

GRAVELY®

A DIVISION OF CLARKE-GRAVELY CORPORATION
A Studebaker-Worthington Company

22161 Rotary Plow
Form No. 22410 (9-77)
Printed in USA



GENERAL

1. The Rotary Plow is a front mount unit designed and built to give many years of excellent service. The plow is recommended for all soil conditions in which a conventional moldboard plow would operate. The unit has all gear drive from the engine to the ground, variable width and depth.
2. The Owner's Manual includes parts list, set up, safety, operation, and maintenance instructions. Use the parts list for reference to individual part numbers. Contact the Gravelly Dealer for further information.
3. Cutting Width: 10" Effective Maximum
Overall Length: 36 Inches
Weight: 118 lbs.
Purpose: One step seedbed preparation.
Drive: Right angle bevel gears, roller bearings, cast iron housing.
Blades: Hi-strength carbon steel
Features: Variable width and depth of furrow.

Recommended Tractors:
All convertible tractors
All riding tractors

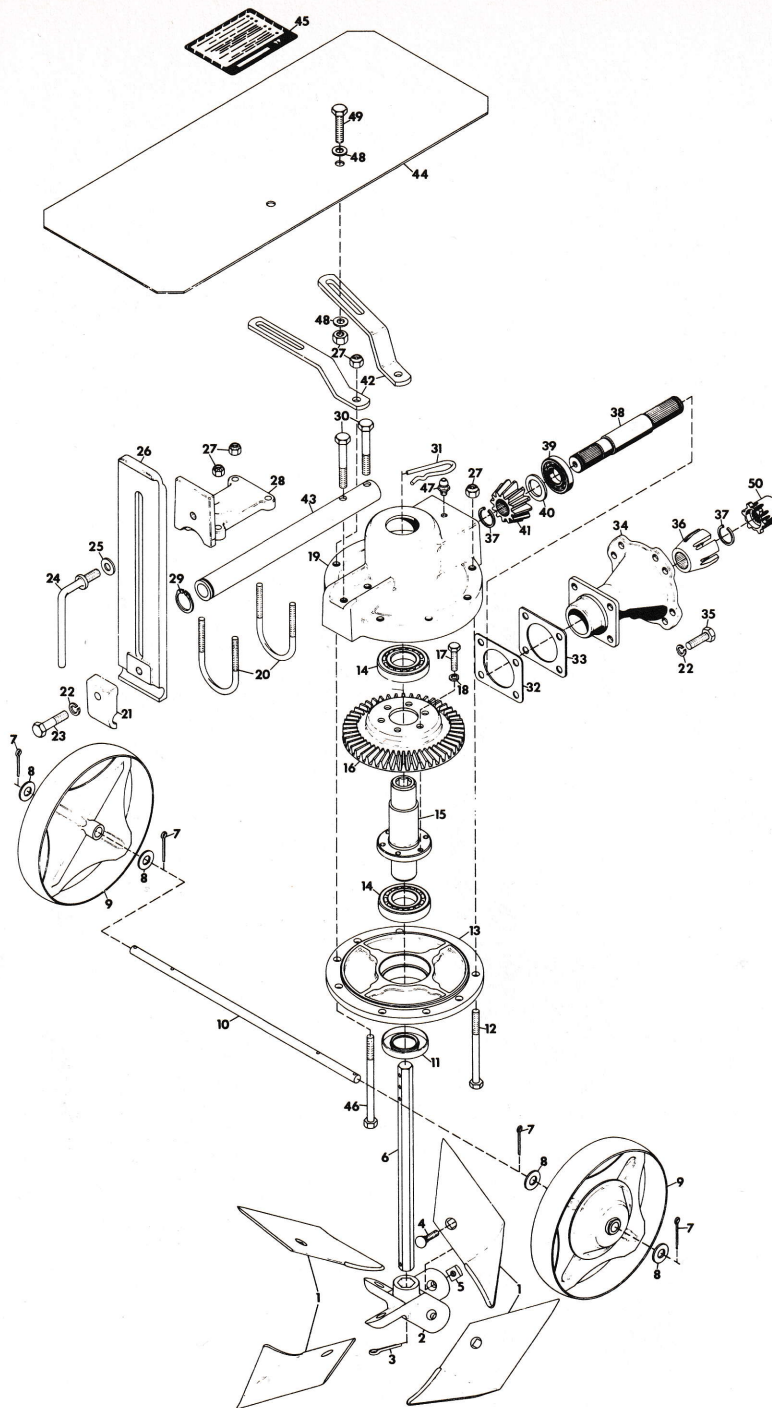
Additional Equipment Required:
Convertible - None
Riders - Front Drive Kit
Front Adapter Kit
Retrofit Kit

Recommended Additions:
Convertible - None
Riders - Individual Wheel Brakes
800 Series Front Wheel Weights

Remarks:

Tractors may be difficult to steer when plowing the first furrow or on rocky ground but not otherwise if properly adjusted and if the ground is plowable. Also, the rear wheels of riding tractors should be in the inboard position.

TO CONTINUE ITS PROGRAM OF QUALITY AND DESIGN IMPROVEMENTS, THE MANUFACTURER RESERVES THE RIGHT TO CHANGE SPECIFICATIONS, DESIGNS AND PRICES WITHOUT NOTICE AND WITHOUT INCURRING OBLIGATION



ITEM NO.	PART NO.	DESCRIPTION	ITEM NO.	PART NO.	DESCRIPTION
1	13468	Blade, Right Spade	25	120390	Washer, Flat; 562 x 1.375 x .109
2	13467	Hub, Rotor	26	22236	Bracket, Wheel
3	103422	Pin, Cotter; .250 x 2.00	27	413534	Nut, Lock; 3/8-16 Type N
4	11709	Bolt, Plow; 1/2-13 x 1.5	28	22234	Swivel, Wheel Bracket
5	125536	Nut, Square; 1/2 - 13	29	22232	Ring, Retaining; 1.938 Shaft
6	5310	Axle, Rotor	30	180188	Bolt, Hex; 1/2 - 13 x 2.75
7	137253	Pin, Cotter; .188 x 1.625	31	13466	Pin, Depth Adjusting
8	131017	Washer, Flat; .812 x 1.468 x .134	32	22230	Shim, .005
9	5327	Wheel, Depth	33	22231	Shim, .020
10	5311	Axle, Depth Wheel	34	22228	Housing, Drive Shaft
11	22223	Seal, Oil; 2.165 x 3.250 x .375	35	180175	Bolt, Hex; 1/2 - 13 x 1.25
12	187070	Bolt, Hex; 3/8 - 16 x 2.562	36	22240	Clutch, Dog
13	22222	Plate, Gear Housing	37	22242	Ring, Retaining; .937 Shaft
14	22241	Bearing, Ball; 2.165 x 3.543 x .709	38	22225	Shaft, Drive
15	22219	Hub, Bevel Gear	39	22229	Bearing, Ball; .984 x 2.047 x .591
16	5315	Gear, Bevel	40	22226	Race, Thrust; 1.002 x 1.552 x .155
17	180121	Bolt, Hex; 3/8 - 16 x .875	41	22227	Pinion, Bevel Rotary Plow
18	120382	Washer, Lock; 3/8 SP	42	22238	Support, Shield
19	22221	Housing, Gear	43	22232	Tube, Support
20	22235	U-Bolt; 3/8 - 16	44	5324	Shield, Dirt
21	5304	Clamp, Axle	45	19479	Decal, Caution
22	120384	Washer, Lock; 1/2 SP	46	180137	Bolt, Hex; 3/8 - 16 x 2.75
23	180177	Bolt, Hex; 1/2 - 13 x 1.50	47	411027	Fitting, Lube; 1/4 - 28
24	5325	Screw, Wheel Bracket Clamp	48	120394	Washer, Flat; .406 x .812 x .065
			49	180120	Bolt, Hex; 3/8 - 16 x .75
			50	21343	Attachment, Dog

ASSEMBLY

1. Install a cotter pin (item 7) in each inside hole at both ends of the gauge wheel axle (item 10).
2. Slide on a washer (item 8), wheel (item 9) and washer (item 8) to each side (wheel cap hub to the inside). Fasten them with cotter pins (item 7).

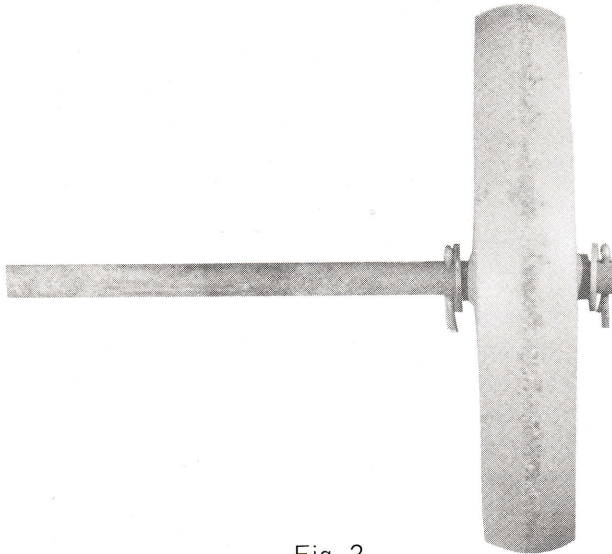


Fig. 2

3. Clamp the axle to the wheel bracket (item 26) with the axle clamp (item 21) with bolt (item 23) and lock washer (item 22). The axle goes in the groove of the wheel bracket.

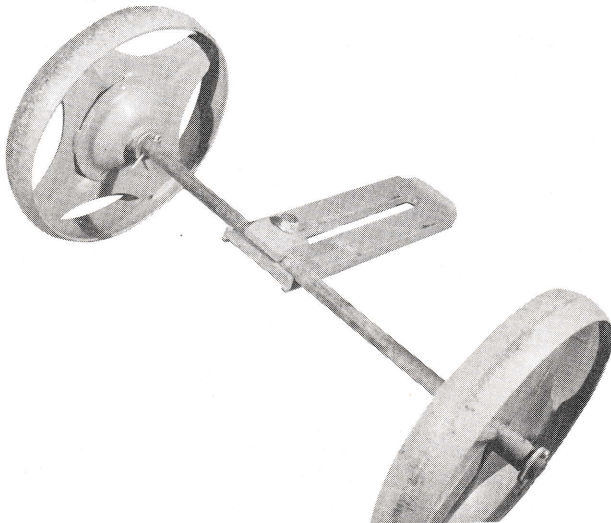


Fig. 3

4. Fasten the wheel bracket swivel (item 28) to the wheel bracket with the wheel bracket clamp screw (item 24) and flat washer (item 25).

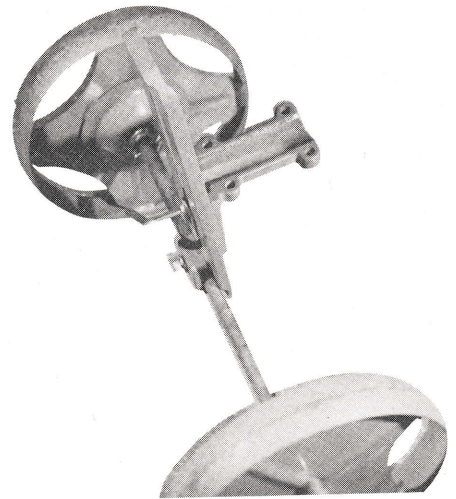


Fig. 4

5. Fasten the support tube (item 43) to the wheel bracket swivel with the U-bolts (item 20) and nuts (item 27). The end of tube with retaining ring goes towards the wheel bracket. Leave bolts loose enough to allow tube to swivel.

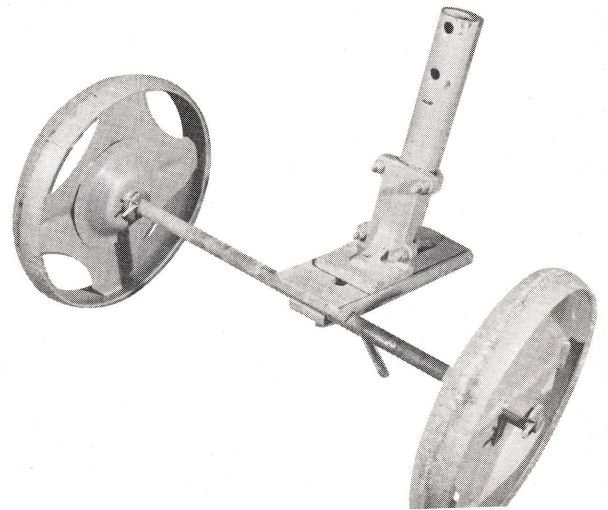


Fig. 5

6. Fasten the plow drive to the support tube with the bolts (item 30).

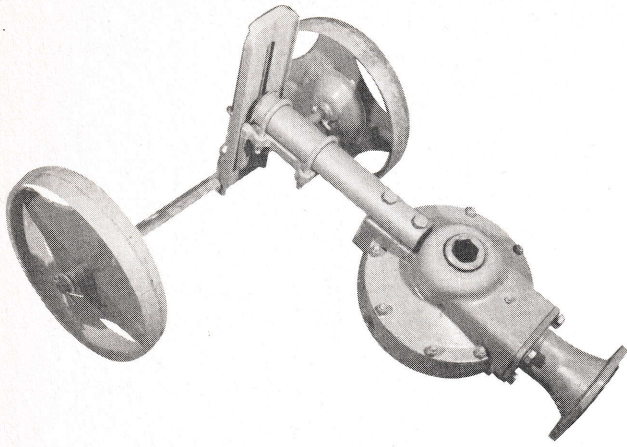


Fig. 6

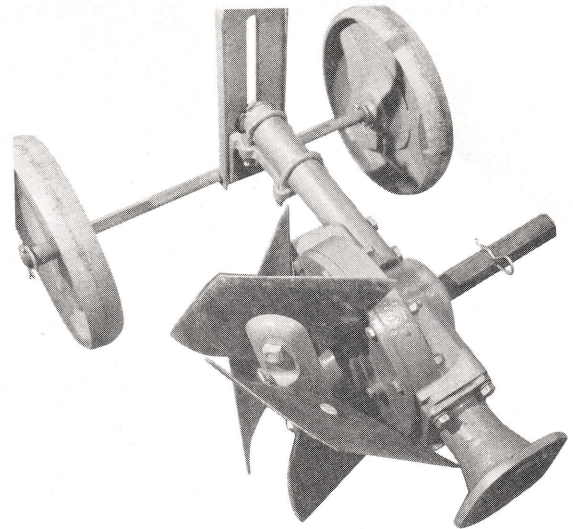


Fig. 8

7. Fasten the blades (item 1) to the hub (item 2) with the plow bolts (item 4) and square nuts (item 5). The curved blunt ends go down.
8. Install the cotter pin (item 3) in the rotor axle (item 6) at the end with only one hole.
9. Slide the rotor axle up through the bottom of the rotor hub (the curved tip side of blades is the bottom).

11. Fasten the braces (item 42) to the dirt shield (item 44) with bolts (item 49) washer (item 48) and bolt (item 27). Use the slotted end of the braces. The decal is on the top of the dirt shield, the braces go on the bottom of the shield.

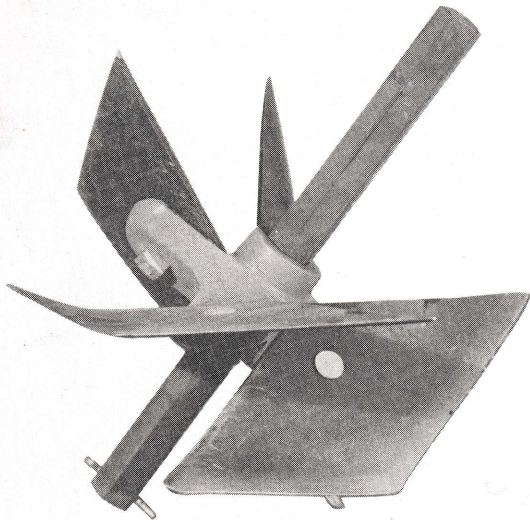


Fig. 7

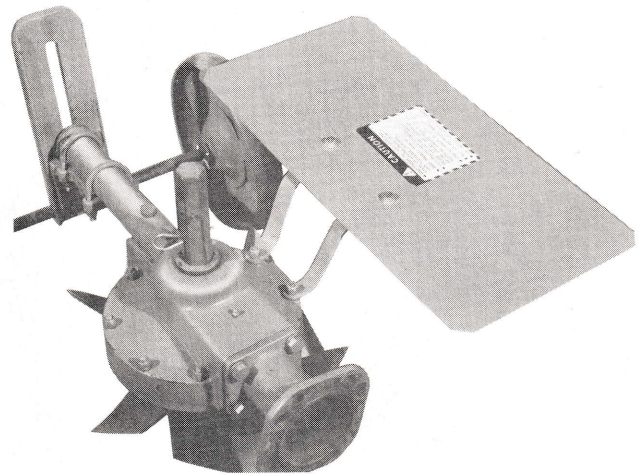


Fig. 9

10. Turn the drive on its side. Slide the rotor axle (with blades) through the drive from the bottom side (the top side has the lube fitting) and put the depth adjusting pin (item 31) in the third hole from the end (easiest for transporting).

12. Remove the nuts from the bolts on the right side of the gearbox. Place the shield braces over the bolts and secure with nuts removed.

LUBRICATION

The gearbox is pre-lubricated at the factory. Lubricate the gearbox through the grease fitting on the top with general purpose grease every 40 operating hours. Add grease until it comes out about the gear hub. Wipe off excess grease.

INSTALLATION

1. Slide the attachment dog (item 50) over the splined shaft of the tractor PTO.

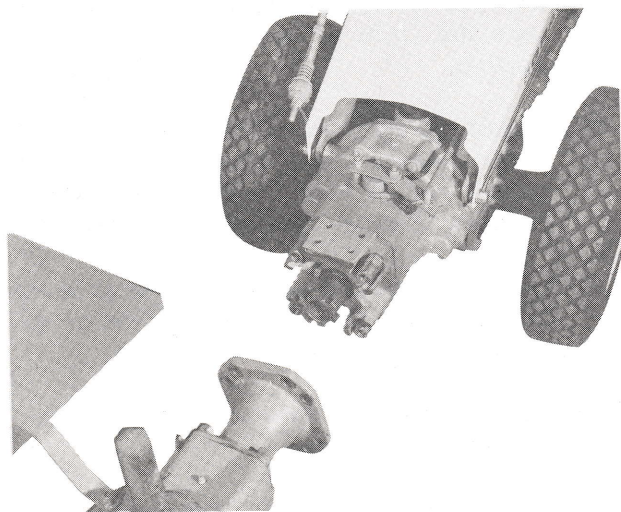


Fig. 10

2. Bolt the plow to the tractor using the four bolts making sure the attachment dog meshes with the clutch dog on plow drive.

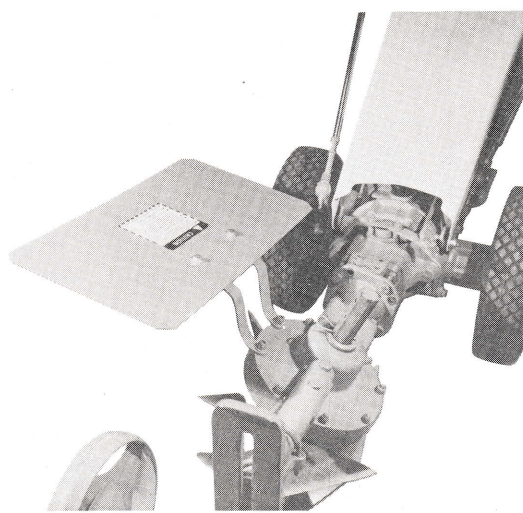


Fig. 11

ADJUSTMENTS

Note: All references to right and left are made from the operators position (at the handles of the tractor).

1. **DEPTH OF CUT:** Put the depth adjusting pin in the top hole of the axle for maximum depth. Put the pin in the third hole for minimum depth.
2. **WIDTH OF CUT:** Move the right gage wheel (the one in the furrow) closer to the wheel bracket assembly to make the width of the cut less. Loosen the axle clamp to slide the axle and then retighten.
3. **PLOW ANGLE:** The plow has two angle adjustments. Vertical for digging holes and angled adjustment for plowing.
4. **GAUGE WHEEL SWIVEL:** Tighten the nuts on the U-bolts to decrease the freedom of the swivel action. Loosen the nuts to increase the freedom of swivel. The wheel assembly should be free enough to follow ground contour but tight enough not to pivot under its own weight when lifted off the ground.
5. **FRONT TO REAR LEVELING:** Move the gear housing extension assembly up or down on the wheel bracket to make the gear housing level (front to rear) with the furrow. Loosen the clamp screw to adjust and then retighten.
6. **DIRT SHIELD:** Position the shield down (by bending the braces) to direct the discharge dirt toward the just plowed furrow. Position it up to discharge the dirt away from the just plowed furrow.
7. **OVERLOAD CLUTCH:** See tractor Owner's Manual for Clutch Adjustment.

SAFETY

1. **READ THE TRACTOR OWNERS MANUAL.** Be familiar with all controls and follow the safety precautions outlined in the manual.
2. **DO NOT ALLOW PASSENGERS** to accompany the operator at any time.

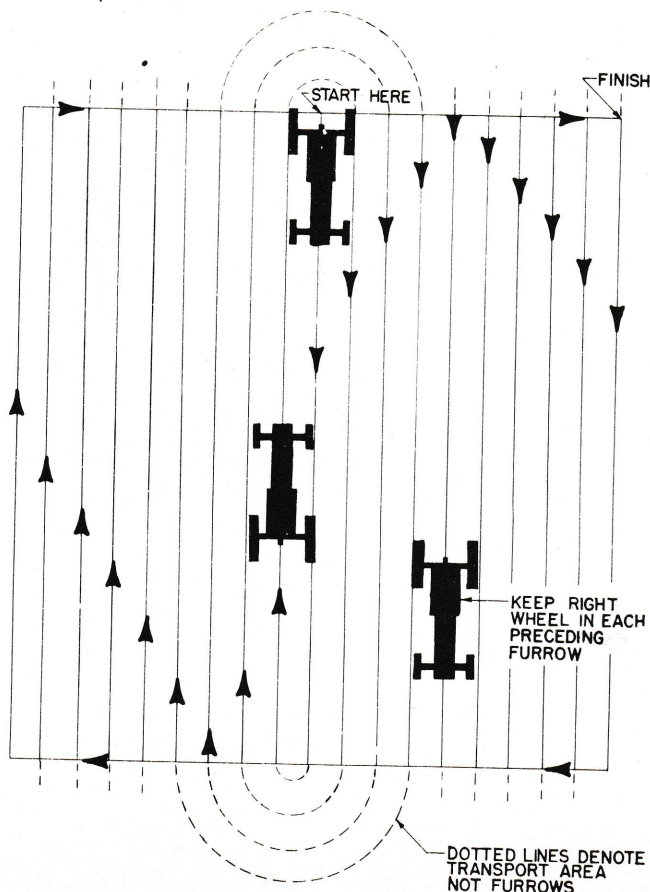
3. DO NOT ALLOW CHILDREN to operate the equipment, nor allow adults to operate it without proper instructions.
4. INSPECT WORK AREA for rocks, glass, metal, bones, and any foreign objects. Stay alert for holes and other hidden objects.
5. DO NOT OPERATE equipment except from proper position.
6. KEEP SAFETY devices and shields in place at all times.
7. DISENGAGE POWER to attachment and stop engine prior to making any adjustment or clearing the unit.
8. DO NOT WEAR LOOSE fitting clothes.
9. KEEP HANDS, feet, hair, clothing, etc., away from moving parts.
10. KEEP BYSTANDERS and pets removed and away from the work area.
11. DIRECT DISCHARGE so as not to endanger life or property; such as people, pets, structures, cars, etc.
7. Adjust for less width of cut when plowing deep in hard soil.
8. Adjust the front to rear leveling when the right gauge wheel and tractor wheel are in the furrow.
9. Adjust for less depth and/or less width of cut when plowing in very hard soil.
 - A. If maximum depth is necessary, adjust for less width of cut.
 - B. If intermediate depth is satisfactory, adjust for as wide a cut as possible.
10. Use the dirt shield to direct the discharge and to help break up the soil.
11. Use the minimum depth adjustment and raise the front of gear housing for transporting.
12. Adjust the overload clutch if the plow stalls under moderate load while the engine and tractor wheels keep running. See tractor Owner's Manual for clutch adjustment.
13. Use the suggested plowing route as in fig. 12. Reverse the route every 3rd or 4th plowing season.
14. Steering may be difficult in hard ground not previously turned.
15. Soil conditions determine the depth, width and forward speed that ground can be plowed.

OPERATING TIPS

Note: See the ADJUSTMENTS section for the procedures to make the adjustments.

1. A few trial adjustments may be necessary before the plow is "tuned" (adjusted) to soil conditions.
2. Use the tractor's lowest ground speed.
3. Operate the tractor at full throttle.
4. When plowing, walk behind the tractor handles - not between them.
5. Allow the tractor to "float" over uneven ground. Let the plow and tractor do all the work.
6. Pivot tractors by bearing down on the handles (raising the plow out of the ground) until the tractor is balanced. Hold back on the right handle and the engine will pivot the tractor around to the right.

Fig. 12



OPERATION

1. Refer to the Tractor Owners Manual for safety and operating instructions to engage and disengage the PTO (power take-off). Read the ADJUSTMENT and OPERATING TIPS section of manual before attempting to plow.
2. Observe the ground to be plowed. Plan the procedure for plowing (starting point, turns, etc.) before beginning. Before starting, mark the point where the first furrow should end to provide a guide for maintaining a straight furrow. Other furrows are plowed with the right gauge wheel in the previously plowed furrow.
3. Preliminary Set-up for the First Furrow:
Depth of Cut: Maximum
Front to Rear Leveling: Slight front down
Dirt Shield: Down
Width of Cut: Center the axle
4. At the point beginning the first furrow, raise the plow off the ground, engage the PTO, and (with engine at full throttle) lower the plow into the ground; no ground speed (forward motion) at this time.
5. After the plow has made a hole and is no longer discharging, start forward motion. Use the tractor's lowest ground speed and full engine throttle.
6. If the ground is so hard that it stalls the plow, adjust for less depth.
7. At the end of the first furrow, pivot the tractor and start the second furrow by setting the right gage wheel in the just plowed furrow; use the same starting technique as in Paragraph 4 if necessary of Operation.
8. With gauge wheel and the tractor in the furrow, the plow will cut deeper on the second and remaining furrows than on the first.
9. If the ground is so hard that it stalls the plow, adjust for less width and/or depth of cut.
10. When 4 of 5 furrows away from the first furrow, raise the dirt shield to allow a smooth spread of discharge.

11. A few trial adjustments may be necessary before the plow is "tuned" (adjusted) to soil conditions.

ROUTINE MAINTENANCE

1. SEE LUBRICATION.
2. Between plowing operations, apply a light coat of general purpose grease to the plow blades to prevent rust.
3. Periodically, check all nuts and bolts to insure tightness.
4. Clear the unit of dirt and debris.

REMOVAL FROM TRACTOR

1. Reverse the procedure for attaching; see INSTALLATION.

STORAGE

1. Clear the unit of dirt and debris.
2. Apply a light coat of oil to preserve the finish and appearance.
3. Apply a heavy coat of general purpose grease to the plow blades to prevent rust.

LIMITED WARRANTY

This Limited Warranty is issued by Clarke-Gravely Corporation, Gravely Division, and consists of the following terms:

1. Only the original purchaser of new Gravely equipment is covered by this Warranty.
2. This Warranty covers repair or replacement of parts manufactured by Gravely which are defective in material or workmanship. Gravely will pay for parts and labor only.
3. The Warranty starts the date of purchase and lasts for NINETY (90) DAYS for products used in commercial applications, and TWELVE (12) MONTHS for products used by the owner to maintain his personal residence. Commercial means any use other than to maintain the grounds around the personal residence of the owner of the product.
4. Some components of Gravely equipment are not covered by the Gravely Warranty. These components are covered by the original manufacturer's warranty, they are:
 - (a) Engines - Onan and Briggs & Stratton
 - (b) Tires - Goodyear, Goodrich & Carlisle
 - (c) 34" Mower Gear Box - Peerless
5. To obtain warranty service on Gravely equipment including components 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 Warranty, they should be referred to:

Gravely Division
Clarke-Gravely Corporation
One Gravely Lane
Clemmons, North Carolina 27012
Attn: Manager of Customer Services

- (e) Warranty service on Gravely equipment must be performed by an authorized Gravely dealer or Gravely factory branch.

6. This Warranty does not cover the following:
 - (a) Transportation between owner's home or place of business and the dealership. If the dealer provides the transportation of the equipment, he will charge the owner his usual rate for such service.
 - (b) Normal maintenance services and normal replacement of items such as spark plugs, belts, oil, oil filters, air filters, and mower blades.
 7. GRAVELY MAKES NO OTHER EXPRESS WARRANTIES. ANY IMPLIED WARRANTIES, INCLUDING WARRANTIES AS TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE PERIOD SET OUT IN PARAGRAPH 3 ABOVE. SOME STATES DO NOT ALLOW LIMITATIONS ON HOW LONG AN IMPLIED WARRANTY LASTS, SO THE ABOVE STATEMENT MAY NOT APPLY TO YOU.
 8. GRAVELY SHALL HAVE NO RESPONSIBILITY FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE BREACH OF ANY WARRANTY, INCLUDING, BUT NOT LIMITED TO, INCONVENIENCE, RENTAL OR PURCHASE OF REPLACEMENT EQUIPMENT, LOSS OF PROFITS OR COMMERCIAL LOSS. 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 equipment registration card is supplied with each Gravely tractor or major attachment. 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 registration card is not required in order to take advantage of this Warranty.
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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