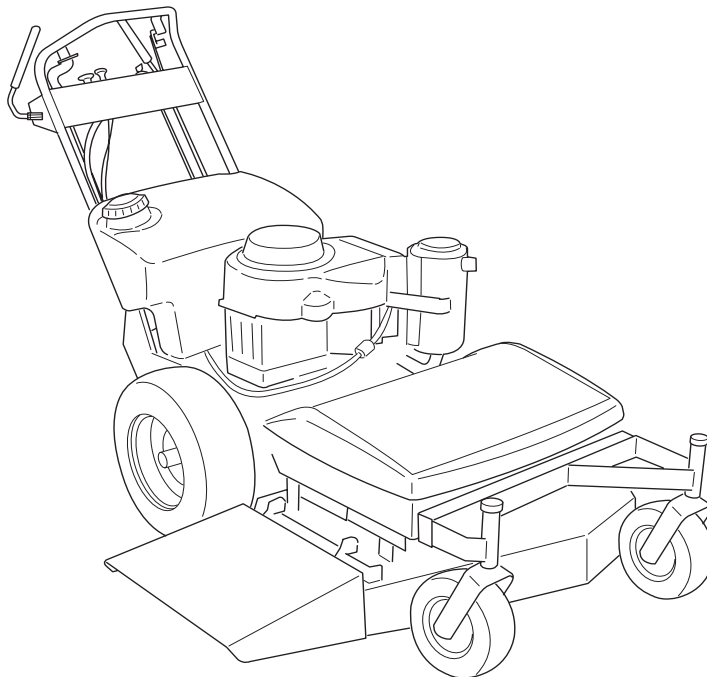




OPERATOR'S MANUAL



13HP Transaxle Drive Walk Behind Mower

Mfg. No.	Description
5091002	SFH13320KW

5023224

Rev. No. 01

Rev. Date: 10/2005

TP 100-7133-01-HC-N



PRODUCTS, INC.
McDonough, GA., 30253

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NOTE: In this manual, “left” and “right” are referred to as seen from the operating position.

WARNING

You must read, understand and comply with all safety and operating instructions in this manual before attempting to set-up and operate your machine.

Failure to comply with all safety and operating instructions can result in loss of machine control, serious personal injury to you and / or bystanders, and risk of equipment and property damage. The triangle  in the text signifies important cautions or warnings which must be followed.

WARNING

Engine exhaust from this product contains chemicals known, in certain quantities, to cause cancer, birth defects, or other reproductive harm.



Safety Rules & Information



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment.

This mowing deck is capable of amputating hands and feet and throwing objects.

The triangle  in text signifies important cautions or warnings which must be followed.

TRAINING

1. Read, understand, and follow all instructions in the manual and on the unit before starting. If the operator(s) or mechanic(s) can not read English it is the owner's responsibility to explain this material to them.
2. Become familiar with the safe operation of the equipment, operator controls, and safety signs.
3. All operators and mechanics should be trained. The owner is responsible for training the users.
4. Only allow responsible adults, who are familiar with the instructions, to operate the unit.
5. Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
6. The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property.
7. Data indicates that operators, age 60 years and above, are involved in a large percentage of riding mower-related injuries. These operators should evaluate their ability to operate the riding mower safely enough to protect themselves and others from serious injury.

PREPARATION

1. Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Use only accessories and attachments approved by the manufacturer.
2. Wear appropriate clothing including safety shoes, safety glasses and ear protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
3. Inspect the area where the equipment is to be used and remove all objects such as rocks, toys and wire, which can be thrown by the machine.
4. Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
 - a) Use only an approved container.
 - b) Never remove fuel cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
 - c) Never refuel or drain the machine indoors.
5. Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

OPERATION

1. Never run an engine in an enclosed area.
2. Mow only in the daylight or with good artificial light, keeping away from holes and hidden hazards.
3. Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position. Use seat belts if provided.
4. Be sure of your footing while using pedestrian controlled equipment, especially when backing up. Walk, don't run. Reduced footing could cause slipping.
5. Slow down and use extra care on hillsides. Be sure to travel in the recommended direction on hillsides. Turf conditions can affect the machines stability. Use caution when operating near drop-offs.
6. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse.
7. Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the deflector in place.
8. Slow down and use caution when making turns and when changing directions on slopes.
9. Never raise deck with the blades running.
10. Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting. Keep hands and feet away from the cutting units.
11. Turn off the PTO switch to disengage the blades when not mowing.
12. Never operate with guards not securely in place. Be sure all interlocks are attached, adjusted properly and functioning properly.
13. Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
14. Do not change the engine governor setting or over-speed the engine.
15. Stop on level ground, lower implements, disengage drives, engage parking brake, shut off engine before leaving the operator's position for any reason including emptying the grass catchers or unclogging the chute.
16. Stop equipment and inspect blades after striking objects or abnormal vibration occurs. Make necessary repairs before resuming operations.
17. Keep hands and feet away from the cutting units.
18. Look behind and down before backing up to be sure of a clear path.
19. Never carry passengers and keep pets and bystanders away.
20. Do not operate the unit while under the influence of alcohol or drugs.
21. Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
22. Use care when loading or unloading the machine into a trailer or truck.

23. Use care when approaching blind corners, shrubs, trees or other objects that may obscure vision.
24. To reduce fire hazard, keep unit free of grass, leaves & excess oil. Do not stop or park over dry leaves, grass or combustible materials.
25. The engine in this unit is not factory equipped with a spark arrester. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on or near any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester meeting any applicable local or state laws. Other states or federal area may have similar laws.
26. OSHA regulations may require the use of hearing protection when exposed to sound levels greater than 85 dBA for an 8 hour time period.

CAUTION



This machine produces sound levels in excess of 85 dBA at the operator's ear and can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

SLOPE OPERATION

Slopes are a major factor related to loss-of-control and tip-over accidents, which can result in severe injury or death. All slopes require extra caution. If you cannot back up the slope or if you feel uneasy on it, do not drive on it.

WARNING

Never operate on slopes greater than 17.6 percent (10°) which is a rise of 3-1/2 feet (106 cm) vertically in 20 feet (607 cm) horizontally.

Select slow ground speed before driving onto slope. Use extra caution when operating on slopes with rear-mounted grass catchers.

Mow across the face of slopes, not up and down, use caution when changing directions and DO NOT START OR STOP ON SLOPE.

Do

1. Mow across slopes, not up and down.
2. Remove obstacles such as rocks, tree limbs, etc.
3. Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
4. Use slow speed. Choose a slow speed so that you will not have to stop or change speed while on the slope.
5. Use extra care with grass catchers or other attachments. These can change the stability of the unit.
6. Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction.
7. See your authorized dealer for recommendations of available weights to improve stability.

Do Not

1. Avoid starting, stopping, or turning on a slope. If tires lose traction (i.e. machine stops forward motion on a slope), disengage the blade(s) (PTO) and drive slow off the slope.
2. Do not turn on slopes unless necessary, and then, turn slowly and gradually uphill, if possible. Never mow down slopes.
3. Do not mow near drop-offs, ditches, or embankments. The operator could lose footing or balance or mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
4. Do not mow on wet grass. Reduced footing or traction could cause sliding.
5. Do not try to stabilize the unit by putting your foot on the ground. (ride-on units)
6. Do not mow excessively steep slopes.
7. Do not use grass catcher on steep slopes.
8. Do not mow slopes if you cannot back up them.

TOWED EQUIPMENT (RIDE-ON UNITS)

1. Tow only with a machine that has a hitch designed for towing. Do not attach towed equipment except at the hitch point.
2. Follow the manufacturer's recommendations for weight limit for towed equipment and towing on slopes. See attaching a trailer under OPERATION.
3. Never allow children or others in or on towed equipment.
4. On slopes, the weight of the towed equipment may cause loss of traction and loss of control.
5. Travel slowly and allow extra distance to stop.
6. Do not shift to neutral and coast down hill.

CHILDREN

Tragic accidents can occur if the operator is not alert to the presence of children. Children are often attracted to the unit and the mowing activity. Never assume that children will remain where you last saw them.

1. Keep children out of the mowing area and under the watchful care of another responsible adult.
2. Be alert and turn unit off if children enter the area.
3. Before and during reverse operation, look behind and down for small children.
4. Never carry children, even with the blade(s) off. They may fall off and be seriously injured or interfere with safe unit operation. Children who have been given rides in the past may suddenly appear in the mowing area for another ride and be run over or backed over by the machine.
5. Never allow children to operate the unit.
6. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

EMISSIONS

1. Engine exhaust from this product contains chemicals known, in certain quantities, to cause cancer, birth defects, or other reproductive harm.
2. Look for the relevant Emissions Durability Period and Air Index information on the engine emissions label.

Safety Rules & Information

SERVICE AND MAINTENANCE

To avoid personal injury or property damage, use extreme care in handling gasoline. Gasoline is extremely flammable and the vapors are explosive.

Safe Handling of Gasoline

1. Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
2. Use only approved gasoline containers.
3. Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.
4. Never fuel the machine indoors.
5. Never store the machine or fuel container where there is an open flame, spark, or pilot light such as near a water heater or other appliance.
6. Never fill containers inside a vehicle or on a truck bed with a plastic bed liner. Always place containers on the ground away from your vehicle before filling.
7. Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
8. Keep nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
9. If fuel is spilled on clothing, change clothing immediately.
10. Never over-fill the fuel tank. Replace gas cap and tighten securely.
11. Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
12. If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
13. Replace all fuel tank caps and fuel container caps securely.

Maintenance and Storage

1. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
2. Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
3. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
4. Never store the machine or fuel container inside where there is an open flame, such as in a water heater. Allow unit to cool before storing.
5. Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
6. Keep all hardware, especially blade attachment bolts, tight and keep all parts in good working condition. Replace all worn or damaged decals.
7. Never tamper with safety devices. Check their proper operation regularly.
8. Disengage drives, lower implement, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
9. Clean grass and debris from cutting units, drives, mufflers, and engine to prevent fires. Clean up oil or fuel spillage.

10. Let engine cool before storing and do not store near flame.
11. Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
12. Park machine on level ground. Never allow untrained personnel to service machine.
13. Use jack stands to support components when required.
14. Carefully release pressure from components with stored energy.
15. Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
16. Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
17. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
18. Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothes and use insulated tools.
19. Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
20. Check brake operation frequently. Adjust and service as required.
21. Use only factory authorized replacement parts when making repairs.
22. Always comply with factory specifications on all settings and adjustments.
23. Only authorized service locations should be utilized for major service and repair requirements.
24. Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.
25. Units with hydraulic pumps, hoses, or motors: **WARNING:** Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result. Keep body and hands away from pin holes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, and not hands, to search for leaks. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. If leaks occur, have the unit serviced immediately by your authorized dealer.
26. **WARNING:** Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.
27. Models equipped with an engine radiator: **WARNING:** Stored energy device. To prevent serious bodily injury from hot coolant or steam blow-out, never attempt to remove the radiator cap while the engine is running. Stop the engine and wait until it is cool. Even then, use extreme care when removing the cap.

ROLL BAR INSTRUCTIONS

For models equipped with factory-installed Roll Over Protection System (ROPS).

WARNING

In order to avoid serious injury or death from roll over, it is important to follow the warnings listed below.

OPERATIONAL WARNINGS

- Always use the seat belt when the roll bar is in the raised position.
- Never use the seat belt when the roll bar is in the down position.
- Remember there is no roll over protection when the roll bar is in the down position so it is very important to always keep the roll bar in the raised position whenever possible.
- Lower the roll bar to the down position only when it is absolutely necessary.
- Check for overhead clearances before driving under any objects. Do not allow roll bar to contact low overhanging obstacles such as tree branches and guide wires.
- Never remove the roll bar from the vehicle.
- Do not exceed the machine weight rating of the roll bar.
- Read and follow all of the instructions shown below regarding the inspection and maintenance of the roll bar structure and the seat belt.

WARNING

Failure to properly inspect and maintain the ROLL BAR protective structure can cause serious injury or death.

INSPECTION OF THE ROLL BAR PROTECTIVE STRUCTURE

A ROLL BAR, like any other safety device, needs to be periodically inspected to verify that the integrity of the device has not been compromised through normal machine use, misuse, age degradation, modifications, or a roll over.

To maintain operator roll over protection and roll bar effectiveness:

- If a ROLL BAR becomes damaged for any reason, such as a collision, roll over or impact, the ROLL BAR must be replaced. Small undetectable cracks can reduce the effectiveness of the ROLL BAR. Never weld, straighten, or repair the ROLL BAR.
- Never alter the ROLL BAR by welding anything to it or by drilling additional holes.

- **BEFORE FIRST TIME USE** - Inspect the ROLL BAR structure and mounting hardware for:

- 1) Check to make sure the machine GVW (Gross Vehicle Weight), including attachments, restrained payload, fuel and operator, is not in excess of the maximum weight specified on the ROLL BAR label.
- 2) Make sure there isn't any missing, damaged, or loose mounting hardware.
- 3) Make sure the ROLL BAR has been correctly and completely installed.

- **EVERY 100 HOURS** - Inspect the ROLL BAR structure and mounting hardware for:

- 1) Any cracks in the structure (structural members and/or welds).
- 2) Significant corrosion on any part of the ROLL BAR structure or hardware.
- 3) Missing, damaged, or loose mounting hardware
- 4) Mounting hardware that is of a grade lesser than specified.
- 5) Machine GVW (Gross Vehicle Weight), including attachments, restrained payload, fuel and operator, in excess of the maximum weight specified on the ROLL BAR label.
- 6) Any modifications that have been made, such as unauthorized welds and holes.
- 7) Any permanent deformation or twisting of the ROLL BAR structure.
- 8) That the ROLL BAR label is still in place and is readable.
- 9) That the ROLL BAR on-product warning labels are still on the ROLL BAR and are readable.

- If there is any doubt as to the condition of the ROLL BAR, remove the machine from service and contact your dealer for assistance.

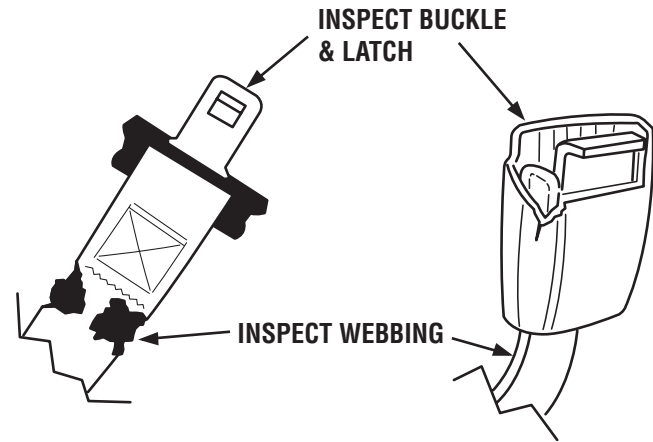
Safety Rules & Information

! WARNING

Failure to properly inspect and maintain the seat belt can cause serious injury or death.

INSPECTION AND MAINTENANCE OF THE ROLL BAR SEAT BELT

- The seat belt like the ROLL BAR, needs to be periodically inspected to verify that the integrity has not been compromised through normal machine use, misuse, age degradation, modifications, or a roll over. If the seat belt does not pass all of the following tests, it should be replaced.
- **BEFORE EACH USE** – Conduct the following inspections/maintenance of the seat belt and retraction mechanism:
 - 1) Check for dirt or debris in the retraction mechanism. If dirt or debris is found, it should be removed.
 - 2) Check to make sure the retraction mechanism retracts easily and completely.
 - 3) Check for damage to any part of the seat belt such as nicks, cuts, loose stitching, or fraying.
 - 4) Check that the buckle and latch operate properly and that the latch plate is not excessively worn, deformed, or the buckle is damaged or cracked. The seat belt should latch and release easily.



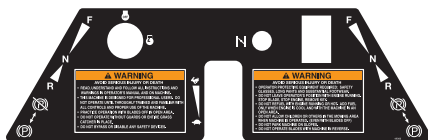
SAFETY DECALS

This unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your unit.

All DANGER, WARNING, CAUTION and instructional messages on your mower should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important!

EARLY MODELS



Decal - Dash Panel
Part No. 5049066



Decal - Hot
Part No. 1704473



Decal - Danger
Part No. 1704276



Decal - Danger
Part No. 1704277



Decal - Danger
Part No. 7013010

The safety decals below are on your mower.

If any of these decals are lost or damaged, replace them at once. See your local dealer for replacements.

These labels are easily applied and will act as a constant visual reminder to you, and others who may use the equipment, to follow the safety instructions necessary for safe, effective operation.

LATER MODELS



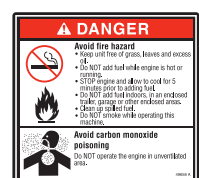
Decal - Dash Panel
Part No. 5100454



Decal - Hot
Part No. 5100387



Decal - Danger
Part No. 5100089



Decal - Danger
Part No. 5049658

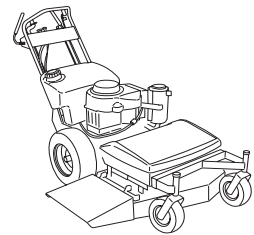


Decal - Danger
Part No. 5100088

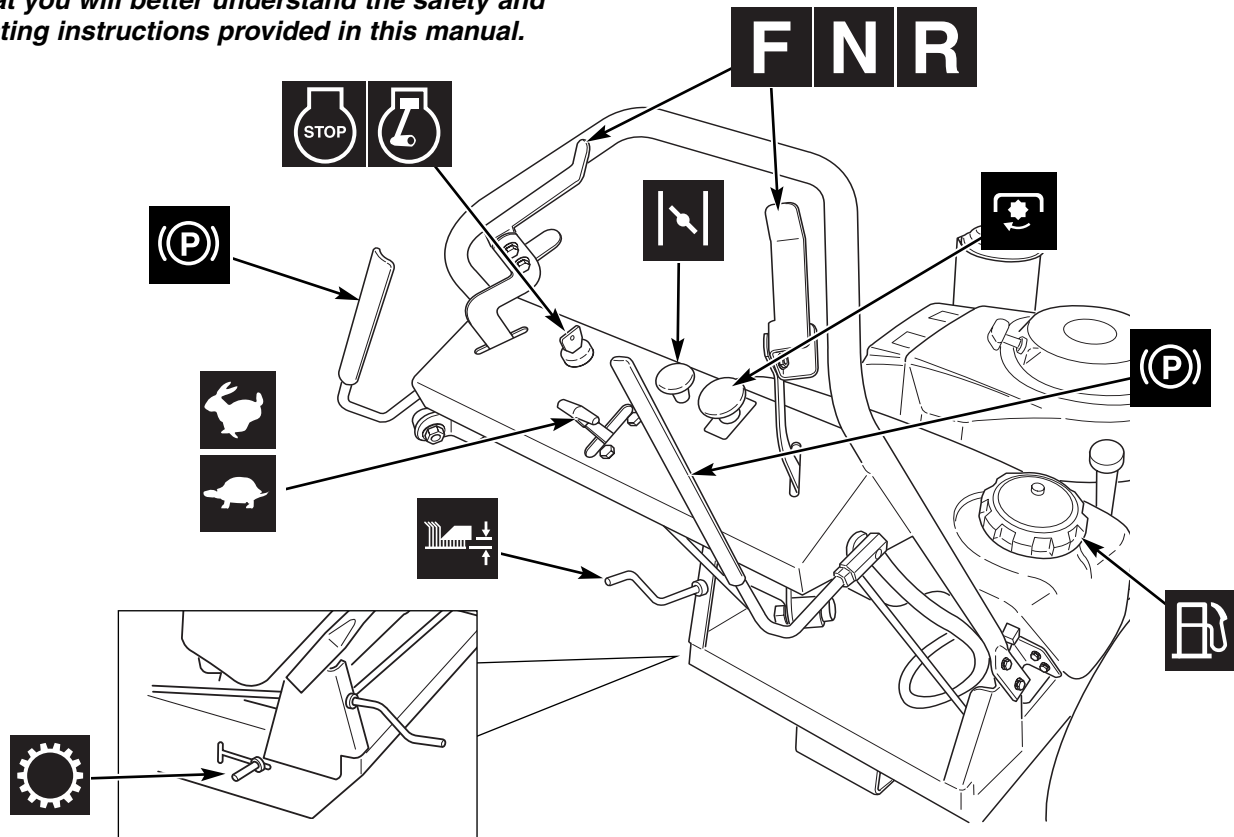


Decal - Danger (SP)
Part No. 5100388

Features & Controls



Please take a moment and familiarize yourself with the name, location, and function of these controls so that you will better understand the safety and operating instructions provided in this manual.



CONTROL FUNCTIONS

The information below briefly describes the function of individual controls. Starting, stopping, driving, and mowing require the combined use of several controls applied in specific sequences. To learn what combination and sequence of controls to use for various tasks see the OPERATION section.

F N R Ground Speed Control Levers

These levers control the ground speed of the mower. The left and right levers are tied together so you can operate either lever to control the mower's ground speed.

Moving a lever forward to "F" increases the FORWARD speed of the mower. Moving a lever back to "R" increases the REVERSE speed. Moving the levers to "N" neutral position stops mower travel.

Note: The further a lever is moved away from the neutral position the faster the mower will travel.

Ignition Switch

Rotate the key switch to the ON position before pulling on the starter rope. Turn the key to STOP to stop the engine.

Throttle Control

Pulling the round choke control knob (D) out fully chokes the engine for cold starts. (A warm engine may not require choking.) Moving the throttle control (C) fully forward is FULL throttle position. Always operate the unit at FULL throttle when mowing.

Choke

Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require choking. Pull the knob UP to close the choke. Push to knob DOWN to open the choke.



PTO (Power Take Off) Switch

The PTO Switch engages and disengages the mower blades.

To engage the mower blades, pull up on the switch. To disengage the mower blades, push down on the switch.

When the PTO engagement lever or switch is in the Engaged position, the Engine Kill system is activated.



Operator Presence / Parking Brake Handles

This control deactivates the engine kill system and disengages the parking brake when depressed. Release the handles to activate the engine kill system and engage the parking brake. The engine will shut off if the operator releases the handles with the PTO engaged.



Cutting Height Adjust Handle

The cutting height adjust handle controls the mower cutting height. To adjust the mower cutting height, turn the crank handle clockwise to raise the cutting height. Turn the crank handle counterclockwise to lower the cutting height. Observe the cutting height indicator on the left side of the mower deck.



Fuel Tank Cap

To remove cap, turn counterclockwise.



Transmission Release Valve

The transmission release valve deactivates the transmissions so that the unit can be pushed by hand.



Engages the transmission; the mower will move under its own power.



Disengages the transmission; the mower can now be pushed by hand.

See PUSHING THE MOWER BY HAND for operational information.



SAFETY INTERLOCK SYSTEM

This unit is equipped with safety interlock switches and other safety devices. These safety systems are present for your safety, do not attempt to bypass safety switches, and never tamper with safety devices. Check their operation regularly.

Operational SAFETY Checks

Your unit is equipped with an operator presence switch safety system. Check the operator presence switch operation every fall and spring with the following tests.

Test 1 — Engine WILL NOT start if:

- PTO switch is engaged.

Test 2 — Engine WILL start if:

- PTO switch is NOT engaged.

Test 3 — Engine should SHUT OFF if:

- Operator releases the operator presence / parking brake handles with PTO engaged.

Test 4 — Blade Brake Check

Mower blades and mower drive belt should come to a complete stop within seven (7) seconds after electric PTO switch is turned off (or operator releases operator presence handles). If mower drive belt does not stop within seven (7) seconds, see your dealer.

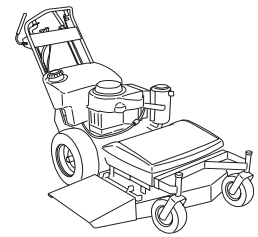
NOTE: Once the engine has stopped, PTO switch must be turned off in order to start the engine.



WARNING

If the unit does not pass a safety test, do not operate it. See your authorized dealer. Under no circumstance should you attempt to defeat the purpose of the safety interlock system.

Operation



GENERAL OPERATING SAFETY

Before first time operation:

- Be sure to read all information in the Safety and Operation sections before attempting to operate this machine.
- Become familiar with all of the controls and how to stop the unit.
- Drive in an open area without mowing to become accustomed to the unit.

CHECKS BEFORE STARTING

- Check that crankcase is filled to full mark on dipstick. See the engine Operator's Manual for instructions and oil recommendations.
- Make sure all nuts, bolts, screws and pins are in place and tight.
- Fill the fuel tank with fresh fuel. Refer to engine manual for fuel recommendations.
- Make sure fuel shut off valve is in the ON position.

WARNING

Before leaving the operator's position for any reason, disengage the PTO, stop the engine and remove the key.

To reduce fire hazard, keep the engine and mower free of grass, leaves and excess grease. Do not stop or park machine over dry leaves, grass or combustible materials.

Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do not allow open flame, smoking or matches in the area. Avoid over-filling and wipe up any spills.

WARNING

If you do not understand how a specific control functions, or have not yet thoroughly read the FEATURES & CONTROLS section, do so now.

Do NOT attempt to operate the machine without first becoming familiar with the location and function of ALL controls.

STARTING THE ENGINE

- Make sure the PTO switch is disengaged.
- Set the engine throttle control to FAST throttle position. Then fully close the choke by pulling the knob OUT fully.

NOTE: A warm engine may not require choking.

- Insert the key into the ignition switch and turn it to RUN.
- Grasp recoil handle and pull cord briskly. (You may have to pull several times before engine starts. If engine fails to start within a reasonable number of attempts, discontinue and check engine manual for further instructions.)

NOTE: Be sure recoil cord retracts fully into recoil unit. A slack recoil cord can cause serious personal injury and/or damage to unit.

- After the engine starts, gradually open the choke (push knob down fully).

Warm up the engine by running it for at least a minute before engaging the PTO lever/switch or driving the mower.

After warming the engine, ALWAYS operate the unit at FULL THROTTLE when mowing.

In the event of an emergency the engine can be stopped by simply turning the ignition switch to STOP. Use this method only in emergency situations. For normal engine shut down follow the procedure given in STOPPING THE MOWER.

DRIVING THE MOWER

- Make sure the PTO switch is disengaged.
- Start the engine (see STARTING THE ENGINE).
- Set the throttle control to FULL.
- Grasp the operator presence / parking brake handles and the handle bar grips at the same time to deactivate engine kill system and disengage the parking brake.
- With your thumbs, pressing the ground speed control levers forward will move the mower forward. Pulling them back will move the mower backwards. The farther the levers are pushed or pulled will result in a faster ground speed.
- To slow the mower, gently release your thumb pressure on the ground speed control levers.

OPERATING ON A SLOPE

While it is not recommended, traveling up and down slopes may be required from time to time. These guide lines are listed for your safety.

Traveling Up a Slope

Since the hill climbing ability of the machine will probably far exceed any other machine you may have operated, caution should be observed.

- Never make abrupt speed or directions changes on a slope.
- Never push down on the handle bars while going up a grade. A slight lifting pressure is recommended to keep the front wheels on the ground.

Traveling Down a Slope

A very slow ground speed should always be used when traveling down a slope. This can be accomplished by GENTLY moving the ground speed control levers towards the reverse direction.

STOPPING THE MOWER

- Returning the ground speed control levers to the neutral position will stop movement.
- Disengage the PTO.
- Release the operator presence / parking brake handles to engage the parking brake.
- Move the throttle control to mid-throttle position and turn the ignition key to OFF. Remove the key.

MOWING

- Make sure the PTO switch is disengaged.
- Start the engine (see STARTING THE ENGINE).
- Set the throttle control to FULL.
- Grasp the operator presence / parking brake handles and the handle bar grips at the same time to deactivate engine kill system and disengage the parking brake.
- Engage the PTO by pulling up on the PTO switch.
- Begin mowing. See Lawn Care Section in the back of this manual for tips on mowing patterns, lawn care, and trouble shooting information.
- When finished, disengage the PTO.
- Stop the engine (see STOPPING THE MOWER).

PUSHING THE MOWER BY HAND



DO NOT TOW MOWER

Towing the unit will cause hydraulic transmission damage. Do not use another vehicle to push or pull this unit.

- Disengage the PTO, turn the ignition OFF, and remove the key.
- Slide the hydraulic release rod forward and lock into the top of the "T" slot. See Figure 1.
- Grasp the operator presence / parking brake handles and the handle bar grips at the same time to disengage the parking brake.

The mower can now be pushed by hand.

- After moving the mower, re-engage the transmission (DRIVE position) by releasing the rod from the "T" and sliding the release handle towards the rear of the machine.

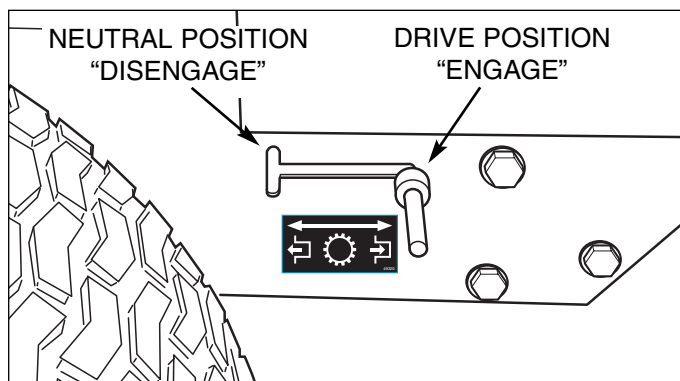


Figure 1. Hydraulic Release Rod

STORAGE

Temporary Storage (30 Days Or Less)

Remember, the fuel tank will still contain some gasoline, so never store the unit indoors or in any other area where fuel vapor could travel to any ignition source. Fuel vapor is also toxic if inhaled, so never store the unit in any structure used for human or animal habitation.

Here is a checklist of things to do when storing your unit temporarily or in between uses:

- Keep the unit in an area away from where children may come into contact with it. If there's any chance of unauthorized use, remove the spark plug (s) and put in a safe place. Be sure the spark plug opening is protected from foreign objects with a suitable cover.
- If the unit can't be stored on a reasonable level surface, chock the wheels.
- Clean all grass and dirt from the mower.

Long Term Storage (Longer Than 30 Days)

Before you store your unit for the off-season, read the Maintenance and Storage instructions in the Safety Rules section, then perform the following steps:

- Drain crankcase oil while engine is hot and refill with a grade of oil that will be required when unit is used again.
- Prepare the mower deck for storage as follows:
 - a. Remove mower deck from the unit.
 - b. Clean underside of mower deck.
 - c. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
- Clean external surfaces and engine.
- Prepare engine for storage. See engine owner's manual.
- Clean any dirt or grass from cylinder head cooling fins, engine housing and air cleaner element.
- Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep out moisture, dirt and insects.
- Completely grease and oil unit as outlined in the Normal Care section.
- Clean up unit and apply paint or rust preventative to any areas where paint is chipped or damaged.

WARNING

Never store the unit, with gasoline in engine or fuel tank, in a heated shelter or in enclosed, poorly ventilated enclosures. Gasoline fumes may reach an open flame, spark or pilot light (such as a furnace, water heater, clothes dryer, etc.) and cause an explosion.

Handle gasoline carefully. It is highly flammable and careless use could result in serious fire damage to your person or property.

Drain fuel into an approved container outdoors away from open flame or sparks.

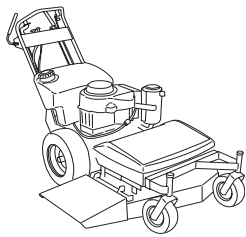
- Drain fuel system completely or add a gasoline stabilizer to the fuel system. If you have chosen to use a fuel stabilizer and have not drained the fuel system, follow all safety instructions and storage precautions in this manual to prevent the possibility of fire from the ignition of gasoline fumes. Remember, gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.

NOTE: Gasoline, if permitted to stand unused for extended periods (30 days or more), may develop gummy deposits which can adversely affect the engine carburetor and cause engine malfunction. To avoid this condition, add a gasoline stabilizer to the fuel tank and run the engine a few minutes, or drain all fuel from the unit before placing it in storage.

STARTING AFTER LONG TERM STORAGE

Before starting the unit after it has been stored for a long period of time, perform the following steps.

- Remove any blocks from under the unit.
- Unplug the exhaust outlet and air cleaner.
- Fill the fuel tank with fresh gasoline. See engine manual for recommendations.
- See engine owner's manual and follow all instructions for preparing engine after storage.
- Check crankcase oil level and add proper oil if necessary. If any condensation has developed during storage, drain crankcase oil and refill.
- Inflate tires to proper pressure. Check fluid levels.
- Start the engine and let it run slowly. DO NOT run at high speed immediately after starting. Be sure to run engine only outdoors or in well ventilated area.



Regular Maintenance

MAINTENANCE SCHEDULE & PROCEDURES

The following schedule should be followed for normal care of your rider and mower. You will need to keep a record of your operating time. Determining operating time is easily accomplished by multiplying the time it takes to do one job by the number of times you've done the job, or you can install an hour meter.

SAFETY ITEMS	See Page	Before First Use	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Spring & Fall
Check Safety Interlock System	9	●					●
Check Mower Blade Stopping Time	23	●				●	
NORMAL CARE ITEMS	See Page	Before First Use	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Spring & Fall
Check Mower for loose hardware	—		●	●			
Check Engine Oil Level	14*	●	●	●			●
Check Engine Air Filter	14*		●			**●	
Change Engine Oil & Filter *	14*				**● Every 50 Hours		***●
Check / Adjust PTO Clutch	23				***	●	
Lubricate Mower	15					**●	
Check Tire Pressure	13	●			●		
Check Fuel Filter	14					●	
Clean & Sharpen Mower Blades	16					●	
Inspect Spark Plug	14*					●	

* See the engine manufacturer's owner's manual. Change original engine oil after first 5 hours of operation.

** More often in hot (over 85° F: 30° C) weather or dusty operating conditions.

*** Service after first 25 hours, then after every 100 hours.

CHECK TIRE PRESSURE

Tire Pressure should be checked periodically, and maintained at the levels shown in the chart. Note that these pressures may differ slightly from the "Max Inflation" stamped on the side-wall of the tires. The pressures shown provide proper traction, improve cut quality, and extend tire life.

Tire	Pressure
Front	25 psi (1,72 bar)
Rear	15 psi (1,03 bar)

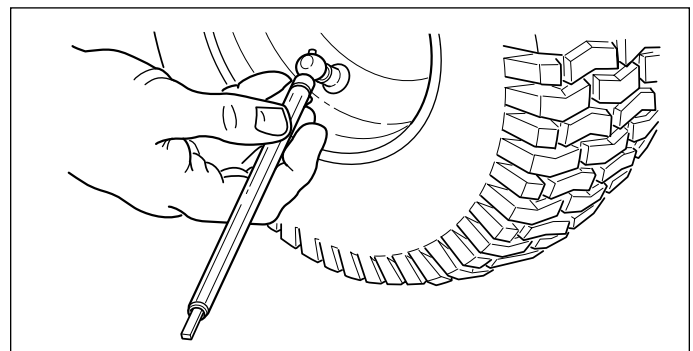


Figure 2. Checking Tire Pressure

Regular Maintenance

CHECKING / ADDING FUEL

To add fuel:

- Remove the fuel cap.
- Fill the tank.

Do not overfill. Leave approximately 1" of room in the tank for fuel expansion. Refer to your engine manual for specific fuel recommendations.

- Install and hand tighten the fuel cap.

FUEL FILTER

The fuel filter is located in the fuel line between the fuel shut off valve and the fuel pump. If filter is dirty or clogged, replace as follows:

- Shut off the fuel valve.
- Place a container below the filter to catch spilled fuel.
- Using a pliers, open and slide hose clamps from fuel filter.
- Remove hoses from filter.
- Install new filter in proper flow direction in fuel line.
- Secure with hose clamps.

OIL & FILTER CHANGE

1. Warm engine by running for a few minutes. (Refer to the engine operator's manual for oil & filter replacement instructions.)
2. Park machine and place the rear tires in a 2 x 4 block of wood (A, Figure 3) or park machine on a slight downhill grade.
3. Place a small pan under the oil drain hose to catch the oil.
4. Using the appropriate tools, turn the oil drain valve (B, Figure 4) counter-clockwise to open the valve and drain the engine oil.
5. After draining, turn the oil drain valve clockwise to close the valve and wipe up any spilled oil.
6. Place a small pan or cup under the engine oil filter.
7. Remove the engine oil filter and replace with a new one.
8. Remove the pan or cup and wipe up any spilled oil.

CHECK / CHANGE AIR FILTER

Refer to engine owners manual.

REPLACE SPARK PLUG

Refer to engine owners manual.

WARNING

Gasoline is highly flammable and must be handled with care. Never fill the tank when the engine is still hot from recent operation. Do not allow open flame, smoking or matches in the area. Avoid over-filling and wipe up any spills.

Do not remove fuel filter when engine is hot, as spilled gasoline may ignite. DO NOT spread hose clamps further than necessary. Ensure clamps grip hoses firmly over filter after installation.



Do not use gasoline containing METHANOL, gasohol containing more than 10% ethanol, gasoline additives, premium gasoline, or white gas because engine/fuel system damage could result.

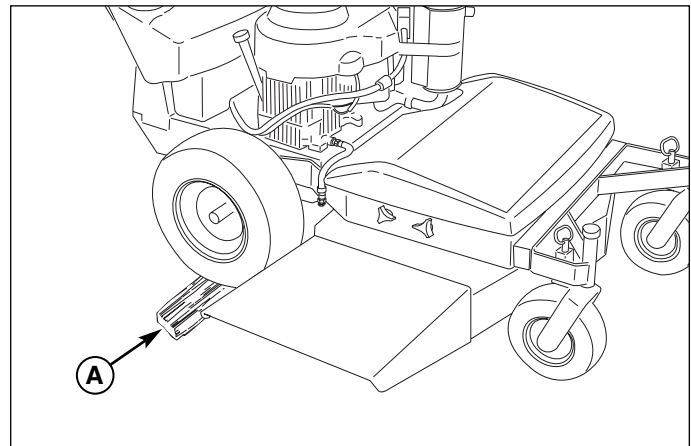


Figure 3. Raise Rear of Machine
A. 2 x 4 Block

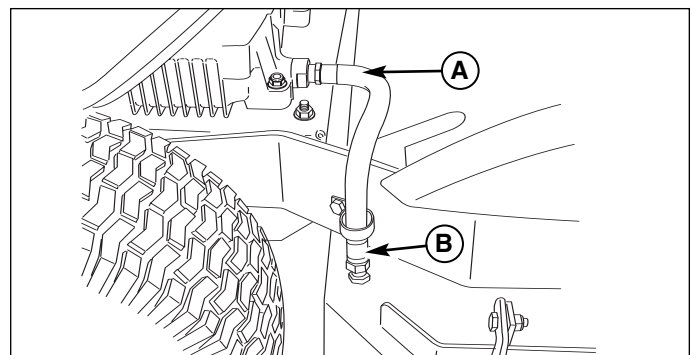


Figure 4. Oil Drain Hose Location
A. Oil Drain Valve
B. Drain Hose

LUBRICATION

Lubricate the unit at the locations shown in Figures 5 through 8 as well as the following lubrication points.

Grease:



- front caster wheel axles
- front caster wheel pivots
- ground speed control shaft pivot
- deck lift shaft screw
- mower deck spindles

Use grease fittings when present. Disassemble parts to apply grease to moving parts when grease fittings are not installed.

Not all greases are compatible. Use automotive-type lithium grease.

Oil:



- operator presence / parking brake handle pivot
- ground speed control lever pivots
- discharge chute pivots
- cutting height adjust handle pivots
- deck lift pivots

Generally, all moving metal parts should be oiled where contact is made with other parts. Keep oil and grease off belts and pulleys. Remember to wipe fittings and surfaces clean both before and after lubrication.

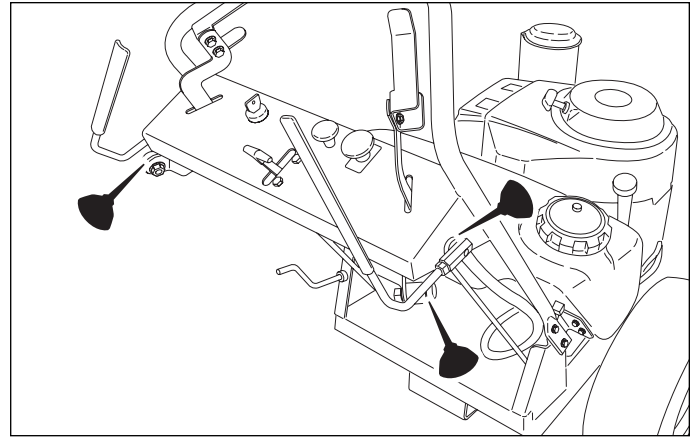


Figure 5. Control Pivots

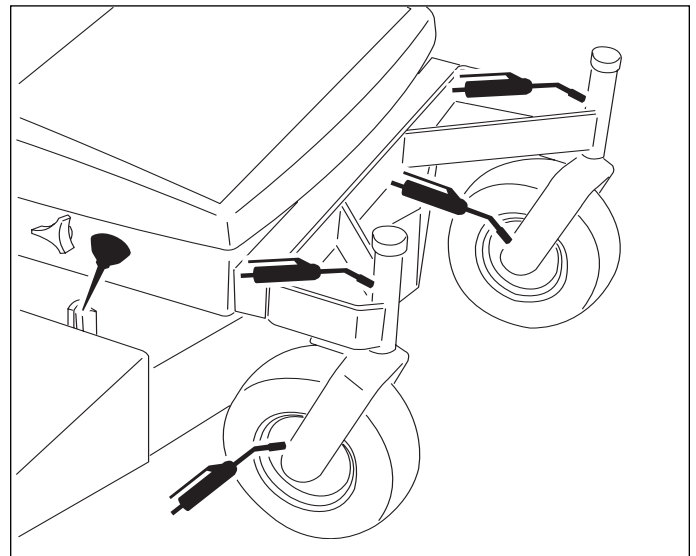


Figure 6. Casters & Chute Hinges

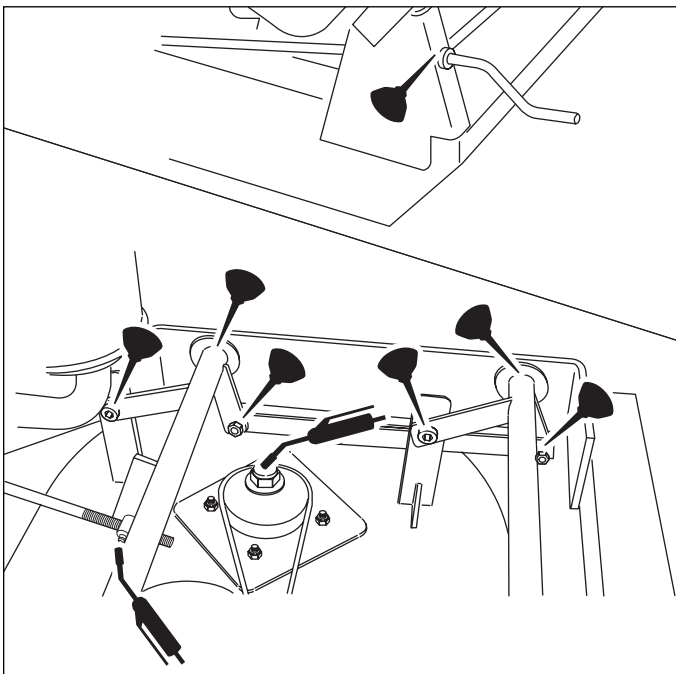


Figure 7. Deck Lift Pivots & Handle

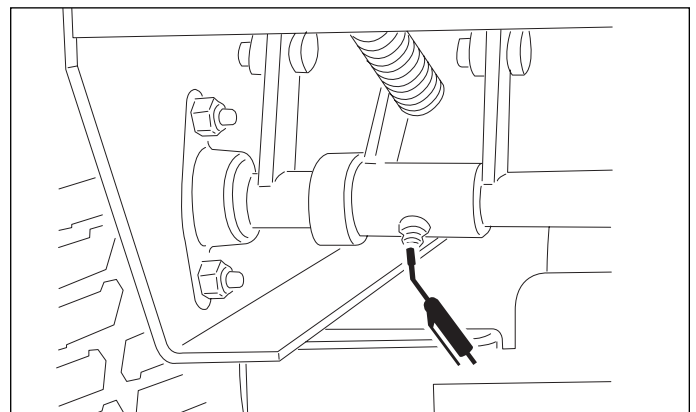


Figure 8. Brake Link Pivot
(rear shield removed for clarity)

Regular Maintenance

SERVICING THE MOWER BLADES

- Blades should be sharp and free of nicks and dents. If not, sharpen blades as described in following steps.
- To remove blade for sharpening, use a 1" wrench on the flats of the spindle shaft while removing the blade mounting bolt with a 15/16" wrench (Figure 9).
- Use a file to sharpen blade to fine edge. Remove all nicks and dents in blade edge. If blade is severely damaged, it should be replaced.
- Balance the blade as shown in Figure 10. Center the blade's hole on a nail lubricated with a drop of oil. A balanced blade will remain level.
- Reinstall each blade with the tabs pointing up toward deck as shown in Figure 11. Secure with a bolt and flat washer and torque bolts to 70 ft.lbs. (94 N.m.).

WARNING

Mower blades are sharp. For your personal safety, do not handle mower blades with bare hands. Careless or improper handling of blades may result in serious injury. For your personal safety, blade mounting bolts must each be installed with a flat washer then securely tightened. Torque blade mounting bolts to 70 ft.lbs. (94 N.m.)

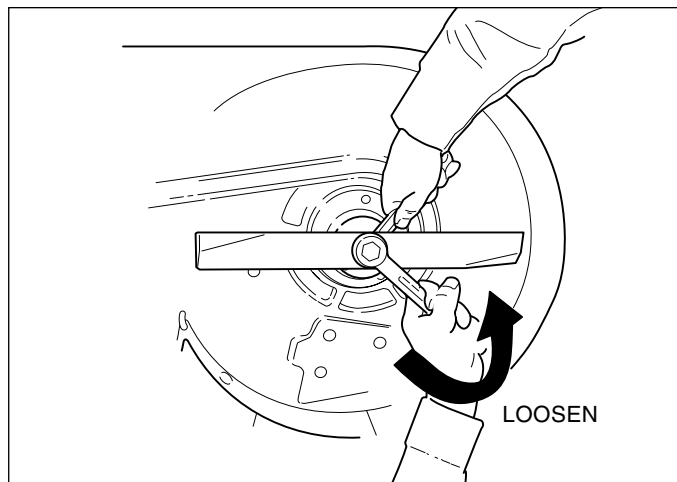


Figure 9. Removing the Blade

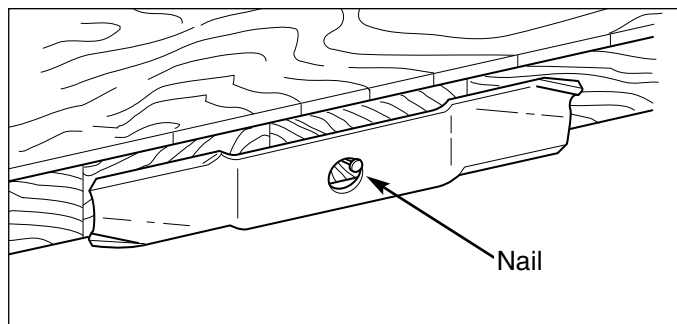


Figure 10. Balancing The Blade

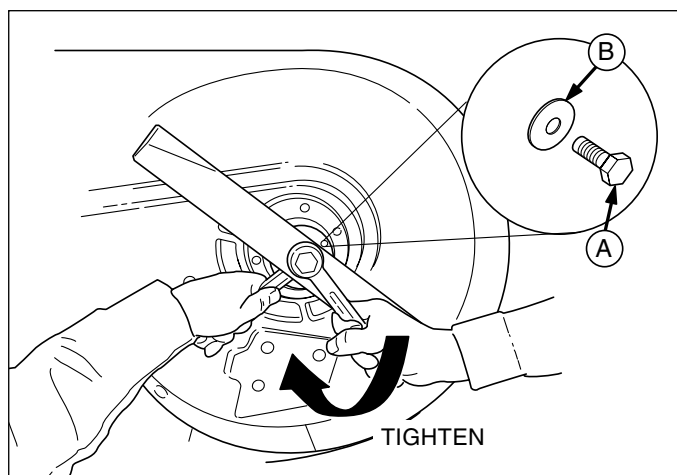
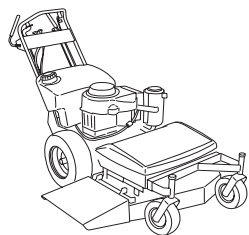


Figure 11. Installing The Blade

- A. Bolt
- B. Flat Washer



Troubleshooting Adjustments & Service

TROUBLESHOOTING

While normal care and regular maintenance will extend the life of your equipment, prolonged or constant use may eventually require that service be performed to allow it to continue operating properly.

The troubleshooting guide below lists the most common problems, their causes and remedies.

See the information on the following pages for instructions on how to perform most of these minor adjustments and service repairs yourself. If you prefer, all of these procedures can be performed for you by your local authorized dealer.

WARNING

To avoid serious injury, perform maintenance on the tractor or mower only when the engine is stopped and the parking brake engaged.

Always remove the ignition key, disconnect the spark plug wire and fasten it away from the plug before beginning the maintenance, to prevent accidental starting of the engine.

TROUBLESHOOTING THE MOWER

PROBLEM	CAUSE	REMEDY
Engine will not turnover or start.	1. PTO (electric clutch) switch in ON position. 2. Out of fuel. 3. Engine flooded. 4. Wiring loose or broken. 5. Safety interlock switch faulty. 6. Spark plug(s) faulty, fouled or incorrectly gapped. 7. Water in fuel. 8. Gas is old or stale.	1. Place in OFF position. 2. If engine is hot, allow it to cool, then refill the fuel tank. 3. Move throttle control out of CHOKE position. 4. Visually check wiring & replace broken or frayed wires. Tighten loose connections. 5. Replace as needed. See authorized service dealer. 6. Clean and gap or replace. See engine manual. 7. Drain fuel & refill with fresh fuel. 8. Drain fuel & replace with fresh fuel.
Engine starts hard or runs poorly.	1. Fuel mixture too rich. 2. Spark plug faulty, fouled, or incorrectly gapped.	1. Clean air filter. Check choke adjustment (throttle control). 2. Clean and gap or replace. (See engine manual.)
Engine knocks.	1. Low oil level. 2. Using wrong grade oil.	1. Check/add oil as required. 2. See engine manual.
Excessive oil consumption.	1. Engine running too hot. 2. Using wrong weight oil. 3. Too much oil in crankcase.	1. Clean engine fins, blower screen and air cleaner. 2. See engine manual. 3. Drain excess oil.
Engine exhaust is black.	1. Dirty air filter. 2. Engine choke control is in closed position.	1. Replace air filter. See engine manual. 2. Open choke control.
Engine runs, but mower will not drive.	1. Hydraulic release valve rod in "open" position. 2. Belt is broken. 3. Drive belt slips. 4. Brake is not fully released.	1. Return release rod to DRIVE position. 2. See Drive Belt Replacement. 3. See problem and cause below. 4. See authorized service dealer
Brake will not hold.	1. Brake is incorrectly adjusted.	1. See authorized service dealer.
Mower drives or handles poorly.	1. Loose control linkages. 2. Improper tire inflation.	1. Check and tighten any loose connections. 2. See Regular Maintenance Section.

TROUBLESHOOTING THE MOWER DECK

PROBLEM	CAUSE	REMEDY
Mower drive belt slips or fails to drive.	1. Clutch is out of adjustment. 2. Pulleys or belt greasy or oily. 3. Idler pulley spring broken or not properly attached. 4. Belt stretched or worn. 5. Mower drive belt broken.	1. See PTO CLutch Adjustment Section. 2. Clean as required. 3. Repair or replace as needed. 4. Replace drive belt. 5. Replace drive belt.
Mower cut is uneven.	1. Mower not leveled properly. 2. Drive tires not inflated equally or properly.	1. See Mower Adjustment. 2. See Regular Maintenance Section.
Mower cut is rough looking.	1. Engine speed too slow. 2. Ground speed too fast. 3. Blades are dull. 4. Mower drive belt slipping because it is oily or worn. 5. Blades not properly fastened to arbors.	1. Set throttle to full. 2. Decrease Ground Speed. 3. Sharpen or replace blades. See Mower Blade Service. 4. Clean or replace belt as necessary. 5. See Servicing the Mower Blades.
Engine stalls easily with mower engaged.	1. Engine speed too slow. 2. Ground speed too fast. 3. Cutting height set too low. 4. Discharge chute plugged with cut grass.	1. Set to full throttle. 2. Decrease Ground Speed. 3. Cut tall grass at maximum cutting height during first pass. 4. Cut grass with discharge pointing toward previously cut area.
Excessive mower vibration.	1. Blade mounting screws are loose. 2. Mower blades, arbors, or pulleys are bent. 3. Mower blades are out of balance. 4. Belt installed incorrectly.	1. Tighten to 70 ft.lbs. (94 N.m.). 2. Check and replace as necessary. 3. Remove, sharpen, and balance blades. See Maintenance Section. 4. Reinstall Correctly.
Excessive belt wear or breakage.	1. Bent or rough pulleys. 2. Using incorrect belt.	1. Repair or replace. 2. Replace with correct belt.

CUTTING HEIGHT ADJUSTMENT

The cutting height can be adjusted within two different ranges. The High Range covers 4-1/2" - 2-1/2" (11,4 - 6,4cm) and the Low Range covers 3-1/2" - 1-1/2" (8,9 - 3,8cm). See Figure 12 for deck height indicator.

Before adjusting the cutting height, you must first determine the average cutting height. Depending on the range you plan to use, it may be necessary to adjust the deck lift pivot locations and the pulley spacer positions. See Figures 13 & 14 for pulley and pivot positions in relation to the cutting range.

To Adjust the Cutting Range:

1. Remove the mower deck drive belt. See Belt Removal & Replacement Section for proper procedure.
2. Remove the spindle nut (B, Figure 14) fastening the pulley to the spindle. Remove the pulley and key. Move the pulley spacers into the proper position in relation to the cutting range. Reinstall the pulley and key. Reinstall the nut and torque to 85-90 ft. lbs. (115-122 Nm).
3. Remove the pivot bolts and nuts (A, Figure 14) and reinstall the proper position in relation to the cutting range. Reinstall the bolts and nuts and tighten securely.

To Adjust the Cutting Height:

Turn the crank handle clockwise to raise the mower deck or counterclockwise to lower the mower deck. See Figure 15.

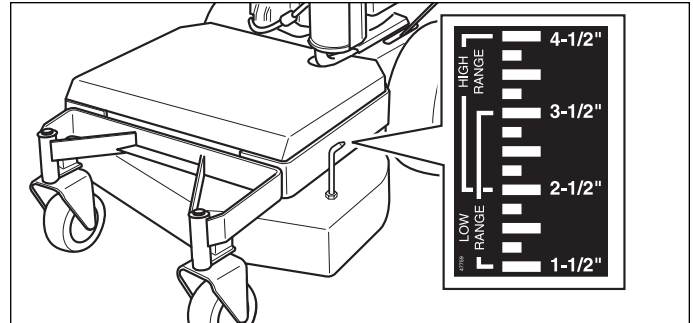


Figure 12. Deck Height Indicator

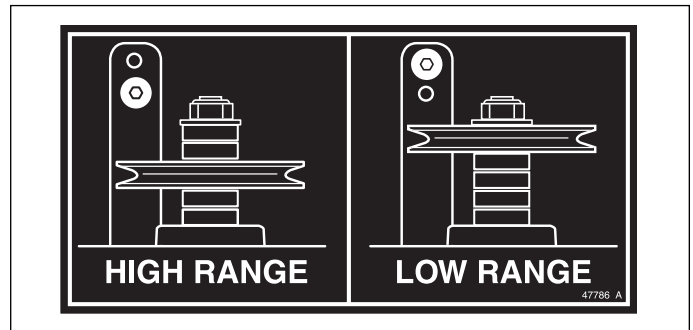


Figure 13. Pulley & Pivot Position

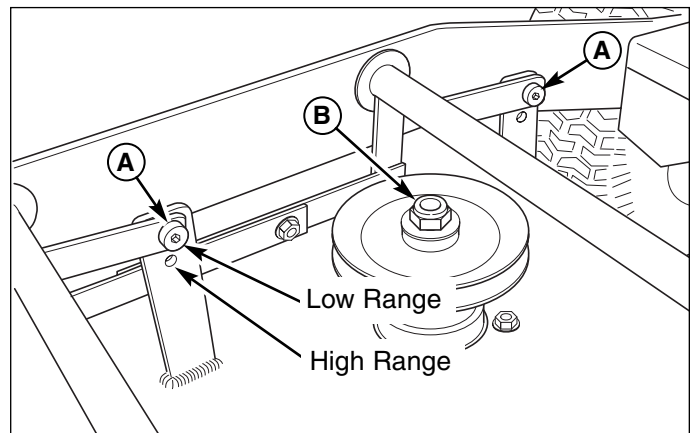


Figure 14. Pulley & Pivot Position

- A. Pivot Bolts & Nuts
- B. Spindle Nut

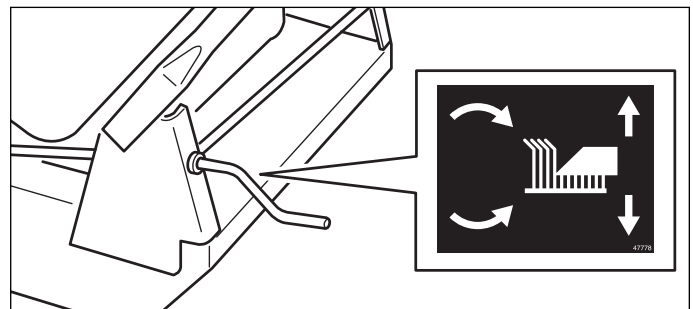


Figure 15. Cutting Height Adjustment

DECK LEVELING ADJUSTMENT

To Level the Mower Deck:

1. Park machine on a flat, level surface.
2. Raise the mower deck until it reaches the upper stop.
- 3A. If the mower deck is in the HIGH RANGE, place 2 x 4 blocks under the outside edges of the mower deck with the 3-1/2" sides being vertical. Place a 1/8" (3mm) thick spacer on top of the rear 2 x 4 blocks. (See Figure 16)
- 3B. If the mower deck is in the LOW RANGE, place 2 x 4 blocks under the outside edges of the mower deck with the 1-1/2" sides being vertical. Place a 1/8" (3mm) thick spacer on top of the rear 2 x 4 blocks. (See Figure 16)
4. Lower the mower deck until the deck rests against the 2 x 4 blocks and spacers.
5. Loosen the bolts (A, Figure 17) that secure the connecting links (B) together. This will remove any tension from the mounting linkages and pivots.
6. Retighten the bolts securely.
7. Verify that the deck height indicator (C) is aligned with the 4" mark (if in the HIGH RANGE) or the 2" mark (if in the LOW RANGE). Adjust the indicator position if necessary.
8. Remove the blocks from under the mower deck.

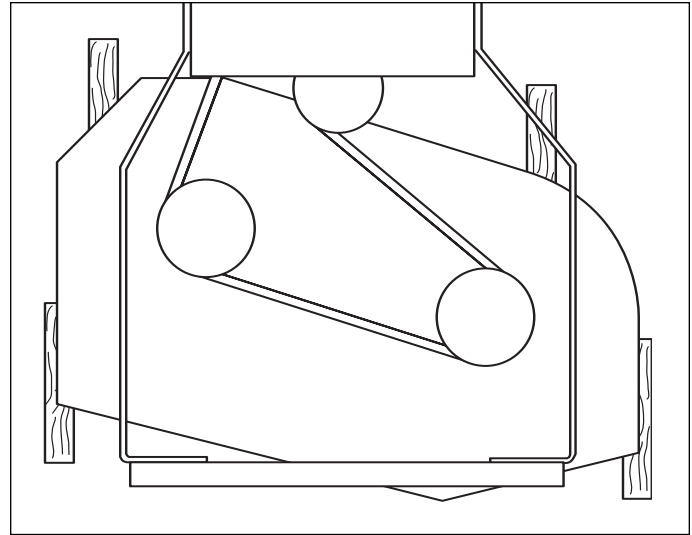


Figure 16. 2 x 4 Placement

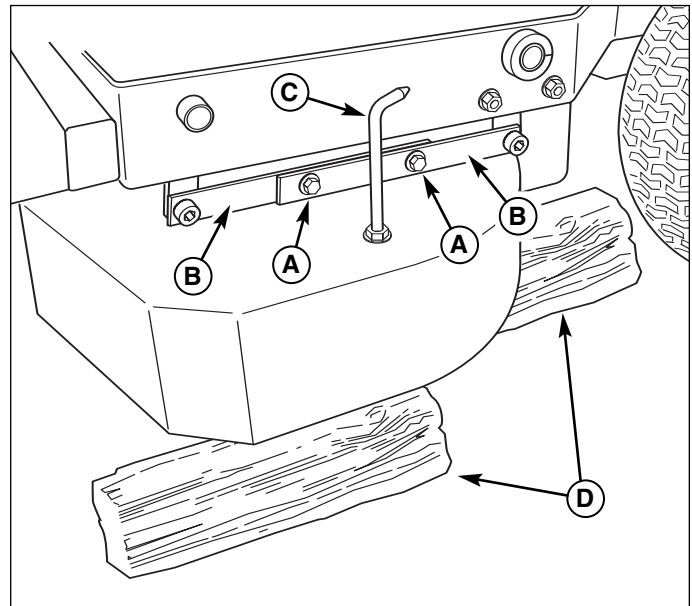


Figure 17. Deck Leveling Linkages

- A. Linkage Bolts
- B. Connecting Links
- C. Deck Height Indicator
- D. 2 x 4 Blocks

BELT REMOVAL AND REPLACEMENT

Mower Deck Drive Belt:

1. Park machine on a flat, level surface.
2. Remove the mower deck shield.
3. Push the idler arm towards the left-hand side of the machine to release the spring tension on the drive belt. (See Figure 18)
4. Slide the drive belt over the edge of the idler pulley (A). Release the idler arm.
5. Remove the old belt and replace with a new one. Make sure the V-side of the belt runs in the pulley grooves.
6. Install the drive belt on the spindle pulleys and the PTO clutch pulley. Again, push the idler arm towards the left-hand side of the machine and install the belt onto the idler pulley (A).
7. Run the mower under no-load condition for about 5 minutes to break in the belt.

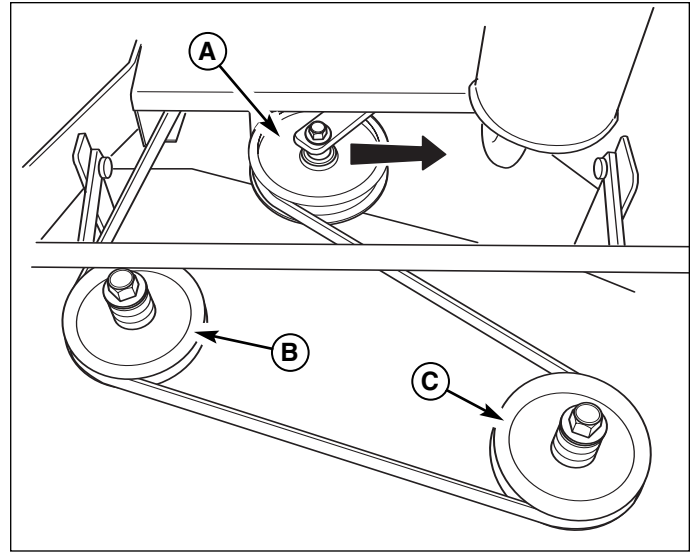


Figure 18. Mower Deck Drive Belt

- A. Idler Pulley**
- B. Right-Hand Spindle Pulley**
- C. Left-Hand Spindle Pulley**

Transaxle Drive Belt:

1. Park machine on a flat, level surface.
2. Remove the rear shield.
3. Remove the mower deck drive belt from the PTO clutch. See instructions above.
4. With a steel coat hanger, form a small hook. Insert the coat hanger through the opening in the right-hand side of the engine deck. Use the coat hanger to remove the spring (A, Figure 19) from the anchor pin (C).
5. Remove the belt from the idler pulley. Then remove the belt from the transaxle drive pulley and pull towards front of machine. Remove the belt from the drive pulley on the engine and drop belt around the PTO clutch to completely remove from machine.
6. Replace the old belt with a new belt. Install the new belt around the PTO clutch and onto the drive pulley on the engine. Reinstall belt onto the transaxle drive pulley and then onto the idler pulley. Make sure the V-side of the belt runs in the pulley grooves.
7. Using the coat hanger, reinstall the spring onto the anchor pin.
8. Reinstall the rear shield.

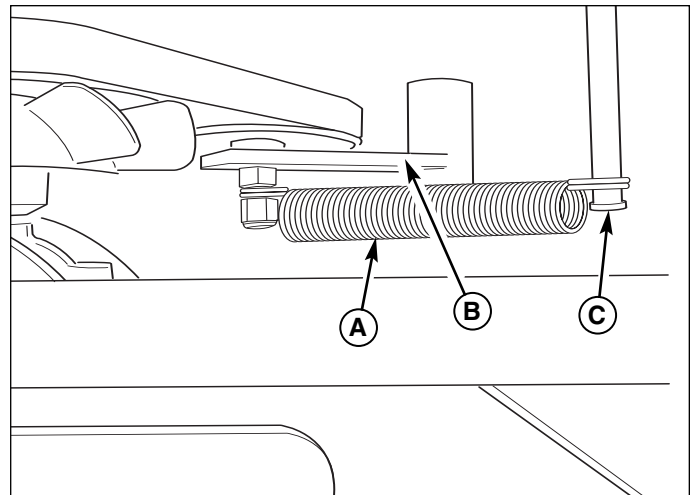


Figure 19. Transaxle Drive Belt

- A. Spring**
- B. Drive Idler Arm**
- C. Anchor Pin**

GROUND SPEED CONTROL LEVER LOCATION ADJUSTMENT

The control levers can be adjusted in two ways to provide a comfortable working range when operating the machine at the average mowing speed.

Adjust both the lever height and lever position at the same time to obtain the most comfortable working position

Adjusting the Lever Height:

1. Loosen the lever fastener (B, Figure 20) to adjust the lever height. Make sure the levers are parallel with the handle bars in both forward and reverse without contacting the handle bars.

Adjusting the Lever Position:

1. Remove the hairpin and clevis pin (D) that fasten the control rod (E) to the lever pivot (C).
2. Loosen the jam nut and adjust the position of the clevis on the rod. By shortening the rod (turning the clevis clockwise), it will move the lever forward. By lengthening the rod (turning the clevis counter-clockwise), it will move the lever rearward. Adjust until the desired lever position is obtained and tighten the jam nuts.
3. Reinstall the clevis on the lever pivot and secure with the clevis pin and hairpin.

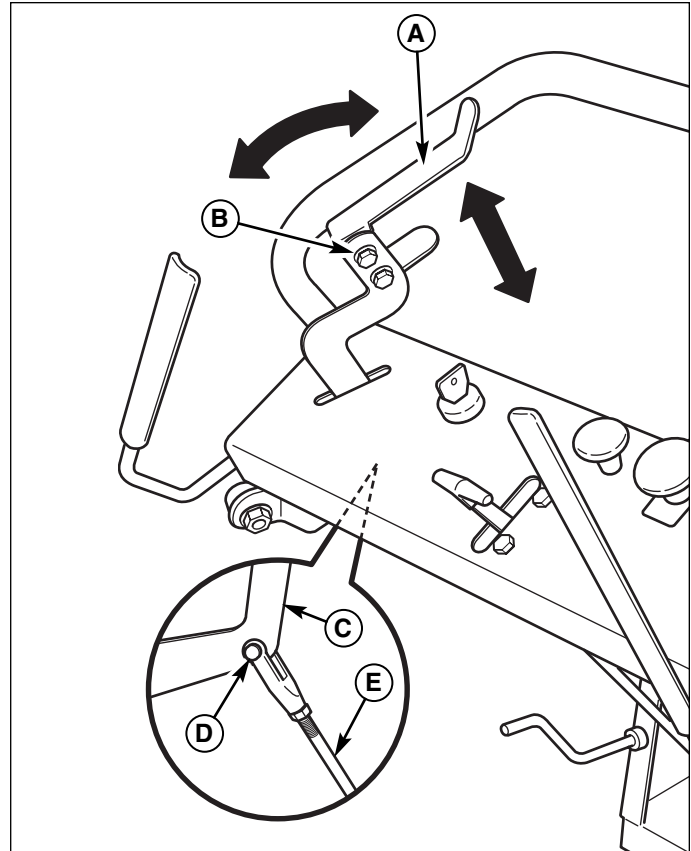


Figure 20. Ground Speed Control Lever Adjustment

- A. Control Lever**
- B. Lever Fastener**
- C. Lever Pivot**
- D. Clevis Pin & Hairpin**
- E. Control Rod**

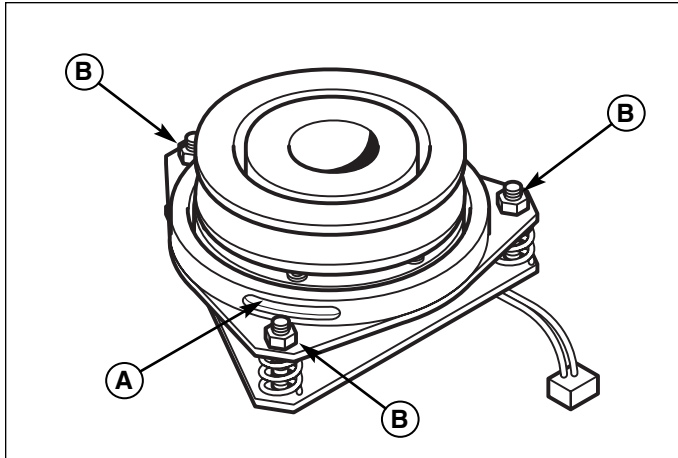


Figure 21. PTO Clutch Adjustment
A. Adjustment Window (Qty. 3, one shown)
B. Adjustment Nut

PTO CLUTCH ADJUSTMENT

Check the PTO clutch adjustment after the initial 25 hour break-in period and then after every 100 hours of operation. Also perform the following procedure if the clutch is slipping or will not engage, or if a new clutch has been installed.

- Remove key from ignition switch and disconnect spark plug wires to prevent the possibility of accidental starting while the PTO is being adjusted.
- See Figure 21. Note the position of the 3 adjustment windows (A) in the side of the brake plate and the nylock adjustment nuts (B).
- Insert a .016"-.018" (0,40-0,45mm) feeler gauge (C) through each window, positioning the gauge between the rotor face and the armature face as shown in Figure 22.
- Alternately tighten the adjustment nuts (B, Figure 21) until the rotor face and armature face just contacts the gauge.
- Check the windows for an equal amount of tension when the gauge is inserted and removed, and make any necessary adjustments by tightening or loosening the adjustment nuts.

NOTE: The actual air gap between the rotor and armature may vary even after performing the adjustment procedure. This is due to dimensional variations on component parts, and is an acceptable condition.

- Check the mower blade stopping time. The mower blades and mower drive belt should come to a complete stop within five seconds after the electric PTO switch is turned off.

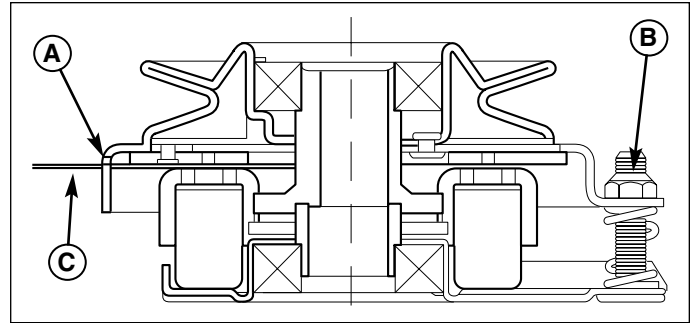


Figure 22. Adjust PTO Clutch
A. Window
B. Adjustment Nut
C. .016"-.018" (0,40-0,45mm) Feeler Gauge

⚠ WARNING

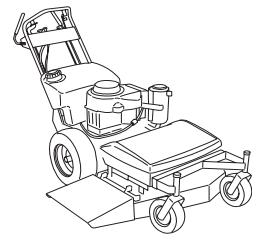
To avoid serious injury, perform adjustments only with engine stopped, key removed and tractor on level ground.

Blade Brake Check

Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned off.

- With PTO disengaged, start the engine.
- Remove the mower deck guard and observe the mower drive belt. Engage the PTO and wait several seconds. Disengage the PTO and check the amount of time it takes for the mower drive belt to stop.
- If the mower drive belt does not stop within five seconds, perform the PTO Clutch Adjustment. If the belt still does not stop within 5 seconds, see your dealer.

Specifications



NOTE: Specifications are correct at time of printing and are subject to change without notice.

** Actual sustained equipment horsepower will likely be lower due to operating limitations and environmental factors.*

ENGINE:

13 HP* Kawasaki Manual Start

Make	Kawasaki
Model	FH381V
Horsepower	13 @ 3600 rpm
Displacement	26.30 Cu. in (431 cc)
Electrical System	12 Volt Clutch Coil, 13 amp
Oil Capacity	3.2 pt. (1.5L) w/ Filter

CHASSIS:

Fuel Tanks	Capacity: 4 Gallons (15.1 L)
Rear Wheels	Tire Size: 16 x 6.50 -12 Inflation Pressure: 15 psi (1,03 bar)
Front Wheels	Tire Size: 9 x 3.5 - 6 Inflation Pressure: 25 psi (1,72 bar)

TRANSMISSION:

HydroGear 334

Type	Unitized Drive Transaxle
Hydraulic Fluid	HydroGear 20W-50 oil
Speeds	Forward: 0-5.5 MPH (0-8.85 km/h)
@ 3400 rpm	Reverse: 0-2 MPH (0-3.22 km/h)
Continuous Torque	160 ft. lbs. (217 N.m.)
Output	
Maximum Weight on Axle	620 lbs. (281 Kg)

DIMENSIONS:

Overall Length	74" (188 cm)
Overall Width	41" (104 cm)
Height	41" (104 cm)
Weight (apx..)	330 lbs. (150 kg)



Lawn Care & Mowing Information

GENERAL INFORMATION

Proper mowing is an important part of maintaining your lawn in the best possible condition. A healthy and well maintained lawn is better able to resist drought, weeds, and other stresses. But too much maintenance is as detrimental to your lawn as neglect. Proper care for your lawn involves more than just “cutting the grass.” To have a healthy lawn, you need to know:

- Types of Grass, Climate and Conditions
- How and When to Water, Fertilize & Aerate
- How High to Mow the Grass
- When and How Often to Mow
- What Mowing Patterns to Use
- Proper Mowing Methods
- How to Solve Common Mowing Problems

TYPES OF GRASS, CLIMATE AND CONDITIONS

A variety of grasses are commonly grown in household lawns, but two main groups known as cool-season grasses (varieties of bluegrass, ryegrass, and fescue), and warm-season grasses (typically bermuda, buffalo grass, and zoysia varieties) are the most common.

The cool-season grasses are better suited to cooler climates, and do not endure hot and dry weather as well as warm-season grasses, but conversely, the warm-season grasses do not grow as well in cooler climates. Most residential lawns are typically seeded with a mixture of these grasses. (A local nursery or lawn center may help you to identify what kind of grass your lawn contains from a sample.)

Knowing your climate and conditions is also important to proper lawn care. Drier climates or conditions will require additional watering, while wetter climates may require more frequent mowing.

HOW AND WHEN TO WATER, FERTILIZE & AERATE

Every lawn's watering needs are unique and are dependent upon the type of grass and soil, the amount of local rainfall, and other conditions. **Most lawns are watered too often, but with too little water.** However too much water can allow development of diseases with your lawn. **It is best to water the lawn only when necessary, and then to water it slowly, evenly, and deeply—imitating a slow, soaking rain.**

WHEN TO WATER YOUR LAWN

When the lawn begins to wilt, the grass's color dulls, or footprints stay compressed for more than a few seconds, the lawn is beginning to dry out, and needs additional moisture. The best time to water is early morning to allow the water to soak deeply into the lawn and reduce the amount that evaporates in the hot afternoon sun.



HOW TO WATER YOUR LAWN

The best method of watering a lawn is to imitate a slow, soaking rain, applying about 1 inch of water. A method of verifying the amount that you have watered, is to place several empty tin cans (low shallow cans work best) in various spots around the lawn, and check the depth of water in the can during the watering process.

HOW TO FERTILIZE YOUR LAWN

Fertilizing with a slow-release fertilizer provides missing nutrients which help create slow, even growth. While opinions vary on the need for fertilizing, when and how much to fertilize will be more a factor of the condition of the lawn and soil than any routine. Remember that over-fertilizing can cause harm, and that most fertilizing should be applied in the spring so that it will release into the lawn through the summer. For more information, check with a local nursery or lawn care specialist, and read and follow the fertilizer manufacturer's instructions.

AERATING YOUR LAWN

Consider aerating your lawn in spring. Using an aerator to remove cores of soil from the lawn increases the speed of clipping decomposition and encourages deeper root growth by opening up the soil and permitting greater movement of water, fertilizer and air.

Lawn Care & Mowing Information

HOW HIGH TO MOW THE GRASS

Often cutting height is a matter of personal preference. Typically, you should mow the grass when it is between three and five inches high. The proper cutting height range for a specific lawn will depend upon several factors, including the type of grass, the amount of rainfall, the prevailing temperature, and the lawn's overall condition.

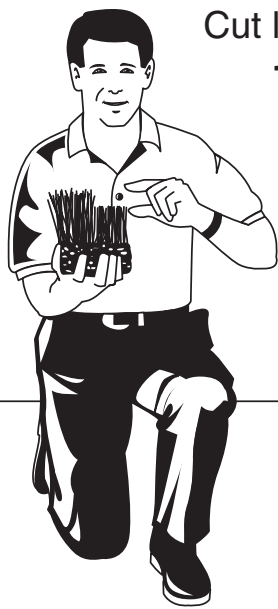
Cutting the grass too short causes weak, thin grass plants, which are easily damaged by dry periods and pests. Cutting too short is often more damaging than allowing the grass to be slightly higher.

Letting grass grow a bit longer—especially when it is hot and dry—reduces heat build-up, preserves needed moisture and protects the grass from heat damage and other problems. However, allowing grass to grow too high can cause thin turf and additional problems.

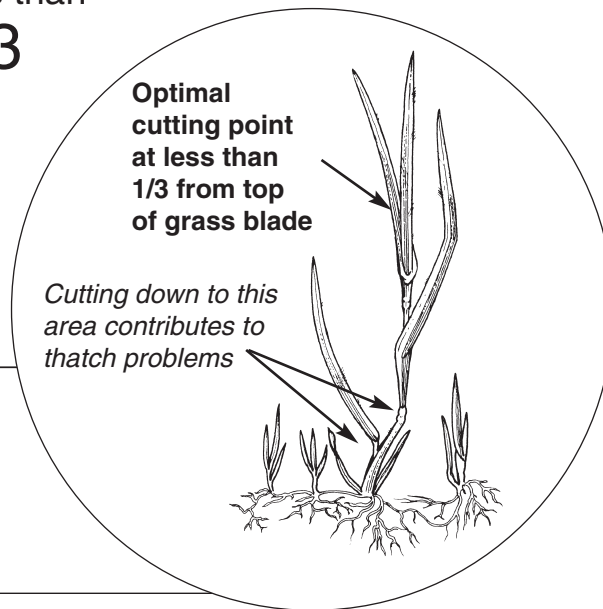
Cutting off too much at one time shocks the plant's growth system and weakens the grass plants. **A good rule of thumb is the 1/3 rule: to cut no more than one third of the grass height, and never more than 1 inch at a time.**

The amount of grass you are able to cut in one pass is also effected by the type of mowing system you are using (for example, broadcasting with side discharge decks can process a much larger volume of grass than mulching does).

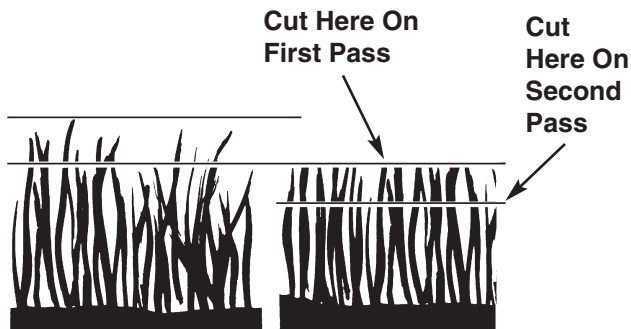
NOTE: We cover some specific mowing instructions for mulching and broadcasting later in this Lawn Care section.



Cut less than
1/3



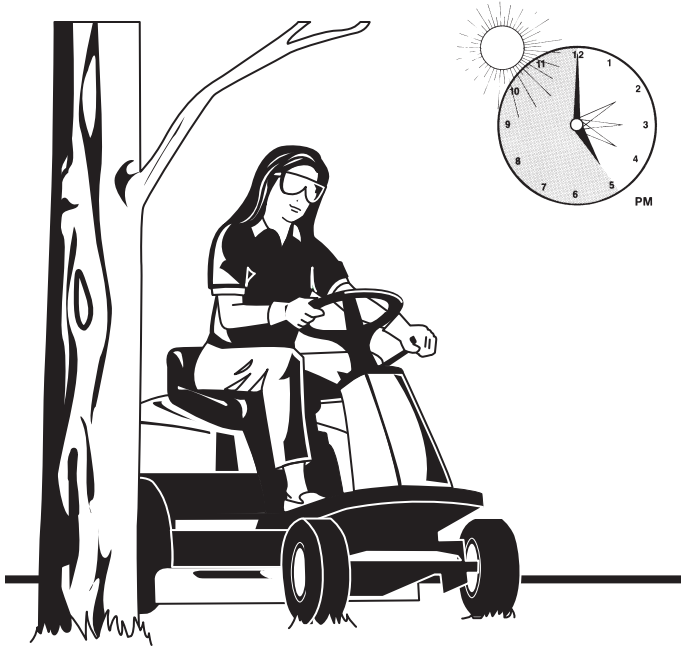
Proper Cutting Height



Tall Grass Requires Incremental Cutting

For extremely tall grass, set the cutting height at maximum for the first pass, and then reset it to the desired height and mow a second or third time.

Don't cover the grass surface with a heavy layer of clippings. Consider using a grass collection system and starting a compost pile.



WHEN AND HOW OFTEN TO MOW

The time of day and condition of the grass greatly affect the results you'll get when mowing. For the best results, follow these guidelines:

- I Mow when the grass is between three and five inches high.
- I Mow with sharp blades. Short clippings of grass one inch or shorter decompose more quickly than longer blades. Sharp mower blades cut grass cleanly and efficiently, preventing frayed edges which harm the grass.
- I Mow at time of day when the grass is cool and dry. Late afternoon or early evening often provide these ideal mowing conditions.
- I Avoid mowing after rain or even heavy dew, and never mulch when the grass is wet (moist grass does not mulch well, and clumps beneath the mower deck).

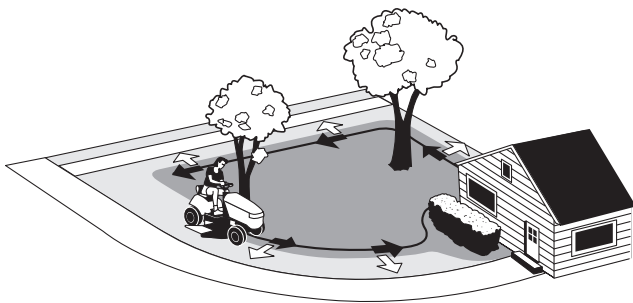
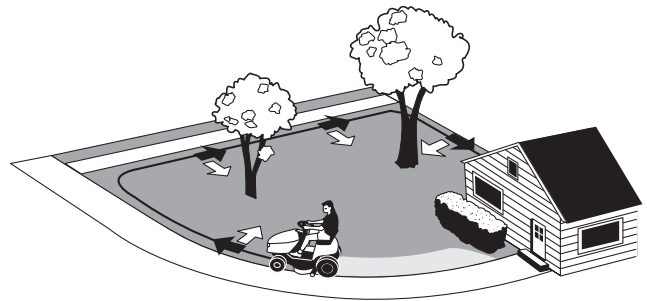
WHAT MOWING PATTERNS TO USE

Always start mowing on a smooth, level area.

The size and type of area to be mowed will determine the best mowing pattern to use. Obstructions such as trees, fences and buildings, and conditions such as slopes and grades must also be considered.

- I Cut long straight strips overlapping slightly.
- I Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.
- I For a truly professional cut, mow across the lawn in one direction, then recut the lawn by mowing perpendicular to the previous cut.

Where possible, make one or two passes around the outside of the area discharging the grass INTO the lawn to keep the cut grass off fences and walks.



The remainder of the mowing should be done in the opposite direction so that the clippings are dispersed OUT onto the area of lawn previously cut.

Note: Always operate the engine at full throttle when mowing.

If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems. Use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual gear models). If you hear the engine slowing down you are mowing too fast, use a slower ground speed.

Lawn Care & Mowing Information

MOWING METHODS

Proper Broadcast Mowing

Broadcasting, or side-discharging, disperses fine clippings evenly over the entire lawn. Many golf courses use this method. Your mower has a deep dish deck to allow freer circulation of clippings so they are broadcast evenly over the lawn.

ENGINE SPEED & GROUND SPEED FOR BROADCASTING

Always operate the engine at full throttle when mowing. If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems.

ALWAYS use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual gear models). If you hear the engine



slowing down you are mowing too fast, use a slower ground speed.

HOW MUCH GRASS TO CUT OFF WHEN BROADCASTING

Mow when the grass is 3-5 inches long. Do not cut the grass shorter than 2 to 2-1/2 inches. Do not cut off more than 1 inch of grass in a single pass.

Proper Mulching

Mulching consists of a mower deck which cuts and recuts clippings into tiny particles and which then blows them down INTO the lawn. These tiny particles decompose rapidly into by-products your lawn can use.

UNDER PROPER CONDI-

TIONS, your mulching mower will virtually eliminate noticeable clippings on the lawn surface.

NOTE: When mulching under heavy cutting conditions, a rumbling sound may be present and is normal.

MULCHING REQUIRES EXCELLENT MOWING CONDITIONS

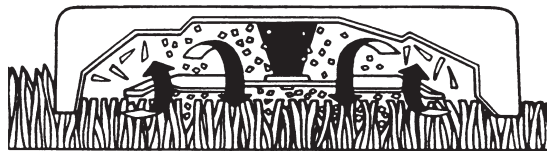
Mulching mowers cannot function properly if the grass is wet, or if the grass is simply high to cut. Even more than normal mowing, mulching requires that the grass be dry and the appropriate amount is cut.

Do not use the mower as a mulching mower during the first two or three mowings in the spring. The long grass blades, quick growth, and often wetter conditions are more suitable for broadcasting (side-discharging) or grass bagging operation.

ENGINE SPEED & GROUND SPEED FOR BROADCASTING

Use full engine throttle matched with a slow ground speed so that clippings will be finely cut. Ground speed while mulching should be HALF of the speed that would be used when broadcasting (side discharging) under similar conditions. Since mulching requires more horsepower than broadcasting, using a slower ground speed is vitally important for proper mulching operation.

Mulching Action



HOW MUCH GRASS TO MULCH

The best mulching action typically results from cutting only the top 1/2 inch to 3/4 inch of grass blade. This provides short clippings which decompose properly (much more quickly than longer clippings). The ideal cutting

height will vary with climate, time of year, and quality of your lawn. We recommend that you experiment with both the cutting height and ground speed until you achieve the best cut. Start with a high cutting height and using progressively lower settings until you find a cutting height that is matched to your mowing conditions and preferences.

TIPS On Dealing With Clippings

Clippings are **beneficial** to your lawn. A common misconception about clippings is that they automatically lead to thatch—this is untrue. Short clippings produced by broadcasting and clippings produced by mulching methods actually **contribute to a healthy lawn** because they:

- Reduce the evaporation of water from your lawn.
- Provide a cushioning layer to reduce lawn wear.
- Moderate soil temperature.
- Clippings act as a safe, non-polluting and inexpensive fertilizer that nourishes your lawn. Fresh cut grass blades are 85% water, and are a rich source of nitrogen which is essential to lush growth. And one garbage bag of clippings contains about 1/4 lb. of usable organic nitrogen.

COMPOSTING

The best way to recycle excess clippings and leave your lawn looking immaculate is to collect them with an efficient collection system and deposit them in a compost pile. A compost pile is a collection of grass, leaves, and other organic wastes which—when properly tended—decompose into an odorless, topsoil material. This material, in turn, acts as an inexpensive fertilizer for your lawn and garden.

How to start a healthy compost pile:

- 1 Build a bin using bricks, fencing, cement blocks, etc. or purchase a prefabricated bin from a garden store. The bin should also have venting on each side and from the bottom to the top.

- 2 Fill the bin with alternating layers of yard waste. Follow this recipe:

First layer: 3-4 inches of chopped brush or other coarse material.

Second layer: 6-8 inches of mixed leaves, grass clippings, sawdust, etc. Materials should be "sponge damp."

Third layer: 1 inch of soil to add micro-organisms that help break down organic matter.

Fourth layer: 1-2 inches of manure to provide the nitrogen needed by micro-organisms.

Keep adding layers until the bin is almost full. Top off with a 4-6 inch layer of straw and scoop out a "basin" to catch rain water.

- 3 Four or five days later the pile will reach temperatures of 140-160 degrees. At this time you'll notice it settling, a good sign your compost is working properly.
- 4 After 5-6 weeks, fork materials into a new pile, turning the outside of the old heap into the center of the new one. Add water if necessary. The compost should be ready to use within three to four months when dark brown, crumbly, and earthy-smelling.



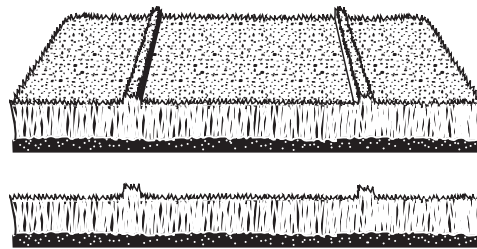
Lawn Care & Mowing Information

SOLUTIONS FOR COMMON MOWING PROBLEMS

Streaking

Streaking is when thin strips of uncut grass are left behind the mower. Streaking is usually caused by operator error or poor blade maintenance.

Streaking



CAUSE

Blades are not sharp
Blades are worn down too far
Engine speed is too slow
Ground speed is too fast
Deck is plugged with grass
Not overlapping cutting rows enough
Not overlapping enough when turning

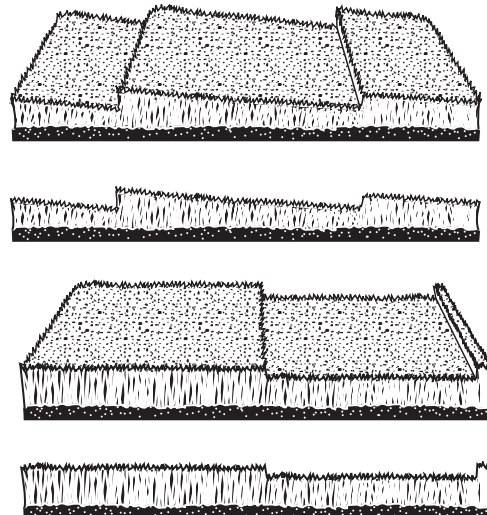
SOLUTION

Sharpen your blades
Replace your blades
Always mow at full throttle
Slow down
Clean out the mower
Overlap your cutting rows
When turning your effective cutting width decreases—overlap more when turning

Stepped Cutting

Stepped cutting is sharp ridges or uneven levels left in the lawn surface. Stepped cutting is usually caused by mower deck damage or misadjustment, or damage to mower blades.

Stepped Cutting



CAUSE

Deck is not leveled correctly
Tires are not properly inflated
Blades are damaged
Deck shell is damaged
Mower spindle is bent or loose
Blades are installed incorrectly

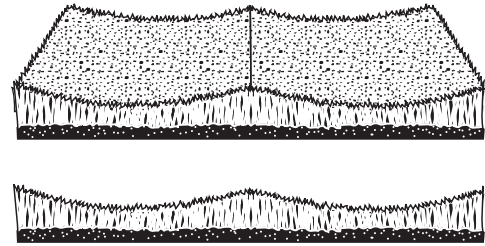
SOLUTION

Level the deck correctly
Check and inflate the tires
Replace the blades
Repair or replace the deck
Repair or replace the spindle
Reinstall the blades correctly

Uneven Cutting

Uneven cutting is waviness or smooth troughs in the lawn surface. Uneven cutting is usually caused by mower deck damage or misadjustment.

Uneven Cutting



CAUSE

Deck is not leveled correctly
Blades are dull or worn
Blades are damaged
Deck is clogged with grass clippings
Deck shell is damaged
Mower spindle is bent or loose
Blades are installed incorrectly

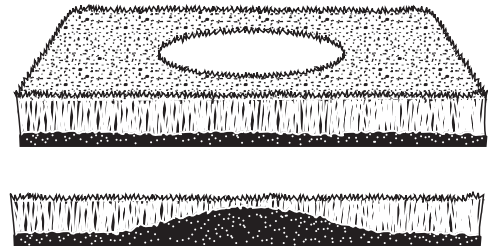
SOLUTION

Level the deck correctly
Sharpen or replace the blades
Replace the blades
Clean out the deck
Repair or replace the deck
Repair or replace the spindle
Reinstall the blades correctly

Scalping

Scalping is when the mower deck comes close to or hits the ground. Scalping can be caused by the mower deck misadjustment, unevenness in the lawn, or by mower deck bouncing because the ground speed is too fast.

Scalping



CAUSE

Lawn is uneven or bumpy
Mower deck cutting height is set too low
Ground speed is too fast
Deck is not leveled correctly
Tire pressure is low or uneven

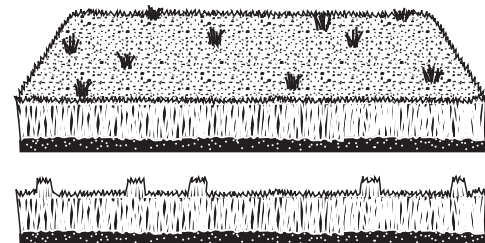
SOLUTION

Roll or level the lawn
Raise the cutting height
Slow down
Correctly level the deck
Check and inflate the tires

Stingers

Stingers are sparse patches of uncut grass left behind the mower. Stingers are usually caused by operator error or poor blade maintenance.

Stingers



CAUSE

Blades are not sharp or are nicked
Blades are worn down too far
Engine speed is too slow
Ground speed is too fast
Deck is plugged with grass

SOLUTION

Sharpen your blades
Replace your blades
Always mow at full throttle
Slow down
Clean out the mower

Common International Symbols



Choke



Fast (Throttle)



Slow (Throttle)



Throttle



Fuel



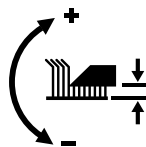
PTO Clutch



Parking Brake



Brake



Mower Cutting
Height Adjustment



Headlights

Technical Manuals

Additional Technical Literature Available

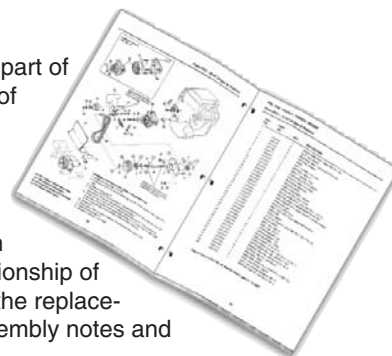


Operators Manuals

Additional copies of this manual are available, (and as part of our product support commitment, we maintain a stock of printed operators manuals going back many years!)

Parts Manuals

Fully illustrated parts manuals are also available — these manuals show all of the product's components in exploded views ("3D" illustrations which show the relationship of the parts and how they go together), as well as giving the replacement part numbers and quantities used. Important assembly notes and special torque values are included in these manuals.



For the applicable manuals currently available for your model, contact your local dealer. Have the information listed in the box at the right available when making your request.

Model: _____

Serial No.: _____

Your Name: _____

Address: _____

City, State, Zip: _____

Visa/Mastercard No.: _____

Card Expiration Date: _____