

JACOBSEN[®]

A Textron Company

4227680-Rev A



Safety & Operation Manual

R-311T[™] Rotary Mower with folding ROPS

69171 – Kubota[®] V2403-M-T



WARNING

If incorrectly used, this machine can cause severe injury. Those who use and maintain this machine should be trained in its proper use, warned of its dangers, and should read the entire manual before attempting to set up, operate, adjust, or service the machine.

JACOBSEN[®]
A Textron Company

When Performance Matters.[™]

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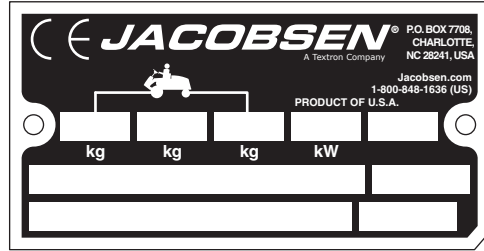
FOREWORD

This manual contains safety and operating instructions for your new Jacobsen mower. This manual should be stored with the equipment for reference during operation.

Before you operate your mower, you and each operator you employ should read the manual carefully in its entirety. By following the safety, operating, and maintenance instructions, you will prolong the life of your equipment and maintain its maximum efficiency.

If additional information is needed, contact your Jacobsen Dealer.

The serial plate is located on the right rear frame rail. Jacobsen recommends you record these numbers below for easy reference.



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Proposition 65 Warning

This product contains or emits chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

1.1 OPERATING SAFETY

**WARNING****EQUIPMENT OPERATED IMPROPERLY OR BY UNTRAINED PERSONNEL CAN BE DANGEROUS.**

Familiarize yourself with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the equipment before being allowed to operate the machine.

1. Safety is dependent upon the awareness, concern, and prudence of those who operate or service the equipment. Never allow minors to operate any equipment.
2. It is your responsibility to read this manual and all publications associated with this equipment (Parts and Maintenance Manual, Engine Manual, and attachments/accessories instruction sheets). If the operator cannot read English it is the owner's responsibility to explain the material contained in this manual to them.
3. Learn the proper use of the machine, the location and purpose of all the controls and gauges before you operate the equipment. Working with unfamiliar equipment can lead to accidents.
4. Never allow anyone to operate or service the machine or its attachments without proper training and instructions; or while under the influence of alcohol or drugs.
5. Wear all the necessary protective clothing and personal safety devices to protect your head, eyes, ears, hands, and feet. Operate the machine only in daylight or in good artificial light.
6. Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by Jacobsen.
7. Stay alert for holes in the terrain and other hidden hazards.
8. Inspect the area where the equipment will be used. Pick up all the debris you can find before operating. Beware of overhead obstructions (low tree limbs, electrical wires, etc.) and also underground obstacles (sprinklers, pipes, tree roots, etc.). Enter a new area cautiously. Stay alert for hidden hazards.
9. Never direct discharge of material toward bystanders, nor allow anyone near the machine while in operation. The owner/operator can prevent and is responsible for injuries inflicted to themselves, to bystanders, and damage to property.
10. Do not carry passengers. Keep bystanders and pets a safe distance away.
11. Never operate equipment that is not in perfect working order or is without decals, guards, shields, discharge deflectors, or other protective devices securely fastened in place.
12. Never disconnect or bypass any switch.
13. Do not change the engine governor setting or overspeed the engine.
14. Carbon monoxide in the exhaust fumes can be fatal when inhaled. Never operate the engine without proper ventilation or in an enclosed area.
15. Fuel is highly flammable; handle with care.
16. Keep the engine clean. Allow the engine to cool before storing and always remove the ignition key.
17. Disengage all drives and engage parking brake before starting the engine (motor). Start the engine only when sitting in operator's seat, never while standing beside the unit.
18. Equipment must comply with the latest federal, state, and local requirements when driven or transported on public roads. Watch out for traffic when crossing or operating on or near roads.
19. Local regulations may restrict the age of the operator.
20. Operate the machine up and down the face of slopes (vertically), not across the face (horizontally).
21. To prevent tipping or loss of control, do not start or stop suddenly on slopes. Reduce speed when making sharp turns. Use caution when changing directions.
22. Always use the seat belt when operating mowers equipped with a Roll Over Protective Structure (ROPS).
Never use a seat belt when operating mowers without a ROPS or with the ROPS folded.
23. Keep legs, arms, and body inside the seating compartment while the vehicle is in motion.
24. Disconnect battery and controller electrical connectors before performing any welding on this mower.

This machine is to be operated and maintained as specified in this manual and is intended for the professional maintenance of specialized turf grasses. It is not intended for use on rough terrain or long grasses.

1 SAFETY

1.2 IMPORTANT SAFETY NOTES



This safety alert symbol is used to alert you to potential hazards.

DANGER - Indicates an imminently hazardous situation which, if not avoided, **WILL** result in death or serious injury.

WARNING - Indicates a potentially hazardous situation which, if not avoided, **COULD** result in death or serious injury.

CAUTION - Indicates a potentially hazardous situation which, if not avoided, **MAY** result in minor or moderate injury and property damage. It may also be used to alert against unsafe practices.

NOTICE - Indicates a potentially hazardous situation which, if not avoided, **MAY** result in property damage. It may also be used to alert against unsafe practices.

For pictorial clarity, some illustrations in this manual may show shields, guards, or plates open or removed. Under no circumstances should this equipment be operated without these devices securely fastened in place.



WARNING

The Interlock System on this mower prevents the mower from starting unless the parking brake is Engaged, PTO switch is off, and traction pedal is in Neutral. The system will stop the engine if the operator leaves the seat without engaging the parking brake or setting the PTO switch off.

NEVER operate mower unless the Interlock System is working.



WARNING

1. Before leaving the operator's position for any reason:
 - a. Return traction pedal to Neutral.
 - b. Disengage all drives.
 - c. Lower all implements to the ground.
 - d. Engage parking brake.
 - e. Stop engine and remove the ignition key.
2. Keep hands, feet, and clothing away from moving parts. Wait for all movement to stop before you clean, adjust, or service the machine.
3. Keep the area of operation clear of all bystanders and pets.
4. Never carry passengers, unless a seat is provided for them.
5. Never operate mowing equipment without the discharge deflector securely fastened in place.

By following all instructions in this manual, you will prolong the life of your machine and maintain its maximum efficiency. Adjustments and maintenance should always be performed by a qualified technician.

If additional information or service is needed, contact your Authorized Jacobsen Dealer who is kept informed of the latest methods to service this equipment and can provide prompt and efficient service.

2.1 DECALS

Familiarize yourself with the following decals. They are critical to the safe operation of the machine. **REPLACE DAMAGED DECALS IMMEDIATELY.**



DANGER

Serious injury or death can result from blade contact or from objects being thrown very long distances.

- Do not operate machine with discharge chute or guards flipped up or removed.
- Do not operate machine with bent or damaged components or with cutting units in the raised position.
- Keep yourself and others away from the mower when in operation.

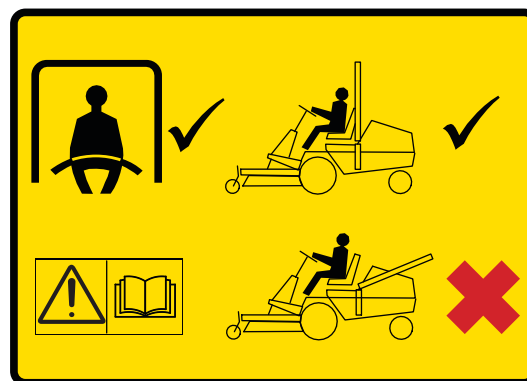


WARNING

Charge filter is under pressure. Remove filter slowly to avoid bodily injury.

CAUTION

Fill oil tank to 2 inches (51 mm) below filler neck. Do not overfill.



WARNING

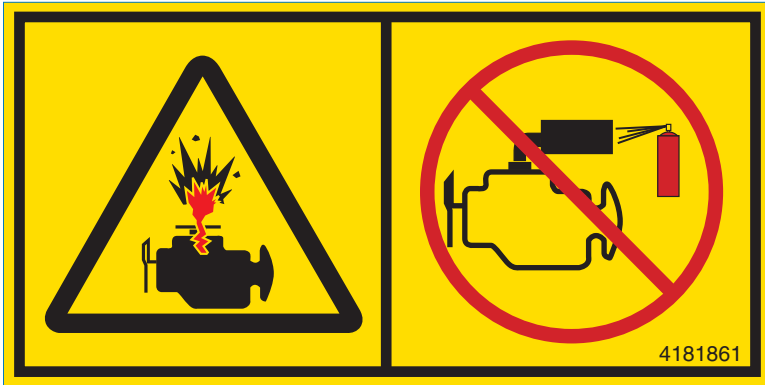
Seat belts must be worn whenever operating the mower with the ROPS in the raised and locked position. Always keep seat belt snugly adjusted. **DO NOT** use seat belts with the ROPS folded down.

NEVER operate the mower with the ROPS folded down on slopes, or near drop offs or water. Only operate in these areas with the ROPS in the raised and locked position.



WARNING

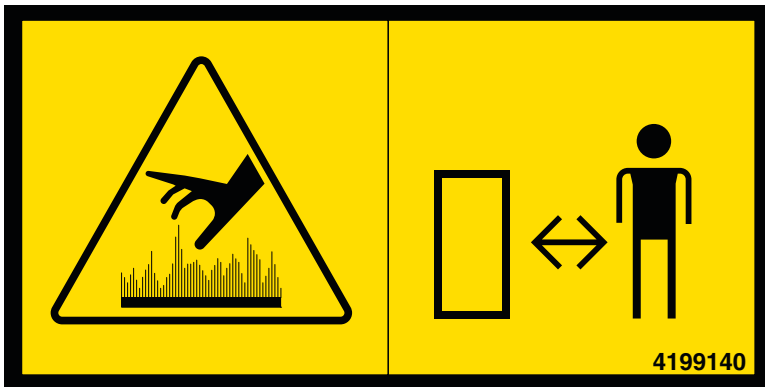
Radiator is under pressure. Remove cap slowly to avoid personal injury.



IMPORTANT

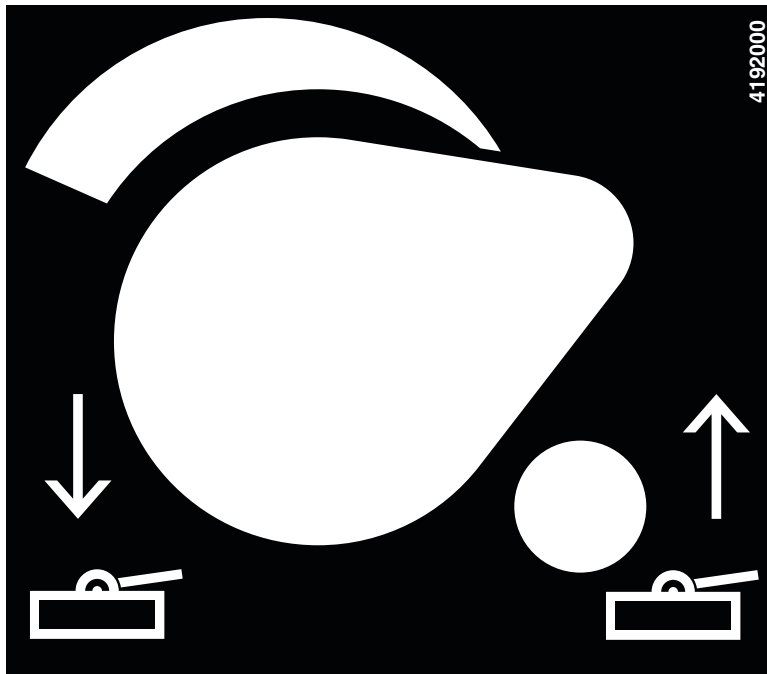
DO NOT USE STARTING ASSIST FLUIDS

Use of starting assist fluids in the air intake system may be potentially explosive or cause a “runaway” engine condition. This could result in serious engine damage.



WARNING

To prevent burns, do not touch muffler or muffler shield. Temperatures may exceed 150° F (66° C).



Weight Transfer

To transfer weight to mower, turn knob clockwise.

To transfer weight to cutting unit, turn knob counter-clockwise.

**PUSH TO LATCH
WING ARMS.
PULL TO RELEASE.**
366608

**USE AUTHORIZED
HYDRAULIC FLUID
SEE MANUAL FOR
SPECIFICATIONS**
352487

Familiarize yourself with the following decals. They are critical to the safe operation of the machine. REPLACE DAMAGED DECALS IMMEDIATELY.



- Read operator's manual. Do not allow untrained operators to use machine.
- Keep shields in place and hardware securely fastened.
- Keep hands, feet, and clothing away from moving parts.

- Before you clean, adjust, or repair this equipment, disengage all drives, engage parking brake, and stop engine.
- Never carry passengers.
- Keep bystanders away.
- Do not use on slopes greater than 14°.

**THIS RADIATOR CONTAINS
ANTI-FREEZE
PROTECTED TO -26°F (-32°C)**

Mix equal parts of clean water and a premium quality ethylene glycol based anti-freeze to maintain the boil over, rust and corrosion protection.

Drain and discard coolant yearly. Read manual for additional instructions.

363995



Horn Button



Brake Relay

Cruise Relay

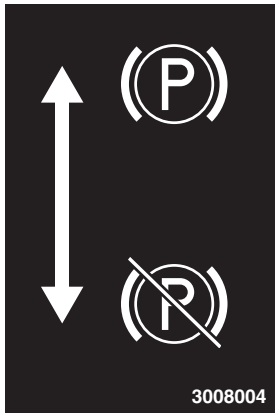
Not used

Fuel Solenoid Relay

Horn Relay

Accessory Relay

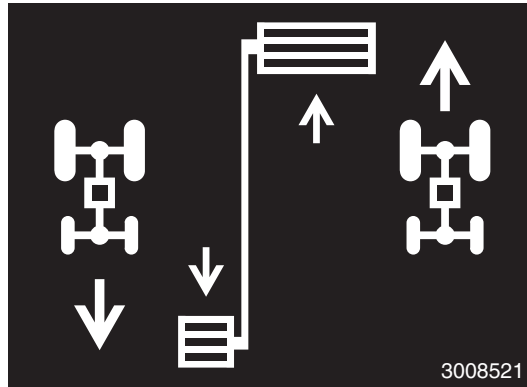
2 DECALS



Parking Brake

Engage

Disengage



Traction Pedal

Forward

Reverse

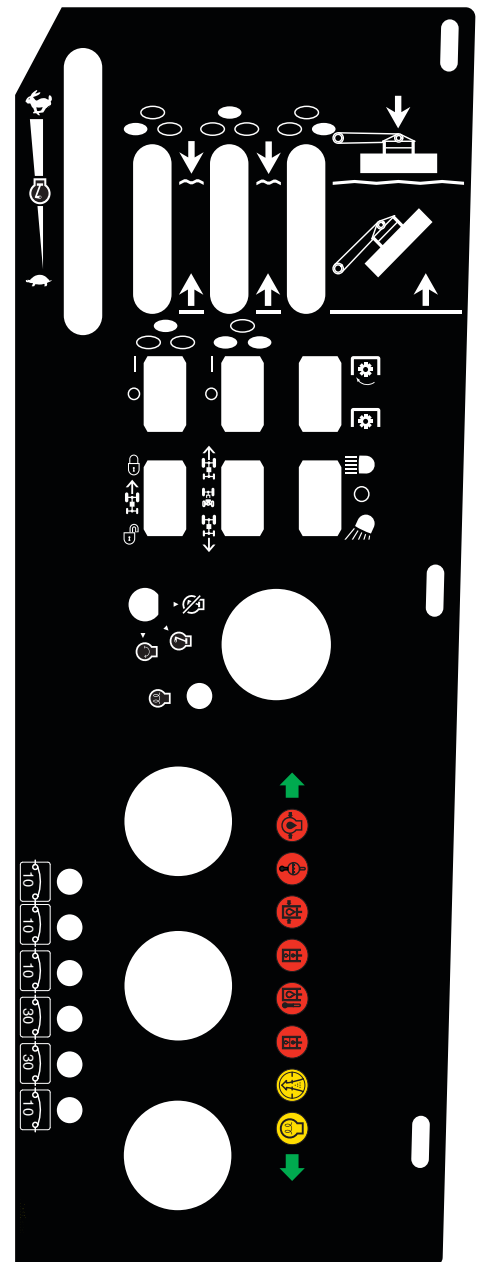


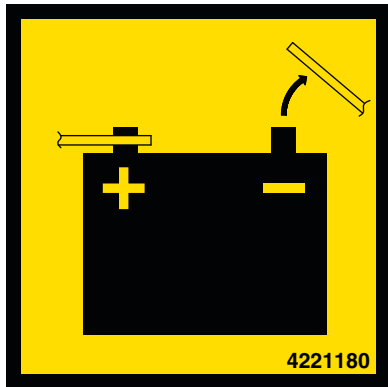
Sound Power Level



WARNING

Do Not use for towing.





WARNING

Connecting Jumper Cables:

1. Connect positive cable to positive remote terminal first.
2. Connect negative cable to negative remote terminal last.

Disconnecting Jumper cables:

1. Remove negative cable first.
2. Remove positive cable last.



WARNING

Use caution when connecting and disconnecting jumper cables. Battery explosion may result if remote terminals are shorted.



Danger

To avoid injury when working with battery:












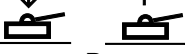
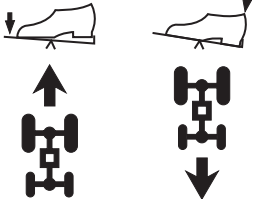
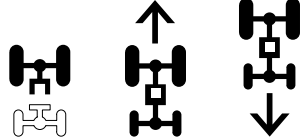

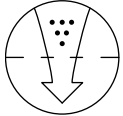

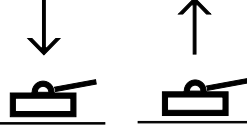







1. Always connect the black (-) ground last and remove it first.
2. Keep sparks and flames away, and avoid contact with acid.

To avoid injury when jumping battery:

1. Connect positive (+) terminal to positive (+) terminal.
2. Connect negative (-) terminal on good battery to frame of vehicle that has dead battery.

3 CONTROLS

3.1 ICONS

<p>Read Manual</p> 	<p>Hour Meter</p> 	<p>Engine Throttle High Low</p> 	<p>Engine Off Run Start</p> 
<p>Coolant Temperature</p> 	<p>Parking Brake</p> 	<p>Diesel Fuel</p> 	<p>Implement Position Left Center Right</p> 
<p>Cruise Control</p> <p>Engage</p>  <p>Disengage</p> 	<p>Weight Transfer to Decks</p>  <p>Increase Decrease</p> 	<p>Traction Forward Reverse</p> 	<p>Drive Mode 2WD 4WD 4WD Momentary</p> 
<p>Engine Oil</p> 	<p>Air Filter</p> 	<p>Filter Service</p> 	<p>Cutting Units Raise Lower</p> 
<p>Horn</p> 	<p>Service Brake</p> 	<p>PTO Switch Engage Disengage</p> 	<p>Hydraulic Oil Temperature Pressure</p> 
<p>Glow Plug</p> 	<p>Lights Work Road</p> 	<p>Filter Service</p> 	

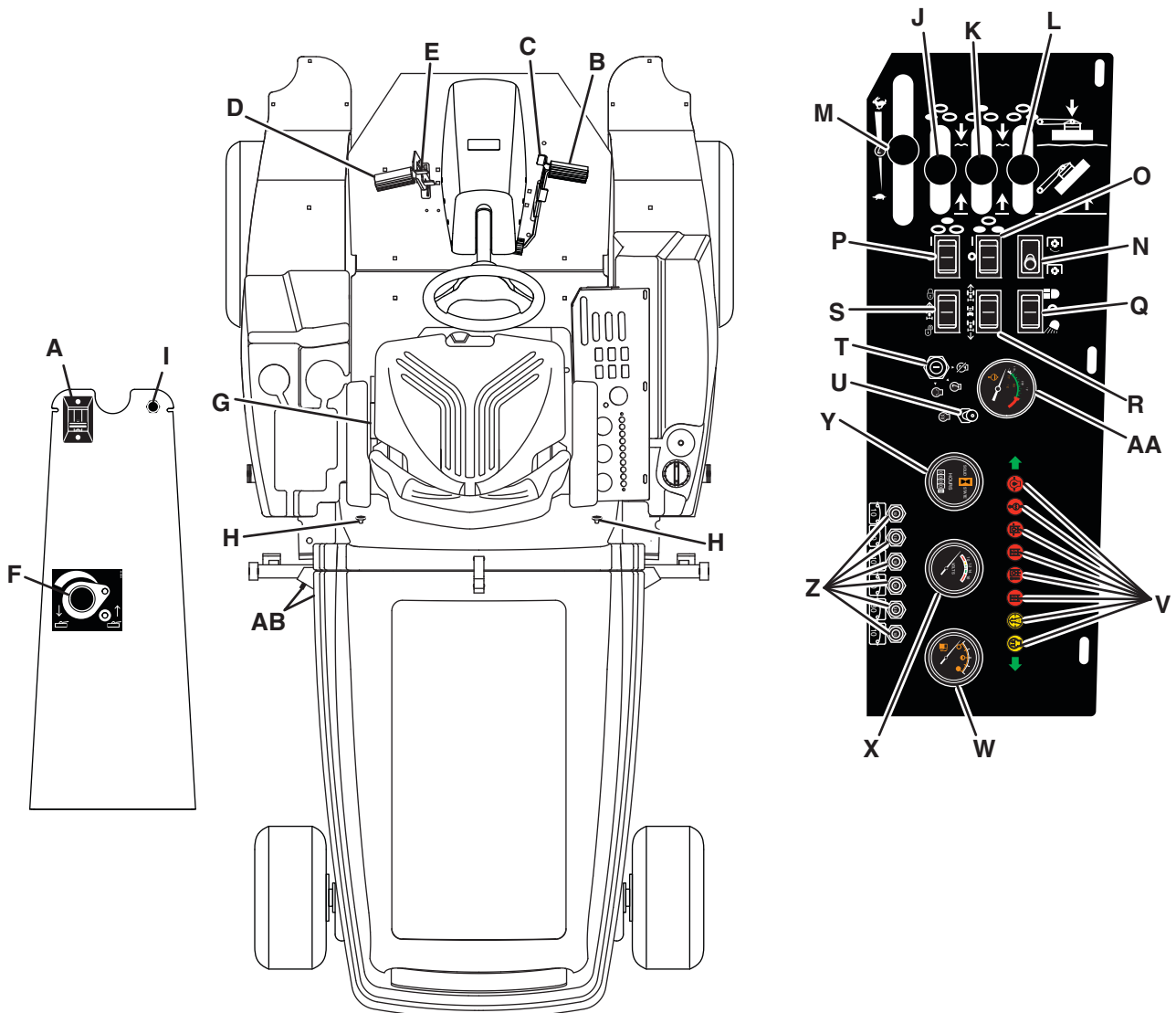
WARNING

Never attempt to drive the mower unless you have read the Safety and Operation Manual and know how to operate all controls correctly.

Familiarize yourself with the icons shown above and what they represent. Learn the location and purpose of all the controls and gauges before operating this mower.

3.2 CONTROL DESCRIPTIONS

- | | | |
|-------------------------------------|--------------------------------------|------------------------------------|
| A Steering Tilt Lever | K Front Lift/Lower Lever | U Glow Plug Switch |
| B Traction Pedal | L Right Wing Lift/Lower Lever | V Warning Lights |
| C Mow Speed Stop | M Throttle Lever | W Fuel Gauge |
| D Brake Pedal | N PTO Switch | X Volt Meter |
| E Parking Brake Latch | O Wing Deck Switch | Y Hour Meter |
| F Weight Transfer | P Front Deck Switch | Z Circuit Breakers |
| G Seat Tilt Lever | Q Light Switch (Optional) | AA Temperature Gauge |
| H Transport Latches | R 2WD / 4WD Switch | AB Remote Battery Terminals |
| I Horn / Test Switch | S Cruise Control Switch | |
| J Left Wing Lift/Lower Lever | T Ignition Switch | |



3 CONTROLS

A. Tilt Steering Lever



Pull lever up to release steering column. Tilt column up or down to position desired. Release lever to lock steering column in place.



CAUTION

Never adjust steering while mower is moving. Stop unit and engage parking brake switch before adjusting.

B. Traction Pedal

Press front of pedal (**B₁**) down for forward travel. Release pedal to slow mower and stop.

Press rear of pedal (**B₂**) down for reverse travel. Release pedal to slow mower and stop. Allow mower to come to a complete stop before reversing directions.

NOTICE

Engine will stop if traction pedal is depressed in either direction with the parking brake engaged.

Disengage parking brake before attempting to drive mower.

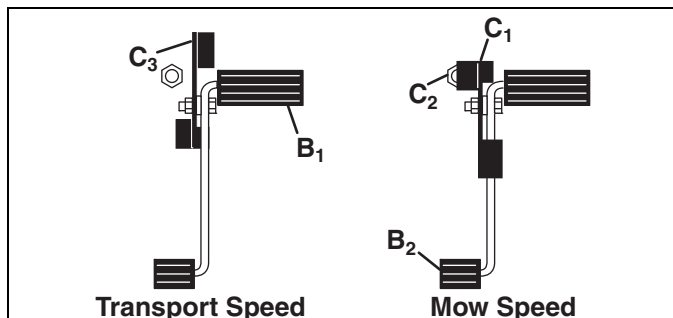


Figure 3A

C. Mow Speed Stop

Limits forward speed while mowing. To operate at lower travel speed while mowing, rotate lever (**Position C₁**) so it contacts stop screw on floor board when forward travel pedal is pressed. To travel at full speed, set lever in position shown (**Position C₃**). Stop screw (**C₂**) can be adjusted to set specific mow speeds. See **Parts & Maintenance Manual**.

D. Brake Pedal

Press pedal down to slow or stop the machine and to disengage cruise control. Never press both service brake pedal and traction pedal at the same time.

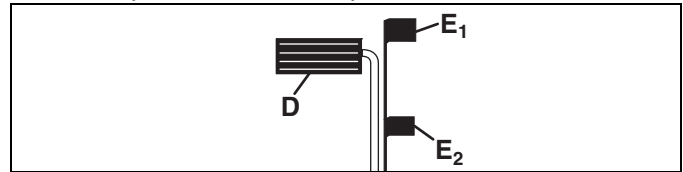


Figure 3B

E. Parking Brake Lock/Release

To lock parking brake, hold brake pedal (**C**) down and press lock (**E₁**) until it engages. To disengage, press brake pedal release (**E₂**).

F. Weight Transfer

Used to adjust the ground pressure of the decks. See **Parts & Maintenance Manual**.

G. Seat Tilt Lever

Used to adjust the rear seat angle. Lift up on lever and tilt seat back as required until seat is in the desired position. Release the lever to lock the seat in position.

H. Transport Latches

Used to prevent accidental lowering of the wing cutting units during transport.

I. Horn/Test Switch

Used to sound horn and test system warning lights. Depress switch, horn should sound and all warning lights, except for glow plug, engine oil and charge pressure, should light.

3.3 CONTROL PANEL LEVERS

J. *Left Wing Lift/Lower Lever*

Raises and lowers left wing deck. Push lever forward to lower left wing deck. Pull lever back to raise left wing deck. Deck will start automatically when lowered when both PTO (**N**) and wing deck (**O**) switches are engaged.

K. *Front Lift/Lower Lever*

Raises and lowers front deck. Push lever forward to lower front deck. Pull lever back to raise front deck. Deck will start automatically when lowered when both PTO (**N**) and front deck (**P**) switches are engaged.

L. *Right Wing Lift/Lower Lever*

Raises and lowers right wing deck. Push lever forward to lower right wing deck. Pull lever back to raise right wing deck. Deck will start automatically when lowered when both PTO (**N**) and wing deck (**O**) switches are engaged.

M. *Throttle Lever*

Regulates engine speed. Push lever forward to increase speed or pull lever back to decrease speed. Always operate mower at full throttle during normal operation.

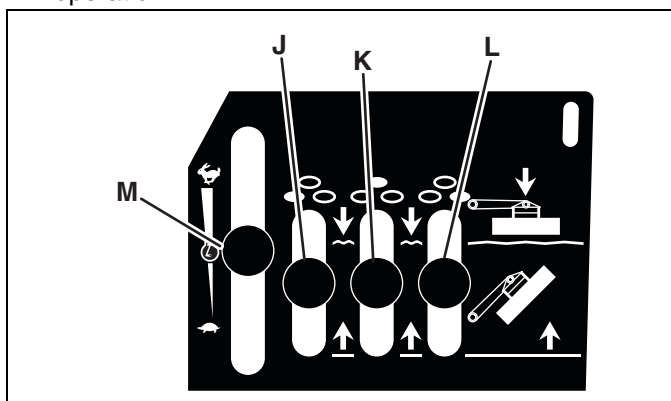
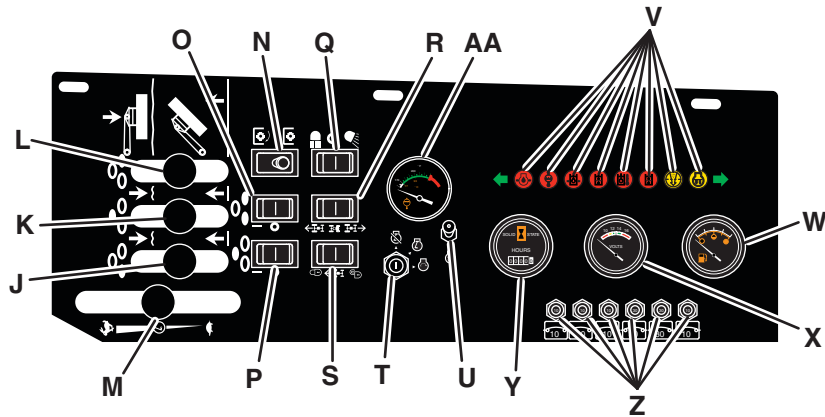


Figure 3C

3 CONTROLS



3.4 CONTROL PANEL SWITCHES

N. PTO Switch

Lift up and push switch lever forward to engage decks and switches (O and P). Pull switch lever back to disengage.

O. Wing Deck Switch

Used to engage or disengage both wing decks. Depress front of switch to engage decks. Return switch to center position to disengage decks. Pressing rear of switch has no function. PTO switch (N) must be engaged and cutting units lowered for switch to operate.

P. Front Deck Switch

Used to engage or disengage front deck. Depress front of switch to engage deck. Return switch to center position to disengage deck. Pressing rear of switch has no function. PTO switch (N) must be engaged and cutting units lowered for switch to operate.

Q. Light Switch

Press front of switch for road lights. Press rear of switch for work lights. Return switch to center position to shut off lights.

R. 2WD / 4WD Switch

Used to switch mower between 2WD and 4WD mode. Depress front of switch for 4WD in forward direction only. Place switch in center position for 2WD. Depress rear of switch for momentary 4WD in reverse. Do not engage or disengage 4WD while mower is moving.

S. Cruise Control Switch

Depress traction pedal for desired speed and press front of switch to engage cruise control. Depress service brake pedal or press rear of switch to disengage cruise control.

T. Ignition Switch

Used to start and stop the engine. The ignition switch has three positions OFF, RUN, and START. To prevent unauthorized use of this mower, remove ignition key when not in use.

U. Glow Plug Switch

Used to energize the glow plugs before starting. Do not hold switch for more than 7 seconds. Glow Plug light will be on when switch is depressed.

3.5 GAUGES AND CIRCUIT BREAKERS

V. Warning Lights

Alerts the operator to conditions requiring immediate action. See Section 3.6.

W. Fuel Gauge

Displays fuel level in tank. Do not allow mower to run out of fuel.

X. Voltmeter

Displays electrical system voltage.

Y. Hour Meter

Records engine operating hours. The hour meter can be used to time maintenance intervals or mowing operations.

Z. Circuit Breakers

Used to protect electrical system. Push down on rubber boot to reset circuit breaker.

AA. Temperature Gauge

Displays engine coolant temperature. Do not operate mower if temperature is above 230° F (110° C).

AB. Remote Battery Terminals

Used for connecting jumper cables with wing decks in raised position. Keep red boot of positive remote terminal in place when not in use.

3.6 WARNING LIGHTS

The R-311 mower monitors vital machine systems. It uses a combination of warning lights and an audible alarm to alert the operator of conditions requiring immediate action. When an alert occurs follow the general guidelines listed in the chart below, and any specific actions outlined by the grounds superintendent or service manager.

To test alarm system:

Turn ignition switch to RUN. The engine oil light (T₁) and charge pressure light (T₃) should come on. All lights should go out once engine is started.

Press horn/test switch (I). Horn will sound and Engine Coolant Temperature (T₂), Return Filter (T₄), Hydraulic

Oil Temperature (T₅), Charge Filter (T₆), and Air Filter (T₇) lights will come on.

With engine off, press glow plug switch (U). Glow plug light (T₈) will come on.

Turn signal lights (T₉) are only used with the optional cab installed.

This system monitors:

- T1. Engine oil pressure
- T2. Engine coolant temperature
- T3. Charge pressure
- T4. Hydraulic return oil filter
- T5. Hydraulic oil temperature
- T6. Hydraulic charge filter
- T7. Air filter
- T8. Glow Plug

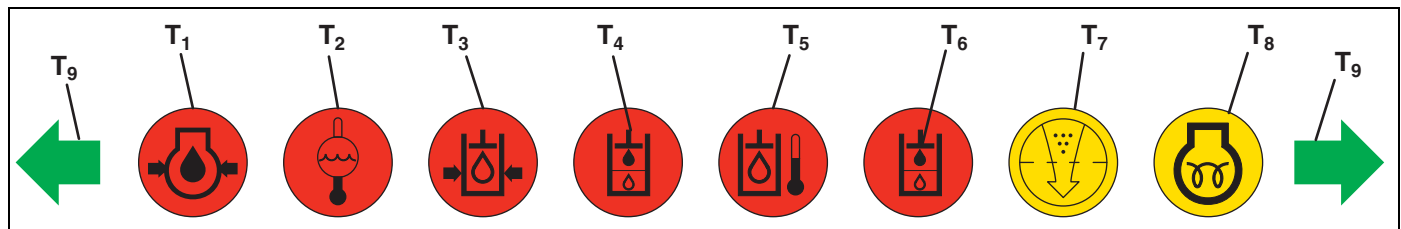



Figure 3D


Alert	Action
T1. Engine Oil Pressure - Alarm sounds and oil pressure light comes on. Oil pressure low.	Stop mower immediately, lower implements and shut off engine! Inspect oil level in engine. If oil light remains on with oil at proper level, shut off engine and tow or trailer mower back to service area. NEVER operate engine with oil light on, severe damage to the engine can occur.
T2. Engine Coolant Temperature Horn sounds. Engine coolant temperature high.	Stop mower immediately, lower implements and shut off engine! Remove debris such as leaves and grass clippings that may be restricting air flow through rear screen on hood and area between radiator and oil cooler. If engine continues to run hot, return mower to service area. CAUTION: Engine coolant is under pressure. Turn engine off and allow fluid to cool before checking fluid level or adding coolant to radiator.
T3. Charge Pressure Light stays on after starting engine or comes on during operation. Indicates low charge pressure in traction system.	Stop mower immediately, lower implements and shut off engine! Check hydraulic oil level in main tank. Visually inspect mower for obvious signs of leaks around connections, hoses and tubes. Tow or trailer mower back to service area. Never operate mower with charge pressure light on, severe damage to hydraulic system components can result. CAUTION: Hydraulic system is under pressure. Turn engine off and allow oil to cool before checking oil level or adding oil to tank.
T4. Hydraulic Return Oil Filter - Oil filter warning light comes on.	Return mower to a service area as soon as possible. Change hydraulic return oil filter.

Continued on next page

3 CONTROLS

Alert	Action
T5. Hydraulic Oil Temperature Horn sounds. Hydraulic oil temperature high.	Stop mower, disengage drives and lower implements. Run engine at low idle for a few minutes until light goes off. If light remains on, shut off engine and allow hydraulic system to cool. Remove debris such as leaves and grass clippings that may be restricting air flow through rear screen on hood and area between radiator and oil cooler. If hydraulics continues to run hot, return mower to service area.  CAUTION: Hydraulic system is under pressure. Turn engine off and allow oil to cool before checking oil level or adding oil to tank.
T6. Hydraulic Charge Oil Filter - Oil filter warning light comes on.	Return mower to a service area as soon as possible. Change hydraulic charge oil filter.
T7. Air Filter - Air filter warning light comes on.	Return mower to a service area as soon as possible. Change air filter.
T8. Glow Plug - Glow plug light comes on.	Glow plug switch depressed. Do not energize glow plugs with engine running.

4.1 DAILY INSPECTION

 **CAUTION**

The daily inspection should be performed only when the engine is off and all fluids are cold. Lower decks to the ground, engage the parking brake, stop engine, and remove ignition key.

1. Perform a visual inspection of the entire unit. Look for signs of wear, loose hardware, and missing or damaged components. Check for fuel or oil leaks to ensure connections are tight and hoses and tubes are in good condition.

2. Check the fuel supply, radiator coolant level, crankcase oil, and air cleaner indicator. All fluids must be at the full level mark with engine cold.
3. Make sure all decks are adjusted to the same cutting height.
4. Visually check tires for proper inflation.
5. Test the Interlock System.

Note: For more detailed maintenance information, adjustments, and maintenance/lube charts, see the **Parts & Maintenance** manual.

4.2 INTERLOCK SYSTEM

1. The Interlock System prevents the engine from starting unless the parking brake is Engaged, traction pedal is in Neutral, and the PTO switch is OFF. The system also stops the engine if the operator leaves the seat with the PTO switch ON, traction pedal out of neutral, or parking brake Disengaged.

 **WARNING**

Never operate equipment with the Interlock System disconnected or malfunctioning. Do not disconnect or bypass any switch.

2. Perform each of the following tests to insure the Interlock System is functioning properly. Stop the test and have the system inspected and repaired if any of the tests **fail** as listed below:
 - the engine **does not** start in test 1;
 - the engine **does** start during tests 2, 3, or 4;
 - the engine **continues** to run during tests 5 or 6.

3. Refer to the chart below for each test and follow the check (✓) marks across the chart. Shut engine off between each test.

Test 1: Represents normal starting procedure. The operator is seated, parking brake is Engaged, traction pedal is in Neutral, and the PTO switch is OFF. The engine should start.

Test 2: The engine must not start if the PTO switch is ON.

Test 3: The engine must not start if the parking brake is Disengaged.

Test 4: The engine must not start if the traction pedal is not in Neutral.

Test 5: Start the engine in the normal manner then turn the PTO switch ON and lift your weight off the seat. ★

Test 6: Start the engine in the normal manner then disengage parking brake and lift your weight off the seat. ★

Interlock System Check

Test	Operator Seated		Parking Brake		Traction Pedal in Neutral		PTO Switch		Engine Starts	
	Yes	No	Engaged	Disengaged	Yes	No	On	Off	Yes	No
1	✓		✓		✓			✓	✓	
2	✓		✓		✓		✓			✓
3	✓			✓	✓			✓		✓
4						✓				
5	✓	★	✓		✓		✓		★	
6	✓	★		✓	✓			✓	★	

★ Lift your weight off seat. The engine will shut down.

4 OPERATION

4.3 OPERATING PROCEDURES

WARNING

A folding Roll Over Protection Structure (ROPS) is included with this mower. Seat belts must be worn whenever operating the mower with the ROPS in the raised and locked position. Always keep seat belt snugly adjusted. **DO NOT** use seat belts with the ROPS folded. **See Section 4.12.**

If the mower is overturning and the ROPS in the raised and locked position, hold onto the steering wheel. Do not attempt to jump out or leave the seat.

CAUTION

To prevent injury, always wear safety glasses, leather work shoes or boots, a hard hat, and ear protection.

1. Under no circumstances should the engine be started without the operator seated on the mower.
2. Do not operate mower or attachments with loose, damaged, or missing components. Whenever possible mow when grass is dry.
3. First mow in a test area to become thoroughly familiar with the operation of the mower and control levers.
4. Study the area to determine the best and safest operating procedure. Consider the height of the grass, type of terrain, and condition of the surface. Each condition will require certain adjustments or precautions.
5. Never direct discharge of material toward bystanders, nor allow anyone near the machine while in operation. The owner/operator is responsible for injuries inflicted to bystanders and/or damage to their property.
8. Disengage the drive motors and raise the decks when crossing paths or roadways. Look out for traffic.
9. Stop and inspect the equipment for damage immediately after striking an obstruction or if the machine begins to vibrate abnormally. Have the equipment repaired before resuming operation.

WARNING

Before you clean, adjust, or repair this equipment, always disengage all drives, lower implements to the ground, engage parking brake, stop engine, and remove key from ignition switch to prevent injuries.

10. Slow down and use extra care on hillsides. Read **Section 4.8.** Use caution when operating near drop offs.
11. Look behind and down before backing up to be sure the path is clear. Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.
12. Never use your hands to clean blades. Use a brush to remove grass clippings from blades. Blades are extremely sharp and can cause serious injuries.

CAUTION

Before mowing, pick up all debris such as rocks, toys, and wire which can be thrown by the machine. Enter a new area cautiously. Always operate at speeds that allow you to have complete control of the mower.

6. Use discretion when mowing near gravel areas (roadway, parking areas, cart paths, etc.). Stones discharged from the implement may cause serious injuries to bystanders and/or damage the equipment.
7. Always turn PTO switch OFF to stop blades when not mowing.

4.4 STARTING


CAUTION

IMPORTANT: Do not use starting assist fluids. Use of such fluids in the air intake system may be potentially explosive or cause a “Runaway” engine condition and could result in serious engine damage.

1. Make sure fuel shut off valve is completely open and the tow valve (**See Section 4.10**) is closed.
2. Sit in operator's seat, make sure the PTO switch (**N**) is OFF, traction pedal is in Neutral, and the parking brake (**E**) is Engaged.
3. Move throttle lever (**M**) between 1/4 to 1/3 throttle. Turn ignition switch (**T**) to RUN.
4. Press glow plug switch (**U**) for about 3 to 7 seconds. The colder the temperature, the longer it will take to energize plugs. Do not press switch for more than 7 seconds. Energizing glow plugs is not necessary when starting a warm engine.
5. Turn ignition switch (**T**) to START position. Release switch as soon as engine starts. Do not hold key in start position for more than 15 seconds at a time. If engine does not start, turn ignition switch off, wait 30 seconds, and try again.
6. Allow the engine to become warm and properly lubricated before operating at high RPM.

NOTICE

Allow engine to operate at low idle for at least one minute before operating mower.

When starting engine at temperatures below 40° F (4° C), operate the engine at low idle for five minutes to prevent damage to engine or hydraulic system.

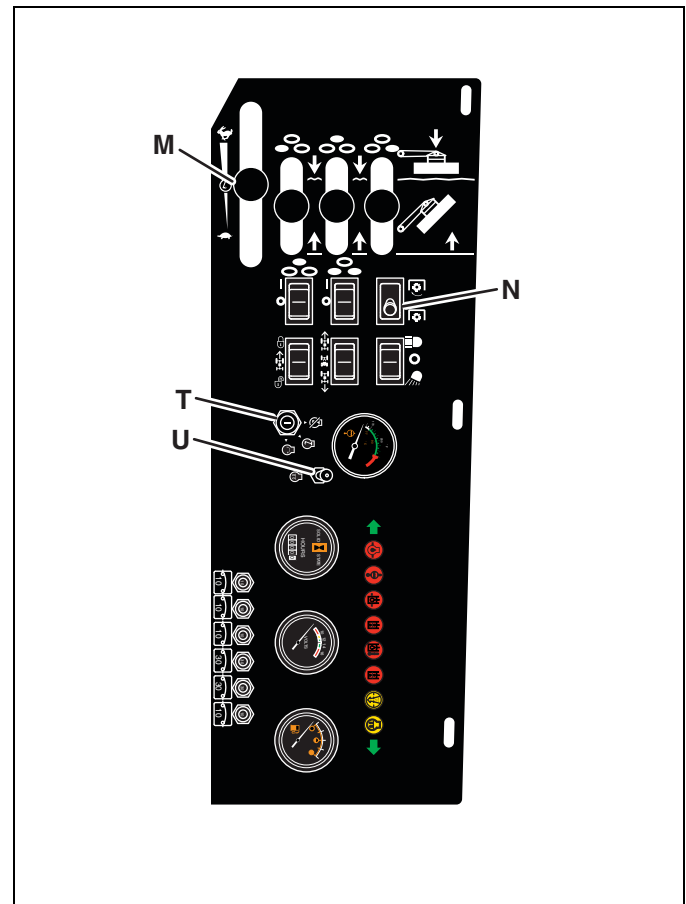


Figure 4A

4 OPERATION

4.5 STOPPING / PARKING

To stop:

Remove your foot from traction pedal and stop the mower. The mower will automatically brake when the traction pedal returns to Neutral.

To park the mower under normal conditions:

1. Disengage the PTO switch, raise the decks, engage transport latches, and move away from the area of operation.
2. Select a flat and level area to park.
 - a. Release traction pedal to bring the mower to a complete stop.
 - b. Disengage all drives, disengage transport latches, lower decks to the ground, reduce throttle to slow, and allow engine to operate at no load for a minute.

4.6 TO DRIVE / TRANSPORT

Read and follow all safety notes contained in this manual when driving or transporting mower. Refer to **Section 4.3** for general operating instructions. When operating in reverse look behind you to ensure you have a clear path.

Important: If this mower is driven on public roads, it must comply with federal, state, and local ordinances. Contact local authorities for regulations and equipment requirements.

4.7 TRANSPORT LATCHES

1. The wing decks are equipped with a latch to prevent accidental lowering of the cutting units during transport or maintenance operations. The latch knobs are located on the engine fire wall, behind and to the left and right of the operator's seat.
2. Fully raise the wing decks and push the latch knobs in to secure the deck. The weight of the deck/lift arm must not rest on the latch.



CAUTION

To prevent injury to bystanders, or damage to the equipment, do not rest the weight of the deck and lift arm on the latch. Weight of deck and lift arm may cause the deck to fall when the latch is released.

NOTICE

Permanent damage to the turbocharger may occur if the engine is shut down without allowing the turbocharger time to cool.

To prevent damage, operate the engine with no load and at half throttle for 3 to 5 minutes before shutting off engine.

3. Engage parking brake, stop the engine, and always remove the ignition key.

If an emergency arises and the mower must be parked in the area of operation, follow the guidelines outlined by the grounds superintendent. If the mower is parked on an incline, chock or block the wheels.

1. Disengage all drives and raise implements to the transport position and engage transport latches when driving to and from the area of operation.
2. Shift mower to 2WD.
3. Disengage parking brake and move throttle lever to FAST. Depress traction pedal slowly.
4. Always bring the mower to a complete stop before changing travel direction or shifting from 2WD to 4WD.

3. To release latch, pull the latch knob out and lower the deck to the ground.

NOTICE

Do not transport with the arms resting on the latch. Transport latches are only used to prevent accidental lowering of the cutting units.

4.8 HILLSIDE OPERATION

WARNING

To minimize the possibility of overturning, the safest method for operating on hills and terraces is to travel up and down the face of the slope (vertically), not across the face (horizontally). Avoid unnecessary turns, travel at reduced speeds, stay alert for hidden hazards, and drop offs.

CAUTION

Do not operate this mower on slopes greater than 14° angle or 25% grade.

The mower has been designed for good traction and stability under normal mowing conditions; however, use caution when operating on slopes, especially over rough terrain, or when the grass is wet. Wet grass reduces traction and steering control.

1. Always mow with the engine at full throttle but reduce forward speed for safe operation.
2. If the mower tends to slide or the tires begin to “mark” the turf, angle mower into a less steep grade until traction is regained or tire marking stops.
3. If mower continues to slide or mark the turf, the grade is too steep for safe operation. Do not make another attempt to climb, back down slowly.
4. When descending a steep slope, always lower implements to the ground to reduce the risk of mower overturning.
5. Correct tire pressure is essential for maximum traction.

Front - 16 to 20 psi (1.10 to 1.38 BAR)
 Rear - 10 to 12 psi (0.69 to 0.83 BAR)

6. If additional traction is required, adjust the weight transfer knob as described in the Parts and Maintenance manual.

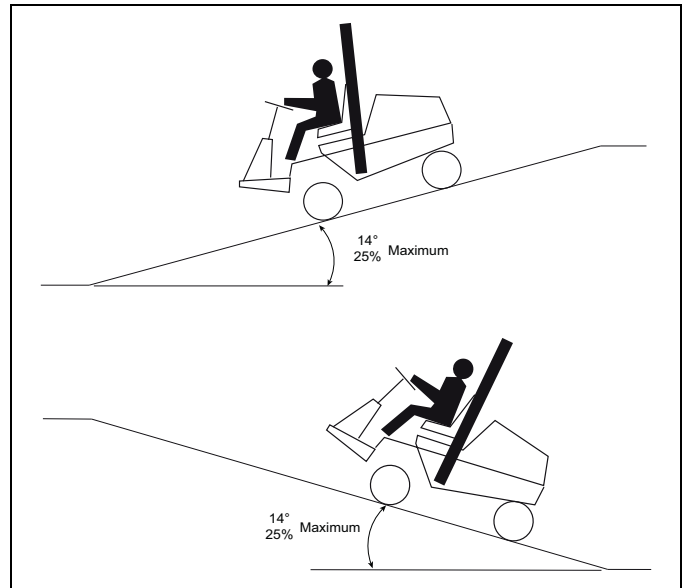


Figure 4B

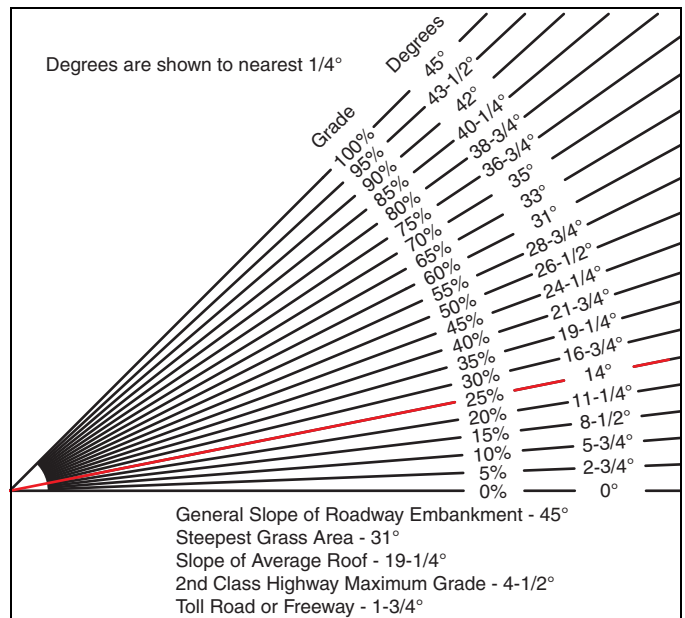


Figure 4C

4 OPERATION

How to calculate a slope:

Tools Required:
 Level (A), either 1 yard, or 1 meter long.
 Tape measure (B).

With the level (A) positioned horizontally, measure the distance (C) with tape measure (B). Use the chart to calculate either the slope angle or the % grade of the slope (D).

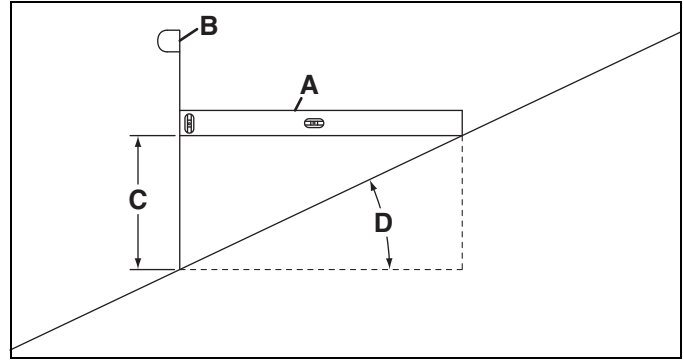


Figure 4D

Height (C)		Result (D)	
Inches with 1 Yard Level (A)	Millimeters with 1 Meter Level (A)	Slope in Degrees	Slope Grade %
3		4.8	8.3
	100	5.7	10.0
	150	8.5	15
6		9.5	16.7
	200	11.3	20.0
7.5		11.8	20.8
	225	12.7	22.5
9		14	25.0
	275	15.4	27.5
10		15.5	27.8
	300	16.7	30.0
11		17.0	30.6
	325	18.0	32.5
12		18.4	33.3
	350	19.3	35.0
13		19.9	36.1
	375	20.6	37.5
14		21.3	38.9
	400	21.8	40.0
15		22.6	41.7
	425	23.0	42.5
16		24	44.4
	475	25.4	47.5
18		26.6	50.0
	500		
20		29.1	55.6
	600	31.0	60.0
25		34.8	69.4
	800	38.7	80.0
30		39.8	83.3
	900	42.0	90
36		45.0	100
	1000		

4.9 MOWING

WARNING

To prevent serious injuries, keep hands, feet, and clothing away from cutting unit when the blades are moving.

NEVER use your hands to clean cutting units. Use a brush to remove grass clippings from blades. Blades can be sharp and could cause injuries.

To clear obstructions from cutting unit, disengage PTO switch, engage parking brake, stop engine, and remove key from ignition switch then remove obstruction.

To mow:

1. Start the engine and lower the decks to the ground.
2. Turn PTO switch to ON, depress front of desired deck switch(es), shift mower to 4WD, and disengage parking brake.

4.10 FOLDING ROPS

A folding Roll Over Protection Structure (ROPS) is included with this mower.

WARNING

There is no roll over protection with the ROPS folded down. NEVER operate the mower with the ROPS folded down on slopes, or near drop offs or water. Only operate in these areas with the ROPS in the raised and locked position.

4.11 TOWING / TRAILERING

If the mower experiences problems and must be shut down and removed from the area, it should be loaded onto a trailer for transport. If a trailer is not available, the unit can be towed slowly short distances.

NOTE: Do not exceed 2 MPH (3.2 KPH) while towing. Long distance towing is not recommended.

Use care when loading and unloading mower. Fasten mower to trailer to prevent mower from rolling or shifting during transport.

Before towing, open tow valve. The tow valve permits moving the mower without starting the engine and prevents possible damage to hydraulic components.

The tow valve (**Z**) is located on the drive pump beneath the seat. Remove hardware and tilt seat towards left side deck. To open valve, use a small wrench to turn the valve counterclockwise 90°.

3. Move throttle lever to FAST then slowly depress traction pedal to the desired mowing speed.
 - a. For complete even cutting, overlap swaths by a few inches.
 - b. When cutting tall grass, cut grass higher than desired the first time so deck will clear unseen obstructions and will not scalp if ground is rough.
 - c. Stop and raise the decks to the transport position when crossing paths or roadways. Look out for traffic.
4. For better traction and handling, adjust weight transfer.
5. When operating in reverse and additional power is required to climb out of a small depression, press and hold the 2WD/4WD in the momentary 4WD Reverse position.

Study the area of operation to determine if folding the ROPS is required. Be aware of overhead obstructions and turf conditions. Only operate the mower with the ROPS folded down when absolutely necessary.

Seat belts must be worn whenever operating the mower with the ROPS in the raised and locked position. Always keep seat belt snugly adjusted. **DO NOT** use seat belts with the ROPS folded down.

To fold ROPS, push top portion of ROPS towards front of mower, remove pins, and fold ROPS towards rear of mower. Secure ROPS in folded position with pins.

After towing, close tow valve completely and make certain seat is closed and secured.

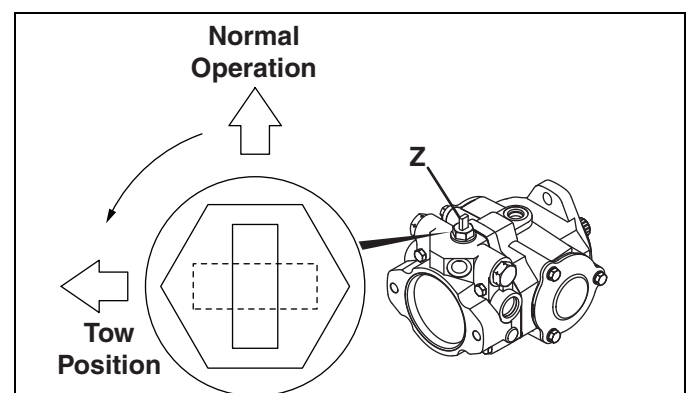


Figure 4E

4 OPERATION

4.12 DAILY MAINTENANCE

Important: For more detailed maintenance information, adjustments, and maintenance/lubrication charts, see the **Parts & Maintenance** manual.

1. Park the mower on a flat, level surface. Fully lower the implements to the ground, engage parking brake, stop the engine, and remove key from ignition switch.
2. Grease and lubricate all points if required. To prevent fires, wash the cutting units and mower after each use.
 - a. Use only fresh water for cleaning your equipment.

Note: *Use of salt water or effluent water has been known to encourage rust and corrosion of metal parts resulting in premature deterioration or failure. Damage of this nature is not covered by the factory warranty.*

- b. Do not use high pressure spray.
- c. Do not spray water directly at the instrument panel, or any electrical components.
- d. Do not spray water into the cooling air intake or the engine air intake.

NOTICE

Do not wash a hot or running engine. Use compressed air to clean the engine and radiator fins.

3. Fill mower's fuel tank at the end of each operating day to within 1 in. (25 mm) below the filler neck.

Use clean, fresh #2 low or ultra-low sulfur diesel fuel. Minimum Cetane Rating 45.

4. Handle fuel with care - it is highly flammable. Use an approved container, the spout must fit inside the fuel filler neck. Avoid using cans and funnels to transfer fuel.
 - a. Never remove the fuel cap from the fuel tank, or add fuel, when the engine is running or while the engine is hot.
 - b. Do not smoke when handling fuel. Never fill or drain the tank indoors.
 - c. Never overfill or allow the tank to become empty. Do not spill fuel. Clean any spilled fuel immediately.
 - d. Never handle or store fuel containers near an open flame or any device that may create sparks and ignite the fuel or fuel vapors.

5. Store fuel according to local, state, or federal ordinances and recommendations from your fuel supplier.



WARNING

To prevent serious injury from hot, high pressure oil, never use your hands to check for oil leaks, use paper or cardboard.

Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin. If 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.

6. Inspect hydraulic hoses and tubes daily. Look for wet hoses or oil spots and replace worn or damaged hoses and tubes before operating the machine.
7. Check the engine oil and hydraulic oil at the start of each day, before starting the engine. If the oil level is low, remove the oil filler cap and add oil as required. Do not overfill.

NOTICE

Care must be used at all times to avoid any contamination of the hydraulic system. Follow recommended maintenance practices and adhere to scheduled intervals for hydraulic oil and filter changes. Introduction of any type of contamination may result in operating issues by causing valves to stick or leak internally.

5.1 QUALITY OF CUT TROUBLESHOOTING

It is recommended that a “test cut” be performed to evaluate the mower’s performance before beginning repairs.

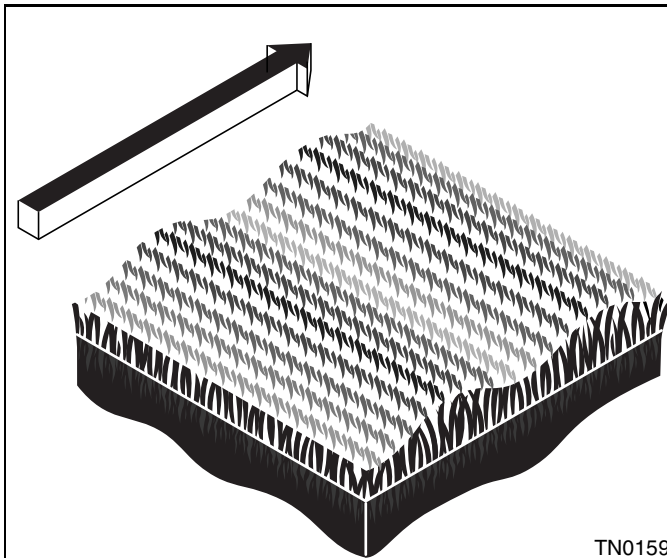
An area should be available where “test cuts” can be made. This area should provide known and consistent turf conditions to allow accurate evaluation of the mower’s performance.

Another “test cut” should be performed after the completion of the repairs and/or adjustments to verify the mower’s performance.

Before performing a “test cut” to diagnose cut appearance and mower performance, the following items should be verified to ensure an accurate “test cut.”

1. Mowing (Ground) Speed
2. Blade Sharpness
3. Height-of-Cut (HOC)
4. Decks Leveled
5. Blade Speed
6. Deck Rake not Set

5.2 WASHBOARDING



NOTE: Arrow indicates direction of travel.

Washboarding is a cyclical pattern of varying cutting heights, resulting in a wave-like cut appearance.

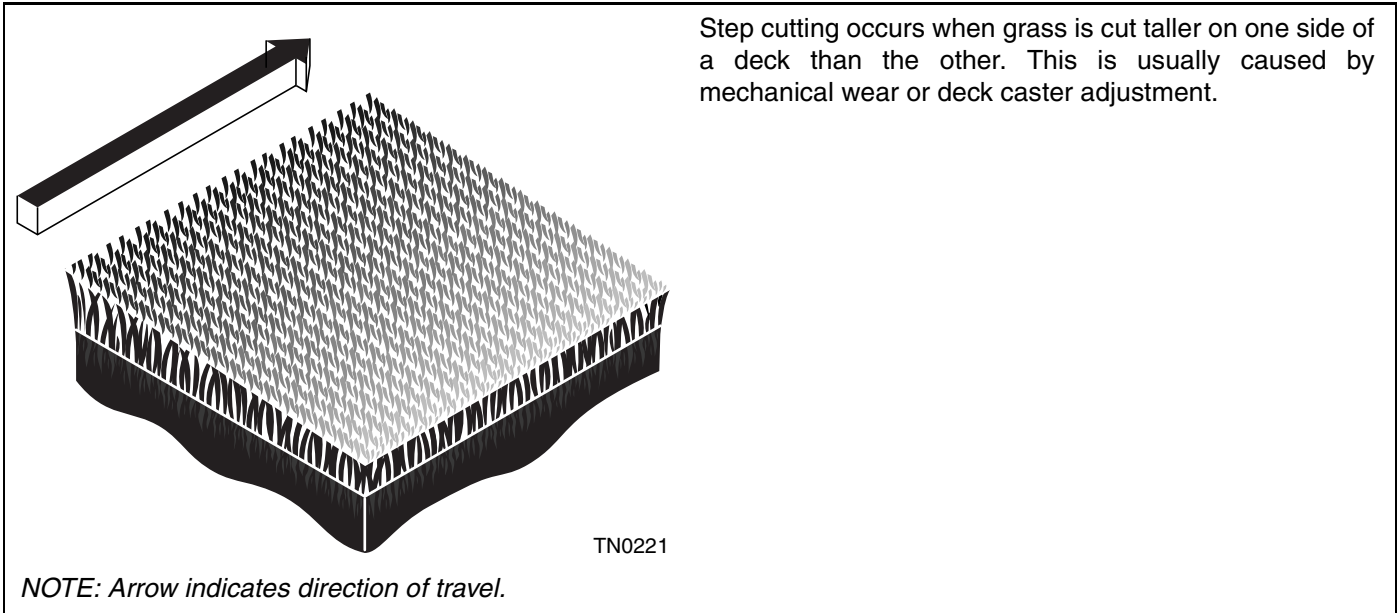
This condition is usually caused by the weight transfer not set correctly.

Washboarding may also be caused by variations in the turf.

Probable Cause	Remedy
Decks have too much or too little weight on them.	Adjust weight transfer valve to put more weight on decks. (Refer to Parts & Maintenance Manual.)

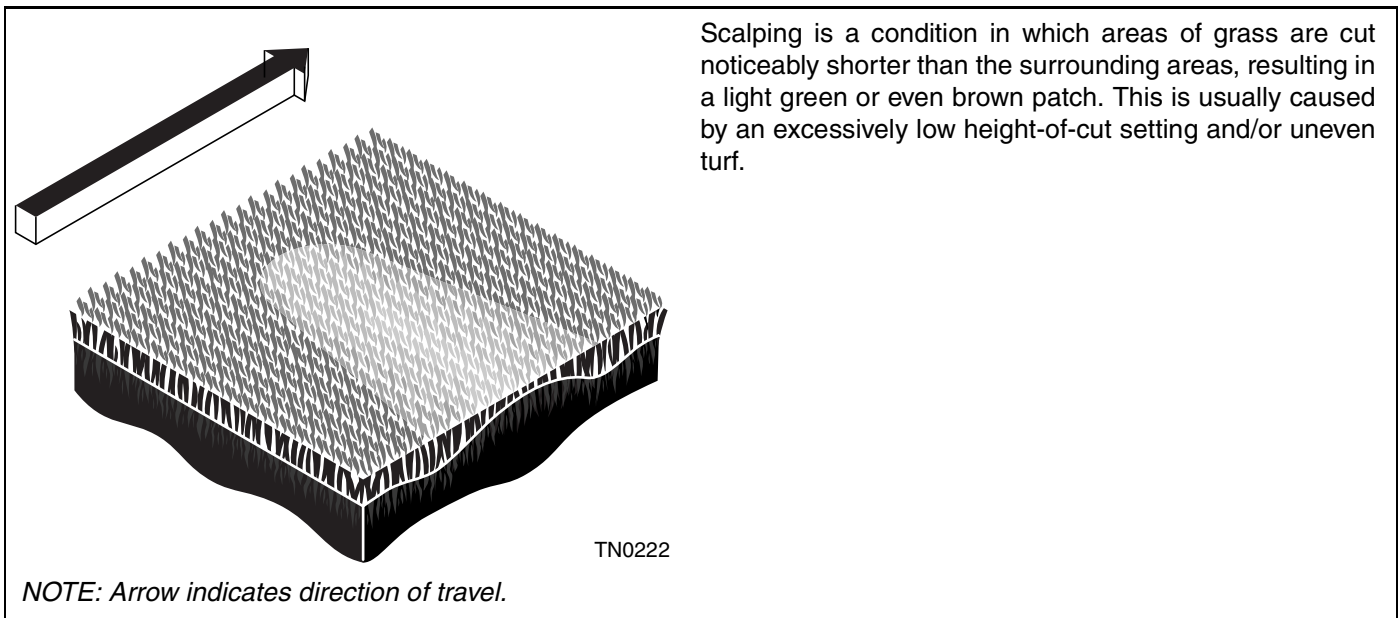
5 QUALITY OF CUT

5.3 STEP CUTTING



Probable Cause	Remedy
HOC (height-of-cut) settings are different from one side of a deck to the other or from one deck to another.	Check HOC adjustment of decks. (Refer to Parts & Maintenance Manual.)
Worn deck caster wheel bearings or fork bushings.	Check/replace deck caster wheel bearings and fork bushings.
Tire pressure uneven.	Check/adjust proper tire inflation pressure. (Refer to Parts & Maintenance Manual.)

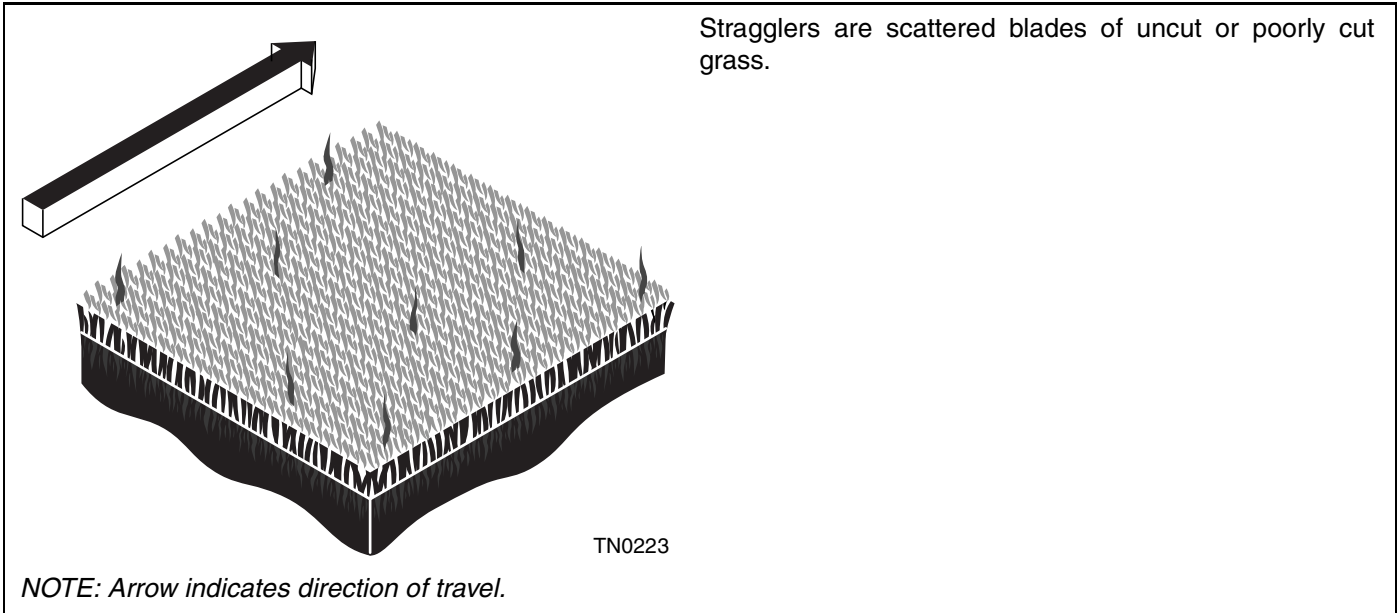
5.4 SCALPING



Probable Cause	Remedy
HOC (height-of-cut) settings are lower than normal.	Check and adjust the HOC settings. (Refer to Parts & Maintenance Manual.)
Turf too uneven for the mower to follow.	Change mowing direction or raise HOC setting.

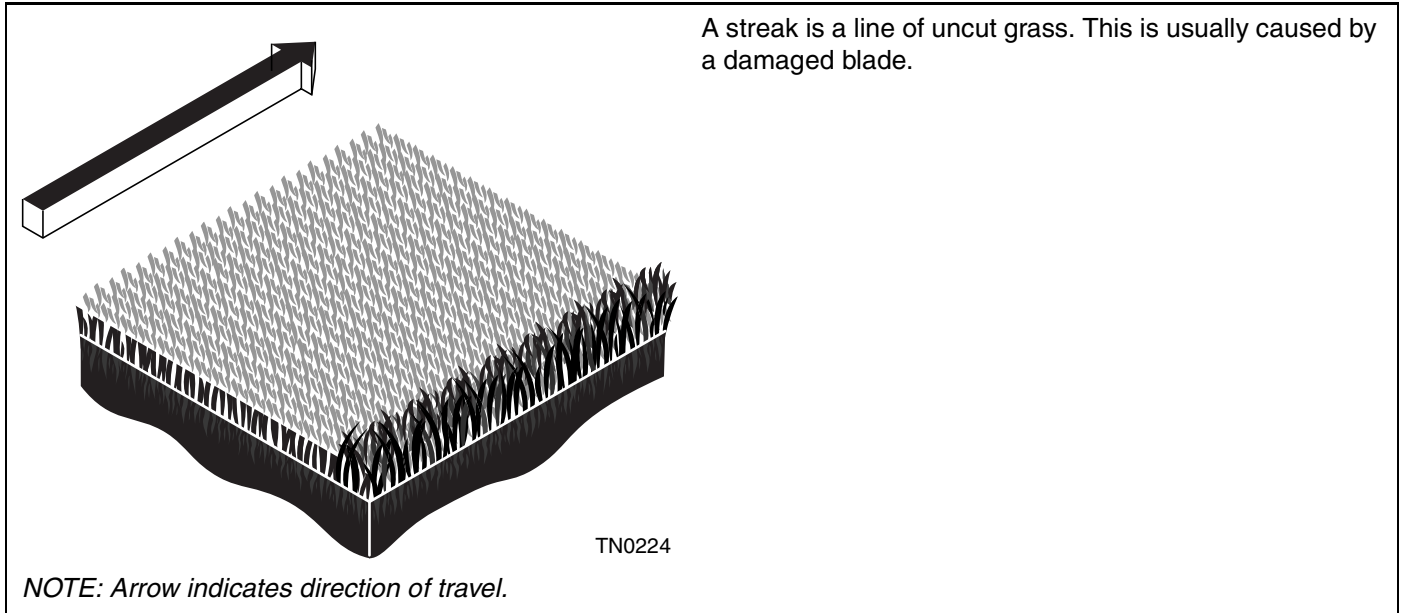
5 QUALITY OF CUT

5.5 STRAGGLERS



Probable Cause	Remedy
Dull cutting blade(s).	Sharpen blade(s). (Refer to Parts & Maintenance Manual.)
Mowing (ground) speed is too fast.	Reduce mowing (ground) speed.
Grass is too tall.	Mow more often.
Mowing in the same direction.	Change mowing direction regularly.
Blade speed too slow	Inspect and repair hydraulic system.

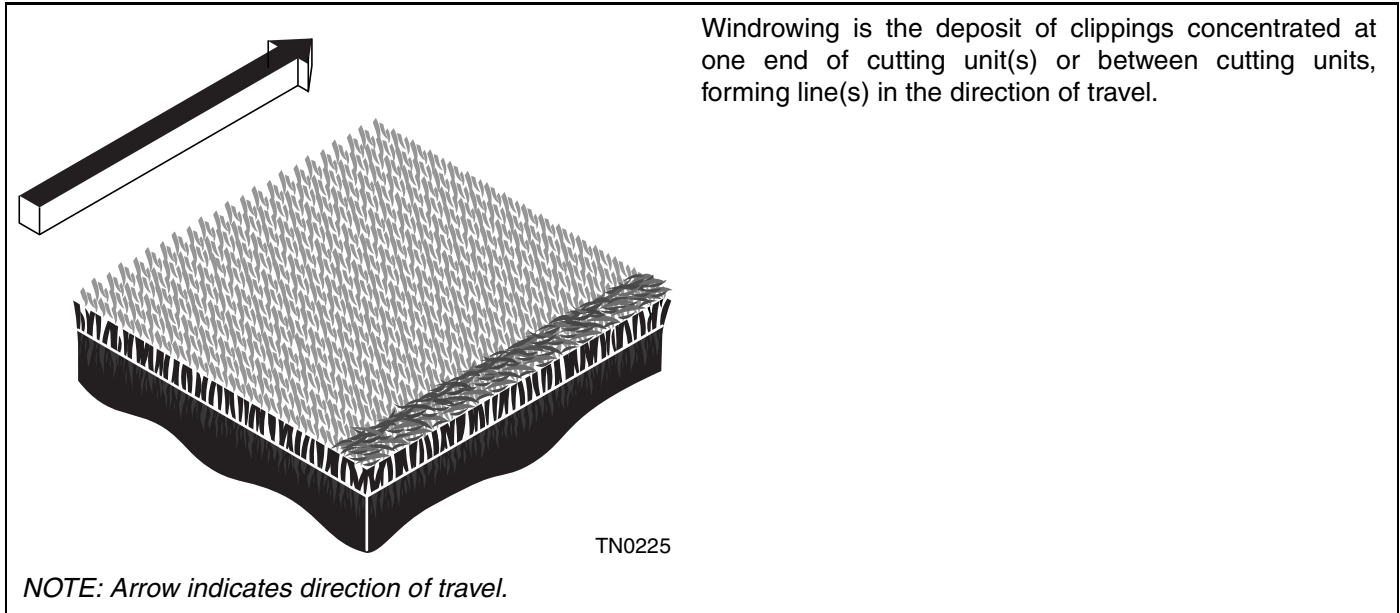
5.6 STREAKS



Probable Cause	Remedy
Damaged blade(s).	Replace blade(s).
Turning too aggressively. Cutting units don't overlap during turns or on side hills.	Turn less aggressively to allow cutting units to overlap. Change mowing direction or pattern on side hills.
Tire mats down grass before it is cut.	Install high lift blades.
Blades installed incorrectly.	Check for proper clockwise/counter-clockwise blade installation.

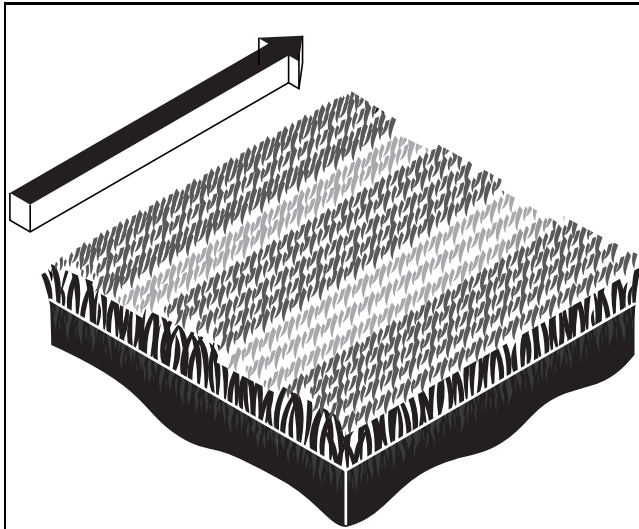
5 QUALITY OF CUT

5.7 WINDROWING



Probable Cause	Remedy
Grass is too tall.	Mow more often.
Mowing while grass is wet.	Mow when grass is dry.

5.8 MISMATCHED CUTTING UNITS



Mismatched decks is a pattern of varying cutting heights, resulting in a stepped cut appearance, usually due to mismatched HOC (height-of-cut) adjustment from one deck to another.

TN1278

NOTE: Arrow indicates direction of travel.

Probable Cause	Remedy
HOC inconsistent from one deck to another.	Check/adjust HOC on decks to same height. (Refer to Parts & Maintenance Manual.)
Difference in blade speeds.	Check operation of rotary cutting motor(s) and repair/replace as necessary.
Difference in deck ride height side to side.	Check/adjust tire inflation pressure. (Refer to Parts & Maintenance Manual.)
Decks not level.	Level decks. (Refer to Parts & Maintenance Manual.)
Deck rake not set.	Adjust decks so that front of blade is 1/8 in. (1.25 mm) lower than rear of blade. (Refer to Parts & Maintenance Manual.)

World Class Quality, Performance And Support

Equipment from Jacobsen is built to exacting standards ensured by ISO 9001 and ISO 14001 registration at all of our manufacturing locations.

A worldwide dealer network and factory trained technicians backed by Genuine Jacobsen Parts provide reliable, high-quality product support.



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