

TORO[®]

MODEL NO. 04128 — 70001 THRU 40001 & UP
(3.5 HP TRACTION UNIT)
MODEL NO. 04215 — 70001 THRU 40001 & UP
(CUTTING UNIT)

**OPERATOR'S
MANUAL**

21" (0.53m) GREENSMASTER[®]



T-127

PRICE \$1.00

FOREWORD

This Operator's Manual has been especially prepared for your information and guidance in the operation and care of your new Toro mower.

Properly adjusted, operated and maintained, this Toro mower will respond quickly and easily to every reasonable demand and give years of reliable service.

Toro mowers have been manufactured by an organization of mowing machinery specialists for over fifty years. Each machine is carefully inspected and tested before leaving the factory. For best performance from your Toro mower, study this manual for regular maintenance procedures.

OPTIONAL SPARK ARRESTER

In some areas there are local, state or federal regulations requiring that a spark arrester be used on the engine of this mower. If a spark arrester is

required, order the following parts from your Authorized Toro Distributor:

(1)	36-2330	Spark Arrester Muffler
(2)	321-15	Capscrew
(2)	3285-7	Lockwasher

These parts are approved by the United States Department of Agriculture and Forestry.



CAUTION

When mower is used or operated on any California forest, brush or grass covered land, a working order spark arrester must be attached to muffler. If not, the operator is violating state law, Section 4442 Public Resources Code.

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SAFETY INSTRUCTIONS

The 21" (0.53 m) Greensmaster is designed and tested to offer safe service. However, improper use or maintenance by the operator or owner of the machine can still result in injury. To reduce the potential for any injury, comply with the following safety instructions.

BEFORE OPERATING

1. Operate the machine only after reading and understanding the contents of this manual. A replacement manual is available by sending complete model and serial number to: The Toro Company, 8111 Lyndale Avenue South, Minneapolis, Minnesota 55420.
2. Never allow children to operate the machine or adults to operate it without proper instructions.
3. Become familiar with the controls and know how to stop the engine quickly.

4. Keep all shields, safety devices and decals in place. If a shield, safety device or decal is defective or damaged, repair or replace it before operating the machine.
5. Always wear substantial shoes. Do not operate machine while wearing sandals, tennis shoes or sneakers. Do not wear loose fitting clothing which could get caught in moving parts and cause personal injury.
6. Wearing safety glasses, safety shoes, long pants and a helmet is advisable and required by some local safety and insurance regulations.
7. Be sure work area is clear of objects which might be picked up and thrown by the reel.
8. Keep everyone, especially children and pets away from the areas of operation.
9. Since gasoline is highly flammable, handle it carefully.

SAFETY INSTRUCTIONS

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

WHILE OPERATING

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

11. Always stand behind the handle when starting and operating the machine.

12. To start and stop the engine only:

- A. Open fuel valve.
- B. Verify that traction clutch lever on handle and reel drive knob on transmission is in DISENGAGE position.
- C. Set choke to full choke position (cold start) and throttle to half-open position.
- D. Pull starter cord to start engine.
- E. Slow engine speed, depress stop switch against spark plug to stop engine.

13. To transport mower from one area to another:

- A. Disengage the cutting unit control and engage traction control on transmission.
- B. Make sure traction clutch lever is disengaged and start engine.
- C. Bear down on handle to raise front of mower and engage traction drive clutch lever.

14. To begin mowing operation:

- A. Depress stop switch against spark plug to stop engine.
- B. Disengage traction drive clutch lever.
- C. Pull reel drive knob fully out to engage reel drive.
- D. Start engine. Control starts and stops with the clutch control lever.

15. Before emptying basket of clippings, move clutch control lever to disengage and depress stop switch against spark plug to stop engine.

16. Do not touch engine, muffler or exhaust pipe while engine is running or soon after it is stopped because these areas could be hot enough to cause burns.

17. If the cutting unit strikes a solid object or vibrates abnormally, stop immediately, turn engine off, wait for all motion to stop and inspect for damage. A damaged reel or bedknife must be repaired or replaced before operation is continued.

18. Whenever machine is left unattended be sure engine is stopped and cutting unit reel is not spinning. Close fuel valve if machine is to be unused for an extended period of time.

MAINTENANCE

19. Before servicing or making adjustments to the machine, stop the engine and pull high tension wire off spark plug to prevent accidental starting of the engine.

20. To make sure entire machine is in good condition, keep all nuts, bolts, screws, belts and chains properly tightened.

21. If major repairs are ever needed or if assistance is desired, contact an Authorized Toro Distributor. Ask about Mobile Service Maintenance.

22. To reduce potential fire hazard, keep the engine area free of excessive grease, grass, leaves and accumulation of dirt.

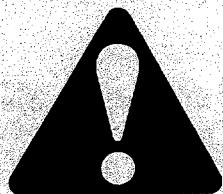
23. If the engine must be running to perform a maintenance adjustment, keep hands, feet, clothing and any parts of the body away from the cutting unit and any moving parts. Keep everyone away.

24. Do not overspeed the engine by changing governor settings. Maximum engine speed is 3600 rpm. To assure safety and accuracy, have an Authorized Toro Distributor check maximum engine speed with a tachometer.

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

26. To be sure of optimum performance and safety, always purchase genuine TORO replacement parts and accessories. Replacement parts and accessories made by other manufacturers could be dangerous. Such use could void the product warranty of The Toro Company.

SAFETY INSTRUCTION DECALS



The following safety and instruction decals are installed on the unit. If any become damaged or illegible, replace them. Decal part numbers are listed below and in your Parts Catalog. Order replacements from your Authorized Toro Distributor.

STARTING INSTRUCTIONS

- 1.) PLACE TRACTION AND CUTTING UNIT CONTROL LEVERS IN NEUTRAL POSITION.
- 2.) SET CHOKE AND THROTTLE AS REQUIRED. (SEE OPERATORS MANUAL)
- 3.) PULL ENGINE STARTER ROPE.
- 4.) TO "STOP" ENGINE, PUSH LEVER AGAINST ENGINE SPARK PLUG.

CAUTION

READ AND UNDERSTAND OPERATORS MANUAL BEFORE OPERATING THIS MACHINE. FREE REPLACEMENT MANUAL IS AVAILABLE BY SENDING COMPLETE MODEL NUMBER TO: THE TORO COMPANY 8111 LYNDALE AVE., MINNEAPOLIS, MINNESOTA 55420

ON ENGINE (Part No. 36-3510)

WARNING

NEVER PLACE HANDS OR FEET IN REEL AREA WHILE ENGINE IS RUNNING.

ON CUTTING UNIT (Part No. 27-5560)

USE UNIVERSAL DRIVE SHAFT FOR LAPPING.

ON REEL BRACKET (Part No. 3-3964)

SPECIFICATIONS

Engine: 3.5 horsepower (2.6 kw) engine with one gallon (3.78 l) capacity gas tank. Champion RCJ-8 spark plug with recommended gap of 0.030 in. (0.76 mm).

Handle: One piece, 3/4 in. (19 mm) O.D. No. 16 (1.65 mm) gauge wall welded steel tubing.

Traction Unit: Cast aluminum housing.

Reel Unit: Cast aluminum and zinc side plates, aluminum extrusion back plate. Reel unit independent of traction unit and catcher.

Front Rollers: 2 in. (51 mm) O.D. steel tube with ball bearings, moisture excluding oil seals and replaceable wear sleeves.

Height-Of-Cut: 1/8 to 11/16 in. (3 to 17 mm).

Width of Cut: 21 in. (0.53 m).

Clip: 0.245 in. (6.2 mm).

Ground Speed: 3.6 mph (5.8 Km/hr.) at 2800 RPM and 4.6 mph (7.4 Km/hr.).

Traction Drive: "A" section "V" belt on 2.0 P.D. and 3.70 P.D. to countershaft (1. 85:1). From countershaft 18T and 48T gear (2. 67:1 and 20T and 56T gear (2. 8:1). All gears 16 pitch, 20° involute full depth, 1/2 in. (13 mm) wide. Gears running in oil.

Reduction, Engine to Traction Drum: 13.86:1.

Traction Drum: 6 in. (15.2 cm) diameter solid rubber on 16 gauge (1.5 mm) steel rims. Two sections running on ball bearings.

Traction Clutch: Engaging jaw type — hand operated at traction unit.

Differential: Enclosed spur gears.

Reel Drive: "A" section V-belt on 2.0 P.D. and 3.70 P.D. to countershaft (1. 85:1) 3/8 in. pitch x 3/16 in. wide chain on 16T and 14T sprockets from countershaft. Reduction Engine to Reel — 1. 62:1.

Reel Clutch: Engaging jaw type — hand operated at traction unit.

Reel: 3-1/2 in. (89 mm) diameter 9 blade, welded tubular construction. Reel blades, high carbon heat treated steel. Reel bearings, taper roller with adjustment.

Bedknife and Bar: Single edge high carbon steel knife, extra hard for long life, screwed to extruded aluminum one-piece bed bar and back plate.

Dimensions:

Width: 27 in. (0.69 m)

Height: 44-3/4 in. (1.1 m) with handle.

Length: 60 in. (1.5 m) including handle and catcher.

Weight: 197 pounds (89.36 Kg) with catcher and cutting unit.

Optional Equipment: Spring Comb Kit (model 2-2939), Brush Kit (model 2-2949), Skid Kit (model 4-7299), Sectional Roller Kit (model 4-7319), Urethane Comb Kit (model 8-2560) Full Roller Kit (model 4-7309), Wiehle Roller Kit (model 4-7289), Spark Arrester Kit (model 36-2330).

KNOW YOUR MOWER

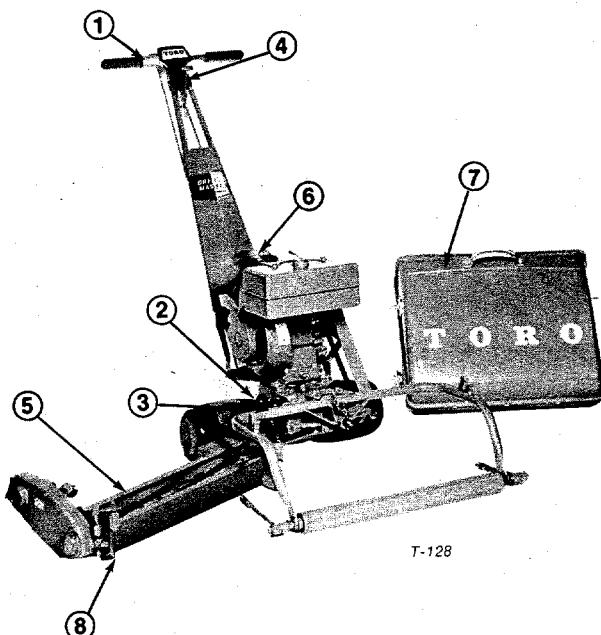


Figure 1

1. Throttle control	5. Cutting unit
2. Traction control	6. Handle adjusting bar
3. Reel drive control	7. Grass basket
4. Traction clutch control	8. Height-of-cut adjustment

LOOSE PARTS CHART

Loose Parts	Qty.	Where Used
Handle Assembly	1	Install on machine. (Mounting fasteners loosely installed on mower.)
Handle Adjusting Bar	1	Attach to bracket on top of engine.
Capscrew 5/16 - 18 x 1-1/4 in. (32 mm)	1	Use to mount handle adjustment bar.
Grommet	2	Install in bracket.
Gauge Bar Assembly	1	Use to set height-of-cut.
Machine Screw 10-32 x 0.88 in. (22 mm)	1	Install in gauge bar.
Jam Nut 10-32	1	Install on machine screw.
Grass Basket	1	Install on machine.
Operator's Manual	1	
Engine Manual	1	
Parts Catalog	1	
Registration Card	1	

SET-UP INSTRUCTIONS

ATTACH HANDLE ADJUSTING BAR

1. Remove capscrew, locknut and grommets from adjusting bar, align adjusting bar hole with holes in engine bracket, insert grommets and secure assembly with capscrew and locknut (Fig. 2).

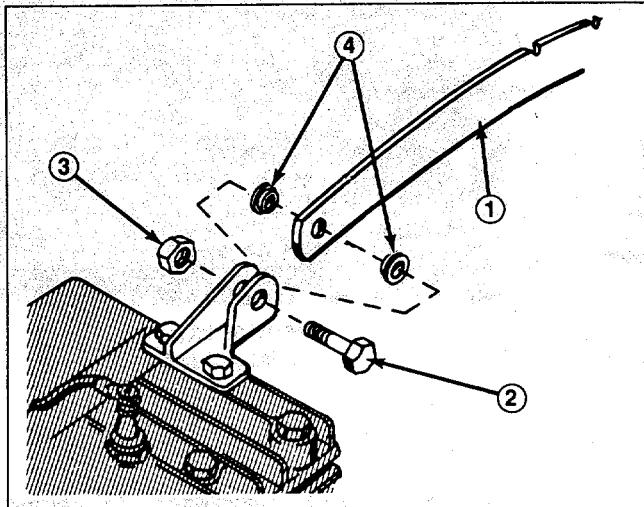


Figure 2

1. Adjusting bar 3. Locknut
2. Capscrew 4. Grommets

INSTALL HANDLE

1. Remove handle mounting fasteners from the main frame (Fig. 3), mount handle, slide mounting screw through handle, frame, bellcranks and other components and secure with nut (Fig. 3).

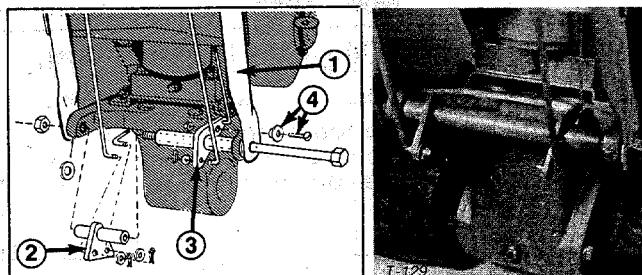


Figure 3

1. Handle 3. Bellcrank-throttle
2. Bellcrank-clutch 4. Throttle wire retainer

2. Raise handle assembly, fit adjusting bar through slotted hole in handle and latch handle into notch in adjusting bar (Fig. 4).

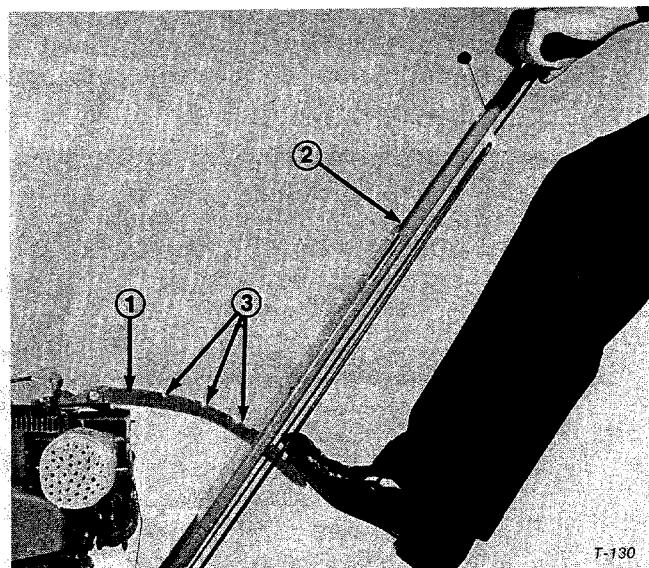


Figure 4

1. Adjusting bar
2. Handle
3. Notches

3. Secure throttle and clutch rods with flat washers and cotter pins and throttle wire with retainer screw (Fig. 3).

ADJUST HANDLE HEIGHT

Adjust the height of the handle to suit the operator's height. Grasp the handle grips, push down on the adjusting bar with your foot and move handle assembly up or down until most comfortable position is achieved (Fig. 4). Lift foot and allow handle to lock into notch in adjusting handle (Fig. 4).

INSTALL FRONT SUPPORT FOR CUTTING UNIT

1. Refer to your local authorized TORO distributor for desired front support.
2. Install support per instruction sheet included with support.

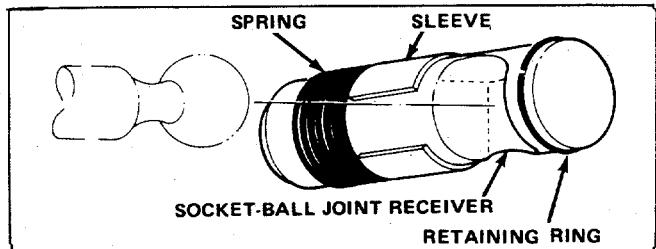
CHECK TRANSMISSION OIL LEVEL

Refer to Checking Transmission Oil Level, page 16.

PREPARATION BEFORE OPERATING

ADJUST HEIGHT-OF-CUT

Height-of-cut brackets are set at maximum setting at the factory. To adjust to a different height setting, refer to Removal and Installation of Cutting Unit, page 13 and Adjusting Height-of-Cut, page 12.



ADJUST REEL TO BEDKNIFE

The reel is adjusted away from the bedknife for shipment, therefore, adjustment is necessary; refer to Reel To Bedknife Adjustment, page 14. Removing Cutting Unit or Yoke Assembly, page 13.

CHECK CUTTING UNIT ALIGNMENT

The cutting unit must be in alignment with the front yoke roller so that the machine will track in a straight line across the greens. The driveshaft must also be aligned with the transmission output shaft. If unit is not properly aligned, use the following alignment procedures.

1. Loosen jam nut securing ball sockets to pull arms on both sides of the yoke (Fig. 5).

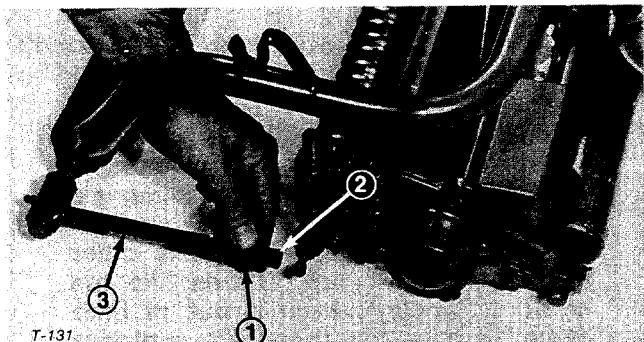


Figure 5

1. Jam nut 2. Ball socket 3. Pull arm

2. Slide sleeves back on each ball joint and rotate each pull arm upward off the ball studs.
3. Align cutting unit with roller and driveshaft with transmission shaft and lengthen or shorten pull rods by threading ball socket on rod (Fig. 5).
4. Align ball sockets with ball studs so hooded portion of socket is at top and open side towards stud (Fig. 6).
5. Slide the sleeve back on the ball joint and rotate the pull arm down so the socket fits over the ball stud. Release the sleeve so it slides forward over the stud and locks the assemblies together. Tighten the jam nuts to secure the sockets in position (Fig. 6).

INSTALL GRASS CATCHER

1. Set pins on basket pivots into brackets on yoke and allow basket adjusting brackets to rest onto yoke (Fig. 7).

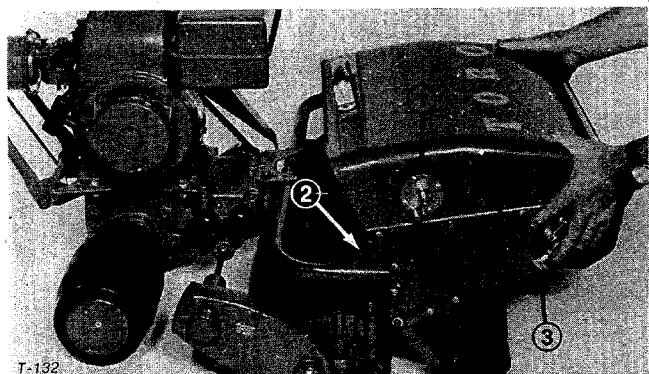


Figure 7

1. Basket pivot 3. Adjusting bracket
2. Yoke bracket 4. Jam nut

2. Measure distance between lip of basket and edge of cutting unit shield. There should be a clearance between the components of no more than $1/4$ inch (6 mm) (Fig. 8). If the dimension is incorrect, adjust basket.

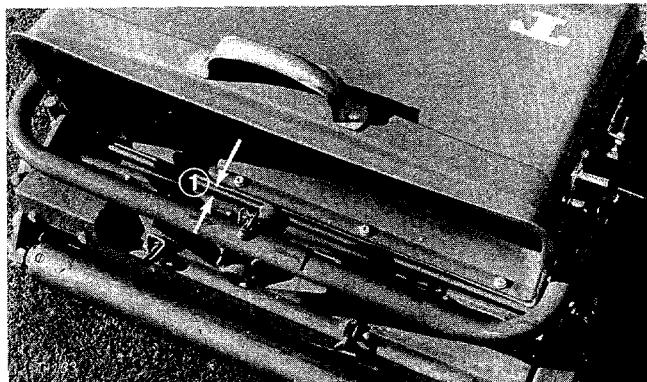


Figure 8

1. $1/4$ inch (6 mm) maximum

Note: Basket should be lower in front to assist clipping throw into basket. Adjust brackets to lower basket (Fig. 7). Make sure basket clears roller by at least $1/16$ in. (1.6 mm).

PREPARATION BEFORE OPERATING

3. Loosen jam nuts on each side of basket and rotate adjusting brackets (Fig. 7). Be sure dimension is equal on both ends of unit and tighten jam nuts.

Note: If cutting unit has been equipped with a comb assembly, raise the basket for clearance with the following procedures:

1. Remove the basket pivots from each side of the basket (Fig. 7).
2. Rotate each pivot 180° and reinstall on the basket.

ADD OIL TO ENGINE

Add approximately 21 ounces (0.62 l) of clean, high quality oil with engine service classification of "SC", "SD" or "SE".

1. Set mower so engine is in level position and remove oil fill plug from front of engine (Fig. 9).

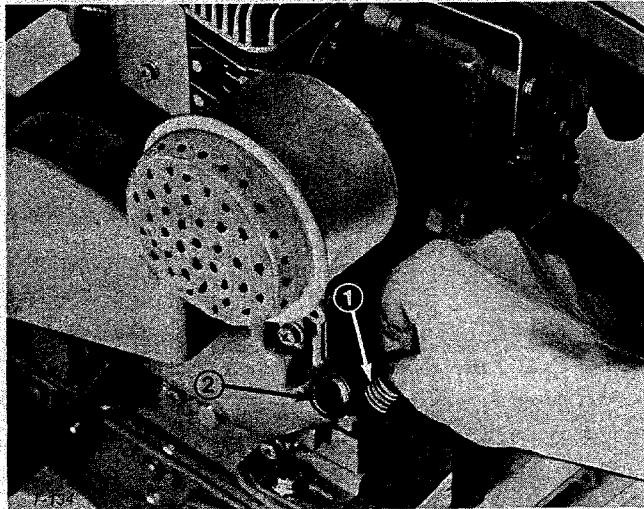


Figure 9

1. Oil fill plug
2. Oil fill hole

2. Add SAE 30 oil to engine until oil overflows out of oil fill hole (Fig. 9).

Note: SAE 10W-30 or SAE 10W-40 oil is an acceptable substitute.

3. Install oil fill plug.

ADD GASOLINE TO FUEL TANK

IMPORTANT: Do not mix oil w/gasoline because engine damage and poor performance may result. Do not use premium gas, white gas or gasoline additives. Lead-free gasoline is recommended to fill the 4 quart (3.79 l) fuel tank. Leaded-regular is an acceptable substitute.

1. Remove cap from fuel tank and fill tank to within 1 inch (25 mm) from the top w/lead free or

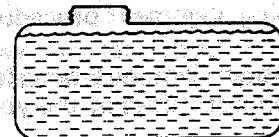
leaded-regular gasoline. Reinstall fuel tank cap (Fig. 10).

Note: Lead-free gasoline reduces combustion deposits and extends valve life, and when available, this type of gasoline is recommended. Otherwise, use leaded-regular gasoline.

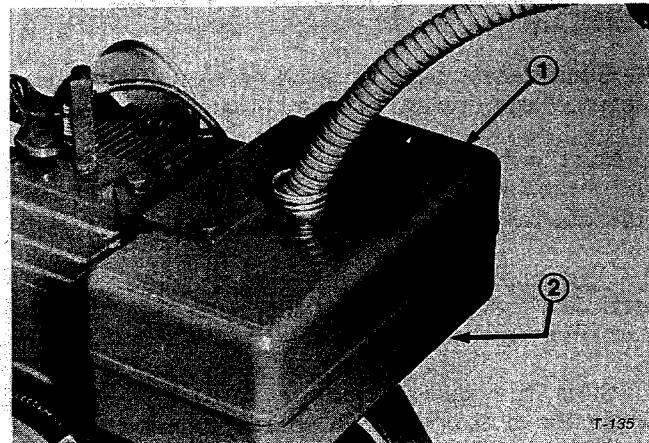


DANGER

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, and fill fuel tank to no more than 1 inch (25 mm) from top of tank, not filler neck.



Store gasoline in a clean, approved container and keep the cap in place on the container. Keep gasoline in a cool, well-ventilated place; never in the house. 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 gasoline, keep it out of their reach because the fumes are explosive and dangerous to inhale.



T-135

Figure 10

1. Fuel tank
2. Fuel shut-off valve (Beneath tank)

CONTROLS

Throttle Control (Fig. 11) — Twist grip control which connects to and operates throttle linkage to carburetor. Control has two positions: SLOW and FAST. Engine speed can be varied between the two settings.

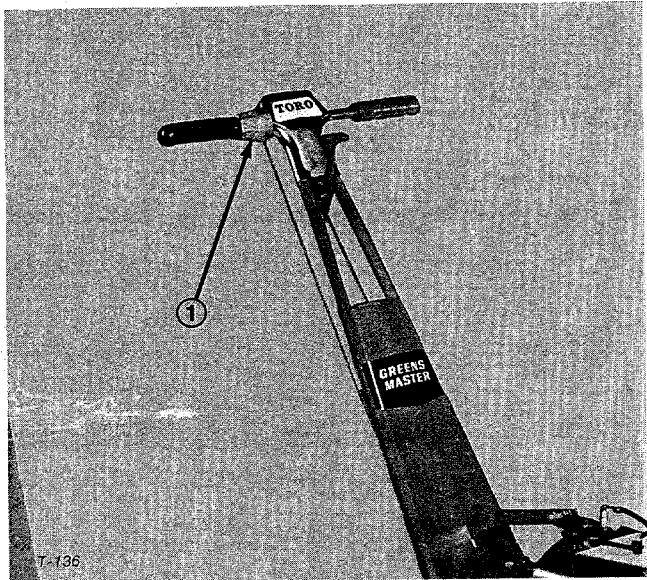


Figure 11

1. Throttle control grip

Clutch Control Lever (Fig. 12) — Located at center of handle. Connects to and controls drive linkage to traction drum. Control has two positions: ENGAGE and DISENGAGE.

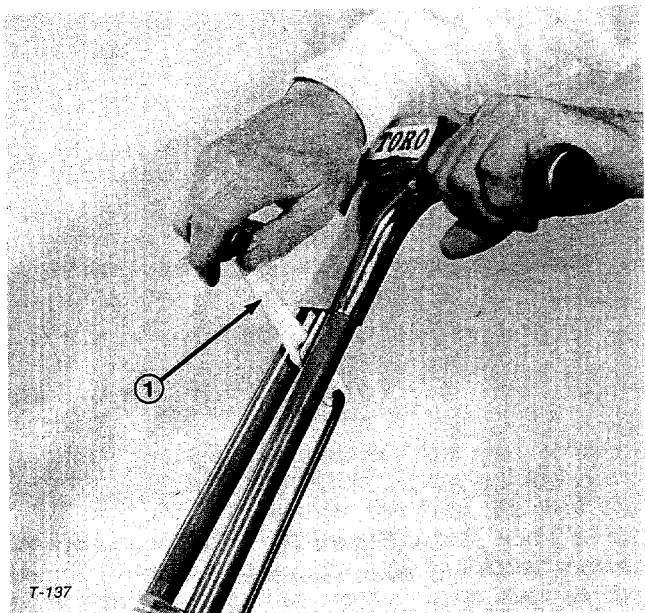


Figure 12

1. Clutch control lever

Transmission Traction Drive Control (Fig. 13) — Knob on transmission closest to engine. Push in

to engage transmission gears which drive the wheels. Engaging traction clutch completes traction drive. Control has two positions: ENGAGE and DISENGAGE.

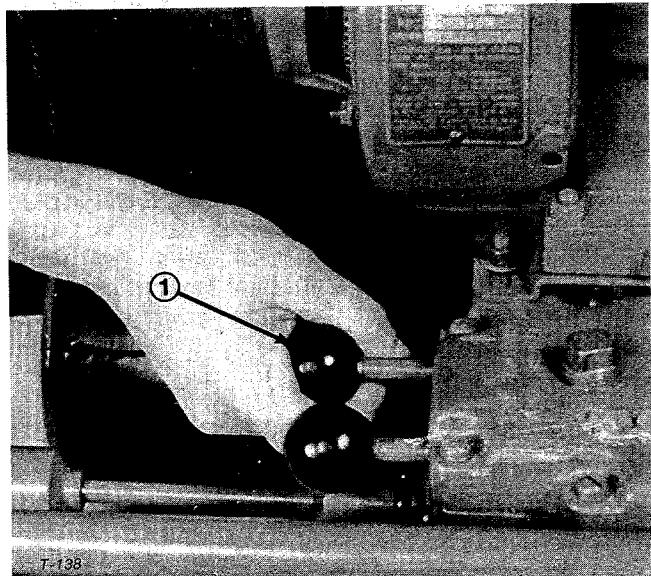


Figure 13

1. Traction drive control knob. Push in to ENGAGE.

Reel Drive Control (Fig. 14) — Forward knob on transmission. Has two positions: ENGAGE and DISENGAGE. Pull out to engage reel drive gears. Push in to disengage.

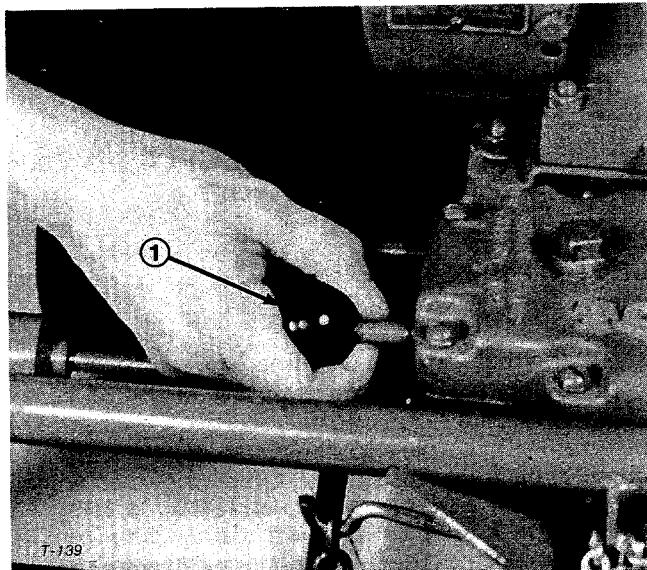


Figure 14

1. Reel drive control — pull out to engage

Choke Lever (Fig. 15) — Rotate lever fully counterclockwise to start a cold engine. Move lever back in increments as engine warms up until choke is fully open. Choke not normally used when engine is warm from previous operation.

CONTROLS

Recoil Starter (Fig. 15) — Pull recoil starter handle to start engine.

Fuel Shut-off Valve (Fig. 15) — At bottom of fuel tank. Open before beginning of operation. Shut off when mower is to be stored for a lengthy period.

Engine Stop Switch (Fig. 15) — Located at top of engine. Push downward and hold against spark plug to stop engine.

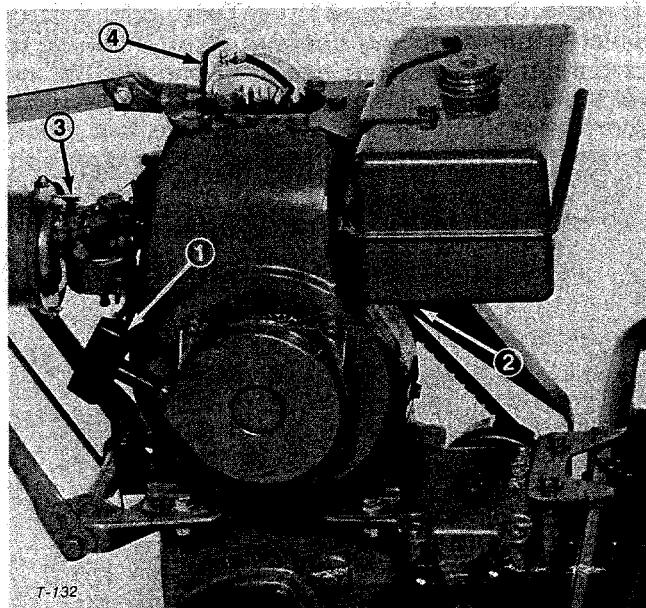


Figure 15

1. Recoil starter
2. Fuel shut-off valve
3. Choke lever
4. Engine stop switch

STARTING AND STOPPING INSTRUCTIONS

Note: Make sure high tension wire is installed on spark plug.

1. Assure traction control lever and reel drive knob are in DISENGAGED position.
2. Open fuel valve on fuel tank (Fig. 15).
3. Move choke lever (Fig. 15) to CHOKE position before starting a cold engine.

Note: A warm or hot engine usually does not require any choking. To start a warm engine, move throttle control to FAST position.

4. Stand behind the machine, move the throttle control grip to FAST position (Fig. 16). Pull recoil starter handle out until positive engagement results. Pull handle vigorously to start engine and allow rope to recoil slowly. Open choke as engine warms up.

IMPORTANT: Do not pull recoil rope to its limit or let go of starter handle when rope is pulled out because rope may break or recoil assembly may be damaged.

5. To stop engine during operation, move traction and reel drive controls to DISENGAGE position, throttle control to SLOW (Fig. 16) and push engine stop switch down and hold against top of spark plug (Fig. 15).

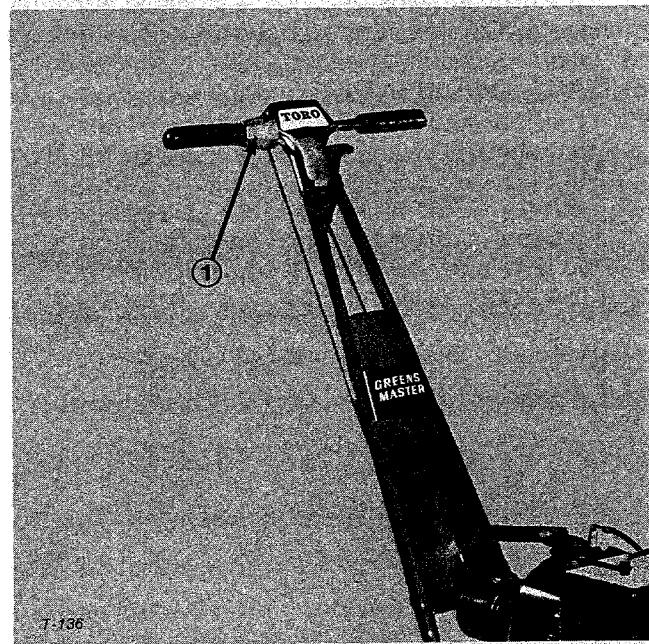


Figure 16

1. Throttle control grip

6. Pull high tension wire off spark plug to prevent possibility of accidental starting before storing machine.
7. Close fuel valve before storing machine (Fig. 15).

OPERATING INSTRUCTIONS

TRANSPORT OPERATION

1. Assure traction and reel drive controls are in DISENGAGE and start engine.
2. Place the handle assembly in the uppermost notch on handle adjusting bar. Set throttle control in SLOW, tip front of machine up and slowly increase engine speed while gradually engaging traction drive control lever so mower moves forward slowly (Fig. 17).

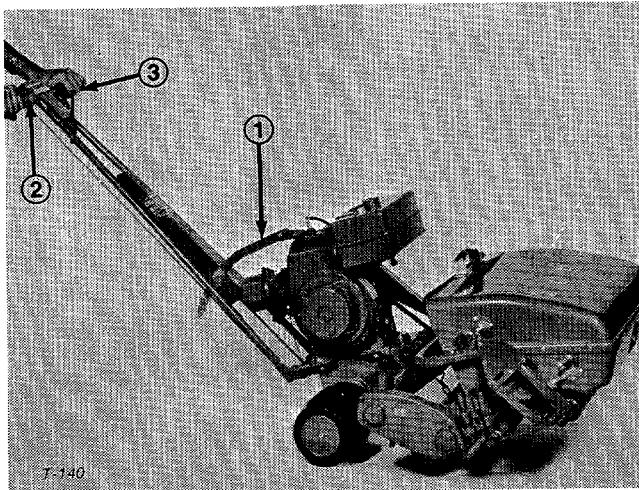


Figure 17

1. Handle adjusting bar
2. Throttle control grip
3. Traction drive control lever

3. Adjust throttle to operate mower at desired ground speed and transport mower to desired destination.

MOWING OPERATION

Proper use of the Toro Greensmaster provides the smoothest turf cutting available. The fundamental suggestions given will provide the utmost performance from your Toro Greensmaster.

PRIOR TO MOWING

Remove dew and worm casts from turf prior to mowing by whipping the turf with a bamboo pole or by dragging a hose over the area. Be sure the Greensmaster is carefully adjusted and is set evenly on both sides of the reel. Improper mower adjustment is magnified many times over in the appearance of the clipped turf. A three-to-five-foot wide (91 to 152 cm) "collar" should be mowed around the area at a slightly higher cut than the putting green area. This will provide sufficient space for turning the Greensmaster without turning on the green area.

METHOD OF MOWING

The greens should be mowed in straight back and forth direction across the green. Avoid circular mowing or turning the mower on greens areas since scuffing may occur. Turning the mower should be done off the green proper by raising the cutting reel (pushing the handle down) and turning on the large rubber covered traction drums. The greens areas should not be mowed in the same direction at any two successive mowings. Cutting in different directions at each mowing will keep the grass growing in an upright position, preventing grain formation. Mowing should be done at a normal walking pace. Faster speed saves very little time and will result in an inferior mowing job.

OPERATING CONTROLS

To operate the controls while mowing;

1. Push the traction knob on the transmission fully in to engage traction drive gears (Fig. 18).

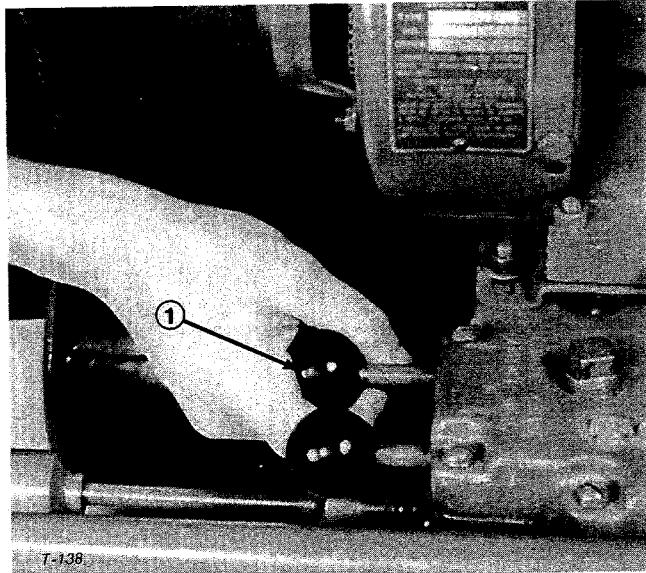


Figure 18

1. Traction drive control knob - push in to ENGAGE

2. Start engine, push down on handle to elevate cutting unit, push traction clutch control lever forward and transport machine onto collar of green (Fig. 19).
3. Pull traction clutch control lever back to DISENGAGE position and pull reel drive control knob on transmission fully out to ENGAGE reel (Fig. 20).
4. Push the traction clutch control forward, increase throttle speed until the unit is traveling at

OPERATING INSTRUCTIONS

the desired ground speed, drive the mower out onto the green area, drop the front of the mower down and commence mowing operation.

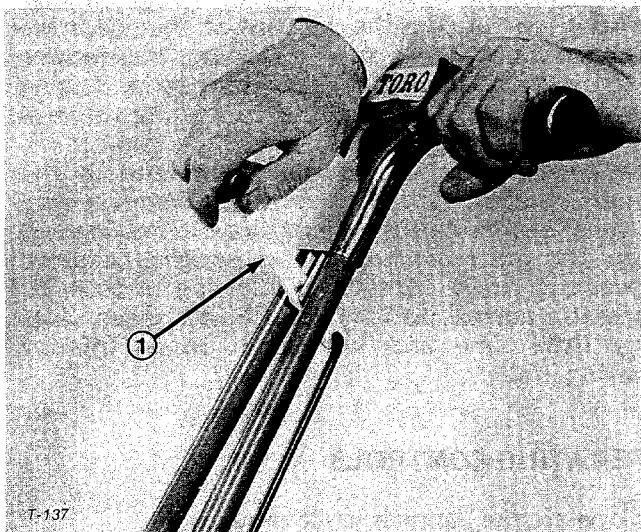


Figure 19

1. Traction clutch control lever - push forward to engage

AFTER MOWING

1. Drive off green, pull traction clutch control lever to DISENGAGE, stop the engine and push the reel drive control knob full in to DISENGAGE.

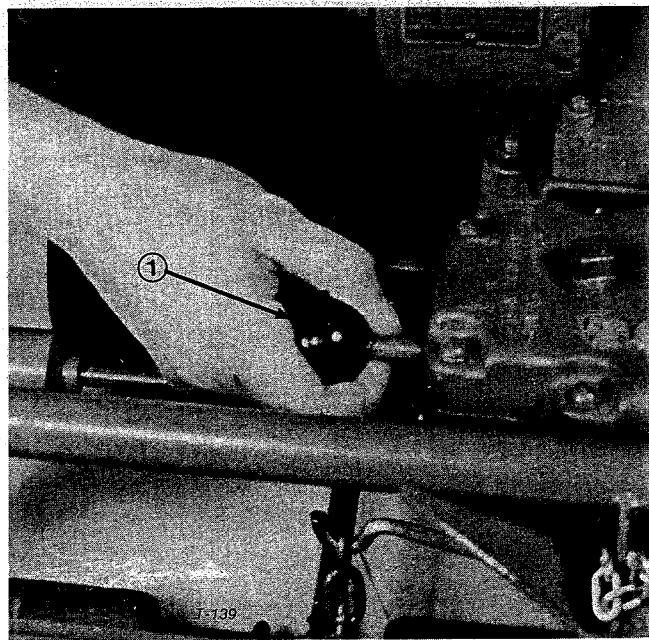


Figure 20

1. Reel drive control knob - pull out to engage

2. Empty the grass catcher of clippings, install grass catcher and commence transport operation; refer to Transport Operation, page 11.

MAINTENANCE



CAUTION

Disconnect spark plug wire before performing any of the maintenance procedures on your mower.

ADJUSTING HEIGHT-OF-CUT

Effective cutting height is dependent upon the condition of the green and the selection of various combinations of skids or rollers available for the Greensmaster. Effective height-of-cut on a green is influenced by the type of grass, frequency of mowing, degree of thatching and resilience of the soil — which is affected by the moisture and organic matter content. The Greensmaster provides an opportunity to select accessories which furnish cutting characteristics suitable to all types of green conditions. For example, progressively lower heights-of-cut with the same gauge setting may be obtained by selecting, in the following order: the skid, full front roller, sectional roller or

the Wiehle roller. The reason for this is that progressively less supporting or contact area is provided for the cutting unit.

1. Loosen wing nut on gauge bar and set adjusting screw to obtain desired distance between bottom of screw head and face of bar (Fig. 21). Tighten wing nut, making sure adjustment is not altered.

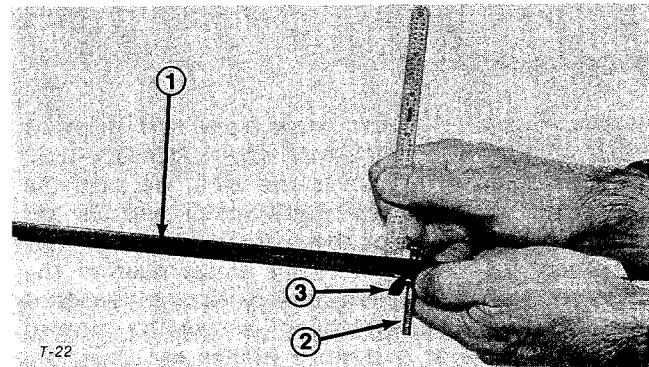


Figure 21

1. Gauge bar
2. Height adjustment screw
3. Wing nut

MAINTENANCE

2. Remove the cutting unit; refer to Removal and Installation of Cutting Unit, page 13.

3. Place cutting unit upside down on bench, position gauge bar on end of unit with one end on front support: skid, full roller, sectional roller, etc., the other end on rear roller (Fig. 22).

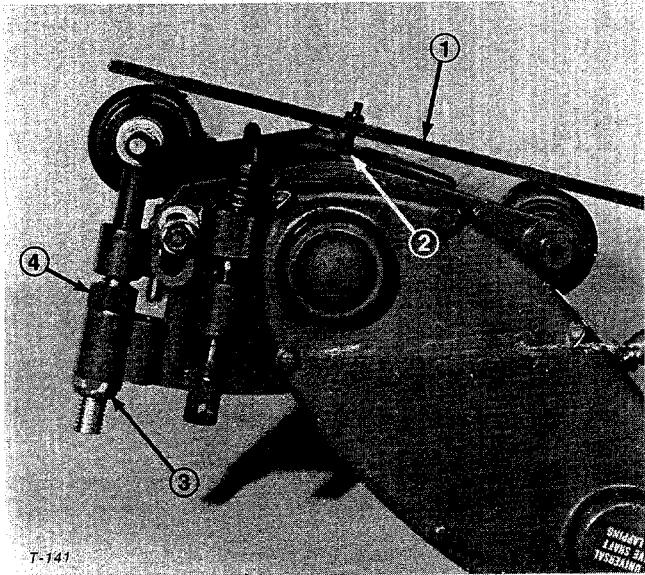


Figure 22

- 1. Gauge bar against rollers
- 2. Screw head over cutting edge
- 3. Top nut
- 4. Adjustment nut

4. Loosen top nut on adjusting screws on each side plate (Fig. 22) and turn adjusting nut to raise or lower front roller or skid assembly (Fig. 22). Raise or lower rollers until they contact outer end of gauge bar. When proper adjustment is obtained, screw head on gauge bar will just pass over cutting edge of bedknife (Fig. 22). ASSURE HEIGHT-OF-CUT IS EXACTLY IDENTICAL AT BOTH ENDS OF BEDKNIFE.

5. Tighten top nuts to secure roller adjustment (Fig. 22). Turn cutting unit over and place on a level surface (Fig. 23). Press down on each end of the front and rear rollers (Fig. 23). Each roller should contact level surface completely across unit (Fig. 23). If rollers do not contact, repeat steps 3 and 4.

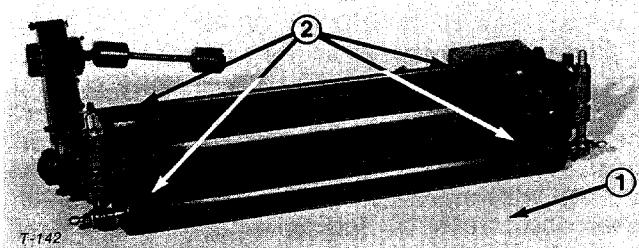


Figure 23

- 1. Level surface
- 2. Press down

REMOVAL AND INSTALLATION OF CUTTING UNIT

1. Remove grass catcher and unhook the two chains from the support hooks (Fig. 24).

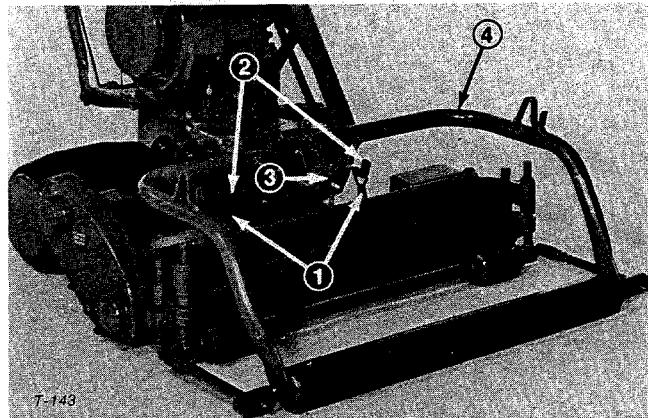


Figure 24

- 1. Chains
- 2. Support hooks
- 3. Cotter pin
- 4. Yoke pivot

2. Slide sleeves back on pull arm ball joints and lift pull arm sockets straight up off ball studs (Fig. 25).

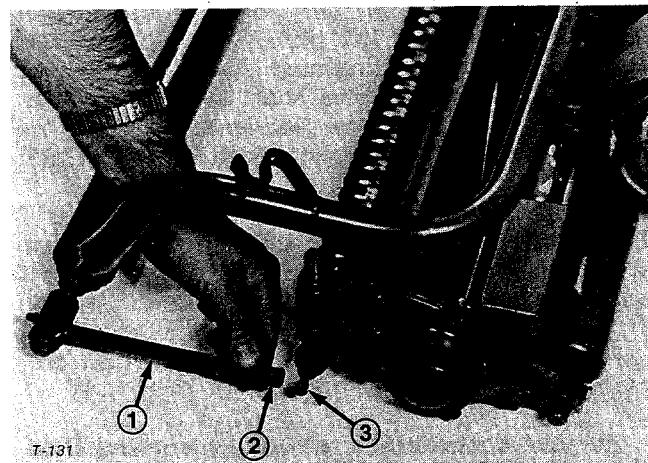


Figure 25

- 1. Sleeve
- 2. Pull arm socket
- 3. Ball stud

3. Grasp cutting unit chain case and pull cutting unit and drive shaft out to right away from traction unit.

Note: Right and left sides are determined from behind the handle.

To install the cutting unit:

1. Slide the cutting unit under the yoke from the right side, line the drive shaft up with transmission shaft and install drive shaft. Be sure pad is installed into drive shaft (Fig. 26).

MAINTENANCE

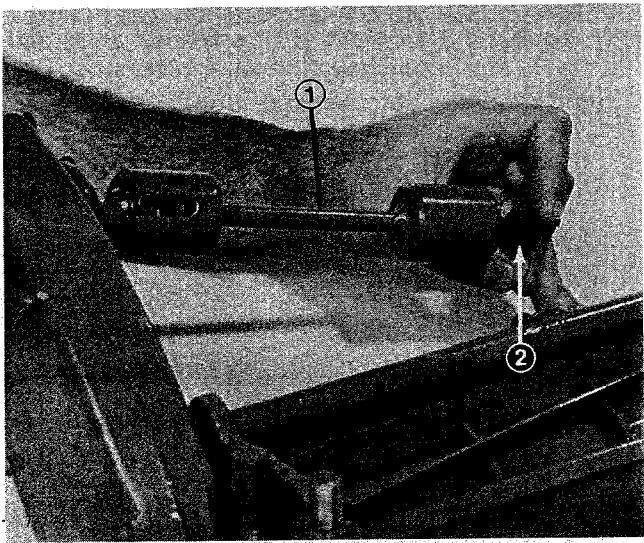


Figure 26

1. Drive shaft
2. Pad

2. Align pull arms with ball studs, slide sleeves back on sockets and drop arm sockets down on ball studs (Fig. 25).
3. Install the chains onto the support hooks (Fig. 24).
4. Make sure the cutting unit is aligned with the yoke roller and the drive shaft with the transmission shaft. If there is misalignment, refer to Check Cutting Unit Alignment, page 7.

REMOVING YOKE ASSEMBLY

To remove yoke:

1. Remove grass catcher and unhook chains from support hooks (Fig. 24).
2. Remove cotter pin from yoke pivot and slide yoke assembly off pivot (Fig. 24).
3. Reverse procedures to install yoke.

REEL TO BEDKNIFE ADJUSTMENT

Note: Adjustment procedures can usually be more accurate and precise with cutting unit adjusted on a workbench.

1. Loosen nuts securing left and right reel brackets to side plates (Fig. 27).
2. Adjust reel to knife clearance with adjusting screws at each end of unit (Fig. 28). NEVER ALLOW BEDKNIFE TO BEAR HEAVILY AGAINST REEL.

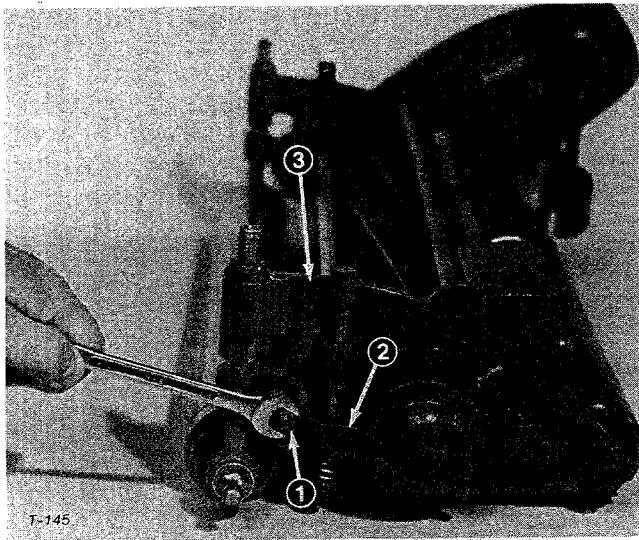


Figure 27

1. Nut
2. Reel bracket
3. Side plate

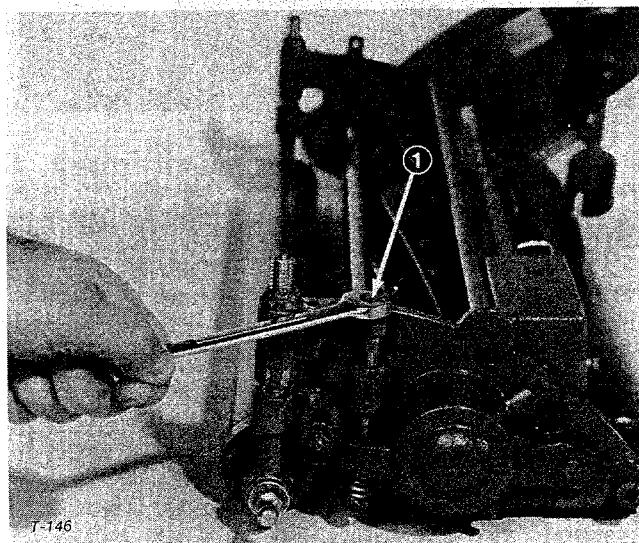


Figure 28

1. Reel adjusting screw

3. Place a strip of newspaper flat on the top face of the bedknife and adjust reel down until reel blades pinch the paper equally all across the bedknife.
4. Place the newspaper at right angles to the top face of the bedknife against the front cutting edge and rotate the reel blades against the paper. The reel blades should cut the paper cleanly all across the bedknife. If the paper is not cleanly cut, the mower should be either backlapped or resharpened: refer to Backlap Operation and Reel and Bedknife Grinding, page 21. If the paper is cleanly cut, proceed to step 5.
5. Tighten nuts to secure the adjustment.

MAINTENANCE

LUBRICATION

ENGINE

IMPORTANT: Check level of oil every 5 operating hours or each time mower is used. Initially, change oil after the first 2 hours of operation; thereafter, under normal conditions, change oil after every 25 hours of operation. However, change oil more frequently when engine is operated in extremely dusty or dirty conditions.

To check the oil level:

1. Move mower to level area to assure engine is on a level plane for accurate oil level readings.
2. Unscrew the oil fill plug and remove it from the fill hole (Fig. 29).

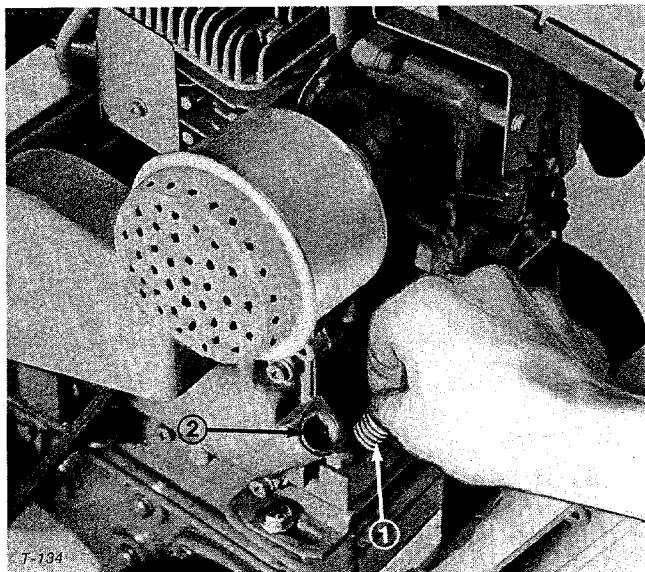


Figure 29

1. Oil fill plug
2. Oil fill hole

3. Oil should be to the top of the fill hole. Add high quality SAE 30 oil with engine service classification of "SC", "SD" or "SE" as necessary.

Note: SAE 10W-30 or 10W-40 is an acceptable substitute.

4. Install and securely tighten fill plug (Fig. 29).

To change the oil:

1. Start and run the engine for a period to warm the engine oil.
2. Stop the engine, place a drain pan under plug in crankcase on handle side of engine, remove the

oil drain plug and allow oil to drain into drain pan (Fig. 30).

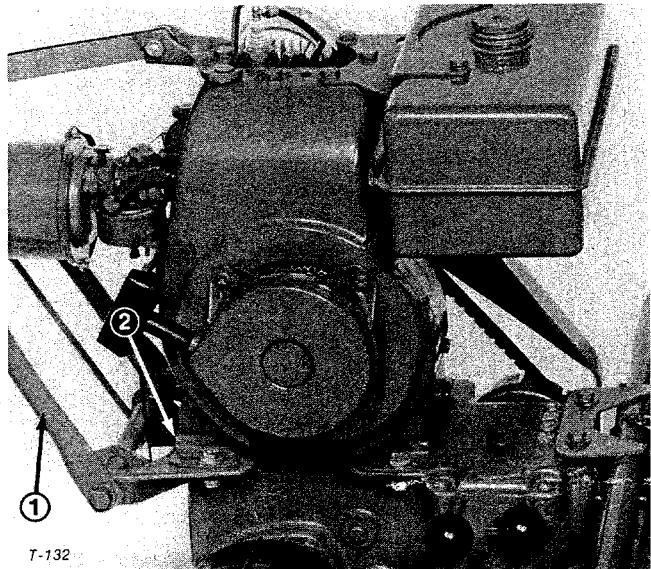


Figure 30

1. Handle
2. Oil drain plug

3. Install drain plug; remove oil fill plug (Fig. 29), assure engine is level and fill crankcase with fresh clean oil; refer to Add Oil, page 8 or to check the oil level, item 3 above.

GREASE FITTINGS

The grease fittings on the mower should be greased at least every 25 hours. Lubricate using a No. 2 multi-purpose lithium base grease. A hand operated grease gun is recommended for best results.

1. Wipe each open grease fitting with a clean rag.
2. Grease components as follows:
 - A. Cutting unit reel bearings (Fig. 31), drive shaft bearing (Fig. 32), front roller or support (Fig. 33), yoke pivot and pull arm bushings (Fig. 33) and rear cutting unit and yoke rollers (Fig. 32, 33).
 - B. To lubricate the rear cutting unit and yoke rollers, remove pipe plugs at each end, install 1/8-27 NPT grease fittings, lubricate bearings, remove fittings and replace pipe plugs (Fig. 32, 33). Apply grease to enclosed bearing areas only until pressure is felt against the grease gun.
 - C. Front roller or support, yoke pivot and pull arms; apply grease to bearings until it begins to show (Fig. 33).

MAINTENANCE

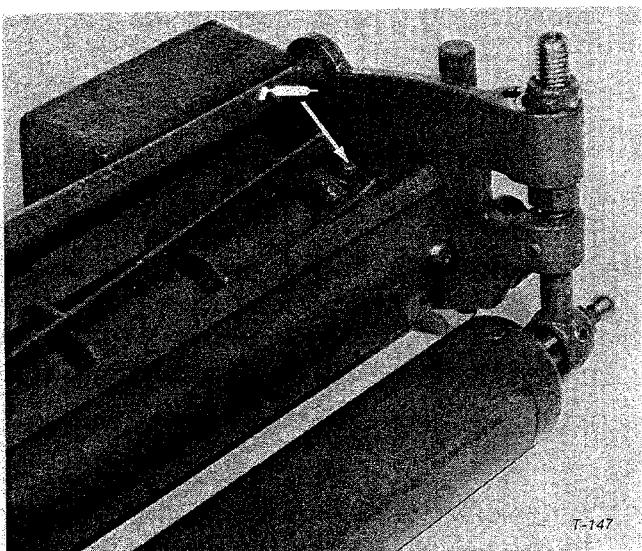


Figure 31

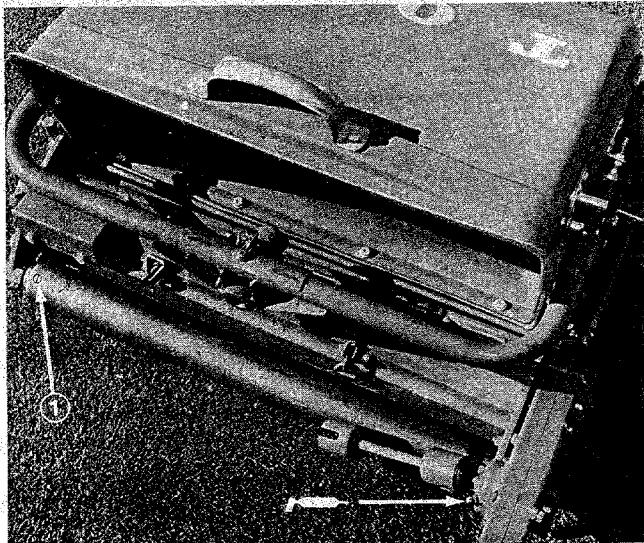


Figure 32

1. Pipe plug

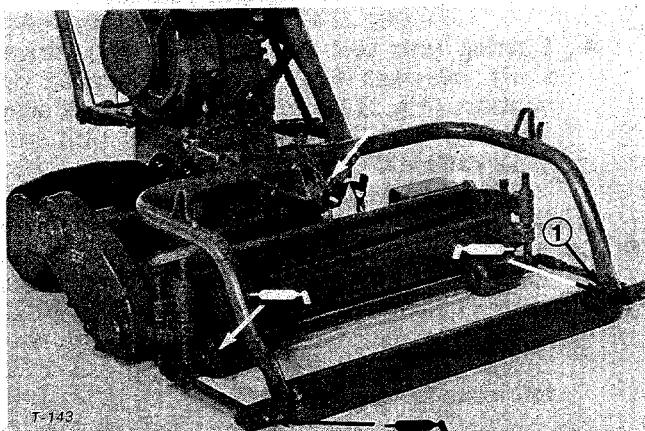


Figure 33

1. Pipe plug

IMPORTANT: Do not apply too much pressure or grease seals will be permanently damaged.

3. Wipe excess grease away.
4. Check transmission oil level at 50 hour intervals.

A. Place mower on level surface and remove pipe plug at rear of gear case. Oil should be to bottom of hole (Fig. 34).

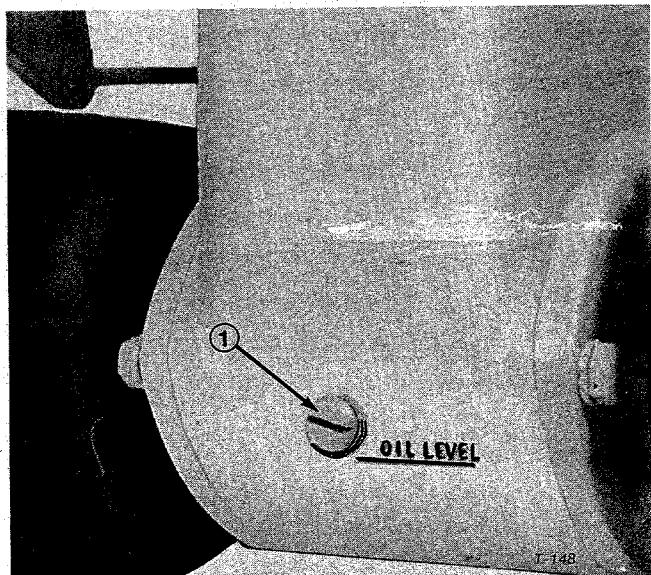


Figure 34

1. Pipe plug

B. If level is correct, replace plug. If level is too low, remove plug in top of transmission and add a good grade of SAE 90 gear oil (Fig. 35). Replace both plugs.

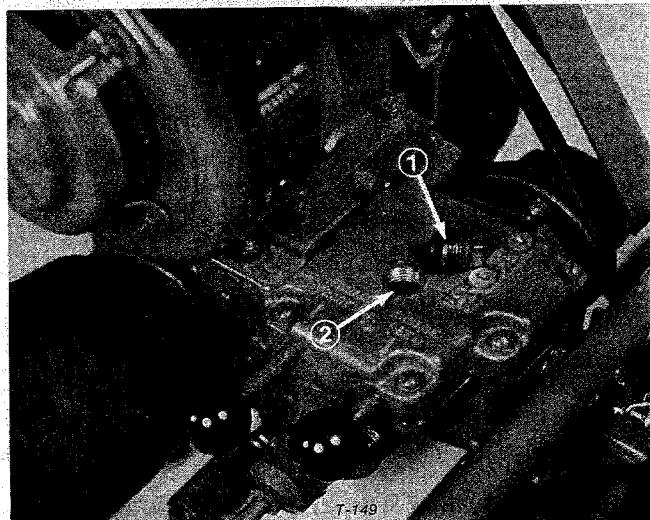


Figure 35

1. Pipe plug
2. Oil fill hole

MAINTENANCE

C. To drain transmission, remove both plugs and tip unit rearward.

5. At the end of each seasons cutting, remove the traction clutch assembly and clean and repack the cam and roller assembly with No. 5 multi-purpose bearing grease (Fig. 36). Take extreme care to make sure that grease is kept off the clutch friction discs (Fig. 36).

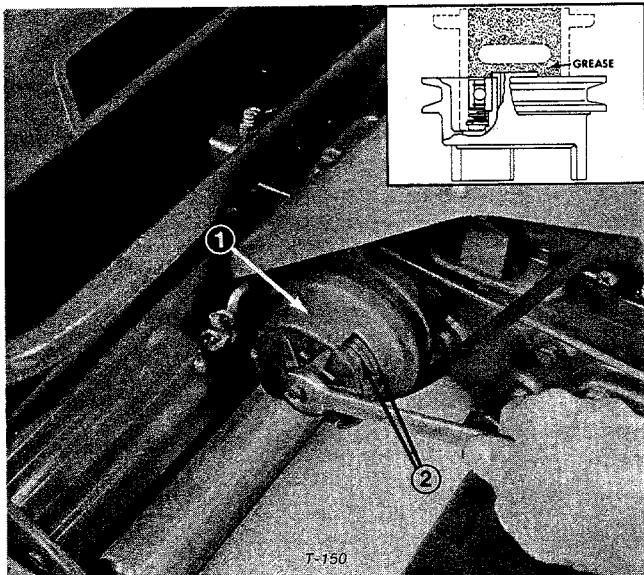


Figure 36
1. Clutch assembly
2. Clutch friction discs

LINKAGE PIVOT POINTS

Oil all pivot points of control linkages weekly with SAE 30 engine oil (Fig. 37, 38).

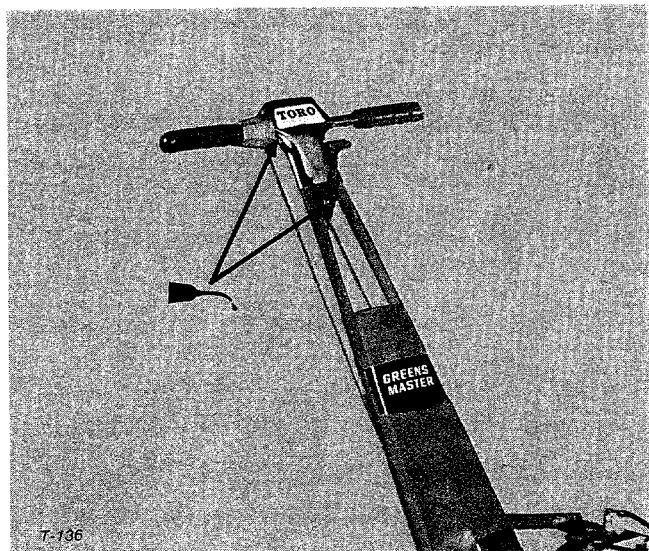


Figure 37

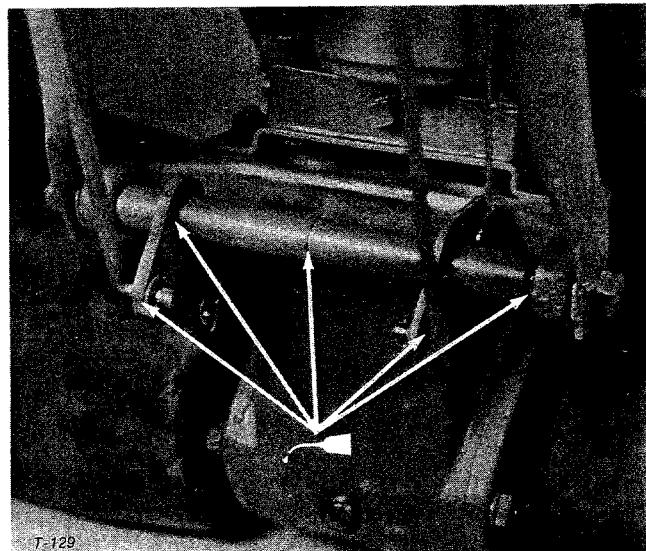


Figure 38

SERVICING AIR CLEANER

Inspect FILTER every twenty-five (25) operating hours, or more often if used in extremely dusty or dirty areas. Proceed as follows:

To Inspect Filter:

1. Loosen two COVER SCREWS (Fig. 39). (These need not be removed completely).

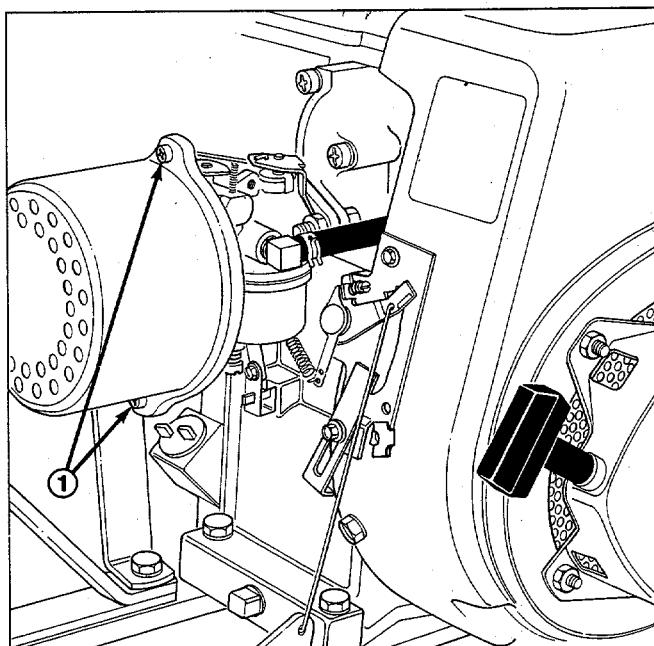


Figure 39
1. Cover screws

2. Rotate COVER counterclockwise and remove from BASE.
3. Inspect FILTER for discoloration and/or dirt accumulation. If either is present, FILTER should be cleaned and re-oiled.

MAINTENANCE

To Clean and Re-Oil Filter:

1. Wash FILTER by immersing in water and detergent (soap) solution and squeezing until all dirt is removed.
2. Dry FILTER by wrapping in a clean cloth and squeezing until completely dry.
3. Saturate FILTER with clean engine oil and squeeze to distribute oil and remove excess oil.
4. Before replacing FILTER, clean inside of BASE and COVER thoroughly.
5. Replace FILTER and COVER making sure that FILTER is seated correctly between BASE and COVER. Tighten COVER SCREWS securely.

IMPORTANT: Never run engine without complete air cleaner installed on engine.

ADJUSTING CARBURETOR

Do not make unnecessary adjustments. Factory settings are satisfactory for most applications and conditions. If adjustments are needed, proceed as follows:

HIGH SPEED ADJUSTMENTS

1. Turn high speed fuel mixture adjusting screw clockwise until finger tight (Fig. 40).

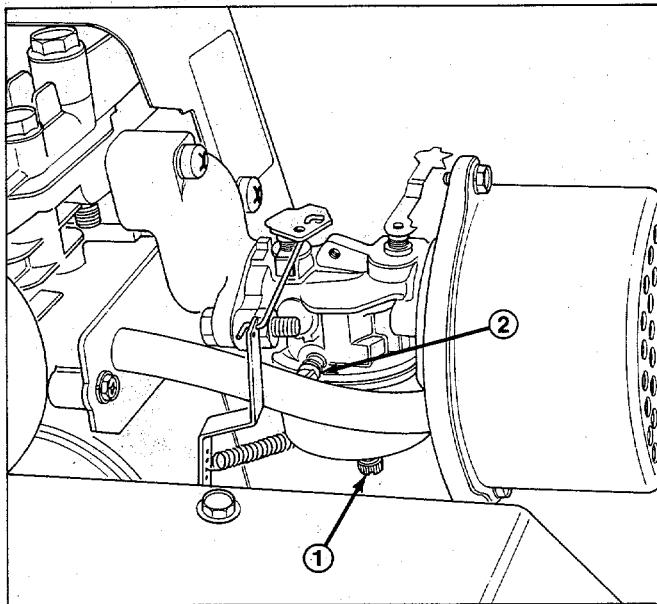


Figure 40

1. High speed fuel mixture adjustment screw
2. Low speed fuel mixture adjustment screw

2. Carefully turn high-speed fuel mixture adjusting screw in a counterclockwise direction 1 turn, start engine and allow it to warm up.
3. After engine has warmed up, run engine at full throttle setting, make final adjustments by turning

screw 1/8 of a turn at a time, allowing an interval between adjustments for the engine to react. Allow setting to be slightly rich to compensate for load. Turn counterclockwise to richen mixture.

IDLE ADJUSTMENTS

1. With engine stopped, turn low speed fuel mixture adjusting screw clockwise until finger tight (Fig. 40).
2. Turn screw counterclockwise 5/8 turn to open and start engine. After engine is started, turn throttle grip to SLOW and make final adjustments by turning screw 1/8 of a turn at a time, allowing time between turns for engine to react.

SERVICING AND 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 spark plug is a Champion RJ-17LM and correct air gap is 0.030 of an inch (0.76 mm).

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

IMPORTANT: A cracked, fouled, dirty or defective 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 electrodes at 0.030 of an inch (0.76 mm) (Fig. 41). Install correctly gapped spark plug w/gasket seal, and tighten plug to 15 ft-lb (20.4 N·m). If torque wrench is not used, tighten plug firmly.

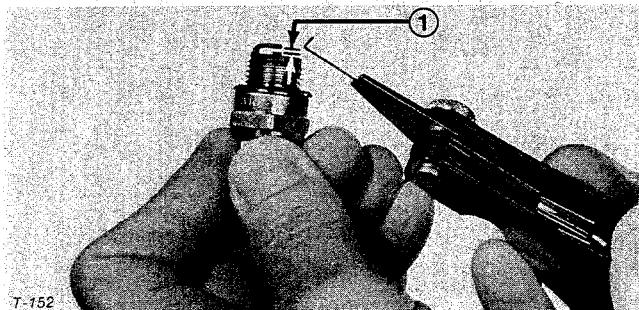


Figure 41

1. Set gap at 0.030 in. (0.76 mm)

MAINTENANCE

5. Do not install high tension wire onto spark plug unless mower will be used immediately. This prevents possibility of accidental starting.

TRACTION DRIVE ADJUSTMENT

Checking and Adjusting Traction Drive Belt:

The belt should be tight enough so traction wheels will spin on cement floor when clutch is engaged with the engine running. Belt should be checked after first eight hours of operation and tightened if necessary. To adjust the belt:

1. Remove the cover over the left side of the machine (Fig. 42).

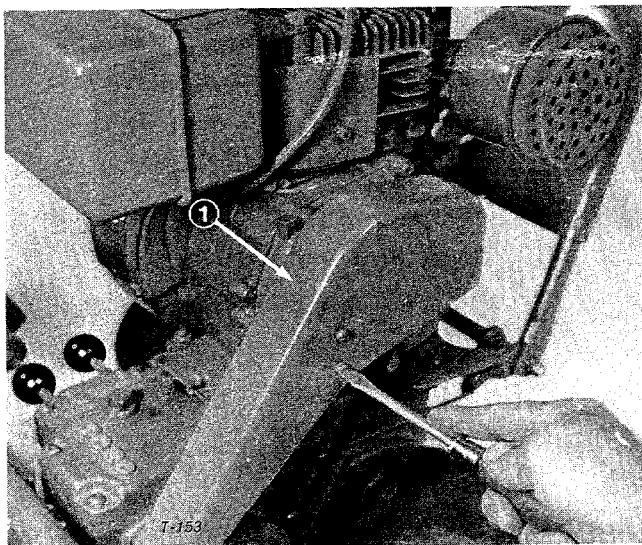


Figure 42

1. Cover

2. Loosen the four engine hold down screws (Fig. 43).

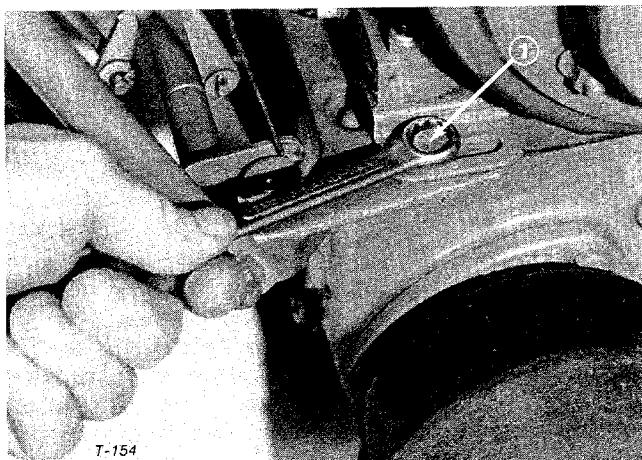


Figure 43

1. Engine mounting fastener

3. Slide engine rearward equally on both sides until belt is tight. Tighten mounting fasteners and check adjustment by placing unit on a cement floor, starting engine and checking to see if traction wheels spin when clutch is engaged.

4. Continue adjustment until tension is correct and install belt guard (Fig. 42).

CLUTCH ADJUSTMENT

Should clutch slippage occur during operation, check and adjust as follows:

1. Move reel clutch lever to ENGAGE position.
2. Tighten clutch locknut in small increments, start engine and test adjustment (Fig. 44).

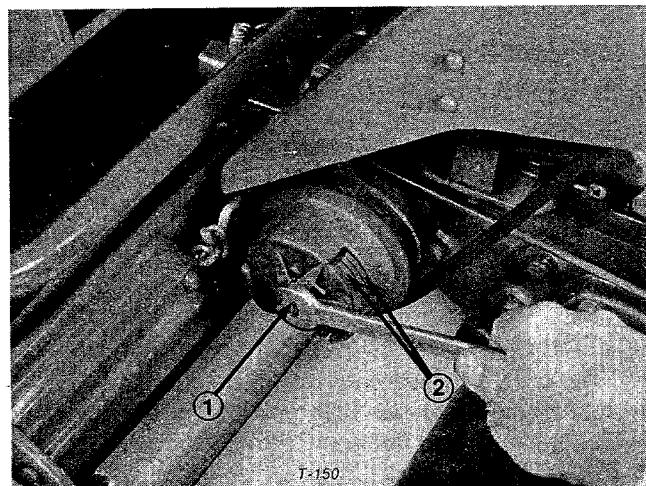


Figure 44

1. Locknut
2. Clutch plates & friction discs

3. Repeat adjustment until clutch operates correctly.

Note: Clutch plates and friction discs should be totally free of grease or oil (Fig. 44).

CUTTING UNIT CHAIN ADJUSTMENT

Once each year, check the chain assembly inside the cutting unit chain case (Fig. 45). Use the following procedures:

1. Remove the grass catcher and cutting unit from the traction unit; refer to Removal and Installation of Cutting Unit, page 13.
2. Remove Allen head set screw anchoring reel shaft to cover (Fig. 45).

MAINTENANCE

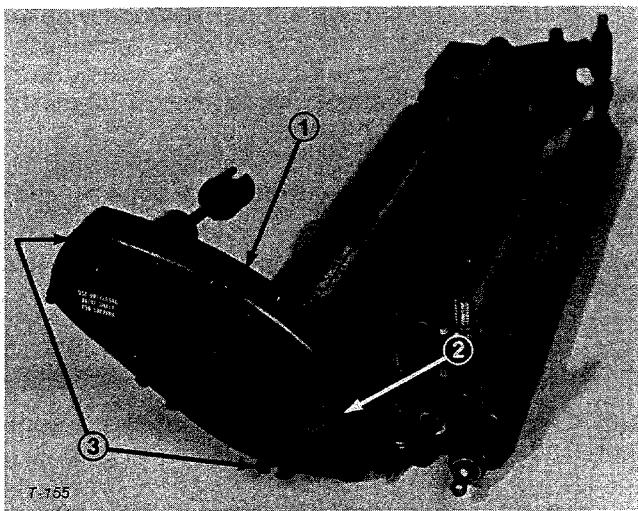


Figure 45

1. Chain case
2. Allen head set screw
3. Tapered nuts

3. Remove 5 cover screws and 2 tapered nuts and remove cover (Fig. 45).

4. Check chain for excess slack (Fig. 46). If chain is too slack, loosen mounting screw for chain idler shoe, push shoe down against chain to remove slack and tighten screw (Fig. 46).

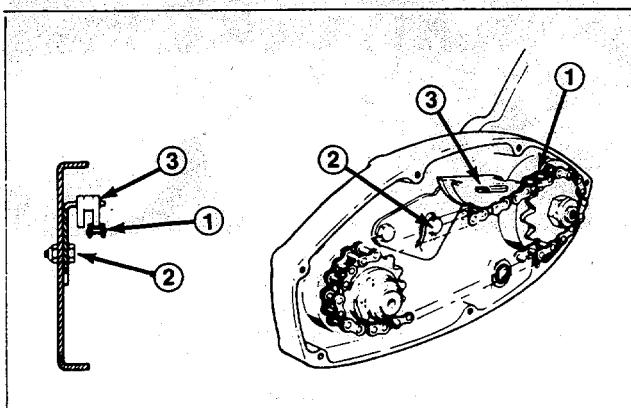


Figure 46

1. Chain
2. Idler screw
3. Shoe

5. Make sure a liberal quantity of lithium base No. 2 grease is around sprocket and install cover (Fig. 46). Install tapered nuts first to make sure cover is aligned with the case (Fig. 45).

REEL BEARING ADJUSTMENT

Loose reel bearings will affect cutting performance. Do not forget to make a check of the bearing adjustment as a part of your troubleshooting pro-

cedures if your cutting unit performance has deteriorated. Also check and adjust the reel bearings before doing any reel grinding.

Adjust as follows:

1. Remove grass catcher and cutting unit from traction unit; refer to Removal and Installation of Cutting Unit, page 13.
2. Remove locknut, reel adjustment screw, allen head set screw and capscrew from left reel bracket and remove reel bracket from left side plate (Fig. 47).

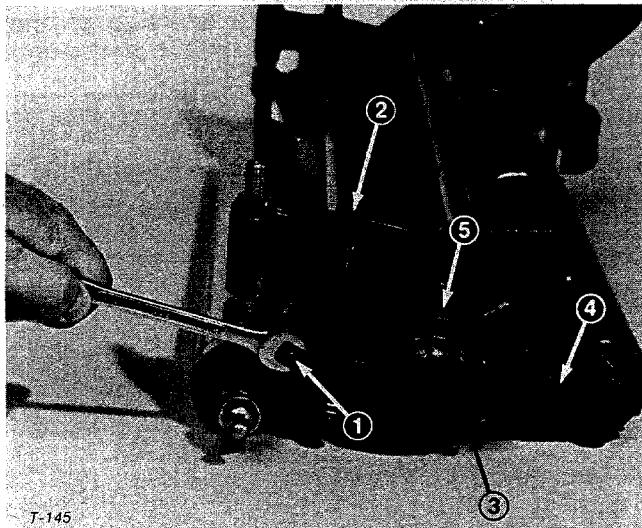


Figure 47

1. Locknut	4. Capscrew
2. Reel adjust screw	5. Left reel bracket
3. Allen head set screw	

3. Check the bearing preload either by use of a torque wrench or by the following method:

- A. Install a 1/4-20 screw into hole in end of reel shaft (Fig. 48).

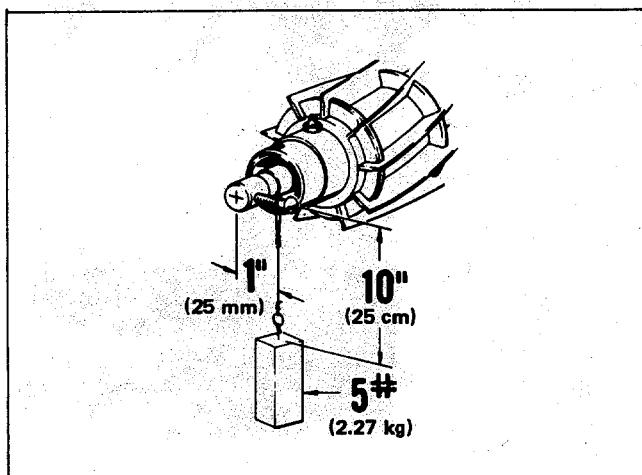


Figure 48

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- B. Support the reel and hang a 5 lb (2.27 kg) weight 1 in. (25 mm) away from center of reel shaft and 10 in. (25 cm) down (Fig. 48).
- C. Weight should be just held when screw is perpendicular to center line of reel shaft.
4. If torque wrench is used, there should be 5-10 in.-lb (5.6 - 11.3 N·m) drag on reel shaft. Rotate the shaft and repeat check to be sure bearings are aligned in cup and cone.
5. If bearings need adjustment, locate and remove lock tab from lockwasher inserted into slot on locknut (Fig. 49).

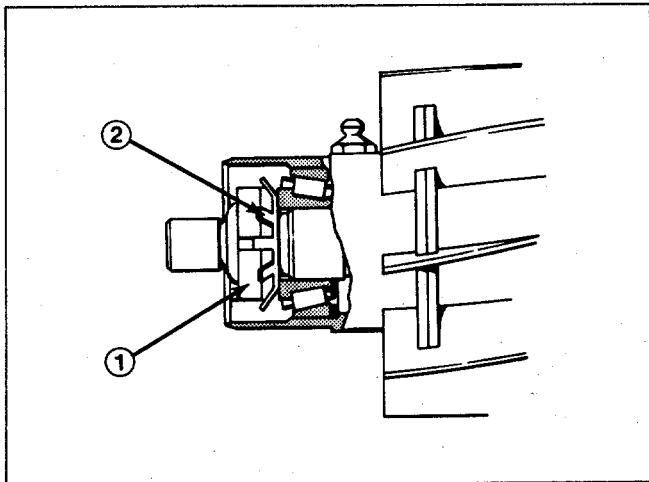


Figure 49

1. Locknut
2. Lockwasher

6. Adjust locknut in small increments and check for proper preload. Bend ears of lockwasher into slots on locknut when adjustment is completed to secure locknut (Fig. 49).

IMPORTANT: Do not over-adjust or bearing life will be affected.

7. Install left reel bracket.

MOWER SHARPENING

BACKLAP OPERATION

Backlap when reel blade and bedknife edges are slightly rounded and do not cut the grass cleanly with a light reel to bedknife adjustment. Also backlap after a reel and bedknife have been re-ground to establish a land area and assure a perfect match between reel and bedknife cutting edges. Backlapping will not correct nicked or severely rounded reel blades or uneven bedknife wear. Correct these conditions by repairing, replacing or regrinding the components.

1. Using a fine-tooth file, remove high spots from reel blades. If any blade is bent, straighten by placing a hammer on one side of blade and tapping on opposite side.

2. Adjust the reel to bedknife to obtain a light contact; refer to Reel to Bedknife Adjustment, page 14.

3. Connect a lapping machine to the cutting unit with an extension coupler, and socket.

4. Use a good grade of medium grit (80) commercial lapping compound with a water soluble carrier to assure the compound will be easily washed away at the completion of the backlapping operation. Dry lapping compound should be mixed with liquid detergent (soap) until the material is of free flowing consistency.

Note: Paste-type pre-mixed lapping compound is also sold in some areas. This is generally used in its original composition and therefore is not free flowing.

5. Operate the lapping machine so the reel turns in a reverse direction for about three minutes. Apply lapping solution continuously with a paint brush across the full width of the reel.



CAUTION

Be careful when lapping the reel because contact with the reel or other moving parts can result in personal injury.

6. Again, lightly adjust the bedknife and reel. Then, lap for approximately two additional minutes. Apply lapping solution continuously.

Wash off all lapping solution.

7. Using newspaper, check for sharpness along the entire length of each reel blade. If the newspaper cannot be cut cleanly along the entire length of each blade, grinding or re-grinding is necessary; refer to Reel and Bedknife Grinding, page 21.

Note: For a better cutting edge, run a file across the front face of the bedknife when the lapping operation is completed. This will remove any burrs or rough edges that may have built up on the cutting edge.

REEL AND BEDKNIFE GRINDING

Refer to the TORO GUIDE TO REEL AND ROTARY MOWER SHARPENING. Copies are available from your local TORO distributor.

MAINTENANCE

Note: In order to grind the bedknife, it has to be removed from the cutting unit. The bedknife is then mounted on the grinding bar (3-1397).

PREPARING MOWER FOR STORAGE

1. Drain gasoline from fuel tank. Start engine and let it run at slow speed until it stops because all gasoline is used.
2. Drain oil from crankcase: refer to To Change the Oil, step 2, page 15. However, do not fill crankcase with oil at this time.
3. Remove grass clippings, dirt and grime from external parts of mower housing and engine. Also clean the engine cooling system.
4. Clean carbon from internal parts of engine and re-assemble engine.
5. Pull high tension wire off spark plug and clean area around plug so foreign matter cannot fall into cylinder when plug is removed. Remove plug from cylinder head and pour two tablespoons (25 ml) of engine oil into spark plug hole. Pull recoil starter handle slowly to distribute oil on inside of cylinder. Reinstall spark plug and tighten it to 15 ft-lb (20.4 N·m). If torque wrench is not used, tighten plug firmly. DO NOT INSTALL HIGH TENSION WIRE ON SPARK PLUG.
6. Remove the cover over left side of machine. Inspect the belt for excessive wear or damage. Repair or replace as necessary. Assure belt is in disengaged position.
7. Check condition of reel blades and bedknife: repair and sharpen as necessary; refer to Mower Sharpening, page 21.
8. Lubricate mower: refer to Lubrication, page 15.
9. Clean the air cleaner: refer to Servicing Air Cleaner, page 17.
10. Check and tighten all capscrews, screws, bolts, nuts and mating parts. If any part is damaged, repair or replace it.

11. "Touch up" all rusted or chipped paint surfaces. Make sure to sand affected area before painting.

Note: TORO Re-Kote "touch-up" paint is available from an Authorized Toro Service Dealer or Distributor. The spray paint dries in minutes to a glossy, factory-finish.

12. Fill crankcase with oil: refer to To Change The Oil, page 15.

13. Store the mower in a clean, dry place. Cover the mower to protect it and keep it clean.

INSTALLING OPTIONAL SPARK ARRESTER

1. Remove original muffler and exhaust pipe.
2. Insure screen is installed in spark arrester muffler housing (Fig. 50) and install muffler. Tighten mounting screws securely.

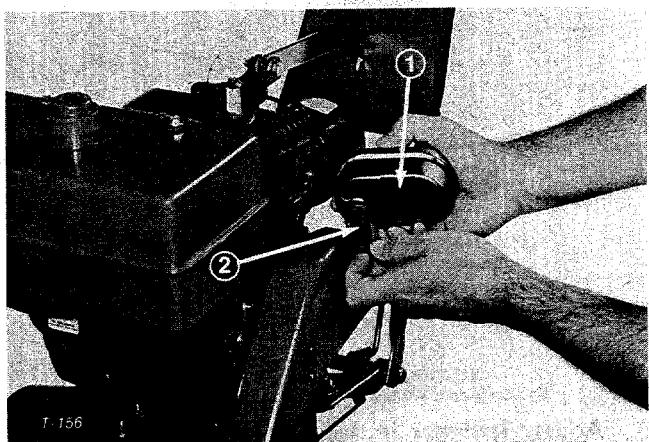


Figure 50

1. Muffler
2. Screen

MAINTENANCE

Remove spark arrester assembly every 20 hours of operation. Remove and clean and inspect screen. If screen mesh is eroded or partly missing, replace screen. Unit is subject to inspection by forest service personnel to determine if the unit is mechanically whole.

IDENTIFICATION AND ORDERING

The mower has two identification numbers: a model number and a serial number. The two numbers are stamped into a plate located at rear of transmission case. 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 number of the mower.
2. Part number, description and quantity of part(s) desired.

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

MAINTENANCE RECORD

The Toro Promise

A ONE YEAR LIMITED WARRANTY ON COMMERCIAL PRODUCTS OTHER THAN TRIMMERS AND BLOWERS.

The Toro Company promises to repair any TORO Product if defective in materials or workmanship. The following time periods from the date of purchase apply:

Commercial Products	1 Year
Trimmers and Blowers	90 Days

The costs of parts and labor are included, but the customer pays the transportation costs on walk rotary mowers, trimmers and blowers.

If you feel your TORO product is defective and wish to rely on The Toro Promise, the following procedure is recommended:

1. Contact your Authorized TORO Distributor or Commercial Dealer (the Yellow Pages of your telephone directory is a good reference source).
2. The TORO Distributor or Commercial Dealer will advise you on the arrangements that can be made to inspect and repair your product.
3. The TORO Distributor or Commercial Dealer will inspect the product and advise you whether the product is defective and, if so, make all repairs necessary to correct the defect without an extra charge to you.

If for any reason you are dissatisfied with the distributor's analysis of the defect or the service performed, you may contact us.

Write:

TORO Commercial Products Service Department
8111 Lyndale Avenue South
Minneapolis, Minnesota 55420

The above remedy of product defects through repair by an Authorized TORO Distributor or Commercial Dealer is the purchaser's sole remedy for any defect.

THERE IS NO OTHER EXPRESS WARRANTY. ALL IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR USE ARE LIMITED TO THE DURATION OF THE EXPRESS WARRANTY.

Some states do not allow limitation on how long implied warranty lasts, so the above limitation may not apply to you.

This Warranty applies only to parts or components which are defective and does not cover repairs necessary due to normal wear, misuse, accidents, or lack of proper maintenance. Regular, routine maintenance of the unit to keep it in proper condition is the responsibility of the owner.

All warranty repairs reimbursable under the Toro Promise must be performed by an Authorized TORO Commercial Dealer or Distributor using Toro approved replacement parts.

Repairs or attempted repairs by anyone other than an Authorized TORO Distributor or Commercial Dealer are not reimbursable under the Toro Promise. In addition, these unauthorized repair attempts may result in additional malfunctions, the correction of which is not covered by warranty.

THE TORO COMPANY IS NOT LIABLE FOR INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE USE OF THE PRODUCT INCLUDING ANY COST OR EXPENSE OF PROVIDING SUBSTITUTE EQUIPMENT OR SERVICE DURING PERIODS OF MALFUNCTION OR NON-USE.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

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

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.