

PARTS LIST, OPERATING AND ASSEMBLY INSTRUCTIONS FOR GRAVELY TWO AND FOUR WHEEL TRACTOR ATTACHMENTS



"MIGHTY MAC"

Before proceeding with the assembly and installation of your MIGHTY MAC attachment on your tractor, examine the shipping carton for damage. If the contents have been damaged, file a claim immediately with the carrier. Carefully study the assembly drawings and make sure you have a complete kit. If there is a shortage, report it to your dealer for replacement. Before operating, recheck the assembly and installation instructions and make sure each step has been followed carefully. Familiarize yourself with the operating instructions.

Warranty: Amerind-MacKissic consumer products are warranted free of defects in material and workmanship for a period of one year after date of purchase. Under normal use, parts or workmanship found defective will be replaced or repaired without charge to the customer other than freight or mailing. We reserve the right to require the return of defective material to verify the claim, parts shipped to us prepaid. Repair or replacement must be done by an authorized Amerind-MacKissic dealer. Delivery or pickup charges between dealer and customer are not a part of this warranty. This warranty does not include the engine, which is covered by the engine manufacturer. This warranty also does not cover the spray hose. This warranty is void if the customer has not returned a warranty-proof of purchase card to Amerind-MacKissic immediately upon purchase. This warranty is extended only to the original purchaser. This warranty applies for ninety days to commercial or rented machines. This is a limited warranty.

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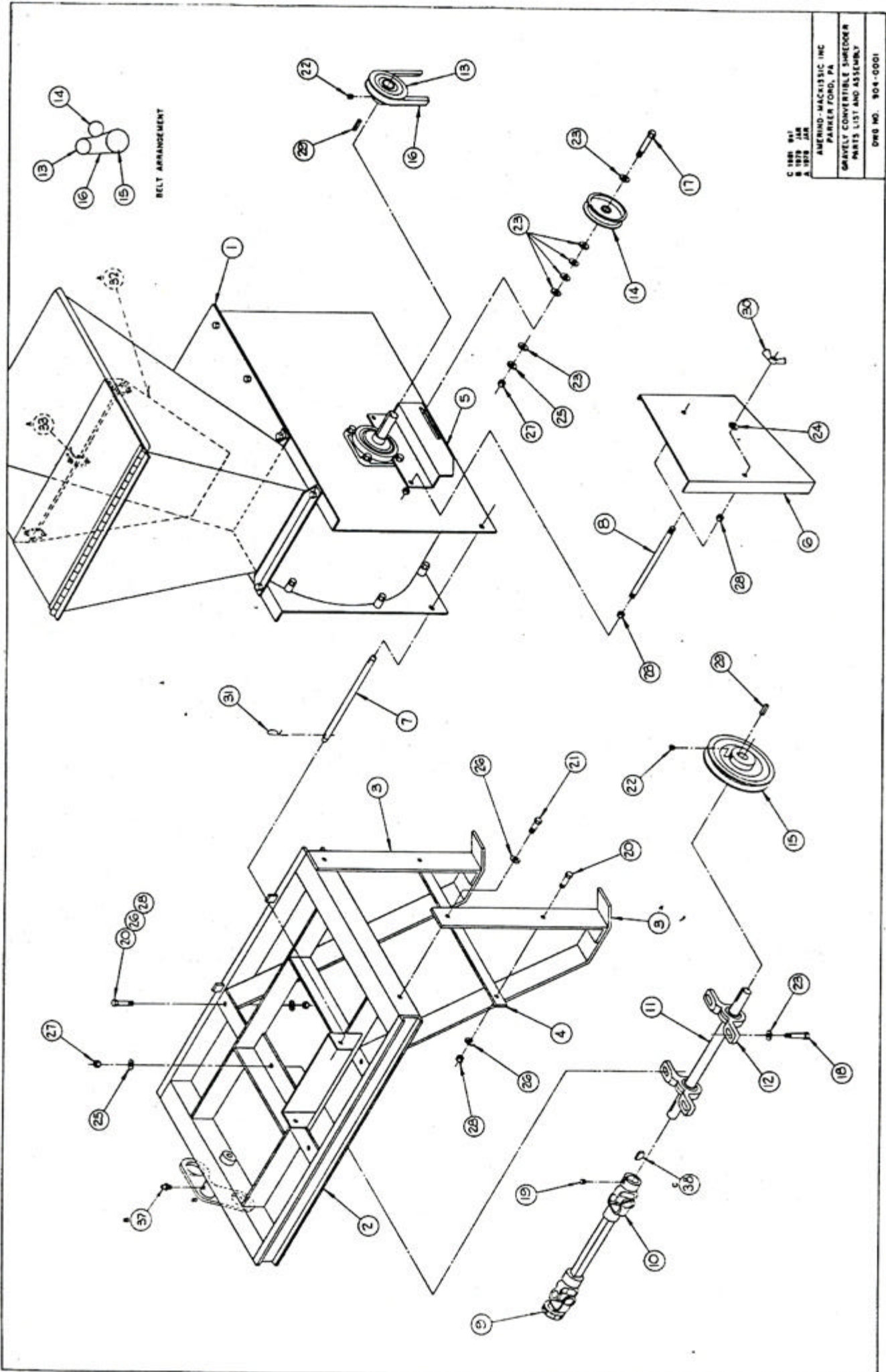
Amerind-MacKissic, Inc.

BOX 111
PARKER FORD, PENNA.
19457

**INSTRUCTIONS FOR MOUNTING A MIGHTY MAC CHIPPER
SHREDDER ON A GRAVELY CONVERTIBLE TRACTOR (Models 9GC and 12GC)**

NOTE: In the following instructions, the item number refers to the number encircled on the assembly drawing for that part, page 3.

1. Assemble the two skids (item no. 3) to the mounting frame (item no. 2) using the bolts, nuts and washers shown. Install the skid brace (item no. 4).
2. Install the jack shaft (item no. 11) and bearing assembly (item no. 12) under the mounting frame using the bolts, nuts and washers shown. Remove the upper left hand bolt from the tractor quick-hitch and install the longer bolt and bushing (page 19) provided.
3. Attach the frame to the quick hitch kit (Gravely Part No. 11898-E1 or 22477) on the front of the tractor. Slide the support arm on the Mighty Mac frame over the bushing.
4. Install the shaft key (item no. 29) in the keyway of the jackshaft. Slip the tractor-half PTO over the tractor PTO and the shredder-half PTO over the end of the jackshaft. Tighten the set screw (item no. 19) securely.
5. Mount the basic machine (item no. 1) on the mounting frame and insert the mounting pin (item no. 7); secure by inserting the two hair cotter pins (item no. 31).
6. Check the alignment of the 9" and 4" pulleys with the idler pulley by placing a straight edge across their faces. If adjustment is required, loosen the set screw and slide the pulley in or out as required. Be sure to retighten the set screws securely.
7. Slip the drive belt (item no. 16) over the 4" and 9" pulleys. Slide the idler pulley against the outside of the belt to achieve the correct belt tension. Tighten the nut and bolt to secure the idler pulley in this position.
8. Install the belt shield (item no. 6) using the shield bracket studs (item no. 8), wing nuts (item no. 3), washers and nuts shown.
9. Read the Operating Instructions (pages 12-15) carefully before using your MIGHTY MAC.



C 1988 WJ
 B 1979 JAK
 A 1978 JAK

AMERIND-MACKISSIC, INC.
 PARKER FORD, PA.
 GRANVELY CONVERTIBLE SUNROOFER
 PARTS LIST AND ASSEMBLY
 DWG NO. 904-0001

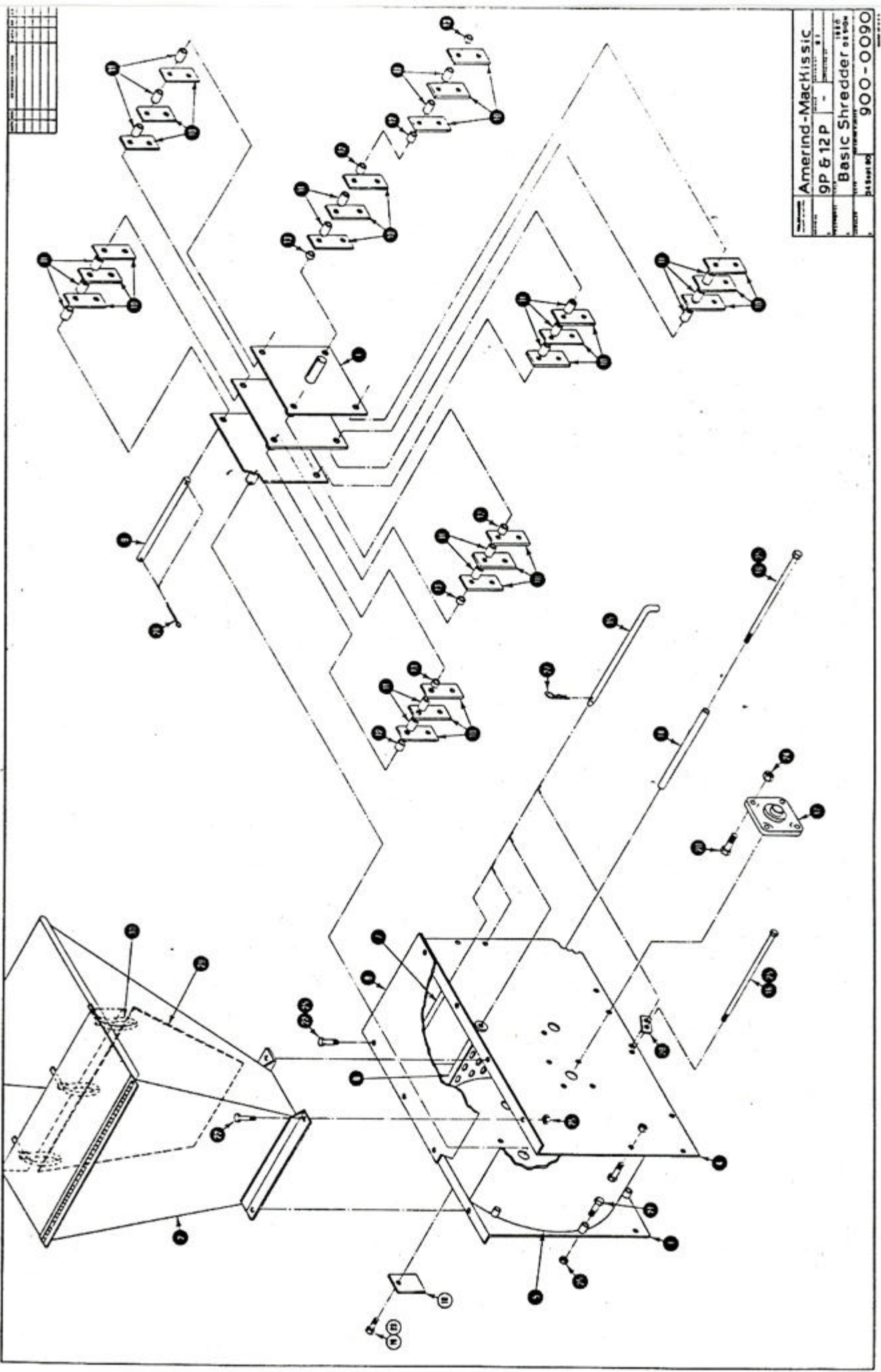
**GRAVELY CONVERTIBLE SHREDDER (Grinder or Chipper/Shredder)
PARTS LIST, Models 9GC and 12GC
(Dwg. No. 904-0001, Page 3)**

| Item No. | Part No. | Description | Qty. |
|----------|-----------|--|------|
| 1 | 900-0051* | Basic Shredder/Grinder | 1 |
| 2 | 904-0010 | Frame | 1 |
| 3 | 504-0006 | Skid | 2 |
| 4 | 504-0007 | Brace | 1 |
| 5 | 904-0006 | Idler Bracket | 1 |
| 6 | 904-0005 | Shield | 1 |
| 7 | 500-0030 | Mounting Pin | 1 |
| 8 | 050-0016 | Shield Bracket Stud | 2 |
| 9 | 030-0029 | Tractor Half P.T.O. | 1 |
| 10 | 502-0003 | Shredder Half P.T.O. | 1 |
| 11 | 502-0011 | Jack Shaft | 1 |
| 12 | 030-0042 | Bearing | 2 |
| **13 | 500-0026 | 4" Pulley | 1 |
| 14 | 100-0024 | Idler Pulley | 1 |
| 15 | 030-0041 | 9" Pulley | 1 |
| 16 | 030-0074 | Belt | 1 |
| 17 | 090-0101 | Hex Cap Screw $\frac{3}{8}$ -16 x $1\frac{3}{4}$ | 1 |
| 18 | 090-0100 | Hex Cap Screw $\frac{3}{8}$ - 16 x $1\frac{1}{2}$ | 4 |
| 19 | 080-0056 | Set Screw $\frac{3}{8}$ - 16 x $\frac{3}{8}$ | 1 |
| 20 | 090-0068 | Hex Cap Screw $\frac{5}{16}$ - 18 x 1 | 4 |
| 21 | 090-0066 | Hex Cap Screw $\frac{5}{16}$ - 18 x $\frac{3}{4}$ | 2 |
| 22 | 080-0053 | Set Screw $\frac{5}{16}$ - 18 x $\frac{5}{16}$ | 2 |
| 23 | 090-0234 | Flat Washer $\frac{3}{8}$ | 10 |
| 24 | 090-0233 | Flat Washer $\frac{5}{16}$ | 2 |
| 25 | 090-0225 | Lock Washer $\frac{3}{8}$ | 5 |
| 26 | 090-0224 | Lock Washer $\frac{5}{16}$ | 6 |
| 27 | 090-0207 | Hex Nut $\frac{3}{8}$ - 16 | 5 |
| 28 | 090-0206 | Hex Nut $\frac{5}{16}$ - 18 | 10 |
| 29 | 500-0031 | Key $\frac{1}{4}$ x $\frac{1}{4}$ x 1 | 2 |
| 30 | 502-0008 | Wing Nut $\frac{5}{16}$ - 18 | 2 |
| 31 | 100-0015 | Hair Cotter Pin 3/32 | 2 |
| 32 | 900-0073 | Hopper Flex Guard | 1 |
| 33 | 900-0074 | Nylon ties | 3 |
| 34 | 104-0008 | Quick-hitch bushing (page 19) | 1 |
| 35 | 090-0370 | Hex head bolt for old style tractors GR5 $\frac{1}{2}$ - 13 x 3 | 1 |
| 36 | 090-0141 | Hex head bolt for new style tractors GR5 $\frac{1}{2}$ -13x1 $\frac{1}{2}$ | 1 |
| 37 | 080-0040 | $\frac{1}{4}$ - 28 Grease fitting | 1 |
| 38 | 080-0086 | No. 15 Woodruff Key | 1 |

* For model 12GC, the basic chipper/shredder is part no. 900-0091

** For model 12GC, the basic part no. is 030-0119.

When ordering always refer to the part by part number.



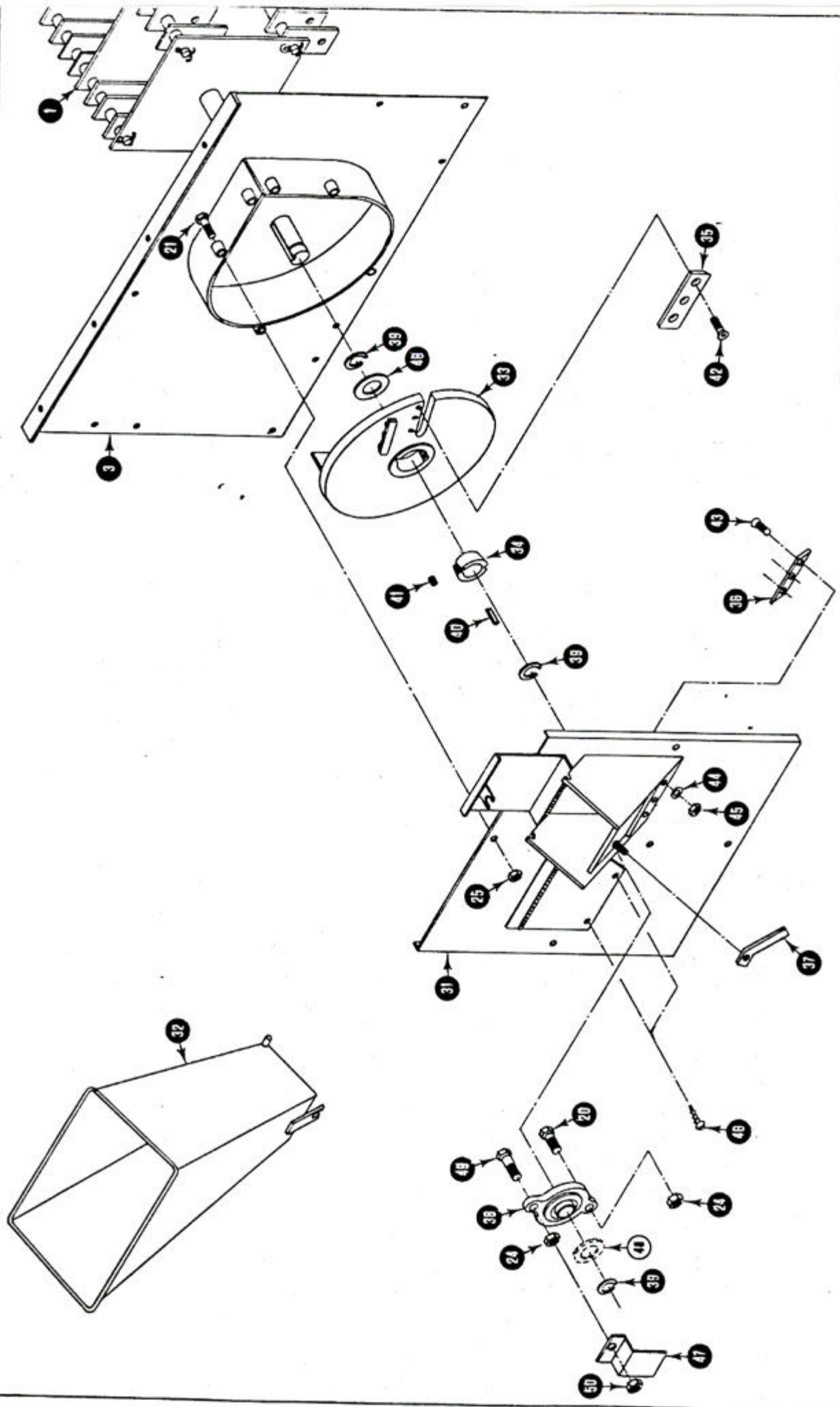
| | |
|-------------------|----------|
| Amerind-MacKissic | |
| 9P & 12P | |
| Basic Shredder | 900-0090 |

**BASIC SHREDDER PARTS LIST, Models 9G and 9GC
(Dwg. No. 900-0090, Page 5)**

| Item No. | Part No. | Description | Qty. |
|----------|----------|---|------|
| 1 | 900-0084 | Rotor | 1 |
| 2 | 900-0046 | Hopper | 1 |
| 3 | 900-0048 | Left Side Plate | 1 |
| 4 | 900-0047 | Right Side Plate | 1 |
| 5 | 900-0005 | Scroll | 1 |
| 6 | 500-0004 | Screen | 1 |
| 7 | 900-0010 | Baffle Plate | 1 |
| 8 | 900-0045 | Top | 1 |
| 9 | 900-0085 | Hammer Rod | 4 |
| 10 | 500-0008 | Hammer | 24 |
| 11 | 500-0011 | Spacer, $\frac{7}{8}$ | 20 |
| 12 | 500-0012 | Spacer, $\frac{5}{8}$ | 4 |
| 13 | 500-0010 | Spacer, 5/16 | 4 |
| 14 | 500-0020 | Spacer | 1 |
| 15 | 500-0015 | Screen and Baffle Rod | 4 |
| 16 | 500-0064 | Tie Rod | 2 |
| 17 | 500-0016 | Bearing | 2 |
| 18 | 900-0040 | Cover Plate | 2 |
| 19 | 020-0004 | Lock Washer Nut | 1 |
| 20 | 500-0018 | S.A.E. No. 5 Cap Screw $\frac{3}{8}$ - 16 x 1 $\frac{1}{4}$ | 8 |
| 21 | 500-0023 | S.A.E. No. 5 Cap Screw 5/16 - 18 x 1 $\frac{1}{4}$ | 6 |
| 22 | 500-0024 | S.A.E. No. 5 Cap Screw 5/16 - 18 x $\frac{3}{4}$ | 8 |
| 23 | 090-0067 | Hex Cap Screw 5/16 - 18 x $\frac{5}{8}$ | 1 |
| 24 | 500-0019 | Lock Nut $\frac{3}{8}$ - 16 | 8 |
| 25 | 500-0021 | Lock Nut 5/16 - 18 | 16 |
| 26 | 090-0000 | Cotter Pin 3/16 x 1 $\frac{1}{4}$ | 4 |
| 27 | 100-0015 | Hair Cotter Pin 3/32 | 4 |

When ordering always refer to the part by part number.

| | | | |
|------|----------|----|-----|
| DATE | REVISION | BY | CHK |
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|---------------------------------------|------|-----------------|----------|
| TOLERANCES UNLESS OTHERWISE SPECIFIED | | | |
| FRONT VIEW | 12 P | SCALE | AS SHOWN |
| FRONT VIEW | 12 P | SCALE | AS SHOWN |
| AMERIND-MACHISSIC, Inc | | DESIGNED BY 91 | |
| 12 P | | CHECKED BY | |
| Basic Chipper | | DRAWN BY | |
| 3056p180 | | REVISION NUMBER | |
| 900-0091 | | MADE IN U.S.A. | |

Item 48 may be located either place at factory assembly

BASIC 12P SHREDDER-CHIPPER, 1980 DESIGN

Parts List per Drawings 900-0090 and 900-0091

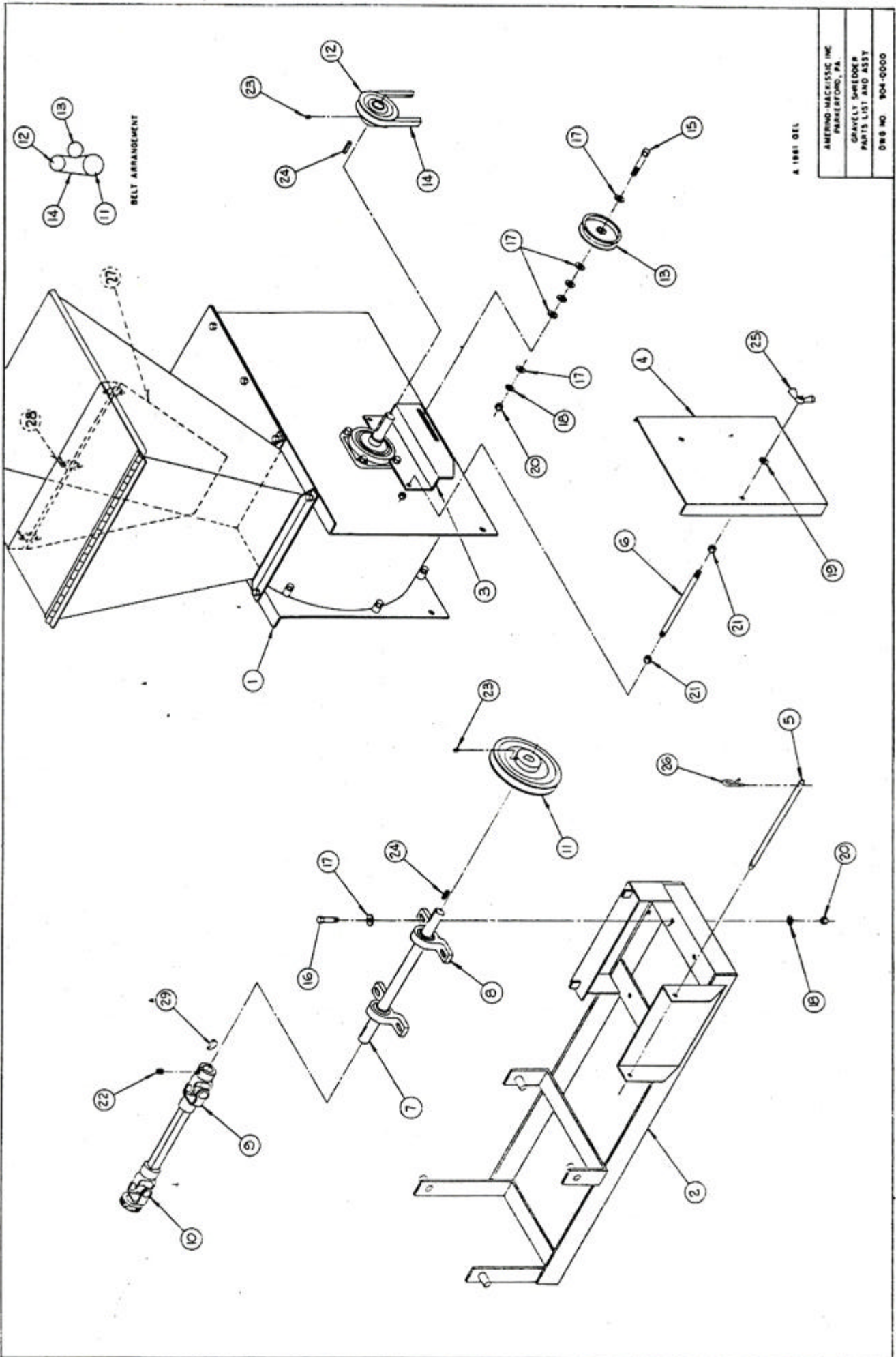
Pages 5 and 7

| Item No. | Part No. | Description | Qty. |
|----------|----------|---|------|
| 1 | 900-0084 | Rotor | 1 |
| 2 | 900-0046 | Hopper | 1 |
| 3 | 900-0086 | Left Side Plate | 1 |
| 4 | 900-0087 | Right Side Plate | 1 |
| 5 | 900-0005 | Scroll | 1 |
| 6 | 500-0004 | Screen (1" Standard) | 1 |
| 7 | 900-0010 | Baffle Plate | 1 |
| 8 | 900-0045 | Top Plate | 1 |
| 9 | 900-0085 | Hammer Rod | 4 |
| 10 | 500-0008 | Hammer | 24 |
| 11 | 500-0011 | Spacer, 7/8" | 20 |
| 12 | 500-0012 | Spacer, 3/8" | 4 |
| 13 | 500-0010 | Spacer, 5/16" | 4 |
| 14 | 500-0020 | Spacer | 1 |
| 15 | 500-0015 | Screen and Baffle Rod | 4 |
| 16 | 500-0064 | Tie Rod | 2 |
| 17 | 030-0114 | Bearing - Right Side | 1 |
| 18* | 900-0040 | Cover Plate (for tractor mounted units only) | 1 |
| 19* | 020-0004 | Lock Washer Nut (for tractor mounted units only) | 1 |
| 20 | 090-0120 | 3/8 - 16 x 1" Grade 5 Cap Screw | 5 |
| 21 | 500-0023 | 5/16 - 18 x 1 1/4" Grade 5 Cap Screw | 12 |
| 22 | 500-0024 | 5/16 - 18 x 3/4" Grade 5 Cap Screw | 8 |
| 23* | 090-0067 | 5/16 - 18 x 3/8" Cap Screw (for tractor mounted units only) | 1 |
| 24 | 500-0019 | 3/8 - 16 Lock Nut | 6 |
| 25 | 500-0021 | 5/16 - 18 Lock Nut | 22 |
| 26 | 090-0000 | Cotter Pin 3/16 x 1 1/4" | 8 |
| 27 | 100-0015 | 3/32 Hair Cotter | 4 |
| 28 | 900-0078 | Screen Rod Reinforcing Plate | 2 |
| 29 | 900-0073 | Hopper Flex Guard | 1 |
| 30 | 900-0074 | Nylon Ties | 3 |
| 31 | 900-0066 | Chipper Side Plate | 1 |
| 32 | 900-0022 | Chipper Hopper | 1 |
| 33 | 900-0016 | Chipper Disc | 1 |
| 34 | 030-0118 | Bushing | 1 |
| 35 | 900-0076 | Knife | 1 |
| 36 | 900-0075 | Wear Plate | 1 |
| 37 | 500-0051 | Hopper Locking Handle | 1 |
| 38 | 030-0115 | Bearing - Left Side | 1 |
| 39 | 030-0117 | Retaining Ring | 3 |
| 40 | 500-0031 | Key 1/4 x 1/4 x 1" | 1 |
| 41 | 020-0001 | Set Screw 3/8 - 16 x 3/8" | 2 |
| 42 | 090-0258 | Flat Head Socket Cap Screw 5/16 - 18 x 3/4" | 3 |
| 43 | 090-0257 | Flat Head Socket Cap Screw 1/4 - 20 x 1" | 3 |
| 44 | 090-0245 | 1/4" Flatwasher | 3 |
| 45 | 090-0031 | 1/4 - 20 Lock Nut | 3 |
| 46 | 080-0062 | 6 - 32 x 3/8" Sheet Metal Screw | 2 |
| 47 | 900-0059 | Shaft Shield (also Wear Plate Gauge) | 1 |
| 48 | 090-0024 | 1 3/16" Flatwasher | 1 |
| 49 | 090-0122 | 3/8 - 16 x 1 1/2" Grade 5 Cap Screw | 1 |
| 50 | 090-0207 | 3/8 - 16 Hex Nut | 1 |

INSTRUCTIONS FOR MOUNTING A MIGHTY MAC SHREDDER—GRINDER ON A GRAVELY FOUR WHEEL TRACTOR, Model 9G

NOTE: In the following instructions the "item" number refers to the number encircled for that part on the assembly drawing, page 10.

1. Install the jackshaft on the mounting frame. Slide the mounting frame under the front axle of the tractor. Lift the front of the frame and slip the mounting pins on the frame into the lugs on the tractor. Then lift the rear of the frame to seat the rear mounting pins in the lugs under the tractor.
2. Insert the shaft key (item no. 24) in the keyway of the jackshaft and slide the shredder PTO (item no. 9) on the jackshaft. Tighten the set screw (item no. 22).
3. Insert the end of the square PTO shaft in the end of the tractor PTO joint (item no. 10). Pull the spring-loaded collar of the PTO joint back and slip the joint over the tractor PTO output shaft. Release the collar to secure the connection.
4. Mount the shredder on the mounting frame. Insert the shredder mounting pin (item no. 5) in the aligned holes in the shredder and the frame. Secure the pin with two hair cotter pins (item no. 26).
5. Check the alignment of the jackshaft pulley (item no. 11), the shredder pulley (item no. 12), and the idler pulley (item no. 13). If adjustment is necessary, loosen the set screws on the jackshaft or shredder pulleys and move in or out as required. Be sure to retighten the set screws.
6. Install the belt (item no. 14). Slide the idler pulley (item no. 13) against the outside of the belt to achieve the correct tension. Be sure to tighten the idler pulley bolt (item no. 15).
7. Install the belt shield (item no. 4) using the shield bracket studs (item no. 6), washers and wing nuts shown.
8. Be sure to read the Operating Instructions, pages 12-15, carefully before operating your MIGHTY MAC.



**GRAVELY SHREDDER PARTS LIST, Model 9G
(Dwg. No. 904-0000, Page 10)**

| Item No. | Part No. | Description | Qty. |
|----------|----------|--|------|
| 1 | 900-0051 | Basic Shredder | 1 |
| 2 | 904-0002 | Frame | 1 |
| 3 | 904-0006 | Idler Bracket | 1 |
| 4 | 904-0004 | Shield | 1 |
| 5 | 500-0030 | Shredder Mounting Pin | 1 |
| 6 | 050-0016 | Shield Bracket Stud | 2 |
| 7 | 502-0011 | Drive Shaft | 1 |
| 8 | 030-0042 | Bearing | 2 |
| 9 | 502-0003 | Shredder P.T.O. | 1 |
| 10 | 030-0029 | Tractor P.T.O. | 1 |
| 11 | 500-0025 | Pulley | 1 |
| 12 | 500-0026 | Pulley | 1 |
| 13 | 100-0024 | Idler Pulley | 1 |
| 14 | 030-0072 | Belt | 1 |
| 15 | 090-0100 | Hex Cap Screw $\frac{3}{8}$ - 16 x 1 $\frac{1}{2}$ | 1 |
| 16 | 090-0367 | Hex Cap Screw $\frac{3}{8}$ - 16 x 1 $\frac{1}{4}$ | 4 |
| 17 | 090-0234 | Flat Washer $\frac{3}{8}$ | 10 |
| 18 | 090-0225 | Lock Washer $\frac{3}{8}$ | 5 |
| 19 | 090-0224 | Lock Washer 5/16 | 2 |
| 20 | 090-0207 | Hex Nut $\frac{3}{8}$ - 16 | 4 |
| 21 | 090-0206 | Hex Nut 5/16 - 18 | 6 |
| 22 | 080-0058 | Set Screw $\frac{3}{8}$ - 24 x $\frac{3}{8}$ | 1 |
| 23 | 080-0053 | Set Screw 5/16 - 18 x 5/16 | 2 |
| 24 | 500-0031 | Key $\frac{1}{4}$ x $\frac{1}{4}$ x 1 | 2 |
| 25 | 502-0008 | Wing Nut 5/16 - 18 | 2 |
| 26 | 100-0015 | Hair Cotter 3/32 | 2 |
| 27 | 900-0073 | Hopper flex-guard | 1 |
| 28 | 900-0074 | Nylon ties | 3 |
| 29 | 080-0086 | No. 15 Woodruff Key | 1 |

When ordering always refer to the part by part number.

THIS MACHINE IS CAPABLE OF INFLICTING SERIOUS INJURY IF OPERATED IMPROPERLY

— READ WARNINGS & CAUTION —

- (1) It is recommended that the operator of this equipment obtain and wear safety glasses and gardening or work gloves at all times while operating this shredder.
- (2) Children must never be allowed to operate this equipment.
- (3) This equipment should never be operated in the vicinity of children, pets, or bystanders.
- (4) Wear proper work apparel; avoid loose clothing such as skirts or dresses.
- (5) Never run this machine in an enclosed area since the exhaust from the engine contains carbon monoxide which is an odorless, tasteless and deadly poisonous gas.
- (6) Do not remove the plastic shield or curtain inside shredding hopper. This device prevents flyback and should be intact at all times when shredding. This is a protective guard.
- (7) When feeding material into this equipment be careful that pieces of metal, glass, rocks, cans or other non-organic or foreign objects are not included.
- (8) Do not allow an accumulation of processed material to build up under the discharge of the shredder as this can prevent following shredded material to discharge and will result in clogging.
- (9) Never allow your hands or any part of your body or clothing inside the feed hopper or discharge area of the shredder-grinder.
- (10) Keep all protective guards on the machine and deflectors in place and in good working condition.
- (11) Always stand clear of the discharge area when the shredder is running.
- (12) Keep your face and body back from the feed hopper to avoid being struck by any material that may bounce back. Do not overreach, keep proper balance and footing.

MAINTENANCE AND STORAGE:

If the cutting mechanism strikes any foreign object or if your machine should start making an unusual noise or vibrating, stop the engine, disconnect spark plug wire from the spark plug. Allow the engine to cool before:

- (a) Inspect for obvious damage.
 - (b) Check for loose parts, bolts, or rods. Examine rotor visually for any obvious defects.
- (1) Lubricate the two rotor bearings before operating and after every 10 hours of operation with multi-purpose bearing lubricant. Also check the bearing collar set screws regularly to be sure they are tight.
 - (2) When not in use, your shredder or chipper should be stored out of reach of children.
 - (3) When the hard steel hammers become dull or round on the cutting or leading edge, they may be reversed. First remove the cover plates (item No. 18 shown on Dwg. No. 900-0090) and the hammer rod (900-0085) access holes are revealed. One hammer rod at a time can be removed through this side hole and the hammers reversed as the rotor is reassembled. Each rod is held in place by a 3/16 x 1 1/4 cotter pin. Install new pins. Extreme care must be taken to reinstall the spacers (Item No. 11, 12, and 13) in exactly the same order as shown on the drawing. We emphasize this point. The spacers and hammers must be reinstalled in exactly their original order as shown on Dwg. 900-0090.

The following comments apply to the Model 12GC Chipper/Shredder only:

- (4) When the steel chipping knife 900-0076 needs replacing or sharpening, rotate the chipper disc until the three cap screws 5/16" holding the blade are under the three knock out seals (older chippers) or access panel (new chippers). Using a 5/16" allen wrench, loosen (do not remove) the three screws. Rotate knife to throat area and remove screws and knife. When you install the knife be certain to use loc-tite material on the threads so they will not come loose.
- (5) Care must be exercised when sharpening the blade to maintain the correct bevel and a straight cutting edge. When you install a knife, the clearance between knife and wear plate 900-0075 must be checked. This clearance or gap should be minimum 3/64" maximum 1/16". See figure 1. To adjust this clearance, loosen the three 1/4" flathead bolts which are located on the outside of the chipper wear plate, next to the chipper side plate. (Key 42, Dwg. No. 900-0091, page 7). Move the wear plate in or out accordingly and tighten the 1/4" nuts securely.
- (6) Note, if the gap between wear plate and knife is excessive, you will have vibration when chipping and the blade will seem to be dull.
- (7) If at any time it becomes necessary to disassemble the chipper for repairs, the chipping disc (900-0016) must be installed in exactly its correct position on the shaft. Refer to Fig. 2 for the distance between inside snap ring and disc hub.

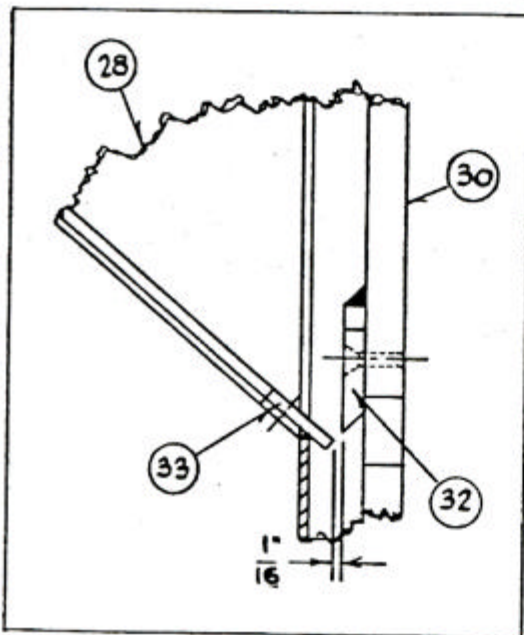


FIGURE 1

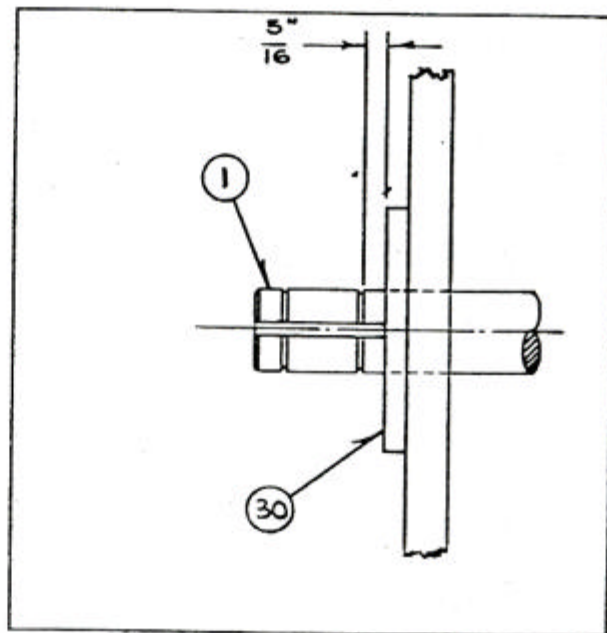


FIGURE 2

OPERATION:

Whenever you operate your shredder, wearing gloves and safety glasses is recommended. If necessary to push material into the shredding chamber, use a wood stick, never hands or steel implements.

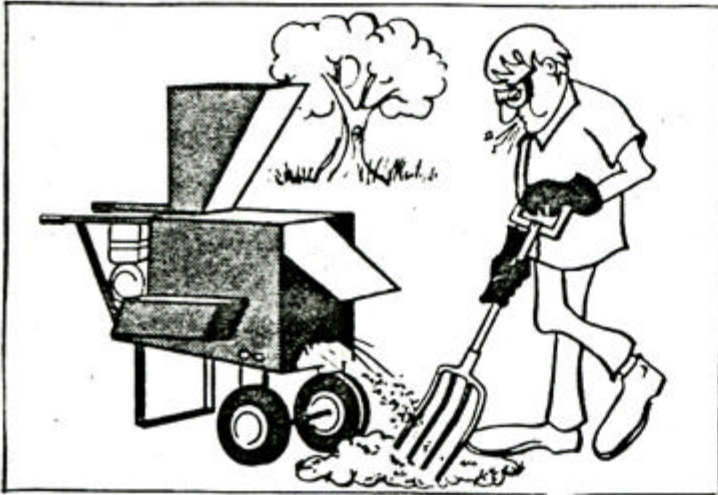
Adjust the baffle plate (900-0010) to direct the discharge down and away from the shredder. The discharge end of the shredder body has three drilled holes in each side through which passes a baffle rod. The loose end of the plate rests over this rod providing you with three angles of discharge. If ever you shred or compost without the perforated screen, be certain the baffle plate is held away from the rotor by its baffle rod (500-0015) at the center hole of the discharge. If not, the baffle plate will swing backward into the grinding chamber striking the rotor hammers. Damage will result.

The shredder will not operate until you engage the tractor PTO at which time the shredder rotor begins to rotate. Proper rotation for the shredder is 2600 rpm + 200 rpm which is approximately $\frac{3}{4}$ open throttle.

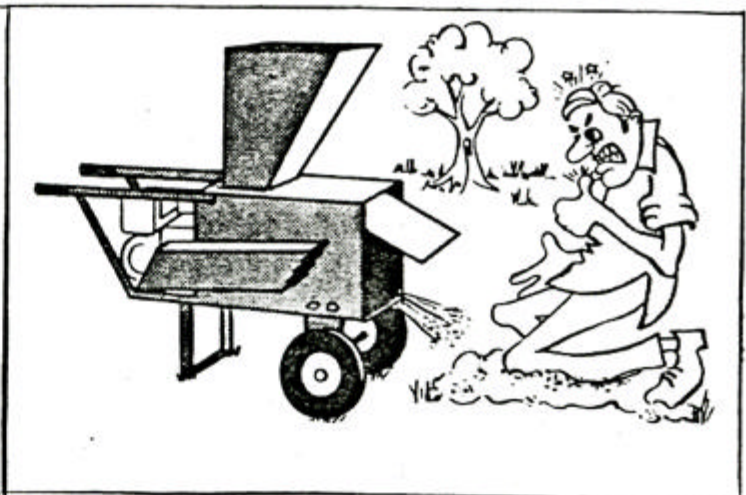
The grinding screen retains the material within the grinding chamber for several seconds until the free swinging hammers have rotated several times. The number of cuts by the hammers and, of course, retention time within the chamber varies with each material being processed but this is what determines the fineness of the ground material.

When viewed from the pulley side of the shredder body, the rotor runs clockwise. This action tends to pull materials into the shredding chamber. Short stalks (bean plants), cobs, sod and similar materials should be fed into the hopper by garden spade or pitchfork. Long stalks like corn or trimmings can best be fed by hand slowly to avoid having the rotor pull in the complete stalk, and stalling the hammermill. When feeding stalks or trimmings by hand, be certain to keep your hands away from the rotor and hammers. Remember, a technique and understanding is required to successfully shred or grind the great variety of materials which may be available to you for compost.

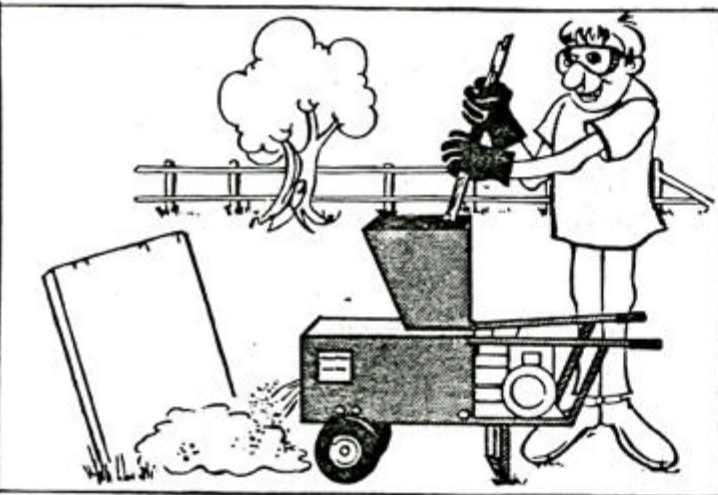
- When material being processed is dry, brittle, hard or woody, use the standard 1" perforated screen in the shredder. For wet, soggy materials, the Mighty Mac will shred better without a screen. The optional bar screen can be used to advantage when shredding green fibrous materials such as corn stalks, wet straw or manure. After processing wet or soggy materials, the shredding chamber can be cleaned quickly by reinstalling the 1" screen and grinding a few branches or wood chips.
- The optional screens with $\frac{1}{4}$ ", $\frac{1}{2}$ ", or $\frac{3}{4}$ " perforations are for special purposes (potting soil or grinding shell fish residue such as clam shells). When using them, it is necessary to first process the material through the 1" screen, then through the smaller hole screen. This works very well on grains for poultry feed.
- When grinding green or damp material (corn stalks, potato vines, tomato vines, green or fresh pulled plants), remove the 1" screen and either install a bar screen or use no screen at all. Direct the shredder discharge into a compost pile or wall, large board or other obstruction. Feed corn stalks by hand, slowly, several at a time until the last 18" remain in your hand - then let go. This will give you a coarsely shredded product several inches long and stripped. With a garden spade or pitchfork refeed this material into the shredder until it reaches the condition you want. A cornstalk that has been processed this way, just one time, will deteriorate within a day or two in your compost heap. For green materials such as tomato or potato vines, you may first have to snap off extending side shoots. Place vine in the hopper and prod further with a rugged stick (never your hands).
- For grinding dry leaves, no problem, use the 1" perforated screen and dump leaves into the top feed hopper by basket, bag, or pitchfork. If bridging occurs, use a stick to stir leaves into the shredding chamber. Wet or damp leaves should be processed through Mighty Mac with no screen and along with other materials. All by themselves, for the most part, wet leaves will simply blow through the shredder. Soggy partly decomposed leaves process very well through a Mighty Mac if you remove the screen. Dump in pitchfork loads and prod through with a stick.
- For green hedge prunings, small diameter wood prunings (with leaves), rose or flower trimmings, process with the 1" perforated screen installed, feeding bunches at a time.
- Only your operator experience will tell you when to use a screen or no screen, how fast to feed and how to process difficult materials. There is such a wide variety of possible materials that we cannot discuss each individually. Some naturally are easier to work with than others, but most all common organic products available to a gardener can be processed by using your Mighty Mac and common sense.



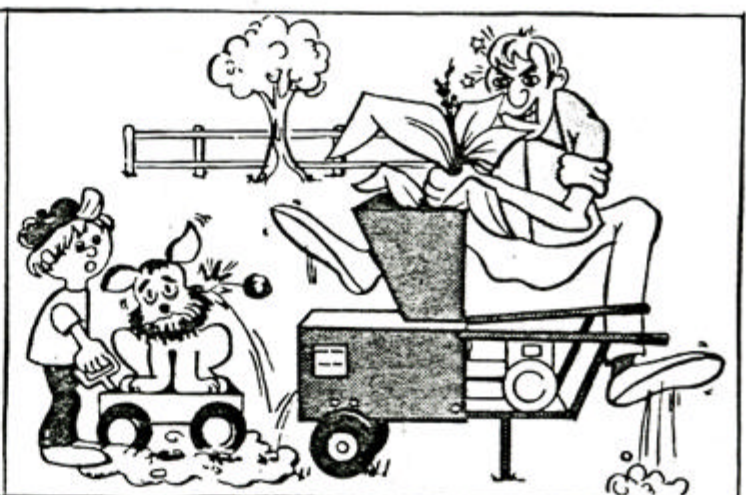
Do clear discharge area of machine with spade, rake or long handle tool.



Don't clear discharge with hands. Never place any part of your body in discharge area.



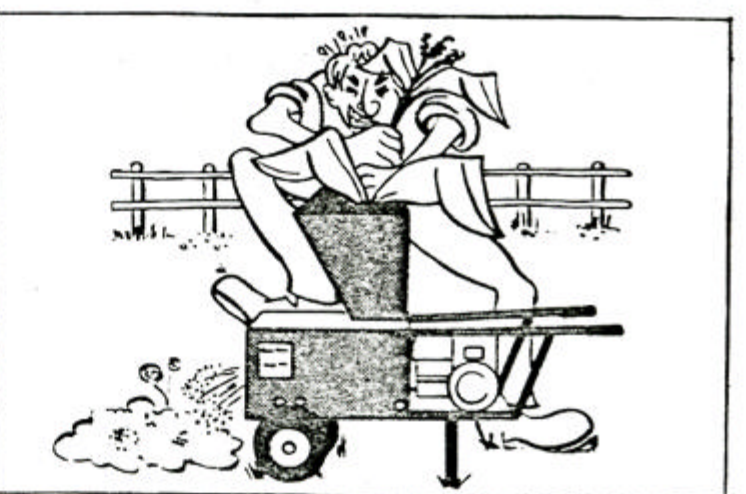
Use stick, never hands, if material bridges in hopper. Do keep people away and discharge shredded material into compost heap or fixed known obstruction.



Don't allow pets, children or bystanders in operating area.



Do stand back - wear glasses and gloves



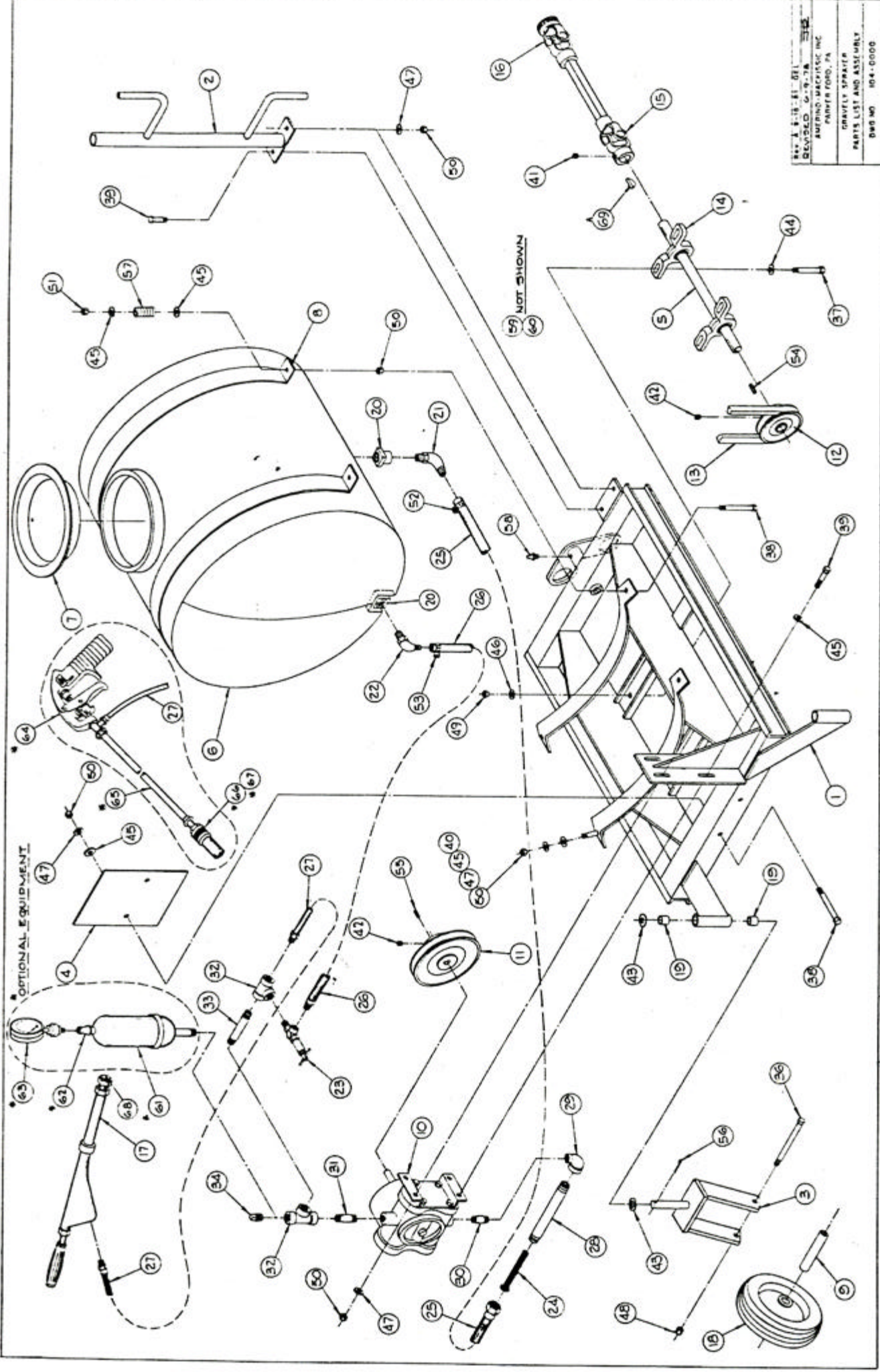
Don't allow hands to enter hopper or peer into hopper with face.

**ASSEMBLY AND MOUNTING INSTRUCTIONS
MIGHTY MAC GRAVELY CONVERTIBLE SPRAYER, Model GCTS**

(NOTE: In the following instructions, the Item Number refers to the number encircled on the drawing, page 17).

1. Install the wheel and wheel swivel assemblies (Item no. 3, 18 etc.) in the mounting sockets on the main frame using washers (Item no. 43) shown. Secure with cotter pins (Item no. 56).
2. Install the discharge hose (Item no. 27) in the tee (Item no. 32) of the pump outlet manifold.
3. Attach the twist-gun (Item no. 17) to the other end of the discharge hose. Loop the discharge hose over the hose rack (Item no. 2) provided. Remove the upper left bolt of the quick-hitch kit and install the bushing (Item no. 59) using the longer bolt provided.
4. Install the key (Item no. 69) in the keyway of the jackshaft (Item no. 5) and slide the sprayer end of the PTO shaft over the key as shown. Tighten the set screw (Item no. 41) securely. Slide the splined end of the PTO shaft over the tractor PTO.
5. Install the sprayer on the tractor utilizing the quick-hitch kit in the socket provided. Slide the support arm on the Mighty Mac frame over the bushing.
6. Read the Operating Instructions, page 20, carefully before starting your sprayer.

REV. 1-18-81-021
 REVISED 6-9-78
 PAPERFORD, PA
 GRAVELL SPRAKER
 PARTS LIST AND ASSEMBLY
 DWG NO. 104-0000



GRAVELY CONVERTIBLE SPRAYER PARTS LIST, Model GCTS (Dwg. No. 104-0000, Page 17)

| Item No. | Part No. | Description | Qty. |
|----------|------------|---|------|
| 1 | 104-0010 | Frame | 1 |
| 2 | 108-0025 | Hose Rack | 1 |
| 3 | 104-0002 | Wheel Swivel | 2 |
| 4 | 104-0004 | Shield | 1 |
| 5 | 502-0011 | Jack Shaft | 1 |
| 6 | 100-0001 | 22 Gallon Tank | 1 |
| 7 | 100-0002 | Lid | 1 |
| 8 | 100-0003 | Tank Band | 2 |
| 9 | 104-0003 | Wheel Bushing | 2 |
| 10 | 100-0008 | Pump | 1 |
| 11 | 030-0089 | 4" Pulley | 1 |
| 12 | 500-0025 | 7" Pulley | 1 |
| 13 | 509-0010 | Belt | 1 |
| 14 | 030-0042 | Bearing | 2 |
| 15 | 502-0003 | PTO | 1 |
| 16 | 030-0029 | PTO | 1 |
| 17 | 100-0009 | Spray Gun | 1 |
| 18 | 020-0005 | Wheel | 2 |
| 19 | 020-0006 | Bushing | 4 |
| 20 | 100-0031 | Bulkhead Fitting | 2 |
| 21 | 100-0032 | Nylon Elbow | 1 |
| 22 | 100-0033 | Nylon Elbow | 1 |
| 23 | 100-0094 | Pressure Relief Valve | 1 |
| 24 | 100-0030 | Strainer | 1 |
| 25 | 104-0005 | Suction Hose | 1 |
| 26 | 104-0006 | Return Hose | 1 |
| 27 | 100-0112 | Spray Hose, 25 feet | 1 |
| 28 | 100-0029 | Strainer Nipple | 1 |
| 29 | 100-0011 | ¾ x ½ 90° ELL | 1 |
| 30 | 080-0364 | ½ Close Nipple | 1 |
| 31 | 080-0366 | ½ x 2½ Nipple | 1 |
| 32 | 080-0010 | ½ Tee | 2 |
| 33 | 080-0368 | ½ x 4 Nipple | 1 |
| 34 | 080-0023 | ½ Pipe Plug | 1 |
| 36 | 090-0375 | Hex Cap Screw - GR 5 Plated ½ - 13 x 5 | 2 |
| 37 | 090-0100 | Hex Cap Screw ¾ - 16 x 1½ | 4 |
| 38 | 090-0074 | Hex Cap Screw 5/16 - 18 x 2½ | 4 |
| 39 | 090-0068 | Hex Cap Screw 5/16 - 18 x 1 | 6 |
| 40 | 090-0069 | Hex Hd. Cap Screw 5/16 - 18 x 1¼ | 2 |
| 41 | 080-0056 | Soc. Hd. Set Screw ¾ - 16 - ¾ | 1 |
| 42 | 080-0053 | Soc. Hd. Set Screw 5/16 - 18 - 5/16 | 2 |
| 43 | 104-0007 | Machined Bushing | 4 |
| 44 | 090-0234 | Flat Washer, Cad. Plate ¾ | 4 |
| 45 | 090-0233 | Flat Washer, Cad. Plate 5/16 | 12 |
| 46 | 090-0225 | Internal Lock Washer ¾ | 4 |
| 47 | 090-0224 | Internal Lock Washer 5/16 | 10 |
| 48 | 090-0035 | Flex Lock Nut ½ - 13 | 2 |
| 49 | 090-0207 | Hex Hd. Nut ¾ - 16 | 4 |
| 50 | 090-0206 | Hex Hd. Nut 5/16 - 18 | 12 |
| 51 | 090-0032 | Flex Lock Nut 5/16 - 18 | 2 |
| 52 | 100-0123 | ½ Hose Clamp | 1 |
| 53 | 100-0016 | ¾ Hose Clamp | 1 |
| 54 | 500-0031 | Shaft Key ¼ x ¼ x 1 | 1 |
| 55 | 100-0018 | Pump Shaft Key 3/16 x 3/16 x 1 | 1 |
| 56 | 090-0247 | Cotter Pin ¼ x 1¼ | 2 |
| 57 | 509-0009 | Spring | 2 |
| 58 | 080-0040 | Grease Fitting ¼ - 28 | 1 |
| 59 | 104-0008 | Gravely, Quick Hitch Bushing (see page 19) | 1 |
| 60 | 090-0370 | Hex Hd. Bolt, Gr. 5, Cad. Plate (For Old Style) ½ - 13 x 3 | 1 |
| | 090-0141 | Hex Hd. Bolt, Gr. 5, Cad. Plate (For New Style) ½ - 13 x 1½ | 1 |
| 61 | * 100-0080 | Pulsation Tank | 1 |
| 62 | * 080-0026 | Pressure Gauge Reducer ½ x ¼ | 1 |
| 63 | * 100-0081 | Pressure Gauge | 1 |
| 64 | * 100-0101 | Spray Gun, Pistol Grip | 1 |
| 65 | * 100-0102 | Spray Gun Extension | 1 |
| 66 | * 100-0103 | Cone Jet Adaptor | 1 |
| 67 | * 100-0104 | Cone Jet | 1 |
| 68 | 100-0115 | Spray Gun Tip | 1 |
| 69 | 080-0086 | No. 15 Woodruff Key | 1 |

* Optional Equipment

Customer Information, obtain from Gravely Dealer if needed:

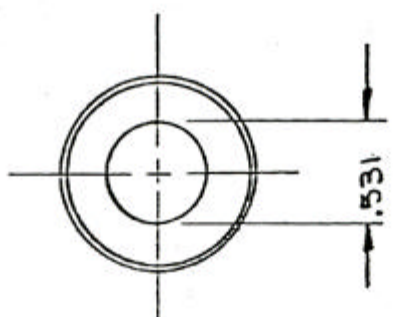
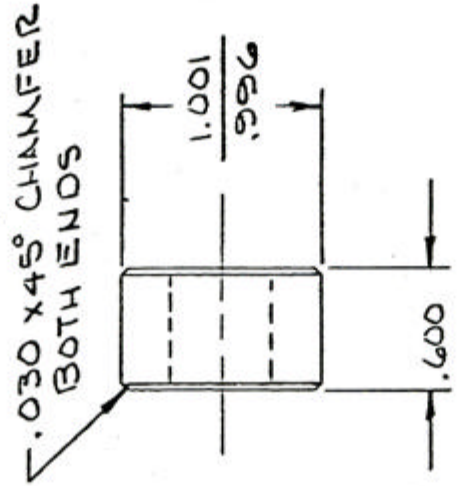
Model No. 22477

Model No. 11898E-1

Gravely, New Style Quick-Hitch Kit

Gravely, Old Style Quick-Hitch Kit

| DATE | SYM | REVISION RECORD | AUTH | DR. | CK. |
|------|-----|-----------------|------|-----|-----|
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PURCHASED FOR GRAVELLY
PART NO. 19297P1

NOTE:

USE 1/2-13 X 3" LG. HEX. HD. BOLT
GR5 F/OLD STYLE

USE 1/2"-13 X 1 1/2" LG. HEX. HD. BOLT
GR. 5, F/NEW STYLE

| | | | |
|---------------------------------|--|----------------------------|-------------|
| TOLERANCES (EXCEPT AS NOTED) | AMERIND MacKISSIC INC. PARKER FORD, PA. 19457 | | |
| DECIMAL ± | SCALE FULL | DRAWN BY JR | APPROVED BY |
| FRACTIONAL ± | TITLE BUSHING F/GRAVELLY QUICK- HITCH OLD & NEW STYLE | | |
| ANGULAR ± | DATE 6-9-78 | DRAWING NUMBER 104-0008 | |

Operating Tips

IMPORTANT NOTE: Never let the 25' spray hose contact any metal part of the sprayer when operating. Damage to the hose can result. Sprayer hose is not warranted.

When operating your "Mighty Mac" sprayer always bear one cardinal rule in mind:

NEVER RUN THE PUMP DRY FOR MORE THAN ONE MINUTE

After the initial assembly or if the sprayer has been idle for some time, the pump must be primed by the following procedure:

1. turn the pressure relief valve adjusting handle counter-clockwise until the internal spring is free (when all spring tension has been removed, the handle will be much easier to turn).
2. fill the tank about $\frac{1}{4}$ full with water.
3. start the engine and allow the pump to recirculate water back to the tank, thereby forcing air from the pump and lines. The hand gun should be placed in the tank opening and the gun opened to remove all air from the discharge line as well.
4. when the system has been completely primed, turn the relief valve adjusting handle clockwise until the desired pressure or spray pattern is reached.

Your sprayer is now ready for use.

Use the steel disc with pinhole opening for mist type spraying of shrubs and small trees. For maximum height as with taller trees, remove the disc and substitute the brass cone-shaped tip.

Pay strict attention to the caution labels of chemicals you're using. They aren't put there to scare you or discourage you from using the product — they're put there simply to help you protect yourself, your family, neighbors and property from unnecessary injury or harm. For instance, it's only good common sense that you should wash your face and hands thoroughly after using such products. Even if you've avoided standing down wind when spraying, it's still quite possible you have some of the material on your skin and it's only prudent to wash it off.

The user who takes a few minutes to read and carefully follow the instructions on his spray material will generally observe better results — and obtain them more safely.

Get into the habit of measuring all chemicals carefully and following all label directions exactly.

Regardless of the type of chemicals you're spraying be very cautious on windy days since "drift" can cause unnecessary waste, or worse, spreading the spray where you didn't want it.

Lawns are best treated with a coarse, drenching spray, one that penetrates to the ground. Trees, shrubs, flowers and vegetables require a fine mist that evenly coats all leaf surfaces.

Proper mixing of wettable powder herbicides in the spray tank is important for uniform application. Start by premixing the herbicide with water in a pail. Half fill the spray tank with water and start the pump so the water will recirculate, then, slowly pour the wettable powder slurry into the tank. Fill the spray tank to the desired water level and spray. Don't leave wettable powder suspensions in the spray tank overnight or vigorous agitation with a paddle will be necessary to resuspend the chemical.

You can calibrate your sprayer easily by catching the discharge from the hand gun in a container such as a gallon bucket and timing how long it takes; thus you'll know that you're spraying at one gallon per minute, for example, and can judge how much insecticide to spray on a fruit tree on this basis.

The pump should be running with the hand gun closed when you add material to the tank; the bypass line then recirculates everything and keeps your solution well agitated.

Emulsion-type liquid sprays can be added directly to the tank.

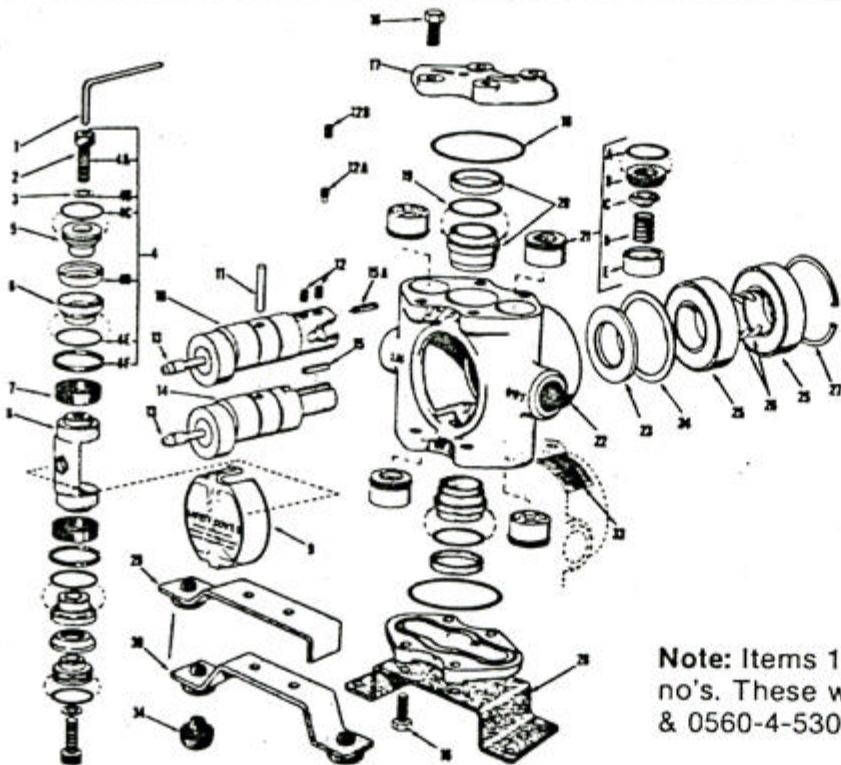
If the sprayer will be idle for two weeks or more, the pump should be flushed with a small amount of oil or rust inhibitor.

When storing for the winter, the system should be thoroughly drained and the pump protected as above for freeze protection.

Periodically remove and clean the stainless steel strainer in the inlet piping to the pump.

Immediately after each use it's a good idea to clean your sprayer thoroughly with a small amount of laundry detergent in water. If a herbicide has been used, the sprayer should be flushed with a solution of 1 pt. of household ammonia in five gallons of water to neutralize any remaining herbicide.

The most common problem that can occur with your sprayer is clogging of the nozzle or passages. The particle that plugs the small passageway can come from a number of sources such as dust, sand or soil that manage to get in the tank. Improperly mixed wettable powders can lead to lumps, or, if the chemical solutions are allowed to remain in the system for an extended time, crystals can form in the solution.



Models PS322T & PS350T
with pump no. 108-0020
use crankshaft item 10A
& spline key item 15A.

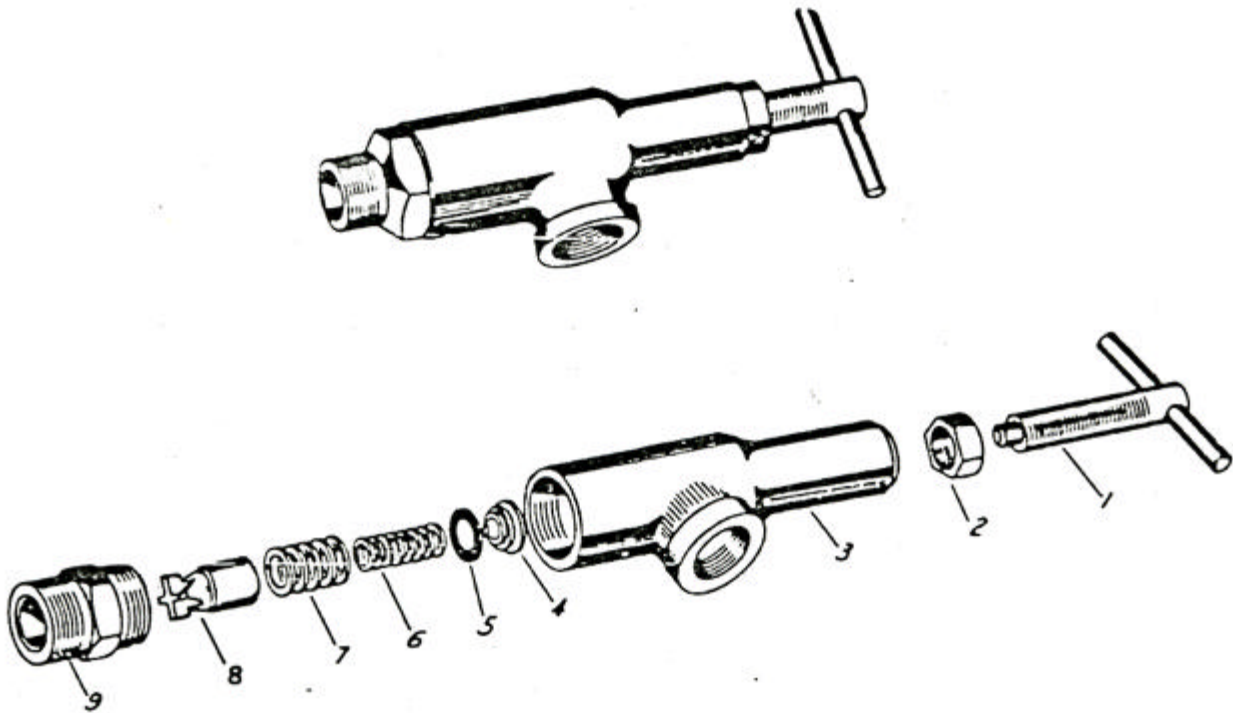
Tractor mounted sprayers
with pump no. 100-0008
use crankshaft item 10
& spline key item 15.

For piston cup repair
kit see item 4.

For piston cup & guide
repair kit see part no.
080-0832.

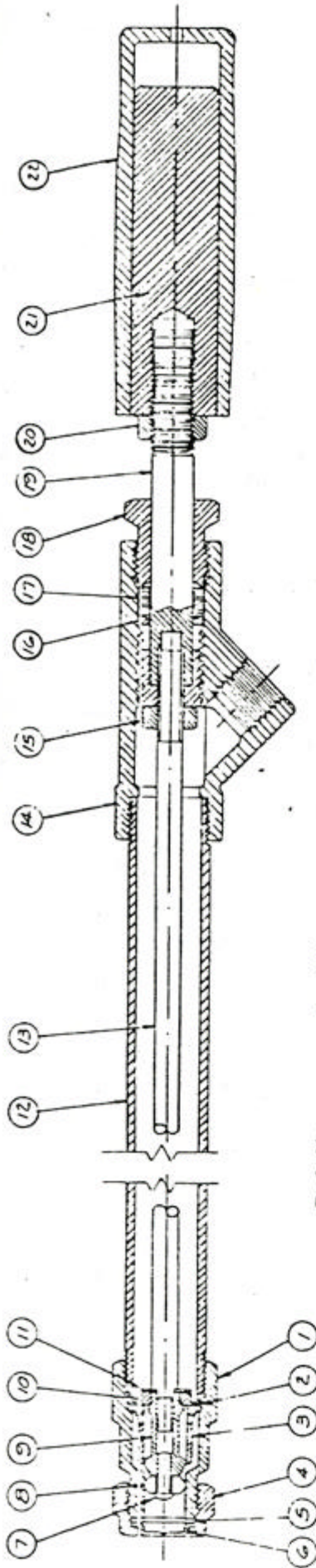
Note: Items 10 & 10A list new hypro crankshaft
no's. These will replace no's. 0510-2-5300
& 0560-4-5300.

| Ref. No. | Part No. | Per Pump | Description |
|----------|----------|----------|-----------------------------|
| 1 | 080-0800 | 1 | Wrench 3020-0001 |
| 2 | 080-0801 | 2 | Cap Screw 2220-0012 |
| 3 | 080-0802 | 2 | Washer Gasket 2270-0011 |
| 4 | 080-0803 | 1 | Piston Kit 3430-0007 |
| 5 | 080-0804 | 2 | Cup Spreader 1830-0017 |
| 6 | 080-0805 | 2 | Cup Plate 1410-0030 |
| 7 | 080-0806 | 2 | Piston Guide 1440-0004 |
| 8 | 080-0807 | 1 | Conn. Rod 0502-5300 |
| 9 | 080-0808 | 1 | Safety Cover 0608-5300 |
| 10 | 080-0809 | 1 | Crank Shaft 5000-5330 |
| 10A | 080-0810 | 1 | Crank Shaft 5500-5330 |
| 11 | 080-0811 | 1 | Retainer Peg 1600-0014 |
| 12 | 080-0812 | 2 | Set Screw 2230-0017 |
| 13 | 080-0813 | 1 | Grease Fitting 2405-0006 |
| 15 | 080-0814 | 1 | Spline Key 1610-0007 |
| 15A | 080-0815 | 1 | Spline Key 1610-0011 |
| 16 | 080-0816 | 8 | Headbolt 2210-0006 |
| 17 | 080-0817 | 2 | Cyl. Head 0200-C5300 |
| 18 | 080-0818 | 2 | Cyl. Head Ring 1720-0038 |
| 19 | 080-0819 | 2 | Cyl. Sleeve Ring 1720-0079 |
| 20 | 080-0820 | 2 | Cyl. Sleeve Assy. 3550-0019 |
| 21 | 080-0821 | 4 | Unitized Valve 3400-0049 |
| 21A | 080-0822 | 1 | O-Ring Valve 1720-0007 |
| 22 | 080-0823 | 1 | Body 0100-C5300 |
| 23 | 080-0824 | 1 | Bearing Shield 2130-0007 |
| 24 | 080-0825 | 1 | Bearing Spacer 2130-0008 |
| 25 | 080-0826 | 2 | Main Bearing 2008-0001 |
| 26 | 080-0827 | 2 | Retainer Ring 1810-0013 |
| 27 | 080-0828 | 1 | Retainer Ring 1820-0006 |
| 28 | 080-0829 | 1 | Mounting Base 1510-0022 |
| 30 | 108-0068 | 1 | Torque Arm |
| 33 | 080-0830 | 1 | Label 6031-0009 |
| 34 | 080-0831 | 2 | Rubber Bumpers |
| | 080-0832 | 1 | Cup & Guide Kit 3430-0008 |



| Ref. No. | Part No. | Description |
|----------|----------|-----------------------------|
| 1 | 080-0700 | Adj. Screw Assy. 5896 Brass |
| 2 | 080-0701 | Locknut 5898 Brass |
| 3 | 080-0702 | Body 6818-1/2 Brass |
| 4 | 080-0703 | Spring Retainer 6545 Brass |
| 5 | 080-0704 | Gasket 5899-BU Buna N |
| 6 | 080-0705 | Inside Spring 6547-SS |
| 7 | 080-0706 | Outside Spring 6546-SS |
| 8 | 080-0707 | Guide Seat 9897 Brass |
| 9 | 080-0708 | Inlet Adapter 6789 Brass |

PRESSURE RELIEF VALVE PART NO. 100-0094



| Ref. No. | Part No. | Description |
|----------|-----------|--------------------------------|
| 1 | 080-0709 | Spray Housing 5869 Brass |
| 2 | 080-0710 | Gasket 4143-CU Copper |
| 3 | 080-0711 | Guide Sleeve 5872 Brass |
| 4 | 100-0100 | Cap 1325 Brass |
| 5 | 100-0099 | Tip Gasket 5871-BU Buna N |
| 6 | See Below | Orifice Disc, Hardened S/S |
| 7 | 080-0712 | Rivet 8037 Brass |
| 8 | 080-0713 | Core 5874 Brass |
| 9 | 080-0714 | Core Body 5873 Brass |
| 10 | 080-0715 | Seat Plate 5798-NY Nylon |
| 11 | 080-0716 | #10 Washer 7985 Brass |
| 12 | 080-0717 | Tubing 6021 Brass |
| 13 | 080-0718 | Stem 6022 Brass |
| 14 | 080-0719 | Inlet Body 6896 Brass |
| 15 | 080-0720 | 1/4-28 Nut 6618 Brass |
| 16 | 080-0721 | Packing Washer 5883 Brass |
| 17 | 080-0722 | Packing 5809-LEA Leather 4/set |
| 18 | 080-0723 | Packing Screw 5811 Brass |
| 19 | 080-0724 | Hand Grip Stud 6113-NP Brass |
| 20 | 080-0725 | 3/8-24 Jam Nut 6551-AL Alum. |
| 21 | 080-0726 | Handle Insert 7013-AL Alum. |
| 22 | 080-0727 | Hand Grip 8119R Rubber |

OPTIONAL DISC AVAILABLE

| Disc# | Part No. | Flow Rate @ | |
|-------|----------|--------------|----------------|
| | | Mist Setting | Stream Setting |
| D-1 | 100-0095 | 0.23 GPM | 0.24 GPM |
| D-2 | 100-0096 | 0.45 GPM | 0.47 GPM |
| D-3 | 100-0121 | 0.68 GPM | 0.70 GPM |
| *D-4 | 100-0097 | 0.92 GPM | 0.94 GPM |
| D-5 | 100-0098 | 1.45 GPM | 1.47 GPM |

*Std. Disc Supplied in Twist Guns

*No. 18 Spare Parts Kit (100-0105) Includes These.

PART NO. 100-0009
SPRAY GUN

6-21-76