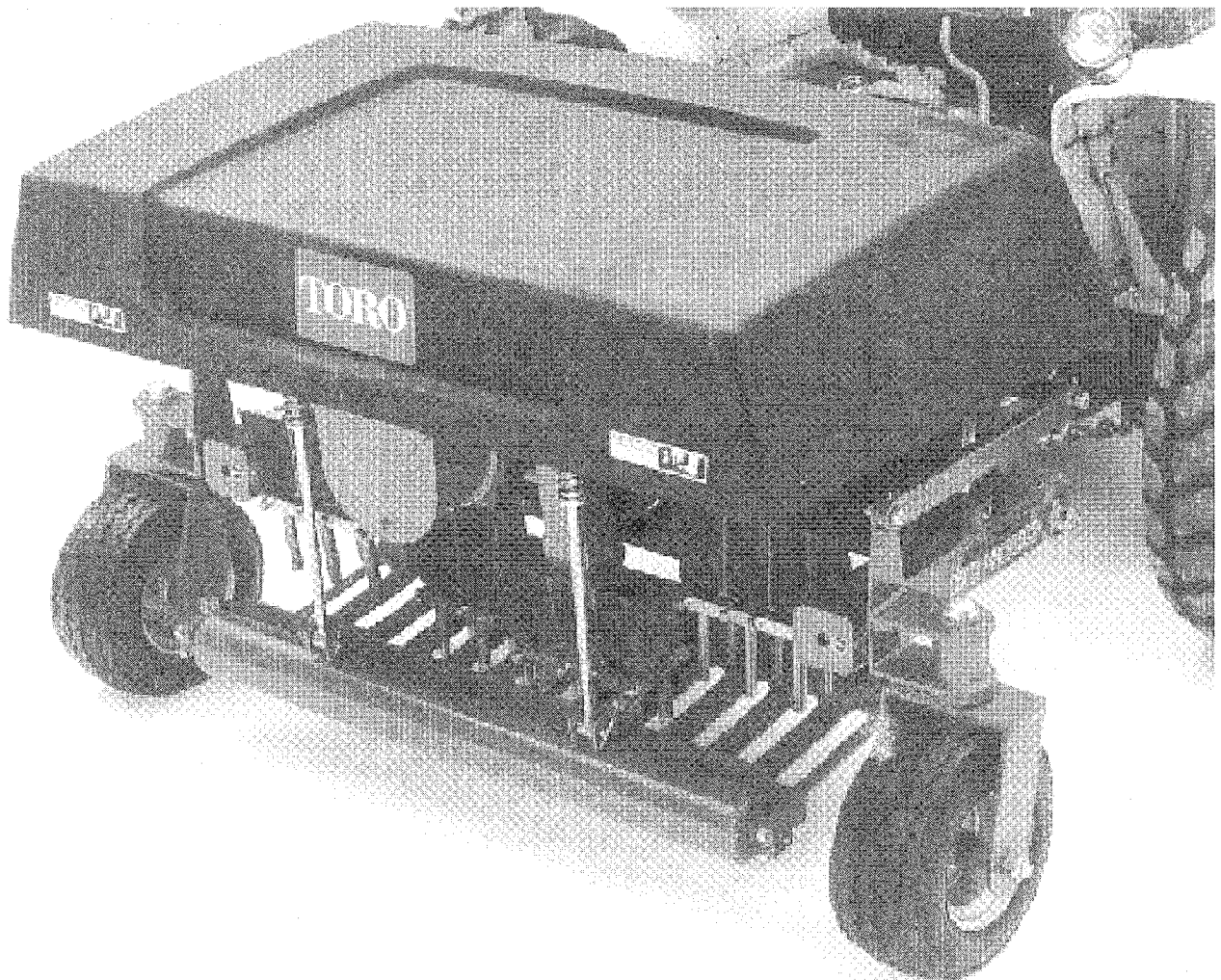


**TORO**MODEL NO. 09600-40001  
thru 50001 & UP**OPERATORS  
MANUAL****HC 4000 AERATOR***Helping you put quality into play.™*

To understand this product, and for safety and optimum performance, read this manual before starting operation. Pay special attention to **SAFETY INSTRUCTIONS** highlighted by this symbol.



It means **CAUTION, WARNING or DANGER** – personal safety instruction. Failure to comply with the instruction may result in personal injury.



# FOREWORD

The HC 4000 Aerator has advanced concepts in engineering and design, and if properly maintained, will provide excellent service.

Since the Aerator is a high quality product, TORO is concerned about its future use and safety of the user. Therefore, anyone involved with the product, including the operator, should read and understand this manual. Major sections are:

- |                              |                                 |
|------------------------------|---------------------------------|
| – <b>Safety Instructions</b> | – <b>Operating Instructions</b> |
| – <b>Specifications</b>      | – <b>Lubrication</b>            |
| – <b>Before Operating</b>    | – <b>Maintenance</b>            |

This manual emphasizes safety, mechanical and general product information. DANGER, WARNING and CAUTION identify safety messages. Whenever the triangular safety alert symbol appears, understand the safety message that follows. For complete safety instructions, read page 3. IMPORTANT highlights special mechanical information and NOTE emphasizes general product information worthy of special attention.

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

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# SAFETY INSTRUCTIONS

## BEFORE OPERATING

1. Read and understand the contents of this manual and tow vehicle manual before operating the machine. Become familiar with all controls and know how to stop quickly. A free replacement manual is available by sending complete model and serial number to:

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

2. The power take–off drive of the aerator requires a tractor with operating speeds of 540 rpm and output power of 25 hp or higher. All safety shields for the tractor drive shaft must always be in place.

3. The tractor tire tread width, tire load capacity and brake system must have adequate capacity to allow installation of a 2100 lb. implement operating at 2 mph (15 mph maximum transport speed). Consult your tractor service agency if you have any questions on the safe operation of your tractor.

4. Do not allow children to operate the machine. Do not allow adults to operate the machine without proper instruction.

5. Remove debris or objects that might interfere with operation. Keep bystanders away from the work area.

6. Keep all shields and safety devices in place. If a safety device, shield or decal malfunctions, becomes damaged or illegible, replace it before operation is commenced. To assure machine is in safe operating condition, tighten loose nuts, bolts and screws.

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

8. The aerator attaches directly to the tow tractor. Therefore, read your tractor operators manual or contact the tractor service agency regarding safety and installation for power take–off driven, semi–mounted implements.

## WHILE OPERATING

9. Using the machine demands attention. To prevent loss of control:

A. Use only in daylight or when there is good artificial light.

B. Watch for holes or other hidden hazards.

C. Do not transport machine close to sand traps, ditches, creeks or other hazards.

D. Operate aerator in straight lines only.

E. Reduce speed on side hills and before making sharp turns to prevent tipping or loss of control.

F. Look behind the aerator before backing up.

G. Observe public road regulations.

10. If the tines strike a solid object or the machine vibrates abnormally, raise aerator, disengage power to aerator, stop prime mover, shift into neutral and engage parking brake before leaving the operator's position. Lift safety/transport stops to full upright position and lower coring head onto stops. Stop engine and disengage power to aerator before making repairs or adjustments. Inspect coring head and other machine parts for damaged or malfunctioning parts and repair or replace before resuming operation. Be sure all parts are in good condition and all fasteners are tight.

11. Before leaving machine unattended, raise aerator to transport position, disengage power to aerator, shift into neutral and set parking brake. Lift safety/transport stops to full upright position and lower unit onto stops. Stop engine. Remove keys from tractor ignition.

12. Never dismount while prime mover is in motion. Never get on or off prime mover while engine is running and PTO drive is engaged. Never step over PTO shaft to reach other side of aerator – walk around the machine.

13. Before transporting machine from one area to another, raise aerator to transport position, disengage power to aerator, stop prime mover, shift into neutral and set parking brake. Lift safety/transport stops to full upright position and lower unit onto stops.

## MAINTENANCE

14. Before servicing machine, raise aerator, disengage power to aerator, shift prime mover into neutral and set parking brake. Lift safety/transport stops to full upright position and lower unit onto stops. Stop engine. Disconnect PTO shaft and hydraulic hose connection.

15. Ensure machine is in safe operating condition. Keep nuts, bolts and screws tight. Check tine mounting nuts and studs frequently to insure they are tightened to specification.

16. Before applying hydraulic pressure to the system, be sure all hydraulic line connectors are tight and hydraulic hoses and lines are in good condition.



## SAFETY INSTRUCTIONS

17. Keep body and hands away from pin hole leaks or nozzles that eject hydraulic fluid under high pressure. Use paper or cardboard, not hands, to search for leaks. Hydraulic fluid escaping under pressure can have sufficient force to penetrate skin and do serious damage. If fluid is injected into the skin it must be surgically removed within a few hours by a doctor familiar with this form of injury or gangrene may result.

18. When aerator is removed from tow tractor, always store it on storage stand, positioned on a level surface.

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



## SAFETY AND INSTRUCTION DECALS

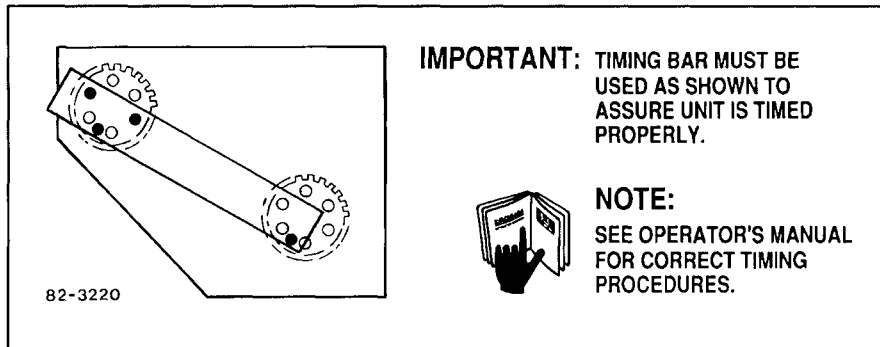
The following decals are installed on the machine. If any become damaged or illegible, replace it. The decal part number is listed below and in your parts catalog. Replacement decals can be ordered from your Authorized Toro Distributor.

### CAUTION

**FIRMLY SECURE THE CORING HEAD STOPS BEFORE TRANSPORTING TO AVOID DAMAGE TO TURF GUARDS OR TINES.**

67-5370

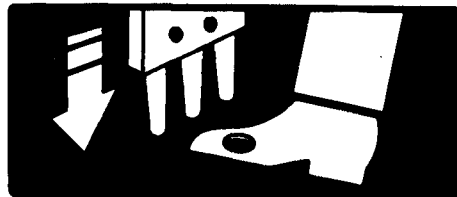
**ON CORING HEAD STOPS  
(Part No. 67-5370)**



**ON TIMING BAR  
(Part No. 82-3220)**

### DANGER

**TINES CAN CAUSE SERIOUS PERSONAL INJURY. KEEP HANDS AND FEET AWAY FROM TINES WHILE IN OPERATION.**



**ON REAR OF FRAME & HOOD  
(Part No. 59-9930)**

# SPECIFICATIONS

**Type:** Semi-mounted tow behind, PTO driven, deep coring mechanical turf/fairway aerator.

**Tractor Requirements:** 25–45 hp @ 540 PTO rpm, category 1, three point hitch with snubber chains to restrain side movement and a hydraulic system with “Lift” and “Float” control provisions. The tractor should also have provisions for a hydraulic control valve and system pressure relief valve to operate two remote single acting hydraulic cylinders. System pressure should be between 1000 p.s.i. and 2000 p.s.i.

The hydraulic cylinders, hoses and quick connection coupler are supplied with aerator.

The aerator attaches directly to the tow tractor. Therefore, read your tractor operators manual or contact the tractor service agency regarding installation for power take-off driven, semi-mounted implements.

**Tractor Attachment:** Two pins provided for attaching lower links of tractor, three point hitch to aerator. Clamps provided for rigid mounting. The upper link of hitch is not used or required. The tractor hydraulic system provides the power to raise the aerator for transport, and provides the “Float” control so aerator will follow the ground contour. A rack and pinion gear, along with a screw adjustable link maintain attitude control for the aerator. Two caster wheels, out board from aerator, partially support the weight of the unit. The remaining weight is transferred to the tractor.

**Speed:** 1.8 to 2.2 mph. – Aerating.  
15 mph maximum – Transport. Transport speed should vary with tractor and terrain.

**Maximum PTO Speed:** 540 rpm, 1–3/8 six spline drive shaft.

**Maximum Top Crankshaft Speed:** 400 rpm.

**Frame Construction:** Welded tubular and structural steel.

**Coring Head Construction:** Welded structural steel bar and plate.

**Tires:** 16.5 x 6.5–8 ,6 ply, two wheels mounted on caster forks, out board of frame.

**Tire Scrapers:** Removes soil build-up from each wheel. Adjustable for desired clearance.

**Drive Line:** Ag-type, telescoping drive shaft with safety shields. Two cardan type universal joints with ratchet type torque limiting clutch. Quick lock, tool-less coupling, provided at both ends. Grease fittings for lubrication.

**Gear Power Train:** Spur gear type gear box with provisions for selecting the correct gear ratio to time the aerators operating speed with the ground speed of the tractor. Two timing gears are required (not included) and must be selected for each individual application. Drive line drives completely sealed. All components operate in oil with anti-friction bearing provided.

Right angle gear box with two output shafts, coupled and driven from gear box previously listed. Gear box is fully sealed with all components operating in oil. Hardened and tempered bevel gears with anti-friction bearings.

Two integral gear boxes within the aerator frame drive the flywheel and plungers for the coring tines. Gear boxes are fully sealed with anti-friction bearings and hardened and tempered spur gears operating in oil. These gear boxes are coupled and driven from the right angle gear box previously listed.

**Lubrication:** All gear boxes are filled at the factory with SAE 80w/90 multi-viscosity gear oil. Each gear case has provisions for checking oil level and drain plugs for servicing its components. A breather is provided to prevent excess pressure for each gear case. Grease fittings are provided to lubricate bearings and suspension components.

**Hydraulic System:** Two, single-acting hydraulic cylinders provide operation for raising and lowering the aerator. Hydraulic hoses with quick coupler fittings attach to tractor hydraulic system.

**Plungers:** Fabricated structural steel tubing, coupled to two flywheel crankshafts to provide controlled entrance and exit of the coring tines into the turf grass. Anti-friction bearings provided. The standard tine holder has provisions for six tines and a optional tine holder for provisions for two tines.

**Turf Guards:** Semi-rigid mounted with compression spring floatation. Rear mounted roller, 4.50” dia. x 44.00” long, provides independent floatation and allows turf guard to follow turf grass contour. Adjustable roller scraper removes soil from roller.

**Cover:** High density Polyethylene material mounted to unit with two draw latches to provide a shield from rotating components.

**Safety/Transport Stops:** Swing-up safety/transport stops prevent accidental lowering of coring head during service or during transport operation.

**Storage Stand:** Provides support for aerator when removed from tractor and allows quick installation.

# SPECIFICATIONS

**Standard Coring Tines:** The aerator is assembled with (4) tine holders for (6) 3/4" tines and matching turf guards. 24 tines are required (not included). Order tines from your Authorized Toro Distributor.

**Required Optional Equipment:** The aerator is shipped without timing gears due to various tractor tire sizes and ground speed ratio's. The correct timing gears must be determined and selected per the instructions in the Operator's Manual. Order gears from your Authorized Toro Distributor.

## **Coring Capacity (theoretical) at 2 mph**

\*(Assumes no reduction in total area due to overlap)

**Coring pattern: 6 Tines (3/4")**

**Effective Coring Width :** 42 in.

**Total Tine Quantity:** 2 rows of 12 = 24

**Hole Pattern :** 3-1/2 " wide x 3 " long

**Depth:** Up to 4 in.

**\*Sq ft/hr:** 36,960 sq ft/hr

**\*Acres/hr:** .85 acres/hr

**Optional Coring pattern: 2 Tines (7/8")**

**Effective Coring Width:** 42 in.

**Total Tine Quantity:** 1 row of 8 tines

**Hole Pattern:** 5-1/4" wide x 6 in. long

**Depth:** Up to 5 in.

**\*Sq ft/hr:** 6,960 sq ft/hr

**\*Acres/hr:** .85 acres/hr

## **Dimensions:**

**Length:** 48 in.

**Width:** 75 in.

**Height:** 35 in.

**Weight:** 1800 lb.

## **Optional Equipment:**

Deep Coring Tine, Part No. 71-0940 – Two 7/8 tubular tine, 8 tines total provides penetration depth up to 5.00". Tine holders and turf guards must be matched for this application. Order from your Authorized Toro Distributor.

Tubular Tine, Part No. 86-9720 – Fits standard 6 tine holder. Provides penetration depth up to 4.00". Order from your Authorized Toro Distributor.

Tubular Tine, Part No. 62-4600 – Fits standard 6 tine holder. Provides penetration depth up to 3.00". Order from your Authorized Toro Distributor.

Open Center Tine, Part No. 92-7900 – Fits standard 6 tine holder. Provides penetration depth up to 4.00". Order from your Authorized Toro Distributor.

Open Center Tine, Part No. 92-7941 – Fits standard 6 tine holder. Provides penetration depth up to 3.00". Order from your Authorized Toro Distributor.

# LOOSE PARTS

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

DESCRIPTION	QTY	USE
Trailing Arm Shaft Allen Head Screw – 1/2–13 x 2” lg. Locknuts – 1/2–13 Pivot Shaft Locknut – 5/8–18 Stop Grommet Flat Head Screw – 5/16–18 x 3/4” lg. Pad Flat Head Screw – 5/16–18 x 3/4” lg. Capscrew – 3/8–16 x 3–1/4” lg. Locknut – 3/8–16 Washer – 5/8” Locknut – 5/8–18 O–ring – 1–3/4”	2 12 12 2 2 2 2 2 4 2 2 2 2 8	Install Left and Right Trailing Arms
Height Adjuster Depth Restrictor Capscrews – 1/2–13 x 2” lg. Flatwashers – 1/2” x 1–1/4” Height Adjuster Foot Capscrews – 1/2–13 x 1–1/4” lg. Flatwashers – 1/2” x 1–1/4”	2 2 4 4 2 4 4	Mount Height Adjusters & Depth Restrictors
Cylinder Mounting Shaft Locknut – 5/8–18 Hydraulic Cylinder Flatwasher – 1/2” x 1–1/4” Lockwasher – 1/2” Capscrew w/grease fitting Pin Assembly Lockwasher – 1/4” Screw – 1/16–18 x 5/8” lg.	2 2 2 2 2 2 2 2 2	Mount Hydraulic Cylinders
Caster Wheel Assembly Washer – 1” Locknut – 1” x 12 Stabilizer Arm Locknut – 5/8–11 Capscrew – 5/8–11 x 1–3/4” Locknut – 5/8–11	2 2 2 2 2 2 2	Mount Caster Wheels
Hydraulic Hose Hydraulic Hose Hydraulic Hose Tee Fitting	1 1 1 1	Connect to Hydraulic Cylinders
Lynch Pin – 1/4” Lynch Pin – 3/8” Mounting Pin – Small Mounting Pin – Large	2 2 2 2	Mount Aerator to Tractor
Male Quick Coupler Female Quick Coupler	1 1	Mount to Hydraulic Hoses and Tractor
Driveline Assembly	1	Install to Aerator Gear Case & Tractor
Dipstick/Plug	1	Install into gear box
Operator’s Manual	1	Read Before Operating Machine
Parts Catalog	1	
Registration Card	1	Fill out and return to Toro

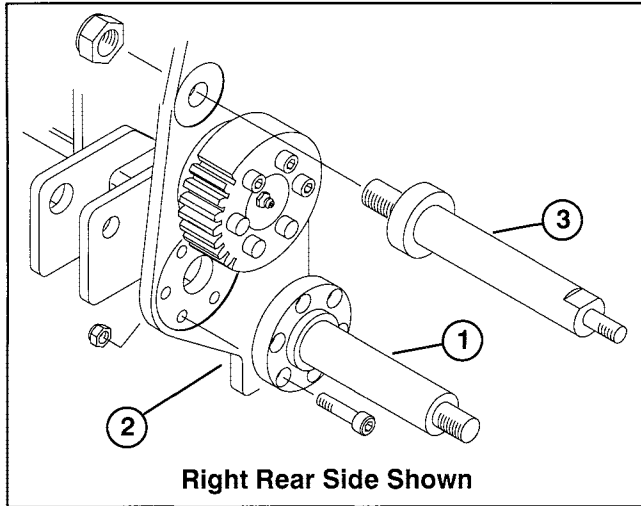
**Specifications and design subject to change without notice.**

# SET-UP INSTRUCTIONS

**Note:** Remove cartoning from aerator, aerator stand and all loose parts. Position aerator and stand on level surface. Unlatch and open hood.

## INSTALL TRAILING ARMS

1. Mount a trailing arm shaft to each rear side of aerator frame with (6) 1/2–13 x 2" lg. Allen head screws and 1/2–13 locknuts (Fig. 1). Torque screws to 110 ft–lbs.

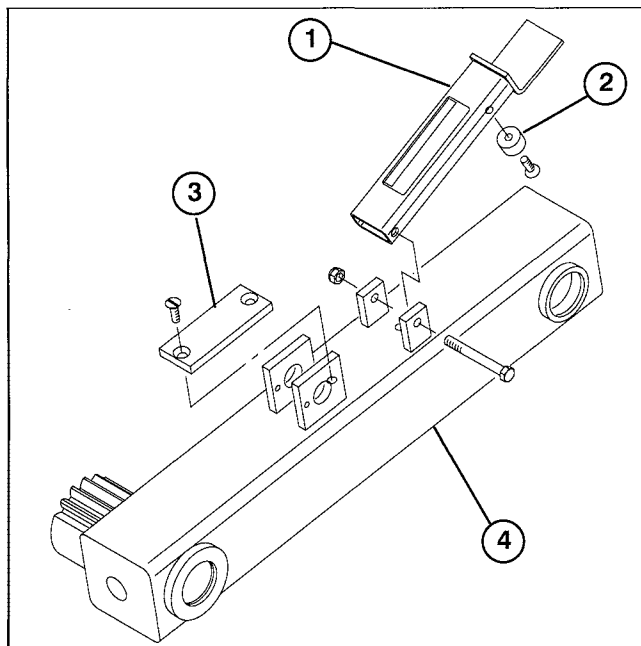


**Figure 1**

- 1. Trailing arm shaft
- 2. Aerator frame
- 3. Pivot shaft

2. Mount a pivot shaft to each side of aerator frame with a 1/2–13 locknut (Fig. 1).

3. Using a 5/16–18 x 3/4" lg. flat head screw, mount a grommet to each stop as shown in figure 2.



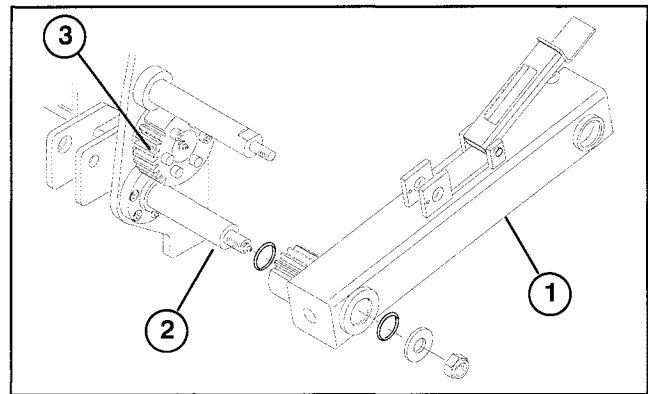
**Figure 2**

- 1. Stop
- 2. Grommet
- 3. Pad
- 4. Trailing arm

4. Mount a pad to each trailing arm with (2) 5/16–18 x 3/4" lg. flat head screws as shown in figure 2.

5. Using a 3/8–16 x 3–1/2" lg. capscrew and 3/8–16 locknut, mount a stop between trailing arm mounting tabs, as shown in figure 2.

6. Coat (2) O–ring seals with grease. Slide a O–ring seal and a trailing arm onto each appropriate trailing arm shaft (Fig. 3). Trailing arms to be in raised position when engaging with quadrant gear. Gear teeth must be centered with each other for full travel in quadrant. Secure each arm to shaft with another O–ring seal, a 1" washer and 1"–12 locknut.

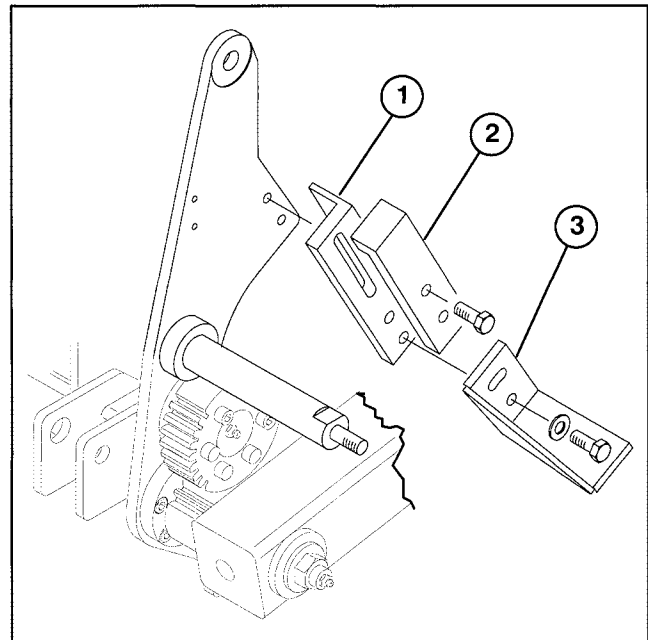


**Figure 3**

- 1. Trailing arm
- 2. Trailing arm shaft
- 3. Quadrant gear

## MOUNT HEIGHT ADJUSTERS

1. Mount appropriate (left or right) height adjuster and depth restrictor to frame with (2) 1/2–13 x 2" lg. capscrews, positioning as shown in figure 4.



**Figure 4**

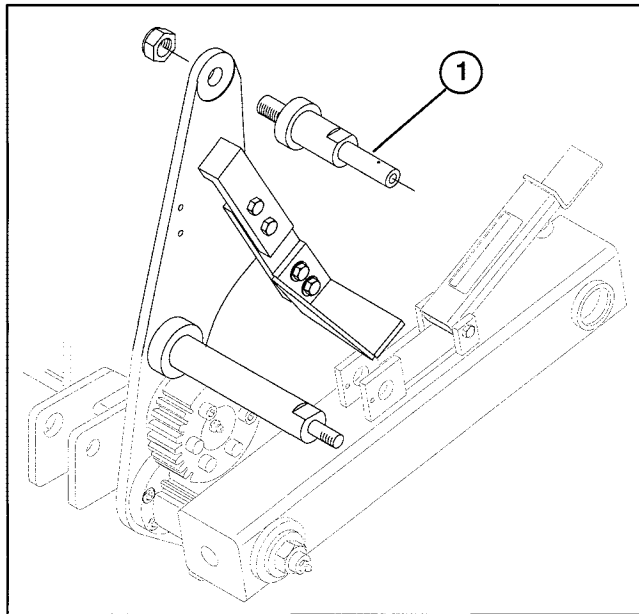
- 1. Height adjuster
- 2. Depth restrictor
- 3. Height adjuster foot

# SET-UP INSTRUCTIONS

2. Loosely mount appropriate (left or right) height adjuster foot to height adjuster with (2) capscrews and flatwashers, positioning as shown in figure 4.

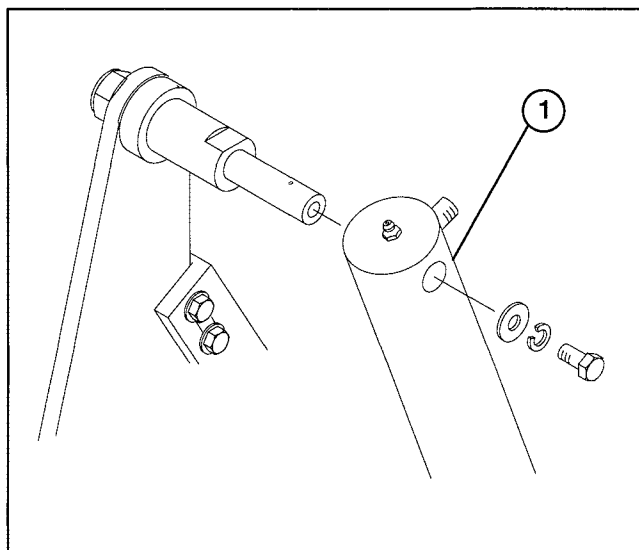
## MOUNT HYDRAULIC CYLINDERS

1. Secure a cylinder mounting shaft to each side of aerator frame with a 5/8–18 locknut (Fig. 5). Torque nuts to 270 ft–lbs.



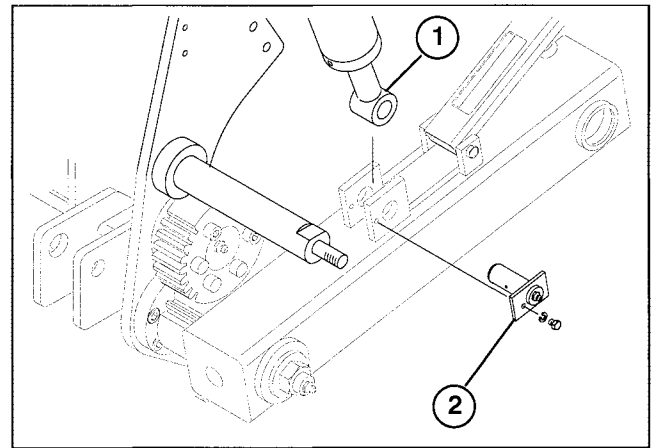
**Figure 5**  
1. Cylinder mounting shaft

2. Slide hydraulic cylinder onto mounting shaft and secure with a 1/2" x 1–1/4" flatwasher, 1/2" lockwasher and capscrew w/grease fitting (Fig. 6). Cylinder to be installed with port forward.



**Figure 6**  
1. Hydraulic cylinder

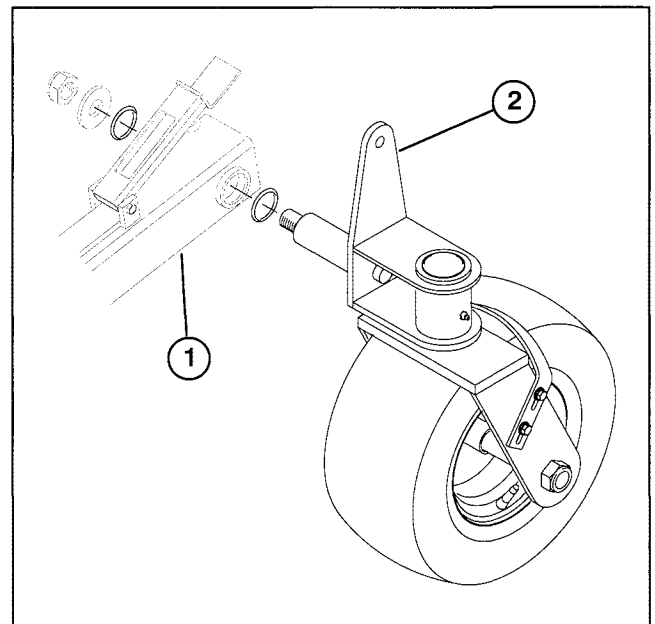
3. Secure cylinder rod to trailing arm mounting tabs with a pin assembly, 15/16" lockwasher and 5/16–18 x 5/8" lg. screw (Fig. 7).



**Figure 7**  
1. Cylinder rod  
2. Pin assembly

## INSTALL CASTER WHEELS

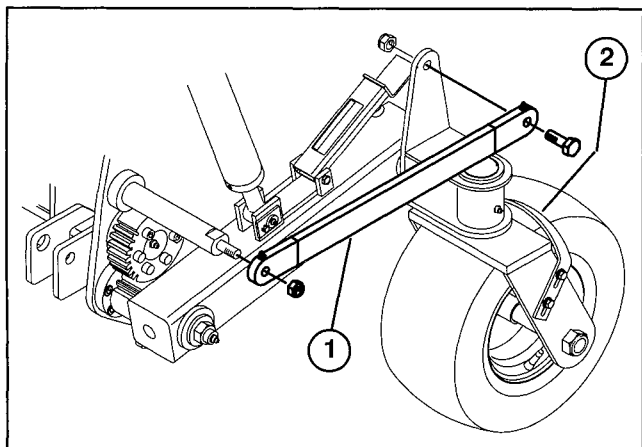
1. Coat (2) O–ring seals with grease. Mount a caster wheel assembly to each trailing arm with (2) O–rings, 1" washer and 1"–12 locknut (Fig. 8).



**Figure 8**  
1. Trailing arm  
2. Caster wheel assembly

2. Insert one end of a stabilizer arm onto pivot shaft and secure with a 5/8–11 locknut. Secure other end of arm to caster wheel assembly with a 5/8–11 x 1–3/4" lg. capscrew and 5/8–11 locknut (Fig. 9). Install arm with grease fittings upward. Tighten fasteners snug to remove end play but not tight. Joints must pivot freely.

# SET-UP INSTRUCTIONS

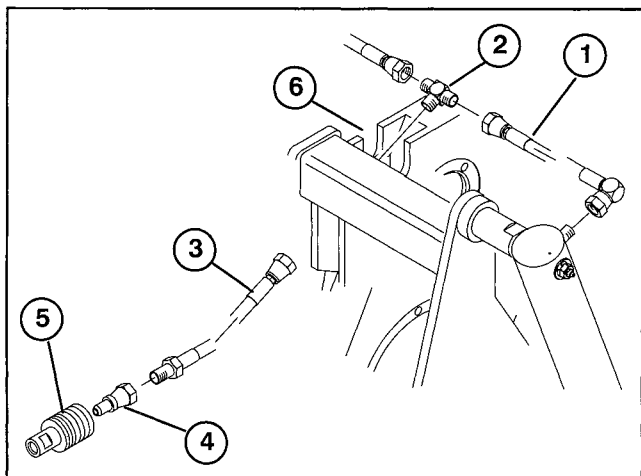


**Figure 9**

1. Stabilizer arm
2. Tire scraper

## INSTALL HYDRAULIC HOSES & FITTINGS

1. Connect straight ends of (2) hydraulic hoses with a tee fitting (Fig. 10). Tee fitting and 90° fittings to point in same direction.
2. Connect remaining hose to tee fitting (Fig. 10).
3. Position hoses on top of aerator frame routing 90° fittings to cylinders and remaining end under frame member to tractor.
4. Connect hoses to cylinders and position hoses in frame slots.



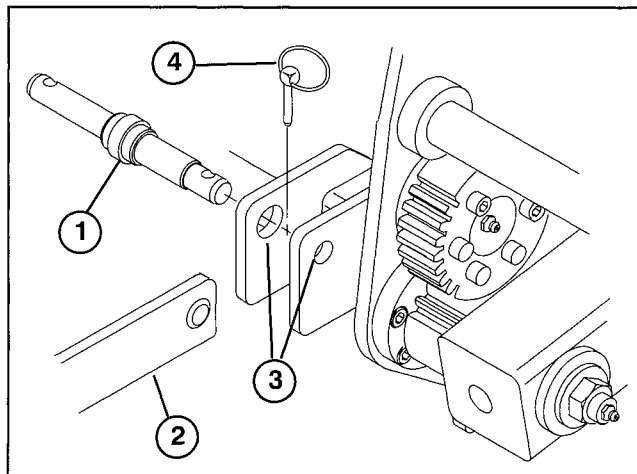
**Figure 10**

1. Hydraulic hose
2. Tee fitting
3. Hose to tractor
4. Male quick coupler
5. Female quick coupler
6. Frame slot

## MOUNT AERATOR TO TRACTOR

1. Back tractor into position in front of aerator. Align lower hitch links of tractor with aerator mounting holes.
2. Determine correct lower link mounting pin size to fit tractor ball joints.

3. Secure hitch links to aerator with mounting pins and lynch pins, as shown in figure 11.



**Figure 11**

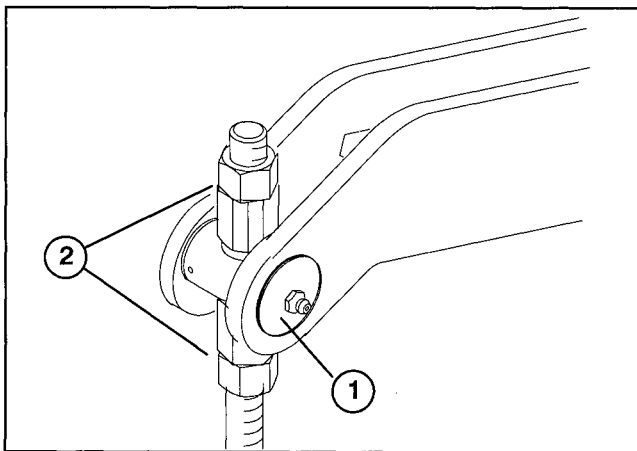
1. Mounting pin
2. Tractor hitch link
3. Aerator mounting holes
4. Lynch pin

4. To assure there is no side to side movement of hitch, make sure snubber chains are attached and tightened. Refer to tractor operator's manual for installation instructions.

**NOTE:** Upper link of three point hitch system and "DRAFT" position are not used for this application.

5. Loosen nuts on trunnion adjuster rod and adjust rod until tie brackets are positioned on hitch links (Fig. 12 & 13)

6. Secure tie brackets to hitch links with tie plates, washers and nuts (Fig. 13).



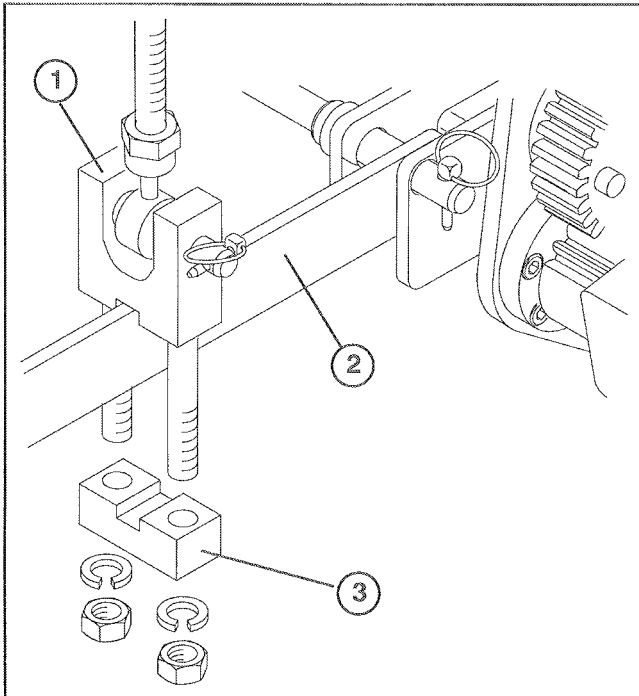
**Figure 12**

1. Trunnion adjuster
2. Adjusting nuts

7. Mount female quick coupler to hydraulic valve on tractor (Fig. 10). Refer to tractor operator's manual for installation and operating instructions for single acting cylinders.

# SET-UP INSTRUCTIONS

8. Connect male quick coupler to hydraulic hose from aerator (Fig. 10).
9. Connect male quick coupler hose from aerator to female quick coupler on tractor valve (Fig. 10).

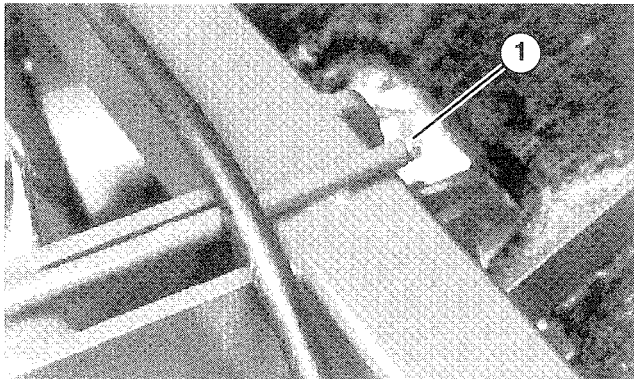


**Figure 13**

1. Tie bracket
2. Tractor hitch link
3. Tie plate

## REMOVE VENT TUBE PLUG

**IMPORTANT:** The aerator is shipped with a plug installed in the end of the gear case vent tube. Remove and discard plug before operating aerator.

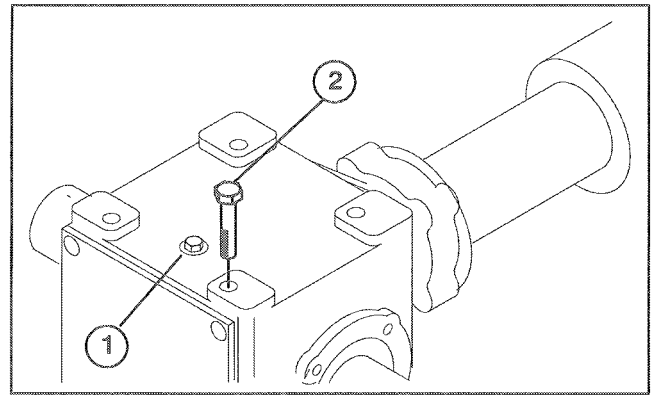


**Figure 14**

1. Vent tube plug

## INSTALL GEAR CASE OIL FILL/DIPSTICK

1. Remove shipping plug installed in top of gear case (Fig. 15).
2. Install new oil fill / dipstick plug into gear case.



**Figure 15**

1. Oil fill / dipstick plug
2. Chain mounting screw

## REMOVE AERATOR STAND

1. Start tractor. Without engaging the PTO, engage hydraulic valve control to raise aerator. Stop tractor and remove stand from under aerator. Check hydraulic oil level in tractor.



## CAUTION

Stop engine and set parking brake before leaving tractor to adjust aerator. Lower aerator onto transport/safety stops. Be sure all fasteners are tightly secured before continuing operation.

## CHECK TIRE PRESSURE

1. Adjust tire pressure to 70 psi.

## LEVEL AERATOR

1. Remove any tines from aerator, if installed. lower safety/transport stops, position tractor and aerator on a level surface and lower aerator.
2. Open hood and place a level on top of aerator frame (Fig. 15). Check from front to back and side to side.
3. Adjust tractor hitch to level aerator from side to side. Refer to tractor operator's manual for adjustment procedure.
4. Adjust aerator trunnion rods (Fig. 12) up or down to level aerator from front to back.

## MOUNT DRIVELINE

1. Align clutch end of driveline with aerator input shaft.
2. Pull back on locking collar while sliding end of driveline onto input shaft until engaged.

# SET-UP INSTRUCTIONS

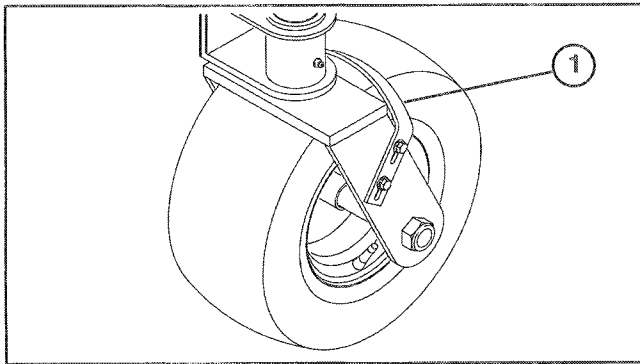
3. Thread a 3/8" capscrew (not included) into one of the front threaded holes in top of gear case. Secure chain from driveline guard cone to capscrew. This keeps guard from rotating and causing possible injury (Fig. 15).

4. Install opposite end of driveline to tractor output shaft. Make sure tractor safety shield is installed.

## ADJUST TIRE SCRAPERS

1. Adjust each tire scraper so there is approximately 1/8" clearance between tire and scraper,

2. Loosen capscrews securing each roller scraper to caster fork, adjust scraper, then tighten mounting screws. Rotate tire to assure there is no contact with scraper.



**Figure 16**  
1. Tire scraper

## ADJUST ROLLER SCRAPER

1. Adjust roller scraper so there is approximately .060" clearance between roller and scraper.

2. Loosen nuts securing roller scraper to rear panel, adjust scraper, then tighten nuts. Rotate roller to assure there is no contact with scraper.

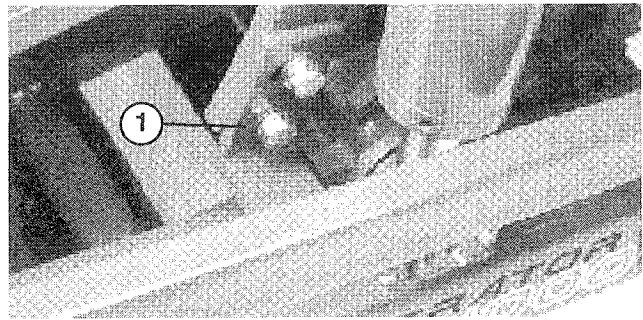
## ADJUST TINE PENETRATION

### To adjust equally on both sides:

1. Loosen capscrews securing the height adjusters (Fig. 18). Raise adjusters until bolt bottoms—out in slot.

**IMPORTANT:** Tine penetration adjustment should be done before installing tines and with aerator in down position. When adjusting for maximum penetration the unit should be rotated by hand to check clearance between tine blocks and turf guards.

2. Maximum penetration depth is 5 in. for 7/8 in. (2 tine) 4 in. for 3/4 in. (6 tine) configurations is achieved with height adjusters bottomed—out in slots. To adjust for less penetration, lower height adjusters; i.e., lowering 1/2 in. allows 4–1/2 in. penetration of 7/8" tines and 2–1/2 in. of 3/4" tines.



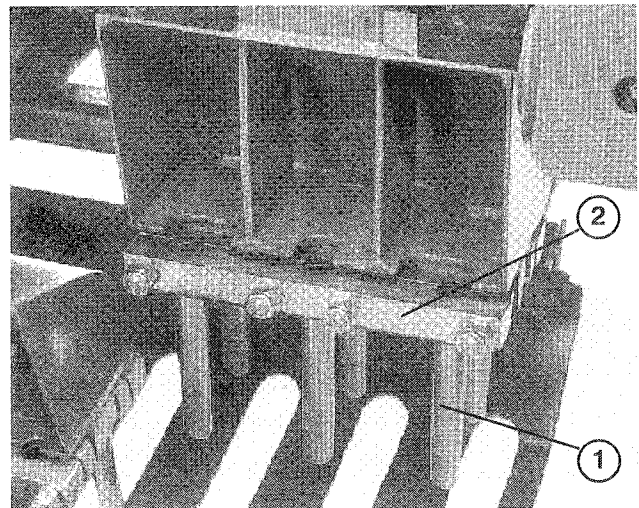
**Figure 17**  
1. Height adjusters

3. After adjusting to desired depth setting, tighten mounting capscrews to secure adjustment. Adjust height adjuster on opposite side to the same setting.

## INSTALL TINES

1. Raise aerator to transport position, raise transport/safety stops and lower aerator onto stops.

2. Loosen fasteners securing tine blocks to stomper assemblies (Fig. 18).



**Figure 18**  
1. Tine block  
2. Tine

**Note:** Depending on tine configuration selected, be sure the correct tine blocks and finger plate assemblies are installed.

3. Mount tines from the underside. Install until they bottom against steps in tine blocks (Fig. 18). Secure tines in blocks, torque locknuts to 75 ft–lb.

**Note:** Use a flat board or similar flat item to hold all (6) tines in position when tightening nuts.

4. When slotted tines are used, slots should face forward for front row of tines and rearward for rear row of tines (Fig. 18).

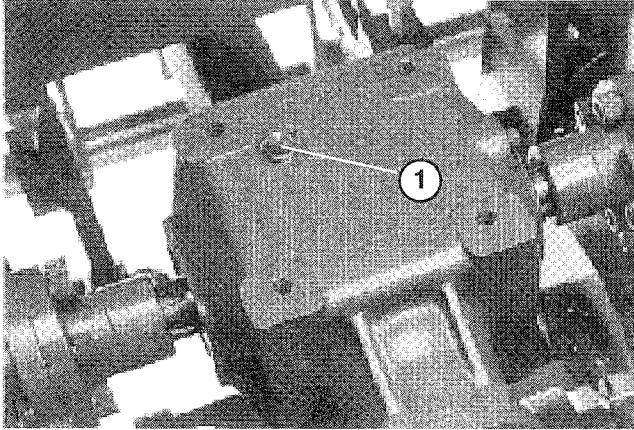
## LUBRICATE MACHINE

Refer to Lubrication, page 17, for location of fittings.

# BEFORE OPERATING

## CHECK 90° GEAR CASE OIL LEVEL

1. With machine on level surface, remove oil fill/dipstick plug from gear case (Fig. 19).



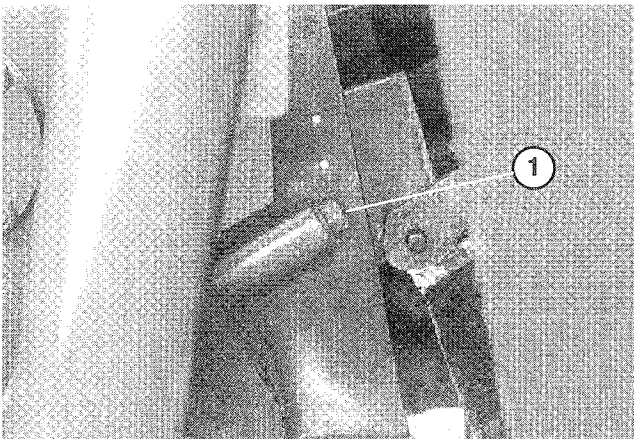
**Figure 19**

1. Oil fill/dipstick & vent

2. Oil level should be to mark indicated on dipstick. If oil is required, add SAE 80–90 (ISO 150/220) gear oil.
3. Install fill plug.

## CHECK GEAR CASE OIL LEVEL

1. At front of aerator, remove (2) plugs from case ports (Fig. 20).
2. Oil level should be to top of each port. If oil is required, add SAE 80–90 (ISO 150/220) gear oil.
3. Install plugs into ports.

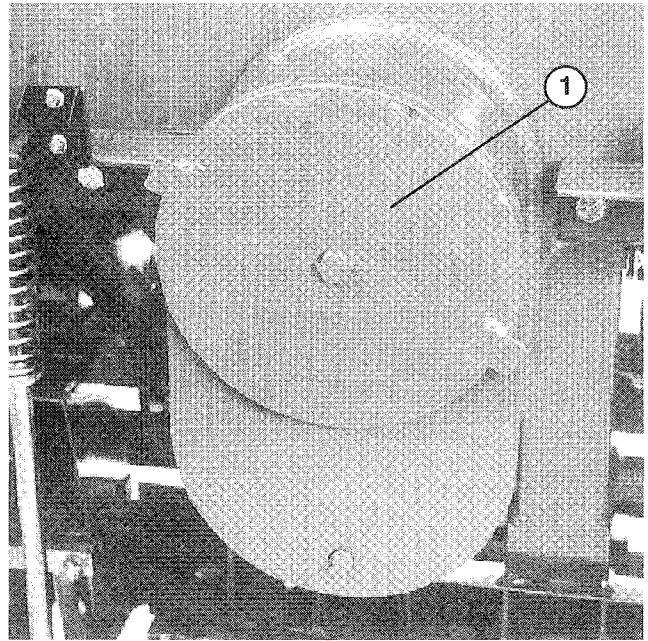


**Figure 20**

1. Reservoir fill plug (2)

## CHECK PICK-OFF GEAR CASE OIL LEVEL

1. Remove cover from pick-off gear case (Fig. 21).
2. Oil level should be at midway point of lower gear shaft. Should oil be needed, add SAE 80–90 (ISO 150/220) gear oil.
3. Replace gear case cover.



**Figure 21**

1. Pick-off gear case cover

## TIMING THE AERATOR OPERATING SPEED TO THE TRACTOR

### Tractor Preparation

To operate the aerator, the tractor must meet the following:

1. PTO rpm must be 540. It is desirable to have a tachometer on tractor to record speed.
2. With PTO operating at 540 rpm, a transmission gear must be selected that allows tractor to travel 100 feet within 30–38 seconds (1.8 – 2.2 mph).

### To Check Tractor Ground Speed:

1. Find a test area and measure and mark off 100 ft (30.5 m).
2. Operate tractor engine at PTO speed of 540 rpm. Select a transmission gear and operate the tractor over the test area (with or without aerator). Record the time necessary to travel 100 ft (30.5 m).

**Note:** If tractor lacks a tachometer, measure PTO shaft rpm with a hand tachometer.

3. Make three passes and record the time intervals. Average operating time over 100 ft (30.5 m) should be between 30–38 seconds. If the time average is not within 30–38 seconds, select another transmission gear and recheck until the average falls within time limits.

**IMPORTANT:** Use the same tractor transmission gear and PTO rpm settings whenever operating the aerator. Never operate aerator in any other gear except the one the tractor was timed in.

# BEFORE OPERATING

## Preparing Aerator:

Select the proper timing gears for the aerator pick-off gear case. (Gears must be obtained from your Authorized Toro Distributor.) Use the following chart to determine which gears to use:

		Gears	
	Sec./100 ft	Driver	Driven
INCREASE HOLE	42.3	30	40
SPACING	39.9	31	39
	37.7	32	38
Optimum	35.5	33	37
Vehicle	33.6	34	36
Speed	31.7	35	35
DECREASE HOLE	30.0	36	34
SPACING	28.3	37	33
	26.7	38	32

**IMPORTANT:** Selected number of gear teeth for the driver and driven gears must add up to 70.

## Gear Installation:

1. Remove pick-off gear case cover (Fig. 21).
2. Remove the lynch pins used to secure the driver and driven gears.
3. Install driver and driven gears matching indicated chart time and secure with lynch pin.

**Note:** Number of gear teeth is stamped on the gear.

4. Install gear case cover and lower aerator cover. Verify timing of the aerator/tractor.

# OPERATION

## TRAINING PERIOD

Before using the aerator, find a clear area to practice using the machine. Operate the tractor at recommended gear setting and PTO speed and become thoroughly familiar with machine handling. Practice stopping and starting, raising and lowering the aerator, disengaging the PTO and aligning the machine with previous passes. A practice session assures confidence in the performance of the aerator and helps ensure use of proper operating techniques wherever the machine is operated.

To prevent turf damage, always make sure tractor is moving and PTO is engaged when raising or lowering the aerator.

When aerating, three point lift system to be in "FLOAT" position.



### CAUTION

**To avoid personal injury, never leave the tractor seat without first setting the parking brake and disengaging the PTO. Never perform aerator repairs without first lowering aerator onto transport/safety stops. Be sure all safety devices are secured in proper place before resuming operation.**

## BEFORE AERATING

Make sure the hydraulic hose is clear of tractor and machine components to avoid damage, and all safety shields are secured in place. Inspect the area of operation for hazards that could damage the machine and remove them, if possible, or plan how to avoid them. Carry replacement tines and tools to effect repairs should tines contact foreign materials.

**CAUTION:** Do not leave machine unattended and to avoid personal injury do not work on machine while it is running.

## VERIFY TIMING BETWEEN TRACTOR AND AERATOR

1. Raise aerator, set parking brake, stop engine and lower safety/transport stops.

2. With transmission in correct gear selection, lower and operate the aerator a short distance, then raise aerator, disengage PTO and stop tractor. Set parking brake.

**IMPORTANT:** Never operate the tractor PTO in excess of 540 rpm or damage to the aerator could occur.

3. In direction of machine travel, measure the distance between tine holes (one tine penetration stroke to another). Depending on tine selection, the distance should be:

**7/8 in. tines – 5–3/4 to 6 in.**

**3/4 in. tines – 2–7/8 to 3 in.**

**Note:** Condition of the turf around the holes can also indicate how well the tractor speed is matched to the aerator. If the rear of the tine holes are torn, the tractor speed is too slow. If the front of the tine holes are torn, the tractor speed is too fast.

4. If the spacing is too short (coring speed too fast), increase the hole spacing; substitute the driver gear with a gear having less teeth and the driven gear with one having more teeth. If hole spacing is too long (coring speed too slow), driver gear teeth quantity should be increased and driven gear teeth decreased; see gear selection chart.

5. Operate machine again and repeat steps 1–4.

**IMPORTANT:** Timing can sometimes be fine tuned by gradually regulating tractor tire pressure. Lowering tire pressure will provide closer spacing and raising tire pressure will increase the spacing.

**CAUTION:** Do not exceed the maximum or minimum inflation pressures as recommended by tire manufacturer.

## AERATING PROCEDURES

When the tractor reaches proper ground speed, 1.8 to 2.2 mph, lower the aerator. The aerator can be operated in slight curves, but for best results operate in a straight line. If the machine must be turned sharply, raise the aerator and disengage the PTO. Otherwise, severe turf damage will result and the machine may also be damaged.

Look behind frequently to ensure the machine is operating properly and alignment is maintained with previous passes.

**Should the driveline ratchet during operation:**

1. Raise the aerator, disengage the PTO and stop immediately.

2. Set the parking brake, lower aerator onto safety/transport stops.

3. Inspect the turf to determine the reason for the ratcheting or tine breakage. Locate where the problem occurred and insert a non-conductive probe into the aerator holes. If foreign material beneath the turf caused the damage, mark the location so the material can be either removed or avoided in future. If the ratcheting occurred because turf was too hard to penetrate, raise depth of penetration and try aerating the area again. Be sure all machine damage has been corrected before resuming operation; refer to step 5.

# OPERATION

4. Always clear the area of all damaged machine parts, such as broken tines, etc., to prevent their being picked up by mowers or other turf maintenance equipment.
5. Replace broken tines, and inspect and correct damage to those still useable. Repair any other machine damage before commencing operation.

## TRANSPORT OPERATION

To begin transport operation, raise the aerator, disengage the PTO and set the parking brake. Raise safety/transport stops and lower aerator onto stops. To avoid loss of control, traverse steep inclines slowly, approach rough areas at reduced speed and cross severe undulations carefully.

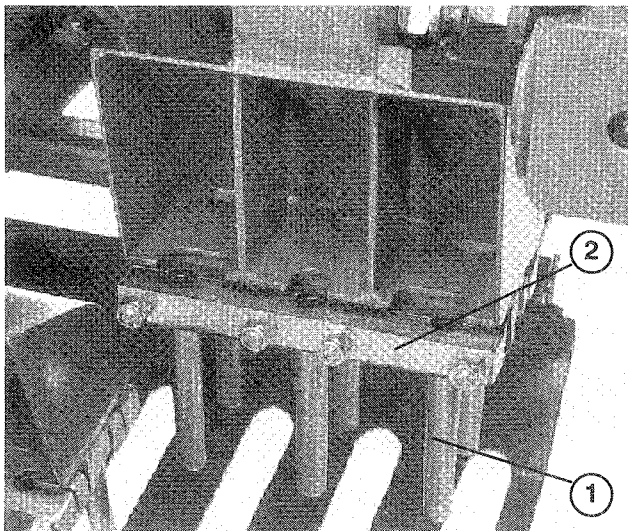
**Important:** Do not exceed transport speeds of 15 mph on smooth level terrain. Use slower speed for more adverse conditions.

## INSPECTION AND CLEAN-UP AFTER USE

After each use, thoroughly wash the machine with a garden hose without a nozzle so contamination and seal and bearing damage due to excessive water pressure will be avoided. A brush may be used to remove caked-on material. Use a mild detergent soap to clean the cover. After cleaning, inspect for machine damage, gear oil leakage, component and tine wear.

## CHANGING TINES

1. Raise aerator, disengage the PTO and set the parking brake. Raise safety/transport stops and lower aerator onto stops.
2. Loosen locknuts securing tines and remove tines (Fig. 22).



**Figure 22**

1. Tine block
2. Tine

3. Install replacement tines and tighten the locknuts to secure the tines in position.
4. If slotted tines are used, slots should face forward for front row of tines and rearward for rear row of tines. The cores from these tines are ejected thru the slots, not thru the holes in the tine holders

## STOMPER ASSEMBLIES

**IMPORTANT:** Within the first five hours of initial machine operation and every 25 hours operation thereafter, all stomper assemblies must be checked for excessive lateral play. This must be done or major machine component failure may result. Refer to Checking Stomper Assemblies, page 19.

## OPERATING TIPS

1. Gradually engage PTO at low engine speed and throttle up to 540 PTO RPM before lowering aerator.
2. Make very gradual turns when aerating. Never make sharp turns.
3. If tractor “bogs” down when operating on hard ground or going uphill, raise aerator slightly until speed is regained, then lower again.
4. Do not aerate if ground is too hard or dry. Best results are obtained after a rain or when turf has been watered the previous day.
5. Raise coring head penetration, if ground is hard packed. Clean-up cores and re-aerate at deeper penetration, preferably after watering.
6. Store aerator on stand provided whenever it is removed from tractor.

# LUBRICATION

## GREASING BEARINGS AND BUSHINGS

The HC 4000 Aerator has grease fittings that must be lubricated regularly with No. 2 General Purpose Lithium Base Grease. If machine is operated under normal conditions, lubricate bearings and bushings after every 25 hours of operation or prior to storage. **Grease stomper arm bearings daily.** Grease drive line shields after every 4 hours of operation

The lubrication points are: Cylinder pivot—upper (2) (Fig. 23); Cylinder pivot—lower (2), stabilizer bar (4), trailing arm (4), finger plate pivot linkage (4) (Fig. 24); Gear box support tube (1), stomper assy. (4), gear box couplings (2) (Fig. 25); castor wheel bearings and pivot shaft mount (4), trailing arm (2), roller (2) (Fig. 26); Trunnion adjuster (2) (Fig. 27) and Drive line (5) (Fig. 28).

1. Wipe grease fitting clean so foreign matter cannot be forced into the bearing or bushing.
2. Pump grease into the bearing or bushing.
3. Wipe up excess grease.

**Note:** It is a good practice to lubricate grease fittings after washing machine.

4. To lubricate the center grease fitting on drive shaft assembly, the aerator must be in the raised (transport) position, to gain access thru slots in shields.

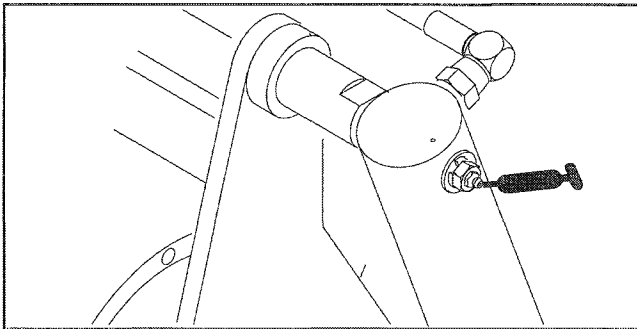


Figure 23

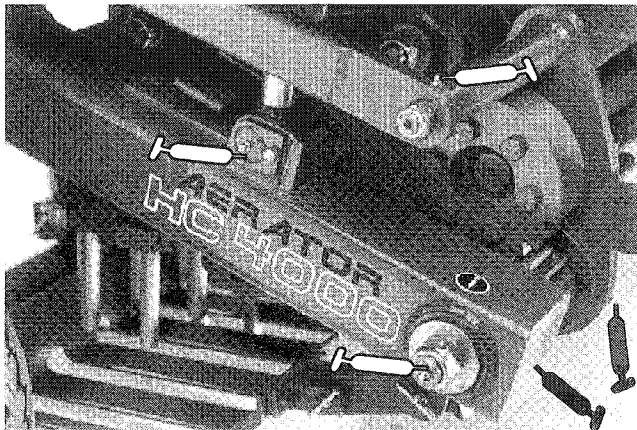


Figure 24

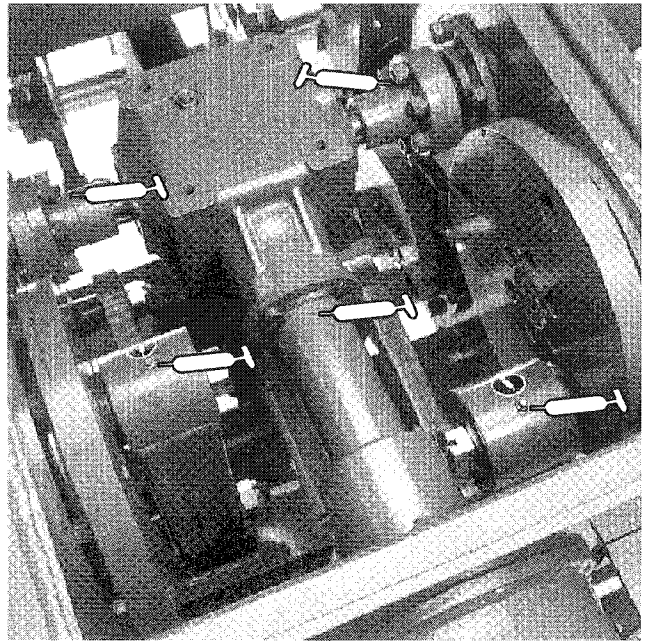


Figure 25

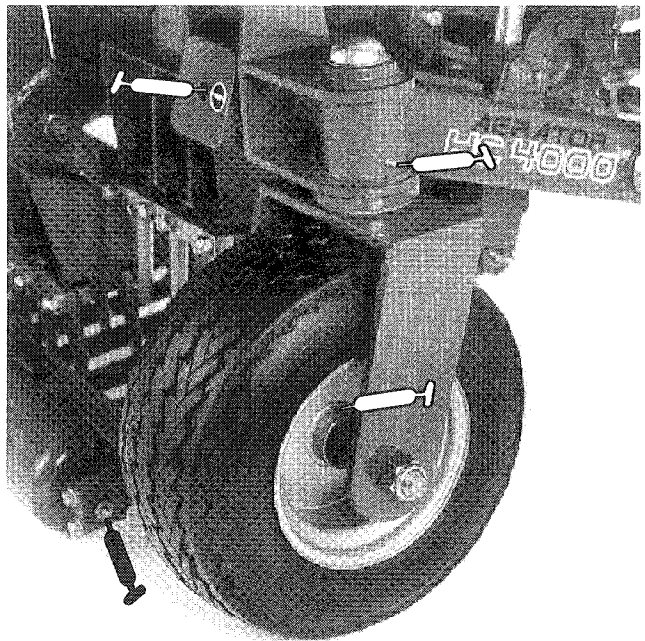


Figure 26

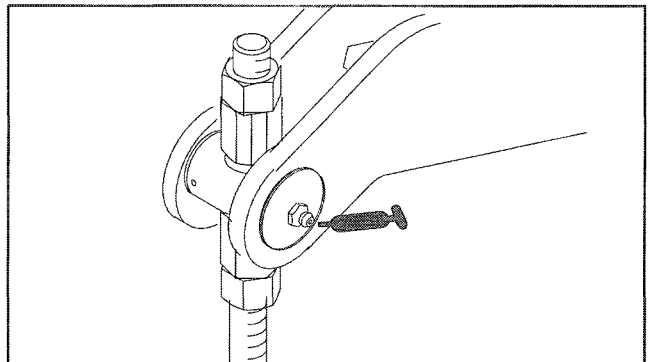


Figure 27

# LUBRICATION

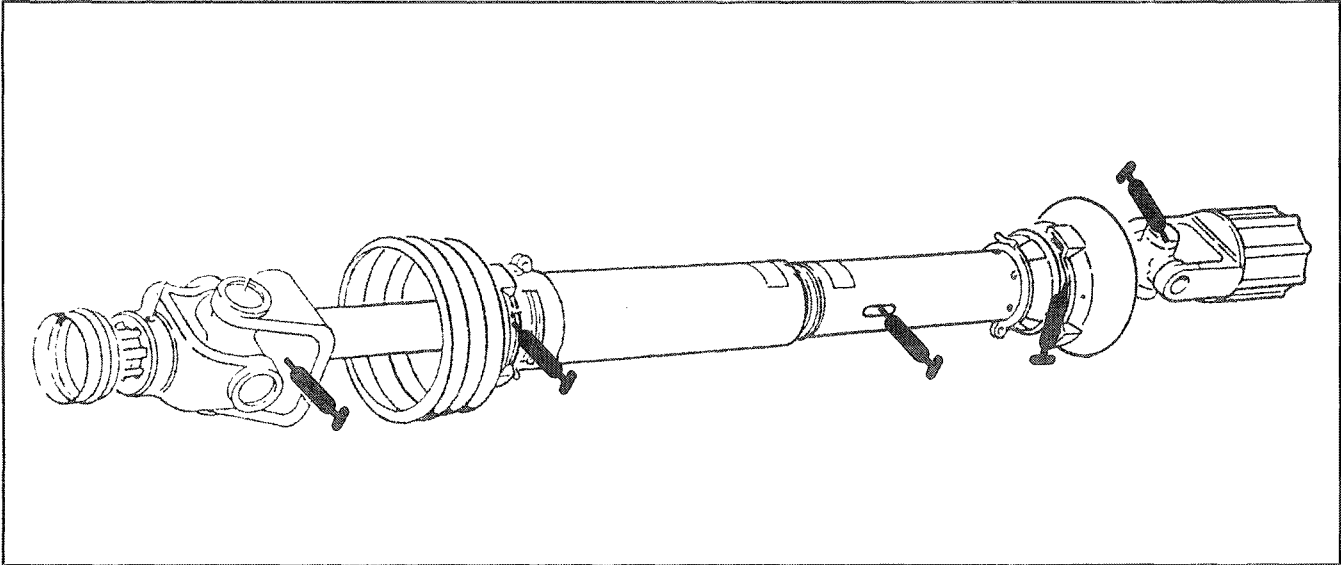


Figure 28

## CHECK GEAR CASE OIL LEVEL

Every 25 hours operation, or seasonally, whichever comes first, check oil level in each gear case.

1. At front of aerator, remove (2) plugs from gear case ports (Fig. 29).

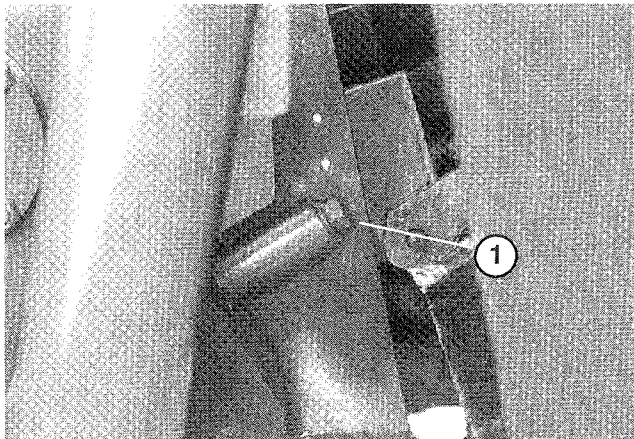


Figure 29  
1. Reservoir fill plug (2)

2. Oil level should be to the top of each port. If oil is required, add SAE 80–90 (ISO 150/220) gear oil.

**NOTE:** Under normal conditions the gear case oil level should not drop. If oil level is low, check for signs of leakage and correct, as necessary. Should major failure of gearbox components occur, drain the gear oil, flush the gear cases and install fresh oil. The oil drain plug (Fig.30) is located on bottom of each gear case.

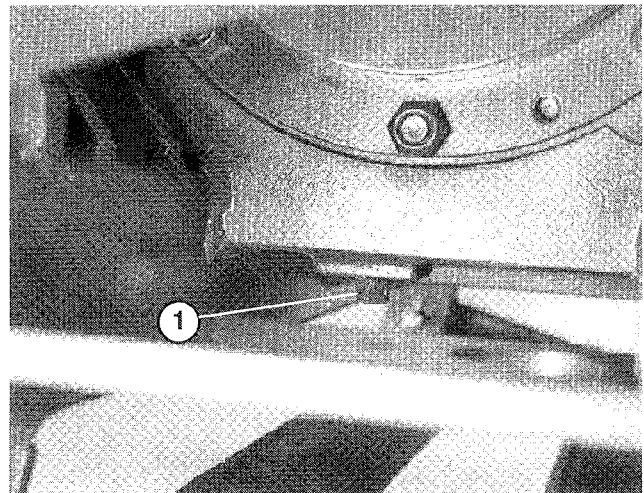


Figure 30  
1. Gear case drain plug

3. Make sure end of gear case vent tube is open and clean (Fig. 31).

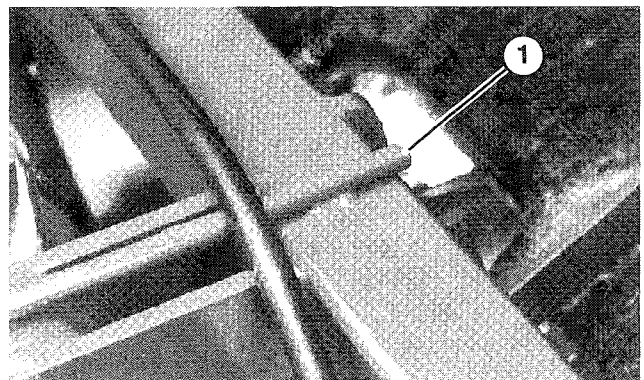
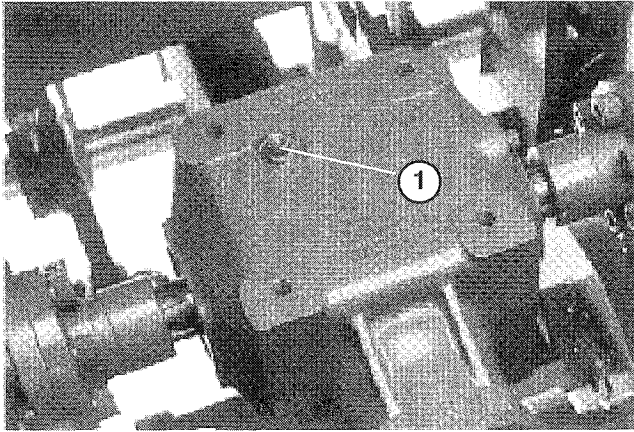


Figure 31  
1. Vent tube

# LUBRICATION

## CHECK 90° GEAR CASE OIL LEVEL

1. With the machine on a level surface, remove the oil fill/dipstick plug (Fig. 32).



**Figure 32**

1. Oil fill/dipstick

2. Add SAE 80–90 (ISO 150/220) gear oil, if needed, and install the fill plug.

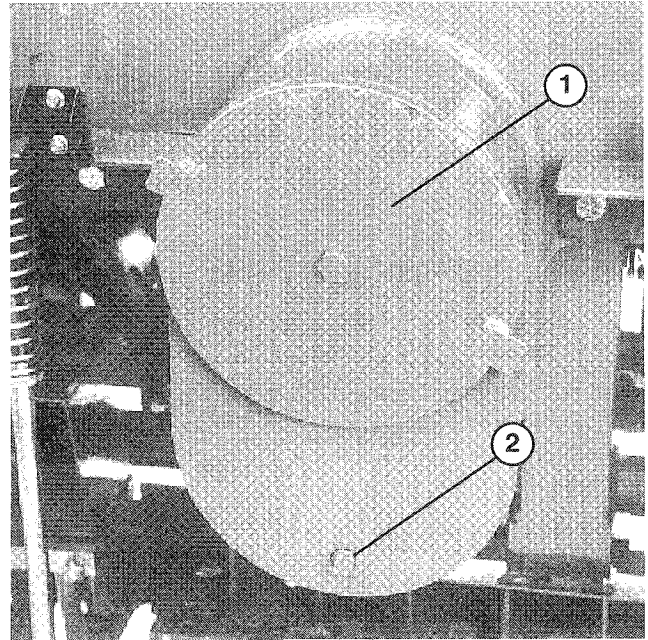
**NOTE:** Under normal conditions the gear case oil level should not drop. If oil level is low, check for signs of leakage and correct, as necessary. Should major failure of gearbox components occur, drain the gear oil, flush the gear case and install fresh oil. The oil drain plug is located on bottom of gear case.

3. Make sure vent hole in oil fill/dipstick plug is open and clean.

## CHECK PICK-OFF GEAR CASE OIL LEVEL

Every 25 hours operation, or seasonally, whichever comes first, check oil level in the pick-off gear case.

1. With the machine on a level surface, remove the gear case cover (Fig. 33).



**Figure 33**

1. Gear case cover
2. Gear case drain plug

2. The oil level should be to the center of the lower gear shaft. If the level is low, add SAE 80–90 (ISO 150/220) gear oil and install the cover.

**Note:** Should major failure of pick-off gear case components occur, the gear oil will be contaminated and should be drained. Flush the gear case and add fresh oil. The gear case oil drain plug is located below cover on front of case (Fig. 33).

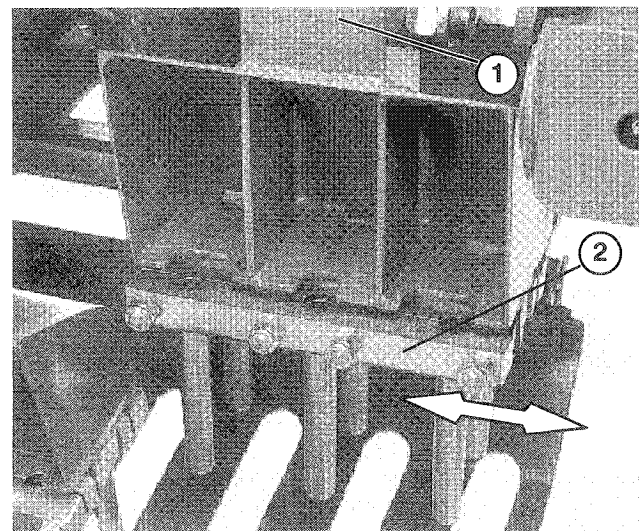
3. Make sure end of gear case vent tube is open and clean (Fig. 31).

# MAINTENANCE

## CHECKING STOMPER ASSEMBLIES

Within the first five hours of initial machine operation and after every 25 hours of operation thereafter, all stomper assemblies must be checked for excessive lateral play. This must be done or major machine component failure may result.

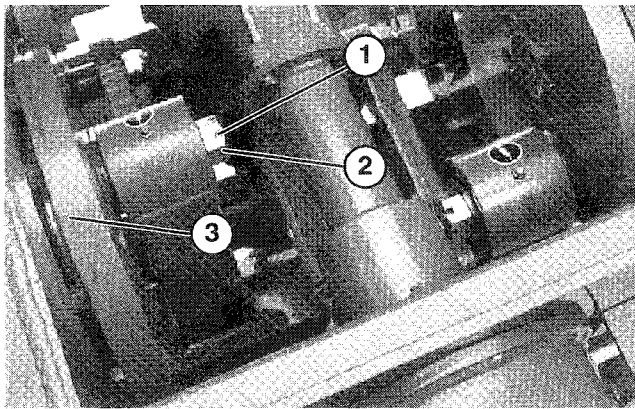
1. Grasp each stomper assembly at the bottom and try to move the assembly laterally in each direction (Fig. 34). Do not move fore and aft. There should be little or no movement of the assembly. If there is movement, proceed to step 2. If there is little or no movement, proceed to check the next assembly.



**Figure 34**

1. Stomper assembly
2. Move laterally—both directions

# MAINTENANCE



**Figure 35**

- 1. Roll pin
- 2. Castle nut
- 3. Top crank

2. Remove the roll pin securing the castle nut to the top crankshaft (Fig. 35). Check the castle nut for tightness with fingers. If the nut is very loose, rotate it clockwise until it is flush against the outer spacer and resistance is felt.

3. Using a torque wrench, rotate the nut clockwise (tighten) until a slot in the nut aligns with the shaft hole. Do not exceed 40 ft-lb. Re-install the roll pin.

**Note:** The shaft is cross drilled, therefore only 1/12 turn (max) should be required to align roll pin hole.

## GENERAL MAINTENANCE

After each use of the machine and when clean-up is completed, perform the following:

Examine tines for damage and sharpness and repair or replace, as necessary.

1. Inspect closely for signs of leakage, excessive component wear or component damage. Repair or replace, as necessary.

2. Thoroughly wash the machine with a garden hose without a nozzle so contamination and seal and bearing damage due to excessive water pressure will be avoided. A brush may be used to remove caked-on material. Use a mild detergent soap to clean the cover. After cleaning, inspect for machine damage, gear oil leakage, component and tine wear.

## AERATOR GEAR CASE TIMING TIPS

If disassembly of the Aerator drive system is required for maintenance, the unit will need to be re-timed to

ensure machine balance, equal loading of tine arms and optimum hole quality. There are two separate procedures to properly time the aerator gear cases. Use the following tips for each procedure when reassembling gear case.

### A. Timing upper and lower crank shafts on each individual gear case

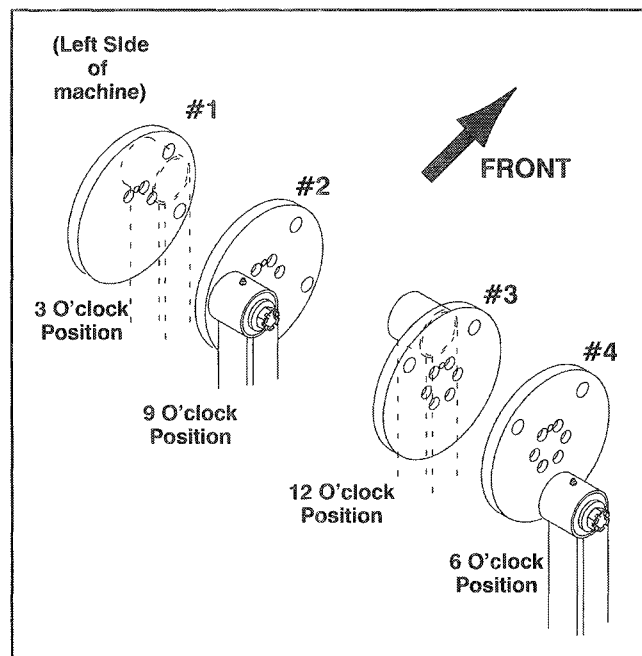
1. The upper and lower crankshaft flywheels for each Tine arm must be assembled so the offset shafts are located in the same "clock" position. If upper offset shaft is positioned at 12 o'clock, then lower offset shaft must be at 12 o'clock position.

2. To achieve the proper "clock" position for each gear case, install Timing Bar (supplied with machine) to the upper and lower crankshaft by aligning each roll pin and securing with socket head capscrew.

### B. Synchronizing gear cases

1. The tine arms are numbered 1 to 4 from left to right, as viewed from rear of machine. Each of the two gear cases must be connected to each other in a proper phase to ensure only one set of tines will enter the turf at a time.

2. Rotate the number 1 tine arm to the 3 O'clock lowest position as a starting point (Fig. 36). When viewed from the left side of the aerator, the remaining tine arms should be in the 9 O'clock, 12 O'clock and 6 O'clock positions respectively.



**Figure 36**

# IDENTIFICATION AND ORDERING

## MODEL AND SERIAL NUMBERS

The HC 4000 aerator has two identification numbers: a model number and a serial number. The two numbers are stamped into a plate which is located on the upper rear frame channel. In any correspondence concerning the mower, supply the model and serial numbers to assure that correct information and replacement parts are obtained.

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

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

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

## MAINTENANCE CHART

Date	Hours Used							

## MAINTENANCE CHART

[illegible]

## MAINTENANCE CHART

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## The Toro Promise

### A One Year Limited Warranty

*The Toro Company promises to repair your Model 09600 HC 4000 Aerator if defective in materials or workmanship. The following time periods from the date of purchase apply:*

<b>Single or *Shared Owner Use .....</b>	<b>1 Year</b>
<b>Contractor – Type or Rental Use .....</b>	<b>120 Days</b>

*The cost of parts, labor and transportation are included.*

**\* No more than 3 customers sharing use and ownership of product.**

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

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

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

Write:

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

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

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

This Warranty applies only to parts or components which are defective and does not cover repairs necessary due to normal wear, misuse, accidents, or lack of proper maintenance.

Operating the HC 4000 Aerator in continuously detrimental conditions (e.g., turf embedded with rock/concrete) is considered misuse. Regular, routine maintenance of the unit to keep it in proper condition is the responsibility of the owner.

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

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

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

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

#### COUNTRIES OTHER THAN THE UNITED STATES OR CANADA

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