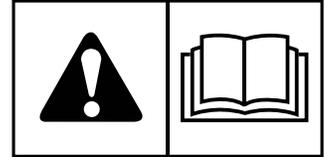




OPERATOR'S MANUAL

FW15 Series Walk Behind Mower



Model No.:	Description
5901736	FW15HON1032
5901737	FW15CWHON1032

**This manual is available in Spanish. For a copy, contact your Ferris dealer or www.ferrismowers.com.
Este manual está disponible en Español. Para obtener una copia, póngase en contacto con su
distribuidor Ferris o www.ferrismowers.com.**

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Thank you for purchasing this quality-built Ferris Commercial Walk Behind Mower. We're pleased that you've placed your confidence in the Ferris brand. When operated and maintained according to the manuals, your Ferris product will provide many years of dependable service.

The manuals contain safety information to make you aware of the hazards and risks associated with the unit and how to avoid them. This Commercial Walk Behind Mower was designed to be used as described in this operator's manual and operated by trained professionals for finish cutting of established lawns and is not intended for any other purpose. It is important that you read and understand the instructions thoroughly before attempting to start or operate this equipment. Save these original instructions for future reference.

Products Covered by This Manual

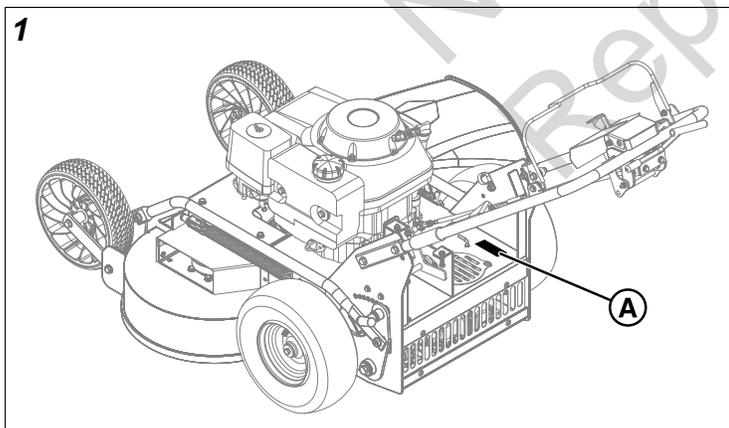
The following products are covered by this manual:
5901736 & 5901737

The images in this document are representative, and are meant to complement the instructional copy they accompany. Your unit may vary from the images displayed. *LEFT* and *RIGHT* are as seen from the operator's position.

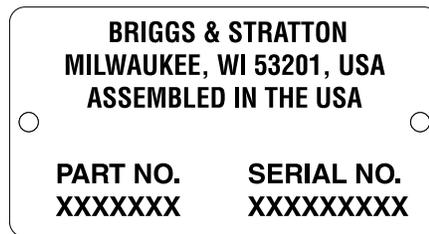
Ferris is a registered trademark of Briggs & Stratton.

Identification Tag Location

The product identification tag (A, Figure 1) can be found in the location shown.



Your unit may feature a serial tag that looks like either one of the following two options:



PRODUCT REFERENCE DATA	
Unit Model Number:	
Unit Serial Number:	
Mower Deck Model Number: (if applicable)	
Mower Deck Serial Number: (if applicable)	
Dealer Name:	
Date Purchased:	
ENGINE REFERENCE DATA	
Engine Make:	
Engine Model:	
Engine Type/Spec:	
Engine Code/Serial Number	

When contacting your authorized service dealer for replacement parts, service, or information you **MUST** have these numbers.

Note: For the location of the engine identification numbers, refer to engine owner's manual.

The Illustrated Parts List for this machine can be downloaded from ferrismowers.com. Please provide model and serial number when ordering replacement parts.

Operator Safety

California Proposition 65



WARNING

This product can expose you to chemicals including gasoline engine exhaust, which is known to the State of California to cause cancer and carbon monoxide, which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

Operating Safely

Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of the 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 safety alert triangle (⚠) in text signifies important cautions or warnings which must be followed.

Operating Safety



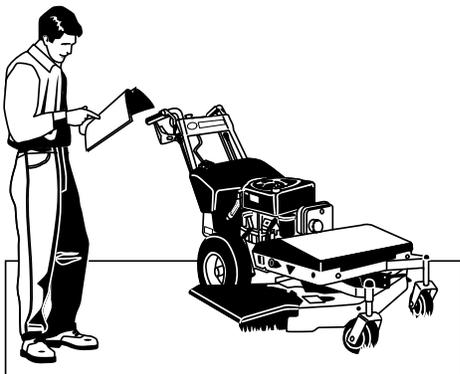
Congratulations on purchasing a superior-quality piece of lawn and garden equipment. Our products are designed and manufactured to meet or exceed all industry standards for safety.

Do not operate this machine unless you have been trained. Reading and understanding this operator's manual is a way to train yourself.

Power equipment is only as safe as the operator. If it is misused, or not properly maintained, it can be dangerous! Remember, you are responsible for your safety and that of those around you.

Use common sense, and think through what you are doing. If you are not sure that the task you are about to perform can be safely done with the equipment you have chosen, ask a professional: contact your local authorized dealer.

Read the Manual

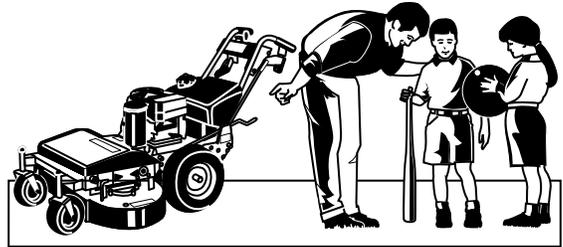


The operator's manual contains important safety information you need to be aware of BEFORE you operate your unit as well as DURING operation.

Safe operating techniques, an explanation of the product's features and controls, and maintenance information is included to help you get the most out of your equipment investment.

Be sure to completely read the Safety Rules and Information found on the following pages. Also completely read the Operation section.

Children



Tragic accidents can occur with children. Do not allow them anywhere near the area of operation. Children are often attracted to the unit and mowing activity. Never assume that children will remain where you last saw them. If there is a risk that children may enter the area where you are mowing, have another responsible adult watch them.

Slope Operation

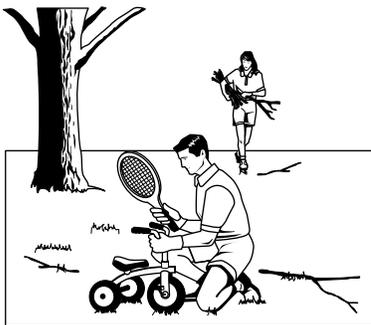


You could be seriously injured if you use this unit on too steep of a slope. Using the unit on a slope that is too steep where you do not have adequate footing and unit traction (and control) can cause you to lose control and possibly slip and fall or roll the unit over.

Always mow across slopes, not up and down (you could slip and fall.)

Also, note that the surface you are on can greatly impact your ability to safely operate this machine. Wet grass or soft soil can seriously affect your footing and traction of the unit. Do not operate on slopes that are slippery, wet, or have soft soil.

Thrown Objects



This unit has spinning mower blades. These blades can pick up and throw debris that could seriously injure a bystander. Be sure to clean up the area to be mowed and remove objects that could be thrown by the blade **BEFORE** you start mowing.

Do not operate this unit without the entire grass catcher or discharge guard (deflector) in place.

Also, do not allow anyone in the area while the unit is running! If someone does enter the area, shut the unit off immediately until they leave.

Moving Parts

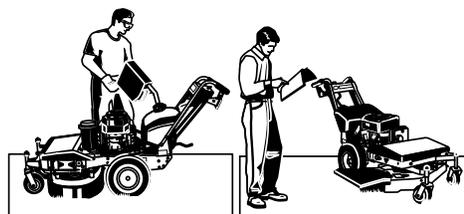


This equipment has many moving parts that can injure you or someone else. However, if you stay in the operator zone (area behind the handles and controls), and follow the safety rules in this operator's manual, the unit is safe to operate.

The mower deck has spinning mower blades that can amputate hands and feet. Do not allow anyone near the unit while it is running! Keep safety devices (guards, shields, and switches) in place and working.

To help you, the operator, use this equipment safely, it is equipped with an operator-present safety system. Do **NOT** attempt to alter or bypass the system. See your dealer immediately if the system does not pass all the safety interlock system tests found in this manual.

Fuel and Maintenance



Always disengage all drives, shutoff the engine and remove the key before doing any cleaning, refueling or servicing.

Gasoline and its vapors are extremely flammable. Do not smoke while operating or refueling. Do not add fuel while engine is hot or running. Allow engine to cool for at least 3 minutes prior to adding fuel.

Do not add fuel indoors, in an enclosed trailer, garage or other enclosed area that is not well ventilated. Gasoline spills should be cleaned up promptly and before operation begins.

Gasoline should be stored only in sealed containers approved for fuel.

Proper maintenance is critical to the safety and performance of your unit. Keep the unit free of grass, leaves and excess oil. Be sure to perform the maintenance procedures listed in this manual, especially periodically testing the safety system.

Enclosed Areas



Only operate this unit outdoors and away from unventilated areas such as inside garages or enclosed trailers. The engine emits poisonous carbon monoxide gas and prolonged exposure in an enclosed area can result in serious injury or death.

Safety Rules and Information Training

- 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.
- Become familiar with the safe operation of the equipment, operator controls, and safety signs.
- All operators and mechanics should be trained. The owner is responsible for training the users.
- Only allow responsible adults, who are familiar with the instructions, to operate the unit.

- Never let children or untrained people operate or service the equipment. Local regulations may restrict the age of the operator.
- The owner/user can prevent and is responsible for accidents or injuries occurring to themselves, other people or property.
- 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.
- Never leave a running unit unattended. Always disengage the PTO, set the parking brake, stop the engine, and remove keys before dismounting. Keep hands and feet away from the cutting units.
- Turn off the PTO switch to disengage the blades when not mowing.
- Never operate with guards not securely in place. Be sure all interlocks are attached, adjusted properly and functioning properly.
- Never operate with the discharge deflector raised, removed or altered, unless using a grass catcher.
- Do not change the engine governor setting or over-speed the engine.
- 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.
- Stop equipment and inspect blades after striking objects or abnormal vibration occurs. Make necessary repairs before resuming operations.
- Keep hands and feet away from the cutting units.
- Look behind and down before backing up to be sure of a clear path.
- Never carry passengers and keep pets and bystanders away.
- Do not operate the unit while under the influence of alcohol or drugs.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop blades if not mowing.
- Use care when loading or unloading the machine into a trailer or truck.
- Use care when approaching blind corners, shrubs, trees or other objects that may obscure vision.
- To reduce fire hazard, keep unit free of grass, leaves & excess oil. Do not stop or park over dry leaves, grass or combustible materials.

Preparation

- 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.
- Wear appropriate clothing including safety shoes, safety glasses and ear protection. Long hair, loose clothing or jewelry may get tangled in moving parts.
- 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.
- Use extra care when handling gasoline and other fuels. They are flammable and vapors are explosive.
- Use only an approved container.
- Never remove fuel cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
- Never refuel or drain the machine indoors.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Never run an engine in an enclosed area.
- Mow only in the daylight or with good artificial light, keeping away from holes and hidden hazards.
- Be sure all drives are in neutral and parking brake is engaged before starting engine. Only start engine from the operator's position.
- Be sure of your footing while using pedestrian controlled equipment, especially when backing up. Walk, don't run. Reduced footing could cause slipping.
- 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.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse.
- 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.
- Slow down and use caution when making turns and when changing directions on slopes.
- Never raise deck with the blades running.



It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact an Authorized Service Dealer to obtain a spark arrester designed for the exhaust system installed on this engine.

- OSHA regulations may require the use of hearing protection when exposed to sound levels greater than 85 dBA for an 8 hour time period.



This machine produces sound level 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

Operating on a steep slope can cause sliding and loss of steering, control, and rollover.

Select slow ground speed before driving onto a 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 A SLOPE.**

Do:

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

Do not:

- 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.
- Do not turn on slopes unless necessary, and then, turn slowly.
- 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.
- Do not mow on wet grass. Reduced footing or traction could cause sliding.
- Do not mow excessively steep slopes.
- Do not use grass catcher on steep slopes.

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.

- Keep children out of the mowing area and under the watchful care of another responsible adult.
- Be alert and turn unit off if children enter the area.
- Before and during reverse operation, look behind and down for small children.

- Never allow children to operate the unit.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Emissions

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

Service and Maintenance Safety



WARNING

Amputation and crushing hazard

Specific steps must be taken in order to perform service and maintenance procedures safely.

Read and follow all the applicable safety and instructional messages in this manual.

Always disengage the mower blades, set the parking brake, turn the engine OFF, remove the ignition key, and wait for all movement to stop prior to performing service and maintenance procedures.

Always disconnect the spark plug wire(s) and fasten it away from the plug before beginning any maintenance or service procedures on order to prevent accidental ignition.

Safe Handling of Gasoline



DANGER

Fire and explosion hazard

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

- Extinguish all cigarettes, cigars, pipes, and other sources of ignition.
- Use only approved gasoline containers.
- Never remove the gas cap or add fuel with the engine running. Allow the engine to cool before refueling.
- Never fuel the machine indoors.
- 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.
- 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.
- 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.
- 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.
- If fuel is spilled on clothing, change clothing immediately.

- Never over-fill the fuel tank. Replace gas cap and tighten securely.
- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
- 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.
- Replace all fuel tank caps and fuel container caps securely.

Maintenance and Storage

- Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
- Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
- Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
- 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.
- Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
- Keep all hardware, especially blade attachment bolts, tight and keep all parts in good working condition. Replace all worn or damaged decals.
- Never tamper with safety devices. Check their proper operation regularly.
- 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.
- Clean grass and debris from cutting units, drives, mufflers, and engine to prevent fires. Clean up oil or fuel spillage.
- Let engine cool before storing and do not store near flame.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Park machine on level ground. Never allow untrained personnel to service machine.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.
- 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.
- 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.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- 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.

- 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.
- Check brake operation frequently. Adjust and service as required.
- Use only factory authorized replacement parts when making repairs.
- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- 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.



WARNING

Units with hydraulic pumps, hoses, or motors: 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.



WARNING

Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.

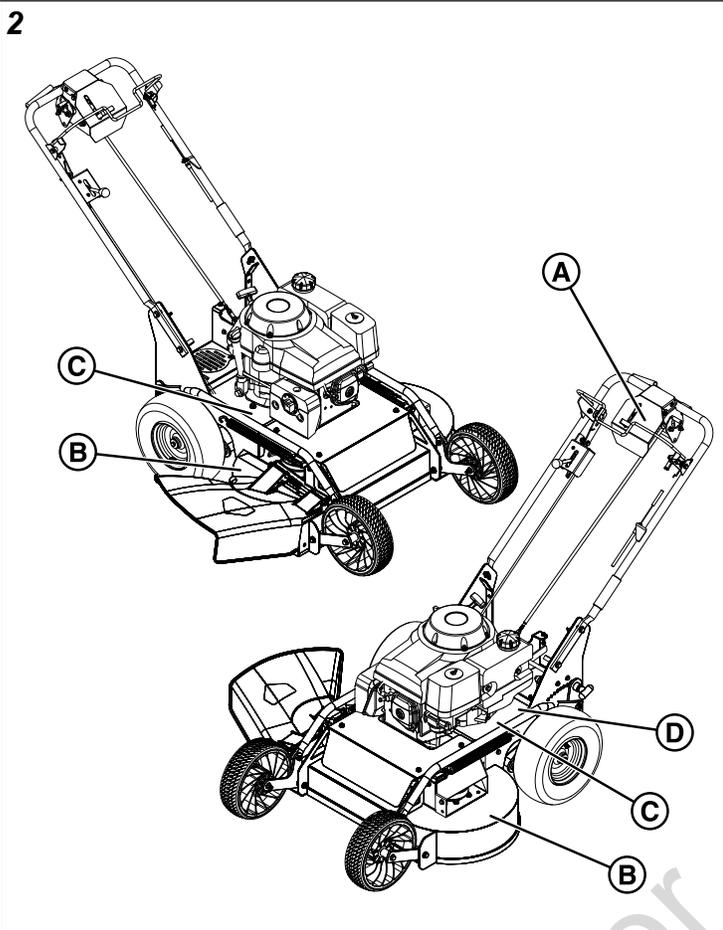
Safety Decals

Before operating your unit, read the safety decals. The cautions and warnings are for your safety. To avoid a personal injury or damage to the unit, understand and follow all safety decals.



WARNING

If any safety decals become worn or damaged and cannot be read, order replacement decals from your local dealer.



A.) Part Number: 5107426 - Decal, Main Safety

⚠ WARNING

Avoid serious injury or death

- Read operator's manual before using this product.
- Go across slopes, NOT up and down.
- Look down and behind before and while backing.
- Stop the mower when children or others are near.
- Remove objects that could be thrown by the blade.
- Keep safety devices (guards, shields, switches, etc.) in place and working.
- Do NOT operate this machine unless you are trained.
- Know the location and function of all controls.
- Avoid steep slopes. Reduce speed and use extreme caution on slopes.

4
3
2
1

5107426 -

B.) Part Number: 5107606 - Decal, Danger Discharge

⚠ DANGER

Amputation and thrown objects hazard

- Keep hands and feet away from deck.
- Do not operate mower unless discharge chute or entire grass catcher is in its proper place.

5107606 -

C.) Part Number: 5061245 - Decal, Pinch Point

⚠ WARNING

PINCH POINT

To avoid injury from loaded spring, read operator's manual before removing spring.

61245

D.) Part Number: 5103665 - Decal, Fire Hazard

⚠ WARNING

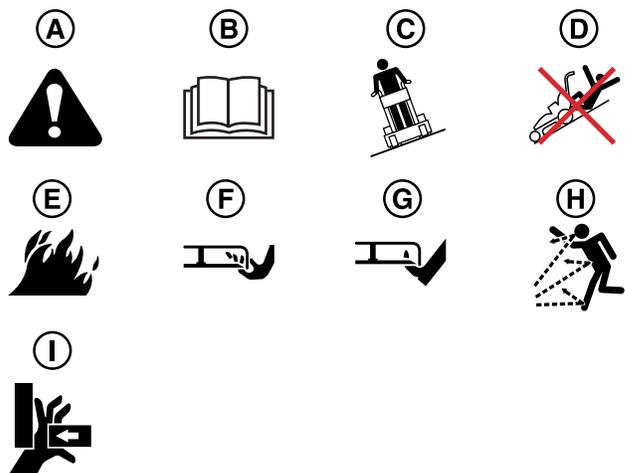
Fire Hazard

Gasoline is flammable.
Debris is combustible.

- Allow engine to cool for at least 3 minutes before refueling.
- Keep unit cleaned of debris
- This equipment may create sparks that can start fires around dry vegetation. A spark arrester may be required. Contact local fire agencies for regulations relating to fire prevention requirements.

5103665

Safety Icons



Callout	Hazard Meaning
A	Alert
B	Read the manual
C	Go across slopes, not up and down

Callout	Hazard Meaning
D	Rollover hazard
E	Fire hazard
F	Amputation - hand in blade
G	Amputation - foot in blade
H	Thrown objects
I	Pinch point

Safety Alert Symbol and Signal Words

The safety alert symbol  identifies safety information about hazards that can result in personal injury. A signal word (**DANGER**, **WARNING**, or **CAUTION**) is used with the alert symbol to indicate the likelihood and the potential severity of injury. In addition, a hazard symbol may be used to represent the type of hazard.

 **DANGER** indicates a hazard which, if not avoided, **will** result in death or serious injury.

 **WARNING** indicates a hazard which, if not avoided, **could** result in death or serious injury.

 **CAUTION** indicates a hazard which, if not avoided, **could** result in minor or moderate injury.

NOTICE indicates information considered important but not hazard-related.

Safety Interlock System

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

Test 1 - Blades should SHUT OFF if:

- The operator releases the blade engagement lever.

Test 2 - Blades SHOULD turn on if:

- Operator releases the blade engagement lockout and depresses the blade engagement lever.

Test 3 - Blade Brake Check

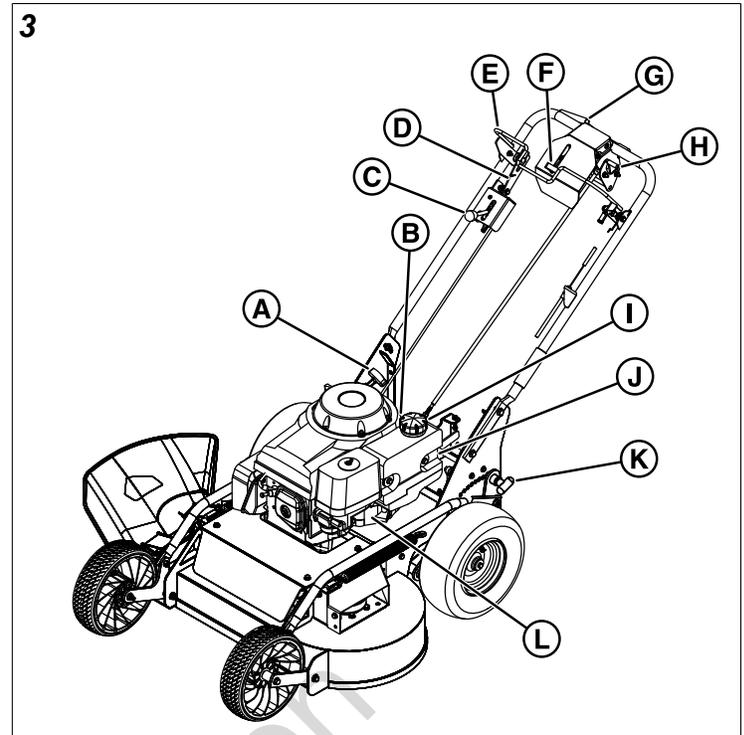
Mower blades and the mower deck drive belt should come to a complete stop within seven (7) seconds after the blade engagement lever is released. If the mower deck drive belt does not stop within seven (7) seconds, see your dealer.

Features and Controls

Control Locations & 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.

Control Locations



A	Recoil Starter Handle
B	Transmission Release Lever
C	Throttle Control and Engine Shut Down Lever
D	Blade Engagement Lever Lockout
E	Blade Engagement Lever
F	Maximum Forward Speed Control Lever
G	Forward Motion Control Lever
H	Reverse Motion Control Lever
I	Fuel Tank Cap
J	Choke
K	Cut Height Adjustment Lever
L	Fuel Shutoff Valve

Recoil Starter Handle: The recoil starter handle is used to start the engine.

Transmission Release Lever:

Icon	Control Name
	Transmission Release Levers

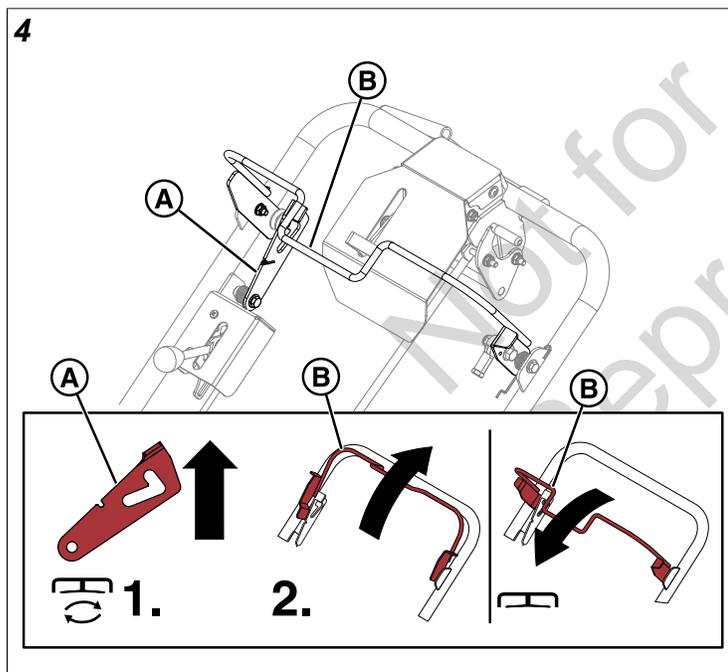
This unit is equipped with a transmission release lever. The transmission release lever deactivates the transaxle so that the unit can be pushed by hand. See *Pushing the Unit by Hand* for operational information.

Throttle Control and Engine Shut Down Lever: The throttle control and engine shut down lever controls the engine speed and shuts down the engine. Move the throttle forward to increase the engine speed and back to decrease engine speed. Always operate at FULL throttle when mowing.

Move the throttle control to the engine shut down position to shut the engine down.

	FAST throttle speed.
	SLOW throttle speed.
	OFF position (Engine shut down).

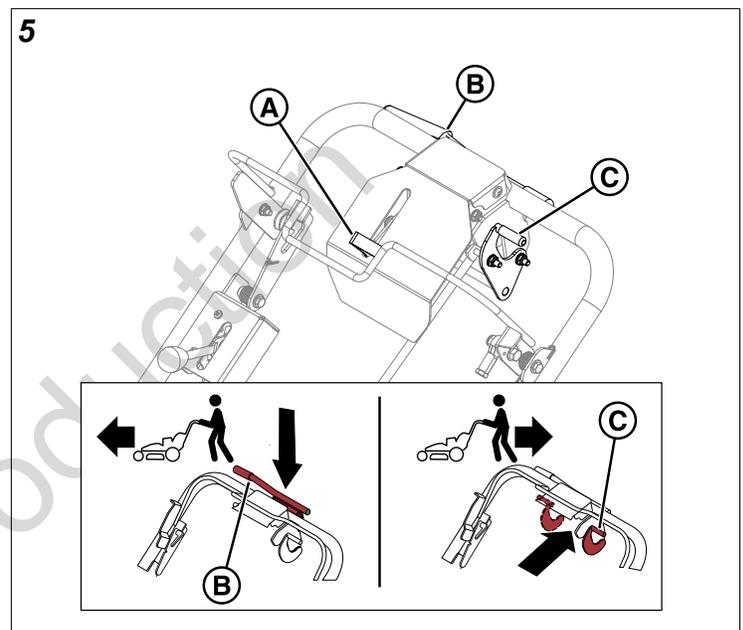
Blade Engagement Lever and Blade Engagement Lever Lockout: The blade engagement lever lockout (A, Figure 4) prevents the operator from being able to engage the mower blades without first being in the operator's position and then releasing the lockout by raising it up. The mower blades are engaged when the operator presses the blade engagement lever (B) down. The mower blades are disengaged when the operator releases the blade engagement lever.



Maximum Forward Speed Control Lever: The maximum forward speed control lever (A, Figure 5) has four positions and determines the maximum forward speed of the unit.

Icon	Control Name
	Maximum Forward Speed Control Lever

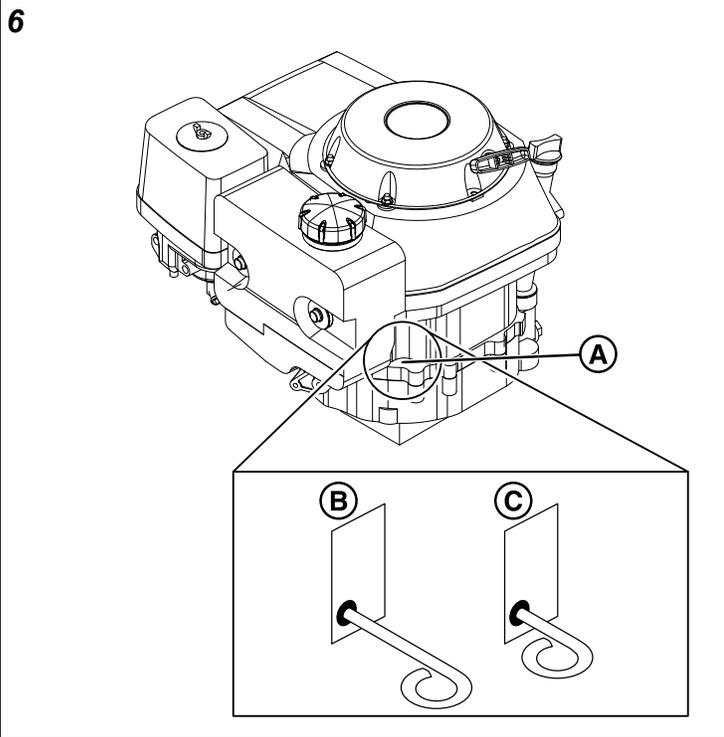
Forward Motion Control Lever: The forward motion control lever (B) controls the forward speed of both drive tires. Press the lever down and forward to make the unit move forward. Release the lever and it will automatically return the transmission to the neutral position.



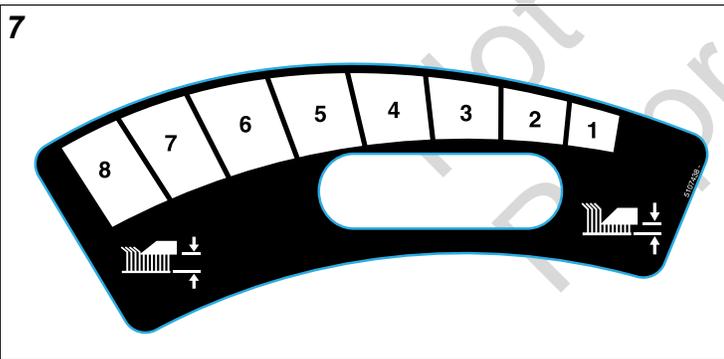
Reverse Motion Control Lever: The reverse motion control lever (C) controls the reverse speed of both drive tires. Pull the levers back towards the handle bar to make the unit move backwards. Release the lever and it will automatically return the transmission to the neutral position.

Fuel Tank Cap: To remove the cap, turn **counter-clockwise**.

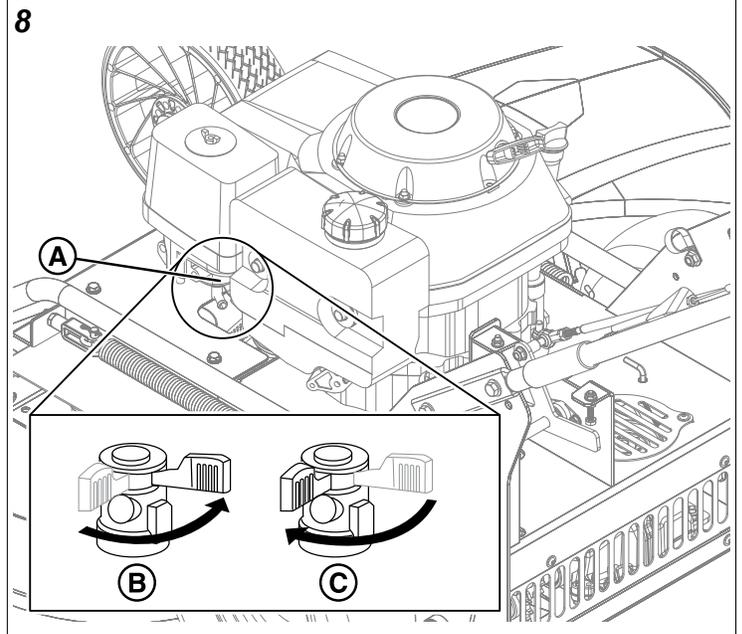
 **Choke:** Close the choke (A, Figure 6) for cold starting. Open the choke once the engine starts. A warm engine may not require choking. Pull the ring OUT (away from the engine) (B) to close the choke. Push the ring IN (towards the engine) (C) to open the choke.



Cut Height Adjustment Lever: The cut height adjustment lever (K, Figure 3) allows the operator to raise or lower the height of the cutting blades into eight different positions. The hole identified as "1" on the cut height decal (Figure 7) represents the lowest cutting height and the hole identified as "8" represents the highest cutting height. See *Cutting Height Adjustment* for instructions on how to set the cut height.



Fuel Shut Off Valve: The fuel shut off valve (A, Figure 8) controls the flow of fuel from the fuel tank to the engine. Prior to starting the engine and operating the unit turn the valve to the ON position (B). After operating the unit, turn the valve to the OFF position (C).



Operation

Before First Time Use

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



WARNING Read the operator's manual before attempting to operate the machine.

If you do not understand how a specific control functions, or have not yet thoroughly read the *Features and Controls* section, do so now.

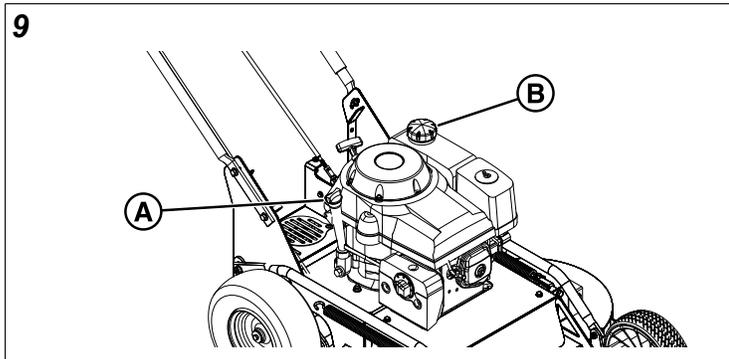
Do not attempt to operate the mower without first becoming familiar with the location and function of all controls.



- Before leaving the operator's position for any reason, stop the directional motion of the machine, release the blade engagement lever, and stop the engine.
- To reduce fire hazard, keep the engine and mower free of grass, leaves, and excess grease. Do NOT stop or park unit 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.

Checks Before Starting

1. Check that the engine crankcase is filled to the full mark on the dipstick (A, Figure 9). See the engine operator's manual for engine oil fill instructions and oil recommendations.



2. Make sure all nuts, bolts, screws, and pins are in place and tight.
3. Fill the fuel tank (B) with fresh fuel. Refer to the engine operator's manual for fuel recommendations.

Starting the Engine



WARNING

If you do not understand how a specific control functions, or have not yet thoroughly read the *Features and Controls* section, do so now.

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

1. Move the engine's fuel shut off valve to the ON position.
2. Pull the choke lever OUT (away from the engine) to close the choke.
3. Move the throttle control and engine stop lever to the FAST position.
4. While standing on the trim side of the unit, grasp the recoil starter handle and pull slowly until resistance is felt and then pull it rapidly. You may have to pull several times before the engine starts. If the engine fails to start within a reasonable number of attempts, discontinue and check the engine operator's manual for further instructions.
5. After the engine starts, gradually open the choke by pushing the choke lever in towards the engine. Reduce the throttle to half throttle speed and allow the engine to warm up. Warm up the engine by running it for at least a minute before engaging the blades or driving the mower.
6. After warming the engine, ALWAYS operate the unit at FULL THROTTLE when mowing.

Stopping the Mower

1. Bring the unit to a complete stop.
2. Release the blade engagement lever to stop the blades.

3. Move the throttle control and engine shut down lever to the OFF position.
4. Move the fuel shut off valve to the OFF position.

Driving the Mower

Before attempting to drive the unit make sure you have read the *Features and Controls* section and understand the location and function of the controls.

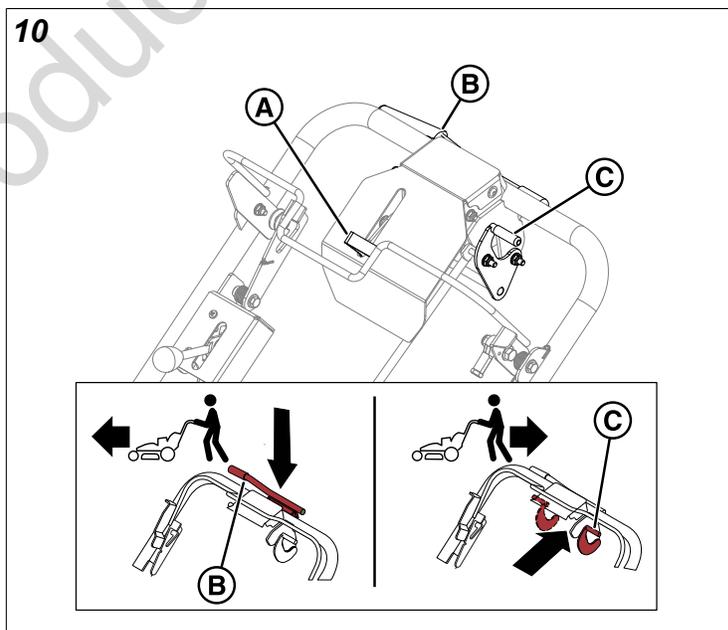
The hydrostatic transmission has an infinite number of speeds between full speed forward and reverse with the faster speeds being achieved by moving the forward speed control lever and reverse speed control levers farthest in their directions of travel.

For normal use, the throttle should be kept fully open and the ground speed of the machine is determined by the maximum forward speed control lever. When transporting the machine or when loading or unloading from a truck or trailer, partial throttle should be used to slow the reaction time of the controls and reduce noise.

Practice maneuvering the machine at a slow engine speed on level ground with the blades disengaged until you are familiar with the controls.

Moving the Unit Forward

1. Set the maximum forward speed control lever (A, Figure 10) to the desired position.



2. Gently squeeze the forward motion control lever (B) down and forward towards the handle bar until the desired speed is achieved.

Moving the Unit Backwards

1. Pull the reverse motion control levers (C, Figure 10) back towards the handle bar to make the unit move backwards. The closer the reverse motion control levers are to the handle bar the faster the unit will move.

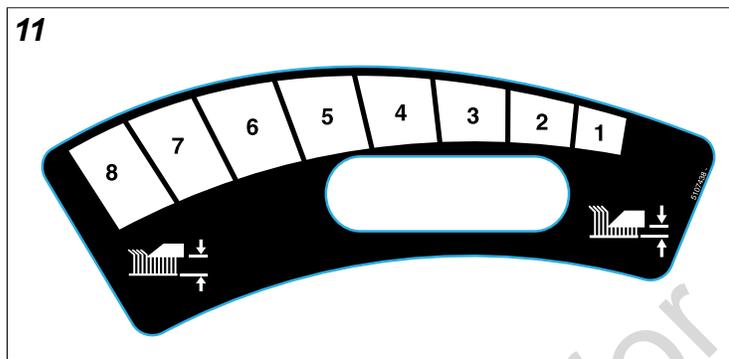
Operating the Unit with a Sulky



Do NOT use a Sulky or any type of operator towing platform on this machine because it will exceed the load limit of the transmission. Permanent damage to the transmission may occur which is NOT covered under warranty.

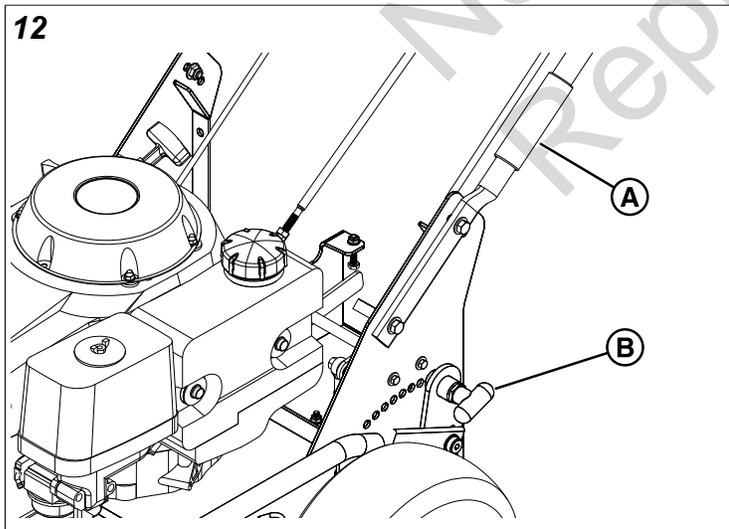
Cutting Height Adjustment

The cutting height of the mower is adjustable in eight (8) different positions as identified by the cut height decal (Figure 11) on the unit.



To adjust the height of cut:

1. While standing on the trim side of the unit, place one hand on the foam grip (A, Figure 12) on the handle bar and your other hand on the cut height adjustment pin (B).



2. Pull the cut height adjustment pin out and lift the handle bar up or down to adjust the blades to the desired cutting height. The cut height adjustment pin is spring loaded and when it aligns with a cut height hole it will snap back into place. Make sure that the pin has engaged a cutting height hole before releasing the handle bar.

Mowing

Before mowing, set the cutting height as described in *Cutting Height Adjustment*.

1. Make sure that the blade engagement lever is in the disengaged position.
2. Start the engine (see *Starting the Engine*).
3. While standing in the operator's position (behind the handle bars) release the blade engagement lever lockout (A, Figure 4) by raising it up and then press the blade engagement lever (B) down to engage the blades.
4. When finished mowing release the blade engagement lever to stop the blades.
5. Move the throttle control and engine shut down lever to the OFF position to stop the engine.

Mowing Recommendations

Several factors can affect how well your unit cuts grass. Following proper mowing recommendations can improve the performance and life of your unit.

Height of Grass

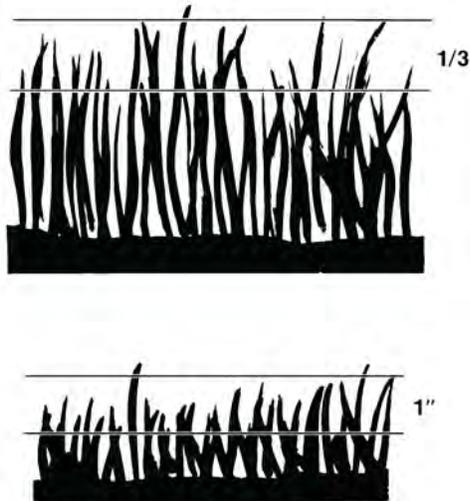
Often cutting height is a matter of personal preference. Typically, you should mow the grass when it is between three and five inches high. The proper cutting height range for a specific lawn will depend upon several factors, including the type of grass, the amount of rainfall, the prevailing temperature,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

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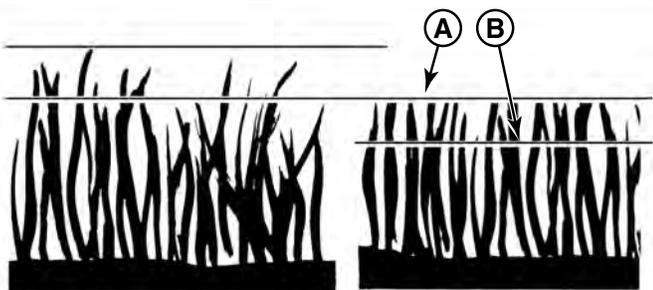


The amount of grass you are able to cut in one pass is also effected by the type of mowing system you are using (for example, broadcasting with side discharge decks can process a much larger volume of grass than mulching does).

Tall grass requires incremental cutting. For extremely tall grass, set the cutting height at maximum for the first pass (A, Figure 14), and then reset it to the desired height and mow a second (B) 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.

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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:

- Mow when the grass is between three and five inches high.
- 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.
- Mow at time of day when the grass is cool and dry. Late afternoon or early evening often provide these ideal mowing conditions.

- 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).

Mowing Patterns

Always start mowing on a smooth, level area.

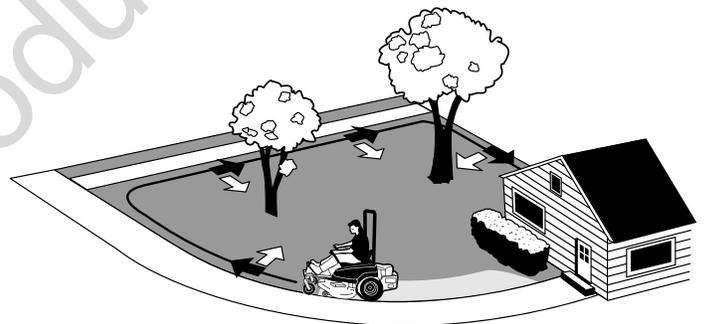
The size and type of area to be mowed will determine the best mowing pattern to use. Obstructions such as trees, fences and buildings, and conditions such as slopes and grades must also be considered.

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

Note: Always operate the engine at FULL THROTTLE when mowing.

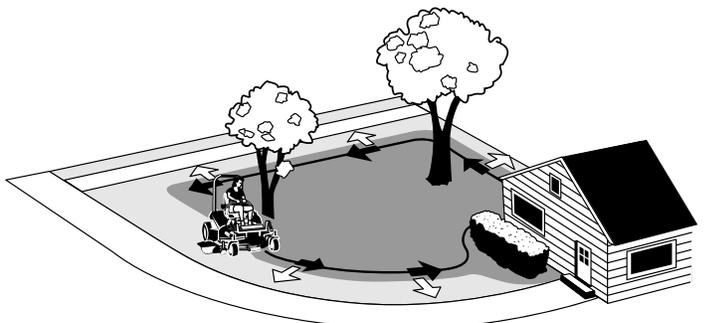
If you hear the engine slowing down, you are mowing too fast—using a slower ground speed will improve the cutting efficiency of the blades and prevents many common cutting problems. Use an appropriate ground speed for the thickness and height of the grass you are cutting (3rd gear or slower for manual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

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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.

16



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.

Mowing Methods

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.

Mulching

Mulching consists of a mower deck which cuts and re-cuts 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 CONDITIONS, 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 too 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 Mulching:

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.

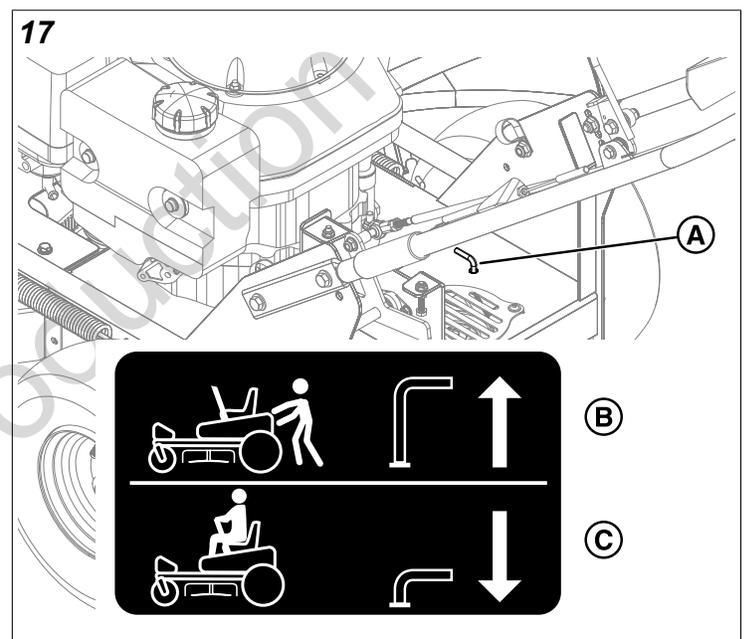
How Much Grass to Mulch:

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.

Pushing the Unit by Hand

NOTICE Towing the unit while the transmission is engaged will cause transmission damage. Do NOT use another vehicle to push or pull this unit.

1. Release the blade engagement lever to stop the blades and move the throttle control and engine shut down lever to the OFF position to stop the engine.
2. Locate the transmission release lever (A, Figure 17) on the engine deck of the unit behind the engine.



3. To open the transmission bypass valves (bypass position) (B) pull the transmission release lever up away from the engine deck.
4. The unit can now be pushed by hand.
5. After moving the unit close the bypass valves (run position) (C) by pushing the transmission release lever down towards the engine deck.

Storage

When preparing this unit for storage you must follow the procedures listed in this manual and in the engine manufacturer's operator's manual.

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.



WARNING

Never store the unit with gasoline in the 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.

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:

1. Drain crankcase oil while engine is hot and refill with a grade of oil that will be required when unit is used again.
2. Prepare the mower deck for storage as follows: Clean underside of mower deck. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
3. Clean external surfaces and engine.
4. Prepare engine for storage. See engine owner's manual.
5. Clean any dirt or grass from cylinder head cooling fins, engine housing and air cleaner element.
6. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep out moisture, dirt and insects.
7. Completely grease and oil unit as outlined in the *Lubrication* section.
8. 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:

1. Remove any blocking from under the unit.
2. Unplug the exhaust outlet and air cleaner.
3. Fill the fuel tank with fresh gasoline. See engine manual for recommendations.
4. See engine owner's manual and follow all instructions for preparing engine after storage.
5. Check crankcase oil level and add proper oil if necessary. If any condensation has developed during storage, drain crankcase oil and refill.
6. Inflate tires to proper pressure.
7. 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.

Maintenance Schedule

The following schedule should be followed for the normal care of your unit. You will need to keep a record of your operating time.

UNIT MAINTENANCE
After First Three Hours of Operation
Check / Adjust mower deck belt tensions.
Before Each Use
Check the safety interlock system
Check the unit for loose hardware.
Check the tire pressures.
Every 25 Hours
Clean mower deck and check / replace mower blades.*
Lubricate unit and mower deck.*
Every 100 Hours
Check mower blade stopping time.
Check / Adjust belt tensions.

ENGINE MAINTENANCE
Before Each Use
Check engine oil level.
Clean visible debris from engine compartment.
Every 50 Hours
Inspect / clean spark arrester.**
Every 100 Hours
Check fuel filter.
Refer To Engine Operator's Manual
Service air filter.
Change engine oil and filter.

ENGINE MAINTENANCE

Check / replace spark plugs.

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

**If equipped. Replace if damaged.

Maintenance Procedures

Service and Maintenance Safety



Amputation and crushing hazard

Specific steps must be taken in order to perform service and maintenance procedures safely.

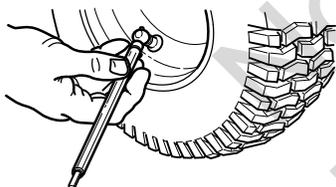
Read and follow all the applicable safety and instructional messages in this manual.

Always disengage the mower blades, turn the engine OFF, and wait for all movement to stop prior to performing service and maintenance procedures.

Always disconnect the spark plug wire(s) and fasten it away from the plug(s) before beginning any maintenance or service procedures in order to prevent accidental ignition.

Checking Tire Pressures

Tire pressure should be checked periodically, and maintained at the levels shown in the Specifications 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 and extend tire life.



Checking / Adding Fuel



Fuel and its vapors are extremely flammable and explosive.

Fire or explosion can cause severe burns or death.

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.

To add fuel:

1. Stop the engine and allow it to cool for at least 3 minutes.
2. Remove the fuel cap.
3. Fill the tank to the bottom of the filler neck. This will allow for fuel expansion.

NOTE: Do not overfill. Refer to your engine manual for specific fuel recommendations.

4. Install and hand tighten the fuel cap.

Check Engine Oil Level

Interval: Before Each Use

Refer to the engine operator's manual for dipstick and oil fill locations and specific engine oil check and fill procedures.

Disposing of Used Engine Oil

Used oil is a hazardous waste product and must be discarded correctly. Do not discard with household waste. Check with your local authorities, service center, or dealer for safe disposal and recycling facilities.

Engine Maintenance and Repair

Refer to the engine manufacturer's manual for maintenance and service information. Warranty coverage on the engine is the responsibility of the engine manufacturer. If your engine requires warranty repair contact your local servicing engine dealer. Have your engine model number and serial number ready when you contact the dealer. If you cannot locate a servicing dealer in your area, you may contact the manufacturer's national service organization at the following numbers:

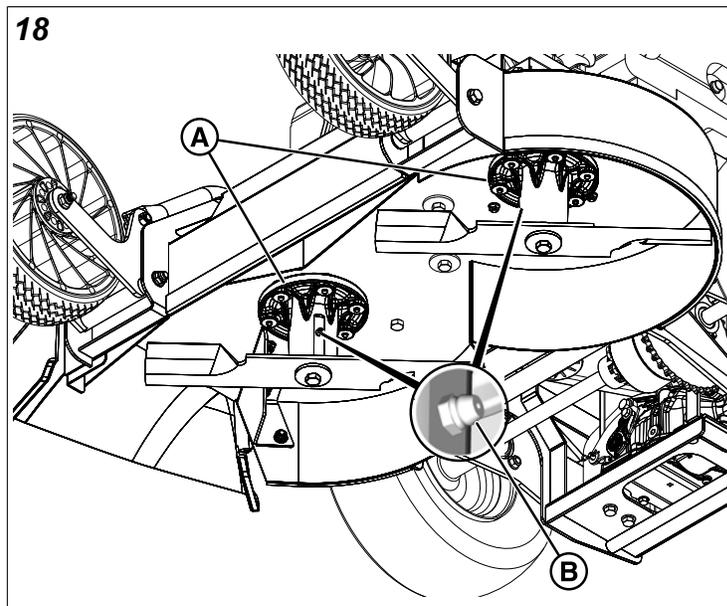
American Honda: (800) 426-7701

Lubrication

Grease:

Moving components with grease fitting must be lubricated at the intervals as specified in the *Maintenance Chart*.

The mower deck has two (2) mower deck spindles (A, Figure 18) and each is equipped with a grease fitting (B) that must be greased.



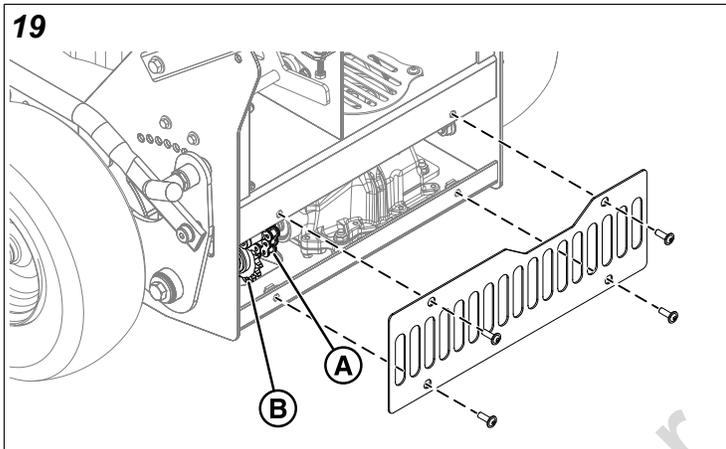
Use grease fitting when present. Disassemble parts to apply grease to moving parts when grease fittings are not installed.

Not all greases are compatible. Red grease (p/n 5022285) is recommended, automotive-type high-temperature, lithium grease may be used when this is not available.

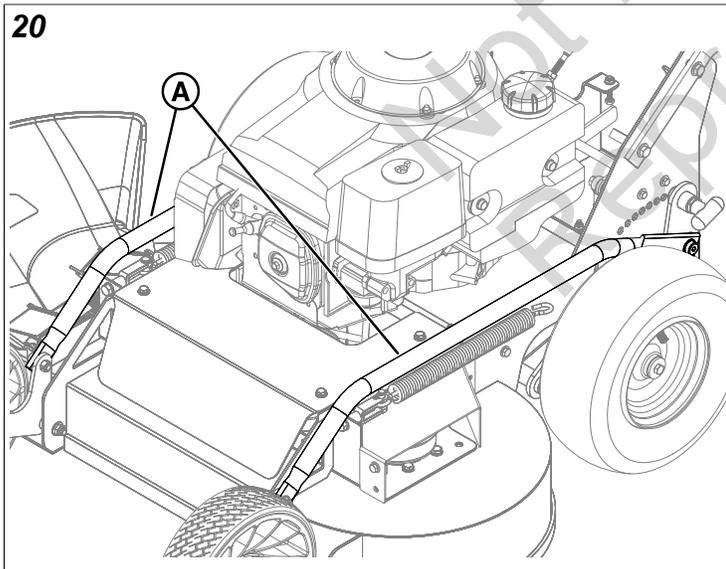
Oil:

Generally, all moving metal parts should be oiled where contact is made with other parts.

This unit has a drive chain (A, Figure 19) that allows the transaxle to power the differential that is located underneath the rear of the engine deck. The drive chain and the idler sprocket (B) that tensions it need oil applied to them.



The mower is equipped with two (2) deck lift linkage bars (A, Figure 20) and they should be oiled at their mounting points.



Keep oil and grease off of belts and pulleys. Remember to wipe grease fitting and surfaces clean both before and after lubrication.

Servicing the Mower Blades

Removing the Mower Blades

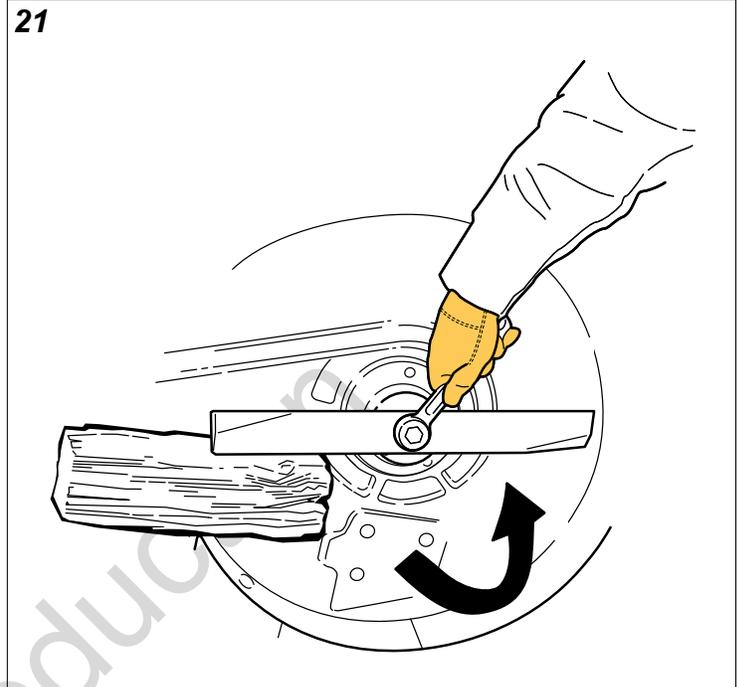
CAUTION

Laceration hazard

Mower blades are sharp.

Always wear gloves when handling, or working near, mower blades.

1. Use a block of wood to prevent the mower blade from turning as shown in Figure 21.



2. Using a wrench, remove the bolt securing the blade to the spindle.

Inspecting the Mower Blades

DANGER

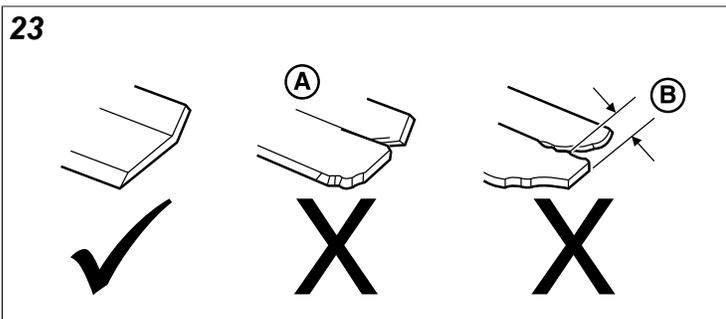
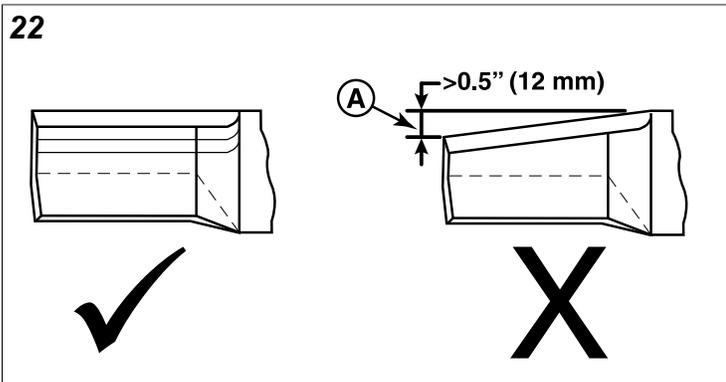
Thrown objects hazard

Avoid injury: a worn or damaged mower blade can break and a piece of the blade could be thrown into the operator's area or bystander's area resulting in serious personal injury or death.

- Inspect the mower blade every 25 hours or at least once per year.
- If the mower blade hits a solid object, stop the engine immediately and inspect the mower blades.
- Never weld or straighten bent mower blades.

1. Remove the mower blade from the unit. See *Removing the Mower Blades*.
2. Inspect the mower blade (Figures 22 and 23). Discard the mower blade if it has any of the following conditions:
 - More than .5" (12,7 mm) of the mower blade metal has been removed from previous sharpening or wear (A, Figure 22)

- The air lifts are excessively eroded (A, Figure 23) and the notch (B) is .25" (6,35 mm) deep or greater.
- The mower blade is broken or bent.



3. If the cutting edges are not sharp or have nicks, sharpen the blades. See *Sharpening the Mower Blades*.

Sharpening the Mower Blades



WARNING

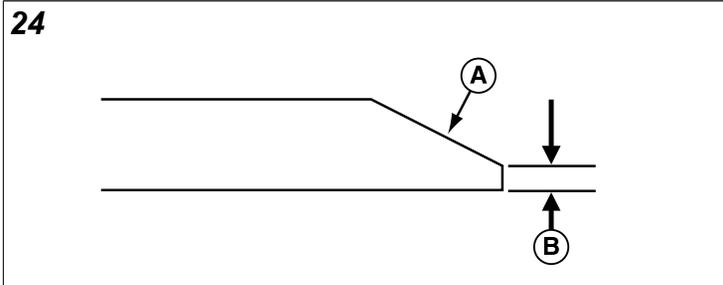
Thrown objects and fire hazard

Grinding mower blades throws sparks and fine metal particles that are capable of igniting gasoline and gasoline vapors, and that can injure unprotected eyes.

Be sure all flammable materials are cleared from the area where grinding will occur.

Always wear safety glasses or goggles when grinding mower blades.

1. Sharpen mower blades with a grinder, hand file, or electric blade sharpener.
2. Sharpen the blade by removing an equal amount of material from the cutting edge of each end of the blade.
3. Keep the original bevel (A, Figure 24) when grinding. DO NOT change the mower blade bevel.



4. The mower blade should have a maximum of 1/64" (0,40 mm) cutting edge (B) or less.

Balancing the Mower Blades



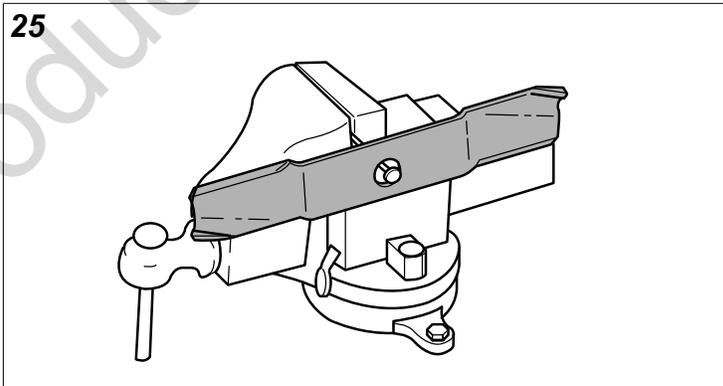
CAUTION

Thrown objects hazard

An unbalanced mower blade can create excessive vibration and damage the unit, or cause mower blade failure resulting in thrown debris.

Be sure blade is balanced before installing.

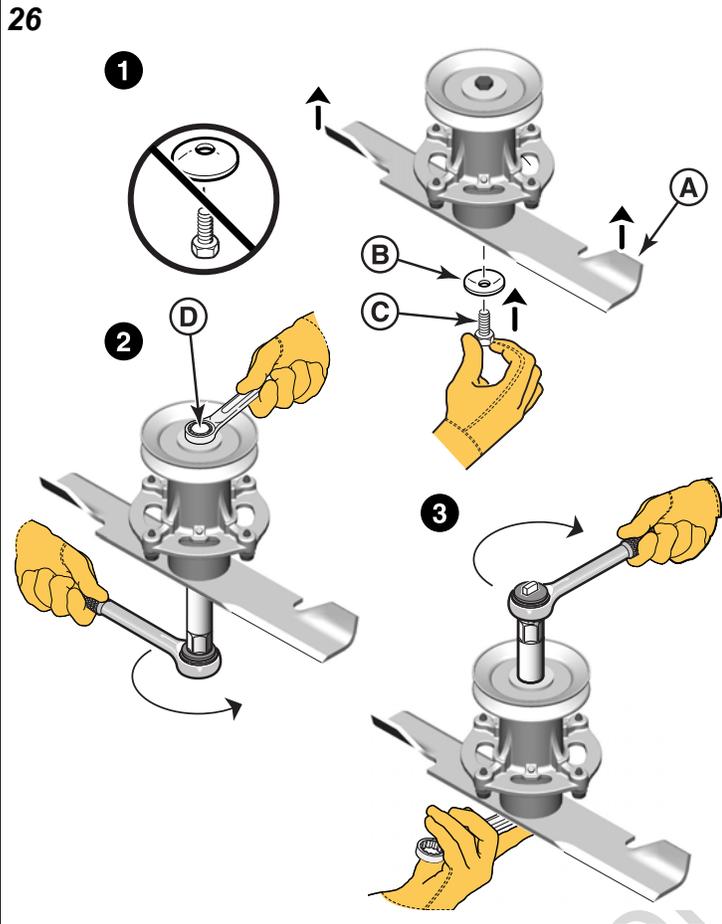
1. Clean the blade to remove any dried grass or other debris.
2. Clamp a nail in a bench vise, hang the blade on the nail, and position the blade in a level horizontal position as shown in Figure 25.



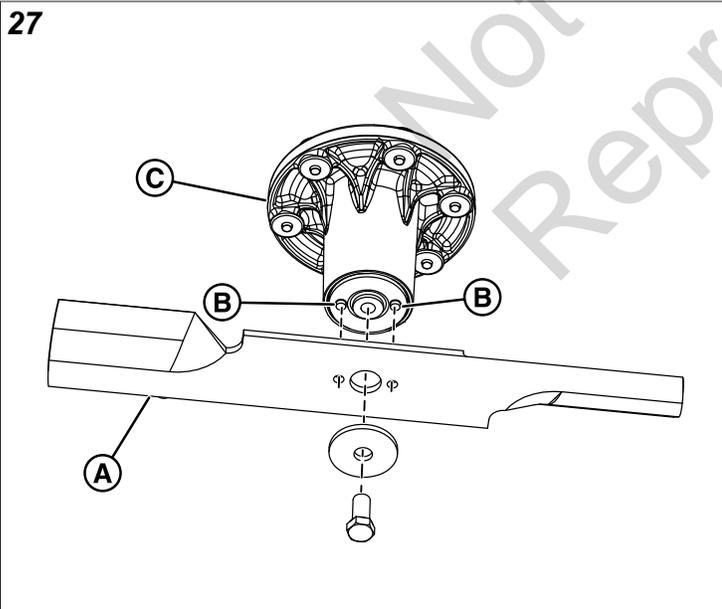
3. Check the balance of the blade. If either end of the blade moves downward the end that moves downward is heavier than the other. Sharpen the heavy end until balance is achieved. See *Sharpening the Mower Blades* for sharpening instructions.
4. Repeat the process until the mower blade remains in the horizontal, level position.

Installing the Mower Blades

1. Install each blade with the airlifts (A, Figure 26) pointing up towards the mower deck as shown.

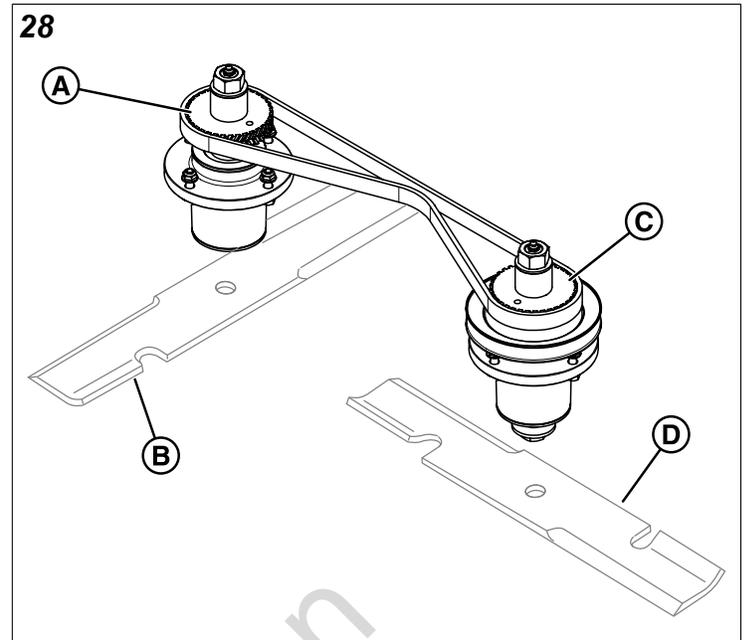


2. Align the two holes in the blade (A, Figure 27) with the two (2) alignment pins (B) on the spindles (C).



3. Install the concave side of the washer (B, Figure 26) towards the blade.
4. Install the blade mounting bolt (C) hand tight to hold the washer and blade onto the shaft (make sure the blade is fully seated onto the shaft and installed on alignment pins).

5. Check that the blades are installed so that the left blade (D, Figure 28) that is installed to the trim side spindle (C) is aligned perpendicular to the right blade (B) that is installed to the discharge side spindle (A).



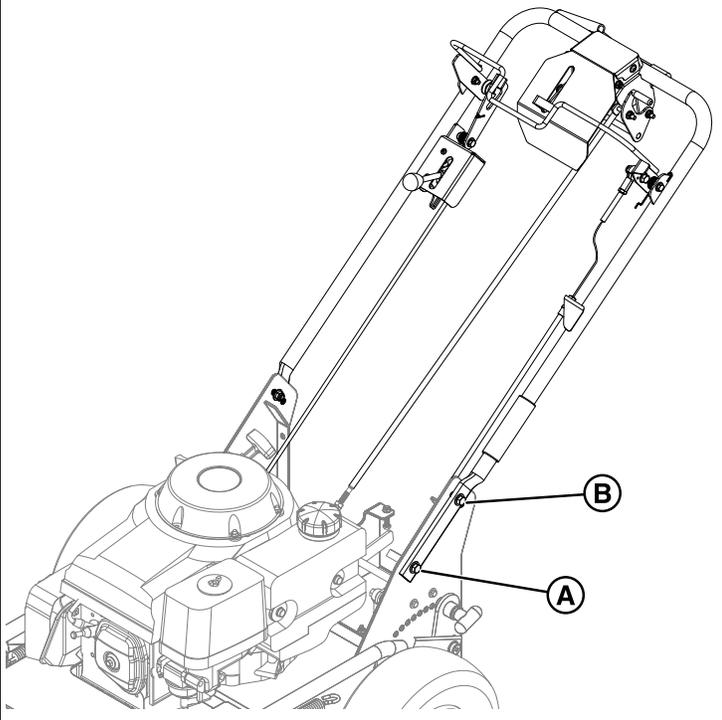
6. Tighten the blade mounting bolt (C, Figure 26) to 50 - 60 ft. lbs. (68 - 81 Nm) or torque while holding onto the appropriate pulley bolt (D) with a wrench.
7. Tighten the pulley bolt to 50 - 60 ft. lbs. (68 - 81 Nm) or torque while holding onto the appropriate blade mounting bolt (D) with a wrench.

Adjusting the Height of the Handle Bars

The handle bars can be adjusted in four (4) different positions to accommodate the height preference of the operator.

1. Loosen, but do not remove, the lower handle bar mounting bolts (A, Figure 29).

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2. Remove the upper handle bar bolts (B).
3. Move the handle bars up or down to the desired height.
4. Install the upper handle bar bolts and tighten.
5. Tighten the lower handle bar mounting bolts.

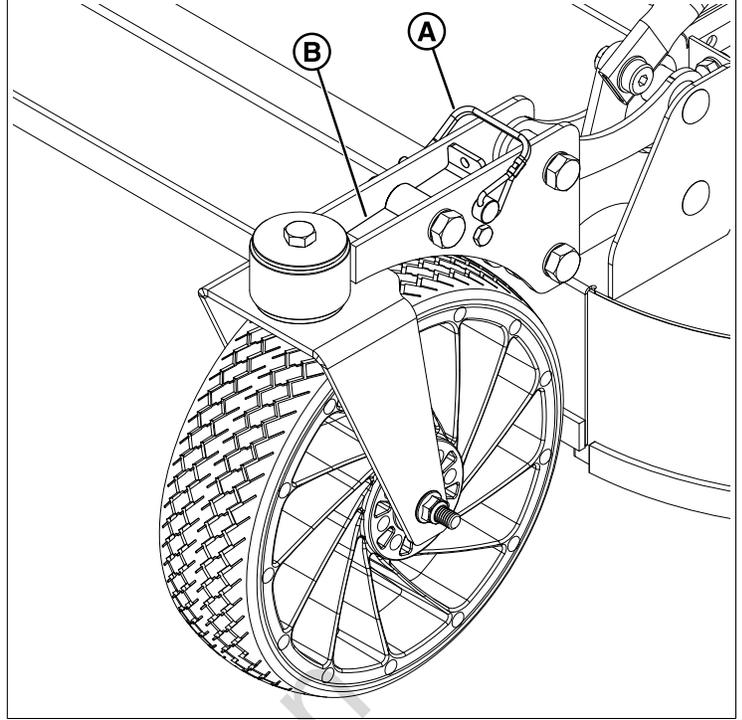
Operating the Front Caster Locks

This procedure only applies to units that are equipped locking front casters.

Note: It is recommended that the front casters should be locked when operating on a hill side.

To lock the front casters:

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1. Align the front tires so they are facing front to back.
2. Remove the locking pin (A, Figure 30).
3. Raise the back of the caster lock (B) up and install the locking pin back into the hole. The locking pin will be beneath the back of the caster lock.
4. Repeat the process for the other side of the unit.

To unlock the front casters:

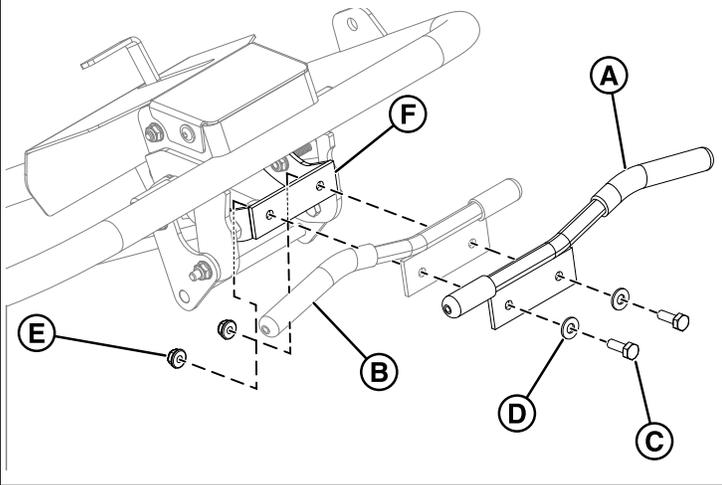
1. Remove the locking pin (A, Figure 30).
2. Press the back of the caster lock (B) down and install the locking pin back into the hole. The locking pin will be above the the back of the caster lock.
3. Repeat the process for the other side of the unit.

Customizing the Forward Motion Control Lever Position

The forward motion control lever (A, Figure 31) can be operated by the pressing down on the large part of the handle with the palm of your hand or the short part of the handle with your thumb. The forward motion control lever is factory installed in the position so that the large part of the handle is depressed by the operator's right hand. The lever can be re-positioned so that large part of the handle can be depressed by the operator's left hand (as identified by callout B).

1. Release the blade engagement lever to stop the blades and move the throttle control and engine shut down lever to the OFF position to stop the engine.
2. Remove the hardware (C, D, and E, Figure 31) that secures the forward motion control lever to the upper motion control bracket (F).

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3. Position the forward motion control lever so that the large part of the handle is on the side of the machine that the operator prefers and install the hardware to secure it back in place.

Note: If your unit has washers installed between the forward motion control lever and the upper motion control bracket, the washers must be re-installed in the same position when assembling

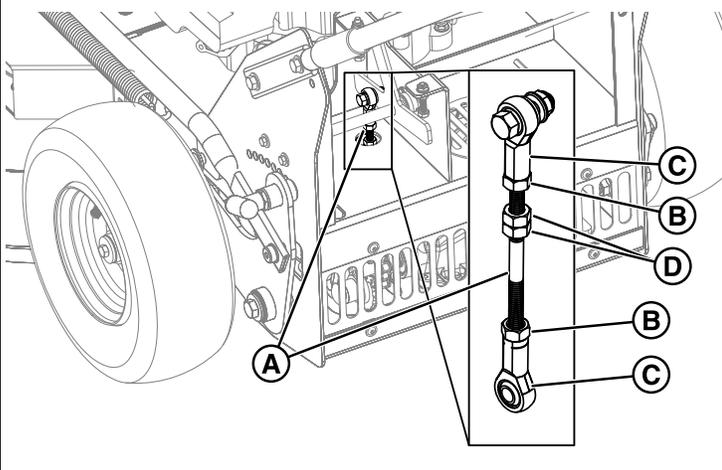
Neutral Adjustment

If the unit "creeps" when the operator is not touching the controls, it may be necessary to adjust the neutral adjustment linkage rod (A, Figure 32).

Prior to making any adjustments you should always check that nothing is binding when the forward and reverse speed control levers are moving through their full range of motions. If there is any binding in the controls that issue must first be addressed before adjusting the neutral.

1. Locate the neutral linkage rod (A, Figure 32) on the left rear of the engine deck.

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2. Chock the front wheels of the unit. Raise the rear wheels of the unit of the ground and secure the unit with jack stands.

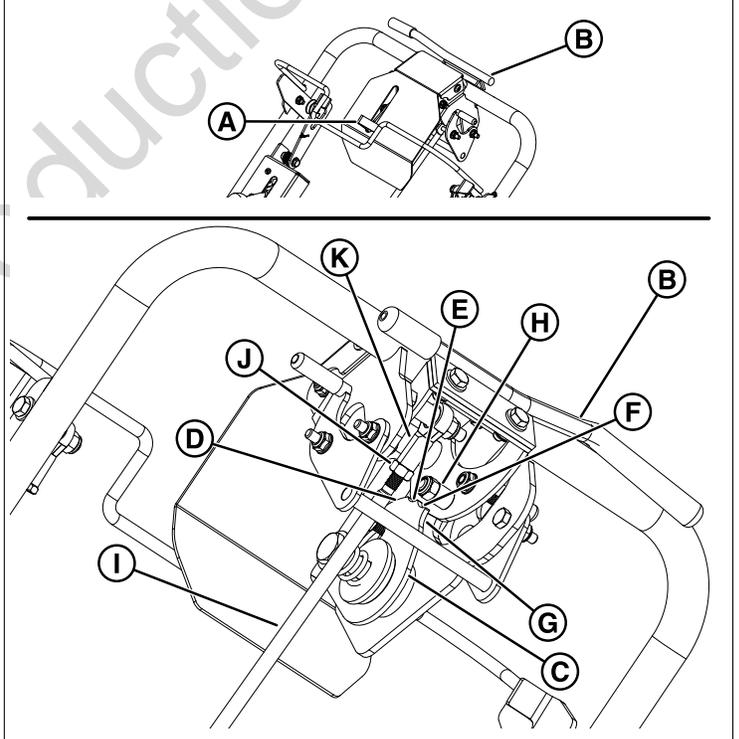
3. Start the engine and adjust the throttle control to the SLOW position. See *Starting the Engine* section for proper starting instructions.
4. Loosen the jam nuts (B) that are tightened against the ball joints (C).
5. Using a wrench, turn the double nut assembly (D) on the neutral linkage rod in whatever direction is necessary to slow the rotation of the tire.
6. Once the tire rotation stops, tighten the jam nuts against the ball joints

Forward Speed Control Lever Placement Adjustment

The forward speed control lever can be placed in four (4) different positions to allow the operator to customize the maximum overall forward speed of the unit.

1. Drive the unit to level, open area that is clear of obstructions.
2. With the mower blades off, place the forward speed control lever (A, Figure 33) in the first setting (labelled 1) and then press the forward motion control lever (B) down and forward to make the unit move forward.

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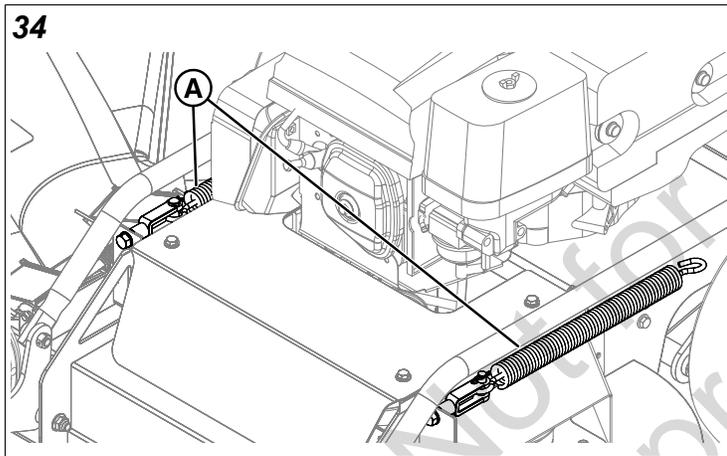


3. Set the forward speed control lever in the second setting (labelled 2); the unit should now move faster. Continue this process for the third and fourth settings (labelled 3 and 4, respectively). With each higher numbered setting the unit should drive faster. If it does not, continue with step #4.
4. Park the machine on a flat, level surface such as a concrete floor. Move the throttle control and engine shut down lever to the shut down position and wait for the engine and all moving parts to stop.

- From underneath the handle bar observe the forward speed control mechanism (C) as an assistant sets the forward speed control lever in each numbered position and then presses the forward motion control lever down and forward. There are four (4) positions (labelled as D, E, F, and G in Figure 33) on the forward speed control mechanism that the forward motion lever stop (H) can press against. If it is not contacting each position then the linkage rod (I) will need to be adjusted to allow it.
- Loosen the jam nuts (J) that are tightened against the ball joints (K) on each end of the adjustment rod.
- Turn the linkage rod to lengthen the rod until the lever stop can press each of the four (4) positions.
- Tighten the jam nuts against the ball joints.

Deck Lift Assist Springs

This model is equipped with deck lift assist springs (A, Figure 34) that assist the operator in raising the mower deck. The deck lift assist springs are factory set to provide optimal lifting performance.



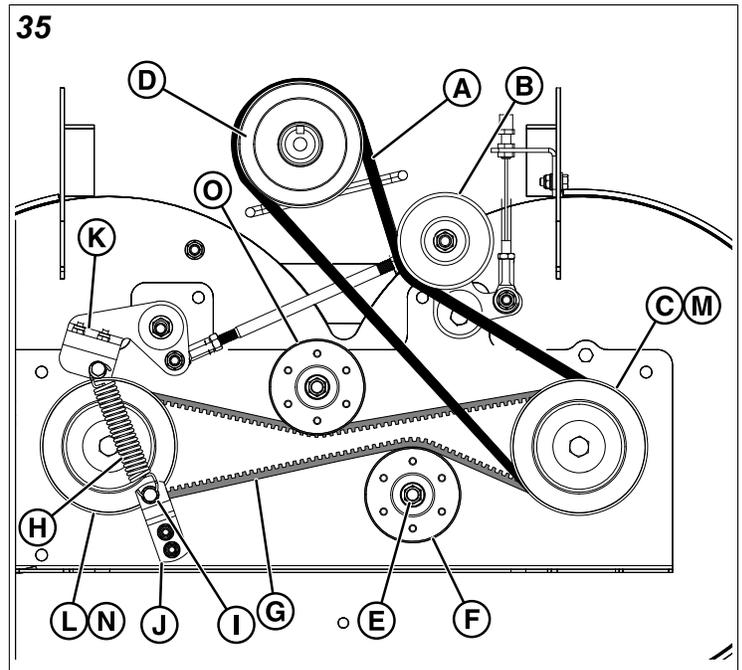
Although it is fastened with a multi-position anchor, this is **not an adjustment point**.

Do NOT attempt to adjust the spring length or lifting performance will be compromised.

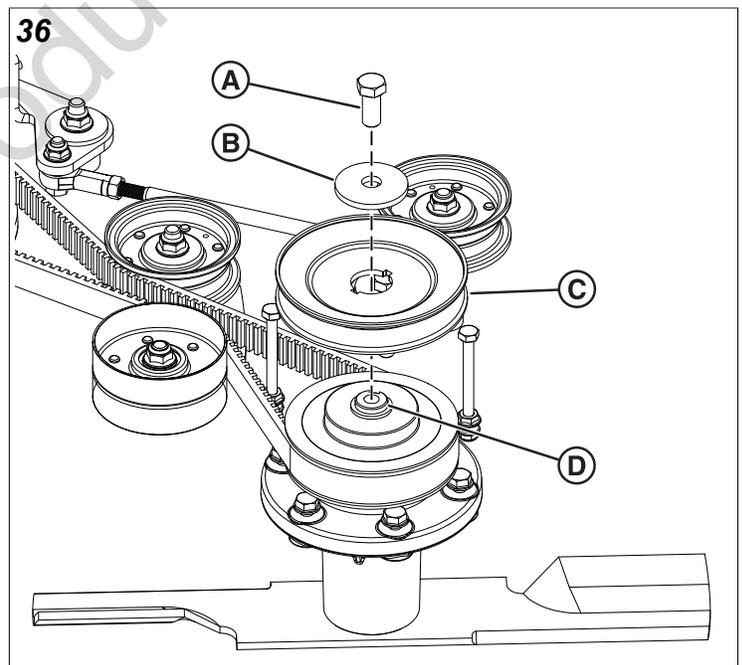
Changing the Mower Deck Belts

Note: Check the tension of these drive belts after the first few hours of usage and re-tension as necessary.

- Release the blade engagement lever to stop the blades and move the throttle control and engine shut down lever to the OFF position to stop the engine.
- Remove the spark plug wire(s) from the spark plug(s).
- Remove the mower deck guards to gain access to the belts.
- With the blade engagement lever released the mower deck drive belt (A, Figure 35) will not be under tension by the tensioning pulley (B).

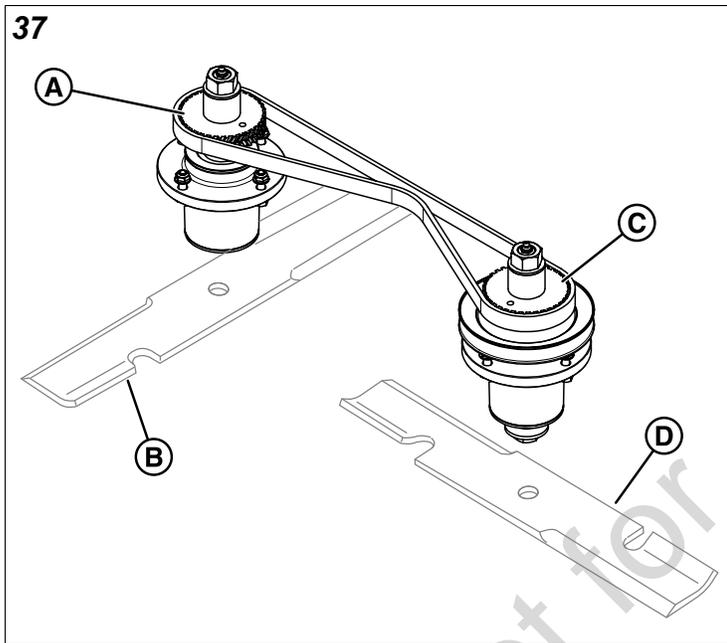


- Slide the mower deck drive belt off of the trim side spindle pulley (C) and then remove the belt from the crankshaft pulley (D).
- While holding the blade mounting bolt with a wrench, remove the bolt (A, Figure 36), washer (B), and pulley (C) from the top of the spindle shaft (D) of the trim side spindle pulley (C, Figure 35).

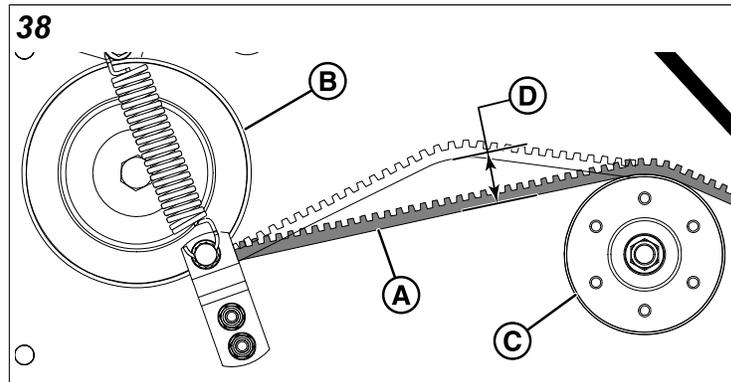


- Loosen the hardware (E) that secures the front idler pulley (F) and then slide it towards the front of the unit to relieve the pressure on the spindle drive belt (G).
- Using a spring puller tool carefully remove the spring (H) from the front spring mounting hardware (I).
- Remove the front spring mounting hardware from the bracket (J).

10. Have an assistant release the blade engagement lever lockout and depress the blade engagement lever. This will pull the blade brake (K) away from the discharge side spindle pulley (L).
11. Remove the spindle drive belt from the trim side spindle sprocket (M) and then the discharge side spindle sprocket (N) and then remove the belt from the unit.
12. Install a new spindle drive belt onto the discharge side spindle sprocket and make sure that the belt is properly seated in the teeth of the sprocket.
13. Rotate the discharge side spindle sprocket (A, 37) so that the blade (B) is facing front to back.



14. Rotate the trim side spindle sprocket (C) so that the blade (D) is facing side to side and then install the belt (G, Figure 35) on the left hand spindle sprocket (M) and make sure that the belt is properly seated in the teeth of the sprocket.
15. Make sure that the back side of the belt is contacting the face of the rear stationary idler pulley (O) and the front adjustable pulley (F).
16. Slide the front adjustable pulley towards the back until it tensions the spindle drive belt and then tighten the mounting hardware (E) to secure it in place.
17. Check the tension of the belt (A, Figure 38) by pressing on the center of the length of belt between the discharge side spindle (B) and the front adjustable pulley (C). While pushing with 3 lbs (1,4 kg) of force the belt should deflect 3/16" (0,5 cm) (D). If it does not, make adjustments to the position of the front adjustable pulley until the correct belt tension is achieved.



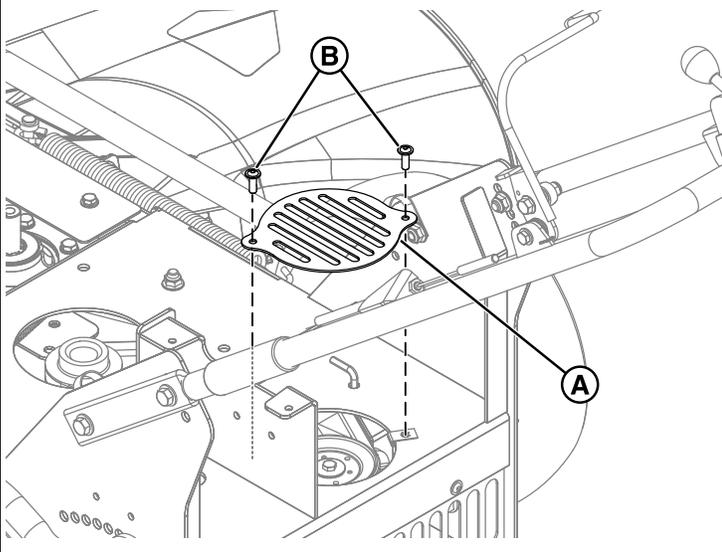
18. Install the front spring mounting hardware (I, Figure 35) into the bracket (J).
19. Using a spring puller tool carefully install the spring (H) onto the front spring mounting hardware.
20. Install the spindle pulley (C, Figure 36) onto the trim side spindle shaft (D) making sure to properly seat the key way of the pulley onto the key. Install the washer (B) with the concave side of the washer towards the pulley. Install the pulley bolt (A) hand tight to hold the washer and pulley in place.
21. Tighten the pulley bolt to 50 - 60 ft. lbs. (68 - 81 Nm) of torque while holding onto the blade mounting bolt with a wrench.
22. Have an assistant release the blade engagement lever. This will move the tensioning pulley (B, Figure 35) away from the belt path allowing you to install the belt.
23. Install the new mower deck drive belt (A) onto the crankshaft pulley (D) and the trim side spindle pulley (C) making sure that the V-side of the belt fits in the grooves of the pulley and that the back side of the belt contacts the face of the tensioning pulley (B).
24. Install the mower deck guards.
25. Install the spark plug wire(s) onto the spark plug(s).
26. Start the engine.
27. Release the blade engagement lever lockout and depress the blade engagement lever and allow the blades to run for a few moments. Release the blade engagement lever. The blades should stop rotating within seven (7) seconds. **If the blades do not stop turning in seven (7) seconds, turn the unit off, remove the unit from service, and see your dealer.**

Changing the Transaxle Drive Belt

Figure 40 depicts the top of the unit as if the operator was looking down at it. Some components are hidden for clarity.

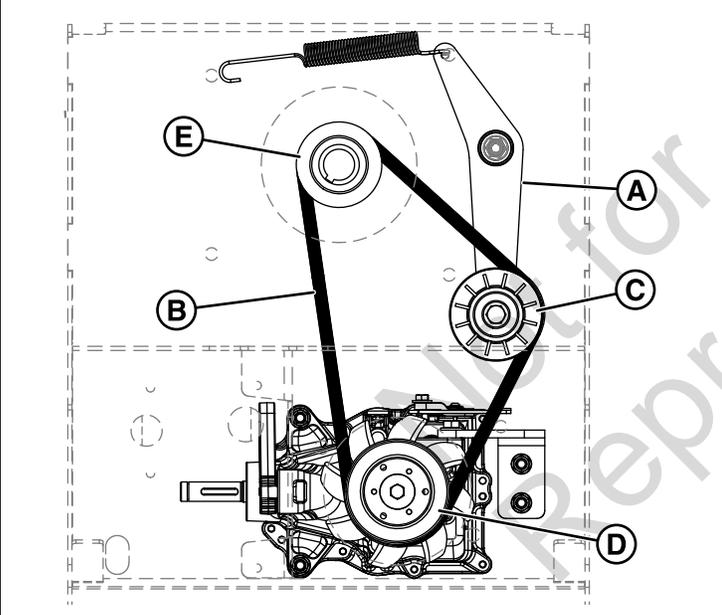
1. Release the blade engagement lever to stop the blades and move the throttle control and engine shut down lever to the OFF position to stop the engine.
2. Remove the mower deck drive belt from the crankshaft pulley. See *Changing the Mower Deck Belts*.
3. Remove the transaxle fan guard (A, Figure 39) and the two (2) screws (B).

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- Carefully rotate the idler arm (A, Figure 40) towards the center of the unit to relieve the tension on the belt (B).

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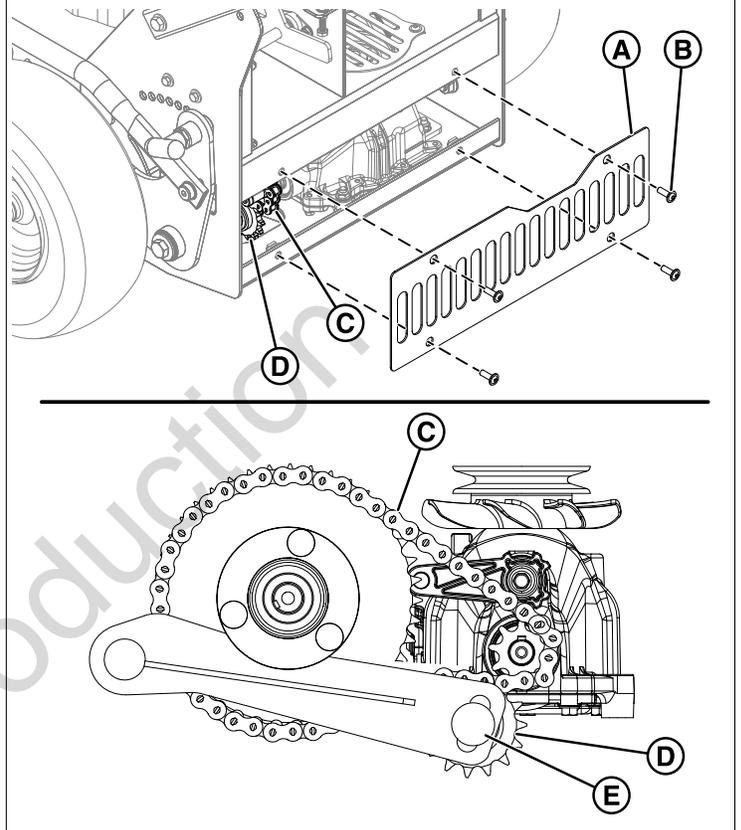
- Remove the belt from tensioning idler pulley (C) and then carefully release the tension on the idler arm.
- Remove the belt from over the top of the transaxle drive pulley (D).
- Slide the belt down under the crankshaft pulley (E) and remove the belt from beneath the engine deck.
- Install the new belt so that the V-side of the belt goes into the pulley grooves of the crankshaft pulley and the transaxle drive pulley.
- Carefully rotate the idler arm towards the center of the unit and install the V-side of the belt into the groove of the tensioning idler pulley and then carefully release the tension on the idler arm.
- Inspect the belt to make sure that the V-side of the belt is installed into the grooves of all three (3) pulleys.

- Install the transaxle fan guard using the two (2) screws.
- Install the mower deck drive belt. See *Changing the Mower Deck Drive Belts*.

Adjusting the Differential Drive Chain

- Release the blade engagement lever to stop the blades and move the throttle control and engine shut down lever to the OFF position to stop the engine.
- Remove the rear guard (A, Figure 41) and the four bolts (B) that secure it into place.

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- Locate the differential drive chain (C) and tensioning sprocket (D) on the left side of the unit.
- Loosen the hardware (E) that secures the tensioning sprocket.
- Position the the tensioning sprocket to provide adequate tension on the differential drive chain and tighten the hardware.

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 to operate properly.

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

Refer to Maintenance Procedures 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 unit or mower deck only when the engine and mower blades are completely stopped.

Always make sure that the throttle control and engine shut down lever is in the OFF position, disconnect the spark plug wire(s) and fasten it away from the spark plug(s) before beginning the maintenance to prevent accidental starting of the engine.

Troubleshooting Charts

Troubleshooting the Unit

Problem: Engine will not turn over or start	
Cause	Remedy
Out of fuel.	If engine is hot, allow it to cool, then fill the fuel tank.
Engine flooded.	Move choke control to the closed position.
Spark plug(s) faulty, fouled, or incorrectly gapped.	Clean and gap or replace. See engine manual.
Water in fuel.	Drain fuel and replace with fresh fuel.
Gas is old or stale.	Drain fuel and replace with fresh fuel.

Problem: Engine starts hard or runs poorly.	
Cause	Remedy
Fuel mixture is too rich.	1.) Clean air filter. 2.) Check choke adjustment.
Spark plug faulty, fouled, or incorrectly gapped.	Clean and gap or replace. See engine manual.

Problem: Engine knocks.	
Cause	Remedy
Low oil level.	Check / Add oil as required.
Using wrong grade oil.	See engine manual.

Problem: Excessive oil consumption.	
Cause	Remedy
Engine running too hot.	Clean engine fins, blower screen, and air cleaner.
Using wrong weight oil.	See engine manual.
Too much oil in crankcase.	Drain excess oil.

Problem: Engine exhaust is black.	
Cause	Remedy
Dirty air filter.	Replace air filter. See engine manual.
Engine choke control is in closed position.	Open choke control.

Problem: Engine runs but mower will not engage.	
Cause	Remedy
Transmission release lever(s) in "disengaged" position.	Move transmission release lever(s) to the "engaged" position.

Problem: Engine runs but mower will not engage.	
Differential drive chain is broken.	Replace Differential drive chain.
Differential drive chain is out of adjustment.	Adjust chain. See "Adjusting the Differential Drive Chain".
Transmission drive belt is broken.	Inspect tensioning spring. Replace, if necessary.
Transmission drive belt is slipping.	See problem and cause below.

Problem: Transmission drive belt slips.	
Cause	Remedy
Pulleys or belt is greasy or oily.	Clean as required.
Tension is too loose.	Adjust spring tension. See "Changing the Transaxle Drive Belt".
Belt stretched or worn.	Replace belt.

Problem: Mower is difficult to drive or handles poorly.	
Cause	Remedy
Improper tire inflation.	See "Specifications" for proper tire inflation and adjust tire pressures accordingly.
Motion control linkage rods are bent or binding.	Inspect linkage rods and repair or replace as necessary.

Troubleshooting the Mower Deck

Problem: Mower Deck is not cutting grass level	
Cause	Remedy
Improper tire inflation.	See "Specifications" for proper tire inflation and adjust tire pressures accordingly.

Problem: Engine stalls easily with mower deck engaged.	
Cause	Remedy
Engine speed too slow.	Set to full throttle.
Ground speed too fast.	Decrease ground speed.
Cutting height set too low.	Cut tall grass at maximum cutting height during first pass, and then at the desired cutting height for the second pass.
Discharge chute jamming with cut grass.	Cut grass with discharge pointing towards previously cut area.

Problem: Excessive mower deck vibration.	
Cause	Remedy
Blade mounting bolts are loose.	Tighten the blade mounting bolts to 50 - 60 ft. lbs. (68 - 81 N.m.)
Mower blades, arbors, or pulleys are bent.	Check and replace as necessary.
Mower blades are out of balance.	Remove, sharpen, and balance blades. See "Servicing the Mower Blades".
Belt installed correctly.	Reinstall the belt correctly. See "Changing the Mower Deck Belts".

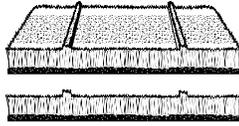
Problem: Excessive belt wear or breakage.	
Cause	Remedy
Bent or rough pulleys.	Repair or replace.
Using incorrect belts.	Replace with correct belts.

Problem: Mower deck drive belt slips or fails to drive.	
Cause	Remedy
Idler pulley spring broken or not properly attached.	Repair or replace as needed.
Mower drive belt is broken.	Replace mower drive belt.

Problem: Mower (blades) does not engage.	
Cause	Remedy
Blade engagement lever linkage is broken or out of adjustment.	Repair or replace as needed.

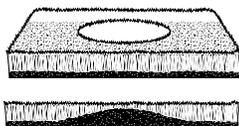
Troubleshooting Common Cutting Problems

Problem: 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.	



Cause	Remedy
Blades are not sharp.	Sharpen your blades.
Blades are worn down too far.	Replace your blades.
Engine speed is too slow.	Always mow at full throttle.
Ground speed is too fast.	Slow down.
Deck is plugged with grass.	Clean out the mower.
Not overlapping cutting rows enough.	Overlap your cutting rows
Not overlapping enough when turning.	When turning your effective cutting width decreases—overlap more when turning.

Problem: 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.	



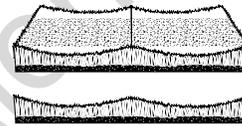
Cause	Remedy
Lawn is uneven or bumpy.	Roll or level the lawn.
Mower deck cutting height is set too low.	Raise the cutting height.
Ground speed is too fast.	Slow down.
Tire pressure is low or uneven.	Check and inflate the tires.

Problem: 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 the mower blades.	

Problem: Stepped Cutting	

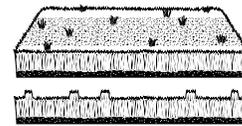
Cause	Remedy
Tires are not properly inflated.	Check and inflate the tires.
Blades are damaged.	Replace the blades.
Deck shell is damaged.	Repair or replace the deck.
Mower spindle is bent or loose.	Repair or replace the spindle.
Blades are installed incorrectly.	Reinstall the blades correctly.

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



Cause	Remedy
Blades are dull or worn.	Sharpen or replace the blades.
Blades are damaged.	Replace the blades.
Deck is clogged with grass clippings.	Clean out the deck.
Deck shell is damaged.	Repair or replace the deck.
Mower spindle is bent or loose.	Repair or replace the spindle.
Blades are installed incorrectly.	Reinstall the blades correctly.
Tires are not properly inflated.	Check and inflate the tires.

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



Cause	Remedy
Blades are not sharp or nicked.	Sharpen your blades.
Blades are worn down too far.	Replace your blades.
Engine speed is too slow.	Always mow at full throttle.
Ground speed is too fast.	Slow down.
Deck is plugged with grass.	Clean out the mower.

Specifications

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

ENGINE

For complete engine specifications see the engine manufacturer's operator's manual included with your unit.

Fits models: 5901736 & 5901737

Honda GXV390	
Make	Honda
Model	GXV390UT1DABG

CHASSIS

Fuel Tank Capacity	Refer to engine manufacturer's operator's manual
Rear Wheels	
Tire Size	13 X 5 - 6.00
Inflation Pressure	25 psi (1,72 bar)
Front Wheels	
Tire Size	10.5" (26,7 cm) tall X 3.0" wide (7,6 cm)

Inflation Pressure	N/A Nylon tire.
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TRANSMISSIONS

Make	Hydro-Gear
Type	RT-310
Hydraulic Fluid	Sealed Transaxle
Speeds @ 3400 rpm	
Forward	4 mph (6,4 km/h)
Reverse	2 mph (3,2 km/h)

DIMENSIONS

Overall Length	71" (180 cm)
Overall Width (with discharge chute down)	43" (109 cm)
Height	41" (104 cm)
Weight (approximate)	270 lbs (122 kg)

Not for
Reproduction

Warranty

If your unit is equipped with a dual function hour meter that displays both engine hours and PTO hours, the warranty is based on the engine hours as displayed by the hour meter.

Do NOT use a Sulky or any type of operator towing platform on this machine because it will exceed the load limit of the transmission. Permanent damage to the transmission may occur which is NOT covered under warranty.

Warranty Statement

BRIGGS & STRATTON WARRANTY POLICY (January 2014)

LIMITED WARRANTY

Briggs & Stratton warrants that, during the warranty period specified below, it will repair or replace, free of charge, any part that is defective in material or workmanship or both. Transportation charges on product submitted for repair or replacement under this warranty must be borne by purchaser. This warranty is effective for and is subject to the time periods and conditions stated below. For warranty service, find the nearest Authorized Service Dealer in our dealer locator map at ferrismowers.com. The purchaser must contact the Authorized Service Dealer, and then make the product available to the Authorized Service Dealer for inspection and testing.

There is no other express warranty. Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to the warranty period listed below, or to the extent permitted by law. Liability for incidental or consequential damages are excluded to the extent exclusion is permitted by law. Some states or countries do not allow limitations on how long an implied warranty lasts, and some states or countries do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation and exclusion may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state or country to country.**

WARRANTY PERIOD		
Covered Parts	Standard Warranty Period	Rental Warranty Period
Riding mowers - except as noted below +	4 years (48 months) or 500 hours, whichever occurs first. Unlimited hours during the first 2 years (24 months)	90 days
Walk mowers - except as noted below + (over 30 inches of cutting width)	2 years (24 months) unlimited hours	90 days
+Hydro Drive Belt, Gearbox Drive Belt, Tires, Brake Pads, Hoses, Battery, Blades	90 days	90 days
+Mower Deck Drive Belt (Conventional Single Belt Deck Drive Systems)	1 year (12 months) or 100 hours, whichever occurs first	90 days
+Mower Deck Drive Belts (Two Belt Deck Drive Systems)	3 years (36 months) or 300 hours, whichever occurs first. (Parts and labor in year one; parts only in years two and three.)	90 days
+Attachments	1 year	90 days
+Engine*	See Engine Operator's Manual	See Engine Operator's Manual

* Emissions-related components are covered by the Emissions Warranty Statement

** In Australia, the following applies, notwithstanding any other provision: Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure. Unless required under Australian Consumer Law, Ferris shall not be liable under this Warranty to the Customer or any other person in connection with this Warranty, for consequential, direct or indirect damages, loss or costs incurred or suffered by the Customer or any other person; or any damage to property, loss of turnover, loss of profits, loss of business or loss of goodwill, arising out of the failure of any product to operate properly. For warranty service, find the nearest Authorized Service Dealer in our dealer locator map at ferrismowers.com (Select region: Australia), or by calling 1300 274 447, or by emailing or writing to salesenquiries@briggsandstratton.com.au, Briggs & Stratton Australia Pty Ltd, 3 Imperata Pl, Kemps Creek, NSW, Australia, 2178.

The warranty period begins on the date of purchase by the first retail or commercial customer.

To ensure prompt and complete warranty coverage, register your product at the website shown above or at www.onlineproductregistration.com, or mail the completed registration card (if provided), or call 1-800-743-4115 (in USA).

Save your proof of purchase receipt. If you do not provide proof of the initial purchase date at the time warranty service is requested, the manufacturing date of the product will be used to determine the warranty period. Product registration is not required to obtain warranty service on Briggs & Stratton products.

ABOUT YOUR WARRANTY

Warranty service is available only through *Ferris* Authorized Service Dealers. This warranty only covers defects in materials or workmanship. It does not cover damage caused by improper use or abuse, improper maintenance or repair, normal wear and tear, or stale or unapproved fuel.

Improper Use and Abuse - The proper, intended use of this product is described in the Operator's Manual. Using the product in a way not described in the Operator's Manual or using the product after it has been damaged will not be covered under this warranty. Warranty coverage will also not be provided if the serial number on the product has been removed or the product has been altered or modified in any way, or if the product has evidence of abuse such as impact damage, or water/chemical corrosion damage.

Improper Maintenance or Repair - This product must be maintained according to the procedures and schedules provided in the Operator's Manual, and serviced or repaired using genuine Briggs & Stratton parts or equivalent. Damage caused by lack of maintenance or use of non-original or non-equivalent parts is not covered by warranty.

Normal Wear and Tear - Like all mechanical devices, the unit is subject to wear even when properly maintained. This warranty does not cover replacement or repairs when normal use has exhausted the life of a part or the equipment. Except as noted in the warranty period, maintenance and wear items such as filters, belts, cutting blades, and brake pads (except engine brake pads) are not covered by warranty due to wear characteristics alone, unless the cause is due to defects in material or workmanship.

Stale or Unapproved Fuel - In order to function correctly, this product requires fresh fuel that conforms to the criteria specified in the Operator's Manual. Engine or equipment damage caused by stale fuel or the use of unapproved fuels (such as E15 or E85 ethanol blends) is not covered by warranty.

Other Exclusions - This warranty excludes damage due to accident, abuse, modifications, alterations, improper servicing, freezing or chemical deterioration. Attachments or accessories that were not originally packaged with the product are also excluded. This warranty does not include used, reconditioned, second-hand, or demonstration equipment or engines. This warranty also excludes failures due to acts of God and other force majeure events beyond the manufacturer's control.

Evaporative Emissions Warranty

For details on the Evaporative Emissions Control System Warranty, contact your *Ferris* Authorized Service Dealer to start Evaporative Emissions Warranty service or refer to the Evaporative Emissions Control System Warranty statement located at ferrismowers.com. The warranty can be located by typing "Emissions Warranty" in the FAQ or by calling 1-800-444-7774. For Exhaust Emissions Control System Warranty related to the engine refer to the engine operator's manual.

