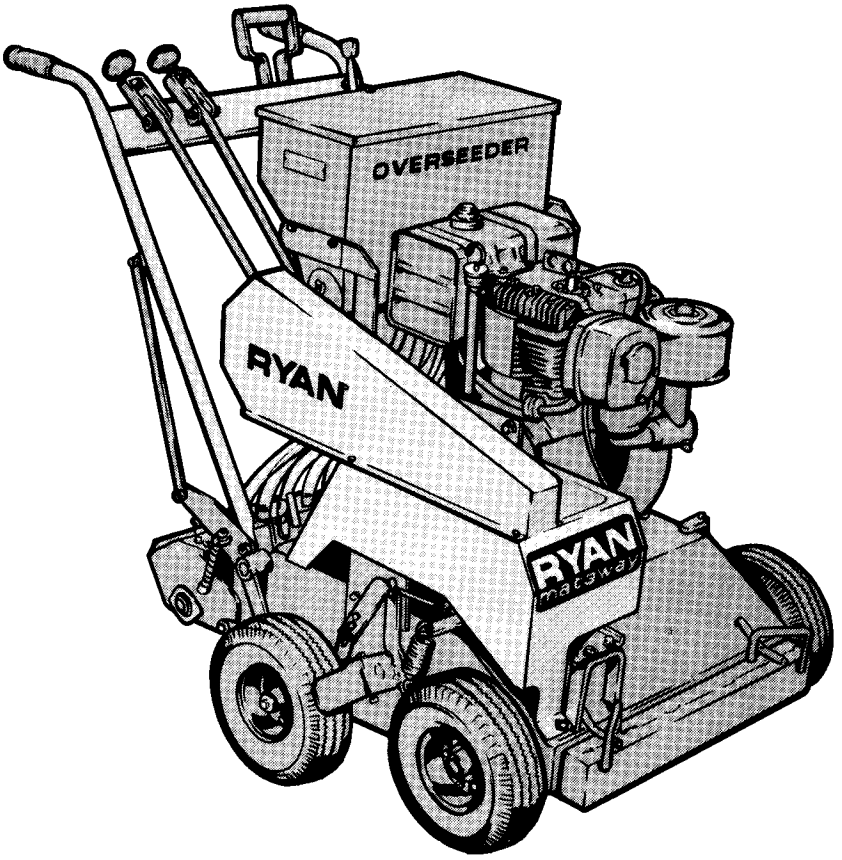
RYAN®

OPERATOR'S, PARTS AND SERVICE MANUAL



MATAWAY® OVERSEEDER

MODEL 544873

MATAWAY OVERSEEDER

GENERAL INFORMATION

To make sure you are fully aware of safety and service information, the following two symbols are used throughout this manual.

This symbol ⚠ (SAFETY WARNING) appears above information (in bold type) that may help keep you and others from being hurt.

This symbol NOTE (NOTE) appears above information or instructions that may help you operate and maintain your equipment for optimum service and performance.

IMPORTANT!

THIS MANUAL WILL AID YOU IN THE SAFE OPERATION AND PROPER MAINTENANCE OF YOUR EQUIPMENT. READ THE MANUAL THOROUGHLY BEFORE ATTEMPTING OPERATION.

IF ANY PORTION OF THIS MANUAL IS NOT CLEARLY UNDERSTOOD, CONTACT AN AUTHORIZED DEALER FOR CLARIFICATION.

Additional operator's manuals are available through your dealer.

⚠ SAFETY WARNING

- **The information and instructions in this manual alert you to certain things you should do very carefully. If you don't, you could:**
  - **Hurt yourself or others.**
  - **Hurt the next person who operates the equipment.**
  - **Damage the unit or accessory attachments.**
- **This manual contains essential safety and operation information. It must remain with the unit at all times, within easy access of any operator.**
- **Altering this equipment in any manner which adversely affects the operation, performance, durability or use may cause hazardous conditions.**

IMPORTANT!

CALIFORNIA PUBLIC RESOURCES CODE, SECTIONS 4428–4442, REQUIRE **SPARK ARRESTERS** WHEN OPERATING ANY INTERNAL COMBUSTION ENGINE ON HYDROCARBON FUELS, ON FOREST–, BRUSH–, OR GRASS–COVERED LANDS.

PRODUCT REFERENCE

Information in this manual may refer to a specific product, brand name, number or tool. Unless specifically stated otherwise, an equivalent product may be used.

ILLUSTRATIONS & SPECIFICATIONS

All information, illustrations and specifications contained in this manual are based on the latest product information available at the time of printing. Cushman Inc. reserves the right to make changes at any time without notice.

OWNER REGISTRATION

Cushman makes every effort to keep owners informed of all safety related information. Therefore, changes in address and/or ownership should be reported to the manufacturer. Your dealer has REGISTRATION CHANGE forms which will be filled out and:

- Returned to the MANUFACTURER,
- Filed by the DEALER for his records.

INDEX

2M–11/92–CU

IDENTIFICATION NUMBERS

The Model number and Serial number are printed on the nameplate decal located on the back of the chassis (See Figure 1). **These numbers must appear on all correspondence concerning this unit.**

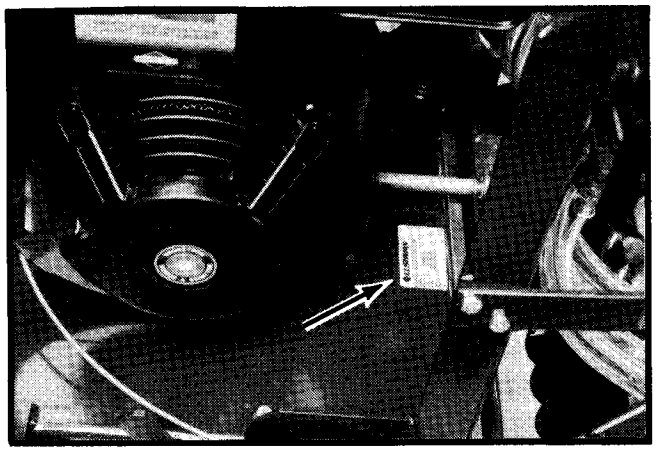


Figure 1. Nameplate Decal

SPECIFICATIONS

Engine . . . . . Briggs & Stratton model 431
10 hp., 4 cycle, w/rewind starter.
Governor set at 3200 RPM – no load.

Clutch . . . . . Belt tightening idler type
for drive and reel.

Chassis . . . . . 3/16" (5 mm) steel plate
formed and welded

Transmission Gear Case . . . . . 22:1 reduction

Drive . . . . One "A" section belt – engine to gear box.
No. 40 roller chain – gear box to front axle.
Three "V" section belts – engine to reel.

Axles:
Front . . . . . 3/4" (19mm) dia. mounted in
self adjusting ball bearings.
Rear . . . . . 3/4" (19mm) dia. welded to pivot arms.

Reduction:
Engine to wheels 36:1
Engine to reel 1:1

Wheels: . . . . . four 4.10/3.50 – 4 pneumatic tires
Front . . . . . driven
Rear . . . . . free wheeling on ball bearings
in line with reel centerline to prevent scalping on rolling terrain and scuffing in turns.

Wheel Base . . . . . 14 1/4" (362 mm)

Speed . . . . . 246 ft/min. (74 M/min.)
@ 3200 RPM engine speed

Reel . . . . . Quick change mounting
Rotates opposite direction of travel

Blades . . . . . hardened high carbon steel

Width Of Cut . . . . . 19" (483 mm)

Depth Of Cut . . . . . 1/4" (6 mm) max.

Depth Adjustment . . . . . micrometer screw

Handle Controls . . . . . reel clutch, drive clutch,
throttle and lift lever

Dimensions:
Width . . . . . 34 1/2" (876 mm)
Height . . . . . 40" (1016mm) including handle
Length . . . . . 53" (1346 mm) including handle

Net Weight (model 544873) . . . . . 425 lbs. (195 Kg.)
with 547553 reel

Hopper Capacity . . . . . 0.83 cu. ft (0.0235 cu. m)

Seed Density . . . . fully adjustable for any seed type

Seed Flow Control . . . seed dispensed automatically
when reel is lowered,
stops dispensing when reel is raised

Spacing . . . . . seed outlets are 2" (50mm) apart

SET UP

Read this manual thoroughly BEFORE attempting set up or operation.

Check the oil level in the transmission. Level should be up to the plug opening in the side of the case. Add EP 80-90 gear lube if required. Case capacity is 1/2 pint (.4L).

Check engine oil level. Refer to engine manual.

Inspect chassis for proper lubrication. Refer to LUBRICATION on page 5.

CONTROLS

Throttle (See Figure 2, item 1)
Move the lever to the right to increase engine speed. Move it to the left to lower engine speed

Lifting Lever (See Figure 2, item 2)
Push the lever down to lower the reel and open the seed gate. Pull the lever up to raise the reel and close the seed gate.

Drive Lever (See Figure 2, item 3)
Push the lever forward to engage the drive belt. Pull the lever back to disengage the drive.

Reel Lever (See Figure 2, Item 4)
Push the lever forward to engage the reel drive and start blade rotation. Pull the lever back to disengage the reel.

Reel Height Adjusting Screw (See Figure 3)
Turn the screw clockwise to raise the reel height, turn it counterclockwise to lower blade height.

Engine Switch (See Figure 4)

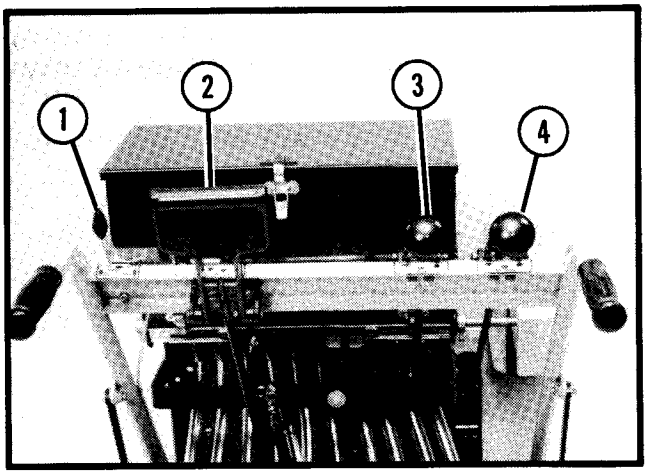


Figure 2. Handle Controls

1. **Throttle**
2. **Reel Lifting Lever**
3. **Drive Lever**
4. **Reel Lever**

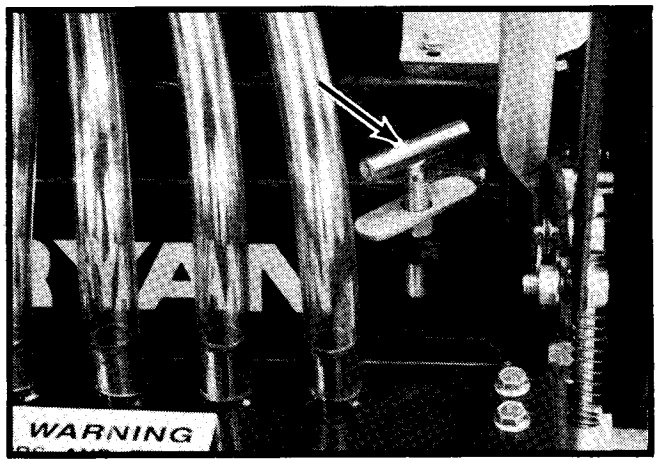


Figure 3. Reel Height Adjustment Screw

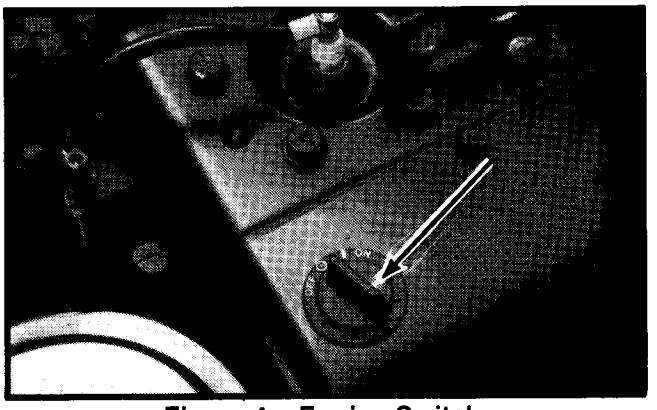


Figure 4. Engine Switch

OPERATION

⚠ SAFETY WARNING

- **To prevent sudden movement and possible injury to operator, ALWAYS make sure the reel is UP and the drive and reel are DISENGAGED when starting the engine.**
- **NEVER operate equipment without all safety shields in place.**
- **NEVER start or run an engine inside where exhaust fumes can collect. Carbon monoxide present in exhaust is an odorless and deadly gas. Provide enough fresh air to keep fumes from getting too strong.**
- **Remove fuel cap slowly. Fuel may be under pressure. Fuel spray may cause injury.**
- **Gasoline is extremely flammable under certain conditions. ALWAYS stop the engine and do not**

smoke or allow open flames or sparks while refueling.

- **Immediately replace any warning decal that becomes hard to read.**
- **To prevent injuries from thrown blades, never operate the unit with blades that are cracked, bent, missing or in any abnormal condition.**
- **Before operating, check the work area and remove any objects that may present a safety hazard or may damage the unit.**
- **To prevent injury due to rotating blades, NEVER place hands or feet beneath the unit.**
- **NEVER make any adjustments or perform any maintenance while the engine is running.**

STARTING INSTRUCTIONS

Before starting the engine:

Check the engine oil level and fill the fuel tank. Refer to the engine manual for the manufacturer's recommendations for oil and fuel.

Staring the engine:

1. Make sure the reel lifting lever is UP (raised).
2. Make sure the drive lever is BACK (neutral).
3. Make sure the reel lever is BACK (disengaged).
4. Turn the engine switch to ON.
5. Set the throttle to approximately half speed.
6. Pull the recoil starter (choke as required to start).

Stopping the engine:

Set the throttle to slow and turn the engine switch to OFF.

REEL HEIGHT ADJUSTMENT

NOTE

- Factory setting allows a maximum of 1/4" (6 mm) turf penetration while operating and 1 1/2" (38 mm) of ground clearance while transporting (on level terrain). Do NOT operate at turf depths exceeding 1/4" (6 mm).

- Initial blade adjustment should be made with the unit on level surface. If the surface is concrete, the reel blades must not touch the surface when in the lowered position or blade damage may occur.

Loosen the adjusting screw's locking nut before attempting to adjust the blade height (See Figure 5).

Turn the adjusting screw clockwise to raise the blade height. Turn the screw counterclockwise to lower it.

Tighten the locking nut after the adjustment has been made.

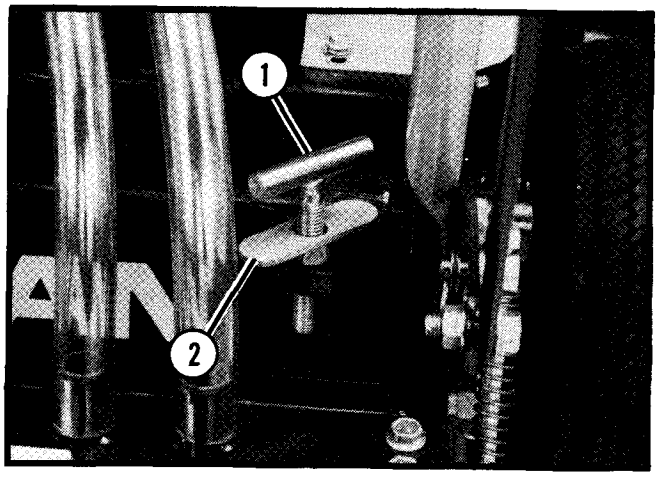


Figure 5. Reel Height Adjustment

1. Adjusting Screw
2. Locking Nut

As the reel blades wear, the clevis on each side of the depth control linkage can be adjusted to maintain maximum 1/4" (6 mm) depth (See Figure 6). Both clevises MUST be adjusted equally to keep the blade level.

Up to 1 1/2" (38 mm) of clevis adjustment is available to provide maximum use of blades as they wear.

NOTE

- Adjusting the clevis down to compensate for blade wear lowers ground clearance during transport. When new reel blades are installed, the clevises must be adjusted back up to their original position for proper ground clearance.

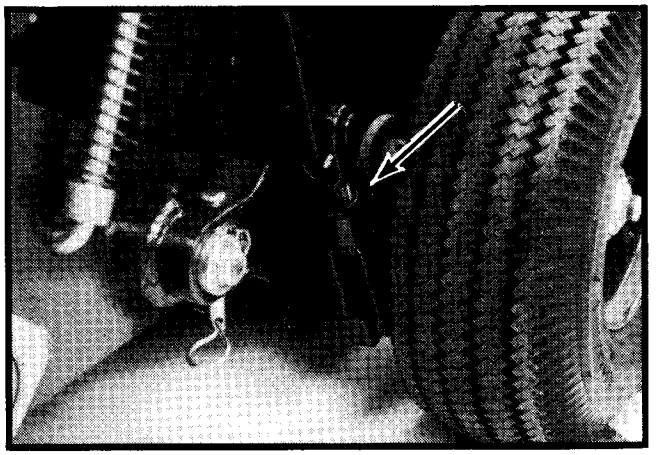


Figure 6. Depth Control Linkage Clevis

TRANSPORTING

The unit may be transported to the work area under it's own power by starting the engine and engaging the drive ONLY (do not lower or engage the reel). Adjust the throttle for desired walking speed.

OPERATING TIPS

- Engage the reel and drive controls **slowly** to lengthen belt life.
- Maintain proper tire pressure to assure blade depth consistency.
- If the unit creeps when the drive is disengaged and the drive belt is properly adjusted, check the transmission pulley for paint present in the groove. Paint can soften and cause the belt to grab. Remove the paint from the pulley groove.

OVERSEEDER OPERATION

1. Adjust reel to desired cutting depth, not to exceed 1/4" (6mm) maximum.

NOTE

- Cutting depth of 1/4" (6 mm) may be too deep for most seed and may prevent germination.

2. Make a test run to check for desired blade penetration.

If one end of the reel is cutting deeper than the other, while on level ground:

The reel depth control linkage clevises may need to be adjusted (refer to Reel Height Adjustment, on page 3).
or
Tire pressure may be uneven. Check all four wheels for correct tire pressure (refer to Tire Pressure on page 15).

3. Set the feed control cam (See Figure 7) on the hopper according to the "Seed Feed Chart" located inside the hopper. Fill the hopper with seed.

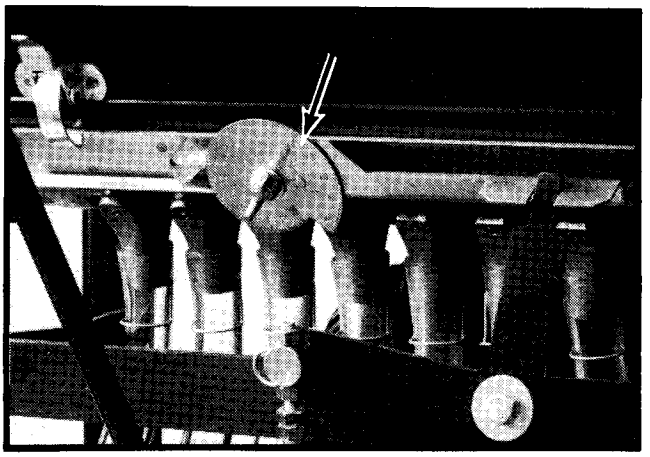


Figure 7. Feed Control Cam

4. Start the engine and move the reel control lever forward to engage the reel.
5. Engage the drive to start the unit moving forward and adjust the throttle to the operator's desired walking speed.
6. Lower the reel AFTER the unit is in motion, the seed gate opens automatically as the reel is lowered.

NOTE

- Never cross hard surfaces or objects (sidewalks, driveways, stepping stones, etc.) while the reel is down and/or engaged.

7. At the end of each pass, raise the reel and disengage the drive. Turn and align the unit for the next pass with the drive disengaged to avoid turf damage and insure operator control. Be sure to overlap the previous pass slightly to assure complete coverage.

CROSSHATCH OVERSEEDING

Making two passes over the same area with the feed cam set at half the desired rate will provide faster fill in.

Make the first set of passes (parallel to each other) over the area in the normal manner but at half the seed feed rate.

Cover the same area again, but make the passes at a 45° angle to the first set of passes. Again at half the seed rate.

This will lay down the seed in a diamond pattern, resulting in better distribution and faster cover after germination.

DE-THATCHING

1. Adjust reel to desired cutting depth, make a test run to check for desired blade penetration.

If one end of the reel is cutting deeper than the other, while on level ground:

The reel depth control linkage clevises may need to be adjusted (refer to Reel Height Adjustment, on page 3).
or
Tire pressure may be uneven. Check all four wheels for correct tire pressure (refer to Tire Pressure on page 15).

NOTE

- For de-thatching operation, make sure there is no seed in the hopper, because seed gate will still open during use.

2. Start the engine and move the reel control lever forward to engage the reel.

3. Engage the drive to start the unit moving forward and adjust the throttle to the operator's desired walking speed.

4. Lower the reel (to prevent turf damage, lower the reel only AFTER the unit is in motion).
Make all passes across the turf at uniform speed.

5. At the end of each pass, raise the reel and disengage the drive. Turn and align the unit for the next pass with the drive disengaged to avoid turf damage and insure operator control. Be sure to overlap the previous pass slightly to assure complete coverage.

NOTE

- Never cross hard surfaces or objects (sidewalks, driveways, stepping stones, etc.) while the reel is down and/or engaged.

SERVICE

⚠ SAFETY WARNING

- **To prevent possible malfunction and/or injury to operator and bystanders, use only genuine RYAN parts or parts with equivalent characteristics including type, strength and material.**
- **NEVER start or run an engine inside where exhaust fumes can collect. Carbon monoxide present in exhaust is an odorless and deadly gas. Provide enough fresh air to keep fumes from getting too strong.**

PREVENTIVE MAINTENANCE

Periodically check all belts for adjustment and condition.

After every use, when the engine has cooled:
- Wash the unit with water.
- Check blades for damage. Replace cracked, broken or bent blades.
- Check Engine oil level (refer to engine manual).
- Check transmission oil level.

LUBRICATION

NOTE

- Take care to keep all belts free of grease and oils.

- The drive chain on this unit is a sealed roller chain. It requires no additional lubrication.

Lubricate each of the 9 lubrication fittings (See Figure 8 & Figure 9) after every 8 hours of use, and before extended storage periods.

Use a good quality Lithium based lubricant and be sure to wipe each fitting before and after lubrication to prevent dirt build-up.

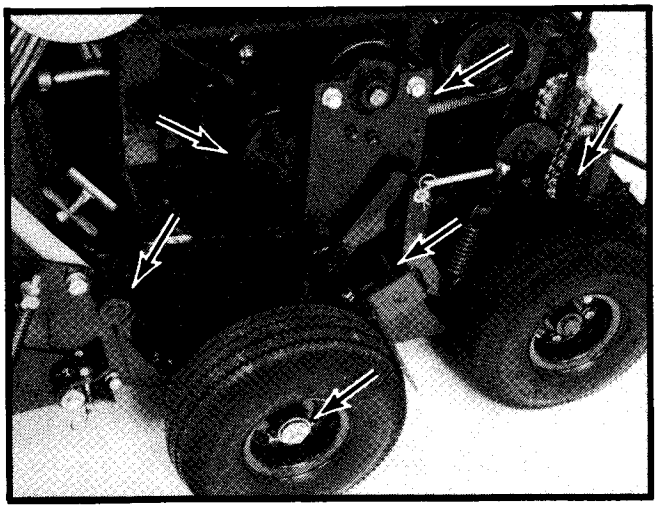


Figure 8. Right Side Lubrication Fittings

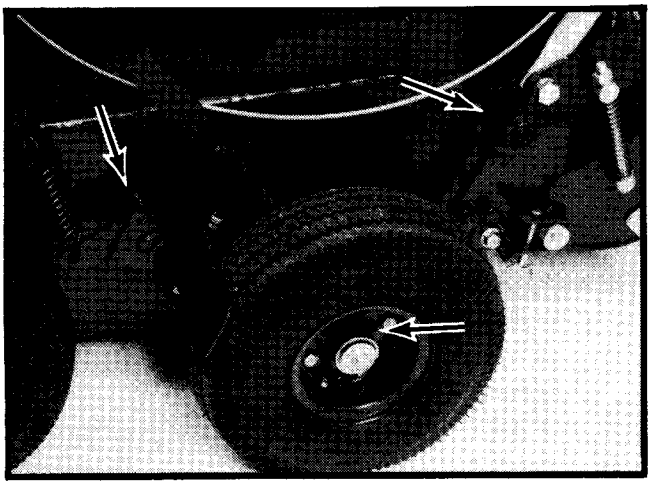


Figure 9. Left Side Lubrication Fittings

CHAIN REPLACEMENT

1. Remove the belt guards and the hopper drive belt.

2. Loosen the chain idler sprocket.

3. Open the connecting link and remove the chain (See Figure 10).

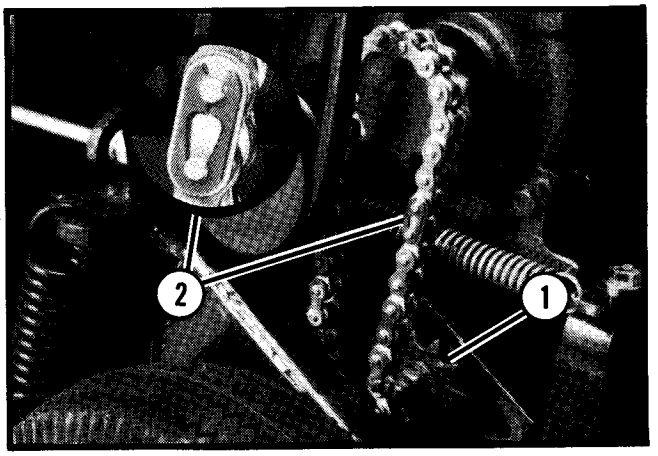


Figure 10. Drive Chain

1. Idler Sprocket
2. Connecting Link

4. Install new chain and connecting link.

5. Tighten the chain by adjusting the idler sprocket until there is only 1/8 to 1/4" (3 – 6 mm) movement in the chain opposite the idler (See Figure 11). Tighten the idler sprocket hardware.

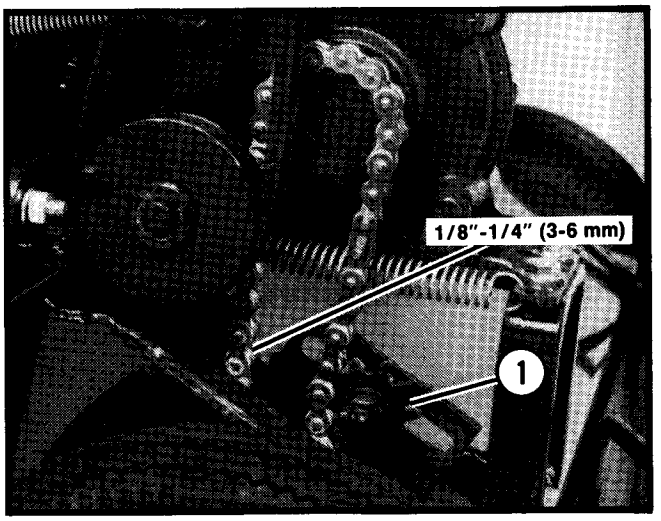


Figure 11. Chain Tension

NOTE

- Proper chain tension is essential. If the chain is too tight, it will cause excessive wear on the bearings. If the chain is too loose, it will cause noisy operation and chain pulsations, resulting in abnormal chain and sprocket wear.

6. Lubricate the fitting on the idler sprocket.

7. Reinstall the hopper drive belt and belt guards.

REEL REMOVAL AND INSTALLATION

1. Tilt the unit forward and support the rear of the chassis with jack stands.

2. Remove the lower belt guard from under the chassis by removing the screw at the front of the guard and swinging the guard down.

3. Release the reel clamps (See Figure 12) on both sides of the unit by pulling the clamp levers back.

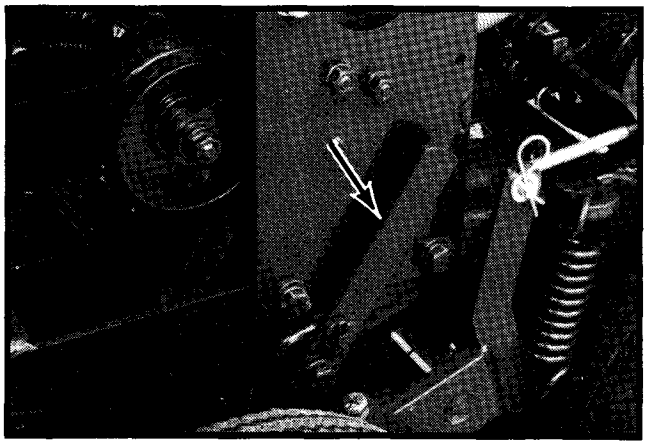


Figure 12. Reel Clamp Lever

4. Lower the left end of the reel and remove the three belts from the pulley at the right end. Remove the reel.

5. Reinstall the reel in reverse procedure to the preceding steps.

⚠ SAFETY WARNING

- **When reinstalling the reel, ALWAYS make sure the reel clamps lock "over center". Failure to do so may allow the reel to work loose causing injury to the operator and/or bystanders.**

REEL BLADE REPLACEMENT

NOTE

- Note how the blades and spacers are arranged on the reel and the direction of the blades BEFORE disassembly, so that it can be reassembled in the same order.

1. On the end of the shaft opposite the pulley, loosen the set screw in the locking collar on the reel shaft. Insert a punch in the small hole in the collar and use hammer to tap the collar clockwise until it's loose (approx. 1/4 turn). Remove the collar. Remove the pillow block and bearing (See Figure 13).

2. Loosen the socket head screw in the reel nut and remove the reel nut from the shaft (See Figure 13).

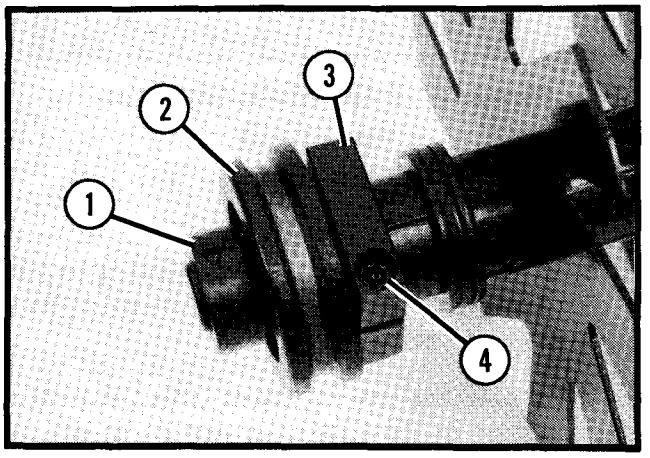


Figure 13. Reel Disassembly

1. Locking Collar
2. Pillow Block w/Bearing
3. Reel Nut
4. Socket Head Screw

3. Slide the blades and spacers off of the shaft.

4. Reassemble the reel with new blades.

5. Make sure the socket head screw in the reel nut is just "snug" or about 1 to 2 ft.–lb. (1.5–3 N·m). Screw the nut onto the reel shaft and torque to 80 ± 10 ft.–lb. (108 ± 13 N·m). Make sure enough spacers are used to prevent the reel nut from contacting the shoulder of the hexagonal section of the shaft. Tighten the socket head screw to 10 to 12 ft.–lb. (13-16 N·m).

6. Install the pillow block with bearing on the shaft. Slide the pillow block on until the outside edge of the block is 5/8" (16mm) from the end of the shaft (See Figure 14).

7. The pillow block must also be perpendicular to the shaft. To check this, hold a ruler against the first blade and across the edge of the pillow block (See Figure 14). Rotate the pillow block by hand. If the edge of the pillow block does not appear to move back and forth, the pillow block is perpendicular.

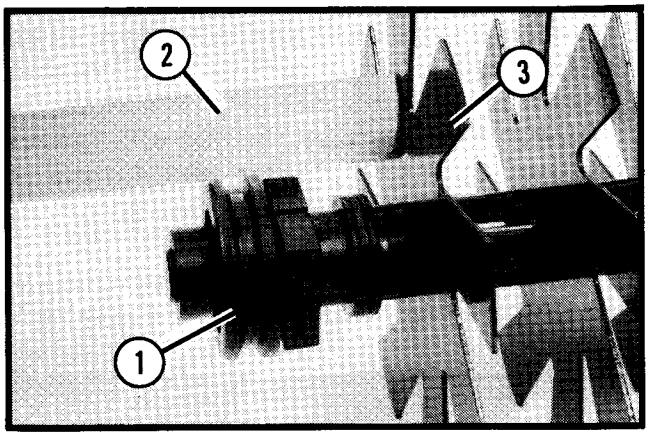


Figure 14. Pillow Block Alignment

1. Pillow Block
2. Ruler
3. Blade

8. Install the locking collar against the bearing by tapping it counterclockwise approx 1/4 turn and tightening the set screw.

9. After the reel has been reinstalled in the unit (refer to the section on Reel Removal And Installation on page 7) readjust the blade height. If the lift assembly clevises had been adjusted to compensate for blade wear, they must be returned to their original position to allow for the size of the new blades.

10. With the unit on a level surface, lower the reel and turn the depth adjusting screw until the blades just touch the ground.

11. Raise the reel and turn the adjustment screw counterclockwise 3 1/2 turns to achieve 1/4" (6 mm) blade penetration.

NOTE

- This unit is designed for a maximum of 1/4" (6 mm) turf penetration. Operating at turf penetration depths exceeding 1/4" will shorten belt life. Additional adjustment allows desired turf penetration to be maintained as the blades become shorter due to wear.

REEL BELT AND DRIVE BELT REPLACEMENT

NOTE

- Reel belts are three matched belts. When replacement is required, replace all three (belts are sold as a set of three).

1. Remove the belt guards and the hopper drive belt.

2. Tilt the unit forward and support the rear of the chassis with jack stands.

3. Remove the lower belt guard from under the chassis and take out the reel. Remove the jack stands and lower the unit.

4. Loosen the set screw in the locking collar on the drive shaft (See Figure 15). Insert a punch in the small hole in the collar and use hammer to tap the collar clockwise (opposite direction of engine rotation) until it's loose (approx. 1/4 turn). Remove the collar.

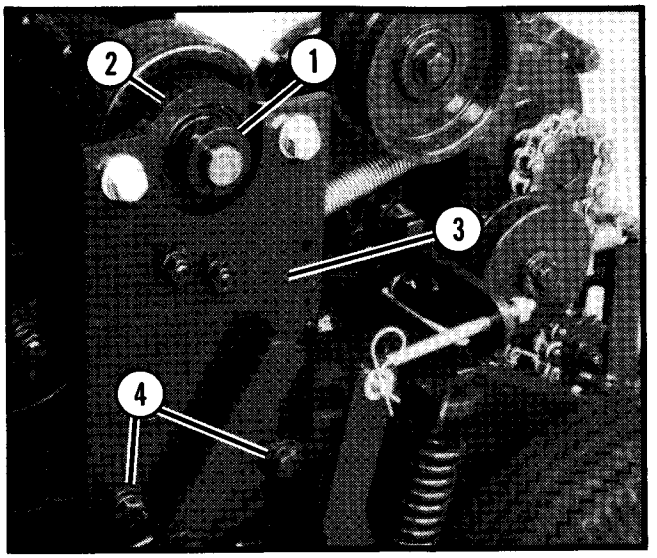


Figure 15. Drive Shaft Bearing Support

1. Locking Collar
2. Pillow Block
3. Mounting Plate
4. Mounting Plate Hardware

5. Unbolt the mounting plate. Remove it and the pillow block (leave the pillow block attached to the mounting plate).

6. Remove all three reel belts.

7. Inspect and/or replace the drive belt to the transmission after the reel belts have been removed.

NOTE

- Replacing the drive belt now will save work and down time.

8. Install new reel belts (matched set of three).

9. Before reinstalling the mounting plate, loosen but do not remove the pillow block.

10. Slide the pillow block bearing onto the shaft and loosely mount the plate to the chassis. Adjust the

mounting plate side–to–side so that there is no side load on the drive shaft. Tighten the mounting plate hardware.

11. Reinstall the locking collar against the bearing by reversing step #4.

12. Adjust the pillow block up and down until it is centered on the shaft. Tighten the pillow block hardware.

13. Rotate the drive shaft by hand to make sure there is no side load.

NOTE

- Excessive side load on the shaft may cause engine crankshaft failure.

14. Check the reel belt pulley alignment (See Figure 16). If adjustment is required, loosen the set screw in the pulley and move the pulley in or out on the shaft.

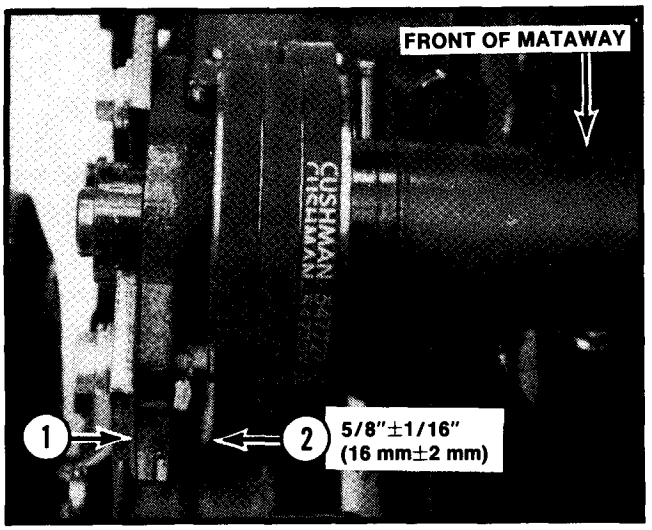


Figure 16. Reel Belt Pulley Alignment

1. Inside Face Of Mounting Plate
2. Outside Edge Of Outer Belt

NOTE

- Pulley is secured to shaft by set screw and key. It may need to be tapped with a hammer for adjustment. Use a plastic, rubber, lead or leather head hammer to avoid breaking the pulley.

15. Reinstall the reel and belt guard beneath the chassis.

16. Install the hopper belt and belt guards before operating the unit.

NOTE

- Belts should be tight when the reel and drive are engaged and loose enough to slip when they are disengaged.

ADJUSTMENT PROCEDURES

For Drive And Reel Belts, Pulley Sprocket, And Disc Alignment

DRIVE AND REEL BELT ADJUSTMENT

Before starting the belt adjustment procedure:

- Loosen the engine mounting hardware and clean the underside of the chassis to allow engine movement.
- Loosen the transmission mounting hardware.
- Loosen the mounting plate that supports the engine shaft coupler (left side of unit).
  AND loosen the pillow block hardware.
- Loosen the locking collar on the engine coupler shaft (see step 1 of Reel Blade Replacement on page 7).
- Make sure the springs are connected to both the drive control rod and the reel control rod.

1. Slide the transmission all the way toward the rear. Tighten the hardware enough to hold it in place.

2. Slide the engine toward the rear until 1/16" (2 mm) of the slotted holes are visible (See Figure 17). Slide the engine to the side, pushing the hardware against the sides of the slots to square the engine with the chassis. Tighten the hardware enough to hold it in place.

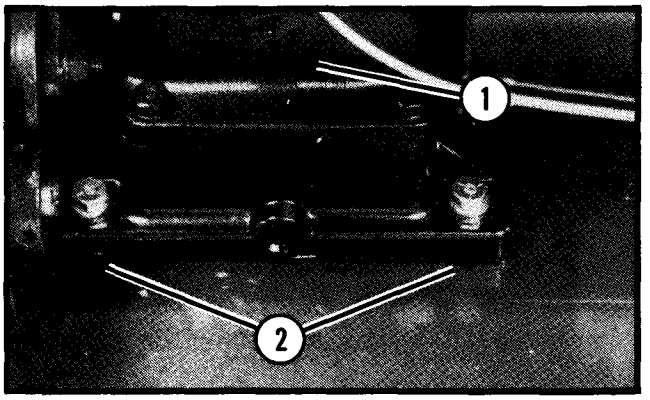


Figure 17. 1/16" Of The Chassis Slot Showing

3. Push the reel lever forward to engage the reel belts. Measure the clearance between the inside face of the belts and the front belt stop (See Figure 18).

Clearance should be 3/4" (19 mm). Loosen and reposition the engine if necessary to obtain this clearance.

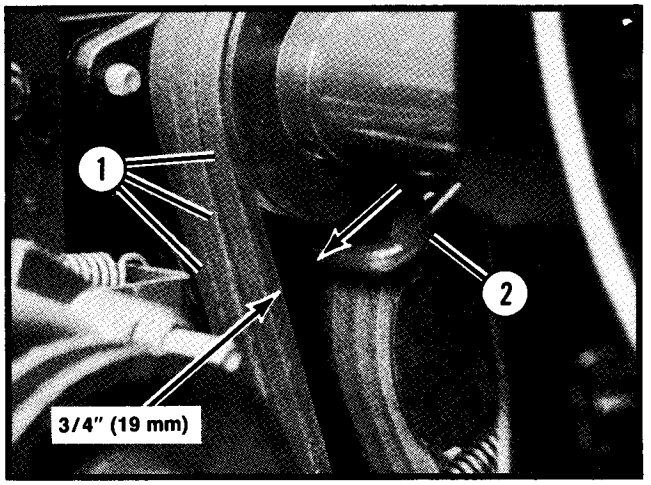


Figure 18. Reel Belt Clearance

1. Reel Belts
2. Front Belt Stop

4. Push drive lever forward to engage drive belt. Measure the distance from the surface of the idler pulley to the top (outside edge) of the drive belt (See Figure 19). The distance should be 1 3/4 to 2" (44 to 51 mm).

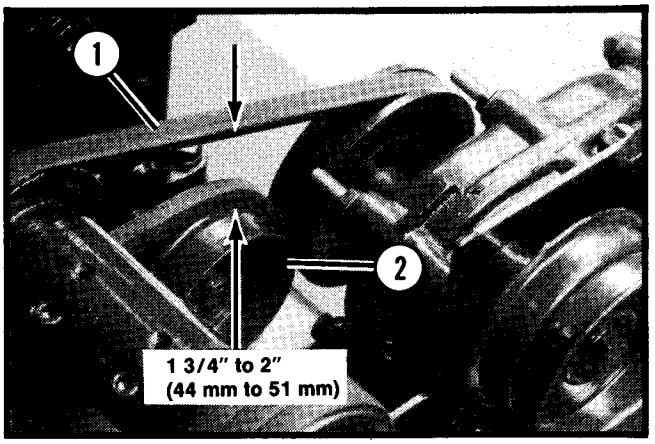


Figure 19. Drive Belt Clearance

1. Drive Belt
2. Drive Belt Pulley

IF the measurement is LESS than 1 3/4" (44 mm), move the TRANSMISSION forward to adjust the belt.

IF the measurement is MORE than 2" (51 mm), move the ENGINE forward to adjust the belt. If the engine is moved, re-check the reel belts for proper adjustment.

NOTE

- The dimensions given for the reel belt and drive belt adjustments are guidelines only.

  The reel belts should engage without slipping and disengage completely.

  The drive belt should engage without slipping and disengage completely so the unit will not creep.

5. Tighten all of the engine and transmission mounting hardware securely.
6. Adjust the position of the mounting plate so that it is perpendicular to the chassis and the bearing mounted to the plate is centered on the coupler shaft. Secure the plate to the chassis by tightening the two mounting screws at the bottom of the plate (See Figure 20).
7. Adjust the pillow block on the plate so that it is centered on the shaft with no top or bottom load on the shaft. Tighten the pillow block mounting hardware (See Figure 20).

NOTE

- If the pillow block bearing is not centered on the shaft, the side load exerted on the shaft may cause engine crankshaft failure.

8. Secure the locking collar against the bearing by tapping it counterclockwise approx 1/4 turn and tightening the set screw (See Figure 20).

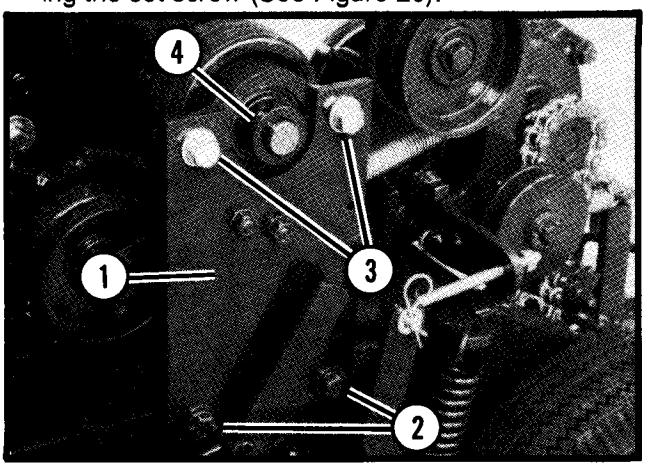


Figure 20. Mounting Plate And Coupler Bearing

1. Mounting Plate
2. Mounting Plate Hardware
3. Pillow Block Hardware
4. Locking Collar

9. With the reel belts still engaged, check the clearance between the belt idler pulley and the rear belt stop

(See Figure 21). WHEN PULLEY IS ENGAGED there should be at least 1/16" (2 mm) between the pulley and the stop. If adjustment is required, loosen the belt stop hardware on the outside of the mounting plate, adjust the stop and retighten the hardware.

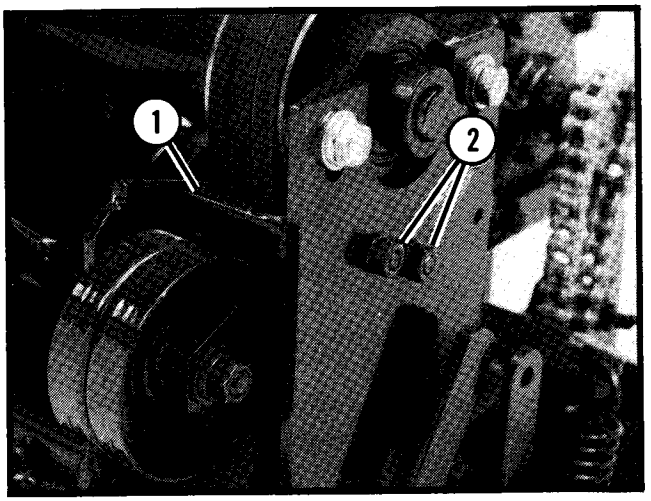


Figure 21. Rear Belt Stop Adjustment

1. Rear Belt Stop
2. Belt Stop Hardware

10. Disengage the reel belt idler, and check to make sure the idler pulley is centered over the three belts and that the two belt stops (the rear belt stop and the inner belt stop welded to the idler arm) have at least 1/32" (1mm) clearance (See Figure 22). The idler mounting hardware can be loosened to adjust the idler's position if required.

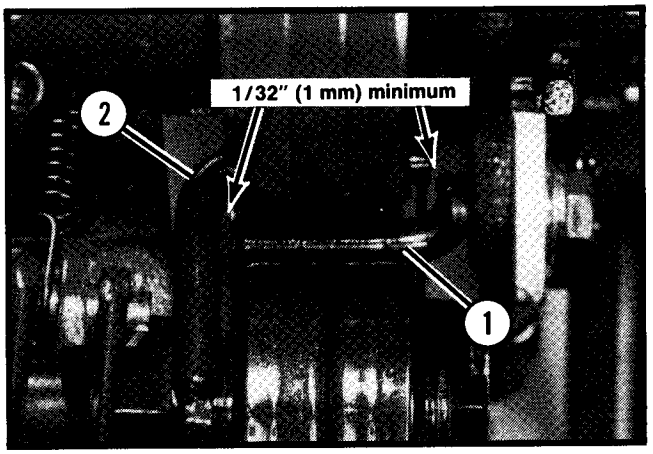


Figure 22. Reel Belt Stop Clearance

1. Rear Belt Stop
2. Inner Belt Stop

NOTE

- When the reel belts are disengaged, the two stops shown in Figure 22 act as a brake to stop and hold the belts. However, overtight belt stops will cause undue belt wear. The reel control lever on the handle should lock over center and the stops should hold the belts but not pinch them severely. This can be adjusted as described starting with step 11.

11. If the belt stops need to be adjusted, disconnect the control rod from the lever by removing the clevis pin.

12. Loosen the jam nut at the bottom of the rod and turn the rod in or out of the clevis attached to the idler arm.

13. Reassemble the lever making sure the two bushings are on either side of the rod, but do not replace the cotter pin. Engage and disengage the idler a few times to make sure the belt stops are correctly adjusted.

14. Replace the cotter pin to secure the clevis pin in the lever (See Figure 23).

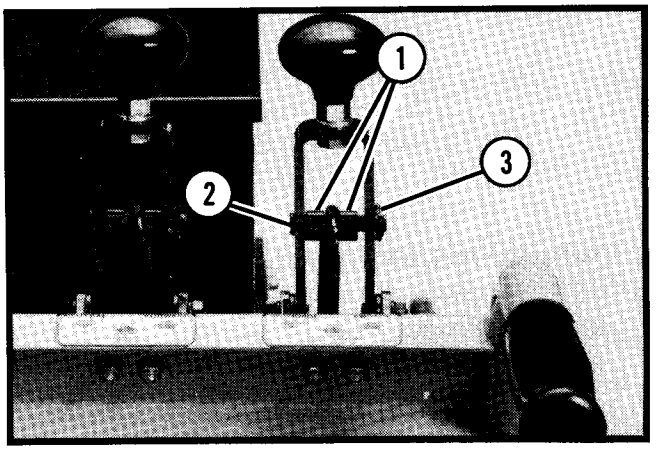


Figure 23. Reel Control Lever

1. Bushings
2. Clevis Pin
3. Cotter Pin

HOPPER DRIVE PULLEY SPROCKET ADJUSTMENT

With the belt covers removed, raise and lower the reel using the Lift Lever, and check to make sure the sprocket on the inside of the hopper drive pulley properly engages the drive chain from the transmission. If it Does NOT:

1. If the pulley sprocket does not align with the chain, the set screw in the drive sprocket on the transmission can be loosened and the sprocket moved in or out on its shaft to line the chain up with the pulley sprocket.

2. If the pulley sprocket is aligned with the chain but does not engage the chain fully, raise the reel and check the chain tension as shown in step 5 of Chain Replacement on page 6.

3. If the chain tension is correct, lower the reel and loosen the nut on the hopper pulley adjustment rod (See Figure 24) until the sprocket fully engages the chain.

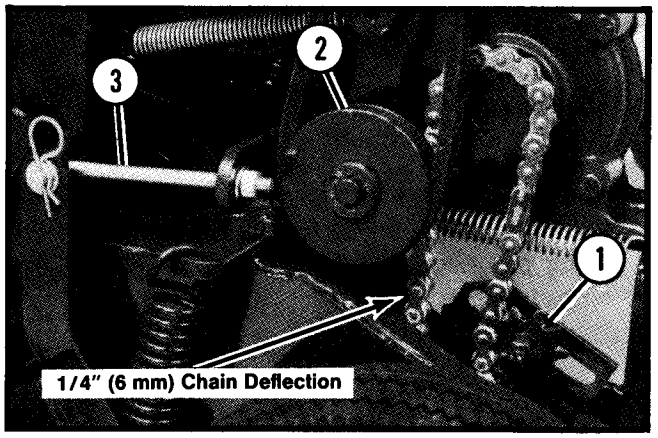


Figure 24. Hopper Pulley Adjustment Rod

1. Chain Idler Sprocket
2. Sprocket Pulley
3. Adjustment Rod

4. Raise the reel, and make sure the pulley sprocket fully disengages the chain and that there is clearance of approximately 1/8" (3 mm) between the sprocket and chain (See Figure 25).

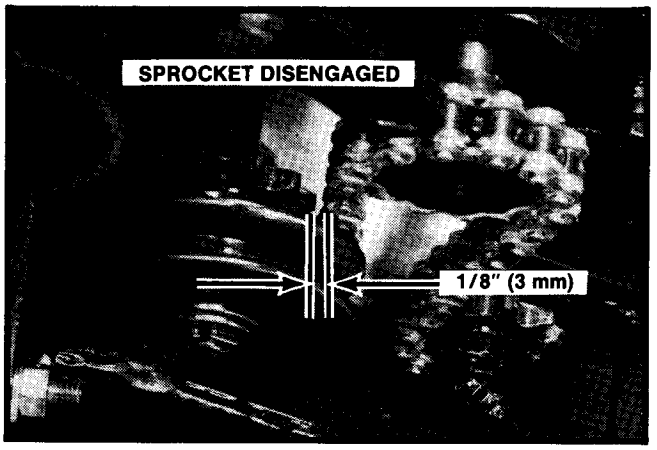


Figure 25. Pulley Sprocket Clearance

DISC ALIGNMENT

With the unit tipped forward and supported by jack stands, check the disc/reel alignment by placing a straight edge against the concave side of the either the fifth or sixth disc and the corresponding blade on the reel. The straight edge should lie flat against both disc and blade (See Figure 26).

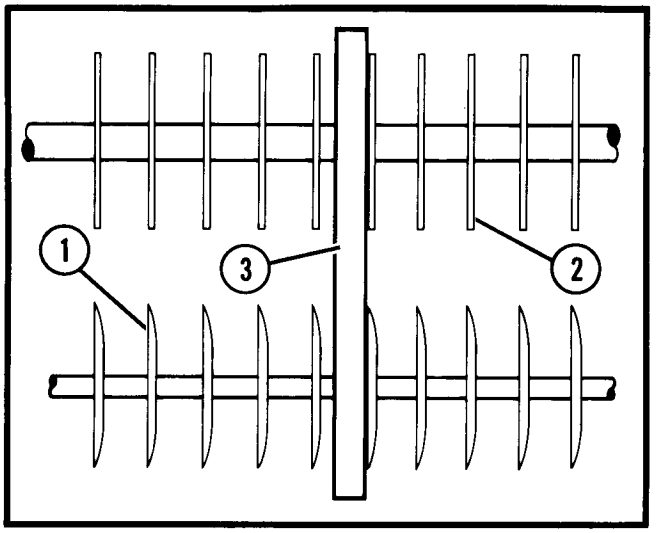


Figure 26. Disc/Blade Alignment

The discs can be aligned with the blades by loosening the two locking collars just inside the bearings at either end of the disc shaft (loosen the set screws and tap the collar clockwise with hammer and punch). Move the entire shaft until the discs align with the blades, lock the collars against the bearings and tighten the set screws.

TRANSMISSION GEAR REPLACEMENT
(8810 AND LATER)

1. Remove the transmission with its mounting bracket from the unit, take out one of the plugs and drain the oil.

2. Remove the sprocket, pulley, and keys. Remove the mounting bracket and bracket with the hopper drive belt pulleys and the rest of the hardware securing the case halves.

3. Take note of which side is input and which is output so that they can be reassembled correctly. Separate the case halves. Tapping the tabs with a soft hammer (lead, leather, etc.) to break the seal may be necessary.

4. Take out the gears, shafts and spacer. Remove the bearings and grease seal from both case halves (See Figure 27).

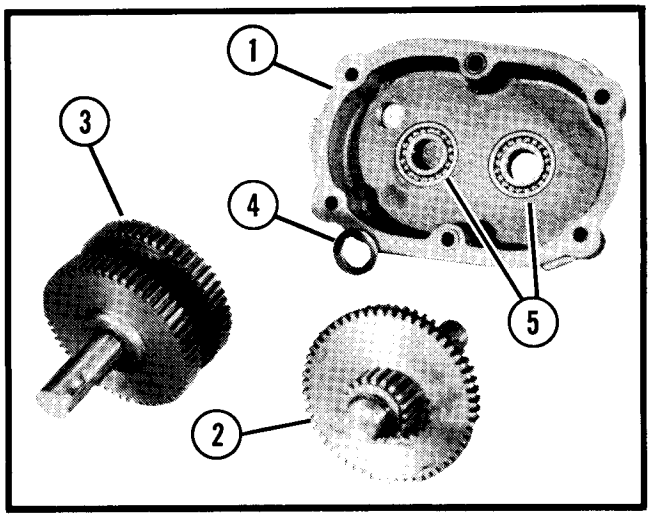


Figure 27. Transmission

1. **Case Half**
2. **Input Shaft w/gears**
3. **Output Shaft w/gears**
4. **Spacer**
5. **Bearings**

5. Install new bearings into both case halves. **Do Not** install grease seals at this time.

6. Remove the gears, key and spacer from the input shaft (See Figure 28).

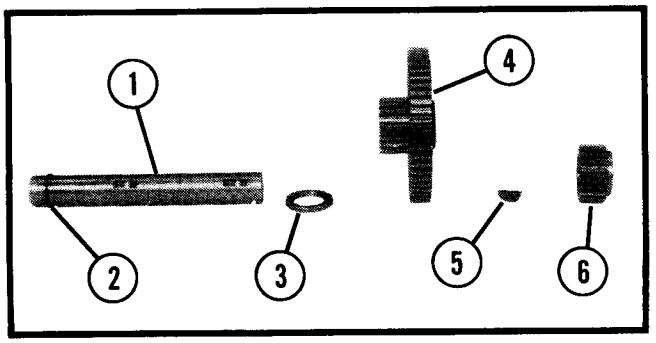


Figure 28. Input Shaft

1. **Input Shaft**
2. **Snap Ring**
3. **Spacer**
4. **Large Double Gear**
5. **Key**
6. **Small Gear**

7. Check the input shaft for wear and replace if necessary (if shaft is replaced, install the existing snap ring on new shaft). If shaft is NOT replaced, remove any burrs from the keyways.

8. Replace the bushings in the large double gear. Be sure to properly align the oil hole. Replace the gear if required.

9. Reassemble the input shaft by putting the spacer next to the snap ring, the large double gear next to the spacer (smaller gear toward spacer), install the key in the keyway and slide the small gear over the key with its flat side toward the large gear.

10. Remove the gears and key from the output shaft (See Figure 29).

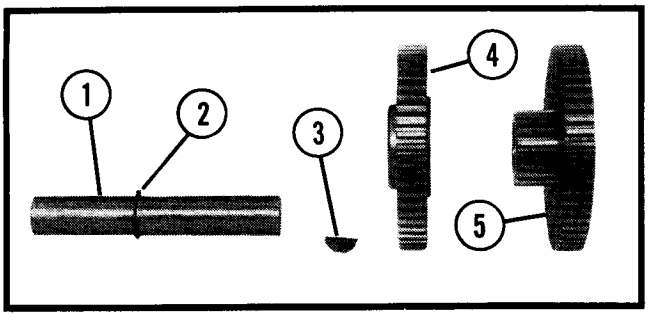


Figure 29. Output Shaft

1. **Output Shaft**
2. **Snap Ring**
3. **Key**
4. **Single Gear**
5. **Double Gear**

11. Check the output shaft for wear and replace if necessary (if shaft is replaced, install the existing snap ring on new shaft). If shaft is NOT replaced, remove any burrs from the keyways.

12. Replace the bushings in the double gear. Be sure to properly align the oil hole. Replace the gear if required.

13. Install the key in the keyway and slide the single gear over the key next to the snap ring (the side with the larger boss goes toward the snap ring).

14. Slide the double gear onto the shaft with the smaller gear against the single gear.

15. Install the spacer on the output shaft next to the double gear.

16. Install the shafts into one case half. Make sure the spacer on the output shaft remains in position. Rotate one of the shafts and make sure it turns the other to assure that the keys are in the proper locations.

17. Apply Loctite 515 to the case halves, check to be sure the spacer bushings are in both the top and bottom center holes, and put the halves together.

18. Install the mounting bracket and overseeder pulley bracket and remaining hardware (screw heads on the output side). Torque the hardware to 16± 2 ft.-lb. (22 N·m).

19. Put a light coat of clean 30W oil on the oil seal lips and install the seals.

20. Install the pulley and sprocket.

21. With the gear case resting level on its mounting bracket, fill the case up to the plug level with EP 80-90 gear lube. Capacity 1/2 pint (.4L).

22. Remount transmission on unit.

23. If belt or chain alignment is required, loosen set screws in sprocket and/or pulley for adjustment.

TRANSMISSION GEAR REPLACEMENT
(8710 AND PRIOR)

1. Drain the oil from the case through the dipstick hole.

2. Remove the mounting plate.

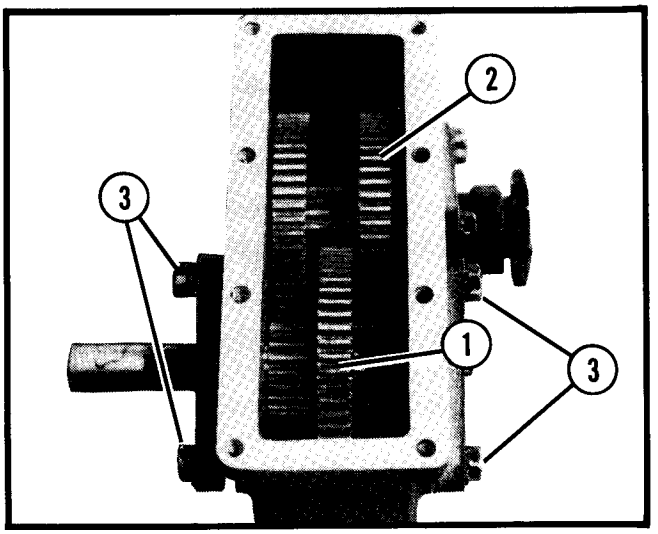


Figure 30. Transmission 8710 And Earlier

1. Pulley Shaft Gears
2. Sprocket Shaft Gears
3. Bearing Cap Screws

To remove pulley shaft gears:

3. Remove pulley from shaft.

4. Remove bearing cap screws from both sides(See Figure 30).

5. Remove the bearing cap on the opposite side from pulley and remove the snap ring (See Figure 31).

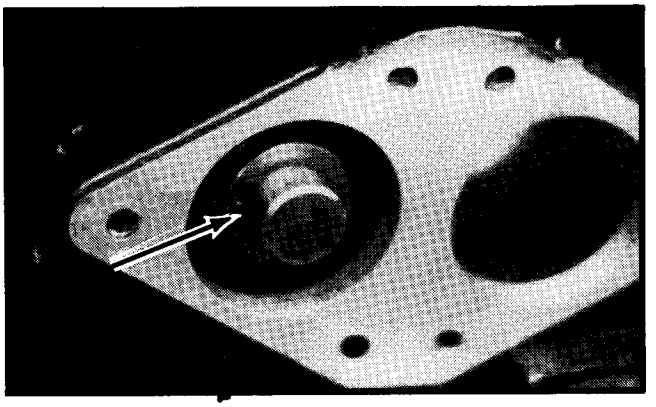


Figure 31. Pulley Shaft Snap Ring

6. Pull out pulley shaft and bearing cap, washer and gears will slide off as shaft is removed.

NOTE

- After replacing bushings (P.N. 515511) in idler gear, be sure to drill oil hole in the bushing using oil hole in gear as a guide.

To remove sprocket shaft gears.

7. Remove bearing cap screws from both sides(See Figure 30).

8. Remove the bearing cap on the opposite side from sprocket.

9. Install a slide hammer on the sprocket and remove the sprocket and shaft together. Remove gears and washer from case.

10. When gears have been serviced or replaced, reassemble pulley and/or sprocket gears in reverse procedure of previous steps.

NOTE

- If both shafts were removed, be sure the pulley shaft is installed in the end of the case with the dipstick hole.

11. Apply permatex sealant to both sides of the gasket and Loctite PST stainless steel pipe sealant with teflon to all screw threads. Reinstall the mounting plate.

12. Torque the 5/16" bearing cap screws to 100 in.–lb. (11 N·m) and the 1/4" mounting plate screws to 75 in.–lb. (8.5 N·m).

13. Fill the case with 1/2 pint (.4L) of EP 80-90 gear lube. Apply Loctite PST stainless steel pipe sealant to the threads of the dipstick before installing it.

TIRES

Keep tires inflated to recommended pressure. Improper inflation will shorten tire life. Uneven tire pressure among the four wheels will cause unsatisfactory operation.

Tire Size ..... 4.10/3.50 - 4, 2 ply
Tire Pressure ..... 24 to 26 PSI (165 to 179 kPa)

⚠ SAFETY WARNING

- **To prevent tire explosion, use care when filling tires with air. Before filling:**
  - **•Check the pressure with a gauge**
  - **•Know the maximum recommended pressure and DO NOT exceed it.**

Due to the low air volume required by small tires, when inflating partially filled tires over-inflation can be reached in 2 or 3 seconds.

STORAGE

⚠ SAFETY WARNING

- **To prevent ignition or explosion of vaporized fuel, do not store equipment in enclosed area with open flame (such as furnace or water heater pilot light), when there is fuel in the fuel tank or carburetor.**

Before storing the unit for periods exceeding 30 days:

1. Drain all fuel from fuel lines and tank.
2. Start the engine and run the fuel out of the carburetor.
3. While the engine is warm, drain the engine oil. Refill the crankcase with oil of the proper weight for the season the unit will next be used.
4. Remove the spark plug and squirt a small amount of clean engine oil into the cylinder. Turn the engine over a few times to distribute oil and reinstall the spark plug.
5. Check the reel for cracked, broken or bent blades. Replace damaged blades.
6. Lubricate all fittings.

To put unit back into services after extended storage, Fill the fuel tank, check the engine oil level, start the engine and check for fuel leaks.

TORQUE SPECIFICATIONS
HEX HEAD CAP SCREWS

The torque values shown should be used as a general guideline when specific torque values are not given.

U.S. Standard Hardware

Grade		Shank Size (Diameter in inches, fine or coarse thread)													
		1/4	5/16	3/8	7/16	1/2	9/16	5/8	3/4	7/8	1	1 1/8			
SAE grade 5 *	ft.-lb.	9	18	31	50	75	110	150	250	378	583	782			
	N·m	12	24	42	68	102	150	203	339	513	790	1060			
SAE grade 8 **	ft.-lb.	13	28	46	75	115	165	225	370	591	893	1410			
	N·m	18	38	62	108	156	224	305	502	801	1211	1912			
Flangelock Screw w/ Flangelock Nut	ft.-lb.		24	40											
	N·m		33	54											

* Grade 5 marking –  Minimum commercial quality (Lower quality not recommended).

** Grade 8 marking – 

Metric Standard Hardware

Grade		Shank Size (Diameter in millimeters, fine or coarse thread)												
		M4	M5	M6	M7	M8	M10	M12	M14	M16	M18	M20	M22	M24	M27
Grade 8.8*	N·m	2	4	7	11	18	32	58	94	144	190	260	368	470	707
	ft.-lb.	1.5	3	5.2	8.2	13.5	24	43.5	70.5	108	142	195	276	353	530
Grade 10.9**	N·m	3	6	10	16	25	47	83	133	196	269	366	520	664	996
	ft.-lb.	2.2	4.5	7.5	12	18.8	35.2	62.2	100	147	202	275	390	498	747
Grade 12.9 ***	N·m	3.6	7	11	20	29	58	100	159	235	323	440	628	794	1205
	ft.-lb.	2.7	5.2	8.2	15	21.8	43.5	75	119	176	242	330	471	596	904

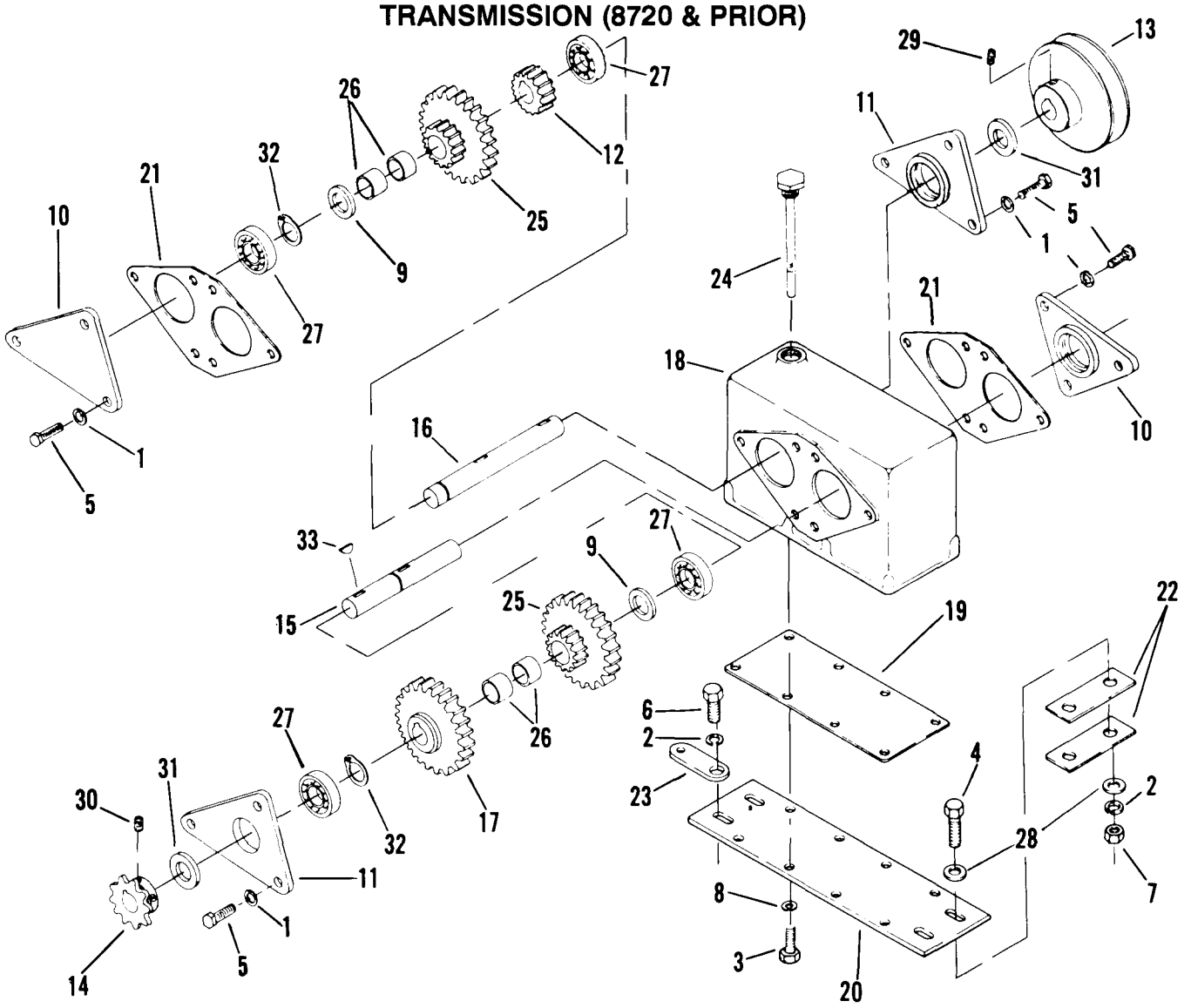
* Grade 8.8 marking – 

** Grade 10.9 marking – 

*** Grade 12.9 marking – 

NOTES

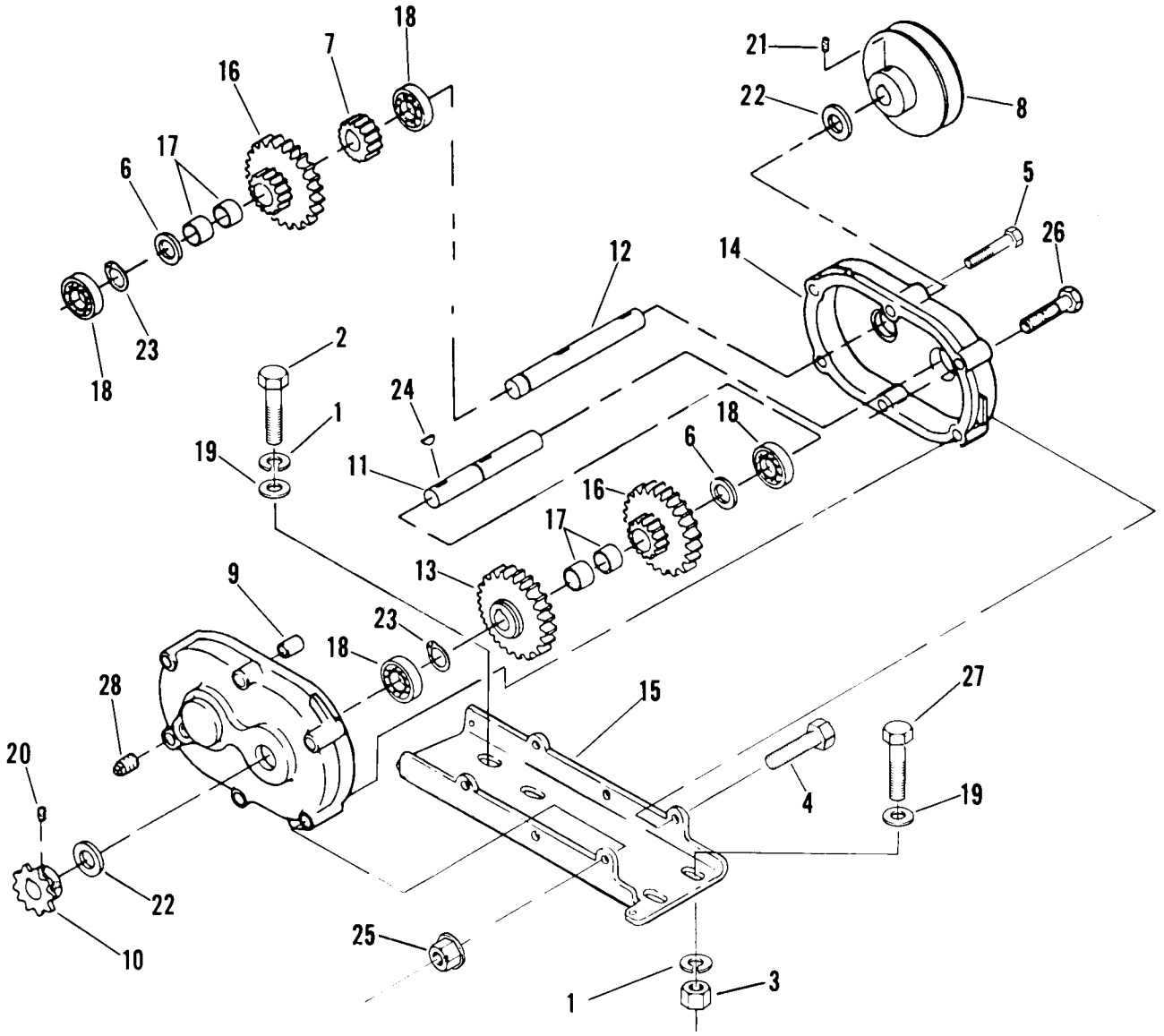
TRANSMISSION (8720 & PRIOR)



Ref. No.	Part No.	Description	No. Req'd.	Ref. No.	Part No.	Description	No. Req'd.
1	103867	Washer, 5/16	12	18	518830	Case, gear	1
2	120177	Lockwasher, 3/8	4	19	518831	Gasket	1
3	300646	Screw, 1/4–20 x 3/4	8	20	518835	Cover	1
4	302600	Screw, 3/8–16 x 1 1/2	2	21	518838	Gasket	2
5	306322	Screw, 5/16–18 x 7/8	12	22	519058	Shim	2
6	306539	Screw, 3/8–16 x 7/8	2	23	521412	Tab, spring	2
7	306562	Nut, 3/8–16	2	24	546032	Dipstick	1
8	308090	Washer, 1/4	8	25	546708	Gear	2
9	516700	Spacer	2	26	515511	•Bushing	2
10	516713	Cage, bearing	2	27	548119	Bearing, ball	4
11	516720	Cage, bearing	2	28	548164	Washer, 3/8	4
12	516724	Gear	1	29	548201	Screw, set 5/16–18 x 5/16	2
13	517137	Pulley	1	30	548204	Screw, set 3/8–18 x 3/8	2
14	517342	Sprocket	1	31	548274	Seal, oil	2
15	518820	Shaft	1	32	548324	Ring, lock	2
16	518826	Shaft	1	33	548369	Key	4
17	518827	Gear	1				

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

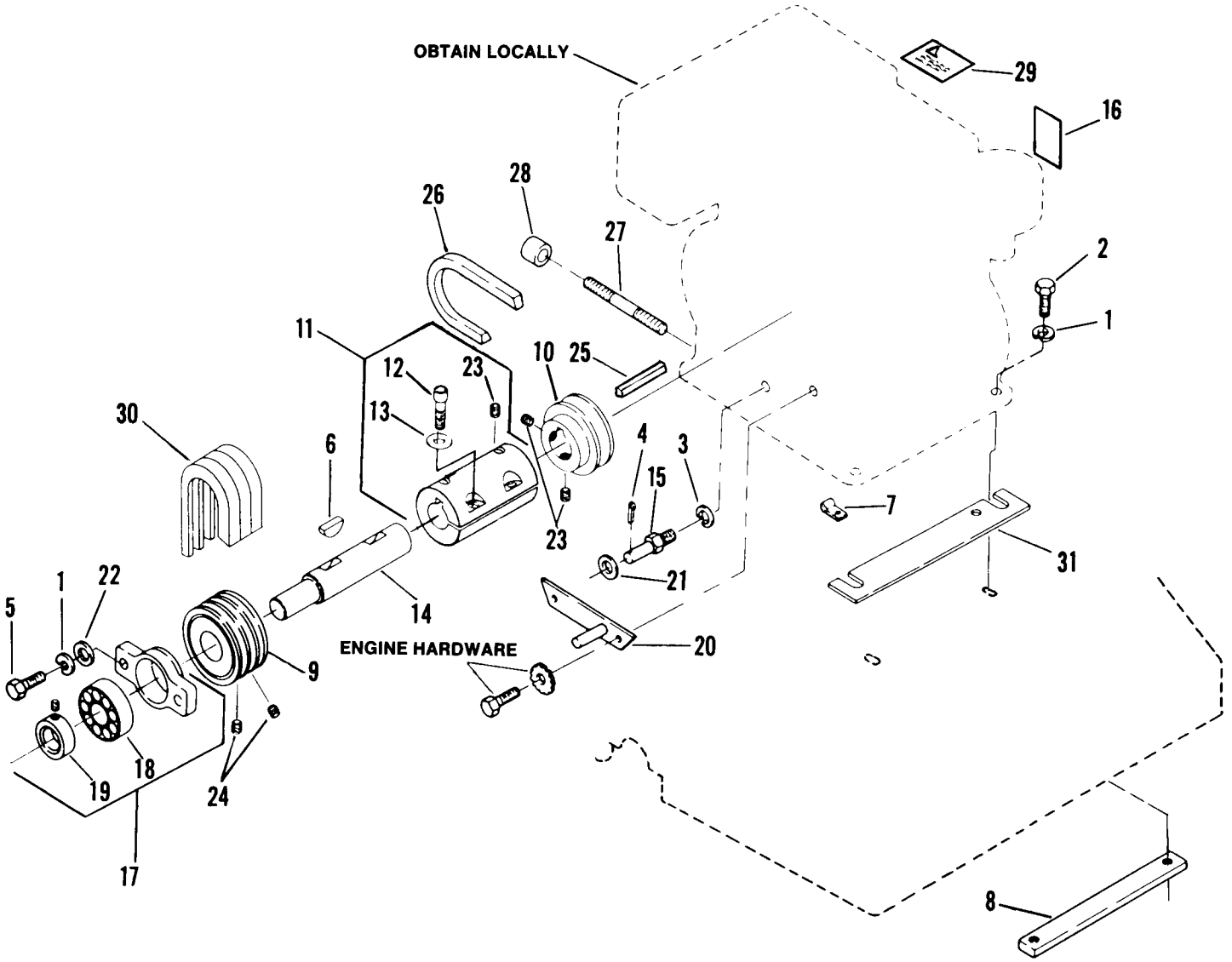
TRANSMISSION (8810 & LATER)



Ref. No.	Part No.	Description	No. Req'd.
1	120177	Lockwasher, 3/8	4
2	306414	Screw, 3/8–16 x 1	2
3	306562	Nut, 3/8–16	2
4	313040	Screw, 5/16–18 x 3 3/4	3
5	316909	Screw, 5/16–18 x 4 1/2	2
6	516700	Spacer	2
7	516724	Gear, 20 tooth	1
8	517137	Pulley, 4" (102mm)	1
9	517226	Bushing	2
10	517342	Sprocket	1
11	518820	Shaft, output	1
12	518826	Shaft, input	1
13	518827	Gear, 56 tooth	1
14	522638	Case gear	2
15	523515	Bracket, mounting	1
16	546708	Gear, double	2
17	515511	•Bushing	2
18	548119	Bearing, ball	4
19	548164	Washer, 3/8	4
20	548201	Screw, set 5/16–18 x 5/16	2
21	548204	Screw, set 3/8–16 x 3/8	1
22	548274	Seal, oil	2
23	548324	Ring, lock	2
24	548369	Key, woodruff	4
25	548911	Nut, flangelock 5/16–18	6
26	548958	Screw, 5/16–18 x 3 1/2	3
27	551094	Screw, 3/8–16 x 1 3/4	2
28	800120	Plug, pipe 3/8–18	2

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

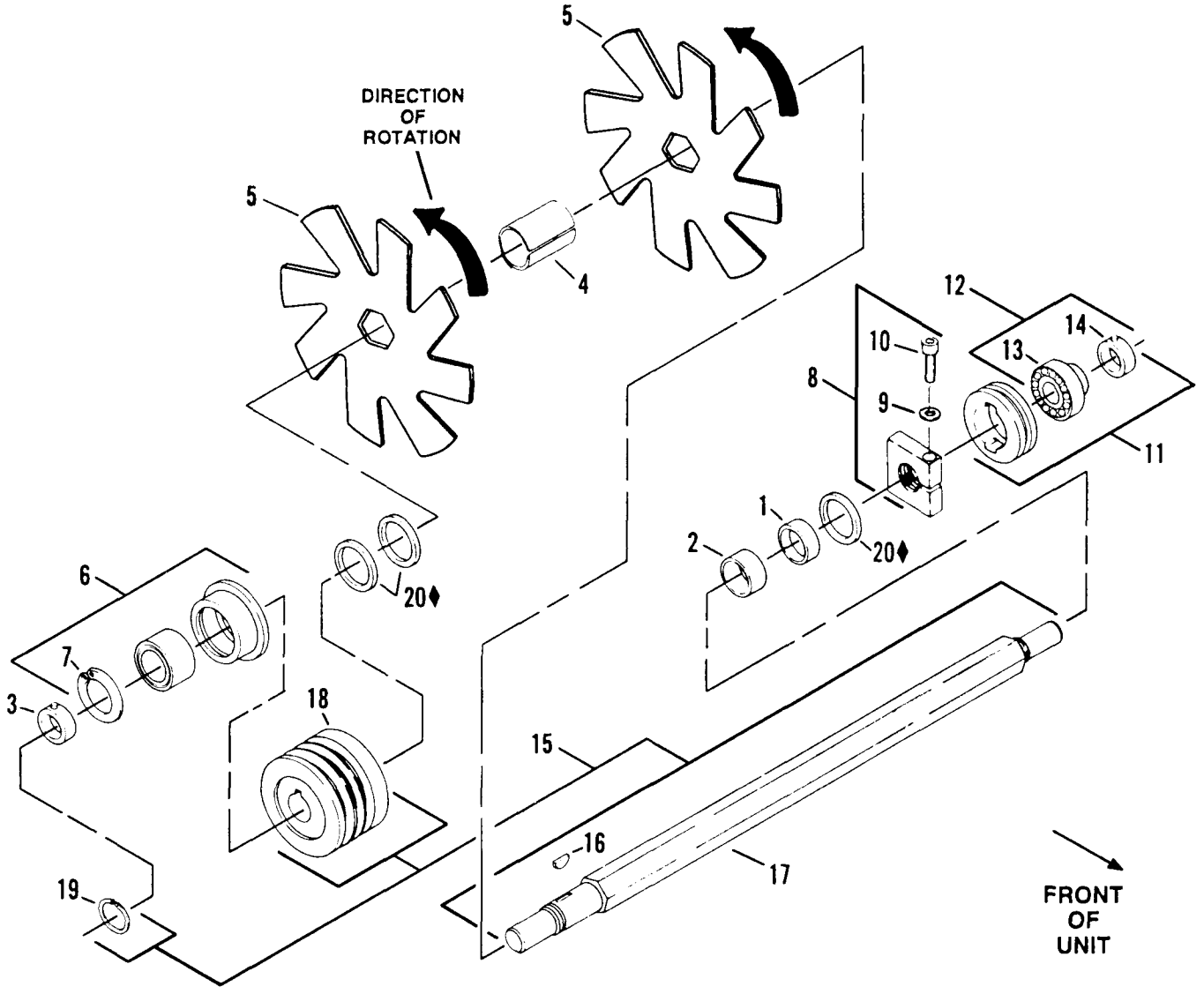
ENGINE AND DRIVE ASSEMBLY



Ref. No.	Part No.	Description	No. Req'd.
1	120177	Lockwasher, 3/8	6
2	551094	Screw, 3/8–18 1 3/4	4
3	303269	Lockwasher, 7/16	1
4	304635	Pin, cotter 1/8 x 1	1
5	306414	Screw, 3/8–16 x 1	2
6	309855	Key	2
7	515755	Clip	1
8	516686	Nut, engine	2
9	516892	Pulley, reel belt	1
10	517101	Pulley, drive belt	1
11	547755	Coupling	1
12	330748	•Screw, sckthd 5/16–18 x 1	2
13	548183	•Lockwasher, 5/16	2
14	517123	Shaft	1
15	519065	Pin	1
16	520910	Decal, choke	1
17	544068	Pillow block	1
18	548101	•Bearing, ball	1
19	521857	••Collar, locking	1
20	545379	Stop, drive belt	1
21	548163	Washer	1
22	548164	Washer, 3/8	2
23	548201	Screw, set 5/16–18 x 5/16	6
24	548204	Screw, set 3/8–16 x 3/8	2
25	548372	Key	1
26	548403	Belt, drive	1
27	800400	Nipple	1
28	800401	Cap, pipe	1
29	521813	Decal, Safety Warning	1
30	547759	Belts, reel (matched set of 3)	1
31	523506	Spacer, engine	1

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

REEL

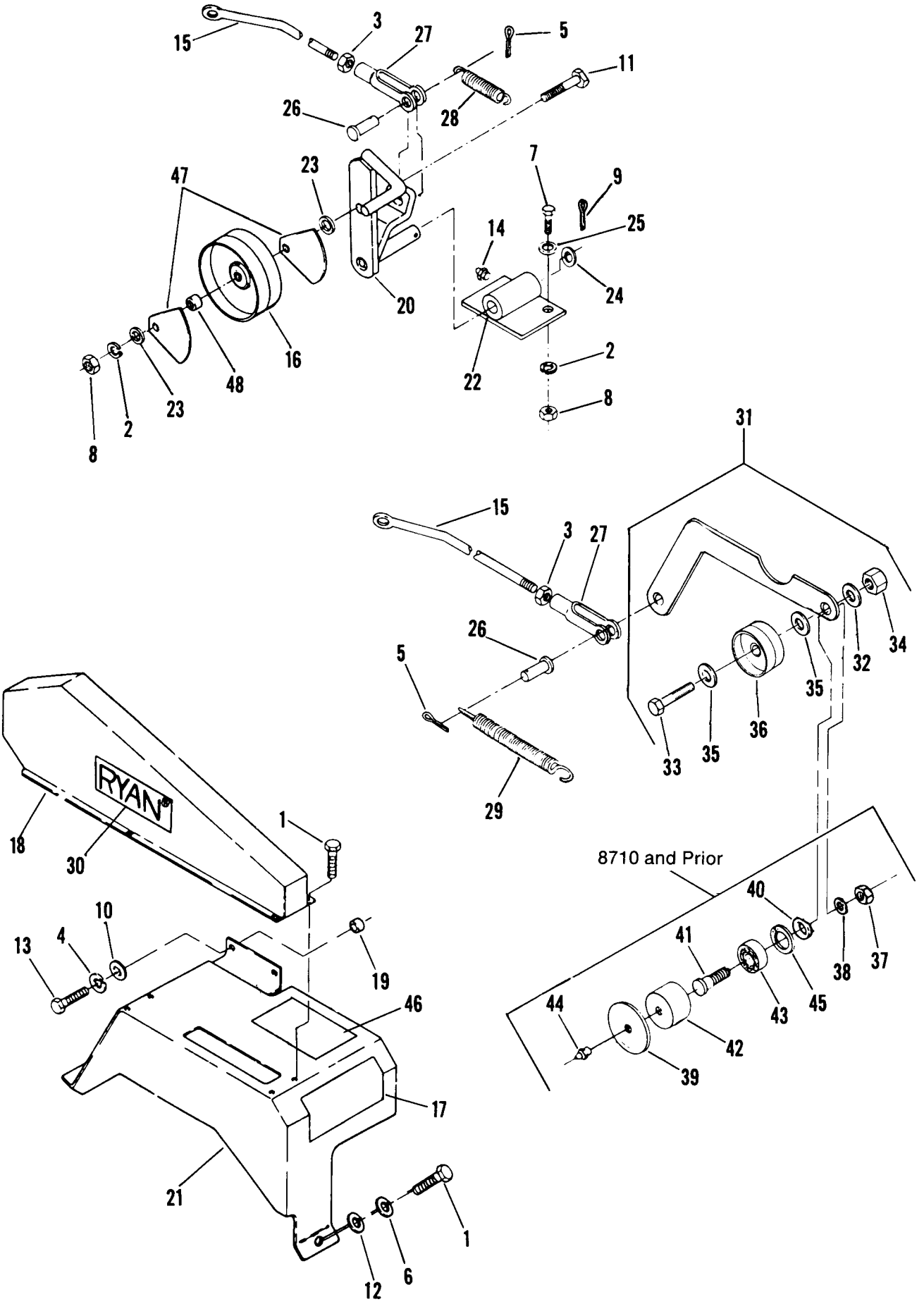


Ref. No.	Part No.	Description	No. Req'd.
	547553	Reel Assembly (complete)	1
1	516903	•Spacer, .5" (13mm) long	1
2	516904	•Spacer, .7" (18mm) long	1
3	521857	•Collar, locking	1
4	522835	•Spacer, 1.925" (50mm) long	9
5	523293	•Blade	10
6	544287	•Pillow Block complete	1
7	548354	••Ring, snap	1
8	547778	•Nut, reel	1
9	548181	••Lockwasher, 1/4	1
10	800583	••Screw, sckthd 1/4–20 x 1	1
11	545640	•Pillow Block complete	1
12	548101	••Bearing, complete	1
13	521856	•••Bearing, ball	1
14	521857	•••Collar, locking	1
15	545967	•Shaft Assembly complete	1
16	306367	••Key, #9 woodruff	1
17	522542	••Shaft	1
18	522543	••Pulley	1
19	522545	••Ring, snap	1
20	820484	•Spacer♦, .125" (3mm)	4

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

♦Use spacers as required to keep the reel nut from contacting the hex shaft when tight.

DRIVE CONTROLS AND GUARDS



DRIVE CONTROLS AND GUARDS

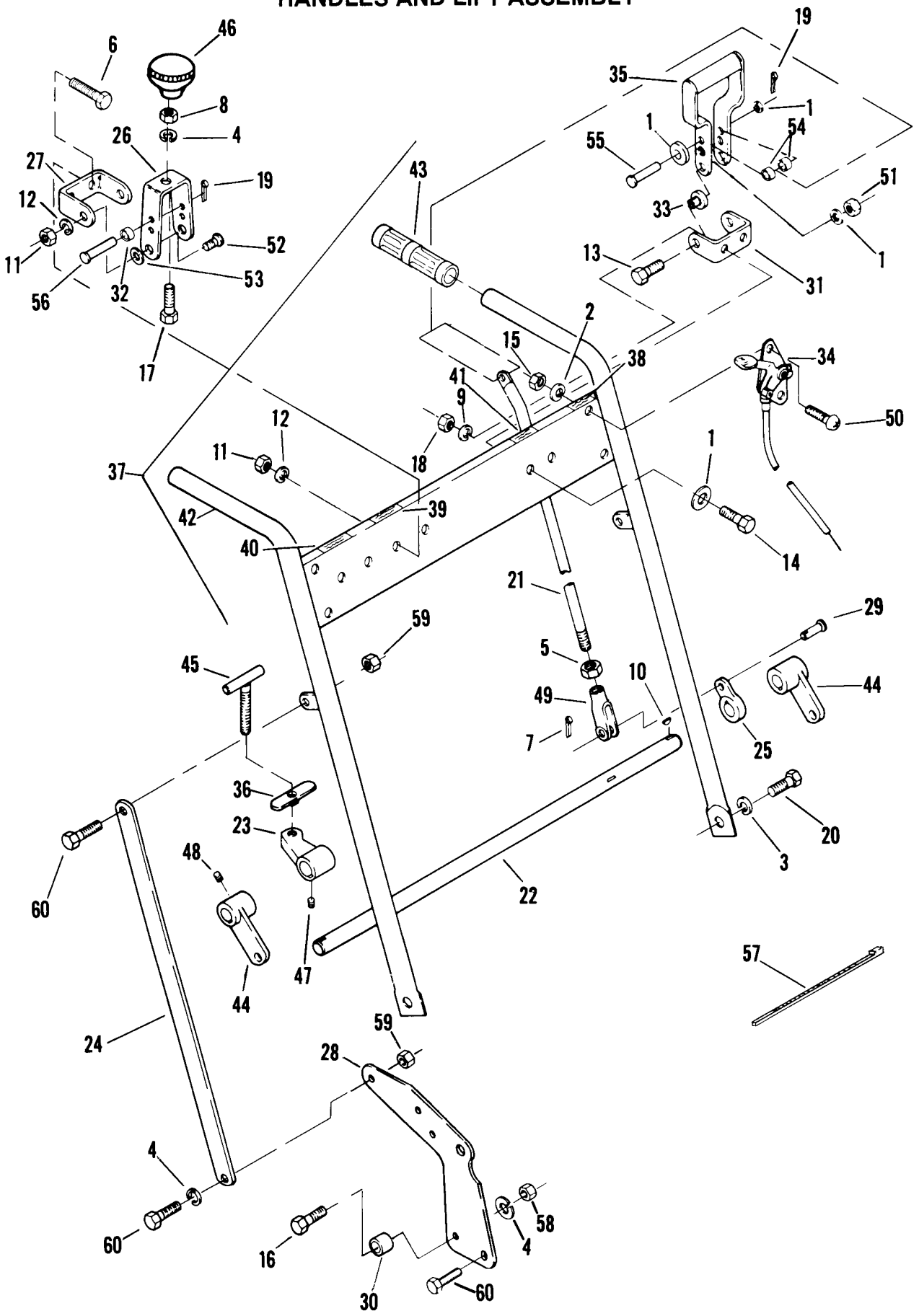
Ref. No.	Part No.	Description	No. Req'd.
1	112050	Screw, 1/4–20 x 5/8	7
2	120177	Lockwasher, 3/8	3
3	130981	Nut, 7/16–20	2
4	303269	Lockwasher, 7/16	2
5	304635	Pin, cotter 1/8 x 1	2
6	306396	Lockwasher, 1/4	3
7	306414	Screw, 3/8–16 x 1	2
8	306562	Nut, 3/8–16	3
9	306956	Pin, cotter 1/8 x 3/5	1
10	306982	Washer, 7/16	2
11	307776	Screw, 3/8–16 x 2 3/4	1
12	308090	Washer, 1/4	3
13	308197	Screw, 7/16–14 x 1 1/2	2
14	548224	Fitting, lubrication	1
15	515836	Rod, drive control	2
16	548942	Pulley, reel idler	1
17	521352	Decal, RYAN/MATAWAY	1
18	522665	Guard, belt (overseeder)	1
19	522982	Bushing	2
20	547744	Idler, reel belt	1
21	545965	Guard, belt (drive)	1
22	547178	Bracket, reel idler	1
23	548155	Washer, 3/8	2
24	548163	Washer, 1/2	1
25	548164	Washer, 3/8	2
26	548456	Pin, clevis	2
27	548507	Clevis	2
28	812368	Spring (short)	1
29	819544	Spring (long)	1
30	521167	Decal, RYAN	1
31	544277	Arm Assembly	1
32	120177	•Lockwasher, 3/8	1
33	131794	•Screw, 3/8–16 x 2	1
34	306562	•Nut, 3/8–16	1
35	306981	•Washer, 3/8	2
36	520870	•Pulley,2.75" (70mm)	1
37	306933	♦Nut, 1/2–13	1
38	309067	♦Lockwasher, 1/2	1
39	◊◊	♦Retainer	1
40	◊◊	♦Spacer	1
41	◊◊	♦Shaft, idler	1
42	◊◊	♦Pulley, reel idler	1
43	548096	♦Bearing	1
44	548228	♦Fitting, lubrication	1
45	548323	♦Ring, lock	1
46	521380	Decal, operation instruction	1
47	523508	Guide, belt	2
48	822474	Spacer	1

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

♦8710 and Prior

◊◊These items have been discontinued. Replace the entire assembly with Part No. 544277 (Ref. No. 31)

HANDLES AND LIFT ASSEMBLY



HANDLES AND LIFT ASSEMBLY

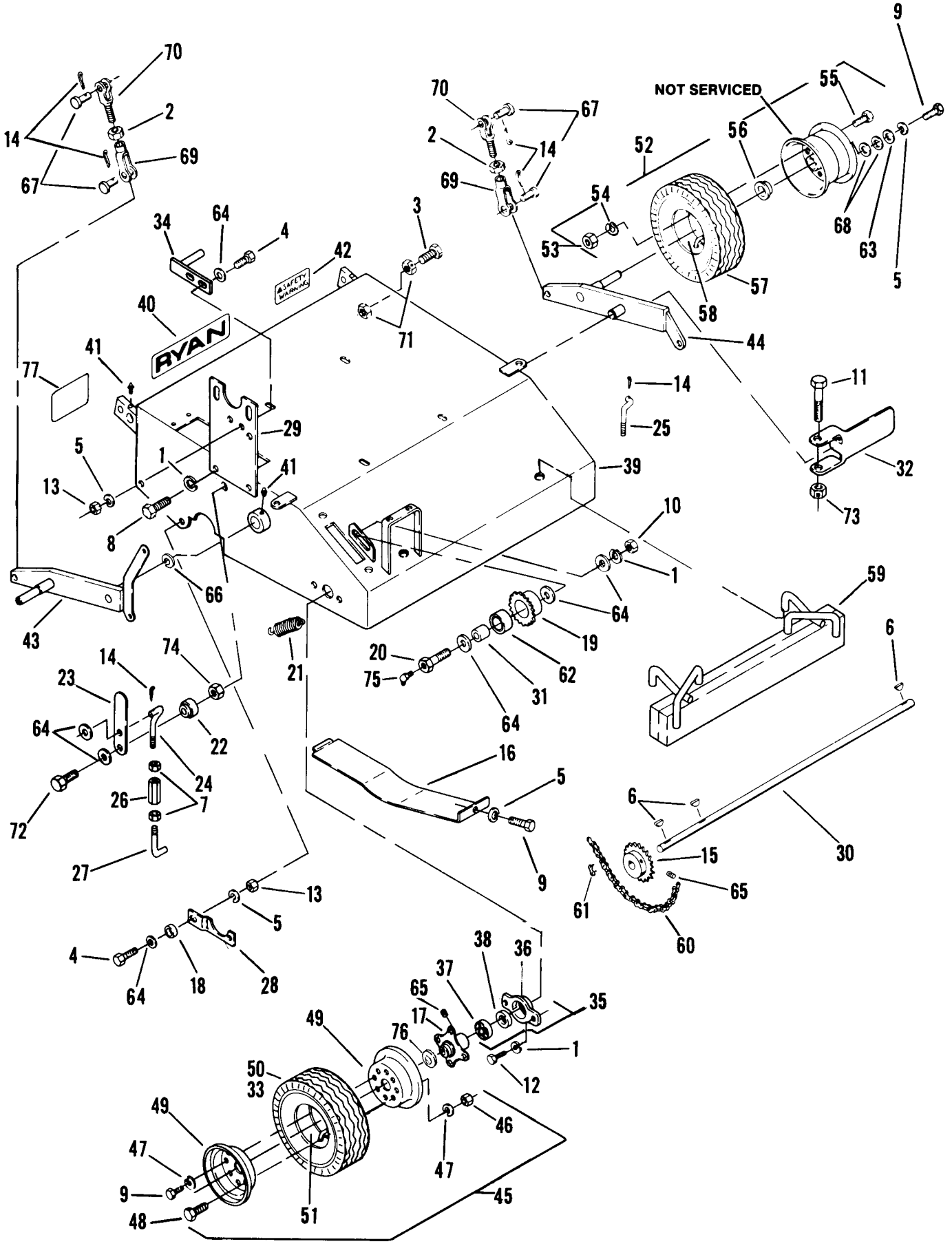
Ref. No.	Part No.	Description	No. Req'd.
1	130867	Washer, 5/16	4
2	120052	Lockwasher, #10	2
3	120166	Lockwasher, 1/2	2
4	120177	Lockwasher, 3/8	4
5	130981	Nut, 7/16–20	1
6	300646	Screw, 1/4–20 x 3/4	4
7	304636	Pin, cotter 1/8 x 1	3
8	306319	Nut, 3/8–24	2
9	306325	Lockwasher, 5/16	2
10	306367	Key, #9 Woodruff	4
11	306375	Nut, 1/4–20	8
12	306396	Lockwasher, 1/4	8
13	306435	Screw, 5/16–18 x 1 1/4	2
14	306450	Screw, 5/16–18 x 3/4	2
15	306531	Nut, #10–24	2
16	306836	Screw, 3/8–16 x 2 1/4	2
17	306866	Screw, 3/8–16 x 1 1/4	2
18	306932	Nut, 5/16–18	6
19	306956	Pin, cotter 1/8 x 3/4	3
20	316910	Screw, 1/2–13 x 1	2
21	515838	Rod, lift control	1
22	516855	Shaft, lift	1
23	516859	Lever, height adjusting	1
24	523479	Brace, handle	2
25	517413	Arm, lift	2
26	522541	Handle, control lever	2
27	522604	Bracket, control lever	2
28	523442	Plate, mounting	2
29	522664	Pin	1
30	522683	Bushing, pivot	2
31	522692	Bracket, lift control lever	1
32	809034	Bushing, drive lever	4
33	522654	Bushing, lift lever	2
34	544285	Control, throttle	1
35	545947	Handle, lift	1
36	545979	Handle, locking	1
37	545981	Handle Assembly	1
38	521365	•Decal, throttle	1
39	521378	•Decal, drive	1
40	521379	•Decal, reel	1
41	522669	•Decal, lift	1
42	♦	•Handle	1
43	548518	•Grip, handle	2
44	545985	Arm, frame lift	2
45	546321	Screw, height adjusting	1
*	548066	Nut, throttle cable	2
46	548171	Knob	2
47	548201	Screw, set 5/16–18 x 5/16	1
48	548204	Screw, set 3/8–16 x 3/8	3
49	548507	Clevis	1
50	548732	Screw, #10–24 x 1/2 PTH	2
51	800290	Nut, lock 5/16–18	2
52	800492	Screw, 1/4–20 x 5/8 socket head (grade 8)	4
53	809183	Washer,	4
54	823216	Bushing, lift handle	2
55	826633	Pin	1
56	830005	Pin	2
57	320107	Tie Strap	2
58	306562	Nut, 3/8–16	2
59	548804	Nut, flangelock 3/8–16	4
60	548905	Screw, 3/8–16 x 1	6

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

* Not Illustrated

♦Not available separately. Order 545981 handle assembly.

FRAME

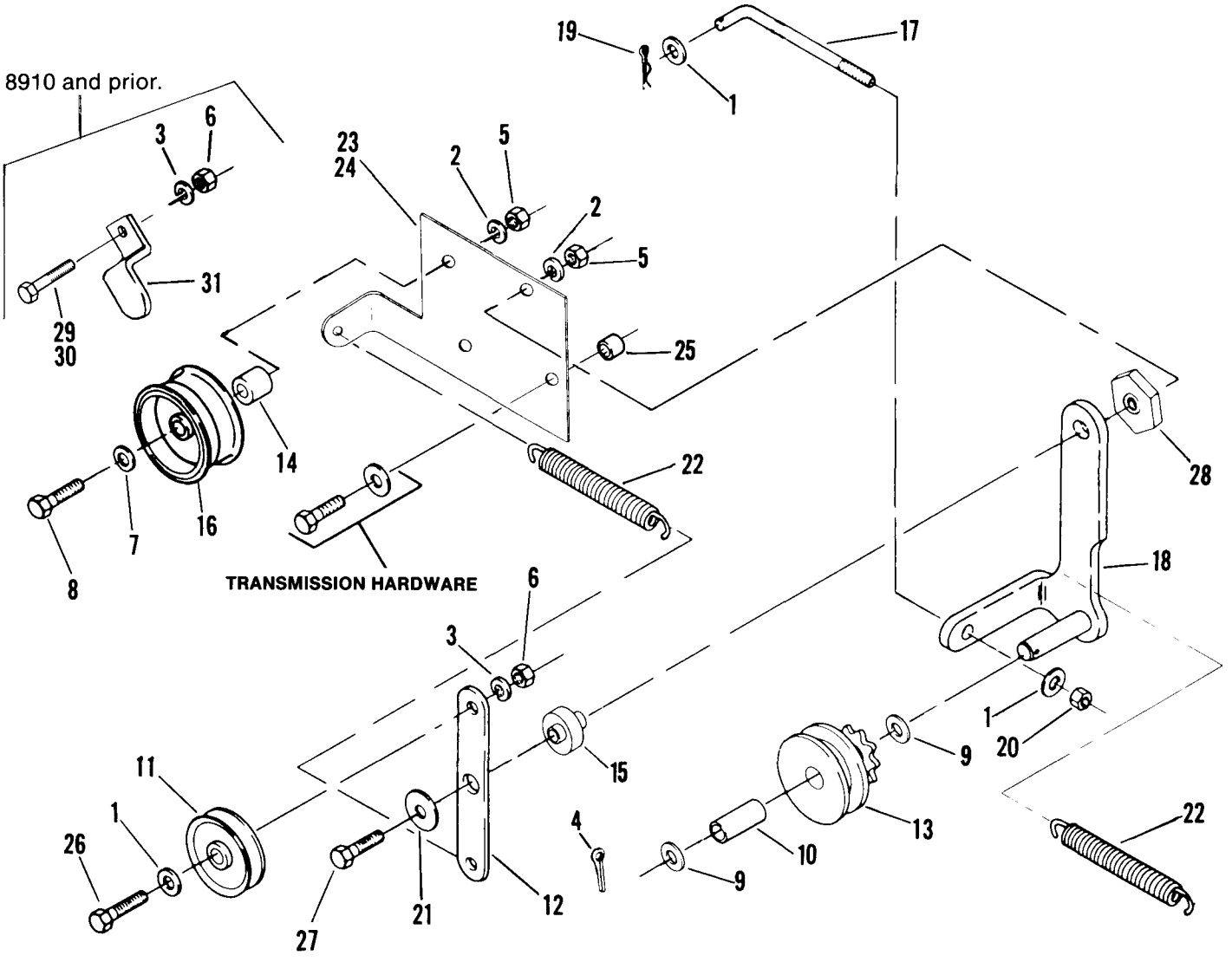


FRAME

Ref. No.	Part No.	Description	No. Req'd.
1	120177	Lockwasher, 3/8	7
2	130981	Nut, 7/16–20	2
3	301431	Screw, 3/8–16 x 2 1/2	1
4	306322	Screw, 5/16–18 x 7/8	4
5	306325	Lockwasher, 5/16	13
6	306367	Key	3
7	306388	Nut, 3/8–24	4
8	306414	Screw, 3/8–16 x 1	2
9	306555	Screw, 5/16–18 x 5/8	10
10	306562	Nut, 3/8–16	1
11	306823	Screw, 5/16–18 x 2 3/4	2
12	306834	Screw, 3/8–16 x 3/4	4
13	306932	Nut, 5/16–18	2
14	306956	Pin, cotter 1/8 x 3/4	5
15	516520	Sprocket	1
16	516825	Guard, lower belt	1
17	516944	Hub, wheel	2
18	517226	Bushing	2
19	517348	Sprocket	1
20	517641	Screw, special	1
21	518506	Spring	2
22	519038	Bushing	2
23	519039	Lever	2
24	519040	Hook, upper right	1
25	519041	Hook, upper left	1
26	519042	Nut, adjusting	2
27	519043	Hook, reel retaining	2
28	519045	Clamp, reel	2
29	519057	Plate	1
30	519059	Axle, front	1
31	519874	Race, inner	1
32	522714	Scraper	2
33	523264	Tire, (optional stud tread) 4.10/3.50–4, 2 ply	As Req'd.
34	547743	Stop, belt	1
35	545639	Pillow Block, complete	2
36	519811	•Pillow Block	1
37	548101	•Bearing	1
38	521857	•Collar, locking	1
39	545399	Frame	1
40	523295	•Decal, RYAN	1
41	548224	•Fitting, lubrication	4
42	823660	•Decal, Safety	1
43	545939	Arm, right	1
44	546318	Arm, left	1
45	546458	Wheel Assembly, front	2
46	306320	•Nut, 5/16–24	4
47	306325	•Lockwasher, 5/16	4
48	306861	•Screw, 5/16–24 x 5/8	4
49	517332	•Rim, (both halves)	1
50	548543	•Tire, 4.10/3.50–4, 2 ply	1
51	548546	•Tube, 4.10/3.50–4	1
52	546459	Wheel Assembly, rear	2
53	306320	•Nut, 5/16–24	4
54	306325	•Lockwasher, 5/16	4
55	306861	•Screw, 5/16–24 x 5/8	4
56	548123	•Bearing, wheel	2
57	548543	•Tire, 4.10/3.50–4, 2 ply	1
58	548546	•Tube, 4.10/3.50–4	1
59	547634	Weight	1
60	547890	Chain, drive	1
61	522122	•Link, connector	1
62	548099	Bearing, needle	1
63	548155	Washer, 3/8	2
64	548164	Washer, 3/8	13
65	548201	Screw, set 5/16–18 x 5/16	9
66	548332	Ring, lock	2
67	548456	Pin, clevis	4
68	548477	Spacer	4
69	548507	Clevis, lower	2
70	548508	Clevis, upper	2
71	548804	Nut, flangelock 3/8–16	2
72	551094	Screw, 3/8–16 x 1 3/4	2
73	800290	Nut, lock 5/16–18	2
74	800292	Nut, lock 3/8–16	2
75	807443	Fitting, lubrication	1
76	548324	Ring, lock	2
77	523505	Decal, reel adjustment	1

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

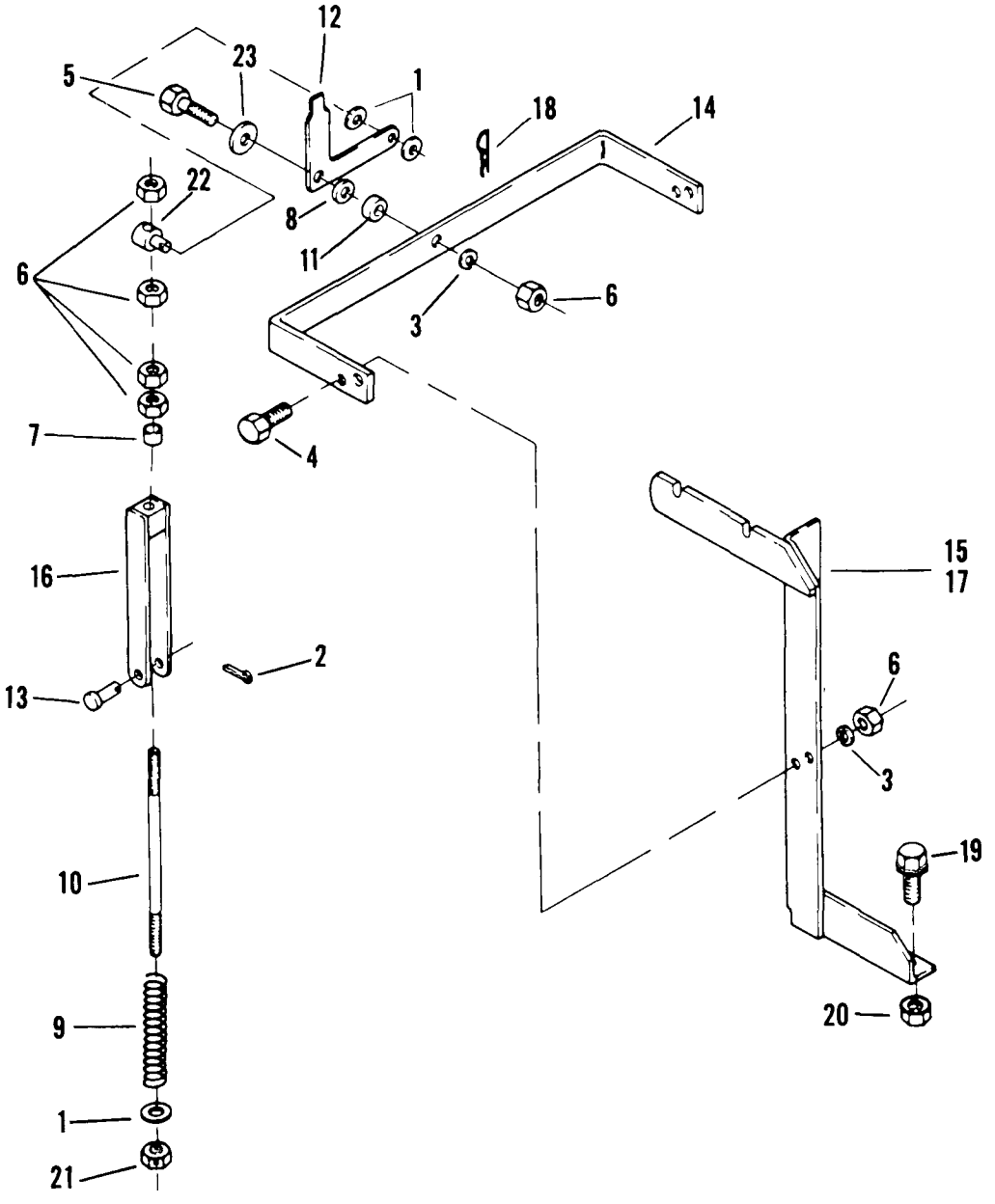
HOPPER DRIVE



Ref. No.	Part No.	Description	No. Req'd.
1	103867	Washer, 5/16	3
2	120177	Lockwasher, 3/8	2
3	306325	Lockwasher, 5/16	2
4	306328	Pin, cotter 3/32 x 3/4	1
5	306562	Nut, 3/8–16	2
6	306932	Nut, 5/16–18	2
7	306981	Washer, 3/8	1
8	307776	Screw, 3/8–16 x 2 3/4	1
9	308091	Washer, 1/2	2
10	521031	Bushing	1
11	521032	Pulley	1
12	522613	Arm, idler	1
13	522614	Pulley, sprocket	1
14	522653	Bushing, .390 I.D. x .75 O.D. x 1.09 long	1
15	523517	Bushing	1
16	522882	Pulley, idler	1
17	522606	Rod, adjustment	1
18	547746	Bracket, sprocket	1
19	548190	Pin, hair	1
20	800290	Nut, lock 5/16–18	1
21	809152	Washer, 5/16	1
22	518487	Spring	2
23	522616	♦Bracket, mounting	1
24	547754	▽Bracket, mounting	1
25	822474	Spacer	2
26	306501	Screw, 5/16–18 x 1 1/2	1
27	306836	Screw, 3/8–16 x 2 1/4	1
28	523516	Nut, special	1
29	306555	♦Screw, 5/16–18 x 5/8	1
30	316909	Screw, 5/16–18 x 4 1/2	1
31	523312	Guide, arm	1

♦8710 and prior. ▽8810 and later.

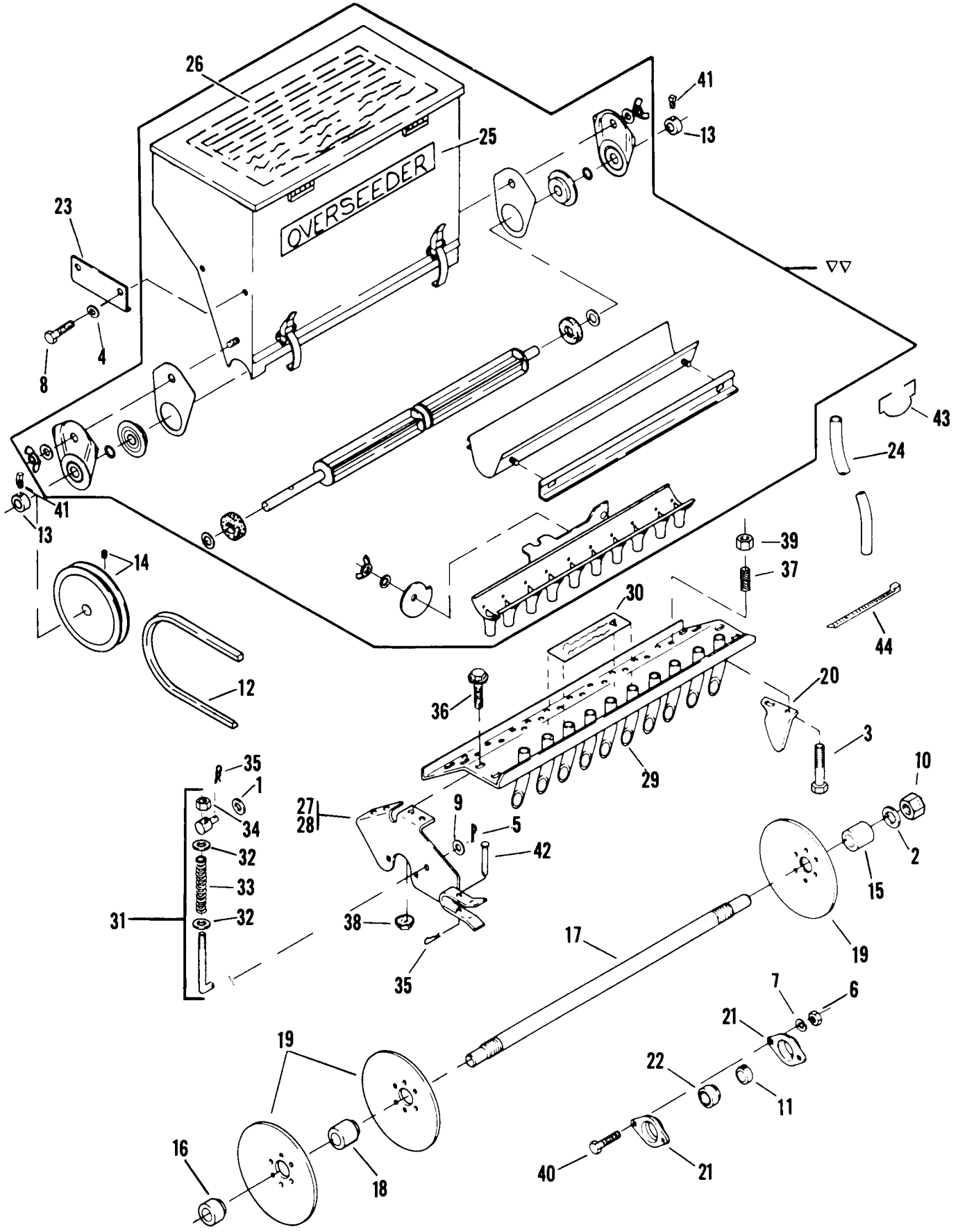
HOPPER FRAME



Ref. No.	Part No.	Description	No. Req'd.
1	103867	Washer, 5/16	3
2	304635	Pin, cotter 1/8 x 1	1
3	306325	Lockwasher, 5/16	5
4	306416	Screw, 5/16–18 x 1	4
5	306423	Screw, 5/16–18 x 1 3/4	1
6	306932	Nut, 5/16–18	9
7	516544	Bushing	1
8	517226	Bushing	1
9	522634	Spring	1
10	522656	Rod, adjustment	1
11	522657	Bushing	1
12	522659	Lever, hopper gate	1

Ref. No.	Part No.	Description	No. Req'd.
13	522664	Pin, clevis	1
14	522691	Support, arm pivot	1
15	545941	Holder, hopper (right)	1
16	545958	Yoke, control	1
17	545960	Holder, hopper (left)	1
18	548190	Pin, hair	1
19	548902	Screw, flangelock 5/16–18 x 1	4
20	548911	Nut, flangelock 5/16–18	4
21	800290	Nut, lock 5/16–18	1
22	806725	Pin	1
23	809152	Washer, 5/16	1

HOPPER AND DISC ASSEMBLY



HOPPER AND DISC ASSEMBLY

Ref. No.	Part No.	Description	No. Req'd.
1	130867	Washer, 5/16	2
2	103960	Washer, 13/16	2
3	303459	Screw, 1/4–20 x 1 1/2	20
4	306325	Lockwasher, 5/16	4
5	306328	Pin, cotter 3/32 x 3/4	2
6	306375	Nut, 1/4–20	4
7	306396	Lockwasher, 1/4	4
8	306416	Screw, 5/16–18 x 1	4
9	306981	Washer, 3/8	2
10	307665	Nut, 3/4–16 jam	2
11	522607	Collar, locking	2
12	522633	Belt, hopper	1
13	522652	Collar, locking	2
14	522662	Pulley, hopper	1
15	522678	Spacer, end (left)	1
16	522679	Spacer, end (right)	1
17	522680	Shaft	1
18	522682	Spacer,	9
19	522684	Blade, disc	10
20	522688	Scraper, blade	10
21	522689	Flange, bearing	4
22	522690	Bearing	2
23	522700	Plate, retaining	2
24	522632	Tube	10
25	522718	Decal, OVERSEEDER	1
26	522834	Decal, seed chart	1
27	545938	Plate, mounting (right)	1
28	545940	Plate, mounting (left)	1
29	545990	Plate, dispensing	1
30	823660	•Decal, Safety Warning	1
31	547648	Rod Assembly	1
32	306405	•Washer,	2
33	518510	•Spring	1
34	800292	•Nut, locking	1
35	548190	Pin, hair	4
36	548604	Screw, flangelock 5/16–18 x 3/4	8
37	548848	Spring	20
38	548911	Nut, flangelock 5/16–18	8
39	800059	Nut, lock 1/4–20	20
40	800069	Screw, 1/4–20 x 1	4
41	548205	Screw, set #10–24 x 1/4	2
42	826633	Pin, clevis	2
43	523493	Clip, tube	10
44	320107	Tie, plastic	1

•INDENTED PART NAMES INDICATE THESE PARTS ARE INCLUDED IN PRECEDING ASSEMBLY

▽▽Applicator available from: Gandy
528 Gandrud Road
Owatona, MN 55060

Their Model Number 09086877

RYAN® LIMITED WARRANTY

Cushman Inc., warrants for one (1) year all new Ryan turf care products, models 8910 and later. All previous models (8810 and prior) with the exception of LA 28, GA 30 and GA 24, have a 90 day warranty. The Ryan LA 28, GA 30 and GA 24 models (8810 and prior) have a (1) year warranty. All new Ryan products are warranted according to the following terms:

This warranty extends to the original retail purchaser only and commences on the date of original retail purchase. Accordingly, this warranty is not transferable to any subsequent purchasers. Any part of the Ryan Product manufactured or supplied by Cushman Inc. and found in the reasonable judgment of Cushman Inc. to be defective in material or workmanship will be repaired or replaced by an authorized Ryan distributor without charge for parts and labor.

The Ryan product including any defective part must be returned to an authorized Ryan distributor within the warranty period. The expense of returning the Ryan product to an authorized distributor for warranty service and the expense of returning it back to the owner after repair or replacement will be paid for by the owner. Cushman Inc.'s responsibility in respect to claims is limited to making the required repairs or replacements, and no claim of breach of warranty shall be cause for cancellation or rescission of the contract of sale of any Ryan product. Proof of purchase will be required by the authorized Ryan distributor to substantiate any warranty claim. All warranty work must be performed by an authorized Ryan distributor.

Cushman Inc. makes no warranty with respect to engines, tires, or other parts not of their manufacture as such parts are usually warranted separately by their respective manufacturers.

This warranty does not include service items subject to normal wear, such as blades, tines, filters, spark plugs, ignition points, brake and clutch linings, or belts. This warranty does not cover any Ryan product that has been subject to misuse, neglect, negligence, or accident, or that has been operated or maintained in any way contrary to the operating or maintenance instructions as specified in the Ryan Operator's Manual. The warranty does not apply to any Ryan product that has been altered or modified so as to adversely affect the product's operation, performance or durability or that has been altered or modified so as to change its intended use. In addition, the warranty does not extend to repairs made necessary by normal wear, or by the use of parts or accessories which in the reasonable judgment of Cushman Inc. are either incompatible with the Ryan product or adversely affect its operation, performance or durability.

Cushman Inc. reserves the right to change or improve the design of any Ryan product without assuming any obligation to modify any product previously manufactured.

ALL **IMPLIED WARRANTIES** ARE **LIMITED IN DURATION** TO THE APPLICABLE **ONE YEAR PERIOD.** ALL IMPLIED WARRANTIES, INCLUDING **MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE** OR OTHERWISE **ARE DISCLAIMED** IN THEIR ENTIRETY AFTER THE EXPIRATION OF THE ONE YEAR WARRANTY PERIOD.

CUSHMAN INC.'S OBLIGATION UNDER THIS WARRANTY IS STRICTLY AND EXCLUSIVELY **LIMITED TO THE REPAIR OR REPLACEMENT** OF DEFECTIVE PARTS, AND CUSHMAN INC. DOES NOT ASSUME OR AUTHORIZE ANYONE TO ASSUME FOR THEM ANY OTHER OBLIGATION.

CUSHMAN INC. ASSUMES NO RESPONSIBILITY FOR INCIDENTAL, CONSEQUENTIAL OR OTHER DAMAGES INCLUDING, BUT NOT LIMITED TO , EXPENSE FOR GASOLINE, EXPENSE OF RETURNING THE RYAN PRODUCT TO AN AUTHORIZED DISTRIBUTOR AND EXPENSE OF RETURNING IT BACK TO THE OWNER, MECHANIC'S TRAVEL TIME, TELEPHONE OR TELEGRAM CHARGES, TRAILERING OR TOWING CHARGES, RENTAL OF A LIKE PRODUCT DURING THE TIME WARRANTY SERVICE IS BEING PERFORMED, TRAVEL, LODGING, LOSS OR DAMAGE TO PERSONAL PROPERTY, LOSS OF REVENUE, LOSS OF USE OF THE RYAN PRODUCT, LOSS OF TIME, OR INCONVENIENCE.

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

This warranty applies to all Ryan products sold in the United States. Any products sold elsewhere are warranted by the affiliated marketing company of Cushman Inc.

CUSHMAN INC.
P.O. BOX 82409
Lincoln, Nebraska 68501–2409

7–18–90

WARRANTY SERVICE

To make claim under warranty, contact the distributor immediately upon realizing a problem exists. We recommend having the warranty work performed by the distributor who originally sold you the product; however, warranty work can be obtained from any authorized Ryan distributor. Remember, your Ryan product must be delivered to an authorized Ryan distributor within the warranty period, and all warranty work must be performed by an authorized Ryan distributor. Proof of purchase will be required by the distributor to substantiate any warranty claim.

EXAMPLES OF ITEMS NOT COVERED UNDER WARRANTY

Provisions of the warranty will not apply to:

Normal service work over and above the repair and replacement of defective parts.

Products subject to misuse, neglect, negligence, or accident.

Products that have been altered or modified so as to adversely affect their operation, performance or durability or to change their intended use.

Repairs made necessary by the use of parts or accessories which are either incompatible with the products or adversely affects the operation, performance or durability.

Products not operated or maintained in accordance with the instructions in the Ryan Operator's Manual.

Normal cleaning, adjusting or replacing of such items as filter, spark plugs, ignition points.

Periodic checking or adding of lubricant to the products or service check–up, tune–up or diagnosis.

Expense of delivering the product to the dealer and expense of returning the product back to the owner, mechanic's travel time, trailering or towing charges, or rental of a like product during the time warranty repairs are being performed.

Engines, tires, or parts manufactured by other than Ryan are not covered under this warranty as such parts are usually warranted by their respective manufacturers.

The warranty applies only to the original retail purchaser. Second–owner or subsequently owned products are not covered under warranty.

OWNER'S OBLIGATION AND RESPONSIBILITY

Normal maintenance service and replacement of service items are the responsibility of the owner and such are not considered defects in material or workmanship within the terms of the warranty. Individual operating habits and usage contribute to the need for maintenance service.

See your Ryan distributor for proper maintenance and care of your product. Proper maintenance and care will assist in keeping your overall operating cost at a minimum.

To validate a warranty claim, it is the owner's responsibility to maintain all components in proper adjustment and service the product as specified in the Ryan Operator's Manual. It is the owner's resposibility to provide proper lubrication for all components and provide correct recommended fuel for the products. It is the owner's responsibility to maintain the correct tire pressures where applicable.

Cushman Inc. • A Ransomes Company
P.O. Box 82409, Lincoln, Nebraska 68501-2409