height.
	The battery level is low	Charge the battery.
	The grass clippings become tangled in the deck or blade.	Remove the battery and check the deck.
	Product temperature is too high.	Turn off and cool down product in shaded area for 10-15 minutes.

* If you cannot find the solution to these problems, consult your nearest service center.

5 ERROR CODES

If an error occurs with the product, the LCD screen will display an error code from 1 to 9. Error codes 1-9 represent distinct error groups, displayed in standard mode. Within these nine groups, errors 1-98 are further categorized. For detailed information about a specific error, enter repair mode. To enter repair mode, press and hold the Drive mode '+' button for 10 seconds. The LCD screen will display a wrench at the top when in repair mode and will show the specific error code (1-98). If more than one error is active, the error codes will blink in a loop, applying to both standard mode and repair mode. Refer to the chart for more information on error codes. To exit repair mode, hold the Drive mode '+' button for 10 seconds.

Error code	Error contents	Operation Suggestions
1	Driving motor over-current error.	Turn off the product and restart.
2	Driving motor overheated error.	Turn off the product and restart.
3	Driving failure error.	Replace the driving controller.
4	Blade over-current error.	Release blade activation lever, and restart.
5	Blade overheated error.	Release blade activation lever, clear the error and wait for the product to cool down and restart.
6	Blade failure error.	Replace the blade controller.
7	PMU failure.	Restart the product. If it doesn't work, replace the PMU controller.
8	Key plate error.	Replace the key plate or restart.
9	Slave communication error.	Check if the communication cable is disconnected or not. If it's normal, replace the controller.
10	SP mainboard internal communication error.	Replace SP controller.
11	SP mainboard over-current error.	Restart the mower. If it doesn't work, replace the SP controller.
12	SP mainboard hall sensor error.	SP drive failure. Replace SP controller.
13	SP mainboard undervoltage error.	Turn off the product, replace battery or charge.
14	SP mainboard offset error.	SP drive controller failure. Replace SP controller.
15	SP mainboard MOS error.	SP drive controller failure. Replace SP controller.
16	SP mainboard overvoltage error.	Restart the device. If it doesn't work, Replace the SP controller.
17	SP mainboard stuck error.	Restart the device. If it doesn't work, Replace the SP controller or check whether the motor is stuck.
18	SP mainboard overheated error.	Turn off the product and allow to cool.
19	SP mainboard phase failure error.	SP drive controller failure. Replace SP controller.
20	SP slave board internal communication error.	SP drive controller failure. Replace SP controller.
21	SP slave board over-current error.	Turn off the product to clear the error to restart. If the errors occur frequently, replace the SP controller.
22	SP slave board hall sensor error.	SP drive controller failure. Replace SP controller.
23	SP slave board undervoltage error.	Turn off the product, replace a battery or charge.
24	SP slave board offset error.	SP drive controller failure. Replace SP controller.
25	SP slave board MOS error.	SP drive controller failure. Replace SP controller.
26	SP slave board stuck error.	Restart the device. If it doesn't work, Replace the SP controller or replace the hub motor wheel.
27	SP slave board Heat error.	Restart the device. If it doesn't work, Replace the SP controller.
28	SP slave board phase failure error.	SP drive controller failure. Replace SP controller.
29	SP slave board other error.	SP drive controller failure. Replace SP controller.
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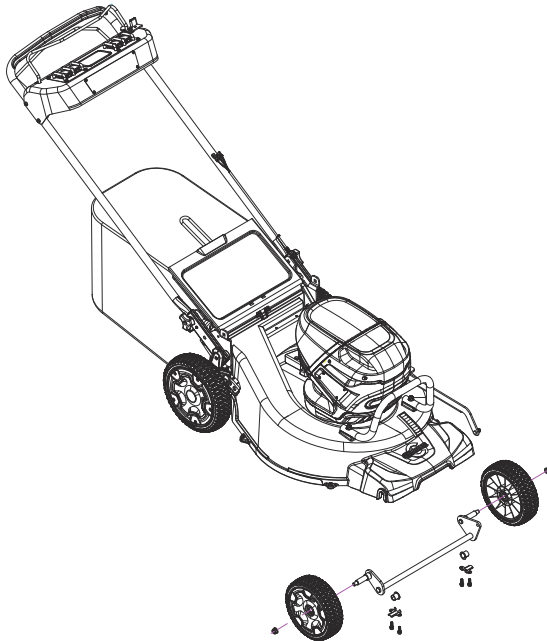
Error code	Error contents	Operation Suggestions
32	Blade motor stuck.	Turn off the product and check if the motor rotor is locked or not.
33	Blade motor out of step.	Release the bail and restart the product. If the error still occurs, replace the blade motor controller.
34	Blade motor phase failure.	Check if the terminals between the controller and the motor is loose. Whether there is an open circuit in the phase line.
35	Blade motor low speed protection.	Release the bail to clear the error.
36	Blade motor overheated protection.	Turn off the blade to cool.
37	Blade motor restart failure.	In case of repeated restart failures, replace the blade motor controller.
38	Cutter bus over-current.	When overloading, release the lever to clear the error, and restart the blade. If the error continues, the blade drive controller needs to be replaced.
39	Blade peak over-current.	Release the bail and restart the product. If the failure still occurs, replace the blade motor controller.
40	Blade short circuit.	Replace the blade motor controller.
41	Low voltage of cutting bus.	Check if the input voltage of the blade motor controller is undervoltage.
42	High voltage of cutting bus.	Check if the input voltage of the blade motor controller is overvoltage.
43	Blade motor controller MOS overheated.	Stop the product and restart it after the MOS cools down. If the fault cannot be eliminated, replace the blade motor controller.
44	Blade motor controller Software authentication exception.	Replace the blade motor controller.
45	Blade self-checking failure.	Replace the blade motor controller.
46	The operation sequence of the blade is incorrect.	Loosen the lever to clear the fault, if the fault cannot be eliminated, it is necessary to replace the blade motor controller.
47	Other errors of blade.	Replace the blade motor controller.
..
49	PMU undervoltage.	Charge the battery.
50	PMU over voltage.	Restart the product.
51	PMU over current.	The product is powered off and restarted. If the fault cannot be eliminated, check whether the PMU or the rear motor drive board is short circuited. Replace the PMU or the motor drive board.
52	PMU has no available battery.	Replace the battery and restart.
53	Short circuit of power circuit.	Restart or replace PMU.
54	Pre-filling failed.	Restart or replace PMU.
55	Current detection bias error.	Restart or replace PMU.
56	Communication interruption of blade.	Restart, replace PMU or blade controller.
57	Communication interruption of driving.	Restart, replace PMU or drive controller.

Error code	Error contents	Operation Suggestions
58	Communication interruption of keypad.	Restart, replace PMU or keypad.
59	Other PMU faults.	Power off and restart. If the fault cannot be eliminated, it is recommended to replace the PMU controller.
..
61	BAT 1 overheated error.	Turn off the product, and restart after the battery cools down. If the problem cannot be solved, consider replacing the battery.
62	BAT1 low temperature.	If the working environment temperature of the product meets the low temperature working environment of the battery, it is necessary to consider replacing the battery.
63	BAT1 undervoltage (Battery communication).	Recharge the battery.
64	BAT1 unbalanced discharge.	Replace battery.
65	BAT1 undervoltage (PMU).	Replace battery.
66	BAT1 overcurrent.	Restart or replace battery.
67	BAT1 communication interruption.	Replace battery.
68	BAT1 overcurrent feedback.	Restart or replace battery.
69	BAT1 relay short-circuited.	Restart or replace PMU.
70	BAT1 current detection bias error	Restart or replace PMU.
71	BAT1 open circuit.	Restart or replace PMU.
72	BAT1 other failure.	Replace battery.
73	BAT 2 overheated error.	Turn off the product, and restart after the battery cools down. If the problem cannot be solved, replace the battery.
74	BAT2 low temperature.	If the working environment temperature of the equipment meets the low temperature working environment of the battery, it is necessary to consider replacing the battery.
75	BAT2 undervoltage (Battery communication).	Recharge the battery.
76	BAT2 unbalanced discharge.	Replace battery.
77	BAT2 undervoltage (PMU).	Replace battery.
78	BAT2 overcurrent.	Restart or replace battery.
79	BAT2 communication interruption.	Replace battery.
80	BAT2 overcurrent feedback.	Restart or replace battery.
81	BAT2 relay short-circuited.	Restart or replace PMU.
82	BAT2 current detection bias error.	Restart or replace PMU.
83	BAT2 open circuit	Restart or replace PMU.
84	BAT2 other failure.	Replace battery.
85	BAT3 overheated error.	Turn off the product, and restart after the battery cools down. If the problem cannot be solved, replace the battery.

Error code	Error contents	Operation Suggestions
86	BAT3 low temperature.	If the working environment temperature of the equipment meets the low temperature working environment of the battery, replace the battery.
87	BAT3 undervoltage (Battery communication).	Recharge the battery.
88	BAT3 unbalanced discharge.	Replace battery.
89	BAT3 undervoltage (PMU).	Replace battery.
90	BAT3 overcurrent.	Restart or replace battery.
91	BAT3 communication interruption.	Replace battery.
92	BAT3 overcurrent feedback.	Restart or replace battery.
93	BAT3 relay short-circuited.	Restart or replace PMU.
94	BAT3 current detection bias error.	Restart or replace PMU.
95	BAT3 open circuit.	Restart or replace PMU.
96	BAT3 other failure.	Replace battery.
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98	SP hall fault.	Replace the keypad or restart.

* If you cannot find the solution to these problems, go to the service center.

6 REPLACE THE FRONT AXLE AND FRONT WHEELS



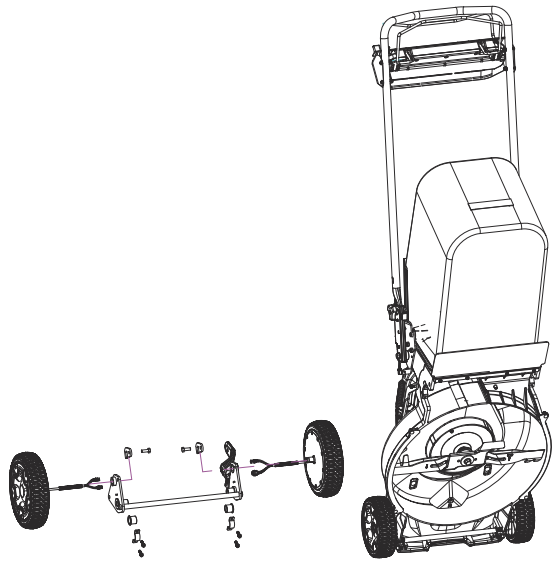
6.1 DISASSEMBLE THE FRONT AXLE AND FRONT WHEELS

- 1. Remove the four screws on the front axle.
- 2. Remove the nuts on both sides of the front wheel.

6.2 ASSEMBLE THE FRONT AXLE AND FRONT WHEELS

- 1. Install the front axle and tighten the four nuts.
- 2. Install the front wheel and tighten the nuts on both sides.

7 REPLACE THE REAR AXLE AND REAR WHEELS



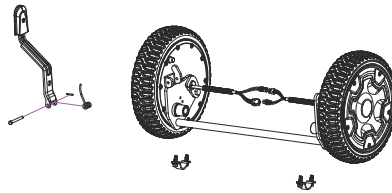
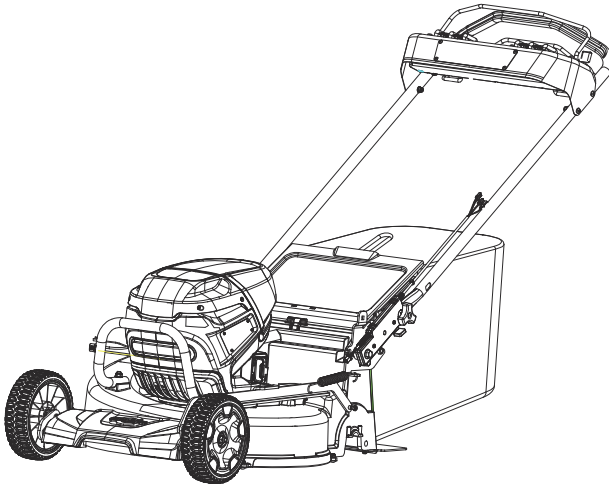
7.1 DISASSEMBLE THE REAR AXLE AND REAR WHEELS

- 1. Remove the four screws on the rear axle.
- 2. Remove the locking bolt and the locking plate.
- 3. Remove the rear wheel hub motor.
- 4. Slide the sliding bearing onto the rear axle.
- 5. Install the rear axle, pressing plate and fasten the fixing screws.

7.2 ASSEMBLE THE REAR AND REAR WHEELS

- 1. Put the rear wheel on the rear axle, install the locking plate and fasten the fixing screws.
- 2. Slide the sliding wheel onto the rear axle.
- 3. Install the rear axle, install the pressure plate and fasten the fixing screws.

8 REPLACE THE HEIGHT ADJUSTMENT LEVER



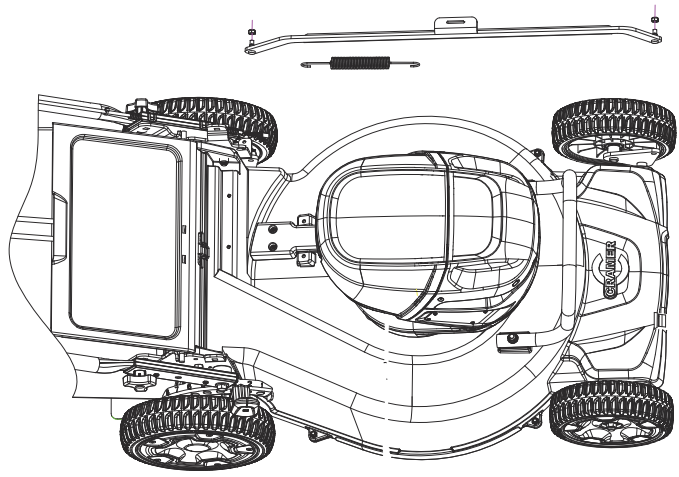
8.1 DISASSEMBLE THE HEIGHT ADJUSTMENT LEVER ASSEMBLY

1. Remove the four screws and the pressure plate from the rear axle.
2. Remove the cotter pin.
3. Pull out the pin and spring.

8.2 ASSEMBLE THE HEIGHT ADJUSTMENT LEVER

1. Place the adjusting handle assembly on the rear axle.
2. Thread the pin and the torsion spring.
3. Install the cotter pin.

9 REPLACE THE HEIGHT ADJUSTMENT LINKAGE AND THE TENSION SPRING



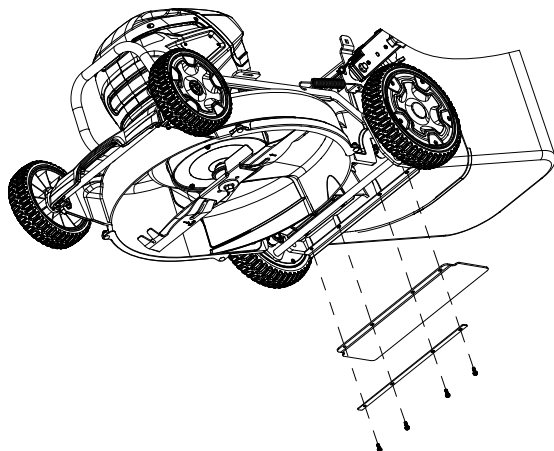
9.1 DISASSEMBLE THE HEIGHT ADJUSTMENT LINKAGE AND THE TENSION SPRING

- 1. Remove the spring.
- 2. Remove two screws.
- 3. Remove the height adjustment linkage.

9.2 ASSEMBLE THE HEIGHT ADJUSTMENT LINKAGE AND THE TENSION SPRING

- 1. Install the height adjustment linkage.
- 2. Tighten screws.
- 3. Install the tension spring.

10 REPLACE THE REAR FLAP



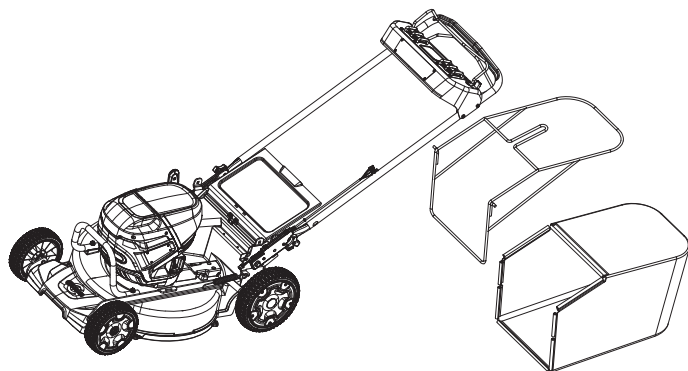
10.1 DISASSEMBLE THE REAR FLAP

1. Remove four screws.
2. Remove the pressing plate.
3. Remove the rear flap.

10.2 ASSEMBLE THE REAR FLAP

1. Install the rear flap and pressuring plate.
2. Tighten four screws.

11 REPLACE THE GRASS CATCHER



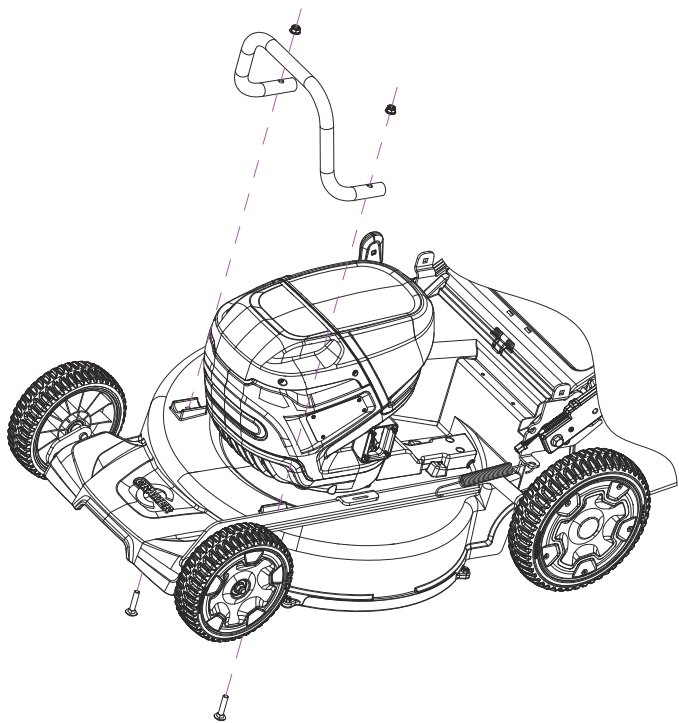
11.1 DISASSEMBLE THE GRASS CATCHER

1. Lift the rear door.
2. Remove the grass catcher assembly.

11.2 ASSEMBLE THE GRASS CATCHER

- 1. Lift the rear door.
- 2. Install the grass catcher.

12 REPLACE THE PROTECTIVE FENCE



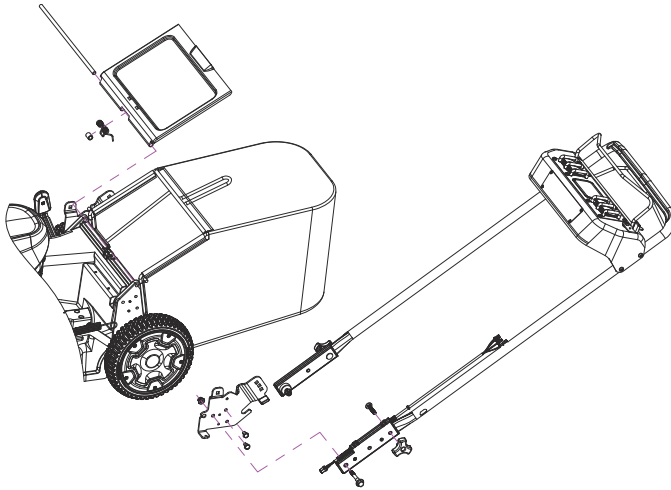
12.1 DISASSEMBLE THE PROTECTIVE FENCE

- 1. Remove the nut.
- 2. Remove the square neck bolt.
- 3. Remove the protective fence.

12.2 ASSEMBLE THE PROTECTIVE FENCE

- 1. Install the square neck bolt.
- 2. Install the protective fence.
- 3. Tighten the nut.

13 REPLACE THE REAR DOOR



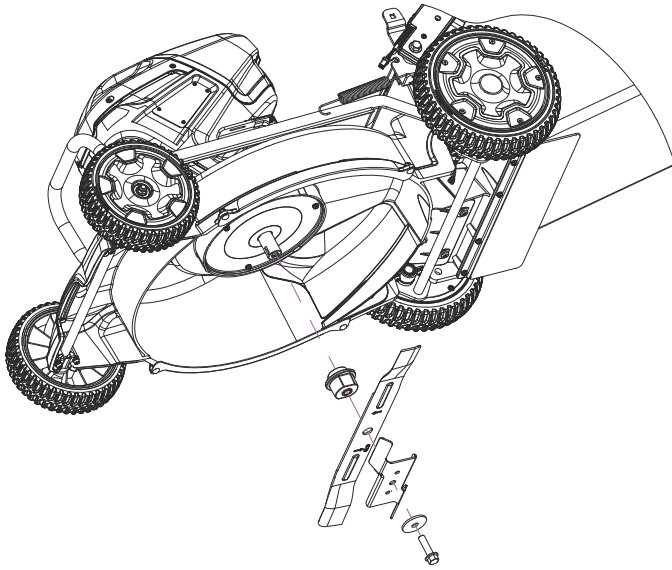
13.1 DISASSEMBLE THE REAR DOOR

1. Remove the handle mounting bolt.
2. Remove the handle assembly.
3. Remove the height adjustment bracket mounting bolt.
4. Remove the height adjustment bracket.
5. Remove the rear door plate shaft and the middle torsion spring.

13.2 ASSEMBLE THE REAR DOOR

1. Install torsion spring and spacer sleeve.
2. Install the rear door and rear door shaft.
3. Install the height adjustment crack and install the bolt.
4. Install the handle assembly and install the bolt.

14 REPLACE THE BLADE



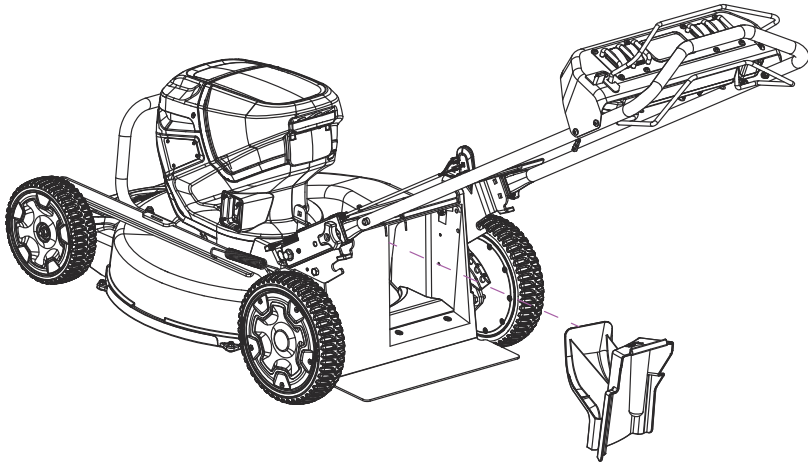
14.1 DISASSEMBLE THE BLADE

1. Remove the blade mounting bolt.
2. Remove the fan blade and spacer.
3. Remove the blade.
4. Remove the blade fixing base.

14.2 ASSEMBLE THE BLADE

1. Install the blade fixing base.
2. Install the blade, fan blade and spacer.
3. Tighten the mounting bolt.

15 REPLACE THE MULCH PLUG



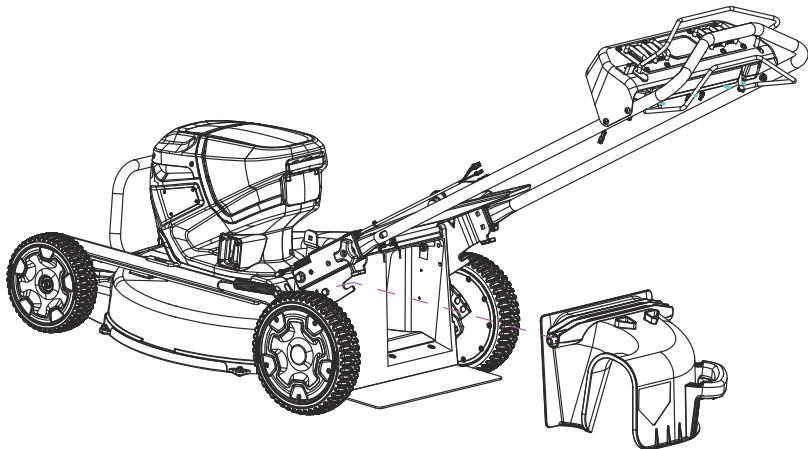
15.1 DISASSEMBLE THE MULCH PLUG

1. Lift the rear door.
2. Remove the mulch plug.

15.2 ASSEMBLE THE MULCH PLUG

1. Lift the rear door.
2. Install the mulch plug.

16 REPLACE THE REAR DISCHARGE



16.1 DISASSEMBLE THE REAR DISCHARGE

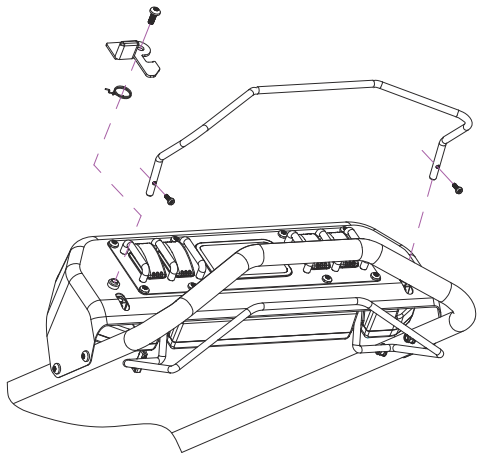
1. Lift the rear door.

2. Remove the rear discharge.

16.2 ASSEMBLE THE REAR DISCHARGE

- 1. Lift the rear door.
- 2. Install the rear discharge.

17 REPLACE THE UPPER HANDLE



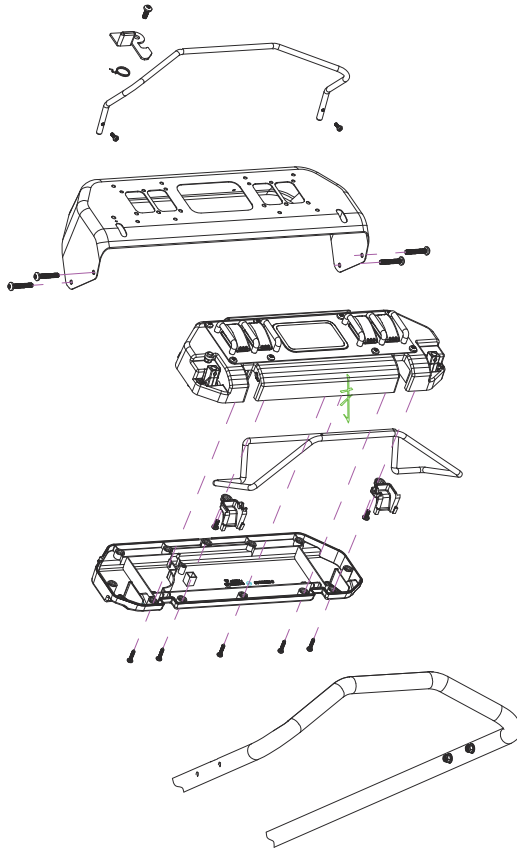
17.1 DISASSEMBLE THE UPPER HANDLE

- 1. Disassemble the upper handle lock plate mounting bolt.
- 2. Remove the lock plate and torsion spring.
- 3. Remove the fixed screws of the upper handle.
- 4. Remove the upper handle.

17.2 ASSEMBLE THE UPPER HANDLE

- 1. Install the upper handle.
- 2. Tighten the fixed screws of the upper handle.
- 3. Install the lock plate and torsion spring.
- 4. Tighten the screws of the fixing plate.

18 REPLACE THE LOWER HANDLE



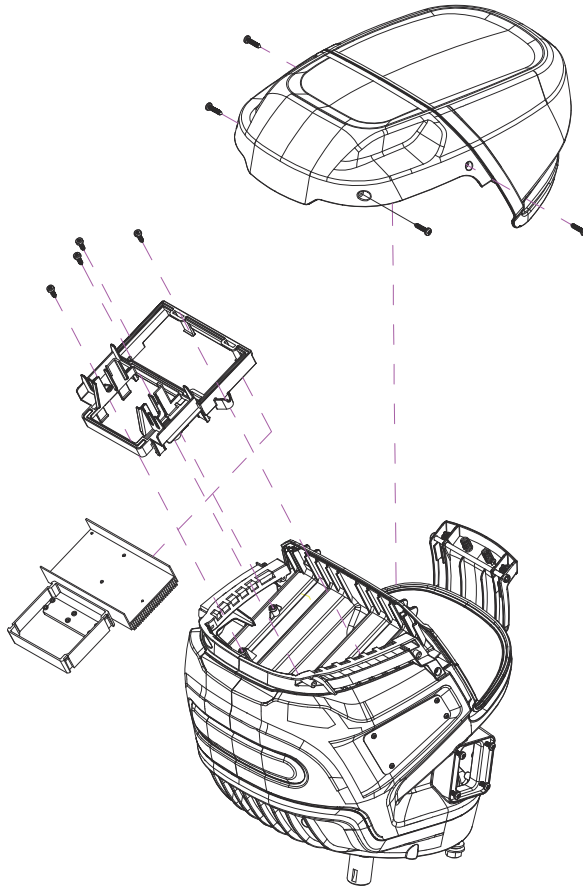
18.1 DISASSEMBLE THE LOWER HANDLE

1. Remove the mounting bolts of panel keys
2. Remove the panel.
3. Remove the lower panel.
4. Remove the fixed seat of the lower handle.
5. Remove the lower handle.

18.2 ASSEMBLE THE LOWER HANDLE

1. Install the lower handle.
2. Install the fixed seat of the lower handle.
3. Install the lower panel.
4. Install the panel.
5. Install the upper handle.
6. Tighten the screws for fixing the panel assembly.

19 REPLACE THE MAIN BLADE AND PARALLEL CONTROL PANEL



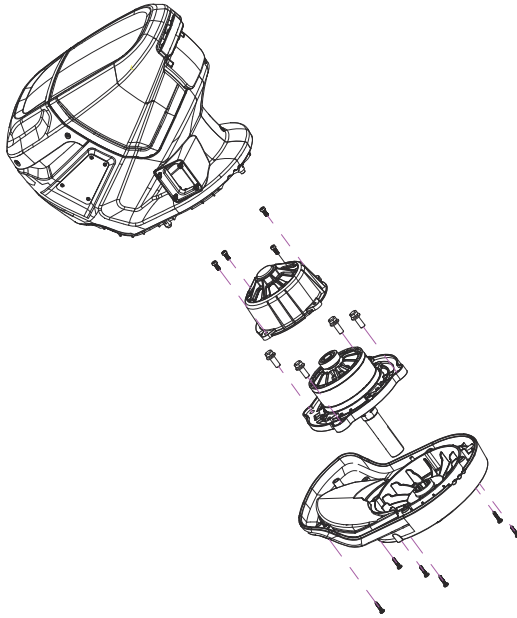
19.1 DISASSEMBLE THE MAIN BLADE AND PARALLEL CONTROL PANEL

1. Remove the upper mounting screws.
2. Remove the fixing screws for the control panel mounting bracket.
3. Remove the control panel.

19.2 ASSEMBLE THE MAIN BLADE AND PARALLEL CONTROL PANEL

1. Install the control panel onto the control bracket.
2. Tighten the control panel mounting screws.
3. Tighten the upper cover assembly mounting screws.

20 REPLACE THE MAIN BLADE MOTOR



20.1 DISASSEMBLE THE MAIN BLADE MOTOR

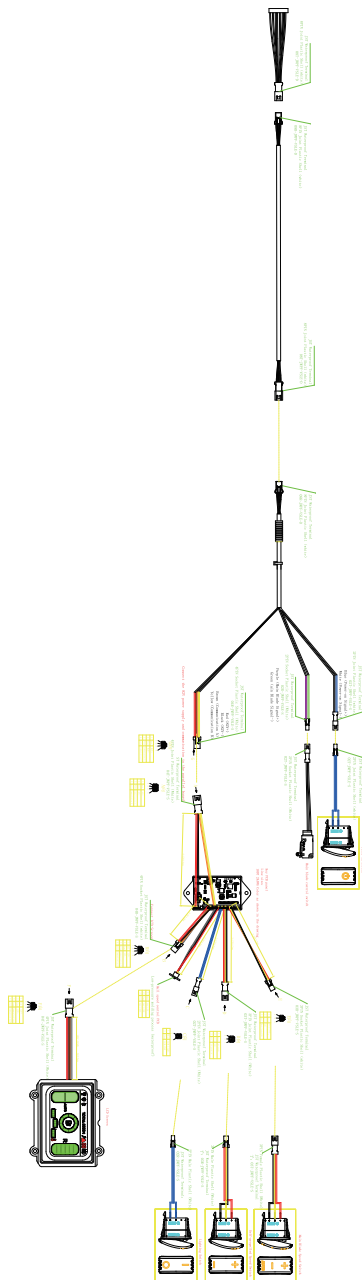
1. Remove the mounting screws for the power head base.
2. Remove the fixing screws for the air collector cover.
3. Remove the fixing screws for the main blade motor.

20.2 ASSEMBLE THE MAIN BLADE MOTOR

1. Install the fixing screws for the main blade motor.
2. Install the fixing screws for the air collector cover.
3. Install the mounting screws for the power head base.

21 WIRING DIAGRAM

21.1 22-INCH LAWN MOWER WIRING DIAGRAM



21.2 MAIN PARALLEL BOARD WIRING DIAGRAM

