

OPERATION

The safe operation of this machine is the responsibility of the operator. The operator should be familiar with the tractor and all attachments that will be used before starting operation. Refer to and read safety information on pages 6 through 11.

CONTROLS AND SWITCHES

Know your controls and how to stop tractor, engine and attachments quickly in an emergency.

- Stop tractor by moving steering levers to neutral position (*refer to section on steering lever operation, page 19 and 20*).
- Stop engine by turning key to “OFF” position.
- Disengage power to attachments by moving PTO switch to “OFF” (down) position.

Operating this unit is not difficult once you master the use of the controls. We recommend you equip the tractor with the attachment you will be using and practice in a flat open area at a medium throttle setting until you are comfortable with the controls.

WARNING

Before operating this machine be sure the operator-presence safety system works. The engine should not run without the operator in the seat if the PTO switch is on or either steering lever is in the run position.

Several safety switches are incorporated in the unit’s design to prevent it from being started out of neutral or with the PTO engaged. All controls must be in the “OFF” or neutral position before the unit can be started. There is a safety switch under the operator’s seat that will cause the engine to stop, should the operator leave the seat with any control engaged.

PRESTART CHECK LIST

- Place tractor on level surface.
- Check crankcase oil level (refer to “Engine

Manual” for proper level and type of oil used).

CAUTION

Never attempt to check oil while engine is running.

- Check radiator coolant.

CAUTION

Do not remove radiator cap while engine is hot!

- Remove and clean air intake screen on radiator.

IMPORTANT

When mowing in dusty conditions, dry grass or long grass it may be necessary to remove and clean air intake on the radiator frequently to prevent engine overheating.

- Check for grass wrapped around PTO shaft. When mowing long grass, turn off key and check for grass wrapped around PTO shaft every 30 minutes of operation.

WARNING

Stop engine and remove ignition key to prevent accidental engine starting before attempting to remove grass from around PTO shaft.

- Check air cleaner (refer to “Engine Manual”). When mowing in dusty conditions, dry grass or long grass it may be necessary to remove and clean air intake on the air cleaner.
- Check to be sure engine is free of dirt and debris.
- Check fuel level. Refer to “Engine Manual” for correct fuel for your requirements.

DANGER

Do not fill fuel tank while engine is running. Allow engine to cool several minutes before refueling. If fuel is spilled do not start engine; avoid

creating any source of ignition until the fuel has evaporated.

- Check tire pressure (see page 22). Improper pressure will adversely affect traction, steering and level cutting height.
- Check that cooling fins on the transmissions are clean.

Test Safety Interlock System Daily

Action	Left Steering Lever	Right Steering Lever	PTO Switch	Parking Brake	Proper Result
Start Circuits					
Try starting engine	Out	Out	Off	On	Engine Cranks
Try starting engine	In	Out	Off	On	Engine will not crank
Try starting engine	Out	In	Off	On	Engine will not crank
Try starting engine	Out	Out	On	On	Engine will not crank
Kill Circuits (with engine running at 1/2 throttle)					
Raise off seat	Out	Out	Off	On	Engine does not stop
Raise off seat	In	Out	Off	Off	Engine Stops
Raise off seat	Out	In	Off	Off	Engine Stops
Raise off seat	Out	Out	On	On	Engine Stops
Move left steering lever in		Out	Off	On	Engine Stops
Move right steering lever in	Out		Off	On	Engine Stops

MOUNTING AND DISMOUNTING THE TRACTOR - WITH MOWER DECK

Always mount and dismount the mower from the left side, with the brake on, the PTO disengaged (down), the engine off, and the steering levers in their swung out (neutral lock) position. Mount the mower by stepping from the ground to the left side of the deck with your left foot, then step over the deck frame to the footrest with your right foot. Wait for all moving parts to stop before dismounting. Dismount the mower by standing up on the footrest, then turn to the

left and step from the footrest, over the deck frame, to the left side of the deck with your right foot, and then step to the ground with your left foot. The left steering lever can be used to stabilize your movement; however, it is not strong enough to support all your weight. Never leave the mower unattended with the key in the ignition.

MOUNTING AND DISMOUNTING THE TRACTOR - WITH ALL OTHER ATTACHMENTS

Always mount and dismount the mower from the left side, with the brake on, the PTO disengaged (down), the engine off, and the steering levers in their swung out (neutral lock) position. Mount the mower by stepping from the ground to the footrest with your right foot. Wait for all moving parts to stop before dismounting. Dismount the mower by standing up on the footrest, then turn to the left, and step from the footrest to the ground with your right foot. The left steering lever can be used to stabilize your movement; however, it is not strong enough to support all your weight. Never leave the mower unattended with the key in the ignition.

STARTING THE ENGINE



Never start the engine in confined rooms. Exhaust gases contain carbon monoxide, an odorless and deadly poison.

Do not allow children to approach the machine while the engine is running.

Do not operate the machine around open flames, i.e., trash fires.

Do not operate the engine when an odor of fuel is present or other explosive conditions exist.

- Position yourself on the tractor seat.
- Place both steering levers in swing-out neutral position.
- Place electric clutch switch in “OFF” (down) position.
- Set the throttle at $\frac{1}{3}$ open.
- Insert the key into the ignition switch and turn to “ON” (black dot on switch plate).
- Check to see that the oil lamp and battery

- lamp are on.
- Turn the key switch counterclockwise to preheat the glow plugs in the engine. This engine is equipped with quick heat glow plugs and the standard preheating time is from 5-10 seconds. Preheating is not required once the engine is warmed up.
- Return the key to “START”. When engine starts release key immediately.
- Check to see that the oil lamp and battery lamp are off. If either lamp remains lit a problem exists in that system.
- Warm the engine up at medium speed for several minutes.

IMPORTANT

If the engine does not start within 10 seconds after the starter is engaged, stop cranking the engine and wait for 30 seconds. Repeat starting sequence (including the preheating sequence). Also, if the engine will not start after refueling or after setting for a prolonged period, refer to bleeding fuel lines in the “Engine Troubleshooting” section of this manual. Never allow the starter motor to run continuously for more than 30 seconds. Be sure to warm engine up regardless of season. Loading an insufficiently warmed up engine will shorten its service life.

COLD WEATHER STARTING TIPS

Use proper viscosity oil for temperature expected (refer to “Engine Manual”).

Set throttle half open.

A warm battery has better starting capacity than a cold one.

Use fresh winter grade fuel. It is better for winter starting than leftover summer grade fuel.

HIGH TEMPERATURE SHUTDOWN

This machine is equipped with a high temperature shutdown system that monitors engine coolant temperature. If coolant is too low, the high temperature shutdown system will not function properly. Check level daily (see Lubrication and Maintenance). When the engine coolant temperature reaches the red level, the electrical system disengages the PTO drive to the attachment. This reduces the load on the engine which reduces heat. If the engine temperature does not lower after the PTO is shut down, turn off the engine immediately. To re-engage the PTO, the shutdown system must be reset. The following procedure should be followed:

1. Set throttle to half, disengage PTO switch and set the parking brake.
2. Dismount the machine and remove the grille.
3. Clean the grille and radiator of all loose debris.
4. Replace grille and remount to the operator seat.
5. Make sure the engine temperature gauge reads in the white or green. This may take a few minutes.
6. Set throttle to slow and turn off the engine at the key switch to reset system.
7. Restart the engine and check engine temperature.

To avoid engine overheating, maintain engine cooling system daily (see Lubrication

and Maintenance section). If you experience repeated occurrences of high engine temperature shutdown, the radiator should be cleaned. Clean radiator with water from a normal pressure garden hose. Make sure direction of spray is straight into the radiator fins. **DO NOT USE HIGH PRESSURE SPRAY.** High pressure, directed at an angle to the fins, will bend fins over so air will not flow through the radiator. A radiator cleanout tool is available through your dealer (part no. 609015).

UNEVEN TERRAIN

WARNING

Be careful when operating machine on uneven ground.

WARNING

Do not operate on steep slopes. Operation on a steep slope could cause loss of control, machine to overturn and personal injury or death.

- Do not operate on steep slopes. This machine was not specifically designed to operate on steep slopes.
- The operator is responsible for safe operation on slopes. Only the operator can determine the stability of the machine on a given slope based on existing conditions like: machine speed and direction, slope variation, slipperiness, drop-offs, holes, obstacles, etc.
- To determine stability on a slope, start at the bottom and try to drive the machine up the slope slowly. If you cannot drive up the slope or if you feel uneasy on it, do not operate on it.
- Always start mowing at the bottom of slopes. Traveling up slopes, this machine has more traction traveling in reverse than forward. Be careful on slopes to avoid driving into a position where there is not enough traction to enable driving out or stopping.

- Tires may lose traction on slopes even though the brakes are functioning properly.
- Avoid sudden stops and deceleration when traveling forward downhill as mower may tip forwards.
- Do not mow slopes when grass is wet because slippery conditions will reduce traction and braking which in turn affects steering.
- Use caution when making turns. Slow the mower down before making sharp turns. Unit can spin very rapidly by positioning one lever too much ahead or behind the other.
- Look around you to be sure the area is clear before turning or backing up.
- Avoid starting or stopping on a slope. If tires lose traction, disengage the blades and proceed slowly straight down the slope.
- Keep all movement on slopes slow and gradual. Do not make sudden changes in speed or direction.
- Pass diagonally through sharp dips and avoid sharp drops.
- Follow manufacturer's recommendation for counterweights for added stability when operating on slopes or using front or rear mounted attachments. Remove weights when not required.
- Use extra care with grass catchers or other attachments. These can change the stability of the machine. Do not use grass catcher on steep slopes.
- Do not operate without ROPS deployed.
- If machine is equipped with a fixed ROPS, always wear seatbelt.
- If machine is equipped with a foldable ROPS, always wear seatbelt when ROPS is deployed.
- Be certain that the seatbelt can be released quickly if the machine is driven or rolls into ponds or water.
- Check carefully for overhead clearances such as, branches, doorways, or electrical wires, before driving under any objects and do not contact them.

STOPPING THE ENGINE

- Set the throttle at $\frac{1}{3}$ open. Allow engine to idle at this setting for several minutes, then move the throttle to slow idle.
- Move ignition switch to "OFF" position (up-right) and remove key.

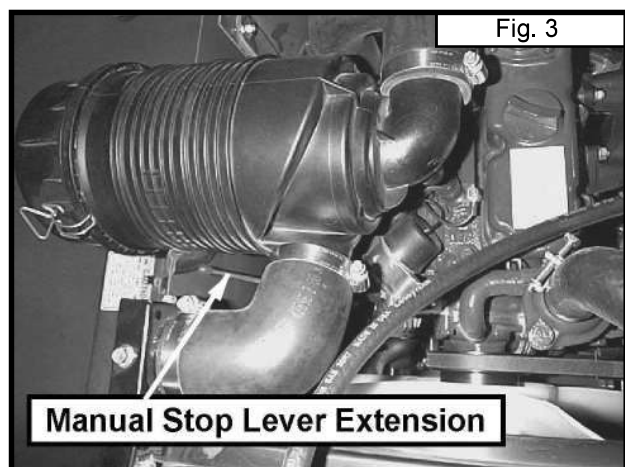
CAUTION

Always remove key from ignition switch when leaving unit unattended or when not in use.

Manual shutdown of engine:

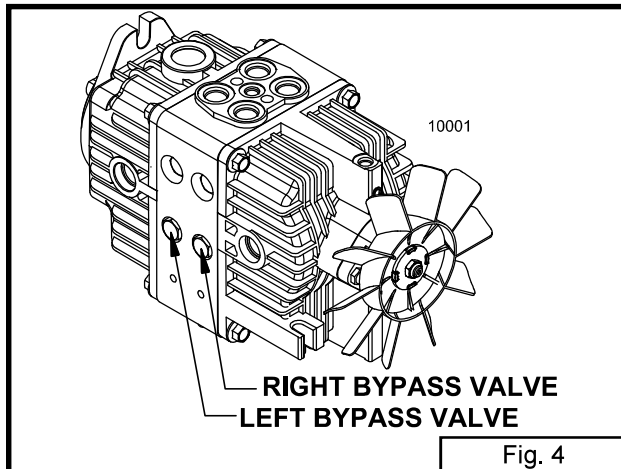
If the engine does not stop running with the throttle at low idle and the ignition switch in the "OFF" position, the following procedure will stop the engine.

- With the parking brake set and the steering levers in the neutral swing-out position, raise the engine hood (item 41, page 33).
- From the right side of the engine, locate the manual stop lever extension, with the red vinyl cap, located forward of the air cleaner. (Fig. 3 & item 16, page 33).
- Push the stop lever extension forward toward the radiator which will rotate the engine stop lever forward. Hold the stop lever in this position until the engine stops running.
- It is important for the operator to be familiar where the parts are located on the engine in case of emergency.



MOVING UNIT WITHOUT POWER

The tandem hydro pump is equipped with bypass valves that allow the unit to be moved without power by deactivating the pump. With the bypass valves in normal operating position, the fluid in the pump will make it difficult to move the unit (even with the steering levers in neutral position). The bypass valves are located on the right side of the pump. Activate each bypass valve by rotating one revolution counter-clockwise with a .625 inch socket. When BOTH bypass valves are activated the unit becomes “freewheeling”, allowing it to be moved. Before the hydro pump becomes operational, the bypass valves must be returned to their normal operating position. **Do not tighten above 120 in lbs (10 ft lbs) maximum.**



STEERING LEVER OPERATION

(refer to Fig. 5)

⚠ WARNING

Do not move steering levers from forward to reverse or reverse to forward position rapidly. The sudden change could cause loss of control or damage to equipment.

The Grasshopper tractor is very unstable without an attachment. Move very slowly when attachment is removed. Never carry passengers.

Steering levers control speed and direction of movement. Pushing the levers forward will move the tractor forward. Pulling levers to the rear will move tractor in reverse. The further forward or rearward the steering levers are moved, the faster the machine will move.

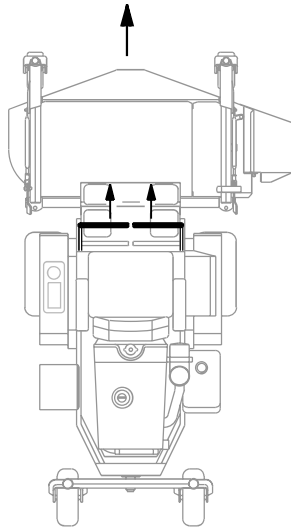
At half throttle move both steering levers from swing-out neutral inward. Move both steering levers forward. To turn right, advance left lever further forward than right lever. To turn left, advance right lever further forward than left lever. If you leave one steering lever in neutral and advance the other lever, the tractor will turn a complete circle. Move the levers to the rear and practice turning and maneuvering in reverse. Once you learn how the controls operate, practice until you become proficient and are comfortable with the unit before you begin operation with an attachment.

IMPORTANT

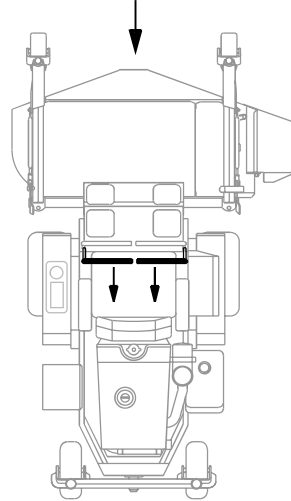
If you become confused during operation release both steering levers, they will automatically return to the centered neutral position and the tractor will stop.

STEERING LEVER OPERATION

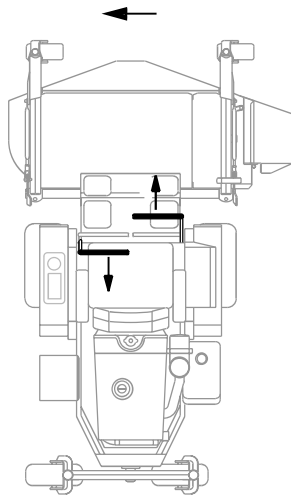
FORWARD



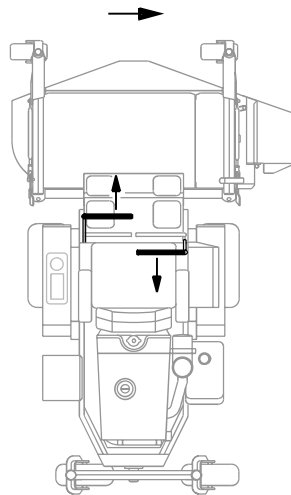
REVERSE



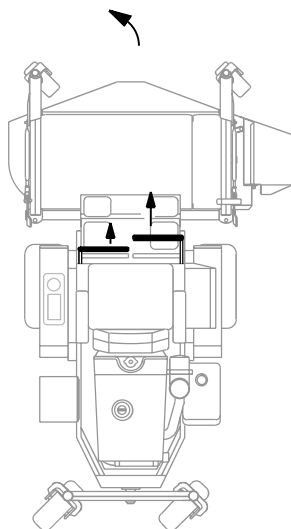
**SHARP
LEFT**



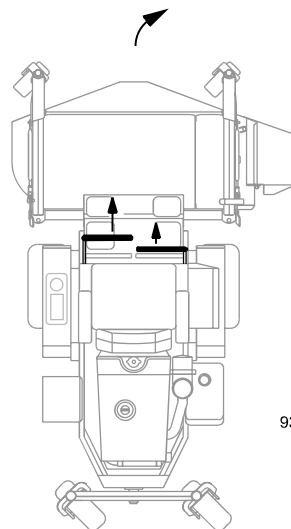
**SHARP
RIGHT**



**GENTLE
LEFT**



**GENTLE
RIGHT**



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Fig. 5

LOADING / TRANSPORTING MACHINE

WARNING

Loading a machine onto a trailer or truck increases the possibility of tip-over and could cause serious injury or death.

Use a heavy-duty trailer to transport your machine. Trailer rating must exceed combined weight of machine and attachments. Trailer must have the necessary lights and signs required by law.

1. Park trailer on a hard level surface.
2. Push PTO switch down to the "OFF" position.
3. Drive FORWARD onto trailer with attachment raised.
 - Use extreme caution when operating machine on a ramp. Move Slowly.
 - Avoid sudden acceleration and deceleration when operating machine on a ramp.
 - Drive machine forward up ramp and reverse down ramp. **DO NOT** attempt to turn machine while on a ramp.
 - Use only a single, full width ramp; **AVOID** individual ramps for each side of the machine.
 - If it is not possible to use one full width ramp, use enough individual ramps tied together to simulate a full width continuous ramp.
 - **DO NOT** exceed a 15 degree angle between ramp and ground or between ramp and trailer or truck.
4. Position machine on trailer for optimal weight distribution (generally slightly forward of trailer axle). Follow tow vehicle and trailer manufacturer guidelines.
5. Lower attachment down to trailer platform.
6. Stop the engine, engage the park brake

and remove the key.

7. Securely fasten machine to trailer with heavy-duty straps, chains or cables. Both front and rear straps must be directed down and outward from machine.