

How to use this file...(Operators Manuals)

Instructions for

Print Vendors (Paper Manuals)

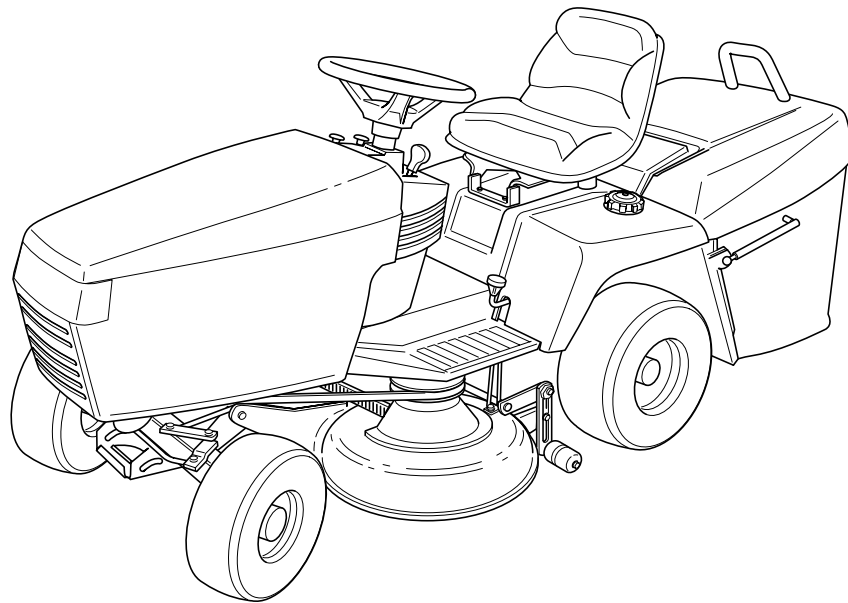
- Paper Size:**
- * 11 x 17
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- Press:**
- * Body—1-color, 2-sided
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- Bindery:**
- * Saddle Stitch, Face Trim
 - * Face Trim
- COVERS:**
- * **This file contains several manuals, which differ only in their covers.**
 - * Covers are all present at the beginning of this file.
 - * Back cover for a particular manual is the page IMMEDIATELY AFTER the front cover.
 - Check the front cover for the individual part number (typically a 171xxxx number).
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- **The body of the manual is identical, regardless of the cover used.**
 - * REMEMBER: ODD number pages are ALWAYS right hand pages, and EVEN number are ALWAYS left hand pages.
- General:**
- * **This instruction page is NOT part of the manual and must NOT be printed.**
 - Pages labeled with the text “THIS PAGE INTENTIONALLY BLANK” are placement pages ONLY, and should NOT be printed.
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Operator's manual



Baron

1693494	Baron tractor (Export)
1693575	102 cm (40") deck (Export)
1693583	Baron tractor
1693585	102 cm (40") deck

1720648-06

Rev. 6/2001

TP 100-2284-06-BR-S

Simplicity[®]

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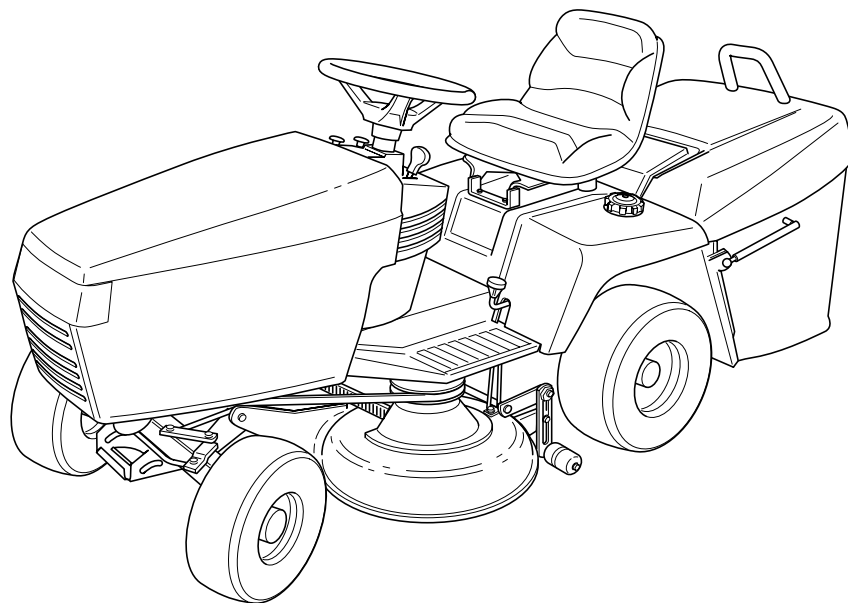
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MASSEY FERGUSON
LAWN & GARDEN EQUIPMENT

EN

Operator's manual



2418 Series

1693687	2418 tractor (Export)
1693685	102 cm (40") deck (Export)

1720648-06

Rev. 6/2001
TP 100-2284-06-BR-S



MASSEY FERGUSON
LAWN & GARDEN EQUIPMENT

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Specifications and Identification numbers.....ii-v



Safety rules and information.....A



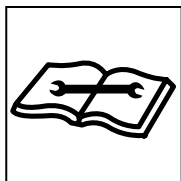
Features and controls.....B



Operating the tractorC



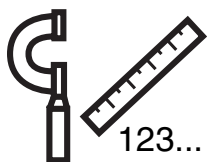
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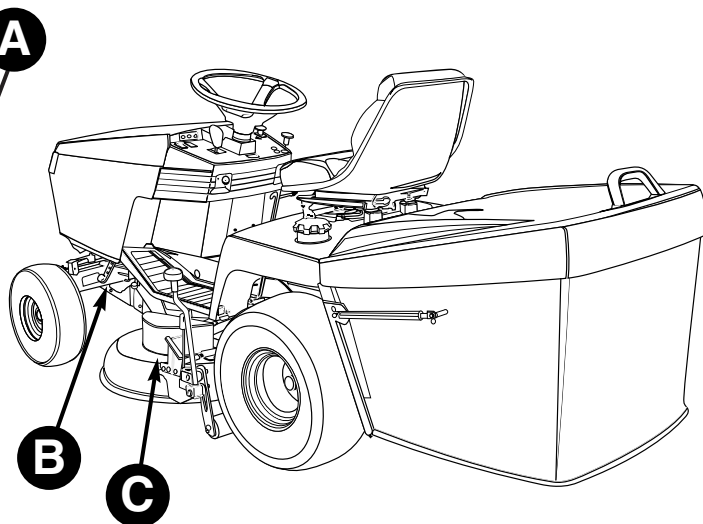
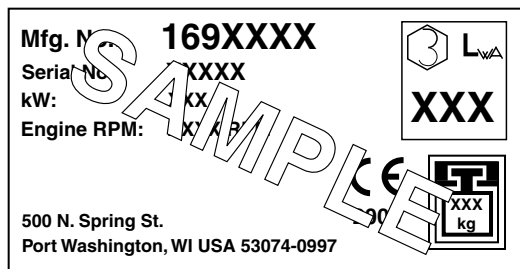


Identification numbers

North American Models



CE Models



Identification numbers

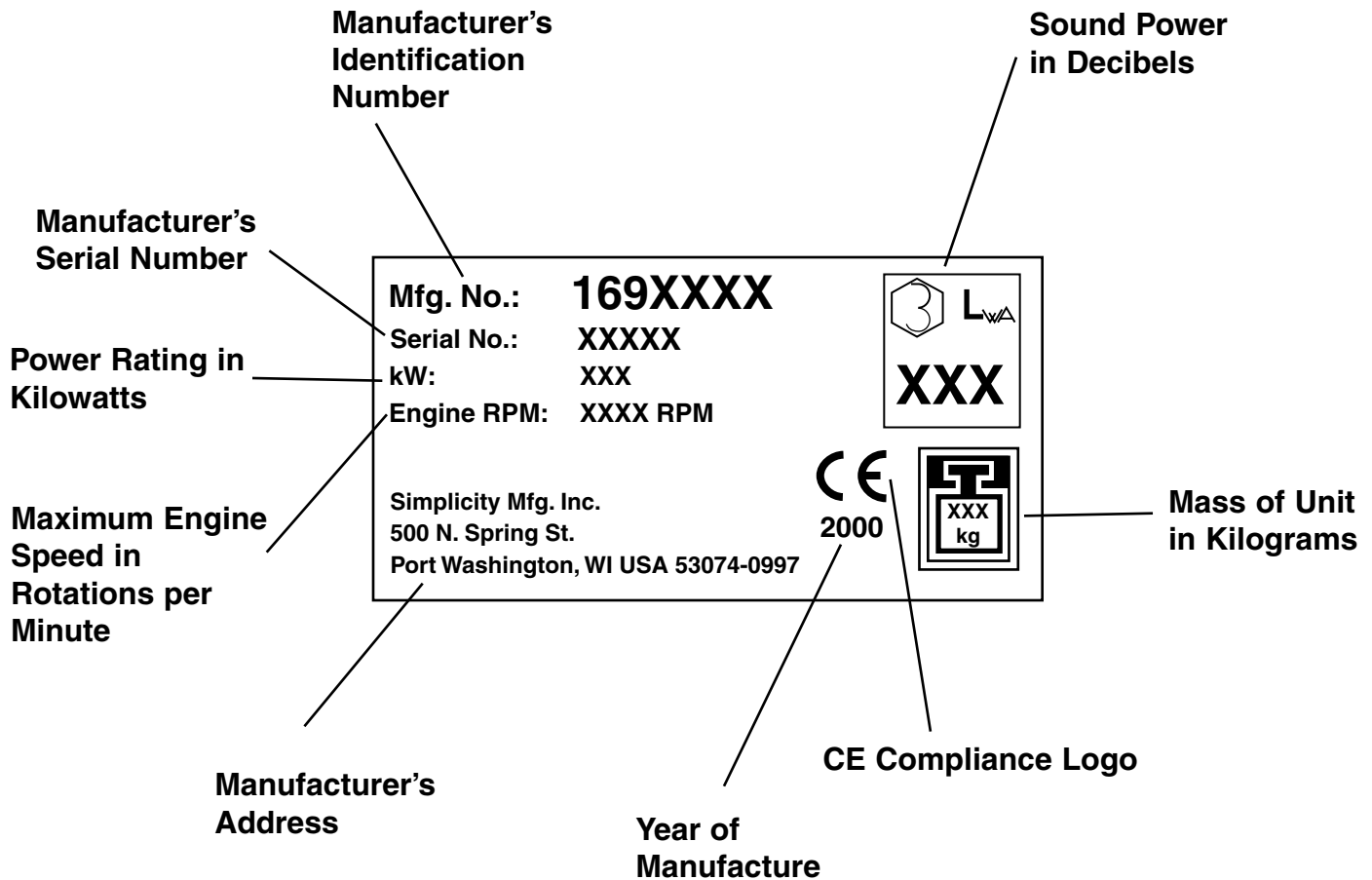
Record the identification numbers for your model in the space provided. The identification tags (A) are located on the tractor (B) and the mower deck (C). For the location of the engine identification numbers, refer to the engine manual.

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

Be sure to fill out and return the warranty registration card supplied with your unit.

Identification numbers	
Tractor manufacturing number 169 _ _ _ _	Tractor serial number
Mower deck manufacturing number 169 _ _ _ _	Mower deck serial number
Dealer name	Date purchased
Engine make and model	Engine serial number

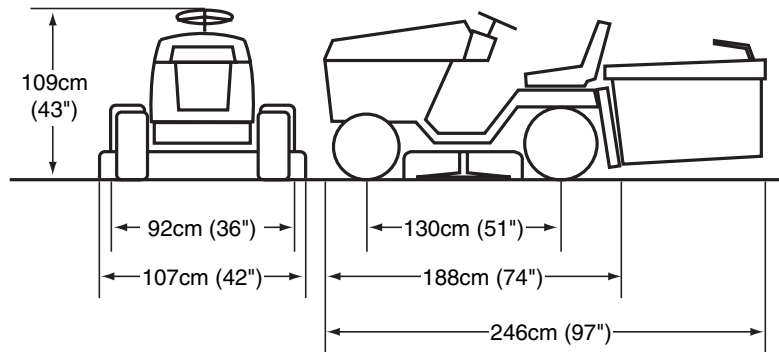
CE Identification tag markings



CE Identification tag

Note: See I.D. tag on unit frame for serial number.

*Export Models:
Place copy of Identification
Tag here.*



Specifications

Weight

Tractor	218 kg (480 lb)
Grass catcher	18 kg (40 lb)
Mower deck	50 kg (110 lb)
Crate (approx)	57 kg (125 lb)

Capacities

Grass catcher	310 liters
Fuel tank	9,3 l (3,5 gal)

Engine

Make	Briggs & Stratton
Model	InTek™ V-Twin
Horsepower	18 HP

Transmission

Make	Tuff Torq
Model	K-51
Max. forward speed	8,8 kph (5,5 mph)
Max. reverse speed	5,5 kph (3,4 mph)
Transmission oil	SAE 10W30, API SG, Motor
Oil capacity	1,7 l (2,5 qt)

Wheels

Tire size	
Front	15 x 6,0-6
Rear	18 x 8,5-8
Tire pressure	
Front	.83-1.04 bar (12-15 psi)
Rear	.41-.55 bar (6-8 psi)



CE Compliance Specifications

Model	1693494	1693583
Vibration Data * At the Steering Wheel (in m/s^2) At the Seat (in m/s^2)	4.8 .3	4.8 .3
Drawbar Force Limits Horizontal Force Limit (in Newton) Vertical Force Limit (in Newton)	444 222	444 222
Sound Pressure Data ** LpA (in dB(A))	86	86
Sound Power Data *** LwA (in dB(A))	100	100
Standards & Directive Compliance		
European Harmonized Lawn Mower Standard EN 836	X	
European Machinery Directive 98/37/EC	X	
European EMC Directive 89/336/EEC	X	
GS Mark Certified by TUV Rheinland		
ANSI B71.1-1998		X

Specifications are correct at the time of printing and subject to change without notice.
Items marked "N/A" are not available at the time of printing.

*Tested according to European Normative Vibration Standards EN 1032 & EN 1033.
Test performed on a concrete floor.

**Tested according to European Noise Directive 79/113/EEC.
Sound pressure at operator's position.

***Tested according to EN 84/538/EEC.



Common replacement parts

Listed below are the more common replacement parts. Only genuine factory replacement parts will assure optimum performance and safety. Do not attempt repairs or maintenance unless proper procedures and safety precautions are followed. For assistance in any area, see your dealer.

Replacement Parts

QTY.	DESCRIPTION	PART NO.
1	Tractor Drive Belt	1720036
1	Key, Ignition	1717163
1	Interlock Switch, Brake	1719681
1	Interlock Switch, Seat	1714770
1	Battery	1685215
1	Solenoid	1685290
1	Switch, PTO (Electric Clutch)	1716332
1	Headlamp Bulb	1677371
1	Collector Bag	1719678
• Mower Blades		
1	- 40" Mower, R.H.	1719737
1	- 40" Mower, L.H.	1719736
• Mower Belts		
1	- PTO V-Belt	1721533
1	- Arbor Drive Belt	1719601

Maintenance Items

DESCRIPTION	PART NO.
• Simplicity Engine Oils	
Case of 12 qts. (Your dealer has 1 qt. cans)	
-SAE 5W-30 SF/CD (Cold Weather 30° & under)	
1685576	
-SAE 30 SG/CC (Warm weather 32° & up)	
1685659	
• Touch-Up Paint	
Deep Orange, 13 oz. spray can	1685611
Deep Orange, 1 quart can	1685612
Deep Orange, 1/2 oz. bottle w/brush cap	1685615
Solar Black, 13 oz. spray can	1686779
Solar Black, 1 quart can	1686781
Red, 13 oz. spray can	1685722
• Touch-Up Daubers	
Deep Orange 1/2 oz. w/Brush Cap	1685615
• Grease Gun Kit w/8 oz. Grease Tube	1685510
Replacement 8 oz. Grease Tube for above 103077	
• Tire Sealant-Stops Tire Leaks. Prevents Flats.	
11 oz. Tube	1685523
• Gas Can-No Tip Design. Durable Polyethylene.	
1 gallon	1685587
2-1/2 gallon	1685555
5-1/4 gallon	1685556
• Cleaner, Polish, Sealant & Protectant	
8 oz. Bottle	1685696
• Degreaser/Degreaser	
32 oz. Bottle w/Trigger Spray	1685619
1 gallon	1685621



Safety rules and information



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

- Read, understand, and follow all instructions in the manual and on the unit before starting.
- Only allow responsible adults, who are familiar with the instructions, to operate the unit (local regulations can restrict operator age).
- Clear the area of objects such as rocks, toys, wire, etc., which could be picked up and thrown by the blade(s).
- Be sure the area is clear of other people before mowing. Stop unit if anyone enters the area.
- Never carry passengers.
- Do not mow in reverse unless absolutely necessary. Always look down and behind before and while travelling in reverse.
- Be aware of the mower discharge direction and do not point it at anyone. Do not operate the mower without either the entire grass catcher or the deflector in place.
- Slow down before turning.
- Never leave a running unit unattended. Always disengage the PTO, set parking brake, stop engine, and remove keys before dismounting.
- Turn off the PTO switch to disengage the blades when not mowing.
- Stop engine before removing grass catcher or unclogging chute.
- Mow only in daylight or good artificial light.
- Do not operate the unit while under the influence of alcohol or drugs.

- Watch for traffic when operating near or crossing roadways.
- Use extra care when loading or unloading the unit into a trailer or truck.
- 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 injury.
- Keep in mind the operator is responsible for accidents occurring to other people or property.
- All drivers should seek and obtain professional and practical instruction.
- Always wear substantial footwear and trousers. Never operate when barefoot or wearing sandals.
- Before using, always visually check that the blades and blade hardware are present, in-tact, and secure. Replace worn or damaged parts.
- Never operate the machine with defective guards, or without safety protective devices in place.
- Disengage attachments before: refuelling, removing an attachment, making adjustments (unless the adjustment can be made from the operator's position).
- When the machine is parked, stored, or left unattended, lower the cutting means unless a positive mechanical lock is used.
- Follow the manufacturer's recommendation for wheel weights or counterweights.

SLOPE OPERATION

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 to determine which weights are available and appropriate for your unit.

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

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

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 operate on it.

Control of a 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.

Do

- See your authorized dealer for recommendations of wheel weights or counterweights to improve stability.
- Mow up and down slopes, not across.
- Remove obstacles such as rocks, tree limbs, etc.
- Watch for holes, ruts, or bumps. Uneven terrain could overturn the unit. Tall grass can hide obstacles.
- Use slow speed. Tires may lose traction on slopes even through the brakes are functioning properly. Choose a low gear so that you will not have to stop or shift while on the slope.
- Use extra care with grass catchers or other attachments. These can change the stability of the unit.
- Keep all movement on the slopes slow and gradual. Do not make sudden changes in speed or direction.
- Always keep unit in gear especially when traveling downhill. When clutching, release clutch slowly.

Do Not

- Do not start or stop on a slope. If tires lose traction, disengage the blade(s) and proceed slowly straight down the slope.
- Do not turn on slopes unless necessary, and then, turn slowly and gradually downhill, if possible.
- 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.
- Do not mow on wet grass. Reduced traction could cause sliding.
- Do not try to stabilize the unit by putting your foot on the ground.
- Do not use grass catchers on steep slopes.
- Do not mow slopes you cannot back up.
- Do not shift to neutral and coast down hill.



Slope Operation Continued

Children

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

- Keep children out of the mowing area and under the watchful care of another responsible adult.
- Be alert and turn unit off if children enter the area.
- Before and during reverse operation, look behind and down for small children.
- Never carry children. They may fall off and be seriously injured or interfere with safe unit operation.
- Never allow children to operate the unit.
- Use extra care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

TOWING

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

SERVICE AND MAINTENANCE

- Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.
 - a) Use only an approved container.
 - b) Never remove gas cap or add fuel with the engine running. Allow engine to cool before refueling. Do not smoke.
 - c) Never refuel the unit indoors.
- 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 petrol vapors have dissipated.
- Replace all fuel tank caps and fuel container caps securely.
- Never fill containers inside a vehicle or on a truck bed with a plastic bed liner. Always place containers on the ground away from your vehicle before filling.
- Remove gas-powered equipment from the truck or trailer and refuel it on the ground. If this is not possible, then refuel such equipment on a trailer with a portable container, rather than from a gasoline dispenser nozzle.
- Keep nozzle in contact with the rim of the fuel tank or container opening at all times until fueling is complete. Do not use a nozzle lock-open device.
- If fuel is spilled on clothing, change clothing immediately.
- Maintain or replace safety and instruction labels as necessary.
- Never run a unit in an enclosed area.
- Keep nuts and bolts, especially blade attachment bolts, tight and keep equipment in good condition.
- Never tamper with safety devices. Check their proper operation regularly and make necessary repairs if they are not functioning properly.
- Keep unit free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.

TRANSPORTING AND STORAGE

WARNING

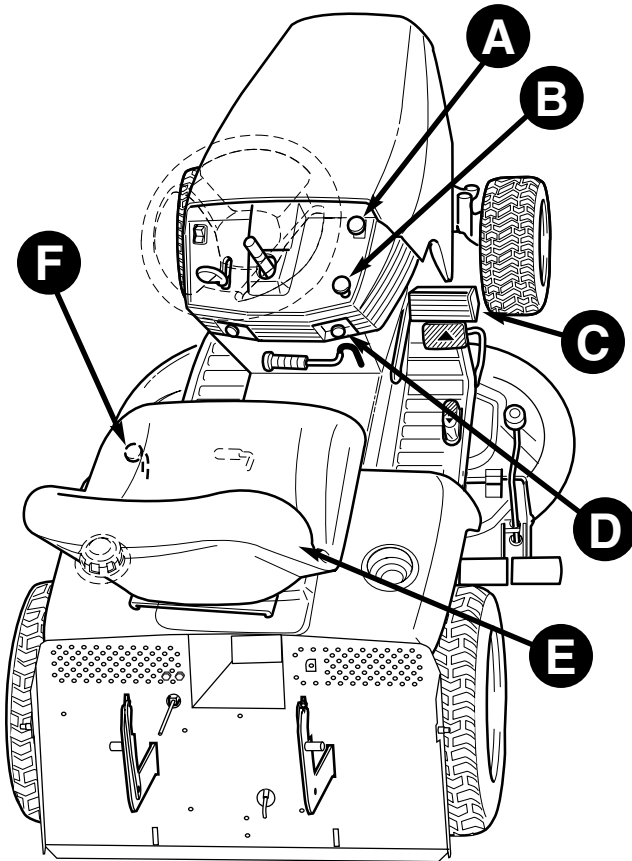
When transporting this tractor on an open trailer, make sure unit is facing forward, toward the direction of travel. If tractor is facing backward, wind lift could cause damage to the hood.

- Always observe safe refueling and fuel handling practices when refueling the tractor after transportation or storage.
- Always follow the engine manual instructions for storage preparations before storing the tractor for both short and long term periods.
- Always follow the engine manual instructions for proper start-up procedures when returning the unit to service.
- Never store the 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.

EMISSIONS

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

- Never make adjustments or repairs with the engine running unless specified otherwise in the engine manufacturer's manual.
- 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.
- Mower blades are sharp and can cut. Wrap the blade(s) or wear gloves, and use extra caution when servicing them.
- Check brake operation frequently. Adjust and service as required.
- Use only factory authorized replacement parts when making repairs.
- Always comply with factory specifications on all settings and adjustments.
- Only authorized service locations should be utilized for major service and repair requirements.
- Never attempt to make major repairs on this unit unless you have been properly trained. Improper service procedures can result in hazardous operation, equipment damage and voiding of manufacturer's warranty.
- On multiple blade mowers, take care as rotating one blade can cause other blades to rotate.
- Do not change engine governor settings or over-speed the engine. Operating the engine at excessive speed can increase the hazard of personal injury.
- 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.
- Never place hands near the hydro pump cooling fan when the tractor is running. Cooling fan is located on top of the transaxle



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 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 the safety switches and never tamper with the safety devices. Check their operation regularly.

Service interval: Every fall and spring

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 (A) is in the on position, or
- Brake pedal (C) is NOT fully depressed [parking brake (B) disengaged].

Test 2 - Engine SHOULD crank if:

- PTO switch (A) is in the off position, and
- Brake pedal (C) is fully depressed [parking brake (B) engaged].

Test 3 - Engine should SHUT OFF if:

- Operator rises off seat (E) with PTO (A) engaged, or
- Operator rises off seat (E) with brake pedal (C) NOT fully depressed [parking brake (B) disengaged].

Test 4 - PTO should SHUT OFF if:

- The grass catcher (F) is opened with the PTO switch (A) in the on position.

Test 5 - Mower blade brake check

The mower blades and mower drive belt should come to a complete stop within five seconds after PTO switch is turned to the off position (or operator rises off seat). If mower drive belt does not stop within five seconds, perform the PTO clutch adjustment found in the "Regular Maintenance" section or see your authorized dealer.



Once the engine has stopped, the PTO switch must be turned off after the operator returns to the seat in order to start the engine.



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.

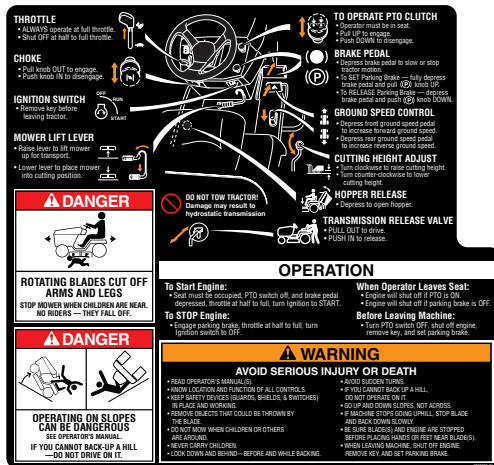
Although reading this manual and the safety instructions it contains will provide you with the necessary basic knowledge to operate this equipment safely and effectively, we have placed several safety labels on the unit to remind you of this important information while you are operating your unit.

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.

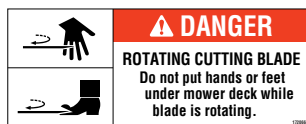
If any of these decals are lost or damaged, replace them at once. See your local dealer for replacements.

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.

North American Models



Decal - Operating Instructions Bottom Panel
Part No. 1720658

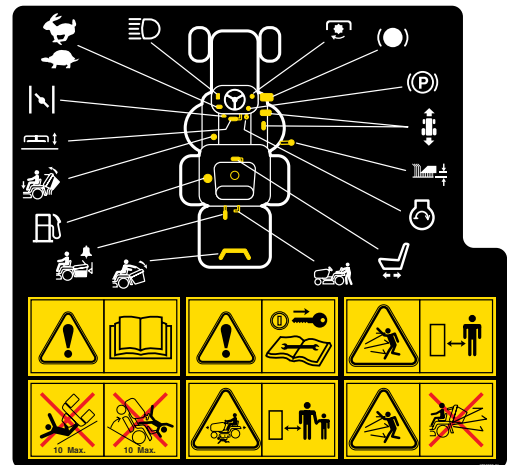


Decal - Danger
Part No. 1720660



Decal - Danger
Part No. 1720661

CE Models



Decal - Operating Instructions Bottom Panel
Part No. 1720392



Decal - Danger
Part No. 1720389



Decal - Danger
Part No. 1720390



Decal - Danger
Part No. 1720391



Decal - Danger
Part No. 1721107



Decal - Danger
Part No. 1721108



CE Safety Icons

Warning: Read Operator's Manual.

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



Danger: Thrown Objects.

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



Warning: Remove Key Before Servicing.

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



Danger: Thrown Objects.

Do not operate the unit with hopper open.



Danger: Machine Rollover.

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



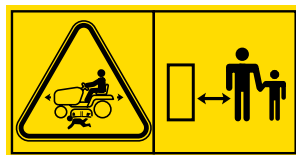
Danger: Thrown Objects.

Do not operate the unit with the hopper removed, or without the deflector installed.



Danger: Dismemberment.

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



Danger: Thrown Objects.

Do not open the hopper door when the PTO is engaged.



Danger: Dismemberment.

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



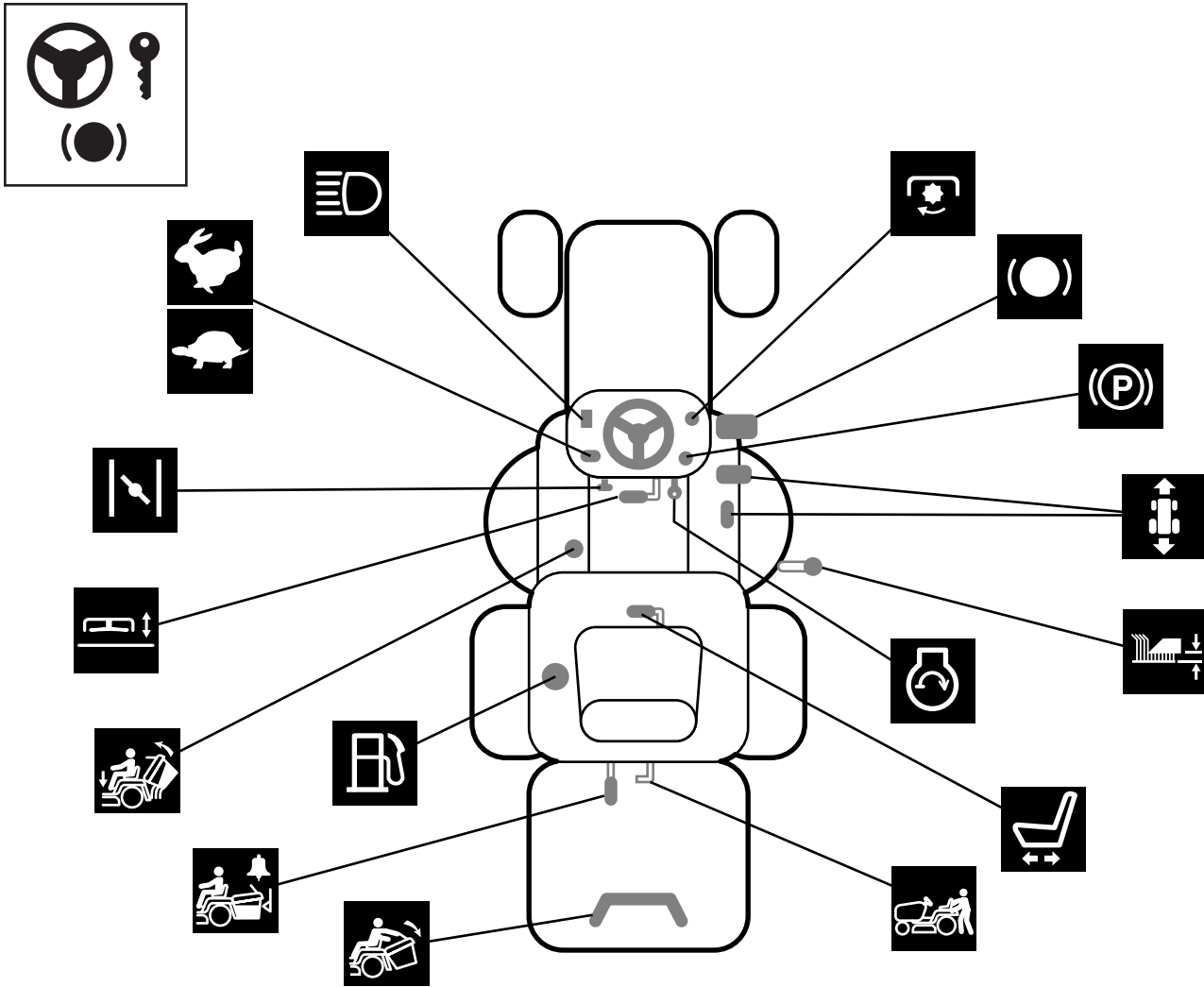
Danger: Thrown Objects.

Do not operate the unit without first connecting the discharge tube to the mower.





Features and controls



Features and controls

	Headlight		PTO switch
	Choke		Brake pedal
	Mower deck lift		Parking brake
	Catcher open		Ground speed controls
	"Catcher full" alarm		Cutting height adjust
	Catcher close		Ignition switch
	Fuel tank		Seat adjustment
	Throttle-Fast		Transmission release lever
	Throttle-Slow		



Headlight

The headlight switch (A) turns the tractor headlights on and off. When the switch is in the on position, the headlight icon (B) in the dashboard display lights up.



Throttle

The throttle (C) controls engine speed. Always operate at full throttle.



Move the throttle forward to increase engine speed.



Move the throttle back to decrease engine speed.



Choke



Pulling the choke control (D) out closes the choke for cold starting.



Pushing the choke control (D) in releases the choke.



Mower deck lift

The mower deck lift lever (E) raises the mower deck off the ground for transporting. DO NOT mow with the lift lever in the raised position.



PTO switch

The PTO switch (F) engages and disengages attachments that use the PTO, such as the mower deck.



To engage the PTO, pull up on the switch.

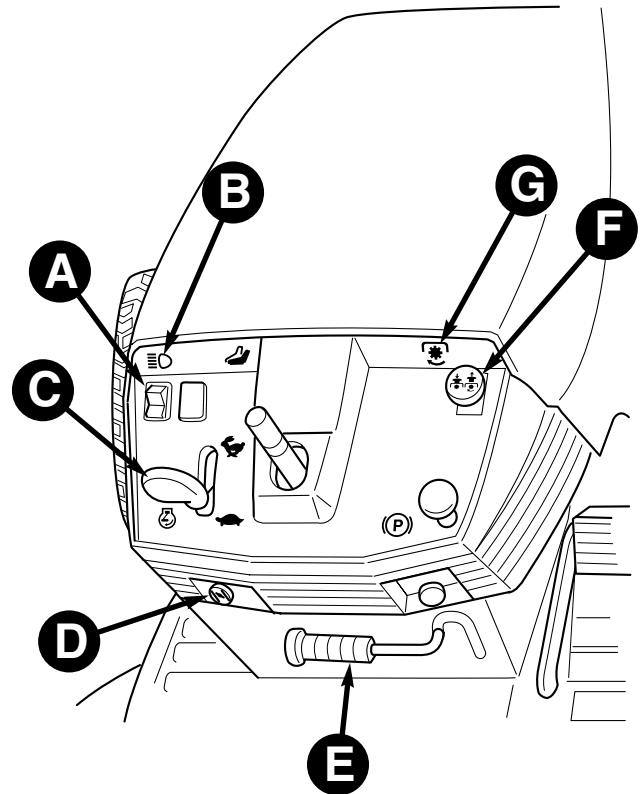


Push down to disengage.

When the PTO is engaged, the PTO indicator light (G) in the dashboard display lights up.



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





⚠ WARNING

DO NOT operate the unit without the rear bagger or deflector installed



“Catcher full” alarm

The “catcher full” alarm sounds when the grass catcher has been filled with cut grass. When the alarm sounds, push the PTO switch (B) down to disengage the mower blades. Travel to the area in which you desire to dump the grass, then empty the catcher.



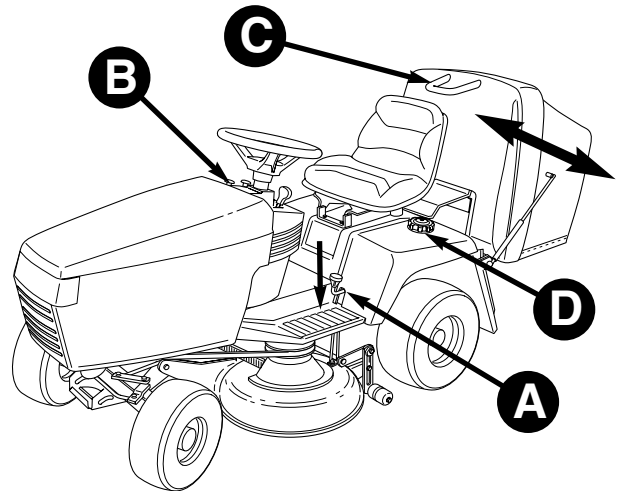
Catcher open

The catcher open pedal (A) unlocks the catcher so that it may be emptied. To empty the catcher, depress the pedal (A) and pull forward on the handle (C) until the catcher opens fully.



Catcher close

Push the handle (C) firmly down until the catcher latches closed.



Fuel tank

The fuel cap (D) is located on the left side of the seat deck. To check the fuel level or to add fuel, remove the fuel cap. Do not overfill the tank; leave room for fuel expansion. Refer to your engine manual for fuel recommendations. Close the cover tightly when finished.



Never use gasoline containing METHANOL, gasohol containing more than 10% ethanol, gasoline additives, premium gasoline or white gas because engine and fuel system damage could result.



Brake pedal

Depress brake pedal (B) to slow or stop tractor motion. In the event you need to stop quickly, fully depressing the brake pedal will stop the tractor.

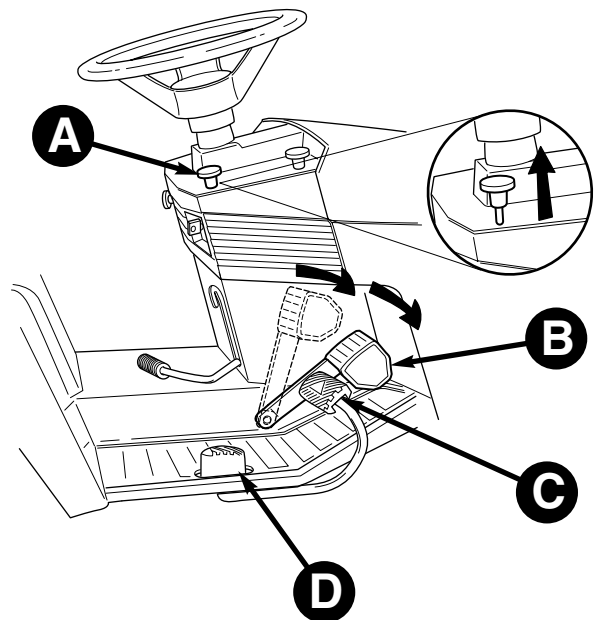


Parking brake

The parking brake mechanism locks the tractor brake and prevents the tractor from rolling or being driven.

To set parking brake: release the ground speed controls (C, D), then fully depress brake pedal (B) and pull knob (A) up.

To release parking brake: depress brake pedal (B) and push knob (A) down.



Ground speed controls



The tractor's forward ground speed is controlled by the forward ground speed control (C). Depress the pedal to increase FORWARD ground speed. Note that the further down the pedal is depressed, the faster the tractor will travel.



The tractor's reverse ground speed is controlled by the reverse ground speed control (D). Depress the pedal to increase REVERSE ground speed. Note that the further down the pedal is depressed, the faster the tractor will travel.



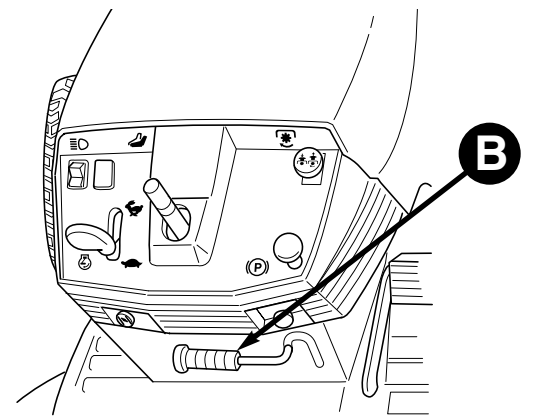
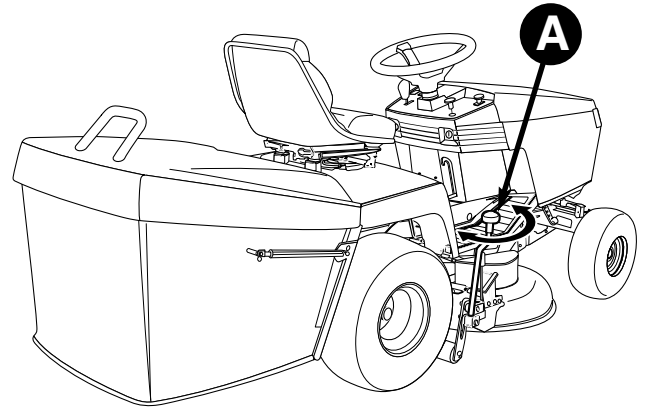
Cutting height adjustment

The cutting height adjust (A) controls the mower deck cutting height. The cutting height is infinitely adjustable between 2.5 and 9 cm (1" and 3-5/8").

Turn the knob clockwise to raise the deck and counterclockwise to lower it.



The cutting height adjust DOES NOT raise the mower deck for transport. Use the mower deck lift lever (B) to raise the mower deck when travelling to and from the mowing area, and whenever the mower deck is not in use.



Ignition switch

The ignition switch (A) 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—Canks the engine for starting.

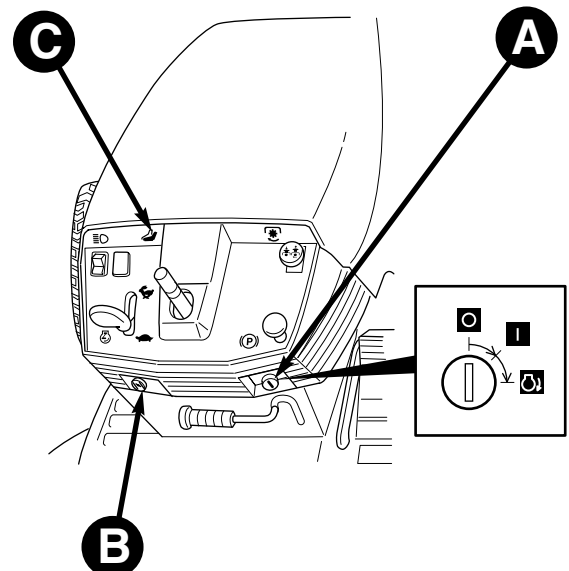
Pulling the choke control (B) out closes the choke for cold starting. (A warm engine may not require choking.)



The operator must be firmly seated for the engine to start.



Never leave the ignition switch in the Run position with the engine stopped; this drains the battery.



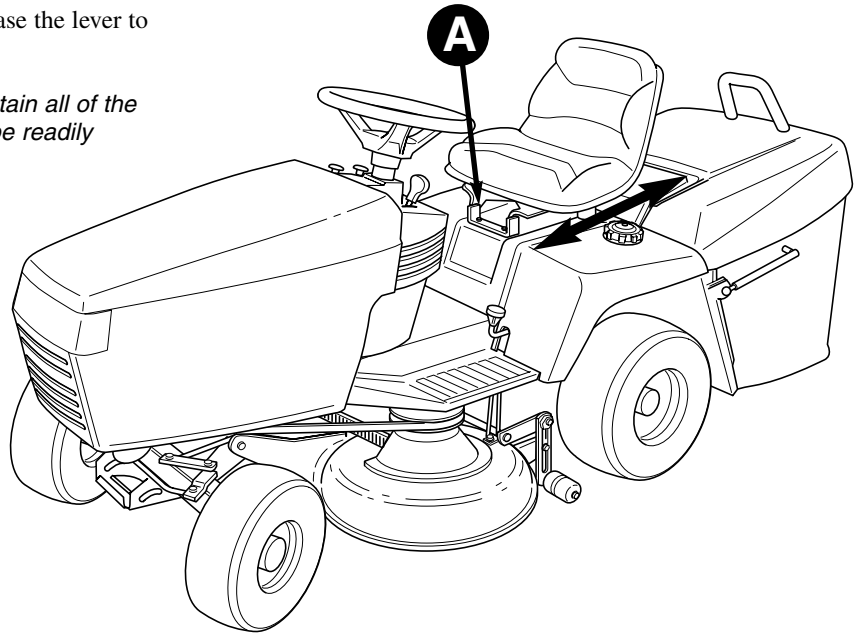


Seat adjustment

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



When adjusting the seat, make certain all of the controls are within reach and can be readily engaged when necessary.



Transmission release lever

The transmission release lever (C) is located at the rear of the unit.

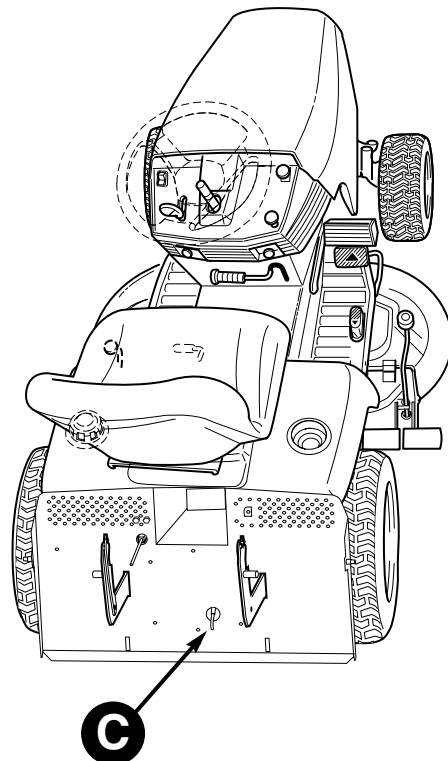
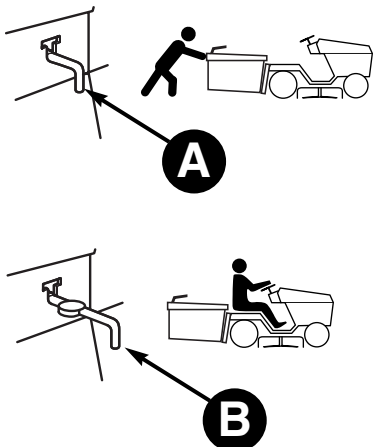
To access the lever, open the catcher.

To release the transmission: lift up on the lever, slide it forward, and push it down to lock in place (B).

To engage the transmission: lift up on the lever, pull it back, and push it down to lock in place (A).



Towing the tractor with another vehicle is not recommended because the transmission will be damaged.





Operating the tractor



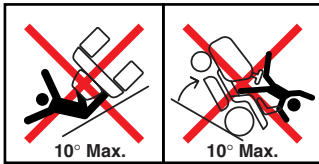
Operating the tractor

General operating safety

Before first time operation:

- Be sure to read all information in the Safety and Operation sections before attempting to operate the tractor and mower deck.
- Do not attempt to operate the tractor without first becoming familiar with the location and function of ALL controls and how to stop the unit. Thoroughly read the “Features and controls” section.
- Drive in an open area without mowing to become accustomed to the unit.
- Never allow passengers to ride on the unit.
- Before leaving the operator’s position for any reason, engage the parking brake, disengage the PTO, stop the engine and remove the key.

Operating on slopes can be dangerous



Never operate on slopes greater than 17.6 percent (10 degrees) which is a rise of 3.5 feet (106 cm) vertically in 20 feet (607 cm) horizontally.

Operate the unit at a slow ground speed when driving onto slope.

When operating on slopes use wheel weights or counterweights.

Use extra caution when operating on slopes with rear-mounted grass catcher. Mow UP and DOWN the slope, never across the face. 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 dipstick. See the engine manual for instructions and oil recommendations.
- Make sure all nuts, bolts, screws and pins are in place and tight.
- Adjust the seat position, and make certain you can reach all controls from operator’s position.
- Fill the fuel tank with fresh gasoline. Refer to engine m for fuel recommendations.
- Make certain wheel weights are installed if you w operating the unit on sloping ground.



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.

Starting the engine

1. While sitting in the operator’s seat, fully depress the brake pedal (D) or set the parking brake (C).
2. Make sure that your feet are not depressing the ground speed controls.
3. Disengage the PTO (B).
4. Set the throttle to the full position (H).
5. Pull the choke knob (J) out to choke the engine. (A warm engine may not require choking.)
6. Insert the ignition key and turn it to the start position.
7. After the engine starts, move the engine throttle (H) control to the slow position. Warm up the engine by running it for at least a minute before engaging the PTO or driving the tractor.



In the event of an emergency, the engine can be stopped by simply turning the ignition switch to the stop position. Use this method only in emergency situations. For normal engine shut down, follow the procedure given in “Stopping the tractor and engine”.

Stopping the tractor and engine

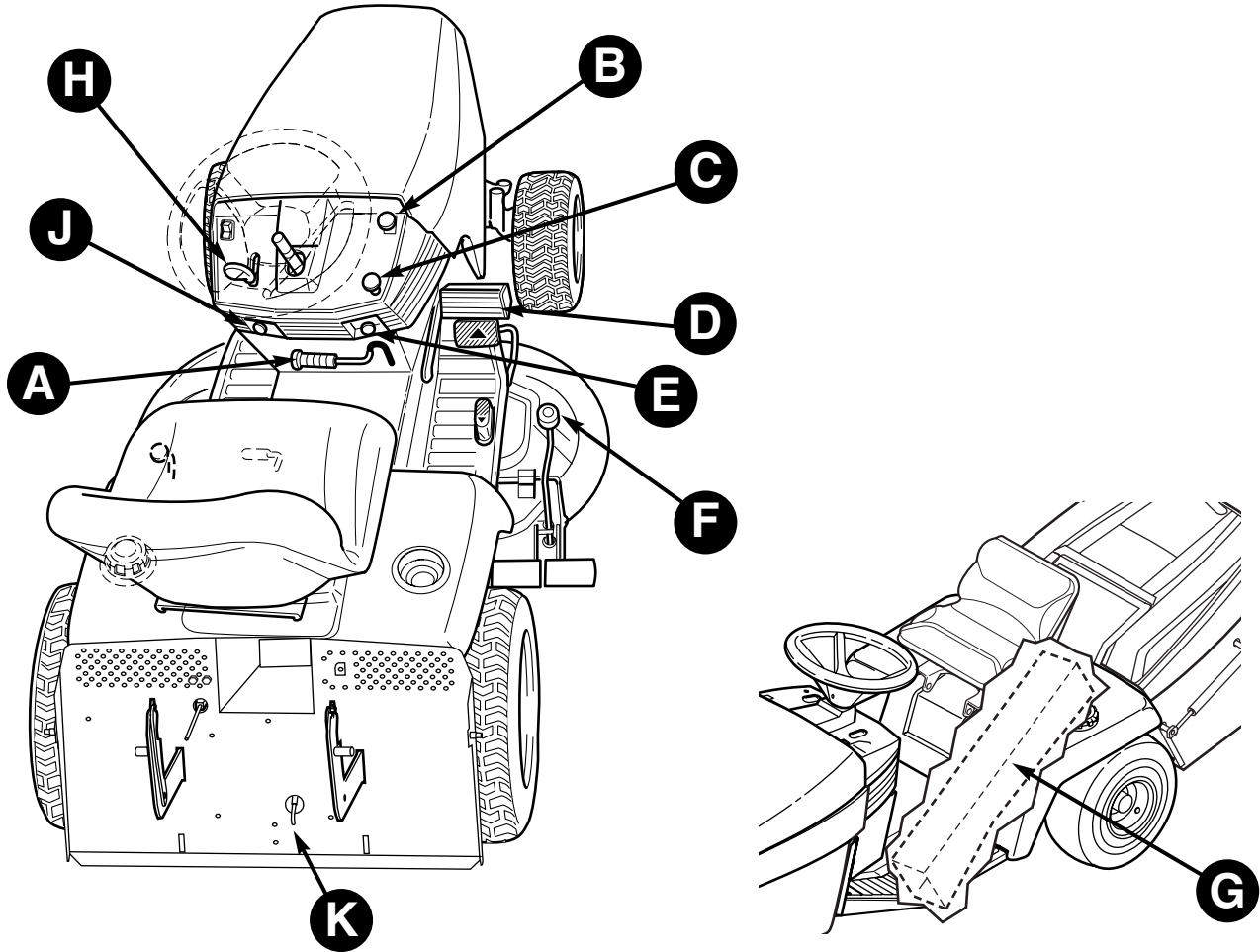
1. Stop tractor movement by releasing the ground speed controls. For emergency stopping, depress the brake pedal.
2. Engage the parking brake (C).
3. Disengage the PTO (B).
4. Place the throttle control in the idle position (H).
5. Turn the ignition switch (E) to the stop position. Remove the key.



Stopping the engine at speeds faster than idle can cause engine damage.



Do not stop or park tractor over dry leaves, grass or combustible materials.



Driving the tractor

1. Sit in the seat and adjust the seat so that you can comfortably reach all controls and see the dashboard display.
2. Engage the parking brake (C).
3. Make sure the PTO (B) is disengaged.
4. Start the engine (see “Starting the engine”).
5. Disengage the parking brake (C) and release the brake pedal (D).
6. Depress the forward ground speed control to travel forward. Release 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 controls, setting the parking brake and stopping the engine (see “Stopping the tractor and engine”).

Pushing the tractor by hand

1. Disengage the PTO and turn the engine off.
2. Move the transmission release lever (K) to the release position (see “Transmission release lever”).
3. The tractor can now be pushed by hand.



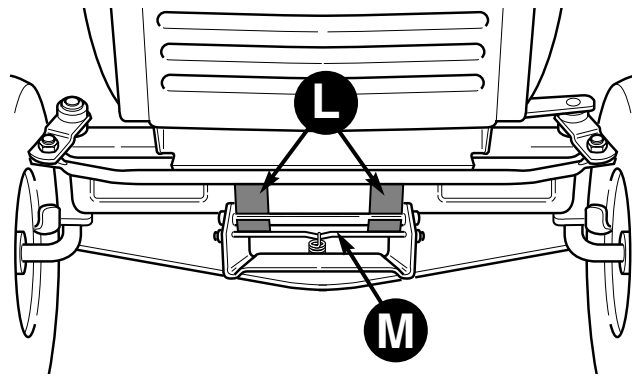
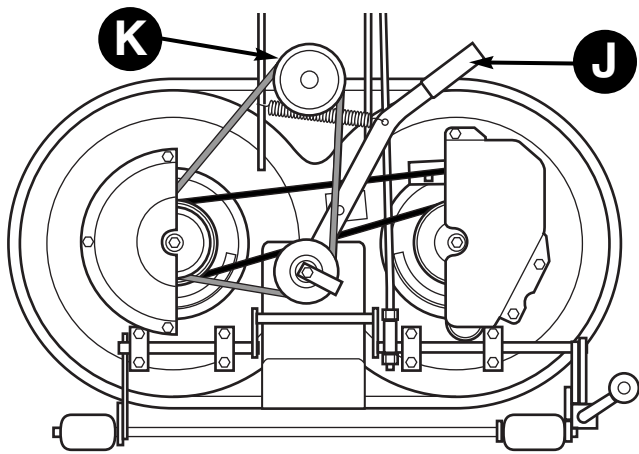
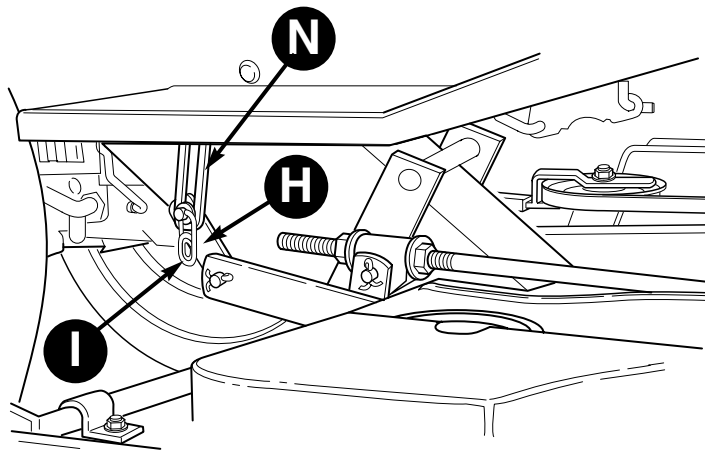
Towing the tractor with another vehicle is not recommended, as the transmission may be damaged.

Mowing

1. Engage the parking brake (D). Make sure the PTO (B) is disengaged.
2. Start the engine (see “Starting the engine”).
3. Lower the mower deck lift lever (A).
4. Set the cutting height (F) to the desired level.
5. Set the throttle to the full position.
6. Engage the PTO to activate the mower deck.
7. Begin mowing.
8. When the “catcher full” alarm sounds, turn off the PTO immediately to prevent discharge tube (G) clogging. Travel to the desired location and empty the catcher.
9. When done mowing, shut off the PTO and raise the mower deck lift lever. Empty the catcher before storing the unit.
10. Stop the engine (see “Stopping the tractor and engine”).



To reduce fire hazard, keep the engine, tractor and mower deck free of grass, leaves and excess grease.

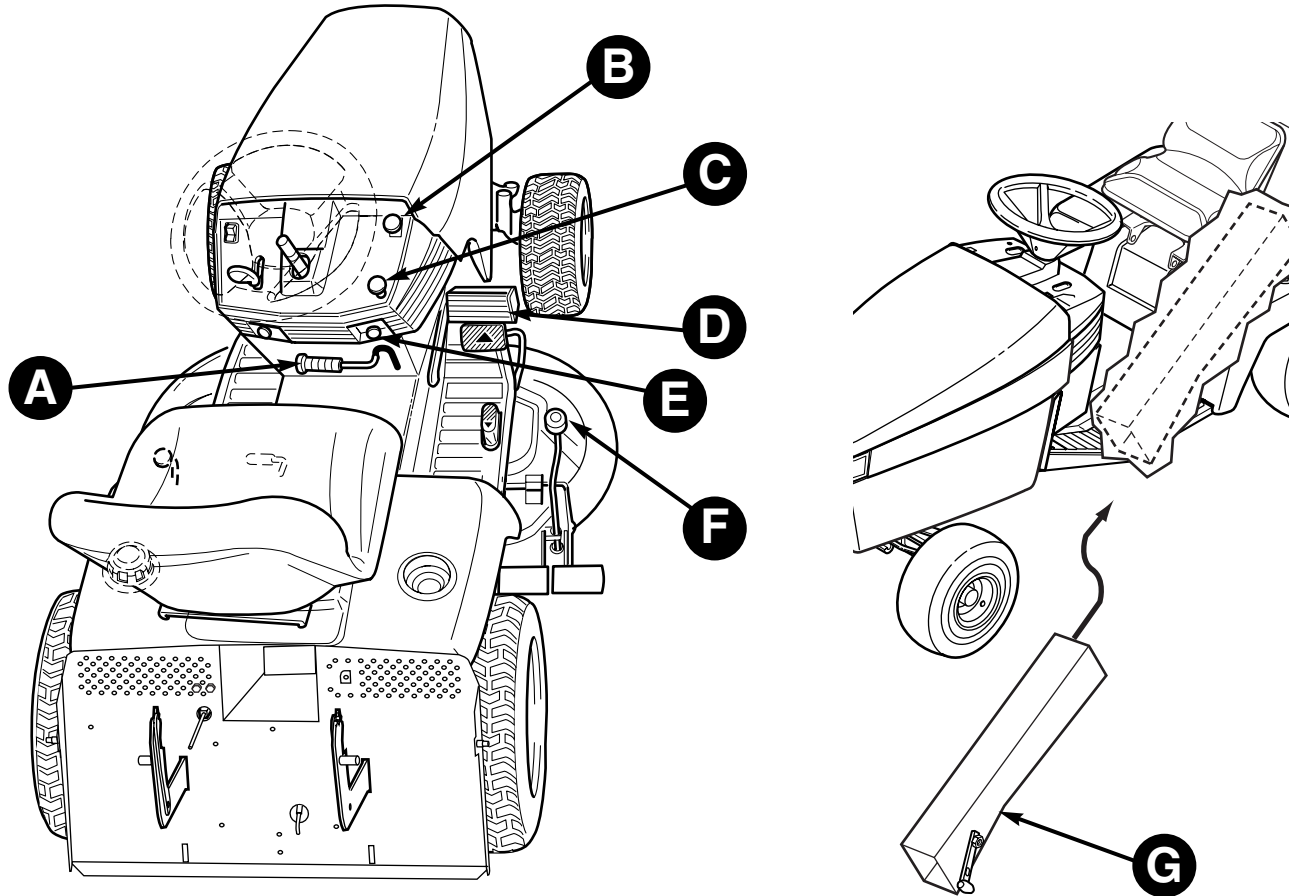


Mower deck removal



The muffler and surrounding areas may be hot.

1. Park tractor on a hard, level surface such as a concrete floor.
Move the PTO switch (B) and ignition switch (E) to the off position, remove the key, depress the brake pedal (D) and apply parking brake (C).
2. Disconnect the discharge tube (G, previous page) from the mower deck.
3. Place the mower deck lift lever (A) in the lowered position.
4. Place mower deck in the lowest cutting position using the cutting height adjust (F).
5. Disconnect the mower deck lift arm (H) from the tractor lift arm (N). Re-install washer and safety clip (I) on the mower deck lift arm (H).
6. Move the idler arm (J) to release belt tension and remove belt from PTO pulley (K).
7. Turn wheels straight ahead. Pull the spring-loaded lever (M) and lift mower deck hitch off of the tractor brackets (L).
8. Turn wheels fully left and slide mower deck out the right side of tractor.



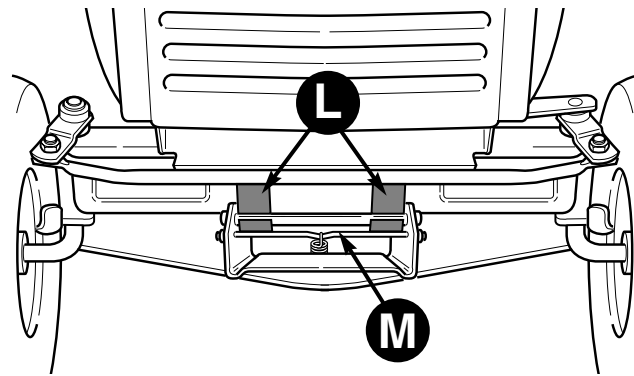
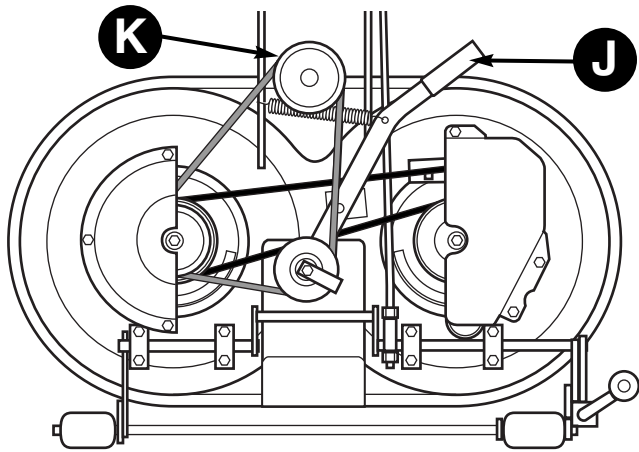
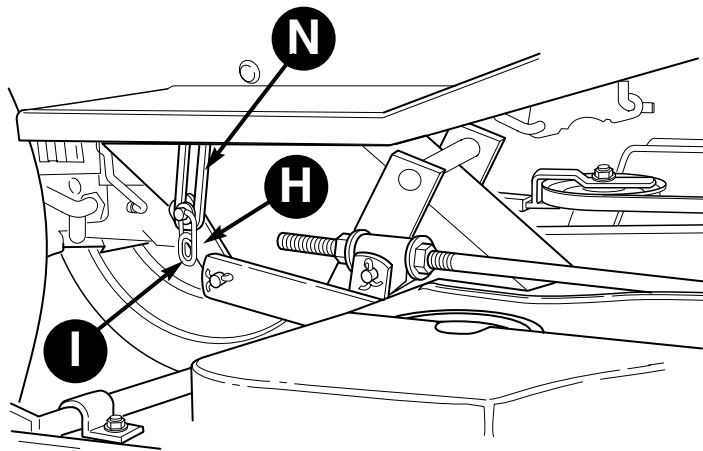
Mower deck installation



The muffler and surrounding areas may be hot.

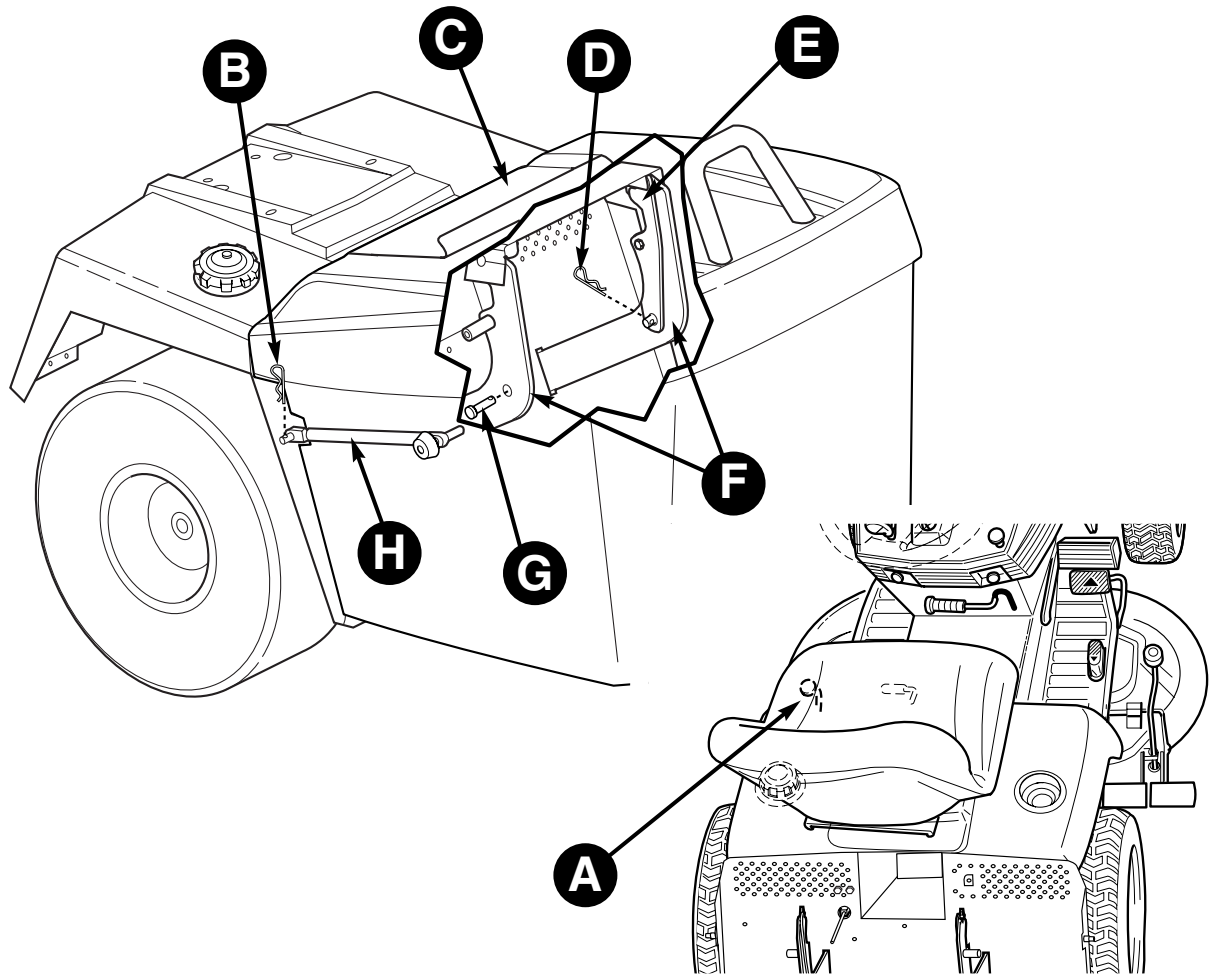
1. Park tractor on a hard, level surface such as a concrete floor. **Move the PTO switch (B) and ignition switch (E) to the off position, remove the key, depress the brake pedal (D), and apply parking brake (C).**
2. If not already done, orient the discharge tube (G) as shown and insert it up through the middle of the tractor.
3. Place cutting height adjust (F) in the lowest cutting position. Place the mower deck lift lever (A) in the lowered position also. Slide mower deck under the right side of tractor so that mower deck hitch is aligned with front tractor hitch.

(procedure continues)



Mower deck installation *(continued)*

4. Turn wheels straight ahead. Pull the spring-loaded lever (M) while lifting up on the mower deck hitch. Install mower deck hitch onto tractor hitch brackets (L).
5. Connect the mower deck lift arm (H) to the tractor lift arm (G) using the flat washer and safety clip (I).
6. Move idler arm (J) to relieve belt tension. Install the belt onto the PTO pulley (K).
7. Secure the discharge tube to the mower deck.



Grass catcher removal

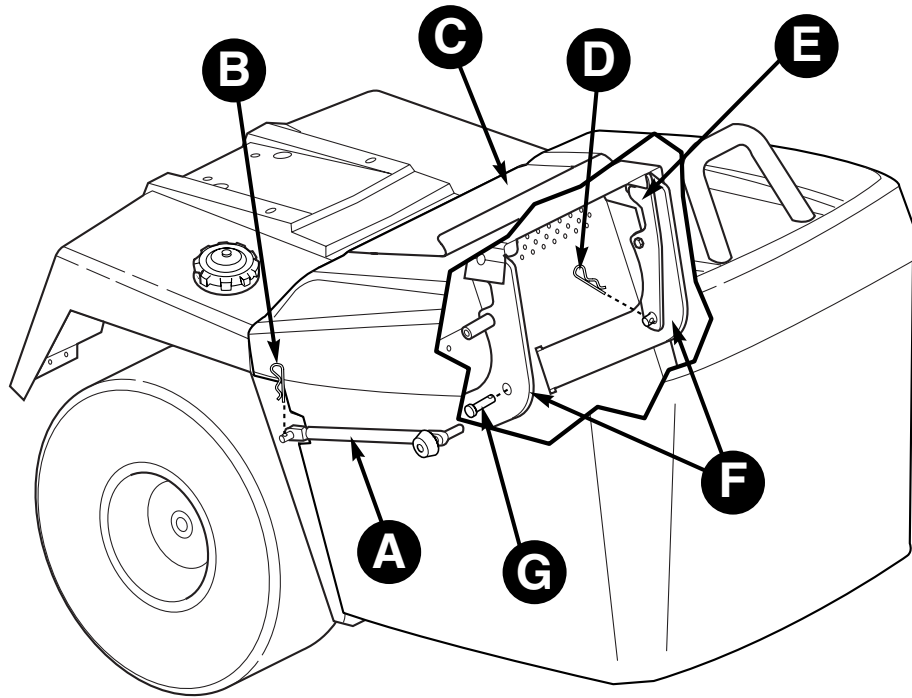


Never operate the tractor without the grass catcher or optional deflector installed.



Before removing the grass catcher: Engage the parking brake, disengage the PTO, stop the engine and remove the key.

1. Set the parking brake, turn off the PTO, turn off the ignition, and remove the key.
2. Depress the catcher release pedal (A) and empty the catcher.
3. Hold the catcher in the fully raised position, remove the clips (B) securing the gas shocks (H) to the tractor. Disconnect the shocks from the tractor. Carefully lower the catcher.
4. Open the cover (C) and remove the clevis pins (G) and hairpin clips (D) from both catcher arms (F).
5. Depress the catcher release pedal (A) and lift the catcher assembly off the catcher arms (F).



Grass catcher installation

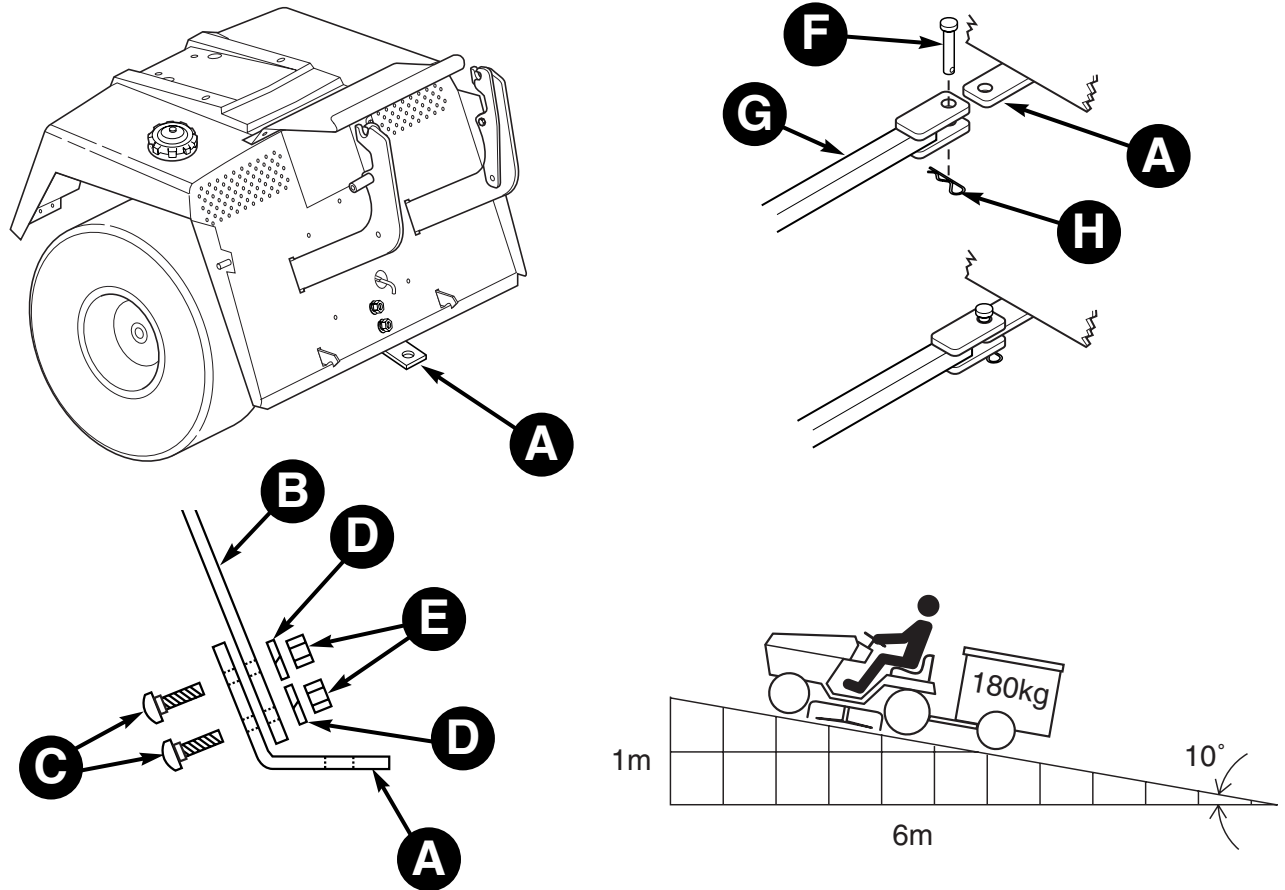


Never operate the tractor without the grass catcher or optional deflector installed.



Before installing the grass catcher: Engage the parking brake, disengage the PTO, stop the engine and remove the key.

1. Set the parking brake, turn off the PTO, turn off the ignition, and remove the key.
2. Open the cover (C).
3. Rest the catcher assembly on the catcher arms (F).
4. Move the swing latches (E) into vertical and locked position. Secure with clevis pins (G) and hairpin clips (D).
5. Close the cover (C).
6. Hold the catcher in the fully raised position.
7. Connect the gas shocks (A) to the tractor. Secure with the clips (B).
8. Carefully lower the catcher.



Optional trailer hitch

This tractor is shipped with an optional trailer hitch (A) that can be installed if desired. The hitch can only be used with the grass catcher removed. When using the catcher, the hitch may remain installed. See CE Compliance Specifications chart for trailer hitch weight limits.

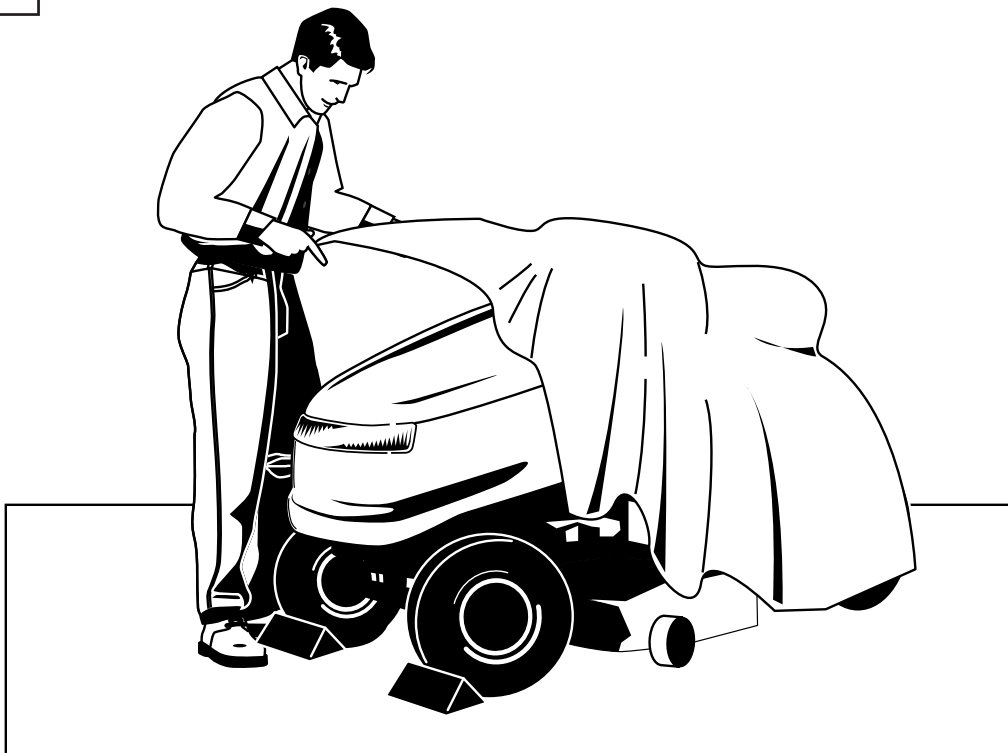
Hitch installation

1. Remove the catcher assembly (see "Grass catcher removal").
2. Install the hitch (A) behind the tractor back plate (B).
3. Insert two 3/8-16 x 1" carriage bolts (C) through the hitch (A) and back plate (B) as shown. Secure with two lockwashers (D) and nuts (E).

Attaching a trailer

The maximum horizontal drawbar force allowed is 444N. The maximum vertical drawbar force is 222N. This equates to a 180 kg trailer on a 10 degree hill.

1. Align the trailer tongue (G) with the trailer hitch (A). Secure using a clevis pin (F) and hair pin clip (H).



Storage



Never store the unit, with gasoline in the engine or fuel tank, in a heated shelter or in an enclosed, poorly-ventilated enclosure.

Gasoline fumes may reach an open flame, spark or pilot light (such as a furnace, water heater, clothes dryer, etc.) and cause an explosion.



Gasoline, if permitted to stand unused for extended periods (30 days or more), may develop gummy deposits that 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.



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



If storing your tractor between winter snow removal jobs in a cold area, we suggest that you fill the fuel tank at the completion of each job to prevent water condensation in the fuel tank.



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



Wait for engine to cool before filling tank.



Temporary storage (30 days or less)

Remember that 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 plugs and put in a safe place. Be sure the spark plug openings are protected from foreign objects with a suitable cover.
- If the unit can't be stored on a reasonably level surface, chock the wheels.
- Clean all grass and dirt from the mower deck.

Long-term storage (longer than 30 days)

Before you store your unit for the off-season, read the maintenance and storage precautions in the "Safety" section, then perform the following steps:

1. Drain crankcase oil 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 manual.
5. Clean any dirt or grass from cylinder head cooling fins, engine housing and air cleaner element.
6. Cover air cleaner and exhaust outlet tightly with plastic or other waterproof material to keep out moisture, dirt and insects.
7. Completely grease and oil unit as outlined in the "Lubrication" section.
8. 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, placed in a cool, dry place and fully charged about once a month. If battery is left in unit, disconnect the negative cable.
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 that gasoline fumes can travel to distant sources of ignition and ignite, causing risk of explosion and fire.

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. Uncover the exhaust outlet and air cleaner.
4. Fill the fuel tank with fresh gasoline. See engine manual for recommendations.
5. See engine 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.



Regular maintenance



Regular maintenance



When servicing the tractor or mower deck, disengage PTO, remove ignition key, set parking brake and disconnect the spark plug wires.

Accessing the engine

Service interval: As required

To gain access to the engine, unhook the rubber straps (A) and tip the hood forward.

Checking/adding fuel



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.

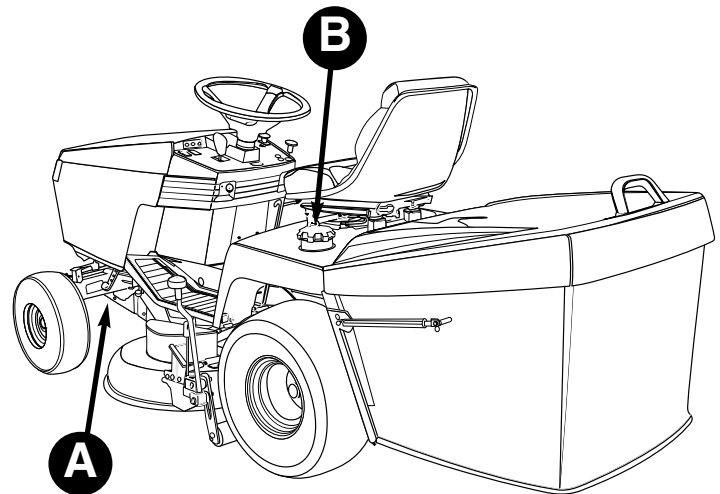
Service interval: As required

To add fuel:

1. Remove the fuel cap (B).
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.



Never use gasoline containing METHANOL, gasohol containing more than 10% ethanol, gasoline additives, premium gasoline or white gas because engine and fuel system damage could result.



Engine maintenance

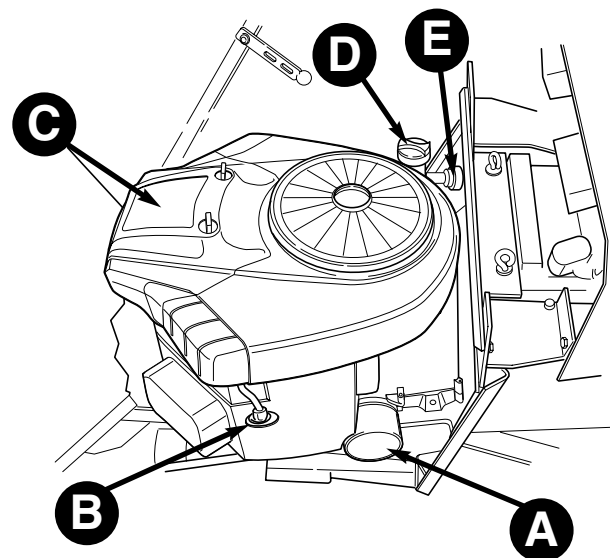
Service interval: See engine manual

The following engine maintenance procedures must be performed at intervals specified in the engine manual: check engine oil, change engine break-in oil, change engine oil and filter, check/change air filter and check/change spark plugs.

See the illustration for location of the maintenance items: engine oil filter (A), spark plugs (B, on both sides of engine), air filter (C), engine oil fill/dipstick (D) and fuel filter (E).



When changing the engine oil, raise the left rear corner of the tractor slightly to help the oil drain. When changing the oil filter, raise the right rear wheel.

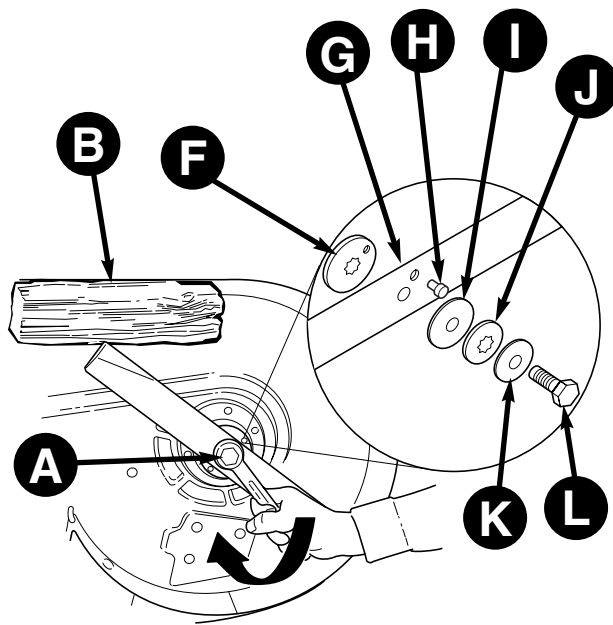


Check tire pressures

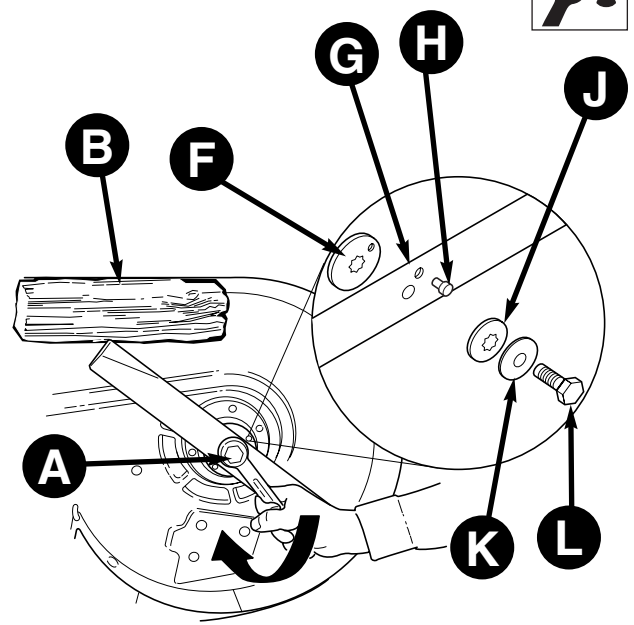
Service interval: Every 25 hours

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

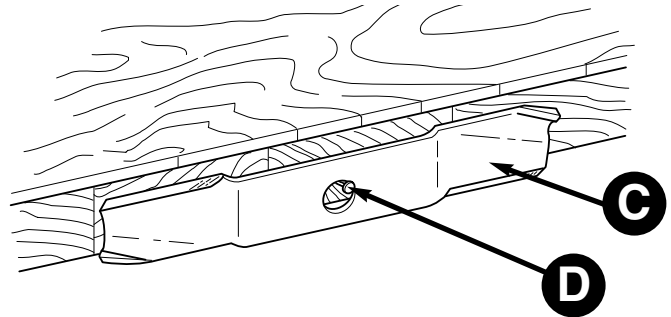
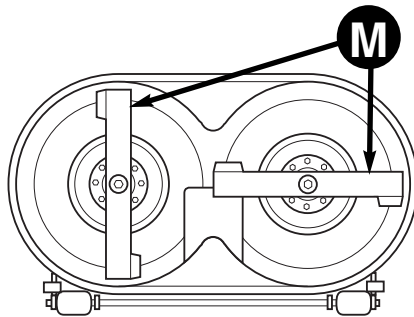
Front tires 12-15 psi (.83-1.04 bar)
Rear tires 6-8 psi (.41-.55 bar)



Serial No. 00001-01999



Serial No. 02000-Up



Servicing the mower blades

Service interval: Every 25 hours



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

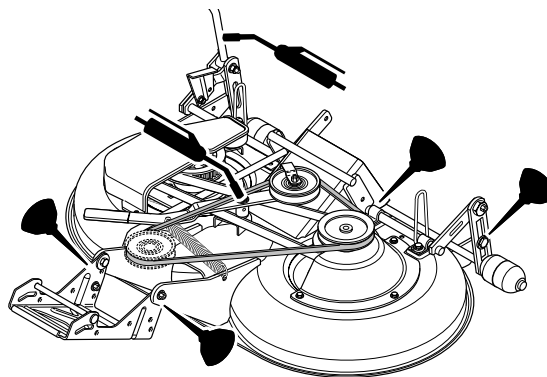
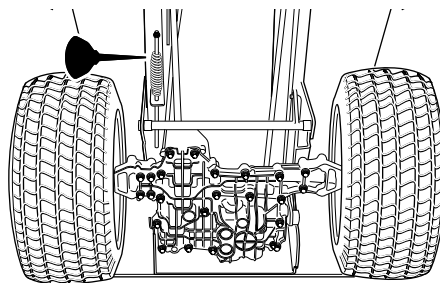
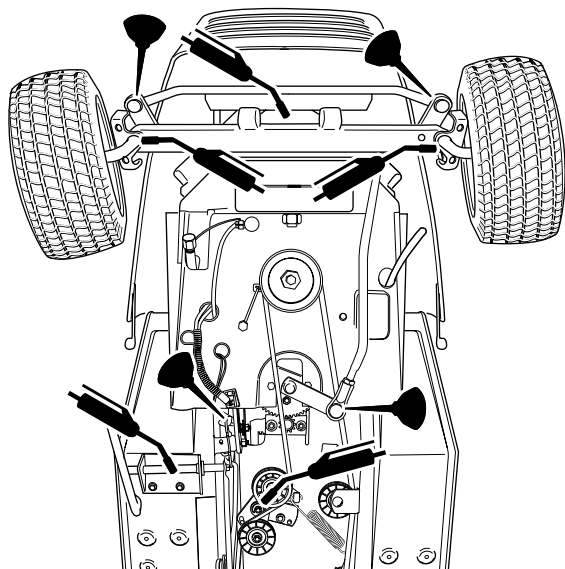
For your personal safety, blade mounting capscrews must each be installed with a spline washer and a spring washer, then securely tightened to 61-75 N.m (45-55 ft. lbs.).

Mower blades must be timed perpendicular to each other.

NOTE: Flat washer (I) is not used on models with serial number 2000-up.

1. Remove mower deck (see "Mower deck removal").
2. To remove blade for sharpening, use a block of wood (B) to prevent blade rotation while loosening the capscrew (A).
3. Remove the capscrew (L), spring washer (K), spline washer (J), flat washer (I), alignment pin (H) and blade (G). Do not remove the blade adapter (F).
4. Use a file to sharpen blade to a fine edge. If blade is severely damaged, it should be replaced.

5. Balance the blade (C) as shown. Center the blade's hole on a nail (D) lubricated with a drop of oil. A balanced blade will remain level.
6. Reinstall the blade (G) with the tabs pointing up toward the mower deck as shown. Reinstall the alignment pin (H). Be sure the blades (M) are positioned perpendicular to each other. If not, perform the mower blade timing procedure found in this section.
7. Reinstall the flat washer (I), spline washer (J), spring washer (K) and capscrew (L). Use a wooden block (B) to prevent blade rotation while tightening the capscrew (L) to 61-75 N.m (45-55 ft. lbs.).



Lubrication

Service interval: Every 25 hours

Lubricate the unit at the locations shown.

Grease



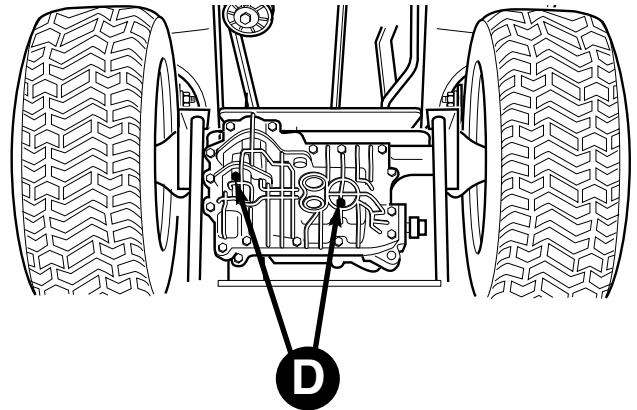
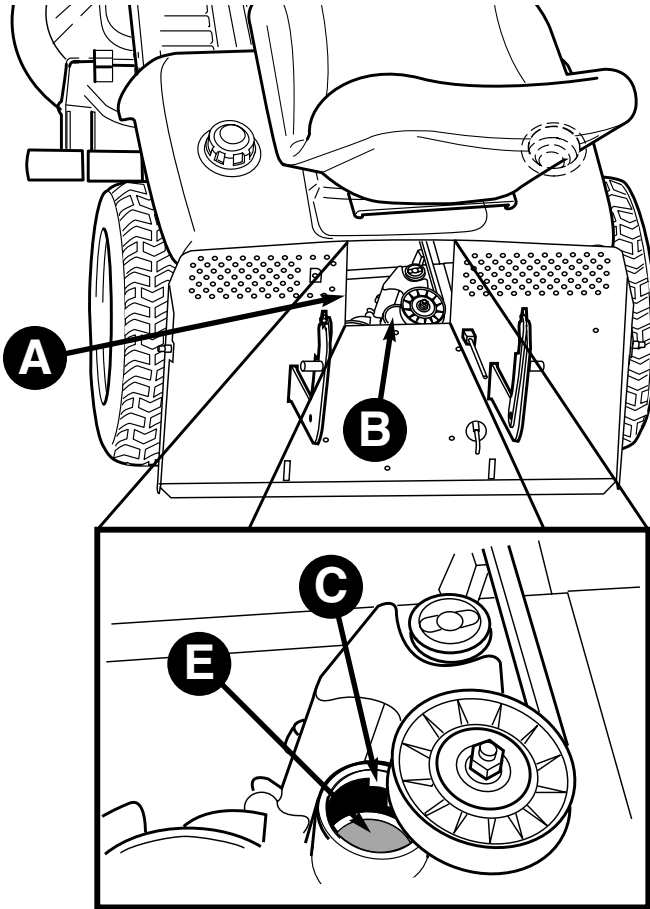
Lubricate with grease where this symbol is shown. Use grease fittings when present. Disassemble parts to apply grease to moving parts when grease fittings are not present. Use only lithium grease.

Oil



Lubricate with oil where this symbol is shown. 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.



Transmission oil change



Do not allow dirt, water or other debris to enter the transmission. Even a small amount of dirt can damage the transmission.

Service interval: Change oil after initial 50 hours, then every 250 hours

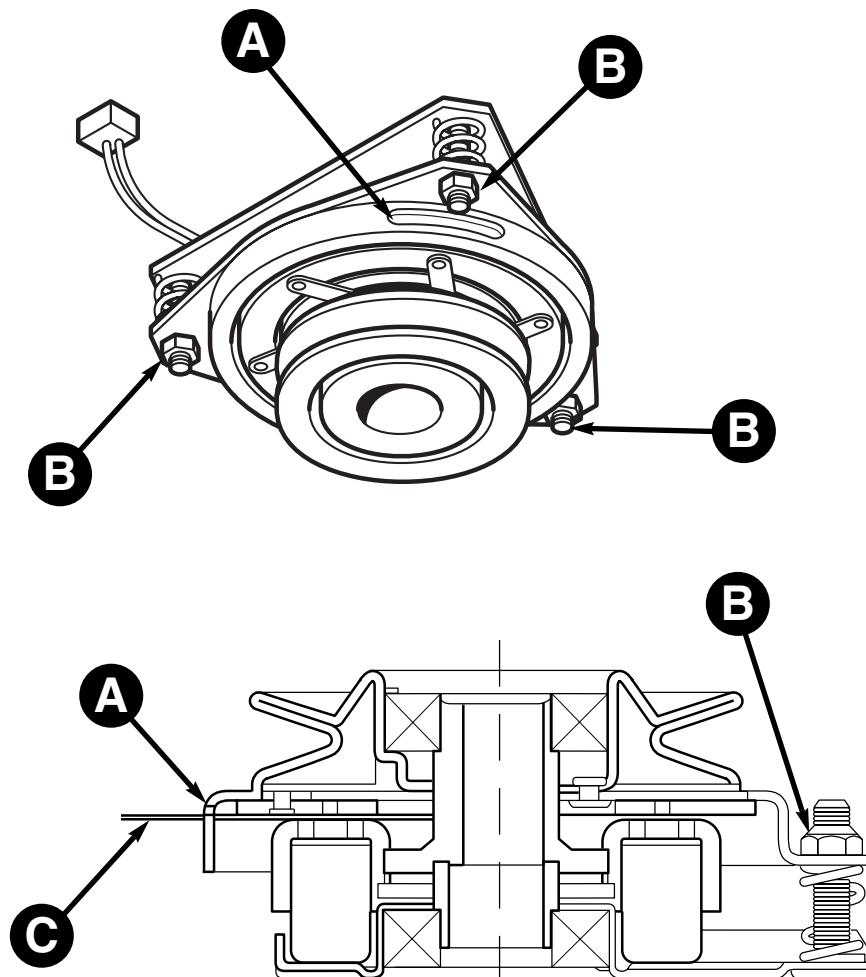
Transmission oil capacity: Approx. 2.4 liters (2-1/2 quarts)

Transmission oil type: SAE 10W-30 with a minimum API rating of SG/CD

1. Turn off the PTO, engage the parking brake, turn off the ignition, and remove the key. Wait for all moving parts to stop.
2. Remove the mower deck (see "Mower deck removal").
3. Slide the mower discharge tube out through the bottom of the tractor.
4. Open the catcher cover to access the top of the transmission through the discharge opening (A). If desired, remove the catcher assembly.

5. Thoroughly clean and dry the transmission and surrounding area (see "Clean off transmission").
6. Place a drain pan below the transmission and remove the drain plugs (D). Allow the transmission to drain for approximately 10 minutes.
7. Replace the drain plugs (D).
8. Remove the fill cap (B), spring, and filter (E).
9. Fill with new transmission oil (see specifications section for oil type). Observe the oil level. The oil should be filled up to the bottom of the top casing notch (C).
10. Reinstall the fill cap (B), spring, and filter (E).
11. Reinstall the discharge tube, mower deck and catcher.

Test run the tractor for several minutes and check the oil level. If the transmission is excessively noisy or unresponsive, perform the transmission purging procedure found in the "Adjustments and Service" section.



PTO clutch adjustment

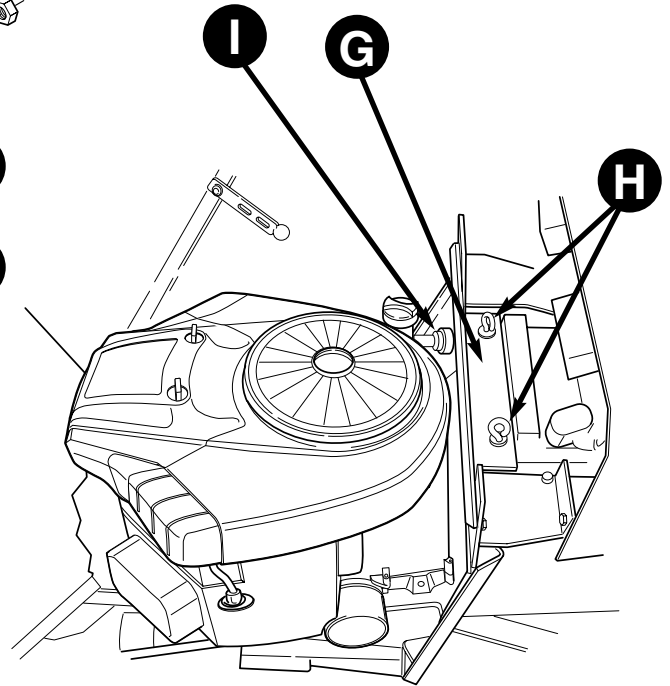
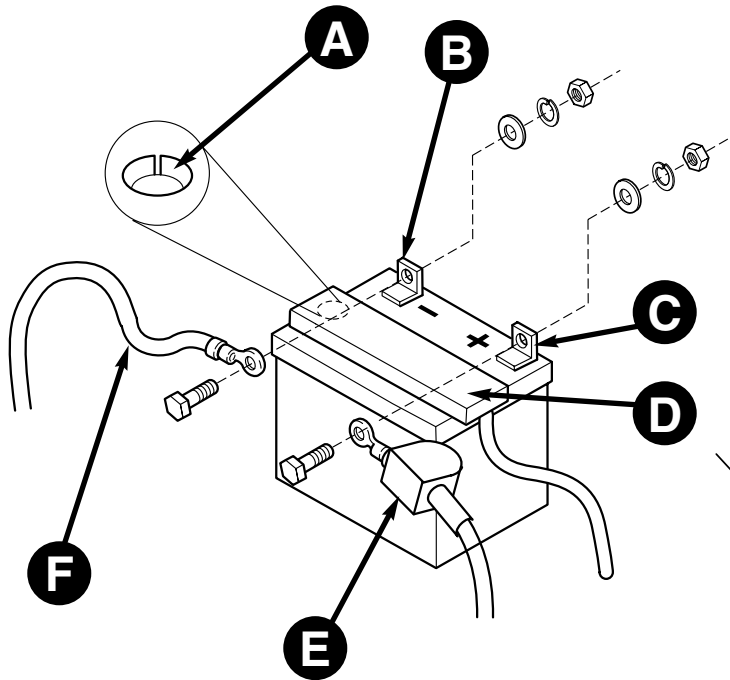
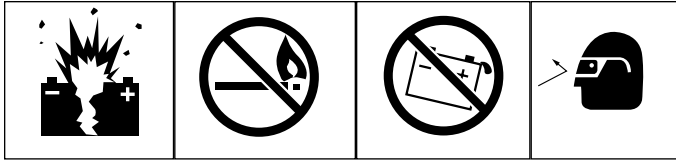
Service interval: After first 50 hours, then every 250 hours
Also perform adjustment if the clutch is slipping

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. Insert a 0.3 mm (0.010") feeler gauge (C) through each window (A), positioning the gauge between the rotor face and the armature face as shown.
3. Alternately tighten the adjustment nuts (B) until the rotor face and armature face just contact the gauge.



The actual air gap between the rotor and armature may vary even after performing the adjustment procedure.

4. Check the mower blade stopping time. The mower blades and mower drive belt must come to a complete stop within five seconds after the PTO is disengaged.



Fuel filter replacement

Service interval: Every 100 hours

The fuel filter (I) is located in the fuel line between the fuel tank and the carburetor.

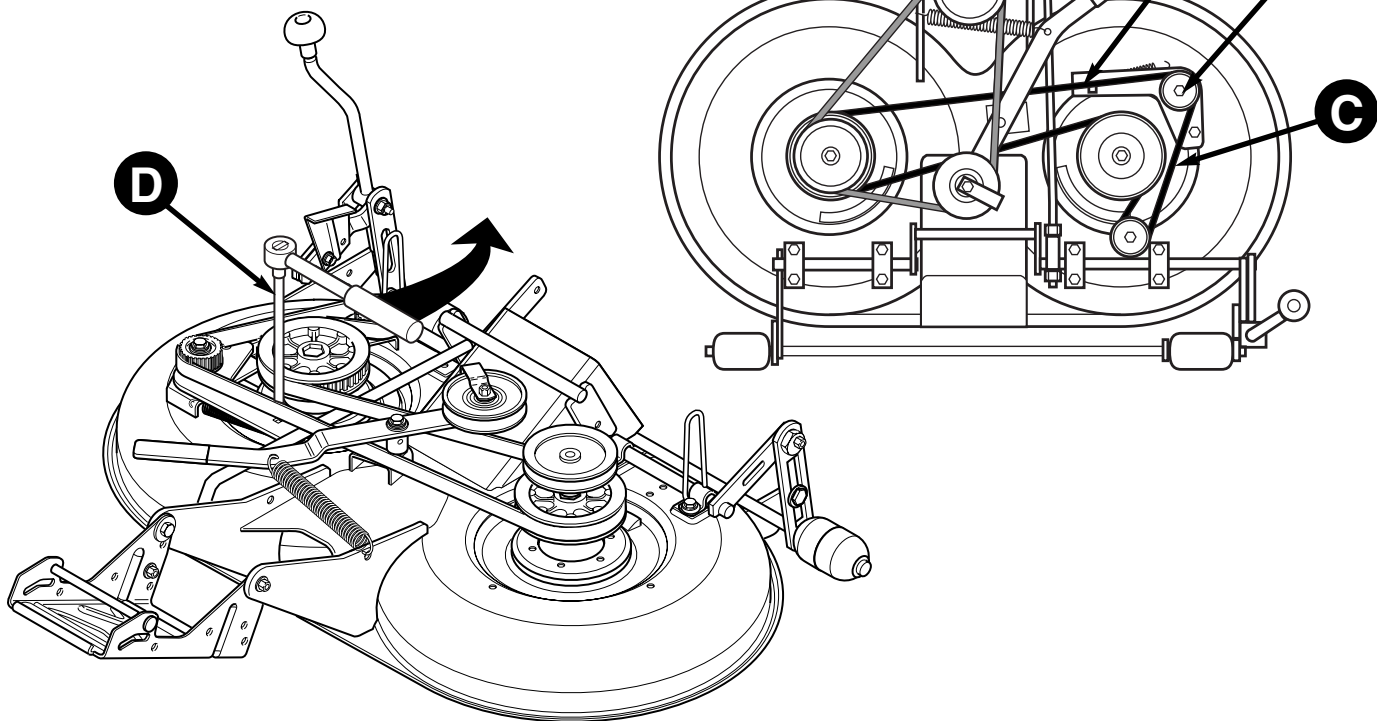
If filter is dirty or clogged, replace as follows:

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

Battery maintenance

Service interval: Every 100 hours

1. **Serviceable batteries only:** Remove the filler cap (D). Fluid must be even with the split ring full mark (A). If not, add distilled water. Reinstall the cap (D).
2. **First, disconnect the negative battery cable (F) from the battery terminal (B). Second, disconnect the positive battery cable (E) from the battery terminal (C).**
3. Remove the battery hold-down rods (H) and hold-down bar (G). Remove battery from the engine compartment.
4. Clean the compartment with a solution of baking soda and water. Clean the battery terminals (B and C) and cables (E and F) with a wire brush and battery terminal cleaner until shiny.
5. Reinstall the battery in the battery compartment. Secure with the battery hold-down rods (H) and hold-down bar (G).
6. **First, reconnect the positive battery cable (E) to the positive battery terminal (C). Slide the terminal cover (D) into place. Second, reconnect the negative battery cable (F) to the negative battery terminal (B).**



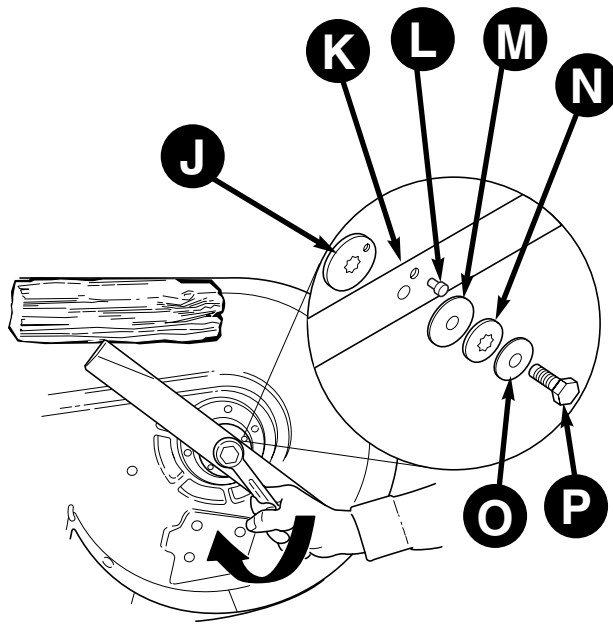
Mower blade belt check



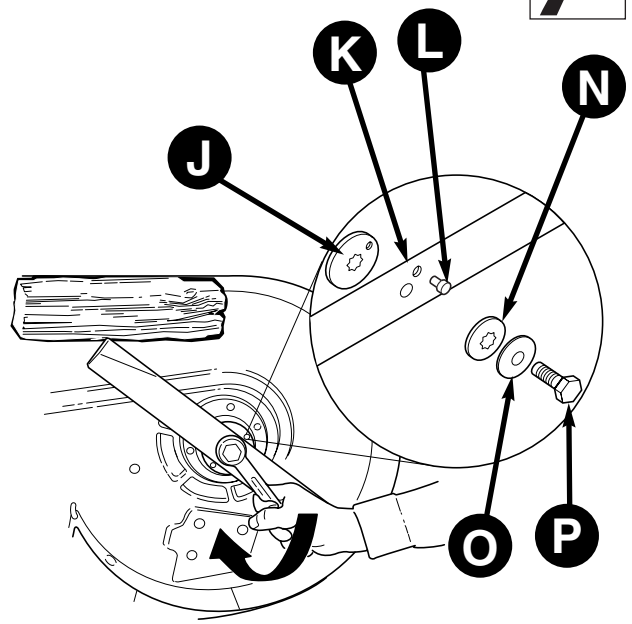
Mower blades are sharp. For your personal safety, do not handle the mower blades with bare hands. Careless or improper handling of blades may result in serious injury.

Service interval: Yearly

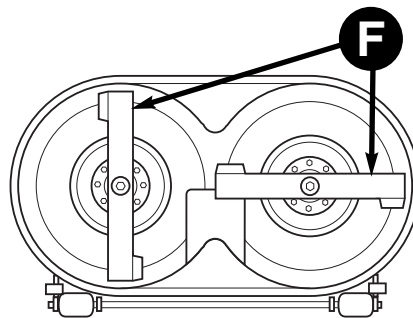
1. Turn the PTO to the off position, engage the parking brake, turn the engine off, and remove the key. Remove the mower deck (see “Mower deck removal”).
2. Remove the screws securing the belt covers. Remove the belt covers.
3. Loosen the idler assembly cap screw (B).
4. Using a 3/8" drive ratchet and extension (D), move the spring-loaded idler assembly (A) to relieve tension on the belt (C).
5. Remove the belt (C) and inspect it for cracks, missing teeth and wear. Replace belt if worn or damaged.
6. Reinstall the belt (C). Releasing the idler assembly (B) allows the spring to automatically tension the cogged belt.
7. Tighten the idler assembly cap screw (B) and reinstall the belt covers.



Serial No. 00001-01999



Serial No. 02000-Up



Check mower blade timing



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

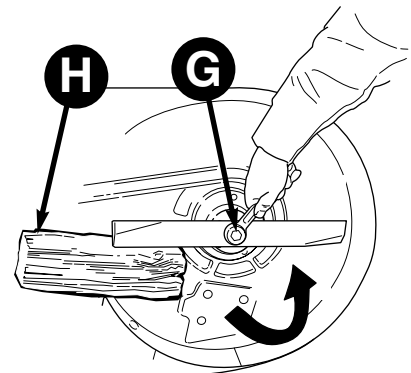
For your personal safety, blade mounting capscrews must each be installed with a spline washer and a spring washer, then securely tightened to 61-75 N.m (45-55 ft. lbs.).

Mower blades must be timed perpendicular to each other.

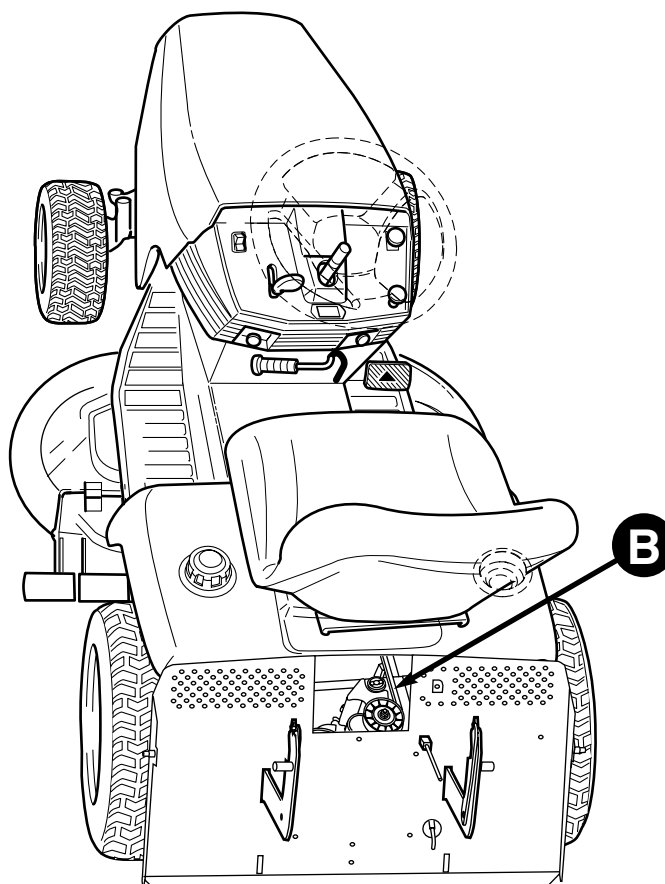
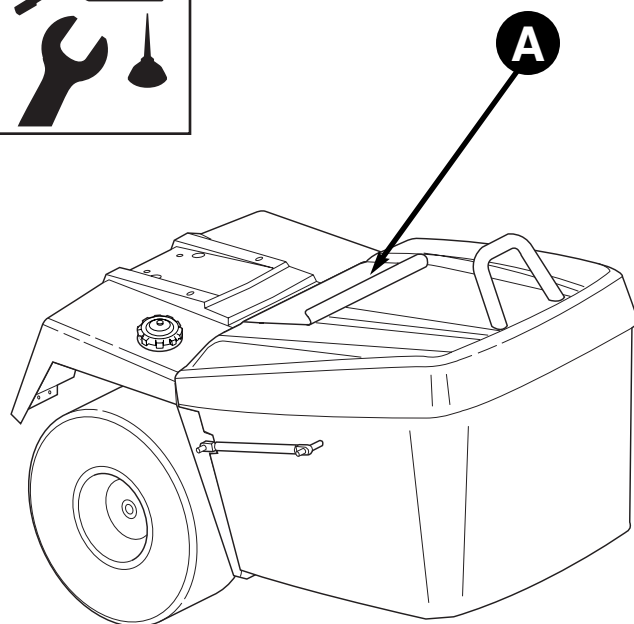
NOTE: Flat washer (M) is not used on models with serial number 02000-up.

Service interval: Yearly

1. Turn the PTO to the off position, 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 (F) must be positioned perpendicular to each other as shown. If not, proceed to step 3.
3. Use a block of wood (H) to prevent blade rotation while loosening the capscrew (G).
4. Remove the capscrew (P), spring washer (O), spline washer (N) and flat washer (M).



5. Remove the alignment pin (L). Rotate the blade (K) manually until the blades (F) are perpendicular to each other as shown. It may be necessary to remove the hub (J) to rotate the blade.
6. Reinstall the alignment pin (L), flat washer (M), spline washer (N), spring washer (O) and capscrew (P). Use a wooden block (H) to prevent blade rotation while tightening the capscrew (G) to 61-75 N.m (45-55 ft. lbs.).



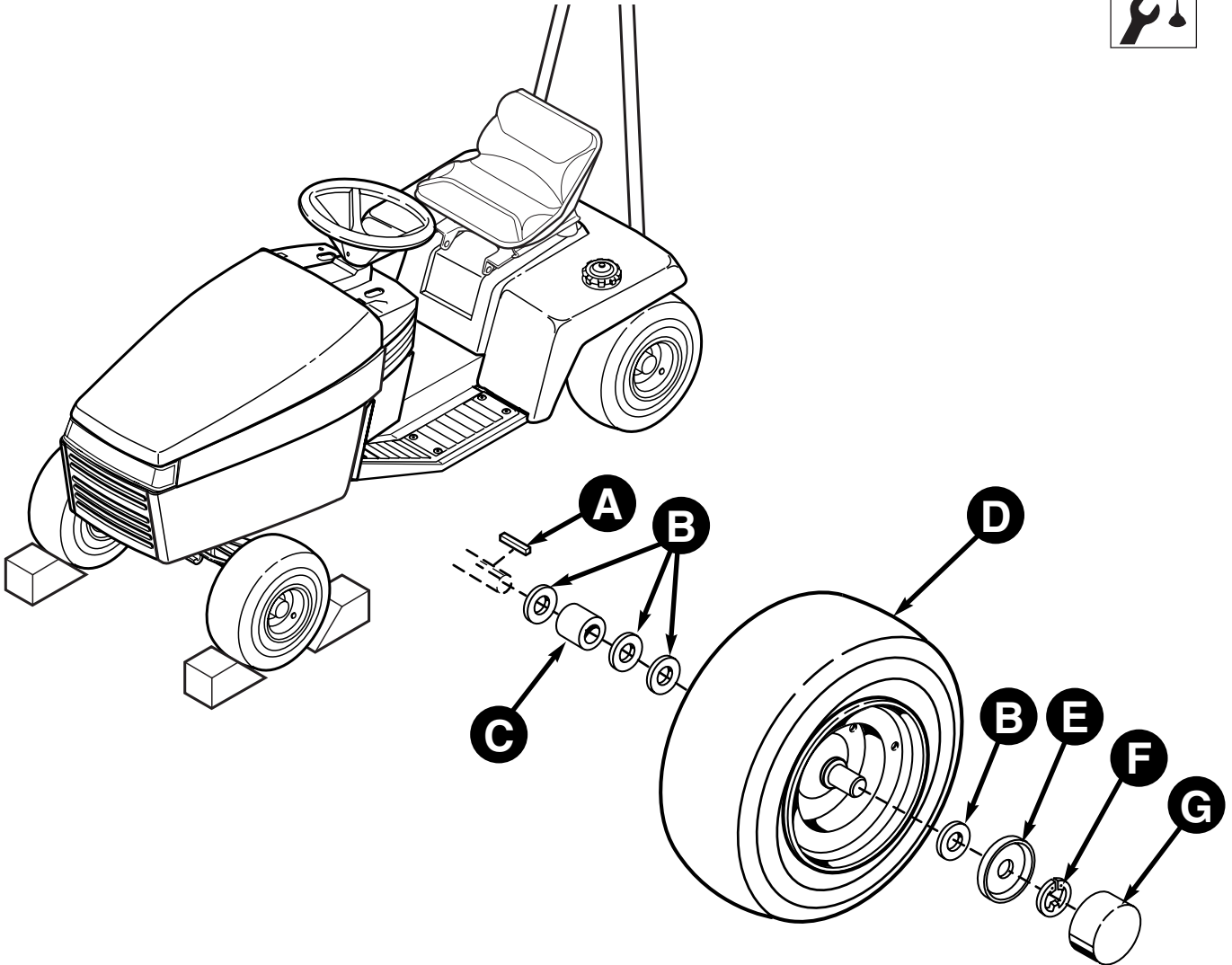
Clean off transmission



Do not allow dirt, water or other debris to enter the transmission. Even a small amount of dirt can damage the transmission.

Service interval: Yearly, more often with frequent cutting

1. Turn off the PTO, engage the parking brake, turn off the ignition, and remove the key. Wait for all moving parts to stop.
2. Remove the mower deck (see "Mower deck removal").
3. Slide the mower discharge tube out through the bottom of the tractor.
4. Open the catcher cover (A) to access the top of the transmission through the discharge opening (B). If desired, remove the catcher assembly.
5. Using water and a scrub brush, clean off the transmission. DO NOT use a pressure washer because you might introduce water into the transmission.



Lubricate rear axles

Service interval: Yearly

1. Remove the ignition key and disconnect the spark plug wires while working on the unit. Engage the parking brake. If desired, remove the catcher assembly.
2. Block the front tires. Using a floor jack or chain hoist, carefully elevate the rear of the tractor 2,5-5 cm (1"-2") off the ground and support with jackstands.

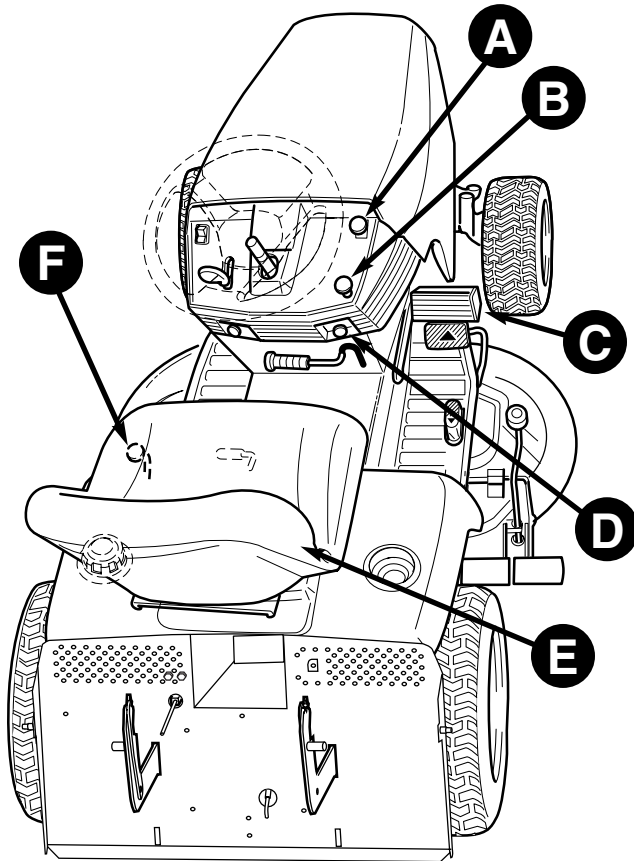


If using an overhead hoist to lift the unit, lift using only the back plate or catcher support arms.



For overall unit stability during service, do not raise rear of the tractor higher than required for wheel removal.

3. Pry the hub cap (G) off using a small screw driver or pliers.
4. Remove the retaining ring (F), hub cap retainer (E) and wheel (D).
5. Remove the large washers (B), spacer (C) and key (A).
6. Lubricate the axle shaft with anti-seize compound or lithium grease.
7. Reinstall components in reverse order of disassembly. Be sure the key (A) is installed in the axle key-way.
8. Lower the tractor.



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 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 the safety switches and never tamper with the safety devices. Check their operation regularly.

Service interval: Every fall and spring

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 (A) is in the on position, or
- Brake pedal (C) is NOT fully depressed [parking brake (B) disengaged].

Test 2 - Engine SHOULD crank if:

- PTO switch (A) is in the off position, and
- Brake pedal (C) is fully depressed [parking brake (B) engaged].

Test 3 - Engine should SHUT OFF if:

- Operator rises off seat (E) with PTO (A) engaged, or
- Operator rises off seat (E) with brake pedal (C) NOT fully depressed [parking brake (B) disengaged].

Test 4 - PTO should SHUT OFF if:

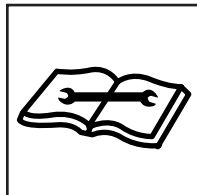
- The grass catcher (F) is opened with the PTO switch (A) in the on position.

Test 5 - Mower blade brake check

The mower blades and mower drive belt should come to a complete stop within five seconds after PTO switch is turned to the off position (or operator rises off seat). If mower drive belt does not stop within five seconds, perform the PTO clutch adjustment found in the "Regular Maintenance" section or see your authorized dealer.



Once the engine has stopped, the PTO switch must be turned off after the operator returns to the seat in order to start the engine.



Adjustments and Service



Adjustments and Service

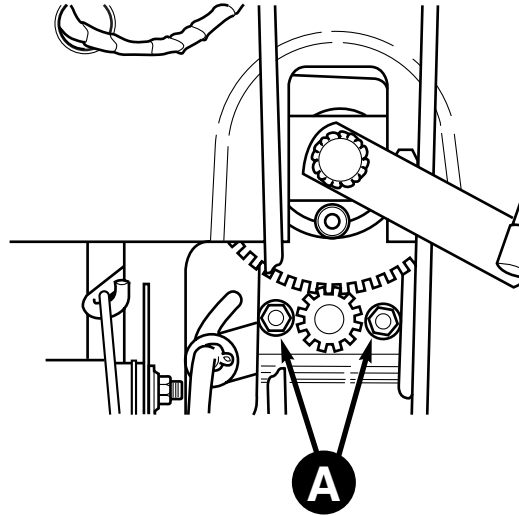


When servicing the tractor or mower deck, disengage PTO, remove ignition key, set parking brake and disconnect the spark plug wires.

Steering gear adjustment

If there is excessive slack in the steering system, the steering gear backlash can be removed.

1. Loosen the two nuts (A) and adjust the bracket so the gear teeth are closely meshed.
2. Tighten nuts after adjustment.

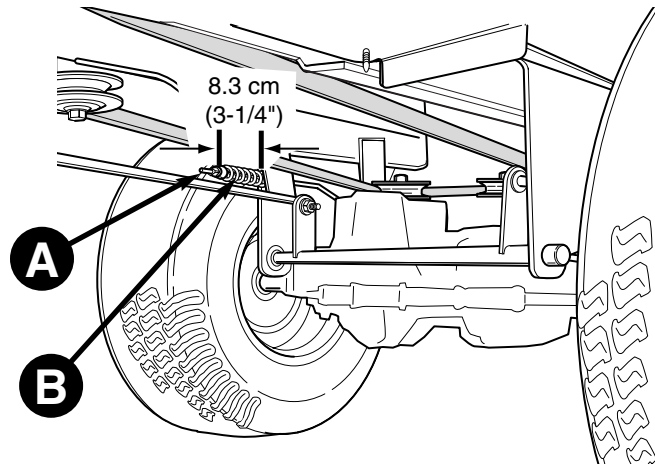


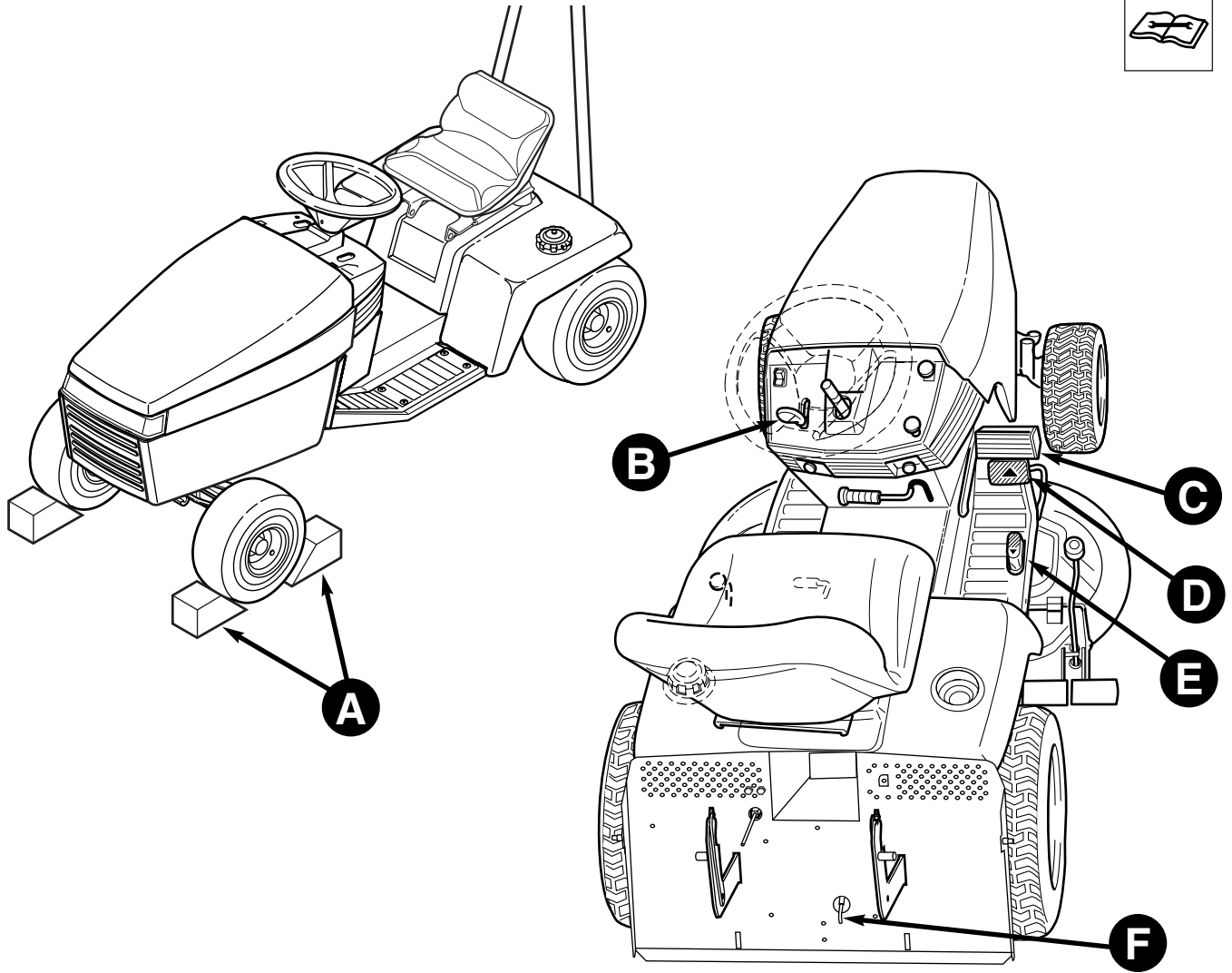
Brake spring adjustment

Compressed brake spring length: 8.3 cm (3-1/4")

1. Disengage the PTO switch, engage the parking brake, turn the ignition to the off position, and remove the key.
2. With the parking brake engaged, measure the length of the compressed brake spring (B); it should measure 8.3 cm (3-1/4"). If not, tighten or loosen the adjustment nut (A).

If the previous adjustment does not correct a braking problem, see your authorized dealer.



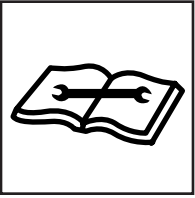


Transmission purging



If using an overhead hoist to lift the unit, lift using only the back plate or catcher support arms.

1. Remove the catcher (see “Grass catcher removal”).
2. Block the front tires (A). Using a floor jack or chain hoist, carefully elevate the rear of the tractor and support with jackstands.
3. Activate the seat switch, depress the brake pedal (C) and start the engine. After the engine has started, set throttle (B) to the idle position.
4. Release the brake pedal (C) and fully depress the forward ground speed pedal (D). While holding the pedal, engage and disengage the transmission release lever (F) several times.
5. Fully depress the reverse ground speed pedal (E). While holding the pedal, engage and disengage the transmission release lever (F) several times.
6. Engage the transmission release lever (F) and depress the forward and reverse pedals several times.
7. Lower the tractor and test run for several minutes.



Steering wheel adjustment

The steering wheel has two positions.

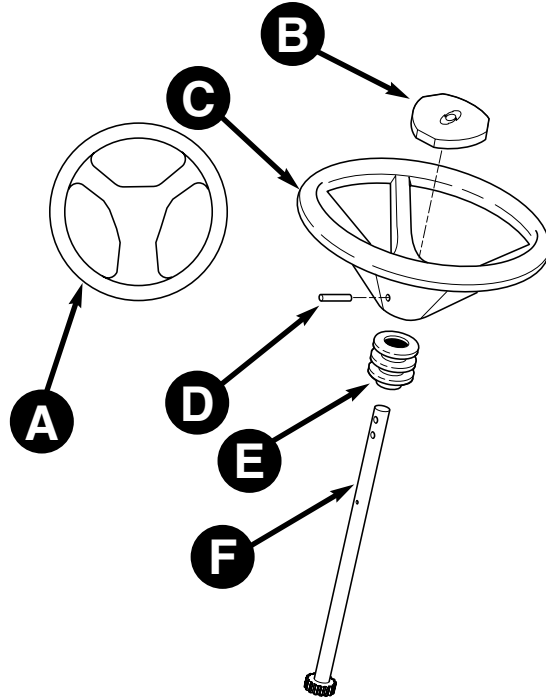


The steering wheel cover (B) is decorative and does not need to be removed for this procedure.

1. Remove the roll pin (D) securing the steering wheel (C) to the steering shaft (F).
2. Remove the flex collar (E) and lubricate the steering shaft (F) with anti-seize compound to ease future service.
3. Reinstall the flex collar (E) and steering wheel (C). Use the lower hole in the steering shaft (F) and reinstall the roll pin (D). The thick spoke of the wheel (A) should face the operator when the wheels are turned straight forward.



The upper hole is for taller operators who need more knee clearance.



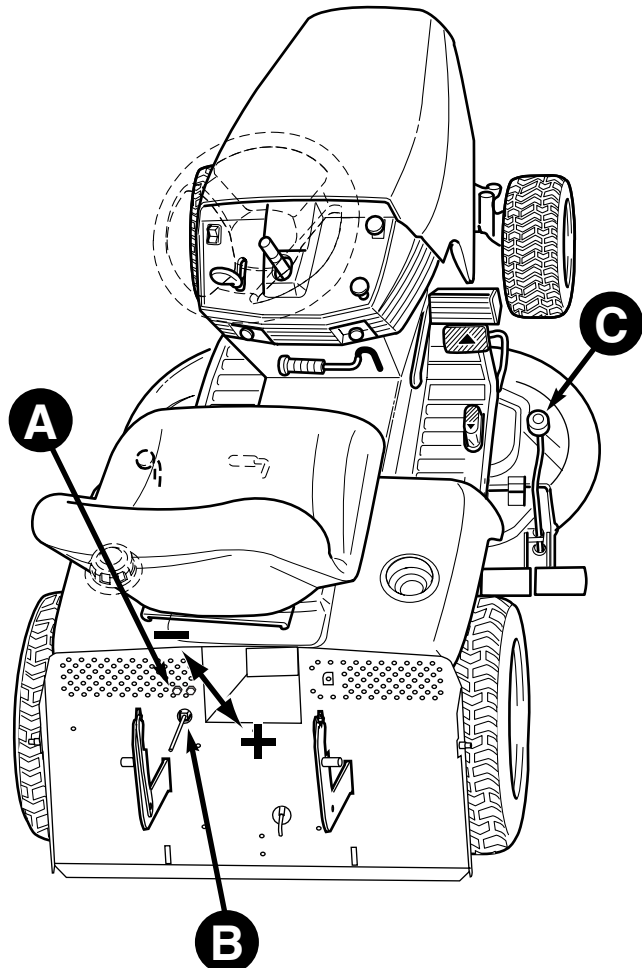
“Catcher full” alarm adjustment

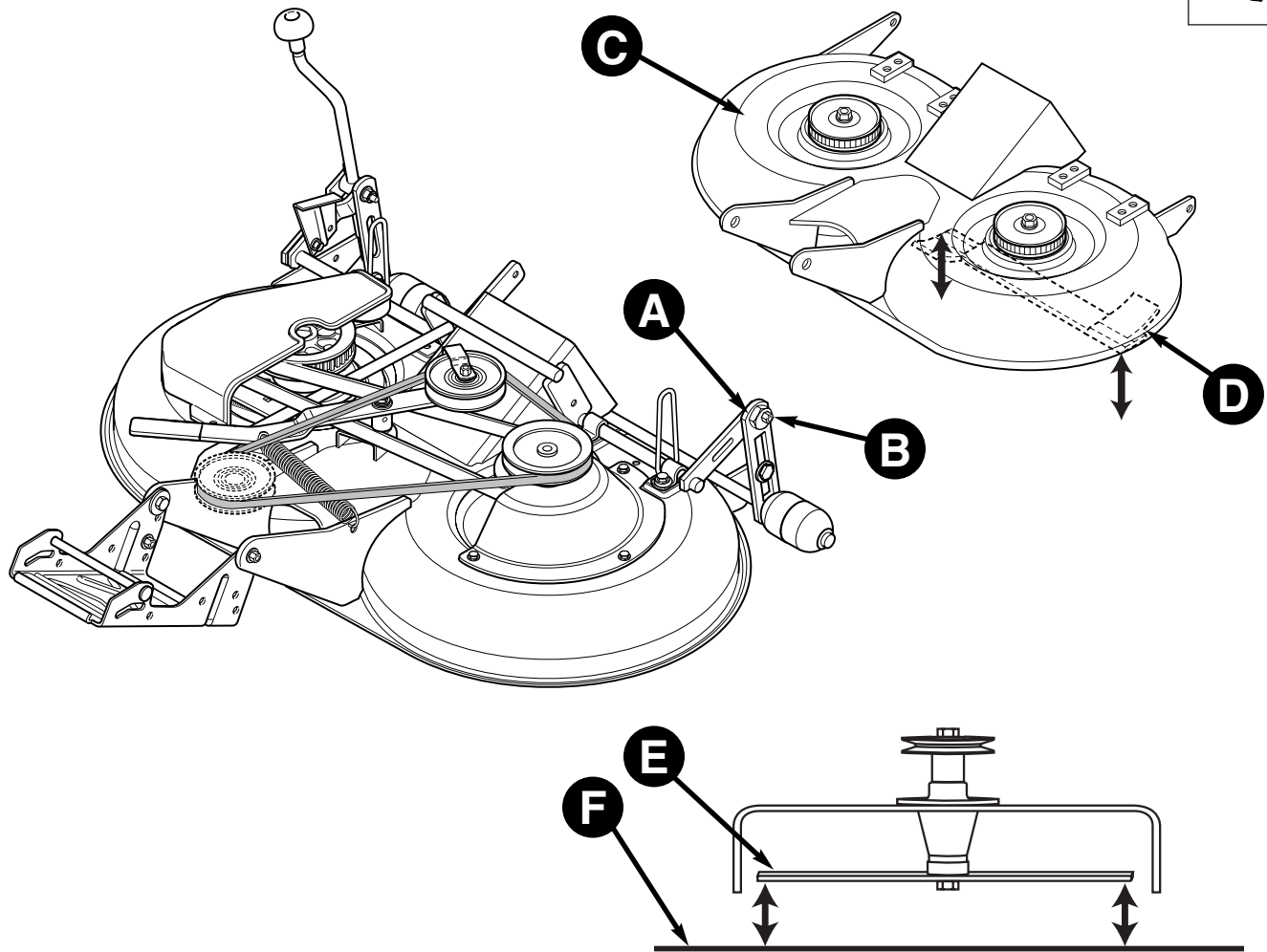
To adjust the “catcher full” alarm, loosen the sensor mounting screws (A) and move the sensor (B) to increase or decrease sensitivity.

Cutting height adjustment

The cutting height adjust (C) controls the mower deck cutting height. The cutting height is infinitely adjustable between 2.5 and 9 cm (1" and 3-5/8").

Turn the knob clockwise to raise the deck and counterclockwise to lower it.

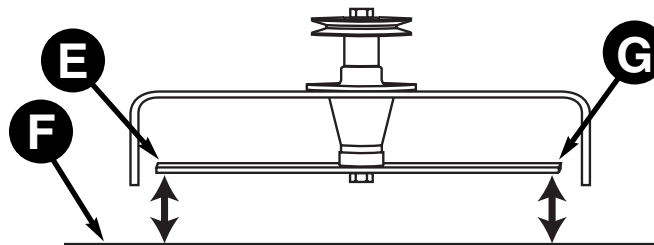
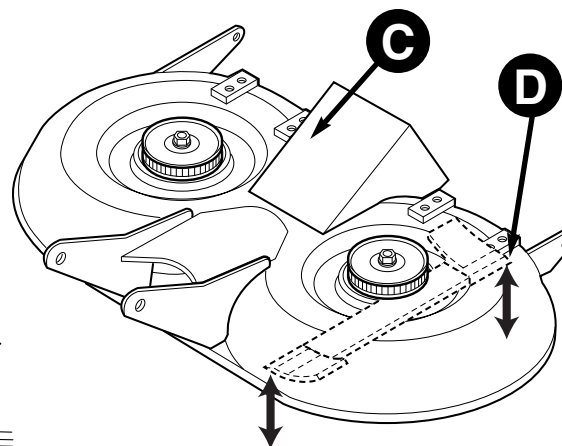
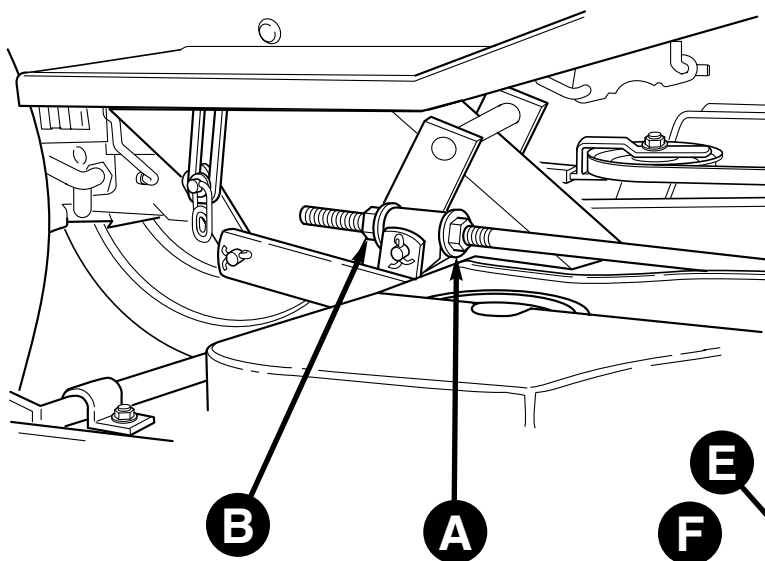
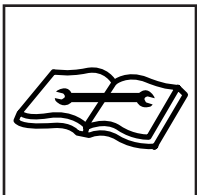




Side-to-side leveling

NOTE: Check the tire pressures before performing deck leveling procedures.

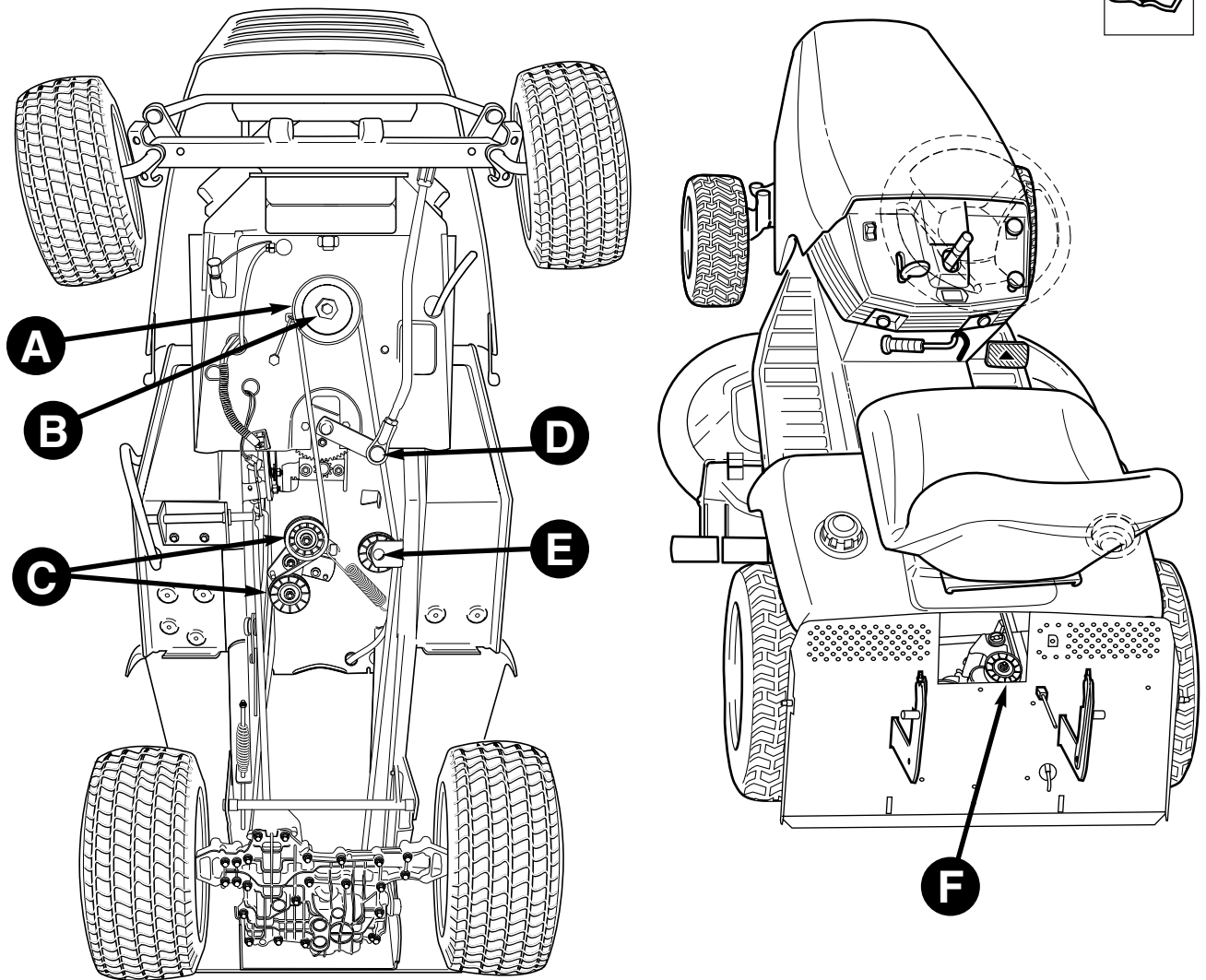
1. With the mower deck installed, place the tractor on a smooth, level surface such as a concrete floor. Turn the front wheels straight forward.
2. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
3. Check for bent blades and replace if necessary.
4. Place the mower deck in mid-cut position. Turn the mower deck pulleys by hand until the right blade (C) faces side-to-side.
5. Measure the distance from the ground (F) to the outside tip of the right blade (E).
6. Repeat steps 4 and 5 for the left blade.
If there is more than 3 mm (1/8") difference between the measurements on each side, loosen the outside nut (B) and turn the eccentric nut (A) to raise or lower the left side of mower deck.
7. When the mower deck is level, hold the eccentric nut while tightening the outside nut.



Front-to-back leveling

NOTE: Check the tire pressures before performing deck leveling procedures.

1. With the mower installed, place the tractor on a smooth, level surface such as a concrete floor. Turn the front wheels straight forward.
2. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key.
3. Check for bent blades and replace if necessary.
4. Place the mower deck in mid-cut position. Turn the mower deck pulleys by hand until the right blade (C) faces front-to-back.
5. Measure the distance from the ground (F) to the front tip (E) and rear tip (G) of the right blade (C).
6. Repeat steps 4 and 5 for the left blade (D).
The front tips (E) should be even with the rear tips (G) or within 3 mm (1/8"). If not, proceed with steps 7 and 8.
7. To raise the front of the mower deck, loosen the front nut (A) and turn the rear nut (B) against the bracket. To lower the front of the mower deck, loosen the rear nut (B) and tighten the front nut (A).
8. Re-check the blade measurements and tighten the both nuts (A and B).



Tractor drive belt replacement

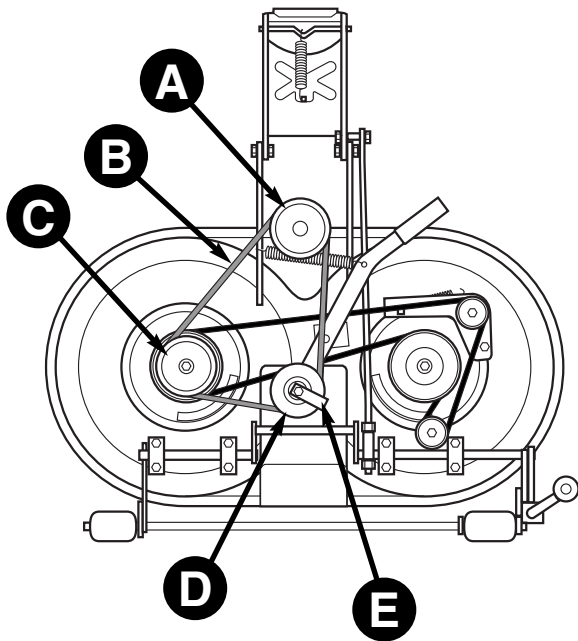
Remove old drive belt

1. Disengage the PTO, engage the parking brake, shut the engine off, and remove the key. Remove the mower deck and discharge tube.
2. Unplug the PTO clutch (A) electrical connector.
3. Remove the PTO clutch cap screw (B) and washers. Remove the PTO clutch, drive pulley and key.
4. Remove the cap screw and locknut from the rear of the drag link (D).
5. Loosen both idler assembly cap screws (C) and remove the belt from the pulleys.
6. Loosen the front and rear frame idler pulleys (E and F) and remove the belt from the pulleys.
7. Loosen the transmission belt guide and remove the belt from the transmission pulley.

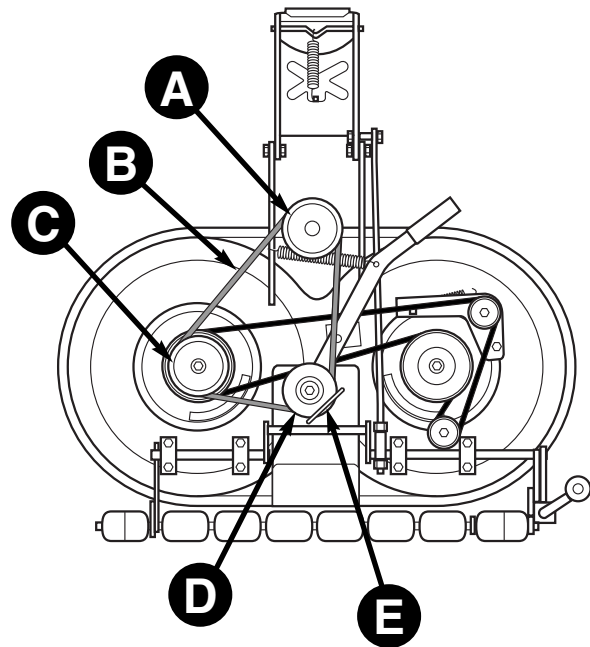
(procedure continues)

Install new drive belt

8. Install the new drive belt on the transmission input pulley, and route the belt through all idler pulleys (C, E and F).
9. Install the engine drive pulley, key, washers and PTO clutch (A). Install the belt on the drive pulley.
10. Secure the PTO clutch (A) using the original hardware. Tighten the PTO clutch cap screw (B) to 61-75 N.m (45-55 ft. lbs.). Be sure the frame clutch anchor engages the PTO clutch.
11. Tighten all idler pulley cap screws (C, E and F).
12. Reconnect the drag link (D) to the steering arm. Coat the drag link cap screw with thread-locking compound and tighten to 23-31 N.m (17-23 ft. lbs.).
13. Release the parking brake.
14. Adjust the transmission input pulley belt guide to within 2-3 mm (1/8"-1/16") of the belt.



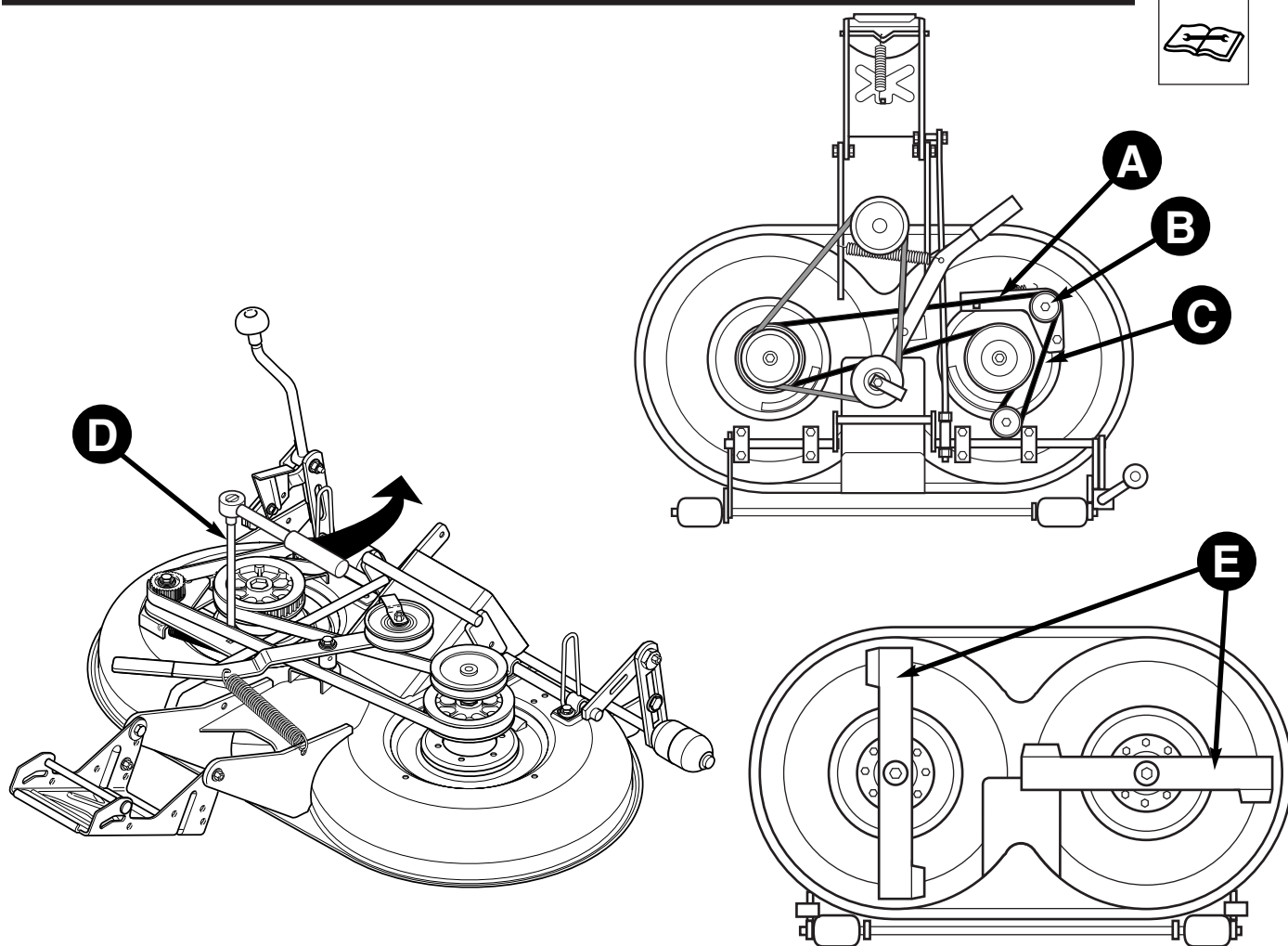
Serial No. 00001-01999



Serial No. 02000-Up

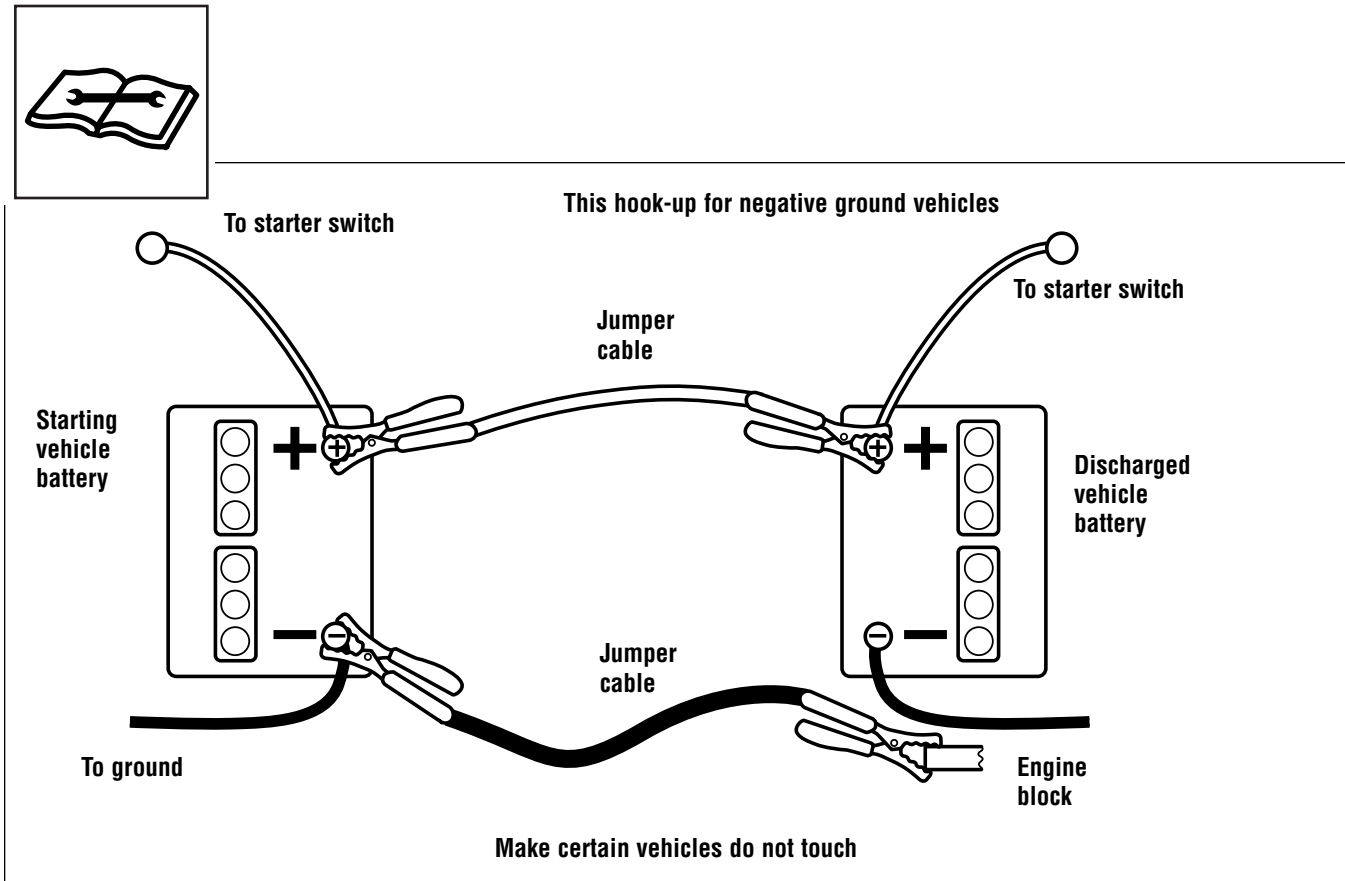
PTO belt replacement

1. With the mower 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"). Remove the belt covers.
3. Note the position of the idler pulley belt guide (E). Loosen the idler pulley capscrew and remove the belt from the pulley (D).
4. Install the new belt (B) as shown. When the mower deck is installed on the tractor, the belt wraps around the PTO clutch pulley (A), idler pulley (D) and mower deck drive pulley (C).
5. Return the idler pulley belt guide (E) to its original position and tighten the idler pulley capscrew.



Arbor drive belt replacement

1. With the mower 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”). Remove the belt covers.
3. Loosen the idler assembly capscrew (B).
4. Using a ratchet (D), move the idler assembly (A) to relieve tension on the belt (C).
5. Remove the belt (C).
6. Install a new belt (C) on the pulleys as shown. Releasing the idler assembly (A) allows the spring to automatically tension the cogged belt.
7. Tighten the idler assembly capscrew (B). Reinstall the belt covers.
8. Check that the blades (E) are positioned perpendicular to each other. If not, perform the mower blade timing procedure found in the “Regular Maintenance” section.



Battery service



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

Checking battery voltage

A voltmeter can be used to determine condition of battery. When engine is off, the voltmeter shows battery voltage, which should be 12 volts. When engine is running, the voltmeter shows voltage of charging circuit which normally is 13 to 14 volts.

A dead battery or one too weak to start the engine may not mean the battery needs to be replaced. For example, it may mean that the alternator is not charging the battery properly. If there is any doubt about the cause of the problem, see your authorized dealer. If you need to replace the battery, follow the steps for battery maintenance in the "Regular maintenance" section.



Do not attempt to charge a frozen battery. Allow the battery to warm to 15.5°C (60°F) before placing on charger.

Charging a completely discharged battery

1. Be aware of all the safety precautions you should observe during the charging operation. If you are unfamiliar with the use of a battery charger and hydrometer, have the battery serviced by your dealer.
2. Add water sufficient to cover the plate (fill to the proper level near the end of the charge). If the battery is extremely cold, allow it to warm before adding water because the water level will rise as it warms. Also, an extremely cold battery will not accept a normal charge until it becomes warm.
3. Always unplug or turn the charger off before attaching or removing the clamp connections.
4. Carefully attach the clamps to the battery in proper polarity (usually red to [+] positive and black to [-] negative).
5. While charging, periodically measure the temperature of the electrolyte. If the temperature exceeds 51.6°C (125°F) or if violent gassing or spewing of electrolyte occurs, the charging rate must be reduced or temporarily halted to prevent battery damage.
6. Charge the battery until fully charged [i.e. until the specific gravity of the electrolyte is 1,250 or higher and the electrolyte temperature is at least 15.5°C (60°F)]. The best method of making certain a battery is fully charged, but not over charged, is to measure the specific gravity of a cell once per hour. The battery is fully charged when the cells are gassing freely at low charging rate and less than 0,003 change in specific gravity occurs over a three-hour period.



Jump starting with an auxiliary (booster) battery

Jump starting is not recommended. However, if it must be done, follow these directions. Both booster and discharged batteries should be treated carefully when using jumper cables. Follow the steps below EXACTLY, being careful not to cause sparks. Refer to the illustration.

1. Both batteries must be of the same voltage.
2. Position the vehicle with the booster battery adjacent to the vehicle with the discharged battery so that booster cables can be connected easily to the batteries in both vehicles. Make certain vehicles do not touch each other.
3. Wear safety glasses and shield eyes and face from batteries at all times. Be sure vent caps are tight. Place damp cloth over vent caps on both batteries.
4. Connect [+] positive cable to positive post of discharged battery (wired to starter or solenoid).
5. Connect the other end of same cable to same post marked [+] positive on booster battery.
6. Connect the second cable negative [-] to other post [-] of booster battery.
7. Make final connection on engine block of stalled vehicle away from battery. Do not lean over batteries.
8. Start the engine of the vehicle with the booster battery. Wait a few minutes, then attempt to start the engine of the vehicle with the discharged battery.
9. If the vehicle does not start after cranking for thirty seconds, STOP PROCEDURE. More than thirty seconds seldom starts the engine unless some mechanical adjustment is made.
10. After starting, allow the engine to return to idle speed. Remove the cable connection at the engine or frame. Then remove the other end of the same cable from the booster battery.
11. Remove the other cable by disconnecting at the discharged battery first and then disconnect the opposite end from the booster battery.
12. Discard the damp cloths that were placed over the battery vent caps.



Any procedure other than the preceding could result in:

(1) personal injury caused by electrolyte squirting out the battery vents,

(2) personal injury or property damage due to battery explosion,

(3) damage to the charging system of the booster vehicle or of the immobilized vehicle.



For your personal safety, use extreme care when jump starting. Never expose battery to open flame or electric spark – battery action generates hydrogen gas which is flammable and explosive. Do not allow battery acid to contact skin, eyes, fabrics, or painted surfaces. Batteries contain a sulfuric acid solution which can cause serious personal injury or property damage.

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.

To avoid engine damage, do not disconnect battery while engine is running. Be sure terminal connections are tight before starting.



Troubleshooting



When servicing the tractor or mower deck, disengage PTO, remove ignition key, set parking brake and disconnect the spark plug wires.

Troubleshooting the tractor

Engine will not turnover or start.

Problem	Solution
1. PTO switch in the on position.	1. Place in the off position.
2. Out of fuel.	2. If engine is hot, allow it to cool, then refill the fuel tank.
3. Engine flooded.	3. Move throttle control out of choke position.
4. Circuit breaker tripped.	4. Wait one minute for automatic reset. Replace if defective.
5. Battery terminals require cleaning.	5. See "Regular maintenance" section.
6. Battery discharged or dead.	6. Recharge or replace.
7. Wiring loose or broken.	7. Visually check wiring and replace if damaged. Tighten loose connections.
8. Solenoid or starter motor faulty.	8. Repair or replace. See authorized dealer.
9. Brake pedal not depressed.	9. Depress brake pedal.
10. Safety interlock switch faulty.	10. See authorized dealer.
11. Spark plugs faulty, fouled or incorrectly gapped.	11. See engine manual.
12. Water in fuel.	12. Drain fuel and replace with fresh fuel.
13. Gas is old or stale.	13. Drain fuel and replace with fresh fuel.

Engine starts hard or runs poorly.

1. Fuel mixture too rich.	1. Clean air filter. Check choke adjustment.
2. Spark plugs faulty, fouled or incorrectly gapped.	2. 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.



Troubleshooting the tractor *(continued)*

Engine exhaust is black.

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| 1. Dirty air filter. | 1. Replace air filter. See engine manual. |
| 2. Choke is closed. | 2. Change engine speed control position. |

Engine runs, but tractor will not drive.

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| 1. Air trapped in transmission. | 1. Purge transmission. |
| 2. Transmission release lever in the released position. | 2. Move into the engaged position. |
| 3. Drive belt is broken. | 3. See "Tractor drive belt replacement". |
| 4. Drive belt slips. | 4. See "Tractor drive belt slips" below. |
| 5. Brake is not fully released. | 5. See authorized dealer. |

Tractor drive belt slips.

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| 1. Clutch linkage binding. | 1. See authorized dealer. |
| 2. Pulleys or belt greasy or oily. | 2. Clean as required. |
| 3. Belt stretched or worn. | 3. Replace belt. |
| 4. Idler pulley pivot bracket frozen in declutched position. | 4. Remove idler pulley bracket. Clean and lubricate. |

Brake will not hold.

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| 1. Brake is incorrectly adjusted. | 1. See "Brake adjustment". |
| 2. Internal brake disc on transaxle worn. | 2. See authorized dealer. |

Tractor steers hard or handles poorly.

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| 1. Steering linkage is loose. | 1. Check and tighten any loose connections. See "Steering gear adjustment". |
| 2. Improper tire inflation. | 2. See "Regular maintenance" section. |
| 3. Spindle bearings dry. | 3. Grease spindles. See "Lubrication" section. |



When servicing the tractor or mower deck, disengage PTO, remove ignition key, set parking brake and disconnect the spark plug wires.

Troubleshooting the mower deck

Cut is uneven.

Problem	Solution
1. Mower deck not leveled properly.	1. See "Mower deck adjustment".
2. Tractor tires not inflated equally or properly.	2. See "Regular maintenance" section.

Cut is rough looking.

1. Engine speed too slow.	1. Set to full throttle.
2. Ground speed too fast.	2. Slow down.
3. Blades are dull.	3. Sharpen or replace blades. See "Servicing the mower blades".
4. Mower drive belt slipping because it is oily or worn.	4. Clean or replace belt as necessary.
5. Mower drive belt slipping.	5. See "PTO clutch adjustment".
6. Blades not properly fastened to arbors.	6. See "Servicing the mower blades".
7. Mower blades not timed.	7. See "Check mower blade timing".
8. Discharge tube clogged.	8. Clean out tube.
9. Grass build-up under mower deck.	9. Clean out underside of mower deck.
10. Grass catcher is full.	10. Empty catcher.
11. Mower deck needs leveling.	11. See mower deck leveling procedures in "Adjustments and service" section.

Engine stalls easily with mower blades engaged.

1. Engine speed too slow.	1. Set to full throttle.
2. Ground speed too fast.	2. Slow down.
3. Cutting height set too low.	3. Cut tall grass at maximum cutting height during first pass.
4. Discharge tube clogged.	4. Clean out tube.
5. Grass build-up under mower deck.	5. Clean out underside of mower deck.
6. Grass catcher is full.	6. Empty catcher.



Troubleshooting the mower deck *(continued)*

Excessive mower deck vibration.

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| 1. Blade mounting capscrews are loose. | 1. Tighten to 61-75 N.m (45-55 ft. lbs.). |
| 2. Mower blades, arbors or pulleys are bent. | 2. Check and replace as necessary. |
| 3. Mower blades out of balance. | 3. Remove, sharpen and balance blades. See "Regular maintenance" section. |
| 4. Mower blades not timed. | 4. See "Check mower blade timing". |
| 5. PTO clutch out of adjustment. | 5. See "PTO clutch adjustment". |

Excessive belt wear or breakage.

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| 1. Bent or rough pulleys. | 1. Repair or replace. |
| 2. Using incorrect belt. | 2. Replace with correct belt. |
| 3. PTO clutch out of adjustment. | 3. See "PTO clutch adjustment". |

Mower drive belt slips or fails to drive.

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| 1. Idler pulley or arbor bearing seized. | 1. Repair or replace as needed. |
| 2. Mower drive belt broken. | 2. Replace belt. |
| 3. PTO clutch out of adjustment. | 3. See "PTO clutch adjustment". |

