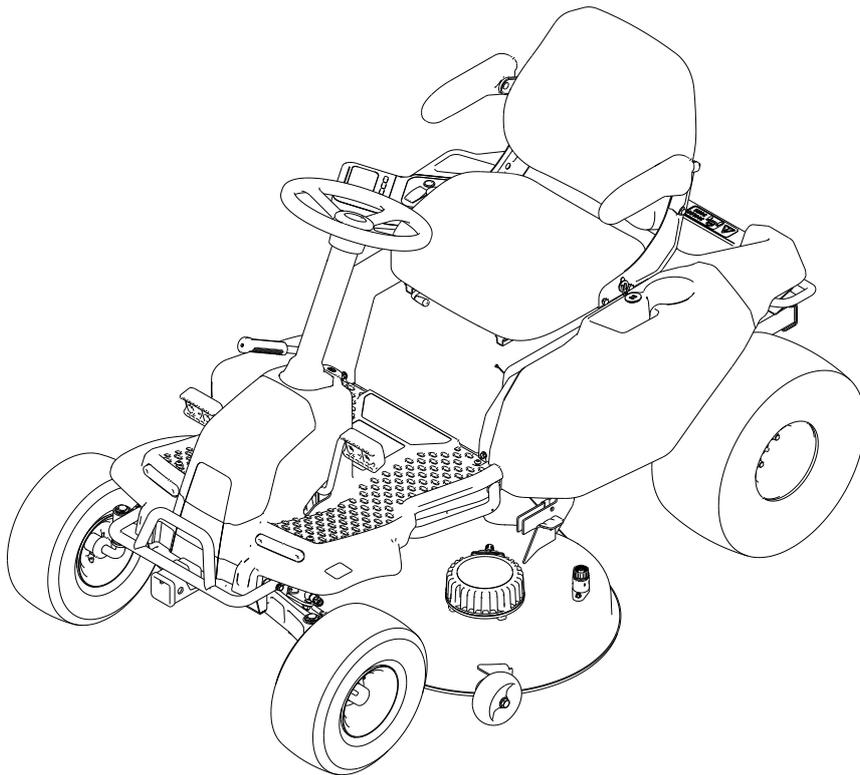


greenworks[®]

CrossoverT Tractor 6-in-parallel

Model No. GC82LT107

Service Manual



WARNING:

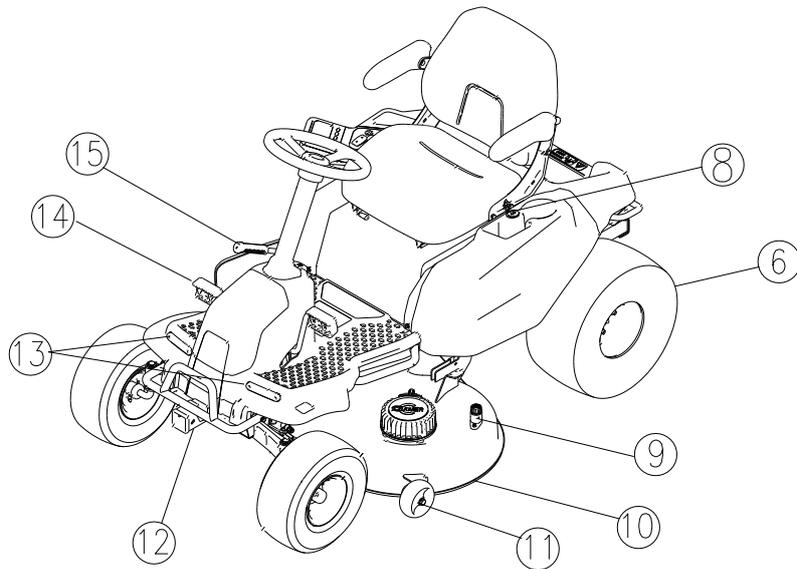
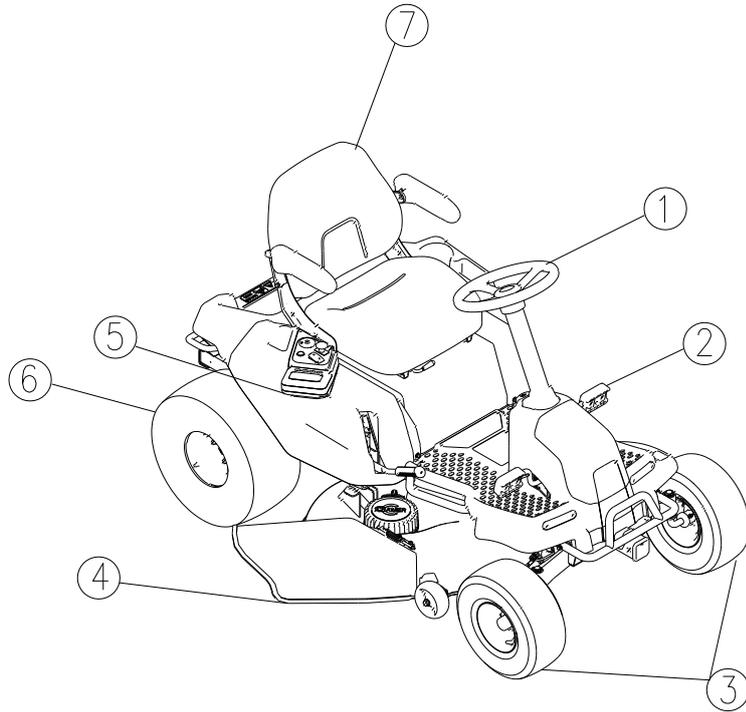
Undertaking repairs to gardening tools can be hazardous. Use correct tools and safety devices noted in the manual and obey all the instructions. Do not proceed until you are confident that you understand all steps and can complete the repair work. Some repairs must only be performed by a qualified technician.

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1. Component location



- | | |
|--------------------|---------------------------------|
| 1. Steering wheel | 9. Cleaning port |
| 2. Brake pedal | 10. Deck |
| 3. Front wheel | 11. Anti-scalp wheel |
| 4. Discharge chute | 12. Bumper |
| 5. Switch panel | 13. LED light |
| 6. Rear wheel | 14. Throttle pedal |
| 7. Seat | 15. Height adjustment component |
| 8. USB port | |

1.1 Terminology

Abbr.	Full term
CAN	Controller Area Network
HW	Hardware
PC	Personal Computer
PTO	PTO Switch
SW	Software
KSI	Key Switch Ignition

2. Warnings

- 2.1. All disassembly, replacement, repair, and maintenance operations must be performed by professional operators who have read this manual.
- 2.2. 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.
- 2.3. In addition to obeying the conventional procedures for most repairing processes, there are some other special reminders:
 - Before any maintenance work, the start switch must be turned off, and if necessary, disconnect the main power supply of the vehicle.
 - 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 operator is near the vehicle under repair or can touch the mechanical parts by accident.

3. Electrical system

3.1 Faults

3.1.1 Fault list

The CANBUS system takes actions to protect the user and the machine when it detects an issue. When it acts to turn off the vehicle or a component, it indicates that a fault occurs and the fault code is shown on the digital display. Each electrical fault has a letter code followed by a number.

The first letter describes the system that caused the fault:

Letter	System
D	Display
V	Vehicle
T	Traction Controller
PMU	Power Management Unit
MR	Right Blade Controller
ML	Left Blade Controller

Most faults are quickly corrected by noting what caused the issue, restarting the machine (cycle key switch / ignition [KSI]) and changing how the operator uses the machine.

Use the chart below to find the solution for immediate fix during operation.

3.1.2 Fault code

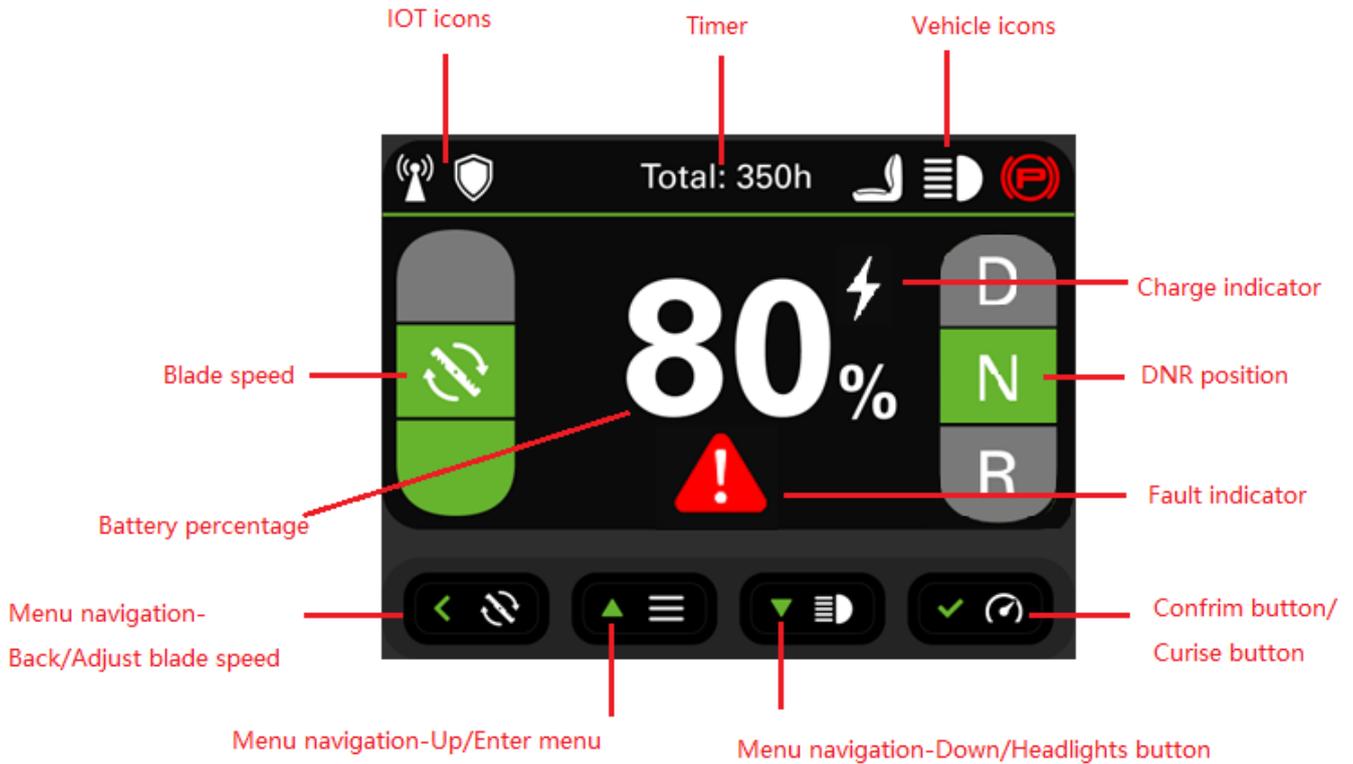
System	Fault code	Fault type	Solutions
Power management unit	PMU 10	Battery pack open circuit error	There is an unconnected battery pack in the battery compartment, which may affect performance. Please contact your supplier.
	PMU 11	PMU minor error	A minor error in the battery compartment prevented the blade system from starting. Wait for the system to recover, and then reset the blade switch.
	PMU 12	PMU major error	A major error in the battery compartment prevented the Drive and blade systems from starting. Restart the power supply and try again.
	PMU 13	No battery pack available	Check that you are using the correct battery pack, and then restart the power supply.
Vehicle	V 14	Reverse mowing operation sequence incorrect	Please press the reverse mowing button before reverse mowing.
	V 15	Vehicle self-test error	<ol style="list-style-type: none"> 1. Before starting the vehicle, check that the brake is in the engaged position. 2. Before starting the vehicle, place the blade switch in the off position and check that the blade switch is

System	Fault code	Fault type	Solutions
			<p>connected properly.</p> <p>3. Before starting the vehicle, place the DNR switch in the N position.</p> <p>4. Check that the connector under the seat is connected properly.</p> <p>5. Do not press the cruise control button when starting the vehicle.</p> <p>Do not press the accelerator pedal when starting the vehicle.</p>
	V 16	Operation sequence incorrect	Return the accelerator and blade switch to their initial positions.
	V 17	SPI communication error	Restart the power supply.
	V 18	Accelerator error	Check that the accelerator cables are connected properly and restart the power supply.
	V 21	PMU CAN communication error	Communication with the battery compartment timed out. Restart the power supply.
	V 23	Seat switch abnormal	Check that the connector under the seat is connected properly, and then restart the power supply.
	V 24	Insufficient battery packs available, functionality may be limited.	Please insert more battery packs.
Traction controller	T 11	Overvoltage	The voltage is too high. Restart the power supply.
	T 12	Undervoltage	The voltage is too low. Charge the battery packs before use.
	T 13	Controller self-test error	If you encounter this issue, contact your distributor for a solution.
	T 14	Drive motor stalled	Check if the drive wheels are stuck and restart the power supply.
	T 15	Motor encoder error	Check that the Hall-effect connector of Drive controller is properly connected, and then restart the power supply.
	T 16	Controller driver circuit error	If you encounter this issue, contact your distributor for a solution.
	T 17	Drive part of controller overtemp	The controller temperature is too high. Wait for the controller to cool down, and then restart the power supply.
	T 18	Drive motor overheat	The motor temperature is too high. Wait for the motor to cool down, and then restart the power supply.
	T 21	Temperature sensor of the drive motor abnormal	Check the wiring of the temperature sensor for abnormalities.
	T 22	Drive part of controller hardware overcurrent	The load is too high. Restart the power supply.
	T 23	Pre-charge error	Restart the power supply.
	T 25	Drive software overcurrent	The load is too high. Restart the power supply.
	T 26	Drive MOS error	If you encounter this issue, contact your distributor for a solution.
	T 27	Motor phase loss	Check that motor cables of the Drive controller are connected properly, and then restart the power supply.
T 28	Drive controller overtemp	The controller temperature is too high. Wait for the controller to cool down, and then restart the power supply.	

System	Fault code	Fault type	Solutions
Left blade controller and motor	ML 3	Left blade software overcurrent	Check the mowing load and restart the power supply.
	ML 4	Left blade stalled	Check the mowing load and return the blade switch to its initial position.
	ML 6	Left blade MOS error	If you encounter this issue, contact your distributor for a solution.
	ML 7	Left blade motor phase loss	Check that the blade controller and motor cables are connected properly, and then restart the power supply.
	ML 9	Left blade controller temperature abnormal	The controller temperature is too high. Wait for the controller to cool down, and then restart the power supply
	ML 14	Left blade hardware overcurrent	Check the mowing load and restart the power supply.
	ML 15	Left blade failed to start	Check the mowing load and return the blade switch to its initial position.
Right blade controller and motor	MR 3	Right blade software overcurrent	Check the mowing load and restart the power supply.
	MR 4	Right blade motor stalled	Check the mowing load and return the blade switch to its initial position.
	MR 6	Right blade MOS error	If you encounter this issue, contact your distributor for a solution.
	MR 7	Right blade motor phase loss	Check that the blade controller and motor cables are connected properly, and then restart the power supply.
	MR 9	Right blade controller overtemperature	The controller temperature is too high. Wait for the controller to cool down, and then restart the power supply
	MR 14	Right blade hardware overcurrent error	Check the mowing load and restart the power supply.
	MR 15	Right blade failed to start	Check the mowing load and return the blade switch to its initial position.

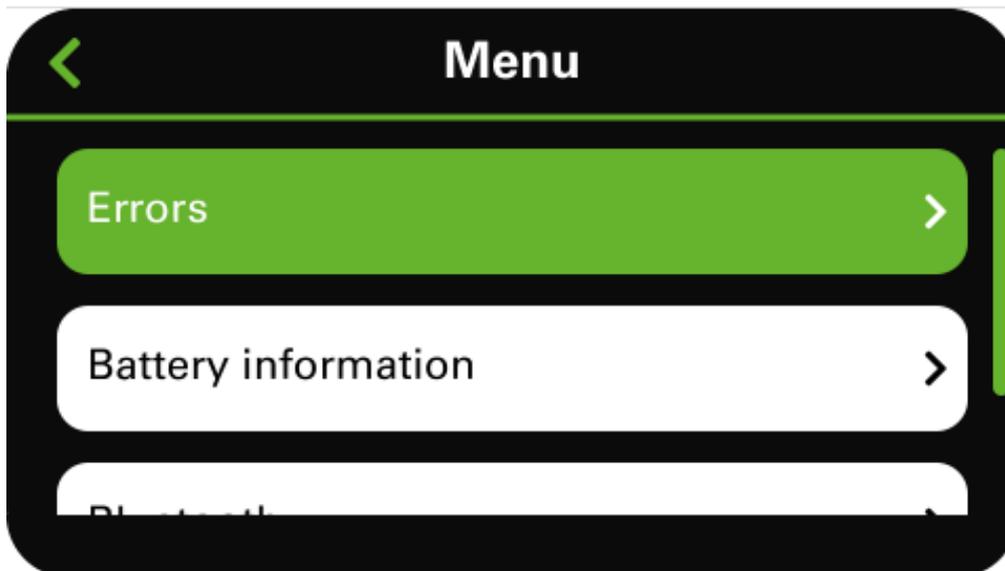
3.2 Reading the fault code (on the display screen)

3.2.1 Instrument main menu

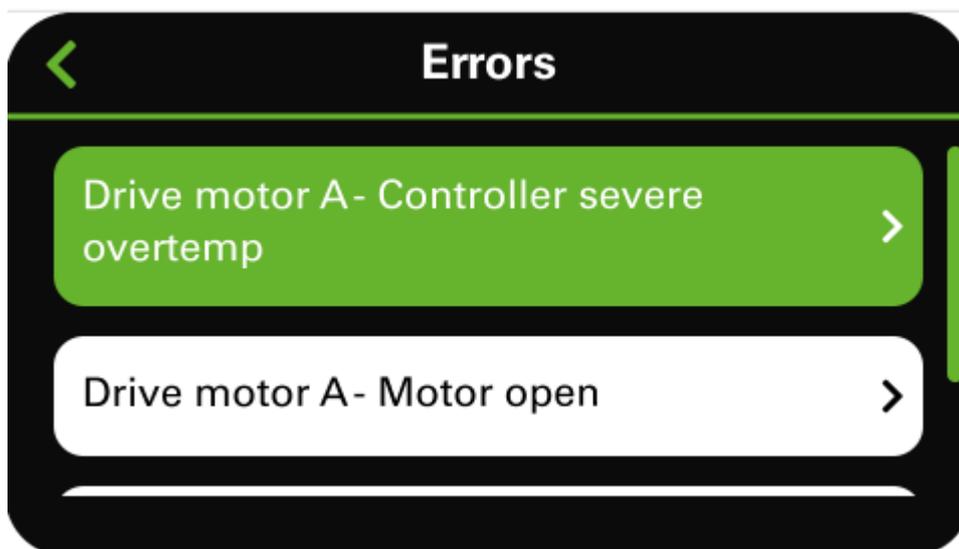


3.2.2 Fault Menu

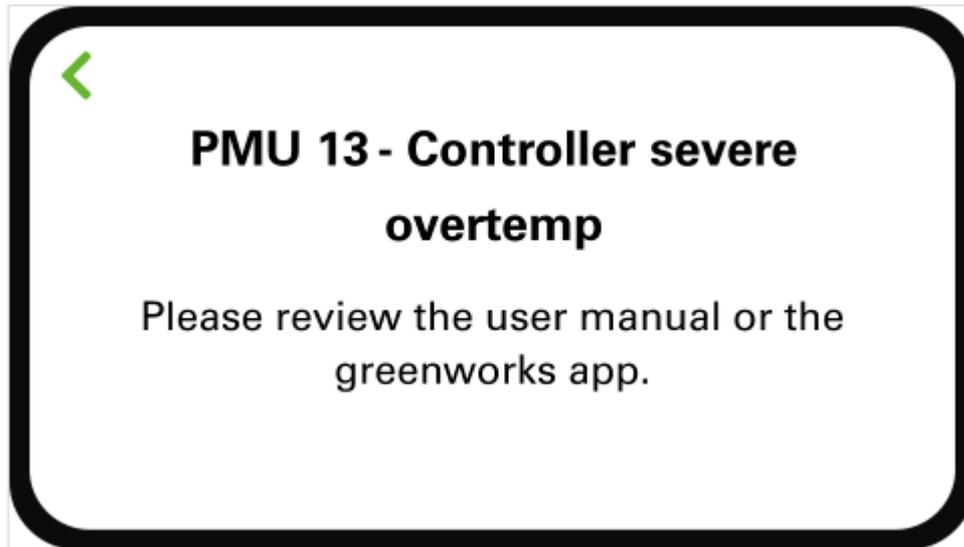
When a fault occurs, the fault indicator will be displayed on the screen. Please press the "Menu navigation - Up/Enter menu" button to enter the menu page.



- (1) Use “Menu navigation - Up/Down” button to select “Errors”, then press “Confirm button/Adjust driving speed” button to enter the fault list.



- (2) Use “Menu navigation - Up/Down” button to select which item you want to check (if there are multiple faults), then press “Confirm button/Adjust driving speed” button to enter the details.



(3) This page provides quick troubleshooting, for more detailed methods, please refer to the manual.

3.3 Electrical components

3.3.1 Switches

Switches either open a circuit to stop current flow or close and allow current to flow through.

- A normally open (NO) switch prevents current flow until the switch is actuated, completing the circuit, and allowing current to flow through it. An example is a light switch - the lights are off until the switch is actuated, and the lights go on.
- A normally closed (NC) switch allows current to flow until the switch is actuated, breaking the circuit, and stopping current flow through it. An example is an ignition switch that grounds the magneto when in the OFF position (completing the circuit) but opens the circuit when in the ON position allowing the engine to operate.

The switches are selected with reference to their nominal current (the contacts must be of sufficient size to carry the required current), rated voltage and type of actuation (pressure switches, traction, rotation, momentary contact or microswitches).

NOTE:

Before doing an electrical test, make sure that the connections to the switches are stable and that the switch is actuated correctly (Safety switches may need adjustment in order to be actuated correctly).

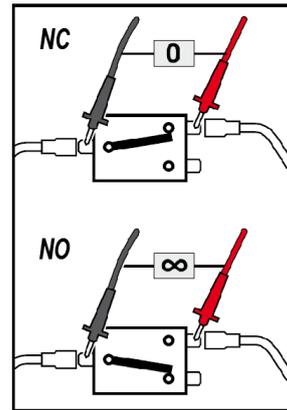
IMPORTANT:

During the checking process, remove the switches from their respective circuits, unplugging the connectors. If the cables are left in place, the machine components or the meters can be damaged.

Normally Open Switch Test

To test a normally closed switch

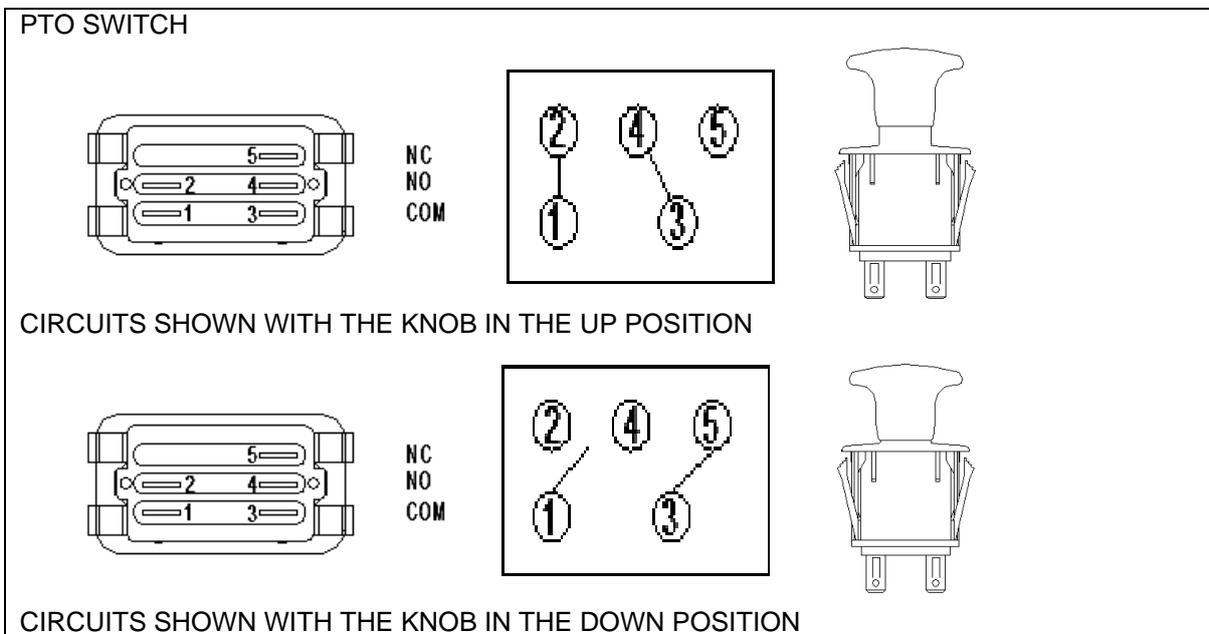
1. Connect the Multimeter between the switch terminals.
 - The meter should indicate an open circuit (infinite resistance).
2. Activate the switch.
 - The Multimeter should indicate a closed circuit (zero resistance). This indicates the switch is operating properly.
 - Variation from test results described indicates a defective switch.



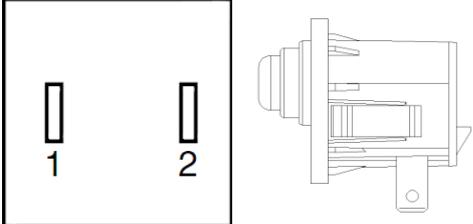
The diagrams show the connections of the electrical components in different situations.

NOTE:

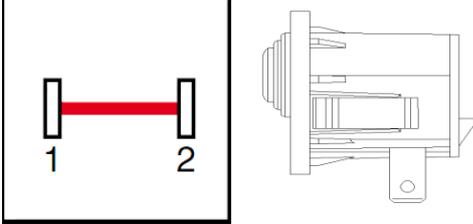
The continuous line indicates the electrical continuity of the circuit. All switches are shown from the rear.



PARK SWITCH

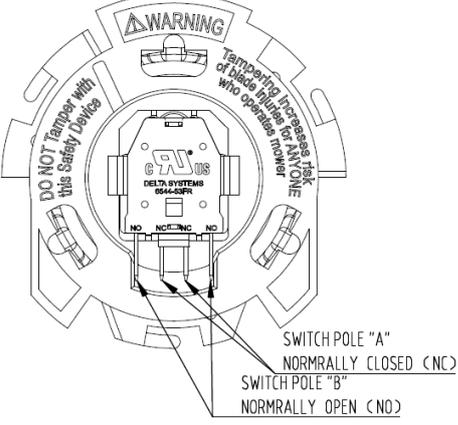


ELECTROMAGNETIC BRAKE ON



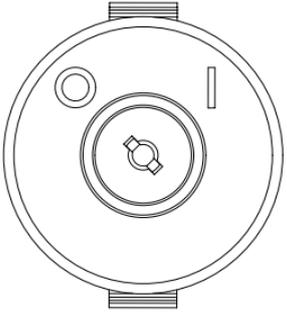
ELECTROMAGNETIC BRAKE OFF

SEAT SWITCH

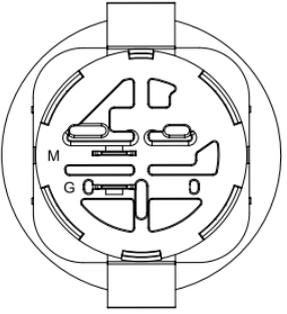


SWITCH POLE 'A' TO TRACTION CONTROLLER (OFF)
SWITCH POLE 'B' TO TRACTION CONTROLLER (NO)

KEY SWITCH



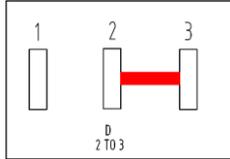
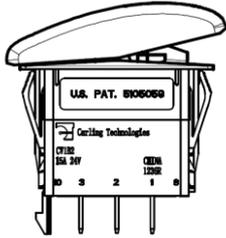
FRONT VIEW



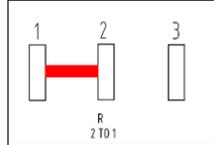
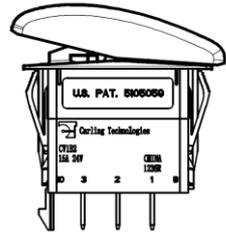
BACK VIEW

POSITION	ROTATION	FUNCTION	CONTACT
1	0°	OFF	OPEN
2	90°	ON	M+G

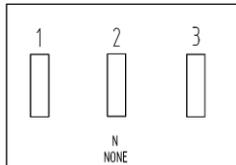
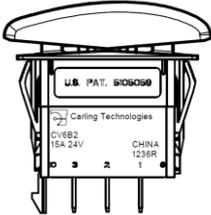
DNR SWITCH



DRIVE

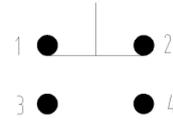


REVERSE

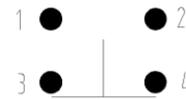


NEUTRAL

REVERSE MOWING BUTTON

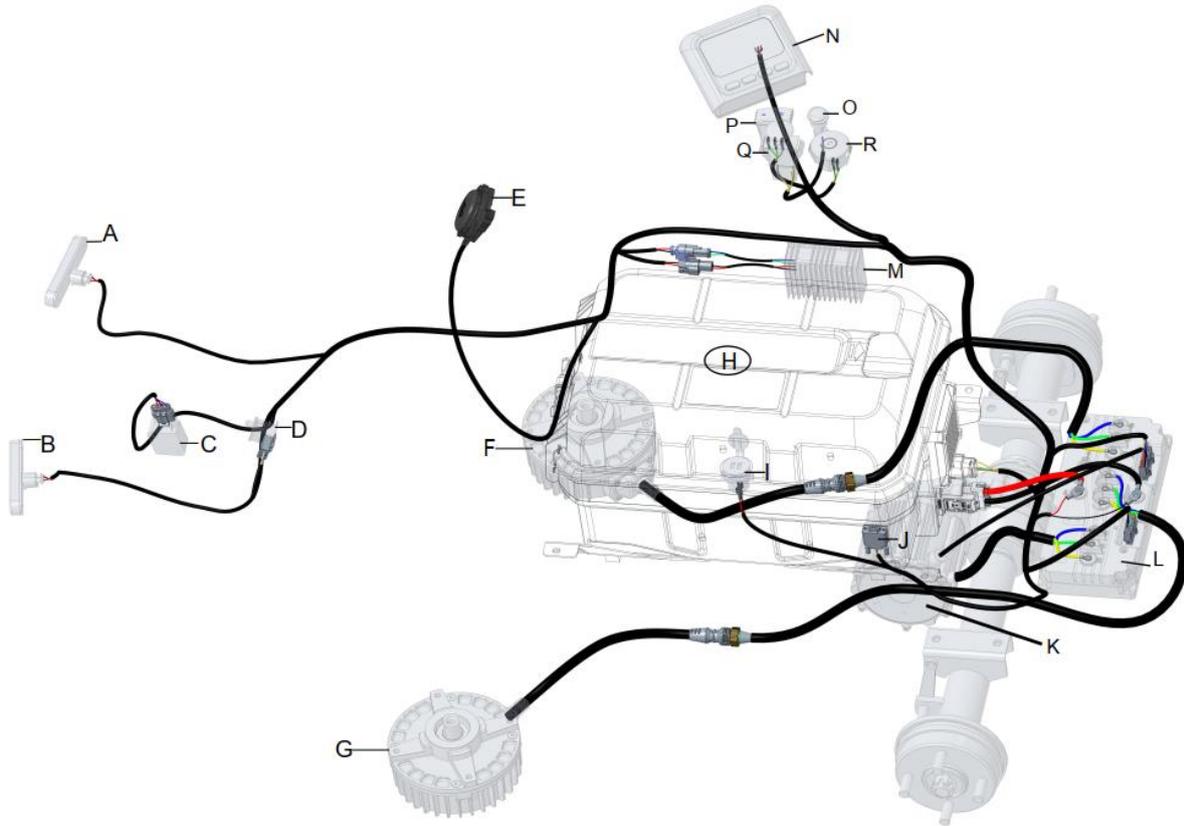


CONTACT OPEN



BUTTON IS PRESSED DOWN AND CONTACT IS CLOSED
PRESS AND RELEASE THE BUTTON TO TURN ON THE REVERSE MOWING FUNCTION

3.4 Electrical wiring diagram



A Right LED Light
 B Left LED Light
 C Accelerator
 D Parking Switch
 E Seat Switch
 F Right Blade Motor
 G Left Blade Motor
 H Battery Pack Assembly
 I USB

J Debug Port
 K Traction Motor and Gearbox
 Assembly
 L Controller
 M 12 Volt Power Converter
 N Instrument
 O Reserve Moving Button
 P DNR Switch
 Q PTO Switch
 R Key Switch

4. Deck

The deck is the part of the vehicle that carries out mowing work, which comprises the blade, the blade motor and the welded body of the deck. When removing the blade and the blade motor, lift the front section of the machine.

IMPORTANT:

Before removal and installation of the following parts specific to the deck, make sure the mower is powered off.

4.1 Blade

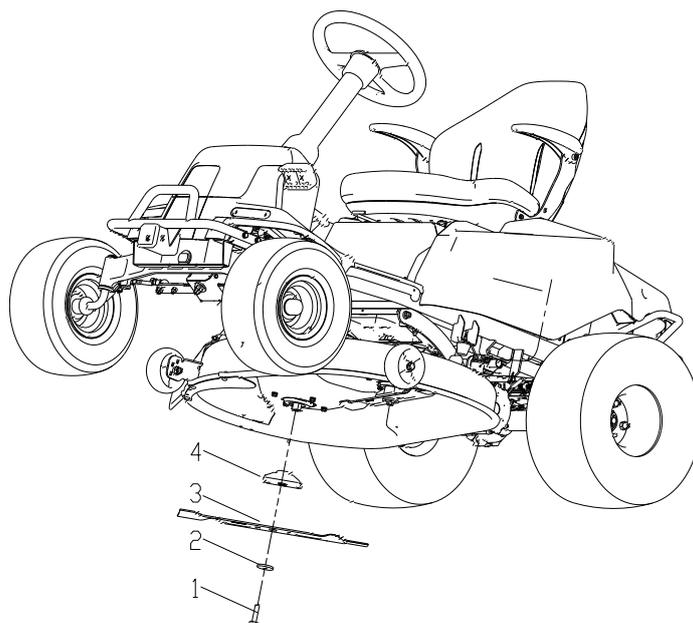
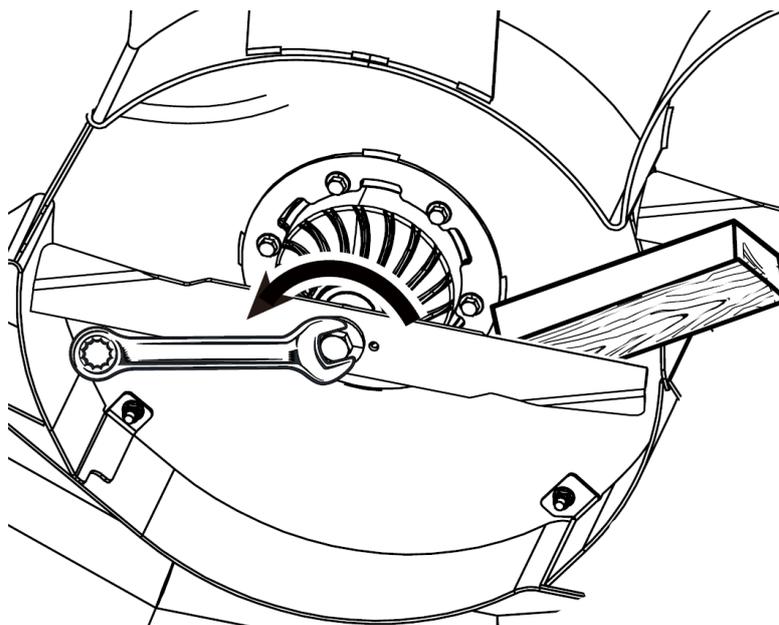


Fig. 1

- | | |
|--------------------|---|
| 1. Bolt 7/16-14UNC | 3. 2-in-1 blade (discharge and mulching blade) or grass blade |
| 2. Disc spring | 4. Blade holder |

Removal:

1. Using a lifting tool, lift the front end of the deck for easier access to the blades. Ensure the mower is secure before working underneath it.
2. Place a block of wood between the blade and the deck to prevent it from spinning while you work.



3. Loosen the bolt (1) with a 16 mm socket by rotating counterclockwise.
4. Remove the bolt (1), disc spring (2), blade (3), and the blade holder (4) in order.

Installation:

1. Put the disc spring (2), blade (3), and the blade holder (4) on the bolt (1) in the order as shown in the Fig. 1 and screw the bolt (1) into the threaded hole of the motor shaft.
2. With protective gloves on, hold the end of the blade (3) with one hand and tighten the bolt (1) with a 16 mm socket by rotating clockwise, with a fastening torque of 90-100 N•m (66~74 Ft-lbs).
3. Gently rotate the blade, make sure that no conflict between the two blades, no conflict between the blades and the deck housing, such that the blades can rotate freely and smoothly.

NOTE:

- Frequently inspect the wear of the blades. Replace in time if a blade is overworn, otherwise it will affect the dynamic balance of the working motor and lead to earlier damage of the blade motor.
- Make sure the mower is secured when it is lifted and while working on it.
- Removal and installation steps for grass blade are same as those of 2-in-1 blade (discharge and mulching blade).

4.2 Blade motor

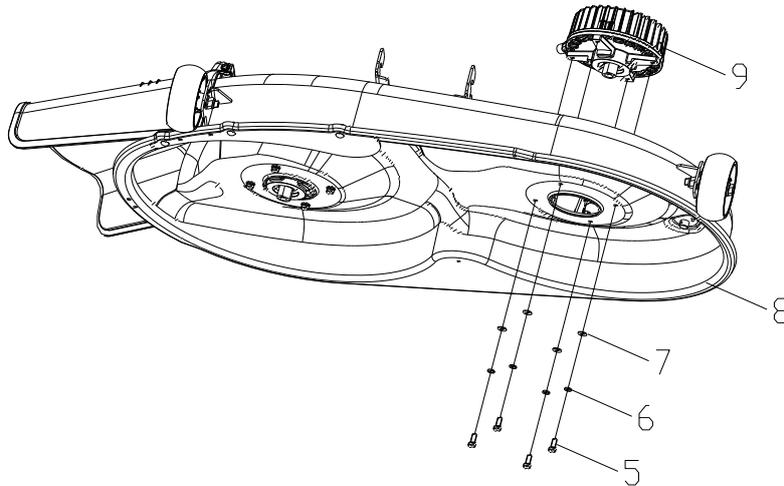


Fig. 2

- | | |
|---------------------------|----------------|
| 5. Bolt 5/16-18UNC | 8. Deck |
| 6. Spring washer $\Phi 8$ | 9. Blade motor |
| 7. Flat washer $\Phi 8$ | |

Removal:

1. Make sure the mower is powered off.
2. Pull out the motor wire plug (10).

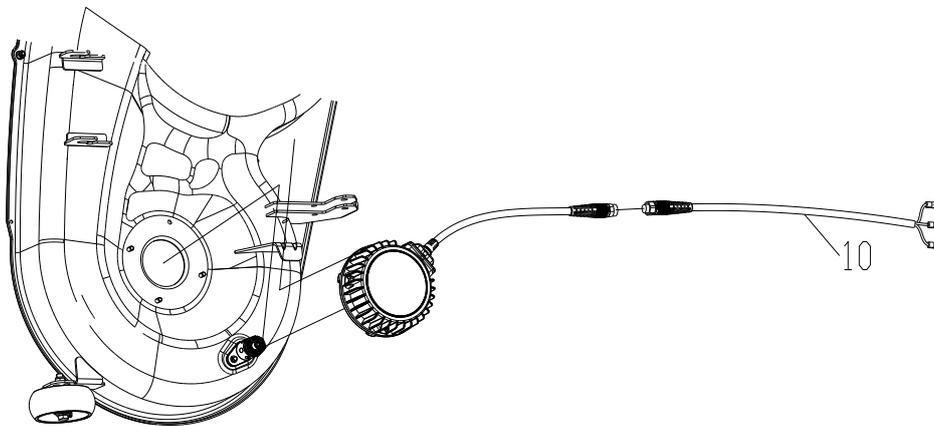


Fig. 3

10. Blade motor wire plug

3. Using a hoisting tool, lift the front end of the deck to a certain angle.
4. Remove the blade (see 4.1 for detailed steps).
5. Use a 13 mm socket wrench to loosen the bolt (5) by rotating counterclockwise.
6. Remove the bolt (5), spring washer (6), and the flat washer (7) altogether. Each motor is fixed with four sets of such bolts.

7. Remove the blade motor (9) from the deck.

Installation:

1. Put the blade motor (9) into the mounting hole of the deck housing. Rotate the motor until the motor mounting hole is aligned with the deck mounting hole.
2. Slip the flat washer (7) and the spring washer (6) onto the bolt (5) in order. Apply thread locker on the end of the thread and manually screw the bolt clockwise into the threaded installation hole of the motor. Each motor is fixed by four sets of bolts.
3. Tighten the bolt (5) clockwise with a 13 mm socket wrench to a tightening torque of 10-15 N•m (7~11 Ft-lbs). Motor installation is complete.
4. Reversing the steps of motor removal, insert the wire plugs of the blade into the motor.

NOTE:

- The removal and installation steps for the two blade motors are the same.
- Before removing the harness of the blade controller, turn off the main power supply of the vehicle.
- When installing the wire plug into the blade motor, do not reverse the correspondence between the motor (left and right) in each position and the blade controller (left and right).

4.3 Anti-scalp wheel

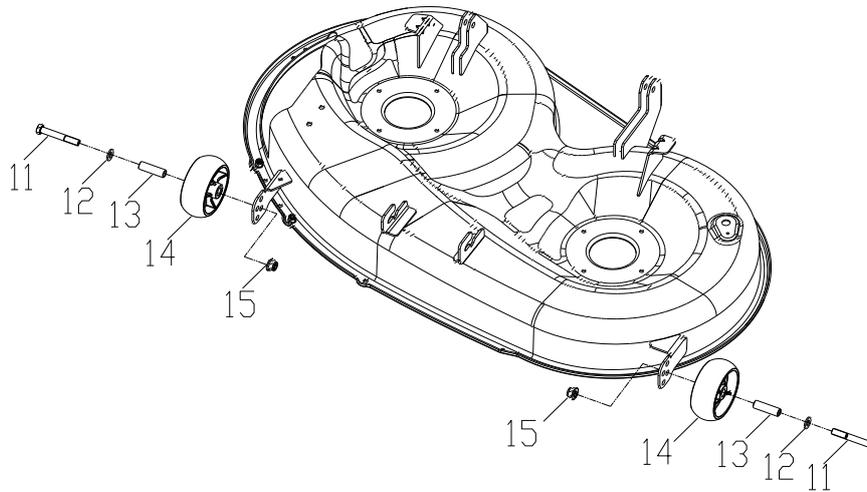


Fig. 4

- | | |
|------------------------------|----------------------|
| 11. Hex head bolt M12×80 | 14. Anti-scalp wheel |
| 12. Flat washer, Grade A Φ12 | 15. Locking nut M12 |
| 13. Roller sleeve | |

Removal:

1. Use two 18 mm sockets wrenches to loosen the bolts (11) and nuts (15).
2. Pull out the bolts (11).
3. Remove the flat washer (12), the roller wheel (14), and the roller sleeve (13) from the deck weldment.

Installation:

1. Install the sleeve (13) into the inner hole of the roller (14) and put them into the installation gap for deck, with the mounting holes aligned.
2. Insert the bolt (11) through the mounting holes of the flat washer (12), the roller sleeve (13) and the deck in order, then tighten the nut (15).
3. Use two 18 mm socket wrenches to tighten the bolts (11) and nuts (15) with a tightening torque of 45-50 N·m (33~37 Ft-lbs). The roller (14) can then rotate freely, while the sleeve (13) cannot.
4. The installation is complete.

NOTE:

- The removal and installation steps for the two anti-scalp wheels are the same.
- The installation direction for the bolts of the two rollers is shown in the figure. The nuts (15) on both sides are located on the inside of the deck.
- Upon installation, check if the rollers can rotate freely and smoothly.

4.4 Cutting height adjustment

Before adjusting the height of the blade, make sure that the tire pressure meets the standards below.

Rear wheels	Front wheels
8-10 PSI	24-26 PSI

4.4.1 Deck levelling

1. Drive the machine to a level ground, put the deck height adjustment lever in the lowest position, which is 1.5-inch position hole (as shown in Fig.5 below).
2. Use an 18 mm open-end wrench to loosen the two adjusting nuts at the upper end of the height adjustment rod.
3. Loosen the hexagon flange nut (17) and adjust the end nut (16) and the nut (18): clockwise to lift and counterclockwise to lower the blades.
4. Use a tape measure to measure the clearance above the ground at the four corners of the deck (A, B, C, D in Fig.5)
5. Use two 18 mm open-end wrenches to roughly adjust the two nuts (16) and (18) to lift A, B, C, and D off the ground at roughly the same height.
6. The rear two positions (B, D) are allowed to be slightly higher than the front two positions (A, C), with a height difference no more than 5 mm. The height difference between the left and right positions A, B and C, D shall be less than 2 mm. The deck can be regarded as levelled within such standard.

NOTE:

After the deck is preliminarily levelled, do not immediately tighten the adjusting nut (17).

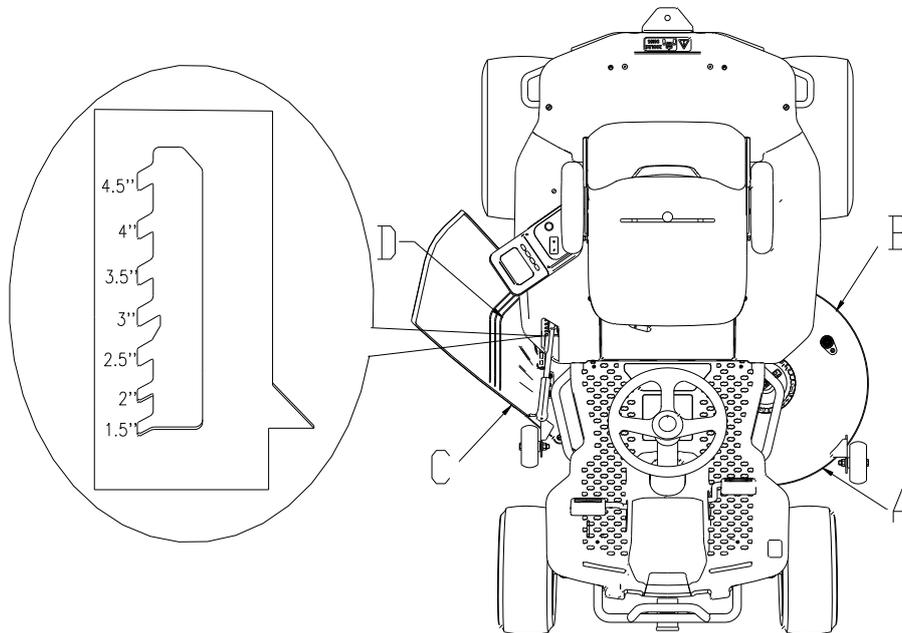


Fig. 5

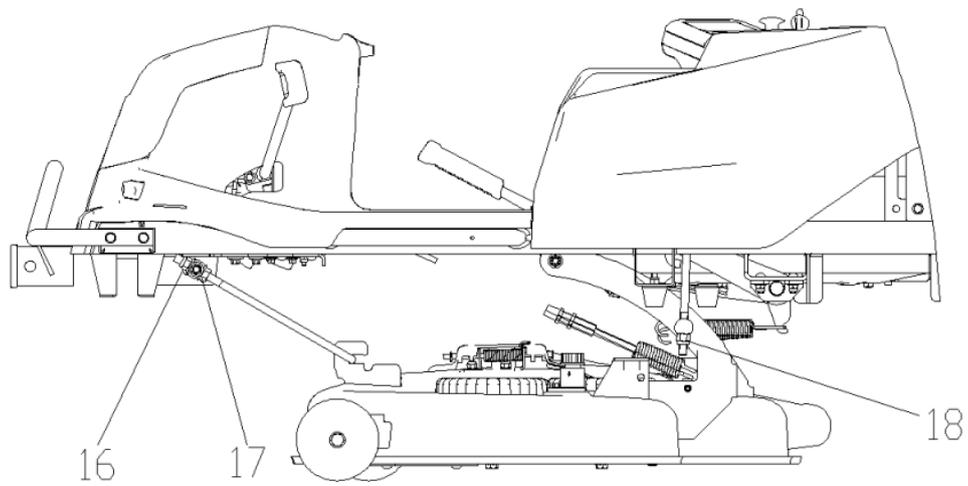


Fig. 6

16. Hex flange locking nut M12
17. Hex flange nut M12

18. Hex locking nut M12

4.4.2 Mulching

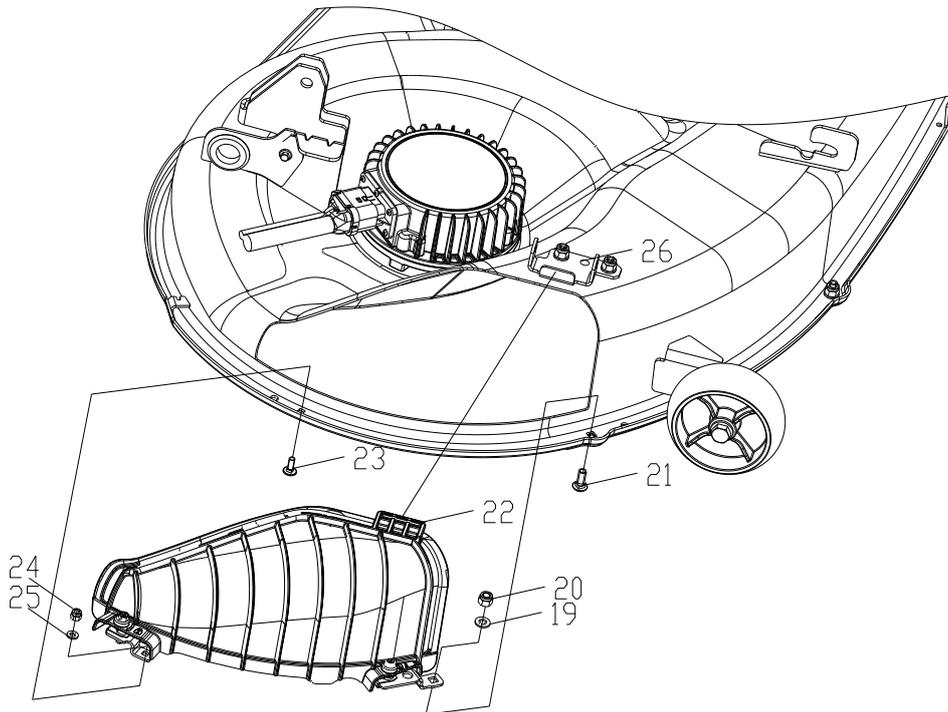


Fig.7

- | | |
|---------------------------|-----------------------------------|
| 19. Flat washer, $\Phi 8$ | 23. Square neck bolt M6 |
| 20. Locking nut M8 | 24. Locking nut M6 |
| 21. Square neck bolt M8 | 25. Flat washer, Grade A $\Phi 6$ |
| 22. Mulching cover | 26. Grass catcher support |

Removal: if the deck is provided with a mulching

1. Use a 13 mm open-end wrench to remove the locking nut (20) counterclockwise and the washer (19) and the bolt (21) altogether.
2. Use a 10 mm open-end wrench to remove the locking nut (24) counterclockwise and the washer (25) and the bolt (23) altogether.
3. Remove the mulching (22) from the grass catcher support (26).

NOTE:

If no mulching is installed, skip this step.

4.4.3 Deck height adjustment

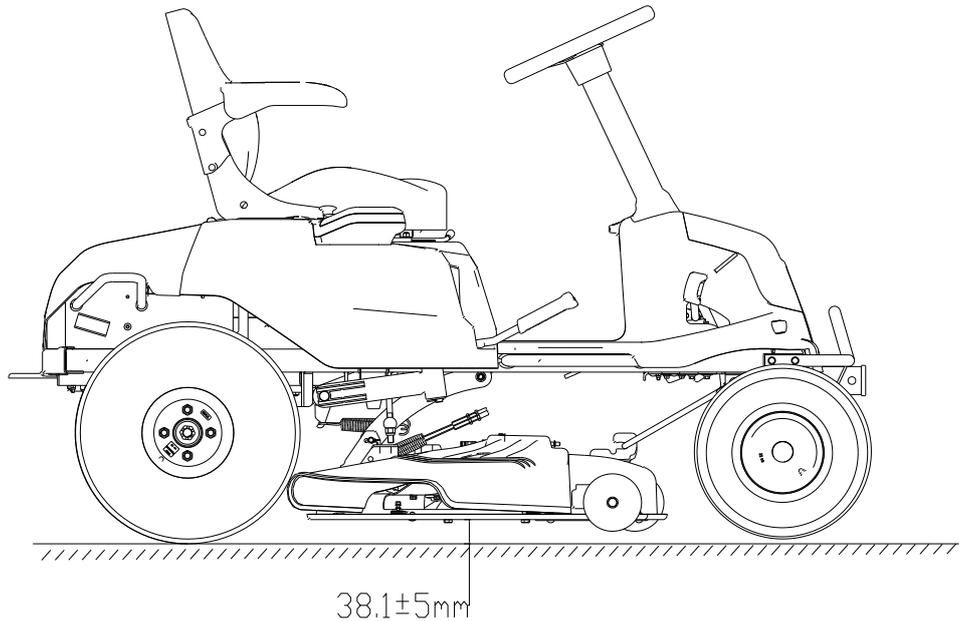


Fig.8

After the preliminary levelling of the deck is completed, adjust the height of the blade.

At this point, the blade needs to have a theoretical clearance of 1.5 inches (38.1±5 mm) above the ground (as shown in Fig.7).

Use a tape measure to measure the clearance of the right blade tip above the ground on the right side around the grass discharge chute. A clearance within the range of 38.1±5 mm is appropriate. If not, use the steps below to adjust the height of the blade.

Adjust the blade height:

1. Loosen the nut (17), then adjust the nuts (16) and (18): clockwise to lift or counterclockwise to lower` the blade.
2. For each adjustment, ensure the direction and rotation of nuts (16) and (18) on four height adjustment rods are same. The height of the blade rises or falls by 1.75 mm per rotation of the nut (16) and (18).
3. Measure and adjust multiple times using the above method until the height of the blade is within the range of 38.1±5 mm.
4. Use two 18 mm open-ended wrenches to tighten the nut (17). When tightening the nut (17), the nut (16) must be kept in place.
5. If the deck is installed with a grass baffle, install the baffle at last. If the deck has no grass baffle, skip this step.

NOTE:

The deck needs to be preliminarily levelled and then raised to ensure the deck is level and the three blades are basically at the same height.

5. Operation components

5.1 Switch panel and USB

Installation:

1. Install the switches and display screen onto the panel correspondingly as shown in Fig.1.
2. PTO switch (1) corresponds to the connector (8) as shown in Fig.2.
3. The display screen (2) corresponds to the connector (9).
4. Key switch (3) corresponds to the connector (11).
5. Reverse mowing button (4) corresponds to the connector (12).
6. The direction switch (5) corresponds to the connector (7), as shown in Fig.2.

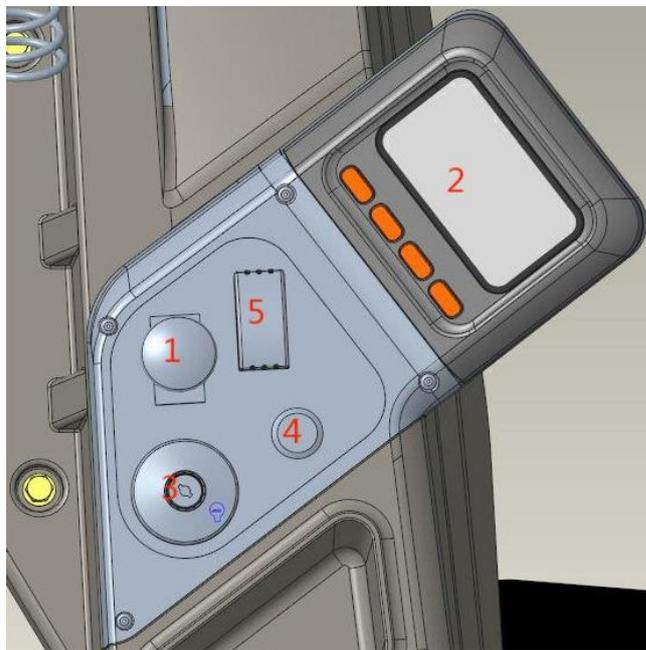


Fig.1

- | | |
|-------------------|--------------------------|
| 1. PTO switch | 4. Reverse mowing button |
| 2. Display screen | 5. D/N/R switch |
| 3. Key switch | |

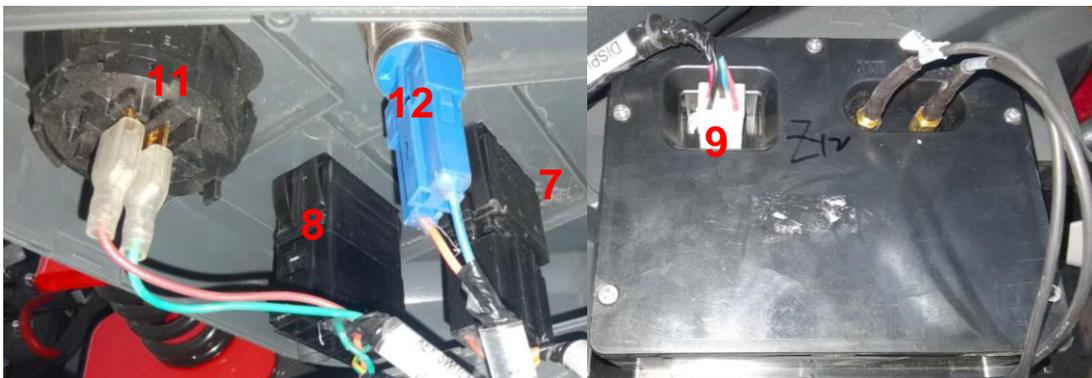


Fig.2



Fig.3

Removal:

1. As shown in Fig. 4, use a T15 screwdriver to remove the bolt (16) counterclockwise and pull out all connectors as shown in Fig. 2. The entire switch panel is now separated from the right enclosure (15).
2. As shown in Fig. 3, connect the black wire with USB (14) negative terminal and the red wire with positive terminal.
3. Pull all plugs in sequence and remove USB (14) built-in nut counterclockwise.
4. Remove the USB from the left enclosure (13).

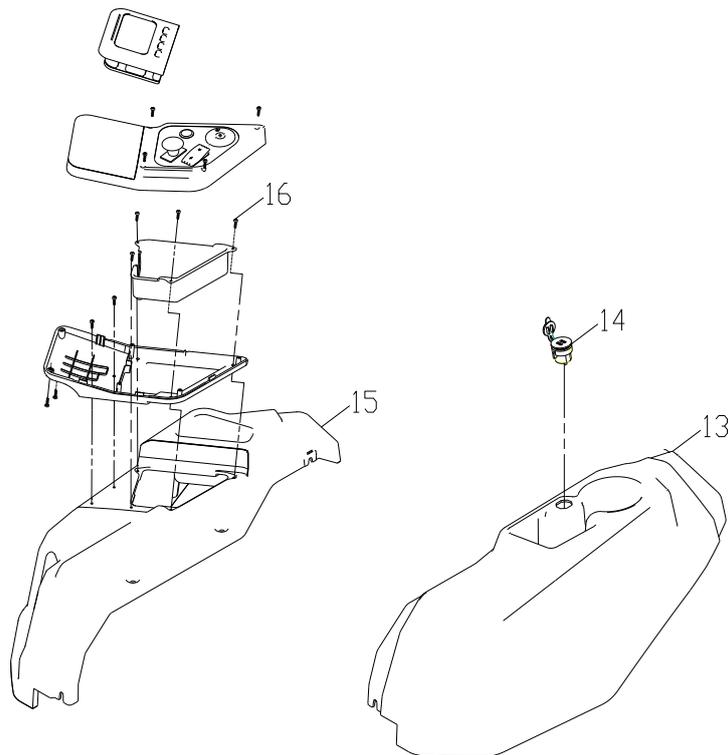


Fig. 4

13. Left enclosure
14. USB

15. Right enclosure
16. Hexalobular socket pan head screw M6

5.2 Control components

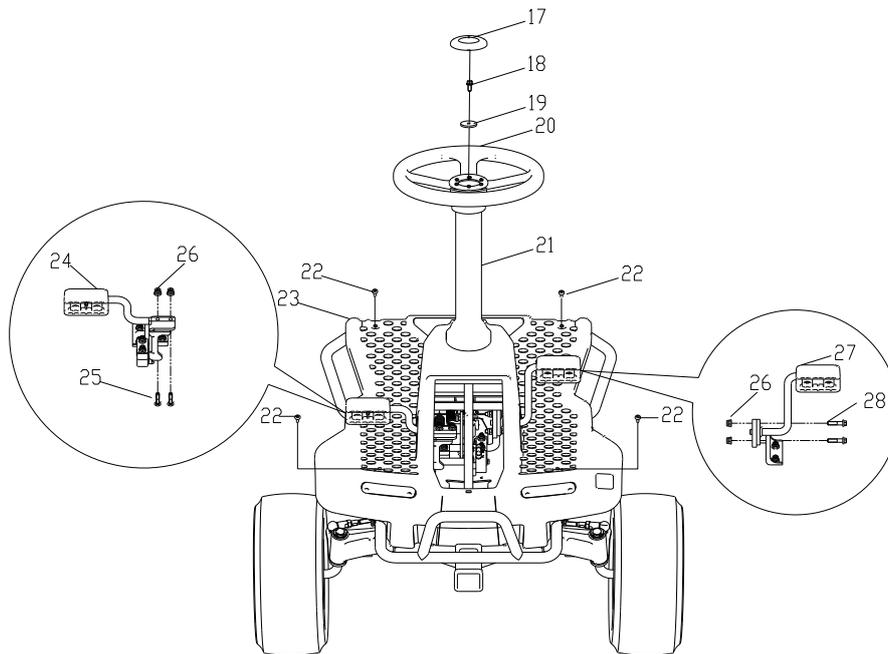


Fig. 5

- | | |
|---|----------------------------|
| 17. Middle cover | 24. Throttle pedal |
| 18. Sems bolt M8 | 25. Bolt M8 |
| 19. Large washer | 26. Spring washer Φ 8 |
| 20. Steering wheel | 27. Brake pedal |
| 21. Steering column cover | 28. Bolt M8 |
| 22. Hexalobular socket wrench
pan head screw | |
| 23. Pedal | |

Removal:

1. Open the middle cover (17).
2. Use a 13 mm socket wrench to loosen the sems bolt (18) counterclockwise and remove the bolt (18).
3. Remove washer (19).
4. Pull out the steering wheel (20) upward.
5. Remove the steering column cover (21).
6. Use a 13 mm socket wrench to loosen the bolt (26) counterclockwise and remove throttle pedal (24).
7. Use a 13 mm socket wrench to loosen the bolt (28) counterclockwise and meanwhile, use a 13 mm open-end wrench to tighten the nut (26).
8. Remove the brake pedal (27).
9. Use a T30 screwdriver to loosen four bolts (22) counterclockwise and remove the pedal (23). Now you can see the operating components as shown in Fig. 6.

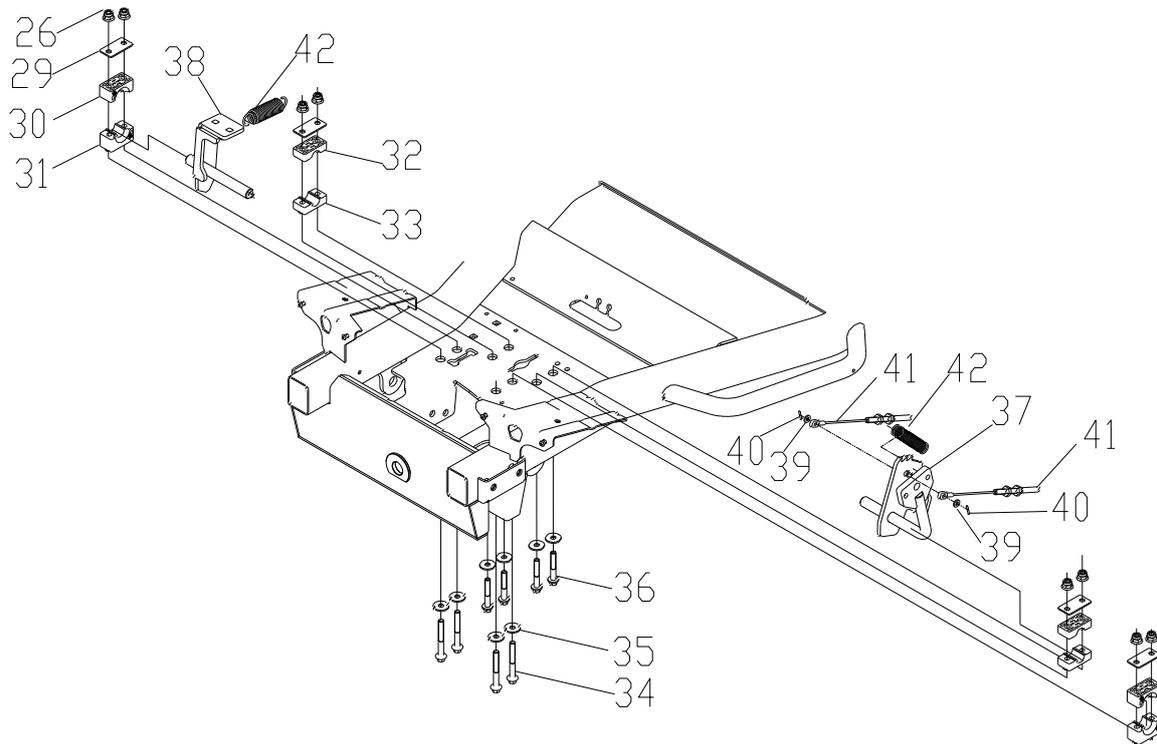
Installation:

Fig. 6

29. Holddown plate	34. Bolt M8	39. Flat gasket $\Phi 6$
30. Upper plate	35. Washer $\Phi 8$	40. Cotter pin
31. Bottom holder	36. Bolt M8	41. Brake cable
32. Upper support	37. Rear shaft weldment	42. Brake retracting spring
33. Lower support	38. Pedal weldment	

1. Apply lubrication inside the arcs of both the bottom holder (31) and the upper plate (30).
2. While holding the nut (26) and the holddown plate (29) in place using a 13 mm open-end wrench, use a 13 mm socket to fasten the bolts (34, 35) by rotating clockwise.
3. Secure the side supports of the pedal (38) on the vehicle chasis and connect the brake retracting spring (42).
4. Apply lubrication inside the arcs of both supports (32, 33).
5. While holding the nut (26) and the holddown plate (29) in place using a 13 mm open-end wrench, use a 13 mm socket to fasten the sems bolt (36, 35) by rotating clockwise.
6. Secure the side supports of the rear shaft weldment (37).
7. Manually rotate the pedel welding (37) and make sure it rotates smoothly.
8. Connect the brake retracting spring (42) and the brake cable (41).
9. Use the flat gasket (39) and the cotter pin (40) to secure the brake cable.

5.3 Steering adjustment

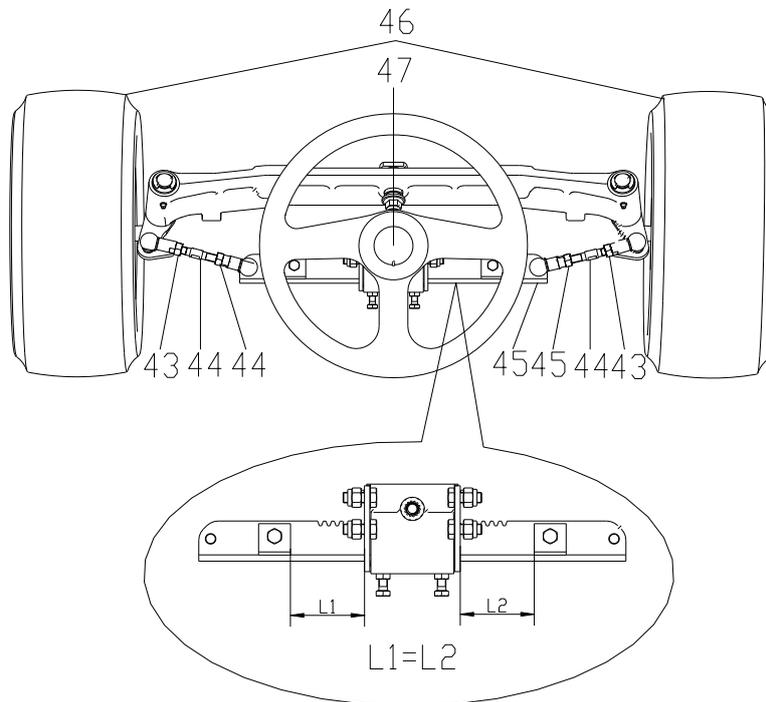


Fig. 7

43. Nut M10	46. Front wheel
44. Steering adjustment lever	47. Steering wheel
45. Nut M10	48. Gear rack

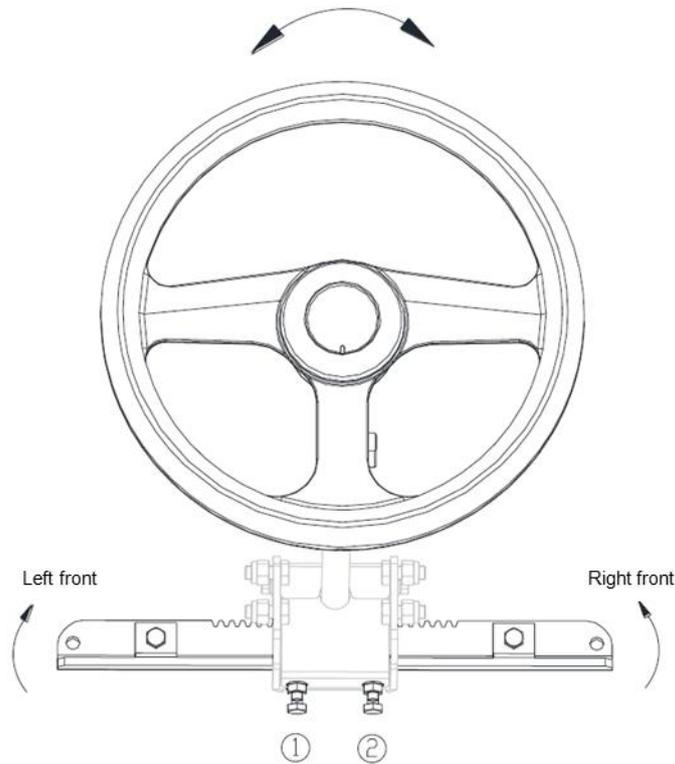
Adjustment:

1. Adjust the gear rack (48) to a middle position to make sure that the length of the left and right are equal ($L1=L2$ in Fig. 7)
2. Before installation, turn the steering wheel (47) to the position shown in Fig. 7.
3. If left and right front wheels (46) are not in the straight-ahead position, keep the steering wheel (47) in a fixed position and regulate the steering adjustment lever (44) to correct the direction of tires.
4. Taking the left front wheel for example, under the conditions that the gear rack is in the middle position and $L1=L2$, if it shows a leftward deviation when the steering wheel (47) turns to the position shown in Fig. 7, you need to use a 10 mm open-end wrench to secure the steering adjustment lever (44) while loosening the nuts (43) and (45) with a 16 mm open-end wrench.
5. Keep the steering wheel (47) in a fixed direction and rotate the steering adjustment lever (44) to regulate the left front wheel back to the straight-ahead direction.
6. Use a 10 mm open-end wrench to keep the steering adjustment lever (44) in fixed position (now, the lever cannot be rotated), use a 16 mm open-end wrench to loosen the nuts (43) and (45).

NOTE:

Repeat above steps to adjust the direction of the right front wheel.

5.4 Gear rack clearance adjustment



Adjustment:

1. Rotate the steering wheel clockwise, if the gear rack tilts in left front direction, you need to adjust the bolt and nut in position ①.
2. Use a 13 mm open-end wrench to tighten the bolt in position ① while using a 13 mm open-end wrench to loosen the nut in position ① at the same time.
3. Rotate the bolt in position ① forward to eliminate the clearance of the gear rack.
4. Rotate the steering wheel counterclockwise, if the gear rack tilts in right front direction, tighten the bolt in position ② to adjust the clearance (same as left side adjustment).
5. After the adjustment is complete, make sure the steering wheel rotates smoothly and the clearance is appropriate.
6. Tighten the nut in position ①/② (use a 13 mm open-end wrench to keep the bolt of position ①/② in fixed position while using a 13 mm open-end wrench to tighten the nut in position ①/② at the same time).

5.5 Parking and braking adjustment



Fig. 8



Fig. 9

1. As shown in Fig. 10, step on the brake pedal (49) and push down the parking lever (50). If the vehicle still moves down along the ramp, you need to move the vehicle to a level ground.
2. As direction shown in Fig. 8, use a 14 mm open-end wrench to rotate the nut behind the brake cable backwards for a distance of 2 mm and pull the cable forwards for a distance of 2 mm.
3. Tighten the nuts at both ends.
4. If there is no adjusting stroke available for the cable thread as shown in Fig. 8, alternatively adjust as direction shown in Fig. 9.
5. Rotate the nut in the front of the vehicle forwards for a distance of 2 mm and pull the cable backwards for a distance of 2 mm.
6. Tighten the nuts at both ends.
7. After adjusting the cable on a level ground, move the vehicle to a 16.7° ramp, for parking operation.
8. If the parking fails again, repeat the adjustment above, until you can successfully park on the ramp.

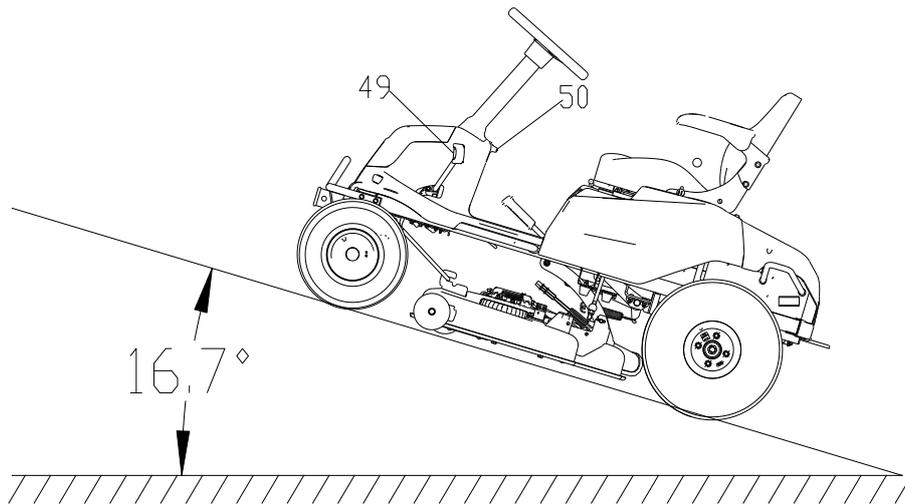


Fig. 10

49. Brake pedal

50. Parking lever

9. Move the vehicle onto a 16.7° ramp.
 10. Step on the brake pedal (49), and push the parking lever (50) down.
 11. Keep the parking lever (50) pushed down and release the braking pedal (49).
- If the vehicle does not move down along the ramp, it means that the parking is effective.

5.6 Potentiometer voltage adjustment



Fig. 11

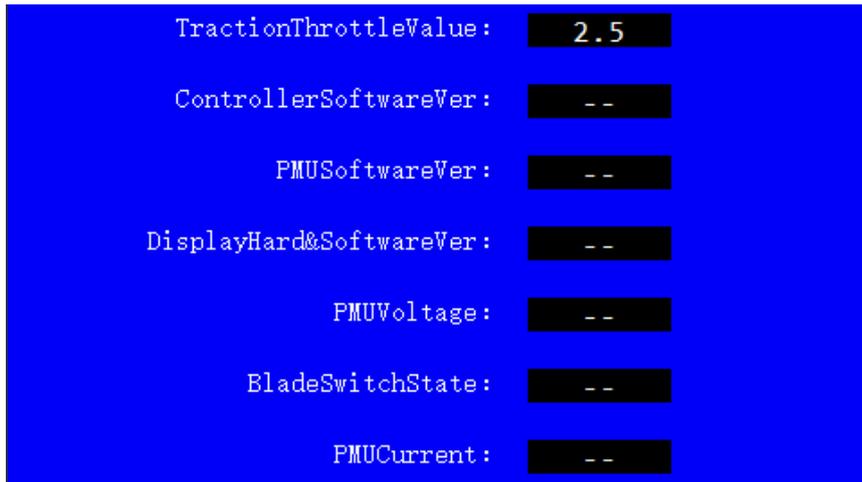


Fig. 12

1. Turn on the vehicle main power and make sure that the control levers are in the middle position and open status.



2. Press and hold the buttons ( and ) for more than 3 seconds, as shown in Fig.11. Then will enter the system management interface.
3. The voltage value displayed in the screen, as shown in Fig.12. The values in the first row represent the voltage of potentiometers. Please refer to the data in the following table for adjustment.

Accelerator Position	Initial	Rearmost
Standard range of the voltage	0.7-1.0 V	4.6-4.9 V

6. Seat and battery compartment

6.1 Seat

Removal:

1. Turn the seat with the seat pan forwards until the seat fall onto the steering wheel.
2. Pull out the protective cover (3).
3. Use a 13 mm socket wrench to loosen the nut (2) counterclockwise and remove the flat washer (1). All four groups shall be dismantled.
4. Pull out the seat switch connector as shown in Fig. 2.
5. Remove the seat from the retaining plate.

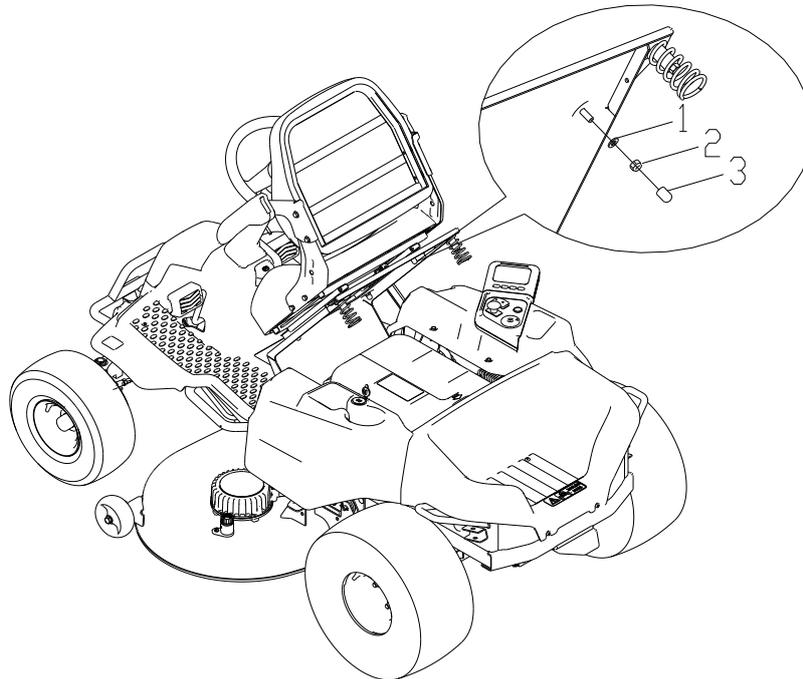


Fig.1

- | | |
|-----------------------------|---------------------|
| 1. Flat washer Φ 8 | 3. Protective cover |
| 2. 5/16-18 self-locking nut | |



Fig.2

NOTE:

Before the seat removal, disconnect the connector shown in Fig. 2 to prevent harness or switch damage.

Installation:

1. Align four bolts at the bottom of seat with four mounting holes for the seat mounting plate. Put the seat on the seat pan and roll it forward together with the seat pan.
2. Install the plain washer (1) and use a 13 mm socket wrench to tighten the nut (2) diagonally. Tighten the nut on the other diagonal line.
3. Wrap the nut (2), the plain washer (1) and the exposed part of the seat bolts with the protective cover (3).
4. Properly install the seat switch connector to complete the seat installation.

6.2 Battery compartment

Before removing the battery compartment, you must remove the cargo bed first.

Removal: cargo bed & battery compartment & battery pack

1. Turn off the vehicle main power.
2. Use a T30 screwdriver to remove the eight binding bolts (Fig.3).
3. Remove the cargo bed of the vehicle.

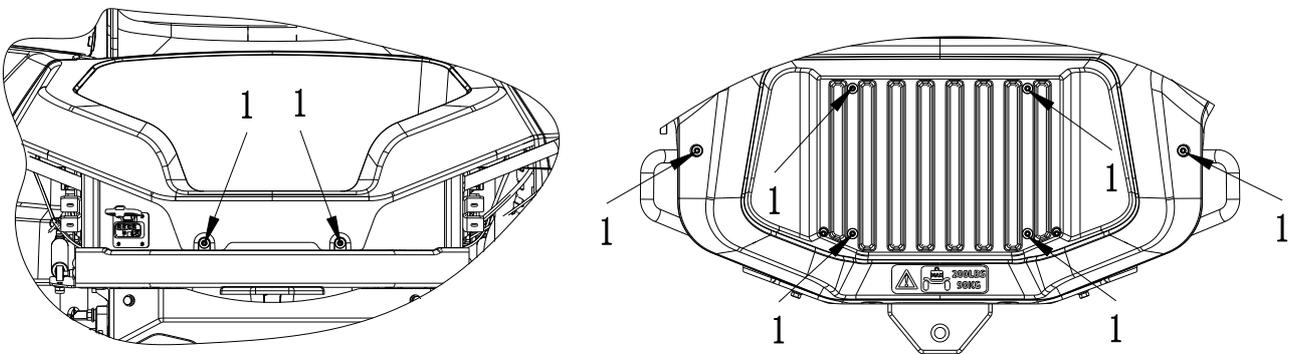
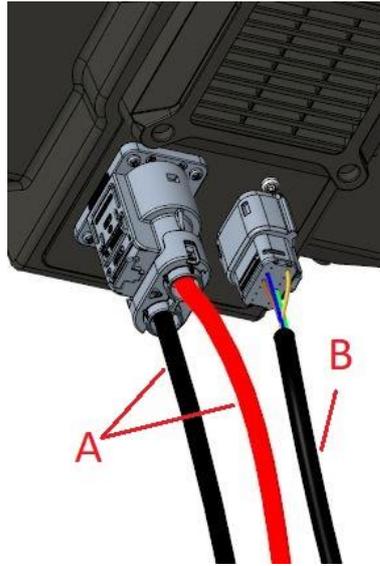


Fig. 3



The battery compartment.

Fig.4

A. Harness - Power

B. Harness - Control & Signal

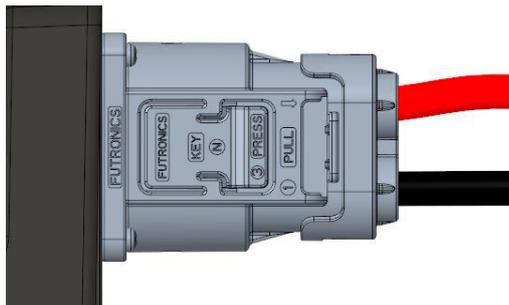


Fig.5-1

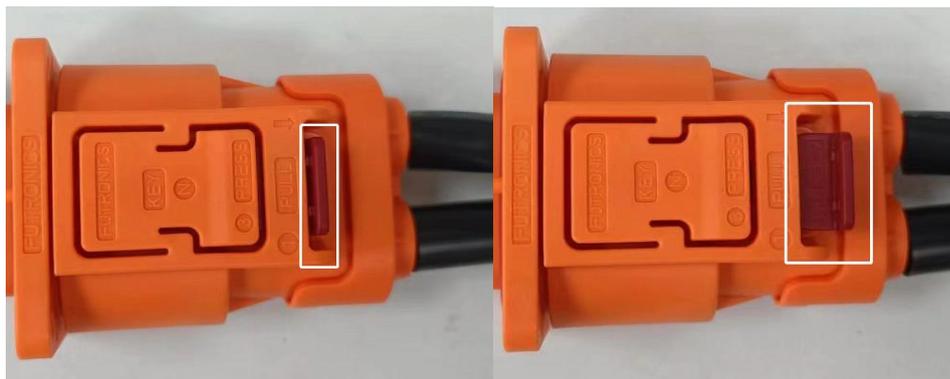


Fig.5-2 Pull back the plug CPA

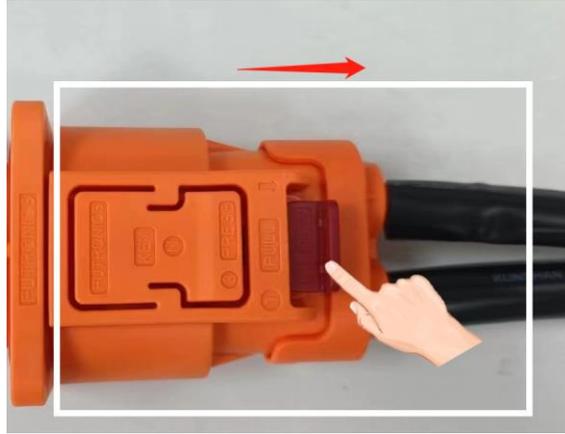


Fig.5-3 Push the CPA down and pull the plug back

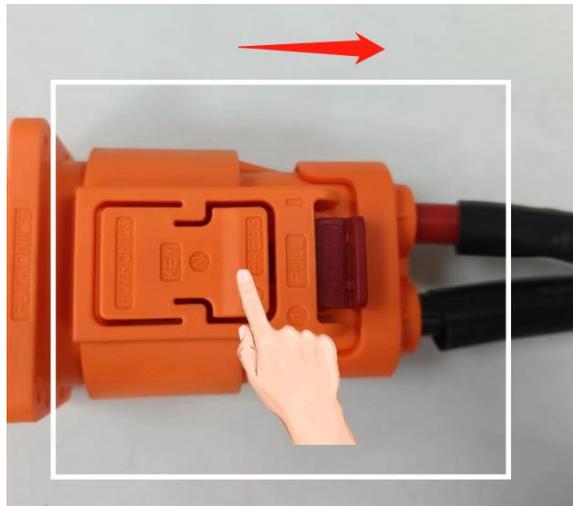


Fig.5-4 Press down the key position and pull out the plug backwards. The plug socket is separated.

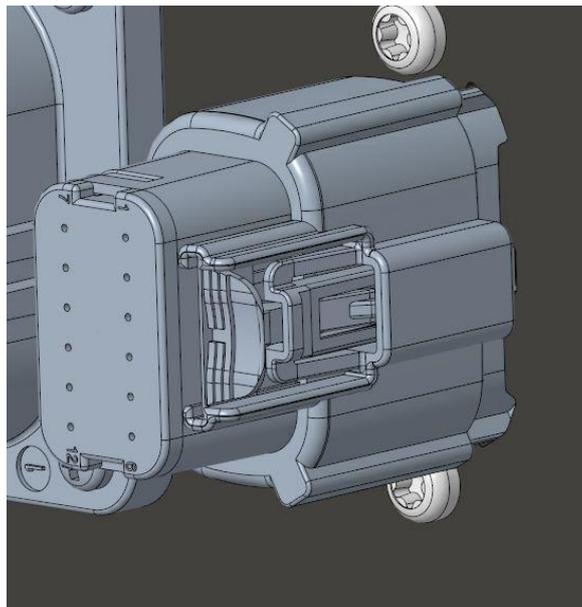


Fig.6-1

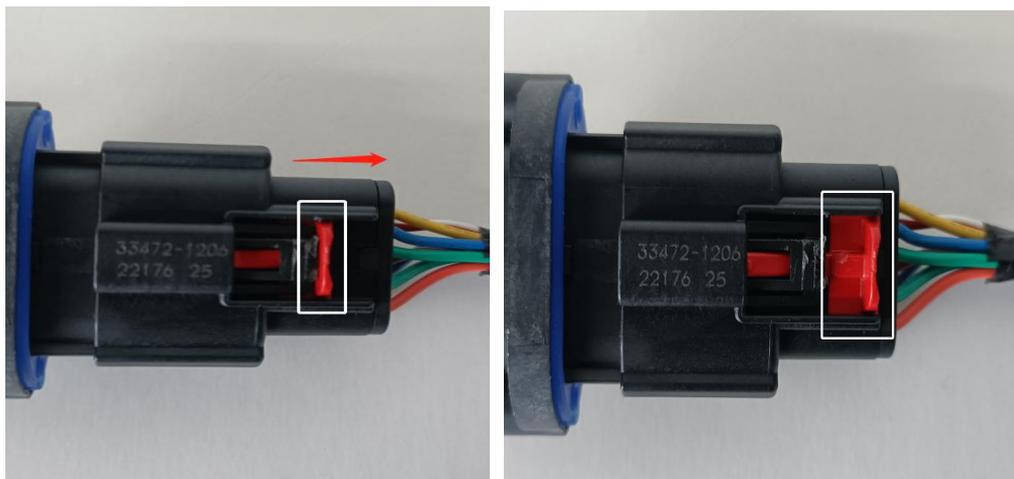


Fig.6-2 Pull back the plug CPA

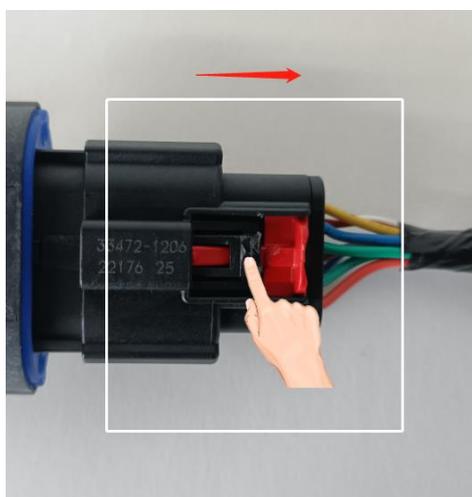


Fig.6-3 Press down the key position and pull out the plug backwards. The plug socket is separate.

4. Remove all the battery packs (3) from the battery compartment (2).
5. Loosen the connector of the harness (A) as shown in Fig.4 and Fig.5).
6. Loosen the connector of the harness (B) as shown in Fig.4 and Fig.6).
7. Use a 13 mm socket to loosen the four nuts (1) in Fig.7 by rotating counterclockwise and remove them.
8. Remove the battery compartment from the vehicle.

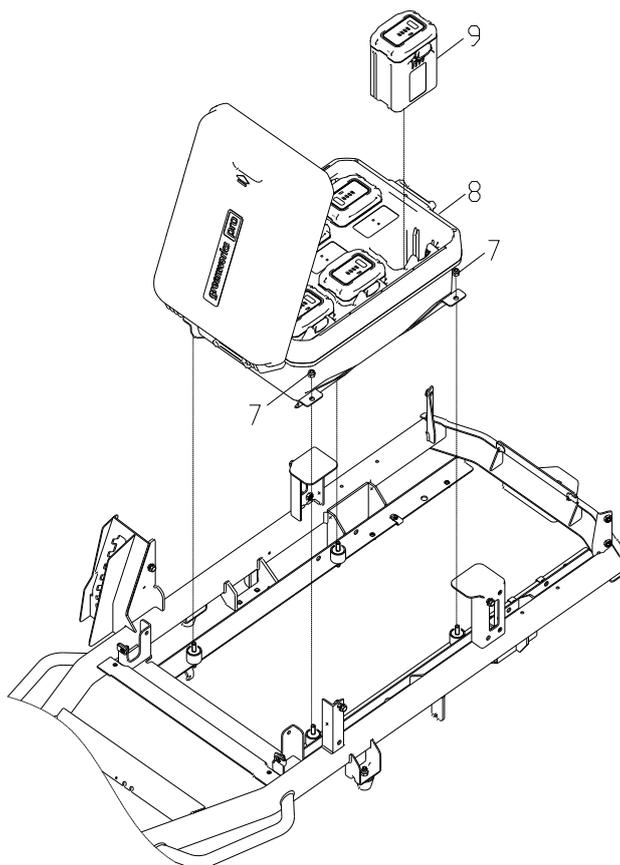


Fig. 7

- | | |
|------------------------|-----------------|
| 1. Nut M8 | 3. Battery pack |
| 2. Battery compartment | |

Installation:

1. Align the four mounting holes of the support beneath the battery compartment (2) with the four studs on the vehicle rubber pad.
2. Using a 13 mm socket wrench, tighten the nuts (1) to the rubber pad by rotating clockwise.
3. Install A, B connectors in Fig.4 to the battery compartment (2).
4. Put the battery pack (3) into the battery compartment (2).
5. Close the cover of the battery compartment (2) and turn the seat over to its original position.
6. Mount the cargo bed onto the frame with a T30 screwdriver and eight M6 hexagon socket fancy pan head screws at eight positions as marked in red circles in Fig.3.

7. Controllers and other components

7.1 3-in-1 controller

Removal:

1. Remove the cargo bed first as described in **6.2**.
2. Power off the vehicle.
3. Use a T30 screwdriver to loosen and remove all four hexalobular socket pan head screws (3) counterclockwise.
4. Dismantle the mounting plate (4).
5. Use an Allen wrench (tip size 6 mm) to loosen and remove all four hexagon socket head cap screws (2) counterclockwise, and loosen all terminals on the controller.
6. Remove the controller (1).

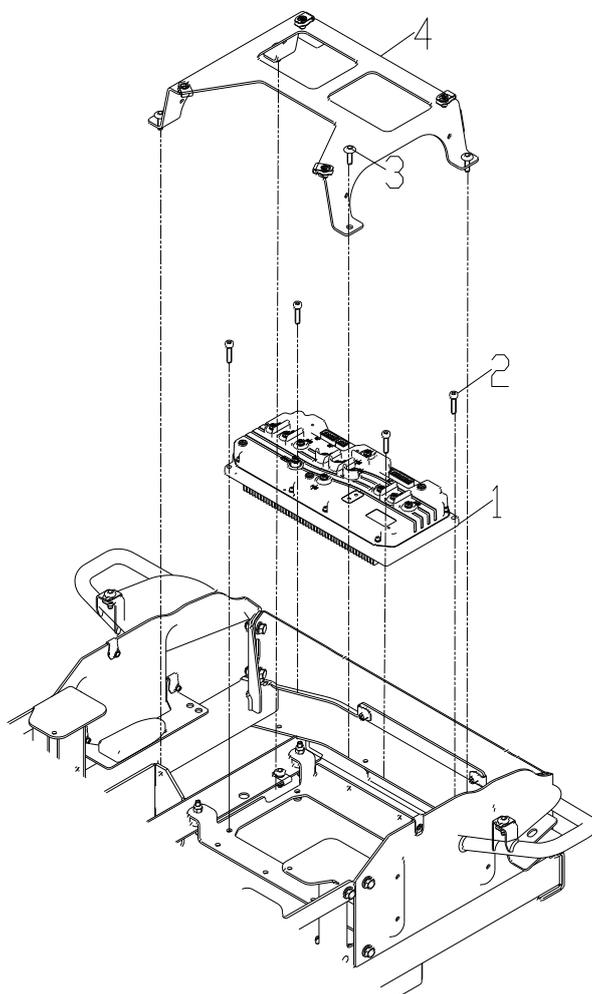


Fig. 1

- | | |
|----------------------------------|---|
| 1. 3-in-1 controller | 3. Hexalobular socket pan head screw M6 |
| 2. Hexagon socket head cap screw | 4. Mounting plate |

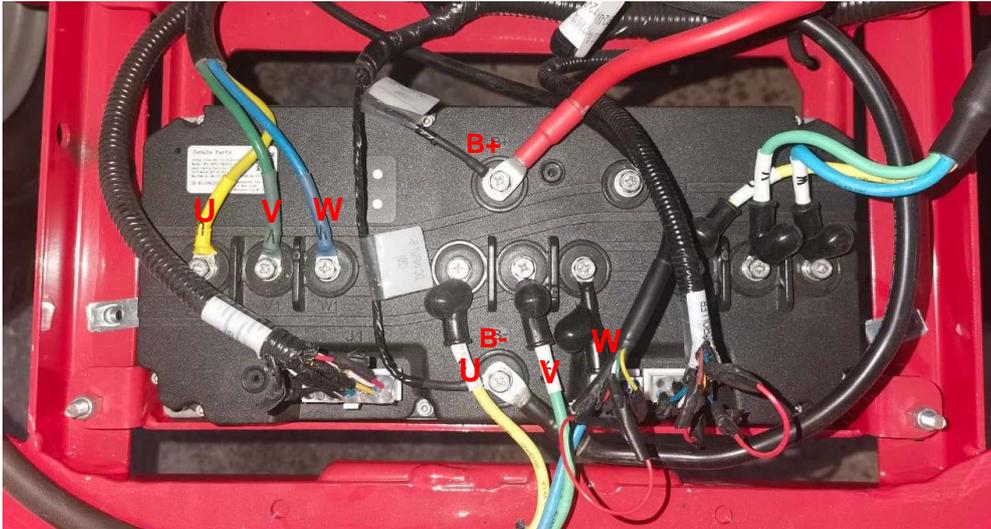
Installation:

Fig. 2

1. As shown in Fig. 2, connect the yellow wire to point U of the drive controller, connect the green wire to point V, the blue wire to point W, the red wire to point B+ and the black wire to point B-.
2. As shown in the steps for drive controller removal above, install in reverse order.
3. Switch on the power source and start the machine to see if the vehicle works properly.

7.2 DC-DC

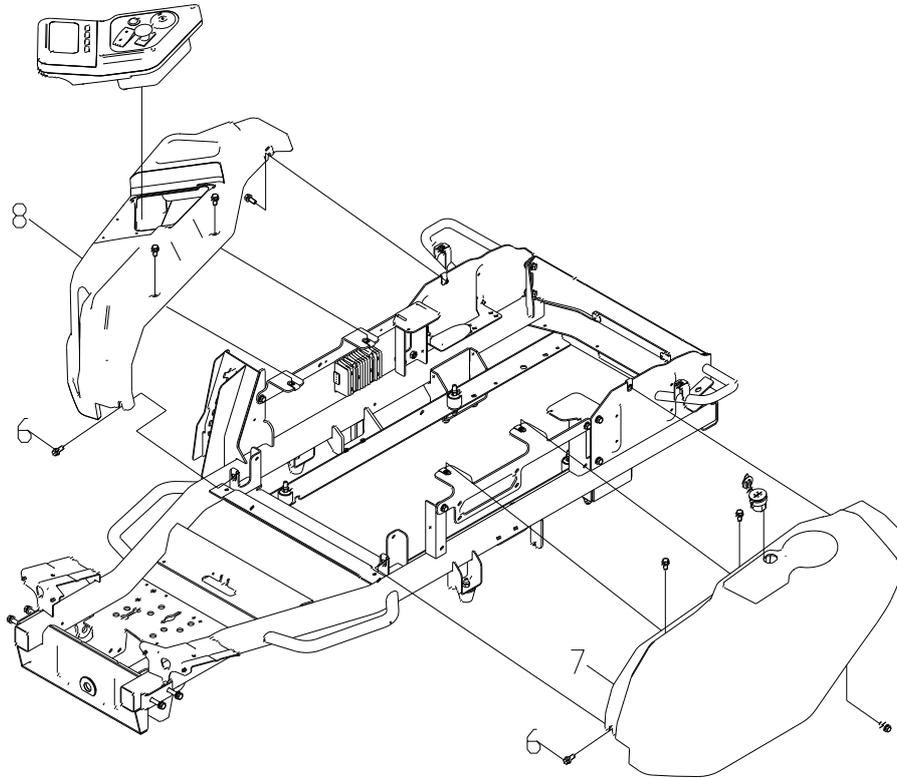


Fig.4

- 6. Bolt M8
- 7. Left enclosure
- 8. Right enclosure

Removal:

1. Loosen the assembling bolts (6) (totally 8 bolts for left & right enclosures) counterclockwise with a 13 mm socket wrench.
2. Pull out all harness connectors by referring to the removal steps for the switch panel and USB shown in 5.1 above.
3. Make sure that the harness is not attached to the enclosure components.
4. Remove the left & right enclosures from the frame.

Note: DC-DC and antenna is under the right enclosure (8).

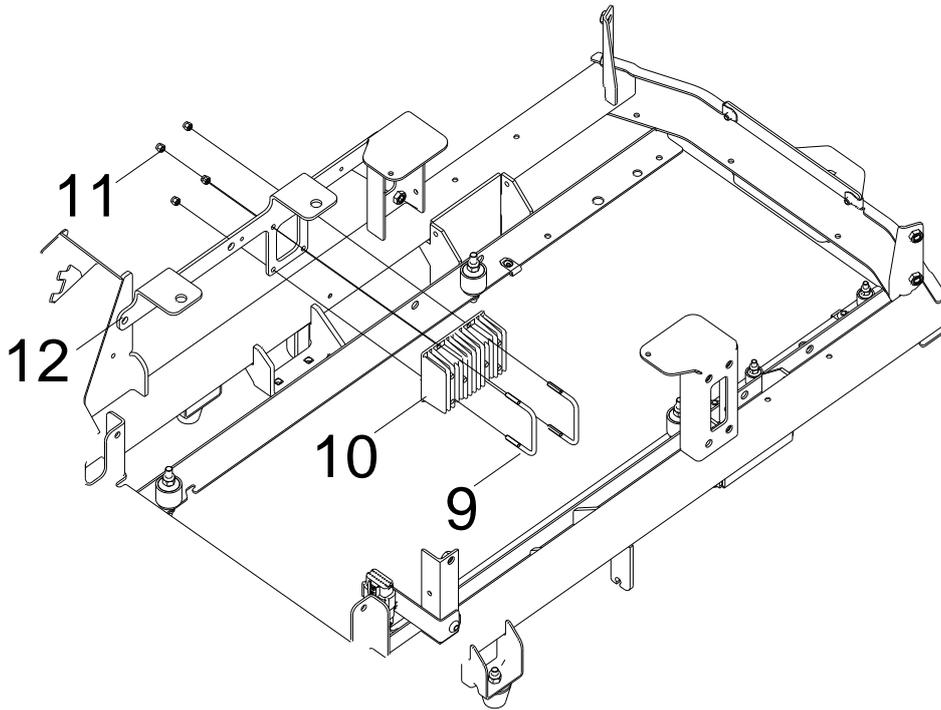


Fig. 5

9. Locking rod

11. Locking nut M5

10. DC-DC

12. Mounting plate

Removal:

1. Disassemble the right enclosure (see 7.2 for detailed steps).
2. Turn off the vehicle main power.
3. Disconnect the connector in the DC power (10).
4. Use an 8 mm socket to loosen the nut (11) by rotating counterclockwise and remove the locking rod (9).
5. Remove the DC power source (10).

Installation:

1. Use the locking rod (9) to install the DC-DC (10) on the mounting plate (12) and align the holes on them.
2. Use an 8 mm socket to fasten the nut (11) to the locking rod (9) with a tightening torque of 5-6 N•m (3.7~4.4 Ft-lbs).
3. Connect all the connectors properly.
4. Install the right enclosure in place (8).

8. Front and rear wheels, drive axle

8.1 Front wheel

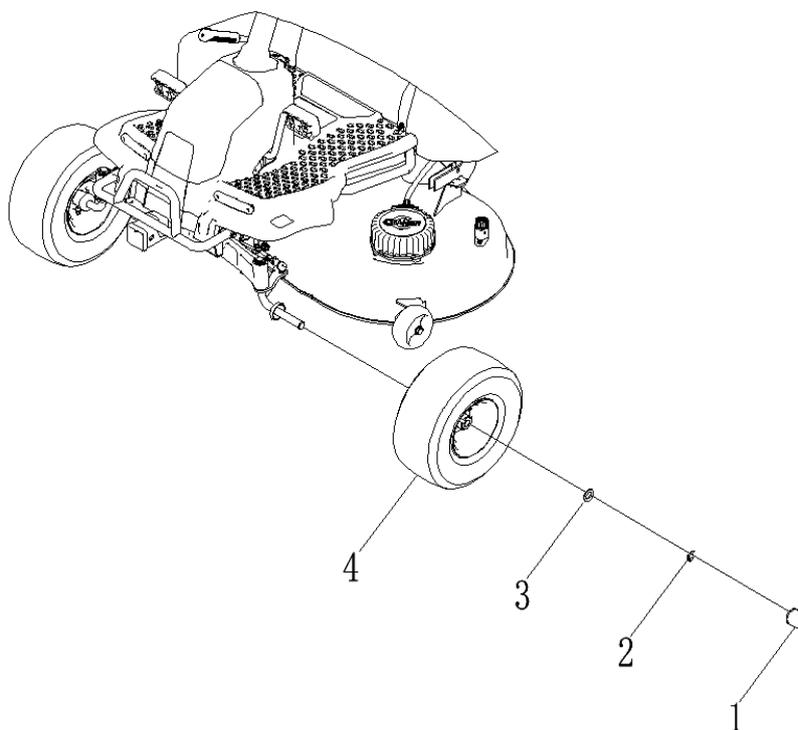


Fig. 1

- | | |
|----------------------|----------------|
| 1. Front wheel cover | 3. Washer |
| 2. E-ring | 4. Front wheel |

Removal:

1. Using a hoisting tool, lift the front end of the vehicle and lift the front wheels off the ground.
2. With protective gloves properly on, pull out the front wheel cover (1).
3. Use a medium-sized slotted screwdriver to insert into the gap of the E-ring (2) and rotate.
4. Remove the E-ring (2).
5. Remove the washer (3).
6. Remove the front wheel assembly (4).
7. Dismantle the other front wheel by repeating the same steps above.

Installation:

1. Make the gas nozzle of the front wheel face outwards and align the central bearing hole with front wheel axle.
2. Install the washer and fix the E-ring.
3. Grease the front wheel with a grease gun until there is grease in the mating hole.
4. Install the front wheel cover.
5. Adjust the pressure of the front wheel installed to 24~26 PSI.

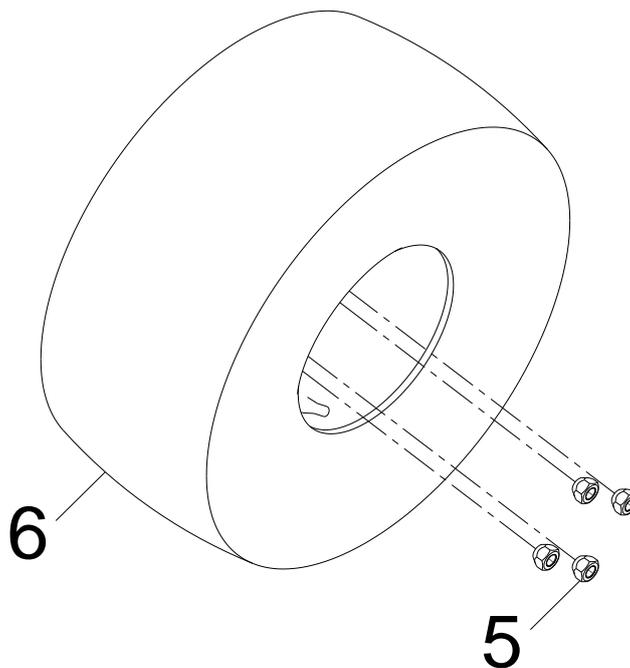
8.2 Rear wheel

Fig. 2

5. Clamp nut 1/2-2 UNF

6. Rear wheel

Removal:

1. Park the vehicle as the steps shown in **5.2 above** (purpose: rear wheel will not run when its clamp nut is loosened).
2. According to Fig. 2, lift the rear end of the vehicle up to a certain height, until the rear wheels are lifted off the ground.
3. Loosen and remove the nut (5) (eight nuts in total for left and right rear wheels) counterclockwise with a 21 mm socket wrench.
4. Upon removal of all nuts, dismantle the rear wheel (6) from the drive axle.

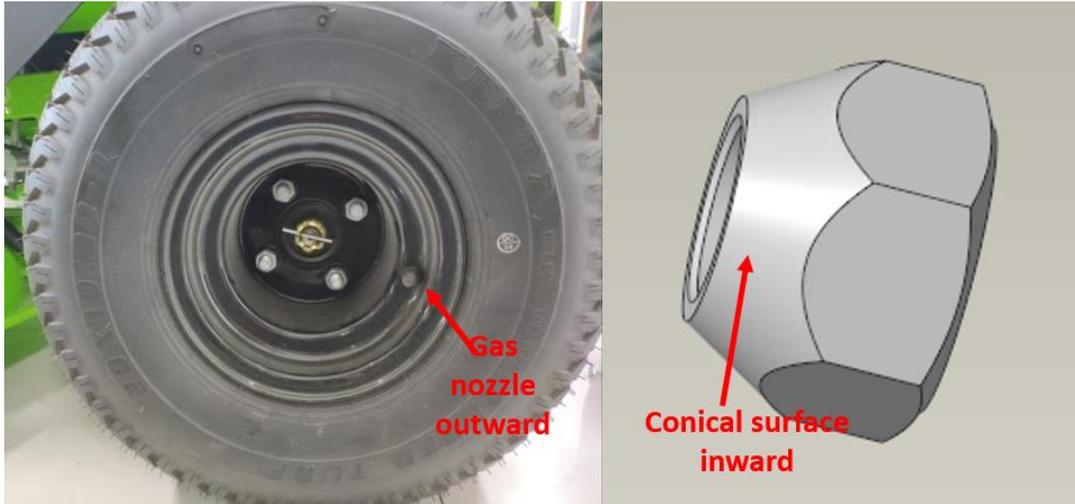


Fig. 3

Installation:

1. Park the vehicle as the steps shown in 5.4 above (purpose: rear wheel will not run when its clamp nut is tightened).
2. According to Fig. 2, lift the rear end of the vehicle up to a certain height.
3. As shown in Fig. 3, make the gas nozzle of the rear wheel facing outwards and make the conical surface of the clamp nut facing inwards. Tighten the clamp nuts (eight nuts in total for left & right rear wheels) clockwise with a 21 mm socket wrench to the torque of 95 N.m.
7. Adjust the pressure of the rear wheels installed to 8~10 PSI.

NOTE:

After completing the installation of front and rear wheels by following steps mentioned above, refer to 4.4.3 to adjust the deck again.

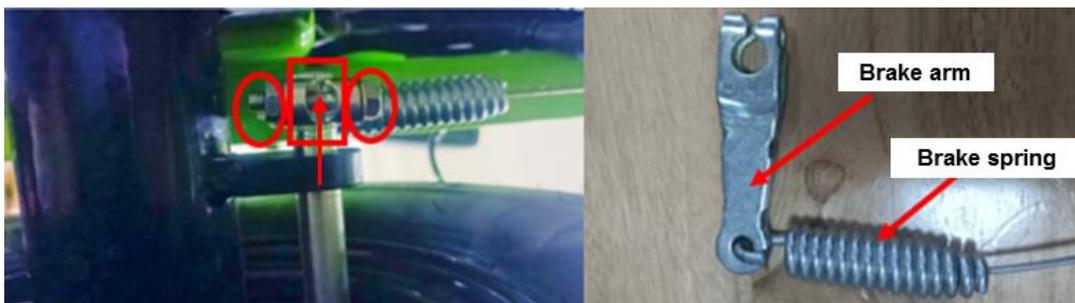
8.3 Drive axle

Fig.4

Removal:

1. Make a color mark between the brake arm gap and the spline shaft (in red box: make an alignment mark for the arm and the spline shaft, as indicated by the arrow in Fig. 4).
2. Use a 10 mm open-end wrench to fix the bolt in red circles in Fig. 4 while using a 10 mm open-end wrench to loosen the nuts in red circles.
3. Remove the brake spring from the brake arm circle hole.
4. Install and fix the brake arm to the position marked in red box. (see Fig. 4)

5. Refer to 7.1 to remove controller.



6. Use a 15 mm open-end wrench to tighten the nut (7) in Fig.6. Use a 16 mm socket wrench to remove the bolt (8) by rotating counterclockwise in Fig. 6 (four sets of bolts and nuts in total for front & rear wheels).
7. Lift the frame tail up and rotate the rear wheel.
8. Remove the drive axle from the frame together with the rear wheels.
9. Loosen and remove the nut (5) in Fig.2 (eight nuts in total for left & right rear wheels) counterclockwise with a 21 mm socket wrench.
10. Remove the rear wheels at both sides of the drive axle.

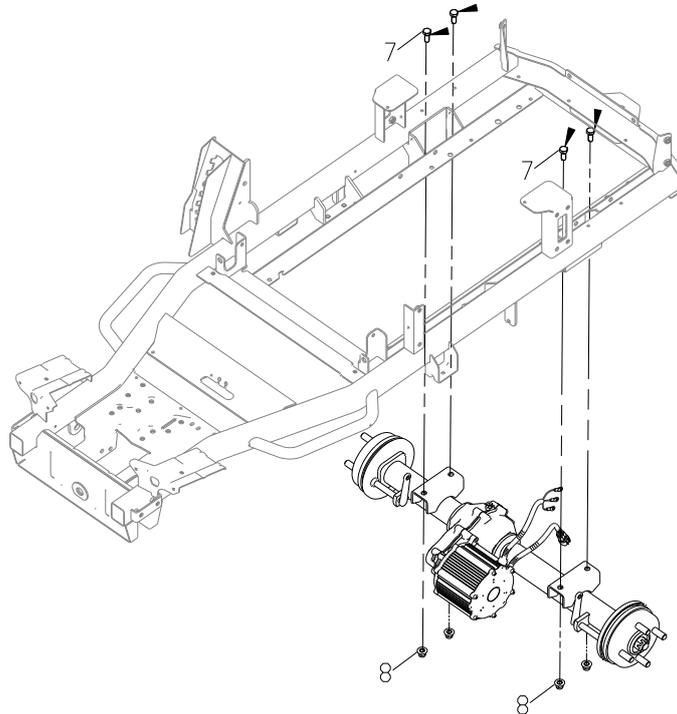


Fig. 6

11. Bolt M10

12. Nut M10

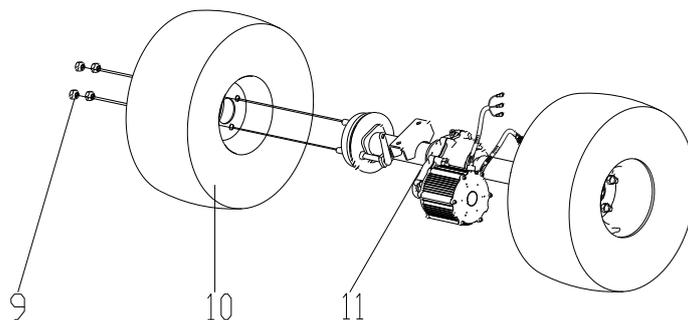
Installation:

Fig. 7

9. Clamp nut 1 / 2-2 UNF

11. Drive axle

10. Rear wheel

1. As shown in Fig. 7, pre-install the rear wheels and drive axle.
2. Fix the rear wheel (10) onto the drive axle (11) with a 21 mm socket wrench and nut (9) to a torque of 95 N.m.
3. Lift the frame tail up, push the drive axle and rear wheels pre-installed under the frame and make sure that the motor faces forwards.
4. Fix brake spring into mounting hole for brake arm of the drive axle.
5. Fasten four sets of bolts & nuts as shown in Fig. 6 above to a torque of 45 N.m.
6. Refer to the wiring method shown in Fig. 5 above, install the three-phase terminals and hall sensor connectors.
7. Mount the cargo bed.

8.4 Gearbox oil change

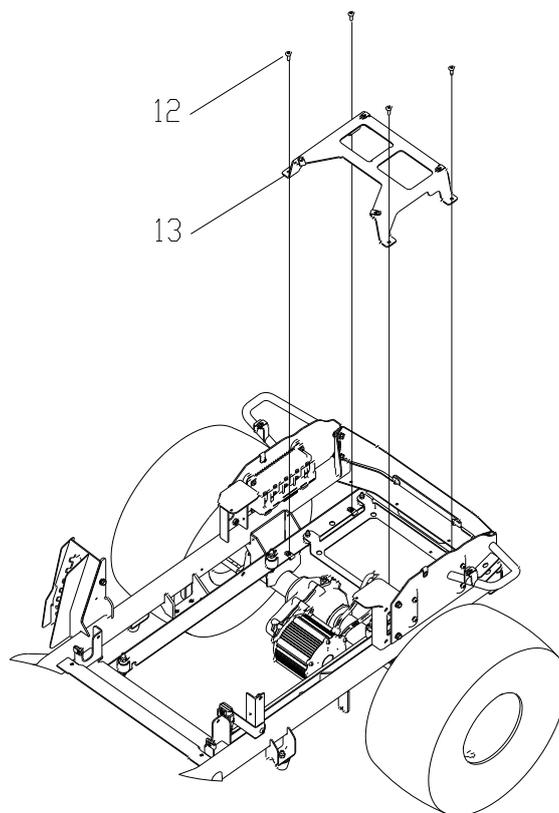


Fig. 8

12. Hexalobular socket pan head screw 13. Mounting plate
14. Fixing support

1. Remove the cargo by repeating steps in **6.2** for cargo removal.
2. As shown in Fig. 8, use a T30 screwdriver to remove the screw (12).
3. Remove the mounting plate.
4. Pull out the connectors connected to the six connecting ports of the fixing support.
5. Remove the fixing support (14).
6. Now you can see the oil inlet for drive axle.

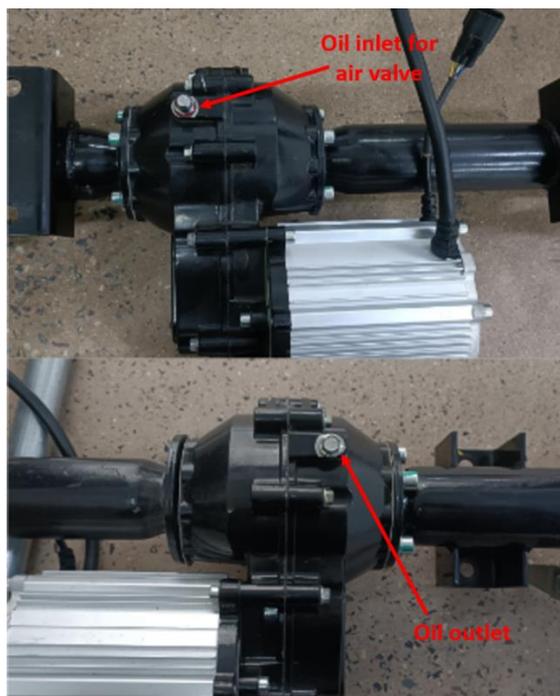


Fig. 9

The gear oil needs to be renewed after a period of time.

First oil change interval for a new vehicle	50 h
Subsequent oil change interval	200 h
Oil specification	SAE85W-90
Oil consumption per gearbox	130 ml

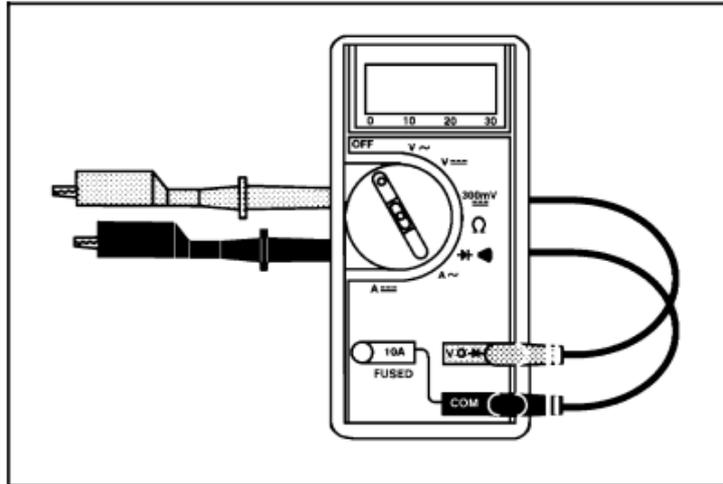
Oil change steps:

1. Remove the bolt of the oil outlet with a 10 mm socket wrench.
2. Remove the bolt of the oil inlet with a 12 mm socket wrench.
3. Discharge all gear oil used in the gearbox.
4. Install the bolt of the oil outlet to a torque of 9 N.m.
5. Add 130 ml gear oil into the oil inlet with the model of SAE85W-90.

9. Special tools

Order special tools from your Distributor. Some tools may also be available from a local supplier.

9.1 Multimeter



The multimeter can test electrical components and circuits for current, resistance or voltage.

NOTE:

Greenworks recommends the use of a DIGITAL Volt-Ohm-Amp multimeter when testing electrical circuits. The high impedance (internal resistance) of a digital meter in the voltage mode will make sure that excess current is not allowed through the meter. This excess current can cause damage to circuits not designed to carry it.

9.2 Special tools

Tools	Cable to Flash Program	Host Computer Program	Remarks
CAN Interface		According to the purpose of each model	ERP: R0203845-00 UPC: 195526020639

10. Specifications

10.1 CRT specifications

ERP	7404507RU
Series Name	GC82LT107
Brand	Greenworks
Weight (lbs)	456.4
Dimension (inch)	61*46*53
Battery (Wh)	360
Battery QTY (PCS)	0
Battery Model	80V 5AH
Power type	Lithium-ion
Voltage (v)	80
Charger Included	0
Charge Time (hrs)	5h (with 80V 600W charger)
Deck Lift System	Manual
Deck Gauge	12
Cutting Range (inch)	1.5"-4.5"
Cut Width (Inch)	42
Cut Height Adjustment	7
Cutting System Motor (kw)	1.2
Number of Blades	2
Blade Speed (RPM)	3200/3000/2400
Blade Tip Speed (m/s)	91.7/86/68.6
Deck Construction	Stamp
Mowing Type	Side-discharge, Mulching
Drive Motor System (kw)	1.2
Cutting Motor System (kw)	1.2
Front Wheel Size	15*6-6
Rear Wheel Size	20*10-8
Turning Radius (inch)	15

Max Forward Speed (mph)	8
Max Forward Cutting Speed (mph)	5
Max Reverse Speed (mph)	2.9
Noise decibel(dB)	< 100
Slope degree (°)	15.0
Cutting Area (acres)	2-2.5
Cargo Storage ability (lbs)	200
Cargo Storage ability when climb hill (lbs)	90
Life Time (hrs)	200
IP Level	X4
Ambient temperature (°C)	-10~40
Brake system	Electromagnetic
Bucket	√
Phone Holder	√
Cup Holder	√
LED Light	√
USB	√
Display	√
Accessories port	Mechanical Only
Bagger	Optional
Bagging Blades	Optional
Mulching Blades	√
4G/GPS	√
APP	√

10.2 Torque specifications

Torque Specification Chart (General Standard Parts)							
Diameter of Thread (mm)	Pitch value of Thread (mm)	Tighten Torque Spec (Mechanical Property of Grade 8.8 for Fasteners components)					
		Standard Value		Max Value		Min Value	
		N•m	Ft-lbs	N•m	N•m	N•m	Ft-lbs
6	1	9.0	6.6	12.0	8.9	6.0	4.4
8	1.25	23.0	17.0	26.0	19.2	16.0	11.8
8	1	25.0	18.5	28.0	20.7	17.0	12.5
10	1.5	59.0	43.5	75.0	55.4	37.0	27.3
10	1.25	63.0	46.5	79.0	58.3	45.0	33.2
10	1	64.0	47.2	80.0	59.0	46.0	33.9
12	1.75	95.0	70.1	111.0	81.9	73.0	53.9
12	1.5	97.0	71.6	113.0	83.4	75.0	55.4
12	1.25	99.0	73.1	115.0	84.9	78.0	57.6
14	2	160.0	118.1	185.0	136.5	122.0	90.0
14	1.5	180.0	132.8	205.0	151.3	146.0	107.7
16	2	215.0	158.7	245.0	180.8	182.0	134.3
16	1.5	240.0	177.1	270.0	199.3	199.0	146.9
18	2.5	268.0	197.8	298.0	219.9	229.0	169.0
18	1.5	316.0	233.2	346.0	255.4	287.0	211.8
20	2.5	430.0	317.3	470.0	346.9	389.0	287.1
20	1.5	440.0	324.7	480.0	354.2	396.0	292.3

Torque Specification Chart (General Standard Parts)							
Diameter of Thread (mm)	Pitch value of Thread (mm)	Tighten Torque Spec (Mechanical Property of Grade 10.9 for Fasteners components)					
		Standard Value		Max Value		Min Value	
		N•m	Ft-lbs	N•m	N•m	N•m	Ft-lbs
10	1.5	74.0	54.6	90.0	66.4	52.0	38.4
10	1.25	78.0	57.6	93.0	68.6	63.0	46.5
10	1	80.0	59.0	95.0	70.1	65.0	48.0
12	1.75	140.0	103.3	156.0	115.1	105.0	77.5
12	1.5	142.0	104.8	158.0	116.6	106.0	78.2
12	1.25	145.0	107.0	161.0	118.8	108.0	79.7
14	2	175.0	129.2	200.0	147.6	141.0	104.1
14	1.5	210.0	155.0	235.0	173.4	178.0	131.4
16	2	280.0	206.6	310.0	228.8	200.0	147.6
16	1.5	305.0	225.1	335.0	247.2	240.0	177.1
18	2.5	437.0	322.5	467.0	344.6	380.0	280.4
18	1.5	467.0	344.6	507.0	374.2	397.0	293.0
20	2.5	528.0	389.7	568.0	419.2	450.0	332.1
20	1.5	558.0	411.8	598.0	441.3	475.0	350.6

Torque Specification Chart (General Standard Parts)							
Diameter of Thread (mm)	Pitch value of Thread (mm)	Tighten Torque Spec (Mechanical Property of Grade 4.6 for Fasteners components)					
		Standard Value		Max Value		Min Value	
		N•m	Ft-lbs	N•m	N•m	N•m	Ft-lbs
6	1	4.0	3.0	5.5	4.1	2.5	1.8
8	1.25	8.0	5.9	11.0	8.1	5.0	3.7
8	1	8.5	6.3	11.5	8.5	5.5	4.1
10	1.5	19.7	14.5	29.7	21.9	14.3	10.6
10	1.25	20.8	15.4	25.8	19.0	16.7	12.3
10	1	21.8	16.1	26.5	19.6	17.0	12.5
12	1.75	37.3	27.5	43.3	32.0	28.0	20.7
12	1.5	38.5	28.4	45.0	33.2	29.0	21.4
12	1.25	39.6	29.2	48.0	35.4	30.0	22.1
14	2	61.2	45.2	75.0	55.4	46.8	34.5
14	1.5	74.6	55.1	92.0	67.9	56.0	41.3
16	2	95.0	70.1	115.0	84.9	73.0	53.9
16	1.5	105.0	77.5	133.0	98.2	76.0	56.1
18	2.5	142.9	105.5	178.0	131.4	107.4	79.3
18	1.5	157.6	116.3	190.0	140.2	124.5	91.9
20	2.5	188.0	138.7	230.0	169.7	135.0	99.6
20	1.5	203.7	150.3	243.0	179.3	149.0	110.0

Torque Specification Chart (General Standard Parts)							
Diameter of Thread (mm)	Pitch value of Thread (mm)	Tighten Torque Spec (Mechanical Property of Grade 5.6 for Fasteners components)					
		Standard Value		Max Value		Min Value	
		N•m	Ft-lbs	N•m	N•m	N•m	Ft-lbs
6	1	4.5	3.3	6.0	4.4	3.0	2.2
8	1.25	10.6	7.8	14.0	10.3	7.0	5.2
8	1	11.0	8.1	15.0	11.1	8.0	5.9
10	1.5	26.0	19.2	33.0	24.4	19.0	14.0
10	1.25	28.0	20.7	34.0	25.1	22.0	16.2
10	1	29.0	21.4	35.0	25.8	23.0	17.0
12	1.75	45.0	33.2	53.0	39.1	37.0	27.3
12	1.5	47.0	34.7	56.0	41.3	38.0	28.0
12	1.25	50.0	36.9	60.0	44.3	40.0	29.5
14	2	81.0	59.8	95.0	70.1	62.0	45.8
14	1.5	90.0	66.4	105.0	77.5	68.0	50.2
16	2	124.0	91.5	150.0	110.7	98.0	72.3
16	1.5	132.0	97.4	160.0	118.1	101.0	74.5
18	2.5	190.0	140.2	220.0	162.4	161.0	118.8
18	1.5	200.0	147.6	230.0	169.7	165.0	121.8
20	2.5	231.6	170.9	272.0	200.7	190.0	140.2
20	1.5	236.6	174.6	285.0	210.3	197.0	145.4