$7.50

TROY-BILT®

Owner/Operator Manual

TROY-BILT® Suburban TRACTORS

- Safety
- Assembly
- Controls
- Operation
- Maintenance

Hydrostatic-Drive Models

13027
13028

Serial Numbers:
130270100101 and up
130280100101 and up

GARDEN WAY INC.

1763973 (11/91)

Thank you for purchasing this Troy-Bilt® Tractor. We feel you now own one of the finest tractors available anywhere.

This manual is a safety, assembly, operation and general maintenance manual which does not attempt to cover major repairs. Our equipment is carefully designed, engineered, and manufactured to provide excellent performance if properly maintained. Review this manual to familiarize yourself with your tractor, its features and its proper operation.

Please complete and return the enclosed Owner Warranty Registration Card. The purpose of the card is to register each owner at the factory so informational bulletins or safety literature may be sent to you.

Your tractor meets the safety standards of the American National Standards Institute for Lawn Tractors—as a result, this tractor is entitled to bear the official OPEI safety seal.

SERVICE INFORMATION

Engine Service:

If your tractor engine ever needs service or repair, contact your nearest Authorized Engine Dealer. To locate the nearest Dealer, refer to the "Yellow Pages" in your telephone book under either "Engines– Gasoline" or "Gasoline Engines."

If you have problems getting engine service or parts locally, let us know so we can provide you with the name of the nearest Dealer. A servicing engine dealer will require Engine Model and Serial Number information found on the engine to assist you properly. Record the engine identification numbers in the area provided below for this purpose.

Tractor Service and Repair:

To obtain tractor service or parts, please contact your local Authorized Troy-Bilt Dealer, a Troy-Bilt Factory Store, or the Troy-Bilt Manufacturing Company (for Factory telephone numbers and addresses, refer to the back cover of this Manual).

You will need to provide the Model and Serial Numbers of your tractor, plus as complete a description as you can provide of specific service and parts needs.

Warranty Service:

To obtain warranty service, please read the information about the Limited Warranty printed on the back cover of this Manual.

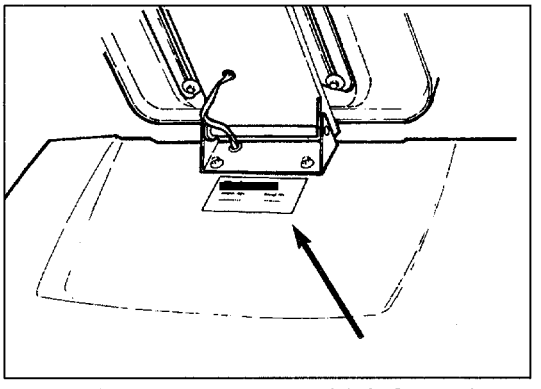
ENTER YOUR PRODUCT IDENTIFICATION NUMBERS BELOW

ENGINE IDENTIFICATION:

Manufacturer Name _____
Model _____
Serial Number _____

TRACTOR IDENTIFICATION

Model Name & Number _____
Serial Number _____



The Serial Number decal with information specific to your tractor is found under the operator's seat.

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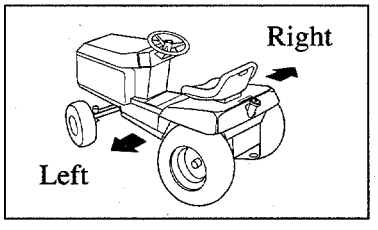
RECOGNIZE IMPORTANT SAFETY INFORMATION.

The triangular-shape symbol at left is the international "Safety Alert Symbol." It is used on your tractor and throughout this Manual to call your attention to important safety messages which, if not followed, can result in serious personal injury.



LEFT AND RIGHT SIDES

Whenever "Left" and "Right" sides of your equipment are mentioned in this Manual, the orientation is from the operator's seated position.

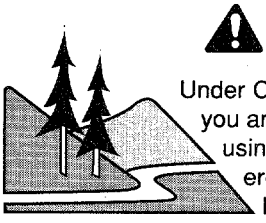
Section 1 Safety

This is a safety alert symbol. It is used in this Owner/Operator Manual and on your tractor to alert you to potential hazards. Whenever you see this symbol, read and obey the safety message that follows it. Failure to obey these safety messages could result in serious personal injury or property damage.

⚠ CAUTION

To Avoid Injury:

- **Read Owner/Operator Manual.**
- **Know location and function of all controls.**
- **Keep all safety devices and shields in place.**
- **Never let children or untrained adults operate tractor.**
- **Shut off engine and remove the ignition key before leaving your equipment.**
- **Keep bystanders away from the tractor.**
- **Keep away from rotating parts.**
- **This cutting machine is capable of amputating hands and feet and throwing objects. Failure to observe the following safety instructions could result in serious injury or death.**

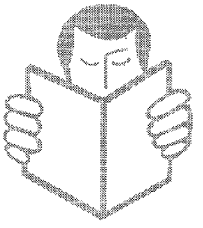


⚠ WARNING TO ALL OPERATORS IN CALIFORNIA AND ALL OTHER APPLICABLE STATES

Under California law, and under the laws of several other states, you are not permitted to operate an internal combustion engine using hydrocarbon fuels on any forest covered, brush covered, or grass covered land, or on land covered with grain, hay, or other flammable agricultural crop, without an engine spark arrester in continuous effective working order.

The engine on your power equipment, like most outdoor power equipment, is an internal combustion engine that burns gasoline, a hydrocarbon fuel. Therefore, your power equipment must be equipped with a spark arrester muffler in continuous effective working order. The spark arrester must be attached to the engine exhaust system in such a manner that flames or heat from the system will not ignite flammable material. Failure of the owner/operator of the equipment to comply with this regulation is a misdemeanor under California law, and may also be a violation of other state and/or federal regulations, laws, ordinances, or codes. Contact your local fire marshal or forest service for specific information about what regulations apply in your area.

TRAINING



1. Thoroughly read and be sure you understand the contents of this Owner/Operator Manual. A free replacement Manual is available by sending your tractor model name and serial number to the Factory. Our address is on the back cover of this Manual, and on the Parts Catalog you received.

2. Also thoroughly read and understand any Attachment Manuals and engine manufacturer literature you received.

3. Know the location and the function of all operating controls on your tractor before using your equipment.

4. Familiarize yourself with all of the safety and operating decals on the tractor and any attachments.

5. Never allow children or untrained adults to operate the tractor. They are not qualified to use this equipment safely. Only responsible, trained adults who have received full instructions should use the tractor.

6. Do not carry passengers under any circumstances. Do not mow when children and others are nearby. Operator must remain on the tractor seat while using the tractor.

7. Gasoline and its vapors are volatile and dangerous. Never allow gasoline or a gas container near the hot engine exhaust. Never allow flame, sparks, smokers' materials or intense heat near gasoline fumes or gasoline itself.

8. The muffler exhaust gas is very hot. To avoid a fire—keep dry

grass, mowed grass, oil, fuel and other combustible materials far away from the engine exhaust.

9. To reduce fire hazard risks, keep the engine free of grass, leaves, oil and grease.

10. Always wear sturdy footwear and hearing protection while using your tractor. Do not wear loose-fitting clothing, jewelry, scarves, ties, etc. that can get caught in moving parts.

11. Check brake operation frequently. Adjust and service as required.

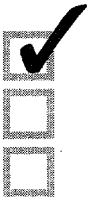
12. Do not operate this tractor or any other implement attached to it if you are under the influence of alcohol, medication, or are tired or ill. Normal awareness and response time are required to use this equipment safely.

13. All safety shields and other safety devices must be in place, securely attached and operating properly. Do not use your tractor otherwise.

14. Use only attachments that are approved for use with your tractor. Contact us if you are not certain as to whether an attachment is appropriate for your tractor.

15. Take all possible precautions before leaving the tractor unattended— a) disengage the power take-off; b) lower any attachment; c) set the parking brake; d) stop the engine; e) remove the ignition key.

PREPARATION

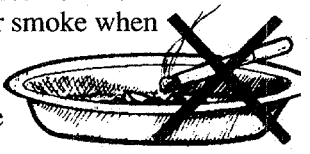


1. Clear the work area of objects which could be picked up and thrown at high speed by rotating equipment parts. Remove objects like rocks, branches, wire, cans, and all other foreign materials.

2. Be sure machine and attachments are in safe operating condition by checking all hardware for tightness. Check the blade mounting hardware frequently to be certain tightening specifications are met. Check brakes, steering, and other major controls for proper operation. Correct any malfunctions before using the tractor or its attachments.

3. Fill fuel tank with gasoline before starting the engine. Do not spill fuel. Wipe up spills immediately. Gasoline is flammable—handle it very carefully.

- Use an approved gas container.
- Do not pour gasoline when equipment is indoors, when engine is running, or when engine is still hot from use.
- Never smoke when near fuel.



- Leave 2" air space at top of fuel tank fill tube when filling tank with gasoline. Fuel needs room to expand.
- When moving equipment outside from a building or enclosure, only run the engine to transport the machine outside. **Do not run the engine in an enclosed area. Engine exhaust contains carbon monoxide gas, a deadly poison that is odorless, colorless, and tasteless.**

4. Operator must be fully seated before the starting procedure is begun. Before starting the engine, move all controls to their neutral or off positions. The PTO Attachment Drive Switch must be OFF. Only the Parking Brake should be ON (it is engaged by depressing the Brake Pedal and then moving the Parking Brake knob backward and up).

5. Always disengage power to attachments, apply the Parking Brake, and stop the engine before leaving the operator's position.

6. Be sure that safety and operating decals are in place and legible. Please order replacement decals if they are needed.

OPERATION

1. Disengage power to attachments when transporting tractor, or when attachments are not being utilized.

2. When using the tractor with a mower deck, proceed as follows:

a. Mow only in daylight or in good artificial light.

b. Never make a cutting height adjustment while the engine is running if the operator must dismount in order to do so.

c. Shut the engine off when removing the grass catcher or unclogging the discharge chute.

d. Check the blade mounting bolts for proper tightness at frequent intervals.

3. Do not use your tractor on slopes when there is a risk of turning over the machine. Do not mow on hills steeper than a 15° incline—see the slope gauge in the Operation Section of this Manual. Never mow across slopes. Stay away from holes, ditches, soft or steep embankments or other potentially dangerous terrain. Tall grass can hide obstacles. Wet surfaces reduce traction and stability.

4. Keep observers far away from the area where you are using your tractor and attachments. Rotating blades can hurl objects at high speed, causing injury to bystanders.

5. Reduce speed and exercise caution on slopes and when making turns. Be especially careful when changing direction on slopes. Do not start or stop suddenly when going uphill or downhill. Always mow up and down the face of terrain that has an incline. Do not mow on an incline greater than 15°. Never mow *across* slopes.

6. If the tractor is unable to continue moving uphill, move the PTO Attachment Drive Switch to OFF and back slowly downward.

7. Always be observant. Watch for and avoid obstacles.

8. Do not direct the discharge of mowed materials toward others.

9. Watch out for traffic when you are crossing or near roadways.

10. The tractor and attachments should be stopped and inspected for damage after striking a foreign object. Repair any damage before using the equipment again.

11. Use caution when pulling loads

- Use only approved drawbar hitch points.
- Limit loads to those that can be safety controlled.
- Do not turn sharply. Use extra caution when backing up.
- Use counterweights or wheel weights for extra traction.

12. Disengage power to the mower attachment before backing up. As a general rule, do not mow in reverse. When absolutely necessary to mow a small area using reverse, go very slowly and carefully watch the area behind the mower.

13. Keep your hands, feet, face and clothing away from rotating attachment and tractor parts at all times. Never leave the operator's seat while the tractor is moving or the mower attachment is in use. A safety interlock switch will shut off the engine if the operator leaves the seat when an attachment is on or the parking brake is not engaged. If not working properly, the safety interlock switch must be repaired before using the tractor.

14. Before crossing a roadway or driveway, disengage power to the mower deck and raise the mower housing to its highest level. This prevents loose materials from being blown around.

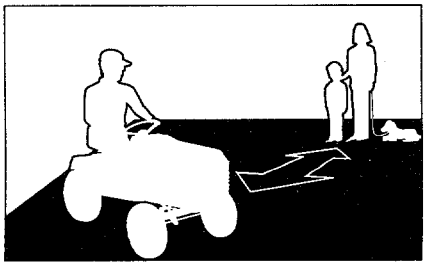
15. Do not leave the operator's position if the tractor has not come to a full stop. Before dismounting:

- Disengage power to mower deck by moving PTO Attachment Drive Switch to OFF.
- Lower all attachments.
- Place all other control levers in their Neutral positions.
- Depress the Brake Pedal and apply the Parking Brake.
- Turn off the engine and remove the ignition key.

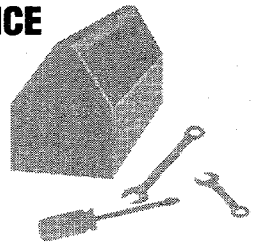
16. Avoid contact with the engine or muffler while the engine is running and for several minutes after the engine is shut off. Hot surfaces can cause a severe burn.

17. Under normal use, the grass catcher bag material (on the optional Power Packer) is subject to deterioration and wear. It should be checked frequently for bag replacement. Replacement bags must comply with the original manufacturer's recommendations or specifications.

18. Always engage the Parking Brake when parking the tractor on a hill.



SERVICE



1. Before performing service or maintenance, disengage power to the attachment, lower the attachment, move all control levers to Neutral, apply the Parking Brake, then shut off the engine and remove the ignition key. Park the tractor on a firm, level surface.

2. If the tractor engine must be running to perform a specific adjustment, keep hands, feet, face, and clothing away from the mower deck blades and any parts that are moving.

3. Do not change the engine's governor setting. Over-speeding the engine may cause engine damage. Have your Authorized Dealer check and adjust engine speed with an accurate tachometer.

4. Disconnect the battery ground (negative) cable, then the positive cable, before working near or with electrical wires or components. To avoid sparks from an accidental short circuit, the battery ground cable must be disconnected first and reconnected last.

5. Disconnect the spark plug wire before servicing or adjusting the engine to prevent any possibility of accidental engine starting.

6. After tipping the tractor up at an angle to perform any maintenance or an adjustment, be certain there is no leakage of fuel from the gas tank or oil from the engine crankcase. Use a very strong block or jack to prop up the tractor.

7. Never store the tractor with fuel in the gas tank inside a building where fumes may reach an open flame or spark. Always let the engine cool down before moving the tractor inside an enclosure.

8. Be prepared for an emergency. Have a fire extinguisher nearby to put out a fire. Keep a first aid kit on hand. Emergency telephone numbers should be kept right next to your telephone.

9. Wheel attachment hardware must be checked regularly for secure attachment.

10. Do not try either to remove or mount a tire on a wheel rim unless you are experienced in doing so, you follow proper safety precautions, and you have the appropriate tools for this service procedure. Mounting a wheel improperly can produce an explosion, resulting in serious injury or death.

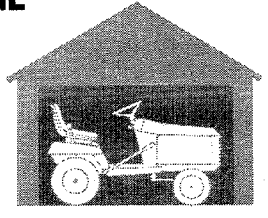
11. Before trying to "charge" a dead battery, familiarize yourself with the correct procedure. See "To Charge The Battery" in Section 2 in this Manual.

12. Always protect your hearing if the engine will be running while you do a service or maintenance procedure. Use quality ear protection devices to minimize noise.

13. Use extra care when loading or unloading the machine into a trailer, truck, or other transport vehicle.

14. Mower blades are sharp and can cut. Wrap blade, or wear gloves, and use extra caution when servicing them.

STORAGE



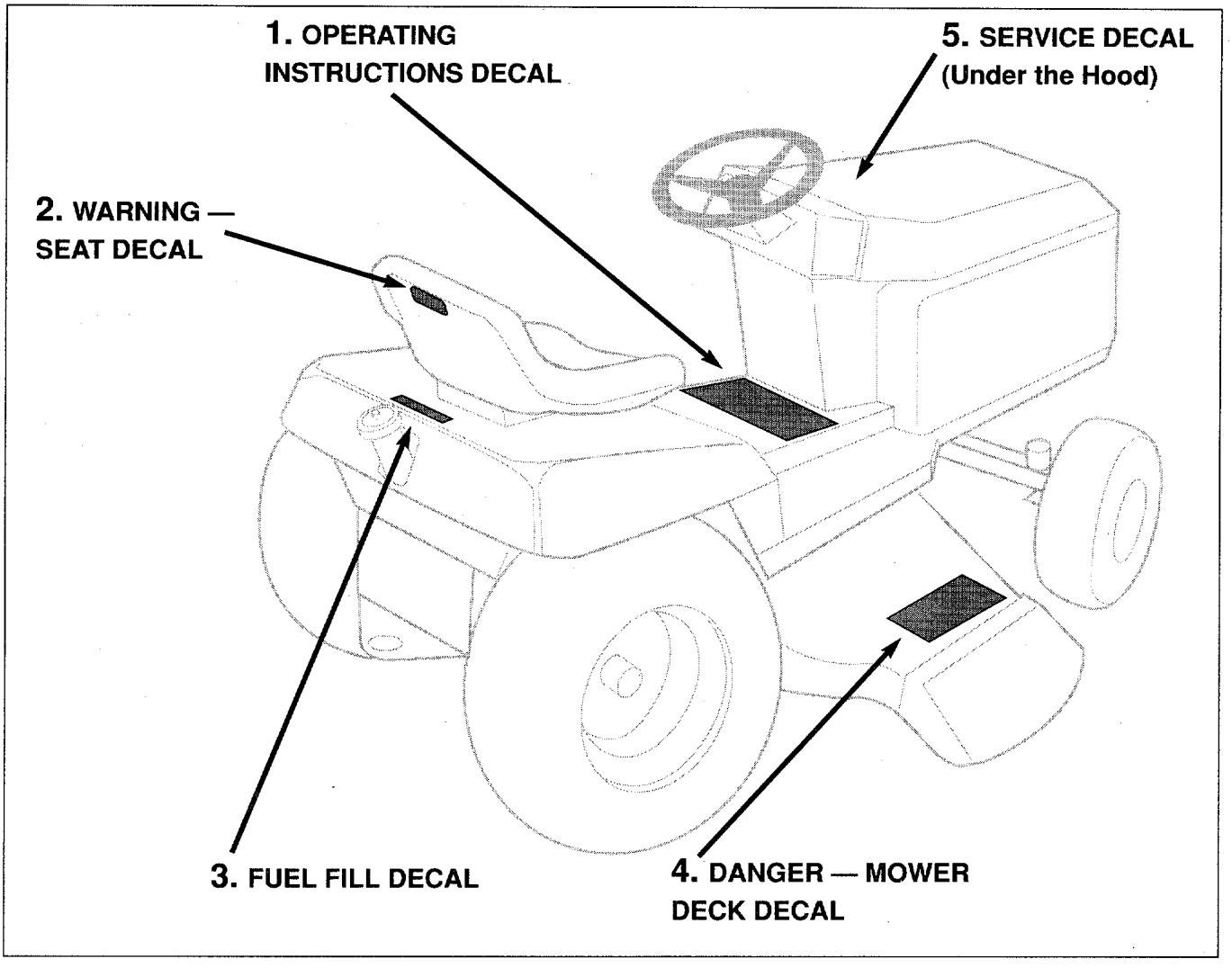
1. Do not store the tractor with fuel in its gas tank inside a building where gasoline fumes could be ignited by flame, sparks, or other ignition sources. Proper ventilation is important for safe storage. Always let the engine cool down before bringing the tractor inside.

2. Keep tractor and fuel supplies securely locked away to prevent children from having access.

3. Remove the ignition key.

4. Disconnect battery cables or remove the battery if tractor will be stored for an extended period. Remove the negative cable first and reinstall it last.

SAFETY AND OPERATING INSTRUCTIONS PRODUCT DECALS



ATTACHMENTS AND KITS

Not All Attachments and Kits are Available for All Tractor Models. Your Authorized Dealer Can Supply You With Up-To-The-Minute Attachment Information For Your Tractor.

- 42" Rear Discharge Rotary Mower (14HP/16HP only)
- 36" Side Discharge Rotary Mower
- 42" Side Discharge Rotary Mower (14HP/16HP only)
- 48" Side Discharge Rotary Mower (14HP/16HP only)
- Grass Reduction System ("GRS")
- 38" Two-Stage Snowthrower (Requires Rear Wheel Weight Kit and an Installation Kit)
- 38" Single-Stage Snowthrower (Requires Rear Wheel Weight Kit)
- 26" Rotary Tiller (14HP/16HP only)—Requires Rear Wheel Weight Kit
- PowerPacker for 36" Mower Deck
- PowerPacker Plus for 42" and 48" Mower Decks (Requires either the Cart Grass Collector or the Two-Bag Grass Collector)
- Electric Lift Kit
- Rear Wheel Weight Kit
- Installation Kit for the 38" Two-Stage Snowthrower
- Cart Grass Collector (used with PowerPacker Plus)
- Two-Bag Grass Collector (used with PowerPacker Plus)
- 42" Blade (Rear Wheel Weight Kit recommended)
- Cab
- Protective Storage Cover

SPECIFICATIONS

TRACTOR MODEL	13024— 12.5HP 13027— 14HP 13028— 14HP	13013— 12HP	13014— 14HP 13015— 14HP 13016— 16HP
ENGINE TYPE	Kohler 12.5HP & 14HP Single-Cylinder 4-Cycle OHV Air-Cooled Full-Pressure Lube	Briggs & Stratton 12 HP Single Cylinder 4-Cycle, I/C Air-Cooled	Briggs & Stratton 14 HP & 16HP Twin Cylinder 4-Cycle OHV Air-Cooled Full-Pressure Lube
IGNITION	Electronic	Magnetron Electronic	Magnetron Electronic
OIL CAPACITY	4 Pints (1.9 Liters)	3 Pints (1.4 Liters)	3.5 Pints (1.65 Liters)
OIL FILTER	Full-flow auto type	N/A	Full-flow auto type
AIR CLEANER	Cartridge w/Pre-Cleaner	Cartridge w/Pre-Cleaner	Cartridge w/Pre-Cleaner
FUEL CAPACITY	5 Gallons (19 Liters)		
DRIVE TYPE	EATON HYDROSTATIC TRANSMISSION (Model 751-047)		
DRIVE SPEEDS	Infinitely Variable Speed Forward: 0-to-5.2 MPH (0-to-8.4 km/hr) Reverse: 0-to-2.1 MPH (0-to-3.4 km/hr)		
POWER TO ATTACHMENTS	ELECTRIC CLUTCH WITH BELT		
BATTERY	45 AMP / 12 Volt (280 CCA / 40 min Reserve)		
TIRES–REAR	20 x 8.00– 8		
TIRES–FRONT	15 x 6.00– 6		
LENGTH	69" (175 cm)		
WIDTH	34-1/2" (88 cm)		
HEIGHT	42" (106 cm)		
WHEEL BASE	45" (114 cm)		
TURNING RADIUS	22" (56 cm) Inside Rear Wheel / 155" (394 cm) Curb to Curb		
GROUND CLEARANCE	Front— 8" (20.3 cm) Rear— 6.5" (16.5 cm)		

Section 2 Assembly

This is a safety alert symbol. It is used in this Owner/Operator Manual and on your tractor to alert you to potential hazards. Whenever you see this symbol, read and obey the safety message that follows it. Failure to obey these safety messages could result in serious personal injury or property damage.

TRACTOR ASSEMBLY STEPS

If your tractor has not been assembled and prepared by an Authorized Dealer, use the instructions that follow to complete the assembly and preparation steps that must be taken prior to starting and using your new Suburban tractor.

The assembly procedure is straightforward and requires minimal tools and mechanical skills. We urge you to have an assistant present during the assembly to make the assembly steps safer and easier for you. Of course, if your tractor has already been assembled and prepared, you can ignore the steps in Section 2 and proceed directly to Section 3 which gives you important information about Controls.

Step 1: Check Shipping Carton Contents for Assembly Parts

Numbers below cross-reference with parts shown in Figure 2-1, Figure 2-2 and Figure 2-3.

Wheels and Wheel Hardware:

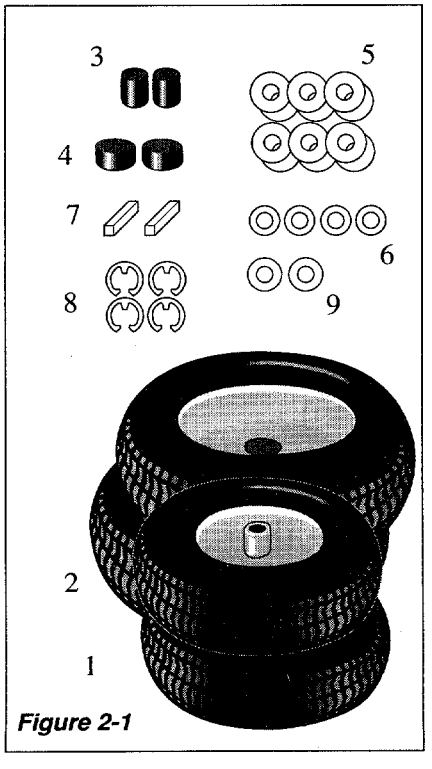


Figure 2-1

1. Two Front Wheels (15 x 6.00-6).
2. Two Rear Wheels (20 x 8.00-8).
3. Two long Hub Caps.
4. Two short Hub Caps.
5. Ten Flat Washers–1" x 2".
6. Four Flat Washers–3/4" x 1-3/8".
7. Two Square Keys.
8. Four Retaining Rings— two 1" and two 3/4".
9. Two Flat Washers— 1" x 1-1/4".

Not Shown is the Ignition Key.

Steering Wheel and Hardware:

10. One Steering Wheel.
11. One Roll Pin (for steering wheel).

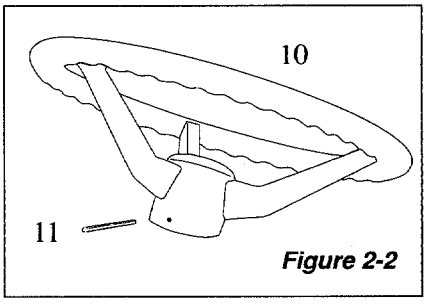


Figure 2-2

Seat and Seat Hardware:

12. One Operator's Seat.
13. Two Knobs with flat washers.
14. Two Bolts, two flat washers, two nylon washers, two wave washers.

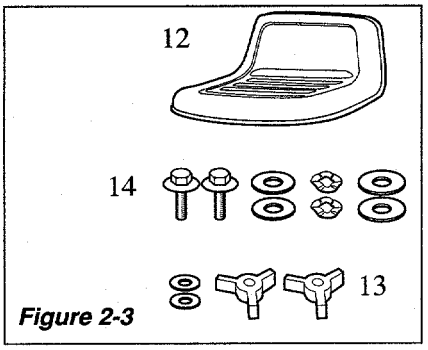


Figure 2-3

Step 2: Tools You Will Need For Assembly

- One 3/8" wrench.
- One 7/16" wrench.*
- One 1/2" wrench.*
- One 9/16" wrench.*
- One Hammer.
- One long flat Punch (to drive the roll pin through the steering column).
- Snap Ring Pliers (external type).
- Sturdy wood props (2).
- Low-pressure Tire Gauge.
- Two quarts of high-quality engine oil (see your Engine Manufacturer's Manual for oil recommendations).
- High-quality grease.

*An adjustable wrench may be substituted.

Step 3: Check Tire Pressure

Before mounting the wheels, use your tire gauge to check, and adjust if necessary, the air pressure in all four tires. The tires were overinflated for shipping purposes only. Be sure that you adjust the pressures as follows:

Front Tires—14 PSI
Rear Tires—12 PSI

Step 4: Install the Wheels

It's easiest to install the wheels first on one side of the tractor, and then on the other side.

1. To begin, first tip up the tractor far enough (on either side) to slide strong wood props under the frame. The props must be high enough so the front and rear axles have clearance for the wheels to go on. The tractor is heavy, so be sure you have an assistant to help.

2. Apply grease to the front and rear axle shafts. An anti-seize lubricant or a similar type of coating is satisfactory.

3. On the rear axle, slide on a 1" x 1-1/4" flat washer. Also insert a square key into the axle.

4. Slide a large rear wheel on the axle—valve stem facing inward. Snug the wheel up against the washer. Now slide on as many 1" x 2" flat washers as will fit between the wheel and the snap ring groove on the axle shaft. You must minimize the amount of wheel end play by adding as many washers as will fit. Then install a 1" retaining ring in the axle shaft snap ring groove using the snap ring pliers. See Figure 2-4.

5. Tap on a short hub cap. Repeat this rear wheel installation procedure (steps 1 - 5) when the other side of the tractor is propped up.

WARNING

It is essential that the assembly steps be followed accurately and completely. Failure to comply can result in a hazardous operating condition which could lead to serious personal injury or property damage. Please read and follow these assembly and preparation instructions.

Now go to the front axle to install one of the front wheels as follows:

6. Slide a small front wheel on the front axle with the valve stem facing inward. (Lubricate the axle with grease prior to installing the wheel.)

7. Slide one (or two) 3/4" x 1-3/8" flat washers up against the wheel. Add a second washer to remove any wheel end play. Install a 3/4" retaining ring in the axle shaft groove with the snap ring pliers.

8. Tap on one of the long hub caps.

9. Now remove the props from this side. Chock the wheels to prevent the tractor from rolling. Then prop up the other side of the tractor.

Repeat the rear wheel and front wheel installation steps as above. Refer to Figure 2-4.

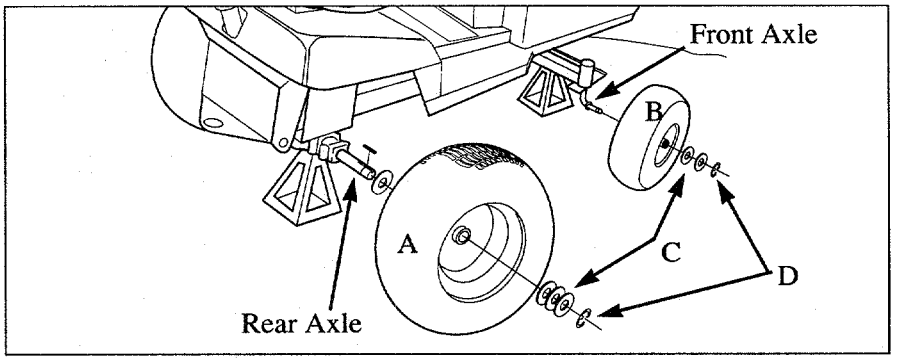


Figure 2-4. Prop tractor up to mount wheels. Install rear ("A") and front ("B") wheels on one side of tractor first, then the other side. Use washers ("C") as shims to take the free play out of the wheels before the retaining rings ("D") are installed.

WARNING

It is essential that the assembly steps be followed accurately and completely. Failure to comply can result in a hazardous operating condition which could lead to serious personal injury or property damage. Please read and follow these assembly and preparation instructions.

Step 5: Install Steering Wheel

You will need the steering wheel and the roll pin. Tools needed are a hammer and a long flat punch. (NOTE: The roll pin may already be started in the steering wheel hub.)

1. Remove tape from steering column, lubricate the column with grease, then place the steering wheel (roll pin may already be partially in the hole in the side of the steering wheel hub) down on the steering column.

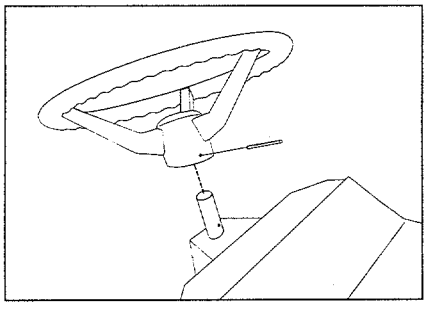


Figure 2-5: Slide the steering wheel over the steering column. Align the holes and tap the roll pin through the holes to secure the wheel.

2. Turn the wheel slowly until the holes in the wheel hub are aligned with the holes in the steering column. See Figure 2-5. When aligned, tap the roll pin through the hub and the column. Use the punch to tap the roll pin in until it is flush with the hub.

Step 6: Install Tractor Seat

The seat must be attached using the hardware that comes already mounted on the seat bottom.

Remove this hardware from the seat first. You should then have the following loose hardware: 2 knobs and the 2 flat washers mated with the knobs; 2 screws, 2 steel washers, 2 nylon washers, and 2 wave washers.

1. Attach the electrical connector at the bottom of the seat to the wire harness connector coming out of the middle of the rear fender assembly. See Figure 2-7. ***These two connectors must be securely plugged together for safety reasons— they allow the automatic engine shutoff feature to work if you leave the operator's seat without turning off the engine or engaging the parking brake. The wire harness must also move freely when the seat is moved forward or backward.***

2. Place the seat on the seat support. Very loosely secure the rear of the seat to the seat support with the two knobs and the two flat washers that accompanied them. Refer to Figure 2-6.

3. At the front of the seat, slide a metal washer between the seat and the seat support (see Fig. 2-6). Next slide a wave washer and then a nylon washer on each of the two screws and insert the screws from underneath the seat support. The screws must pass up through the seat support, the metal washer and the seat frame. See Figure 2-6. Securely tighten the screws.

4. If the seat is propped up, lower it. Adjust the seat forward and backward until comfortable for you. Tighten the two knobs at the rear of the seat.

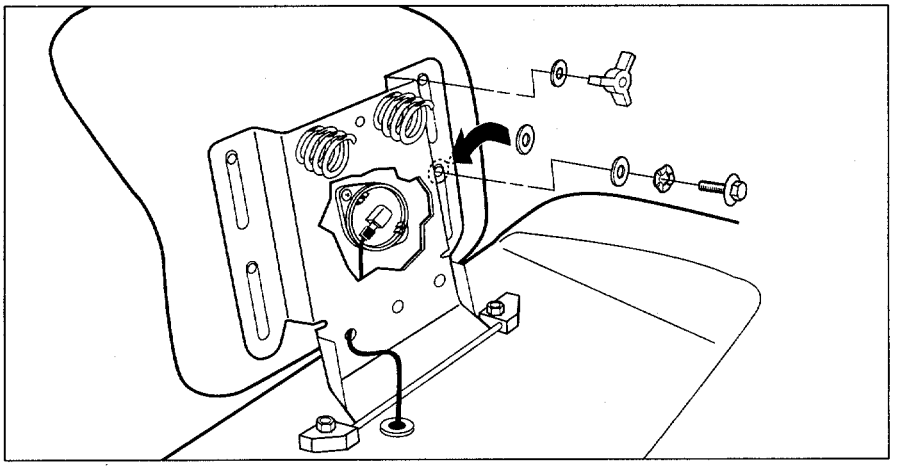


Figure 2-6: Remove hardware from seat first. Place seat on seat support. Mount knobs and washers at rear. Mount screws and washers at front.

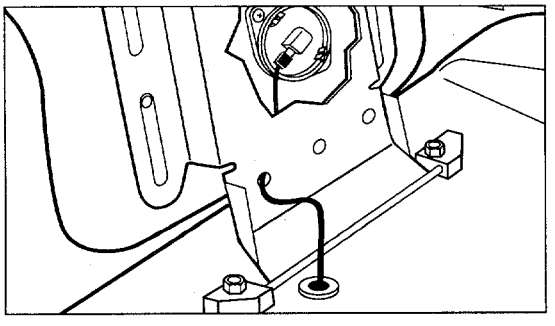


Figure 2-7: Connect the wire coming up from the fender to the electrical switch underneath the seat.

DANGER

- **Battery electrolyte solution contains sulfuric acid which can burn your skin, eyes and clothes.**
- **Wear protective clothing, rubber gloves and shield eyes with safety goggles when you work near battery.**
- **Keep sparks, flame and all smokers' materials away.**
- **Ventilate area when charging battery in an enclosed space.**
- **The venting path of the battery must always be open.**

Step 7: Remove Tractor Battery For Servicing, Then Reinstall

If your battery has **not** been dealer serviced or charged, it will be necessary to remove the battery from the tractor, activate it with electrolyte solution and charge it correctly, then reinstall the battery. **We urge you, however, to have a professional battery technician do this job for you if you are not experienced in doing this work.**

Tools Required: one 7/16" wrench; one 3/8" wrench; two quarts of battery-grade electrolyte solution; battery charger; flashlight; safety glasses and gloves; baking soda.

Remove Battery from Tractor:

1. Unlatch the two black, rubber hold-down straps securing the rear of the tractor hood. One strap is located on each side of the tractor's control panel. Tip the hood upward and forward.

2. The battery is located at the back of the engine compartment. Use a 7/16" wrench to remove the two nuts securing the hold-down bracket over the battery. Put the hold-down bracket aside along with its hardware. See Figure 2-8.

3. If connected, use a 3/8" wrench to disconnect the black battery cable from the negative (-) battery terminal. Bend the cable away.

4. Disconnect the red battery cable from the positive (+) battery terminal. Use a 3/8" wrench.

5. Remove battery from tractor. Take the battery to a qualified service technician, or place it on a wood or plastic surface to service the battery.

To Activate the Battery:

6. Make sure all switches are in the 'Off' position (on battery charger). Before opening the electrolyte, read instructions on its container. Also read operating instructions for the battery charger.

7. Put on safety goggles and rubber gloves. Remove filler caps from top of battery. Fill battery cells to proper level with electrolyte. LET BATTERY SIT FOR 20 MINUTES BEFORE CONTINUING.

To Charge the Battery:

8. With filler caps removed, connect battery to charger and charge at 2 Amperes until specific gravity reading is 1.265-to-1.275. This may take several hours. When charged, the electrolyte in the cells will be gassing freely—the surface will be bubbling. Wearing your safety goggles, examine the cells with your flashlight. Turn the charger OFF. Disconnect it from the battery.

9. If electrolyte level has fallen, refill cells to proper level with distilled water only.

10. Reinstall the battery caps. Wash any acid spillage off the battery with water and baking soda.

Reinstall Battery

11. If the ignition key is in the keyswitch, remove the key.

12. Place the battery back on the tractor battery support—the positive terminal must be on the left-hand side as viewed from the operator's position.

13. Reconnect red positive cable to the positive battery terminal. Securely attach with the original screw and nut.

14. Reconnect black negative cable to negative battery terminal.

15. Re-attach the hold-down bracket over the battery.

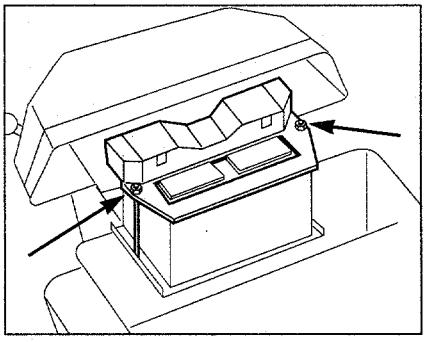


Figure 2-8: Remove battery hold-down bracket so battery can be removed for servicing.

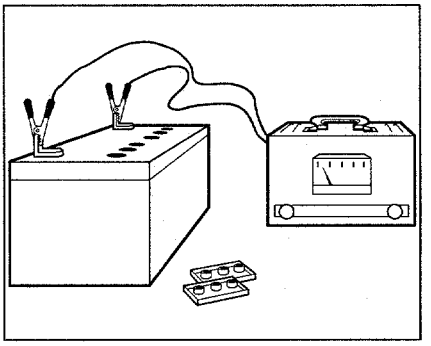


Figure 2-9: Fill cells with electrolyte solution, then charge battery at 2 amperes until specific gravity reads between 1.265 - 1.275.

Step 8: Add Motor Oil to the Tractor Engine

1. The tractor must be on a level surface.

2. Unhook the two rubber latches securing the tractor hood. Lift the tractor hood up.

3. Remove the engine oil dipstick from the oil fill tube. The dipstick is located near the top of the engine (all engine makes are similar in this regard — see your engine manufacturer literature for specifics regarding your engine). Refer to Figure 2-10. Place a clean oil funnel into the oil fill tube.

4. Refer to the Engine Owner's Manual for all-important information about motor oil type, viscosity, and quantity of motor oil required. **Be certain to follow the engine manufacturer's literature so you do not risk having your engine warranty coverage voided due to using incorrect motor oil.**

5. Very slowly add oil to the engine through the oil fill tube. Check the level frequently as you add oil. Replace the oil dipstick completely. Remove the dipstick to check the level. Allow enough time for the oil to settle. Oil doesn't flow quickly and may give a false reading if checked too soon.

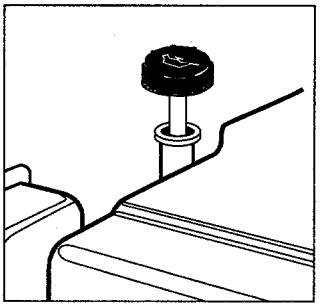


Figure 2-10: Remove dipstick at top of engine to add motor oil. See engine manufacturer literature for important motor oil specifications.

When the level is up to the full mark on the dipstick, replace the dipstick securely for the last time.

Step 9: PTO Attachment Drive Clutch— Break-In Procedure

After you install either a mower deck or a snowthrower attachment to your tractor (by following separate installation instructions provided with that attachment), you will need to perform a simple, but important, break-in procedure so the PTO attachment clutch mechanism operates smoothly. Do the following:

a. Adjust the attachment's leveling or lift (as applicable).

b. Start the tractor engine. Allow it to warm up and run at the idle speed.

c. Engage and disengage the tractor's PTO Attachment Drive Switch 10 or 15 times. Refer to Figure 2-11. Be certain the attachment is neither cutting grass nor blowing snow while you perform this break-in procedure.

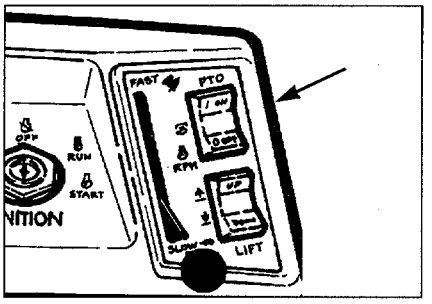


Figure 2-11: After an attachment is installed, turn the PTO Attachment Drive Switch ON and OFF about a dozen times to complete the "break-in" procedure.

Step 10: Check Hydrostatic Transmission Fluid Level

The tractor transmission is filled at the factory with transmission fluid. Please re-check the fluid level before using your tractor.

1. Roll the tractor to level ground (please see "Free-Wheeling" on next page before proceeding).

2. Look beneath the left-hand rear fender to see the white opaque reservoir for the transmission fluid. Fluid level must be up to the "Full Cold" line. If not, add the correct amount of SAE 20W20 transmission fluid to the reservoir per Step 3 next.

3. From under the rear fender, push the black plastic plug upward until it pops out of the fender.

Unscrew the cover from the top of the reservoir. See Figure 2-12. Insert a clean funnel down through the fender hole and into the reservoir. Slowly add the correct amount of transmission fluid (up to "Full Cold" line).

4. Reinstall the reservoir cover. Last, push the black plastic plug back into the hole in the fender.

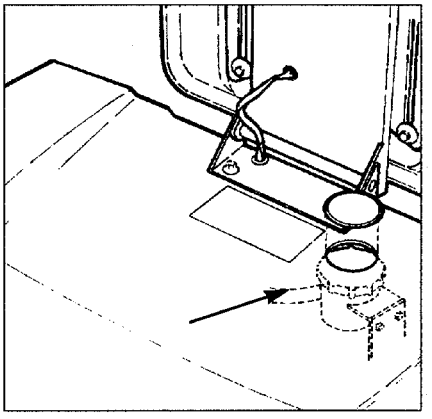


Figure 2-12: Check transmission fluid level in reservoir under fender. Add SAE 20W20 oil to reservoir if needed. Remove plastic plug in fender for access to reservoir.

'Free-Wheeling' Your Tractor

When your tractor must be moved without the engine running, be sure to first push *UP* the Lock Lever underneath the transmission housing (see Figure 2-13, "A").

This disengages the transmission and allows the tractor to be 'free-wheeled' easily to another location. **Remember to re-engage the Lock Lever by pulling it *DOWN*** after you've rolled the tractor to its new location.

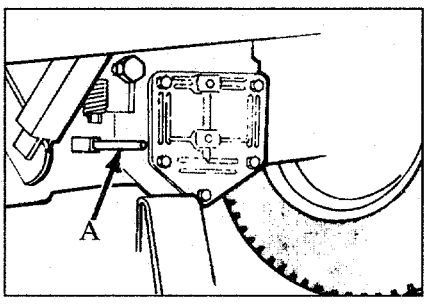


Figure 2-13: To free-wheel tractor, locate the Lock Lever ("A") under the transmission and move it UP.

Final Assembly Review

Please take the time to make sure you performed all the assembly steps as described. The performance of your tractor, not to mention your personal safety, are good reasons to do so.

Check all electrical connections. Is the spark plug wire(s) on the engine securely attached (raise the hood to verify)? Go around your tractor and be sure hardware is securely tightened. Does the steering wheel turn the wheels positively from left to right and back? Is the seat hardware secure? Inspect your tractor carefully and completely. If you are unsure of anything, please contact your Authorized Dealer before you start and operate your tractor.

Section 3 Controls

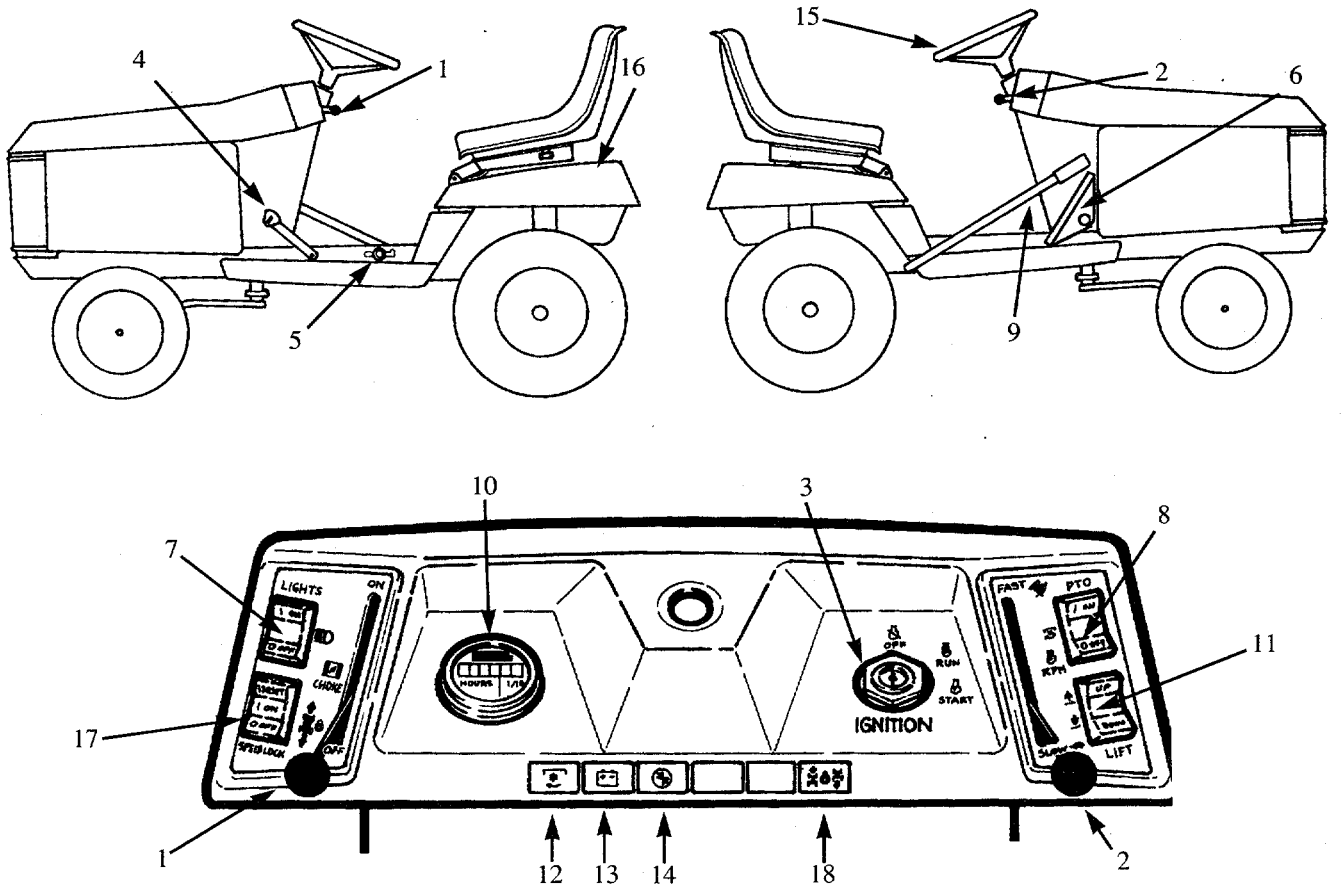


Figure 3-1

IDENTIFICATION AND FUNCTIONS OF CONTROLS AND FEATURES

Prior to the actual operation of your tractor, it is very important that you know where all the controls are and what they do. The major operating controls and their functions are described here.

1. Engine Choke Lever

Located on the left-hand side of the instrument panel. When moved upward to the "ON" position, helps to start a cold engine. Move to "ON" before starting. Once engine starts, move slowly downward to "OFF" position. Choke may not be needed to start a warm engine.

2. Engine Throttle Lever

Located on the right-hand side of the instrument panel. Provides infinite engine speed selection from "Slow" to "Fast." Prior to starting the engine, move lever three-quarters of the way to "Fast." **Always move it fully to "Fast" position when operating attachments.**

WARNING

Before operating your tractor, be sure you read and understand all safety, controls, and operation instructions in this Owner/Operator Manual and on the decals on your tractor.

Failure to follow these instructions can result in serious personal injury or property damage.

3. Ignition Keyswitch

Located on the right-hand side of the instrument panel. Accepts your ignition key which is used to start the engine. The keyswitch has three key positions— "OFF", "RUN", and "START." When the key is turned to the "Off" position, the engine will be shut off. Turn the key to "Start" to start the engine. Release the key after starting and it will move automatically to the "Run" position.

4. Brake Pedal

Located near the operator's left foot when the operator is seated in the tractor seat. This pedal is used to stop the tractor. When fully depressed, it also allows the parking brake knob to be engaged.

5. Parking Brake

Near the operator's left foot, the Parking Brake knob should be engaged before you leave the tractor. To engage it, push Brake Pedal down fully, then lift the knob which will latch the pedal in the "park" position. To release the Parking Brake, push the Brake Pedal down again.

6. Travel Pedal

Positioned to the right of the operator's seat, this pedal allows the tractor to go in forward or reverse direction when pressed down. Press the *top* of the pedal to go forward. Press the *bottom* of the pedal to go in reverse. Remove your foot from the pedal for neutral position.

7. Light Switch

This rocker switch is on the left-hand side of the instrument panel. It controls the headlights at the front of the tractor. It has "On" and "Off" positions.

8. PTO Attachment Drive Switch

Located on the right-hand side of the instrument panel. It electrically engages and disengages power to your attachments. It has two positions– "On" and "Off." Always move this switch to Off before leaving the operator's seat. If you leave the seat while the switch is "On", the engine will stop automatically. If left in the "On" position, the engine will not restart.

9. Attachment Lift Lever

The long lever located alongside the operator's right leg. To raise an attachment, pull the lever back to the rear; lower the attachment by pushing the lever forward.

10. Hour Meter (Optional)

A graphic display, in the pod on the left-hand side of the instrument panel, that registers hours of tractor use. Optional on some models, standard on other models.

11. Electric Lift Switch (Optional)

If ordered as an optional kit on your tractor, this rocker switch is located on the right side of the instrument panel and electrically controls the raising and lowering of attachments. It is used instead of the Attachment Lift Lever (#9).

12. PTO Indicator Light

Located on the bottom of the instrument panel. Lights up when the PTO Attachment Drive Switch is moved to "On."

13. Voltage Indicator Light (Optional)

Located on the bottom of the instrument panel. This light comes on if the battery voltage is low. Identify the electrical problem before using your tractor further. Available only on certain models.

14. Safety Start Switch Indicator Light

Located on the bottom of the instrument panel. This light comes on to indicate that the safety interlock switches are not properly activated to start the engine.

15. Steering Wheel

The steering wheel controls a helical gear and sector steering design. The turning radius is 22".

16. Fuel Cap and Gauge

The fuel tank is located at the rear of the tractor. Its fuel cap (with built-in gauge) is mounted on top of the tank.

17. Cruise Switch (Optional)

Located on left-hand side of instrument panel. Activates cruise control feature. To deactivate cruise control, either move switch to off or press down on Brake Pedal. Available on 14HP and 16HP models.

18. Cruise Indicator Light (Opt.)

Lights up when cruise control feature is activated. Available on 14HP and 16HP models.

Section 4 Operation

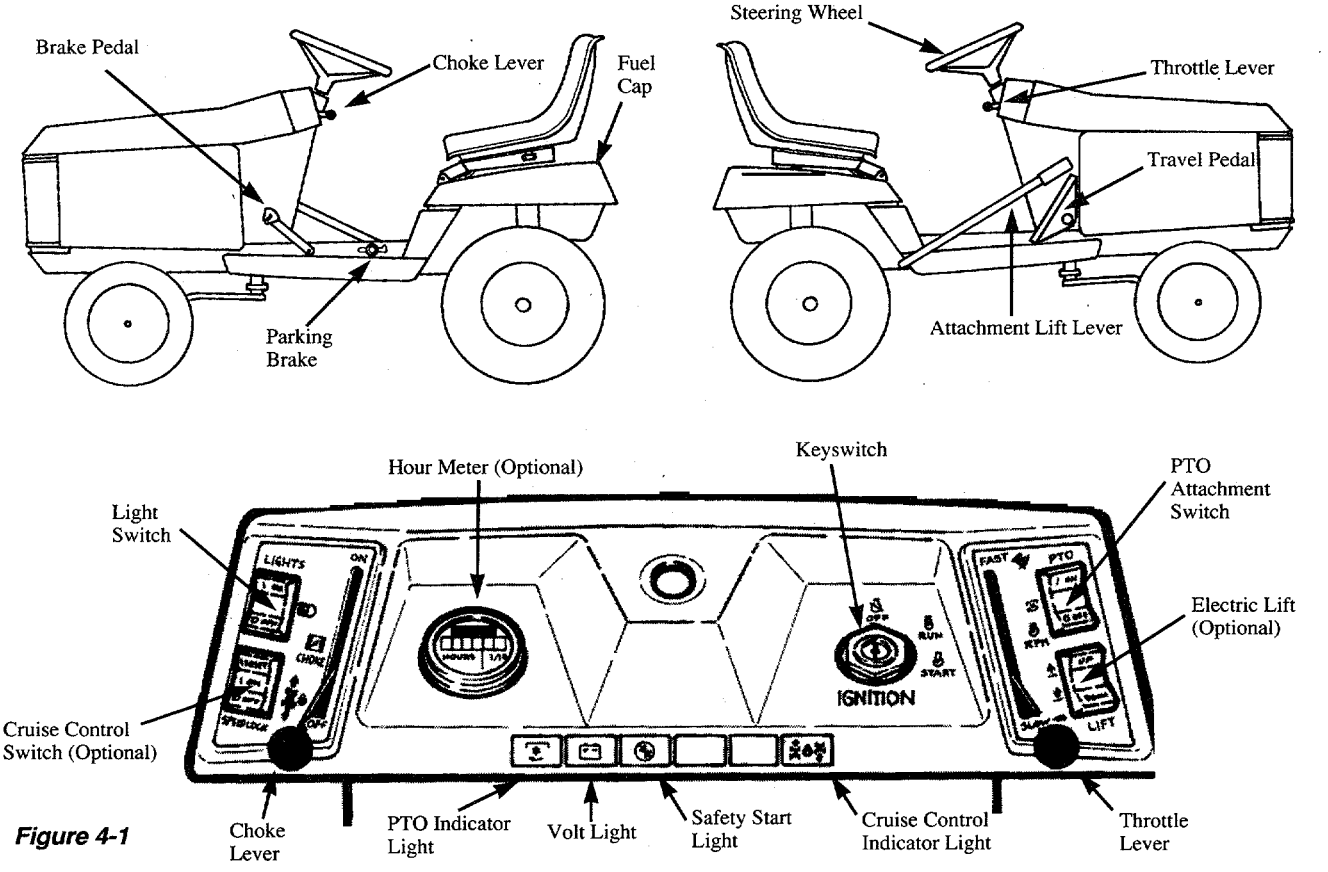


Figure 4-1

WARNING

Before operating your tractor, be sure you read and understand all safety, controls, and operation instructions in this Owner/Operator Manual and on the decals on your tractor.

Failure to follow these instructions can result in serious personal injury or property damage.

PRE-STARTING INSTRUCTIONS

Please read and carry out the following pre-starting instructions and procedures before starting the tractor engine and using your equipment.

1. Be sure the engine has been filled with the proper type and amount of motor oil. Check the oil level by removing the engine dipstick on top of the engine (see Assembly Step 8 in Section 2).

2. Check for any oil or fluid leaks on the tractor or on the ground. Any leaks must be attended to before starting your equipment. See your Authorized Dealer for assistance if needed.

3. Check the battery electrolyte level. Fill any cells that are below the full mark with distilled water.

4. Fill the fuel tank with fresh, clean unleaded gasoline. Automotive-grade Unleaded Regular gasoline with an octane rating of 87 minimum is highly recommended. Clean up any spills. DO NOT MIX MOTOR OIL WITH THE GASOLINE!

5. Adjust the operator's seat to the position most suitable for you. To move the seat forward or backward, loosen the two knobs underneath the seat at the rear, slide the seat ahead or back, and securely retighten the two knobs.

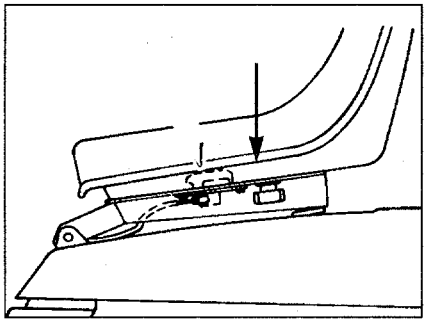


Figure 4-2: Be sure the seat is adjusted so you can reach all controls quickly and conveniently.

6. The attachment you will be using (mower deck, snowthrower, etc.) must be properly and securely attached according to the separate instructions provided with that attachment.

7. Move the Attachment Lift Lever forward and backward to lower and raise the attachment. Verify that it's working properly.

8. Check the operation of the Parking Brake. Do so by depressing the Brake Pedal and lifting the Parking Brake knob— this locks the Brake Pedal down. To release the Parking Brake, step down on the Brake Pedal.

Note: Always engage the Parking Brake before you leave the tractor or before starting the engine.

9. Clear the area in which you will be working of any debris. Remove branches, rocks, cans, bottles and any other foreign objects which could be picked up and thrown by rotating blades or other moving parts on your tractor.

10. Check to see that the air cleaner element and the entire engine compartment are free of any debris.

ENGINE OPERATION INSTRUCTIONS

To Start the Engine:

1. Take your position in the operator's seat. Have the ignition key ready to install.

2. Move the PTO Attachment Drive Switch to "Off" if not already in the Off position.

3. Engage the Parking Brake if not already engaged. To do so, depress the Brake Pedal fully, and lift up the Parking Brake knob. This locks the Brake Pedal down, applying the brakes. The tractor can not roll now.

4. Keep your foot away from the Travel Pedal so the tractor remains in Neutral.

5. Move the Attachment Lift Lever forward to lower the attachment to the ground.

6. Insert the key into the ignition keyswitch.

7. Move the Engine Choke Lever all the way up to "On" position.

8. Move the Engine Throttle Lever about three-quarters of the way toward the "Fast" position. This position is for starting only.

Important–You will be starting the engine next. The electrical starter will operate only if the PTO Attachment Drive Switch is "Off", the Brake Pedal is depressed (with Parking Brake preferably engaged), and the operator is fully seated.

9. To start the engine, turn the ignition key to the right to the "Start" position. Release key when the engine starts.

Important– In case of a "false start" (where engine attains enough speed to disengage the starter, then fails to keep running), allow engine to stop completely before another starting attempt is made. Failure to comply can damage the starting mechanism and the engine. Limit continuous cranking to 30 seconds maximum to avoid overheating the starter and causing starter damage.

10. Slowly move Engine Choke Lever down to "Off" and let engine warm up for a minute or so. In normal operation, it must be in the "Off" position.

11. Move the Engine Throttle Lever to the "Fast" position. Engine is designed to operate most efficiently at "Fast" throttle.

You are now ready to operate the tractor and any attachment you may have mounted. If you wish to stop the engine and leave the tractor at anytime, do as follows:

To Stop the Engine:

1. Be sure the PTO Attachment Drive Switch is "Off."

2. Depress the Brake Pedal and move the Parking Brake Knob up to engage the Parking Brake.

3. Move Engine Throttle Lever to "Slow" so engine is idling.

4. Turn ignition key to "Off." Remove the ignition key.

See "Tractor Operation" instructions next to operate the tractor.

TRACTOR OPERATION

To operate your tractor, first start the tractor engine using the engine starting instructions (steps 1 through 11) given previously. Remember– the starter motor will not turn the engine over unless the PTO Attachment Drive Switch is "Off", the Brake Pedal is depressed, and the operator is in the operator's seat.

WARNING

Do not permit any person other than the operator to ride on the tractor.

Do not drive close to edges of banks which could collapse under the tractor's weight.

While turning, reduce your operating speed.

Failure to comply could result in serious personal injury.

To Start the Tractor:

1. After starting, let the engine warm up. Slowly move the Choke Lever to "Off." Then move the Engine Throttle Lever to "Fast."

Note: Always operate unit at Fast engine throttle setting whenever using attachments.

2. Move the Attachment Lift Lever forward to lower the attachment. Move the PTO Attachment Drive Switch to "On" to power your attachment.

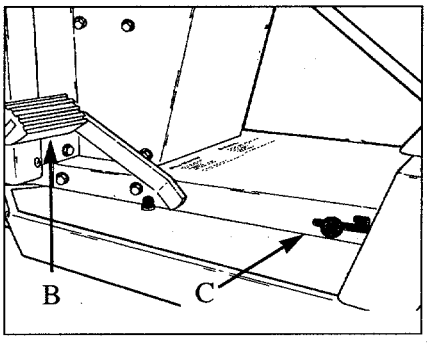


Figure 4-3: Depress Brake Pedal ("B") fully to disengage the parking brake ("C").

3. Release Parking Brake ("C", Fig. 4-3), by fully depressing the Brake Pedal ("B"). Position both hands securely on steering wheel.

4. Place your right foot on the Travel Pedal. See Figure 4-4 below. The Travel Pedal provides infinitely variable speed. To go forward, slowly press the *top* of the Travel Pedal down. To go in reverse, press the *bottom* of the Travel Pedal. Top speed in forward is 5.2 MPH (8.4 km/hr); in reverse, top speed is 2.1 MPH (3.4 km/hr). Be very careful not to exceed the speed at which you are in total control of the tractor.

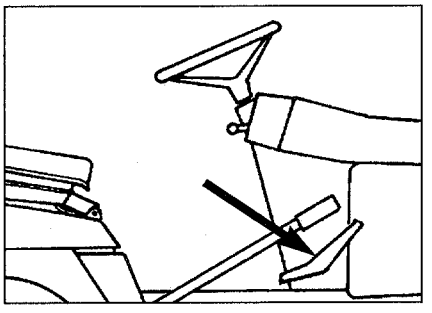


Figure 4-4: The Travel Pedal provides infinitely variable forward and reverse tractor speeds.

To Stop the Tractor:

1. Take your right foot off the Travel Pedal and apply the brakes with your left foot using the Brake Pedal.

2. Move the PTO Attachment Drive Switch to "Off."

3. Engage the Parking Brake.

You may now leave the operator's seat temporarily, if desired, and the engine will not shut off providing the PTO Attachment switch is Off and the Parking Brake is engaged. Never leave the tractor *unattended* while the engine is running. If you are stopping work, also shut the engine off and take the ignition key with you.

IMPORTANT: When parked on a hill, always engage the tractor Parking Brake.

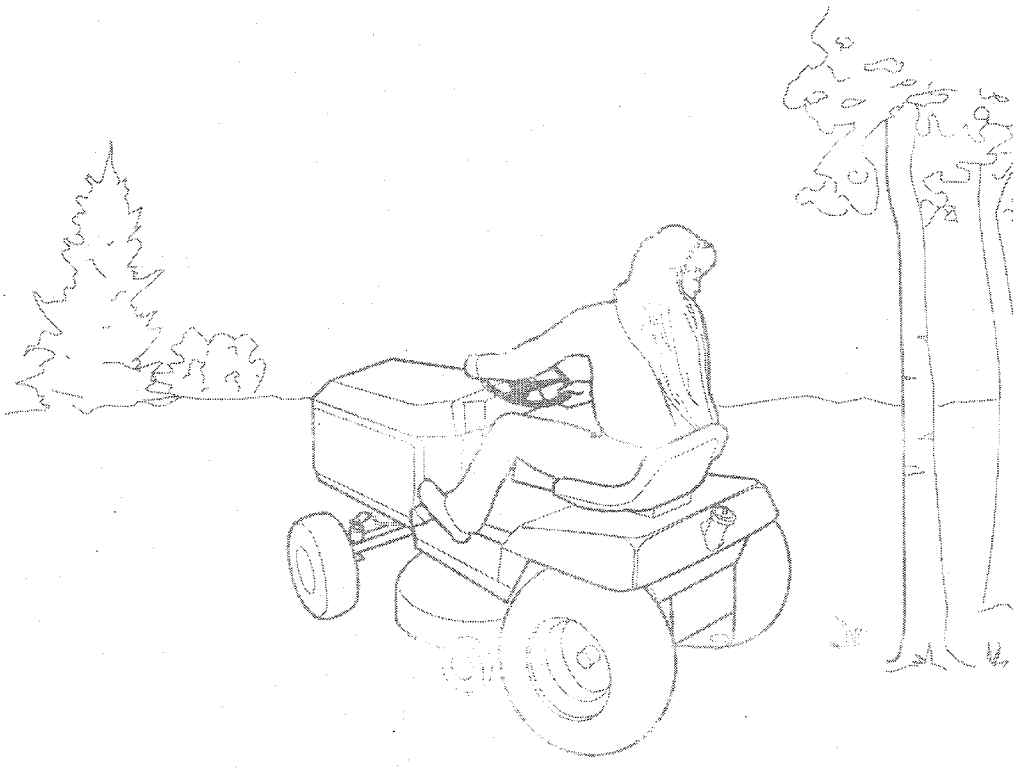
WHICH GROUND SPEED?

Knowing how quickly or slowly you should travel on your tractor has much to do with your specific job site and the nature of the job itself, as well as your own experience, but here are some very general guidelines that you may find helpful.

Ground Speed Guidelines	
Slow	Going up or down moderate hills, traveling on slippery surfaces, high grass, deep snow, towing heavier loads, moving out of storage site, maneuvering in tight areas.
Slow/Moderate	Level terrain to mild slopes, normal grass and snow depths, towing light loads.
Moderate	Level terrain, light mowing and snowthrowing.
Moderate/Quick	Travel on level terrain from storage site to work locations.

GENERAL OPERATING TIPS AND TECHNIQUES FOR LAWN MOWING

Figure 4-5:
Your tractor excels at lawn care maintenance. For best results, cut no more than one-third (1/3) the height of the grass at a time. Proceed at a moderate speed. Set engine throttle to "Fast." Always be alert for the presence of children and small animals, changes in terrain, foreign objects, and slippery surfaces. You have a powerful piece of outdoor equipment at your command—please operate it with safety foremost in mind.



Regardless of the engine horsepower rating of your tractor or the width of the mower deck attached to the tractor, there are some general mowing procedures and guidelines you'll want to practice so you obtain the best mowing results and the best performance from your equipment. ***Please be sure to read the specific mower deck operating instructions in your Attachment Owner/Operator Manual.***

- It is always preferable to mow a lawn in natural daylight. If you need to mow in the evening, be sure the area is very well lighted and level.
- Only engage the PTO Attachment Drive Switch under a no-load condition. For example, on previously cut grass it is OK to lower the mower deck, then to engage the PTO Switch. But in high grass, engage the PTO Switch first, then lower the deck.
- As a general rule, do not operate your tractor across the face of a slope. There is too much risk of the equipment tipping over and seriously injuring the operator.
- On sloped terrain, always travel up and down the slope. Do not attempt to go on slopes that have an incline steeper than 15°. See Figure 4-6 for reference.
- Mowing the grass when it is dry is far preferable to mowing it when wet or damp. The quality of the job will be superior and your equipment will not have to work as hard. Traction will also be better.
- If the grass is high, make two separate passes at gradually lower cutting heights to cut it to the correct final height. This will put less stress on both the grass and your equipment.

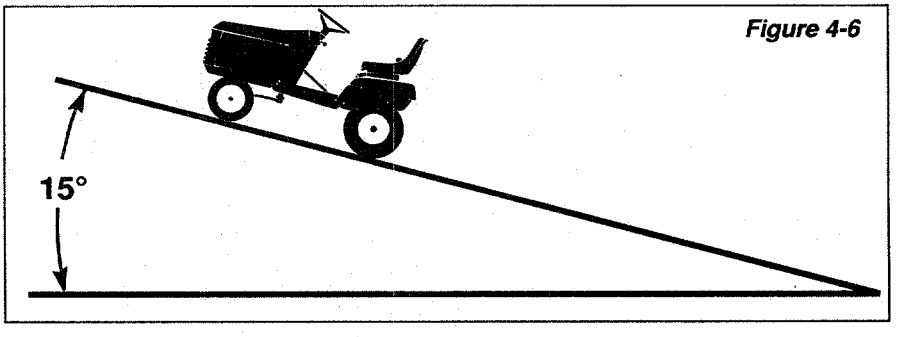


Figure 4-6

GENERAL TECHNIQUES FOR SNOW THROWING

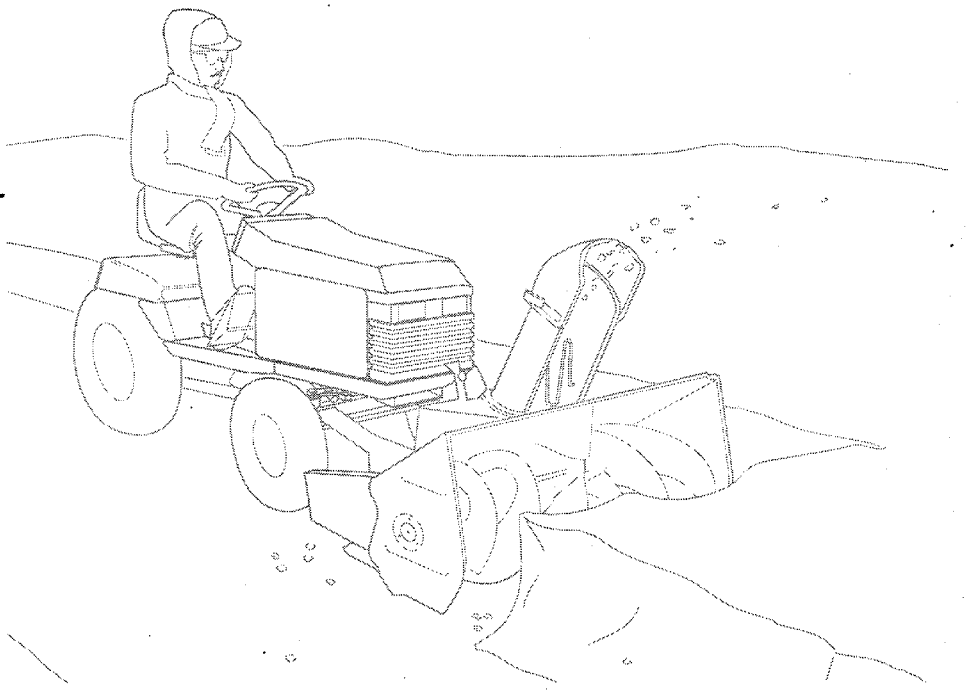


Figure 4-7: There are Two-Stage and Single-Stage Snow Thrower models – your particular tractor model will determine which snow throwers you will be able to choose from. See your Authorized Dealer for complete product specifications and recommendations.

By purchasing an optional snow thrower attachment for your tractor, you expand the property-management capability of your equipment substantially.

Please be sure to read the assembly, operating and safety instructions for the specific snow thrower model you purchase in that attachment's Owner / Operator Manual.

WARNING

Before operating your tractor with an attachment, be sure you read and understand all safety, controls, and operation instructions in this Owner /Operator Manual and in the Attachment Manual.

Failure to follow these instructions can result in serious personal injury or property damage.

Each property is unique, but here are some general tips to make snow throwing more effective.

- If possible, perform snow throwing operations during the daylight hours for maximum visibility.
- In deep snow, it is recommended that you reduce the *width* of the cuts to lessen the strain on the equipment.
- Under normal snow conditions, keep the Engine Throttle Lever at "Fast" position and proceed at a suitable ground speed.
- When blowing light snow or cleaning up scattered patches, set the tractor at a higher ground speed to maintain a stream of snow coming out of the chute.
- Check wind direction. For maximum performance, throw the snow in the direction in which the wind blows. With the wind blowing across the area to be cleared, begin on the windward side and cast snow downwind.
- When turning around, turn with the wind. Adjust the chute as you turn to keep the discharge downwind.
- Before putting the snow thrower away, clean all the excess snow and slush off the unit to prevent the controls and chute from freezing.

Section 5 Maintenance

MAINTENANCE

There are several maintenance procedures which you as the owner can confidently perform to keep your tractor in good operating condition. Changing the motor oil and the oil filter (if equipped with one), are very important. As is servicing the air cleaner. You can do other checks and adjustments as well.

Major service procedures such as engine and transmission repairs, bearing replacement and other moderate to heavy-duty jobs should probably best be done by your Authorized Dealer or, in the case of the engine, by the engine manufacturer's local representative.

There is a Troubleshooting Chart and a Maintenance Chart in this section which you should refer to regularly. Please refer to the Operator Manual supplied with an Attachment should it need service.

WARNING

Before performing any maintenance on the tractor or the engine, the tractor must be stopped, the PTO switch shut Off, the Parking Brake engaged, the engine stopped and the key removed, and the spark plug wire must be disconnected and kept away from the plug. Always let engine and muffler cool down.

Failure to comply can result in serious personal injury.

Engine Maintenance

Checking & Changing Motor Oil

It is vitally important to maintain the correct motor oil level in your engine in order to prevent premature wear or failure. You should check the oil level before using your tractor every time. And you should change your motor oil (and oil filter if so equipped) per the service information following.

Kohler 12.5HP / 14HP Engines

Checking Oil Level: Refer to Figure 5-1 for the Oil Dipstick/Oil Fill Tube location. Simply unlatch the tractor hood, and raise the hood for access to the engine. Unthread and remove the dipstick. Wipe oil off. Reinsert dipstick and rest it on the fill tube (do not re-thread). Remove dipstick and check oil level. Add oil up to "Full" mark if needed. Securely re-install the dipstick.

Changing Oil: After the first 5 hours of operation on a new Kohler engine, change the oil. Thereafter, change the oil every 100 operating hours. Change the oil filter every 200 operating hours. Refer to Figure 5-2 for location of engine oil drain plug, oil filter, and oil filter drain plug.

See your engine manufacturer literature for complete motor oil and oil filter changing instructions and requirements.

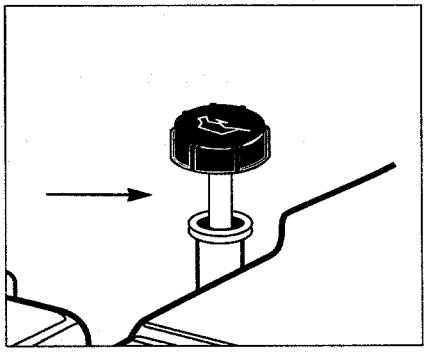


Figure 5-1: Kohler 12.5 HP / 14HP engine Oil Fill Dipstick/Oil Fill Tube.

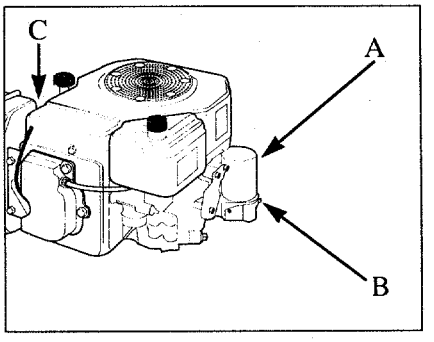


Figure 5-2: The Kohler engine oil filter ("A") is a spin-off automotive type. Note engine oil filter drain plug ("B") location. Oil crankcase drain plug ("C") is on opposite side.

Kohler Recommended Motor Oil Viscosity Grades:

Use API Service Class SF oil. High-quality detergent oil is recommended.

0° F to 100° F: SAE 10W-30, 10W-40.
-20° F to 32° F: SAE 5W-20, 5W-30.

WARNING

Before performing any maintenance on the tractor or the engine, the tractor must be stopped, the PTO switch shut Off, the Parking Brake engaged, the engine stopped and the key removed, and the spark plug wire must be disconnected and kept away from the plug. Always let engine and muffler cool down.

Failure to comply can result in serious personal injury or property damage.

Briggs & Stratton 12HP , 14 HP, and 16 HP Engines

Checking Oil Level: Refer to Figures 5-3 and 5-4 for Oil Dipstick / Oil Fill Tube locations on the 12HP and 14HP/16HP Briggs engines. The oil level should be checked before every use.

To check properly—Place engine so it is level. Unscrew the dipstick and wipe it clean. Screw the dipstick firmly back into place. Remove it again to check the level. Add oil as necessary to bring it up to the "Full" mark on the dipstick.

Changing Oil–12HP Briggs: Change oil after the first 5 hours of operation. Thereafter, change oil every 50 hours, or every 25 hours if operated under heavy load or in high temperatures. This engine does not have a removable oil filter. See Figure 5-5 for oil drain plug location at bottom of engine. Remove the drain plug. Drain oil while it is still warm to promote more complete drainage. Securely replace drain plug, then add fresh motor oil through oil fill tube at top of engine. Fill to "Full" mark on the dipstick.

Changing Oil–14HP And 16HP Briggs Engines: Change oil after the first 8 hours of operation. Thereafter, change the oil every 50 operating hours, or every 25 hours if used under heavy loads or at high temperatures. The spin-off automotive-type oil filter needs changing every 100 hours of operation. See Figure 5-6 for location of oil filter and oil drain plug. To change the oil, use the same procedure described previously with the 12HP Briggs engine.

See your engine manufacturer literature for complete motor oil and oil filter changing instructions and requirements.

Briggs & Stratton Recommended Motor Oil Viscosity Grades:

Use API Service Class SE,SF, or SG oil. High quality detergent oil is recommended. No special additives should be used. DO NOT MIX OIL WITH GASOLINE.

40° F to 100° F: SAE 30 weight oil.
0° F to 40° F: SAE 5W-30 or SAE 10W-30; or synthetic 5W-20 or 5W-30.
-20° F to 40° F: synthetic 5W-20 or 5W-30.

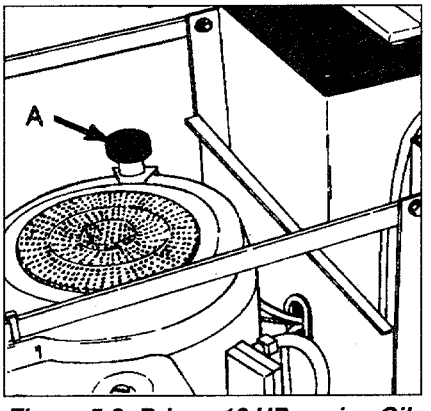


Figure 5-3: Briggs 12 HP engine Oil Fill Dipstick / Oil Fill Tube ("A").

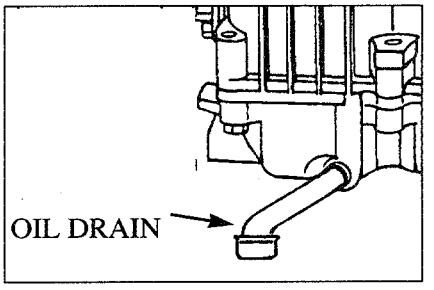


Figure 5-5: Briggs 12 HP engine—removal of oil drain plug is shown.

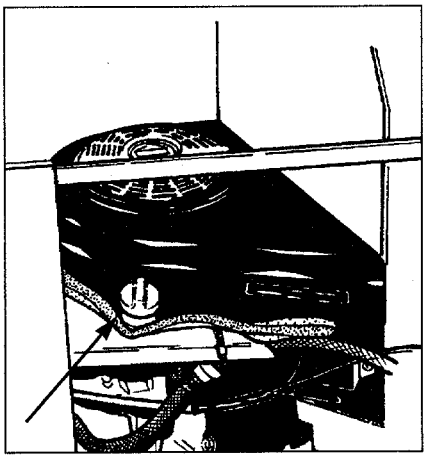


Figure 5-4: Briggs 14 HP / 16HP engines—location of Oil Fill Dipstick / Oil Fill Tube.

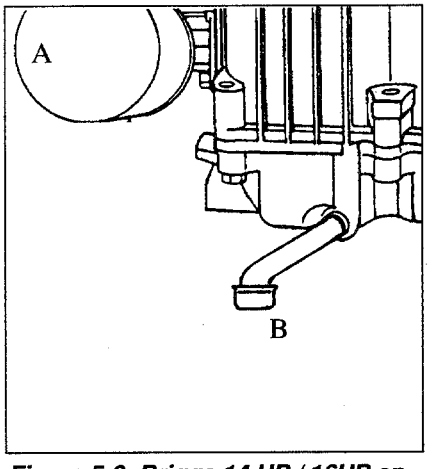


Figure 5-6: Briggs 14 HP / 16HP engines. Spin-off oil filter ("A") and oil drain plug ("B") are shown.

Fuel Filter Service

Your engine may be equipped with an in-line fuel filter placed in the fuel line between the gas tank and the carburetor. Visually inspect the fuel filter periodically (every 100 hours or once a year) and replace when dirty. The filter is a throw-away type.

Carburetor

The carburetor is adjusted at the factory and should not have to be readjusted. If any black exhaust is noticed, check the air cleaner components first. An overly "rich" mixture is usually caused by a poorly serviced, clogged air cleaner element, not by an improperly adjusted carburetor.

Clean the Air Cooling System

Grass, chaff, and dirt may clog the rotating screen in the blower housing, and work underneath the blower housing, especially after prolonged service cutting dry grasses. It is recommended that the screen (see Figure 5-7) be cleaned off regularly, and the blower housing be removed every 100 operating hours (or each season) to clean out any debris that has collected around the cooling fins and flywheel. Your engine is air cooled only, so keeping it free of debris allows it to run at lower temperatures.

Ignition System

Your engine has a dependable, electronic ignition system. Beyond periodically checking/replacing the spark plug, there are no other maintenance, timing or other types of adjustments needed.

Spark Plug

Every 100 hours of operation, remove the spark plug, check its condition, and either reset the gap

WARNING

Before performing any maintenance on the tractor or the engine, the tractor must be stopped, the PTO switch shut Off, the Parking Brake engaged, the engine stopped and the key removed, and the spark plug wire must be disconnected and kept away from the plug. Always let engine and muffler cool down.

Failure to comply can result in serious personal injury or property damage.

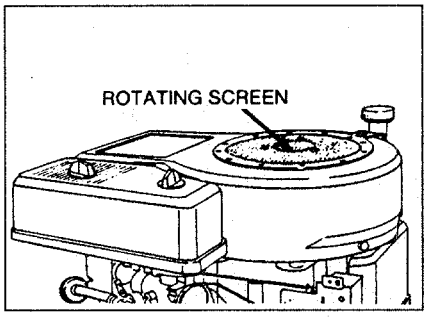


Figure 5-7: The rotating screen on top of your engine must be kept free of all debris. Clean it off regularly so the engine runs cooler.

or replace the plug as necessary. **See your engine manufacturer literature for spark plug gap settings and recommended spark plugs.** Good operating conditions are present when the plug has a light coating of a gray or tan deposit. A black coating may indicate an over-rich fuel mixture (caused by either a clogged air cleaner or improper carburetor adjustment.) A badly worn plug should be replaced with a new one.

NOTE: Do Not Sandblast Spark Plugs to clean them. Remaining grit on the plug could enter the engine causing extensive wear and damage.

Battery Care

When servicing the battery, be sure the battery cables are disconnected before you remove the battery from the tractor. Always disconnect the negative (-) cable first. When installing the battery, always check the polarity of the battery terminals to be sure you will be connecting the positive cable to the positive terminal, and the negative cable to the negative terminal.

Apply a light coating of petroleum jelly or oil to the inside of the clamp terminals and over the bolt studs before connecting the cables. Always re-connect the negative cable last.

WARNING

Electric storage batteries give off highly flammable gas while charging, and continue to do so for some time after receiving a steady charge. Do not permit any electric spark or an open flame near the battery. Do not set tools across the battery terminals as this may result in a spark or short circuit and cause an explosion. Be very careful to avoid contact with battery electrolyte—it can burn skin and clothing.

Diode Rectifier or Voltage Regulator

The 12HP Briggs engine has a diode assembly in the wiring harness at the dash console. The diode changes alternating current (AC) from the alternator to direct current (DC) to charge the battery. See the wiring diagram in the Parts Catalog. On other engines, a voltage regulator is featured.

Fuse

A fuse is located in the wiring harness at the dash console.

WARNING

Before performing any maintenance on the tractor or the engine, the tractor must be stopped, the PTO switch shut Off, the Parking Brake engaged, the engine stopped and the key removed, and the spark plug wire must be disconnected and kept away from the plug. Always let engine and muffler cool down.

Failure to comply can result in serious personal injury or property damage.

Air Cleaner Maintenance

Following the recommended engine manufacturer maintenance schedule and service procedures for the air cleaner on your engine is important for good engine performance and long engine life.

The air cleaner filters out dirt and impurities from the air before it enters the carburetor and mixes with the fuel. The air cleaner must be cleaned regularly and re-assembled properly. The following air cleaner information is a brief overview— for detailed instructions and recommendations, see the engine manufacturer literature that was supplied with your engine. **Note:** Service the air cleaner system at more frequent intervals than recommended if your tractor is operated under very dusty or dirty conditions.

Kohler 12.5HP / 14HP Engines

Kohler engines have a dual element air cleaner design— an outer foam pre-cleaner and an inner paper cartridge element. Refer to Figure 5-8 to see the components. Check the air cleaner daily or before starting the engine.

Service Schedule—

Outer Foam Pre-Cleaner: Wash and re-oil the pre-cleaner every 25 hours of operation or more often under extremely dusty or dirty conditions.

Inner Paper Cartridge Element: Check the paper element every 100 operating hours. Clean or replace the element as necessary.

Cleaning Instructions—

1. Remove the air cleaner cover retaining knob, the external cover, and the paper element with surrounding foam pre-cleaner. See Figure 5-8.

2. Remove the foam pre-cleaner from the paper element.

3. Wash the pre-cleaner in warm water with detergent. *Rinse thoroughly.* Squeeze out (do not wring) all excess water. Air dry.

4. Saturate pre-cleaner with new engine oil. Squeeze out all excess engine oil.

5. Reinstall pre-cleaner over the paper element and reassemble the components (unless the paper element also needs cleaning which is described next).

6. Gently tap paper element against a solid vertical surface to dislodge dirt and dust. **Do not wash this element or use pressurized air to clean it, as this will damage the element.** Replace a dirty, bent or damaged element.

7. Carefully wipe off the base on which the filters sit.

8. Reassemble all components as shown in Figure 5-8. Remember to carefully read the engine manufacturer's literature for additional procedures and requirements.

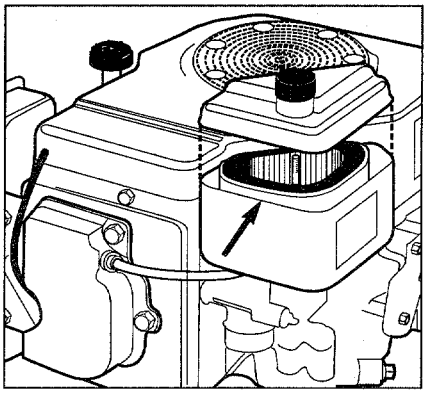


Figure 5-8: 12.5HP / 14HP Kohler engine dual-element air cleaner.

Briggs & Stratton 12HP, 14HP and 16HP Engines

The Briggs & Stratton 12HP, 14HP, and 16HP engines have a dual-element air cleaner system. Although different in design as shown in Figures 5-9 and 5-10, the service schedules and cleaning instructions are the same for both systems. Please refer to your engine manufacturer literature as well as the information that follows.

Service Schedule—

Outer Foam Pre-Cleaner: Wash and re-oil the foam pre-cleaner every 25 operating hours or every season, whichever occurs first.

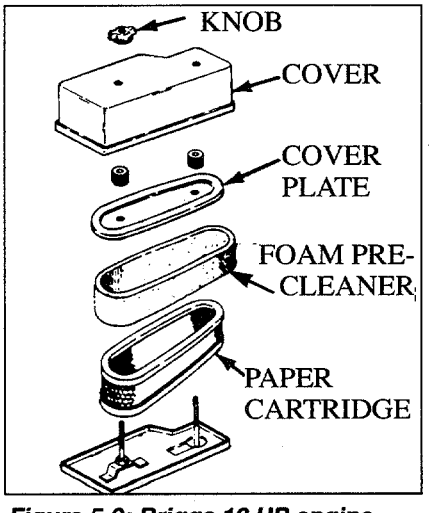


Figure 5-9: Briggs 12 HP engine dual-element air cleaner system.

Inner Paper Cartridge: Clean or replace the paper cartridge every 100 operating hours or every season, whichever comes first.

Cleaning Instructions—

1. Unhook clips on both sides of air cleaner and remove cover. Remove knob and small cover plate Lift out the cartridge and the foam pre-cleaner. Carefully separate the pre-cleaner from the paper cartridge.

2. Wash the pre-cleaner in liquid detergent and warm water. Squeeze it dry in a clean cloth.

3. Saturate the pre-cleaner in clean engine oil. Wrap it in a clean, absorbent cloth and squeeze to *remove all excess* engine oil.

4. Reassemble the components, unless the paper cartridge is also being serviced (see next step).

5. The paper cartridge can be cleaned by tapping it gently. If very dirty, replace or wash in non-sudsing detergent and warm water. Rinse *thoroughly* with clean water from inside out. Air dry *fully*.

6. Reinstall the foam pre-cleaner over the cartridge. Reassemble the components securely. Lock the outer cover on the air cleaner body with the hooks.

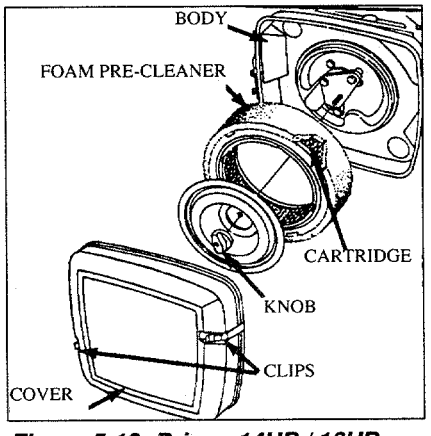


Figure 5-10: Briggs 14HP / 16HP Vanguard dual element air cleaner.

Tractor Maintenance

Transmission Maintenance

The Eaton Hydrostatic Model 751-047 transmission fitted to your tractor is a rugged, carefully engineered unit. Do make periodic visual checks of the transaxle and surrounding area, inspecting for leakage on the transmission itself and on the ground. Remove all dirt from around the transmission area. Clean the transmission cooling fins periodically. In operating in a dusty environment, check and clean cooling fins frequently. Let tractor cool before cleaning.

If damage or leakage has occurred, contact your Authorized Dealer for service and/or repairs. Please do not attempt to disassemble and perform transmission service work on your own.

WARNING

Improper tire pressure or damage to a tire can result in a hazardous operating condition. Inflate tires properly and repair any tire damage before using the tractor.

Failure to comply can result in serious personal injury or property damage.

Tires

Closely examine the tires on your tractor every time before you use the tractor.

Look for cuts, abrasions, bulges or other signs of damage to the tires. Repairs must be made before using the tractor again. Tire pressure is very important— the front tires should be evenly inflated at 14 PSI; the rear tires at 12 PSI. Incorrect pressure can damage the tires and adversely affect tractor performance. Significant under- or over-inflation can produce a hazardous handling situation.

WARNING

Before performing any maintenance on the tractor or the engine, the tractor must be stopped, the PTO switch shut Off, the Parking Brake engaged, the engine stopped and the key removed, and the spark plug wire must be disconnected and kept away from the plug. Always let engine and muffler cool down.

Failure to comply can result in serious personal injury or property damage.

Tighten Hardware Regularly

Often overlooked, but extremely important, is a routine that requires you to check tractor hardware regularly. This includes seat knobs, hood latches, battery cable connecting hardware, wheel attachment hardware, and other major areas. Do this frequently.

Interlock Safety Switch System

Your tractor is equipped with three (3) electrical Interlock Safety Switches that are always functioning simultaneously. Their purpose is to shut the tractor engine off immediately by grounding the electrical system if any of several unsafe operating conditions is present. The Interlock Safety Switches are described below.

1. One interlock safety switch is located in the PTO Attachment Drive Switch system. The engine will not start if the PTO Drive Switch is in the "On" position. The PTO Drive Switch must be moved to "Off" before the engine will turn over.

2. The second interlock safety switch is located underneath the operator's seat. The operator must be sitting in the seat before the engine can be started. Also– if the operator should leave the seat while the engine is running and does not turn the PTO Attachment Drive Switch to "Off" and engage the Parking Brake, the engine will shut off automatically.

3. The third interlock safety switch is located as shown in Figure 5-11, "A". It prevents the engine from starting if the Brake Pedal is not fully depressed manually (or held down by the engaged Parking Brake) during the engine starting procedure. If the bracket ("B", Figure 5-11) next to the interlock switch does not depress the plunger of the switch when the Parking Brake lever is engaged, have your Authorized Dealer make an adjustment to the safety switch.

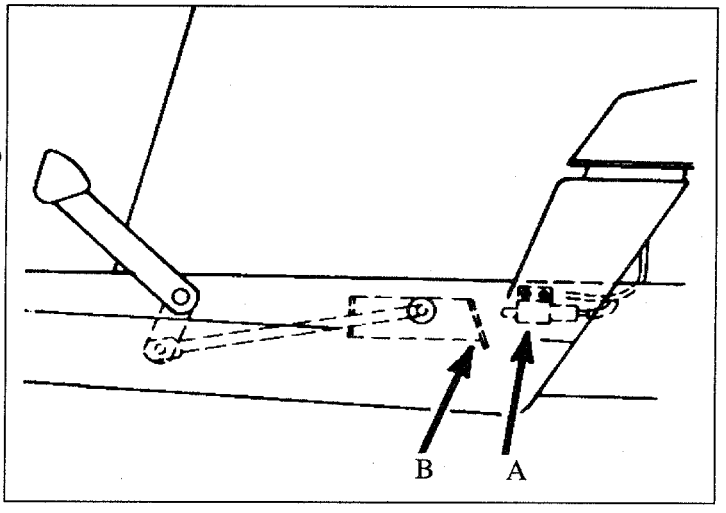


Figure 5-11: This is the third of three interlock safety switches ("A") on your tractor. The three switches are linked to the operation of the Brake Pedal, the operator's seat, and the PTO Attachment Drive Switch. The engine will not start unless the PTO Attachment Drive Switch is "Off" and the Brake Pedal is depressed (or Parking Brake is engaged). When the engine is running, the operator must shut off the PTO Attachment Drive Switch and engage the Parking Brake before leaving the seat or the engine will stop.

WARNING

Before performing any maintenance on the tractor or the engine, the tractor must be stopped, the PTO switch shut Off, the Parking Brake engaged, the engine stopped and the key removed, and the spark plug wire must be disconnected and kept away from the plug. Always let engine and muffler cool down.

Failure to comply can result in serious personal injury or property damage.

Steering Adjustment

When the steering wheel has been turned fully to either the right or the left, the spindle stop ("B", Figure 5-12) of the steering arm should make contact with the front axle. "A" is the adjustment rod. If an adjustment is necessary, please contact your Authorized Dealer for this service. This is a very important adjustment that your Dealer is highly qualified to make.

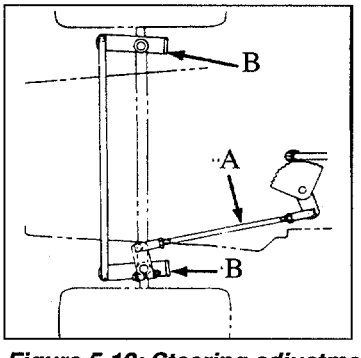


Figure 5-12: Steering adjustment.

Brake Adjustment

When the brake will no longer hold the tractor with the brake lock engaged, an adjustment is required.

Locate nut "A" (Figure 5-13) on the brake rod. Adjust the nut until the rod end ("B", Figure 5-13) is in the center of the slot in the arm ("F").

When you have finished making this adjustment, be sure to check the brakes for proper braking.

Hydrostatic Neutral Adjustment

If the tractor 'creeps' when the Travel Pedal is in the Neutral position (foot off the pedal), an adjustment is required. Do not use the tractor in this condition. Please contact your Authorized Dealer to have this adjustment performed.

Hydrostatic Drive Adjustment

With the brake pedal depressed, engage the Parking Brake knob. Now check the distance between idler pulley "K" (Figure 5-13) and the frame wall. This dimension should be between 3-1/2" and 3-3/4". If an adjustment is required, adjust at pivot "L", Figure 5-13.

Note: The belt should not creep when Parking Brake is engaged and engine is running at high RPM.

Drive Belt Removal And Installation

1. Cut and remove the old belt.

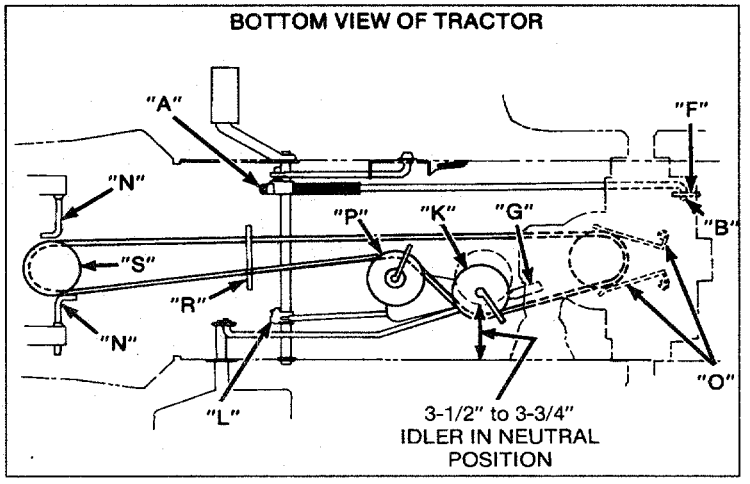
2. Loosen the electric clutch locating retainer ("M", Figure 5-14).

3. Loosen belt guides ("N", Figure 5-13).

4. Remove ball joint ("G", Figure 5-13).

5. Use only a genuine replacement belt– do not use a substitute. Route the new V-belt up and over the fan (Figure 5-15) and then down until it rests in the pulley groove. It will be necessary to loosen and reposition belt guides ("O", Figure 5-13) to install. Retighten guides when V-belt is in place.

Figure 5-13: View from underneath the tractor.



6. Route V-belt around idlers "K" and "P", Figure 5-13. Belt guides must be moved slightly to assemble.

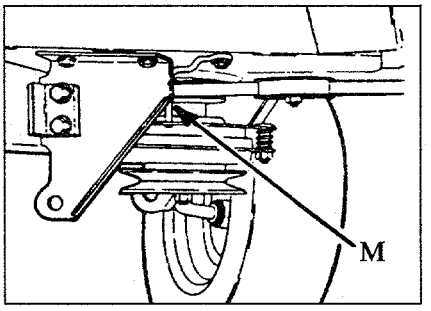


Figure 5-14:

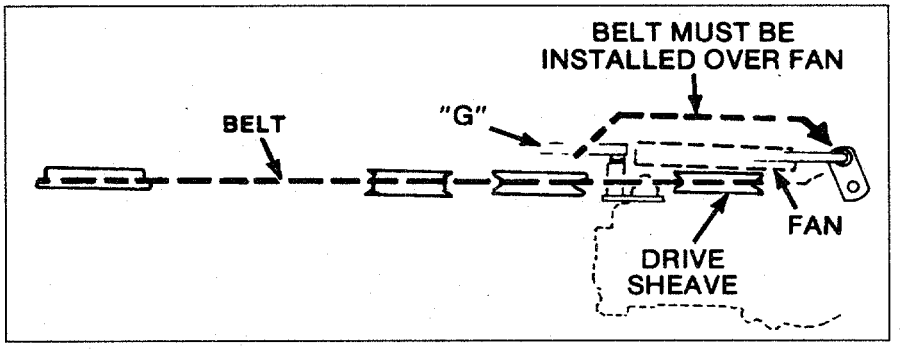


Figure 5-15:

7. Position V-belt between rod "R" in Figure 5-13 and place over engine pulley "S".

8. Retighten the electric clutch locating retainer ("M", Figure 5-14).

9. With the Brake Pedal disengaged, check that the belt guides at idler pulleys "K" and "P" in Figure 5-13 are in the position shown.

10. Check that belt guides "O" on the hydrostatic drive pulley are within 1/16" to 1/8" of the belt.

11. Check that belt guides "N" in Figure 5-13 are within 1/8" to 3/16" of the electric clutch sleeve ("S").

12. After assembly check Hydrostatic Drive adjustment.

LUBRICATION CHART

Area To Be Lubricated	Frequency	Type of Lubricant	Amount
1. Engine Crankcase	Kohler— first 5 hours Then every 100* hours Briggs— first 5 hours Then every 25* hours	See recommendations-pg.23 See recommendations-pg. 24	4 pts(12.5/14HP) 3 pts(12HP) 3.5 pts(14/16HP)
2. Transmission	Check daily.	SAE 20W20; Type SC,SD or SE	To Full Mark
3. Pivot Points / Linkages	50 hours	Clean motor oil	As needed
4. Front Wheel Bearings	25 hours	Multi-Purpose Grease	1-to-2 strokes
5. Front Wheel Spindles	25 hours	Multi-Purpose Grease	1-to-2 strokes
6. Brake Pedal Shaft & Bushings	10 hours	Clean Motor Oil	Small amount
7. Tie Rod Ends / Drag Links	10 hours	Clean Motor Oil	Small amount
8. Steering Shaft	10 hours	Clean Motor Oil	Small amount
9. Front Axle Pivot	25 hours	Clean Motor Oil	Small amount

* More often under extreme conditions.

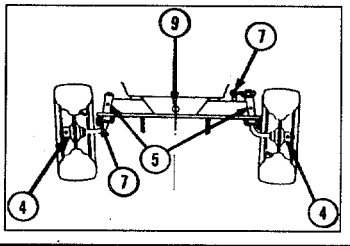


Figure 5-16

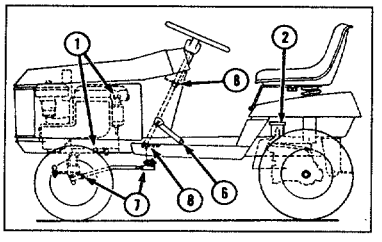


Figure 5-17

STORING YOUR SUBURBAN TRACTOR

Keep your tractor in a dry, secure location to protect it from harsh weather. Over the years, this will make a difference in performance and appearance.

If the tractor is not to be used for some time, take several steps for long-term storage.

1. Completely clean all accumulated dirt and debris from all parts, particularly around the engine fins and on the engine flywheel screen. Let engine cool before cleaning it.

2. Apply rust preventative (or oil) to surfaces subject to rust. Touch up areas where paint has chipped.

3. Drain gasoline from the fuel tank and the carburetor. Fuel goes stale and also forms varnish deposits on critical parts. It is best to remove the fuel if your tractor will not be used for several months. Or you may add a gas stabilizer to the fuel instead of draining it, if you prefer.

4. Drain oil from engine crankcase. Refill the engine with clean motor oil per engine manufacturer recommendations.

5. Check the fuel filter and replace it if dirty.

6. Remove, clean and re-gap the spark plug (or replace it), and put a small amount of oil (SAE 10W-30) in the cylinder before reinstalling the spark plug. Turn engine over a few times to lubricate internal parts. To do this, just engage the ignition key briefly a few times.

7. Keep battery terminal posts clean and coated with petroleum jelly. Fill battery cells and recharge the battery before storage. Store at 20° F (-7° C) to 50° F (10° C). Check every two months and fully recharge as necessary.

8. The air cleaner should be cleaned prior to storage.

9. Any mounted attachment **MUST** be lowered to the ground. Put the PTO Attachment Drive Switch in the "Off" position.

COMPONENT	HEADLIGHT WILL NOT LIGHT	ENGINE WILL NOT CRANK TO START	ENGINE CRANKS BUT WILL NOT START	ENGINE RUNS BUT TRACTOR FAILS TO MOVE	ATTACHMENT WILL NOT OPERATE	BRAKES DO NOT STOP TRACTOR OR HOLD WHEN IN PARK	CRUISE WILL NOT ENGAGE PROPERLY	ENGINE NOT RUNNING OR BATTERY NOT CHARGING	ENGINE STARTS WHEN BRAKE PEDAL NOT APPLIED OR PTO ATTACHMENT DRIVE SWITCH IS ON	ENGINE RUNS ROUGHLY		BATTERY NOT CHARGING	CAUSES
		PROBLEM											
BRAKE PEDAL		●											NOT ENGAGED
		●											INTERLOCK NOT ADJUSTED
				●									BRAKE NOT RELEASED
KEY		●											CHECK KEYSWITCH
ATTACHMENT DRIVE SWITCH		●											NOT IN START POSITION
		●			●								CHECK SWITCH
ENGINE	●							●					DEAD BATTERY
IGNITION SWITCH AND WIRING	●												CHECK LIGHT SWITCH
		●					●						CHECK BRAKE SWITCH
		●							●				CHECK BRAKE AND PTO ATTACHMENT SWITCH
FUSE		●										●	OPEN
BATTERY		●						●					TERMINAL CORRODED OR WIRE LOOSE
		●											BATTERY DEAD
		●						●					LOW FLUID LEVEL
CARBURETOR			●							●			NOT ADJUSTED PROPERLY
ENGINE RPM CONTROL			●										UNDER CHOKING—ENGINE COLD
			●										EXCESSIVE CHOKE— WARM ENGINE
FUEL			●										NO FUEL
			●										PLUGGED FILTER OR GAS LINE
			●										INOPERATIVE FUEL SOLENOID. CHECK SOLENOID. SEE WIRING DIAGRAM IN PARTS CATALOG
LIGHT DIODE	●												OPEN DIODE
CHARGE DIODE								●				●	OPEN DIODE
BELTS					●								IMPROPERLY ROUTED
				●	●								BROKEN
				●	●								TOO LOOSE
SPARK PLUG			●										DIRTY OR BROKEN
			●										WIRE LOOSE
BRAKE						●							NOT ADJUSTED
						●							WORN

LIMITED WARRANTY

I. PRODUCTS COVERED

This warranty applies to all Troy-Bilt® branded equipment, to include their attachments and/or accessories, and all Troy-Bilt® branded equipment sold as commercial – institutional – industrial – rental or demonstrator application.

II. PRODUCT WARRANTY: NON-COMMERCIAL RESIDENTIAL: THREE YEAR LIMITED WARRANTY

All new Troy-Bilt® equipment specified above is warranted by Garden Way, Inc. to the original retail purchaser only, to be free from defects in material and workmanship, under normal use and service for a period of three (3) years from date of purchase.

Engines manufactured by Briggs & Stratton, Kohler, and Tecumseh, or transmissions manufactured by Peerless, will also be warranted for this three year warranty period through the authorized repair stations of their respective manufacturers.

EXCLUSIONS - The following items are not covered under the second and third years of this extended home use limited warranty: Belts, Hoses, Seats, Batteries, Blades, Knives, Filters, Tires, Wheels, Paint and Appearance Items, Light Bulbs, and similar items which are normally replaced through periodic maintenance.

III. PRODUCT WARRANTY: COMMERCIAL - INSTITUTIONAL - INDUSTRIAL - RENTAL -DEMONSTRATOR: ONE YEAR LIMITED WARRANTY

The Commercial, Institutional, Industrial, Rental, and Demonstrator Limited Warranty covering defects in material and workmanship will be for a period of one (1) year from date of purchase on all Troy-Bilt® units and their manufactured attachments. This warranty applies to the original purchaser only.

Engines manufactured by Briggs & Stratton, Kohler and Tecumseh, and transmissions manufactured by Peerless, will also be warranted for this one (1) year warranty period through the authorized repair stations of their respective manufacturers.

IV. GENERAL INFORMATION

Garden Way, Inc.'s obligation under this warranty is limited to the repair or replacement, at its option, by an authorized Garden Way equipment dealer, of any part found to be defective in material or workmanship, without charge for parts and labor.

In order to obtain warranty service, the owner is responsible for:

1) Providing proof of purchase documentation, ownership registration or copy of bill of sale.
2) Informing any authorized Garden Way equipment dealer of the defect and making the product available for repair. (Charges for pick-up, delivery, and service calls are not covered by this warranty.)

This warranty does not cover defects, malfunctions, or failures caused by:

1) Use of unauthorized accessories or attachments.
2) Lack of reasonable and necessary maintenance as specified in the "Operation and Safety Instructions."
3) Misuse, accidents, or normal wear.

DISCLAIMER OF CONSEQUENTIAL DAMAGES: GARDEN WAY, INC. SHALL NOT BE LIABLE UNDER ANY CIRCUMSTANCES FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OR EXPENSE OF ANY KIND, INCLUDING BUT NOT LIMITED TO COST OF EQUIPMENT RENTAL, LOSS OF PROFITS, OR COST OF HIRING SERVICES TO PERFORM TASKS NORMALLY PERFORMED BY THE EQUIPMENT.

LIMITATION OF IMPLIED WARRANTIES: ANY IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, SHALL BE LIMITED IN DURATION TO A PERIOD OF THREE YEARS (1 YEAR IF PRODUCT IS PURCHASED FOR COMMERCIAL, INSTITUTIONAL, INDUSTRIAL, RENTAL OR DEMONSTRATOR USE) FROM THE DATE OF SALE.

SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, OR LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS. THEREFORE, THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.

Garden Way Inc.
102nd St. & 9th Avenue
Troy, New York 12180

TROY-BILT MANUFACTURING CO., 102nd St. & 9th Ave., Troy, New York 12180
For Technical Service call Toll-Free: 1-800-833-6990 — For Parts call Toll-Free: 1-800-648-6776
GARDEN WAY CANADA, 1515 Matheson Blvd. E., Unit B11, Mississauga, Ontario L4W 2P5
Call Toll-Free: 1-800-225-3585

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