



**REAR PTO
OPERATOR'S MANUAL**

FORM NO. 45967(7-88)

PART NO. 45965

PRINTED IN USA
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NOTE

Read this manual carefully and learn to operate and service your rear PTO before using it.

To keep the warranty, the rear PTO must be maintained and operated as directed in this manual.

All references to "left-side", "right-side", "front", and "back" are given from the operator's position.

Use the serial number to ensure prompt and correct service when ordering parts, requesting service, or making inquiries.

REAR PTO SERIAL NUMBER _____



Look for this symbol to point out important safety precautions. It means—ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED.

INSTRUCTIONS FOR SAFE OPERATION

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SECTION 1

INSTRUCTIONS FOR SAFE OPERATION

Improper use of this rear PTO can injure people and damage the equipment. People using or servicing this rear PTO must read and follow the instructions in this manual.

It is important to understand that this manual and any other Gravely instruction manuals do not cover every possible danger. It is impossible for Gravely to know all possible dangers in operating and servicing the equipment.

The purchaser must give these instructions to the people operating and maintaining this rear PTO. These people must use eye and foot protection.

1.1 Preparation:

1. Read this manual, the tractor operator's manual and tiller operator's manual carefully. Be familiar with all controls and follow the safety precautions outlined in these manuals. Know how to STOP the tractor and tiller quickly in an emergency.
2. Inspect and clear the work area (prior to tilling) of rocks, glass, metal, bones, and any other foreign objects that might be picked up and thrown or tangled in the tiller. Stay alert for holes and other hidden hazards.
3. Do not wear loose fitting clothing or accessories that might get caught in moving parts or on the controls. Keep hands, feet, hair, clothing, etc., away from moving parts.
4. Keep safety devices, interlocks, and shields in place at all times.
5. Put the PTO in the "OFF" position when the tiller is not in use or is being transported.
6. Maintain the tiller and rear PTO in good condition. Keep the equipment as directed in the tractor, tiller, and rear PTO operator's manuals.
7. Follow instructions listed on decals.

1.2 Operation:

1. Read the tractor and tiller operator's manuals for safely engaging and disengaging the tiller. Know how to STOP the tiller quickly in an emergency. Raise tiller before starting engine.
2. Keep bystanders and pets removed from the work area and a safe distance away.
3. Do not allow children to operate the equipment, nor allow adults to operate it without their having knowledge of safe operating practices.

SECTION 2
SERVICE INSTRUCTIONS

4. Do not use the equipment after dark without adequate lighting.
5. Operate the tiller from the operator's position on the seat of the tractor.
6. Use caution when transporting tiller. Be careful when crossing dips in terrain to avoid dragging tiller. Keep PTO in "OFF" position. Use suggested weight accessories to increase steering control.
7. After striking a foreign object, STOP the engine, put the PTO in the "OFF" position, and lower tiller before inspecting for damage. Any damage must be repaired before restarting the equipment.
8. Disengage power to the tiller and STOP the engine before clearing the unit.
9. Observe ground to be cultivated. Plan a route (for seedbed preparation).
10. To begin, keep tiller raised in transport position. Run engine at full throttle.
11. Select the tractor's lowest ground speed and engage forward motion, then lower tiller.
12. Always till slowly over rough ground and on hillsides. Till at speeds slow enough to insure your safety. Be alert for holes, ditches, and other irregularities that may cause the tractor to overturn.
13. When tilling loose ground (well established loamy garden soil), increase ground speed to cover more ground in less time and still do a good job.
14. Do not back up with tiller down. Raise tiller to transport position before backing up or turning sharply.
15. Do not stop or start suddenly when going up or downhill.
16. Avoid steep hillside operation which could cause the tractor to overturn. Reduce speed when turning so there is no danger of the tractor overturning.
17. Always look behind you when backing up.
18. Never leave the equipment running when unattended— always STOP engine and put the PTO in the "OFF" position and lower tiller before leaving the machine.

SECTION 2

SERVICE INSTRUCTIONS

2.1 Lubrication:

1. Apply grease to the shaft bearings in the axle bearing retainer after every 8 hours of use. Apply multi-purpose grease to the grease fitting until it comes out around the shaft.
2. Check the oil level in the chain box after every 40 hours of use. Hold the gear box in a vertical position. Remove the lower plug (see Figure 1). Fill with SAE 30W-40 oil until it is level with the hole. Replace the plug.

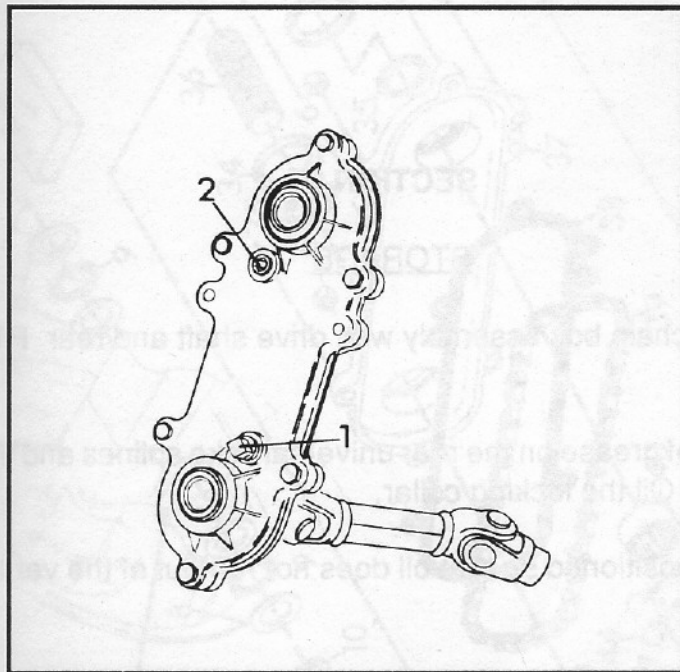
2.2 Installation and Removal:

- 2.1 Clean the shaft in the axle bearing retainer and the PTO shaft. Coat these shafts with grease.
- 2.2 Turn the engine "OFF" and put the PTO control in the "ON" position.
- 2.3 Depress the locking collar on the chain box and hold it in position while sliding it onto the transmission PTO shaft. Release the locking collar and slide the gear box back and forth on the transmission PTO shaft until it locks in place. Putting the PTO in the "ON" position (engine off) will assist. Be sure to reposition the PTO control in the "OFF" position.
- 2.4 Move the bracket on the chain box to the "UP" position.
- 2.5 Swing the chain box up while guiding the universal drive shaft onto the shaft in the axle bearing retainer. Rotate the shaft so that the hole in the shaft aligns with the hole in the yoke of the universal drive shaft.
- 2.6 Retain the universal drive shaft to the shaft with a bolt and lock nut.
- 2.7 Put a flat washer on the 1/2" bolt and slide it just through the tractor frame from the outside. Put two flat washer on the bolt and slide the bolt through the bracket. Put a lock nut on the bolt.

NOTE: See Section 5.2. If the rear PTO is being installed on a tractor which requires the rear PTO bracket with a "hook", put the hook of the bracket over the cross shaft of the tractor. Tighten the 3/8" bolt which fastens the bracket to the chain box, then procede to Step 2.9.

- 2.8 Tighten the 1/2" bolt and 3/8" bolt which connect the bracket to the tractor frame and the chain box.
- 2.9 To remove, reverse the installation process. Be sure the engine is "OFF" before the PTO control is put in the "ON" position.

ILLUSTRATED PARTS AND PARTS LIST



1 - Pipe Plug

2 - Vent Plug

FIGURE 1

SECTION 2

SERVICE INSTRUCTIONS

2.1 Lubrication:

1. Apply grease to the shaft bearings in the axle bearing housing after every 6 hours of use. Apply multi-purpose grease to the grease fitting and grease cup around the shaft.
2. Check the oil level in the chain box after every 40 hours of use. Hold the gear box in a vertical position. Remove the lower plug (see Figure 7). Fill with SAE 30W-10 oil until it is level with the hole. Replace the plug.

2.2 Installation and Removal:

2.1 Oil up the chain in the axle bearing housing and the PTO shaft. Coat these shafts with grease.

2.2 Turn the engine "OFF" and put the PTO control in the "ON" position.

2.3 Secure the locking collar on the PTO shaft. Put the locking collar and side the gear box. Tighten the transmission PTO shaft. Put the locking collar and side the gear box. Tighten the

SECTION 3

STORAGE

- 3.1 Remove rear PTO chain box assembly with drive shaft and rear PTO bracket from the tractor.
- 3.2 Clean and put a film of grease on the rear universal yoke splines and the PTO shaft splines at the locking collar. Oil the locking collar.
- 3.3 Store in a dry place positioned so that oil does not run out of the vented plug at the top of the chain box.

2.6 Rotate the universal drive shaft from back to front a bit and lock out.

2.7 Put a flat washer on the 1/2" bolt through the tractor frame from the outside. Put two flat washer on the 3/8" bolt and the rest through the bracket. Put a lock nut on the bolt.

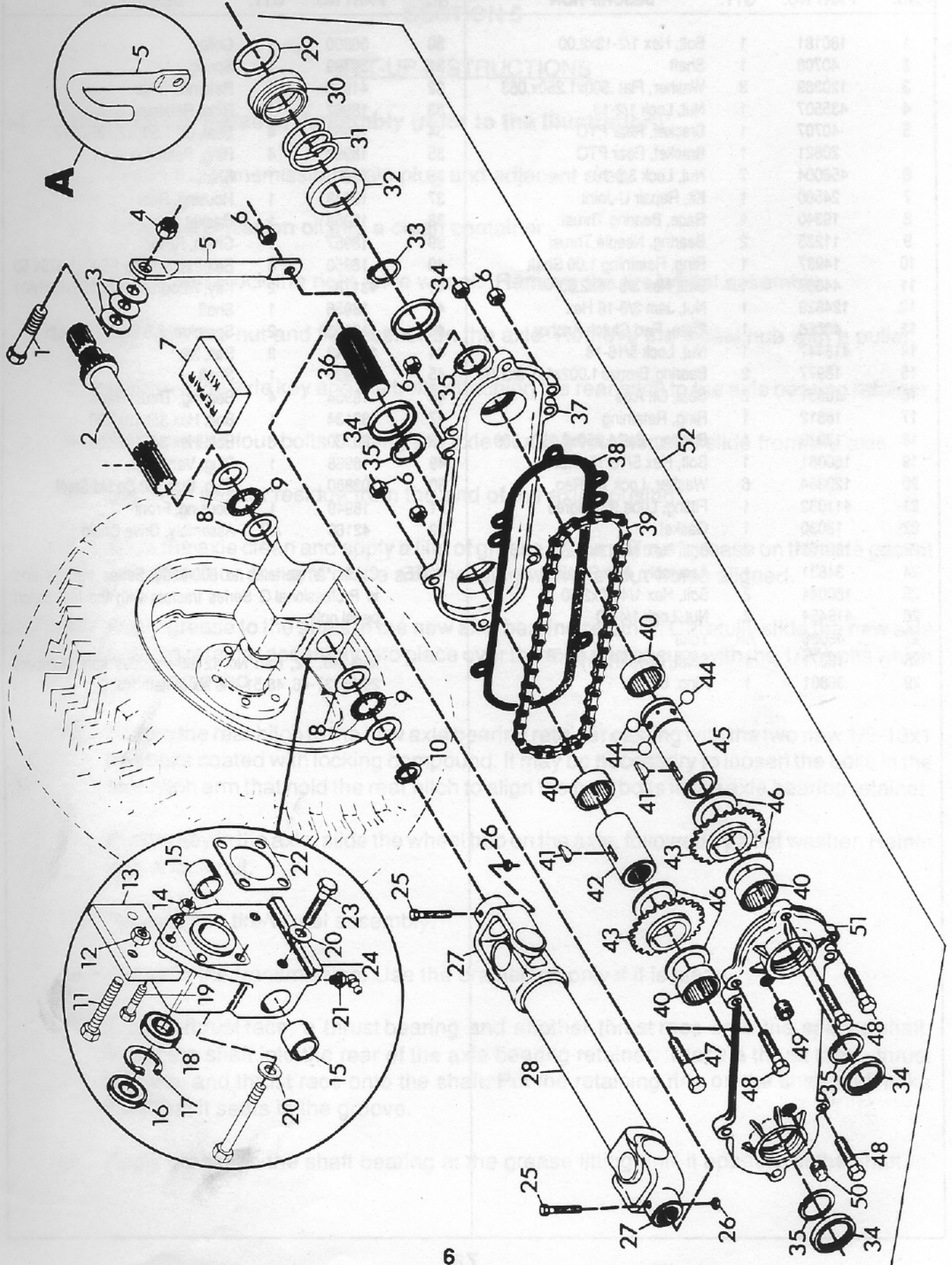
NOTE: See Section 5.2 if the rear PTO is being installed on a tractor which requires the rear PTO bracket with a "hook" which hooks on the bracket over the cross shaft of the tractor. Tighten the 3/8" bolt which fastens the bracket to the chain box, then proceed to Step 2.8.

2.8 Tighten the 1/2" bolt and 3/8" bolt which connect the bracket to the frame and the chain box.

2.9 To remove, reverse the installation process. Be sure the engine is "OFF" before the PTO is moved in the "OFF" position.

SECTION 4

ILLUSTRATED PARTS AND PARTS LIST



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ITEM NO.	PART NO.	QTY.	DESCRIPTION	ITEM NO.	PART NO.	QTY.	DESCRIPTION
1	180181	1	Bolt, Hex 1/2-13x2.00	30	36800	1	Collar
2	40708	1	Shaft	31	36799	1	Spring
3	120389	3	Washer, Flat .500x1.250x.083	32	41996	1	Retainer, Inner
4	435507	1	Nut, Lock 1/2-13	33	18962	1	Ring, Retaining
5	40707	1	Bracket, Rear PTO	34	18961	4	Seal, Oil 1.500x2.125x.312
	20821	1	Bracket, Rear PTO	35	18960	4	Ring, Retaining
6	456004	7	Nut, Lock 3/8-16	36	18972	1	Shaft
7	24560	1	Kit, Repair U-Joint	37	18948	1	Housing, Rear
8	19340	4	Race, Bearing Thrust	38	18958	1	Gasket
9	11225	2	Bearing, Needle Thrust	39	18957	1	Chain, Roller
10	14987	1	Ring, Retaining 1.00 Shaft	40	18950	4	Bearing, Needle 1.500x1.875x.50
11	44609	1	Bolt, Hex 3/8-16x2.50	41	431787	2	Key, Woodruff .187x.625 Hard #61
12	124829	1	Nut, Jam 3/8-16 Hex	42	18956	1	Shaft
13	46066	1	Plate, Fwd Clutch Anchor	43	18953	2	Sprocket, 5/8 Pitch 14 Teeth
14	413447	1	Nut, Lock 5/16-18	44	145643	3	Ball, 3/8
15	18977	2	Bearing, Bronze 1.002x1.378x1.00	45	41995	1	Shaft
16	18031	2	Seal, Oil Axle	46	18954	4	Bearing, Thrust Race
17	18812	1	Ring, Retaining	47	180134	1	Bolt, Hex 3/8-16x2.50
18	18029	1	Bearing, Ball 1.250x2.250x.500	48	180130	6	Bolt, Hex 3/8-16x2.00
19	180081	1	Bolt, Hex 5/16-18x1.25	49	18968	1	Plug, Vented
20	120384	6	Washer, Lock 1/2 Reg.	50	103880	1	Plug, Pipe .50 Sq Hd Steel
21	411032	1	Fitting, Lube 90 Degree	51	18949	1	Housing, Front
22	18030	1	Gasket	52	42160	AR	Assembly, Drive Chain
23	180175	2	Bolt, Hex 1/2-13x1.25				
24	34831	1	Assembly, Axle Retainer				
25	180044	2	Bolt, Hex 1/4-20x2.00				
26	419454	2	Nut, Lock 1/4-20				
27	46086	AR	Yoke				
28	18971	1	Shaft, Drive (Rear)				
29	36801	1	Ring, Snap				

NOTE: Circle "A" pertains to 800/8000 Series tractors and to Professional G Series tractors with the foot clutch pedal only.

Item No. 52, Part No. 42160 includes Item Numbers 29-35, 37-46, 48-51 and six of Item No. 6.

SECTION 5

SET-UP INSTRUCTIONS

5.1 Axle Bearing Retainer Assembly (refer to the illustration):

1. Clean the transmission drain plug and adjacent area.
2. Drain transmission oil into a clean container.
3. Raise and block the right drive wheel. Remove the tire/wheel assembly.
4. Remove the nut and flat washer on the axle. Remove the wheel hub with a puller.
5. Remove the axle key and the bolts attaching the rear hitch to the axle bearing retainer.
6. Remove the four bolts holding the axle bearing retainer and slide from the axle.
7. Clean all gasket residue from the end of the axle housing.
8. Wipe the axle clean and apply a film of grease. Wipe a film of grease on the axle gasket and stick it on the end of the axle housing with the four holes aligned.
9. Apply grease to the seals in the new axle bearing retainer. Carefully slide the new axle bearing retainer assembly into place over the axle and secure with the 1/2" bolts which were removed.
10. Fasten the rear hitch to the new axle bearing retainer casting with the two new 1/2-13x1 hex bolts coated with locking compound. It may be necessary to loosen the bolts in the rear hitch arm that hold the rear hitch to align the new bolts in the axle bearing retainer.
11. Put the key in the axle, slide the wheel hub on the axle, followed by a flat washer. Retain with a lock nut.
12. Replace the tire/wheel assembly.
13. Put oil in the transmission. Use the drained oil only if it is clean.
14. Slide a thrust race, a thrust bearing and another thrust race onto the splined shaft. Insert the shaft into the rear of the axle bearing retainer. Place a thrust race, thrust bearing, and thrust race onto the shaft. Put the retaining ring on the shaft and make sure that it seats in the groove.
15. Apply grease to the shaft bearing at the grease fitting until it appears at the shaft.

5.2 Chain Box Assembly (refer to the illustration):

1. Bolt the bracket to the rear side of the chain box with a 3/8 bolt and lock nut. Do not completely tighten.

NOTE: 800/8000 Series tractors and Professional G Series tractors with the foot clutch pedal use the bracket with the "hook". 8000-G Series and Professional G Series tractors with the hand operated forward-reverse lever use the other bracket.

2. Slide the shaft into the universal yoke so that the holes align. Secure with a 1/4x2 bolt and lock nut.
3. Slide the shaft into the rear side of the chain box.

SECTION 6

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 EXPRESSED 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**

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