



OPERATOR'S MANUAL



Regent XL / RD Series

19.5 HP Hydro Tractors

Mfg. No.	Title	Description
2690782	19.5 HP Simplicity	Regent XL RD, 19.5 HP OHV
2690784	19.5 HP Snapper	ELT19540RD

22 HP Hydro Tractors

Mfg. No.	Title	Description
2690783	22 HP Simplicity	Regent XL RD, 22 HP V-Twin
2690785	22 HP Snapper	ELT2240RD



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

Safety Rules & Information



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.

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.

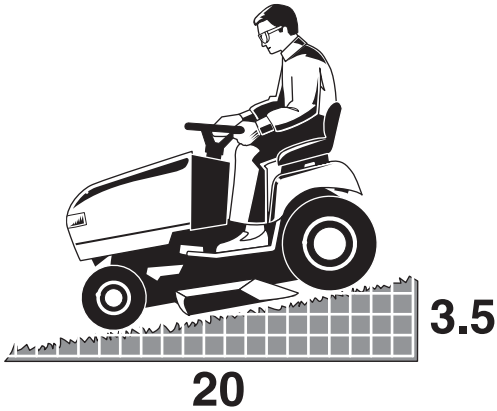
DO NOT GIVE CHILDREN RIDES ON THIS UNIT! This encourages them to come near the unit in the future while it is running, and they could be seriously hurt. They may then approach the unit for a ride when you are not expecting it, and you may run over them.

Reverse

Do not mow in reverse unless absolutely necessary. Always look down and behind before and while traveling in reverse even with the mower blades disengaged.



Slope Operation



You could be seriously injured or even killed if you use this unit on too steep an incline. Using the unit on a slope that is too steep or where you don't have adequate traction can cause you to lose control or roll over.

A good rule of thumb is to not operate on any slope you cannot back up (in 2-wheel drive mode). You should not operate on inclines with a slope greater than a 3.5 foot rise over a 20 foot length. Always drive up and down slopes: never cross the face.

Also note that the surface you are driving on can greatly impact stability and control. Wet grass or icy pavement can seriously affect your ability to control the unit.

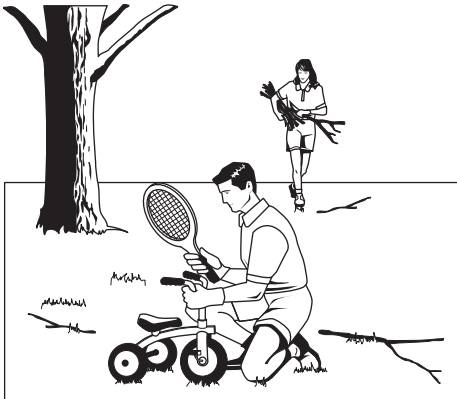
If you feel unsure about operating the unit on an incline, don't do it. It's not worth the risk.

Moving Parts

This equipment has many moving parts that can injure you or someone else. However, if you are seated in the seat properly, and follow all the rules in this book, 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 equipment while it is running!

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.



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 BEFORE you start mowing.

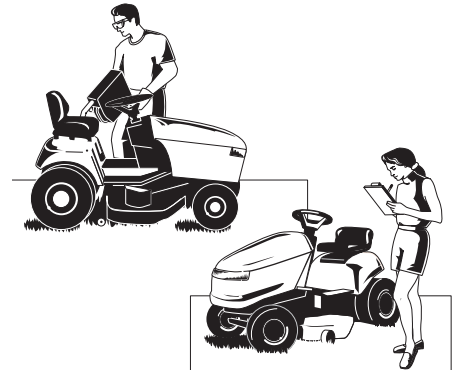
Do not operate this unit without the entire grass catcher or discharge guard (deflector) in place.

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.

Fuel and Maintenance

Gasoline is extremely flammable. Its vapors are also extremely flammable and can travel to distant ignition sources. Gasoline must only be used as a fuel, not as a solvent or cleaner. It should never be stored any place where its vapors can build up or travel to an ignition source like a pilot light. Fuel belongs in an approved, plastic, sealed gas can, or in the tractor fuel tank with the cap securely closed. Spilled fuel needs to be cleaned up immediately.

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




Safety Rules & Information



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

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

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

GENERAL OPERATION

1. Read, understand, and follow all instructions in the manual and on the unit before starting.
2. Do not put hands or feet near rotating parts or under the machine. Keep clear of the discharge opening at all times.
3. Only allow responsible adults, who are familiar with the instructions, to operate the unit (local regulations can restrict operator age).
4. Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade(s).
5. Be sure the area is clear of other people before mowing. Stop the unit if anyone enters the area.
6. Never carry passengers.
7. Do not mow in reverse unless absolutely necessary. Always look down and behind before and while travelling in reverse.
8. Never direct discharge material toward anyone. Avoid discharging material against a wall or obstruction. Material may ricochet back toward the operator. Stop the blade(s) when crossing gravel surfaces.
9. Do not operate the machine without the entire grass catcher, discharge guard (deflector), or other safety devices in place.
10. Slow down before turning.
11. Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting.
12. Disengage blades (PTO) when not mowing. Shut off engine and wait for all parts to come to a complete stop before cleaning the machine, removing the grass catcher, or unclogging the discharge guard.
13. Operate the machine only in daylight or good artificial light.
14. Do not operate the unit while under the influence of alcohol or drugs.
15. Watch for traffic when operating near or crossing roadways.
16. Use extra care when loading or unloading the unit into a trailer or truck.
17. Always wear eye protection when operating this unit.
18. Data indicates that operators, age 60 years and above, are involved in a large percentage of power equipment-related injuries. These operators should evaluate their ability to operate the equipment safely enough to protect themselves and others from injury.
19. Follow the manufacturer's recommendations for wheel weights or counterweights.
20. Keep in mind the operator is responsible for accidents occurring to other people or property.
21. All drivers should seek and obtain professional and practical instruction.
22. Always wear substantial footwear and trousers. Never operate when barefoot or wearing sandals.
23. Before using, always visually check that the blades and blade hardware are present, intact, and secure. Replace worn or damaged parts.
24. Disengage attachments before: refueling, removing an attachment, making adjustments (unless the adjustment can be made from the operator's position).
25. When the machine is parked, stored, or left unattended, lower the cutting means unless a positive mechanical lock is used.
26. Before leaving the operator's position for any reason, engage the parking brake (if equipped), disengage the PTO, stop the engine, and remove the key.
27. To reduce fire hazard, keep the unit free of grass, leaves, & excess oil. Do not stop or park over dry leaves, grass, or combustible materials.
28. 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 areas may have similar laws.

TRANSPORTING AND STORAGE

1. When transporting the unit on an open trailer, make sure it is facing forward, in the direction of travel. If the unit is facing backwards, wind lift could damage the unit.
2. Always observe safe refueling and fuel handling practices when refueling the unit after transportation or storage.
3. Never store the unit (with fuel) in an enclosed poorly ventilated structure. Fuel vapors can travel to an ignition source (such as a furnace, water heater, etc.) and cause an explosion. Fuel vapor is also toxic to humans and animals.
4. Always follow the engine manual instructions for storage preparations before storing the unit for both short and long term periods.
5. Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
6. Never store the unit or fuel container inside where there is an open flame or pilot light, such as in a water heater. Allow unit to cool before storing.

SLOPE OPERATION

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

Control of a walk-behind or ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are: insufficient tire grip on the ground, speed too fast, inadequate braking, the type of machine is unsuitable for its task, lack of awareness of the ground conditions, incorrect hitching and load distribution.

1. Mow up and down slopes, not across.
2. Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
3. Choose a slow speed so that you will not have to stop or change speeds while on the slope.
4. Do not mow on wet grass. Tires may lose traction.
5. Always keep unit in gear especially when traveling down slopes. Do not shift to neutral and coast downhill.
6. Avoid starting, stopping, or turning on a slope. If tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.
7. Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction, which could cause the machine to rollover.
8. Use extra care while operating machines with grass catchers or other attachments; they can affect the stability of the unit. Do not use on steep slopes.
9. Do not try to stabilize the machine by putting your foot on the ground (ride-on units).
10. Do not mow near drop-offs, ditches, or embankments. The mower could suddenly turn over if a wheel is over the edge of a cliff or ditch, or if an edge caves in.
11. Do not use grass catchers on steep slopes.
12. Do not mow slopes you cannot back up them.
13. See your authorized dealer/retailer for recommendations of wheel weights or counterweights to improve stability.
14. Remove obstacles such as rocks, tree limbs, etc.
15. Use slow speed. Tires may lose traction on slopes even through the brakes are functioning properly.
16. Do not turn on slopes unless necessary, and then, turn slowly and gradually downhill, if possible.

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.
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.

WARNING

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

When operating on slopes use additional wheel weights or counterweights. See your dealer/retailer to determine which weights are available and appropriate for your unit.

Select slow ground speed before driving onto slope. In addition to front weights, use extra caution when operating on slopes with rear-mounted grass catchers.

Mow UP and DOWN the slope, never across the face, use caution when changing directions and **DO NOT START OR STOP ON SLOPE.**

CHILDREN

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

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

EMISSIONS

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

IGNITION SYSTEM

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

Safety Rules & Information

SERVICE AND MAINTENANCE

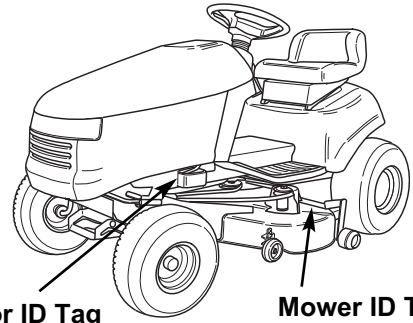
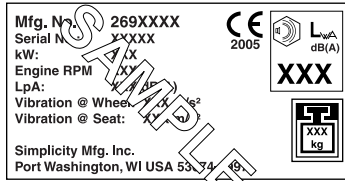
Safe Handling of Gasoline

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.
13. If the fuel tank must be drained, it should be drained outdoors.
14. Replace faulty silencers/mufflers.
15. Use only factory authorized replacement parts when making repairs.
16. Always comply with factory specifications on all settings and adjustments.
17. Only authorized service locations should be utilized for major service and repair requirements.
18. 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.
19. On multiple blade mowers, take care as rotating one blade can cause other blades to rotate.
20. Do not change engine governor settings or over-speed the engine. Operating the engine at excessive speed can increase the hazard of personal injury.
21. Disengage drive attachments, stop the engine, remove the key, and disconnect the spark plug wire(s) before: clearing attachment blockages and chutes, performing service work, striking an object, or if the unit vibrates abnormally. After striking an object, inspect the machine for damage and make repairs before restarting and operating the equipment.
22. Never place hands near the moving parts, such as a hydro pump cooling fan, when the tractor is running. (Hydro pump cooling fans are typically located on top of the transaxle).
23. 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.

Service & Maintenance

1. Never run the unit in an enclosed area where carbon monoxide fumes may collect.
2. Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
3. Never tamper with safety devices. Check their proper operation regularly and make necessary repairs if they are not functioning properly.
4. Keep unit free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage. and remove any fuel-soaked debris. Allow machine to cool before storage.
5. If you strike an object, stop and inspect the machine. Repair, if necessary, before restarting.
6. Never make adjustments or repairs with the engine running.
7. Check grass catcher components and the discharge guard frequently and replace with manufacturer's recommended parts, when necessary.
8. Mower blades are sharp. Wrap the blade or wear gloves, and use extra caution when servicing them.
9. Check brake operation frequently. Adjust and service as required.
10. Maintain or replace safety and instructions labels, as necessary.
11. Do not remove the fuel filter when the engine is hot as spilled gasoline may ignite. Do not spread fuel line clamps further than necessary. Ensure clamps grip hoses firmly over the filter after installation.
12. Do not use gasoline containing METHANOL, gasohol containing more than 10% ETHANOL, gasoline additives, or white gas because engine/fuel system damage could result.
24. **WARNING:** Stored energy device. Improper release of springs can result in serious personal injury. Springs should be removed by an authorized technician.
25. Models equipped with an engine radiator: **WARNING:** Stored energy device. To prevent serious bodily injury from hot coolant or steam blow-out, never attempt to remove the radiator cap while the engine is running. Stop the engine and wait until it is cool. Even then, use extreme care when removing the cap.

Identification Numbers



Tractor ID Tag

Mower ID Tag

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

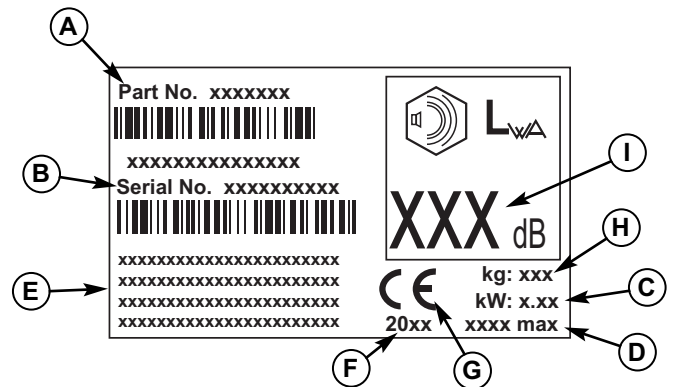
Record your model name/number, manufacturer's identification numbers, and engine serial numbers in the space provided for easy access. These numbers can be found in the locations shown.

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

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

CE Identification Tag Markings

- A. Manufacturer's Identification Number
- B. Manufacturer's Serial Number
- C. Power Rating in Kilowatts
- D. Maximum Engine Speed in Rotations per Minute
- E. Manufacturer's Address
- F. Year of Manufacture
- G. CE Compliance Logo
- H. Mass of Unit in Kilograms
- I. Sound Power in Decibels
- J. Sound Pressure at Operator's Position in Decibels
- K. Vibration at the Seat



Safety Decals

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 rider and mower should be carefully read and obeyed. Personal bodily injury can result when these instructions are not followed. The information is for your safety and it is important! The safety decals below are on your rider and mower.

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

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

Safety Icons

Warning: Read Operator's Manual.

Read and understand the Operator's Manual before using this machine.



Danger: Dismemberment.

This mower deck can amputate limbs. Keep hands and feet away from blades.



Danger: Thrown Objects.

This machine is capable of throwing objects and debris. Keep bystanders away.



Danger: Fire Hazard.

Do not add fuel while engine is hot or running. Stop engine and allow to cool for 3 minutes prior to adding fuel.



Warning: Remove Key Before Servicing.

Remove the key and consult technical literature before performing repairs or maintenance.



Danger: Hot Surface.

Allow machine to cool before touching this area.



Danger: Machine Rollover.

Do not use this machine on slopes greater than 10°.



Danger: Carbon Monoxide Poisoning.

Do not operate the engine in an unventilated area.



Danger: Dismemberment.

This machine can amputate limbs. Keep bystanders and children away when engine is running.

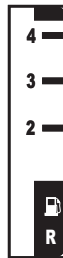
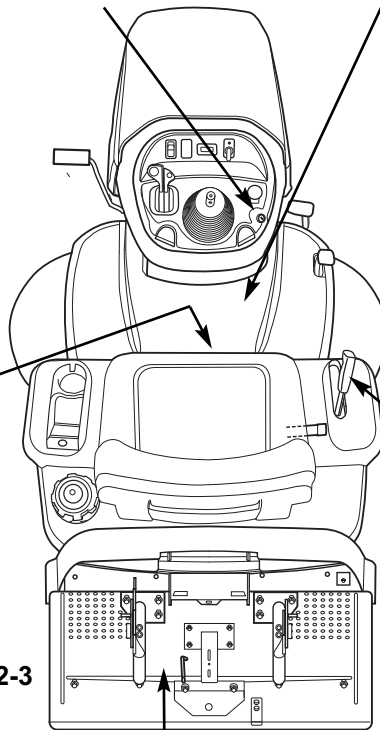


Decal Locations

**Operating Instructions,
CE Models, Part No. 1734027**



**Ignition Switch
Positions
Part No. 1722806**



**Fuel Level
Part No. S532-0-8732-762-3**

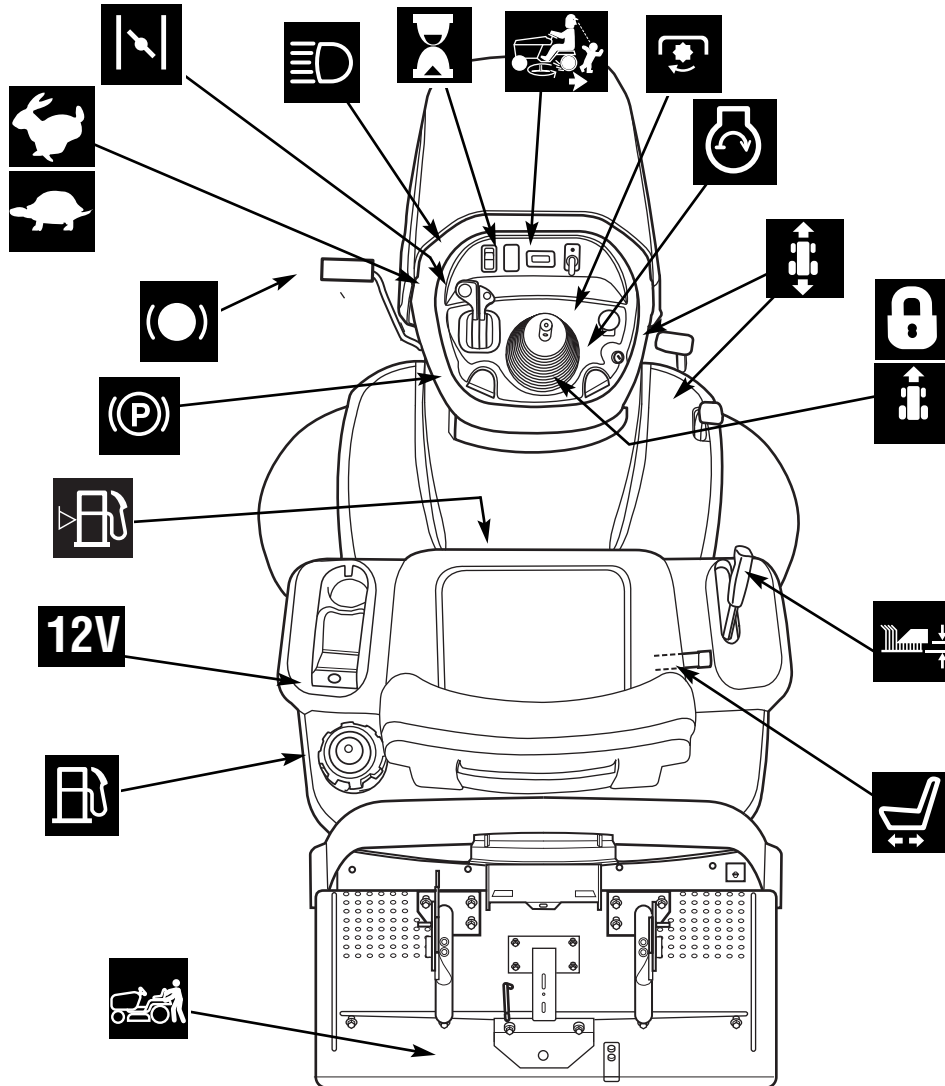


**Attachment Lift
Part No. 1730264**



**Transmission
Release
Part No. 1735265**

Features & Controls



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.



Throttle Control

The throttle controls engine speed. Move the throttle forward to increase engine speed and back to decrease engine speed. Always operate at FULL throttle.



Choke

Close the choke for cold starting. Open the choke once the engine starts. A warm engine may not require choking. Move the lever forward to close the choke.



Headlights

The light switch turns the tractor headlights on and off.



Hour Meter

The hour meter measures the number of hours the key has been in the RUN position.



Reverse Mowing Option (RMO)

The Reverse Mowing Option allows for mowing (or use of other PTO driven attachments) while traveling in reverse. If you choose to mow in reverse, turn the RMO key after the PTO is engaged. The L.E.D. light will illuminate, and the operator can then mow in reverse. Each time the PTO is engaged the RMO needs to be reactivated if desired.



PTO Switch

The PTO (Power Take-Off) switch engages and disengages attachments that use the PTO. To engage the PTO, pull UP on the switch. Push DOWN to disengage.

Note that the operator must be seated firmly in the tractor seat for the PTO to function.



Ignition Switch

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



OFF Stops the engine and shuts off the electrical system.



RUN Allows the engine to run and powers the electrical system.



START Cranks the engine for starting.

NOTE: Never leave the ignition switch in the RUN position with the engine stopped—this drains the battery.



Ground Speed Pedals

The tractor's forward ground speed is controlled by the forward ground speed control pedal. The tractor's reverse ground speed is controlled by the reverse ground speed control pedal.

Depressing either pedal will increase ground speed. Note that the further down the pedal is depressed, the faster the tractor will travel.



Cruise Control

The cruise control is used to lock the ground speed control in forward. The cruise control has five lock positions.



Mower Lift Lever

The mower lift lever controls the mower cutting height. Pull lever to lower the height and pull up to raise the height.



Seat Adjustment Lever

The seat can be adjusted forward and back. Move the lever, position the seat as desired, and release the lever to lock the seat into position.



Transmission Release Valve Lever

The transmission release valve lever deactivates the transmission so that the tractor can be pushed by hand. See PUSHING THE TRACTOR BY HAND for operational information.



Fuel Tank

To remove the cap, turn counterclockwise.



12V Power Outlet (Select Models)

The power outlet is 12V-DC. Accessory must be rated at 9 amps or less.



Fuel Level Gauge

Displays the fuel level in the tank.



Parking Brake

The parking brake knob is used to lock the parking brake when the tractor is stopped. Fully depressing the brake pedal and pulling up on the knob engages the parking brake. Refer to page 12 for a full explanation of parking brake functions.



Brake Pedal

Depressing the brake pedal applies the tractor brake.

Features & Controls

Parking Brake Function

Applying the Parking Brake - See Figure 2. To lock the parking brake, release the ground speed pedals (A), fully depress the brake pedal (B), pull UP on the parking brake knob (C), and then release brake pedal.

Releasing the Parking Brake - See Figure 2. To release the parking brake, depress the brake pedal (B).

Cruise Control Operation

TO ENGAGE:

1. Pull up on the cruise control knob (D, Figure 2).
2. Depress the forward ground speed pedal (A).
3. Lift up the cruise control knob (D) when desired speed is reached. The Cruise will lock in one of its five locking positions.

TO DISENGAGE:

1. Depress the brake pedal (B).

OR

2. Depress the forward ground speed pedal (A).

Hour Meter

The hour meter (E, Figure 2) measures the number of hours the key has been in the RUN position.

CAUTION

Avoid Injury. Safe operation requires your full attention. Do not wear radio or music headphones while operating machine.

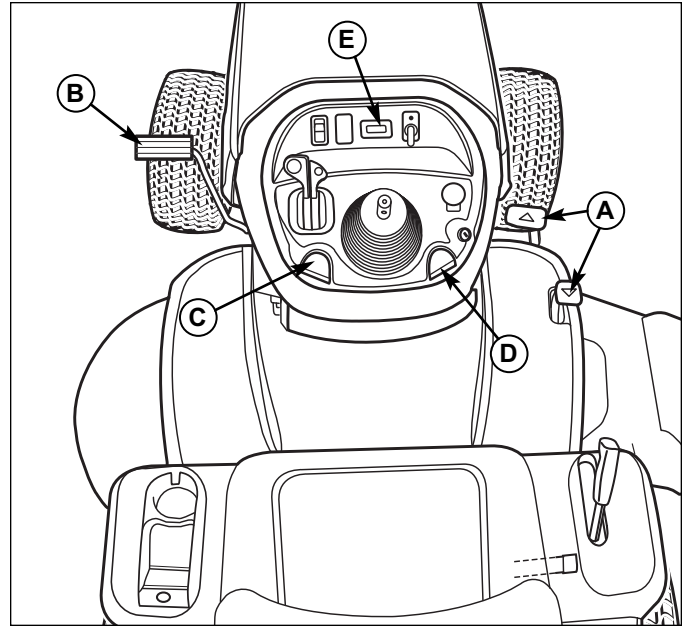


Figure 1. Engaging the Parking Brake

- A. Ground Speed Pedals**
- B. Brake Pedal**
- C. Parking Brake Knob**
- D. Cruise Control Knob**
- E. Hour Meter**



Operating the Tractor



Safety Interlock System Tests

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

Operational SAFETY Checks

Your unit is equipped with a seat switch safety system. Check the seat switch operation every fall and spring with the following tests.

Test 1 — Engine should NOT crank if:

- PTO switch is ON, OR
- Brake pedal is NOT fully depressed (parking brake OFF), OR
- The cruise control lever is NOT in NEUTRAL.

Test 2 — Engine SHOULD crank and start if:

- Operator is sitting in seat, AND
- PTO switch is OFF, AND
- Brake pedal is fully depressed (parking brake ON), AND
- The cruise control lever is in NEUTRAL

Test 3 — Engine should SHUT OFF if:

- Operator rises off seat.

Test 4 — Blade Brake Check

Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned OFF (or operator rises off seat). If mower drive belt does not stop within five seconds, readjust the PTO clutch as described in the ADJUSTMENTS section or see your dealer.

Test 5 — Reverse Mow Option (RMO) Check

- Engine should shut off if reverse travel is attempted if the PTO has been switched on and RMO has not been activated.
- RMO light should illuminate when RMO has been activated.



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.

General Operating Safety

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.

Adding Fuel

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 use gasoline containing METHANOL, gasohol containing more than 10% ETHANOL, gasoline additives, or white gas because engine/fuel system damage could result.

To add fuel:

1. Remove the fuel cap (A, Figure 3).
2. Fill the tank. Do not overfill. Leave room in the tank for fuel expansion. Refer to your engine manual for specific fuel recommendations.
3. Install and hand tighten the fuel cap.

Starting the Engine

1. While sitting in the operator's seat, fully depress the brake pedal or set the parking brake.
 2. Make sure that your feet are not depressing the ground speed control pedals and that the cruise control lever is in neutral.
 3. Disengage the PTO clutch.
 4. Set the throttle to FULL.
 5. Close the choke.
- NOTE: A warm engine may not require choking.*
6. Insert the ignition key and turn it to START.
 7. After the engine starts, move the engine throttle control to half speed. Warm up the engine by running it for at least 30 seconds.
 8. Set throttle to FULL.

NOTE: 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 TRACTOR.

Operating the Tractor

Stopping the Tractor & Engine

1. Return the ground speed control(s) to neutral.
2. Disengage the PTO and wait for all moving parts to stop.
3. **Briggs & Stratton Models:** Move the throttle control to SLOW position and turn the ignition key to OFF. Remove the key.

Driving the Tractor

1. Sit in the seat and adjust the seat so that you can comfortably reach all the controls and see the dashboard display.
2. Engage the parking brake.
3. Make sure the PTO switch is disengaged.
4. Start the engine (see STARTING THE ENGINE).
5. Disengage the parking brake and release the brake pedal.
6. Depress the forward ground speed control pedal to travel forward. Release the pedal to stop. Note that the further down the pedal is depressed the faster the tractor will travel.
7. Stop the tractor by releasing the ground speed control pedals, setting the parking brake, and stopping the engine (see STOPPING THE TRACTOR AND ENGINE).

Mowing

1. Set the mower cutting height to the desired level and set the gauge wheels to the appropriate position (if equipped).
2. Engage the parking brake. Make sure the PTO switch is disengaged.
3. Start the engine (see STARTING THE ENGINE).
4. Fully lower the mower using the attachment lift lever and set cutting height.
5. Set the throttle to FULL.
6. Engage the PTO (Mower Deck).
7. Begin mowing. See Section LC for tips on mowing patterns, lawn care, and troubleshooting information.
8. When finished, shut off the PTO and raise the mower using the attachment lift control lever.
9. Stop the engine (see STOPPING THE TRACTOR AND ENGINE).

WARNING

The engine will shut off if the reverse ground speed pedal is depressed while the PTO is on and the RMO has not been activated. The operator should always turn the PTO off prior to driving across on roads, paths or any area that maybe used by other vehicles. Sudden loss of drive could create a hazard.

WARNING

Mowing in reverse can be hazardous to bystanders. Tragic accidents can occur if the operator is not alert to the presence of children. Never activate RMO if children are present. Children are often attracted to the unit and the mowing activity.

Mowing in Reverse

If an operator chooses to mow in reverse, the RMO system can be used. To use the Reverse Mowing Option (RMO) turn the RMO key after the PTO is engaged. The L.E.D. light will illuminate, and the operator can then mow in reverse. Each time the PTO is engaged the RMO needs to be reactivated if desired. The key should be removed to restrict access to the RMO feature.

Attachment Operation in Reverse

If an operator chooses to operate a PTO driven attachment in reverse, the RMO system can be used. To use the Reverse Mowing Option (RMO) turn the RMO key after the PTO is engaged. The L.E.D. light will illuminate, and the operator can then operate the attachment in reverse. Each time the PTO is disengaged the RMO needs to be reactivated if desired. The key should be removed to restrict access to the RMO feature.

Pushing the Tractor by Hand

1. Disengage the PTO and turn the engine off.
2. Pull the transmission release (B, Figure 3) back approximately 2-3/8" (6 cm) to lock into released position.
3. The tractor can now be pushed by hand.



DO NOT TOW TRACTOR

Towing the unit will cause transmission damage. • Do not use another vehicle to push or pull this unit. • Do not actuate the transmission release valve lever while the engine is running.

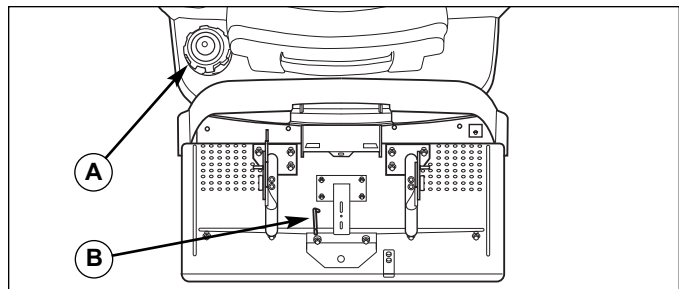


Figure 2. Transmission Release Lever & Fuel Tank
A. Fuel Tank Cap
B. Transmission Release Lever

⚠ WARNING

Engage parking brake, disengage PTO, stop engine and remove key before attempting to install or remove the mower.

Mower Deck Removal & Installation

Removing the Mower Deck

1. Park tractor on a hard, level surface such as a concrete floor. Turn off PTO switch and engine, remove the key and apply parking brake.
2. Place mower in the lowest cutting position using the mower lift lever (A, Figure 3).
3. Place the mower lift lever (A) in the lowered position.
4. Disconnect the hair pins (A, Figure 4) from the trunions (B) on both sides of the mower deck. Remove trunions from mower deck lift arms (C). Re-install the hair pins to prevent loss.
5. Remove upper spring (D) and the two lower springs (E) on each side of the mower deck.

⚠ CAUTION

The muffler and surrounding areas may be hot.

6. Release belt tension with idler arm (A). Remove belt from PTO pulley (B, Figure 5).
7. Turn wheels straight ahead. Lift mower hitch off of the tractor brackets (A, Figure 6).
8. Push the discharge tube (A, Figure 7) toward the back to separate it from the mower discharge opening (B).
9. Turn wheels fully left, and slide mower deck out right side of tractor.

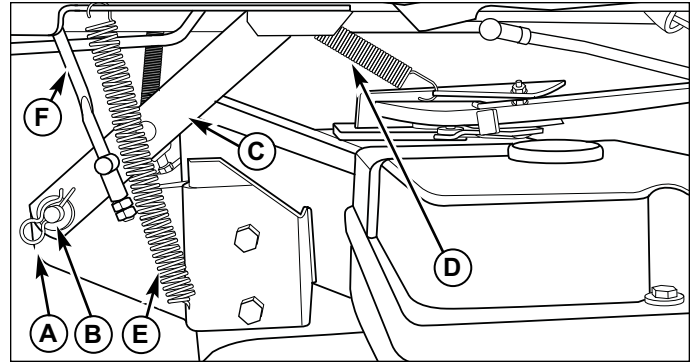


Figure 4. Mower Deck Removal and Installation (viewed from underneath right side of tractor)
A. Hair Pins
B. Trunions
C. Lift Arm
D. Upper Spring
E. Lower Spring (2)
F. Lift Rod

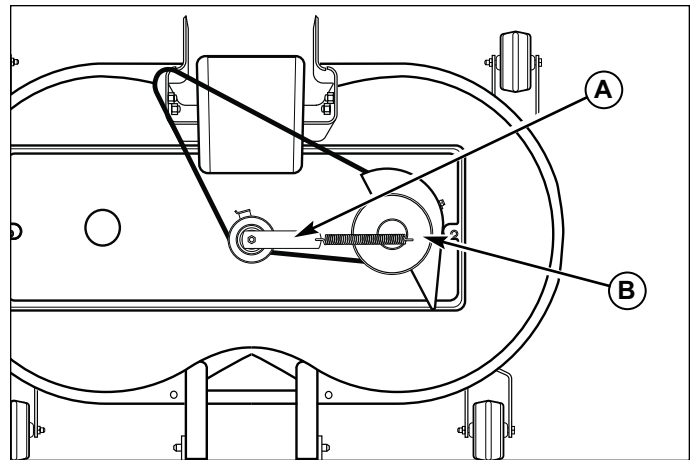


Figure 5. Removing & Installing Belt
A. Idler Arm
B. PTO Pulley

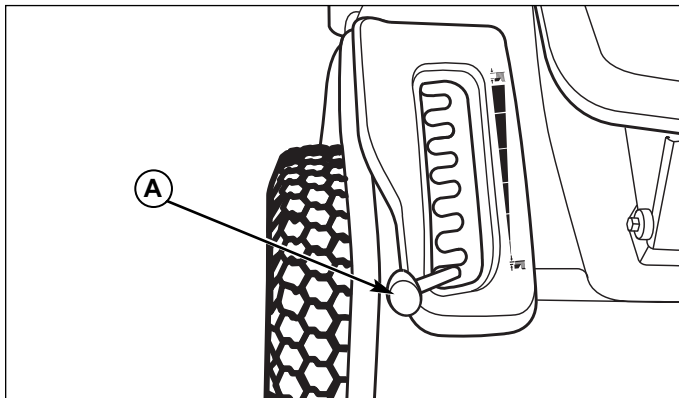


Figure 3. Mower Lift Lever (Lowered Position)
A. Lift Lever

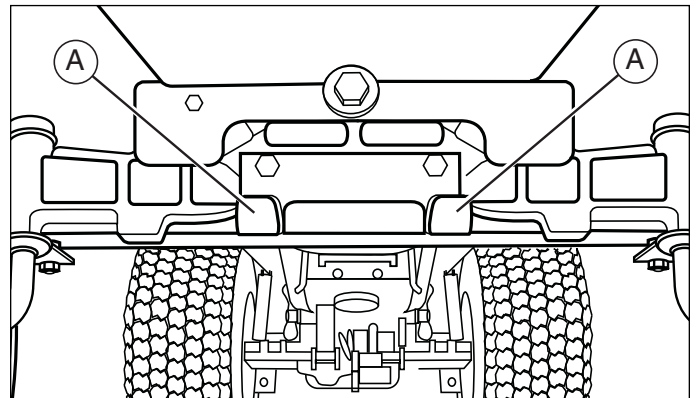


Figure 6. Mower Hitch
A. Tractor Hitch Brackets

Operating the Tractor

Installing the Mower Deck

1. Park tractor, shut off PTO and engine, remove the key and apply parking brake. Turn the wheels fully to the left and slide mower deck under right side of tractor.
2. From the rear with the grass catcher open pull discharge chute to rear.
3. Push the discharge chute tube (A, Figure 7) toward the back to separate it from the mower discharge opening.
4. Turn wheels straight ahead. Place lift mower hitch on the tractor hitch brackets (A, Figure 6).
5. Place belt on PTO pulley.
6. Attach upper spring (D, Figure 4) and the two lower side springs (E) on each side of mower deck.
7. Connect the trunions (B) to mower deck lift arms (C). Secure with hair pins (A).
8. Move idler arm (A, Figure 5) to increase belt tension.
9. Align and connect the discharge tube and mower discharge opening.
10. Install the grass catcher (see "Catcher Removal & Installation").
11. Adjust mower deck, if necessary (see "Cutting Height Adjustment" section).

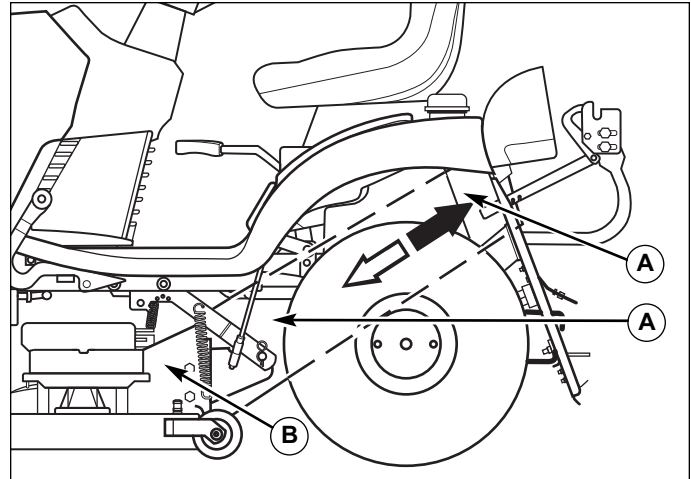


Figure 7. Discharge Chute Tube
A. Discharge Tube
B. Mower Discharge Opening

Catcher Removal & Installation

⚠ WARNING

Do not operate the unit without the hopper or deflector in place.

1. Move the lock lever (A, Figure 8) backward to unlock the catcher from the rear support arms.
2. Lift the catcher off the rear support arms.
3. Install in reverse order of removal.
To assist installing the catcher, be sure to line up the alignment marks on the catcher and rear of the tractor.

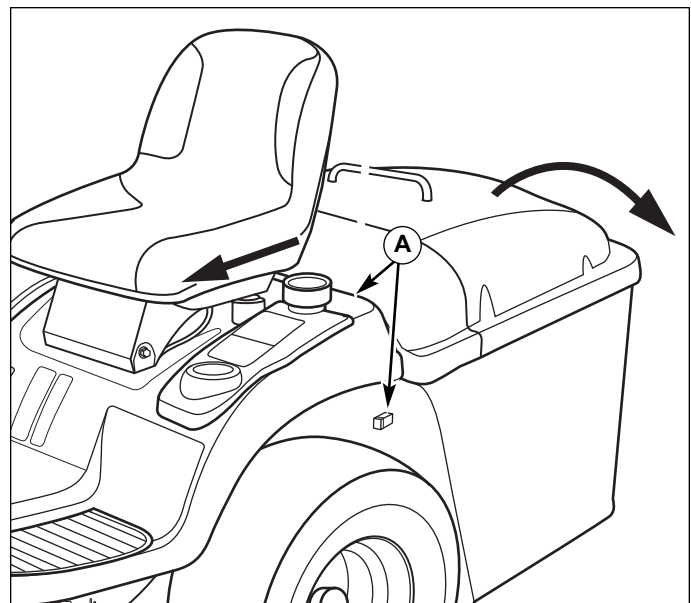


Figure 8. Emptying the Hopper
A. Lock Lever

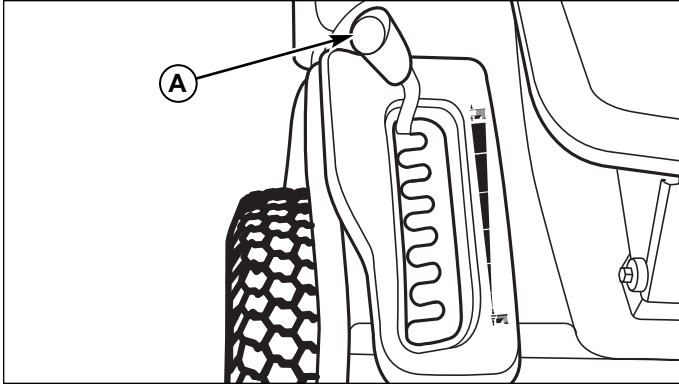


Figure 9. Raising & Lowering Mower
A. Mower Lift Lever

Cutting Height Adjustment

The mower lift lever (A, Figure 9) is used to lower the deck to cutting position and raise the deck to transport position.

To lower the deck, pull back slightly on the mower lift lever (A), push it to the left and slide it down. To raise the deck to transport pull up on the mower lift lever (A) and lock in notch to the right. **Do not cut in transport.**

Attaching a Trailer

The maximum horizontal drawbar force allowed is 280 Newton. The maximum vertical drawbar force is 160 Newton. This equates to a 250 lbs (113 kg) trailer on a 10 degree hill. Secure the trailer with an appropriately sized clevis pin (A, Figure 10) and clip (B).

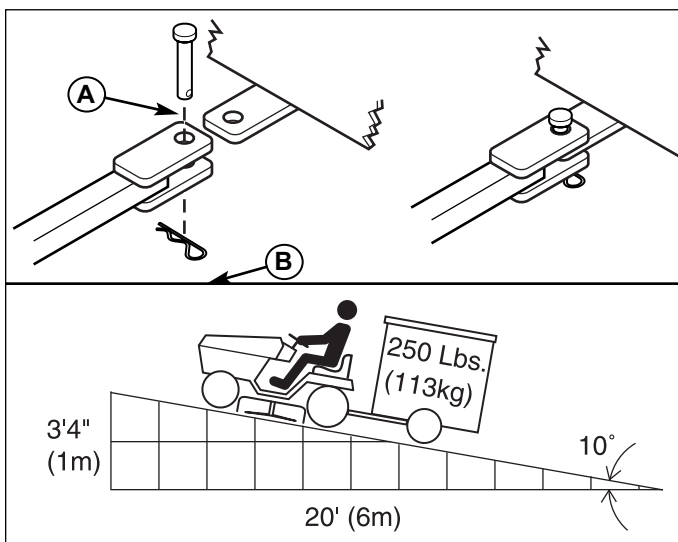


Figure 10. Trailer Weight Recommendations
A. Clevis Pin **B. Clip**

⚠ WARNING

Never store the unit (with fuel) in an enclosed, poorly ventilated structure. Fuel vapors can travel to an ignition source (such as a furnace, water heater, etc.) and cause an explosion. Fuel vapor is also toxic to humans and animals.

Storage

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:

- Disengage the PTO, set the parking brake, and remove the key.
- Perform engine maintenance and storage measures listed in the engine owner's manual. This includes draining the fuel system, or adding stabilizer to the fuel (do not store a fueled unit in an enclosed structure - see warning).
- Battery life will be increased if it is removed, put in a cool, dry place and fully charged about once a month. If the battery is left in the unit, disconnect the negative cable.

Before starting the unit after it has been stored:

- Check all fluid levels. Check all maintenance items.
- Perform all recommended checks and procedures found in the engine owner's manual.
- Allow the engine to warm up for several minutes before use.



Regular Maintenance

Maintenance Schedule & Procedures

The following schedule should be followed for normal care of your tractor and mower.

SAFETY ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Safety Interlock System						•
Check Tractor Brakes						•
Check Mower Blade Stopping Time				•		•
TRACTOR MAINTENANCE ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 100 Hours	Every 250 Hours	Spring & Fall
Check Timing Belt Tension	•					•
Check Moving System V Belt Tension	•					•
Check Tractor/Mower for loose hardware		•				
Check / Clean Cooling Fins (If Equipped)				•		
Check / Adjust PTO Clutch					•	
Lubricate Tractor & Mower **			•			
Lubricate Rear Axle Shafts						Yearly
Clean Battery & Cables				•		
Check Tire Pressure			•			
Clean Deck & Check/Replace Mower Blades**				•		
ENGINE MAINTENANCE ITEMS	Before Each Use	Every 5 Hours	Every 25 Hours	Every 50 Hours	Every 100 Hours	Spring & Fall
Check Engine Oil Level	•					
Check / Change Engine Air Filter *			•			
Change Engine Oil *				B & S	•	•
Change Engine Oil & Filter *					•	
Inspect Spark Plug(s) *						•
Check / Replace Fuel Filter *						

• = All Models

B & S = Briggs & Stratton Models

* 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.

Check Tire Pressure

Service Interval: Every 25 Hours

Tire pressure should be checked periodically, and maintained at the levels shown in the chart (see Figure 11). 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.

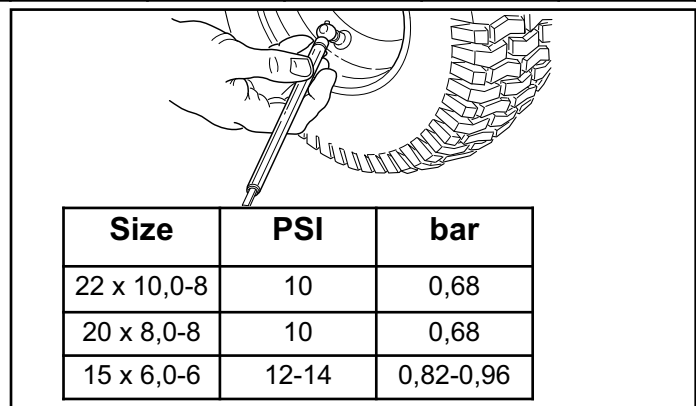


Figure 11. Tire Pressure

Safety Interlock System Check

Service Interval: Every Fall & Spring

Check the function of the safety interlock system using the test procedure found on page 13 of this manual. If the tractor fails any of the tests, see your dealer.

Blade Brake Check

Service Interval: Every 100 Hours or Fall & Spring

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

1. With tractor in neutral, PTO disengaged and operator in seat, start the engine.
2. Look over the left-hand footrest at the mower drive belt. Engage the PTO and wait several seconds. Disengage the PTO and check the amount of time it takes for the mower drive belt to stop.
3. If mower drive belt does not stop within five seconds, re-adjust the clutch or see your dealer.

PTO Clutch Adjustment Check

Service Interval: Every 250 Hrs

Check the PTO clutch adjustment after every 250 hours of operation—or if the clutch starts slipping or will not engage. Check and adjust the clutch using the procedure outlined in the Adjustments section of this manual.

Engine Maintenance

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

Battery Maintenance

⚠ WARNING

When removing or installing battery cables, disconnect the negative cable **FIRST** and reconnect it **LAST**. If not done in this order, the positive terminal can be shorted to the frame by a tool.

Cleaning the Battery and Cables

Service Interval: Every 100 Hours

1. Disconnect the cables from the battery, negative cables first (A, Figure 12) then the cover and positive cables (B).
2. Loosen the wingnut and washer (D).
3. Pivot the hold-down rod (C) up and away from battery. Secure to steering tower.
4. Remove the battery (E).
5. Clean the battery compartment with a solution of baking soda and water.
6. Clean the battery terminals and cable ends with a wire brush and battery terminal cleaner until shiny.
7. Reinstall the battery (E) in the battery compartment. Secure with the battery hold-down rod (C) and wingnut and washer (D).
8. Re-attach the battery cables, positive cables and cover first (B) then the negative cables (A).
9. Coat the cable ends and battery terminals with petroleum jelly or non-conducting grease.

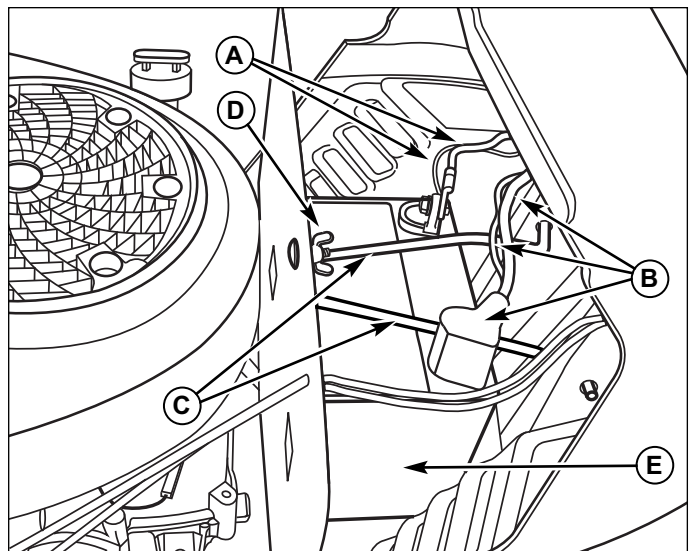


Figure 12. Battery Maintenance

- A. Negative Cables
- B. Positive Cables & Cover
- C. Hold-Down Rod
- D. Wingnut & Washer
- E. Battery

Regular Maintenance

Transmission Identification

To determine what transmission is in your tractor, check the identification tag attached to the axle of the transmission (Figure 13), or check your tractor's parts book.

Transmission Maintenance

The K46 transmission is a sealed unit and does not require regular maintenance. If the transmission lacks drive or is excessively noisy, it may need to be purged. See dealer for service.

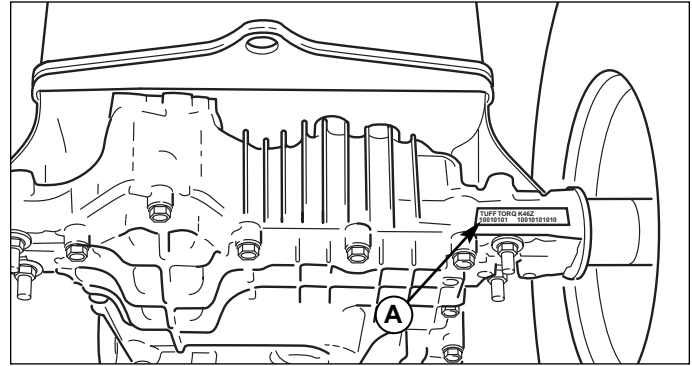


Figure 13. Transmission ID Tag Location
A. ID Tag

Hood Removal and Installation

HOOD REMOVAL

1. Open the hood.
2. Remove the socket and bulbs (A, Figure 14) by twisting the socket counterclockwise and pulling it out of the bezel (B). Repeat on other side.
3. Rock the hood back slightly and lift hood (B, Figure 16) off pivot posts (C). Set hood on a clean and flat surface.

HOOD INSTALLATION

1. Set hinge posts (A, Figure 15) onto pivot posts (C).
2. Roll the hood forward until it reaches the stops (D).
3. Install the socket and bulb (A) by pushing it into the bezel (B) twisting the socket and bulb clockwise. Repeat on other side.
4. Close the hood.

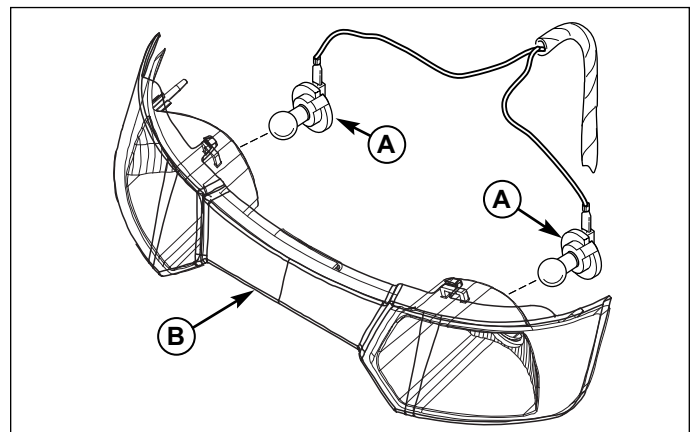


Figure 14. Head Light
A. Socket and Bulb
B. Bezel

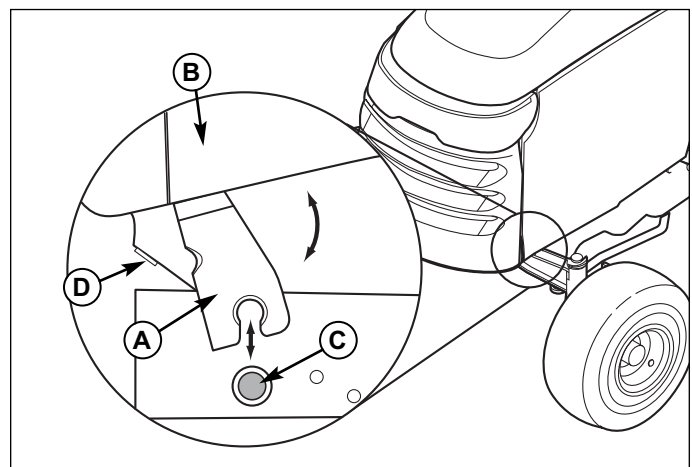


Figure 15. Hood Removal and Installation
A. Hinge Post
B. Hood
C. Pivot Post
D. Stop

Lubrication

Service Interval: Every 25 Hours

Lubricate the unit at the locations shown in Figures 16-20 as well as the lubrication points listed. Generally, all moving metal parts should be oiled where contact is made with other parts. Keep oil and grease off belts and pulleys. Wipe surfaces clean before and after lubrication.

Grease:



- steering linkage
- mower linkage
- rear axle shafts (remove wheel hubs)
- front axle pivot

Use grease fittings when present. Automotive lithium grease is recommended.

Oil:



- foot pedal rods & brackets
- seat adjustment assembly
- draglink
- mower deck height adjustment linkage
- transmission idler assembly

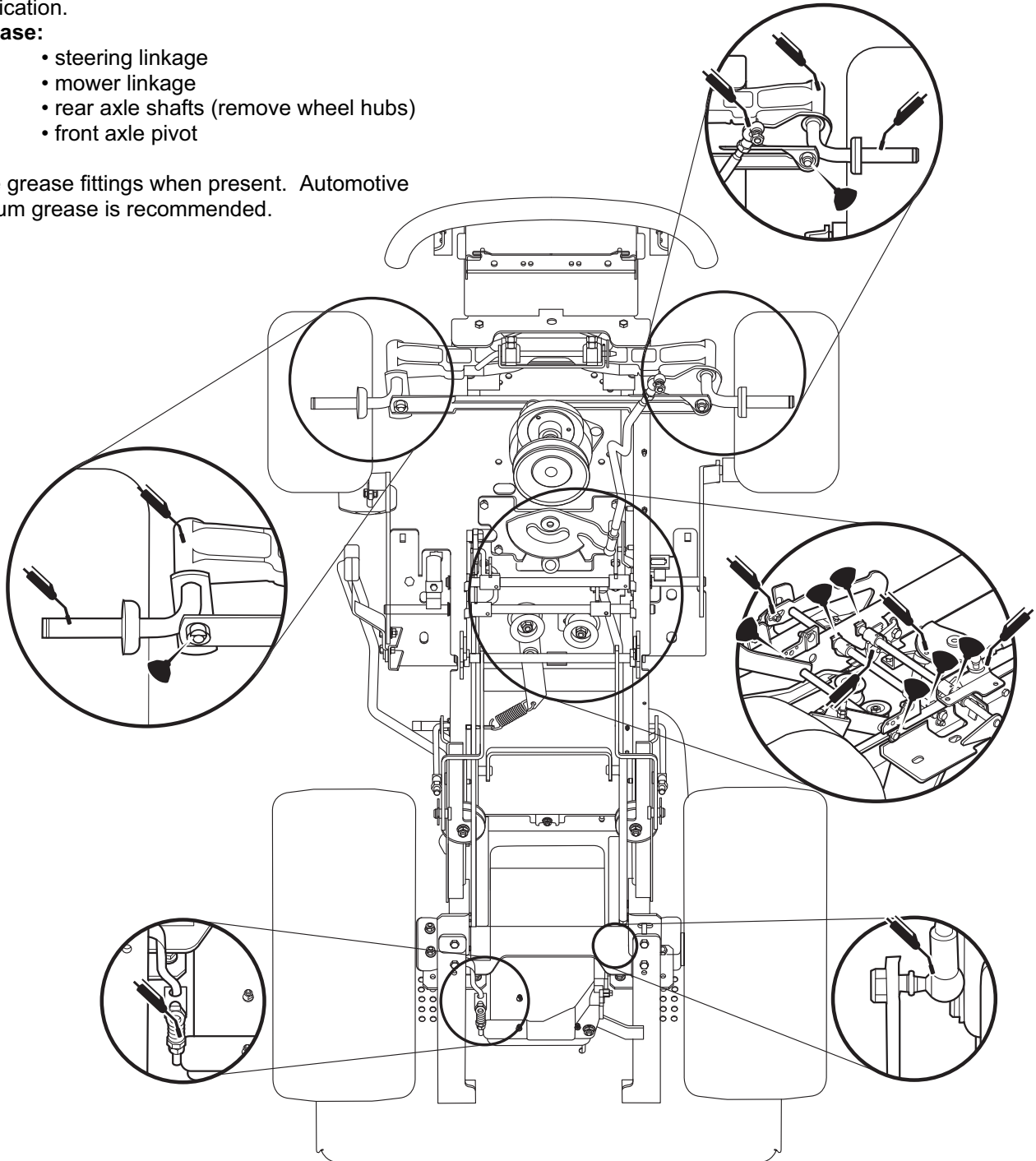


Figure 16. Tractor Lubrication Points

Regular Maintenance

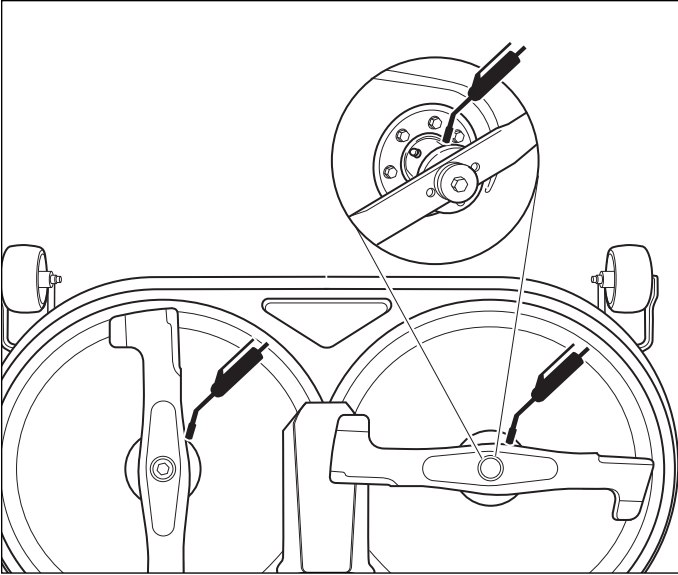


Figure 18. Arbor Lubrication Points

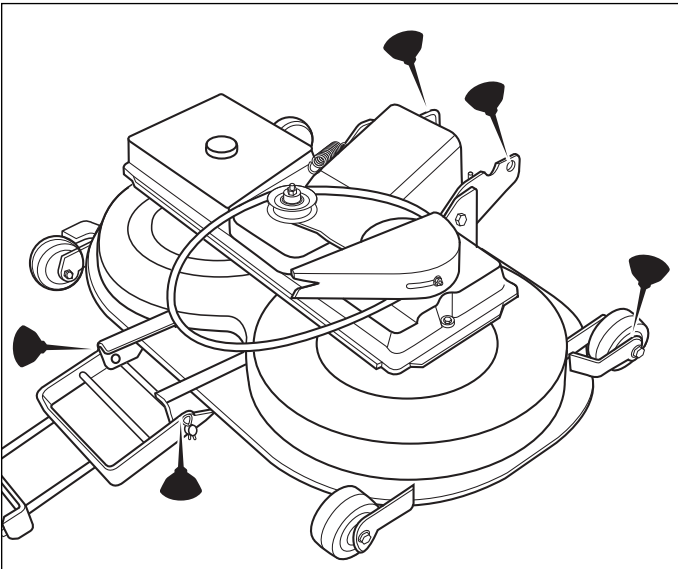


Figure 19. Lubricate Deck Linkage (Typical)

Lubricate Rear Axle Shafts

Service Interval: Yearly

We recommend removing the rear wheel hubs and lubricating the axle shafts yearly. This prevents the wheel hubs from seizing onto the axle shaft and makes future service easier.

1. Turn off the ignition, turn off the PTO, engage the parking brake, and block the front tires.
2. Using a jack or chain hoist positioned at the center of the rear frame, carefully jack the unit up until the rear tires are approximately 1"- 2" (2.5-5 cm) off the ground.

NOTE: For overall unit stability during service, do not jack rear end higher than required for wheel removal.

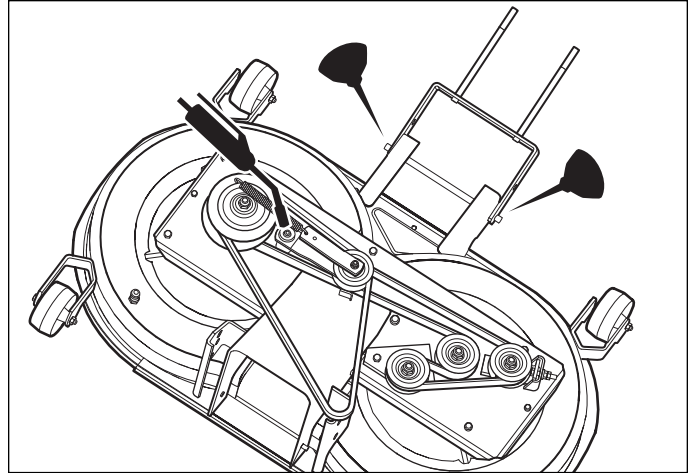


Figure 20. Mower Lubrication Points

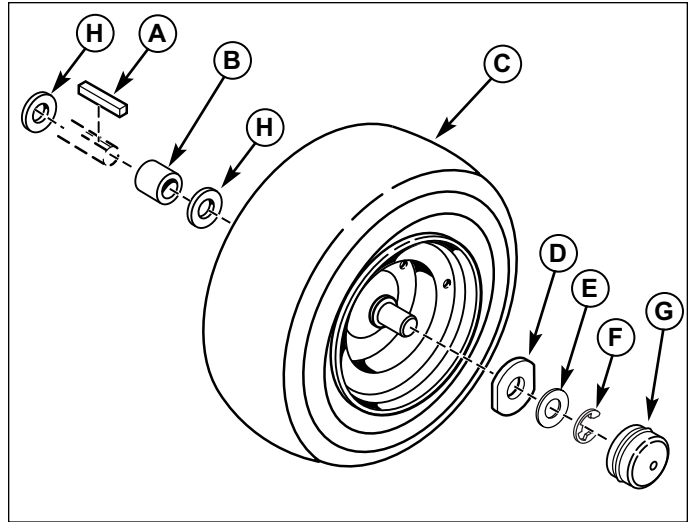


Figure 21. Rear Axle Hardware

- A. Key
- B. Spacer
- C. Wheel & Hub
- D. Special Washer
- E. Small Washer
- F. E-Clip
- G. Axle Cap
- H. Large Washer

3. Support the rear of the unit on jackstands positioned under the rear frame.

NOTE: Your axle assembly may differ slightly from the assembly pictured: the quantity of washers is adjusted to allow a small amount of axle end-play.

4. Remove the hardware retaining the wheel assembly to the axle and lubricate the axle shaft using anti-seize compound or lithium grease.
5. Reinstall the components in reverse order of disassembly and lower the unit. Be sure the key (A, Figure 21) is in place in the axle keyway.

⚠ WARNING

For your personal safety, do not handle the sharp mower blades with bare hands. Careless or improper handling of blades may result in serious injury.

⚠ WARNING

For your personal safety, blade mounting capscrews must each be installed with a hex washer and spring washer, then securely tightened. Tighten blade mounting capscrew to 30 +/- 3 Nm.

⚠ CAUTION

At the moment the mower blades hit a solid object, stop the engine immediately and check the blades. The shear pins may be damaged or cut.

Servicing the Mower Blades

Service Interval: Every 100 Hours or As Required

NOTE: The mower blades must be sharp, balanced, and straight. These conditions are important for the evenness of height of mowing and quality of cut. The blunt cutting edge worsens both the quality of mowing and result of mowed grass collecting.

1. Remove mower deck (see "Mower Deck Removal").
2. See Figure 22. To remove blade for sharpening, use a block of wood to prevent blade rotation while loosening the capscrew.
3. Remove the capscrew (A, Figure 24), spring washer (B), spline washer (E), alignment pin (C) and blade (D). Do not remove the blade adapter (F).
4. Use a file to sharpen blade to a fine edge. If blade is damaged, it must be replaced.
5. Balance the blade as shown in Figure 23. Center the blade's hole on a nail lubricated with a drop of oil. A balanced blade will remain level.
6. Reinstall the blade with the tabs pointing up toward the mower deck as shown.
7. Position blades perpendicular to each other as shown in Figure 26. If not, perform "Check Mower Blade Timing" in this section.
8. Reinstall the spline washer (E, Figure 24), spring washer (B) and capscrew (A). Use a wooden block to prevent blade rotation while tightening the capscrew (A) 30 +/- 3 Nm.

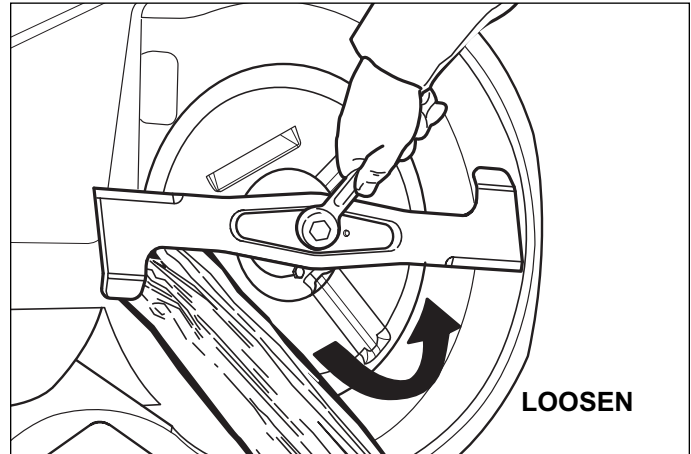


Figure 22. Blade Removal

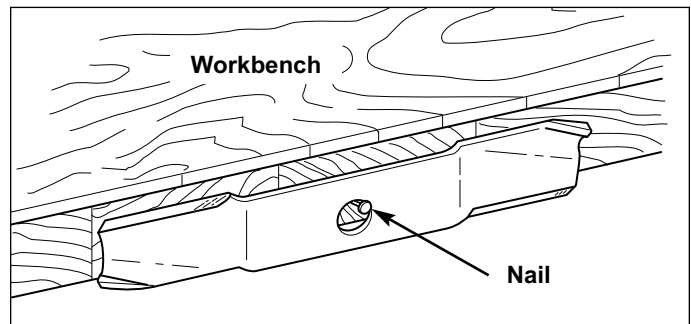


Figure 23. Balancing The Blade

Regular Maintenance

Check Mower Blade Timing

Service Interval: Yearly

1. Turn the PTO OFF, engage the parking brake, turn the engine off, and remove the key. Remove the mower deck (see "Mower Deck Removal").
2. Turn the mower deck over and check the position of the blades. The blades must be positioned perpendicular to each other as shown in Figure 25. If not, proceed to step 3.
3. See Figure 22. Use a block of wood to prevent blade rotation while loosening the capscrew.
4. Remove the capscrew (A, Figure 24), spring washer (B), and spline washer (E).
5. Remove the alignment pin (C). Rotate the blade (D) manually until the blades are perpendicular to each other as shown in Figure 25. It may be necessary to remove and rotate the blade adapter (F) to align the blade hole and adapter hole.
6. Reinstall the alignment pin (C, Figure 24), spline washer (E), spring washer (B) and capscrew (A). Use a wooden block to prevent blade rotation while tightening the capscrew (A) 30 +/- 3 Nm.

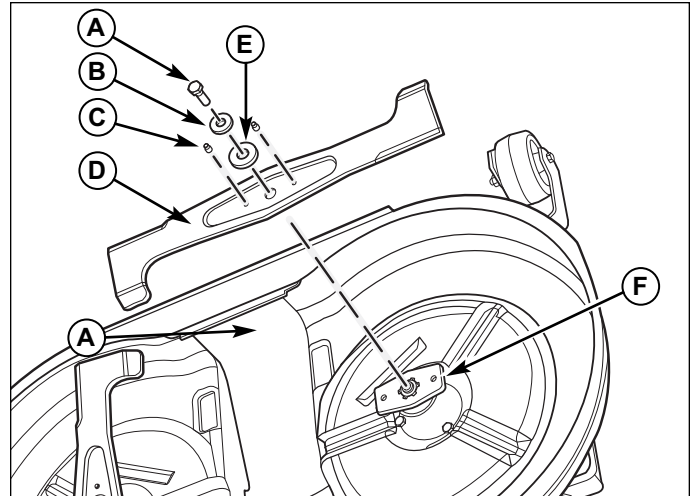


Figure 24. Blade Installation

- A. Capscrew
- B. Spring Washer
- C. Alignment Pin
- D. Blade
- E. Spline Washer
- F. Blade Adapter

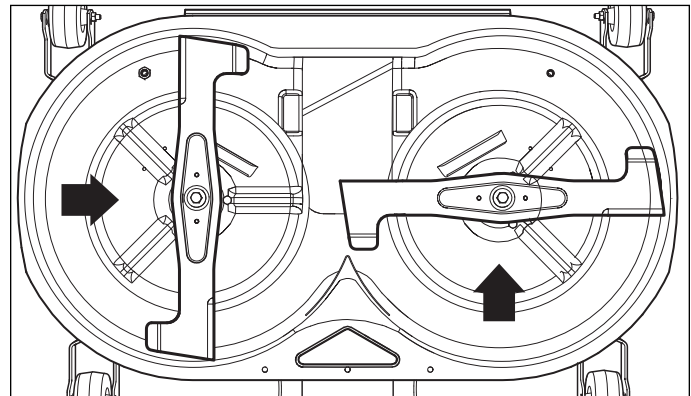


Figure 25. Check Blade Timing

Check & Fill Engine Oil

Service Interval: Before each use, and every 8 hours.

1. Turn the engine off, and set the parking brake to PARK.
2. Clean the area around the dipstick (C, Figure 26 or 27).
3. Remove the dipstick (C) and clean it with a paper towel.
4. Insert the dipstick (C) back into the engine. **Briggs & Stratton Models**, thread the cap back onto the tube.
5. Remove the dipstick and read the oil level. The oil level should be between the "FULL" and "ADD" marks (D). If not, add oil according to the "Recommended Engine Oil" chart (see Figure 28).

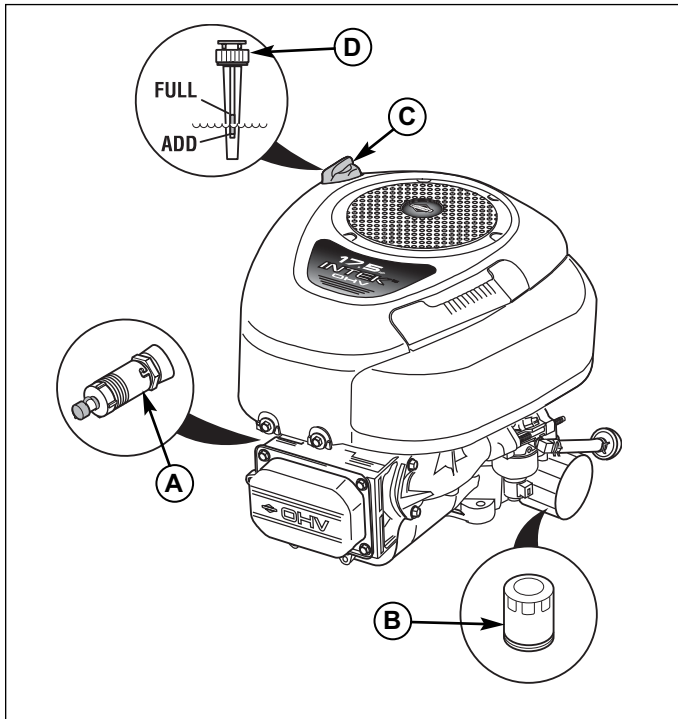


Figure 26. Single Cylinder Engine Models
A. Oil Drain Valve
B. Oil Filter
C. Dipstick
D. Checking Oil Level

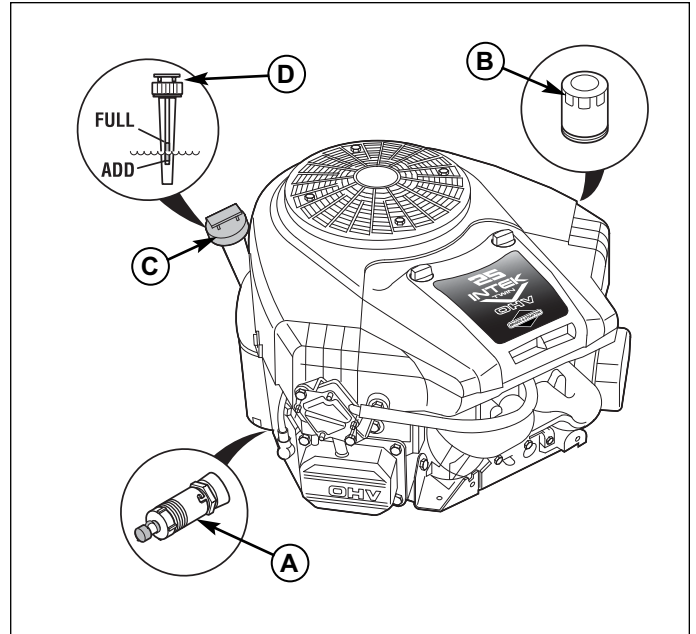


Figure 27. V-Twin Engine Models
A. Oil Drain Valve
B. Oil Filter
C. Dipstick
D. Checking Oil Level

Use oil classified API Service Class SF, SG, SH, SJ or better with SAE Viscosity:

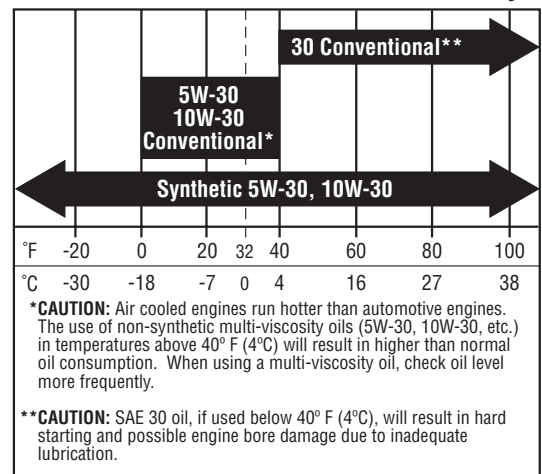


Figure 28. Recommended Engine Oil

Regular Maintenance

Oil Drain Valve Operation

1. Place a suitable container with a 4 quart capacity under the oil drain valve (A, Figure 26 or 27).
2. Loosen or remove the dipstick (C).
3. Wipe oil drain valve (B, Figure 29) and cover (C) with paper towel or rag.

NOTE: Sliding a hose with a 1/2" (12.5 mm) inside diameter tube over the valve nipple may aid in guiding the draining oil.

4. Rotate the oil drain valve (B) counterclockwise and pull out 1/4" (6.35 mm) for engine oil to drain. Allow ample time for complete drainage.
5. After all the oil has drained, close the oil drain valve (B) by pushing in and rotating clockwise to close.
6. Wipe the nipple (D) with paper towel or rag. Install the cover (C) over nipple (D).

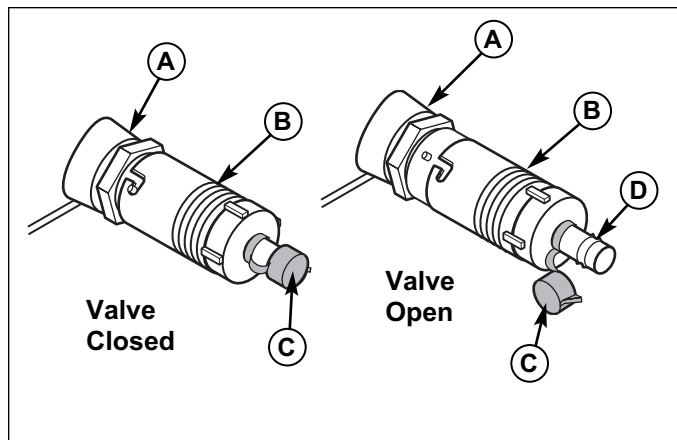


Figure 29. Oil Drain Valve
A. Engine Block / Valve Base
B. Oil Drain Valve
C. Cover
D. Nipple

Change Engine Oil

BRIGGS & STRATTON MODELS

Service Interval: 50 hours or once per season.

Oil Capacity: Approximately 1-7/8 quarts (1.8 L) without filter change.

NOTE: Change engine oil while the engine is warm. Run the engine for a few minutes, then shut the engine off and allow it to cool from hot to warm.

1. Clean the area around the dipstick (C, Figure 26 or 27) and oil drain valve (A).
2. Drain engine oil. See OIL DRAIN VALVE OPERATION above.
3. Fill the crankcase with oil. See CHECK ENGINE OIL LEVEL.

5. Turn the filter clockwise until the rubber gasket meets the filter base. Then turn filter an additional 1/2 to 3/4 turn.
6. Fill the crankcase with oil. See CHECK ENGINE OIL LEVEL.
7. Test run the engine to check for leaks. Stop the engine for 1 minute, then recheck the oil level.

Change Engine Oil & Filter

BRIGGS & STRATTON MODELS

Service Interval: 100 hours or once per season.

Oil Capacity: Approximately 2 quarts (1.9 L) with oil filter change.

NOTE: Change engine oil while the engine is warm. Run the engine for a few minutes, then shut the engine off and allow it to cool from hot to warm.

1. Clean the area around the dipstick (C, Figure 26 or 27) and oil drain valve (A).
2. Drain engine oil. See OIL DRAIN VALVE OPERATION above.
3. Remove the oil filter (B). Discard the filter.
4. Using a drop of oil on your finger tip, wet the rubber gasket on the bottom of the new filter.

Air Filter & Pre-Cleaner Service

V-TWIN MODELS

Service Interval: Pre-Cleaner: Every 25 hours or as required. Air Filter: Every 50 hours or as required.

Replacement Interval: Pre-Cleaner: As required. Air Filter: Every 200 hours or once per season.

Air Filter Removal & Installation

1. Unscrew the four knobs (A, Figure 30) by turning counterclockwise.
2. Remove the cover (B). Remove the air filter (C) and pre-cleaner (D).
3. Install the pre-cleaner (D) with the mesh side up. Install the air filter (C) as shown.
4. Install the cover (B) making sure the tabs are inserted into their slots. Secure by turning screws clockwise until snug.

Pre-Cleaner Service

NOTE: Replace a worn or damaged pre-cleaner.

1. Wash the pre-cleaner in liquid detergent and water (see Figure 31).
2. Squeeze the pre-cleaner dry and saturate with engine oil. Remove all excess oil by squeezing the pre-cleaner in an absorbent cloth.

Air Filter Service

NOTE: Replace a worn or damaged air filter.

1. If stamped "Washable," the filter can be washed with warm water and mild soap (see Figure 31).
2. Rinse with tap water with the screen side UP allowing dirt and debris to filter out.
3. Allow the filter to dry overnight before reinstalling

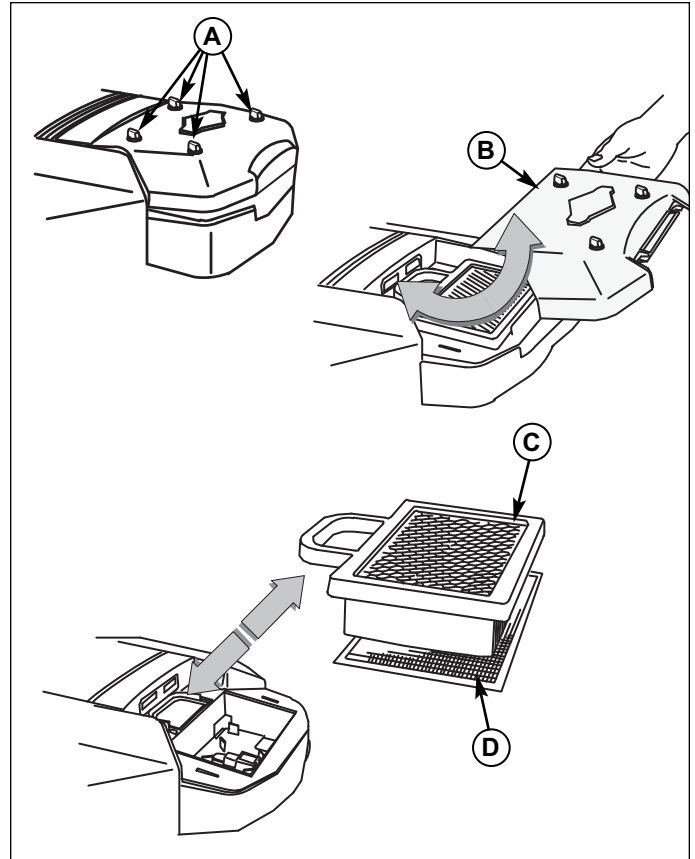


Figure 30. Air Filter Assembly - V-Twin Models

- A. Knobs
- B. Cover
- C. Air Filter
- D. Pre-Cleaner

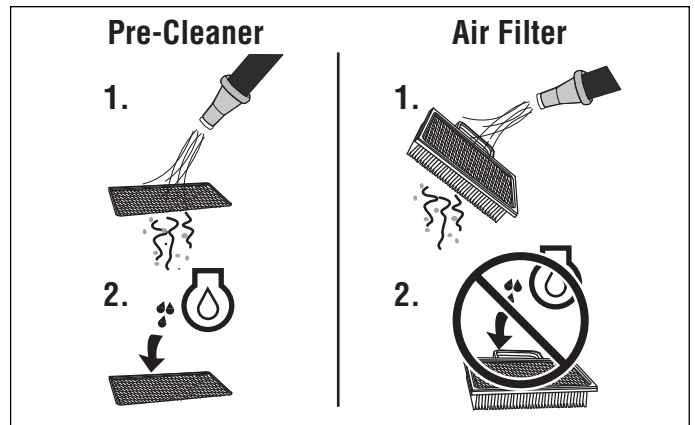


Figure 31. Air Filter Service

Regular Maintenance

Air Filter & Pre-Cleaner Service

SINGLE CYLINDER MODELS - BRIGGS & STRATTON

Service Interval: Pre-Cleaner: Every 25 hours or as required. Air Filter: Every 50 hours or as required.

Replacement Interval: Pre-Cleaner: As required. Air Filter: Every 200 hours or once per season.

Air Filter Removal & Installation

1. Lift up on the latch (A, Figure 32).
2. Rotate the latch to the inside.
3. Pull cover (B) out and off.
4. Lift air filter (C, Figure 33) and pre-cleaner (D) if equipped, from blower housing.
5. Install the pre-cleaner (D) with the mesh side up. Install the air filter (C) as shown.
6. Install the cover (B) making sure the tabs are inserted into their slots. Secure with the latch (A).

Pre-Cleaner Service

NOTE: Replace a worn or damaged pre-cleaner.

1. Wash the pre-cleaner in liquid detergent and water (see Figure 31).
2. Squeeze the pre-cleaner dry. **Do not oil pre-cleaner.**

Air Filter Service

NOTE: Replace a worn or damaged air filter.

1. If stamped "Washable," the filter can be washed with warm water and mild soap (see Figure 31).
2. Rinse with tap water with the screen side up allowing dirt and debris to filter out.
3. Allow the filter to dry overnight before reinstalling.

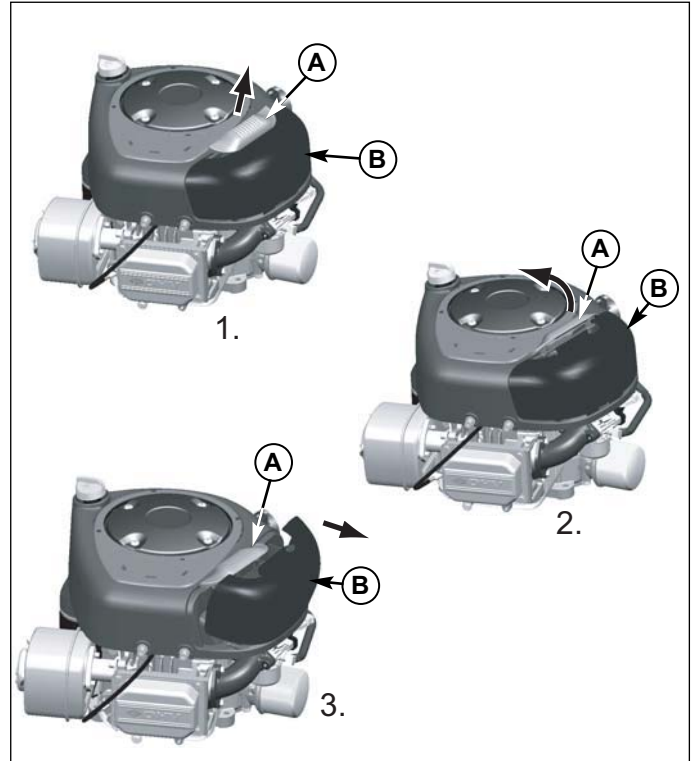


Figure 32. Air Filter Assembly - Single Cylinder Models
A. Latch
B. Cover

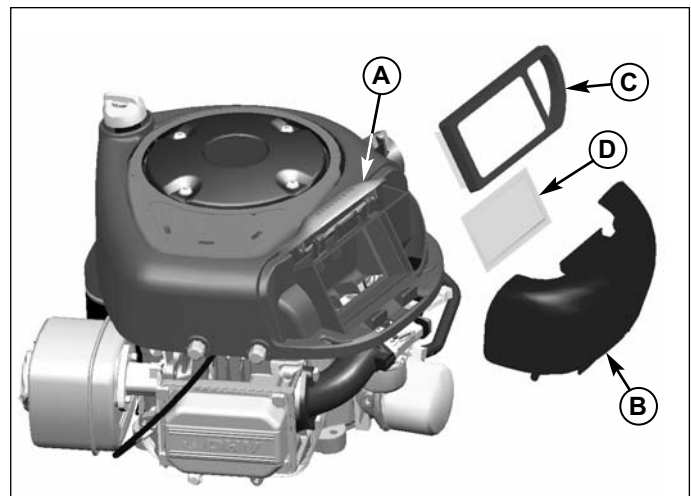


Figure 33. Air Filter Service - Single Cylinder Models
A. Latch
B. Cover
C. Air Filter
D. Pre-Cleaner

Replace Spark Plug

Service Interval: Yearly

Spark Plug Gap: .030" (.76mm)

Replacement Spark Plug

Resistor Spark Plug, Champion RC12YC

1. Stop the engine and allow it to cool.
2. Clean the area around the spark plug (see Figure 34 or 35).
3. Remove the spark plug.
4. Check the spark plug gap. It should be .030".
5. Reinstall the plug into the cylinder head. Tighten the plug to 180 in-lbs (20 Nm).

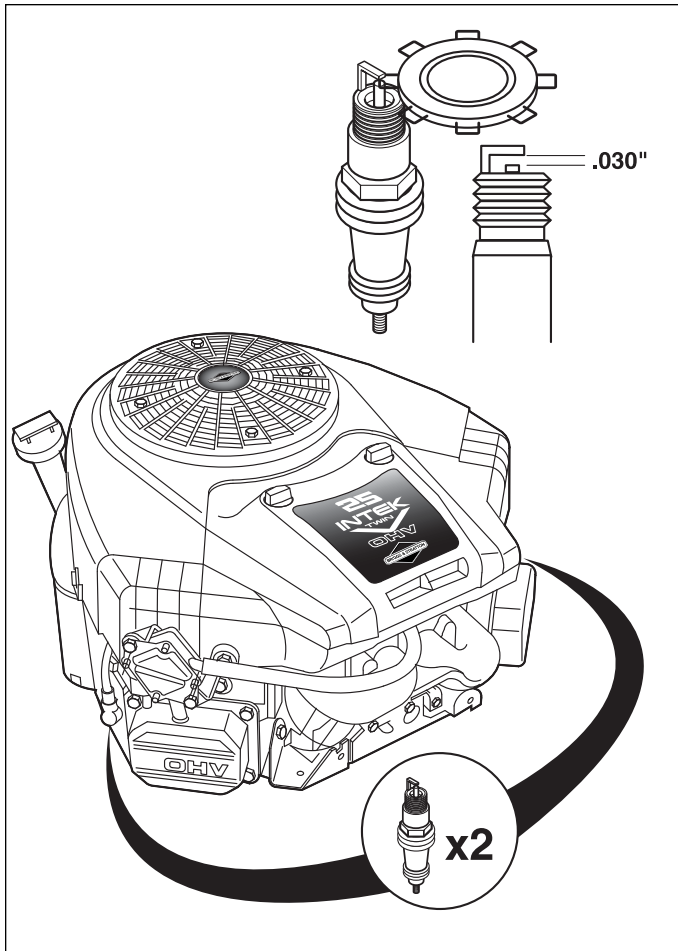


Figure 34. Spark Plug Gapping

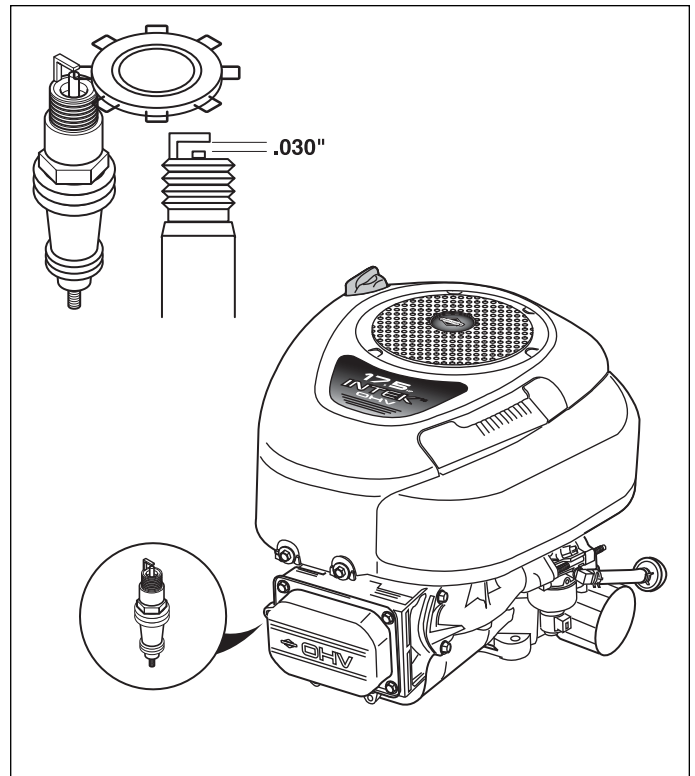


Figure 35. Spark Plug Gapping

Troubleshooting, Adjustment, & Service



Troubleshooting

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

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

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

WARNING

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

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

Troubleshooting the Tractor

PROBLEM	CAUSE	REMEDY
Engine will not turnover or start.	<ol style="list-style-type: none"> 1. Brake pedal not depressed. 2. PTO (electric clutch) switch in ON position. 3. Cruise control engaged. 4. Out of fuel. 5. Engine flooded. 6. Fuse Blown. 7. Battery terminals require cleaning. 8. Battery discharged or dead. 9. Wiring loose or broken. 10. Solenoid or starter motor faulty. 11. Safety interlock switch faulty 12. Spark plug(s) faulty, fouled or incorrectly gapped. 13. Water in fuel. 14. Gas is old or stale. 	<p>Fully depress brake pedal. Place in OFF position.</p> <p>Move knob to Neutral/Off position. If engine is hot, allow it to cool, then refill the fuel tank. Disengage choke. Replace. See Battery Maintenance Section.</p> <p>Recharge or replace. Visually check wiring & replace broken or frayed wires. Tighten loose connections. See your dealer. See your dealer. Clean and gap or replace. See engine manual. Drain fuel & refill with fresh fuel. Replace fuel filter. Drain fuel & refill with fresh fuel. Replace fuel filter.</p>
Engine starts hard or runs poorly.	<ol style="list-style-type: none"> 1. Fuel mixture too rich. 2. Spark plug(s) faulty, fouled, or incorrectly gapped. 	<p>Clean air filter. Check choke adjustment Clean and gap or replace. See engine manual.</p>
Engine knocks.	<ol style="list-style-type: none"> 1. Low oil level. 2. Using wrong grade oil. 	<p>Check/add oil as required. See engine manual.</p>
Excessive oil consumption.	<ol style="list-style-type: none"> 1. Engine running too hot. 2. Using wrong weight oil. 3. Too much oil in crankcase. 	<p>Clean engine fins, blower screen and air cleaner. Clean radiator screen. See engine manual. Drain excess oil.</p>
Engine exhaust is black.	<ol style="list-style-type: none"> 1. Dirty air filter. 2. Choke closed. 	<p>Replace air filter. See engine manual. Open choke.</p>
Engine runs, but tractor will not drive.	<ol style="list-style-type: none"> 1. Ground speed control pedals not depressed. 2. Transmission release lever in "push" position. 3. Drive belt is broken. 4. Drive belt slips. 5. Parking brake is engaged. 	<p>Depress pedals.</p> <p>Move into drive position.</p> <p>See Dealer. See cause and remedy below. Disengage parking brake.</p>

Troubleshooting, Adjustment, & Service

Tractor Troubleshooting Cont.

Tractor drive belt slips.	<ol style="list-style-type: none"> 1. Pulleys or belt greasy or oily. 2. Belt stretched or worn. 3. Idler pulley pivot bracket "frozen" in declutched position. 	<p>Clean as required. See Dealer. Remove idler pulley bracket, clean and lubricate.</p>
Brake will not hold.	<ol style="list-style-type: none"> 1. Internal brake worn. 	See your dealer.
Tractor steers hard or handles poorly.	<ol style="list-style-type: none"> 1. Steering linkage is loose. 2. Improper tire inflation. 3. Front wheel spindle bearings dry. 	<p>Check and tighten any loose connections. See Steering Gear Adjustment. Check and correct. Grease spindles. See Lubricating the Tractor.</p>

Troubleshooting the Mower

PROBLEM	CAUSE	REMEDY
Mower will not raise.	<ol style="list-style-type: none"> 1. Lift linkage not properly attached or damaged. 	Attach or repair.
Mower cut is uneven.	<ol style="list-style-type: none"> 1. Mower not leveled properly. 2. Tractor tires not inflated equally or properly. 	<p>See Mower Adjustment. See Maintenance Section.</p>
Mower cut is rough looking.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Blades are dull. 4. Mower drive belt slipping because it is oily or worn. 5. Check PTO (Electric Clutch) Adjustment. 6. Blades not properly fastened to arbors. 	<p>Set to full throttle. Slow down. Sharpen or replace blades. See Mower Blade Service. Clean or replace belt as necessary.</p> <p>See Adjustments Section.</p> <p>See Servicing the Mower Blades.</p>
Engine stalls easily with mower engaged.	<ol style="list-style-type: none"> 1. Engine speed too slow. 2. Ground speed too fast. 3. Dirty or Clogged air filter. 4. Cutting height set too low. 5. Discharge chute jamming with cut grass. 6. Engine not up to operating temperature. 7. Starting mower in tall grass. 	<p>Set to full throttle. Slow down. See Engine Manual. Cut tall grass at maximum cutting height during first pass. Cut grass with discharge pointing toward previously cut area. Run engine for several minutes to warm-up.</p> <p>Start the mower in a cleared area.</p>
Excessive mower vibration.	<ol style="list-style-type: none"> 1. Blade mounting screws are loose. 2. Mower blades, arbors, or pulleys are bent. 3. Mower blades are out of balance. 4. Belt installed incorrectly. 	<p>Tighten to 45-55 ft - lbs. (61-75 Nm).</p> <p>Check and replace as necessary.</p> <p>Remove, sharpen, and balance blades. See Servicing the Mower Blades. Reinstall Correctly.</p>
Excessive belt wear or breakage.	<ol style="list-style-type: none"> 1. Bent or rough pulleys. 2. Using incorrect belt. 	<p>Repair or replace. Replace with correct belt.</p>
Mower drive belt slips or fails to drive.	<ol style="list-style-type: none"> 1. Idler pulley spring broken or not properly attached. 2. Belt stops out of adjustment. 3. Mower drive belt broken. 4. PTO clutch out of adjustment. 	<p>Repair or replace as needed.</p> <p>Check belt stops. Replace drive belt. Adjust PTO clutch.</p>

Seat Adjustment

The seat can be adjusted forward and back. Move the lever (A, Figure 36), position the seat as desired, and release the lever to lock the seat into position.

Brake Adjustment

This unit does not have a manually adjustable brake. If the brake does not function properly, see your dealer.

Battery Charging

WARNING

Keep open flames and sparks away from the battery; the gasses coming from it are highly explosive. Ventilate the battery well during charging.

A dead battery or one too weak to start the engine may be the result of a defect in the charging system or other electrical component. If there is any doubt about the cause of the problem, see your dealer. If you need to replace the battery, follow the steps under “Cleaning the Battery & Cables” in the Regular Maintenance Section.

To charge the battery, follow the instructions provided by the battery charger manufacturer as well as all warnings included in the “Safety Rules” section of this book. Charge the battery until fully charged. Do not charge at a rate higher than 10 amps.

Fuse Replacement

The fuse is a 20-amp blade type automotive fuse located behind the battery on the steering tower. **Replace only with the same rated fuse: 20-amp.**

To replace the fuse:

1. Open the hood and locate the fuse holder (B, Figure 37) and fuse (A) attached to the steering tower.
2. Hold the fuse holder (B) and pull out the fuse (A).
3. Inspect the fuse for a broken fusible link (see Figure 38). Replace fuse if connection is broken. If you are not sure if the fusible link is broken, replace fuse.
4. Hold the fuse holder (B, Figure 37) and insert new fuse (A) until it is seated properly.

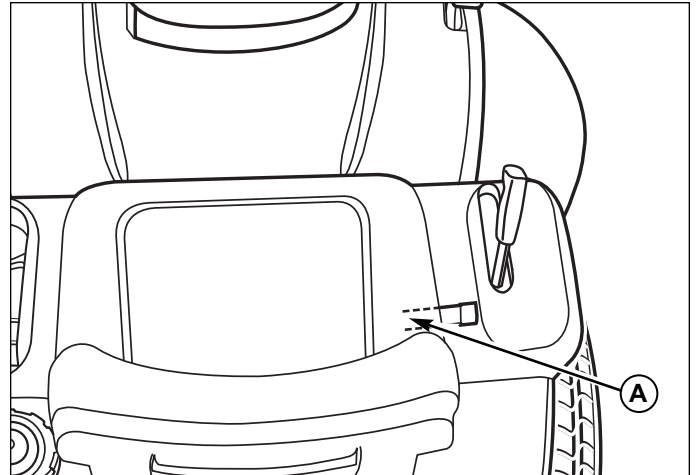


Figure 36. Seat Adjustment
A. Seat Adjustment Lever

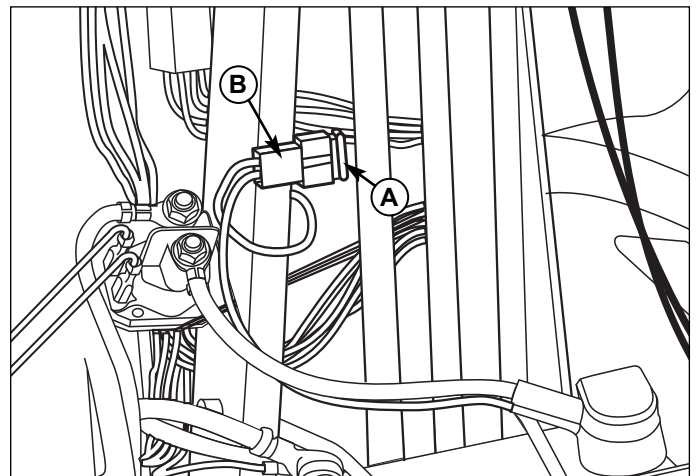


Figure 37. Fuse
A. Fuse, 20-amp
B. Fuse Holder

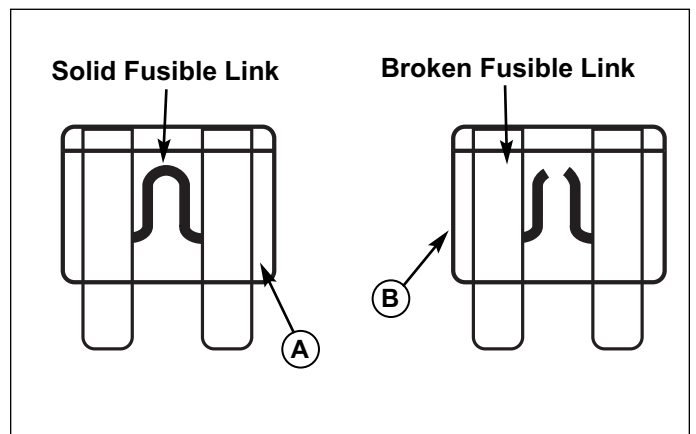


Figure 38. Blade Type Fuse
A. Good Fuse with Solid Fusible link
B. No Good Fuse with Broken Fusible link

PTO Clutch Adjustment

WARNING

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

Check the PTO clutch adjustment after every 250 hours of operation. Also perform the following procedure if the clutch is slipping or will not engage, or if a new clutch has been installed.

1. Remove key from ignition switch and disconnect spark plug wires to prevent the possibility of accidental starting while the PTO is being adjusted.
2. See Figure 39. Note the position of the three adjustment windows (A) in the side of the brake plate and the nylock adjustment nuts (B).
3. Insert a .012" - .015" (2,5 - 4 mm) feeler gauge (C) through each window, positioning the gauge between the rotor face and the armature face as shown in Figure 40.
4. Alternately tighten the adjustment nuts (B, Figure 39) until the rotor face and armature face just contacts the gauge.
5. Check the windows for an equal amount of tension when the gauge is inserted and removed, and make any necessary adjustments by tightening or loosening the adjustment nuts.

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

6. Check the mower blade stopping time. The mower blades and mower drive belt should come to a complete stop within five seconds after the electric PTO switch is turned off.
7. Perform the BLADE BRAKE CHECK found in the MAINTENANCE Section. Mower blades and mower drive belt should come to a complete stop within five seconds after electric PTO switch is turned off.

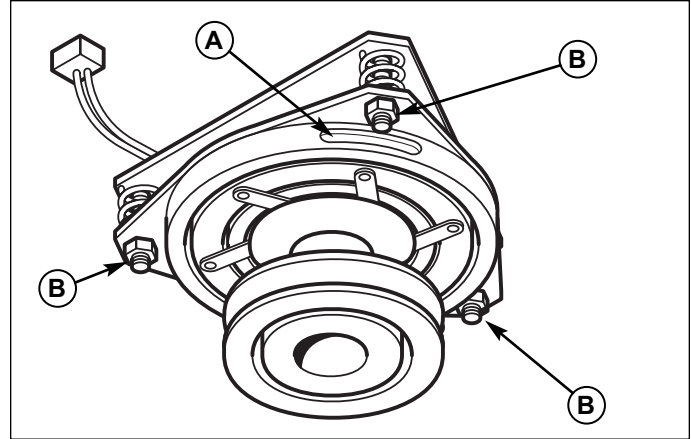


Figure 39. PTO Clutch Adjustment
A. Adjustment Window (Qty. 3, one shown)
B. Adjustment Nut

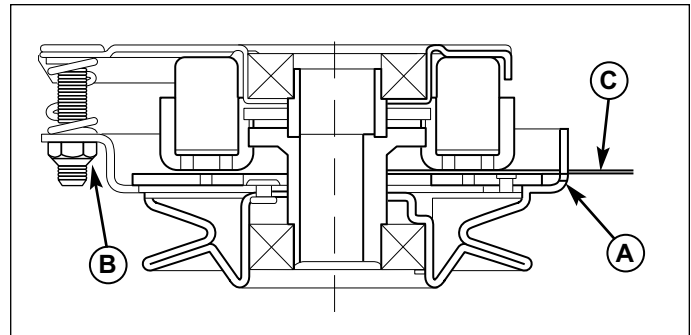


Figure 40. Adjust PTO Clutch
A. Window
B. Adjustment Nut (3)
C. Feeler Gauge

Mower Belt Replacement



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

1. Park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
2. Remove the mower deck (see “Mower Deck Removal”).
3. Remove the belt cover for the PTO pulley (A, Figure 41).
4. Remove idler assembly (B) and mower arbor drive belt (C).
5. Remove PTO pulley (A) and idler pulley (D) from the belt cover.
6. Remove the mower belt cover to access the mower pulleys (E) and mower belt (F).
7. Remove the old belt and replace with a new belt. Route the belt as shown in Figure 41.
8. Check that the blades are positioned perpendicular to each other (see Figure 42). If not, perform the “Check Mower Blade Timing” procedure in the Maintenance section.
9. Install mower belt cover.
10. Install PTO pulley, idler pulley, mower arbor drive belt, and idler assembly.
11. Install cover for PTO pulley.
12. Install mower on tractor (see “Mower Deck Installation”).
13. Run the mower under no-load conditions for about 5 minutes.

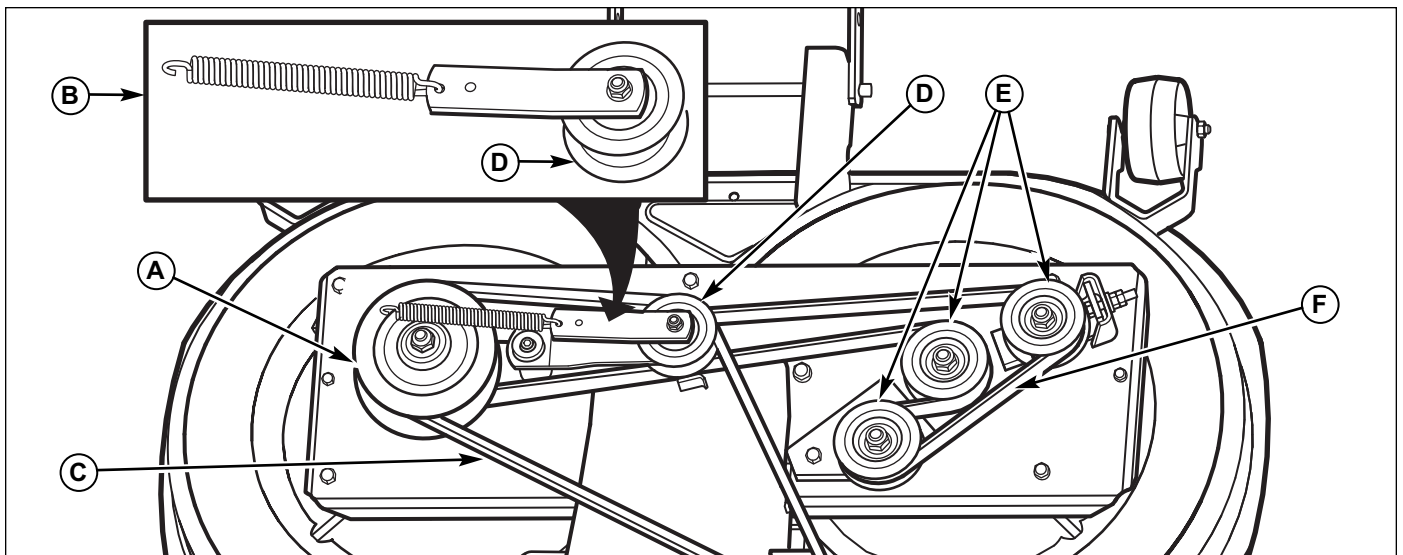


Figure 41. Mower Belt Replacement

- A. PTO Pulley
- B. Idler Assembly
- C. Mower Arbor Drive Belt
- D. Idler Pulley
- E. Mower Pulley (4)
- F. Mower Belt

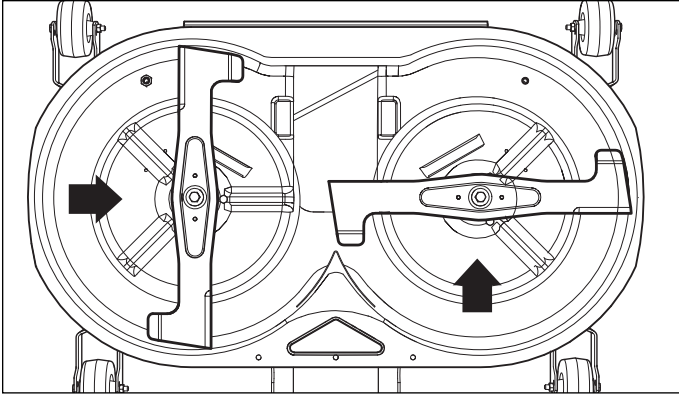


Figure 42. Mower Blade Timing

Arbor Drive Belt Replacement

1. With the deck installed, park the tractor on a smooth, level surface such as a concrete floor. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
2. Remove the mower deck (see “Mower Deck Removal”).
3. Remove the belt cover for the PTO pulley (A, Figure 43).
4. Unhitch the idler spring (B) from the hole at the frame bracket.
5. Remove the PTO belt (C).
6. Install a new belt on the PTO pulley (A) and idler pulley (D) as shown.
7. Hitch the idler spring back on the frame bracket.

NOTE: The PTO belt of the mower is tensioned by means of a pulley with a spring. If the tension releases, increase it by placing the eye of the spring into the second hole in the pulley lever, or in another hole at the frame bracket.

8. Reinstall the belt cover.

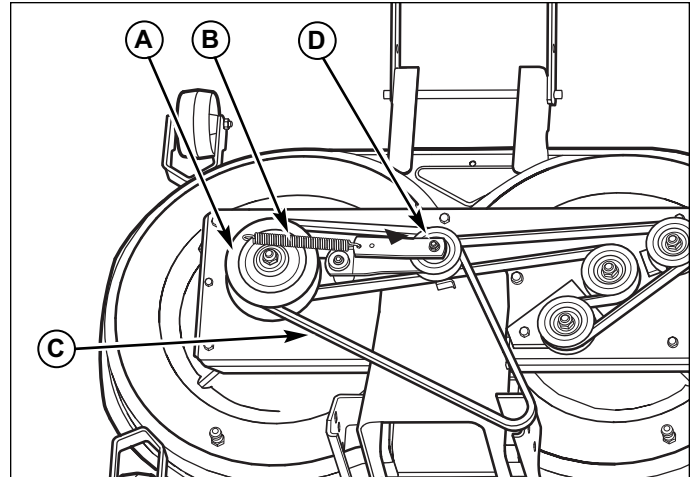


Figure 43. Mower Deck (Belt Covers Removed)

- A. PTO Pulley
- B. Spring
- C. Belt
- D. Idler Pulley
- E. Idler Assembly

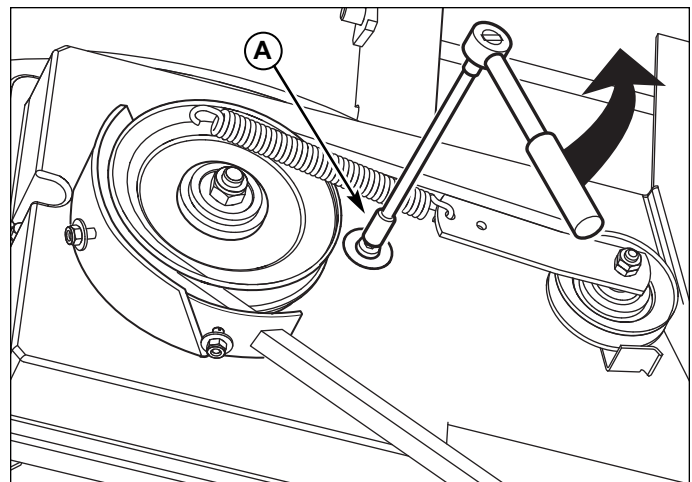


Figure 44. Tighten Idler Assembly Capscrew
A. 3/8” Ratchet and Extension



Specifications

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

ENGINE:

22 HP* Briggs & Stratton

Make	Briggs & Stratton
Model	Intek
Horsepower	22 @ 2700 +/- 100 rpm
Displacement	44.2 Cu. in (724 cc)
Electrical System	12 Volt, 9 amp. Alternator, Battery: 230 CCA
Oil Capacity	64 Oz. (1.9 L)

19.5 HP* Briggs & Stratton

Make	Briggs & Stratton
Model	Intek
Horsepower	19.5 @ 2700 +/- 100 rpm
Displacement	30.5 Cu. in (500 cc)
Electrical System	12 Volt, 9 amp. Alternator, Battery: 230 CCA
Oil Capacity	48 Oz. (1.4 L)

CHASSIS:

Fuel Tank Cap.	Capacity: 2.5 Gallons (9,4 L)
Rear Wheels	Tire Size: 22 x 10 -8 Inflation Pressure: 10 psi (.68 bar)
Front Wheels	Tire Size: 15 x 6.0-6 Inflation Press.: 12-14 psi (.82-0,96 bar)

TRANSMISSION:

K46

Type	Hydrostatic Tuff Torq K46
Hydraulic Fluid	10w 30 Premium Engine Oil
Speeds	Forward: 0-5.5 MPH (9.0 km/h) Reverse: 0-3.0 MPH (4.6 km/h)
@ 3400 rpm	170 ft-lbs.
Continuous Torque Output	
Drawbar Rating	227 lbs (103 kg)
Maximum Weight on Axle	675 lbs (306 kg)

DIMENSIONS:

Overall Length	103"
Overall Width	42"
Height	49"
Weight:	617 lbs (280 kg)

**19.5 hp or 22 hp Tractor
w/ 40" Mower Deck**

**Briggs & Stratton Models: The gross power rating for individual gas engine models is labeled in accordance with 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). Torque values are derived at 3060 RPM; horsepower values are derived at 3600 RPM. Actual gross engine power will be lower and is affected by, among other things, 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 horsepower). 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. Due to manufacturing and capacity limitations, Briggs & Stratton may substitute an engine of higher rated power for this Series engine.*

Parts & Accessories



Replacement Parts

Replacement parts are available from your authorized dealer.

Maintenance Items

Many convenient and helpful service and maintenance items are available from you authorized dealer. Some of these items include:

- | | |
|-------------------|--------------------|
| Engine Oil | Tire Sealant |
| Touch-Up Paint | Degrimer/Degreaser |
| Grease Gun Kit | Gas Stabilizer |
| 8 oz. Grease Tube | |

Model: _____

Mfg. No: _____

Your Name: _____

Address: _____

City, State, Zip: _____

Visa/Mastercard No: _____

Card Expiration Date: _____



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