

TORO®

MODEL NO. 30191 – 590001 & Up

**OPERATOR'S
MANUAL****20hp PROLINE MID-SIZE
TRACTION UNIT****TORO****THIS UNIT CONFORMS
TO ANSI B71.4-1990**

To assure maximum safety, optimum performance, and to gain knowledge of the product, it is essential that you or any other operator of the machine read and understand the contents of this manual before the engine is ever started. Pay particular attention to the **SAFETY INSTRUCTIONS** highlighted by this symbol —

The safety alert symbol means **CAUTION, WARNING or DANGER** — personal safety instruction. Failure to comply with the instruction may result in personal injury.



FOREWORD

The Proline mid size mowers have advanced concepts in engineering, design and safety; and if maintained properly, will give excellent service.

Since this is a high-quality product, Toro is concerned about the future use of the machine and safety of the user. Therefore, read this manual to familiarize yourself with proper set-up, operation and maintenance instructions. The major sections of the manual are:


- | | | |
|------------------------|---------------------|----------------|
| 1. Safety Instructions | 3. Before Operating | 5. Maintenance |
| 2. Set-up Instructions | 4. Operation | |

Certain information in this manual is emphasized. DANGER, WARNING and CAUTION identify personal safety related information. IMPORTANT identifies mechanical information demanding special attention. Be sure to read this directive because it deals with the possibility of damaging a part or parts of the machine. NOTE identifies general information worthy of special attention.

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SAFETY INSTRUCTIONS



The safety alert symbol means **CAUTION, WARNING or DANGER** — “personal safety instruction”. Read and understand the instruction because it has to do with safety. Failure to comply with the instruction may result in personal injury.

Hazard control and accident prevention are dependent upon the awareness, concern, and proper training of the personnel involved in the operation, transport, maintenance, and storage of the machine. Improper use or maintenance of the machine can result in injury or death. To reduce the potential for injury or death, comply with the following safety instructions.

WARNING: Engine exhaust contains carbon monoxide which is an odorless, deadly poison. Carbon monoxide is also known to the State of California to cause birth defects. Do not run engine indoors or in an enclosed area.

BEFORE OPERATING

1. Read and understand the contents of this Operator's Manual before operating the machine. Become familiar with all controls and know how to stop quickly. A replacement manual is available by sending complete Model and Serial Number to:

The Toro Company
8111 Lyndale Avenue South
Bloomington, Minnesota 55420-1196

2. Never allow children to operate the machine. Do not allow adults to operate machine without proper instruction. Only trained operators who have read this manual should operate this machine.

3. Never operate the machine when under the influence of drugs or alcohol.

SAFETY INSTRUCTIONS

4. Before attempting to start engine, make sure control bar pivots freely forward and reverse and returns to neutral when released.

5. Remove all debris or other objects that might be picked up and thrown by the cutter blades. Keep all bystanders away from the mowing area.

6. Do not operate unless all shields and safety devices in place. If a shield, safety device or decal is illegible or damaged, repair or replace it before operation is commenced. Also tighten any loose nuts, bolts and screws to assure machine is in safe operating condition.

7. Do not operate machine while wearing sandals, tennis shoes, sneakers or shorts. Also, do not wear loose fitting clothing which could get caught in moving parts. Always wear long pants and substantial shoes. Wearing safety glasses, safety shoes and a helmet is advisable and required by some local ordinances and insurance regulations.

8. Fill fuel tank with gasoline before starting the engine. Avoid spilling gasoline. Since gasoline is flammable, handle it carefully.

- A. Use an approved gasoline container.
- B. Do not fill tank while engine is hot or running.
- C. Do not smoke while handling gasoline.
- D. Fill fuel tank outdoors and up to about one inch (25 mm) from top of the tank, not the filler neck.
- E. Wipe up any spilled gasoline.

WHILE OPERATING

9. Start engine when machine is on level ground and control bar is in neutral position.

10. Do not run the engine in a confined area without adequate ventilation. Exhaust fumes are hazardous and could possibly be deadly.

11. Using the machine demands attention, and to prevent loss of control:

- A. Mow only in daylight or when there is good artificial light.
- B. Watch for holes or other hidden hazards.
- C. Do not drive close to a sand trap, ditch, creek or other hazard.
- D. Reduce speed when making sharp turns and when turning on hillsides.

12. Do not operate unless grass deflector, Recycler cover or entire grass collector is installed. The grass deflector must always be installed and in down position on the side discharge cutting unit. This product is designed to drive objects into the ground where they lose energy quickly in grassy areas. **However, don't take an injury risk!!** 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 area is cleared.

13. Never raise the cutting unit while the blades are rotating.

14. If the cutting blades strike a solid object or the machine vibrates abnormally, shut the engine off. Remove wire from spark plug to prevent possibility of accidental starting. Check cutting unit and traction unit for damage and malfunctioning parts. Repair any damage before restarting the engine and operating the cutting unit. Be sure blades are in good condition and blade bolts are tight.

15. Cut grass slopes carefully. Do not start, stop, or turn suddenly.

16. Do not touch engine or muffler while engine is running or soon after it is stopped. These areas could be hot enough to cause a burn.

17. Before leaving the operator's position — behind handle or leaving mower unattended, park machine on a level surface, release control bail and control bar, shut OFF engine and remove key from ignition.

MAINTENANCE

18. Remove key and disconnect wire from spark plug(s) to prevent accidental starting of the engine when servicing, adjusting or storing the machine.

19. If traction unit and mower must be tipped to perform maintenance or an adjustment, drain gasoline from fuel tank, oil from crankcase and remove.

20. When operating unit, always use reference handle in conjunction with control bar to guide machine.

21. To reduce potential fire hazard, keep the engine free of excessive grease, grass, leaves and accumulations of dirt.

22. Be sure machine is in safe operating condition by keeping nuts, bolts and screws tight. Check the blade mounting bolts and nuts frequently to be sure they are tightened to specification.

23. If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing and other parts of the body away from the cutting unit blades and other moving parts.

SAFETY INSTRUCTIONS

24. Do not overspeed the engine by changing governor settings. To be sure of safety and accuracy, have an Authorized TORO Proline Service Dealer check maximum engine speed with a tachometer.

25. Make sure all hydraulic line connectors are tight, and all hydraulic hoses and lines are in good condition before applying pressure to the system.

26. Keep body and hands away from pin hole leaks in hydraulic lines that eject high pressure hydraulic fluid. Use cardboard or paper to find hydraulic leaks. Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid accidentally injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

27. Before disconnecting or performing any work on the hydraulic system, all pressure in system must be relieved by stopping engine.

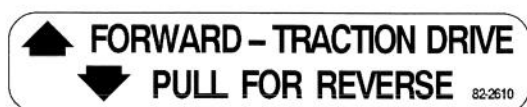
28. Engine must be shut off before checking oil or adding oil to the crankcase.

29. Allow engine to cool before storing mower in any enclosure such as a garage or storage shed. Make sure the mower fuel tank is empty if machine is to be stored in excess of 30 days. Do not store mower near any open flame or where gasoline fumes may be ignited by a spark. Always store gasoline in a safety-approved, red metal container.

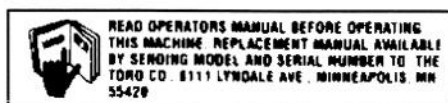
30. Perform only those maintenance instructions described in this manual. If major repairs are ever needed or assistance is desired, contact an Authorized Toro Proline Service Dealer. To ensure optimum performance and continued safety conformance of the machine, use genuine TORO replacement parts and accessories. Replacement parts and accessories made by other manufacturers may result in non-conformance with safety standards and could void the warranty.

SAFETY AND INSTRUCTION DECALS

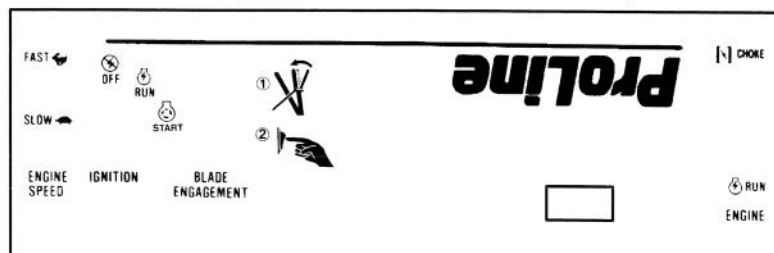
The following decals are installed on the machine. If any become damaged or illegible, replace it. The decal part number is listed below and in your parts catalog. Replacement can be ordered from your Authorized Toro Distributor.



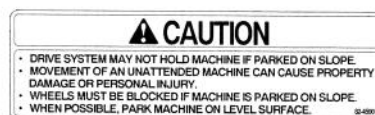
ON CONTROL BAR
(Part No. 82-2610)



ON CONTROL PANEL
(Part No. 65-3090)



ON CONTROL PANEL
(Part No. 82-7741)



ON UPPER HANDLE
(Part No. 82-4590)



ON CONTROL PANEL
(Part No. 71-1280)



ON OIL COOLER
(Part No. 74-0490)



ON RIGHT SIDE OF ENGINE
(Part No. 63-8440)

SPECIFICATIONS

20 hp Kohler Engine: four cycle, air cooled, electric start vertical shaft engine has output of 20 hp @ 3600 RPM and 32 ft-lb torque @ 2500 RPM. Displacement is 38.1 cubic inches. Crankcase oil capacity is 4 pints w/ filter and fuel tank capacity is 5 gallons. Correct spark plug is Champion RC 12YC or equivalent.

Frame: 11 ga. formed and welded steel box for lower frame, 1/4" x 4.0" formed upper frame and 1/4" x 5.0" formed steel motor support.

Handle: 1-1/4" dia., 14 ga. tubing bolted to rear frame. Height adjustable from 31" to 37" for operator comfort.

Controls: Throttle, choke, control bar, deck engagement control bail, deck engagement switch, ignition switch and hour meter are conveniently located for operator comfort.

Wheels and Tires: 6.5 x 15 pneumatic tires are mounted on welded steel wheels. Recommended tire pressure is 15 psi.

Fuel Tank Capacity: 5 Gallons.

Battery: 12 volt, lead acid, 32 amp hours.

Traction Drive: Hydraulic drive consisting of twin closed circuit systems. Each circuit consists of a Sundstrand BDP-10L axial piston pump and a 12 in³

TRW/Ross wheel motor to drive each wheel independently. The charge/cooling circuits of the two systems are combined at the pump case drains and flow through an oil cooler, expansion tank and filter.

Hydraulic Filter: 25 micron, spin on type.

Expansion Tank Capacity: 1.75 quarts.

Ground Speed @ 3200 Engine rpm:

Forward 0-6.3 mph

Reverse 0-2.3 mph

Deck Drive: Electromagnetic clutch.

Service Brakes: Hydraulic braking from pumps and motors.

Dimensions:

Width	33.5 in.
Height	44.5 in.
Length	43 in.
Handle end to axle	30.5 in.
Weight	375 lb.

Optional Accessories:

Sulky attachment, Model #30123

Specifications and design subject to change without notice.

LOOSE PARTS

NOTE: Use this chart as a checklist to assure all parts have been received. Without these parts, total set-up cannot be completed.

Description	Qty.	Use
Flange Capscrew 3/8 - 16 X 1" Lg.	2	Secure upper handle to frame
Flangenut 3/8-16	2	
Carriage Bolt	1	Secure reference handle to upper handle
Latch Spacer	1	
Handle Knob	1	
Bolt Retainer	1	
Flange Capscrew 1/2 - 13 X 1-1/4" Lg.	4	Replace (6) 1" lg. bolts supplied with deck
Flange Capscrew 1/2 - 13 X 1-3/4" Lg.	2	
Keys	2	Use in ignition switch
Battery	1	Install battery
Battery Holder	2	
Battery Strap	1	
Battery Support Rod	2	
Lock Nut 1/4-20	2	
Capscrew 5/16-18	2	
Locknut 5/16-18	2	
Terminal Boot	2	
Hydraulic Filter	1	Use for initial hydraulic filter change
Operator's Manual	1	Read before operating machine
Parts Catalog	1	Fill out and return to Toro
Registration Card	1	

SET-UP INSTRUCTIONS

INSTALL UPPER HANDLE

1. Rotate handle upward aligning mounting holes with holes in frame. Secure each side of handle to frame with a 3/8 -16 x 1" lg. flange capscrew and flange nut. Tighten all four handle mounting screws and nuts. Torque nuts to 20-25 ft-lb.

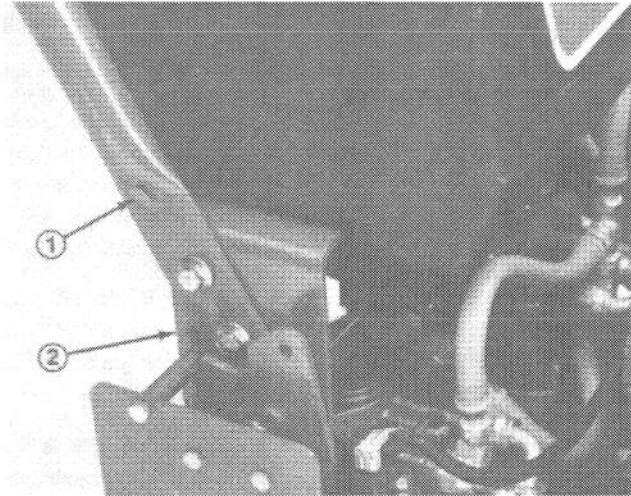


Figure 1

- 1. Handle
- 2. Frame

INSTALL WHEELS

1. Mount wheels to wheel motor hubs with lug nuts (4 Each). Torque nuts to 50-70 ft-lb.

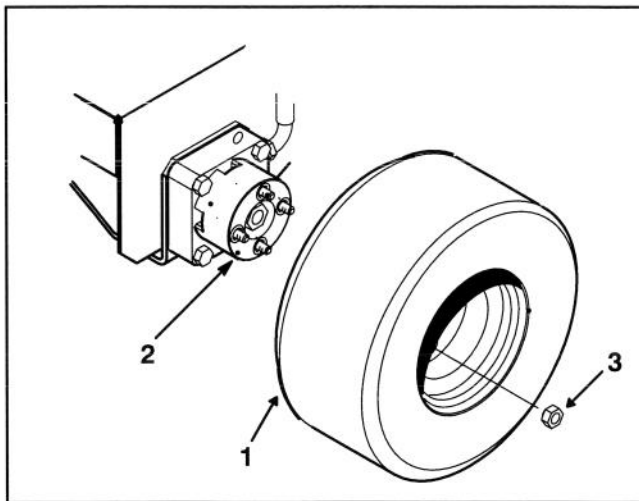


Figure 2

- 1. Wheel
- 2. Hub
- 3. Lug nut

CHECK TIRE PRESSURE

Tires are over inflated at the factory. Check tires and insure they are inflated to 15 psi.

INSTALL CONTROL RODS

1. Mount control rod fitting ends to mounting holes in pivot assemblies (from outside) with clevis pins, washers and hairpin cotters.

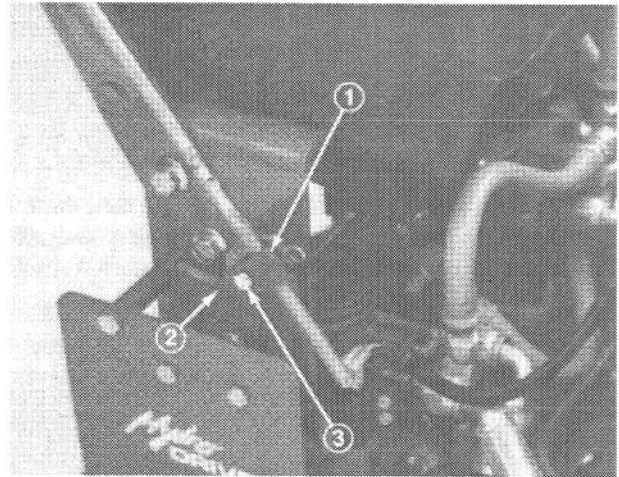


Figure 3

- 1. Control rod fitting
- 2. Pivot assembly
- 3. Clevis pin, washer & hairpin cotter

2. Upon completion of set up, check to make sure machine tracks straight when pushing control bar forward. If machine moves to one side or the other when pushing control bar straight ahead, an adjustment to one of the control rods is required. Proceed to next step for adjustment procedure.

3. On the side of machine to which machine turned, remove hairpin cotter and washer securing end of control rod to upper control bar, thread rod out of rod fitting to desired position and reinstall to control bar with washer and hairpin cotter. Check operation and repeat procedure until machine moves in straight direction.

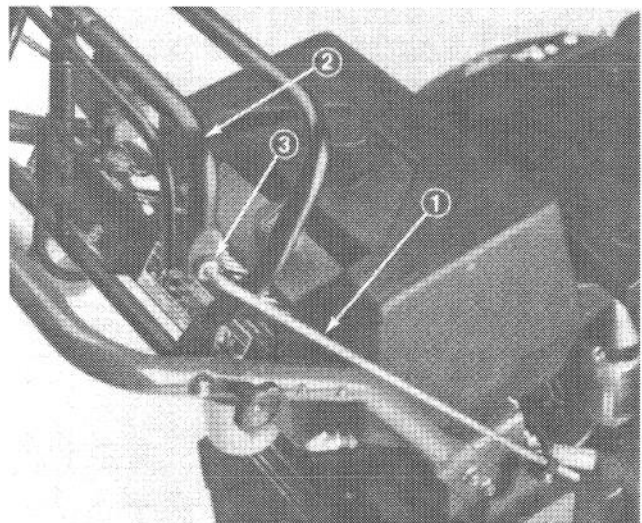


Figure 4

- 1. Control rod
- 2. Control bar
- 3. Washer & hairpin cotter

SET-UP INSTRUCTIONS

SECURE REFERENCE HANDLE

1. Pivot reference handle upward until slot in bracket is aligned with thru holes in handle.
2. Loosely secure handle assembly bracket to upper handle with a carriage bolt, latch spacer, handle knob and bolt retainer as shown in fig. 5.

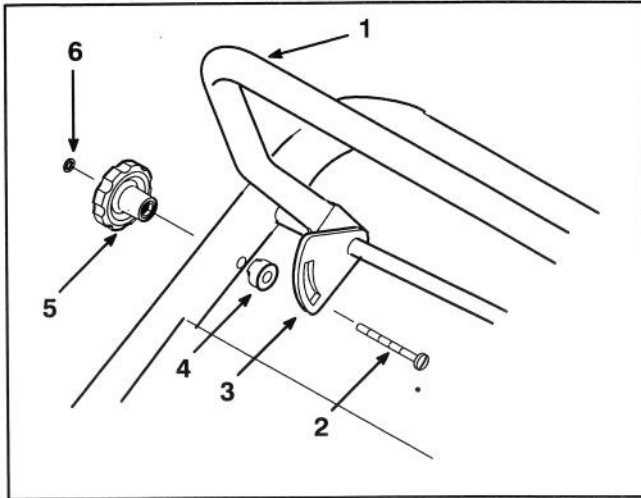


Figure 5

- | | |
|---------------------|------------------|
| 1. Reference handle | 4. Latch spacer |
| 2. Carriage bolt | 5. Handle knob |
| 3. Handle bracket | 6. Bolt retainer |

INSTALL BATTERY

1. Mount battery holder and cutting unit carrier frame at the same time to upper holes on right side of traction unit. Use (2) 1/2-13 x 1-1/4" lg. flange head cap-screws and lock nuts (Fig. 6).
2. Fill battery with electrolyte and charge, refer to ACTIVATING AND CHARGING BATTERY, page 8.

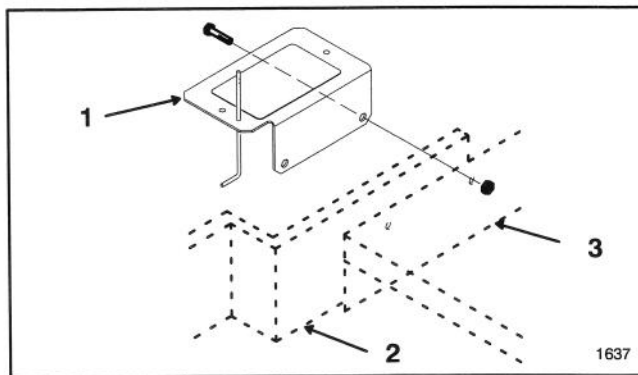


Figure 6

1. Battery holder
2. Carrier frame
3. Traction frame

3. Position battery onto holder with terminal posts away from the engine (Fig. 7).
4. Slide the red terminal boot onto the red battery cable and the black terminal boot onto the the black battery cable.
5. Install the positive (red) battery cable to positive (+) battery terminal and the negative battery cable to the negative (-) battery terminal and secure with carriage bolts and locknuts.
6. Mount battery to holder with (2) support rods, a battery clamp and (2) locknuts. Position support rods in mounting holes (Fig. 7). Tighten locknuts so battery is held securely in position and will not slide. **DO NOT OVERTIGHTEN.**
7. Slide vent tube through hole, next to support rod, in battery holder.

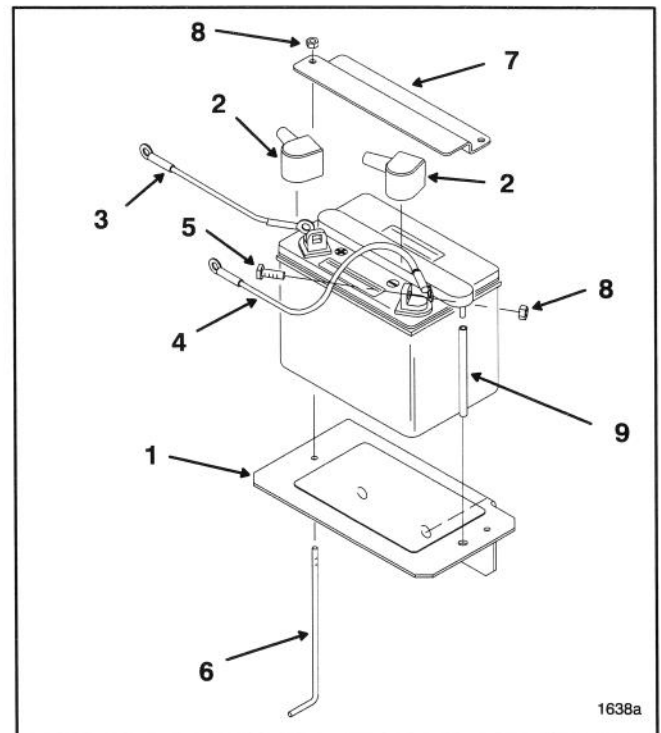


Figure 7

- | | |
|---------------------------|------------------------|
| 1. Battery holder | 5. Carriage bolt |
| 2. Terminal boot | 6. Battery support rod |
| 3. Positive battery cable | 7. Battery clamp |
| 4. Negative battery cable | 8. Lock nut |
| | 9. Vent tube |

BEFORE OPERATING

ACTIVATE AND CHARGE BATTERY (12 VOLT)

Since battery is not filled with electrolyte or activated, the battery, if you have not already done so, must be removed from the machine so it can be filled with electrolyte and charged. Bulk electrolyte with 1.260 specific gravity must be purchased from a local battery supply outlet. Remove the battery and activate it as follows:



WARNING

Electrolyte gases are explosive and can cause serious injury to eyes, lungs and skin. Wear safety goggles and rubber gloves when working with electrolyte or battery. Charge the battery in a well ventilated place so gasses produced while charging can dissipate. Since the gases are explosive, keep open flames and electrical spark away from the battery; do not smoke. Nausea may result if the gases are inhaled. Unplug charger from electrical outlet before connecting to or disconnecting charger leads from battery posts.

1. Remove filler cap from battery and slowly fill each cell until electrolyte is just above the plates. To obtain best results, let battery set for 20 minutes. Add electrolyte to the maximum capacity
2. Leave filler cap off and connect a 3 to 4 amp battery charger to the battery posts. Charge the battery at a rate of 4 amperes or less for 4 hours.
3. When battery is charged, disconnect charger from electrical outlet and battery posts.
4. Slowly add electrolyte to each cell until level is up to fill ring. Install filler cap.

IMPORTANT: Do not overfill battery. Electrolyte will overflow onto other parts of the machine and severe corrosion and deterioration will result.

CHECK ENGINE OIL LEVEL

The Kohler engine is shipped from the factory with 4 pints of 10W-30 oil in the crankcase, however check level of oil before starting engine and after every 5 hours of operation. Maintain oil level at FULL mark on dipstick.

Check oil before each use as follows:

1. Make sure the engine is stopped, level and is cool so the oil has had time to drain into the sump.
2. Clean area around the oil fill cap/dipstick before removing it. This will help keep dirt, grass clippings, etc., out of the engine.
3. Un-thread and remove the oil fill cap/dipstick; wipe oil off. Reinstall the dipstick into the tube and rest the oil fill cap on the tube. Do not thread the cap onto the tube (Fig. 8).
4. Remove dipstick and check oil level. The level should be between the FULL and ADD marks. If low, add oil of proper type up to the FULL mark. Reinstall the oil fill cap/dipstick and thread tight (Fig. 8).

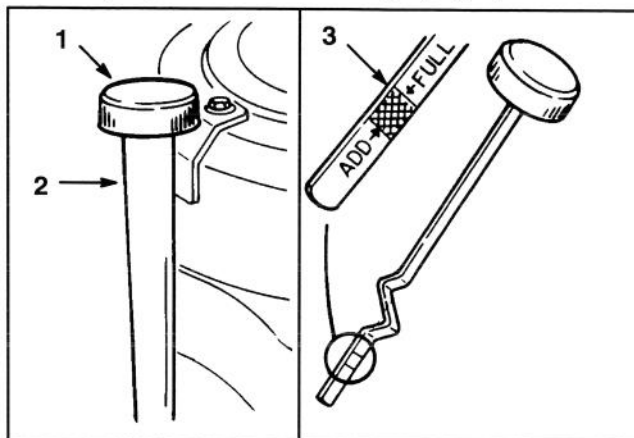


Figure 8

1. Dipstick
2. Fill tube
3. Oil level

5. Use any high quality detergent oil having the American Petroleum Institute - API - "service classification" SF, SG or SH. Oil viscosity (weight) must be selected according to anticipated ambient temperature:
 - A. Above 32° F (0° C) – Use SAE 10W-30 or 10W-40
 - B. Below 32° F (0° C) – Use 5W-20 or 5W-30

Slowly pour oil into the filler neck

6. Check oil level. **DO NOT ADD OIL SO LEVEL RISES ABOVE "FULL" MARK BECAUSE ENGINE COULD BE DAMAGED WHEN IT IS STARTED.**
7. Remove dipstick and check oil level. The level should be between the FULL and ADD marks. If low, add oil of proper type up to the FULL mark. Reinstall the oil fill cap/dipstick and thread tight (Fig. 8).

Note: Check level of oil after every 5 operating hours or each time the mower is used. Initially, change oil after the first 5 hours of operation; thereafter, when conditions are normal, change oil after every 25 hours of operation. However, change oil more frequently when mower is operated in dusty or dirty conditions.

BEFORE OPERATING

CHECK HYDRAULIC OIL

The hydraulic system is designed to operate on Mobil DTE 26 or equivalent anti-wear hydraulic fluid. The machine's expansion tank is filled at the factory with approximately 1-3/4 quarts of fluid.

Check hydraulic oil before initial starting

IMPORTANT: Change hydraulic oil filter initially after the first 5 hours of operation, thereafter change filter after every 250 hours of operation. Do not substitute automotive oil filter or severe hydraulic system damage may result.

IMPORTANT: Use only hydraulic oils specified. Other fluids could cause system damage.

1. Position machine on a level surface and stop the engine.
2. Clean area around filler neck and cap of hydraulic tank. Remove cap from filler neck.



Figure 9

1. Hydraulic Tank Cap
2. Fuel Tank Cap

3. Remove dipstick from filler neck and wipe it with a clean rag. Insert dipstick and make sure it is seated all the way into filler neck; then remove it and check level of fluid. Fluid level should be in between marks on dipstick.

4. If level is low, add Mobil DTE 26 or equivalent fluid to raise level to full mark.

Hydraulic Oil (Recommended brands):

Mobil	DTE 26
Shell	Tellus 68
Amoco	Rykon Oil 68
Conoco	Super Hydraulic Oil 68
Exxon	Nuto 68
Kendall	Kenoil R&O AW 68
Pennzoil	Penreco 68
Phillips	Magnus A 68
Standard	Energol HLP 68
Sun	Sunvis 831 WR
Union	Unax AW 68
Chevron	AW Hydraulic Oil 68

Note: All are interchangeable.

5. Install dipstick and cap onto filler neck.

BEFORE OPERATING

FILL FUEL TANK WITH GASOLINE

THE TORO COMPANY STRONGLY RECOMMENDS THE USE OF FRESH CLEAN, UNLEADED REGULAR GRADE GASOLINE IN TORO GASOLINE POWERED PRODUCTS. UNLEADED GASOLINE BURNS CLEANER, EXTENDS ENGINE LIFE, AND PROMOTES GOOD STARTING BY REDUCING THE BUILD-UP OF COMBUSTION CHAMBER DEPOSITS.

NOTE: NEVER USE METHANOL, GASOLINE CONTAINING METHANOL, GASOLINE CONTAINING MORE THAN 10% ETHANOL, GASOLINE ADDITIVES, PREMIUM GASOLINE, OR WHITE GAS BECAUSE ENGINE FUEL SYSTEM DAMAGE COULD RESULT.

1. Clean area around fuel tank cap and remove cap from tank.
2. Fill fuel tank to about 1 inch from top of the tank, not filler neck. Install fuel tank cap securely.
3. Wipe up spilled gasoline.



DANGER

Because gasoline is flammable, caution must be used when storing or handling it. Do not fill fuel tank while engine is running, hot or when machine is in an enclosed area. Vapors may build up and be ignited by a spark or flame source many feet away. DO NOT SMOKE while filling the fuel tank to prevent the possibility of an explosion. Always fill fuel tank outside and wipe up any spilled gasoline before starting engine. Use a funnel or spout to prevent spilling gasoline before starting engine and fill tank to about 1 inch from top of tank, not filler neck. Store gasoline in a clean safety-approved container and keep the cap in place on the container. Keep gasoline in a cool, well-ventilated place; never in an enclosed area such as a hot storage shed. To assure volatility, do not buy more than a 30 day supply of gasoline. Gasoline is a fuel for internal combustion engines; therefore, do not use it for any other purpose. Since many children like the smell of gas, keep it out of their reach because the fumes are explosive and dangerous to inhale.

CONTROLS

Throttle Control (Fig. 9) – The throttle control has two positions: FAST and SLOW.

Choke Control (Fig. 9) – The choke control has two positions: CHOKE and RUN.

Deck Engagement Control Bail (Fig. 9) – Control bail used in conjunction with deck engagement switch to release blade brake and engage electromagnetic clutch to drive deck pulleys. Release bail to disengage deck pulleys.

Deck Engagement Switch (Fig. 9) – Rocker switch used in conjunction with control bail to release blade brake and engage electromagnetic clutch to drive deck pulleys.

Hour Meter (Fig. 9) – Shows total hours that machine has been operated. Only operates with ignition key in "ON" position.

Upper Control Bar (Fig. 9) – Push forward on control bar to engage forward traction operation and pull back to engage reverse traction operation. Push right side of control bar to turn left and left side to turn right.

Reference Handle (Fig. 9) – Limits forward travel of control bar to pre-set position to help maintain desired ground speed and direction of travel.

Ignition Switch (Fig. 9) – Switch is part of battery ignition system and it has three positions: OFF, RUN and START. Key automatically returns to RUN position from position when released after engine starts.

Fuel Shut-off Valve – (Under fuel tank) Close fuel shut-off valve when transporting or storing mower.

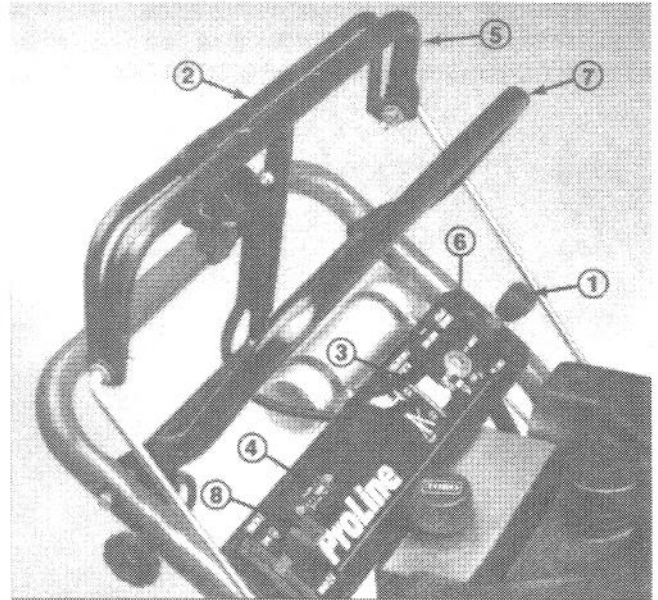


Figure 10

- | | |
|---------------------------------|----------------------|
| 1. Throttle control | 5. Upper control bar |
| 2. Deck engagement control bail | 6. Ignition switch |
| 3. Deck engagement switch | 7. Reference handle |
| 4. Hour meter | 8. Choke control |

OPERATING INSTRUCTIONS

STARTING AND STOPPING

1. Make sure spark plug wires are installed on spark plug and fuel valve is open.
2. Turn ignition key to RUN position.
3. Move throttle control to half throttle.
4. Move choke control to CHOKE position before starting a cold engine.

Note: A warm or hot engine usually does not require as much choking.

5. Rotate ignition key to START. When engine starts, release key, gradually move choke to run and regulate throttle to desired speed.

IMPORTANT: To prevent overheating of the starter motor, do not engage starter longer than 10 seconds. After 10 seconds of continuous cranking, wait 60 seconds before engaging starter motor again.

6. Loosen reference handle knob, adjust handle to desired position and tighten knob.

7. To engage blade, squeeze deck engagement control bail against upper control bar and press rocker switch forward. Hold control bail against control bar while operating. Releasing control bail disengages deck pulleys. Repeat procedure to engage deck pulleys if control bail is released.

8. To stop engine, release control bail and control bar, move throttle to SLOW and turn ignition key to OFF. Wait for all parts to stop moving before leaving the operating position behind handle.

9. Pull wire off spark plug to prevent possibility of accidental starting before storing machine.

10. Close fuel shut off valve before storing machine.

CAUTION: Make sure fuel shut off valve is closed before transporting or storing machine, as fuel leakage may occur.

OPERATING INSTRUCTIONS

PUSHING MACHINE

In an emergency the machine can be pushed for a very short distance.

1. Locate by-pass valves on each pump.

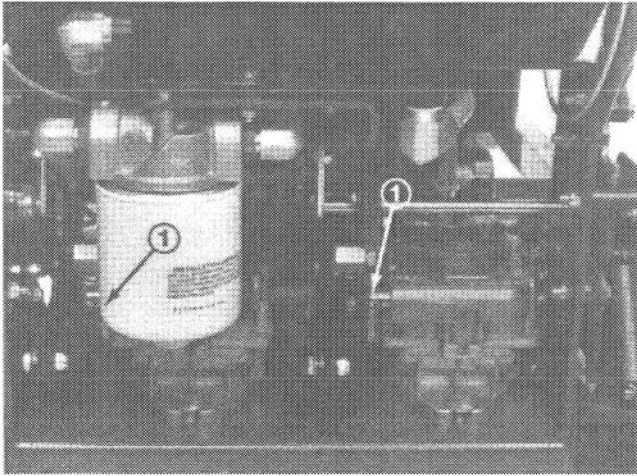


Figure 11

1. By-pass valve

2. Rotate each valve 1/2 to 3/4 turn counterclockwise.
3. Move machine to desired location and close each valve.

CHECK TRACTION DRIVE

1. Start machine. Refer to Starting and Stopping, page 10.
2. Slowly move control bar forward, both wheels should drive evenly. If one or both wheels do not drive, refer to Bleeding Hydraulic System, page 13.
3. Machine should drive straight when control bar is held against reference handle. If machine does not drive straight, refer Install Control Rods, page 6.
4. While in drive position, release control bar allowing it to return to the neutral position. Machine should stop and not creep. If machine does not stop or creeps, refer to Neutral Adjustment, page 14.

CHECK INTERLOCK SYSTEM

The purpose of the safety interlock system is to prevent the engine from cranking or starting unless the control bar is in NEUTRAL. Check operation of the switches daily to assure interlock system is operating.

To check interlock system:

1. Position machine on a flat, open area.
2. Push control bar full forward.
3. Rotating the ignition key to the START position. Slowly move control bar back to neutral. Starter should not engage until control bar is within 5° of neutral position. If engine cranks, the interlock system is malfunctioning and must be repaired by an Authorized TORO Proline Service Dealer. If engine does not crank, the interlock system is functioning correctly, proceed to step 4.
4. With engine running and control bar in neutral position, squeeze control bail against control bar (Do not press deck engagement switch), deck pulleys must not engage. If the interlock system is malfunctioning and must be repaired by an Authorized TORO Proline Service Dealer. If deck pulleys do not engage, the interlock system is functioning correctly, proceed to step 4.
5. With engine running and control bar in neutral position, press deck engagement switch (Do not squeeze control bail against control bar), deck pulleys must not engage. If deck pulleys engage, the interlock system is malfunctioning and must be repaired by an Authorized TORO Proline Service Dealer. If deck pulleys do not engage, the interlock system is functioning correctly, proceed to step 5.
6. With engine running, control bar in neutral position and deck pulleys engaged, release control bail. Deck pulleys must disengage. If deck pulleys do not disengage, the interlock system is malfunctioning and must be repaired by an Authorized TORO Proline Service Dealer. If deck pulleys disengage, the interlock system is functioning correctly.



CAUTION

THE INTERLOCK SWITCHES ARE FOR THE OPERATOR'S PROTECTION, SO DO NOT DISCONNECT THEM. CHECK OPERATION OF THE SWITCHES DAILY TO ASSURE INTERLOCK SYSTEM IS OPERATING. IF A SWITCH IS DEFECTIVE, REPLACE IT BEFORE OPERATING. REPLACE SWITCHES EVERY TWO YEARS TO ASSURE MAXIMUM SAFETY. DO NOT RELY ENTIRELY ON SAFETY SWITCHES – USE COMMON SENSE!

MAINTENANCE



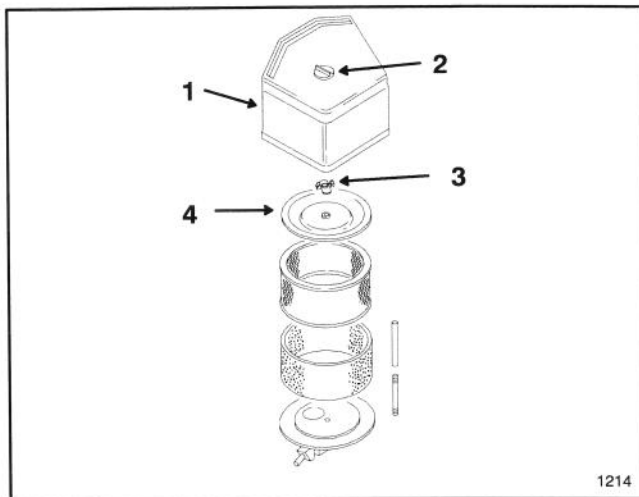
CAUTION

To prevent accidental starting of the engine while performing maintenance, shut engine off. Also, pull wires off spark plugs. Make sure wires do not contact plugs accidentally.

SERVICING AIR CLEANER

The foam pre-cleaner must be cleaned and re-oiled after every 25 hours of engine operation if engine is operated in clean air conditions. However, air cleaner must be cleaned every few hours if operating conditions are extremely dusty or sandy.

1. Remove knob and cover (Fig. 12). Remove wing nut and element cover.



1. Cover
2. Knob

3. Wing nut
4. Element cover

Figure 12

2. Carefully slide foam pre-cleaner off the paper element (Fig. 13).

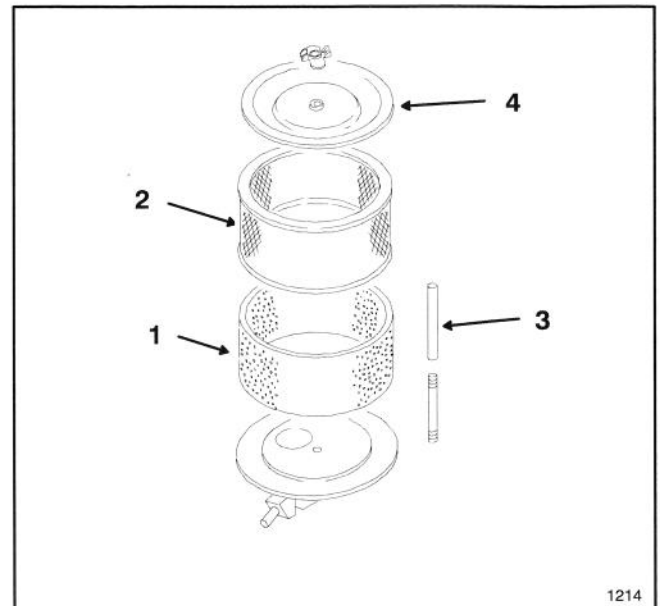


Figure 13

1. Foam pre-cleaner
2. Paper element
3. Rubber seal
4. Element cover

3. a. Wash foam pre-cleaner in detergent and warm water.
b. Rinse the pre-cleaner thoroughly until all traces of detergent are eliminated. Squeeze out excess water (do not wring). Air dry.
c. Saturate foam pre-cleaner in engine oil. Squeeze to remove excess oil.
4. Reinstall foam pre-cleaner on paper element.

Inspect paper element every 50 hours of operation and replace when dirty or damaged. Do not wash paper element or do not clean with compressed air as damage will occur.

Note: With air cleaner disassembled, check air cleaner components for damage. Replace if necessary. Make sure rubber seal is on shaft or severe engine damage may occur.

5. Reinstall paper element with pre-cleaner, rubber seal, element cover and wing nut
6. Tighten wing nut 1/2 to 1 turn after nut contacts cover. Do not overtighten. Install air cleaner cover and knob.

IMPORTANT: Always operate engine with air cleaner element in place or engine damage will result.

MAINTENANCE

CHANGING ENGINE OIL AND FILTER

1. Check level of oil before starting engine and after every 5 hours of operation. Maintain oil level at FULL mark on dipstick.

Check oil level before each use as follows:

2. Make sure the engine is stopped, level and is cool so the oil has had time to drain into the sump.
3. Clean area around the oil fill cap/dipstick before removing it. This will help keep dirt, grass clippings, etc., out of the engine.
4. Un-thread and remove the oil fill cap/dipstick; wipe oil off. Reinstall the dipstick into the tube and rest the oil fill cap on the tube. Do not thread the cap onto the tube.
5. Remove dipstick and check oil level. The level should be between the FULL and ADD marks. If low, add oil of proper type up to the FULL mark. Reinstall the oil fill cap/dipstick and thread tight.
6. Change oil after first 5 hours of operation; every 25 hours thereafter. Change oil more frequently when operating conditions are extremely dusty or dirty.

To change oil:

1. Position mower on level surface. Start and run engine for a period to warm the oil.
2. Turn engine off and place drain pan under frame, below drain plug (Fig. 14). Remove drain plug and allow all oil to flow into drain pan. Install drain plug after oil stops flowing.
3. Remove dipstick and add oil to crankcase. Refer to FILL CRANKCASE WITH OIL, page 10. Capacity of crankcase is 4 pints when changing filter, 3 pints when changing oil only. DO NOT OVERFILL or engine damage may result.
4. Change the oil filter every other oil change. To change filter:

To change filter:

1. Drain the oil from the engine crankcase, refer To Change Oil, page 15.

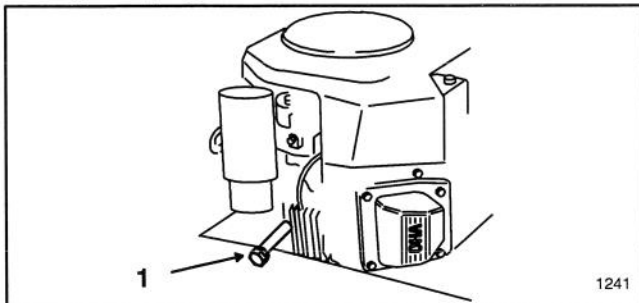


Figure 14
1. Drain plug

2. Remove old filter and wipe off the filter adapter.
3. Apply a thin coating of new oil to the rubber gasket on the new oil filter.
4. Install the new oil filter to the filter adapter. Tighten oil filter clockwise until the rubber gasket contacts the filter adapter, then tighten the filter an additional 1/4 turn. Fill the crankcase with new oil (4 pints). Refer to FILL CRANKCASE WITH OIL, page 10.

FUEL FILTER REPLACEMENT

An in-line filter is incorporated into the fuel line between the fuel tank and carburetor (Fig. 15). Use the following procedures should replacement become necessary:

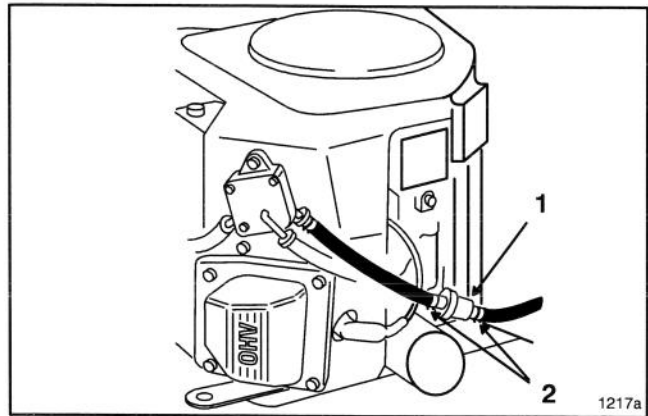


Figure 15

1. Fuel filter
2. Hose clamps

1. Close fuel shut off valve, loosen the hose clamp on the carburetor side of filter and remove the fuel line from the filter.
2. Place a drain pan under filter, loosen the remaining hose clamp and remove filter.



CAUTION

Since gasoline is highly flammable, drain it outdoors and make sure engine is cool to prevent a potential fire hazard. Wipe up any gasoline that may have spilled. Do not drain gasoline near any open flame or where gasoline fumes may be ignited by a spark. Do not smoke a cigar, cigarette, or a pipe when handling gasoline.

3. Install the new filter with arrow on the filter body pointing towards the carburetor.

MAINTENANCE

REPLACING HYDRAULIC FILTER

Change hydraulic filter initially after the first 5 operating hours, thereafter change every 250 hours.

IMPORTANT: Do not substitute automotive oil filter or severe hydraulic system damage may result.

1. Position machine on a level surface, stop the engine, and remove key from ignition switch.
2. Clean area around filter mounting area. Place drain pan under filter and remove filter.

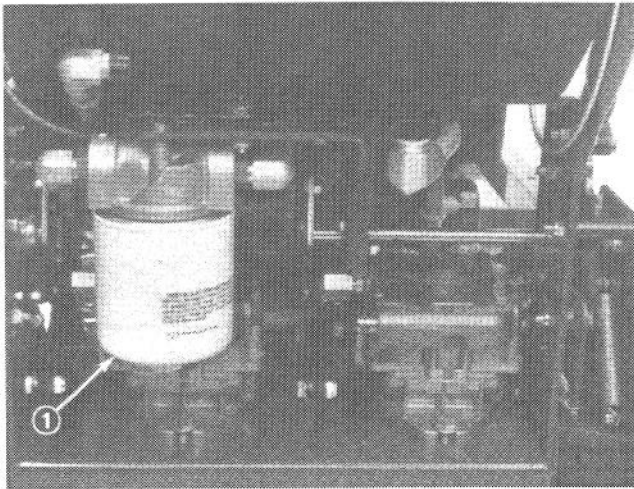


Figure 16

1. Hydraulic Filter

Note: Make sure oil is completely drained before installing new filter.

3. Lubricate new filter gasket and fill the filter with hydraulic oil.
4. Assure filter mounting area is clean. Screw filter on until gasket contacts mounting surface. Then tighten filter one-half turn.
5. Check level of oil and add enough to raise level to FULL mark on dipstick. DO NOT OVER FILL.
6. Start engine and let run for about two minutes to purge air from the system. Stop the engine and check for leaks. If one or both wheels will not drive, refer Bleeding Hydraulic System, page 13.
7. Recheck fluid level and add if necessary.

BLEEDING HYDRAULIC SYSTEM

Although the traction system is self bleeding, it may be necessary to bleed system if oil is changed or work on the system is necessary.

1. Raise the rear of machine until wheels are off the floor and support with jack stands.
2. Start the engine and run at idle speed. Engage traction on one side and spin the wheel by hand.
3. When the wheel begins to spin on its own, keep it engaged until both wheels drive smoothly. (2 minute minimum)
4. Check hydraulic fluid level as it drops and add as required to maintain level.
5. Repeat procedure on opposite wheel.

CHECKING HYDRAULIC LINES AND HOSES

After every 100 operating hours, check hydraulic lines and hoses for leaks, kinked lines, loose mounting supports, wear, loose fittings, weather deterioration and chemical deterioration. Make all necessary repairs before operating.



WARNING

Keep body and hands away from pin hole leaks or nozzles that eject high pressure hydraulic fluid. Use cardboard or paper to find hydraulic leaks. Hydraulic fluid escaping under pressure can penetrate skin and cause injury. Fluid accidentally injected into the skin must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

MAINTENANCE

NEUTRAL ADJUSTMENT

If either wheel creeps when control bar is in the neutral position an adjustment is required.

1. Raise the rear of machine until wheels are off the floor and support with jack stands.
2. Start the engine and run at 3/4 throttle until hydraulic fluid is warm.
3. If either wheel rotates on it own, loosen the bolt and while holding the outer linkage bracket still rotate the inner pump bracket either direction until wheel rotation stops, then tighten bolt.
4. Repeat procedure on opposite wheel, if required.

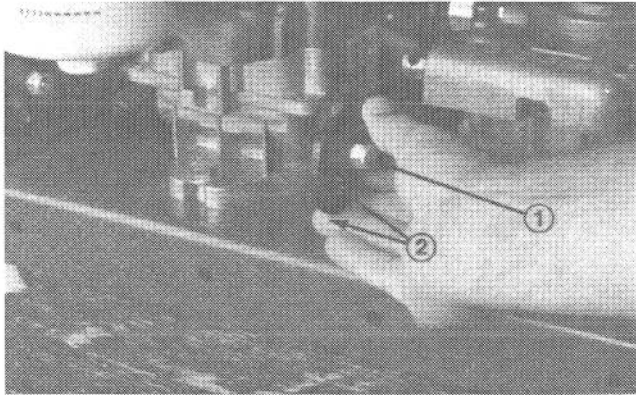


Figure 17

1. Bolt 2. Brackets

REPLACING SPARK PLUG

Since air gap between center and side electrodes of the spark plug increases gradually during normal operation of the engine, check condition of electrodes after every 25 operating hours. Recommended air gap is 0.040 of an inch (0.102 mm). Correct spark plug to use is a Champion RC-12YC or equivalent.

Note: The spark plug usually lasts a long time; however, the plug should be removed and checked whenever the engine malfunctions.

1. Clean area around spark plug so foreign matter cannot fall into cylinder when spark plug is removed.
2. Pull spark plug wire off spark plug and remove plug from cylinder head.
3. Check condition of side electrode, center electrode, and center electrode insulator to assure there is no damage.

IMPORTANT: A cracked, fouled, dirty or otherwise malfunctioning spark plug must be replaced. Do not sand blast, scrape, or clean electrodes by using a wire brush because grit may eventually release from the plug and fall into the cylinder. The result is usually a damaged engine.

4. Set air gap between center and side of electrodes at 0.040 of an inch (0.102 mm) (Fig. 18). Install correctly gapped spark plug w/gasket seal, and tighten plug to 20 ft.-lb. (27 N.m). If torque wrench is not used, tighten plug firmly.

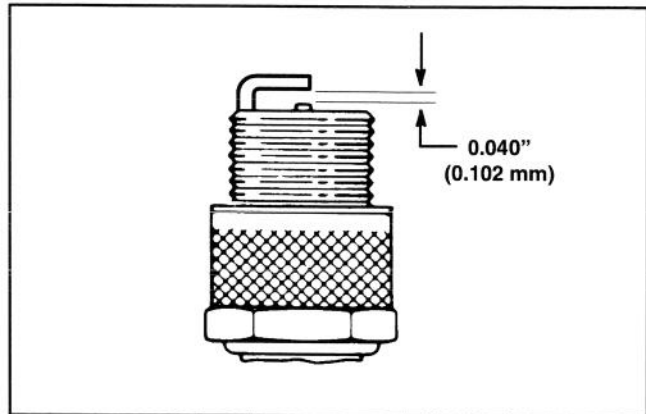


Figure 18

MAINTENANCE

ADJUSTING CARBURETOR

The carburetor is designed to deliver the correct fuel-air mixture to the engine under all operating conditions. The main fuel jet is calibrated at the factory and is not adjustable. The idle fuel adjusting needle is also set at the factory and normally does not need adjustment. If, however, the engine is hard starting or does not operate correctly at idle speeds, it may be necessary to adjust the idle fuel needle.

IMPORTANT: Before the carburetor is adjusted, the air cleaner must be clean, and throttle and choke controls must be checked for proper operation: refer to **Servicing Air Cleaner**, page 14 and **Adjusting Throttle and Choke Controls**, page 16.

1. **Idle Fuel Adjusting Needle** (Fig. 19) - Close needle by gently rotating it clockwise.

IMPORTANT: Do not close the needle too tight because the needle and seat in carburetor will likely be damaged.

2. Rotate - open - the needle 1 turn counterclockwise (Fig. 19).

3. Start engine and let it run at half throttle for approximately five to ten minutes to warm up.



WARNING

Engine must be running so final adjustment of the carburetor can be performed. To guard against possible personal injury, shift into neutral, and engage parking brake. Keep hands, feet, face, and other parts of the body away from the cutter blades, underside of mower housing, discharge area, and any rotating engine parts.

4. **Idle Speed Setting** - Move the throttle control to SLOW setting. Set the idle speed to 1500 rpm \pm 75 RPM by turning the idle speed adjusting screw in or out (Fig. 19). Check speed with a tachometer.

5. **Final Setting Idle Fuel Needle** - Move the throttle control to the slow position. Turn the idle fuel adjusting needle out (counterclockwise) until the engine speed decreases (rich). Note position of the needle.

Now turn the adjusting needle in (clockwise). The engine speed may increase, then it will decrease as the needle is turned in (lean). Note position of the needle.

Set the needle midway between the rich and lean settings.

6. Recheck idle speed using a tachometer.
- 3200 \pm 100 - High Idle
- 1500 \pm 100 - Low Idle

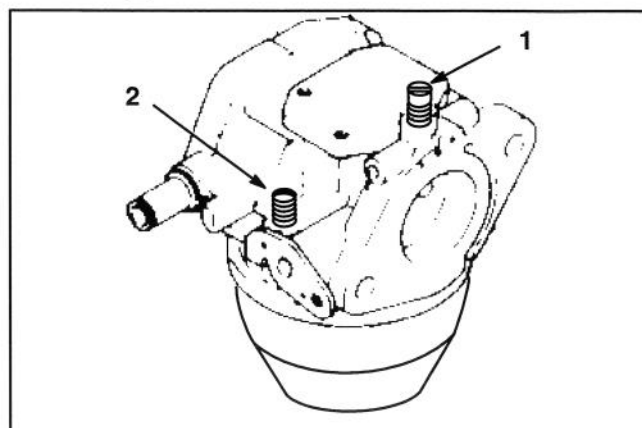


Figure 19

1. Idle fuel adjusting needle
2. Idle speed adjusting screw

ADJUSTING THROTTLE CONTROL

Proper throttle operation is dependent upon proper adjustment of throttle control. Before adjusting the carburetor, assure the throttle control is operating properly.

1. Loosen cable clamp screw securing cable to engine (Fig. 20).
2. Position remote engine speed control lever rearward until there is approximately 1/8" between lever and rear end of slot in control base.
3. Push firmly on engine speed control cable until governor arm contacts stop and tighten cable clamp screw (Fig. 20).

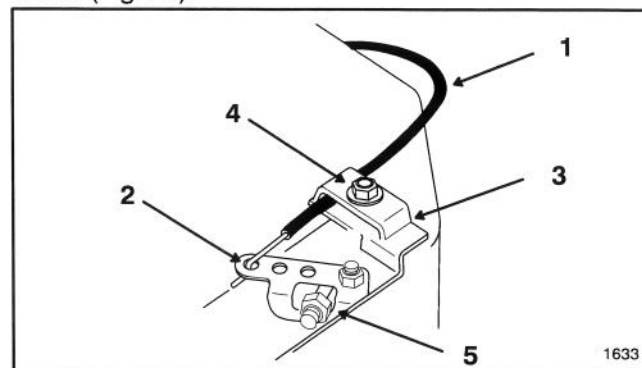


Figure 20

1. Engine speed control cable
2. Last hole in governor arm
3. Cable clamp
4. Cable clamp screw
5. Stop

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MAINTENANCE

ADJUSTING CHOKE CONTROL

1. Position remote choke control until there is approximately 1/8" between lever and rear end of slot in control base.
2. Loosen cable clamp screw securing cable to engine.
3. Push firmly on choke cable until choke lever is in the full open position. Tighten cable clamp screw (Fig. 21).
4. Secure choke cable to lift ring, on right side of engine, and handle, just above fuel tank bracket, with cable ties (Fig. 21).

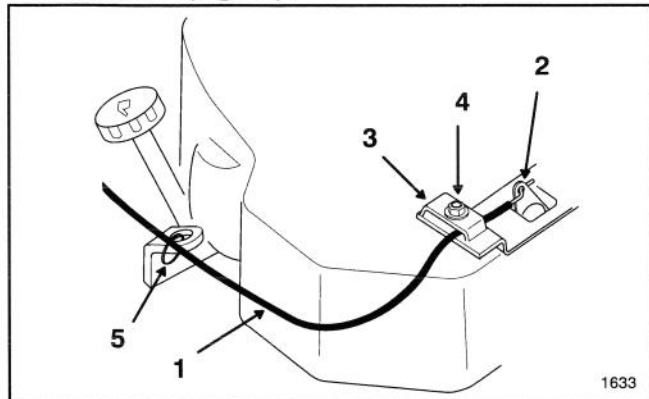


Figure 21

- | | |
|----------------|----------------------|
| 1. Choke cable | 4. Cable clamp screw |
| 2. Choke lever | 5. Cable tie |
| 3. Cable clamp | |

REPLACING TRACTION BELT

1. Slide belt off idler pulley.
2. Remove left front engine mounting bolt securing clutch retainer to frame. Unhook retainer from clutch and remove retainer.
3. Disconnect in-line wire connector and remove belt from idler pulley.
4. Unhook idler pulley spring from side of machine.
5. Remove belt from clutch and drive pulleys.

6. Install new belt around clutch and drive pulleys.
7. Secure in-line connectors and reinstall clutch retainer to clutch and frame with engine mounting bolt. Torque engine mounting bolt to 170–220 in-lb.

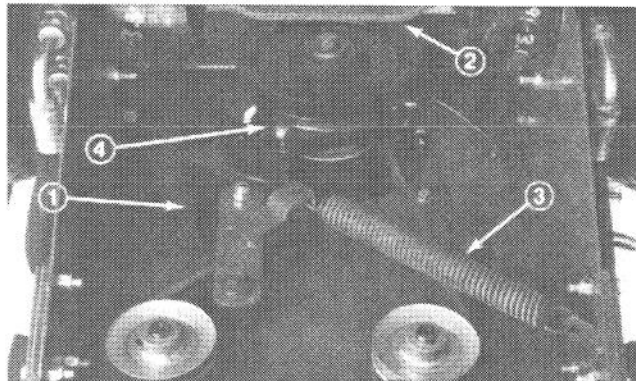


Figure 22

- | |
|---------------------------|
| 1. Idler pulley |
| 2. Clutch retainer |
| 3. Spring |
| 4. Locknut on flange stud |

8. Route belt around clutch and drive pulleys.
9. Reinstall idler spring.
10. Reinstall belt on idler pulley.

ADJUSTING ELECTRIC CLUTCH

The electric clutch is adjustable to ensure proper engagement.

1. To adjust clutch, tighten or loosen locknuts on flange studs.
2. Check adjustment by inserting feeler gauge thru slots next to flange studs.
3. The proper disengaged clearance between the clutch plates is .012 – .018 inches. It will be necessary to check this clearance at each of the three slots to ensure the plates are parallel to each other.

MAINTENANCE

CLEANING COOLING SYSTEM

Clean any build-up of grass, dirt or other debris from the engine and oil cooler frequently to help insure adequate cooling and correct engine operation and reduce the possibility of overheating and mechanical damage.

1. Removing Debris – Remove debris from engine area and oil cooler daily, clean more frequently in dirty conditions.

IMPORTANT: Do not allow debris to accumulate during operation. Stop machine, shut off engine and thoroughly clean off any buildup.

A. Turn engine off. Clean engine area thoroughly of all debris. Inspect area between cooler and screen and under side of cooler for debris. If debris is present proceed to next step.

B. Remove (4) screws securing oil cooler to top of engine.

C. Clean both sides of oil cooler thoroughly with compressed air. Pivot oil cooler back into position and secure with screws.

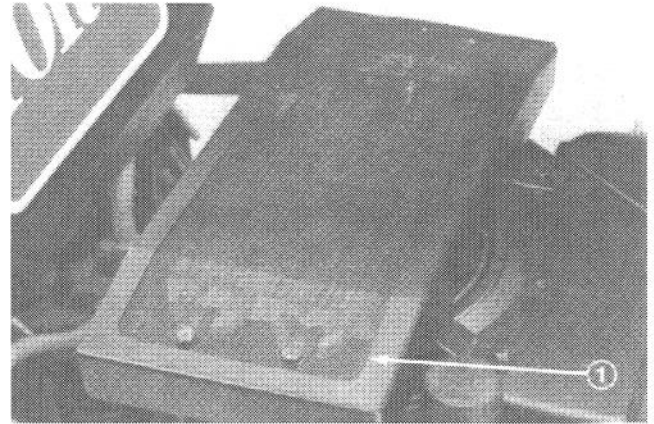
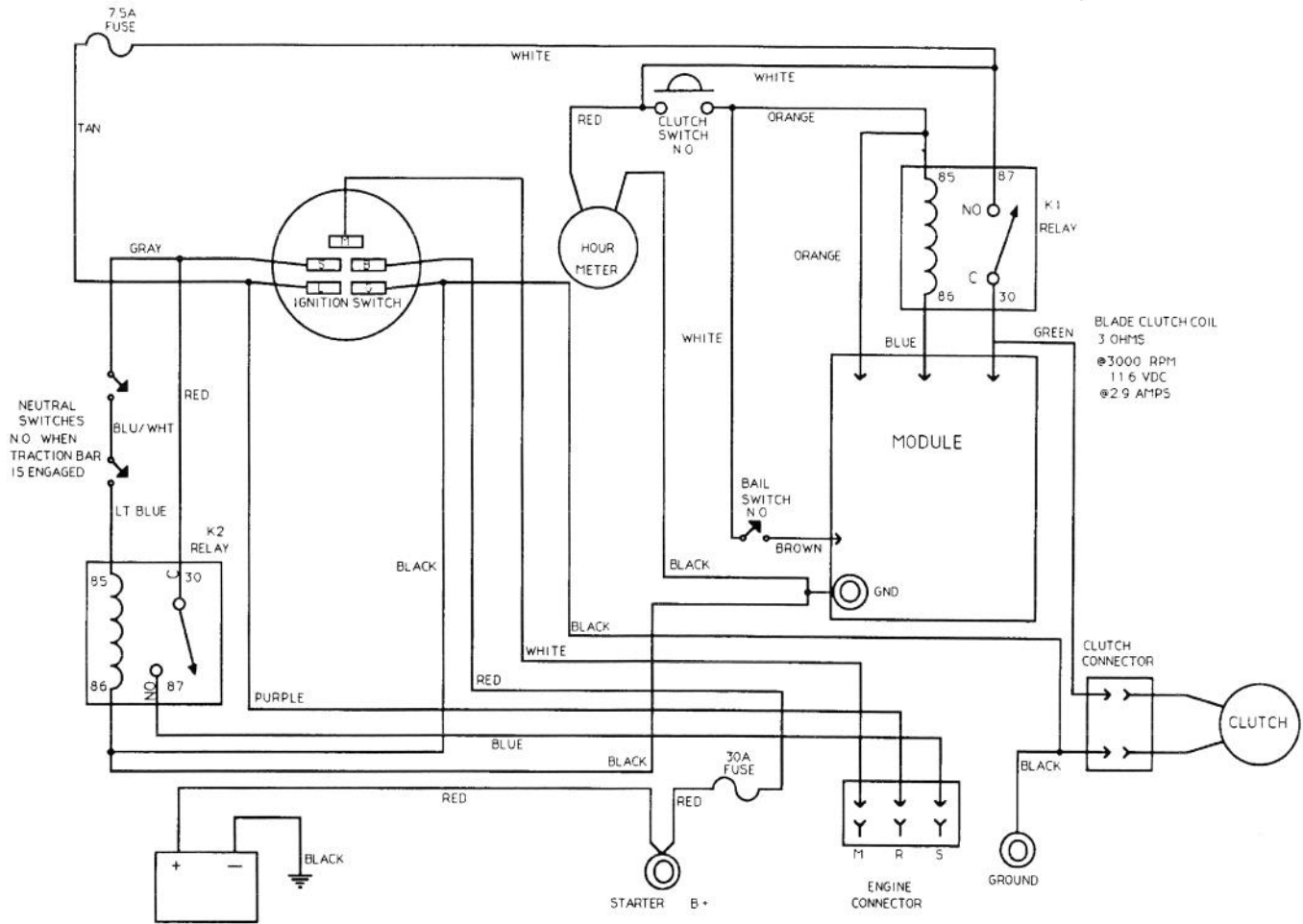


Figure 23

1. Oil cooler

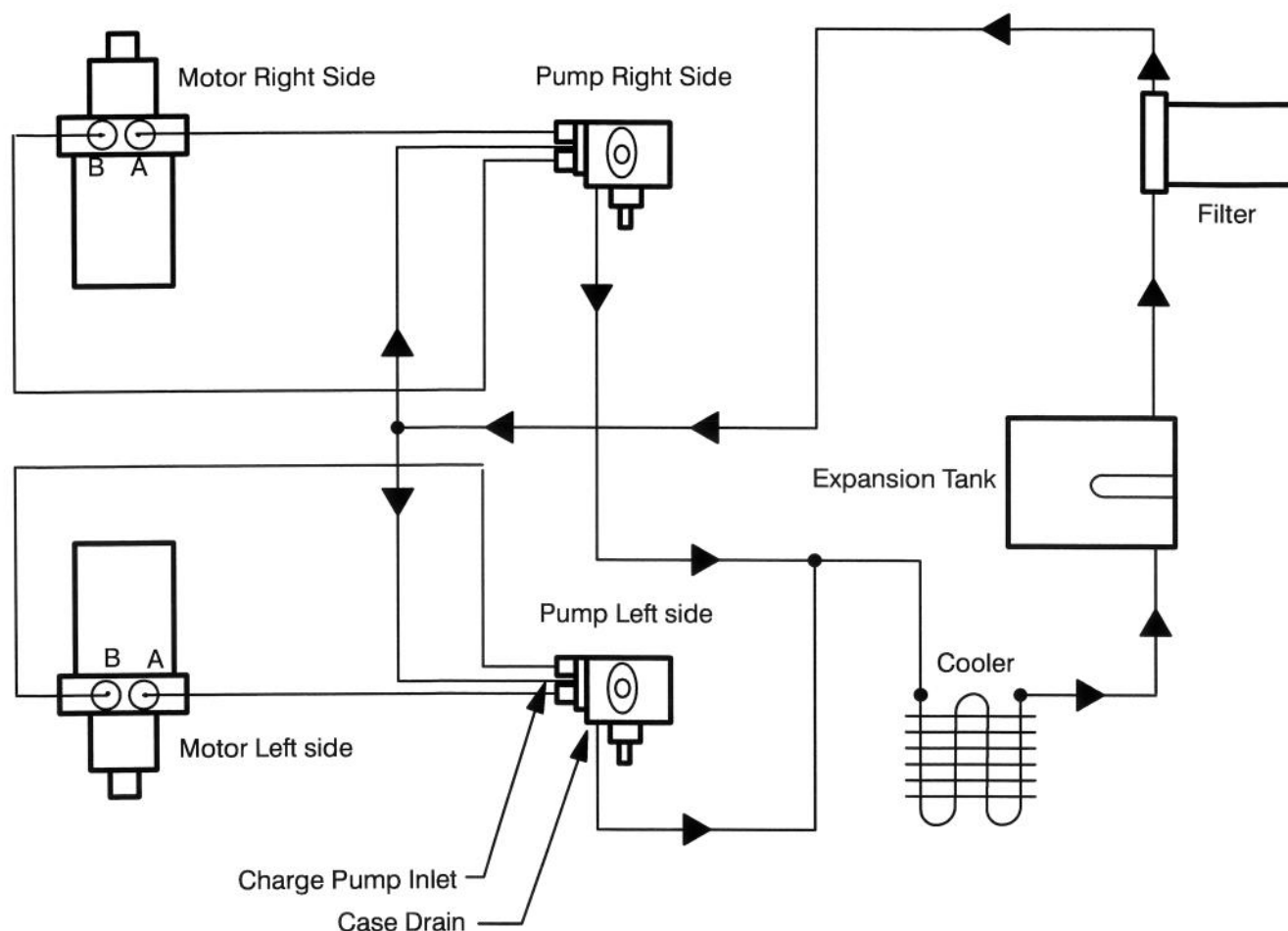
WIRING SCHEMATIC



Ignition Switch

Position	Circuits
Off	G + M
Run	L + B
Start	B + S

HYDRAULIC SCHEMATIC



IDENTIFICATION AND ORDERING

The traction unit has two identification numbers: a model number and a serial number. The two numbers are stamped into a plate that is riveted to the frame on the left rear corner of mower. In any correspondence concerning the mower, supply the model and serial numbers to assure that correct information and replacement parts are obtained.

To order replacement parts from an authorized TORO Distributor, supply the following information:

1. Model and serial numbers of the machine.
2. Part number, description and quantity of parts desired.

Note: Do not order by reference number if a parts catalog is being used; use the part number.

MAINTENANCE CHART

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MAINTENANCE CHART

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ProLine
Products

THE TORO TOTAL COVERAGE GUARANTEE

A One Year Limited Warranty
(A Full Two-Year Warranty for Residential Use)

What Is Covered By This Express Warranty?

The Toro Company promises to repair any TORO ProLine product used for commercial, institutional, or rental purposes if defective in materials or workmanship for a period of one year from the date of purchase. The cost of parts and labor are included as well as transportation within a 15 mile radius of a TORO ProLine Service Dealer.

What Products Are Covered By This Warranty?

ProLine products covered by this warranty include the ProLine 120, 220, 616, 620, 724 riding products and wide area walk behind mowers and their cutting decks and accessories.

How About Residential Use?

TORO ProLine products used for residential use are covered by a full two-year warranty.

How Do You Get Warranty Service?

Should you feel your TORO ProLine product contains a defect in materials or workmanship, contact the dealer who sold you the product or any TORO ProLine Service Dealer. The Yellow Pages of your telephone directory is a good reference source; look under TORO Commercial Service Dealers. The Service Dealer will either arrange service at his/her dealership or recommend another authorized Service Dealer who may be more convenient. You may need proof of purchase (copy of registration card, sales receipt, etc.) for warranty validation.

If for any reason you are dissatisfied with a Service Dealer's analysis of the defect in materials or workmanship or if you need a referral to a TORO ProLine Service Dealer, please feel free to contact us at the following address:

Toro Customer Service Department
8111 Lyndale Avenue South
Bloomington, MN 55420-1196
612-888-8801

What Must You Do To Keep The Warranty In Effect?

You must maintain your TORO Product by following the maintenance procedures described in the operator's manual. Such routine maintenance, whether performed by a dealer or by you, is at your expense.

What Does This Warranty Not Cover? and

How Does Your State Law Relate To This Warranty?

There is no other express warranty except as described above. This express warranty does not cover:

- Cost of regular maintenance service or parts, such as filters, fuel, lubricants, tune-up parts, blade sharpening, brake and clutch adjustments.
- Any product or part which has been altered or misused or required replacement or repair due to normal wear, accidents, or lack of proper maintenance.
- Repairs necessary due to improper fuel, contaminants in the fuel system, or failure to properly prepare the fuel system prior to any period of non-use over three months.
- Pickup and delivery charges for distances beyond a 15 mile radius from a TORO ProLine Service Dealer.

All repairs covered by this warranty must be performed by a TORO Service Dealer using Toro approved replacement parts.

Repair by a TORO Service Dealer is your sole remedy under this warranty.

The Toro Company is not 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. Some states do not allow exclusions of incidental or consequential damages, so the above exclusion may not apply to you.

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

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 The Toro Company.