Form No. 3352–346 Rev. G

TORO®

Groundsmaster 3320

Traction Unit

Model No. 30307–250000001 and Up

Operator's Manual

CE

English (EN, GB)

Warning

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

Important The engine in this product is not equipped with a spark arrester muffler. It is a violation of California Public Resource Code Section 4442 to use or operate this engine on any forest-covered, brush-covered, or grass-covered land as defined in CPRC 4126. Other states or federal areas may have similar laws.

Contents

8111 Lyndale Avenue South
Bloomington, MN 55420-1196

Introduction

Read this manual carefully to learn how to operate and maintain your product properly. The information in this manual can help you and others avoid injury and product damage. Although Toro designs and produces safe products, you are responsible for operating the product properly and safely.

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. Figure 1 illustrates the location of the model and serial numbers on the product.

Figure 1

1. Location of the model and serial numbers

Write the product model and serial numbers in the space below:

Model No. _____

Serial No. _____

This manual identifies potential hazards and has special safety messages that help you and others avoid personal injury and even death. ***Danger***, ***Warning***, and ***Caution*** are signal words used to identify the level of hazard. However, regardless of the hazard, be extremely careful.

Danger signals an extreme hazard that *will* cause serious injury or death if you do not follow the recommended precautions.

Warning signals a hazard that *may* cause serious injury or death if you do not follow the recommended precautions.

Caution signals a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

This manual uses two other words to highlight information. **Important** calls attention to special mechanical information and **Note:** emphasizes general information worthy of special attention.

Safety

This machine meets or exceeds CEN standard EN 836:1997, ISO standard 5395:1990 (when appropriate decals applied), and ANSI B71.4-2004 specifications in effect at the time of production when equipped with rear weight. Refer to the section in this manual on Rear Weight.

Improper use or maintenance by the operator or owner can result in injury. To reduce the potential for injury, comply with these safety instructions and always pay attention to the safety alert ⚠ symbol, which means CAUTION, WARNING, or DANGER—"personal safety instruction." Failure to comply with the instruction may result in personal injury or death.

Safe Operating Practices

The following instructions are from the CEN standard EN 836:1997, ISO standard 5395:1990, and ANSI B71.4-2004.

Training

- Read the operator's manual and other training material carefully. Be familiar with the controls, safety signs, and the proper use of the equipment.
- If the operator or mechanic can not read the language of is the owner's responsibility to explain this material to them.
- Never allow children or people unfamiliar with these instructions to use or service the mower. Local regulations may restrict the age of the operator.
- Never mow while people, especially children, or pets are nearby.
- Keep in mind that the operator or user is responsible for accidents or hazards occurring to other people or their property.
- Do not carry passengers.
- All drivers and mechanics should seek and obtain professional and practical instruction. The owner is responsible for training the users. Such instruction should emphasize:
  - the need for care and concentration when working with ride-on machines;
  - control of a ride-on machine sliding on a slope will not be regained by the application of the brake. The main reasons for loss of control are:

- insufficient wheel grip;
- being driven too fast;
- inadequate braking;
- the type of machine is unsuitable for its task;
- lack of awareness of the effect of ground conditions, especially slopes;
- incorrect hitching and load distribution.

- The owner/user can prevent and is responsible for accidents or injuries occurring to himself or herself, other people, or property.

Preparation

- While mowing, always wear substantial footwear, long trousers, hard hat, safety glasses, and ear protection. Long hair, loose clothing, or jewelry may get tangled in moving parts. Do not operate the equipment when barefoot or wearing open sandals.
- Thoroughly inspect the area where the equipment is to be used and remove all objects which may be thrown by the machine.
- **Warning**—Fuel is highly flammable. Take the following precautions:
  - Store fuel in containers specifically designed for this purpose.
  - Refuel outdoors only and do not smoke while refueling.
  - Add fuel before starting the engine. Never remove the cap of the fuel tank or add fuel while the engine is running or when the engine is hot.
  - If fuel is spilled, do not attempt to start the engine but move the machine away from the area of spillage and avoid creating any source of ignition until fuel vapors have dissipated.
  - Replace all fuel tanks and container caps securely.
- Replace faulty silencers/mufflers.
- Evaluate the terrain to determine what accessories and attachments are needed to properly and safely perform the job. Only use accessories and attachments approved by the manufacturer.
- Check that operator's presence controls, safety switches and shields are attached and functioning properly. Do not operate unless they are functioning properly.

Operation

- Do not operate the engine in a confined space where dangerous carbon monoxide fumes can collect.
- Mow only in daylight or in good artificial light.
- Before attempting to start the engine, disengage all blade attachment clutches, shift into neutral, and engage the parking brake.
- Do not put hands or feet near or under rotating parts. Keep clear of the discharge opening at all times.
- Remember there is no such thing as a safe slope. Travel on grass slopes requires particular care. To guard against overturning:
  - do not stop or start suddenly when going up or downhill;
  - engage clutch slowly, always keep machine in gear, especially when travelling downhill;
  - machine speeds should be kept low on slopes and during tight turns;
  - stay alert for humps and hollows and other hidden hazards;
  - never mow across the face of the slope, unless the mower is designed for this purpose.
- Stay alert for holes in the terrain and other hidden hazards.
- Use care when pulling loads or using heavy equipment.
  - Use only approved drawbar hitch points.
  - Limit loads to those you can safely control.
  - Do not turn sharply. Use care when reversing.
  - Use counterweight(s) or wheel weights when suggested in the operator's manual.
- Watch out for traffic when crossing or near roadways.
- Stop the blades rotating before crossing surfaces other than grass.
- When using any attachments, never direct discharge of material toward bystanders nor allow anyone near the machine while in operation.
- Never operate the machine with damaged guards, shields, or without safety protective devices in place. Be sure all interlocks are attached, adjusted properly, and functioning properly.
- Do not change the engine governor settings or overspeed the engine. Operating the engine at excessive speed may increase the hazard of personal injury.
- Before leaving the operator's position:
  - stop on level ground;
  - disengage the power take-off and lower the attachments;

Warning

Engine exhaust contains carbon monoxide, which is an odorless, deadly poison that can kill you.

Do not run engine indoors or in an enclosed area.

  - change into neutral and set the parking brake;
  - stop the engine and remove the key.
- Disengage drive to attachments when transporting or not in use.
- Stop the engine and disengage drive to attachment
  - before refuelling;
  - before removing the grass catcher/catchers;
  - before making height adjustment unless adjustment can be made from the operator's position.
  - before clearing blockages;
  - before checking, cleaning or working on the mower;
  - after striking a foreign object or if an abnormal vibration occurs. Inspect the mower for damage and make repairs before restarting and operating the equipment.
- Reduce the throttle setting before engine shut down and, if the engine is provided with a shut-off valve, turn the fuel off at the conclusion of mowing.
- Keep hands and feet away from the mower deck.
- Look behind and down before backing up to be sure of a clear path.
- Slow down and use caution when making turns and crossing roads and sidewalks. Stop cylinders/reels if not mowing.
- Be aware of the mower discharge direction and do not point it at anyone.
- Do not operate the mower under the influence of alcohol or drugs
- Use care when loading or unloading the machine into a trailer or truck
- Use care when approaching blind corners, shrubs, trees, or other objects that may obscure vision.

Using the Rollover Protection System (ROPS)

- Keep the roll bar in the raised and locked position and use the seat belt when operating the machine.
- Be certain the seat belt can be released quickly in the event of an emergency.
- Be aware there is no rollover protection when the roll bar is down.
- Check the area to be mowed and never fold the ROPS in the areas where there are slopes, drop offs or water.
- Lower the roll bar only when absolutely necessary. Do not wear the seat belt with the roll bar folded down.
- Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.

Maintenance and Storage

- Keep all nuts, bolts and screws tight to be sure the equipment is in safe working condition.
- Never store the equipment with fuel in the tank inside a building where fumes may reach an open flame or spark.
- Allow the engine to cool before storing in any enclosure.
- To reduce the fire hazard, keep the engine, silencer/muffler, battery compartment and fuel storage area free of grass, leaves, or excessive grease.
- Check the grass catcher frequently for wear or deterioration.
- Keep all parts in good working condition and all hardware and hydraulic fittings tightened. Replace all worn or damaged parts and decals.
- If the fuel tank has to be drained, do this outdoors.
- Be careful during adjustment of the machine to prevent entrapment of the fingers between moving blades and fixed parts of the machine.
- On multi-spindle mowers, take care as rotating one blade can cause other blades to rotate.
- Disengage drives, lower the deck, set parking brake, stop engine and remove key and disconnect spark plug wire. Wait for all movement to stop before adjusting, cleaning or repairing.
- Clean grass and debris from decks, drives, silencers/mufflers, and engine to help prevent fires. Clean up oil or fuel spillage.
- Use jack stands to support components when required.
- Carefully release pressure from components with stored energy.

- Disconnect battery and remove spark plug wire before making any repairs. Disconnect the negative terminal first and the positive last. Reconnect positive first and negative last.
- Keep hands and feet away from moving parts. If possible, do not make adjustments with the engine running.
- Charge batteries in an open well ventilated area, away from spark and flames. Unplug charger before connecting or disconnecting from battery. Wear protective clothing and use insulated tools.

Toro Riding Mower Safety

The following list contains safety information specific to Toro products or other safety information that you must know that is not included in the CEN, ISO, or ANSI standard.

This product is capable of amputating hands and feet and throwing objects. Always follow all safety instructions to avoid serious injury or death.

Use of this product for purposes other than its intended use could prove dangerous to user and bystanders.

- Know how to stop the engine quickly.
- Do not operate the machine while wearing tennis shoes or sneakers.
- Wearing safety shoes and long pants is advisable and required by some local ordinances and insurance regulations.
- Handle fuel carefully. Wipe up any spills.
- Check the safety interlock switches daily for proper operation. If a switch should fail, replace the switch before operating the machine. After every two years, replace all interlock switches in the safety system, whether they are working properly or not.
- Before starting the engine, sit on the seat.
- Using the machine demands attention. To prevent loss of control:
  - Do not drive close to sand traps, ditches, creeks, or other hazards.
  - Reduce speed when making sharp turns. Avoid sudden stops and starts.
  - When near or crossing roads, always yield the right-of-way.
  - Apply the service brakes when going downhill to keep forward speed slow and to maintain control of the machine.
- Do not touch the engine, silencer/muffler, or exhaust pipe while the engine is running or soon after it has stopped because these areas could be hot enough to cause burns.
- If the engine stalls or loses headway and cannot make it to the top of a slope, do not turn the machine around. Always back slowly, straight down the slope.
- When a person or pet appears unexpectedly in or near the mowing area, **stop mowing.** Careless operation, combined with terrain angles, ricochets, or improperly positioned guards can lead to thrown object injuries. Do not resume mowing until the area is cleared.

Maintenance and Storage

- Make sure all hydraulic line connectors are tight and all hydraulic hoses and lines are in good condition before applying pressure to the system.
- Keep your body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not your hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate the skin and cause serious injury. Seek immediate medical attention if fluid is injected into skin.
- Before disconnecting or performing any work on the hydraulic system, all pressure in the system must be relieved by stopping the engine and lowering the deck and attachments to the ground.
- Check all fuel lines for tightness and wear on a regular basis. Tighten or repair them as needed.
- If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing, and any parts of the body away from the deck, attachments, and any moving parts, especially the screen at the side of the engine. Keep everyone away.
- To ensure safety and accuracy, have an Authorized Toro Distributor check the maximum engine speed with a tachometer.
- If major repairs are ever needed or if assistance is desired, contact an Authorized Toro Distributor.
- Use only Toro-approved attachments and replacement parts. The warranty may be voided if used with unapproved attachments.

Sound Pressure Level

This unit has an equivalent continuous A-weighted sound pressure at the operator ear of: 90 dB(A), based on measurements of identical machines per Directive 98/37/EC and amendments.

Sound Power Level

This unit has a sound power level of: 105 dB(A) 1 pW, based on measurements of identical machines per Directive 2000/14/EC and amendments.

Vibration Level

Hand-Arm

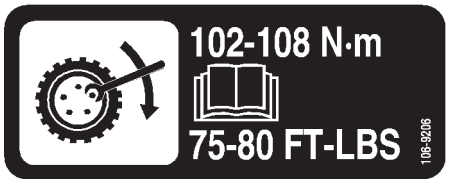
This unit does not exceed a vibration level of 2.5 m/s2 at the hands based on measurements of identical machines per ISO 5349 procedures.

Whole Body

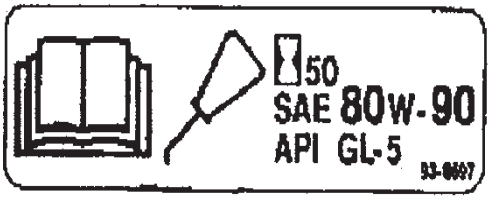
This unit does not exceed a vibration level of .5 m/s2 at the posterior based on measurements of identical machines per ISO 2631 procedures.

Safety and Instruction Decals

Safety decals and instructions are easily visible to the operator and are located near any area of potential danger. Replace any decal that is damaged or lost.

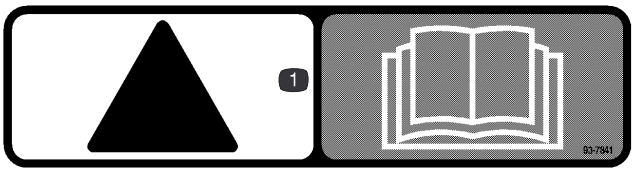


106-9206



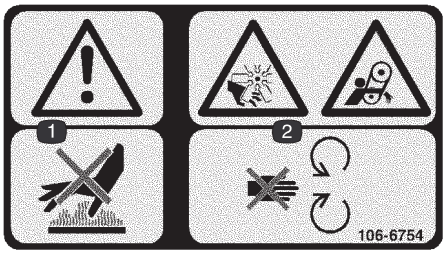
93–6697

1. Read operator's manual for lubrication intervals



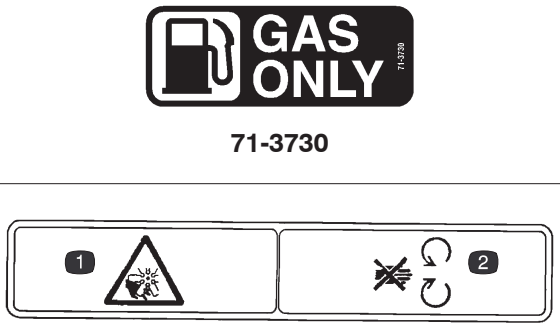
93–7841

1. Danger–See operator's manual



106-6754

1. Warning—do not touch the hot surface.
2. Cutting/dismemberment hazard, fan and entanglement hazard, belt—stay away from moving parts



71-3730

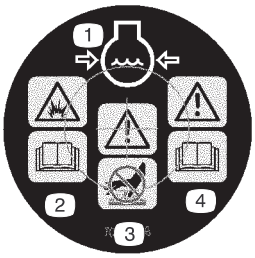
93–7272

1. Fan blades can cause injury
2. Stay away from moving parts

105-9584

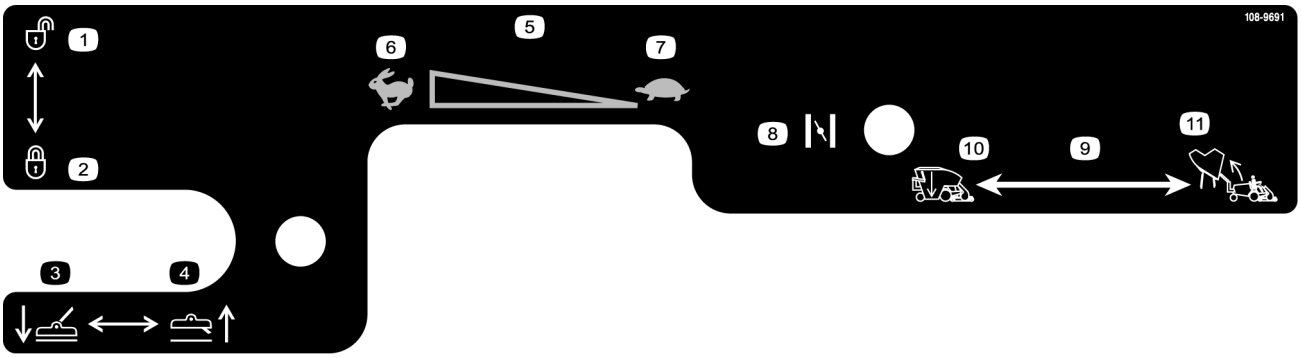
93-6686

1. Hydraulic oil
2. Read the *Operator's Manual.*



106-5976

1. Engine coolant under pressure
2. Explosion hazard—read the *Operator's Manual.*
3. Warning—do not touch the hot surface.
4. Warning—read the *Operator's Manual.*



108-9691

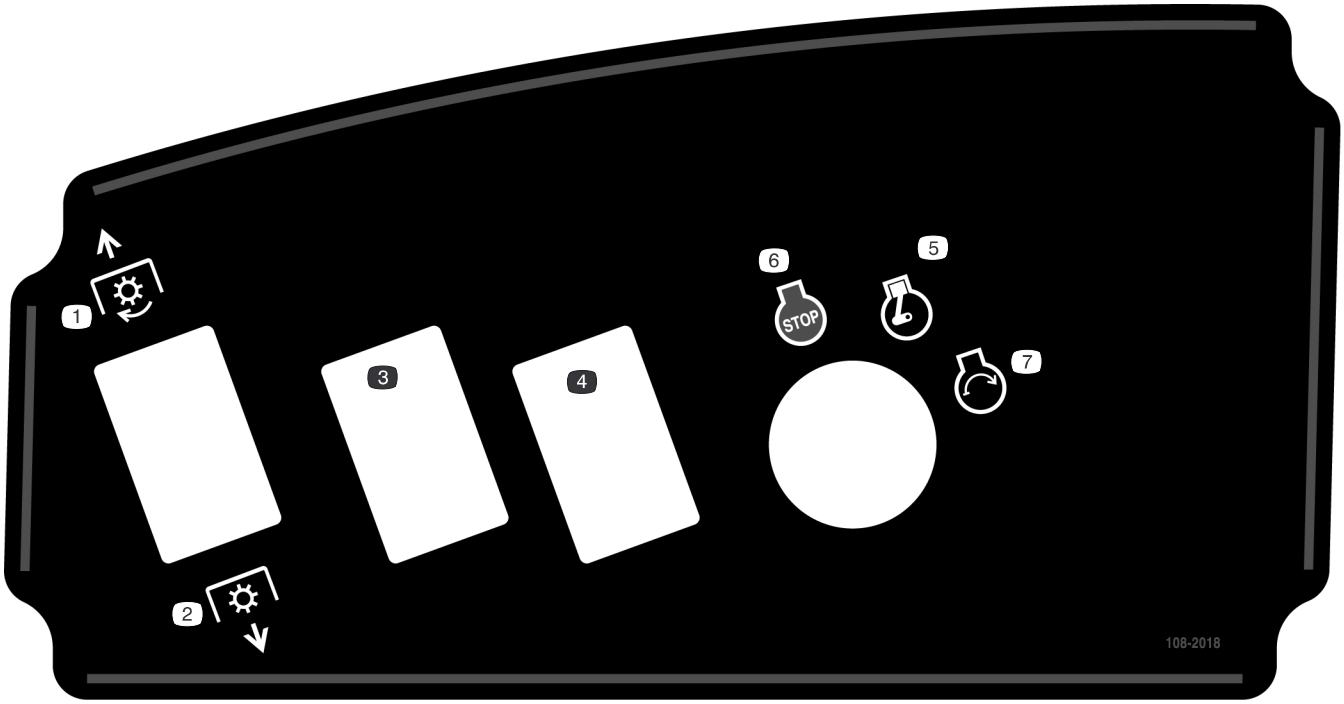
1. Unlocked
2. Locked
3. Lower the cutting units
4. Raise the cutting units
5. Engine speed
6. Fast
7. Slow
8. Choke
9. Hopper control
10. Lower the hopper
11. Raise the hopper

82-8940

1. Locked
2. Tilt steering
3. Unlocked

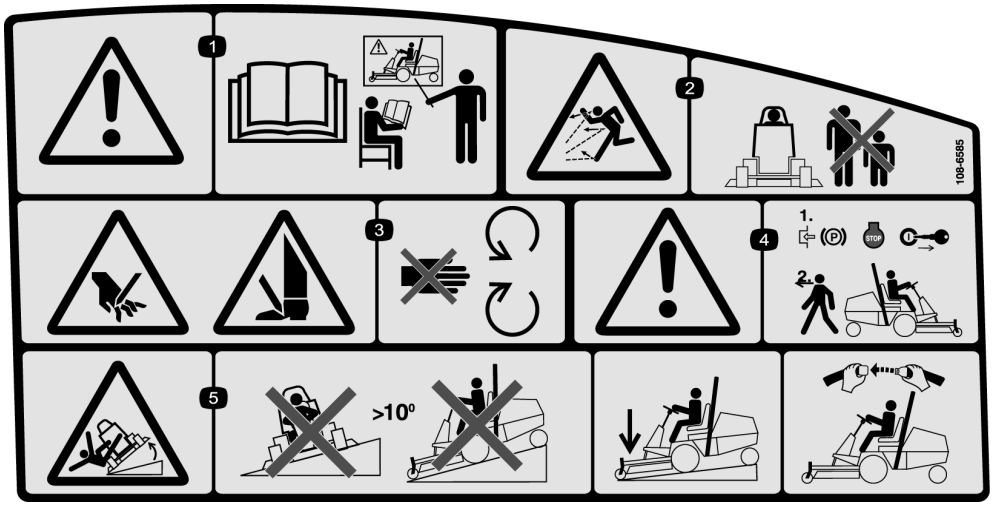
105-7179

1. Read the *Operator's Manual.*
2. Parking brake



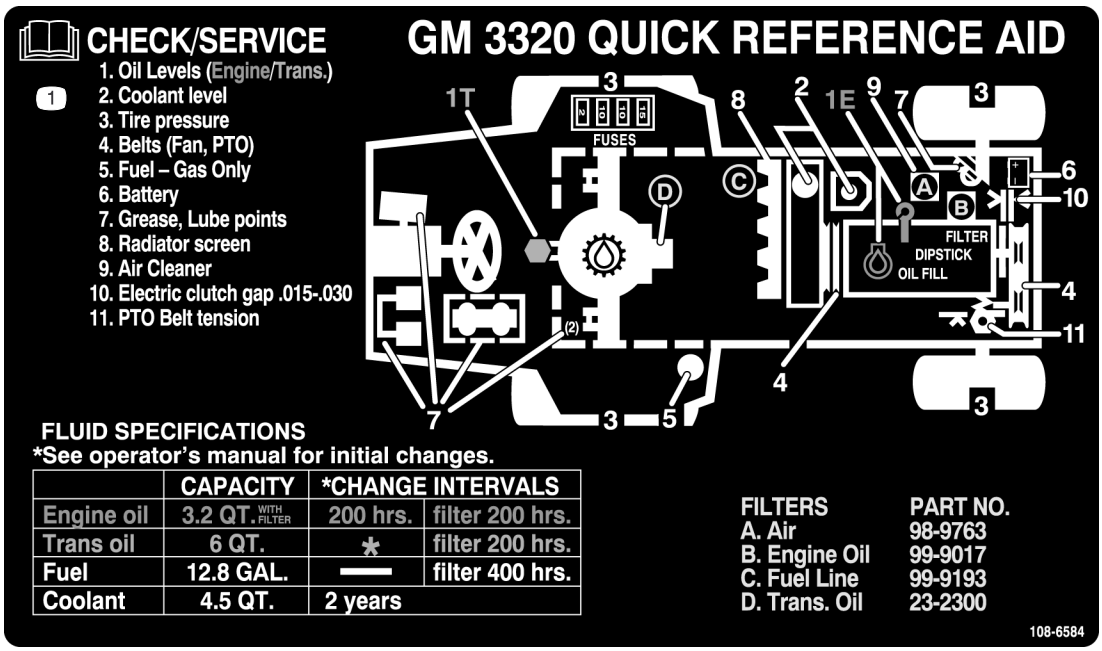
108-2018

1. PTO—Off
2. PTO—On
3. Optional Equipment
4. Optional Equipment
5. Engine—Run
6. Engine—Stop
7. Engine—Start



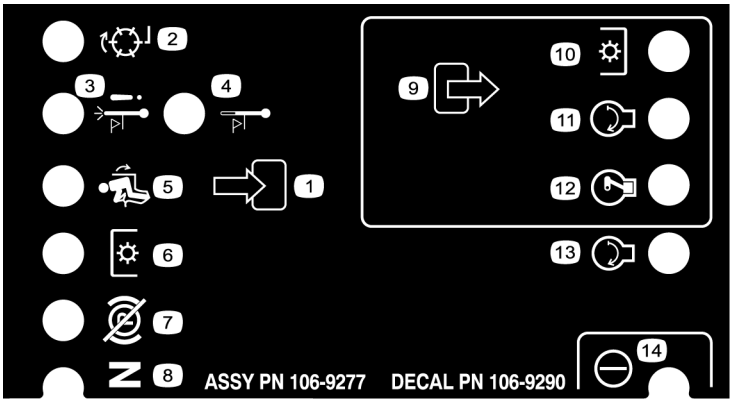
108-6585

1. Warning—read the *Operator's Manual*, all operators should be trained before operating the machine.
2. Thrown object hazard—keep bystanders a safe distance from the machine and keep the deflector in place.
3. Cutting/dismemberment hazard of hands or feet, mower blade—stay away from moving parts.
4. Warning—engage the parking brake, and remove the ignition key before leaving the machine.
5. Tipping hazard—do not drive the machine on a slope greater than 10 degrees; when driving down slopes, lower the cutting unit, and always wear a seat belt with the roll bar in the raised and locked position.



108-6584

1. Read the *Operator's Manual* for more information

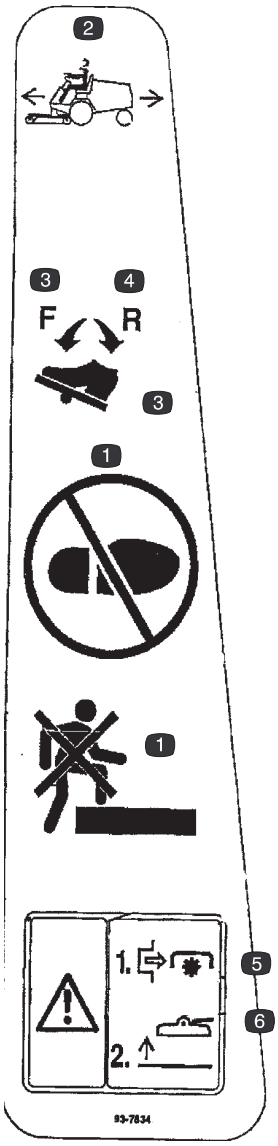


106-9290

1. Inputs
2. Backlap
3. High temperature shutdown
4. High temperature warning
5. In seat
6. Power Take–off (PTO)
7. Parking brake Off
8. Neutral
9. Outputs
10. Power Take–off (PTO)
11. Start
12. Energize to Run (ETR)
13. Start
14. Power

108-2073

1. Warning—there is no rollover protection when the roll bar is down.
2. To avoid injury or death from a rollover accident, keep the roll bar in the raised and locked position and wear the seat belt. Lower the roll bar only when absolutely necessary; do not wear the the seat belt when the roll bar is down.
3. Read the *Operator's Manual*; drive slowly and carefully.



93–7834

1. No step
2. Traction pedal
3. Traction–forward
4. Traction–reverse
5. Danger – Shut off PTO prior to raising decks
6. Danger – Do not operate decks when they are in raised position

Battery Symbols

Some or all of these symbols are on your battery.

1. Explosion hazard
2. No fire, open flames, or smoking.
3. Caustic liquid/chemical burn hazard
4. Wear eye protection
5. Read the *Operator's Manual.*
6. Keep bystanders a safe distance from the battery.
7. Wear eye protection; explosive gases can cause blindness and other injuries
8. Battery acid can cause blindness or severe burns.
9. Flush eyes immediately with water and get medical help fast.
10. Contains lead; do not discard.

Specifications

Note: Specifications and design subject to change without notice.

General Specifications

Engine	Briggs & Stratton/Daihatsu, 4 cycle liquid cooled gasoline engine. 24.9 hp @ 2900. Engine governed to 3200–3250 rpm high idle, no load. Low idle is 1600–1650 rpm.
Air Cleaner	Heavy duty remote mounted.
Fuel Tank Capacity	12.8 gal. (48.5 l) Equipped with a fuel filter.
Fuel Pump	12 volt electric (transistor type) w/replaceable fuel filter.
Cooling System	4 qt (3.7 l) capacity. Remote mounted expansion tank 1/2 qt (0.47 l) capacity. System contains a 50/50 mix of ethylene glycol anti-freeze and water. Front mounted air/oil cooler used to cool hydraulic oil for the hydrostatic transmission.
Electrical	12 volt with 525 cold cranking amps at 0° F and 80 minute reserve capacity at 80° F.
Drive Coupling	Transmission driven by steel shaft with flexible rubber couplings at each end.
Transmission	Hydrostatic, U–type. Implement Relief Setting — 700-800 psi.
Hydraulic Filter	Replaceable 25 micron filter mounted directly to transmission.
Front Axle	The front axle serves as a hydraulic fluid reservoir and mates directly with the transmission. Approximately 6 qt (5.7 l) capacity.
Brakes	Mechanical drum type. Individually controlled by two pedals connected by cable and conduit for steering assist. Pedals may be latched together for two wheel braking. Lever provided for parking brake.
Tires	Front Tires — 23 x 9.50 – 12, Two Wheel Drive Rear Tires — 16 x 6.50 – 8. All tires 4 ply rating, tubeless type. Pressure — 20 psi (138 kPa).
Ground Speed	0–10 MPH forward and reverse.
Power Steering	Tilt steering wheel, released and locked by single lever control.
Instrumentation	Fuel gauge, hour meter and warning lights for high temperature shutdown, oil pressure and amperage.
Controls	Throttle, PTO switch, choke, parking brake, implement lift, implement lift lock and ignition switch are all hand-operated. Forward/reverse traction pedal and turning brakes are foot operated.
PTO Drive	Splined PTO shaft is clutched by a torque-teamed HA Section, spring tensioned V-belt directly from engine output shaft. PTO shaft engaged by electric clutch/brake assembly. PTO speed — 2200 RPM @ 3250 RPM engine speed.
Attachment Drive	Universal joint and telescoping shaft assembly.
Lift Cylinders	Two with 2 in. (51 mm) bore, 3.5 in. (89 mm) stroke.
Interlock Switches	Prevents engine starting if traction pedal or PTO switch are engaged. Stops engine if operator leaves seat with either traction pedal or PTO switch engaged. Stops engine if traction pedal is engaged with parking brake engaged.

Measurements

Length	83.5 in.
Width (Rear Wheels)	47 in.
Height w/o ROPS	56 in.
Weight	1340 lb.

Optional Equipment

52” Side Discharge Deck	Model No. 30555
62” Rear Discharge Deck	Model No. 30367
62” Guardian Recycler Deck	Model No. 30376
72” Rear Discharge Deck	Model No. 30369
72” Guardian Recycler Deck	Model No. 30379
60” Side Discharge Deck Standard	Model No. 30366
72” Side Discharge Deck	Model No. 30368
62” Rear Discharge Deck to Guardian Recycler Deck Kit	Model No. 30377
72” Side Discharge Deck to Guardian Recycler Deck Kit	Model No. 30378
Debris Blower	Model No. 30823
Rear Weight Box Kit	Part No. 62–6590
52” Blower Kit	Model No. 30502□
60” Blower Kit	Model No. 30357□
15 cu. ft. Hopper Kit	Model No. 30356
Wide Tires w/rim 23 x 10.5 –12, 4 ply	Part No. 108–6598
Wheel Weights–50 lbs. (23kg.)	Part No. 11–0440
Rear Weight Kit–70 lbs. (32 kg.)	Part No. 24–5780
Rear Weight Kit–65 lbs. (29 kg.)	Part No. 108–9682
Weight Kit–20 lbs.	Part No. 92–8763
Tire Chains (Front)	Part No. 82531
Seat Kit	Model 30398
Mechanical Seat Suspension Kit	Model No. 30312
Pneumatic Seat Suspension Kit	Model No. 30313
Auxiliary Power Kit	Part No. 108–8662

□ 52” Blower Kit (for Model 30555 deck) or Model 30357 60” Blower Kit (for Model 30366 deck) can be used with Model No. 30356, 15 cu. ft. Hopper Kit.

Setup

Note: Determine the left and right sides of the machine from the normal operating position.

Note: Use this chart as a checklist to ensure that all parts necessary for assembly have been received. Without these parts, total set-up cannot be completed. Some parts may have already been assembled at the factory.

Description	Qty.	Use
Steering wheel Cover	1 1	Install steering wheel
Handle Screws	1 2	Install handle to hood
Seat belt Screw Lockwasher Flatwasher	2 2 2 2	Mount seat belt
Manual tube & cap R–clamp Capscrew Washer	1 2 2 2	Install on left underside of seat
Roll pin Capscrew 5/16–18 x 1–3/4” lg. Locknut 5/16–18	1 2 2	Secure universal shaft to implement
Cylinder pin Cotter pin 3/16 x 1–1/2”	2 4	Secure deck lift arms to lift cylinders
Brake return springs	2	Mount to deck lift arms
Ignition & hood latch key	1	
Operator’s Manual (Traction Unit)	2	Read before operating machine
Engine Operator’s Manual	1	
Engine Warranty	1	
Predelivery Inspection Form	1	
Parts Catalog	1	
CE Certificate	1	
Certificate of Quality	1	
Operator Video	1	View before operating machine

Warning

- **PTO universal shaft is attached to traction unit frame. DO NOT ENGAGE PTO without first removing universal shaft or coupling it to a suitable implement.**

Install the Steering Wheel

1. Remove steering wheel from seat plate. Remove cap from steering wheel (Fig. 2).
2. Remove jam nut from steering shaft. Make sure foam collar is on steering shaft (Fig. 2). Slide steering wheel onto steering shaft.
3. Secure steering wheel to shaft with jam nut and tighten it to 17–23 ft–lb.
4. Mount cover to steering wheel.

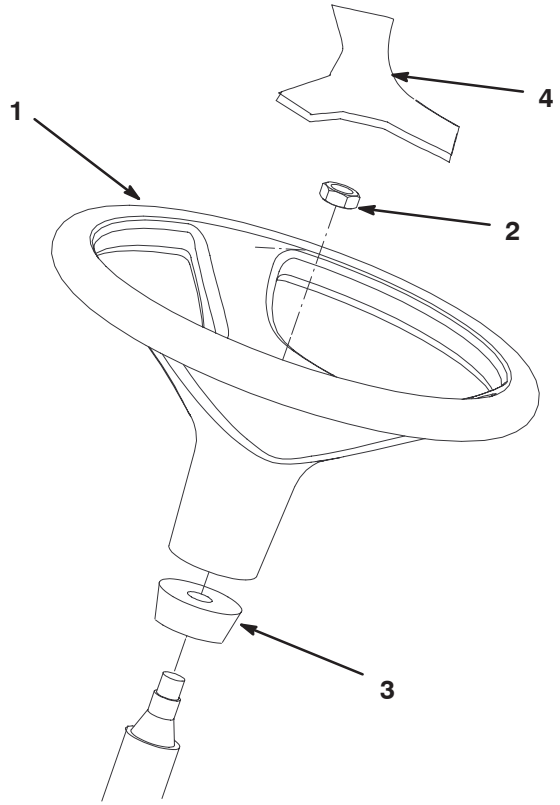


Figure 2

1. Steering wheel
2. Jam nut
3. Foam collar
4. Cover

Install the Handle to the Hood

1. Remove and discard the (2) screws and nuts securing the hood cable bracket and to the underside of the hood (Fig. 3).

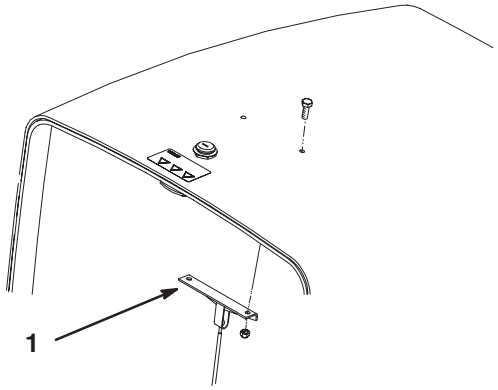


Figure 3

1. Hood cable bracket

2. Mount the handle and the cable bracket to the hood with (2) screws (Fig. 4).

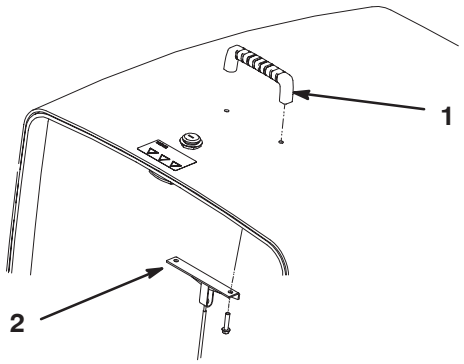


Figure 4

1. Handle
2. Hood cable bracket

Install the Seat

The Groundsmaster 3320 is shipped without the seat assembly. The optional Seat, Model 30398 and the Mechanical Seat Suspension Kit, Model No. 30312 or the Pneumatic Seat Suspension Kit, Model No. 30313 must be obtained and installed. Refer to the seat kit for installation instructions.

Note: An Auxiliary Power Unit Kit, Model No. 30382, must be obtained and installed before installing a Pneumatic Suspension Seat Kit to the traction unit.

Install the Seat Belt

1. Install each end of the seat belt in the holes in the back of the seat with (2) 7/16 x 20 – 1" lg. capscrews, 7/16 flatwashers and 7/16 lockwashers (Fig. 5). Tighten securely. The latch side of the belt is to be mounted to the left side of the seat.

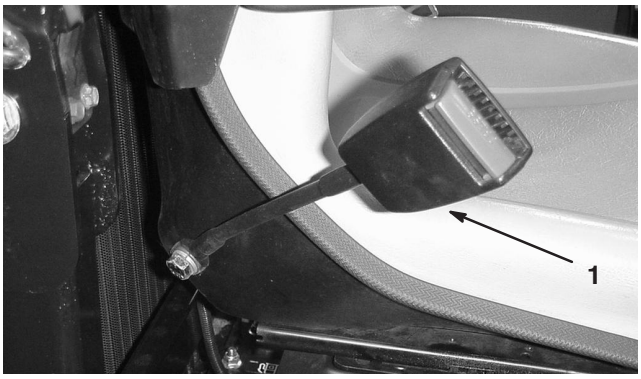


Figure 5

1. Seat belt

Install the Manual Tube

1. Remove manual tube and R–clamps secured to seat plate. Retain (2) mounting capscrews and flatwashers.
2. Loosely mount R–clamps to outer holes in left side of seat with (2) capscrews and flatwashers previously removed. (Fig. 6).

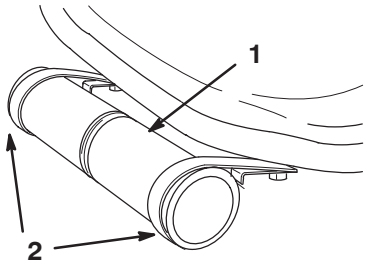


Figure 6

1. Manual tube
2. R–clamps

3. Install manual tube into R–clamps, insert manual into tube and thread cap into tube (Fig. 6). Tighten capscrews.

Activating and Charging the Battery

Use only electrolyte (1.265 Specific Gravity) to fill battery initially.

1. Remove the battery from the machine.

Important Do not add electrolyte while the battery is in the machine. You could spill it, causing corrosion.

2. Clean the top of the battery and remove the vent caps (Fig. 7).

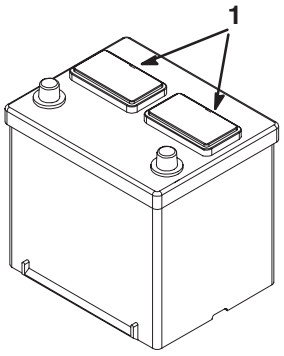


Figure 7

1. Vent caps

3. Carefully fill each cell with electrolyte until the plates are covered with about 1/4 inch (6 mm) of fluid.

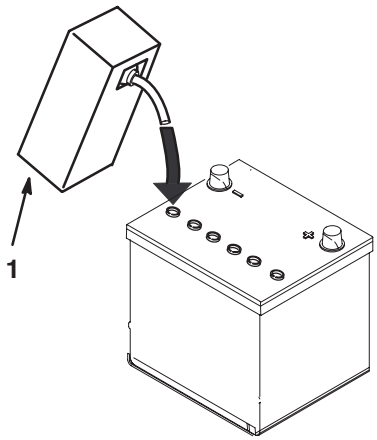


Figure 8

1. Electrolyte

4. Allow approximately 20 to 30 minutes for the electrolyte to soak into the plates. Refill as necessary to bring the electrolyte to within about 1/4 inch (6 mm) of the bottom of the fill well (Fig. 8).

Warning

Charging the battery produces gasses that can explode.

Never smoke near the battery and keep sparks and flames away from battery.

5. Connect a 3 to 4 amp battery charger to the battery posts. Charge the battery at a rate of 3 to 4 amps until the specific gravity is 1.250 or higher and the temperature is at least 60°F (16°C) with all sells gassing freely.

6. When the battery is charged, disconnect the charger from the electrical outlet and battery posts.

Note: After the battery has been activated, add only distilled water to replace normal loss, although maintenance–free batteries should not require water under normal operating conditions.

Warning

CALIFORNIA

Proposition 65 Warning

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. *Wash hands after handling*.

Warning

Battery terminals or metal tools could short against metal tractor components causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **When removing or installing the battery, do not allow the battery terminals to touch any metal parts of the tractor.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the tractor.**

7. Reinstall the battery to the machine.

8. First, install the positive cable (red) to the positive (+) terminal and then the negative cable (black) to the negative (–) terminal of the battery (Fig. 9). Slide the rubber boot over the positive terminal to prevent a possible short from occurring.

Warning

Incorrect battery cable routing could damage the machine and cables causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **Always *disconnect* the negative (black) battery cable before disconnecting the positive (red) cable.**
- **Always *connect* the positive (red) battery cable before connecting the negative (black) cable.**

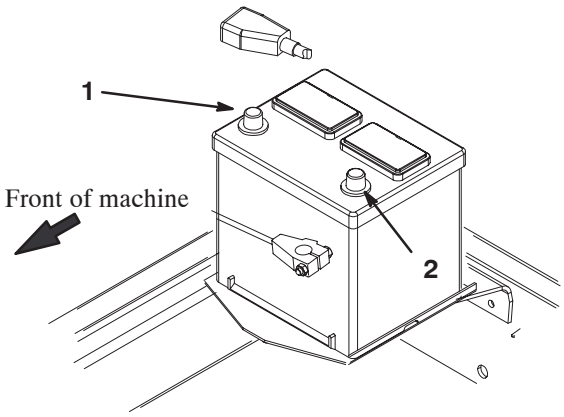


Figure 9

1. Positive (+)
2. Negative (–)

Warning

- **Connecting cables to the wrong post could damage the electrical system and result in personal injury.**

Note: Make sure battery cables are routed away from any sharp edges or moving parts.

Adjusting the ROPS

1. Remove the hairpin cotter pins and remove the two pins (Fig. 10).

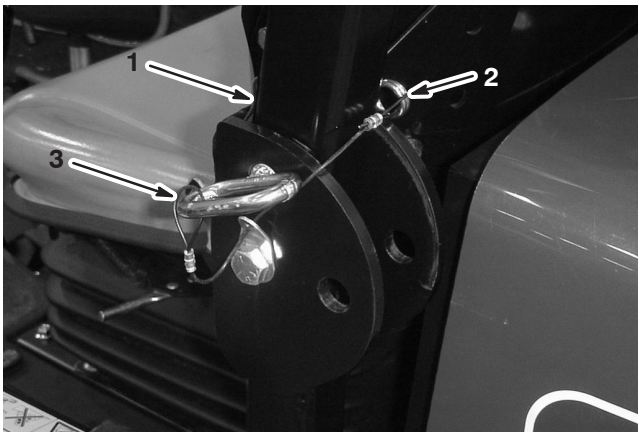


Figure 10

1. Roll bar
2. Pin
3. Hairpin cotter pin

2. Raise the roll bar to the upright position and install the two pins and secure them with the hairpin cotter pins (Fig. 10).

Note: Lower roll bar slowly so damage to hood does not occur.

Checking the Tire Pressure

The tires are over–inflated for shipping. Therefore, release some of the air to reduce the pressure. Correct air pressure in front and rear tires is 20 psi.

Rear Weight

The Groundsmaster 3320 Series Traction Units comply with ANSI B71.4–2004 Standard when equipped with rear weight. 20 lb. of rear weight is installed at the factory. Use charts below to determine combinations of additionaql weight required. Order parts from your local Authorized Toro Distributor.

	Rear Weight Required	Left Side Weight Required	Weight Part Number	Weight Description	Qty.
52” Side Discharge Deck (Model 30555)	35 lb.	0 lb.	24–5790 325–8 3253–7 3217–9	Rear Weight–35 lb. Capscrew–1/2–13 x 2” Lockwasher–1/2 Nut–1/2	1 2 2 2
52” Side Discharge Deck with 15 cu. ft. Hopper	0 lb.	180 lb.*	*77–6700 & 92–9670 & 24–5780 & 24–5790 325–8 3253–7 3217–9	75 lb. Wheel Weight & Bracket Kit & Rear Weight Kit & Rear Weight–35 lb. Capscrew–1/2–13 x 2” Lockwasher–1/2 Nut–1/2	1 1 1 1 2 2 2
62” Rear Discharge Deck (Model 30367) or 62” Guardian Recycler Deck (Model 30376)	205 lb.	0 lb.	24–5780 108–9682	Rear Weight Kit Rear Weight Kit	2 1
60” Side Discharge Deck with 15 cu. ft. Hopper	0 lb.	75 lb.*	*77–6700	75 lb. Wheel Weight	1
72” Side Discharge Deck (Model 30368)	275 lb.	0 lb.	24–5780 108–9682	Rear Weight Kit Rear Weight Kit	3 1
60” Side Discharge Deck (Model 30366) or 72” Rear Discharge Deck (Model 30369) or 72” Guardian Recycler Deck (Model 30379)	240 lb.	0 lb.	24–5780 108–9682 24–5790 325–8 3253–7 3217–9	Rear Weight Kit Rear Weight Kit Rear Weight–35 lb. Capscrew–1/2–13 x 2” Lockwasher–1/2 Nut–1/2	2 1 1 2 2 2

* 75 lb. wheel weight (included with 15 cu. ft. hopper) required on left wheel

Adjust Counterbalance Pressure

For best performance, the cutting unit bounce on uneven turf is minimal and it does not ride heavily over flat terrain. If scalping occurs or the cut is uneven from side to side, there may be too much weight on the deck and the weight may have to be transferred to the traction unit: i.e. increased counterbalance pressure.

By contrast, if too much weight is transferred to the traction unit, the deck will bounce excessively and the cut will be uneven. If the cutting unit does not perform properly, adjust the counterbalance pressure as follows:

1. To make sure the the fluid is warm, operate the machine for 15 minutes prior to adjusting the counterbalance pressure.
2. Ensure the parking brake is set, the PTO switch is in OFF position and the lift lever is in the FLOAT position.
3. Connect a pressure gauge to the test port behind the left lift cylinder (Fig. 11).

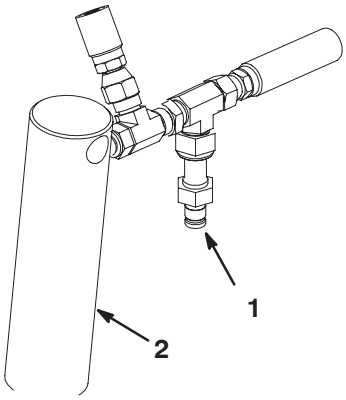


Figure 11

1. Test port
2. Left lift cylinder

4. Loosen the jam nut at the bottom of the lift valve (Fig. 12). The lift valve is located on the right side of the machine.

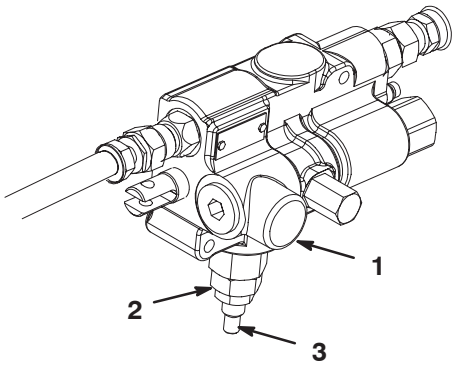


Figure 12

1. Lift valve
2. Jam nut
3. Spool

5. Start the engine and set the throttle to high idle.
6. Using an Allen wrench, adjust the lift valve spool until the desired pressure is attained on the gauge. See the chart below for the recommended pressure setting for the cutting deck.

Cutting Deck	Counterbalance Pressure
52” Side Discharge Deck (Model 30555)	100 psi
60” Side Discharge Deck (Model 30366) or 62” Rear Discharge Deck (Model 30367) or 62” Guardian Recycler Deck (Model 30376)	175 psi
72” Side Discharge Deck (Model 30368) or 72” Rear Discharge Deck (Model 30369) or 72” Guardian Recycler Deck (Model 30379)	220 psi

7. Stop the engine.
8. Tighten the jam nut on the lift valve. Torque nut to 10–12 ft.–lb.
9. Remove the pressure gauge from the test port.

Before Operating

Checking the Crankcase Oil

The engine is shipped with oil in the crankcase; however, the oil level must be checked before and after the engine is first started.

Crankcase capacity is approximately 3.2 qt. (3 l) with the filter.

Use high-quality engine oil that meets the following specifications:

API Classification Level Required: SJ, SK, SL or higher.

Preferred oil: SAE 10W–30 (all temperatures)

Alternate oil: SAE 5W–30 (all temperatures)
SAE 30 (above 32°F)

Toro Premium Engine oil is available from your distributor in 10W–30 viscosity. See the parts catalog for part numbers.

1. Park the machine on a level surface, lower the cutting deck, stop the engine and remove the key from the ignition switch. Open the hood.
2. Remove the dipstick (Fig. 13), wipe it clean and reinstall the dipstick. Remove the dipstick and check the oil level. The oil level should be up to the FULL mark on the dipstick

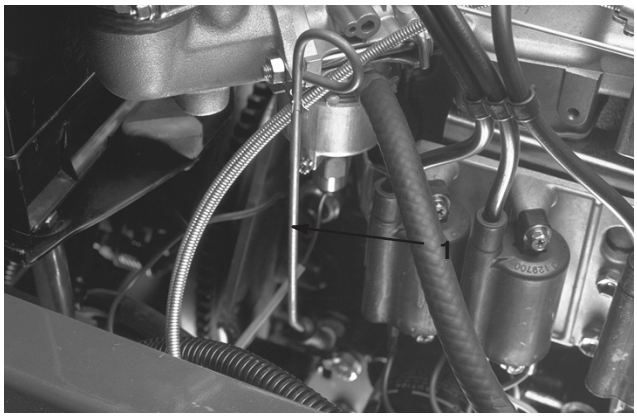


Figure 13

1. Dipstick

3. If the oil level is below the FULL mark, remove the fill cap (Fig. 14) and add oil until it level reaches the FULL mark on the dipstick. DO NOT OVERFILL.
4. Install the oil fill cap and close the hood.

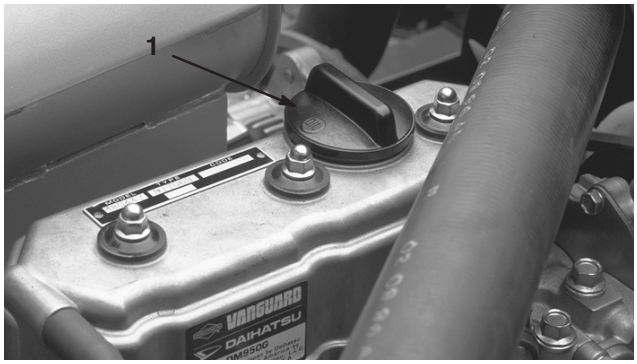


Figure 14

1. Oil fill

Checking the Cooling System

Clean debris off the screen and the radiator/oil cooler daily, more often if conditions are extremely dusty and dirty; refer to section on Engine Cooling System.

The cooling system is filled with a 50 / 50 solution of water and permanent ethylene glycol anti–freeze. Check the level of the coolant in the expansion tank at the beginning of each day before starting the engine. The capacity of the cooling system is 4 qt (3.7 l).

Caution

- **If the engine has been running, pressurized hot coolant can escape when the radiator cap is removed and cause burns.**

1. Check the level of the coolant in the expansion tank (Fig. 15). The coolant level should be between the marks on the side of the tank.

Figure 15

1. Expansion tank

2. If coolant level is low, remove expansion tank cap and replenish the system. DO NOT OVERFILL.
3. Install expansion tank cap.

Checking the Hydraulic System

The machines reservoir is filled at the factory with approximately 5 quarts (4.7 l) of high quality hydraulic fluid. **Check the level of the hydraulic fluid before the engine is first started and daily thereafter.** The recommended replacement fluid is:

Toro Premium Transmission/Hydraulic Tractor Fluid
(Available in 5 gallon pails or 55 gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other petroleum–based Universal Tractor Hydraulic Fluids (UTHF) may be used provided its specifications fall within the listed range for all the following material properties and it meets industry standards. We do not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation.

Material Properties:

Viscosity, ASTM D445	cSt @ 40°C 55 to 62
	cSt @ 100°C 9.1 to 9.8
Viscosity Index ASTM D2270	140 – 152
Pour Point, ASTM D97	–35°F to –46°F

Industry Specifications:
API GL–4, AGCO Powerfluid 821 XL, Ford New Holland FNHA–2–C–201.00, Kubota UDT, John Deere J20C, Vickers 35VQ25 and Volvo WB–101/BM.

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz. (20 ml) bottles. One bottle is sufficient for 4–6 gal (15–22 1) of hydraulic oil. Order part no. 44–2500 from your authorized Toro distributor.

1. Position machine on a level surface. Place all control in neutral position and start the engine. Run engine at lowest possible RPM to purge the system of air. **DO NOT ENGAGE PTO.** Cycle steering wheel several times fully to the left and right. Raise the deck to extend lift cylinders, aiming steering wheels straight forward and stop the engine.
2. Remove dipstick cap (Fig. 16) from filler neck and wipe it with a clean rag. Screw dipstick cap finger-tight onto filler neck; then remove it and check level of fluid. If level is not within 1/2 inch (13 mm) from the groove in the dipstick (Fig. 16), add enough high quality hydraulic fluid to raise level to groove mark. Do not overfill.

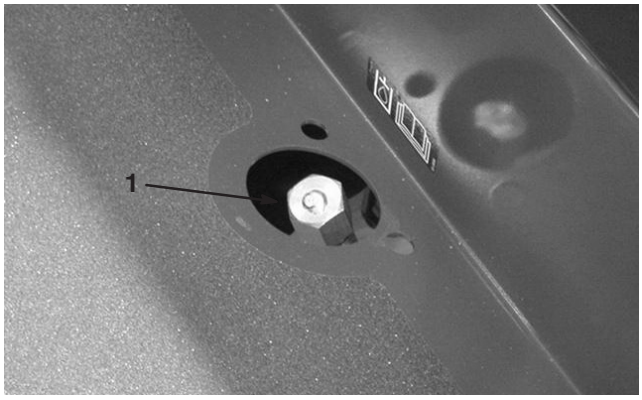


Figure 16

1. Hydraulic system reservoir fluid/add dipstick cap

3. Thread dipstick fill cap finger-tight onto filler neck. It is not recommended to tighten cap with a wrench.
4. Check all hoses and fittings for leaks.

Filling the Fuel Tank

Fuel tank capacity is approximately 12.8 gallon (48.5 l).

1. Using a clean rag, clean area around fuel tank cap.
2. Remove cap from the fuel tank (Fig. 17).

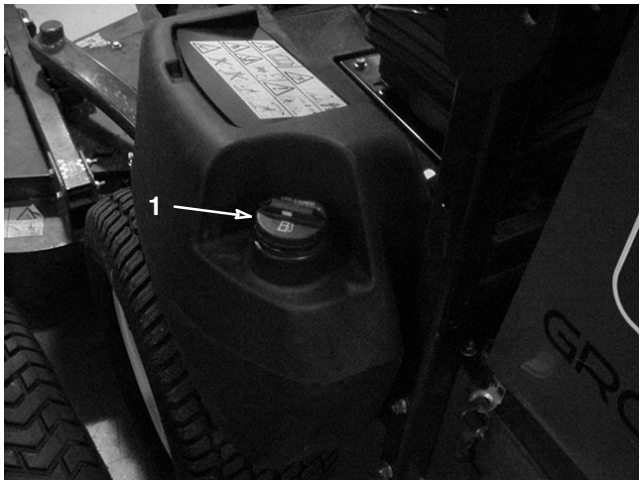


Figure 17

1. Fuel tank cap

3. Fill the tank until the level is to the bottom of the filler neck with unleaded fuel.
4. Install fuel tank cap tightly after filling tank.

Danger

Under certain conditions, fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is to the bottom of the filler neck.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, safety-approved container and keep the cap in place.**

Controls

Service Brakes

The left and right brake pedals (Fig. 18) are connected to the left and right front wheels. Since both brakes work independently of each other, the brakes can be used to turn sharply or to increase traction if one wheel tends to slip while operating on certain slope conditions. However, wet grass or soft turf could be damaged when brakes are used to turn sharply. To make a “quick-stop”, depress both brake pedals together. Always lock brakes together when transporting the traction unit.

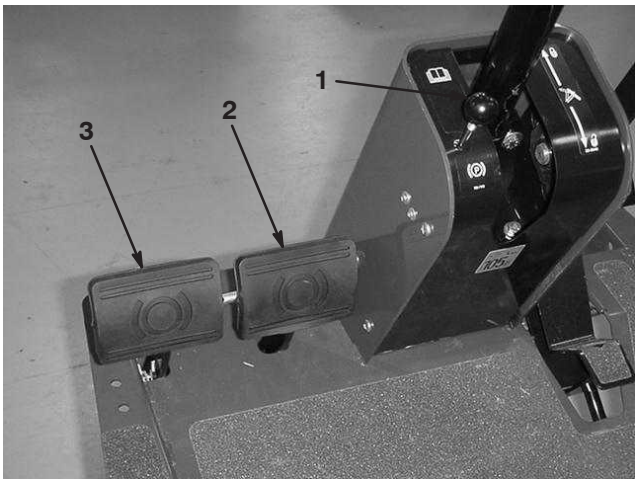


Figure 18

1. Parking brake knob
2. Right brake pedal
3. Left brake pedal

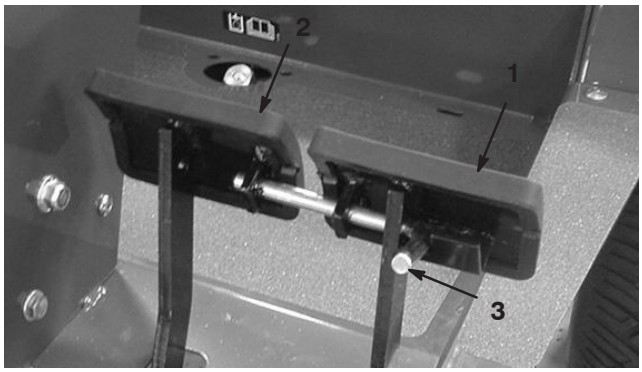


Figure 19

1. Left brake pedal
2. Right brake pedal
3. Lock arm

Traction Pedal

Traction pedal (Fig. 20) has two functions: one is to make the machine move forward, the other is to make it move rearward. Using the heel and toe of the right foot, depress top of pedal to move forward and bottom of pedal to move rearward. Ground speed is proportionate to how far pedal is depressed. For maximum ground speed, traction pedal must be fully depressed while throttle is in FAST position. Maximum speed forward is 10 mph (16 Km/hr) (approx.). To get maximum power under heavy load or when ascending a hill, have throttle in FAST position while depressing traction pedal slightly to keep engine rpm high. When engine rpm begins to decrease, release traction pedal slightly to allow rpm to increase.

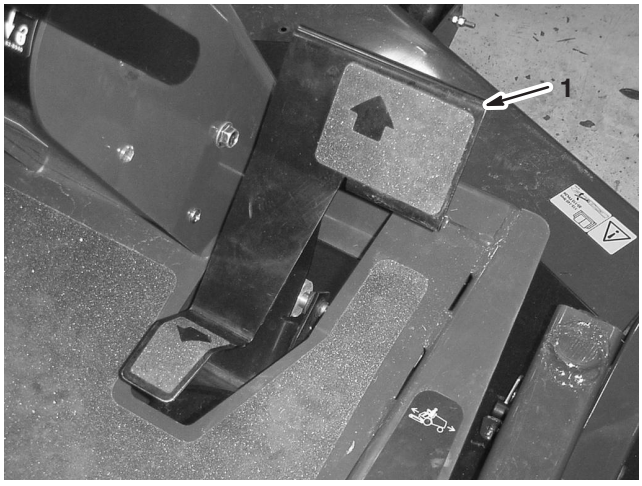


Figure 20

1. Traction pedal

Parking Brake

Whenever the engine is shut off, the parking brake must be engaged to prevent accidental movement of the machine. To engage the parking brake, push lock arm (Fig. 19) on left brake pedal so that it locks together with the right pedal. Next, push down fully on both pedals and pull parking brake knob out (Fig. 18) then release the pedals. To release parking brake, depress both pedals until parking brake knob retracts. Before starting the engine, however, lock arm may be disengaged from left brake pedal so both pedals work independently with each front wheel.

Tilt Steering Control

The tilt steering control is a lever on right side of steering column (Fig. 21). Pull lever rearward to adjust steering wheel to desired fore or aft operating position and push lever forward to lock adjustment.

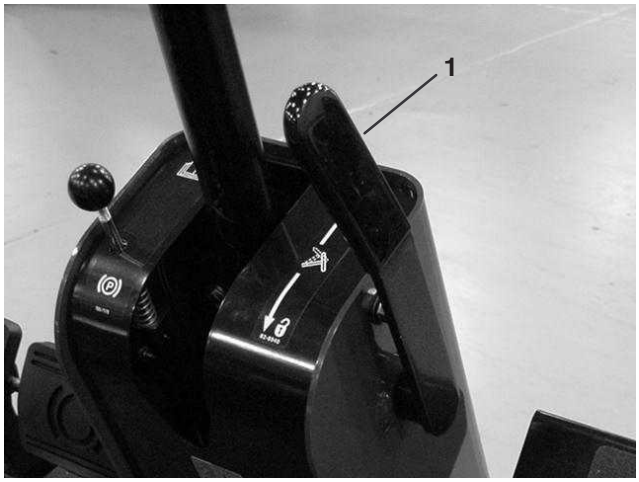


Figure 21

1. Tilt steering control

Caution

- **Never raise deck while blades are rotating because it is hazardous.**

Hydraulic LIft Lever

The hydraulic lift lever (Fig. 22) has three positions: FLOAT, TRANSPORT and RAISE. To lower the deck to the ground, move the lift lever forward momentarily to the FLOAT position. The FLOAT position is used for mowing and when machine is not in operation. To raise deck, pull lift lever rearward to the RAISE position. After deck is raised, allow lift lever to move to the TRANSPORT position. Deck must be raised when driving from one work area to another.

PTO Switch

Pull up on the switch knob to ENGAGE the electric PTO clutch (Fig. 22). Push down on the knob to DISENGAGE electric PTO clutch. The only time the PTO switch should be in the ENGAGE position is when the implement is down in operating position and ready to begin operation. If the operator leaves the seat when the PTO switch is engaged, the traction unit will shut down. To re–engage the PTO, push down and pull up on the knob.

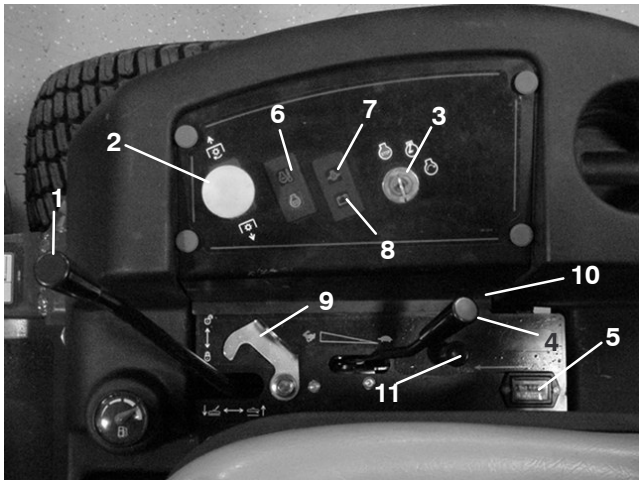


Figure 22

1. Hydraulic Lift lever
2. PTO Switch
3. Ignition switch
4. Throttle
5. Hour meter
6. Engine coolant temperature
7. Oil pressure indicator
8. Charge indicator
9. Lift lever lock
10. Power point
11. Choke

Fuel Gauge

The fuel gauge (Fig. 23) indicates quantity of fuel remaining in fuel tank.

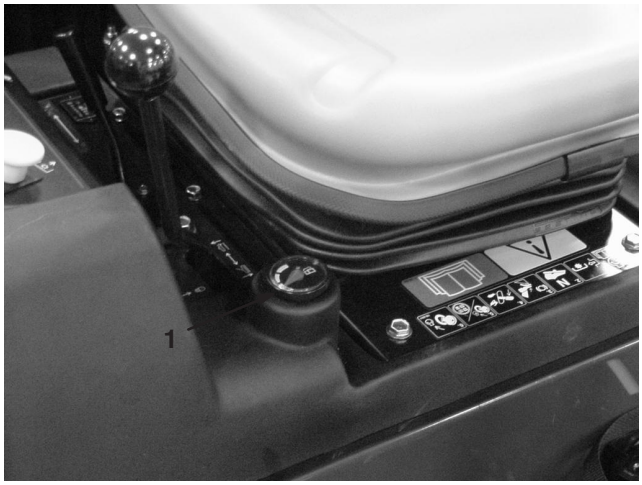


Figure 23

1. Fuel gauge

Ignition Switch

Three positions: OFF, RUN and START. (Fig. 22).

Throttle

Throttle (Fig. 22) is used to operate engine at various speeds. Moving throttle forward increases engine speed — FAST; rearward decreases engine speed — SLOW. The throttle controls the speed of the cutter blades and, in conjunction with traction pedal, controls ground speed of the traction unit. The detent is the high idle position.

Hour Meter

The hour meter (Fig. 22) registers accumulated hours of engine operation.

Engine Coolant Temperature Warning Light

The temperature warning light (Fig. 22) glows and the implement stops if the engine coolant temperature is high. If the traction unit is not stopped and the coolant temperature rises another 20° F, the engine will kill.

Choke

To start engine, close carburetor choke (Fig. 22) by pulling choke control upward. After engine starts, regulate choke to keep engine running smoothly. As soon as possible, open the choke by pushing it inward. A warm engine requires little or no choking.

Charge Indicator

Illuminates when system charging circuit malfunctions (Fig. 22).

Oil Pressure Warning Light

The oil pressure warning light (Fig. 22) glows when oil pressure in engine drops below a safe level. If low oil pressure ever occurs, stop engine and determine the cause. Repair the damage before starting the engine again.

LIft Lever Lock

Lock lift lever (Fig. 22), in raised position, when performing maintenance on deck.

Operation

Note: Determine the left and right sides of the machine from the normal operating position.

Using the Rollover Protection System (ROPS)

Warning

To avoid injury or death from rollover: keep the roll bar in the raised locked position and use the seat belt.

Ensure that the rear part of the seat is secured with the seat latch.

Warning

There is no rollover protection when the roll bar is in the down position.

- **Lower the roll bar only when absolutely necessary.**
- **Do not wear the seat belt when the roll bar is in the down position.**
- **Drive slowly and carefully.**
- **Raise the roll bar as soon as clearance permits.**
- **Check carefully for overhead clearances (i.e. branches, doorways, electrical wires) before driving under any objects and do not contact them.**
- **Lower roll bar slowly so damage to hood does not occur.**

Important Lower the roll bar only when absolutely necessary.

1. To lower the roll bar, remove the hairpin cotter pins and remove the two pins (Fig. 24).
2. Lower the the roll bar to the down position.
3. Install the two pins and secure them with the hairpin cotter pins (Fig. 24).

Important Always use the seat belt with the roll bar in the raised position.

4. To raise the roll bar, remove the hairpin cotter pins and remove the two pins (Fig. 24).
5. Raise the roll bar to the upright position and install the two pins and secure them with the hairpin cotter pins (Fig. 24).

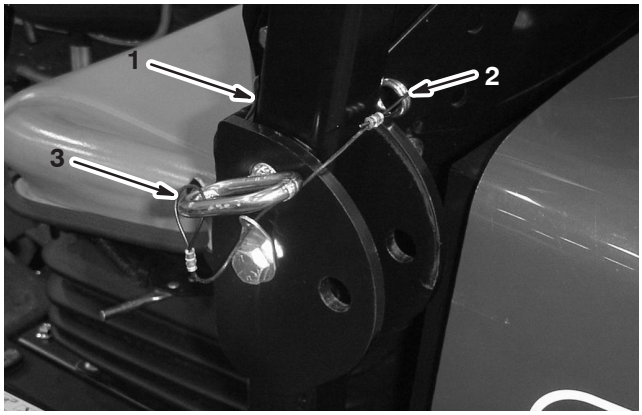


Figure 24

1. Roll bar
2. Pin
3. Hairpin cotter pin

Starting/Stopping the Engine

1. Ensure parking brake is set, PTO switch is in OFF position and lift lever is in TRANSPORT or FLOAT position. Remove foot from traction pedal and insure it is in neutral.
2. Pull choke to full choke position and move throttle control to SLOW position.
3. Turn key in ignition switch to START position. Release key immediately when engine starts and allow it to return to RUN position. Regulate choke to keep engine running smoothly.

Note: Do not run starter motor more than 20 seconds at a time or premature starter failure may result. If engine fails to start after 20 seconds, turn key to OFF position, recheck controls and procedures, wait 10 additional seconds and repeat starter operation.

4. When engine is started for the first time, or after engine oil change, or overhaul of engine, transmission or axle, operate the machine in forward and reverse for one to two minutes. Also operate the lift lever and PTO lever to assure proper operation of all parts. Turn power steering wheel to the left and right to check steering response. Then shut engine off and check fluid levels, check for oil leaks, loose parts and any other noticeable malfunctions.

Caution

- **Shut engine off and wait for all moving parts to stop before checking for oil leaks, loose parts or other malfunctions.**

5. To stop engine, move throttle control backward to SLOW position, move PTO switch to OFF position and rotate ignition key to OFF. Remove key from switch to prevent accidental starting.

Checking Interlock System

The purpose of the safety interlock system is to prevent the engine from cranking or starting unless the traction pedal is in neutral and the PTO switch is in the OFF position. In addition, the engine will stop when the PTO control is engaged or traction pedal is depressed with operator off the seat or when parking brake is engaged.

Caution

If safety interlock switches are disconnected or damaged the machine could operate unexpectedly causing personal injury.

- **Do not tamper with the interlock switches.**
- **Check the operation of the interlock switches daily and replace any damaged switches before operating the machine.**
- **Replace switches every two years regardless of whether they are operating properly or not.**

1. Move PTO switch to OFF position and remove foot from traction pedal so it is fully released.
2. Rotate the ignition key to START. Engine should crank. If engine cranks, proceed to step 3. If engine does not crank, there may be a malfunction in the interlock system.
3. Raise off the seat and engage the PTO switch while the engine is running. The engine should stop within 2 seconds. If engine stops, the switch is operating correctly; thus, proceed to step 4. If engine does not stop, there is a malfunction in the interlock system.
4. Raise off the seat and depress the traction pedal while engine is running and the PTO lever is disengaged. The engine should stop within 2 seconds. If engine stops, the switch is operating correctly; thus, proceed to step 5 If engine does not stop, there is a malfunction in the interlock system.
5. Engage the parking brake. Depress the traction pedal while engine is running and the PTO lever is disengaged. The engine should stop within 2 seconds. If engine stops, the switch is operating correctly; thus, continue operation. If engine does not stop, there is a malfunction in the interlock system.

Pushing Or Towing the Traction Unit

In an emergency, the traction unit can be pushed or towed for a very short distance. However, Toro does not recommend this as standard procedure.

Important Do not push or tow the traction unit faster than 2 to 3 mph (3.2 to 4.8 Km/hr) because transmission may be damaged. If the traction unit must be moved a considerable distance, transport it on a truck or trailer. Whenever traction unit is pushed or towed, by-pass valve must be open.

1. Loosen the knob and remove the access cover at the rear of the seat mounting plate (Fig. 25).

Figure 25

1. Access cover knob

2. Depress and hold the pins located in the center of the two (2) check valve assemblies in the top of the transmission (Fig. 26) while pushing or towing the machine. Figure 26 is shown with seat and seat mounting plate removed.

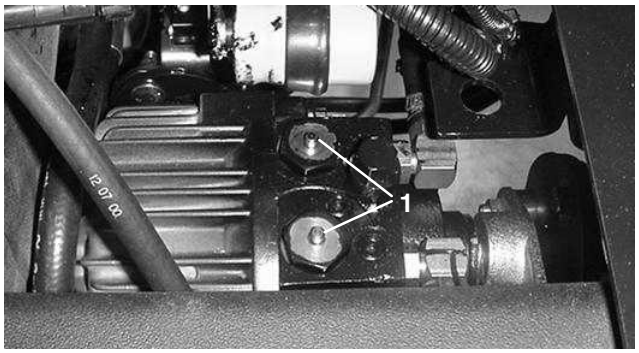


Figure 26

1. Transmission check valve by–pass pins (2)

3. Start the engine momentarily after the repairs are completed and make sure the pins are in the full disengaged (fully up) position.

Important Running the machine with by-pass valve open will cause the transmission to overheat.

4. Reinstall the access cover.

Operating Characteristics

Practice driving the GROUNDSMASTER® 3320 before initial operation because it has a hydrostatic transmission and its characteristics are different than some turf maintenance machines. Some points to consider when operating the traction unit and deck are the transmission, engine speed, load on the cutting blades, and the importance of the brakes.

To maintain enough power for the traction unit and deck while mowing, regulate traction pedal to keep engine rpm high and somewhat constant. A good rule to follow is: decrease ground speed as the load on the cutting blades increases; and increase ground speed as load on the blades decreases. This allows the engine, working with the transmission, to sense the proper ground speed while maintaining high blade tip speed necessary for good quality-of-cut. Therefore, allow traction pedal to move upward as engine speed decreases, and depress pedal slowly as speed increases. By comparison, when driving from one work area to another—with no load and deck raised—have throttle in FAST position and depress traction pedal slowly but fully to attain maximum ground speed.

Caution

This machine produces sound levels in excess of 85dBA at the operators ear and can cause hearing loss through extended periods of exposure.

Wear hearing protection when operating this machine.

Caution

Adequate rear weight is necessary to prevent the rear wheels from leaving the ground. Do not stop suddenly while deck or implement is raised. Do not travel down hill with the deck or implement raised. If the rear wheel leaves the ground, steering is lost.

Another characteristic to consider is the operation of the brakes. The brakes can be used to assist in turning the machine; however, use them carefully, especially on soft or wet grass because the turf may be torn accidentally. The brakes can be used to great advantage to control the direction of the deck when trimming along fences or similar objects. The other benefit of the brakes is to maintain traction. For example; in some slope conditions, the uphill wheel slips and loses traction. If this situation occurs, depress uphill brake pedal gradually and intermittently until the uphill wheel stops slipping; thus, increasing traction on the downhill wheel. If independent braking is not desired, engage the lever on left brake pedal with right pedal. This provides simultaneous braking at both wheels.

Before stopping the engine, disengage all control and move throttle to SLOW. Moving throttle to SLOW reduces high engine speed, noise and vibration. Turn ignition key to OFF to stop the engine.

Standard Control Module (SCM)

The Standard Control Module is a ”potted” electronic device produced in a ”one size fits all” configuration. The module uses solid state and mechanical components to monitor and control standard electrical features required for safe product operation.

The module monitors inputs including neutral, parking brake, PTO, start, backlap, and high temperature. The module energizes outputs including PTO, Starter, and ETR (energize to run) solenoid.

The module is divided into inputs and outputs. Inputs and outputs are identified by yellow LED indicators mounted on the printed circuit board.

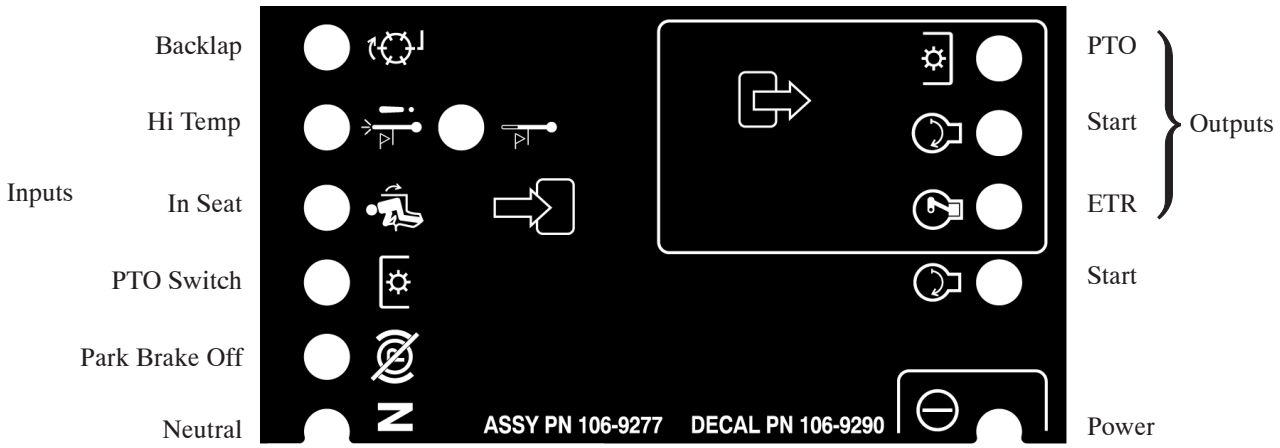
The start circuit input is energized by 12 VDC. All other inputs are energized when the circuit is closed to ground. Each input has a LED that is illuminated when the specific circuit is energized. Use the input LED’s for switch and input circuit troubleshooting.

Output circuits are energized by an appropriate set of input conditions. The three outputs include PTO, ETR, and START. Output LED’s monitor relay condition indicating the presence of voltage at one of three specific output terminals.

Output circuits do not determine output device integrity so electrical troubleshooting includes output LED inspection and conventional device and wire harness integrity testing. Measure disconnected component impedance, impedance through wire harness (disconnect at SCM), or by temporarily ”test energizing” the specific component.

The SCM does not connect to an external computer or hand held device, can not be re–programmed, and does not record intermittent fault troubleshooting data.

The decal on the SCM only includes symbols. Three LED output symbols are shown in the output box. All other LED’s are inputs. The chart below identifies the symbols.



Here are the logical troubleshooting steps for the SCM device.

1. Determine the output fault you are trying to resolve (PTO, START, or ETR).
2. Move key switch to ”ON” and ensure the red ”power” LED is illuminated.
3. Move all input switches to ensure all LED’s change state (Seat, Brake,Traction Pedal, PTO and Start.
4. Position input devices at appropriate position to achieve the appropriate output. Use the following logic chart to determine the appropriate input condition.
5. If specific output LED is illuminated without appropriate output function, check output harness, connections, and component. Repair as required.
6. If specific output LED is not illuminated, check both fuses.
7. If specific output LED is not illuminated and inputs are in appropriate condition, install new SCM and determine if fault disappears.

Each row (across) in the logic chart below identifies input and output requirements for each specific product function. Product functions are listed in the left column. Symbols identify specific circuit condition including: energized to voltage, closed to ground, and open to ground.

		INPUTS								**OUTPUTS**		
Function	Power ON	In Neutral	Start ON	Brake ON	PTO ON	In Seat	Hi Temp Shutdown	Hi Temp Warning	Back Lap	Start	ETR	PTO
Start	—	—	+	○	○	—	○	○	N/A	+	+	○
Run (Off Unit)	—	—	○	○	○	○	○	○	N/A	○	+	○
Run (On Unit)	—	○	○	—	○	—	○	○	N/A	○	+	○
Mow	—	○	○	—	—	—	○	○	N/A	○	+	+
Hi Temp Warning	—		○				○	— (A)	N/A	+	+	○
Hi Temp Shutdown	—		○				—		N/A	○	○	○

(—) Indicates a circuit closed to ground. – LED ON

(○) Indicates a circuit open to ground or de–energized – LED OFF

(+) Indicates an energized circuit (clutch coil, solenoid, or start input) LED ON.

“ ” A Blank indicates a circuit that is not involved with the logic.

(A) PTO input must be re–initiated after engine cool down (cycle key on–off)

N/A Not applicable

To troubleshoot, turn on the key without starting the engine. Identify the specific function that does not work and work across the logic chart. Inspect the condition of each input LED's to ensure it matches the logic chart.

If the input LED's are correct, check the output LED. If the output LED is illuminated but the device is not energized, measure available voltage at the output device, continuity of the disconnected device, and potential voltage on the ground circuit (floating ground). Repairs will vary depending on your findings.

Lubrication

Greasing the Bearings And Bushings

The traction unit has grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease. If machine is operated under normal conditions, lubricate all bearings and bushings after every 50 hours of operation. Bearings and bushings must be lubricated daily when operating conditions are extremely dusty and dirty. Dusty and dirty operating conditions could cause dirt to get into the bearings and bushings, resulting in accelerated wear. Lubricate grease fitting immediately after every washing, regardless of interval specified.

Apply a liberal coating of grease to the check valve pins once each year (Fig. 26). Also grease the bearings in the rear axle every 500 hours, or yearly, whichever comes first (not shown). The bearing and bushing lubrication points are:

- PTO universal shaft (Fig. 27)
- Lift arm pivot bushings (Fig. 28)
- Brake pivot bushings (Fig. 29)
- Brake cables (drive wheel and brake pedal ends) (Fig. 29)
- PTO tension pivot (Fig. 30)
- Rear PTO bearing (Fig. 30)
- Transmission neutral shaft (Fig. 31)
- Rear wheel spindle bushings (Fig. 32)
- Steering plate bushings (Fig. 33)
- Axle pin bushing (Fig. 33)

1. Wipe grease fitting clean so foreign matter cannot be forced into the bearing or bushing.
2. Pump grease into the bearing or bushing.
3. Wipe up excess grease.

Figure 27

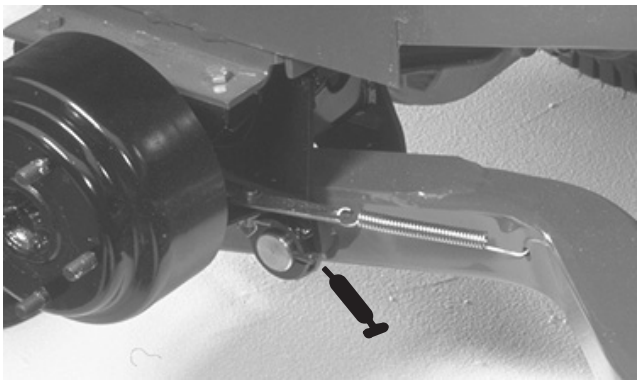


Figure 28

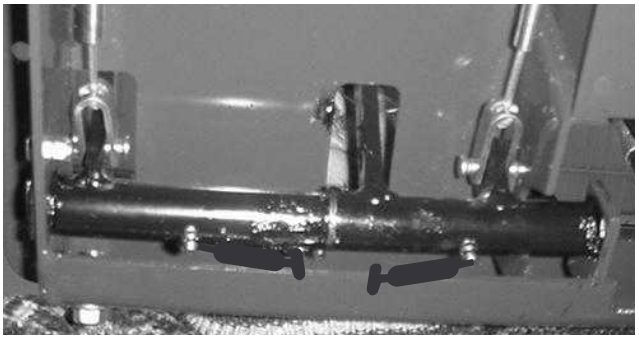


Figure 29

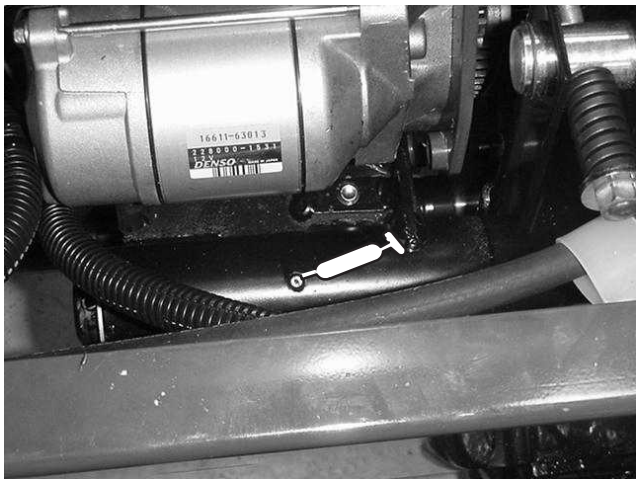


Figure 30

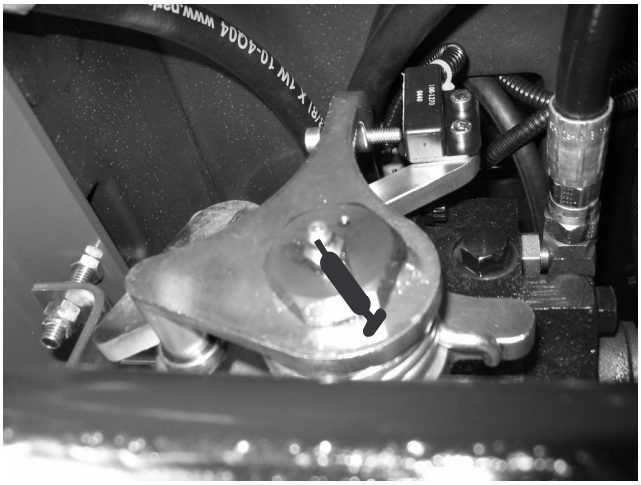


Figure 31

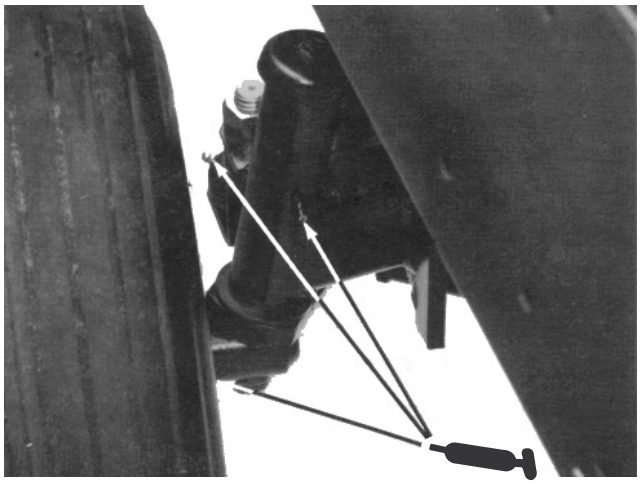


Figure 32

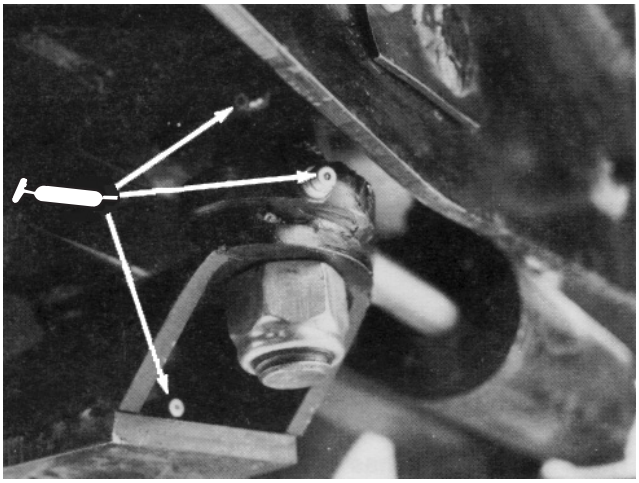


Figure 33

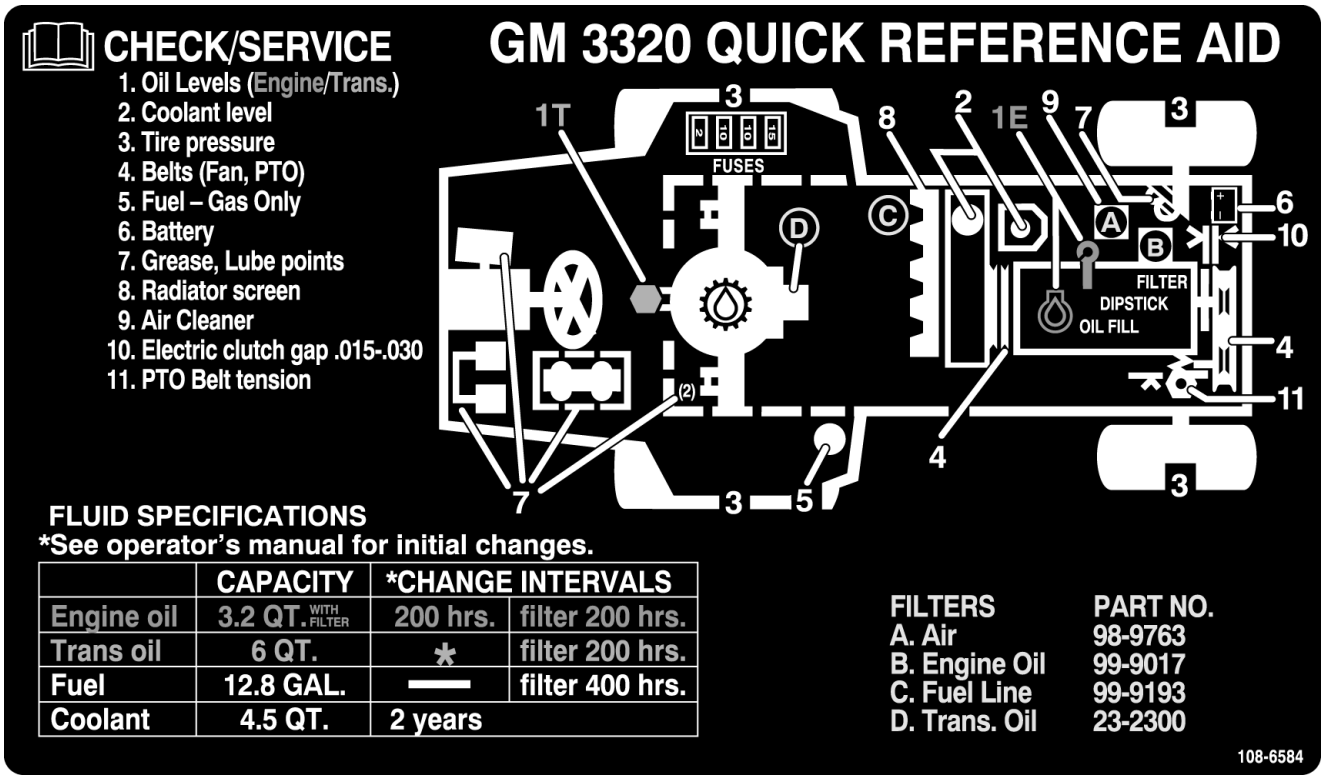
Note: Bearings rarely fail from defects in materials or workmanship. The most common reason for failure is moisture and contamination working its way past the protective seals. Bearings that are greased will rely upon regular maintenance to purge harmful debris from the bearing area. **Sealed** bearings rely on an initial fill of special grease and a robust integral seal to keep contaminants and moisture out of the rolling elements.

The sealed bearings require no lubrication or short term maintenance. This minimizes routine service required and reduces the potential of turf damage due to grease contamination. These sealed bearing packages will provide good performance and life under normal use, but periodic inspections of bearing condition and seal integrity should be conducted to avoid downtime. These bearings should be inspected seasonally and replaced if damaged or worn. Bearings should operate smoothly with no detrimental characteristics such as high heat, noise, looseness or indications of corrosion (rust).

Due to the operating conditions these bearing/seal packages are subject to (i.e. sand, turf chemicals, water, impacts, etc.) they are considered normal wear items. Bearings that fail due to causes other than defects in materials or workmanship are typically not covered under warranty.

Note: Bearing life can be negatively affected by improper wash down procedures. Do not wash down the unit when it is still hot and avoid directing high–pressure or high volume spray at the bearings.

Service Interval Chart



Maintenance

Recommended Maintenance Schedule

Maintenance Service Interval	Maintenance Procedure
After first 10 hours	• Check PTO Belt Tension • Check Fan and Alternator Belt Tension • Change Transmission Filter • Torque Wheel Lug Nuts • Check Brake Operation
After first 50 hours	• Change Engine Oil and Filter • Check PTO Belt Tension • Check Brake Operation
Every 50 hours	• Check Battery Fluid Level • Check Battery Cable Connections • Lubricate All Grease Fittings • Lubricate Brake Cables • Inspect Air Filter, Dust Cup, and Baffle
Every 200 hours	• Check Electric Clutch Gap Adjustment • Check PTO Belt Tension • Check Fan and Alternator Belt Tension • Inspect Cooling System Hoses • Change Engine Oil and Filter • Check Rear Wheel Toe–In and Steering Linkage • Change Transmission Filter • Torque Wheel Lug Nuts
Every 400 hours	• Replace Air Filter • Replace Fuel Filter • Coat Transmission Bypass Pins with Grease • Adjust Valves and Check Engine RPM
Every 1500 hours	• Replace Moving Hoses • Replace Safety Switches • Coolant System – Flush/Replace Fluid • Replace Hydraulic Oil

Caution

If you leave the key in the ignition switch, someone could accidently start the engine and seriously injure you or other bystanders.

Remove the key from the ignition before you do any maintenance. Set the wire aside so that it does not accidentally contact the spark plug.

Daily Maintenance Checklist

Duplicate this page for routine use.

Maintenance Check Item	For the week of: Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Sun.
Check Safety Interlock Operation							
Check Grass Deflector in Down Position							
Check Brake Operation							
Check Fuel Level							
Check Engine Oil Level							
Check Cooling System Fluid Level							
Check Air Filter Restriction Indicator[2]							
Check Radiator & Screen for Debris							
Check Unusual Engine Noises							
Check Unusual Operating Noises							
Check Transmission Oil Level							
Check Hydraulic Hoses for Damage							
Check Fluid Leaks							
Check Tire Pressure							
Check Instrument Operation							
Check Condition of Blades							
Lubricate All Grease Fittings[1]							
Touch–up Damaged Paint							

[1]= Immediately after every washing, regardless of the interval listed.
[2]= If indicator shows red

Important Refer to your engine operator's manual for additional maintenance procedures.

Notation for Areas of Concern

Inspection performed by:		
Item	**Date**	**Information**
1		
2		
3		
4		
5		
6		
7		

Maintenance

Note: Determine the left and right sides of the machine from the normal operating position.

General Air Cleaner Maintenance

- Check air cleaner body for damage which could possibly cause an air leak. Replace a damaged air cleaner body. Check the whole intake system for leaks, damage or loose hose clamps.
- Service the air cleaner filter when air cleaner indicator (Fig. 34) shows red or every 400 hours (more frequently in extreme dusty or dirty conditions). Do not over service air filter.

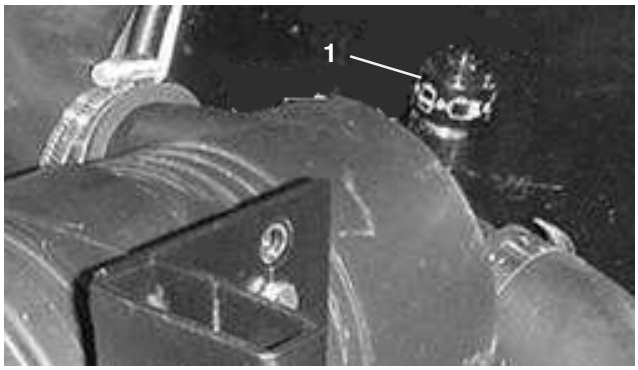


Figure 34

1. Air cleaner indicator

- Be sure the cover is seated correctly and seals with the air cleaner body.

Servicing the Air Cleaner

1. Pull latch outward and rotate air cleaner cover counter–clockwise (Fig. 35).
2. Remove the cover from the air cleaner body. Before removing the filter, use low pressure air (40 psi, clean and dry) to help remove large accumulations of debris packed between outside of primary filter and the canister. Avoid using high pressure air which could force dirt through the filter into the intake tract. This cleaning process prevents debris from migrating into the intake when the primary filter is removed.
3. Remove and replace the primary filter (Fig. 36). Cleaning of the used element is not recommended due to the possibility of damage to the filter media. Inspect the new filter for shipping damage, checking the sealing end of the filter and the body. Do not use a damaged element. Insert the new filter by applying pressure to the outer rim of the element to seat it in the canister. Do not apply pressure to the flexible center of the filter.
4. Clean the dirt ejection port located in the removable cover. Remove the rubber outlet valve from the cover, clean the cavity and replace the outlet valve.
5. Install the cover orienting the rubber outlet valve in a downward position – between approximately 5:00 to 7:00 when viewed from the end (Fig. 35).

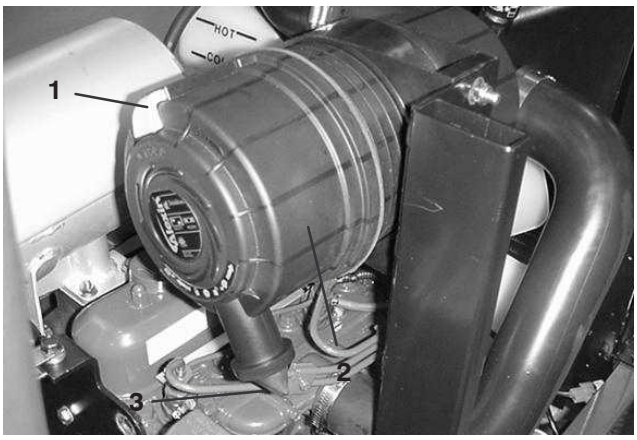


Figure 35

1. Air cleaner latch
2. Air cleaner cover
3. Rubber outlet valve

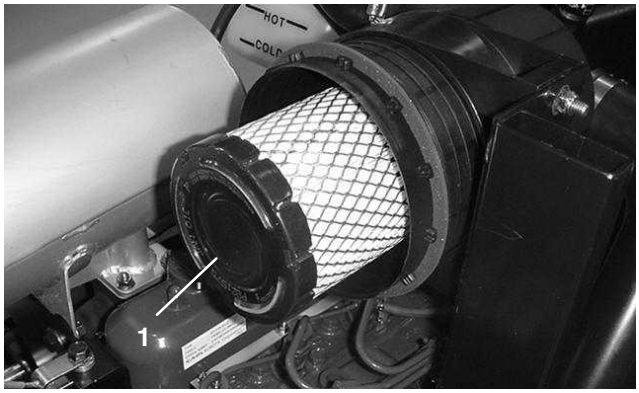


Figure 36

1. Filter

6. Reset indicator (Fig. 34) if showing red.

Cleaning the Radiator and the Screen

To prevent the engine from overheating, the screen and radiator must be kept clean. Normally, check the screen and radiator daily and, if necessary, clean any debris off these parts. However, it will be necessary to check and clean the screen and radiator frequently in extremely dusty and dirty conditions.

Note: If engine shuts off due to overheating, first check the radiator and screen for excessive buildup of debris.

To thoroughly clean the radiator:

1. Remove the screen.
2. Working from the fan side of the radiator, blow with low pressure (25 p.s.i.) compressed air (Do Not Use Water). Repeat procedure from the front of radiator and again from the fan side.
3. After the radiator is thoroughly cleaned, clean out debris that may have collected in the channel at the radiator base.
4. Clean and install the screen.

Changing the Engine Oil And Filter

Check oil level after each day's operation or each time machine is used. Change oil and filter initially after first 50 hours of operation; change oil and filter after every 200 hours of operation thereafter. If possible, run engine just before changing oil because warm oil flows better and carries more contaminants than cold oil.

1. Position machine on a level surface.
2. Open the hood. Set drain pan under the oil pan and in line with drain plug (Fig. 37).
3. Clean area around drain plug.

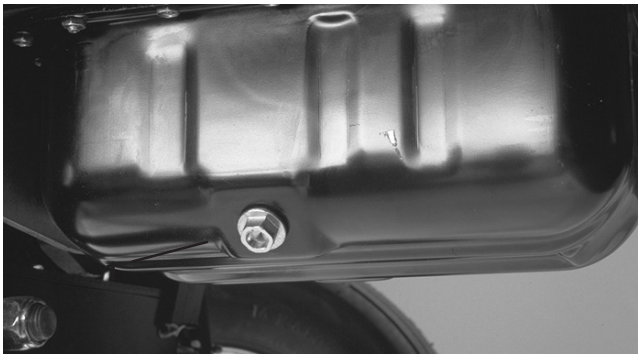


Figure 37

1. Drain plug

4. Remove oil drain plug and allow oil to flow into drain pan.
5. Remove and replace oil filter (Fig. 38).
6. After oil is drained, reinstall drain plug and wipe up any oil that is spilled.
7. Fill crankcase with oil; refer to Check Crankcase Oil.

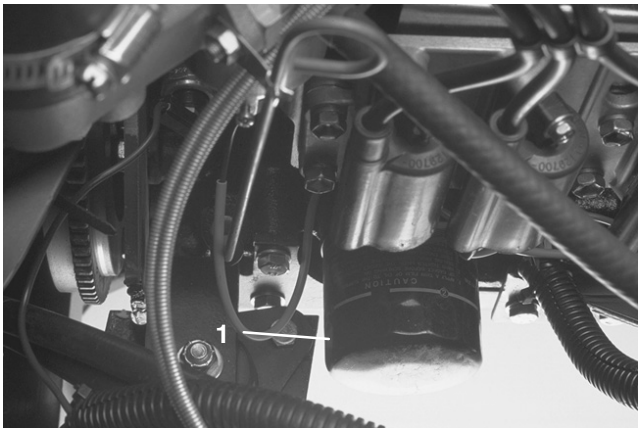


Figure 38

1. Oil filter

Servicing the Fuel System

Fuel Tank

Drain and clean fuel if tank becomes contaminated or machine is to be stored for an extended period. Use clean solvent to flush out the tank.

8. Lubricate gasket on filter canister with clean oil.
9. Install filter canister by hand until gasket contacts mounting surface, then rotate an additional 1/2 turn.

Replacing Fuel Pre Filter

Replace the fuel pre filter (Fig. 39), located between fuel tank and fuel pump after every 400 operating hours or yearly, whichever occurs first.

1. Clamp both fuel lines that connect to the fuel filter so fuel cannot drain when lines are removed (Fig. 39).
2. Loosen the hose clamps at both ends of the filter and pull fuel lines off filter.

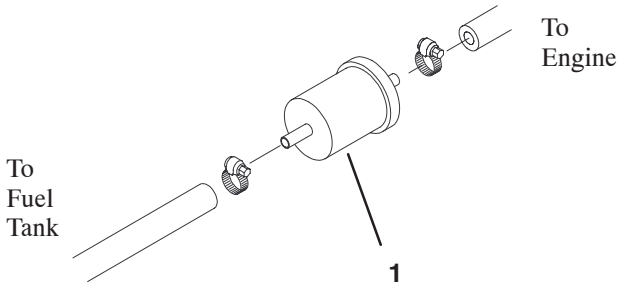


Figure 39

1. Fuel pre filter

Danger

Under certain conditions, fuel and fuel vapors are highly flammable and explosive. A fire or explosion from fuel can burn you and others and can cause property damage.

- **Use a funnel and fill the fuel tank outdoors, in an open area, when the engine is off and is cold. Wipe up any fuel that spills.**
- **Do not fill the fuel tank completely full. Add fuel to the fuel tank until the level is to the bottom of the filler neck.**
- **Never smoke when handling fuel, and stay away from an open flame or where fuel fumes may be ignited by a spark.**
- **Store fuel in a clean, safety-approved container and keep the cap in place.**

3. Slide hose clamps onto ends of fuel lines. Push fuel lines onto fuel filter and secure them with hose clamps. Be sure arrow on side of filter points toward the injection pump.

Fuel Lines and Connections

Check lines and connections every 400 hours or yearly, whichever comes first. Inspect for deterioration, damage or loose connections.

Servicing the Alternator Belt

Check the alternator belt tension every 200 hours.

1. Check tension by depressing belt midway of span with 18 lb of force. Belt should deflect 3/8 in. to 1/2 in. If deflection is incorrect, proceed to step 2. If correct, continue operation.
2. Loosen bolt securing brace to engine and bolt securing alternator to brace (Fig. 40).
3. Insert pry bar between alternator and engine and pry out on alternator.
4. Hold alternator in position after proper belt tension setting is achieved and tighten alternator and brace bolts to secure adjustment.

To Replace Belt:

1. Loosen bolts securing brace to engine and alternator to brace (Fig. 40).
2. Remove two capscrews holding the transmission drive shaft coupler to the engine pulley. Do not remove the drive shaft from the transmission.

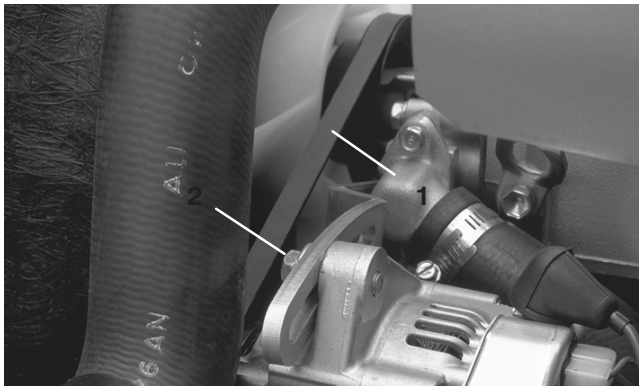


Figure 40

1. Alternator belt
2. Tension adjustment bolt

3. Move the drive shaft out of the way sot that the fan belt can be removed and a new belt installed. Install the new belt around the fan before positioning it around the drive pulley.
4. Reinstall the drive shaft. Tension the new belt.
5. Check the belt tension after one day's use.

Servicing the PTO Belt

Check the PTO belt tension every 200 hours.

1. Turn engine off and remove the ignition key. Set the parking brake. Raise the engine hood and allow the engine to cool.
2. Loosen the tensioning rod jam nut (Fig. 41).

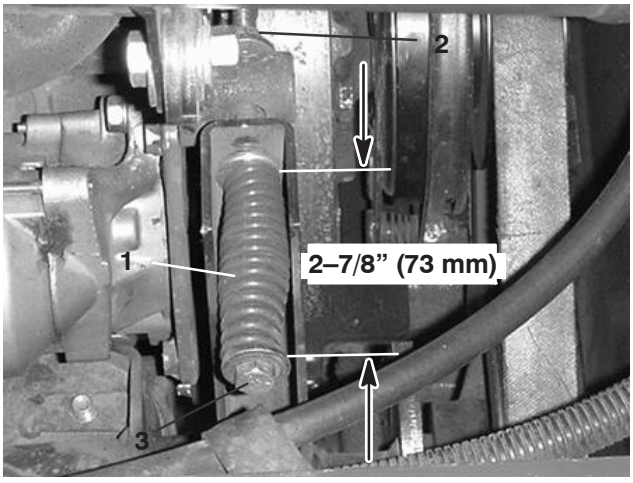


Figure 41

1. Tensioning spring
2. Tensioning rod jam nut
3. Tension adjusting bolt

3. Use a 1/2" wrench to tighten or loosen the belt tensioning spring (Fig. 41). Adjust spring to a length of 2-7/8" (73 mm).

4. Tighten jam nut.

To Replace Belt:

1. Turn off the engine and remove the ignition key. Set the parking brake. Raise the hood and allow the engine to cool.
2. Loosen the tensioning rod jam nut (Fig. 41).
3. Using a 1/2” wrench, loosen the belt tensioning spring (Fig. 41) all the way.
4. Rotate PTO pulley toward the engine and remove the belt.
5. Install the new PTO belt and re–tension the pulley spring to 2–7/8” (73 mm) (Fig. 41).
6. Tighten the jam nut (Fig. 41) and close the hood.

Adjusting the PTO Clutch

The power take off electric clutch can be adjusted by following the following procedure:

1. Turn engine off and remove the ignition key. Set the parking brake. Raise the engine hood and allow the engine to cool.
2. Unplug clutch electric connector (Fig. 42).

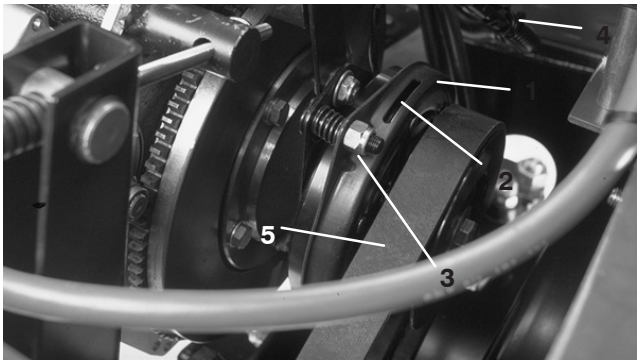


Figure 42

1. Clutch
2. .015” air gap (3)
3. Adjusting nut (3)
4. Electrical connector
5. PTO Belt

3. Adjust the air gap so that a .015 inch feeler gauge slides in between the clutch lining and friction plate with light pressure (Fig. 42). The gap can be decreased by turning the adjusting nut clockwise (Fig. 42). The maximum service gap is 0.030 inch.
4. Rotate the clutch by hand and adjust all three air gaps. After all three gaps have been set, check all three again. Adjusting one gap can alter the other gaps.
5. Reconnect the clutch electrical connector.

Adjusting the Traction Drive for Neutral

If the machine moves when the traction pedal is in the neutral position, the traction cam must be adjusted.

1. Park the machine on a level surface and turn the engine off.
2. Raise one front wheel and one rear wheel off of the floor and place support blocks under the frame.

Warning

If the machine is not supported adequately, it may accidentally fall, injuring anyone under the machine.

One front wheel *and* one rear wheel must be raised off of the ground or the machine will move during adjustment.

3. Loosen the retaining screw on the opposite side of the traction adjustment cam (Fig. 43).

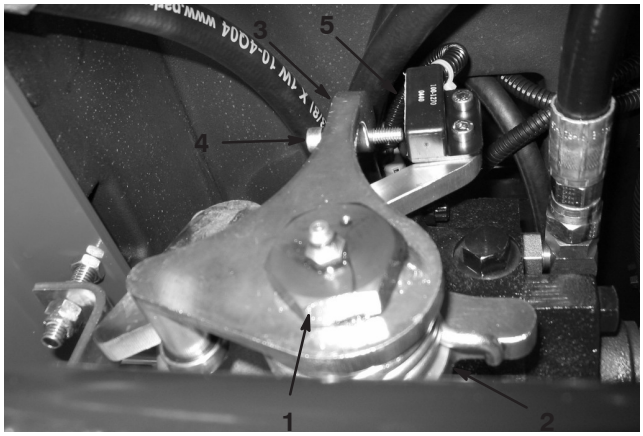


Figure 43

1. Traction adjustment cam
2. Retaining screw
3. Neutral return arm
4. Adjusting screw
5. Neutral return switch

Warning

The engine must be running so a final adjustment of the traction adjustment cam can be performed. Contact with hot or moving parts can result in personal injury.

Keep hands, feet, face, and other body parts away from the muffler, other hot parts of the engine, and other rotating parts.

4. Start the engine and rotate the cam hex forward until the front wheel starts to rotate, then rotate hex cam backward until front wheel starts to rotate. Determine the mid position of the neutral span and tighten the retaining screw. Do procedure at low speed idle and at high engine speed.

5. Tighten the screw securing the adjustment. Torque to 15–18 ft–lb (20–24 N•m)

6. Stop the engine.

7. Adjust the screw on the neutral return arm (Fig. 43) until the gap between the end of the screw and the switch contact is .090–.120 inch.

8. Remove the support blocks and lower the machine to the shop floor. Test drive the machine to make sure it does not move when the traction pedal is in neutral.

Adjusting the Parking Brake Interlock Switch

1. Turn the engine off and remove the ignition key. **Do not** engage the parking brake.

2. Remove knob from parking brake rod and screws from steering tower cover (Fig. 44).

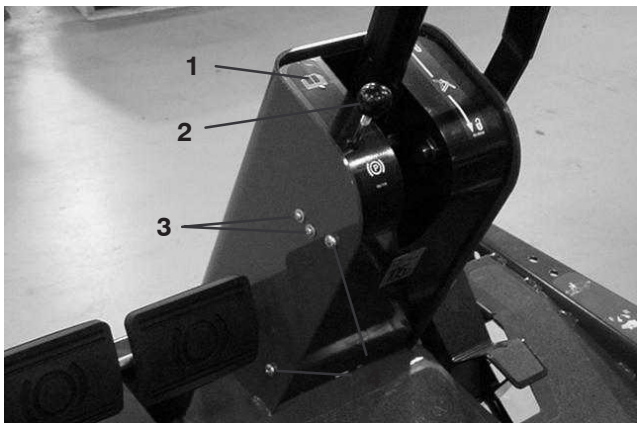


Figure 44

1. Steering tower cover
2. Parking brake knob/rod
3. Switch mounting screws
4. Cover mounting screws

3. Slide cover up steering shaft to expose parking brake switch (Fig. 45).

4. Loosen screws and nuts securing parking brake switch to left side of steering tower (Fig. 44).

5. Align parking brake rod paddle with switch plunger (Fig. 45)

6. Press down on parking brake rod and push up on switch until compressed length of switch plunger is .030” (Fig. 45, inset) . This the distance between the brake rod paddle and switch plunger housing.

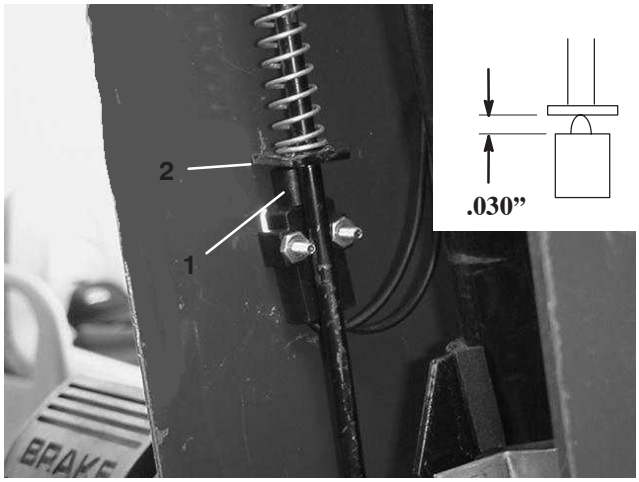


Figure 45

1. Parking brake interlock switch
2. Parking brake rod paddle

7. Tighten switch mounting screws and nuts.

8. With parking brake disengaged, the switch circuit **should have** continuity. If there is no continuity, move switch down slightly until there is continuity.

9. Check adjustment as follows:

- Engage the parking brake. Depress the traction pedal while engine is running and the PTO lever is disengaged. The engine should stop within 2 seconds. If engine stops, the switch is operating correctly; thus, continue operation. If engine does not stop, there is a malfunction in the interlock system.

10. Install steering tower cover and brake rod knob.

Changing the Hydraulic Oil And Filter

Initially, replace the hydraulic system filter after the first full day’s operation — NOT TO EXCEED 10 HOURS. Replace the filter after every 200 hours and oil after every 1500 hours.

The axle housing acts as the reservoir for the system. The transmission and axle housing are shipped from the factory with approximately 6 quarts (5.6 l) of high quality hydraulic fluid. **Check the level of hydraulic fluid before the engine is first started and daily thereafter.** The recommended replacement fluid is:

Toro Premium Transmission/Hydraulic Tractor Fluid
(Available in 5 gallon pails or 55 gallon drums. See parts catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other petroleum–based Universal Tractor Hydraulic Fluids (UTHF) may be used provided its specifications fall within

the listed range for all the following material properties and it meets industry standards. We do not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation.

Material Properties:

Viscosity, ASTM D445 cSt @ 40°C 55 to 62
cSt @ 100°C 9.1 to 9.8

Viscosity Index ASTM D2270 140 – 152

Pour Point, ASTM D97 –35°F to –46°F

Industry Specifications:

API GL–4, AGCO Powerfluid 821 XL, Ford New Holland FNHA–2–C–201.00, Kubota UDT, John Deere J20C, Vickers 35VQ25 and Volvo WB–101/BM.

Note: Fluid to operate the power steering is supplied by the hydraulic system transmission charge pump.

Cold weather start–up may result in "stiff" operation of the steering until the hydraulic system has warmed up. Using proper weight hydraulic oil in system will minimize this condition.

Note: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz. (20 ml) bottles. One bottle is sufficient for 4–6 gal (15–22 1) of hydraulic oil. Order part no. 44–2500 from your authorized Toro distributor.

1. Lower deck to shop floor, set parking brake, and turn engine OFF. Block the two rear wheels.
2. Jack up both sides of the front axle and support it with jack stands.
3. Clean the area around the hydraulic oil filter and remove the filter (Fig. 46).
4. Remove the tube that connects the axle housing to the transmission and allow the oil to flow into a drain pan.
5. Install new hydraulic oil filter and connect the tube between axle housing and transmission. Fill axle (reservoir) to proper level (approx. 6 qt.); refer to Check Hydraulic System Fluid. Remove jack stands.
6. Start engine, cycle steering and lift cylinders, and check for oil leaks. allow engine to run for about five minute. Then shut engine off.
7. After two minutes, check level of transmission fluid; refer to Check Hydraulic System Fluid.

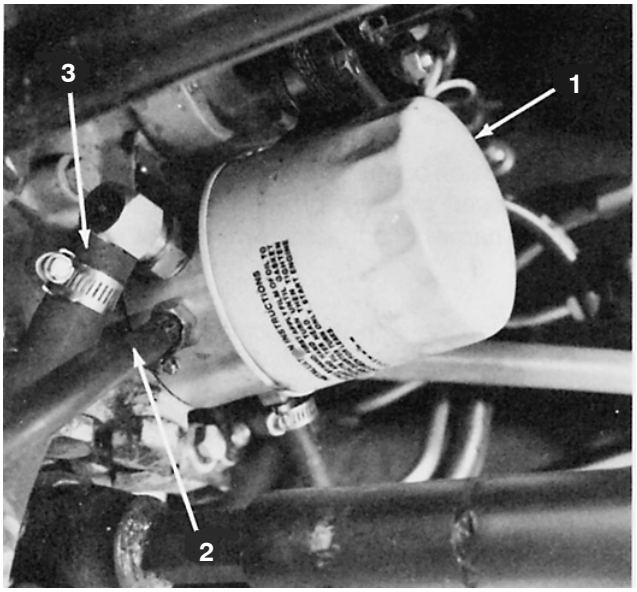


Figure 46

1. Filter
2. Return line
3. Suction line

Adjusting the Traction Pedal

The traction pedal can be adjusted for operator comfort or to reduce the maximum reverse speed of the machine.

1. Check the traction pedal stop adjustment. The pedal stop (Fig. 47) should contact the frame slightly before the pump reaches full stroke.
2. To adjust pedal stop, loosen jam nuts, push down on traction pedal and tighten jam nuts when adjustment is attained.

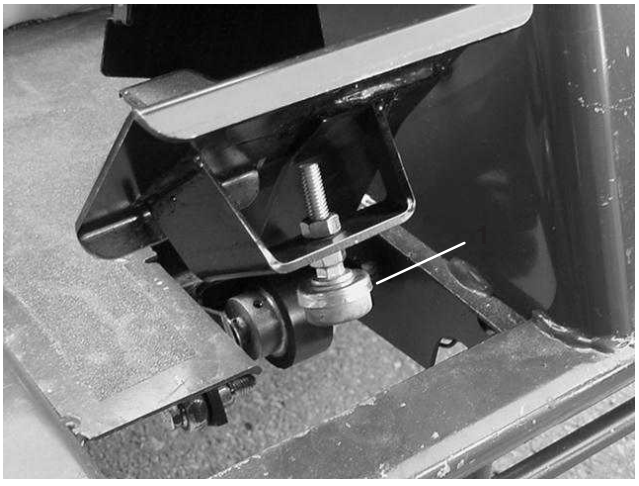


Figure 47

1. Traction pedal stop

3. If more adjustment is required, adjust traction rod (Fig. 48) as follows:

   - Remove capscrew and nut securing traction rod end to pedal.
   - Loosen jam nut securing rod end to traction rod.
   - Rotate rod until desired length is attained.
   - Tighten jam nut and secure rod end to traction pedal with capscrew and nut removed to lock the angle of the foot pedal.

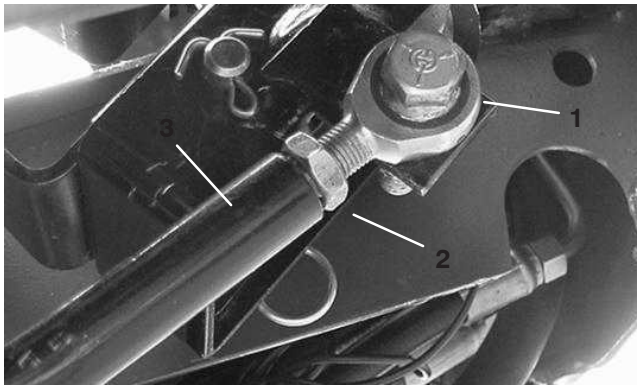


Figure 48

1. Rod end
2. Jam nut
3. Traction rod

4. To reduce rear speed,

Adjusting the Service Brakes

Adjust the service brakes when there is more than one inch (25 mm) of "free travel" of the brake pedals, or when the brakes do not work effectively. Free travel is the distance the brake pedal moves before braking resistance is felt.

The brakes should be checked for adjustment after the first 10 hours of operation and should only need adjusting after considerable use thereafter. These periodic adjustments can be performed where the brake cable connect to the bottom of the brake pedals. When the cable is no longer adjustable, the star nut on inside of the brake drum must be adjusted to move the brake shoes outward. However, the brake cables must be adjusted again to compensate for this adjustment.

1. Disengage lock arm from right brake pedal so both pedals work independently of each other.
2. To reduce free travel of brake pedals — tighten the brakes — loosen front nut on threaded end of brake cable (Fig. 49). Then tighten rear nut to move cable backward until brake pedals have 1/2 to 1 inch (13 mm to 25 mm) of free travel. Tighten front nut after brakes are adjusted correctly.

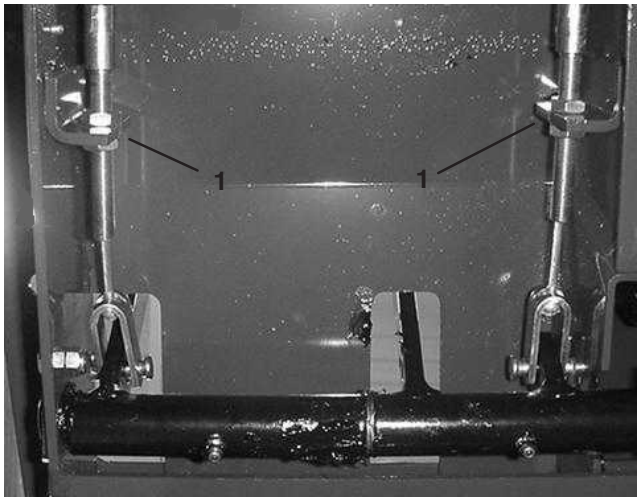


Figure 49

1. Brake cable jam nuts

Adjusting the Tilt Steering Control

If steering wheel tilt control lever must be adjusted, proceed as follows:

1. Remove knob from parking brake and screws from steering column cover (Fig. 50).

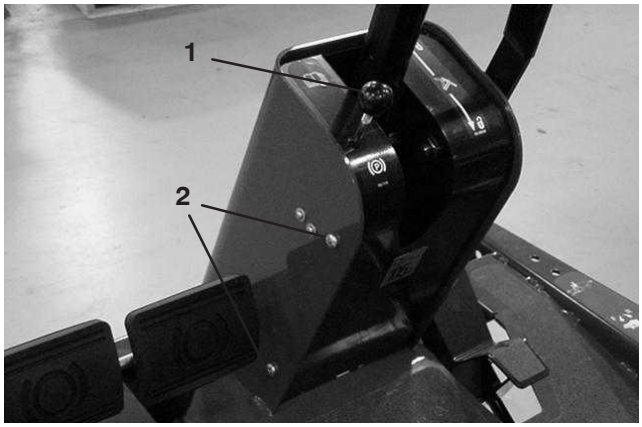


Figure 50

1. Parking brake knob
2. Mounting screw (4)

2. Slide cover up steering shaft to expose pivot bracket (Fig. 51).

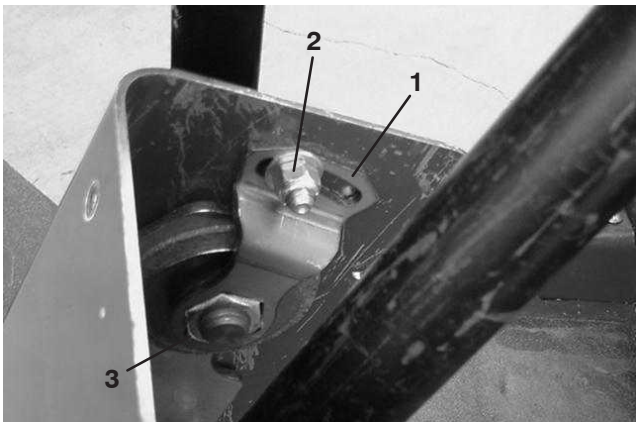


Figure 51

1. Pivot plate
2. Small nut
3. Large nut

3. Loosen small nut, rotate pivot bracket until it tightens large nut below (Fig. 51). Retighten small nut.
4. Reinstall steering column cover and parking brake knob.

Servicing the Battery

The battery electrolyte level must be properly maintained and the top of the battery kept clean. lf the machine is stored in a location where temperatures are extremely high, the battery will run down more rapidly than if the machine is stored in a location where temperatures are cool.

Check the electrolyte level every 50 operating hours or, if the machine is in storage, every 30 days.

Maintain the cell level with distilled or demineralized water. Do not fill the cells above the bottom of the split ring inside each cell.

Warning

CALIFORNIA

Proposition 65 Warning

Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. *Wash hands after handling*.

Danger

Battery electrolyte contains sulfuric acid which is a deadly poison and causes severe burns.

- **Do not drink electrolyte and avoid contact with skin, eyes or clothing. Wear safety glasses to shield your eyes and rubber gloves to protect your hands.**
- **Fill the battery where clean water is always available for flushing the skin.**

Keep the top of the battery clean by washing it periodically with a brush dipped in ammonia or bicarbonate of soda solution. Flush the top surface with water after cleaning it. Do not remove the fill caps while cleaning the battery.

The battery cables must be tight on the terminals to provide good electrical contact.

If corrosion occurs at the terminals, disconnect the cables, negative (–) cable first, and scrape the clamps and terminals separately. Reconnect the cables, positive (+) cable first, and coat the terminals with petroleum jelly.

Warning

Battery terminals or metal tools could short against metal tractor components causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **When removing or installing the battery, do not allow the battery terminals to touch any metal parts of the tractor.**
- **Do not allow metal tools to short between the battery terminals and metal parts of the tractor.**

Warning

Incorrect battery cable routing could damage the tractor and cables causing sparks. Sparks can cause the battery gasses to explode, resulting in personal injury.

- **Always *disconnect* the negative (black) battery cable before disconnecting the positive (red) cable.**
- **Always *connect* the positive (red) battery cable before connecting the negative (black) cable.**

Storing the Battery

If the machine will be stored more than 30 days, remove the battery and charge it fully. Either store it on the shelf on the machine. Leave the cables disconnected if it is stored on the machine. Store the battery in a cool atmosphere to avoid quick deterioration of the charge in the battery. To prevent the battery from freezing, make sure it is fully charged. The specific gravity of a fully charged battery is 1.265–1.299.

Servicing the Wiring Harness

Prevent corrosion of wiring terminals by applying Grafo 112X (Skin-over) grease, Toro Part No. 505-47, to the inside of all harness connectors whenever the harness is replaced.

Whenever working with the electrical system, always disconnect battery cables, negative (–) cable first, to prevent possible wiring damage from short-outs.

Servicing the Fuses

Fuses are located under the control panel (Fig. 52).

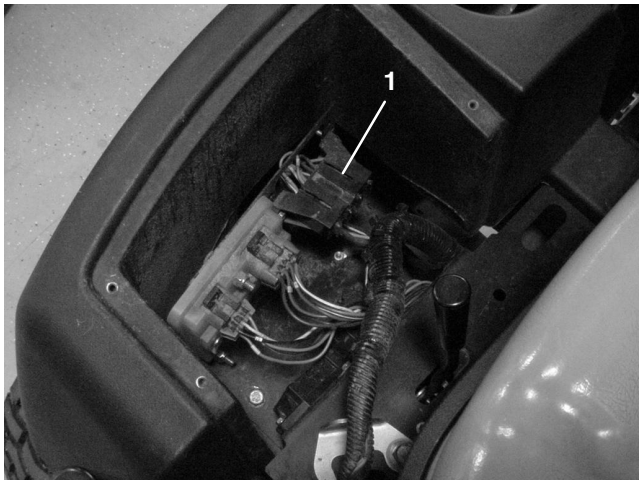
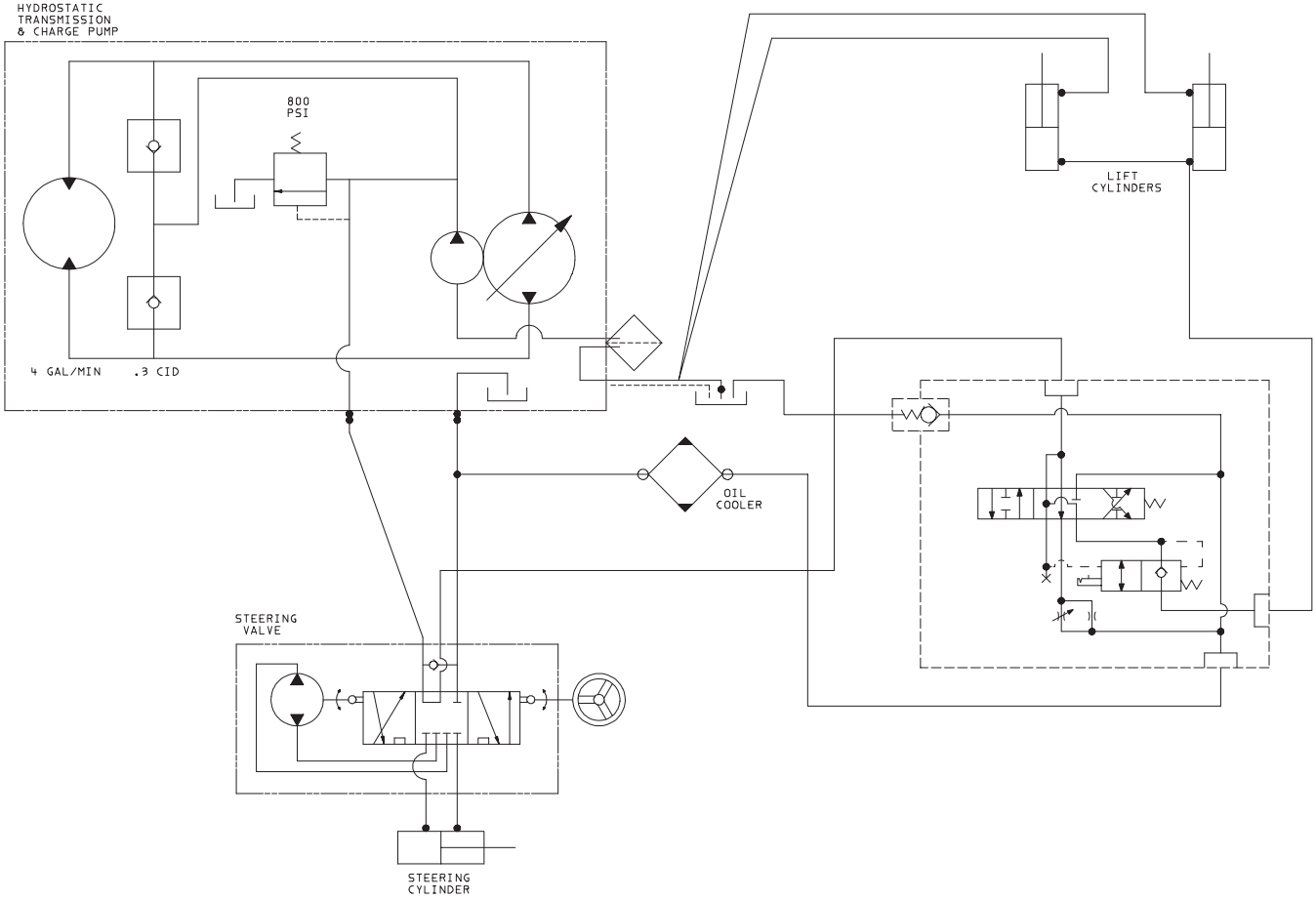


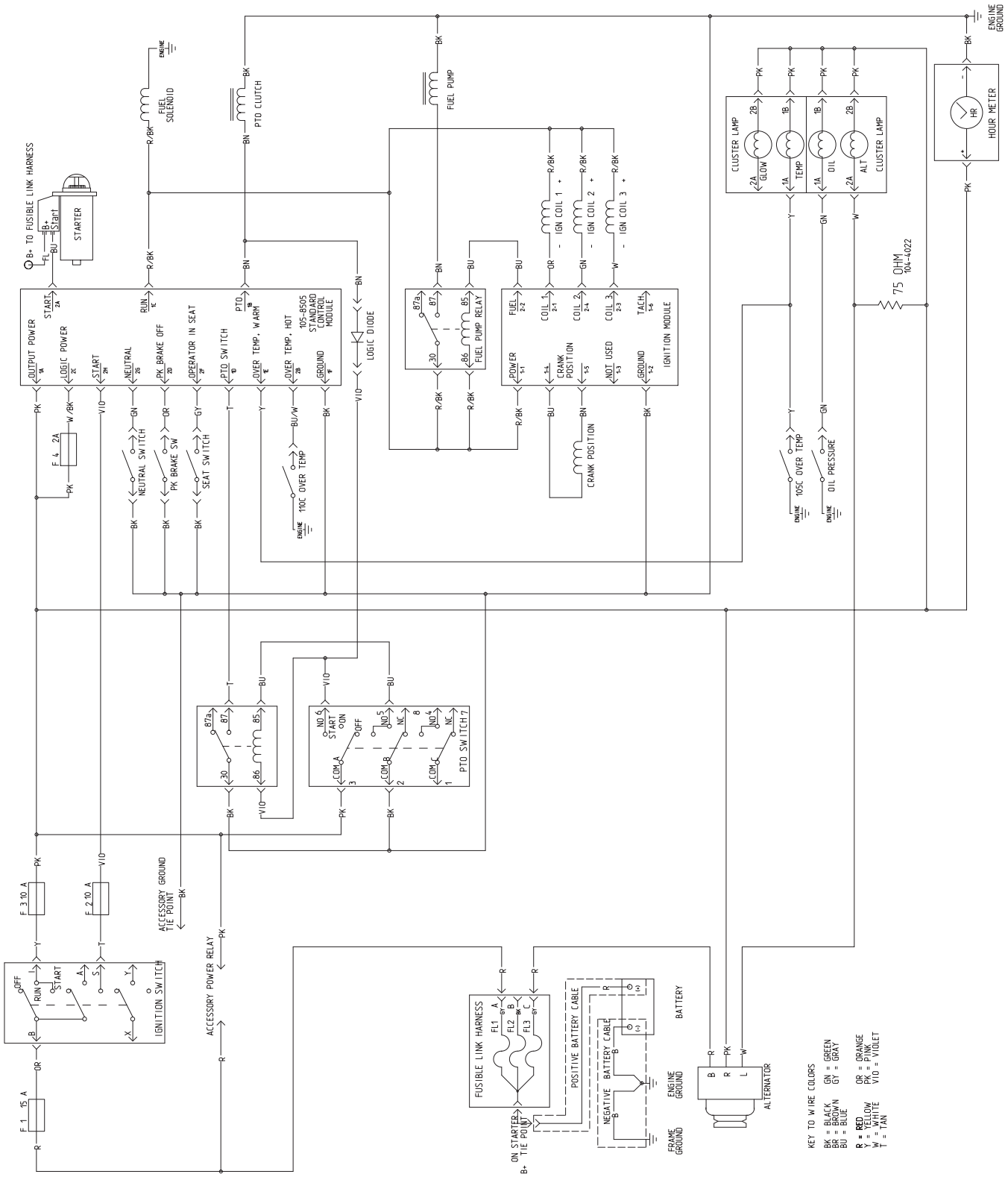
Figure 52

1. Fuse block

Hydraulic Schematic



Electrical Schematic



Storage

Traction Unit

1. Thoroughly clean the traction unit, deck and the engine, paying special attention to these areas:

- radiator and radiator screen
- underneath the deck
- under the deck belt covers
- counterbalance springs
- P.T.O. Shaft Assembly
- all grease fittings and pivot points
- remove control panel and clean out inside of the control box
- beneath seat plate and top of transmission

2. Check the tire pressure. Inflate all traction unit tires to 20 psi.
3. Remove, sharpen and balance the deck's blades. Reinstall the blades and torque the blade fasteners to 85-110 ft-lb (115-149 N·m).
4. Check all fasteners for looseness; tighten as necessary.
5. Grease or oil all grease fittings, pivot points, and transmission by-pass valve pins. Wipe off any excess lubricant.
6. Lightly sand and use touch up paint on painted areas that are scratched, chipped or rusted. Repair any dents in the metal body.
7. Service the battery and cables as follows:

   A. Remove the battery terminals from the battery posts.

   B. Clean the battery, terminals and posts with a wire brush and baking soda solution.

   C. Coat the cable terminals and battery posts with Grafo 112X skin-over grease (Toro Part No. 505-47), or petroleum jelly to prevent corrosion.

   D. Slowly recharge the battery for 24 hours every 60 days to prevent lead sulfation of the battery.

Engine

1. Drain the engine oil from the oil pan and replace the drain plug.
2. Remove and discard the oil filter. Install a new filter.
3. Refill the engine with recommended motor oil. Refer to Changing Crankcase Oil.
4. Start the engine and run at idle speed for two minutes.
5. Thoroughly clean and service the air cleaner assembly.
6. Seal the air cleaner inlet and the exhaust outlet with weather proof masking tape.
7. Check the oil filler cap and fuel tank cap to ensure they are securely in place.

The Toro General Commercial Products Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your Toro Commercial Product ("Product") to be free from defects in materials or workmanship for two years or 1500 operational hours*, whichever occurs first. Where a warrantable condition exists, we will repair the Product at no cost to you including diagnosis, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.

* Product equipped with hour meter

Instructions for Obtaining Warranty Service

You are responsible for notifying the Commercial Products Distributor or Authorized Commercial Products Dealer from whom you purchased the Product as soon as you believe a warrantable condition exists.

If you need help locating a Commercial Products Distributor or Authorized Dealer, or if you have questions regarding your warranty rights or responsibilities, you may contact us at:

Toro Commercial Products Service Department
Toro Warranty Company
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
952-888-8801 or 800-982-2740
E-mail: commercial.service@toro.com

Owner Responsibilities

As the Product owner, you are responsible for required maintenance and adjustments stated in your operator's manual. Failure to perform required maintenance and adjustments can be grounds for disallowing a warranty claim.

Items and Conditions Not Covered

Not all product failures or malfunctions that occur during the warranty period are defects in materials or workmanship. This express warranty does not cover the following:

- Product failures which result from the use of non-Toro replacement parts, or from installation and use of add-on, modified, or unapproved accessories
- Product failures which result from failure to perform required maintenance and/or adjustments
- Product failures which result from operating the Product in an abusive, negligent or reckless manner
- Parts subject to consumption through use unless found to be defective. Examples of parts which are consumed, or used up, during normal Product operation include, but are not limited to, blades, reels, bedknives, tines, spark plugs, castor wheels, tires, filters, belts, and certain sprayer components such as diaphragms, nozzles, and check valves, etc.
- Failures caused by outside influence. Items considered to be outside influence include, but are not limited to, weather, storage practices, contamination, use of unapproved coolants, lubricants, additives, or chemicals, etc.
- Normal "wear and tear" items. Normal "wear and tear" includes, but is not limited to, damage to seats due to wear or abrasion, worn painted surfaces, scratched decals or windows, etc.

Parts

Parts scheduled for replacement as required maintenance are warranted for the period of time up to the scheduled replacement time for that part.

Parts replaced under this warranty become the property of Toro. Toro will make the final decision whether to repair any existing part or assembly or replace it. Toro may use factory remanufactured parts rather than new parts for some warranty repairs.

General Conditions

Repair by an Authorized Toro Distributor or Dealer is your sole remedy under this warranty.

Neither The Toro Company nor Toro Warranty Company is liable for indirect, incidental or consequential damages in connection with the use of the Toro Products covered by this warranty, including any cost or expense of providing substitute equipment or service during reasonable periods of malfunction or non-use pending completion of repairs under this warranty. Except for the Emissions warranty referenced below, if applicable, there is no other express warranty. All implied warranties of merchantability and fitness for use are limited to the duration of this express warranty.

Some states do not allow exclusions of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions and limitations 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.

Note regarding engine warranty: The Emissions Control System on your Product may be covered by a separate warranty meeting requirements established by the U.S. Environmental Protection Agency (EPA) and/or the California Air Resources Board (CARB). The hour limitations set forth above do not apply to the Emissions Control System Warranty. Refer to the Engine Emission Control Warranty Statement printed in your operator's manual or contained in the engine manufacturer's documentation for details.

Countries Other than the United States or Canada

Customers who have purchased Toro products exported from the United States or Canada should contact their Toro Distributor (Dealer) to obtain guarantee policies for your country, province, or state. If for any reason you are dissatisfied with your Distributor's service or have difficulty obtaining guarantee information, contact the Toro importer. If all other remedies fail, you may contact us at Toro Warranty Company.

Part No. 374-0031 Rev. C