

# **GRAVELY**®

CLARKE-GRAVELY CORPORATION  
A Studebaker-Worthington Company

# OPERATOR'S MANUAL

**NAME: ROOFER BRUSH**

**PART NUMBER(S): 23185  
23322**



Read this manual carefully and understand how to operate and maintain the brush before attempting to use it. With proper operation and maintenance the brush will perform for many years to come. Knowing how to use the tractor and power brush is the largest part of getting the job done.

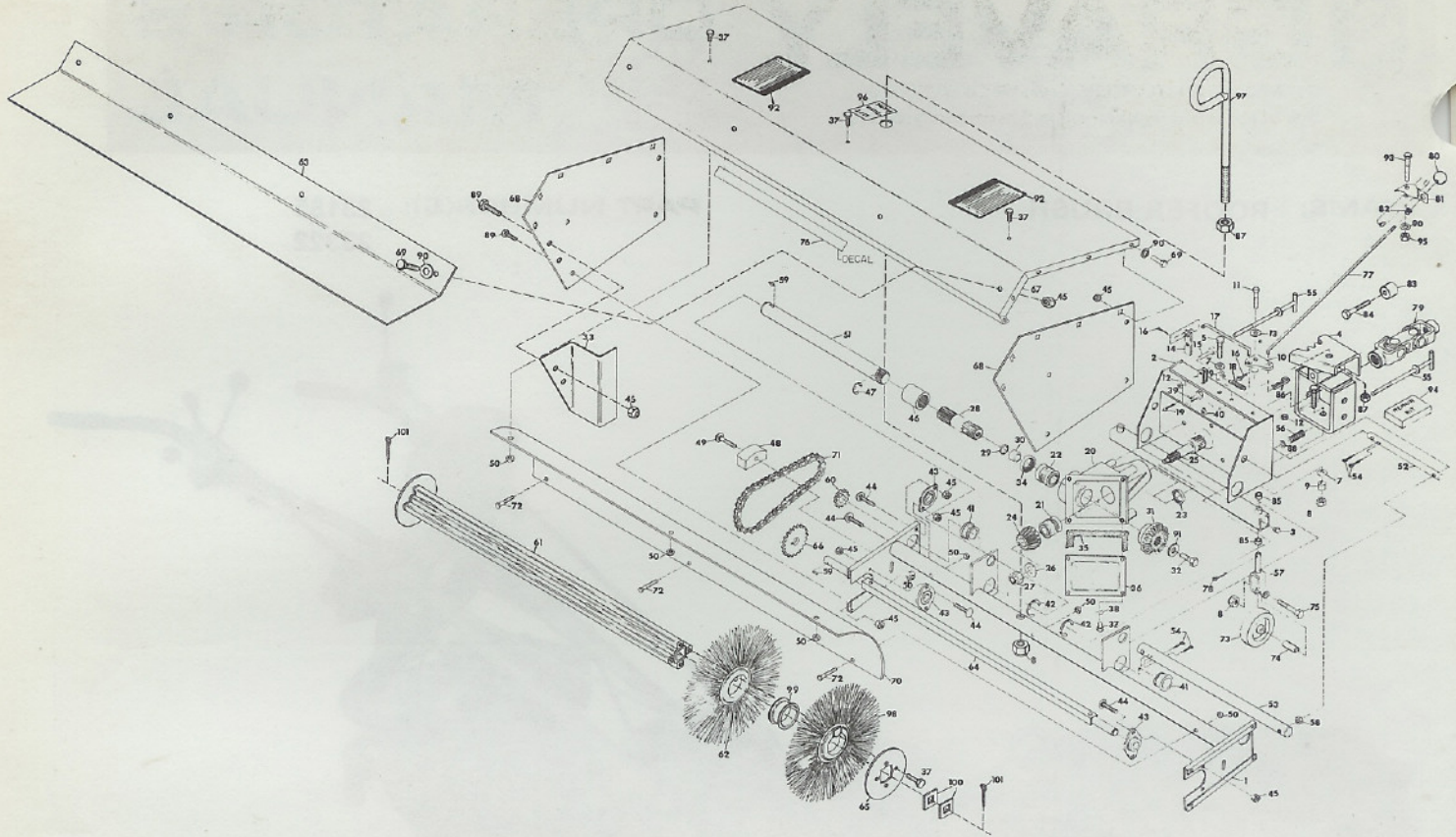
The 44" power brush is a front mount unit powered by the engine of the tractor. Power to the brush is controlled by the PTO (power take-off) of the tractor. After initial installation no tools are required to disconnect or reconnect the brush to the tractor.

This manual includes parts lists, set up, safety, operator and maintenance instructions. All references to right, left, front, rear are made from the operator's position at the handles of the tractor. Contact the Gravely Dealer for further information.

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.

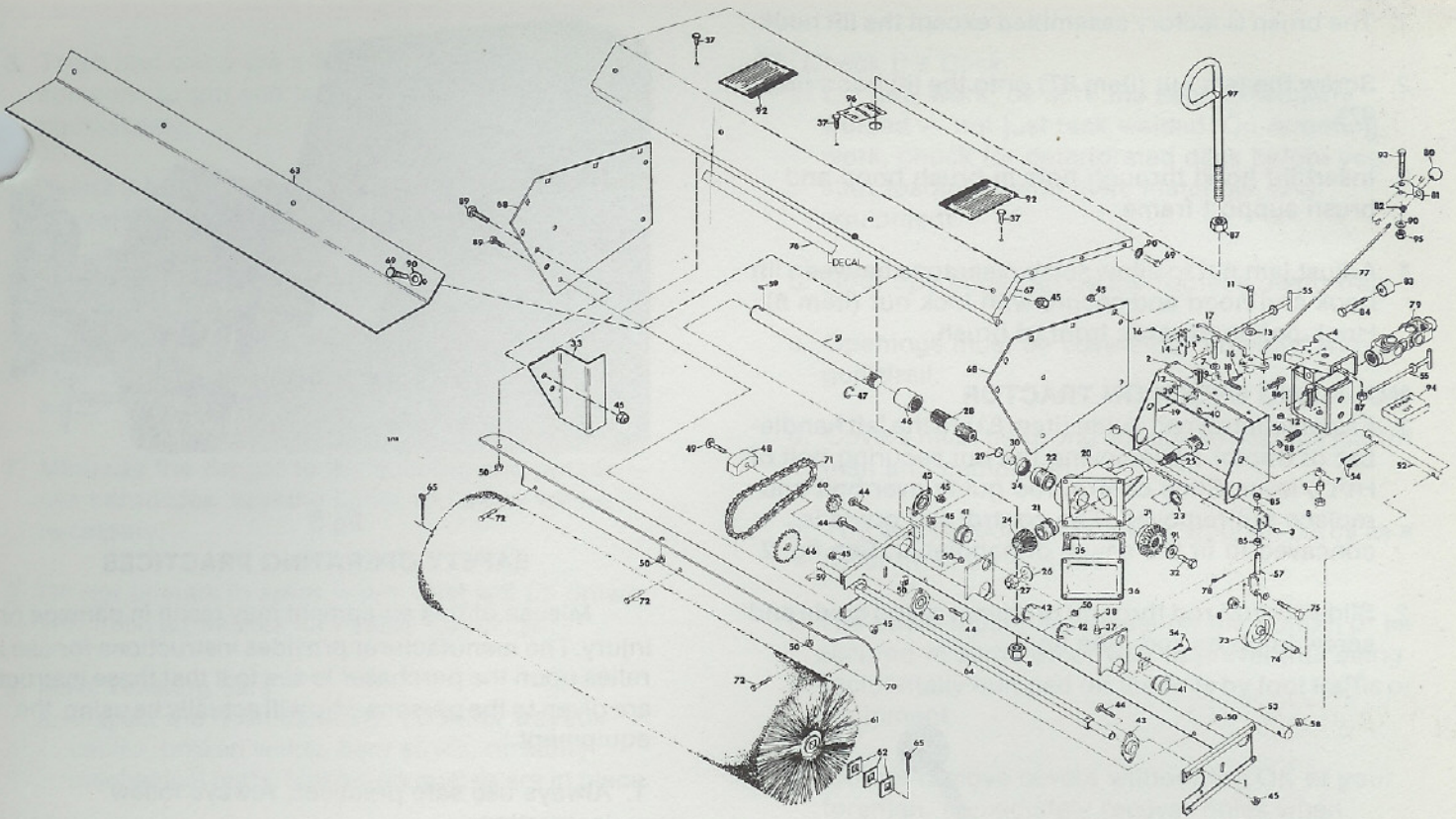
Form No. 23358 (9-77)

Printed in U.S.A.



ITEM NO.	PART NO.	DESCRIPTION	ITEM NO.	PART NO.	DESCRIPTION
1	23192	Frame, Brush Support	54	137204	Pin, Cotter; .125 x 1.500
2	19251	Weldment, Pivot Frame	55	19278	Weldment, Rod
3	411027	Fitting, Lube; 1/4-28	56	11779	Spring, Compression; 1.00 x .78 x 338 lb/in
4	22166	Weldment, Pivot Power Brush	57	11385	Weldment, Caster Fork
5	180175	Bolt, Hex; 1/2-13 x 1.250	58	120378	Nut, Hex; 1/2-13
6	180181	Bolt, Hex; 1/2-13 x 2.000	59	218211	Key, Woodruff; .250 x .750 Hard
7	120396	Washer, Flat; .500 x 1.062 x .095	60	19282	Sprocket
8	435507	Nut, Lock; 1/2-13 Washer Insert	61	23321	Weldment, Wafer Brush Core
9	19260	Bushing, Pivot Casting	62	23317	Wafer, Nylon
10	19261	Weldment, Bracket	63	23186	Shield, Dust; (Front)
11	180132	Bolt, Hex; 3/8-16 x 2.250	64	22116	Shaft, Power Brush
12	456004	Nut, Lock; 3/8-16 Washer Insert	65	23318	Wafer, Steel
13	120394	Washer, Flat; .406 x .812 x .065	66	19287	Sprocket
14	19264	Plate, Locking	67	23191	Hood
15	180126	Bolt, Hex; 3/8-16 x 1.500	68	23190	Plate, Side
16	177923	Pin, Cotter; .125 x .750	69	180075	Bolt, Hex; 5/16-18 x .625
17	19266	Rod, Linkage	70	19292	Shield
18	15353	Spring, Extension; .62 x .75 x 11.8 lb/in	71	19288	Chain, Roller
19	414218	Pin, Cotter; .375 x 1.375	72	180046	Bolt, Hex; 1/4-20 x 2.250
20	14636	Casting, Gear Box	73	11386	Wheel, Caster
NS	19267	Assembly, Gear Box	74	11387	Bushing; .515 x .750 x 2.594
21	14644	Assembly, Bearing; .750 x 1.781 x 1.499	75	180193	Bolt, Hex; 1/2-13 x 3.750
22	14640	Assembly, Bearing; 1.000 x 1.980 x 1.243	76	19365	Decal, Gravely White Vinyl
23	14646	Seal, Oil; 1.250 x 1.987 x .250	77	19293	Arm, Control
24	11831	Gear, Bevel	78	120123	Pin, Cotter; .125 x 1.250
25	19268	Shaft	79	11967	Assembly, Double Joint
26	417098	Washer, Flat; .531 x 1.000 x .063	80	19295	Knob
27	11835	Nut, Lock; 1/2-20 Light Thin	81	19296	Guide, Control Rod
28	14637	Shaft, Drive	82	12325	Grommet, Shifter
29	14642	Ring, Retaining; 1.000 Shaft	83	19297	Bushing; .531 x 1.000 x .600
30	14641	Spacer, Ring	84	180188	Bolt, Hex; 1/2-13 x 2.750
31	11220	Gear, Bevel	85	11375	Bearing, Bronze; .751 x .877 x .750
32	13624	Bolt, Hex; 1/2-13 x 1.000 Nylon Insert	86	11860	Cotter, Hair Pin
33	23189	Shield, Chain	87	120238	Nut, Jam; 1/2-13
34	19321	Seal, Oil; 1.000 x 1.690 x .250	88	415543	Washer, Flat; .531 x 1.250 x .10
35	11231	Gasket, Gear Housing	89	180077	Bolt, Hex; 5/16-18 x .750
36	10982	Cover, Gear Housing	90	120393	Washer, Flat; .344 x .688 x .065
37	180016	Bolt, Hex; 1/4-20 x .500	91	15369	Washer, Flat; .563 x 1.500 x .180
38	120380	Washer, Lock; 1/4 SP	92	19479	Decal, Caution
39	180173	Bolt, Hex; 1/2-13 x 1.000	93	181618	Bolt, Hex; 5/16-24 x 1.750
40	120384	Washer, Lock; 1/2 SP	94	12134	Kit, Repair; Universal Joint Rockwell Std.
41	19269	Bushing	95	20573	Kit, Repair; Universal Joint Neapco
42	19270	E-Ring; 1.375 Shaft	96	190139	Nut, Lock; 5/16-24 Washer Insert Hex
43	19271	Bearing, Flangette	97	23194	Decal, Lift
44	126216	Bolt, 5/16-18 x .750 Rd Hd Sq Nk	98	23187	Hook, Lift
45	419455	Nut, Lock; 5/16-18 Washer Insert	99	23320	Plate, End
46	19272	Coupling	100	23319	Spacer, Brush
47	19273	E-Ring; .875 Shaft	101	22117	Spacer, Square; 1.010 x 2.000 x .125
48	19274	Block, Tension	NS	103422	Pin, Cotter; .250 x 2.000
49	126342	Bolt, 1/4-20 x 1.750 Rd Hd Sq Nk	NS	23316	Brush, 8 Steel and 17 Nylon Wafer
50	419454	Nut, Lock; 1/4-20 Washer Insert			
51	19275	Shaft			
52	19276	Adjustment, Anchor			
53	19277	Anchor, Threaded Adjustment			

FIG. 1A ILLUSTRATED PARTS LIST



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7	120396	Washer, Flat; .500 x 1.062 x .095	60	19282	Sprocket
8	435507	Nut, Lock; 1/2-13 Washer Insert	61	22115	Brush
9	19260	Bushing, Pivot Casting	62	22117	Spacer, Square; 1.010 x 2.000 x .125
10	19261	Weldment, Bracket	63	23186	Shield, Dust; (Front)
11	180132	Bolt, Hex; 3/8-16 x 2.250	64	22116	Shaft
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FIG. 1B ILLUSTRATED PARTS LIST

## ASSEMBLY

1. The brush is factory assembled except the lift hook.
2. Screw the jam nut (item 87) onto the lift hood (item 97).
3. Insert lift hood through hole in brush hood and brush support frame.
4. Adjust jam nut to allow some clearance between lift hook and hood and secure with lock nut (item 8). Hook points towards front of brush.

## MOUNTING BRUSH ON TRACTOR

1. Fasten control rod guide (item 81) to the left handlebar of tractor by removing the nut securing bolt of Hi/Lo lever. Slide control rod guide over bolt and replace nut removed. The control rod guide is concaved to fit the shape of handlebar. See fig. 2.
2. Slide control rod through grommet of rod guide and screw knob on rod. See fig 2.

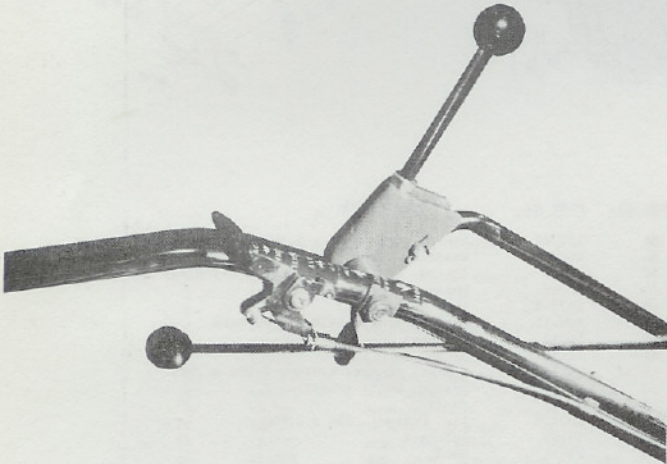


fig 2

3. Slide one end of the double "U" joint onto splined gearbox shaft of brush.
4. Guide pivot pin of quick hitch into pivot casting of brush and at the same time start "U" joint onto PTO shaft of quick hitch.
5. Slide pivot pin of quick hitch through casting of brush and secure with washer and "klik" pin. Be sure special bolt and spacer go into hole of pivot casting. See fig 3.
6. Connect control rod to linkage on brush with hairpin cotter. See fig 3.

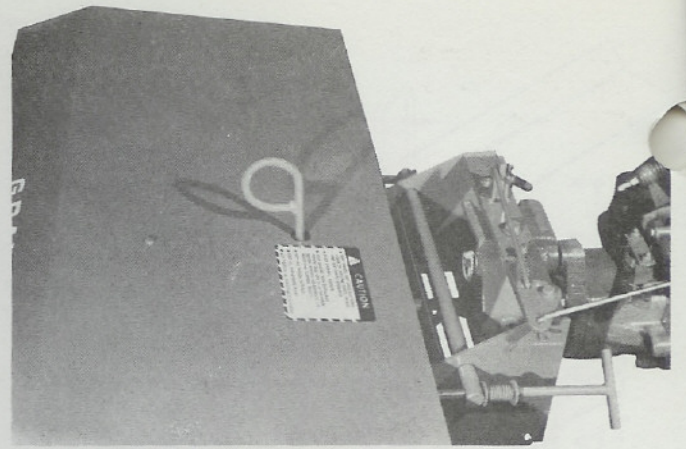


fig 3

## SAFETY OPERATING PRACTICES

Misuse of this equipment may result in damage or injury. The manufacturer provides instructions for use and relies upon the purchaser to see to it that these instructions are given to the persons who will actually be using the equipment.

1. Always use safe practices. Always follow instructions.
2. Watch out for the safety of other workers.
3. Plan your work ahead to prevent accidents.
4. Keep your mind on the job.

## WEAR PROPER PROTECTIVE APPAREL:

1. Long sleeved shirt, buttoned at the cuffs.
2. Properly fitting pants, without cuffs.
3. Gloves with a snug fitting cuff.
4. High-top steel toed shoes, laced to the top, with thick rubber or composition soles.
5. Goggles or face shields.
6. Hard hats at all times.

## WORK AREA

1. Materials must be neatly stacked and placed out of the way.
2. Equipment must be stored away from the edge of the roof.

3. Trash and scrap are a fire hazard and may cause someone to trip and fall. Collect and dispose of immediately.
4. Select a hoisting area where the ground is firm, reasonably level, and free of debris.
5. Make sure the hoisting area is clear of wires and overhead obstructions.
6. Maintain at least 10 feet clearance from all electrical wires.
7. Minimize the danger to the building and people — use barricades, flashing lights and signs where necessary.
8. Do not operate in areas where dust will be drawn into fresh air intakes for nearby buildings.
9. Make Hoisting Safe
  - a. Inspect the hoist carefully. Look for frayed cables, broken welds, bent struts, or faulty mechanical parts. Make sure guards are in place.
  - b. Check counter balance before operating the hoist.
  - c. Don't exceed the capacity of the hoist.
  - d. Rig loads with safe slings and hooks.
  - e. Never ride on a hoist or conveyor.
  - f. Know the standard hoisting signals and use them.
  - g. Never hoist a load over anyone's head — men on the ground must stand clear and see that others do not walk under a suspended load.
  - h. Watch your fingers and clothing around hoist and conveyor mechanisms.
  - i. Don't leave lines hanging loose at night.
  - j. Do not hoist tractor and brush as a unit. Disconnect tractor from brush before hoisting.
  - k. Use **ONLY** designated hoisting points on equipment (brush and tractor) for hoisting. (Wrapping the tractor with chain or cable can damage the control rods, causing a malfunction!)
  - l. Inspect equipment hoisting points for safe repair **before** hoisting.

10. Check the Deck
  - a. On new work, be sure the deck is properly welded — not just tack welded. On reroofing work, check for deteriorated deck before you start loading it with men, materials, and equipment.
  - b. Roof openings can be the roofer's death-trap.
  - c. Openings must be covered or provided with a guardrail.
  - d. Covers must be strong enough to bear the load of men and equipment.
  - e. The use of roof insulation or wooden curbs as a cover must be avoided.
  - f. The cover must have cleats on the bottom or be secured in some other way to prevent its being accidentally bumped off the hole by foot traffic or equipment.
  - g. Do not remove covers without the OK of your foreman. Immediately recover holes when flashing work is complete.
  - h. Be especially careful when removing covers — many roofers have picked up a cover and then walked into the hole.

#### EQUIPMENT SAFETY

1. Read the operator's manual for the tractor and brush.
2. Make sure all control rods, linkages, etc., are not damaged and that they operate properly before lifting to the roof.
3. Keep the tractor and brush clean.
4. Make sure the operator knows how to operate before using on a roof.
5. Use only designated hoist points for loading and unloading the other equipment with ties at designated points to prevent damage during transit.

## OPERATION

1. Read the tractor Owner's Manual. Know how to safely operate the tractor and how to engage and disengage the PTO. Know how to STOP quickly in an emergency.
2. Have the Power Brush in ready maintenance. Perform lubrication and adjustments before use. Keep all fasteners secure.
3. At the site to be swept, engage PTO and run engine at full throttle.

### Determining Ground Speed

4. Select a ground speed fast enough to get the job done, yet slow enough to sweep clean. Some trials may be necessary to find an optimum ground speed to do a satisfactory job. Reduce ground speed (not engine speed) to allow the brush enough (more) time to sweep. Shift to lower gear to reduce ground speed. Keep engine at full throttle.

### Brush Angle Adjustment

5. The brush has three positions; angled right, angled left and straight ahead. To change angle, release latch by pulling on control rod and while holding, move front of tractor in opposite direction desired for brush to sweep. Example: to angle brush left: using handles, pivot to right, release latch to lock in position.

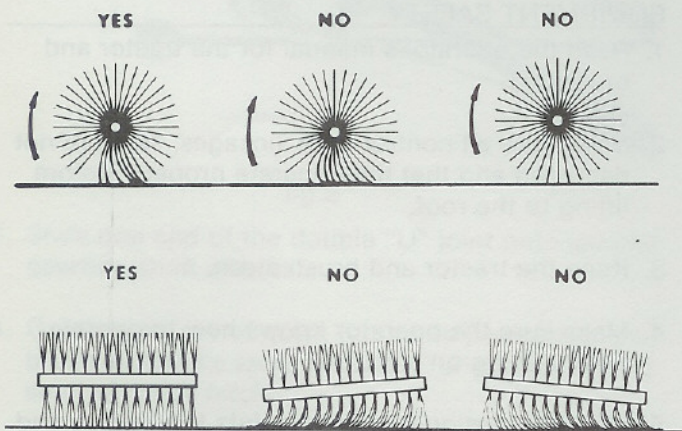


fig 4

### Bristle Contact Adjustment, fig 4

6. Correct bristle contact is important to brush life and quality of sweeping being done. As brush wears it will lose working contact with surface being swept. The frame of brush is supported on caster wheels.

7. Not enough bristle contact may result in poor sweeping. To lower brush, loosen jam nuts and turn both bristle contact adjusters counter-clockwise the same amount, then tighten jam nuts. Lowering brush too much causes unnecessary work for engine and premature brush wear out. Adjust for least amount of contact that will do a good job of sweeping.

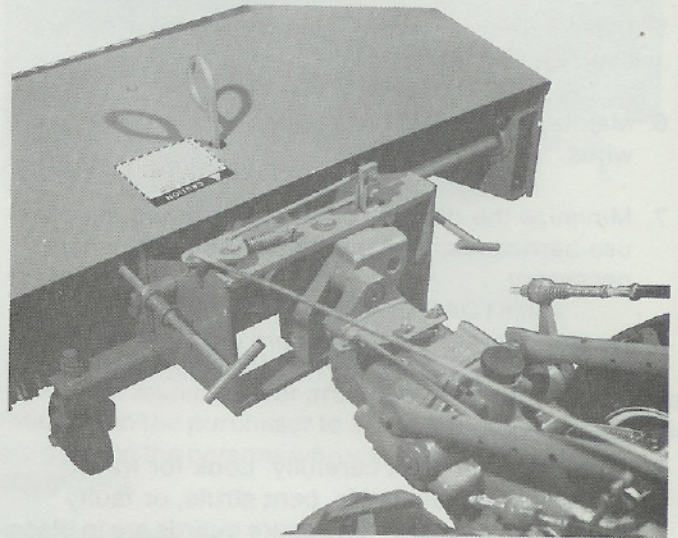


fig 5

NOTE: When brush is not turning, it will "stand-up" on bristles and may appear to be out of adjustment. But, when brush is turning, it will "settle-down" to amount of contact allowed by adjusters.

8. Some trials may be necessary to set bristle contact for optimum performance. Be sure to turn each adjuster same amount to keep brush level.

## ROUTINE MAINTENANCE

1. When working in dusty conditions service air filter and engine oil of the tractor more often than regularly scheduled.
2. Points to be lubricated with general purpose grease through grease fittings are:  
Caster Fork Bushings — 2  
Caster Wheels — 2  
Wipe fittings clean so as not to force dirt into fittings.
3. Each point is to be lubricated before each use or every 8 operating hours. Lubricate more often when operating in severe dust and/or grit conditions. Add grease through fittings until it comes out around bushings; remove excess grease.
4. The gearbox is prelubricated and only needs internal inspection once a year. If signs of leakage present during routine maintenance, refill box to its capacity with general purpose grease. Do not damage gasket. If leakage is substantial a repair should be made.

5. When performing other maintenance, visually inspect chain for accumulation of debris.

When chain is very dirty and/or dry, service as follows:

1. Remove side plate.
2. Remove master link from chain.
3. Remove chain, wash in solvent and dry; clean sprockets.
4. Inspect chain and sprockets for wear; replace as necessary. Replace chain and side cover.

6. The brush is considered worn-out when the end of adjustment is reached and the brush will not sufficiently contact the surface to be swept. Removing the bristle contact adjuster from the adjusting anchor (allowing the brush to hang free) is not acceptable practice due to poor performance and uncontrollable bristle contact. Replace a wornout brush.



## ATTACHMENT 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 manufactured attachments 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 attachments used in Roofer applications, and TWELVE (12) MONTHS for products used in all other applications.
4. Some components of Gravely attachments are not covered by the Gravely Warranty. These components are covered by the original manufacturer's warranty. They are:
  - (a) Tires - Goodyear, Goodrich, Armstrong, General and Firestone
5. To obtain warranty service on Gravely attachments including components not manufactured by Gravely, use this procedure:
  - (a) Notify the Gravely dealer from whom you purchased the attachment.
  - (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 attachment 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  
Clarke-Gravely Corporation  
A Studebaker-Worthington Company  
One Gravely Lane  
Clemmons, N. C. 27012  
Attn: Manager of Customer Services
  - (e) Warranty service on Gravely attachments 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 attachment, he will charge the owner his usual rate for such service.
  - (b) Normal maintenance services and normal replacement of items such as belts lubricants, mower, plow or cultivator 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 registration card is supplied with each Gravely attachment. Please complete the card and return it to Gravely at the address listed on the card. The 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.