

GRAVELLY OPERATOR'S MANUAL

NAME: REAR TILLER

PART NUMBER(S): 18886



79060

The Rear Tiller is used with the Gravely 8000 Series tractors.

To connect the rear tiller to an 8000 Series Gravely tractor, a liftable rear hitch (part number 24487) and a rear PTO (part number 19814) are needed.

All reference to left side, right side, front, and rear are given from the operator's position.

To continue its program of quality and design improvement, the manufacturer reserves the right to change specifications, designs and prices without notice and incurring obligation.

FORM NO. 33149 (7-86)


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NOTE: This warning symbol  indicates that there is danger to persons or equipment. Read these warnings carefully and follow them.

This section gives warnings for you about operating and doing maintenance on this equipment.

Using this equipment the wrong way can cause injury to persons and damage to the equipment. Persons operating or doing maintenance on this equipment must read the Operator's Manual and follow the instructions.

It is important to understand that this Operator's Manual and other Gravelly instruction books do not list every possible danger. It is not possible for Gravelly to know and tell of all the dangers in operating and doing maintenance on the equipment.

The purchaser must give these instructions to the persons operating and doing maintenance on this equipment. The purchaser must get the operator and person doing maintenance on this equipment to use eye and foot protection.

1.1 Instructions Before Operating

1. Read this Operator's Manual and the Operator's Manual for the tractor carefully before operating or doing maintenance.
2. Learn the location and the function of all the controls on the rear tiller and the tractor.
3. Know how to use the controls to stop the tractor and the rear tiller quickly.
4. Never permit children to operate or ride on the tractor or the rear tiller.
5. Use caution with gasoline. Gasoline is very flammable. Keep gasoline in a clean and tight fuel container. Keep gasoline away from fire or hot items. Never put gasoline in the fuel tank while the engine is running or hot. Clean any leakage of gasoline from the tractor before starting the engine.

1.2 Preparation For Operation

1. Make sure all the shields and the guards are in the correct position before operating.
2. Wear strong shoes. Wear clothing that is not loose. Wear protection for your eyes.
3. Before starting the engine, put the direction control lever in the "NEUTRAL" position and the PTO control lever in the "OFF" position.
4. Do not operate the tractor where the area of operation is too dark for the operator to see.
5. Keep the tractor and the attachment in good operating condition. Do the maintenance as shown in the Operator's Manuals.
6. Never operate the tractor or the attachment when there is damage to any part or when any part is not in the correct position. Replace all parts that are damaged or missing before operating.

1.3 Operation

1. Keep away from moving parts.
2. Keep all persons and animals away from the area of operation.
3. Do not let persons ride on the tractor or the attachment.
4. When operating on slopes, use a slow speed and engage the direction control lever slowly.
5. Always look for and keep away from holes and other hazards.
6. Use caution when moving backwards. Look for persons and hazards in the way.
7. After hitting an item, stop the tractor and the engine and check for damage. If there is damage, make repairs before restarting.
8. Operate the equipment only when in the operator's position in the seat of the tractor.
9. Before leaving the tractor, put the PTO control in the "OFF" position. Lower the attachment to the ground. Turn the ignition switch to the "OFF" position and remove the ignition key.
10. If there is a sudden change in the sound or vibration of the tractor or the attachment, stop the tractor and check for damage. If there is damage, make repairs before operating.
11. Never start and run the engine inside a building except to move the equipment outside. Exhaust fumes are dangerous.
12. Go slow on surfaces where the tractor can slide.
13. Always follow traffic laws while going on or near a road.
14. Before leaving the operator's position to make adjustments or to do maintenance, put the PTO control lever in the "OFF" position. Turn the ignition switch to the "OFF" position. Wait until the engine and moving parts have stopped.



2.0 BOLT TORQUE SPECIFICATIONS



The specifications for tightening the bolts used to assemble the Attachment are given in the bolt torque specifications, figure 2.0-1.

Tighten the bolts used to the torque given, unless shown differently.

BOLT TORQUE SPECIFICATIONS		
BOLT SIZE	FOOT POUNDS (ft. lbs.)	NEWTON METERS (N.m)
1/4"	7	9.5
5/16"	14	19
3/8"	25	34
7/16"	40	54
1/2"	60	82
9/16"	83	113
5/8"	120	163
3/4"	200	271

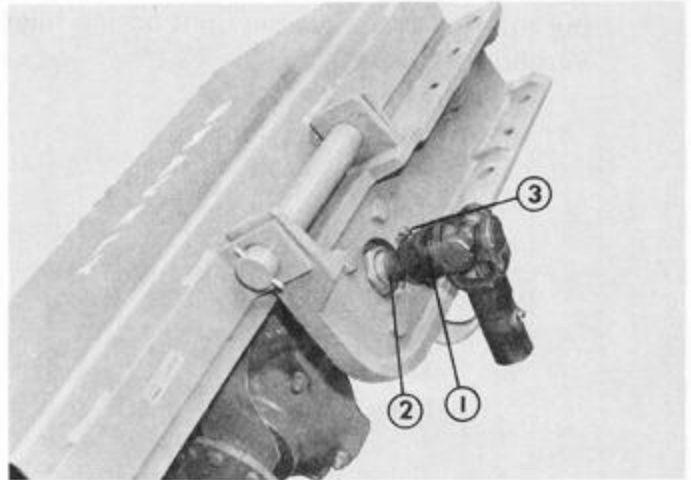
Figure 2.0-1



3.0 HOW TO CONNECT THE TILLER TO THE TRACTOR



1. Align the holes in the universal joint with the hole in the drive shaft of the tiller. Slide the universal joint on the shaft. See figure 3.0-1.

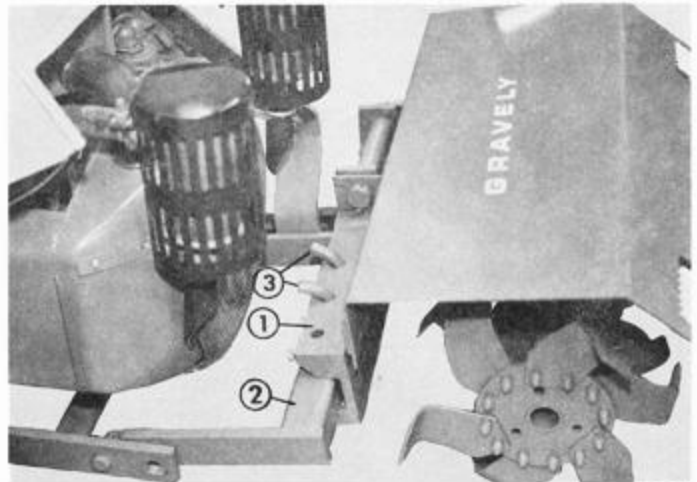


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- 1 - Universal Joint
- 2 - Drive Shaft
- 3 - Bolt and Nut

Figure 3.0-1

2. Fasten the universal joint to the drive shaft with the 1/4" x 2" bolt and 1/4" lock nut.
3. Put the tiller in position on the rear hitch. See figure 3.0-2.

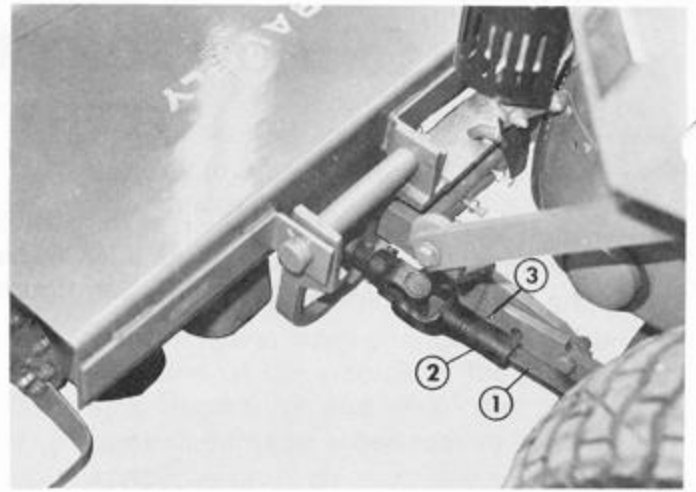


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- 1 - Tiller
- 2 - Rear Hitch
- 3 - Hitch Pins

Figure 3.0-2

- Align the two holes nearest the drive shaft with the holes in the rear hitch. Fasten the tiller to the rear hitch with the two hitch pins.
- Apply multi-purpose grease to the square shaft of the universal joint. Put the shaft in the tube of the universal joint on the tiller. See figure 3.0-3.



- 1 - Square Shaft
- 2 - Tube
- 3 - Grease Fitting

Figure 3.0-3

- Pull the locking collar toward the universal joint and hold it in that position. Slide the locking collar half way on the axle drive shaft and release the locking collar. Push the locking collar on the axle drive shaft until it locks in position. See figure 3.0-4.



- 1 - Locking Collar
- 2 - Axle Drive Shaft (not shown)

Figure 3.0-4



4.0 HOW TO DISCONNECT THE TILLER FROM THE TRACTOR



- Pull the locking collar toward the universal joint and remove it from the axle drive shaft. See figure 3.0-4.
- Remove the two hitch pins that fasten the tiller to the rear hitch. See figure 3.0-2.
- Remove the tiller from the rear hitch.



5.0 HOW TO OPERATE THE TILLER



Read this Operator's Manual and the tractor Operator's Manual before operating the tiller. Use first gear, "LO" range, until you know how to operate the tiller.

1. Make a plan for operating as shown in figure 5.0-1.
2. Start the tractor engine and wait until the engine is running smoothly before operating.
3. Use the lift lever on the tractor to raise the tiller off the ground.
4. Put the RANGE selector in the "LO" position.
5. Put the GEAR selector in the "1" position.
6. Move the THROTTLE lever to the "FAST" position.
7. Engage the PTO.
8. Put the direction control lever in the "FORWARD" position.

WARNING: Never move in the reverse direction when the tiller is on the ground. Always raise the tiller before going in the reverse direction.

9. If the tractor has a manual lift, lower the tiller to the ground.
10. To lower the tiller to the ground if the tractor has a hydraulic lift, put the lift lever in the "FLOAT" position.
11. At the end of each row, use the lift lever to raise the tiller off the ground.
12. Repeat steps 8, 9, 10, and 11 for each row.

NOTE: The depth of the tiller can be controlled by the speed of the tractor. To cause the tiller to dig deeper, use a slower tractor speed.

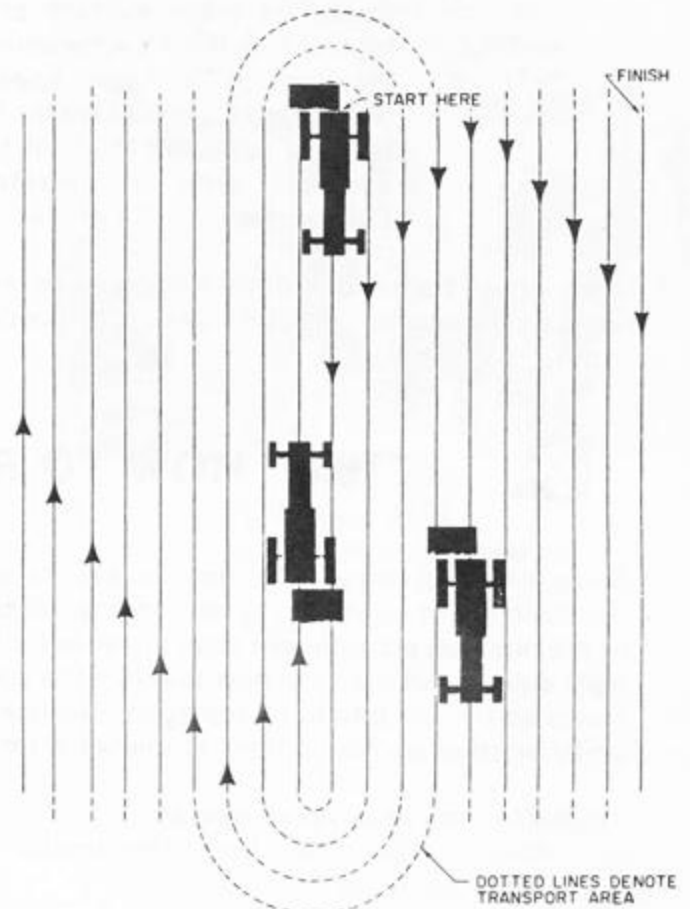


Figure 5.0-1

⚠ WARNING: On hard ground, the tiller can cause the rear wheel of the tractor to be raised off the ground. This will cause the tractor to move forward at a high speed. If the tractor moves forward at a high speed, disengage the PTO. Use the lift lever to raise the tiller off the ground. Stop the tractor. Follow steps 3 through 12.

If the ground is hard, cultivate the area several times until the ground is cultivated to the needed depth.



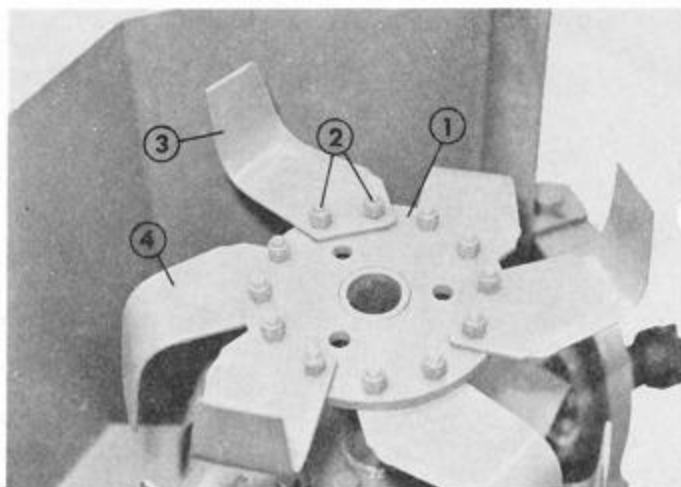
6.0 HOW TO REPLACE THE TINES



Since the sharp edges of the tines must all face in the direction of rotation, the tines for the left side of the tine hub are different from the tines for the right side. Make sure the new tine has the same shape as the old one to be replaced. Replace all badly worn or damaged tines at the same time.

To replace the tines do as follows:

1. Remove the tiller from the tractor as described in section 4.0.
2. Remove the bolts that fasten the tines to the plate. See figure 6.0-1.
3. Install the tines with the cutting edge toward the direction of rotation. The tines rotate clockwise as seen from the right side.



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- 1 - Plate
- 2 - Bolts
- 3 - Left Side Tine
- 4 - Right Side Tine

Figure 6.0-1

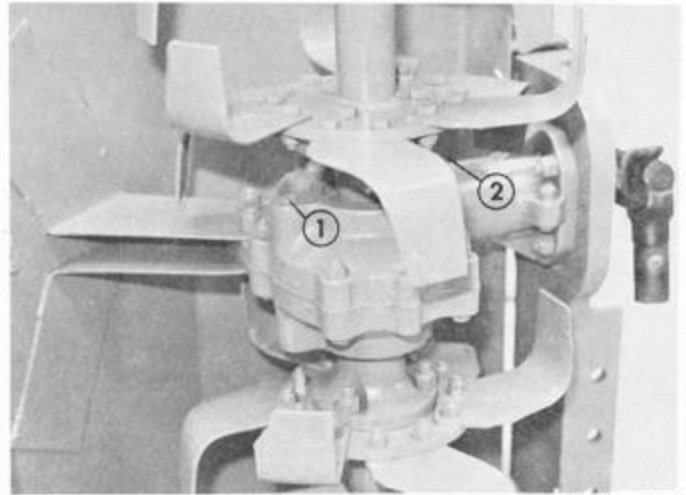


7.0 HOW TO DO MAINTENANCE



1. After each use do the following:
 - A. Stop the tractor engine.
 - B. Remove all dirt and debris from the tiller.
 - C. Inspect all nuts, bolts, and other fasteners to make sure they are tight. Replace any that are missing.
 - D. Check the tines to see if they are badly worn or if there is damage. If the tines are badly worn or damaged, replace the tines as shown in section 6.0.

2. After every 40 hours of operation, do the following:
 - A. Clean the grease fitting on the universal joint. Add multipurpose grease to the grease fitting until it comes out around the shaft. See figure 3.0-3.
 - B. Check the level of the lubricant in the gear housing. To check the level, do as follows: Stop the tractor on a level surface and lower the tiller to the ground. Turn the ignition key to the "OFF" position. Remove the check plug by turning the plug counterclockwise. The level of the lubricant is correct when the level is at the bottom of the check plug hole. See figure 7.0-1.
 - C. If the level of the lubricant is low, remove the fill plug by turning the plug counterclockwise. Add SAE 90W EP gear lubricant through the fill plug hole until it shows at the check plug hole. Install the plugs.



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- 1 - Check Plug
2 - Fill Plug (not shown)

Figure 7.0-1



8.0 HOW TO PUT THE TILLER IN STORAGE



When the tiller will not be operated for three months or more, do the following:

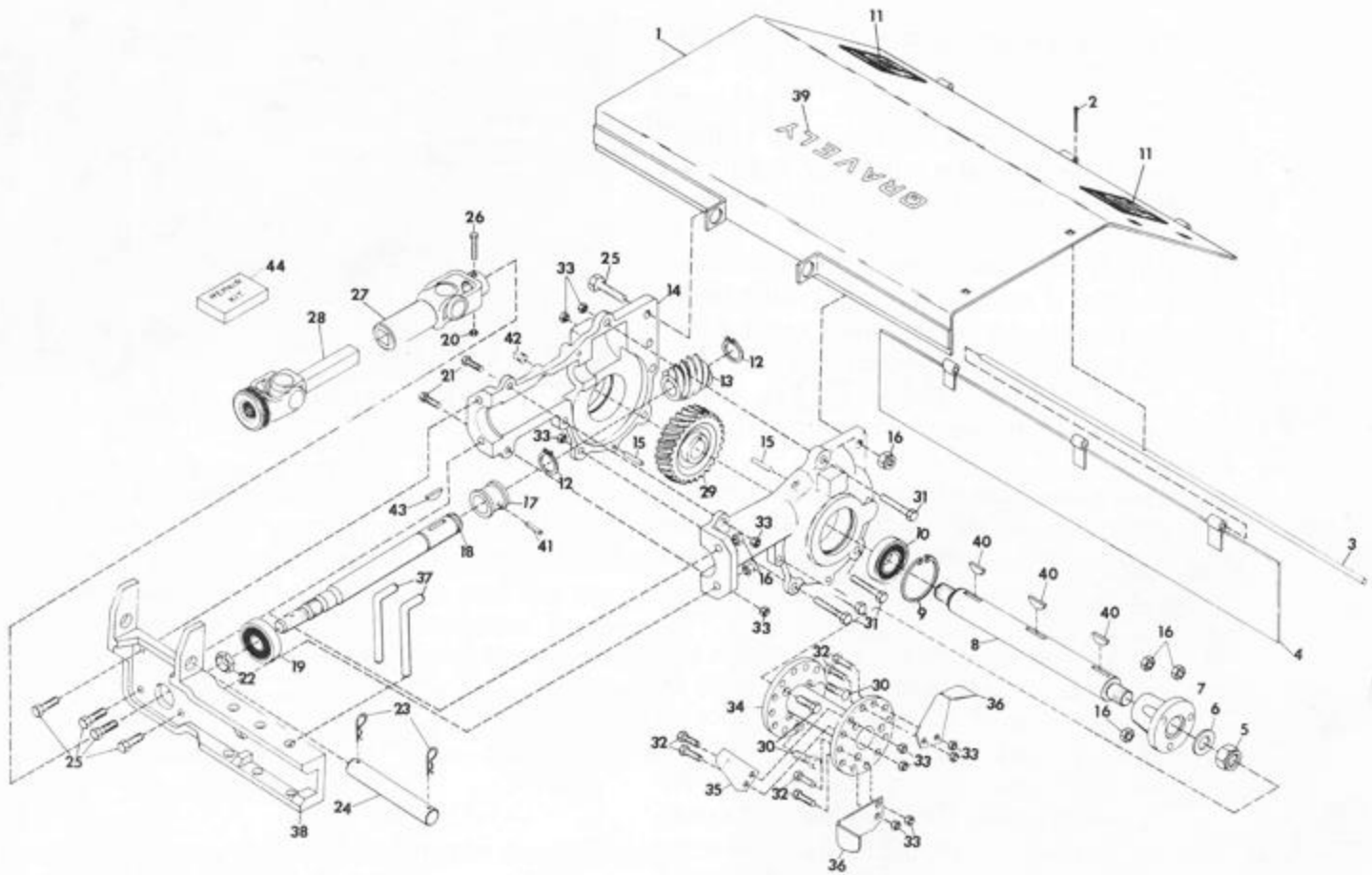
1. Do the maintenance shown in section 7.0.
2. To prevent rust, put paint or lubricant on any area where the paint has been removed.



9.0 ILLUSTRATED PARTS LIST



REAR TILLER



Item No.	Part No.	Qty.	Description
1	18902	1	Hood
2	137946	1	Pin, Cotter 1/8 x 1/2
3	18911	1	Rod
4	18909	1	Skirt
5	456007	2	Nut, Lock 3/4-10
6	18885	2	Washer
7	18884	2	Hub
8	18881	1	Axle
9	18872	2	Ring, Retaining
10	18873	2	Bearing, Ball
11	19479	2	Decal, Warning
12	17966	2	Ring, Retaining
13	18877	1	Gear, Worm
14	19372	1	Housing, Asm.
15	3184	2	Pin, Dowel 3/8 x .75
16	435507	12	Nut, Lock 1/2-13
17	18878	1	Bearing, Sleeve
18	18875	1	Shaft
19	18879	1	Bearing, Ball
20	419454	1	Nut, Lock 1/4-20
21	180128	2	Bolt, Hex 3/8-16 x 1.75
22	18880	1	Nut, Lock

Item No.	Part No.	Qty.	Description
23	10405	2	Hair Pin Cotter
24	18908	1	Rod
25	180181	6	Bolt, Hex 1/2-13 x 2
26	180044	1	Bolt, Hex 1/4-20 x 2
27	13518	1	Universal Shaft, Female End
28	19074	1	Universal Shaft, Male End
29	18882	1	Gear, Worm
30	180179	6	Bolt, Hex 1/2-13 x 1.75
31	187070	5	Bolt, Hex 3/8-16 x 2.625
32	180123	48	Bolt, Hex 3/8-16 x 1.125
33	456004	55	Nut, Lock 3/8-16
34	18913	2	Tine Hub
35	18939	12	Tine, Right Hand
36	18940	12	Tine, Left Hand
37	18864	2	Pin, Hitch
38	18889	1	Bracket
39	19365	1	Decal, Gravely
40	117986	3	Key, Woodruff 3/8 x 1.5
41	455160	1	Pin, Spring .188 x .500
42	444867	2	Plug, Pipe 3/8 NPT
43	117977	1	Key, Woodruff 5/16 x 1
NS	20573		Repair Kit for Universal Shaft

LIMITED FIVE-YEAR WARRANTY

1. This Limited Five-Year Warranty is issued by Gravely International, Inc., only to the original purchaser. If Gravely equipment is leased by Gravely, this Warranty shall extend also to the original lessee as if such lessee were the original purchaser.
2. Gravely warrants that all new equipment manufactured by Gravely ("Gravely Products") shall be free of defects in material and workmanship for the term described in paragraph 4, below. Except as hereinafter provided, this Warranty does not cover any engine, tires or battery forming a part of the Gravely Product. Engine and tires are covered by and subject to separate warranties of the manufacturers thereof.
3. In the event that any Gravely Product warranted hereunder shall be defective or fail to conform with this Warranty, Gravely shall, subject to the provisions hereof, pay for, or provide labor and materials for, the repair or replacement of such defective Gravely Product.
4. This Warranty is for five years (60 months) from purchase date for Gravely Products used exclusively for personal, family or household purposes, and two years (24 months) for products used for other purposes (commercial use), excluding rental firms. Gravely products used for rental purposes will be warranted for 90 days. Repair of Gravely Products after the second year (24 months from date of purchase) shall be subject to a \$50.00 deductible for each repair. (After two years, Gravely agrees to repair or replace defective Gravely Products used exclusively for personal, family or household purposes only to the extent that the cost of such warranty covered repair or replacement exceeds \$50.00.)

Batteries are warranted by Gravely for a period of twelve (12) months only. If a battery shall fail within twelve (12) months of purchase, the replacement cost thereof shall be prorated over a twelve-month term based upon the number of months since purchase.
5. To obtain Warranty Service on a Gravely Product (including any battery or other component not manufactured by Gravely), use this procedure:
 - a. Notify the Gravely dealer from whom you purchased the equipment.
 - b. If you have moved and it is not convenient to notify the selling dealer, notify the nearest Gravely dealer. You should supply this dealer with a copy of the bill of sale as proof of the date of purchase.
 - c. Make arrangements to have the equipment delivered to the dealer (refer to paragraph 6 a., below).
 - d. If you have any questions concerning the Gravely Limited Warranty, they should be referred to:

Gravely International, Inc.
One Gravely Lane
Clemmons, NC 27012
Attn: Customer Service Department
 - e. Warranty service on Gravely Products must be performed by an authorized Gravely dealer.
6. This Warranty does not cover the following:
 - a. Transportation to the Gravely dealership. (If the Gravely dealer provides transportation, he will charge for such service.)
 - b. Normal maintenance services and normal replacement of items such as spark plugs, belts, oil, oil filters, air filters, and mower, plow or cultivator blades, gauge wheels, skids and other wear items.
 - c. Any Gravely Product which has been altered or modified in any way.
 - d. Any repair or replacement occasioned by customer neglect or lack of proper maintenance. (The purchaser is responsible for making sure that Gravely Products are operated and serviced as directed in the applicable manual or service instruction. Incorrect use or maintenance will void this Warranty.)
 - e. Any repair occasioned by the use of any attachment not approved by Gravely. (The use of any such unapproved attachment will void this Warranty.)
7. GRAVELY MAKES NO OTHER EXPRESS OR IMPLIED WARRANTIES, OR WARRANTIES AS TO THE MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. ALL WARRANTIES ARE LIMITED IN DURATION TO THE TERMS SET OUT IN PARAGRAPH 4, ABOVE. GRAVELY SHALL HAVE NO LIABILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE BREACH OF ANY WARRANTY, INCLUDING, BUT NOT LIMITED TO, LIABILITY FOR INCONVENIENCE, RENTAL OR PURCHASE OF REPLACEMENT EQUIPMENT, OR FOR LOSS OF PROFITS OR OTHER COMMERCIAL LOSS.
8. Some states do not allow limitations on how long an implied warranty lasts, so the above statement may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.
9. This Warranty gives you specific legal rights, and you may have other rights which vary from state to state.
10. A Gravely product registration card is supplied with each Gravely Product. Please complete the card and return it to Gravely at the address listed on the card. The equipment registration card will be used by Gravely for:
 - a. Recording date of purchase.
 - b. Notification of owners in compliance with the Consumer Product Safety Act, should any notification be necessary.The return of such card is necessary for your warranty to be effective.
11. This Warranty is not subject to change or modification by anyone, including Gravely dealers and no Gravely dealer is authorized to make any representations or promises on Gravely's behalf.

 **GRAVELY**

One Gravely Lane, Clemmons, NC 27012