

Operator Agreement & Safety Acknowledgement

The Grator Lowrider is a powerful mower designed for steep terrain. This agreement protects both parties and establishes your responsibilities and rights. Your safety depends on following this manual and using good judgment. Without this agreement, we would have to add excessive safety features that could reduce the Grator's capabilities.

Operator Responsibility (Indemnification)

I accept full responsibility for operating the Grator Lowrider safely, following the user manual, and using good judgment. I am liable for any harm caused by my operation, including actions by others operating with my permission or due to my negligence. I will not permit unskilled persons or minors to operate it. If I sell the Grator, I will ensure the new owner accepts Grator's terms (grator.com/terms), or I remain liable.

Essential Safety Promises

- I will verify all controls are in neutral position and ensure a clear 6m (20ft) safety perimeter before powering on
- I and all bystanders within the safety perimeter will wear protective clothing, including ANSI Z87.1/EN 166 compliant face shields, to prevent injury from ejected debris.
- I will immediately stop if anyone/animal enters the safety perimeter
- I will prevent anyone from standing downhill (rollover risk) or uphill (slip/fall risk) during operation
- I acknowledge this is a professional-grade machine requiring my full attention and skill
- I will practice in a safe, open area until confident and never operate when impaired
- I understand promotional videos showcase controlled conditions not for normal operation
- I will charge batteries in open areas away from flammables and store/inspect properly
- I understand the 70° slope rating is an engineering limit, not a safe operating recommendation. Slopes over 40° drastically increase rollover risk.
- I will carefully assess slopes considering terrain, obstacles, and my skill level
- In limited visibility, I will proceed with extreme caution watching for hidden hazards

EU law grants consumers who purchase online 14 days to withdraw. However, you are liable for diminished value from handling beyond necessary testing (Article 14(2), Directive 2011/83/EU). This applies only to consumer purchases. Business/professional purchases: No withdrawal rights, all sales final.

Testing is limited to a maximum 30 minutes runtime on 100m² area to verify basic functions (less than 1/4 battery cycle). You will be charged for diminished value if inspection reveals: grass residue/dirt buildup inside deck beyond minimal testing, wheel wear, blade dulling, scratches indicating production use, battery usage beyond testing, or any use exceeding these testing limits.

We photograph all units before shipping and track battery cycles through BMS data. Returns showing excessive use will be charged €50/operational hour (estimated from wear patterns and battery cycles) plus restoration costs. You bear return shipping costs (€150-300).

I confirm I have read and understood this document and the user manual, acknowledge the risks, and accept full responsibility for safe operation.

Owner: _____, Signature: _____, Date: _____

Grator Lowrider Operating Manual

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Quick Summary

Grator Safety Tips:

- **WARNING, Dangerous Machine:** The Grator can cause injuries if you accidentally press the joystick while near the wheels. Shrapnel can fly around, so protect your face with a ANSI Z87.1/EN 166 compliant face shield and stay at least 6 meters (20 feet) away during operation. Avoid standing downhill from the Grator as it can roll over and hit you. Also avoid standing above it as you can slip and get your limbs under the mower.

Starting the Grator:

- **Tighten the screws:** Hand-tighten all three thumb-screws around the Grator's mask. Before each use, check all other screws and wrench-tighten if needed. **Do not tighten the 8 joint screws** (holding the driving axis and lifting motors). They have to be slightly loose to allow movement.
- **Joystick Position:** Ensure all joystick buttons are in a neutral position before turning on the power. The mowing blade rotary button should be turned all the way off (to the left).
- **Cable Safety:** When closing the mask make sure the cable that connects the mask to the rest of the machine is positioned so that it can't touch the mower motor. Shape the cable in a half-circle away from the motor. If the mask doesn't close properly, adjust the cable.
- **Starting the Blade:** To start the mowing blade, gently turn the rotary button (front left side) to the right. Turn it slowly; if you turn it too fast, the blade will stop. Turn it in small increments. You can't start the blade in thick grass. Move the Grator to a clear area or increase its height so that the blade can spin freely when starting up.

Proper Use:

- **Keep the underside clean:** Regularly clean the underside of the Grator. Mud and wet grass sticks to the mower deck and reduces the blade's working area. This makes mulching less efficient and chokes out the blade.
- **Blade Speed:** For tall, thick and wet grass or tough conditions, set the blade speed to between 50-75%. Never operate the blade at full speed because this reduces performance. For shorter grass, find the minimum efficient blade speed to extend battery life.
- **Avoid Hard Objects:** Do not hit rocks, roots, branches, or any immovable objects. If the terrain is covered with tall grass/brush, raise the deck high on the first pass so that you don't hit any hidden obstacles.
- **Check the blade hub:** Before each use, confirm the blade hub is present and not broken. Some wiggling is ok. The blade hub is a sacrificial part that sits between the motor and the blade and is designed to break on impact so the motor doesn't. Operating without a working hub can destroy the mowing motor. See Section 6.
- **Keep Dry:** Do not submerge the machine in water or use it in the rain. Do not wash it with water. The Grator is not waterproof.
- **Drive Slowly:** The Grator is a mulcher, not a mower in a classical sense. It finely shreds grass into micro clippings (no raking needed), just work slower for thicker grass and make extra passes if any clippings remain. Example video:
<https://www.youtube.com/watch?v=xvBltXUdlwk>
- **Listen to the sound of the blade:** If the sound changes, material is building up under the deck. Stop, turn the Grator off, tip it on the side and clean the deck.
- **Sharpen the blade** when the cut is no longer nice.

Understand the Difference Between Mowers and Mulchers:

- Mowers cut grass and throw it out the side. You must rake and remove the cut grass.
- Mulchers cut and finely shred the grass into tiny pieces (dust). These small pieces stay on the ground as natural fertilizer.

Key differences:

- Mulchers have a closed deck—no side opening. The grass stays inside until it is shredded completely.
- Mowers can move faster because they eject the grass out of the way.
- Mulchers must move slower, especially in tall or thick grass, to shred it completely into fine pieces. Moving too fast can clog and stop the blade.

Result:

- With a mulcher, the work is slower, but the result is cleaner—no raking or extra cleanup is needed. The extra time you spend on slow driving is the time you save when you don't have to dispose of the cut grass.

Feature	Mower	Mulcher
Cutting Action	Cuts and ejects grass	Cuts and finely shreds grass
Grass Disposal	Ejects cut grass	Finely shreds grass, leaves it on the ground
Cleanup	Requires raking	No raking needed
Speed	Generally faster	Generally slower
Fertilization	No direct fertilization	Fertilizes soil with shredded grass
Deck Design	Side opening for ejection	Closed deck for trapping and shredding

Pro Tip: Drive slow! If you see clippings left behind, simply make another pass. The Grator will suck them back up and shred them finer. If you are still not getting a nice result, please make sure the blade is sharp.

2. Introduction and product overview

Grator Lowrider is a battery-powered remotely controlled mulcher designed for steep terrain. This manual will guide you through the setup, operation, and maintenance of your new mower.



Technical characteristics

- 4x4 electric all wheel drive
- Remotely controlled
- Capable of traversing slopes up to 70 degrees
- Remote height adjustment (2 - 9 cm)
- 52V, 40 Ah Li-ion battery
- 2 hours of work per charge
- ~3 hours to recharge (fast charger)
- 2000 Watt rotary mulcher
- 56 cm mulcher blade
- 57 kg total weight
- 105 x 60 x 30 cm (fits in a car trunk)

Features

Inclination

If the ground is compact, the Grator Lowrider can climb slopes of up to 70° inclination. This won't work on sand or loose soil. It will work when the ground is held together with dense grass that provides strong support to the climbing wheels.

Battery duration

The battery can handle around 2 hours of normal work. Driving sideways instead of up/down will extend the work duration. Keeping the grass regularly trimmed will put less stress on the blade motor and extend the work duration.

Battery charging time

The provided fast charger can recharge the battery in about 3 hours.

Remote height adjustment

The height of the mower deck can be adjusted remotely. The range is from 2 to 9 cm.

Low height

The Grator Lowrider is only 30 cm tall. Because of this, it can reach under benches, around vineyard vines, under solar panels, ranch fences, and so on.

Self-servicing

Designed to be user-serviceable. All the components are plug-and-play should anything ever need replacing. Servicing videos are available for various servicing scenarios.

Compact size

Grator Lowrider is designed to fit in a standard car trunk. Total width 60 cm, length: 105 cm, height 30 cm. Cutting width: 56 cm. Total weight: 57 kg.

3. Safety Instructions

Important Safety Instructions for Using the Grator Lowrider

Failure to maintain a 6-meter distance during operation may result in serious injury or death. Always wear a face shield and ensure bystanders are also protected.

WARNING (must read) Safety Checklist:

- **Joystick Position:** Ensure all joystick controls are in neutral before turning on the machine. Accidentally pressing a button can move the wheels or start the blade, leading to injuries.
- **Avoid Standing in Front or Behind:** Do not stand in front or behind the machine when turning it on, as the wheels can move and cause injuries.
- **Keep Distance:** Ensure no one, including animals, is within 6 meters (20 feet) before starting the machine. The mowing blade can eject rocks, debris, and blade fragments with significant force. These projectiles can cause eye injuries, puncture wounds, and other trauma. The metal wheels can cause injuries. When the warning light is on, everyone should stay at least 6 meters away before the operator starts the blade or moves the wheels.
- **Wear Protection:** The operator must wear a face ANSI Z87.1/EN 166 compliant face shield while using the machine. Do not start the mowing blade until you are at least 6 meters away to avoid injury from potentially flying shrapnel.
- **Safety of others:** Do not let people watch the machine operation without face shields.
- **Avoid Standing Downhill:** Nobody, including the operator, should stand downhill from the machine during operation. If it overturns, it can roll and injure people, or animals.
- **Avoid Standing Uphill:** Do not stand uphill from the machine during operation. You could slip and fall onto the wheels or get limbs under the mowing deck.
- **Watch Safety Videos:** Do not operate the machine until you have watched the user manual video and safety guidelines.
- **Secure the Battery:** Tighten the screws on the machine's mask to prevent the battery from falling out if the machine overturns.
- **Slope Safety Warning:** While the Grator is engineered to handle steep slopes up to 70°, operating at such extreme angles significantly increases the risk of rollover. For safe operation, avoid slopes exceeding 40° whenever possible. Always travel straight up or down slopes—never sideways. Assess terrain conditions carefully and prioritize safety over technical capability.
- **Practice First:** Practice operating the Grator in a safe, open area, far from people, animals and objects. Don't attempt actual work until you've built sufficient skill and operating the Grator becomes intuitive to you.

Battery Safety: Handle the battery carefully to avoid dropping it. When charging, ensure the battery and charger are several meters away from anything flammable. Lithium-ion batteries can be dangerous if mishandled. Always charge the battery in a well-ventilated area. Do not expose the battery to temperatures above 60°C (140°F).

Risk of overturning: Operating the mower on slopes above 40 degrees increases the risk of overturning. Always operate the mower up and down the slope, never sideways. Avoid obstacles such as rocks, roots, and vines that could cause the mower to overturn.

Flying Debris: The mowing blade can throw shrapnel at high speeds, causing serious injury or death. Always wear a face shield and ensure bystanders are likewise protected. Everyone should stand at least 6 meters away from the mower during operation.

4. Installation and Setup

Safety First: Always follow the safety instructions. The Grator Lowrider is a powerful and dangerous machine. It must be handled carefully.

Unpacking

1. **Open the Box:** The Grator comes in a wooden box. Remove the screws from the bottom of the box and lift the box upwards.
2. **Detach the Grator:** The wheels are screwed to the wooden base. Remove the screws that hold them down.
3. **Find the Remote:** The remote controller is under the deck. Carefully lift one side of the Grator to find it.
4. **Lift the Grator:** Two people should lift the Grator from the wooden base to the floor.

Preparing the Grator for Use

1. **Open the Mask:** Unscrew the thumb-screws around the mask. Remove the rear screw completely and loosen the front two screws enough to lift the mask upwards.
2. **Handle the Cable Carefully:** The mask is connected to the electronics with a 50 cm cable. Be gentle to avoid damaging the cable or connectors.
3. **Charge the Battery:** The Grator comes with a half-charged battery. Fully charge it before first use. The battery is fully charged when the charger's fan stops and the LED light turns green. Charge the remote controller too.
4. **Optional Step:** The battery has a built-in bluetooth module. You can connect to it using the "Grator Battery" app for Android. Search for "Grator Battery" on Google Play and download it to your device. Enable your GPS and Bluetooth, grant the app permission to scan for and connect to nearby devices, then start scanning and connect to your battery. Using the app you can see the battery level, health of the cells, error alerts, and other diagnostics—plus, if you have multiple batteries, you can rename each for easy identification.
5. **Read Safety Instructions Again:** Before plugging in the battery, make sure the machine's on/off button is in the off position (pressed down).
6. **Check Connections:** Ensure the cable connecting the mask to the electronics is slightly tightened but not too tight to avoid damage.
7. **Avoid Obstructions:** Make sure nothing touches the mowing motor or wheels before plugging in the battery. Plug the main power connector into the battery.

8. **Secure the Cable:** Ensure the cable connected to the mask does not touch the mower motor when closing the mask. Shape it in a half-circle away from the motor. Make sure you don't pinch this cable when closing the mask.
9. **Tighten Screws:** Tighten all the thumb-screws around the mask.
10. **Check Screws Regularly:** Check and tighten all screws before each use. Vibrations can cause them to loosen.
11. **Leave Some Screws Loose:** Some screws act as joints and should not be fully tightened. Specifically, the screws on both sides of the lifting motors and those holding the front and rear axles should be slightly loose to allow movement.

If you have followed all these steps, your Grator is ready for use.

5. Operating Instructions

Safety first! Please don't skip the above safety instructions, they can save you. The Grator is dangerous. Everyone should stand at a safe distance and wear face protection.

Remote controller

Here is a brief video demonstration of the remote controller's commands:

<https://youtu.be/C9IBOSrlzWY>

Height control

Look at the front of the remote controller. On the left side, there's a 3-pole switch. If you flick it up, the Grator's height increases. In the middle position, height modification stops. Flick it down to decrease the Grator's height. When you reach your desired height, put the switch back in the middle position to maintain it.

Warning: Don't accidentally flick the switch while holding the joystick. During machine operation, if you lower it unintentionally, you might damage the grass or the blade might hit the ground on uneven terrain.

Driving:

- The Grator has two joysticks - one for the left side wheels and one for the right side.
- When you push both joysticks forward, the Grator moves forward.
- Pulling both joysticks backward makes it go backward.

- Pushing the joysticks just a little makes the Grator move slowly. Pushing them far makes it move faster.

Driving speed:

Look at the front of the remote controller. On the right side, there's a 3-pole switch. If you flick it up, the Grator's driving speed increases. In the middle position, the speed is medium. Flick it down to reduce the driving speed to the slowest.

Turning:

1. **Sharp Turns (Not Recommended for Lawns):**
 - Push one joystick forward and the other backward to spin in place.
 - *Note:* This will tear the terrain, so avoid it when possible.
2. **Gentle Turns (Better for Lawns):**
 - Slow down the side you want to turn toward (e.g., slow the right side to turn right).
 - Keep a slight speed difference between both sides for smooth, lawn-friendly turns.
3. **Pro Tip for Smoother Turns:**
 - Instead of fully stopping one side, lightly tap the joystick to slightly delay that side while keeping movement fluid. This method helps protect your lawn while maintaining control.

Practice makes perfect! 🌿

Mowing blade speed control:

- The remote controller has a turning knob on the front facing left side. It controls the speed of the blade.
- Turn the knob clockwise to make the mowing blade spin faster.
- Turn it counter-clockwise to slow down the blade.

Blade Speed Guidelines:

- **60-75% speed:** Maximum cutting power for tall grass and brush. Peak efficiency at 75%.
- **Higher speeds:** Only suitable for short grass where cutting power isn't needed - allows fast mowing by matching blade speed to driving speed.
- **Never use 100% speed:** Blade becomes too weak to cut effectively and wastes battery.

The key principle: Higher blade speed = weaker cutting but faster rotation. Short grass doesn't need power, so you can trade torque for speed and mow quickly. Tall grass needs the torque, so stay in the 60-75% sweet spot.

To **start the blade** on your Grator:

1. Ensure there are no obstructions (like tall grass) under the blade. Otherwise the blade motor won't start.
2. Turn the knob gently clockwise until you hear the motor start spinning.
 - a. *Note: If you speed up too fast, the motor will stop because the required torque is too high. The same thing happens when the blade runs into an obstacle.*
3. Wait a second for the speed to stabilize.
4. Continue turning the knob until you reach your desired speed. (~60% is optimal for tall grass and brush).

If the mowing motor stops:

1. Roll the knob back to the off position.
2. Check for obstacles under the blade. Move the Grator away from the obstacle.
3. Restart the motor again, turning the knob slowly.

Battery

Grator Lowrider uses 14S 52V 40Ah NMC Lithium-ion batteries.

Charging Safety:

- **Location:** Charge the battery in an open, well-ventilated area, away from any flammable materials or objects. This reduces the risk of fire spreading in case of an incident.

Handling Precautions:

- **Avoid Dropping:** Handle the battery with care to avoid dropping it. Dropping the battery can cause internal damage, leading to potential safety hazards.
- **Connecting:** When connecting the battery, make sure the connector is pushed all the way in.
- **Securing:** Tighten all screws around the machine's mask to prevent the battery from falling out if the mower rolls.

Temperature Guidelines:

- **Maximum Temperature:** Do not expose the battery to temperatures exceeding 60°C (140°F). High temperatures can cause the battery to overheat, leading to potential fire or explosion hazards.
- **Sun Exposure:** Do not leave the Grator parked in the sun while the blade is not running. The blade cools the components and prevents them from overheating.

- **Storage Conditions:** Store the battery in a cool, dry place, ideally between 20°C (68°F) and 25°C (77°F), to maintain its longevity and safety.

Winter Storage:

- **Preparation:** Before storing the battery for winter, charge it to around 50-60% capacity. This helps preserve its lifespan.
- **Storage Location:** Keep the battery in a cool, dry place, away from direct sunlight and heat sources. A temperature range of 10°C (50°F) to 20°C (68°F) is ideal.
- **Regular Checks:** Every month, check the battery's charge level. If it drops below 50%, recharge it to maintain optimal capacity.
- **Avoid Moisture:** Ensure the storage area is free from moisture to prevent corrosion and damage.

Battery Level:

- **Reserve:** The Grator Lowrider is designed so that when the battery levels drop below 43V the mowing motor begins to slow down and eventually stops. The driving motors keep operating until the battery drops below 41V. This configuration lets the Grator return to the charging station before the battery runs out.
- **Beeping:** When the remote controller battery or the main Grator battery reaches critical levels, the remote controller will start beeping.
- **Battery app:** The battery has a built-in bluetooth module. You can connect to it using the "Grator Battery" app for Android. Search for "Grator Battery" on Google Play and download it to your device. Enable your GPS and Bluetooth, grant the app permission to scan for and connect to nearby devices, then start scanning and connect to your battery. Using the app you can see the battery level, health of the cells, error alerts, and other diagnostics.

When operating multiple batteries, separate them by at least 100 metres before connecting so that the intended battery is the only one within Bluetooth range. Once connected, assign each battery a distinct name in the app to allow reliable identification in future sessions.

Tips and Tricks

Solution to 99% of problems

1. Never run the blade at 100% speed. Anything above 75% makes the cut less efficient. The equilibrium between torque and speed is at or below 75%. Try to find the slowest speed that is still effective for the task.

2. Dirt stuck to the underside of the mower deck reduces the working space for the mulching blade. Less space means less efficient mulching and higher battery use. During operation periodically stop the Grator and clean the underside when necessary.
3. Listen to the sound of the blade. The sound changes when the deck has too much dirt stuck underneath. The cut becomes noticeably less efficient and the blade struggles (or often stops).
4. Drive slowly when the grass is tall, dense or wet. Difficult conditions require more time for efficient mulching. The more material there is to shred, the more time the blade needs.
5. In difficult conditions raise the deck high on the first pass. Let the cut grass dry and then go over it again with a lower deck to trim it to your desired height.
6. Don't drive deep into thick or tall grass. Instead, create an opening and keep widening it (as shown in this video: <https://youtu.be/4NY9kEgDLqc?t=198>). When you hear the sound of the blade change (almost choking), reverse into the clear area to disperse the clippings that may be stuck under the deck.
7. Make sure the blade is sharp.
8. If the blade stops as soon as it touches grass, it's usually because the battery needs charging.

Mowing Tall Grass

Sharpen the blade if necessary. Set the mowing blade speed to around 75% or lower. (*Note: If you run the blade at full speed it will perform significantly worse*). Below 75% is an optimal mowing motor speed for tough challenges. Fully increase the Grator's height to make room for expelling a big quantity of shredded material. Drive very slowly.

The "One meter forward, one meter backward" technique (as demonstrated in these two videos: <https://www.youtube.com/shorts/WKNfjdG1t-E> and <https://www.youtube.com/shorts/U2W706Gsipc>) is the most suitable for tall grass. By going slowly and systematically you allow the Grator to shred the tall grass without overburdening the blade. Go one meter into the tall grass, and back. Repeat until the patch is mowed to your preference, then proceed to the next meter. This technique avoids having tall grass wrapped around the wheels and "grabbing" the Grator.

When driving over tall grass, it lays down and arches. The trick is to not let it come out on the other side of the Grator but instead reverse direction so that the blade cuts into the arch. This seems to be the most effective way to shred tall grass.

Discovering Obstacles in Unknown Terrain

When mowing areas with tall grass where obstacles are hidden, reduce blade speed to 20-30%. At this very low speed, the mowing results will resemble a string trimmer - larger chunks of

grass will remain on the ground rather than being fully mulched. However, if the blade hits a rock or obstacle at this speed, the chance of damage to the blade hub is significantly reduced. The blade hub is a sacrificial coupling between the motor and the blade — it is designed to break before the motor does. See "Check the Blade Hub" in Section 6 for inspection and replacement.

After the first pass reveals all obstacles (stones, stumps, debris), you can:

- Mark or remove the discovered obstacles
- Increase blade speed to 50-75% for optimal cutting
- Lower the deck height
- Make additional passes to properly mulch the remaining grass chunks into dust

This two-stage approach prioritizes equipment protection during the discovery phase while still achieving a clean final result.

Mowing Wet Grass

Avoid mowing wet grass if possible. But if you must, be ready to **clean under the deck frequently**. Wet grass and dirt stick to the deck, creating mud. This reduces the space under the hood and reduces the shredding efficiency. If the deck isn't clean, the grass won't be cut well, and the blade will struggle.

Lower the blade speed to keep the mower deck self-cleaning. Gradually reduce the blade rotation speed until you find the slowest setting that still cuts effectively.

Clean it: If the Grator isn't cutting well or the motor sounds like it's struggling:

1. Find a flat area.
2. Turn off the mower (safety precaution!).
3. Tilt it onto two side wheels.
4. Use a spatula or stick to clean under the deck. This will restore the performance!

Mowing Steep Slopes

To avoid the risk of overturning the machine, never go sideways on steep slopes. Only up and down is suitable for slopes above 40 degrees.

When your Grator is transitioning from a slope to a flat area, raise the machine's height to avoid the blade hitting the ground.

Driving uphill on extreme slopes (above 55 degrees) requires all four motors. This means no turning when driving up. Either adjust your direction before the steepest part, or adjust your direction while going downhill.

Avoid the Dangers of Overturning

The Grator is strong enough to climb vertically up a tree/wall until it overturns. While going uphill, If a strong vine wraps around one of its rear wheels, the machine can potentially pull itself over and overturn. Go slow in such situations so that you can stop the Grator before it overturns.

Going sideways on any slope increases the chances of overturning. Be especially vigilant if there are any bumps, stones, roots, bushes on the way. They can push the Grator past the overturning point (as shown in this video <https://www.youtube.com/shorts/-KpxONAUlb8> - in all cases it was pushed over by something)

6. Maintenance and Troubleshooting

Pre-use inspection:

Before every use, please go through the following procedures. Create and keep a maintenance log with the date and checkmarks for every action performed.

Check the Screws and Nuts

The Grator is under strong vibrations, so some screws might come loose. But not all screws should be tight; eight of them are supposed to be a bit loose to let the joints flex. These are the four screws for the front and rear axles, and the four for the height control motors. The rest should be regularly checked and tightened if needed. But don't over-tighten the ones that are already tight to avoid breaking them.

Inspect All the Wires and Connectors for Signs of Damage

All the cables/wires should be damage-free. The ones that are exposed can potentially be damaged by accidents.

- Make sure the cable connecting the mask to the electronics didn't touch the motor, as this can wear out the wires inside and cause a short circuit.
- Ensure the driving motor wires are in good shape too. Check where they go into the mask and make sure there's no damage to the wire insulation.

- Make sure the two thin gray wires (radio antennas) are secured in their original position so they don't touch the mowing motor.

Check the Blade Hub

The blade hub is the coupling between the mowing motor's shaft and the cutting blade. It is intentionally the weakest mechanical link in the cutting system. When the blade strikes a rock, stump, or other immovable object, the hub absorbs the impact — shearing, deforming, or breaking — so the shock does not travel up into the motor. In short, the blade hub is designed to fail so that the motor doesn't.

A replacement hub costs a small fraction of a replacement motor. Operating without a working hub removes this protection and exposes the motor directly to every impact. A single hard hit on a stone can then destroy the motor, and motor damage caused by operating without a working blade hub is not covered by warranty.

To inspect it, disconnect the battery and tip the Grator onto two side wheels. The hub sits at the centre of the underside, between the motor and the blade.

Before every use, check:

- Is it there? The blade should be mounted to a clearly visible hub, not directly to a bare motor shaft. If the hub is missing, do not operate the machine.
- Is it intact? Look for cracks, missing material, or deformation.
- Is it tight? Hold the blade by the dull outer edges and try to rotate it without turning the motor. The hub should hold firmly. Wobble, clicking, or free rotation means the hub is failing.
- Is the blade aligned? A bent or off-centre blade often means the hub has taken a hit and is partially damaged even if it still holds.

If any check fails, replace the hub before next use.

Signs a hub has failed during use:

- The blade stops cutting grass even though the motor is clearly running.
- New vibration or rattling from the mowing motor area.
- The blade no longer spins when you turn the knob, but the motor sounds different from a normal stall in thick grass.
- A sharp impact followed by a sudden change in machine behaviour.

If you suspect a broken hub, turn the blade off, disconnect the battery, and inspect before continuing.

Replacing the blade hub:

1. Turn the Grator off and disconnect the battery.
2. Tip the machine onto two side wheels on a flat surface.
3. Remove the central blade bolt. Note its orientation.
4. Remove the blade.
5. Remove the old hub from the motor shaft. Depending on the hub type, this may require loosening a setscrew or using a hub puller.
6. Clean the motor shaft of any debris or remnants of the old hub.
7. Slide the new hub onto the shaft in the correct orientation. Tighten any setscrew or fastener firmly.
8. Refit the blade, ensuring it is centred and seated flush against the hub.
9. Reinstall and tighten the blade bolt firmly.
10. Spin the blade by hand to confirm it rotates without wobble.
11. Reconnect the battery and test the blade at low speed (20–30%) in a clear area before resuming work.

Cleaning the Grator

1. **Inside:** After you finish using the machine or when you change the battery, always clean the area underneath the hood. The easiest way to do this is by using a leaf blower to blow away any dust and debris that has collected there.
2. **Under the deck:** When you are done mowing, move the Grator to a flat area. Turn it off. Tilt it onto two side wheels. Use a spatula or even a stick to clean the deck. If you are mowing wet grass, you will have to do this every few minutes to improve the Grator's performance.
3. **Grass around the wheels:** Do not attempt to remove the wheels. They are press-fitted and the screws are glued to prevent them from loosening due to vibrations. If grass gets stuck around the wheels, simply pull it off as much as you can. Leave the rest and the wheels will grind it off during the next use. They are self-cleaning.

Don't pressure-wash the Grator. The exposed motors are water-resistant but not water-tight. Just blow the dust off, pull or wipe the mud off, then use a window cleaning fluid/sprayer and wipe it down with paper towels.

Sharpening the Blade

The blade can be sharpened the right way, or the quick way. According to Youtube gurus, they are not necessarily the same.

- The right way is to remove the blade from the mower and have it sharpened by a professional.
- The quick way is to turn the machine off (disconnect the battery), tilt it on two side wheels and use a hand file (or an angle grinder if you are a professional and know how to use it safely) to grind the edge of the blade at an angle of approximately 30° degrees.

7. Warranty and Service

Grator d.o.o. guarantees that this product will be free from defects in materials and workmanship under normal use, as described in the product materials (including the user manual, video guides, and specifications) for a period of 2 years from the date of purchase.

Batteries are covered for 12 months or 800 charge cycles (whichever occurs first), excluding normal capacity degradation below 80%.

Warranty claim process

If your product has issues during the 2-year warranty period, contact Grator customer service for assistance. For products purchased from a local dealer, please contact the dealer first. You will need to provide proof of purchase (receipt or order number) and the product's serial number to initiate a warranty claim.

Grator will attempt to resolve issues via email (info@grator.com), phone, or online chat. If the problem cannot be resolved remotely, you may need to send the product (at your expense) to an authorized service center or Grator for inspection and repair.

By claiming warranty, the purchaser consents to Grator's collection and analysis of operational data to verify compliance with warranty terms.

Repair Costs & Returns

If inspection confirms the returned Grator (or parts) malfunctioned under warrantable conditions, Grator covers replacement parts and return shipping costs. If the issue is excluded from warranty coverage (e.g., due to misuse, neglect, failure to follow instructions, or excessive use), the owner bears all associated costs—including service time, replacement parts, and return shipping.

All warranty replacements require return of the original parts for inspection. These components become Grator property and will not be returned.

Limitation of Liability

We guarantee repairs or part replacements under warranty, but can't assume responsibility for consequential effects like operational downtime or rented alternatives—regardless of legal theory or prior notice. These limits apply to the fullest extent your local law permits.

Warranty Coverage Includes:

- Defects in materials or manufacturing.
- Malfunctions under normal operating conditions (see **Definition of Normal Usage** below).
- Warranty covers firmware defects but excludes issues arising from unauthorized software modifications or failure to install Grator-provided updates.
- Where local laws prohibit specific exclusions (e.g., statutory warranties), Grator's liability is limited to the minimum required by such laws.

Warranty Exclusions:

The warranty **does not** cover:

1. Excessive Use Beyond Normal Operating Conditions:

- **Normal usage** is defined as **up to 4 hours per day, 28 hours per week, and no more than 784 hours per year** (based on a 28-week season from April to mid-October) - regardless of climate, geography, or personal usage patterns.
- Usage exceeding these limits is considered **professional or power-user operation**, which accelerates wear and voids warranty coverage.
- Grator reserves the right to assess usage logs, electronics and battery diagnostics, or operational data to determine if a claim falls under excessive use.

2. Misuse, Neglect, or Failure to Follow Instructions:

- Damage from improper operation, including:
 - Not following the instructions in this user manual
 - Damage from liquid exposure, including rain, submersion, pressure washing, or condensation due to improper storage.
 - Corrosion or damage due to improper cleaning.
 - Forceful connector misuse: Damage from pulling, bending, or disconnecting cables/connectors in ways they are not designed to withstand.
 - Rolling or impact damage: Mechanical harm caused by the machine overturning, rolling downhill, or collisions with obstacles (e.g., trees, rocks, vehicles).

3. Consumable Parts & Modifications:

- Cutting blades, screws, bolts, nuts, and other wear items.
 - Unauthorized modifications or repairs.
 - Tampering with serial numbers or warranty labels.
4. **External Factors:**
- Damage from accidents, natural disasters, or improper charging.
 - Shipping damage not reported at delivery.
5. **Non-authorized servicing:**
- Warranty is void if repairs are attempted by non-authorized personnel without Grator's prior approval.

This warranty applies only to the original purchaser and is non-transferable without Grator's prior written consent.

Examples of Voided Warranty Claims:

- Not following the user manual instructions.
- Damage to the machine after blade hitting a rock (impact damage).
- Motor failure due to daily 8-hour operation (excessive use).
- Water damage from pressure washing (misuse).
- Damage during shipment that is not reported upon delivery or without proof from the shipping company.
- Malfunctions due to accidents, misuse, natural disasters, spills, incorrect charging, or other external factors.
- Using the product in ways not intended by Grator.
- Modifying the product without written permission from Grator.
- Tampering with product labels or serial numbers.
- Not providing valid proof of purchase or if the proof is suspected to be forged.

Declaration of Conformity

EC/EU Declaration of Conformity

Manufacturer:

Grator d.o.o.

Za Kalvarijo 129, Maribor, 2000, Slovenia

Person authorized to compile the technical file:

Darko Savic, Grator d.o.o.

Za Kalvarijo 129, Maribor, 2000, Slovenia

Herewith declares that the machinery:

Generic Designation: Remotely Controlled Lawnmower

Product Name: Grator Lowrider

Type / Model(s): Lowrider

Description: Remotely controlled mulcher/mower for steep slopes

Cutting Width: 560 mm

Power: 2000 Watt mowing / 1000 Watt driving / 40 Watt height adjustment

Complies with the following Directives:

Machinery Directive (2006/42/EC):

- EN 50636-2-107:2015
- EN ISO 13854:2020
- EN ISO 14120:2016
- EN 1005-1:2002+A1:2008
- EN ISO 13849-1:2016
- EN ISO 13857:2020

Low Voltage Directive (2014/35/EU):

- EN 60204-1:2006/A1:2018

Electromagnetic Compatibility (EMC) Directive (2014/30/EU):

- EN 61000-6-2:2005
- EN 61000-6-4:2007/A1:2011

General Product Safety Directive (2001/95/EC):

- EN ISO 13732-1:2008 (Thermal dangers)
- EN ISO 11688-1:2009 (Noise dangers)
- EN 614-2:2001+A1:2008 (Ergonomic dangers)
- EN 894
- EN 61310-3:2008

Signed for and on behalf of: Grator d.o.o.

Signed: *Darko Savic*

Name: Darko Savic

Date: 1. 8. 2024

Position: CEO

Place: Maribor, Slovenia

CE