SNAPPERPRO™

OPERATOR'S MANUAL

SW20 Series

Walk-Behind Mowers

Model Number:	Description
5900700	SW20KAV1748, 17HP Kawasaki, 48" Cut Walk-Behind Mower
5900702	SW20KAV1336, 13HP Kawasaki, 36" Cut Walk-Behind Mower

Briggs & Stratton Power Products Group
5375 North Main Street
Munnsville, NY 13409
800-933-6175

5101263
Revision IR
Rev. Date: 11/2007
TP 100-7359-IR-WD-SP

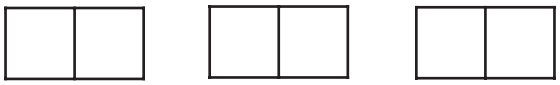
Thank you for purchasing this quality-built Snapper Pro product. We're pleased that you've placed your confidence in the Snapper Pro brand. When operated and maintained according to the instructions in this manual, your Snapper Pro product will provide many years of dependable service.

This manual contains safety information to make you aware of the hazards and risks associated with this machine and how to avoid them. This machine is designed and intended to be used and maintained according to the 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 these instructions thoroughly before attempting to start or operate this equipment

PRODUCT REFERENCE DATA	
Unit Model Number	Unit SERIAL Number
Mower Deck Model Number	Mower Deck SERIAL Number
Dealer Name	Date Purchased
ENGINE REFERENCE DATA	
Engine Make	Engine Model
Engine Type/Spec.	Engine Code/Serial Number

See ***Features and Controls*** for the location of Identification Numbers

DATE PURCHASED



⚠ WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

Contact Information:

Briggs & Stratton Power Products Group
5375 N. Main St.
Munnsville, NY 13409-4003
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NOTE: In this manual, "left" and "right" are referred to as seen from the operating position.

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.

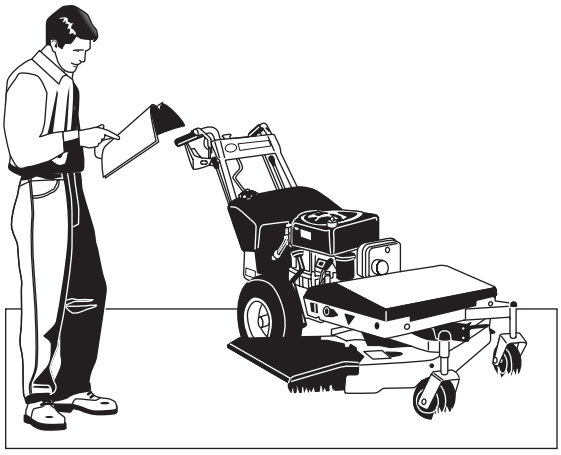
Use common sense, and think through what you are doing. If you are not sure that the task you are about to perform can be safely done with the equipment you have chosen, ask a professional: contact your local authorized dealer.

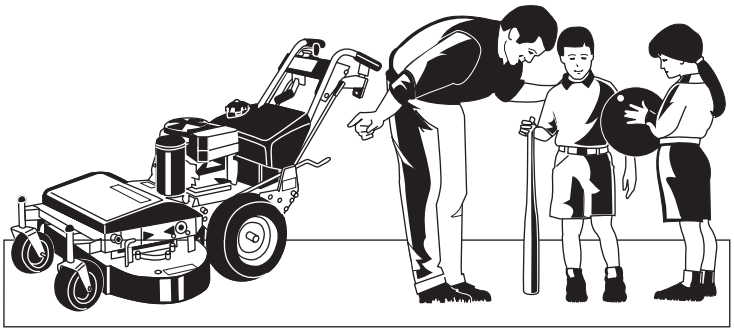
Read the Manual

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.)

You should not operate on a slope greater than a 5.4 foot rise over a 20 foot length (15 degrees).

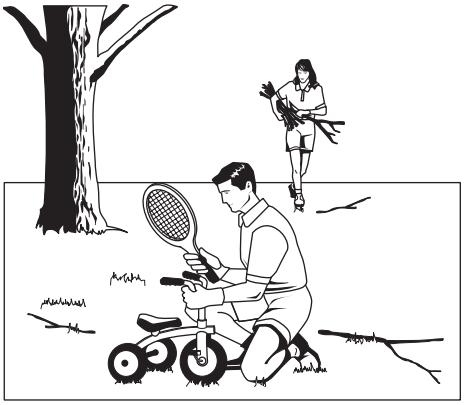
Also, note that the surface you are on can greatly impact your ability to safely operate this machine. Wet grass or soft soil can seriously affect your footing and traction of the unit. Do not operate on slopes that are slippery, wet, or have soft soil.

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.

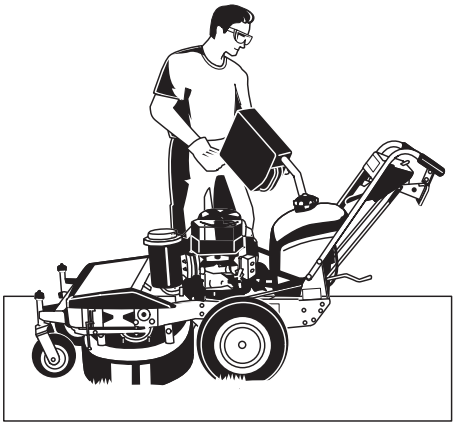


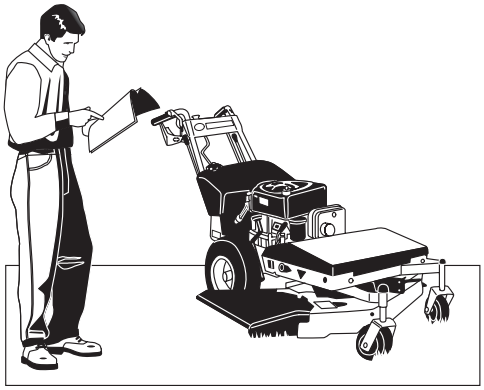
Moving Parts

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.

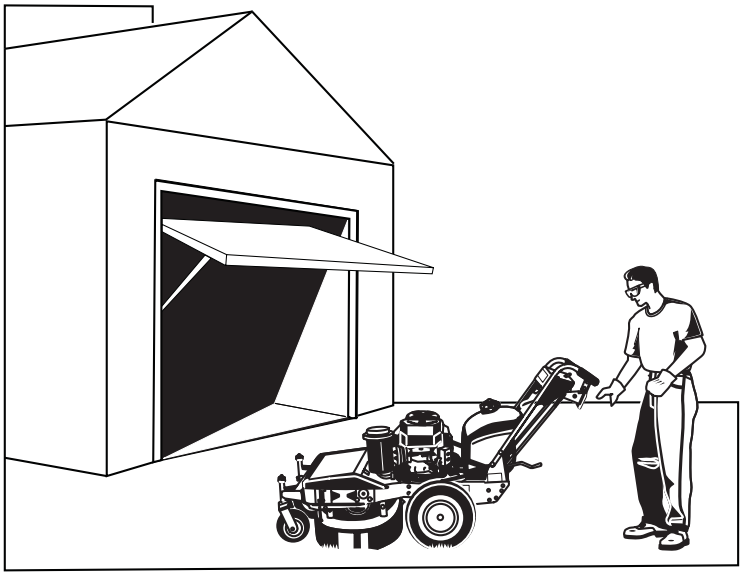
Do not add fuel indoors, in an enclosed trailer, garage or other enclosed area that is not well ventilated. Gasoline spills should be cleaned up promptly and before operation begins.

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.



Read these safety rules and follow them closely. Failure to obey these rules could result in loss of control of unit, severe personal injury or death to you, or bystanders, or damage to property or equipment. **This mowing deck is capable of amputating hands and feet and throwing objects.** The triangle ⚠ in text signifies important cautions or warnings which must be followed.

TRAINING

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

PREPARATION

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

OPERATION

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

spark arrester. It is a violation of California Public Resource Code Section 4442 to use or operate the engine on or near any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester meeting any applicable local or state laws. Other states or federal area may have similar laws.

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

⚠ CAUTION

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

Wear hearing protection when operating this machine.

SLOPE OPERATION

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

⚠ WARNING

Never operate on slopes greater than 15° which is a rise of 5.4 feet (165 cm) vertically in 20 feet (607 cm) horizontally.

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

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

Do

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

Do Not

1. Avoid starting, stopping, or turning on a slope. If tires lose traction (i.e. machine stops forward motion on a slope), disengage the blade(s) (PTO) and drive slow off the slope.
2. Do not turn on slopes unless necessary, and then, turn slowly.
3. Do not mow near drop-offs, ditches, or embankments. The operator could lose footing or balance or mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
4. Do not mow on wet grass. Reduced footing or traction could cause sliding.
5. Do not try to stabilize the unit by putting your foot on the ground. (ride-on units)
6. Do not mow excessively steep slopes.
7. Do not use grass catcher on steep slopes.

TOWED EQUIPMENT (RIDE-ON UNITS)

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

CHILDREN

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

1. Keep children out of the mowing area and under the watchful care of another responsible adult.
2. Be alert and turn unit off if children enter the area.
3. Before and during reverse operation, look behind and down for small children.
4. Never allow children to operate the unit.
5. Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

EMISSIONS

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

IGNITION SYSTEM (GASOLINE MODELS)

1. This spark ignition system complies with Canadian ICES-002.

SERVICE AND MAINTENANCE

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

Safe Handling of Gasoline

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

Maintenance and Storage

1. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
2. Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
3. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
4. Never store the machine or fuel container inside where there is an open flame, such as in a water heater. Allow unit to cool before storing.
5. Shut off fuel while storing or transporting. Do not store fuel near flames or drain indoors.
6. Keep all hardware, especially blade attachment bolts, tight and keep all parts in good working condition. Replace all worn or damaged decals.
7. Never tamper with safety devices. Check their proper operation regularly.
8. Disengage drives, lower implement, set parking brake, stop engine and remove key or disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
9. Clean grass and debris from cutting units, drives, mufflers, and engine to prevent fires. Clean up oil or fuel spillage.
10. Let engine cool before storing and do not store near flame.
11. Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
12. Park machine on level ground. Never allow untrained personnel to service machine.
13. Use jack stands to support components when required.
14. Carefully release pressure from components with stored energy.
15. Disconnect battery or remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
16. Use care when checking blades. Wrap the blade(s) or wear gloves, and use caution when servicing them. Only replace blades. Never straighten or weld them.
17. Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
18. Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothes and use insulated tools.
19. Grass catcher components are subject to wear, damage, and deterioration, which could expose moving parts or allow objects to be thrown. Frequently check components and replace with manufacturer's recommended parts, when necessary.
20. Check brake operation frequently. Adjust and service as required.
21. Use only factory authorized replacement parts when making repairs.
22. Always comply with factory specifications on all settings and adjustments.
23. Only authorized service locations should be utilized for major service and repair requirements.
24. Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.
25. Units with hydraulic pumps, hoses, or motors: WARNING: Hydraulic fluid escaping under pressure may have sufficient force to penetrate skin and cause serious injury. If foreign fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result. Keep body and hands away from pin holes or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, and not hands, to search for leaks. Make sure all hydraulic fluid connections are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system. If leaks occur, have the unit serviced immediately by your authorized dealer.
26. WARNING: Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.

Safety Decals

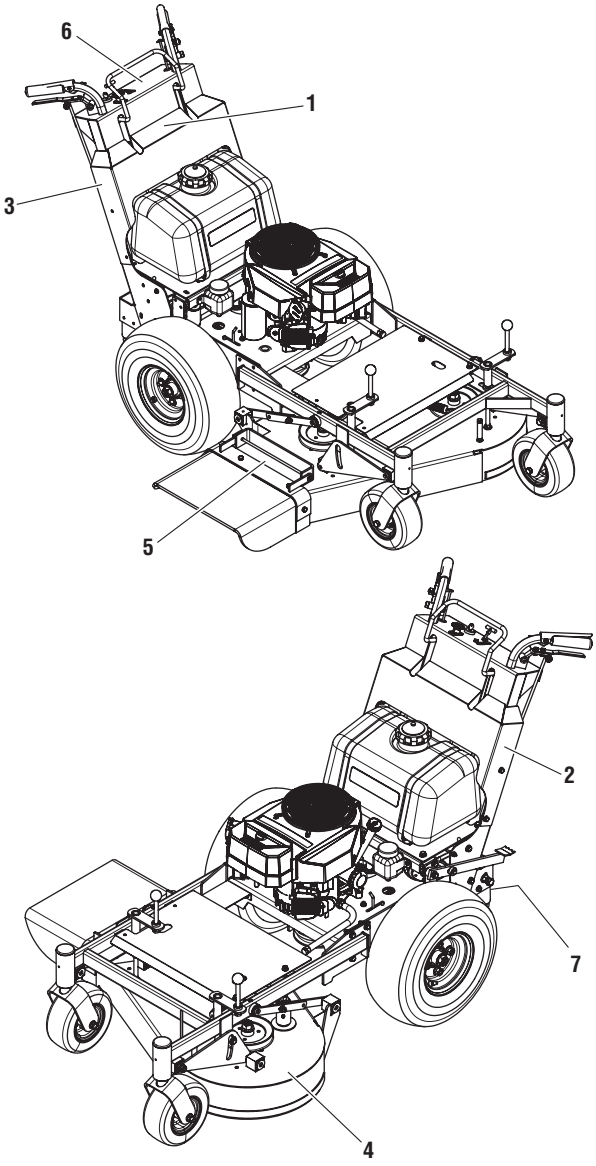
This unit has been designed and manufactured to provide you with the safety and reliability you would expect from an industry leader in outdoor power equipment manufacturing.

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

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

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

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



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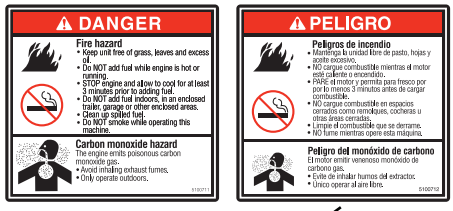

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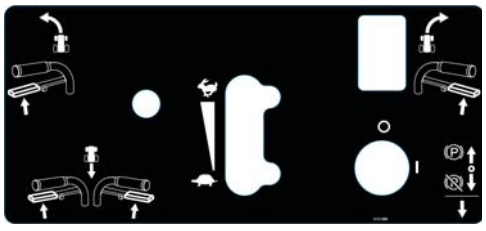

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Safety Interlock System

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

Operational SAFETY Checks

Test 1 — Engine should NOT crank if:

- PTO switch is engaged, OR
- Parking brake is not engaged, OR
- Forward Speed Control Lever is not in the NEUTRAL position.

Test 2 — Engine SHOULD crank if:

- PTO switch is NOT engaged, AND
- Parking brake is engaged, AND
- Forward Speed Control Lever is in the NEUTRAL position.

Test 3 — Engine should SHUT OFF if:

- Operator releases the operator presence handles with PTO engaged, OR
- Operator releases the operator presence handles with the parking brake disengaged.

Test 4 — Blade Brake Check

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

NOTE: Once the engine has stopped, PTO switch must be turned off, parking brake must be engaged, and the motion control handle must be returned to the NEUTRAL position in order to start the engine.

⚠ WARNING

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

Safety Icons

The alert symbol ⚠ is used to identity 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 the injury. In addition, a hazard icon may be used to represent the type of hazard. An explanation of hazard levels and icons are as follows:

⚠ DANGER

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

⚠ WARNING

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

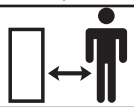
⚠ CAUTION

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

CAUTION or NOTICE

These messages presented without the alert symbol indicate a situation where the unit or property could be damaged.

North American Safety Icons

Hazard	Safety Icon	Hazard	Safety Icon
Alert		Amputation Foot in Blade	
Toxic Fumes		Thrown Objects	
Read the Manual		Maintain a Safe Distance	
Open Flame Hazard		Keep Children Away	
Fire Hazard		Hot Surface	
Amputation Rotating Parts		Wear Protective Gear	
Amputation Hand in Blade		Pinch Point	

Features and Controls

Identification Numbers

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

Record your part number, serial number and engine serial numbers in the space provided on the inside front cover for easy access. These numbers can be found in the locations shown in Figure 1.

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

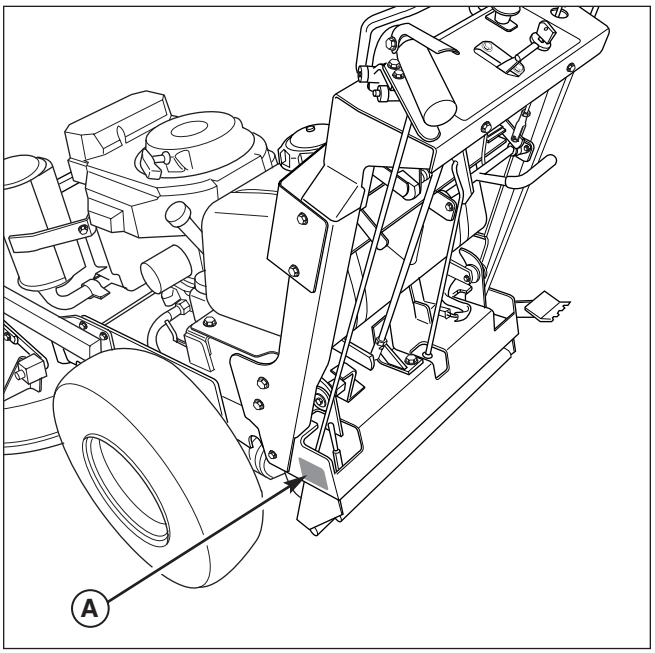


Figure 1. Identification Numbers
A. Identification Tag

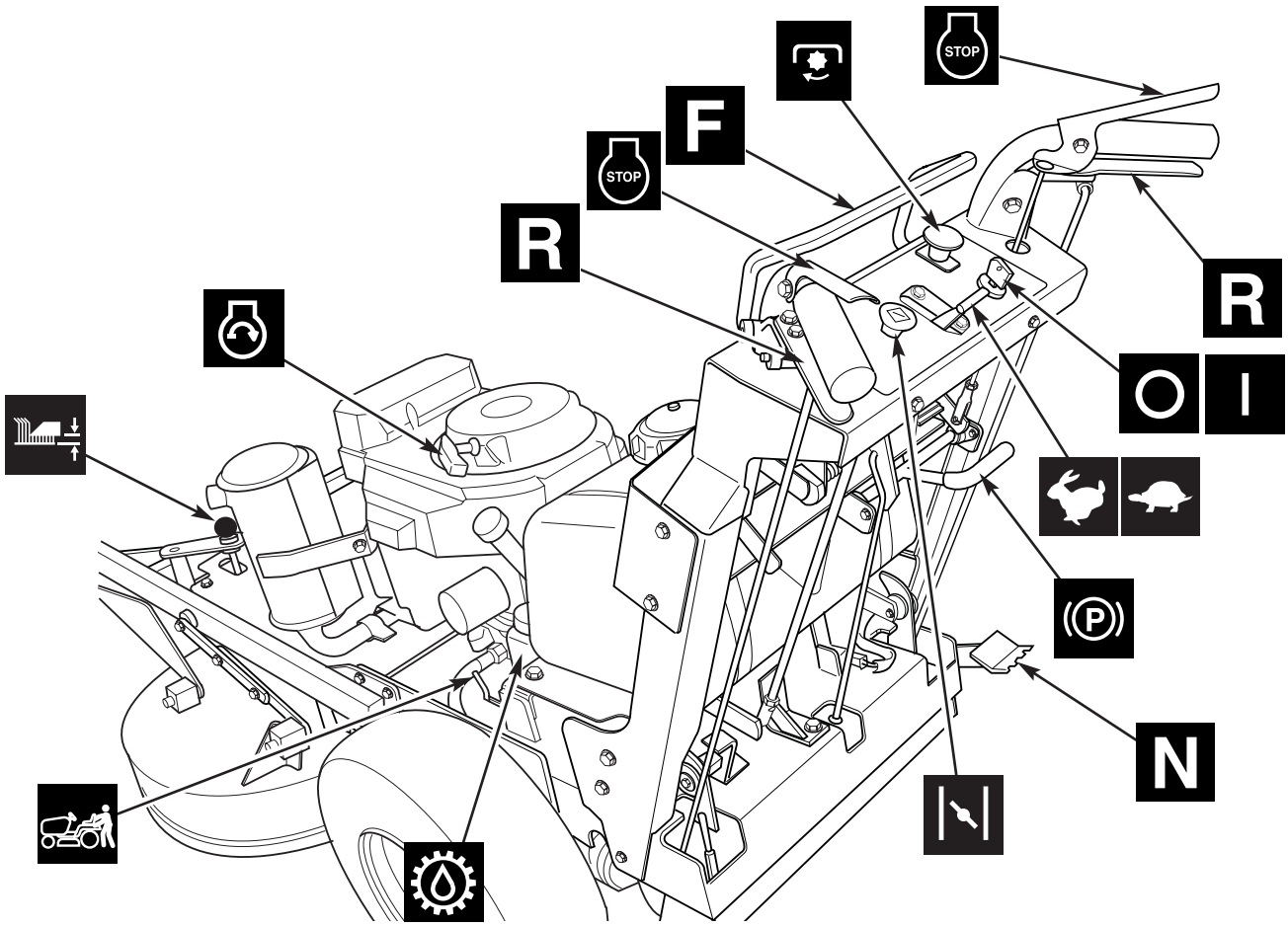


Figure 2. Control Locations

Control Functions

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

F Forward Speed Control Lever

R Reverse Speed Control Levers

These levers control the ground speed of the mower.

The forward speed control lever controls the forward ground speed of both drive wheels.

The left reverse speed control lever controls the steering and reverse ground speed of the left drive wheel. The right reverse speed control lever controls the steering and reverse ground speed of the right drive wheel.

See the Operation section for proper steering instructions.

O I Ignition Switch

The ignition switch starts and stops the engine, it has two positions:

O	OFF	Stops the engine
I	RUN	Rotate the ignition switch to the RUN position before pulling on the starter rope to start the engine.

Recoil Starter Handle

The recoil starter handle is used to start the engine.

Parking Brake

DISENGAGE Releases the parking brake.

ENGAGE Locks the parking brake.

Pull the parking brake handle up to engage the parking brake. Push the parking brake handle down to disengage the parking brake. *NOTE: To start the unit the parking brake must be engaged.*

PTO (Power Take Off) Switch

The PTO switch engages and disengages the mower. Pull UP on the switch to engage, and push DOWN to disengage.

Neutral Return Pedal

The neutral return pedal provides a hands-free return to neutral. The pedal is used in conjunction with the Reverse Speed Control Levers to properly stop the machine.

See the Operation section for Driving Instructions.

Throttle Control

The throttle controls the engine speed. Move the throttle control forward towards the FAST position to increase the engine speed and back towards the SLOW position to decrease the engine speed. Always operate at FULL throttle.

FAST Speeds up the engine speed.

SLOW Slows down the engine speed.

Cutting Height Adjustment Handles

The cutting height adjustment handles control the mower deck cutting height. To raise the mower deck cutting height crank the cutting height adjustment handles clockwise. To lower the mower deck cutting height, crank the cutting height adjustment handles counter-clockwise. To ensure an even cut, both cutting height adjustment handles must be adjusted to the same height.

Fuel Tank Cap

To remove the cap, turn counterclockwise.

Engine Kill / Operator Presence Handles

These handles are a major factor in the safety interlock system of the mower. Both handles are tied together so depressing one handle depresses both. The operator must depress the handles in order to deactivate the engine kill system. Handles must be depressed to disengage the parking brake and engage the PTO switch.

Transmission Release Valves

The transmission release levers deactivate the transaxle so that the unit can be pushed by hand. See PUSHING THE UNIT BY HAND for operational information.

Transmission Oil Fill

Transmission oil is added through the transmission oil reservoirs. It also serves as extra holding capacity for oil as the transmissions heat up and the oil expands. See CHECK TRANSMISSION OIL for oil level check and fill procedures.

Choke Control

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

Operation

General Operating Safety

Before first time operation:

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

⚠ WARNING

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

To reduce fire hazard, keep the engine, unit 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.

⚠ WARNING

Never operate on slopes greater than 15° which is a rise of 5.4 feet (1,6 m) vertically in 20 feet (607 cm) horizontally.

Select a slow ground speed before driving onto a slope.

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

Checks Before Starting

- Check that crankcase is filled to full mark on the engine oil dipstick (B, Figure 3). See the engine Operator's Manual for instructions and oil recommendations.
- Fill the fuel tank (A) with fresh fuel. Refer to engine manual for fuel recommendations.
- Make sure all nuts, bolts, screws and pins are in place and tight.
- Check the tire pressures. See *Check Tire Pressures*.
- Check the hydraulic oil tank (C) and make sure that the oil level is up to the FULL COLD mark.
- Adjust the height of the mower deck to the desired position. See *Mowing Height Adjustment.*

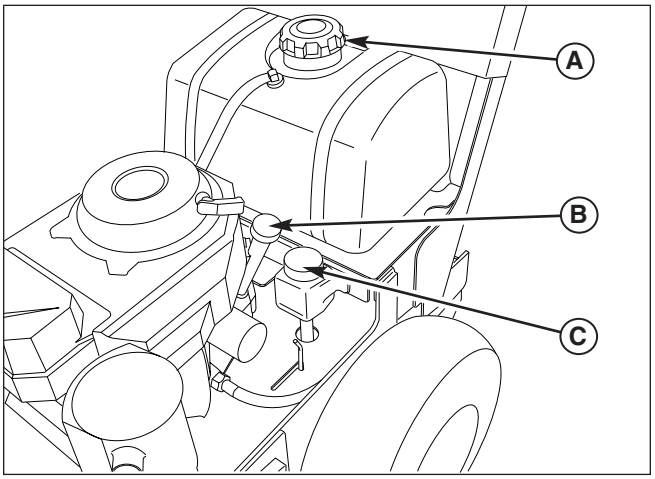


Figure 3. Pre-start Checks
A. Fuel Tank Filler Neck
B. Engine Oil Dipstick
C. Hydraulic Oil Fill

Check Tire Pressures

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

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

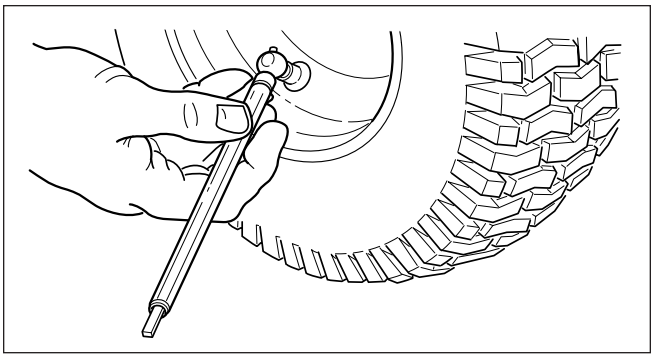


Figure 4. Checking Tire Pressure

Pushing the Mower By Hand

NOTICE

DO NOT TOW MOWER

Towing the units will cause hydraulic pump and wheel motor damage. Do not use another vehicle to push or pull this unit.

1. Disengage the PTO, engage the parking brake, turn the ignition OFF, and remove the key.
2. Locate the transmission release levers (A, Figure 5) by the rear wheels of the unit.
3. To disengage the pumps (free-wheel position), pull both transmission release levers back and out so they lock in the disengaged (free-wheel) position.
4. Disengage the parking brake.
   The unit can now be pushed by hand.
5. After moving the unit, re-engage the pumps (drive position) by pulling the transmission release levers rearward and inward to release them from the disengaged position and then allow them to move to the engaged (drive) position.

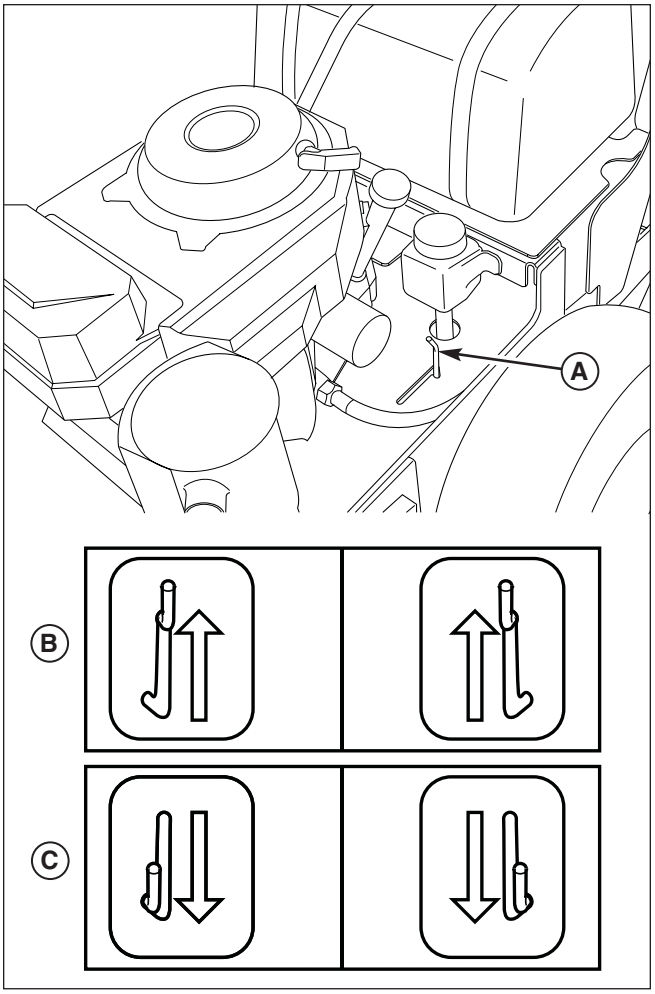


Figure 5. Transmission Release Levers (LH Shown)
A. Transmission Release Levers
B. Engaged Position (Drive Position)
C. Disengaged Position (Free-Wheel Position)

Cutting Height Adjustment

The cutting height can be adjusted within two different ranges. The lower cutting range is adjustable between 1-1/2" (3,8 cm) and 2-3/4" (6,9 cm). The upper cutting range is adjustable between 2-3/4" (6,9 cm) and 4-1/2" (11,5 cm).

Before adjusting the cutting height, you must first determine the average cutting height. Depending on the range you plan to use, it may be necessary to adjust which pulley the deck drive belt runs in.

To Adjust the Cutting Range:

1. Remove the mower deck guard (A, Figure 6) to gain access to the mower deck drive belt.

⚠ WARNING

Use extreme caution when rotating the idler arm with the breaker bar, due to the increased tension in the spring as the idler arm is being rotated. Injury may result if the breaker bar is prematurely released while the spring is under tension.

2. Using a 1/2" breaker bar (A, Figure 7), place the square end in the square hole located on the end of the idler arm (B). Carefully rotate the breaker bar CLOCKWISE, which will relieve the tension on the belt exerted from the idler arm.
3. Slide the drive belt over the edge of the Stationary idler pulley (C). Carefully release the tension on the breaker bar until the idler arm comes to a stop.
4. See Figure 8. If you are adjusting the cutting height range between 1-1/2" (3,8 cm) and 2-3/4" (6,9 cm) position the belt in the lower pulley on PTO clutch. If you are adjusting the cutting height range between 2-3/4" (6,9 cm) and 4.5" (11,5 cm) position the belt in the upper pulley on the PTO clutch.
5. Carefully rotate the breaker bar CLOCKWISE and install the drive belt on the stationary idler pulley. Carefully release the tension on the breaker bar. The belt should be routed exactly as shown in figure 9.
6. Reinstall the mower deck guard.

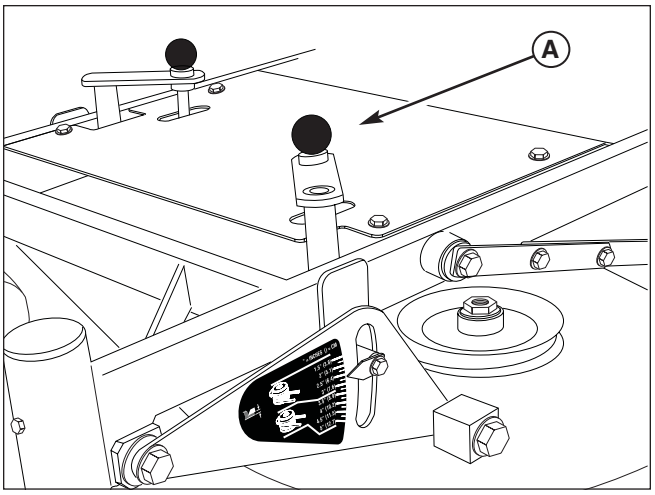


Figure 6. Remove the Cutter Deck Guard
A. Cutter Deck Guard

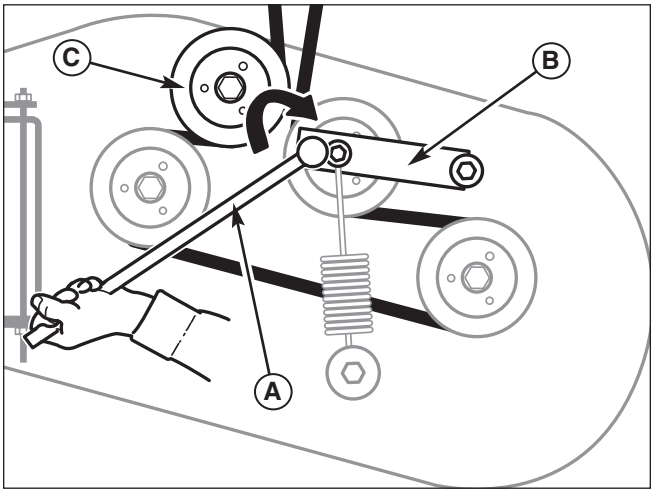


Figure 7. Remove the Cutter Deck Belt
A. Breaker Bar
B. Idler Arm
C. Stationary Idler Pulley

To Adjust the Cutting Height:

The cutting range must be adjusted to the correct range before the cutting height can be adjusted. The cutting height indicators will help you identify the cutting height.

1. Pull the cutting height adjustment handle (A, Figure 10) up and out of the handle lock position (B) and crank the handle CLOCKWISE to raise the deck to the desired cutting height. Crank the handle COUNTER-CLOCKWISE to lower the deck to the desired cutting height. After the desired cutting heights are achieved position the cutting height adjustment handles into the handle lock position.
2. Repeat the process for the other side of the machine.

NOTE: Both sides of the cutter deck must be adjusted to the same height to insure a proper cut.

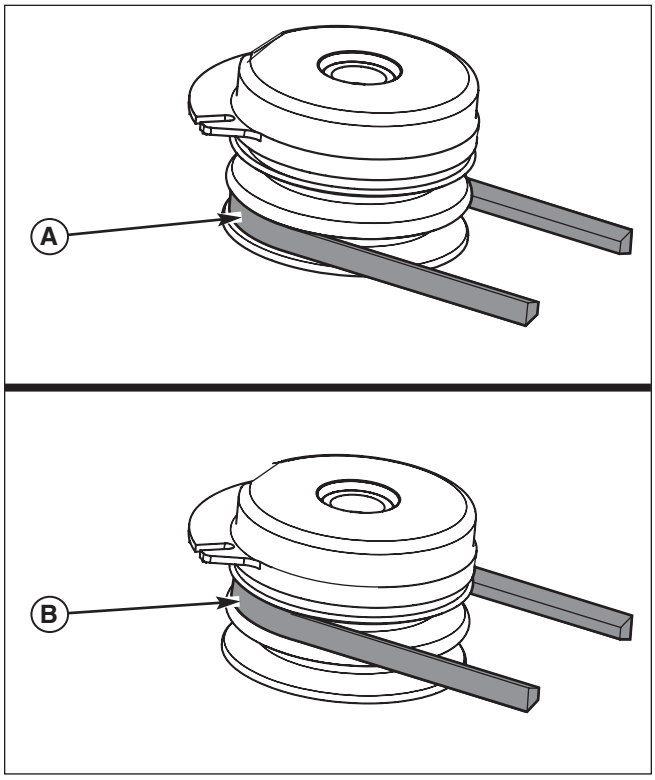


Figure 8. Belt Positioning for Cutting Range
A. Deck Drive Belt Positioned for Lower Cutting Range
B. Deck Drive Belt Positioned for Upper Cutting Range

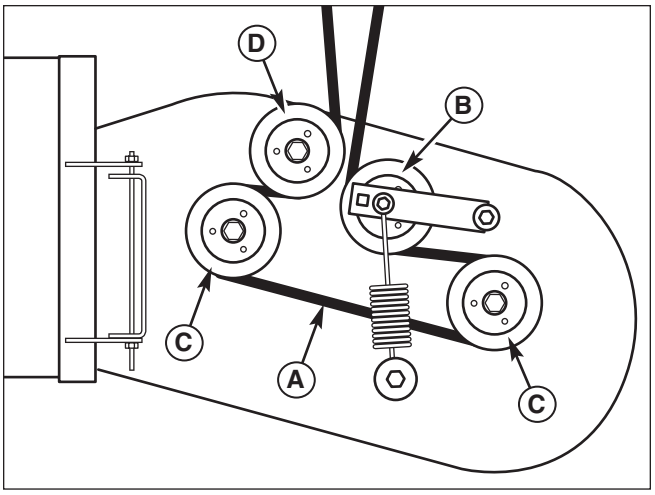


Figure 9. Mower Deck Belt Routing
A. Mower Deck Belt
B. Adjustable Idler Pulley
C. Spindle Pulley
D. Stationary Idler Pulley

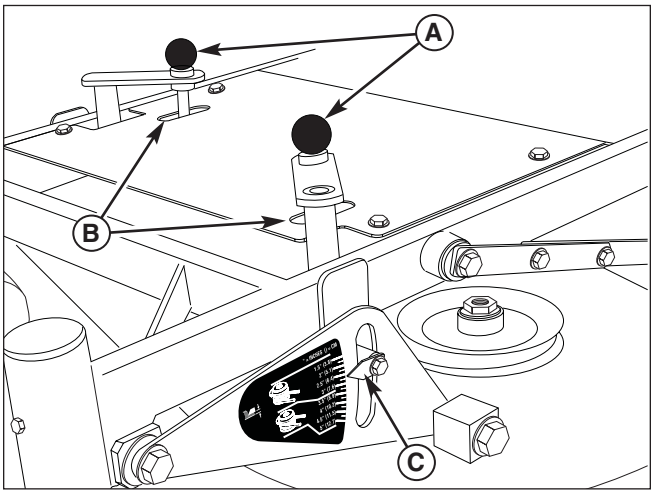


Figure 10. Remove the Cutter Deck Guard
A. Cutter Height Adjustment Handle
B. Handle Lock Position
C. Cutting Height Indicator

Starting the Engine

⚠ WARNING

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

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

1. Engage the parking brake and make sure that the PTO switch is disengaged and the forward speed control lever is in the NEUTRAL position.
2. ***NOTE: A warm engine may not require choking.***
   Set the engine throttle control to FULL throttle position. Then fully close the choke by pulling the knob OUT fully.
3. Insert the key into the ignition switch and turn it to RUN.
4. Grasp the recoil starter handle and pull slowly until resistance is felt and then pull 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 engine manual for further instructions.

⚠ WARNING

Impact Hazard

Rapid retraction of starter cord (kickback) will pull hand and arm toward engine faster than you can let go. Broken bones, fractures, bruises or sprains could result.

When starting engine, pull starter cord slowly until resistance is felt and then pull rapidly to avoid kickback.

4. After the engine starts, gradually open the choke (push knob down fully). Reduce to half throttle speed and allow to warm up.

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

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

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

Stopping the Mower

1. Gently squeeze both reverse speed control levers evenly to stop the unit.
2. Once the unit is stopped, firmly depress the neutral return pedal to place the transmission in neutral.
3. Disengage the PTO by pushing down on the PTO switch.
3. Engage the parking brake by pulling the handle up until it locks into position.
4. Move the throttle control to mid-throttle position and turn the ignition key to OFF. Remove the key.

Driving The Mower

NOTE: Before attempting to drive the mower 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 the direction of travel.

For normal use, the throttle should be kept fully open and the ground speed of the machine determined by the 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 PTO switch in the "OFF" position until you are familiar with the controls.

TO MOVE FORWARD AND SET FORWARD SPEED (See Figure 11.)

1. Disengage the parking brake.
2. Gently move the forward speed control lever (A, Figure 11) forward until desired speed is achieved.

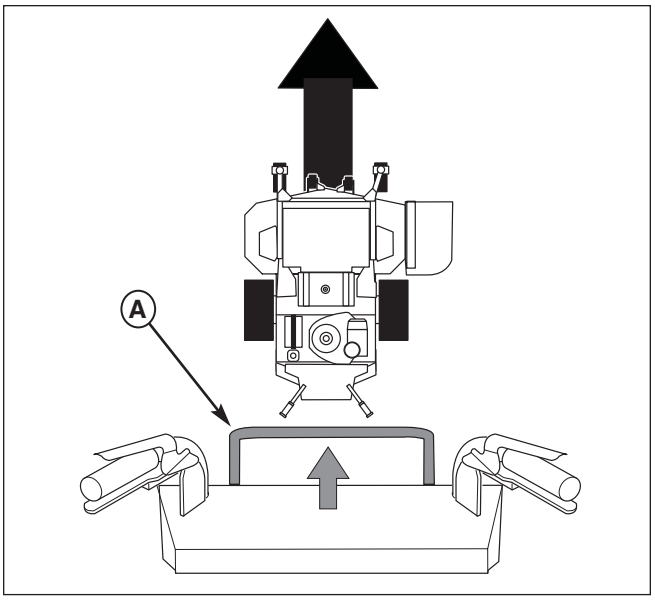


Figure 11. Forward Travel.
A. Forward Speed Control Lever

TO MOVE BACKWARD (See Figure 12.)

1. Disengage the parking brake.
2. Gently squeeze both reverse speed control levers (A, Figure 12) evenly, until desired speed is achieved.

TO SLOW OR STOP MACHINE

1. Gently squeeze both reverse speed control levers evenly to slow the machine.
2. Continuing to squeeze the reverse speed control levers will stop the machine.
3. Once the machine is stopped, firmly depress the neutral return pedal to place the transmissions in neutral.
4. Engage the parking brake.

NOTE: Continuing to squeeze the reverse speed control levers after the machine is stopped, will cause the machine to move in reverse.

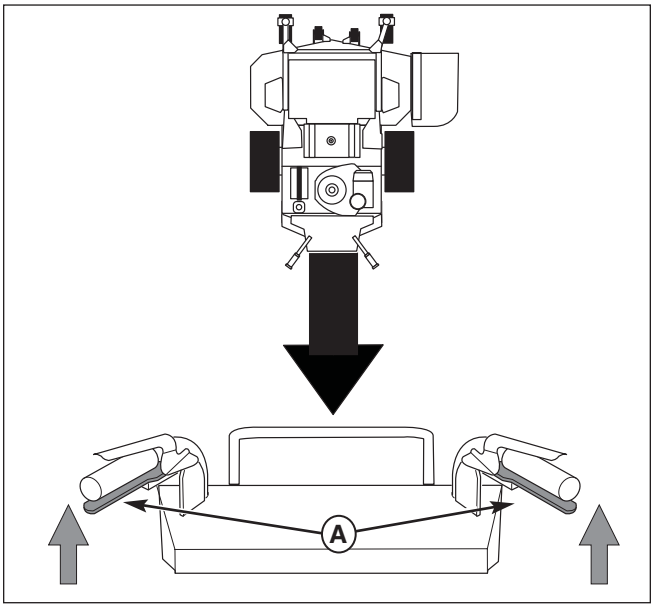


Figure 12. Reverse Travel.
A. Reverse Speed Control Levers

TO TURN MACHINE

NOTE: ALWAYS REDUCE SPEED IN A TURN.

To make a left-hand turn (See Figure 13):

Gently squeeze the left hand reverse speed control lever (A, Figure 13). A sharp or gentle turn is determined by the amount of force applied to the steering control lever.

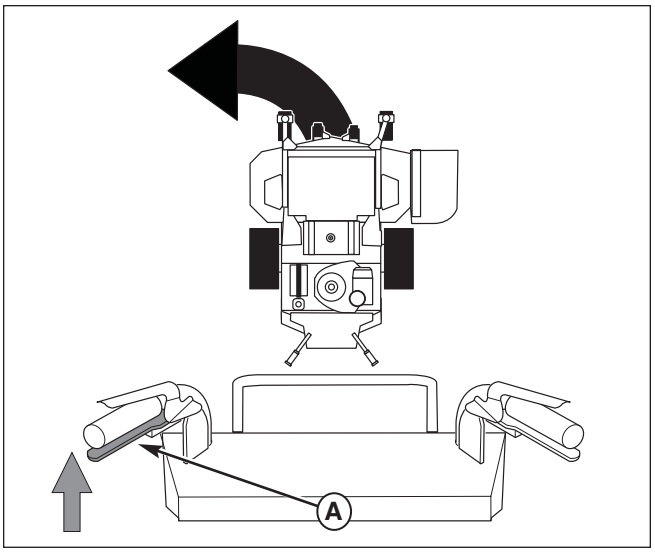


Figure 13. Left Turn Travel.
A. Left Hand Reverse Speed Control Lever

To make a right-hand turn (See Figure 14):

Gently squeeze the right hand reverse speed control lever (A, Figure 14). A sharp or gentle turn is determined by the amount of force applied to the steering control lever.

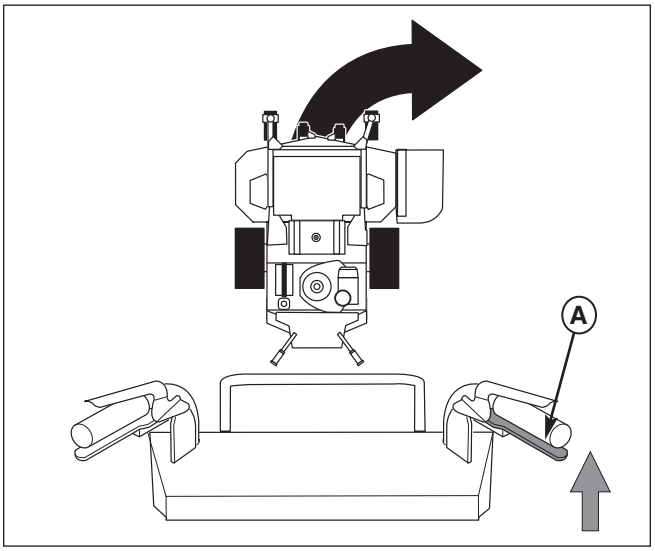


Figure 14. Right Turn Travel.
A. Right Hand Reverse Speed Control Lever

Mowing

Before mowing, set the cutting height as described in CUTTING HEIGHT ADJUSTMENT.

1. Engage the parking brake. Make sure the PTO switch is disengaged and the forward speed control lever is in the NEUTRAL position
2. Start the engine (see *Starting The Engine*).
3. Set the throttle to FULL.
4. Engage the PTO by pulling up on the PTO switch.
5. Begin mowing. See *Mowing Recommendations* for tips on mowing patterns, lawn care, and trouble shooting information.
6. When finished, shut off the PTO by pushing the PTO switch down completely.
7. Stop the engine (see *Stopping The Engine*).

Mowing Recommendations

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

Height of Grass

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

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

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

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

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

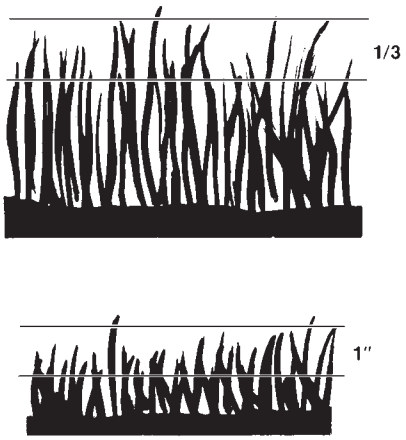


Figure 15. Proper Cutting Height

Tall Grass Requires Incremental Cutting

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

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

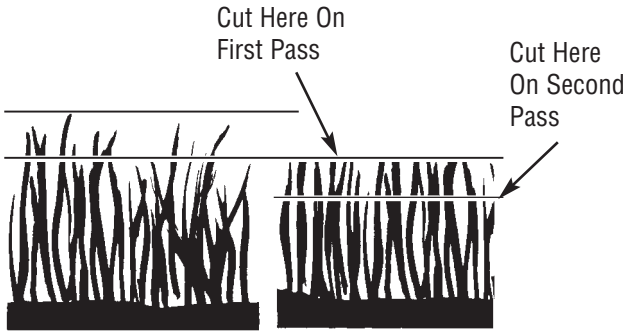


Figure 16. Incremental Cutting

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:

1. Mow when the grass is between three and five inches high.
2. 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.
3. Mow at time of day when the grass is cool and dry. Late afternoon or early evening often provide these ideal mowing conditions.
4. 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

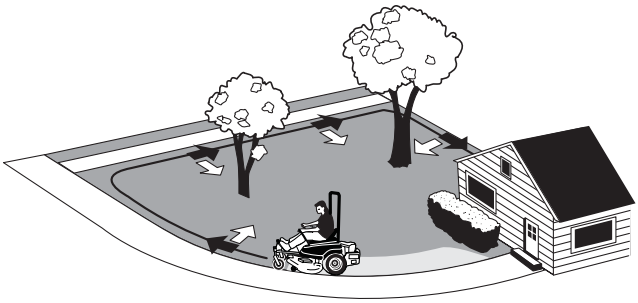
Always start mowing on a smooth, level area.

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.

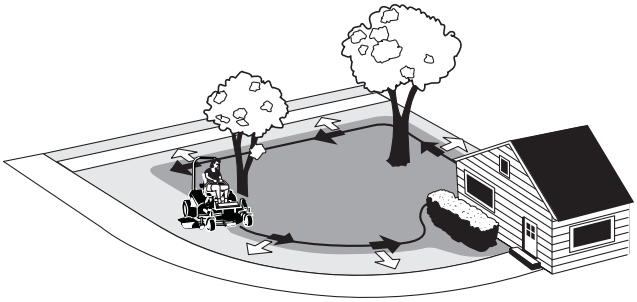
1. Cut long straight strips overlapping slightly.
2. Where possible, change patterns occasionally to eliminate matting, graining or a corrugated appearance.
3. For a truly professional cut, mow across the lawn in one direction, then recut the lawn by mowing perpendicular to the previous cut.

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.



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



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

Mowing Methods

Proper Broadcast Mowing

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

Engine Speed & Ground Speed for Broadcasting

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

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

How Much Grass to Cut Off When Broadcasting

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

Proper Mulching

Mulching consists of a mower deck which cuts and recuts clippings into tiny particles and which then blows them down INTO the lawn. These tiny particles decompose rapidly into by-products your lawn can use. UNDER PROPER 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 to high to cut. Even more than normal mowing, mulching requires that the grass be dry and the 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.

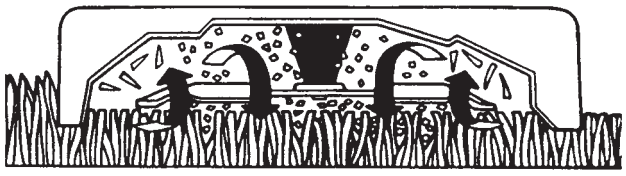


Figure 17. Mulching Action

Regular Maintenance

Maintenance Schedule

The following schedule should be followed for normal care of your mower and mower deck. You will need to keep a record of your operating time. Determining operating time is easily accomplished by observing the elapsed time recorded by the hour meter.

Safety Items	**Before Each Use**	**Every 5 Hours**	**Every 25 Hours**	**Every 100 Hours**	**Every 200 Hours**	**Spring & Fall**
Check Safety Interlock System	●					●
Check Mower Brakes	●					●
Check Mower Blade Stopping Time				●		●
Mower Maintenance	**Before Each Use**	**Every 5 Hours**	**Every 25 Hours**	**Every 100 Hours**	**Every 200 Hours**	**Spring & Fall**
Check Unit for Loose Hardware	●	●				
Clean Deck & Check / Replace Mower Blades**			●			
Lubricate Mower & Mower Deck **			●			
Check Tire Pressure			●			
Check Hydraulic Oil	●				●	
Change Hydraulic Oil Filter **					●	
Engine Maintenance	**Before Each Use**	**Every 5 Hours**	**Every 25 Hours**	**Every 100 Hours**	**Every 200 Hours**	**Spring & Fall**
Check Engine Oil Level	●					
Check / Clean Cooling Fins & Intake **	●					
Service Air Filter *			●			
Change Oil & Filter ***				●		
Check / Replace Spark Plugs *				●		
Check / Replace Fuel Filter *				●		

* Refer to engine owner's manual. Change original engine oil after initial break-in period.
** More often in hot (over 85° F: 30° C) weather or dusty operating conditions.
*** Change original engine oil after first 8 hours of operation.

Checking / Adding Fuel

To add fuel:

1. Remove the fuel cap (E, Figure 18).
2. 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.

3. Install and hand tighten the fuel cap.

Fuel Filter

The fuel filter is located in the fuel line between fuel tank and carburetor, near the fuel pump. If filter is dirty or clogged, replace as follows:

1. Place a container below the fuel filter (F) to catch spilled fuel.
2. Using pliers, open and slide hose clamps from fuel filter.
3. Remove hoses from filter.
4. Install new filter in proper flow direction in fuel line.
5. Secure with hose clamps.
6. Reconnect the negative battery cable when finished.

Change Oil & Filter

1. Warm engine by running for a few minutes. (Refer to the engine operator's manual for oil and filter replacement instructions.)
2. Route the oil drain hose (A) over the front end of the engine deck. Place the drain hose down between the front of the engine deck and the back of the cutter deck.
3. Place a small pan under the oil drain hose to catch the oil. Using the appropriate tools, remove the cap (B), from the oil drain hose and drain the engine oil into the pan.
4. After draining, replace the cap and wipe up any spilled oil. Reposition the oil drain hose so that it is facing towards the back of the machine.
5. Place an absorbent shop cloth under the engine oil filter (C). Remove the engine oil filter and replace with a new one.
6. Remove the oil dipstick (D) and refill with oil. (Refer to the engine operator's manual for oil recommendations.)
7. Remove the shop cloth and wipe up any spilled oil.

Engine Maintenance

Refer to engine owner's manual for all engine maintenance procedures and recommendations.

⚠ WARNING

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

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

NOTICE

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

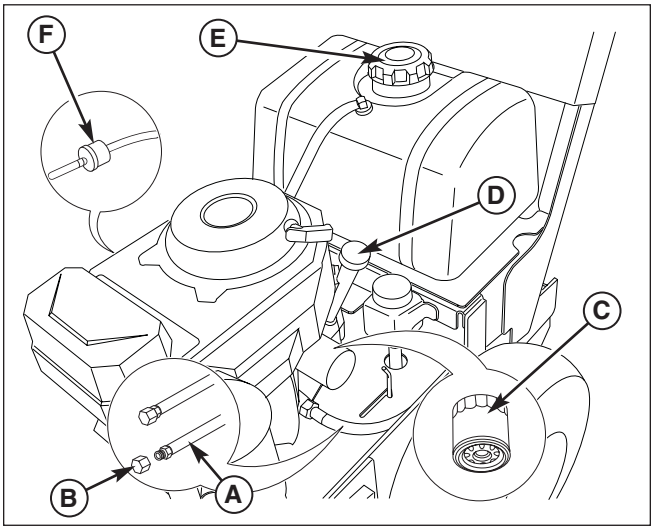


Figure 18. Engine Oil Drain
A. Oil Drain Hose
B. Cap
C. Oil Filter
D. Oil Dipstick
E. Fuel Tank Cap
F. Fuel Filter

Lubrication

Lubricate the unit at the locations shown in Figures 19 as well as the following lubrication points.

Grease:

- front caster wheel axles & yokes
- deck lift pivot blocks
- mower deck spindles
- mower deck idler arm

Use grease fittings 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:

- control handle pivots
- deck lift pivots
- discharge chute hinge
- neutral return pedal pivots

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

Lubricating the Front Casters:

NOTE: Front casters should be lubricated annually.

1. Remove the 1/4-28 bolt (A, Figure 20) screwed into the front caster and install a 1/4-28 grease fitting.
2. Grease the front caster.
3. Remove the 1/4-28 grease fitting and reinstall the 1/4-28 bolt.
4. Repeat process for the other side of the machine.

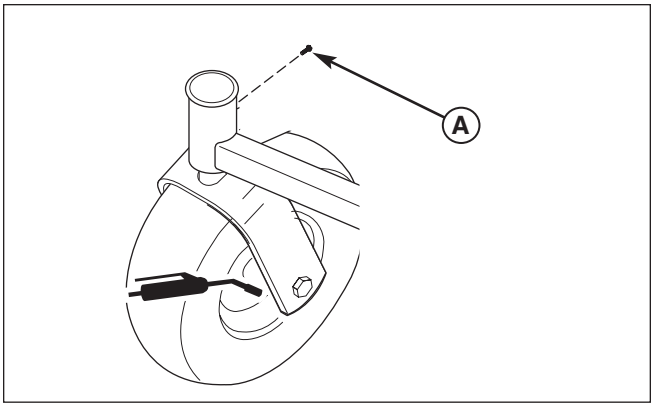


Figure 20. Front Caster & Wheel
A. 1/4-28 Bolt

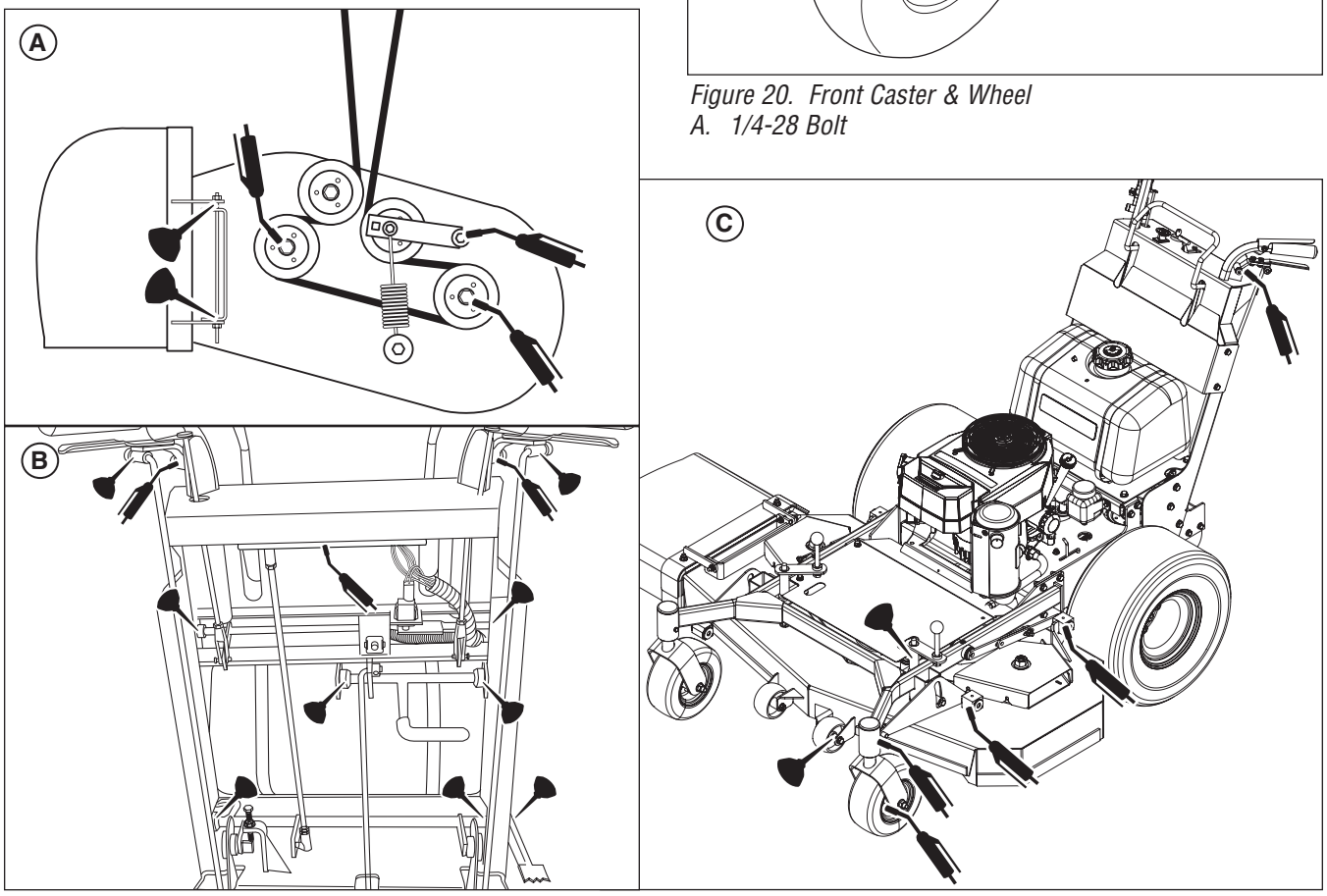


Figure 19. Lubrication Points
A. Mower Deck Lubrication Points *B. Handle Bar Lubrication Points*
C. General Lubrication Points (Left Side Shown, Right Side points identical.)

Check / Fill Transmission Oil

Oil Type: 20W-50 conventional detergent motor oil.

1. Check the oil level when the unit is cold. Locate the transmission oil reservoirs (A, Figure 21) located on the by the fuel tank. The oil should be up to the "FULL COLD" mark (B). If the oil is below this level, proceed to step 2.
2. Before removing the reservoir caps, make sure the area around the reservoir cap and fill neck of the reservoir is free of dust, dirt, or other debris. Remove the reservoir cap.
3. Add oil up to the "FULL COLD" mark (B).
4. Reinstall the reservoir caps.

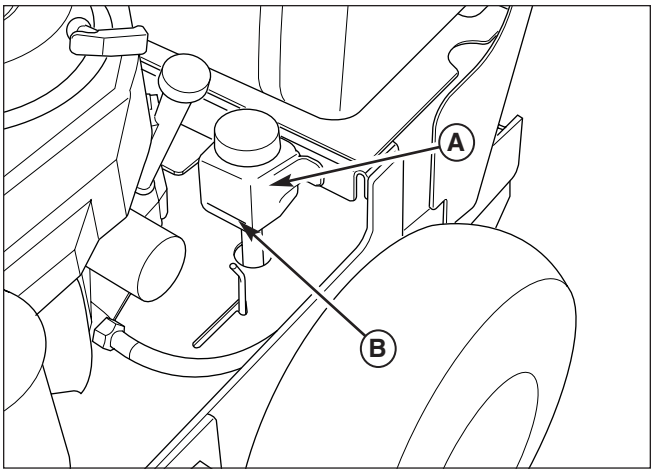


Figure 21. Transmission Oil Reservoir (LH Shown)
A. Transmission Oil Reservoir
B. "FULL COLD" Mark

Transmission Oil Filter Change

Change Interval: Every 200 Hours

Replacement Filter Number: 5101026X1

1. Locate the transmission oil filters (A, Figure 22) underneath the rear of the machine on the transmissions.
2. Remove the three 1/4" filter guard screws (C) and the filter guard (B).
3. Clean the area around the filter base and remove the filter.
4. Apply a film of new oil to the gasket of the new replacement filter. After the oil has drained, thread the new filter onto the filter base until the gasket makes contact, then tighten 3/4 of a turn more.
5. Reinstall the filter guard with the three 1/4" filter guard screws
6. Using a hex bit swivel socket or a modified allen wrench remove the top port plug from the transmissions.
7. Remove the transmission reservoir cap and fill with oil until oil appears at the bottom of the transmission's top port (approximately 2 qts (1,89L).
8. Reinstall the top port plug and tighten to 15 ft lbs (20,38 Nm).
9. Continue to add oil to the transmission oil reservoirs until the oil level reaches the "FULL COLD" mark. Reinstall the oil reservoir cap.
10. Repeat this process for the other side of the machine.
11. Run the unit for several minutes and check the transmission oil level.

IMPORTANT NOTE: Use caution after changing the filter; air in the hydraulic system may affect the responsiveness of the ground speed control levers. Repeat step 11 until the air is out of the system.

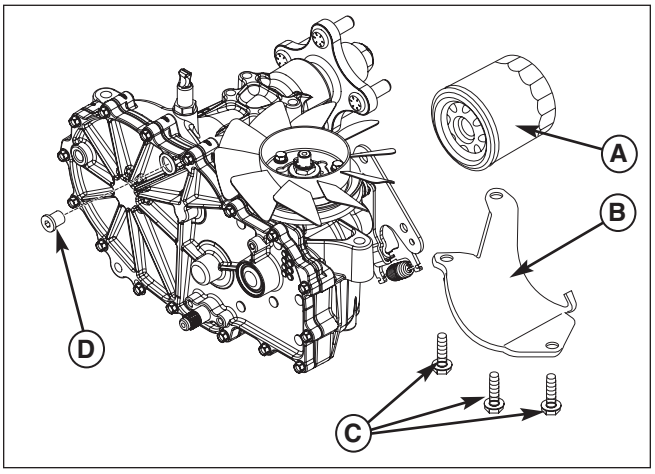


Figure 22. Transmission (Left Side Shown.)
A. Transmission Oil Filter
B. Filter Guard
C. 1/4" Filter Guard Screws
D. Top Port Plug

Servicing The Mower Blades

Removing the Mower Blade

⚠ CAUTION

Avoid injury! Mower blades are sharp.

- **Always wear gloves when handling mower blades or working near blades.**

1. To remove the mower blade, use a 1" wrench on the flats of the spindle shaft and remove the mower blade mounting bolt with a 15/16" wrench (Figure 23).
2. If there are no flats on the spindle shaft, wedge a wooden block between the mower blade and the mower deck housing to keep the mower blade from turning.

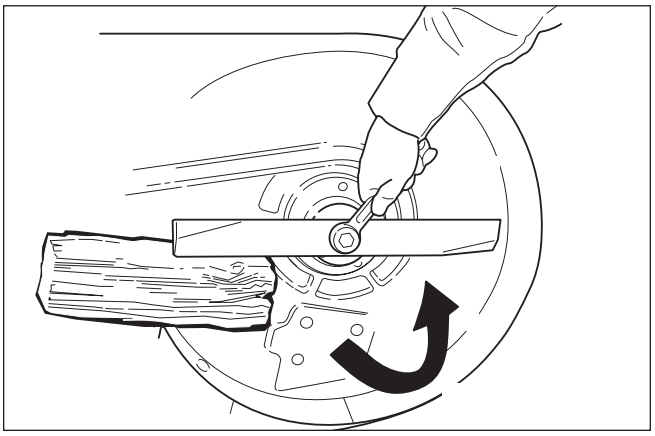


Figure 23. Loosening the Mower Blade for Removal

Inspecting the Mower Blades

⚠ DANGER

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

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

1. Remove the mower blade from the unit. *See Removing the Blade.*
2. Inspect the mower blade (Figures 24 & 25). **Discard the mower blade if it has any of the below conditions.**

   A.) Has more than .5" (12,7 mm) of the mower blade metal removed from previous sharpening or wear (D, Figure 24).

   B.) The air lifts are excessively eroded (B & C, Figure 25) and the notch (C) is .25" (6,35 mm) deep or greater.

   C.) Mower blade is bent or broken.
3. If the cutting edges are not sharp or have nicks, sharpen the blades. *See Sharpening the Mower Blades.*

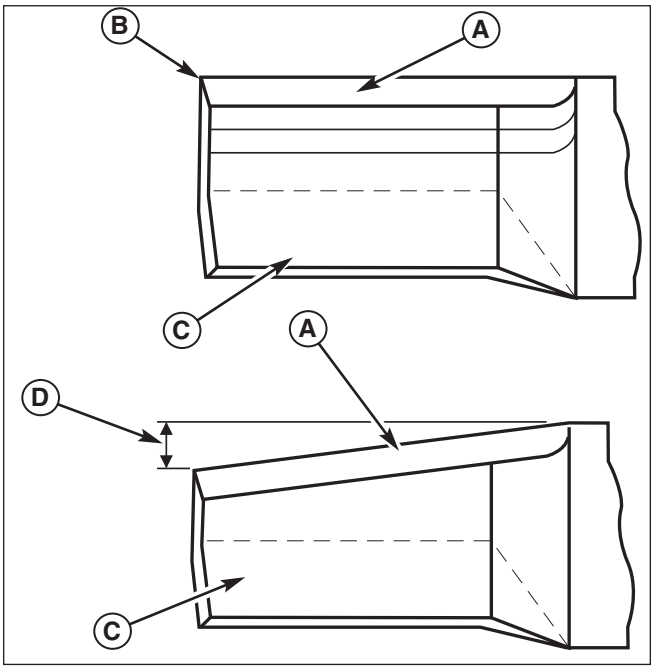


Figure 24. inspecting the Mower Blade Tips
A. Mower Blade Cutting Edge
B. Square Corner
C. Air Lift
D. Wear Measurement - DISCARD Mower Blade If greater than .5" (12,7 mm)

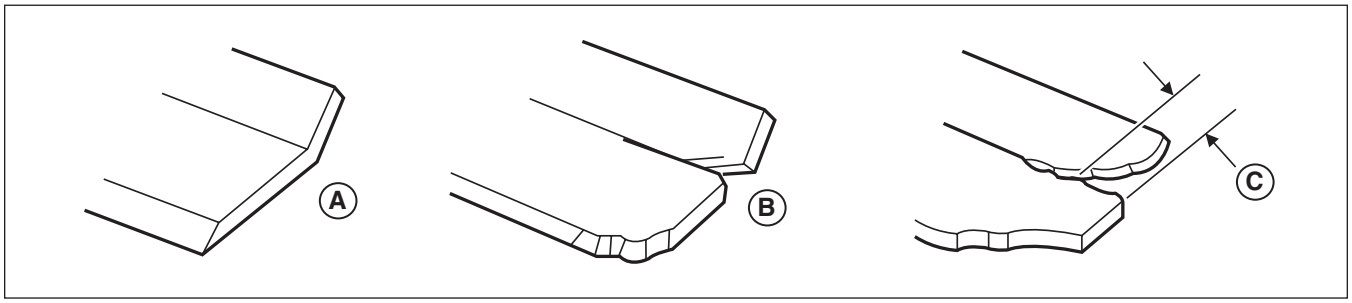


Figure 25. inspecting the Mower Blade Air Lifts
A. New Mower Blade
B. Mower Blade at Wear Limit (A notch begins to form)
C. Mower Blade in Dangerous Condition (Notch measures .25" (6,35 mm) or greater DO NOT USE. Replace with new mower blade.)

Sharpening the Mower Blade

⚠ CAUTION

Avoid injury! Mower blades are sharp.

- **Always wear gloves when handling the mower blades.**
- **Always wear safety eye protection when grinding.**

1. Sharpen the mower blades with grinder, hand file, or electric blade sharpener.
2. Sharpen the mower blade by removing an equal amount of material from each end of the mower blade.
3. Keep the original bevel (A, Figure 26) when grinding. DO NOT change the mower blade bevel.
4. The mower blade should have a maximum 1/64" (0,40 mm) cutting edge (B) or less.
5. Balance the mower blades before installing.

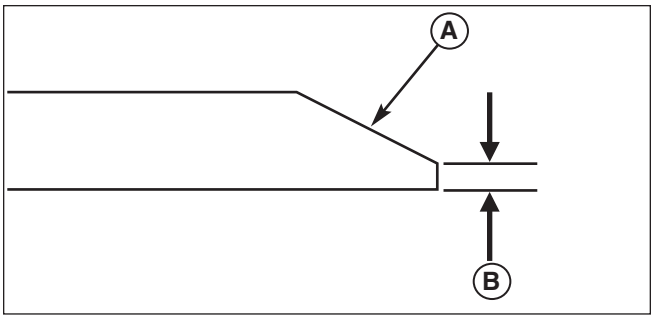


Figure 26. Sharpening the Mower Blade
A. Mower Blade Bevel
B. Mower Blade Cutting Edge

Balancing the Mower Blades

⚠ CAUTION

Avoid injury! Keep mower blades balanced.

- **An unbalanced mower blade can create excessive vibration and damage the unit or cause mower blade failure.**

1. Clean the mower blade to remove any dried grass or other debris.
2. See Figure 27. Put the mower blade on a nail in a vise and turn the mower blade to the horizontal position.
3. Check the balance of the mower blade. If either end of the mower blade moves downward, sharpen the heavy end until the mower blade is balanced. *See Sharpening the Mower Blades* for proper sharpening instructions.
4. Repeat the process until the mower blade remains in the horizontal position.

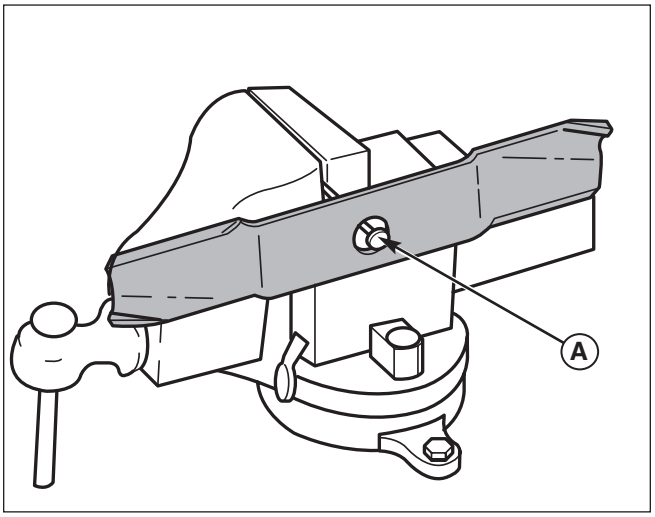


Figure 27. Balancing the Mower Blade
A. Nail

Reinstalling the Mower Blades

1. Reinstall each mower blade with the air lifts pointing up towards the mower deck as shown in Figure 28. Secure with the mower blade mounting bolt and flat washer (A & B, Figure 28) and torque to 70 ft. lbs (94 Nm).
2. If there are no flats on the spindle shaft, wedge a wooden block between the mower blade and the mower deck housing to keep the mower blade from turning.

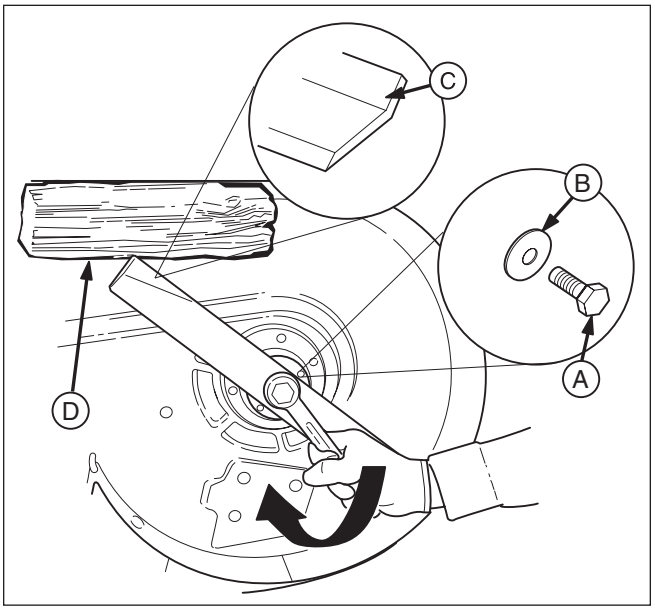


Figure 28. Tightening the Mower Blade for Installation
A. Mower Blade Mounting Bolt
B. Flat Washer
C. Mower Blade Air Lift (Points Up For Installation)
D. 4 X 4 Wooden Block

Neutral Adjustment

If the unit "creeps" while the forward speed control lever is locked in the NEUTRAL position, then it may be necessary to adjust the linkage rod.

NOTE: Perform this adjustment on a hard, level surface such as a concrete floor.

1. Disengage the PTO, engage the parking brake and turn off the engine.
2. There are two jam nuts (B, Figure 29) on the linkage rod (A). Loosen the jam nuts on the linkage rod and turn the linkage rod to adjust. If the machine creeps forward, turn the rod COUNTER-CLOCKWISE (while standing at the rear of the machine, looking down), if the machine creeps backward, turn the rod CLOCKWISE.
3. Lock the jam nuts (B) against the ball studs when neutral is achieved.

NOTE: This adjustment should not be performed while the machine is running. It may take several attempts to achieved neutral, depending upon how much the machine creeps.

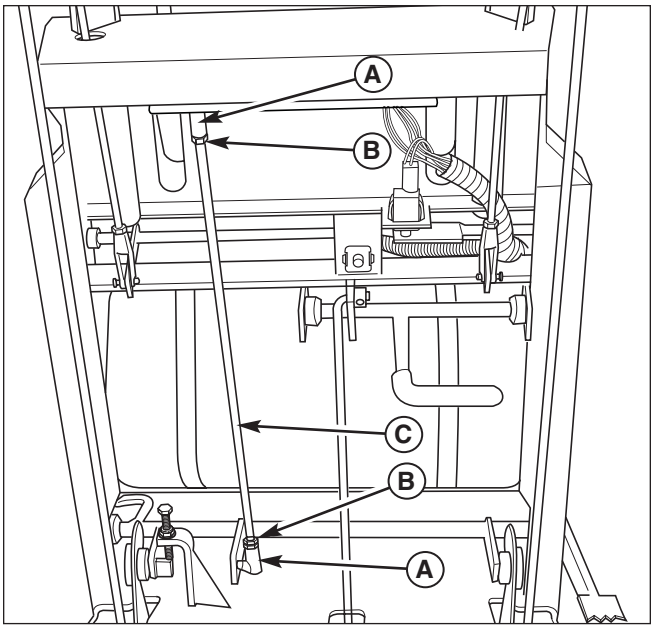


Figure 29. Neutral Adjustment
A. Ball Stud
B. Nuts
C. Adjustment Linkage Rod

Speed Balancing Adjustment

If the unit veers to the right or left when you are driving the machine, the top speed of each wheel can be balanced by turning the linkage adjuster rod (C, Figure 30). Only adjust the speed of the wheel that is traveling faster.

To Reduce the Speed of the Faster Wheel:

1. Loosen the jam nut (B).
2. Turn the linkage adjuster rod COUNTER-CLOCKWISE to reduce the speed.
3. Retighten the jam nut when adjustment is complete.

⚠ WARNING

DO NOT adjust the unit for a faster overall speed forward or reverse than it was designed for.

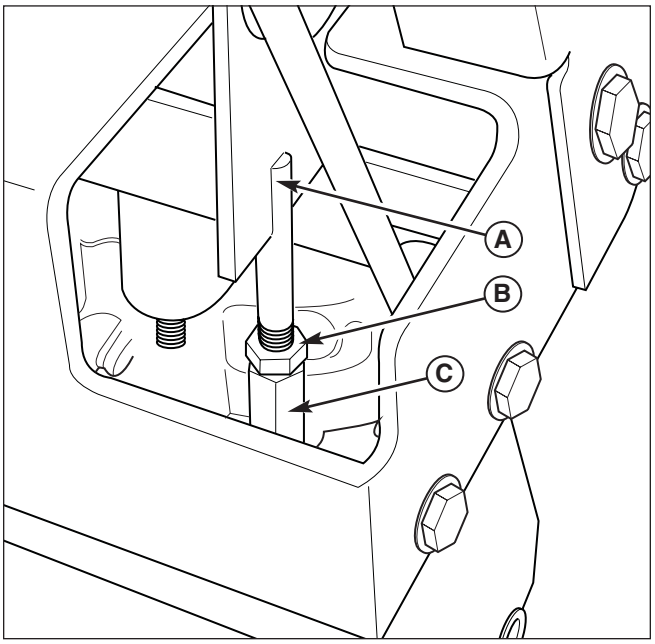


Figure 30. Adjusting the Speed of the Faster Wheel (RH side shown)
A. Control Ramp Rod
B. Jam Nut
C. Linkage Adjuster Rod

Parking Brake Adjustment

1. Disengage the PTO, stop the engine, remove the ignition key, and engage the parking brake.
2. Locate the brake spring (A, Figure 31) underneath the rear of the machine.
3. With the parking brake engaged, measure the compressed spring length of the brake spring. The spring should be 2-3/8" (6,03 cm) when compressed. If not, position the lock nut until the measurement equals 2-3/8" (6,03 cm).
4. Measure the distance between the back of the brake pivot link (G) and the front edge of the set collar (F). The measurement should be 1/8" (0,32 cm). If not, position the set collar until the measurement equals 1/8" (0,32 cm).

If this does not correct the braking problem, see your Snapper Pro dealer.

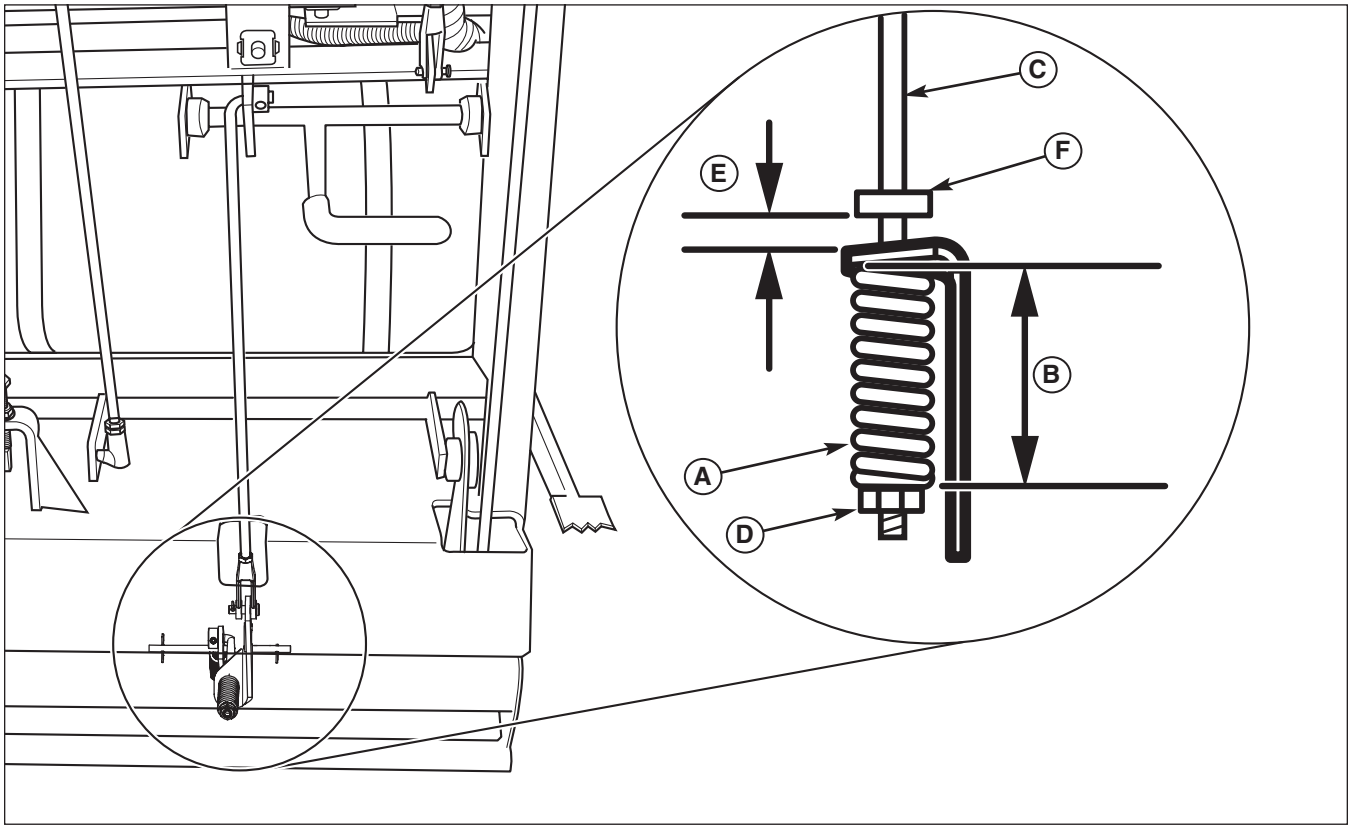


Figure 31. Parking Brake Adjustment
A. Brake Spring
B. First Measurement - .2-3/8" (6,03 cm)
C. Brake Spring Rod
D. Lock Nut
E. Second Measurement - 1/8" (0,32 cm)
F. Set Collar
G. Brake Pivot Link

Deck Leveling Adjustment

To Level the Mower Deck:

1. Park the machine on a flat, level surface. Disengage the PTO, stop the engine and engage the parking brake. Rear tires must be inflated to 15 psi (1,03 bar); front tires to 25 psi (1,72 bar).
2. Pull the cutting height adjustment handle (A, Figure 32) up and out of the handle lock position (B) and crank the handle CLOCKWISE and adjust the deck to the 3" (7,6 cm) position.
3. Repeat process for other side of machine.

NOTE: Both sides of the deck must be adjusted to the same height.

4. Place 2 x 4 blocks under the rear of the mower deck with the 3-1/2" sides being vertical. See Figure 33.
5. Loosen the deck leveling hardware (D, Figure 32) on both sides of the machine.
6. Make sure that the rear of the deck is resting on the 2 x 4's. Tighten the deck leveling hardware on both sides of the machine.
7. Remove all 2 x 4 blocks from under the mower deck.

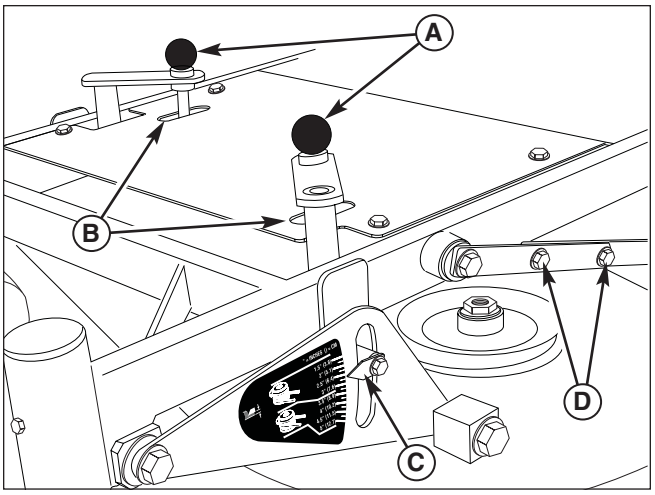


Figure 32. Remove the Cutter Deck Guard
A. Cutter Height Adjustment Handle
B. Handle Lock Position
C. Cutting Height Indicator
D. Deck Leveling Hardware

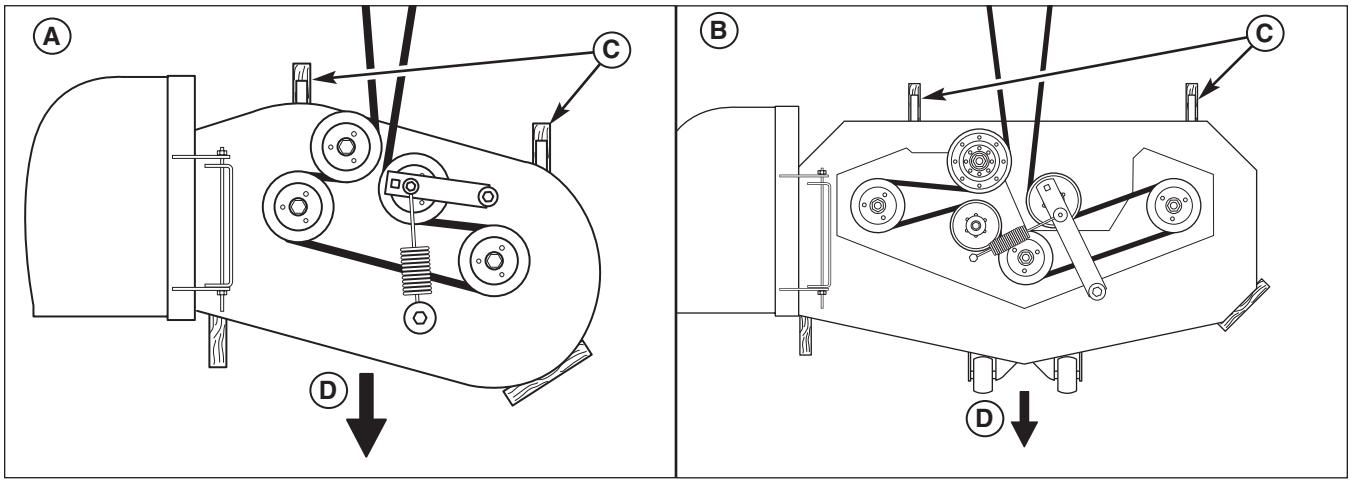


Figure 33. 2 x 4 Locations
A. 36" Mower Deck
B. 48" Mower Deck
C. 2 x 4 Blocks
D. Arrow Indicating the Front of the Machine

Mower Belt Replacement

NOTICE

To avoid damaging belts, DO NOT PRY BELTS OVER PULLEYS.

1. Park the unit on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.
2. Lower the mower deck to its lowest cutting position and remove the mower deck guard.
3. Using a 1/2" breaker bar (A, Figure 34), place the square end in the square hole located on the end of the idler arm (B). Carefully rotate the breaker bar CLOCKWISE, which will relieve the tension on the belt exerted from the idler arm.

⚠ WARNING

Use extreme caution when rotating the idler arm with the breaker bar, due to the increased tension in the spring as the idler arm is being rotated. Injury may result if the breaker bar is prematurely released while the spring is under tension.

4. Slide the mower drive belt over the edge of the stationary idler pulley (C). Carefully release the tension on the breaker bar.
5. Remove the old belt and replace with a new one. Make sure the V-side of the belt runs in the pulley grooves (Figure 35).
6. Install the mower drive belt on the PTO pulley, the spindle pulleys and all idler pulleys except the stationary pulley (C, Figure 34). Carefully rotate the breaker bar counter-clockwise and install the belt on the stationary idler pulley. Carefully release the tension on the breaker bar.
7. **36" Models:** Using the cutting height adjustment handles, adjust the cutting height of the mower deck to 1-1/2" (3,8 cm).

NOTE: Make sure that both sides of the deck are adjusted to the same cutting height.

Measure the mower belt tensioner spring (C, Figure 36). The measurement should equal 12-1/4" (31,1 cm). If the measurement does not equal 12-1/4" (31,1 cm), adjust the anchor eyebolt (A) by turning the adjustment nut (B) until a measurement of 12-1/4" (31,1 cm) is achieved.

8. Reinstall the mower deck guards.
9. Run the mower under no-load condition for about 5 minutes to break-in the new belt.

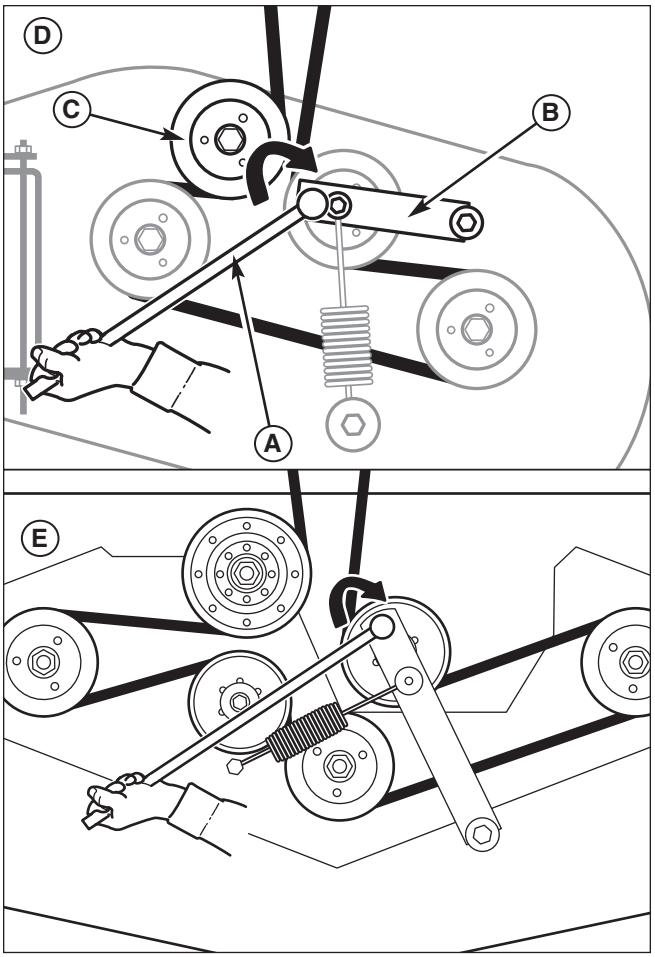


Figure 34. Remove the Mower Belt
A. Breaker Bar
B. Idler Arm
C. Stationary Idler Pulley
D. 36" Mower Deck
E. 48" Mower Deck

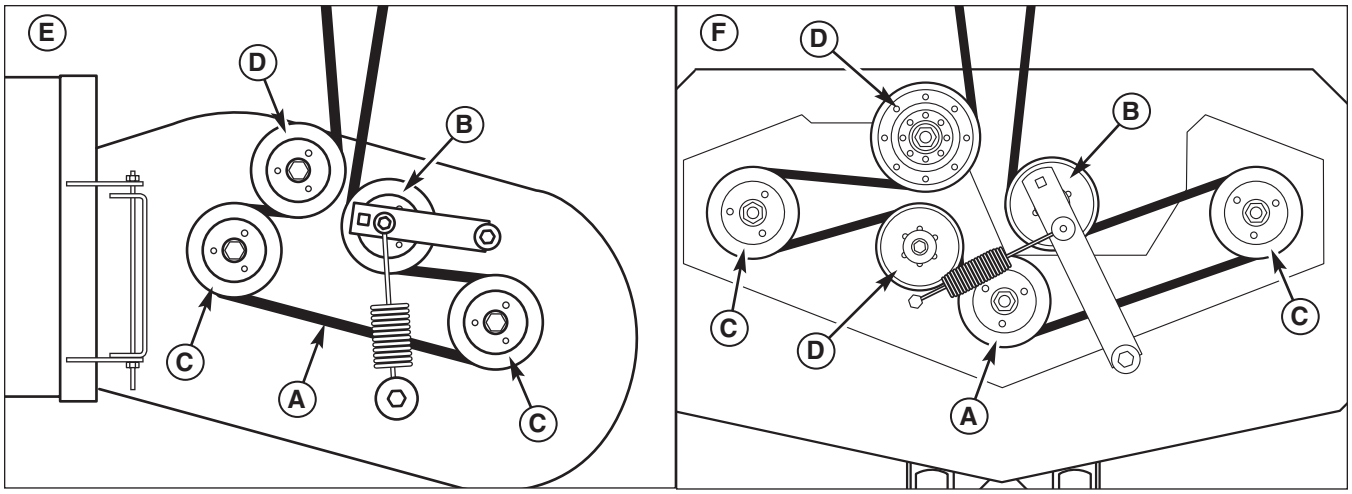


Figure 35. Mower Deck Belt Routing
A. Mower Drive Belt
B. Adjustable Idler Pulley
C. Spindle Pulley
D. Stationary Idler Pulley
E. 36" Mower Deck
F. 48" Mower Deck

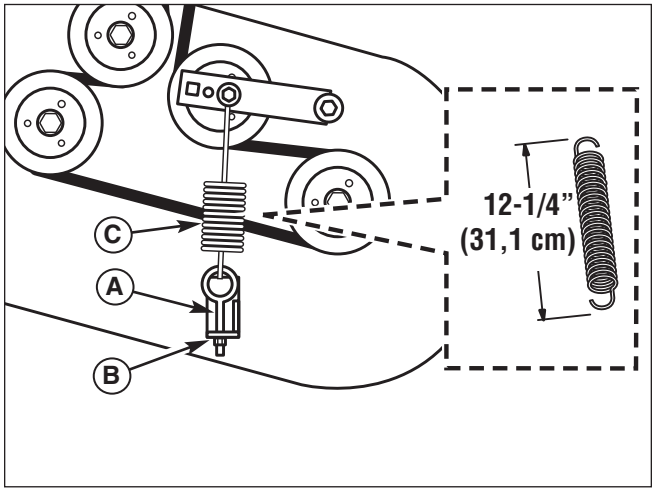


Figure 36. Mower Belt Tensioner Spring Measurement (36" Models)
A. Anchor Eyebolt
B. Adjustment Nut
C. Mower Belt Tensioner Spring

Transmission Drive Belt Replacement

1. Park the unit on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, turn off the engine, and remove the ignition key.
2. Remove the PTO drive belt (see MOWER BELT REPLACEMENT for removal instructions).
3. Loosen and remove the crankshaft bolt (C, Figure 37) and the PTO clutch (B) from the engine crankshaft.

⚠ WARNING

STORED ENERGY DEVICE: Improper release of the belt tension spring can result in personal injury. Use extreme caution when removing this spring.

4. Loosen the nut on the spring anchor eyebolt (G, Figure 38) to release the majority of the belt tension. Use caution and remove the nut to completely release the tension.
5. Remove the old belt and replace it with the new one. Make sure the V-side of the belt runs in the grooves of the crankshaft pulley and transmission pulleys (B & C).
6. Reinstall the spring anchor eyebolt (G) into the anchor tab and loosely fasten the nut. Adjust the anchor eyebolt until a measurement of 8-3/8" (21,2 cm) is achieved from the outside of the spring hooks. Tighten nut.
7. Reinstall the PTO clutch to the engine crankshaft and secure with the crankshaft bolt. Tighten the crankshaft bolt to 65 ft. lbs (88 Nm).

NOTE: Make sure that the slot in the PTO clutch lines up with the PTO clutch mounting tab (A, Figure 37) underneath the engine deck.

8. Reinstall the PTO drive belt.

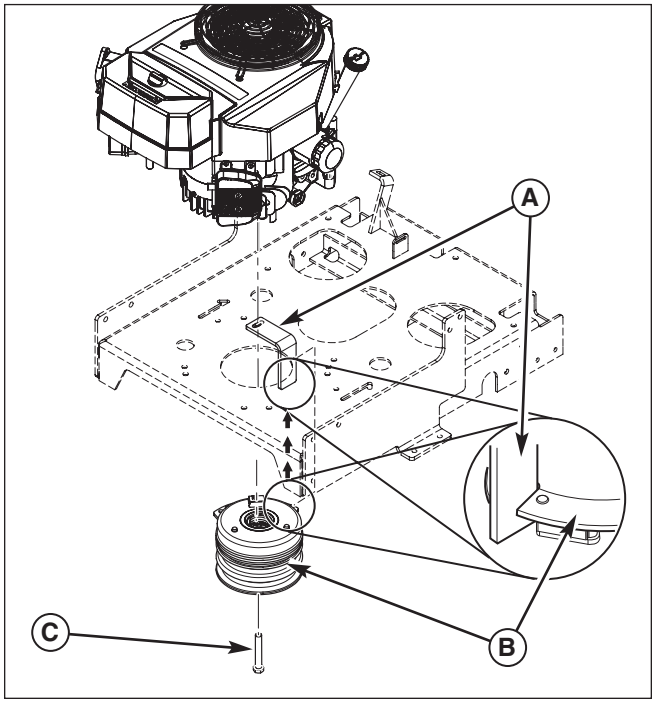


Figure 37. Remove the PTO Clutch
A. PTO Clutch Mounting Tab
B. PTO Clutch
C. Crankshaft Bolt

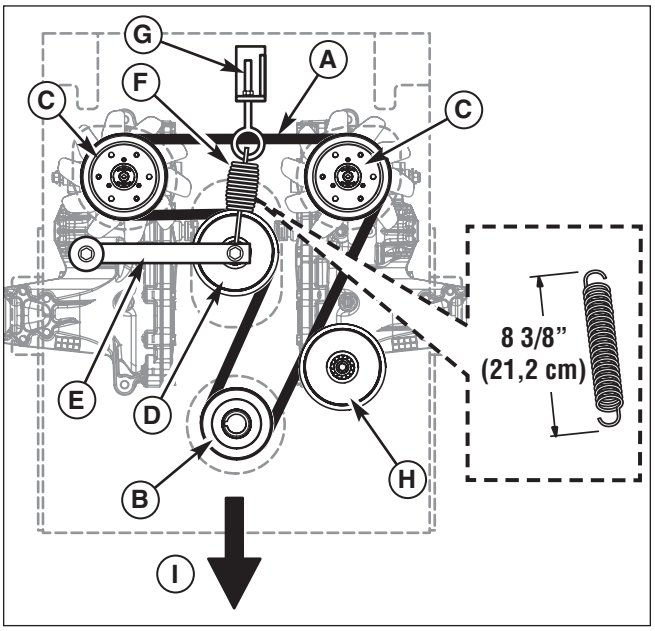


Figure 38. Hydraulic Pump Drive Belt Replacement
A. Transmission Drive Belt
B. Crankshaft Pulley
C. Transmission Pulleys
D. Idler Pulley
E. Idler Arm
F. Spring
G. Spring Anchor Eyebolt
H. Stationary Idler Pulley
I. Arrow Indicating the Front of the Machine

Reverse Speed Control Levers Comfort Adjustment

The amount of pressure necessary to depress the Reverse Speed Control Levers (A, Figure 39) can be adjusted to meet the comfort needs of the operator.

1. Disengage the PTO, engage the parking brake and turn off the engine.
2. To increase the amount of pressure necessary to depress the Reverse Speed Control Levers turn the lock nut (B) CLOCKWISE until the desired comfort level is achieved. To decrease the amount of pressure necessary to depress the Reverse Speed Control Levers turn the lock nut COUNTER-CLOCKWISE until the desired comfort level is achieved.
3. Repeat process for other side of the unit.

NOTE: Both Reverse Speed Control Levers should be adjusted so that it takes the same amount of pressure to depress both handles.

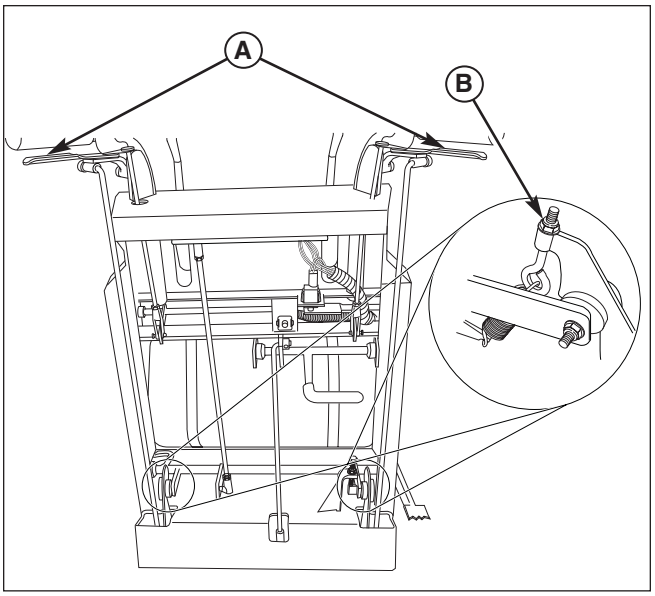


Figure 39. Reverse Speed Control Levers Comfort Adjustment
A. Reverse Speed Control Levers
B. Lock Nut

Storage

Temporary Storage (30 Days Or Less)

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

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

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

Long Term Storage (Longer Than 30 Days)

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

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:
   a. Remove mower deck from the unit.
   b. Clean underside of mower deck.
   c. Coat all bare metal surfaces with paint or light coat of oil to prevent rusting.
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 Normal Care section.
8. Clean up unit and apply paint or rust preventative to any areas where paint is chipped or damaged.
9. Be sure the battery is filled to the proper level with water and is fully charged. Battery life will be increased if it is removed, put in a cool, dry place and fully charged about once a month. If battery is left in unit, disconnect the negative cable.

⚠ WARNING

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

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

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

10. 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 blocks from under the unit.
2. Install the battery if it was removed.
3. Unplug the exhaust outlet and air cleaner.
4. Fill the fuel tank with fresh gasoline. See engine manual for recommendations.
5. See engine owner's manual and follow all instructions for preparing engine after storage.
6. Check crankcase oil level and add proper oil if necessary. If any condensation has developed during storage, drain crankcase oil and refill.
7. Inflate tires to proper pressure. Check fluid levels.
8. 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.

Troubleshooting

Troubleshooting Chart

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

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

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

⚠ WARNING

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

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

Troubleshooting the Mower

Problem	Cause	Remedy
Engine will not turnover or start.	1. Parking brake not engaged.	1. Engage parking brake.
	2. PTO (electric clutch) switch in ON position.	2. Place in OFF position.
	3. Out of fuel.	3. If engine is hot, allow it to cool, then refill the fuel tank.
	4. Engine flooded.	4. Move choke control to closed position.
	5. Fuse blown.	5. Replace fuse.
	6. Wiring loose or broken.	8. Visually check wiring & replace broken or frayed wires. Tighten loose connections.
	7. Safety interlock switch faulty.	10. Replace as needed. See authorized service dealer.
	8. Spark plug(s) faulty, fouled or incorrectly gapped.	11. Clean and gap or replace. See engine manual.
	9. Water in fuel.	12. Drain fuel & replace with fresh fuel.
	10. Gas is old or stale.	13. Drain fuel & replace with fresh fuel.
Engine starts hard or runs poorly.	1. Fuel mixture too rich.	1. Clean air filter. Check choke adjustment.
	2. Spark plug faulty, fouled, or incorrectly gapped.	2. Clean and gap or replace. (See engine manual.)
Engine knocks.	1. Low oil level.	1. Check/add oil as required.
	2. Using wrong grade oil.	2. See engine manual.
Excessive oil consumption.	1. Engine running too hot.	1. Clean engine fins, blower screen and air cleaner.
	2. Using wrong weight oil.	2. See engine manual.
	3. Too much oil in crankcase.	3. Drain excess oil.
Engine exhaust is black.	1. Dirty air filter.	1. Replace air filter. See engine manual.
	2. Engine choke control is in closed position.	2. Open choke control.

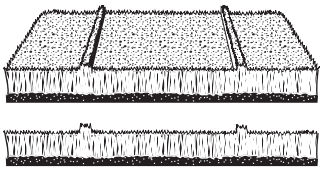
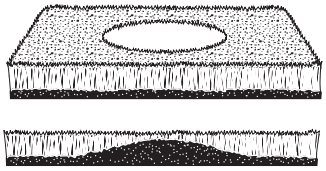
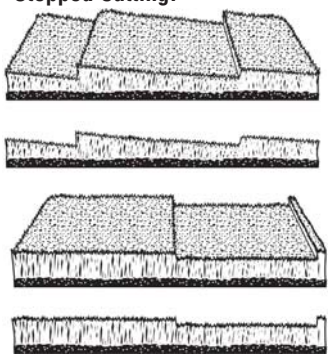
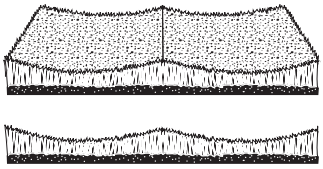
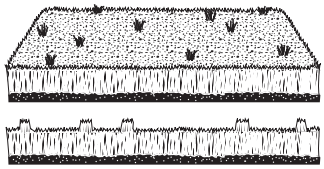
Mower Troubleshooting Continued.

Problem	Cause	Remedy
Engine runs, but mower will not drive.	1. Transmission release lever(s) in "disengaged" position. 2. Belt is broken. 3. Drive belt slips. 4. Brake is not fully released.	1. Move transmission release lever(s) to the "engaged" position. 2. See Drive Belt Replacement. 3. See problem and cause below. 4. See authorized service dealer
Mower drive belt slips.	1. Pulleys or belt greasy or oily. 2. Tension too loose. 3. Belt stretched or worn.	1. Clean as required. 2. Adjust spring tension. See Drive Belt Replacement 3. Replace belt.
Brake will not hold.	1. Brake is incorrectly adjusted.	1. See Brake Adjustment.
Mower steers or handles poorly.	1. Steering linkage is loose. 2. Improper tire inflation.	1. Check and tighten any loose connections. 2. See Regular Maintenance Section.

Troubleshooting the Mower Deck

Problem	Cause	Remedy
Mower Deck will not raise.	1. Lift linkage not properly attached or damaged.	1. See authorized service dealer for repair.
Engine stalls easily with mower deck engaged.	1. Engine speed too slow. 2. Ground speed too fast. 3. Cutting height set too low. 4. Discharge chute jamming with cut grass.	1. Set to full throttle. 2. Decrease Ground Speed. 3. Cut tall grass at maximum cutting height during first pass. 4. Cut grass with discharge pointing toward previously cut area.
Excessive mower deck vibration.	1. Blade mounting bolts are loose. 2. Mower blades, arbors, or pulleys are bent. 3. Mower blades are out of balance. 4. Belt installed incorrectly.	1. Tighten to 70 ft.lbs. (94 N.m.). 2. Check and replace as necessary. 3. Remove, sharpen, and balance blades. See Maintenance Section. 4. Reinstall Correctly.
Excessive belt wear or breakage.	1. Bent or rough pulleys. 2. Using incorrect belt.	1. Repair or replace. 2. Replace with correct belt.
Mower drive belt slips or fails to drive.	1. Idler pulley spring broken or not properly attached. 2. Mower drive belt broken.	1. Repair or replace as needed. 2. Replace drive belt.
Mower does not engage.	1. Electrical wiring damage.	1. Locate & repair damaged wire.

Troubleshooting Common Cutting Problems

Problem	Cause	Remedy
Streaking. 	1. Blades are not sharp. 2. Blades are worn down to far. 3. Engine speed is too slow. 4. Ground speed is too fast. 5. Deck is plugged with grass 6. Not overlapping cutting rows enough. 7. Not overlapping enough when turning.	1. Sharpen your blades. 2. Replace your blades. 3. Always mow at full throttle. 4. Slow down. 5. Clean out the mower. 6. Overlap your cutting rows. 7. When turning your effective cutting width decreases–overlap more when turning.
Scalping. 	1. Lawn is uneven or bumpy. 2. Mower deck cutting height is set too low. 3. Ground speed is too fast. 4. Deck is not leveled correctly. 5. Tire pressure is low or uneven	1. Roll or level the lawn. 2. Raise the cutting height. 3. Slow down. 4. Correctly level the deck. 5. Check and inflate the tires.
Stepped Cutting. 	1. Deck is not leveled correctly. 2. Tires are not properly inflated. 3. Blades are damaged. 4. Deck shell is damaged. 5. Mower spindle is bent or loose. 6. Blades are installed incorrectly.	1. Level the deck correctly. 2. Check and inflate the tires. 3. Replace the blades. 4. Repair or replace the deck. 5. Repair or replace the spindle. 6. Reinstall the blades correctly.
Uneven Cutting. 	1. Deck is not leveled correctly. 2. Blades are dull or worn. 3. Blades are damaged. 4. Deck is clogged with grass clippings. 5. Deck shell is damaged. 6. Mower spindle is bent or loose. 7. Blades are installed incorrectly. 8. Tires are not properly inflated.	1. Level the deck correctly. 2. Sharpen or replace the blades. 3. Replace the blades. 4. Clean out the deck. 5. Repair or replace the deck. 6. Repair or replace the spindle. 7. Reinstall the blades correctly. 8. Check and inflate the tires.
Stingers. 	1. Blades are not sharp or nicked. 2. Blades are worn down too far. 3. Engine speed is too slow. 4. Ground speed is too fast. 5. Deck is plugged with grass.	1. Sharpen your blades. 2. Replace your blades. 3. Always mow at full throttle. 4. Slow down. 5. Clean out the mower.

Specifications

NOTE: Specifications are correct at time of printing and are subject to change without notice.
**Actual sustained equipment horsepower likely to be lower due to operating limitations and environmental factors.*

ENGINE:

13 HP* Kawasaki

Make	Kawasaki
Model	FH381V
Horsepower	13 @ 3600 rpm
Displacement	26.3 Cu. in (431 cc)
Electrical System	12 Volt Clutch Coil, 13 amp.
Oil Capacity	1.9 US qt. (1,8 L) w/ Filter

17 HP* Kawasaki

Make	Kawasaki
Model	FH541V
Horsepower	17 @ 3600 rpm
Displacement	35.7 Cu. in (585 cc)
Electrical System	12 Volt Clutch Coil, 13 amp.
Oil Capacity	1.9 US qt. (1,8 L) w/ Filter

CHASSIS:

Fuel Tank	Capacity: 5.5 Gallons (20,82 L)
Rear Wheels	Tire Size: 18 x 6.50 - 8 (36")
	Tire Size: 18 x 8.50 - 8 (48")
	Inflation Pressure: 15 psi (1,03 bar)
Front Wheels	Tire Size: 9 x 3.50 - 4
	Inflation Pressure: 25 psi (1,72 bar)

TRANSMISSIONS:
HydroGear ZH-KMBB-3A5A-1LLX (LH)
HydroGear ZH-GMBB-3A5A-1LLX (RH)

Type	ZT2800
Hydraulic Fluid	SAE 20W-50 motor oil
Speeds	Forward: 0-6 MPH (0-9.66 km/h)
@ 3400 rpm	Reverse: 0-3 MPH (0-4.83 km/h)
Continuous Torque	180 ft. lbs. (244 N.m.)
Output	
Maximum Weight	440 lbs. (200 Kg)
on Axle	

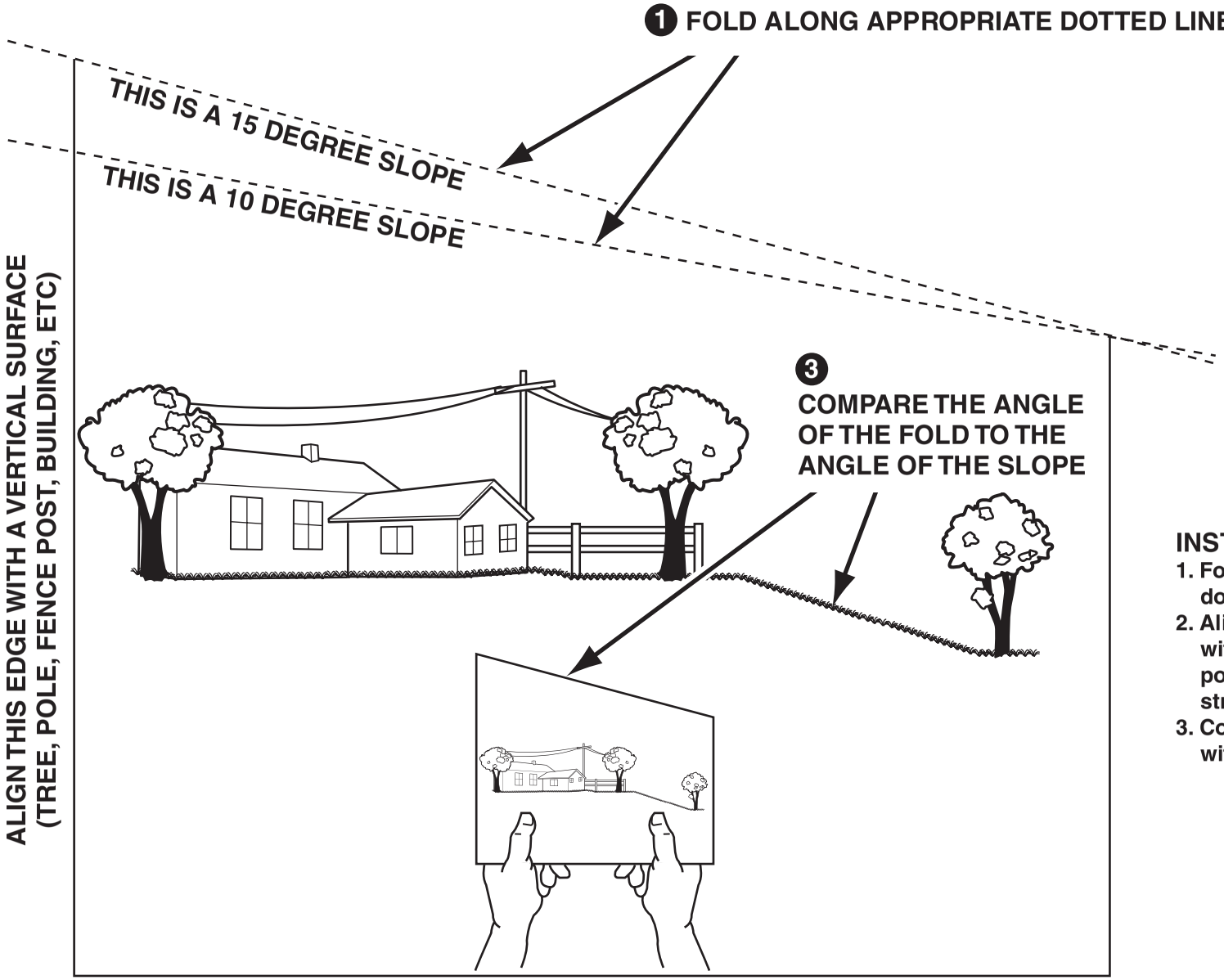
DIMENSIONS:

Overall Length	
36" Model:	76" (193 cm)
48" Model:	72" (183 cm)
Overall Width	
36" Model:	37" (93,9 cm)
48" Model:	49" (124,5 cm)
Height	42" (106,5 cm)
Weight (apx..)	
36" Model:	480 lbs. (218 kg)
48" Model:	600 lbs. (272 kg)

Engine Power Rating Information

The gross power rating labels for individual gas engine models meet or exceed SAE (Society of Automotive Engineers) code J1940 (Small Engine Power & Torque Rating Procedure) and rating performance has been obtained and corrected in accordance with SAE J1995 (Revision 2002-05). Actual gross engine power may be lower and is affected by, but not limited to, ambient operating conditions and engine to engine variability. Given both the wide array of products on which engines are placed, and the variety of environmental issues applicable to operating the equipment, the gas engine will not develop the rated gross power when used in a given piece of power equipment (actual "on-site" or net power). This difference is due to a variety of factors including, but not limited to, accessories (air cleaner, exhaust, charging, cooling, carburetor, fuel pump, etc.), application limitations, ambient operating conditions (temperature, humidity, altitude), and engine to engine variability.

SLOPE INDENTIFICATION GUIDE



INSTRUCTIONS

1. Fold this page along the dotted line indicated above.
2. Align the left edge of this guide with a vertical tree, a power line pole, a fence post, or any vertical structure.
3. Compare the angle of the fold with the angle of the hill.

Notes

Notes

Snapper Pro - a division of Briggs & Stratton Power Products Group, LLC.
Owner's Limited Warranty Information

(Effective 08/01/2007)

Thank you for purchasing Snapper Pro commercial mowing equipment. Please take a few minutes to read this limited warranty information. It contains all the information you will need to have your Snapper Pro mower repaired in the unlikely event that a breakdown covered by this limited warranty should occur.

Owner's Responsibilities - As a condition to our obligations under this limited warranty, you shall have read the operator's manual and you shall have completed and submitted to Snapper Pro, within 20 days from the date of purchase, the Snapper Pro Product Registration. You must properly service and maintain your Snapper Pro product as described in the operator's manual. Such routine maintenance, whether performed by a dealer or by you, is at your expense. The Snapper Pro equipment, including any defective part covered by this limited warranty, must be returned to an authorized Snapper Pro dealer within the warranty period for warranty service. This limited warranty extends only to equipment operated under normal conditions and in accordance with Snapper Pro' instructions.

Warranty Start Date - The limited warranty coverage begins on the day you buy your new Snapper Pro commercial mowing equipment. An authorized Snapper Pro dealer will assist you in filling out a Snapper Pro Product Registration with specific information for the model you purchase and your personal information, which must be returned to Snapper Pro.

Limited Warranty - The limited warranty, set forth below, is a written guarantee by Snapper Pro, during the warranty period, to repair or replace parts which have a substantial defect in materials or workmanship. The warranty is "limited" because it is for a specified period of time, applies to the original purchaser only, and is subject to other restrictions.

SNAPPER PRO LIMITED WARRANTY

Snapper Pro warrants, in accordance with the provisions below, to the original purchaser only, for the periods described below that the commercial mower shall be free from substantial defects in material or workmanship under normal use and service. If you wish to file a claim under this limited warranty, you must provide prompt notice of your claim to an authorized Snapper Pro dealer during the warranty period. Snapper Pro' obligation under this limited warranty is, at Snapper Pro' option, to repair or replace any part or parts of the mower, which, in the judgment of Snapper Pro, are found to be defective and covered by this limited warranty. An authorized Snapper Pro dealer will repair or replace the defective part or parts, at the dealer's place of business, at no charge for the labor or parts. This limited warranty applies only to mowers sold in the United States and Canada and is subject to the following limitations.

Covered Parts	**Warranty Period**
All Mowers	2-years (24 months) from date of retail purchase by the original purchaser for parts & labor (90 days for rental mowers) (Except as noted below*)
*Belts, Tires, Brake Pads And Hoses, Battery, Blades	90 days from date of retail purchase by the original purchaser
*Attachments	1 year from date of retail purchase by the original purchaser
*Engine	If the engine manufacturer provides any warranty on the mower's engine, Snapper Pro will assign that warranty to the original purchaser of the mower if such assignment is reasonably practicable. Please refer to the engine manufacturer's warranty statement, if any, that is included in the owner's packet. We are not authoized to handle warranty adjustments or repairs on engines. Snapper Pro offers **NO WARRANTY** on mower engines. Snapper Pro does not guarantee or represent that any engine manufacturer will comply with the terms of its warranty.

Items and Conditions Not Covered

This warranty does not cover, and Snapper Pro makes **NO WARRANTY** regarding, the following:

- Mowers or their parts if a complete and accurate Snapper Pro Product Registration has not been received by Snapper Pro.
- Loss or damage to person or property other than that expressly covered by the terms of this limited warranty.
- Pickup and delivery charges and risk of loss or damage in transit to and from any authorized Snapper Pro dealer.
- Any damage or deterioration due to normal use, wear and tear, or environmental or natural elements, or exposure.
- Cost of regular maintenance service or parts, such as but not limited to, filters, fuel, lubricants, tune-up parts, and adjustments.
- Claims arising due to failure to follow Snapper Pro' written instructions, or improper storage or maintenance.
- Any repairs necessary due to use of parts, accessories or supplies, including gasoline, oil or lubricants, incompatible with the mowing equipment, or other than as recommended in the operator's manual or other written operational instructions provided by Snapper Pro.
- Use of non-Snapper Pro approved parts or accessories.
- Any overtime or other extraordinary repair charges or charges relating to repairs or replacements.
- Rental of like or similar replacement equipment during the period of any warranty, repair or replacement work.
- Loss of revenue, time or use of the mowing equipment.
- Travel, telephone or other communication charges.
- Damage from continued use of defective mowing equipment.
- Freight charges on replacement parts.
- Any mowing equipment or part which, in the judgment of Snapper Pro, has been altered or tampered with in any way or has been subjected to misuse, abuse, abnormal usage, unauthorized repair, neglect or accident, damage in transit, or has had the serial numbers altered, effaced or removed.
- Any equipment, part or item not mentioned under "Covered Parts," above.

General Conditions

Snapper Pro is continually striving to improve its products, and therefore reserves the right to make improvements or changes without incurring any obligation to make changes or additions to products sold previously. Any oral or written description of Snapper Pro products is for the sole purpose of identifying the products and shall not be construed as an express warranty. No warranty claim shall give rise to a right for the purchaser to cancel or rescind any sale. No person is authorized to make any warranty or assume for Snapper Pro any liability not strictly in accordance with this limited warranty. Any assistance Snapper Pro provides to or procures for the purchaser outside the terms, limitations or exclusions of this limited warranty will not constitute a waiver of the terms, limitations or exclusions of this limited warranty, nor will such assistance extend or revive the limited warranty. Snapper Pro will not reimburse the purchaser for any expenses incurred by the purchaser in repairing, correcting or replacing any defective products except for those incurred with Snapper Pro' prior written permission and in accordance with this limited warranty.

Snapper Pro' sole and exclusive liability with respect to this limited warranty, and the purchaser's exclusive remedy, shall be repair or replacement as set forth herein. All warranty work must be performed by an authorized Snapper Pro dealer using only Snapper Pro approved replacement parts. **SNAPPER PRO SHALL HAVE NO LIABILITY FOR ANY OTHER COST, LOSS OR DAMAGE, INCLUDING BUT NOT LIMITED TO, ANY INCIDENTAL, COMPENSATORY, INDIRECT, PUNITIVE, SPECIAL OR CONSEQUENTIAL LOSS OR DAMAGE. SNAPPER PRO' AGGREGATE LIABILITY WITH RESPECT TO A DEFECTIVE PRODUCT OR PART SHALL BE LIMITED TO AN AMOUNT EQUAL TO THE MONIES PAID BY THE PURCHASER FOR THAT DEFECTIVE PRODUCT OR PART. THIS LIMITED WARRANTY, AND SNAPPER PRO' OBLIGATIONS HEREUNDER, ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTY OF MERCHANTABILITY AND THE IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. SNAPPER PRO SHALL NOT BE LIABLE TO THE PURCHASER, OR TO ANYONE CLAIMING UNDER THE PURCHASER, FOR ANY OTHER OBLIGATIONS OR LIABILITIES, INCLUDING, BUT NOT LIMITED TO, OBLIGATIONS OR LIABILITIES ARISING OUT OF BREACH OF CONTRACT OR WARRANTY, NEGLIGENCE OR OTHER TORT OR ANY THEORY OF STRICT LIABILITY, WITH RESPECT TO SNAPPER PRO PRODUCTS OR SNAPPER PRO' ACTS OR OMISSIONS OR OTHERWISE.**

It is the express wish of the parties that this agreement and any related documents be drafted in English. Il est la volonté expresse des parties que cette convention et tous les documents s'y rattachent soient rédigés en anglais.

SNAPPER PRO™

OPERATOR'S MANUAL

SW20 Series

Walk-Behind Mowers

Product Specifications:

ENGINE:

13 HP Kawasaki

Make	Kawasaki
Model	FH381V
Oil Capacity	1.9 US qt. (1.8 L) w/ Filter

17 HP Kawasaki

Make	Kawasaki
Model	FH541V
Oil Capacity	1.9 US qt. (1.8 L) w/ Filter

CHASSIS:

Fuel Tank	Capacity: 5.5 Gallons (20,82 L)
Rear Wheels	Tire Size: 18 x 6.50 - 8 (36" Model) Tire Size: 18 x 8.50 - 8 (48" Model) Inflation Pressure: 15 psi (1,03 bar)
Front Wheels	Tire Size: 9 x 3.50 - 4 Inflation Pressure: 25 psi (1,72 bar)

Common Service Parts:

BELTS AND BLADES:

TRACTOR

Pump Drive Belt	5021770

36" MOWER DECK

Deck Drive Belt	5101313
Mower Blade	5021227

48" MOWER DECK

Deck Drive Belt	5021650
Mower Blade	5020843

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