FORM NO. 3315–448 REV. B

TORO®

MODEL NO. 04129 – 30001
thru 50001 & UP
MODEL NO. 04215–30001
thru 50001 & UP

OPERATOR'S MANUAL

GREENSMASTER® 500
TRACTION UNIT & CUTTING UNIT

To achieve maximum safety, optimum performance, and to gain knowledge of the machine, it is essential that you or any other operator of the machine read and understand the contents of this manual before the engine is started.

Pay particular attention to the instructions highlighted by the triangular safety alert symbol. Failure to comply with the safety instructions may result in personal injury.

FOREWORD

The GREENSMASTER® 500 was developed to provide an efficient trouble free method of mowing high quality turf on the finest greens. The latest concepts of engineering, design and safety have been incorporated into this machine, along with the highest quality parts and workmanship. Excellent service will be derived if proper operation and maintenance practices are followed.

You know, since you have purchased the industry leader in mowing excellence, that future performance and dependability are of prime importance. TORO also is concerned about future use of the machine and of safety to the user. Therefore, this manual must be read by you and those involved with the GREENSMASTER® 500 to make sure that safety, proper set-up, operation and maintenance procedures are followed at all times. The major sections of the manual are:

1. Safety Instructions
2. Set-Up Instructions
3. Before Operating
4. Operating Instructions
5. Maintenance

Safety, mechanical and some general information in this manual are emphasized. **DANGER**, **WARNING** and **CAUTION** identify safety messages. Whenever the triangle safety symbol appears, it is followed by a safety message that must be read and understood. For more details concerning safety, read the safety instructions on pages 3 and 4. **IMPORTANT** identifies special mechanical information and **NOTE** identifies general information worthy of special attention.

If help concerning set up, operation, maintenance or safety is ever needed, contact your local Authorized TORO Distributor. In addition to genuine TORO replacement parts, the distributor also has optional equipment for the complete line of TORO turf care equipment. Keep your Toro all TORO. Buy genuine TORO parts and accessories.

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SAFETY INSTRUCTIONS

The Greensmaster 500 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 the complete model and serial number to:

   The Toro Company
   8111 Lyndale Avenue South
   Bloomington, MN 55420–1196

2. Never allow children, or adults unfamiliar with its operation, to operate the machine. Keep everyone, especially children and pets away from the area of operation.

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.

   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. Move ON/OFF switch to ON position.

   D. Move choke to full choke position (cold start, if required) and throttle to half–open position.

   E. Pull starter rope to start engine.

   F. Move throttle to SLOW and on/off switch to OFF position to stop engine.

13. To transport mower from one area to another:

   A. Disengage the reel drive knob on transmission.

IMPORTANT: Excessive operating of the cutting unit with the absence of any grass clippings (lubricant) can damage the cutting unit.

   B. Make sure traction clutch lever on handle is disengaged and start engine.

   C. Press down on handle to raise front of mower and engage traction drive clutch lever.

14. To begin mowing operation:

   A. Move ON/OFF switch to OFF position.

   B. Disengage traction drive clutch lever.

   C. Pull reel 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. Move ON/OFF switch to OFF position.

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 shut–off 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 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.

SAFETY INSTRUCTIONS

21. If major repairs are ever needed or if assistance is desired, contact an Authorized TORO Distributor.

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

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

24. Do not overspeed the engine by changing the governor settings. Maximum engine speed is 3000 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.

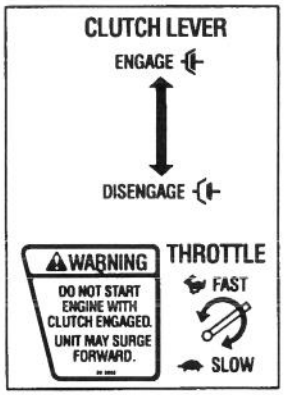
SAFETY INSTRUCTION DECALS

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.

ON REEL BRACKET
(Part No. 3–3964)

ON CUTTING UNIT & YOKE ASSEMBLY
(Part No. 67–7960)

ON FUEL TANK
(Part No. 88–7620)



ON HANDLE
(Part No. 88–8960)

ON FUEL TANK
(Part No. 63–8440)

ON REAR OF TRANSAXLE
(Part No. 3–1553)

ON BELT GUARD BRACKET
(Part No. 88–8950)

SPECIFICATIONS

Engine: 3.7 horsepower (2.7 kw) engine with 2.64 quarts (2.5 l) capacity gas tank. NGK BP5ES spark plug recommended with 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: 0.197 in. (5.0 mm).

Ground Speed: 2.1 mph (3.4 Km/hr) at 1600 RPM and 4.0 mph (6.4 Km/hr.) at 3100 RPM.

Traction Drive: "A" section "V" belt on 2.0 P.D. and 3.70 P.D. to countershaft (1. 85:1) 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 Drive Clutch: Friction Disk type – Hand operated at handle controls.

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 20T and 14T sprockets from countershaft. Reduction Engine to Reel – 1.30:1.

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:
Brush Kit, Part No. 2–2949
Skid Kit, Part No. 4–7299
Sectional Roller Kit, Part No. 4–7319
Urethane Comb Kit, Part No. 8–2560
Full Roller Kit, Part No. 4–7309

LOOSE PARTS CHART

Loose Parts	Qty.	Where Used
Handle Assembly	1	Install on machine. (Mounting fasteners loosely installed on mower.)
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.
EEC Noise Certification	1	
Operator's Manual	1	
Engine Manual	1	
Parts Catalog	1	
Registration Card	1	

SET–UP INSTRUCTIONS

INSTALL HANDLE

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

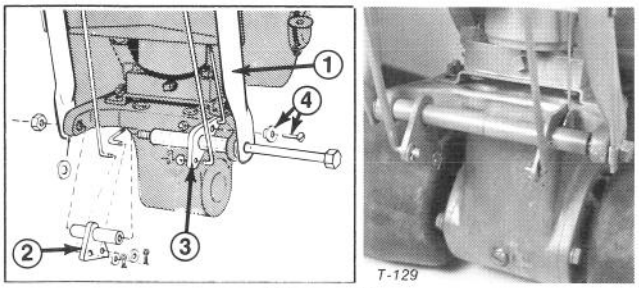


Figure 1

1. Handle
2. Bellcrank–clutch
3.. Bellcrank–throttle
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. 2).

3. Secure throttle and clutch rods with flat washers and cotter pins and throttle wire with retainer screw (Fig. 1).

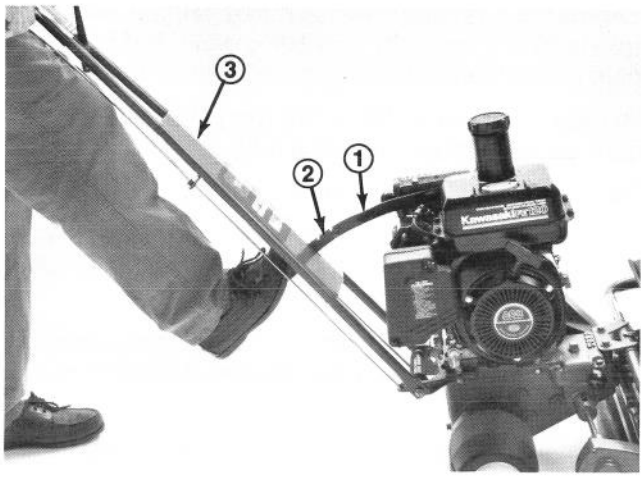


Figure 2

1. Adjusting bar
2. Notches
3. Handle

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. 2). Lift foot and allow handle to lock into notch in adjusting handle (Fig. 2).

PREPARATION BEFORE OPERATING

ADD OIL

Initially, crankcase must be filled with approximately16 ounces of proper viscosity oil (See chart below). Use any high quality detergent oil having the American Petroleum Institute (API) "service classification"—MS, or SC.

Temperature	Oil Viscosity
50° or below	SAE 10W30 wt.
50° to 95°	SAE 10W30 wt. or 30 wt.
Above 95°	SAE 40

1. Position mower so the engine is level and clean around oil level gauge (Fig. 3).

2. Remove gauge by rotating counterclockwise.

3. Wipe gauge clean and insert it into filler port. Then remove and check level of oil. Do not screw into port. If level is low, add only enough oil to raise level to filler opening.

Note: The TORO Company recommends that the oil level be checked each time mower is used or after every 5 operating hours. Initially, change oil after the first 20 hours of operation; thereafter, change oil after every 50 hours of operation. **More frequent oil changes are required in dusty or dirty conditions.**

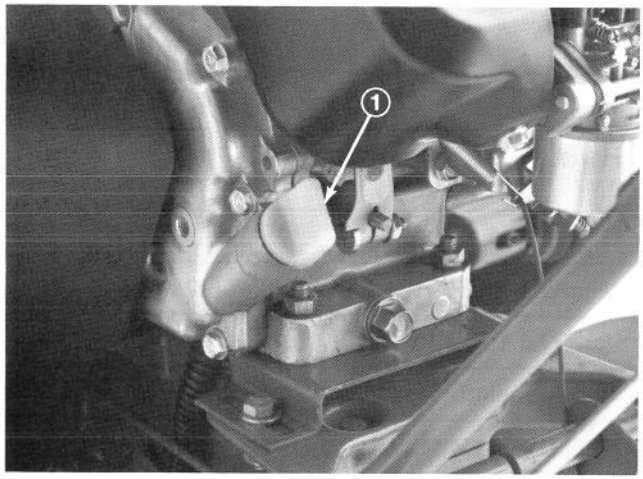


Figure 3
1. Oil level gauge

FILL FUEL TANK

NOTE: 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. LEADED GASOLINE CAN BE USED IF UNLEADED IS NOT AVAILABLE.

PREPARATION BEFORE OPERATING

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 around fuel tank cap and remove cap from tank (Fig. 4). Using unleaded gasoline, fill fuel tank no higher than to bottom of filter screen. **DO NOT OVER FILL.**

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 NO 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 tank no higher than to bottom of filter screen. DO NOT OVER FILL. Store gasoline in a clean safety approved container and keep the cap 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.

Figure 4
1. Fuel tank cap

2. Install fuel tank cap and wipe up any spilled gasoline.

CHECK TRANSMISSION OIL LEVEL

Check transmission oil level before initial startup and after every 50 hours of operation.

1. Place mower on level surface and remove pipe plug at rear of gear case. Oil should be to bottom of hole (Fig. 5).

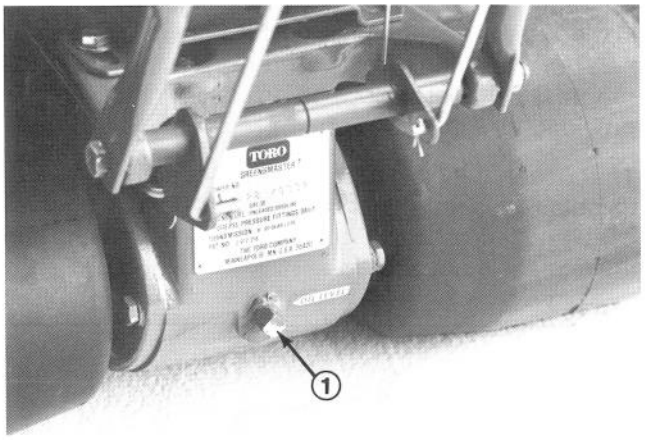


Figure 5
1. Pipe plug

2.. 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. 6). Replace both plugs.

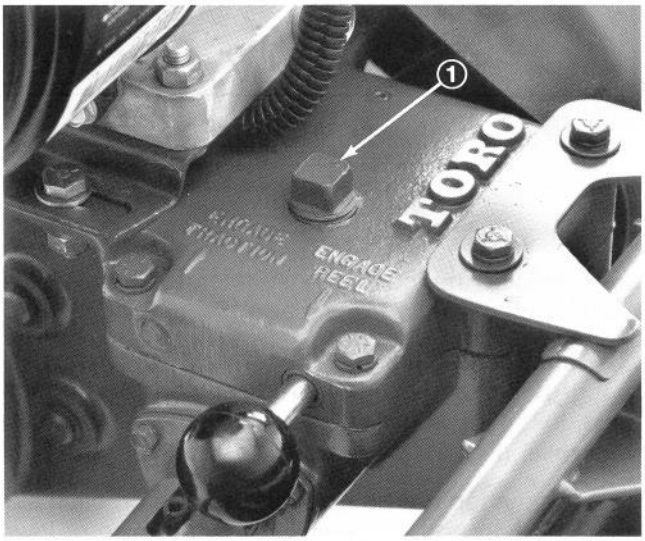


Figure 6
1. Transmission oil fill plug

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

PREPARATION BEFORE OPERATING

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 500. 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 500 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 nut on gauge bar and set adjusting screw to obtain desired distance between bottom of screw head and face of bar (Fig. 7). Tighten nut, making sure adjustment is not altered.

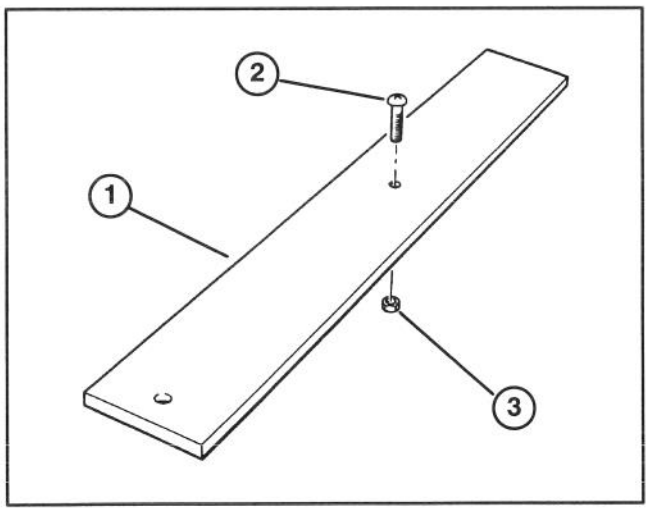


Figure 7

1. **Gauge bar**
2. **Height adjustment screw**
3. **Nut**

2. Remove the cutting unit; refer to removal and Installation of Cutting Unit, page 15.

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. 8).

4. Loosen top nut on adjusting screws on each side plate (Fig. 8) and turn adjusting nut to raise or lower front roller or skid assembly (Fig. 8). Raise or lower rollers until they contact out end of gauge bar. When proper adjustment is obtained, screw head on gauge bar will just pass over cutting edge of bedknife (Fig. 8). ASSURE HEIGHT–OF–CUT IS EXACTLY IDENTICAL AT BOTH ENDS OF BEDKNIFE.

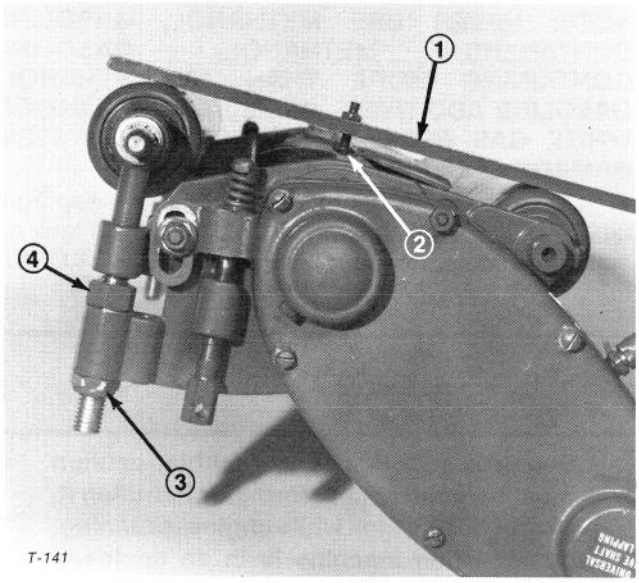


Figure 8

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

5. Tighten top nuts to secure roller adjustment (Fig. 8). Turn cutting unit over and place on a level surface (Fig. 9). Press down on each end of the front and rear rollers (Fig. 9). Each roller should contact level surface completely across unit (Fig. 9). If rollers do not contact, repeat steps 3 and 4.

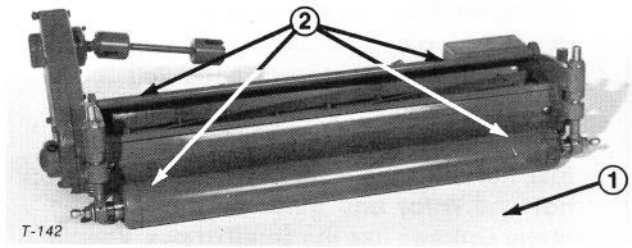


Figure 9

1. **Level surface**
2. **Press down**

6. 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 20. If the paper is cleanly cut, proceed to step 7.

7. Tighten nuts to secure the adjustment.

8. 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 20. If the paper is cleanly cut, proceed to step 9.

9. Tighten nuts to secure the adjustment.

PREPARATION BEFORE OPERATING

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. 10).

2. Adjust reel to knife clearance with adjusting screws at each end of unit (Fig. 11). NEVER ALLOW BEDKNIFE TO BEAR HEAVILY AGAINST REEL.

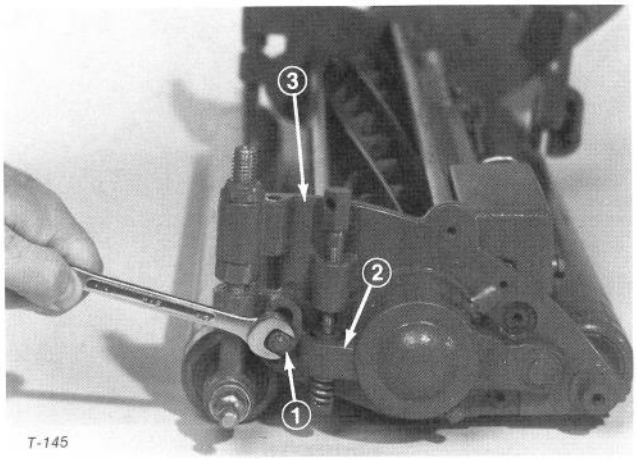


Figure 10

1. Nut
2. Reel bracket
3. Side plate

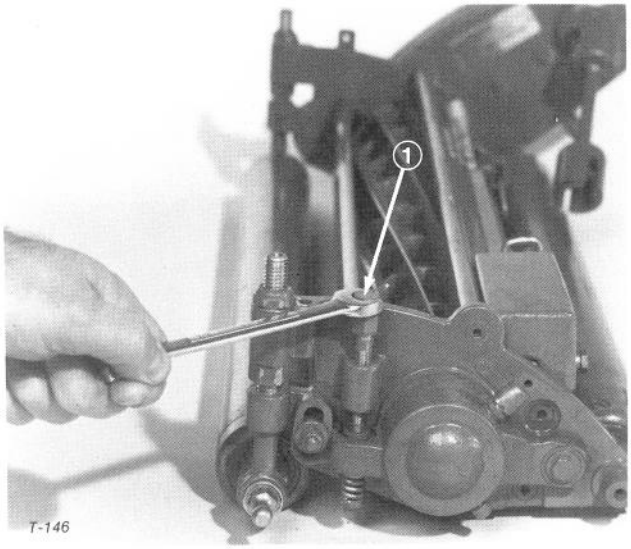


Figure 11

1. Reel adjusting screw

3. 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 20. If the paper is cleanly cut, proceed to step .

4. Tighten nuts to secure the adjustment.

5. 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.

ADJUST REAR ROLLER SCRAPER

The adjustment of the rear roller scraper depends on the many conditions of the green (i.e. leaves, seeds, dew, etc.).

1. Adjust scraper rod locknuts and brackets to attain .06"–.10" clearance between scraper rod and roller surface. Distance between bottom of rod and level surface should be the same height as height–of–cut setting.

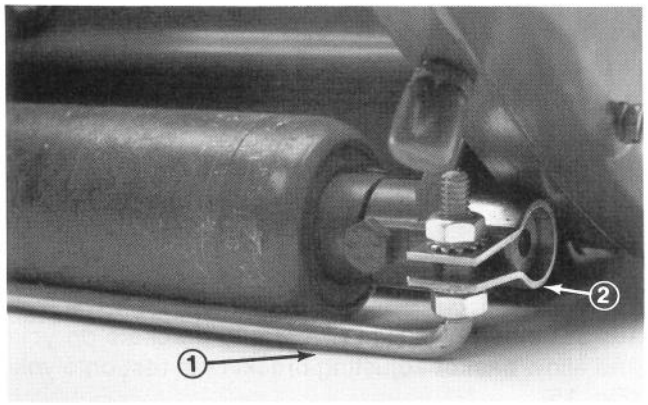


Figure 12

1. Scraper rod
2. Bracket

2. Assure scraper rod is parallel to roller and level surface.

Note: Readjust height of scraper rod if height–of–cut is changed.

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 side of the yoke (Fig. 13).

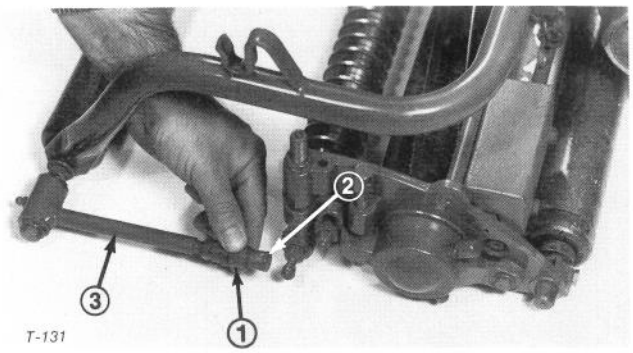


Figure 13

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. 13).

4. Align ball sockets with ball studs so hooded portion of socket is at top and open side toward stud (Fig. 14).

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 slids forward over the stud and locks the assemblies together. Tighten the jam nuts to secure the sockets in position (Fig. 14).

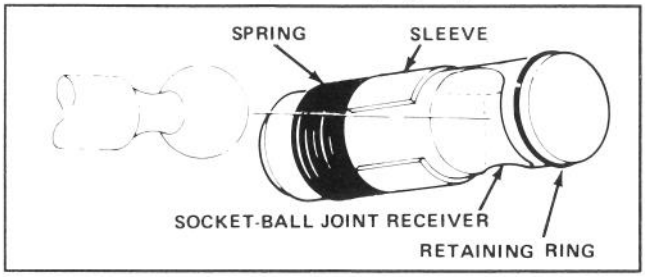


Figure 14

INSTALL GRASS CATCHER

1. Set pins on basket pivots into brackets on yoke and allow basket adjusting brackets to rest onto yoke (Fig. 15).

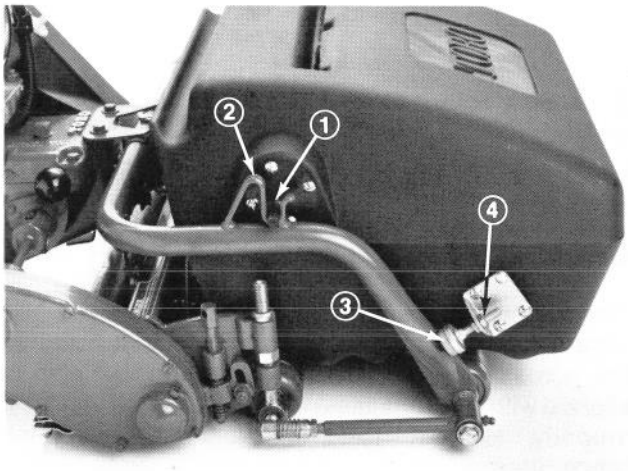


Figure 15

1. **Basket pivot**
2. **Yoke bracket**
3. **Adjusting 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. 16). If the dimension is incorrect, adjust basket.

Note: Basket should be lower in front to assist clipping throw into basket. Adjust brackets to lower basket (Fig. 15). Make sure basket clears roller by at least 1/16 in. (1.6 mm).

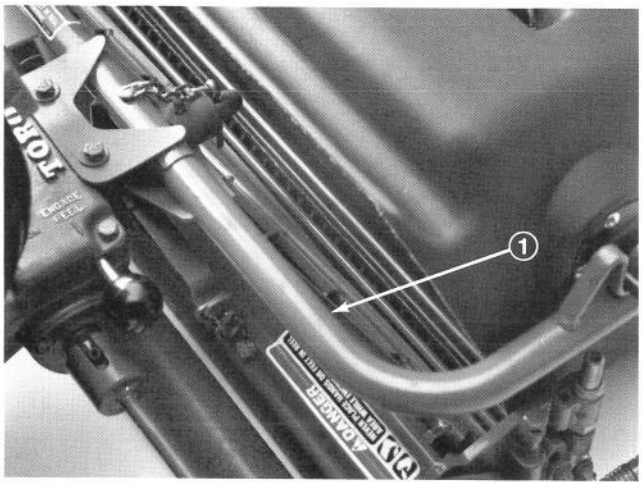


Figure 16

1. **1–1/4 inch (6 mm) maximum**

3. Loosen jam nuts on each side of basket and rotate adjusting brackets (Fig. 15). Be sure dimension is equal on both ends of unit and tighten jam nuts.

CONTROLS

Throttle Control (Fig. 17) — 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.

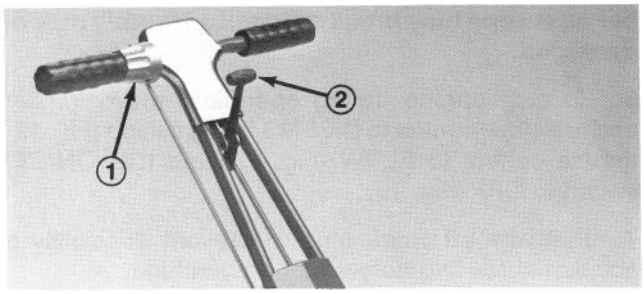


Figure 17
1. **Throttle control grip**
2. **Clutch control lever**

Clutch Control Lever (Fig. 17) — Located at center of handle. Connects to and controls drive linkage to traction drum. Control has two positions: ENGAGE and DISENGAGE.

Choke Lever (Fig. 18) — Located on rear of engine. Lever has two positions: RUN and CHOKE. Move lever to CHOKE position when starting a cold engine. After engine starts move lever to RUN position.

Fuel Shut–off Valve (Fig. 18) — Located on left side of engine. Valve has two positions: CLOSED and OPEN. Move lever to closed position when storing or transpo› before starting engine.

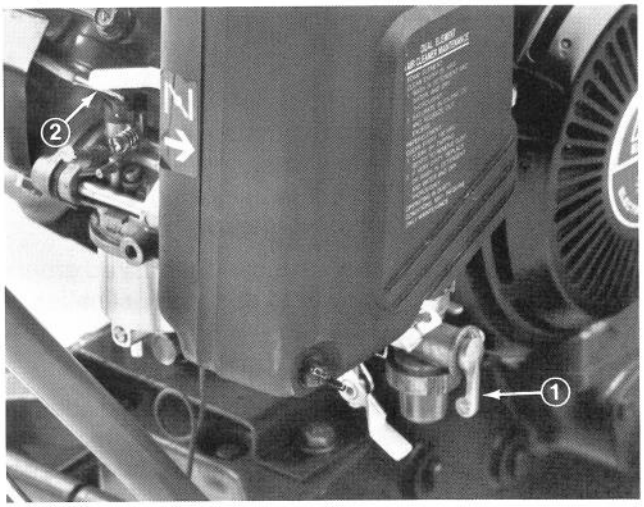


Figure 18
1. **Fuel shut–off valve**
2. **Choke lever**

Reel Drive Control (Fig. 19) — Control knob, located on right side transmission, has two positions: ENGAGE and DISENGAGE. Pull out knob to engage reel drive gears. Push in to disengage.

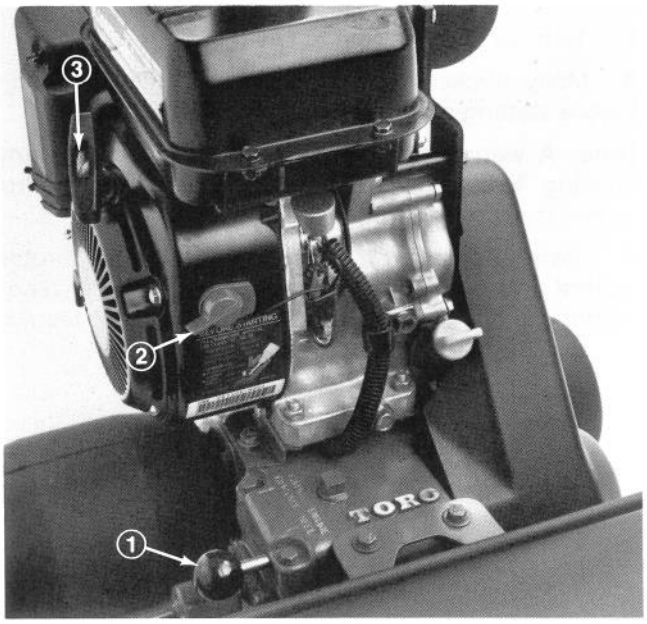


Figure 19
1. **Reel drive control knob**
2. **Engine stop switch**
3. **Recoil starter**

Engine Stop Switch (Fig. 19) — Located on front of engine. Rotate to OFF to stop engine.

Recoil Starter (Fig. 19) — Pull recoil starter handle to start engine.

STARTING AND STOPPING INSTRUCTIONS

Note: Make sure wire is installed on spark plug.

1. Assure traction control lever and reel drive knob are in DISENGAGED position.

2. Open fuel valve on front of engine (Fig. 18).

3. Turn ON/OFF switch to ON (Fig. 19)

4. Move choke lever (Fig. 18) to CHOKE position before starting a cold engine, only if necessary.

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

5. Stand behind the machine, move the throttle control grip to mid throttle position (Fig.17). Pull recoil starter handle out until positive engagement results. Pull handle to start engine and allow rope to recoil slowly. Open choke as engine warms up, if used.

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.

6. To stop engine during operation, move traction and reel drive control to DISENGAGE position (Fig. 19), throttle control to SLOW (Fig. 17) and turn ON/OFF switch to OFF (Fig. 19).

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

8. Close fuel valve before storing machine (Fig. 18).

OPERATING INSTRUCTIONS

TRANSPORT OPERATION

1. Assure traction clutch and reel drive control are in DISENGAGE and start engine.

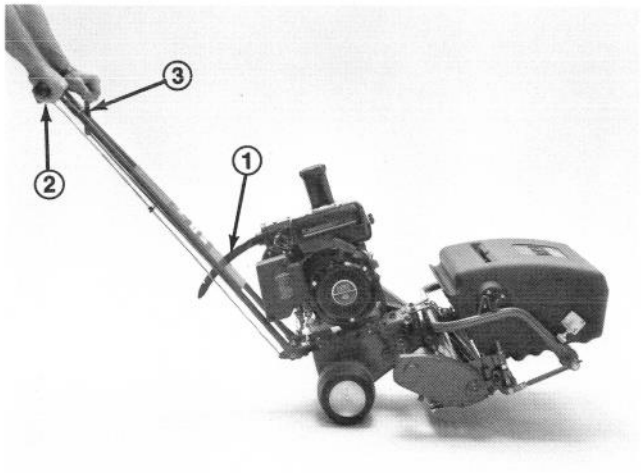


Figure 20

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

IMPORTANT: Excessive operating of the cutting unit with the absence of any grass clippings (lubricant) can damage the cutting unit.

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 moved forward slowly (Fig. 20).

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

MOWING OPERATION

Proper use of the Toro Greensmaster 500 provides the smoothest turf cutting available. The fundamental suggestions given will provide the utmost performance from your Toro Greensmaster 500.

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.

OPERATING INSTRUCTIONS

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. Start engine, push down on handle to elevate cutting unit, push traction clutch control lever forward and transport machine onto collar of green.

2. Pull traction clutch control lever (Fig. 21) back to DISENGAGE position and pull reel drive control knob on transmission fully out to ENGAGE reel (Fig. 22).

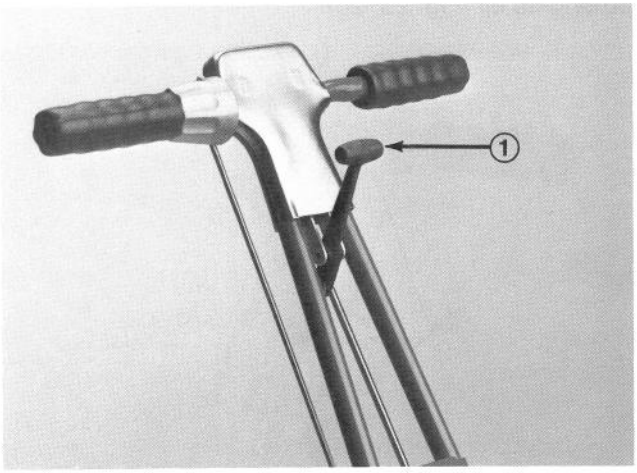


Figure 21
1. Traction clutch control lever—Push forward to ENGAGE

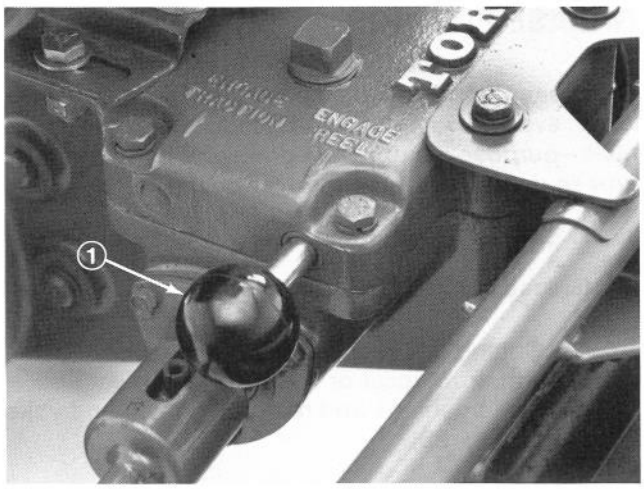


Figure 22
1. Reel drive control knob—Pull out to ENGAGE

3. Push the traction clutch control forward, increase throttle speed until the unit is traveling at the desired ground speed, drive the mower out onto the green area, drop the front of the mower down and commence mowing operation.

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.

2. Empty the grass catcher of clippings, install grass catcher and commence transport operation; refer to Transport Operation, page 12.

LUBRICATION

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, drive shaft bearing, front roller or support, yoke pivot and pull arm bushings and rear cutting unit and yoke rollers (Fig. 23).

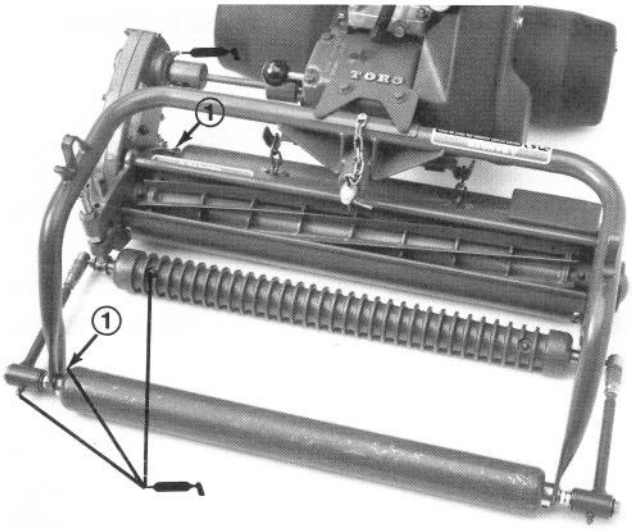


Figure 23
1. Pipe plug

   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. 23). 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. 23).

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

3. Wipe excess grease away.

GREASING TRACTION CLUTCH

1. At the end of each seasons cutting, remove the traction clutch assembly and clean and re–pack the cam and roller assembly with No. 5 multi–purpose bearing grease (Fig. 24). Take extreme care to make sure that grease is kept off the clutch friction discs (Fig. 24).

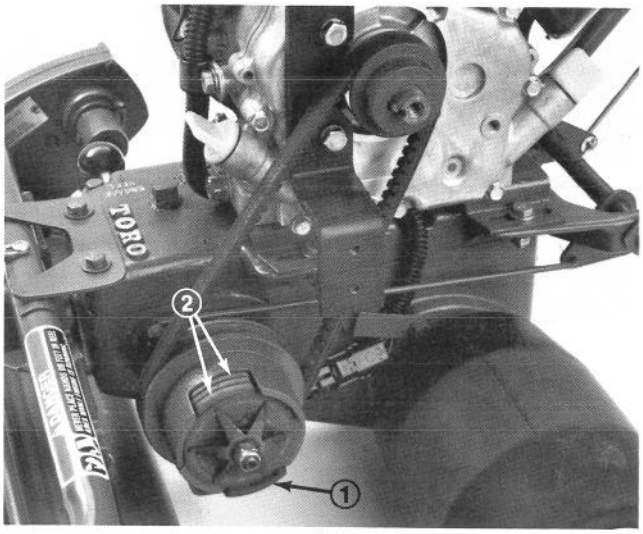


Figure 24
1. Clutch assembly
2. Clutch friction discs

LINKAGE PIVOT POINTS

Oil all pivot points of control linkages weekly with SAE 30 engine oil (Fig. 25, 26).

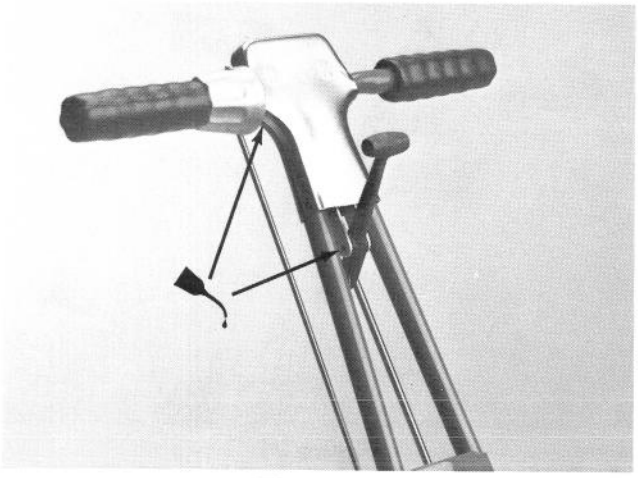


Figure 25

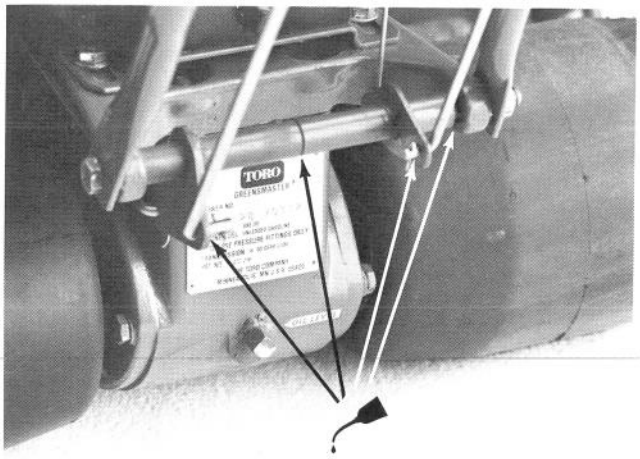


Figure 26

MAINTENANCE

⚠ CAUTION

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

REMOVAL AND INSTALLATION OF CUTTING UNIT

1. Slide sleeves back on pull arm ball joints and lift pull arm sockets straight up off ball studs (Fig. 27).

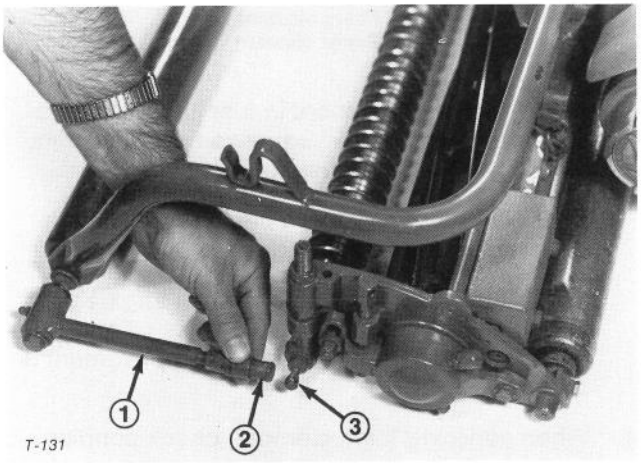


Figure 27

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

2. Remove grass catcher and unhook the two chains from the support hooks (Fig. 28).

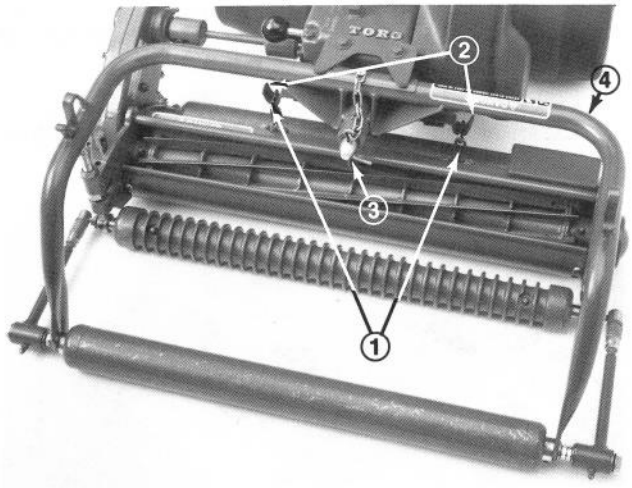


Figure 28

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

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 the transmission shaft and install drive shaft. Be sure pad is installed into drive shaft (Fig. 29).

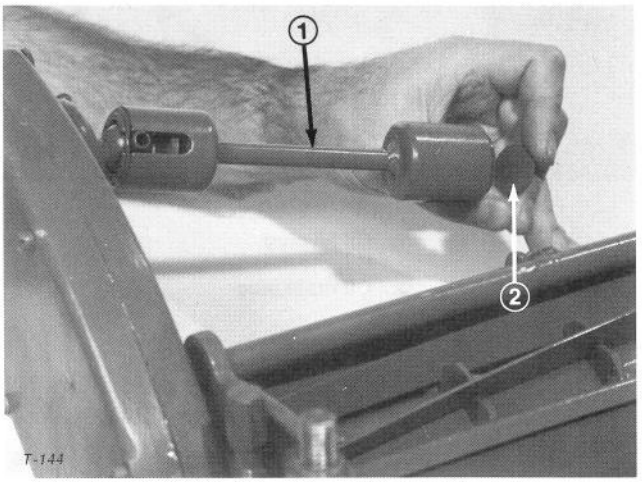


Figure 29

1. Drive shaft
2. Pad

2. Install the chains onto the support hooks (Fig. 28).

3. Align pull arms with ball studs, slide sleeves back on sockets and drop arm sockets down on ball studs (Fig. 27).

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 9.

REMOVING YOKE ASSEMBLY

To remove yoke:

1. Remove grass catcher and unhook chains from support hooks (Fig. 28).

2. Remove cotter pin from yoke pivot and slide yoke assembly off pivot (Fig. 28).

3. Reverse procedure to install yoke.

CHANGING ENGINE OIL

1. Start and run engine for a period to warm the engine oil.

2. Stop engine, place a drain pan under plug in crankcase on handle side of engine, remove oil drain plug and allow oil to drain into drain pan (Fig. 30).

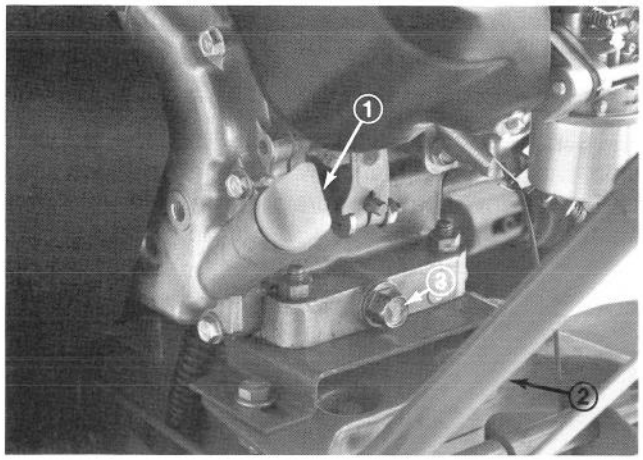


Figure 30
1. Oil fill plug
2. Handle
3. Oil drain plug

3. Install drain plug; remove oil fill plug (Fig. 30), assure engine is level and fill crankcase with fresh clean oil; refer to Add Oil, page 6.

SERVICING AIR CLEANER

Clean the air cleaner element after every 25 hours of engine operation if the mower is operated in clean air conditions. The element, however, must be cleaned more frequently when the mower is operated in dusty or dirty conditions.

1. Pull wire off spark plug.

2. Remove wing nuts and cover to expose air cleaner element (Fig. 31).

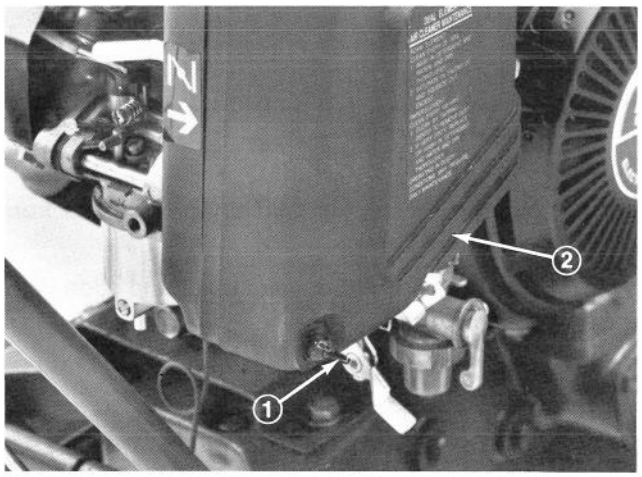


Figure 31
1. Wing nuts
2. Cover

3. Examine foam element around filter. If element is dirty or discolored, it must be removed from the air cleaner body, then cleaned (Fig. 32).

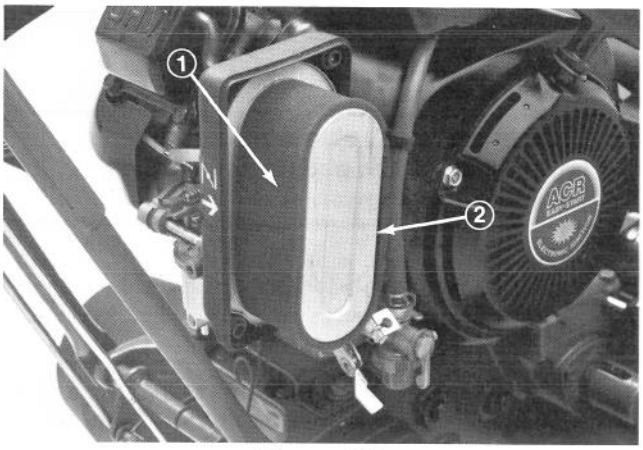


Figure 32
1. Foam element
2 Paper element

A. WASH foam element in a solution of liquid soap and warm water. Squeeze to remove dirt, but do not twist because foam may tear.

B. DRY by wrapping in a clean rag. Squeeze rag and foam element to dry.

C. SATURATE element with clean engine oil. Squeeze element to remove excess oil and to distribute oil thoroughly. An oil damp element is desirable.

4. When servicing foam element, check condition of paper element. Clean or replace as required.

5. Reinstall foam element, paper element and air cleaner cover.

IMPORTANT: Do not operate engine without air cleaner element because extreme engine wear and damage will likely result.

REPLACING SPARK PLUG

Use an **NGK BP 5ES** spark plug or equivalent. Correct air gap is 0.028" – 0.031". Remove plug after every 100 operating hours and check its condition.

1. Pull wire off spark plug.

2. Clean around spark plug and remove plug from cylinder head (Fig. 33)

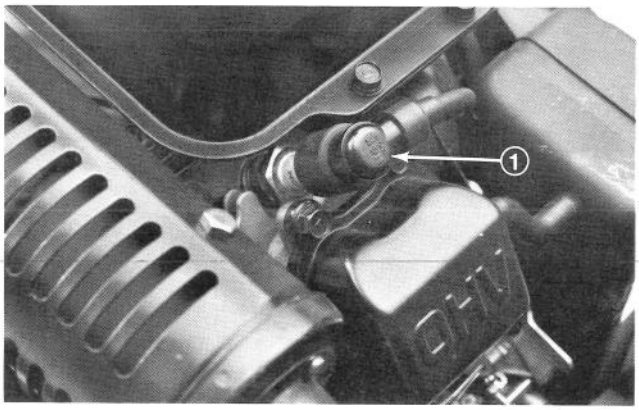


Figure 33
1. Spark plug

IMPORTANT: Replace a cracked, fouled, or dirty spark plug. Do not sand blast, scrape, or clean electrodes because engine damage could result from grit entering cylinder.

3. Set air gap at 0.028"– 0.031" (Fig. 34). Install correctly gapped spark plug and tighten firmly to 20 ft–lb.

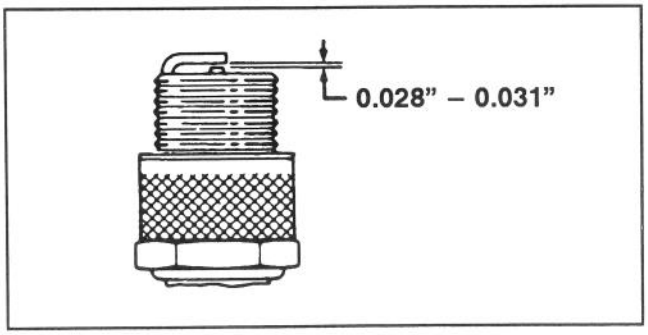


Figure 34

CLEANING FUEL FILTER

Initially, clean fuel filter after the first 20 hours of operation; thereafter clean after every 50 hours operation.

1. Close fuel shut off valve and unscrew bowl from filter body (Fig. 35).

2. Clean bowl and filter in clean gasoline and reinstall.

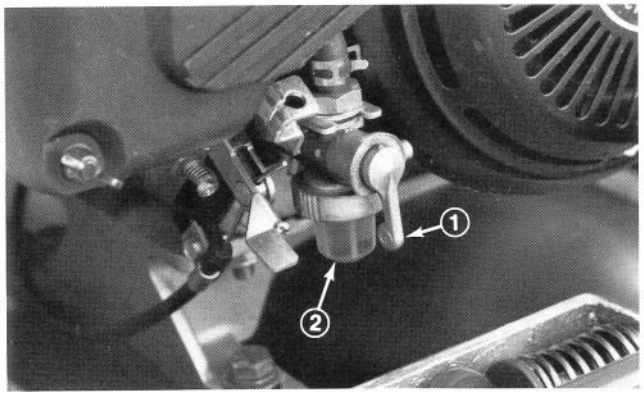


Figure 35
1. Shut off valve
2. Bowl

ADJUSTING THROTTLE CONTROL

If throttle control must be adjusted, a proceed as follows:

1. Check high and low idle speed settings with a tachometer.

Low idle speed is 1600 rpm

High Idle speed is 3000 rpm

2. Adjust idle speed screws (Fig. 36) in or out to attain correct speed setting.

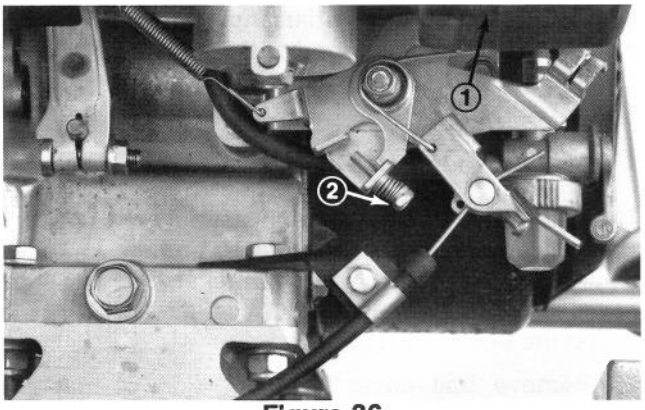


Figure 36
1. Low speed idle screw
2. High speed idle screw

ADJUSTING CARBURETOR

1. Pilot Screw (Fig. 37)- Close screw by gently rotating it clockwise.

IMPORTANT: Do not close the screw too tight because carburetor damage will occur.

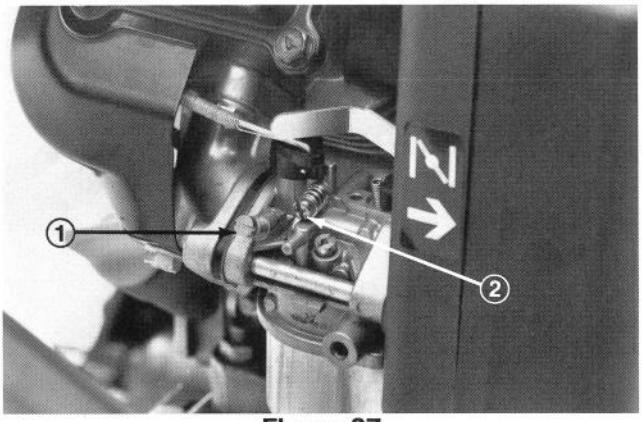


Figure 37
1. Pilot screw
2. Carburetor adjusting screw

2. Rotate -open- pilot screw 1 turn counterclockwise.

3. Turn screw clockwise to lean the mixture and counterclockwise to richen the mixture.

WARNING

Engine must be running so final adjustment of the carburetor can be performed. To guard against possible personal injury, keep hands, feet, face and other parts of the body away from the muffler, other hot parts of the engine, and other moving or rotating parts of the engine. Assure all controls are DISENGAGED.

4. Start engine and allow it to warm up.

5. Rotate carburetor adjusting screw (Fig. 37) clockwise to increase speed and counterclockwise to lower idle speed. Using a tachometer set speed to 800 rpm.

TRACTION DRIVE ADJUSTMENT

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 belt cover from left side of machine (Fig. 38).

2. Loosen the four engine hold down screws.

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. 38).

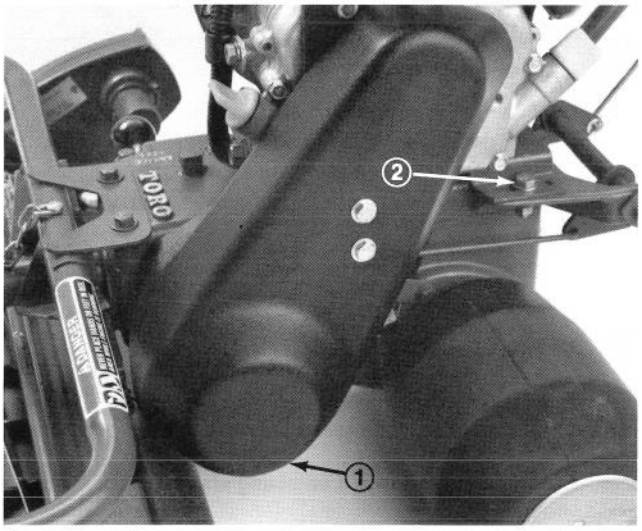


Figure 38

1. **Cover**
2. **Engine mounting fastener**

CLUTCH ADJUSTMENT

Should clutch slip during operation, check and adjust as follows:

> **⚠ WARNING**
>
> **Do not adjust clutch with the engine running. Clutch could catch and cause harm to both you and machine.**

1. Move reel clutch lever to ENGAGE position.

2. Tighten clutch locknut in small increments, start engine and test adjustment (Fig. 39).

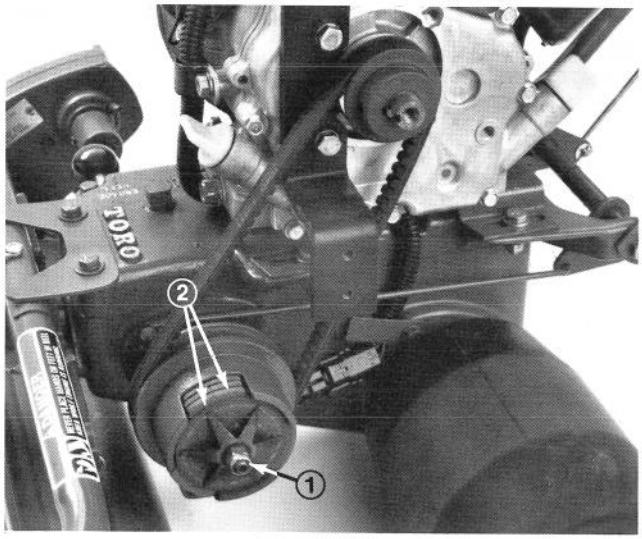


Figure 39

1. **Locknut**
2. **Clutch plates and friction discs**

3. Repeat adjustment until clutch operates correctly.

Note: Clutch plates and friction discs should be totally free of grease or oil (Fig. 39).

CUTTING UNIT CHAIN ADJUSTMENT

Once each year, check the chain assembly inside the cutting unit chain case (Fig. 40). 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 15.

2. Remove Allen head set screw anchoring steel shaft to cover (Fig. 40).

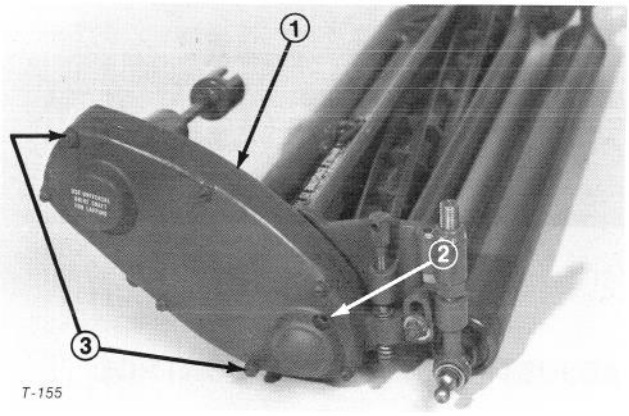


Figure 40

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

3. Remove (5) cover screws and (2) tapered nuts and remove cover (Fig. 40).

4. Check chain for excess slack (Fig. 41). If chain is too slack, loosen mounting screw for chain idler shoe, push down against chain to remove slack and tighten screw (Fig. 41).

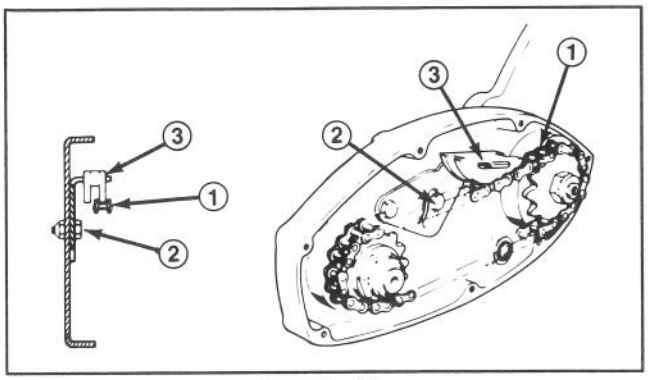


Figure 41
1. Chain
2. Idler screw
3. Shoe

5. Make sure a liberal quantity of lithium base No.2 grease is around sprocket and install cover (Fig. 41). Install tapered nuts first to make sure cover is aligned with the case (Fig. 40).

6. If idler shoe is worn excessively, flip and use other side or replace.

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

1. Remove grass catcher and cutting unit from traction unit; refer to Removal and Installation of Cutting Unit, page 15.

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. 42).

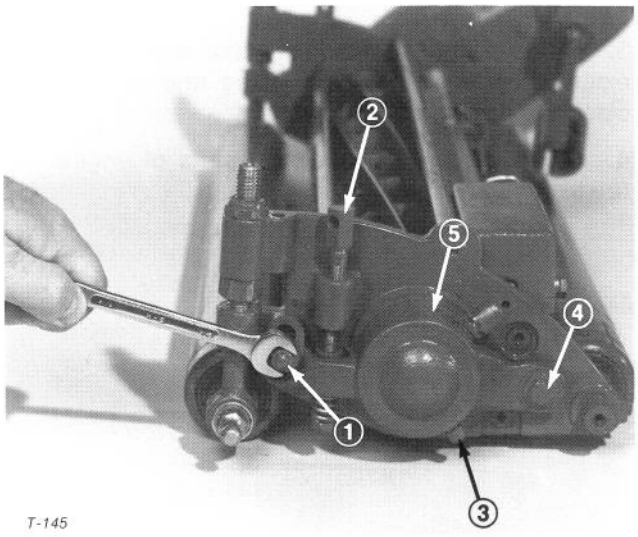


Figure 42
1. Locknut
2. Reel adjust screw
3. Allen head set screw
4. Capscrew
5. Left reel bracket

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

A. Install a 1/4–20 screw into hole in end of reel shaft (Fig. 43).

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. 43).

C. Weight should be just held when screw is perpendicular to center line of reel shaft.

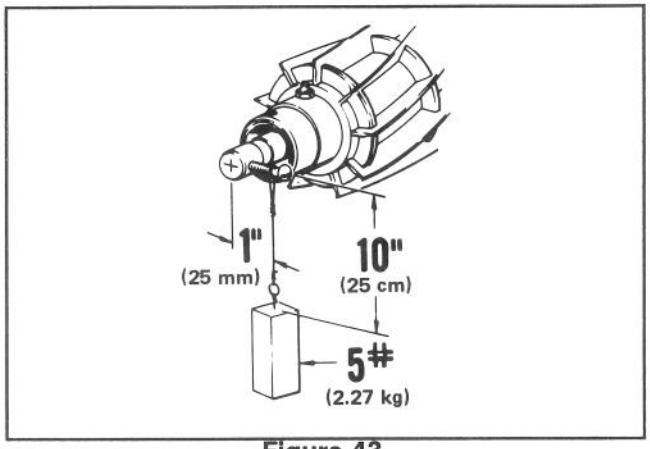


Figure 43

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. 44).

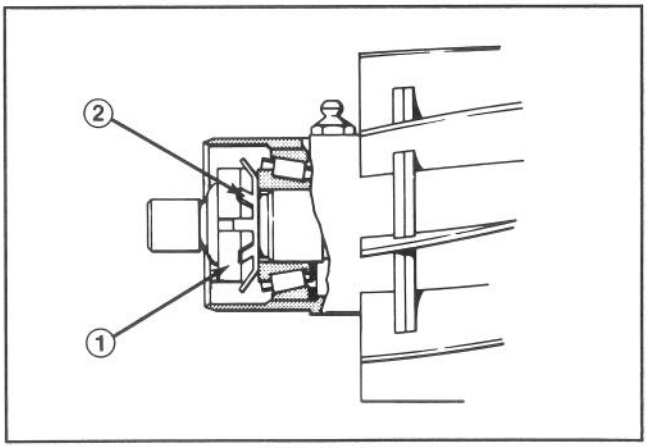


Figure 44
1. Locknut
2. Lockwasher

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. 44).

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

7. Install left reel bracket.

MAINTENANCE

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 reground 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 9.

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 20.

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.

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).

CLEANING MOWER

It is recommended to wash the cutting unit, transaxle, and grass basket after each day's use. Chemicals in the turf may cause premature deterioration to certain components if not washed daily.

IMPORTANT: Do not direct "high–pressure" water at oil seals, bearings, electrical connectors/switches, etc.; contamination of these parts could cause premature wear.

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 Changing Engine Oil, 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.

MAINTENANCE

5. Pull 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 WIRE ON SPARK PLUG.

6. Remove the belt 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 Reel And Bedknife Grinding, page 20.

8. Lubricate mower: refer to Lubrication, page 14.

9. Clean the air cleaner: refer to Servicing Air Cleaner, page 16.

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 Changing Engine Oil, page 16.

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

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 is a parts catalog is being used; use the PART NUMBER.

MAINTENANCE CHART

Date	Hours Used	Oil Change	Air Cleaner Service	Lubrication	Winter Storage	Spring Service	Spark Plug Gap	

MAINTENANCE CHART

Date	Hours Used	Oil Change	Air Cleaner Service	Lubrication	Winter Storage	Spring Service	Spark Plug Gap	

V43-014

The Toro Promise

A One Year Limited Warranty

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

Commercial Products ..... 1 Year

The cost of parts, labor and transportation are included.

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, MN 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 MERCHANTIBILITY AND FITNESS FOR USE ARE LIMITED TO THE DURATION OF THE EXPRESS WARRANTY.

Some states do not allow limitations on how long an 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 operating 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 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.

Compliance with Radio Interference Regulations Certified.