Form No. 3312–270 Rev. H

TORO®

Reelmaster 5, 7, & 11 Blade

Model No. 01005—Serial No. 40001 thru 70001 and Up
Model No. 01007—Serial No. 40001 thru 70001 and Up
Model No. 01011—Serial No. 40001 thru 70001 and Up

Operator’s Manual

English (EN)

Contents

Introduction

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

Whenever you need service, genuine Toro parts, or additional information, contact an Authorized Service Dealer or Toro Customer Service and have the model and serial numbers of your product ready. The two numbers are stamped on a plate which is located on the cross tube.

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

Model No. _____

Serial No. _____

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

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

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

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

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

8111 Lyndale Avenue South
Bloomington, MN 55420-1196

Specifications

General Specifications

Reel Drive	Reel driven by wheels 75T ring gear to 10T pinion through 14T disengaging idler gear.
Reduction, Reel to Wheels	7.5:1
Welded Reel	Medium carbon steel, induction hardened blades are welded to seven steel spiders which are mounted on a 1–1/2” (38 mm) diameter shaft. Tapered roller bearings support reel shaft, and an adjusting nut compensates for bearing wear. Diameter of 11 blade reel is 7 inches (17.8 cm). 5 and 7 blade reels are 8” inches (20.3 cm).
Bedknife & Bedbar	Single edge high carbon steel knife attached to a fabricated steel bar; single screw adjustment on adjustable rod ends.
Bedknife to Reel Adjustment	Bedknife adjusts against reel, with positive adjustment control knob located at center of bedbar. Adjustment knob contains detent with .001 inch (0.0254 mm) movement of bedknife for each indexed position. Pivot point at top of bedbar is greasable.
Wheels and Tires	16” (0.406 m) diameter pneumatic wheels with tire and tube, studded tread, stamped steel wheel and cast iron hubs; 16” (0.406 m) diameter semi pneumatic tires with stamped steel wheels and cast iron hubs; 16” (0.4(06 m) diameter cast iron wheels – one piece construction; 16” (0.406 m) diameter low profile semi–pneumatic tires with stamped steel wheels and cast iron hubs; 18” (0.457 m) semi–pneumatic tires with stamped steel wheels and cast iron hubs.
Differential	Disengaging over–running idler gear in gear train.
Width of Cut	30” (0.762 m)
Height of Cut	11 Blade – .38 inches (9.5 mm) to 1.25 inches (32 mm) with 16” (0.406 m) dia. wheel. 7 Blade – .75 inches (19 mm) to 1.75 inches (45 mm) with 16” (0.406 m) dia. wheel. 5 Blade – 1.25 inches (32 mm) to 2.25 inches (57 mm) with 16” (0.406 m) dia. wheel 5 Blade – 2.00 inches (50 mm) to 3.00 inches (76 mm) with 18” (0.457 m) dia. wheel All adjustment are made in .040 inch increments.
Frequency of Clip	11 Blade w/16” wheels – .58” clip (68 cuts per meter) 7 Blade w/16” wheels – .91” clip (43 cuts per meter) 5 Blade w/16’ wheels – 1.28” clip (31 cuts per meter) 5 Blade w/18” wheels – 1.51” clip (26 cuts per meter)
Chassis	Ribbed cast iron gear cases with tubular cross members. Front cross member provides easy attachment for the mower to the Reelmaster Universal and Reelmaster Transport frames.
Roller	3–1/2” (88.9 mm) O.D. Iron pipe running on taper bearings double lip oil seal with wear sleeves. Grease fittings provided.

General Specifications (continued)

General Specifications (approx.)	Width 41–1/2” (1.054 m) with iron wheels, 45” (1. 1 43 m) with semi–pneumatic tires. Height 16” (0.406 m) or 18” (0.457 m) depending on tires. Weight 11 Blade – 252 lbs. (114 kg) 7 Blade – 248 lbs. (112 kg) 5 Blade – 243 lbs. (110 kg) All with 16” (0.406 m) semi–pneumatic tires (without draw bars).

Note: Specifications and design subject to change without notice.

Optional Equipment

16” (0.406 m) cast iron wheel	Model No. 01336
16” (0.406 m) pneumatic tires	Model No. 01323
16” (0.406 m) semi–pneumatic low profile	Model No. 01304
18” (0.457 m) semi–pneumatic tires	Model No. 01035
Roller Scraper Kit	Part No. 47–4540
Grass Dispersion Shield Kit (5 & 7 Blade)	Part No. 51–0800
Grass Dispersion Shield Kit (11 Blade)	Part No. 47–5390
Adapter Kit	Model No. 01050
Universal Frame Adapter Kit	Part No. 47–2220

Setting Up Instructions

Remove Mower From Carton

1. Slit four corners of carton so sides lie flat.
2. Remove shipping caps from wheel hubs.

Note: Keep the shipping caps. They can be installed on wheel hubs to prevent grinding dust from entering wheel bearing whenever reel is ground.

Check Wheel Hubs And Install Wheels

1. Rotate wheel hub (Fig. 1) to check bearing adjustment. A slight drag must be felt when hub is rotated. If drag is not evident, tighten wheel hub nut (Fig. 1) until slight drag is felt when hub is rotated.

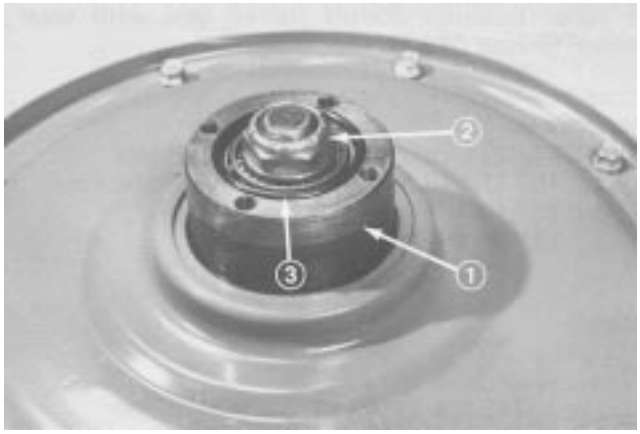

Figure 1

1. Wheel hub
2. Wheel hub nut
3. O–ring

Important Do not over–tighten wheel hub nut because the bearing will wear rapidly.

2. Check O–ring to assure it is not damaged, and make sure it is seated in inside diameter of wheel hub (Fig. 1).

Important An O–ring that is damaged or installed incorrectly will allow oil to leak out of the gear case. If enough oil leaks out, mechanical damage will likely result.

3. If pneumatic wheels are installed, set tire pressure at 35 psi (241.3 Kpa).
4. Install drive wheels with capscrews and lockwashers (Fig. 2). Do not try to install wheels over the shipping caps.

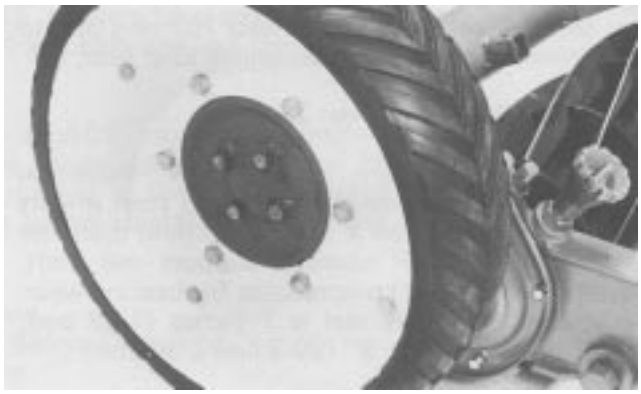

Figure 2

Gear Case Oil

1. Position mower on a level surface.
2. Raise and block back of mower until there is approximately 10–1/4 inches (0.260 m) between bottom of gear case extending behind roller bracket and level surface (Fig. 3).

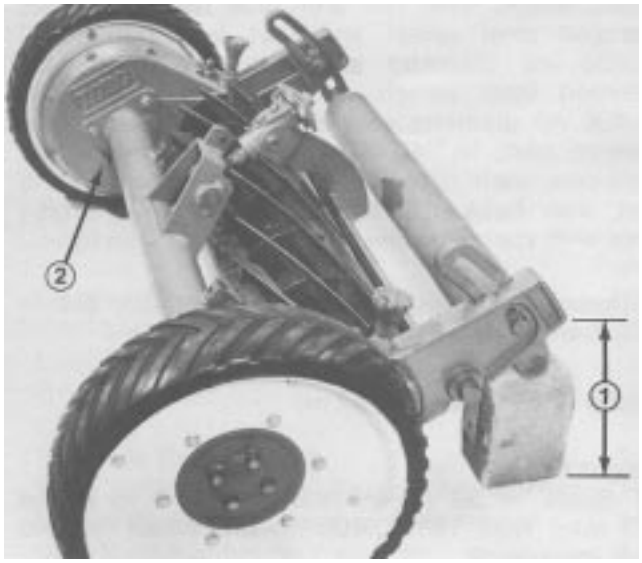

Figure 3

1. 10–1/4 inches
2. Filler plug

3. Remove filler plug from inside of each gear case (Fig. 3). Check oil level in gear case: it should be level with bottom of filler hole. If oil is level with bottom of hole, reinstall filler plug.

Important Check for oil leaks caused by a defective or improperly installed O–ring or gasket, and loose side plate bolts. Make all repairs before adding oil to gear cases.

4. If level of oil is low, fill gear case to point of overflowing with SAE 80–90 gear lube and reinstall filler plug. DO NOT OVERFILL.

Critical Adjustments

Check Reel Bearings And Mower Fasteners

1. Rotate center adjusting knob until bedknife does not contact reel. Try to spin the reel. If reel does not spin, adjust reel bearings; refer to Reel Bearing Adjustment, page 6. If reel spins freely, proceed to step 2.
2. Try to move reel back and forth. If reel can be moved, reel bearings must be adjusted; refer to Reel Bearing Adjustment, page 7.
3. Check and tighten all nuts, bolts, and screws to assure all parts are secure.

Parallel Bedknife To Reel

1. Position mower on a level surface. Remove paint and grease from bedknife and reel cutting edges.
2. Make sure throwout knobs (Fig. 4) are disengaged and bedknife to reel contact is removed by turning bedknife adjustment knob counterclockwise.
3. Insert a long strip of newspaper between reel blade and bedknife. While rotating reel backward, turn bedknife adjusting knob (Fig. 4) clockwise, one click at a time, until paper is pinched lightly, which results in paper being cut or a slight drag when paper is pulled.

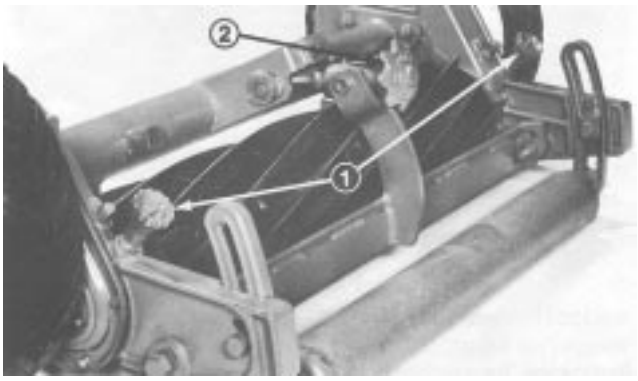

Figure 4

1. Throwout knobs
2. Bedknife adjusting knob

4. Continue to check for light contact across full length of bedknife using paper. If light contact is not evident, bedknife is not parallel to reel.
5. Loosen nut on left bedbar pivot bolt enough to ease turning of eccentric bolt.
6. Parallel bedknife to reel by rotating the left bed– bar pivot bolt (Fig. 5). The left pivot bolt has an offset thread which, when rotated, acts as a cam to raise or lower the bedbar. On the left hand pivot bolt there is an offset dot (Fig. 5) which denotes the thread of the bolt. When the dot is in the up position (Fig. 5) the left end of bedbar is raised. As bolt is turned clockwise and dot is lowered, so is the left end of bedbar. Identification dot is to be positioned within the rear (180°) position when adjusting.

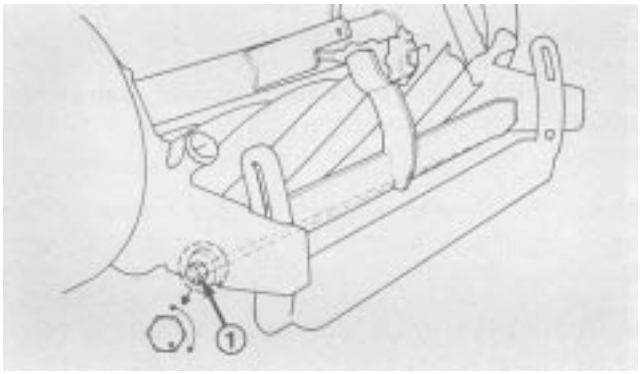

Figure 5

1. Bedbar pivot bolt

7. Rotate left pivot bolt to raise or lower bedbar.
8. Insert a long strip of newspaper between reel blade and bedknife. While rotating reel backward, turn bedknife adjusting knob clockwise, one click at a time, until paper is pinched lightly, which results in paper being cut or a slight drag when paper is pulled.
9. When light contact is evident across full length of bedknife, tighten pivot bolt nut, while holding bolt in position and check to make sure pivot bolt did not become misadjusted when tightened. Readjust as required.

Important To make sure bedknife and reel are not damaged while mowers are transported to or installed on the towing frame, rotate bedknife adjusting knob counterclockwise until bedknife does not touch the reel.

Set Height Of Cut

The height of cut is adjustable in approximately 3/32” (2.38 mm) increments by raising or lowering rear roller.

1. Loosen capscrews securing adjusting nuts in roller brackets (Fig. 6).

Figure 6

1. Bottom edge of adjusting nut
2. 11 blade mounting hole
3. 5 & 7 blade mounting hole

2. Position roller adjusting nuts in desired notches and tighten capscrews. Make sure same number of notches show below adjusting nuts.

3. If a higher height of cut is desired, every notch moved adds approximately 3/32 of an inch (2.38 mm) to the cutting height.

Note: These are bench settings. The mower will cut at a different height in turf because of grass conditions and the weight of the mower.

4. To make a finer adjustment to cutting height or to adjust roller, adjusting nut may be moved 1/2 notch or 3/64 of an inch (1.19 mm) by using the following procedure:

A. Remove capscrew and adjusting nut securing roller bracket to gear case. Do not move roller bracket.

B. Reposition capscrew and adjusting nut to upper hole in gear case.

C. Slide roller bracket up or down 1/2 notch to position adjusting nut into correct notch and tighten capscrew.

Reel Bearing Adjustment

If end play is evident in reel or if mower has been disassembled, an adjustment to the reel bearing may be necessary.

1. Remove (4) four screws securing left wheel to wheel hub and remove wheel. Place wheel under gear case for support.

2. Raise and block back of mower until there is 7 to 8 inches (0.178 to 0.203 m) between bottom of gear case extending behind roller bracket and level surface.

3. Remove (3) three capscrews securing inspection cover to gear case cover.

4. In small increments, rotate the adjusting nut on reel shaft, in clockwise direction to remove all end play from the reel. Make sure to hold reel so it cannot rotate.

5. When end play is removed, rotate nut an additional 1/4 turn to preload the bearing.

6. Reinstall inspection cover and the wheel.

Operating Instructions

Adjust Bedknife To Reel For Light Contact

Important After mower is set up and installed on the towing frame, the bedknife and reel must be adjusted for light contact. Adjust bedknife to reel while mower is setting on the grass to be cut because the force of turf against underside of bedknife during actual operation must be duplicated to ensure correct setting. To assure sharp cutting edges, bedknife and reel must have light contact.

1. Stand behind the mower.
2. Disengage reel throwout knobs (Fig. 7). Carefully spin reel backward to insure free movement.
3. While spinning reel backward, rotate bedknife adjusting knob counterclockwise (Fig. 7) until bedknife does not touch reel blades.

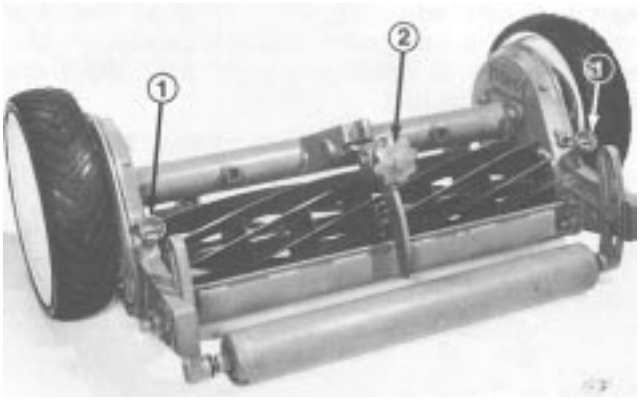

Figure 7

1. Throwout knobs
2. Bedknife adjusting knob

4. While spinning reel backward, rotate adjusting knob clockwise (Fig. 7), one click at a time, until light contact of bedknife and reel is noticed or a whispering cutting sound is heard.

Note: Spring arm (clicker) may be adjusted for positive detent by loosening capscrews securing spring arm to adjustment arm retainer, adjust until a solid clicking sound is achieved when adjusting knob is turned, and retightening capscrews.

5. Check the reel "carry over" by spinning reel backward again. Reel should rotate one to two complete revolutions. Less than one revolution indicates heavy contact, which means the bedknife and reel must be readjusted for light contact; refer to steps 1, 3 and 4.
6. At the beginning of the cutting day, when reels are cold, engage the reel throwout knobs (Fig. 7). Operate mowers for 15 to 20 minutes so the bedknife and reel reach normal operating temperature; then stop operation. Next, disengage reel throwout knobs and spin reel backward. A whispering sound, not clicking, should be emitted, and this assures correct adjustment. If a whispering sound is not heard, bedknife and reel must be readjusted; refer to steps 3–5. By contrast, when reels are warm from being used, use only steps 1–5 to maintain light contact between bedknife and reel.

Important Never adjust bedknife to reel for light contact if mowers are cold because the increase in temperature during operation could cause the metal to expand and result in heavy contact. Heavy contact causes uneven bedknife wear and poor quality of cut. However, light contact between bedknife and reel, which is desirable, minimizes wear and keeps cutting edges sharp. Adjust for light contact every four hours or sooner, even though quality of cut is acceptable. When mowers are operated in sparse grass or temperature of air is high, the adjustment for light contact must be checked even more frequently to avoid heavy contact between the bedknife and reel. If mowers are not operated for a short time, one hour after any use, check for light contact after resuming operation for 15 to 20 minutes; refer to steps 1–6.

Mower Use

1. Mowing Speed – The mower is designed to cut grass well at any ground speed between 1 and 6 mph (1.6 and 9.66 km/hr) but for most turf conditions, ground speeds of 4–6 mph (6.4–9.66 km/hr) produce the best quality of cut. Ground speed, however, must be reduced when turning because excessive speed will cause outside mowers to bounce and skip on the turf. Excessive heat, caused by the reel spinning too fast, can also damage the bedknife and reel. Since grass lubricates the bedknife and reel during operation, slow down when cutting sparse grass, extremely dry grass, or when trimming. Any lack or significant reduction of lubrication produces excessive heat build–up and subsequently, heavy contact between bedknife and reel, which results in uneven bedknife wear and poor quality of cut. Therefore, reels must be disengaged and stopped before mowers are transported across parking lots, roads, or whenever lubrication is minimal.
2. Height–of–Cut – To determine the effective height–of–cut, the length of the grass to be cut must be checked. Height–of–cut should be set and turf mowed frequently so no more than 1/3 of the leaf is cut off. If

mower is equipped with pneumatic tires, pressure must be maintained at 35 psi (241.3 kpa) (Fig. 8). Low tire pressure can cause bedknife to dip into the grass and scalp the turf. An uneven cut will likely result.

Figure 8

3. Operating Sound – A mower that is adjusted correctly gives off a whispering sound when operated. If there are buzzing, clicking, or metallic sounds, the mower has probably been operated with heavy contact between bedknife and reel. The reel or bedknife could also have hit a foreign object. A noisy mower must be stopped, repaired, and adjusted or severe damage will result.

4. Mowing Pattern – To prevent grass from lying down and improve appearance of turf, alternate mowing directions if possible, each time an area is cut.

Causes of Poor Quality of Cut

1. Bedknife/Reel Contact (Fig. 9) – There must be light contact between bedknife and reel to keep cutting edges sharp and to produce an excellent quality of cut. By contrast, mowers operated with– out light contact allow abrasive materials and grass to pass between the bedknife and reel. This eroding action rounds off the bedknife and reel cutting edges, which results in a poor quality of cut. If cutting edges become round, bedknife and reel must be lapped. Excessive rounding off of cutting edges may require that bedknife and reel be ground and lapped. Never compensate for round cutting edges by tightening bedknife adjusting knob until there is heavy contact because the bedknife and reel will wear unevenly and cause “rifling”.

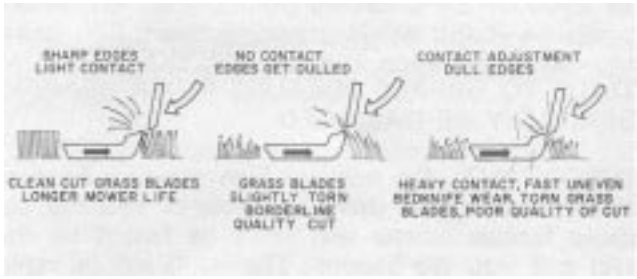

Figure 9

Note: Rifling is the uneven or wavy condition that develops on bedknife and reel when there is heavy contact between these two parts (Fig. 10). Streaks of uncut grass and an overall poor quality of cut are signs of rifling. Grinding the bedknife and reel is the only way to repair a rifled mower.

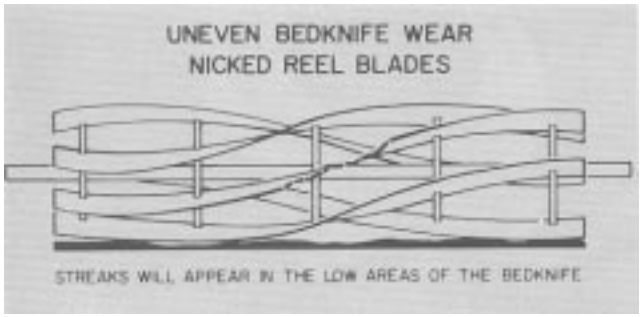

Figure 10

2. Noise – A mower that has sharp cutting edges and is adjusted with light contact will emit a desirable whispering sound when reel is spinning. By contrast, buzzing, clicking, or metallic sounds during operation indicate that mower is probably being operated with heavy contact between bedknife and reel. Heavy contact causes uneven or wavy wear on the bedknife and reel cutting edges. Grinding is required to repair a damaged bedknife and reel. Although the bedknife and reel are adjusted correctly for light contact, notches will eventually develop at both ends of the bedknife. These notches must be rounded off or filed flush with cutting edge of bedknife to assure smooth operation.

3. Loose Reel Bearings – If reel bearings are suspected to be loose, check them immediately or extensive damage may result; refer to Reel Bearing Adjustment, page 7.

4. Hitting a Foreign Object – The bedknife and reel cutting edges can be damaged if a foreign object is hit. The damage, if it is not too severe, can be repaired in the field. Start by filing down high spots on the

bedknife and reel (Fig. 11). Use a ball peen hammer to straighten any reel blades that may be bent. Since bedknife usually springs away from the reel upon impact, bedknife must be adjusted; refer to Parallel Bedknife to Reel, page 6.

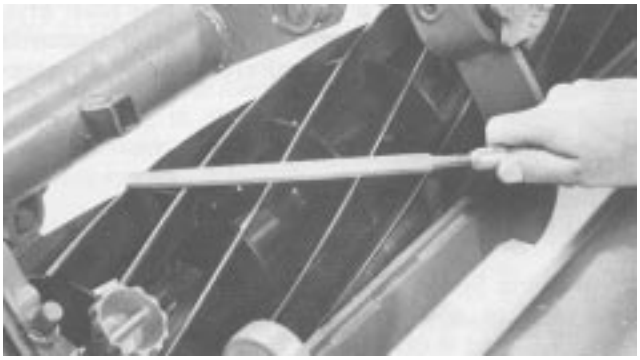

Figure 11

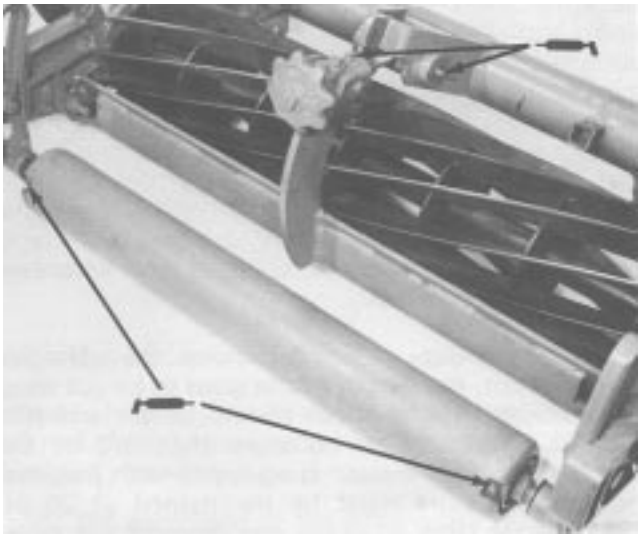

Figure 12

Maintenance

Lubrication

1. The gear cases have been fully lubricated at the factory. Once each season, drain and clean the right and left gear cases. When gear cases are clean, add SAE 140 gear lube; refer to Gear Case Oil, page 5.
2. The mowers should be greased every 8 hours of operation with Heavy Duty 2 wheel bearing grease, to obtain maximum life. This grease can be used on all greasing points (Fig. 12). When pressure is felt while greasing the roller, bearing cavity between seals if full. DO NOT CONTINUE TO GREASE BECAUSE INNER BEARING SEAL MAY BE DAMAGED.

Important Do not use high pressure hose to clean areas where there are seals or bearings because foreign matter will likely be forced into the bearing. The result will be rapid seal and bearing deterioration. Grease the mower immediately after cleaning. Failure to do so may cause damage to the bearings or other components.

Grinding

Note: For detailed sharpening information, order the Toro Sharpening Reel and Rotary Mowers Manual, from the Commercial Service Department.

New and old bedknives should be ground attached to the bedbar; this ensures rigidity during grinding and insures a true knife. Refer to figure 13 when grinding tHe knives and obtain as near as possible the relief angles indicated. In grinding, avoid a hard contact between knife and grinding wheel. If hard contact occurs, excessive heat buildup will take place, causing premature wearing of the grinding wheel and reduced life of the knife.

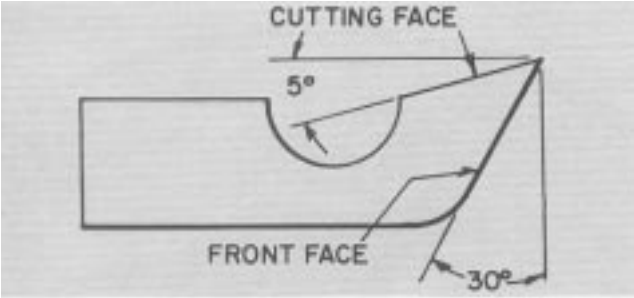

Figure 13

The land area and relief angle of reel blade are pointed out in figure 14. The land area is that part of the reel blade that actually comes in contact with the bedknife and cuts the grass in a scissors action. The relief or back grind angle is ground into reel blade to provide clearance or relief be–hind contacting edges to reduce drag or friction. Recommended relief angle is 15 degrees.

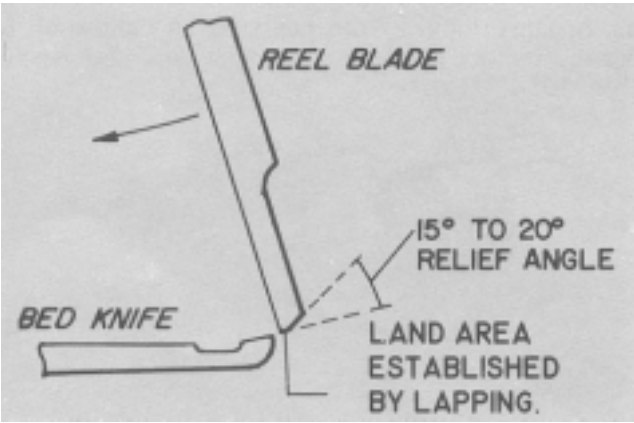

Figure 14

Note: After a reel has run for an extended period of time the blade contact point or land area will keep getting wider and eventually will be full blade width. This is normal and does not mean that the reel has to be reground to stay effective. A cutting unit can cut effectively with full width blades if the adjustment is checked frequently to maintain sharp cutting edges.

After reel and bedknife have been ground, perform the following adjustments:

1. Set Height–of–Cut, page 7.
2. Parallel Bedknife to Reel, page 6.

Note: As the reel blades continue to run against the bedknife a slight burr will appear on the front cutting edge surface the full length of the bedknife. If a file is occasionally run across the front edge to remove this burr, improved cutting can be obtained.

If the reel blade edges and bedknife edge are slightly rounded and do not have severe nicks, lapping only with a lapping compound may restore the edges and match. Oftentimes a mower is deemed by users to need grinding when reel bearing adjustment, bedknife adjustment and/or lapping is all that is necessary.

Lapping

Mowers are set up as follows:

1. Remove the right hand wheel.
2. Place wheel under gear case for support.
3. Remove the reel pinion cover (Fig. 15).

Figure 15

1. Reel pinion cover

4. Disengage the reel.
5. Connect the lapping machine coupler to the nut on the end of the reel shaft.

When lapping, use a good grade of commercial lapping compound. A medium grit should be for initial lapping and a fine grit for finishing. A solution of one part liquid detergent and two parts lapping compound is recommended. The liquid detergent greatly eases washing away the compound when finished. Water soluble oil may also be used as a compound carrier.

Note: Lapping solution must be kept in free flowing condition to get even distribution on bedknife and reel.

The lapping procedure is as follows:

1. Adjust bedknife to reel so light contact is evident.
2. Operate the lapping machine so the reel turns in a reverse direction. Apply lapping solution continuously and maintain light bedknife to reel contact.
3. Stop lapping machine periodically to check cutting surfaces for sharpness. Continue lapping until sharp cutting edges have been restored.

Note: If the cutting edges are severely rounded, both sharpening and lapping may be required.

4. Wash off all lapping solution. Using paper, check for sharpness along entire length of each reel blade. If paper cannot be cut cleanly along entire length of each reel blade, continued lapping is necessary.

Bedknife Replacement

1. To replace the bedknife, remove the eleven (11) screws holding the knife to the bed bar; replace the knife and reinstall the screws. All screws should be lubricated with oil and torqued to 250–300 in.–lb (28.3 – 33.9 N.m). The screws should be tightened by starting at center of the bedknife and alternating until all screws are secured.
2. True the bedknife attached to the bedbar by grinding. Refer to the TORO SHARPENING REEL and ROTARY MOWERS MANUAL.
3. After bedknife has been ground and is “true”, perform the following adjustments:

Reel, Roller and Wheel Bearing Adjustment

After the initial 30 operating hours, check the reel bearing, roller bearing, and wheel bearing. Thereafter, check these parts every 200–250 operating hours. If necessary, adjust the reel bearing (See Reel Bearing Adjustment, page 7. If necessary, adjust the roller bearing (See Roller Assembly, page 17). If necessary, adjust the wheel bearing (See Check Wheel Hubs, page 5.)

Mower Servicing Procedure Disassembly

1. Remove four (4) capscrews securing wheel to wheel hub. Remove wheel from hub.
2. Remove O–ring from inside of hub (Fig. 16).

Figure 16

3. Remove wheel hub nut from axle shaft (Fig. 17).

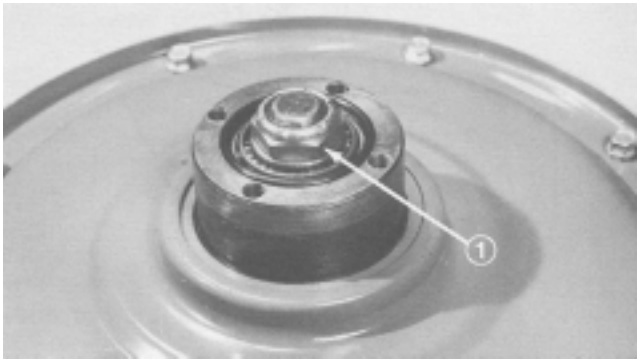

Figure 17

1. Wheel hub nut

4. Place oil pan under gear case assembly. Loosen the ten (10) capscrews securing cover to gear case (Fig. 18).

Figure 18

1. Mounting capscrews

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5. Separate cover from gear case and allow oil to drain. Remove cover and discard gear case gasket (Fig. 19).

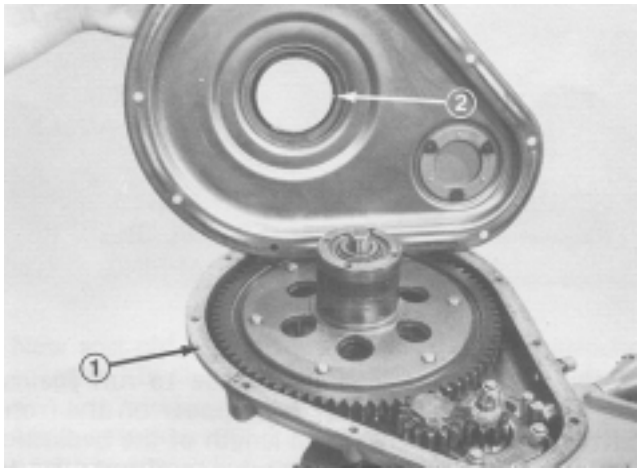

Figure 19

1. Gasket
2. Double lip seal

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6. Remove double lip seal (Fig. 19) from cover if worn or damaged. The ring gear hub and gear assembly can be removed from axle shaft as soon as gear case cover is removed.

7. Use a drift pin punch to remove bearing cups from hub (Fig. 20).

Note: Access is provided in the bore for drift pin punch.

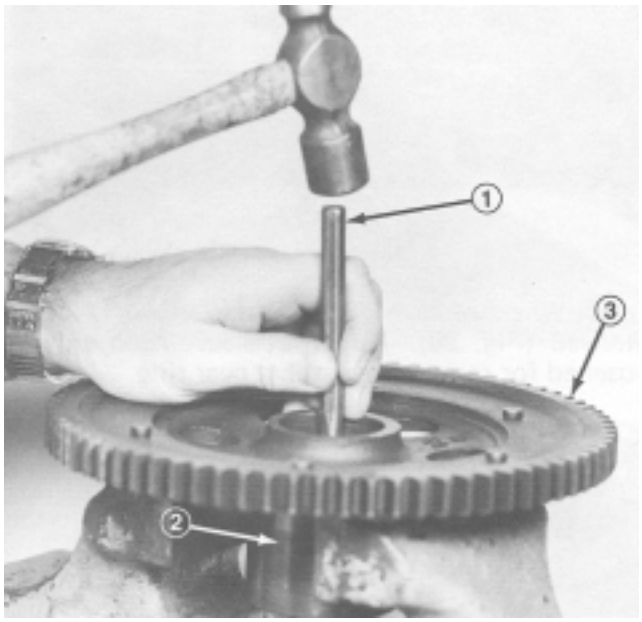

Figure 20

1. Drift pin punch
2. Bearing cups
3. Hub

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8. Remove inner cone and O–ring from axle shaft (Fig. 21).

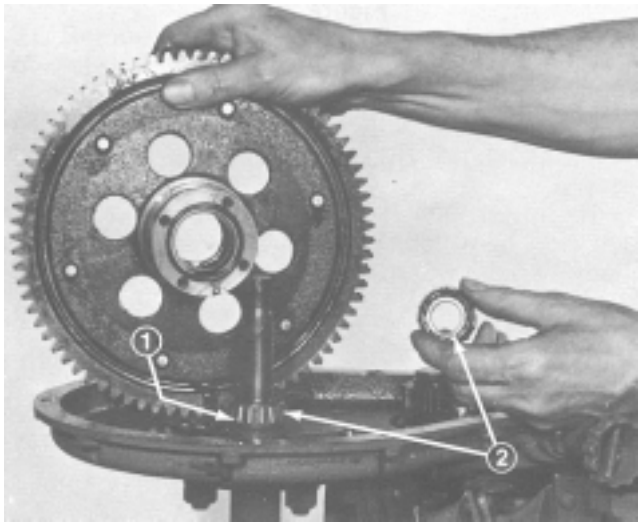

Figure 21

1. O–ring
2. Bearing cones

---

9. To prevent the reel from turning, place a wooden block between reel blades and axle shaft.

Using a socket wrench, remove ratchet gear stud securing ratchet gear (Fig. 22). Remove left–hand ratchet gear stud by rotating it clockwise. Remove right–hand ratchet gear stud by rotating it counterclockwise. Removal of the ratchet gear stud will free ratchet gear (Fig. 22).

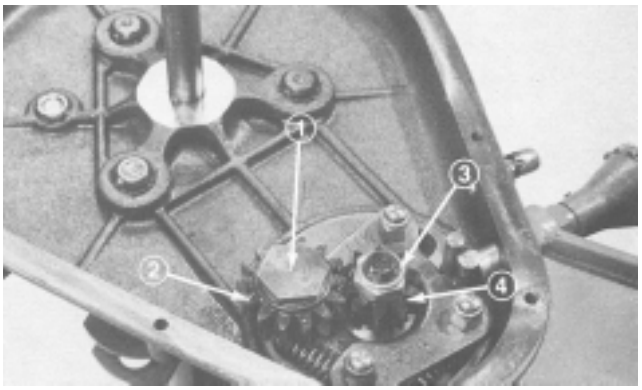

Figure 22

1. Rachet gear stud
2. Rachet gear
3. Nut
4. Pinion gear

10. Remove needle bearing from ratchet gear using a sleeve and arbor press (Fig. 23).

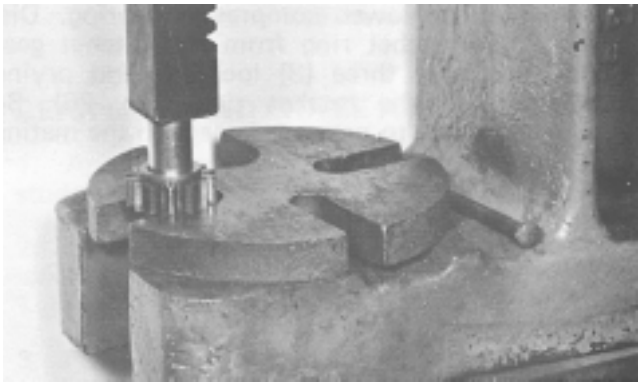

Figure 23

11. (Left end) Remove nut securing pinion gear to reel shaft and slide gear off splined shaft (Fig. 24).

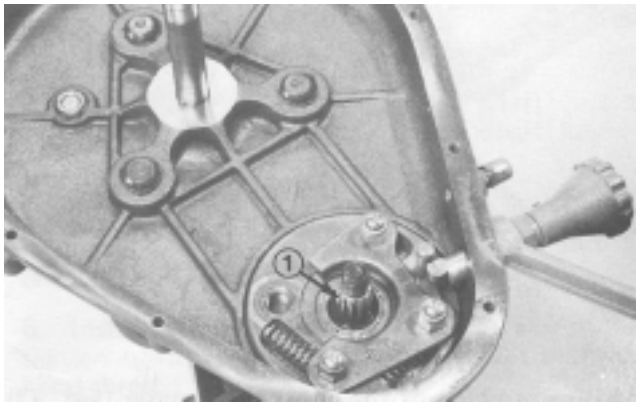

Figure 24

1. Splined shaft

12. (Right end) Remove nut securing pinion gear to reel shaft. Insert a pry bar in groove provided and pry off pinion gear. Remove woodruff key from key way in reel shaft (Fig. 25).

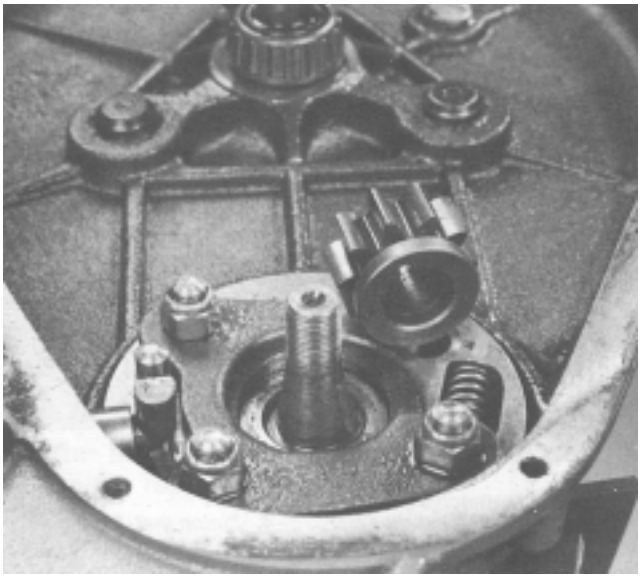

Figure 25

13. Remove the lower compression spring. Disassemble the ratchet ring from the ratchet gear ring by removing three (3) locknuts and prying equally around the ratchet ring (Fig. 26). Be extremely careful to prevent damage to the mating surfaces.

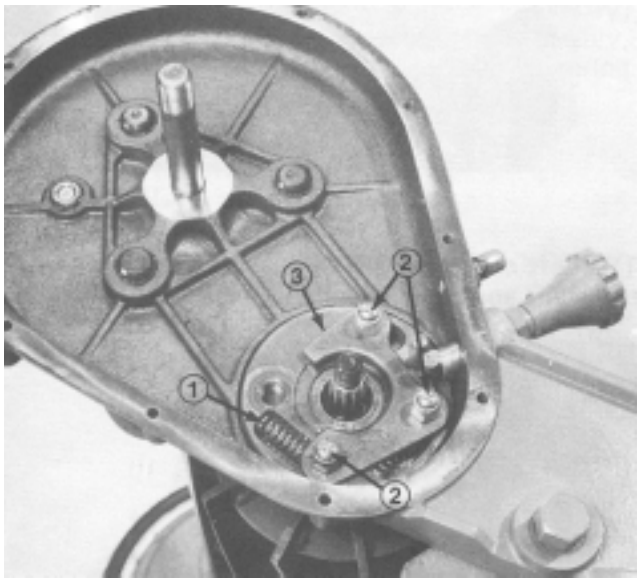

Figure 26

1. Lower compression spring
2. Locknuts
3. Rachet ring

14. For removal of the throwout handle (Fig. 27), O–ring and finger, drive pin from throwout handle. Remove throwout sleeve by turning counterclockwise.

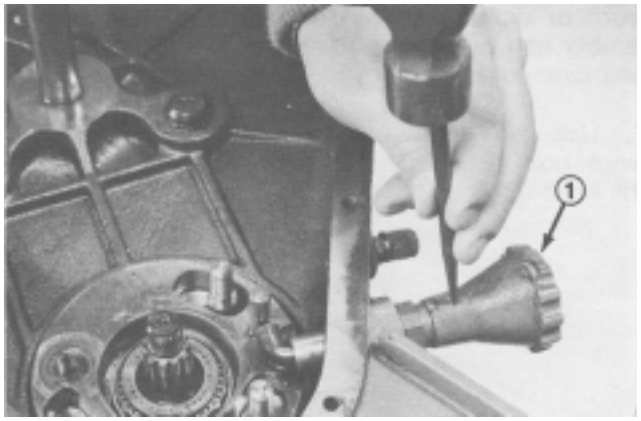

Figure 27

1. Throwout handle

Note: When replacing O–ring, sleeve must be removed (Fig. 28). Throwout sleeve need only be loosened for removal of rachet ring gear.

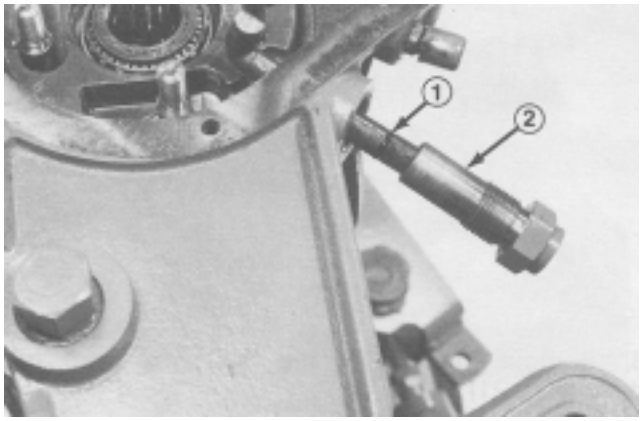

Figure 28

1. O–ring
2. Sleeve

15. Lift out the upper compression spring. Remove rachet gear ring from gear case.

16. Remove roller adjustment bolts and nuts from each side of roller (Fig. 29).

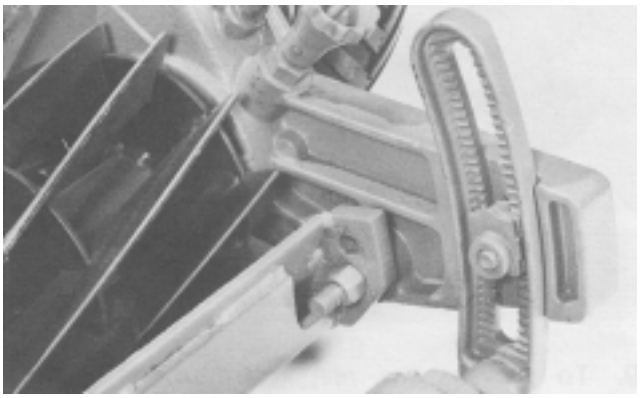

Figure 29

17. Loosen locknuts allowing removal of Allen head set screws securing bedbar to bedbar retainer (Fig. 30).

Note: When reinstalling bedbar to bedbar retainer, center bedbar retainer, tighten setscrews until seated and tighten locknuts.

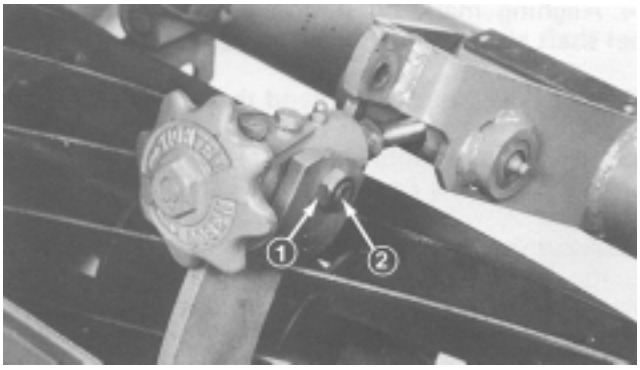

Figure 30

1. Locknuts
2. Allen head set screws

18. Remove pivot bolts and nuts securing bedbar assembly to gear cases (Fig. 29).

19. Remove three nuts securing each gear case to cross tube. Using a soft head mallet, drive gear cases off cross tube.

20. Bearing and gear case will now slide off left end of reel shaft.

Note: To aid in the removal of reel bearings, a Bearing Removal Tool, Part No. 49–8060, is available from your Authorized Toro Distributor.

21. Remove bearing and gear case from right end of reel shaft (Fig. 31).

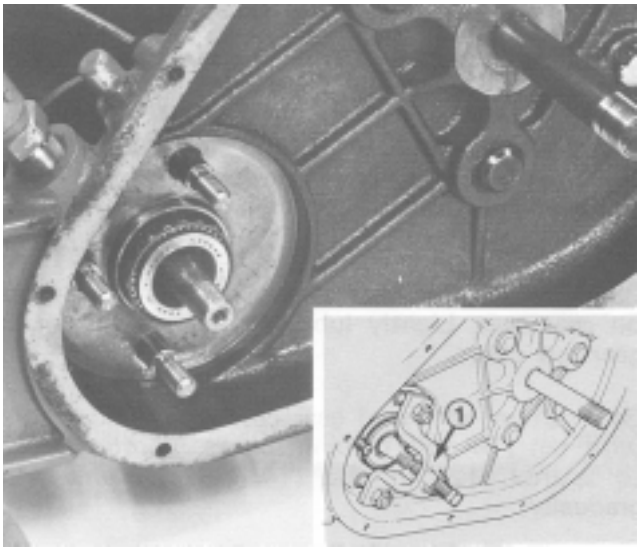

Figure 31

1. Bearing removal tool, part no. 49–8060

Note: Remove any rust from cross tube shaft to prevent binding. Clean gear case with solvent. If studs have been removed, apply Permatex No. 2 to threads.

22. Remove stub axle shaft from gear case by loosening locknut and tapping with soft head mallet (Fig. 32).

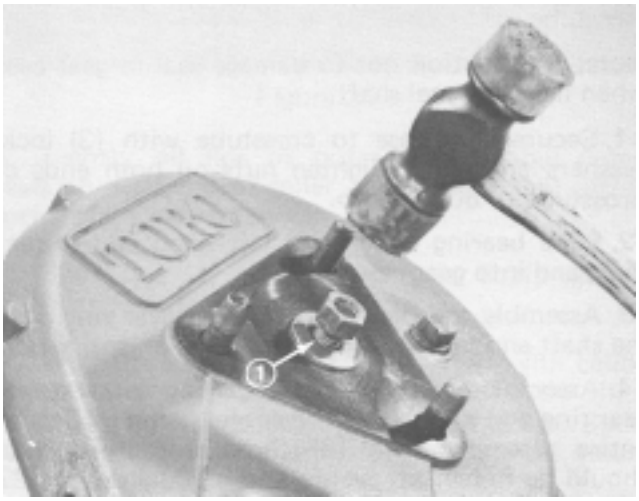

Figure 32

1. Stub axle shaft

Gear Case And Frame Assembly

1. Apply Permatex #2 to serrations on drive tube studs and press into gear case.

2. Apply Never Seez to threads and mount stub axles to gear cases and secure with locknuts. Tighten locknuts to 40–55 ft. lb.

3. Press seal and bearing cup into right hand gear case. Make sure plastic seal guard is installed over seal boss.

4. Slide gear case onto right hand end of reel shaft (key slot end).

Note: Use caution not to damage seal in gear case when inserting reel shaft.

5. Tap bearing cone onto reel shaft just far enough to allow insertion of woodruff key and pinion gear.

Important Right hand bearing must be pressed onto reel shaft by tightening pinion gear nut. DO NOT PRESS ON OTHERWISE.

6. Install woodruff key, pinion gear, and nut and tighten until gear bottoms out on reel shaft (left hand thread).

7. Remove nut, pinion gear and woodruff key before continuing assembly.

8. Mount cross tube to right hand gear case and secure finger tight with (3) lockwashers and nuts.

9. Press seal and bearing cup into left hand gear case. Make sure plastic seal guard is installed over seal boss.

10. Slide gear case onto left hand end of reel shaft and gear case studs into mounting holes in cross tube.

Note: Use caution not to damage seal in gear case when inserting reel shaft.

11. Secure gear case to cross tube with (3) lockwashers and nuts. Tighten nuts on both ends of cross tube to 80–90 ft.–lb.

12. Slide bearing cone onto left hand end of reel shaft and into gear case.

13. Assemble the right hand ratchet gear ring over the shaft and insert two (2) compression springs.

14. Assemble right hand ratchet ring over ratchet gear ring and seat with a driver and hammer. Secure entire assembly with (3) three stop nuts. Nuts should be drawn up evenly and gradually to 14–22 ft. lb. (19.04–29.8 N–m) to prevent breaking the ratchet ring.

Note: Ensure that assembly will ratchet. If assembly does not ratchet, back nuts off slightly.

15. Place O–ring into groove on right hand throwout finger, coat ring with heavy oil or grease, and slide through sideplate, making sure that O–ring does not get damaged. Install throwout sleeve over throwout finger and tighten securely in gear case.

16. Slide throwout handle over finger and secure in place with drive lock pin.

17. Position woodruff key in key slot in reel shaft and slide on pinion gear.

18. Secure nut (left hand thread) on right hand reel shaft.

19. Assemble the ratchet gear and bearing assembly to right hand, ratchet gear ring and secure with right hand ratchet gear stud.

20. On the left side, assemble ratchet gear ring over the reel shaft and insert (2) compression springs.

21. Assemble left hand ratchet ring over the ratchet gear ring and seat with a driver and hammer. Secure entire assembly with three (3) stop nuts. Nuts should be drawn up evenly and gradually to 14–22 ft. lb. (19.04–29.8 N.m) to prevent breakage of the ratchet ring.

Note: Ensure that assembly will ratchet. If assembly does not ratchet, back nuts off slightly.

22. Place O–ring into groove on left hand throwout finger, coat ring with heavy oil or grease, and slide through sideplate, making sure that O–ring does not get damaged. Install throwout sleeve over throwout finger and tighten securely in gear case.

23. Slide throwout handle over finger and secure in place with a drive lock pin.

24. Aligning mark on pinion gear with mark on reel shaft slide gear onto spline shaft.

25. Instal new nut (right hand thread) on left hand reel shaft but do not tighten. When mower is completely reassembled adjust reel bearing, refer to Adjusting Reel Bearing, page 7.

26. Assemble the ratchet gear and bearing assembly to the left hand reel ratchet gear ring and secure with the left hand ratchet gear stud.

27. Mount bedbar to gear cases with shoulder bolts, rubber spacers, plastic washers and locknuts. Use bottom mounting hole in bedbar for 1 1 blade reels and top mounting hole for 5 and 7 blade reels. When installing left hand shoulder bolt (offset thread) thread the bolt in until it touches rubber spacer, then back it out one complete turn and tighten nut. Do not back out right hand bolt. This will allow bedbar adjustment. Refer to Parallel Bedknife to Reel, page 6.

28. Position roller bracket assembly in slots of gear case.

29. Position right hand and left hand roller adjusting nuts on roller bracket assemblies. Secure in place with capscrews and lockwashers.

30. Press bearing cups in ring gear hub. Assemble bearing cone to left side of stub shaft. Place large ring gear and hub assembly over stub shaft and bearing cone.

31. Place another bearing over stub shaft and into ring gear hub.

32. Position wheel hub nut on stub shaft and run down with an open end wrench. Adjust bearing by tightening nut until slight drag is felt when wheel bolt is rotated.

33. Press seal into gear case cover. Position gasket on gear case. Lightly lubricate wheel hub seal in gear case cover.

34. Position left hand gear case cover and secure with ten (10) self tapping screws. Torque screws to approx. 125 in. lbs. (14.1 N–m) evenly and gradually.

35. Add approximately 15 ounces (0.44 1) of SAE 80–90 gear lubricant to gear. DO NOT OVERFILL.

36. Place O–ring into recess in wheel hub.

37. Secure the wheel to the wheel hub with four (4) capscrews.

38. Repeat steps 30–37 on opposite side.

Roller Disassembly

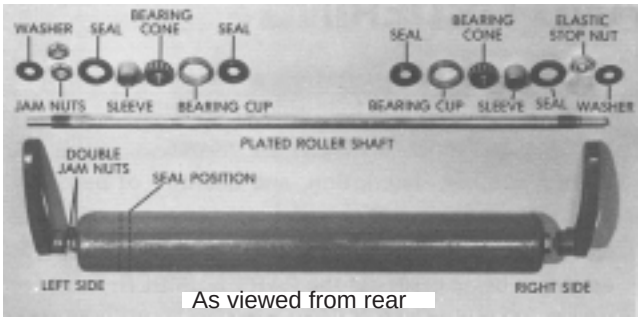

Figure 33

1. Remove brackets and washers from each end of roller and inspect bushings.

2. Remove elastic stop nut.

Note: After elastic stop nut has been removed, slide sleeve off roller shaft. Point end of roller downward into a container, at the same time pulling roller shaft out, allowing lubricant to drain from roller.

3. If roller shaft is to be replaced, remove double jam nuts.

4. Remove remaining sleeve and seals from both ends of roller.

5. Remove bearing cones from each end of roller.

6. Remove bearing cups with caution.

7. Remove inner seals by using a seal remover.

Roller Assembly

1. Lightly oil lips of inner seals. Install inner seals on each end of roller, making sure that garter springs face inboard.

2. Replace bearing cups and insert bearing cones into roller.

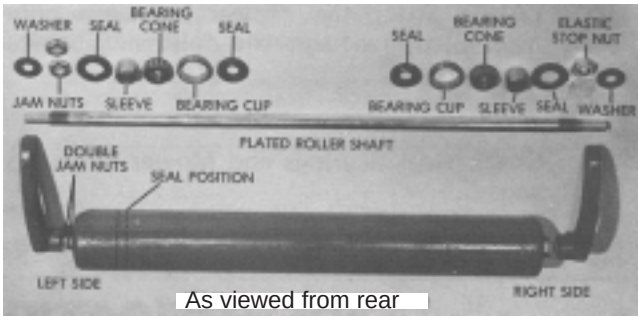

Figure 34

3. Lightly oil lips of outer seals. Install outer seals on each end of roller, making sure that garter springs face inboard.

4. Slide one (1) sleeve onto roller shaft against double jam nuts.

5. Wrap threaded area of roller shaft with cellophane tape to protect seals, and carefully slide shaft through right–hand side of the roller. Slide roller shaft into roller until it penetrates the inner most oil seal on the right–hand side.

6. Pour approximately one (1) pint (16 ounces [0.0296 l) of SAE 90 or 140 gear oil into the roller housing.

7. After oil has been added, carefully push roller shaft through the entire roller assembly. Remove cellophane tape.

8. Install sleeve on roller shaft and slide up against bearing cone.

9. Install elastic stop nut and secure by holding double jam nuts. Tighten elastic stop nut (Fig. 35).

Note: Tighten elastic stop nut until all axial and radial motion has been removed from the roller shaft and bearings. Ensure that roller rotates freely on shaft.

10. Grease bearings with Heavy Duty 2 wheel bearing grease.

11. Reinstall washers and install left and right–hand bracket and bushing assemblies.

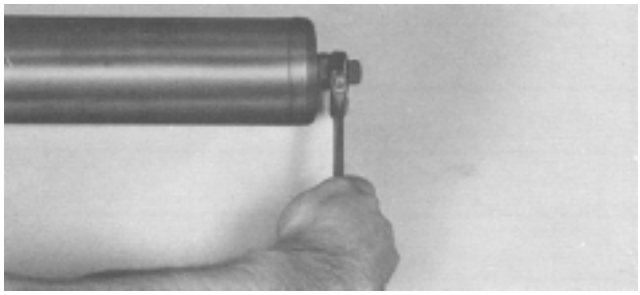

Figure 35

Important After the mower has been completely assembled, perform the following critical adjustments:

A. Check Reel Bearings and Mower Fasteners, page 6.

B. Set Height–of–Cut, page 7.

C. Parallel Bedknife to Reel, page 6.

When the adjustments have been completed, move the mower to a turf area and adjust the bedknife to reel (See Adjust Bedknife to Reel For Light Contact, page 8).

The Toro General Commercial Products Warranty

A Two-Year Limited Warranty

Conditions and Products Covered

The Toro Company and its affiliate, Toro Warranty Company, pursuant to an agreement between them, jointly warrant your 1996 or newer Toro Commercial Product ("Product") purchased after January 1, 1997, to be free from defects in materials or workmanship for two years or 1500 operational hours*, whichever occurs first. Where a warrantable condition exists, we will repair the Product at no cost to you including diagnosis, labor, parts, and transportation. This warranty begins on the date the Product is delivered to the original retail purchaser.

* Product equipped with hour meter

Instructions for Obtaining Warranty Service

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

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

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

Owner Responsibilities

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

Items and Conditions Not Covered

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

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

Parts

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

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

General Conditions

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

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

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

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

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

Countries Other than the United States or Canada

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

Part No. 374-0031 Rev. –