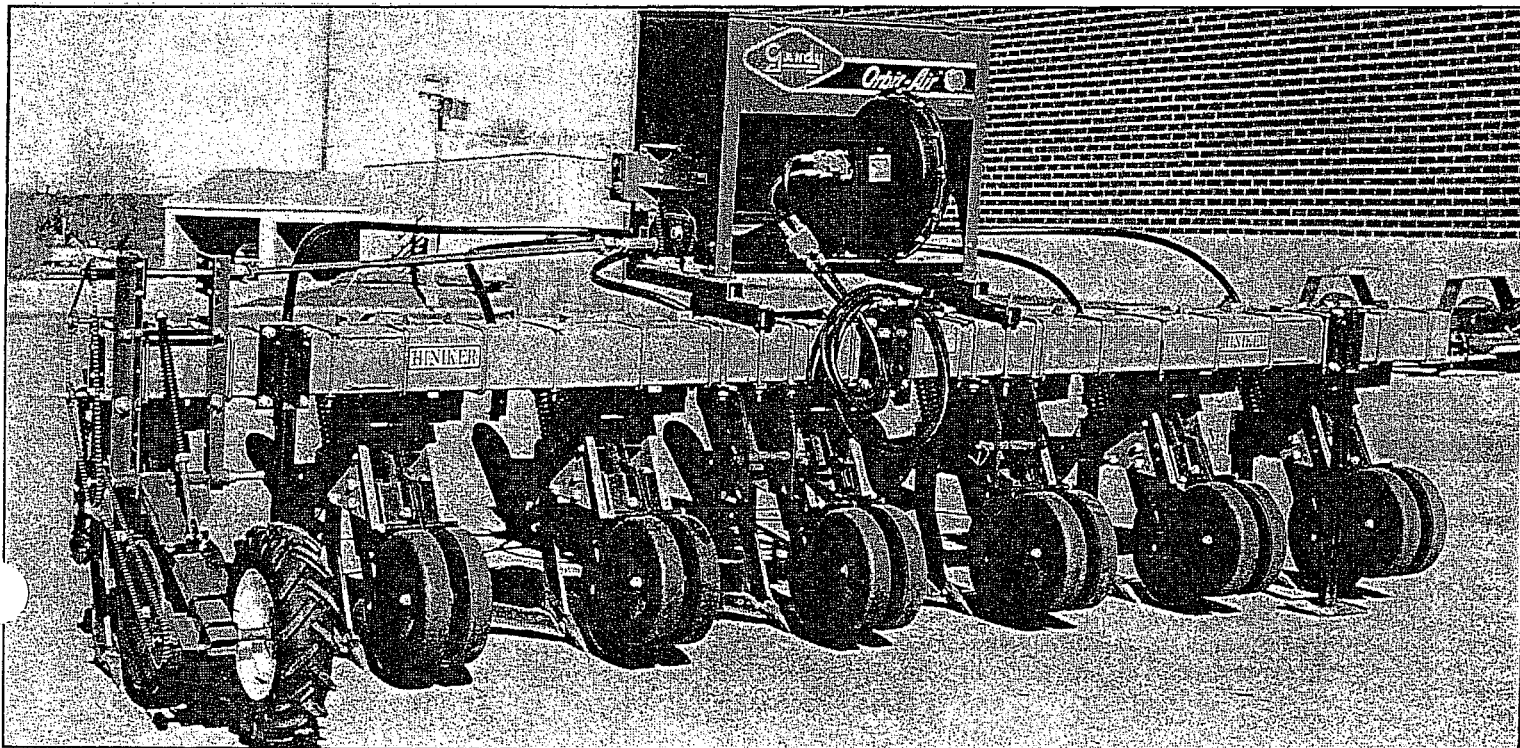
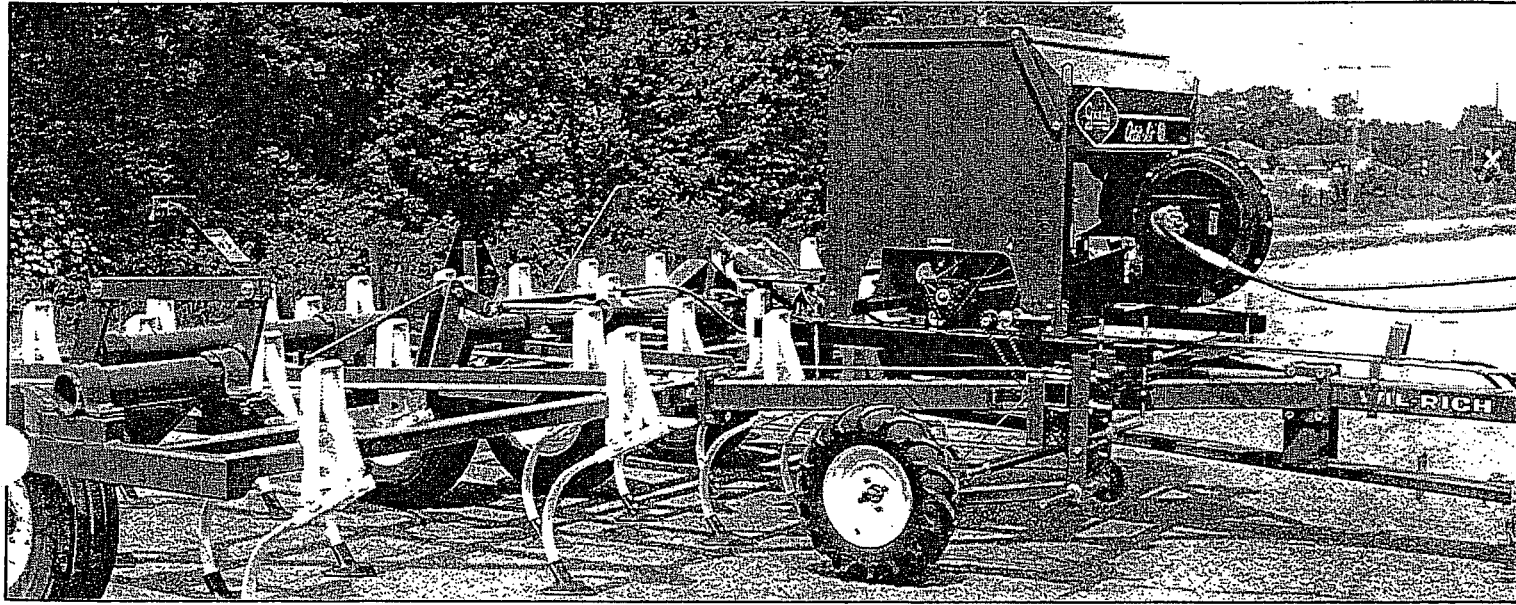




Orbit-Air 

Operator's Manual

for ground-driven Gandy Orbit-Air® 8, 10, 21.9 & 30 cu. ft. models



YOUR OWNER'S MANUAL —

To help you assemble, use and care for your Gandy Orbit-Air® is the purpose of this manual. Proper calibration, operation and care as explained inside are important. When in need of replacement parts, always specify the model and serial numbers. For your reference, write these serial numbers in the space provided. Serial number plates are located below the blower on all models.

Model: _____ Serial Number: _____

Note: Please return enclosed warranty form provided in your packet.

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SAFETY SUGGESTIONS

BEFORE OPERATING

- Review the operator's manual.
- Observe any warning stickers on the machine.
- Check all hoppers to see that no foreign matter or objects have entered or been placed in them.
- Exercise care in unfolding unit.
- Make sure there is ample room to maneuver machine. Before moving, make sure area is clear.

DURING OPERATION

- Exercise care when operating close to ditches, fences, on hillsides or when turning.
- Check all bolts for tightness after first two hours' use; check periodically thereafter.
- Check blower and hydraulic motor bearings for wear or potential failure.
- Keep hands, feet, clothing and objects out of the hopper.
- Do not permit riding the applicator.

DURING TRANSPORT

- Disengage any ground wheel drives or clutches.
- Drive at a reasonable speed to maintain complete control of the machine at all times.
- Comply with your state and local laws governing highway safety and with regulations when moving machinery on a highway.



PLEASE PROTECT YOURSELF AND OTHERS!

Before applying any agricultural chemical, read all product labels and directions for proper use. Wear protective clothing as directed, and exercise care while filling, operating and cleaning chemical applicator equipment.

Be sure to follow all label recommendations closely so not only are you and your crop protected, but also the welfare of the surrounding environment and ultimately the users of your crop.

HOPPER & METERING ASSEMBLY of Gandy 8, 10, 21.9, & 30 cu. ft. Orbit-Air models for fertilizer, seed, or granular application with Zero-Max control.

Note: In assembly, 8, 10, 21.9, & 30 cu. ft. Orbit-Air applicators follow similar steps. Differences will be noted in the following procedure. Some differences in components may also occur through in-line production changes made subsequent to manual preparation. Save and refer to parts & packing list shipped with your unit.

1. With hopper upside down, insert 1" shaft through uppermost holes in hopper ends. Place bearing with grease fitting over each end of shaft, securing bearings to hopper frame with two hex bolts, lock washers and nuts in each. Insert 5/8" shaft through lower holes in hopper ends.

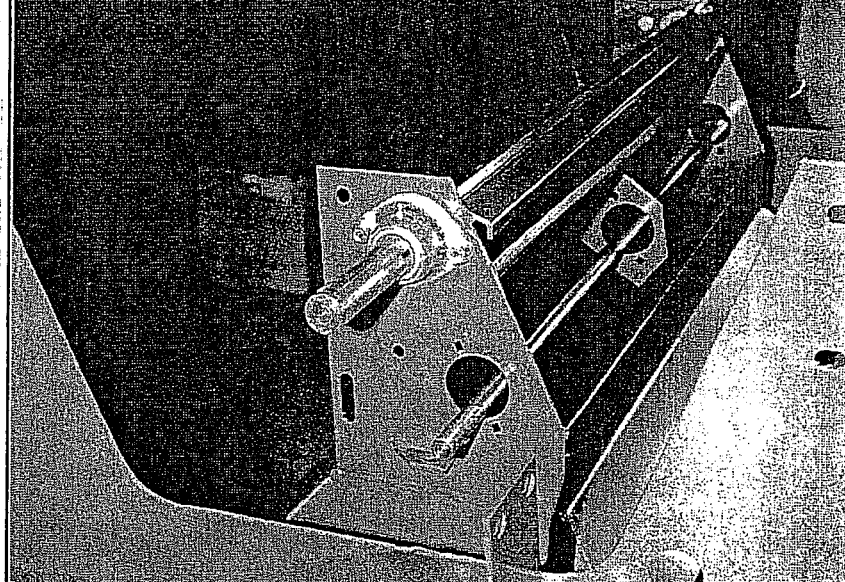
2. On split shaft 10, 21.9, & 30 cu. ft. models, place bushing on both outside ends of 1" shaft. One bushing is required on 1" shaft of single shaft models if they are not equipped with clutches. (See Step 4 for bushing & clutch assembly).

On end of 5/8" shaft nearest speed control unit, insert cotter pin, and slide on flat washer and plastic bearing with flangettes. Secure flangettes with two 1/4 x 1/2" carriage bolts. Split shaft models have a center opening with a third plastic bearing and flangettes secured with carriage bolts.

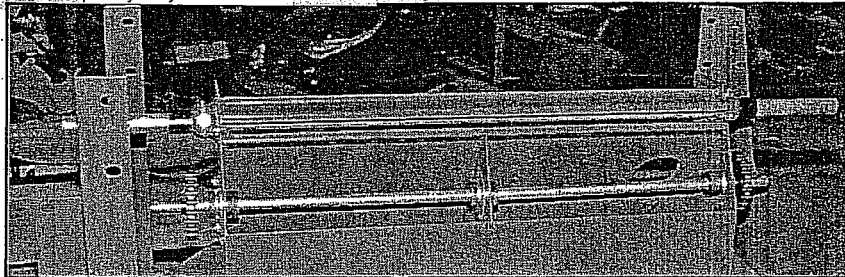
Place 21T chain sprocket on both ends of 5/8" shaft on split shaft models, securing in second hole using cotter pin. Single-shaft models require only one 21T chain sprocket on end nearest speed control unit.

3. On opposite end of 5/8" shaft on single-shaft models, insert cotter pin and slide on flat washer and plastic bearing flangettes and secure with one 1/4 x 5/8" carriage bolt in the lower hole (as viewed) and 1/4 x 1" carriage bolt assembled with magnetic sensor mounting bracket in the upper. Leave mounting bracket loose.

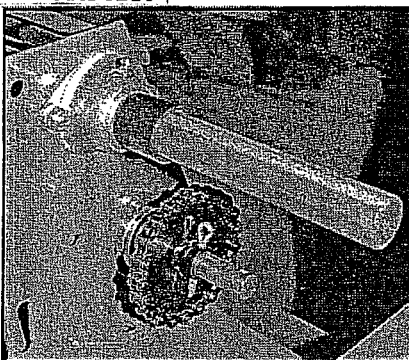
4. Place one 628720-7 bushing on 1" shaft on end nearest speed control mounting bracket, then install 24T sprocket on same end of 5/8" shaft. Mesh this sprocket with the chain sprocket in place on keyed clutch assembly. Slide each on respective shafts and secure 24T sprocket with cotter pin. Leave clutch loose. Model 6210 has the 24T sprocket and clutch assembly on each outside end of the split shaft.



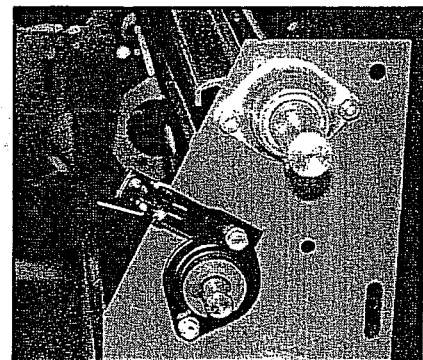
Models 8, 10, 21.9 & 30 cu. ft.



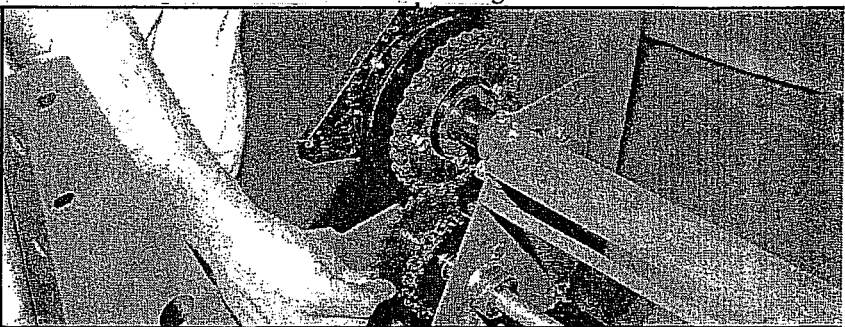
Model 6210



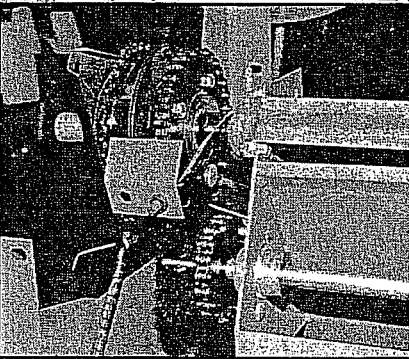
All models with clutch



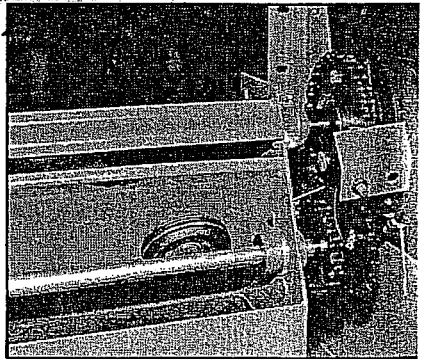
Single shaft model



Model 8, 10, 21.9 & 30 cu. ft. with clutch



Split shaft models, drive side



Single shaft, drive side

5. On 8 & 10 cu. ft. models, mount Zero-Max control on mounting bracket on end of hopper, placing drive shafts through openings in hopper leg. Secure to mounting base with four hex bolts, lock washers and hex nuts.

On 21.9 & 30 cu. ft. models, proceed to Step 6 and install 16T sprockets on Zero-Max shafts first, then install Zero-Max as described above.

6. Place 5/8" bore 16T sprocket on lower shaft (as viewed) and 1/2" bore 16T sprocket on upper shaft (as viewed), hubs outward. Secure 5/8" bore sprocket with two socket set screws and key in keyway of shaft. Secure 1/2" bore sprocket with two socket set screws.

7. Attach nylon roller and bushing to inside of hopper end frame in slot using 3/8 x 2-1/2" carriage bolt, placing wrought washer on inside of hopper end, followed by bushing, roller, wrought washer, lock washer and secured with hex nut.

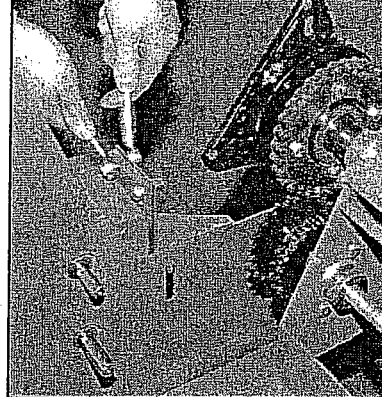
8. Attach windshield to channel on hopper using hex bolts, SAE washers and whiz lock flange nuts.

9. On 8 & 10 cu. ft. models, place 74-link roller chain around electric clutch sprocket, over nylon roller and 5/8" bore 16T sprocket. On 21.9 and 30 cu. ft. models, use 100-link roller chain.

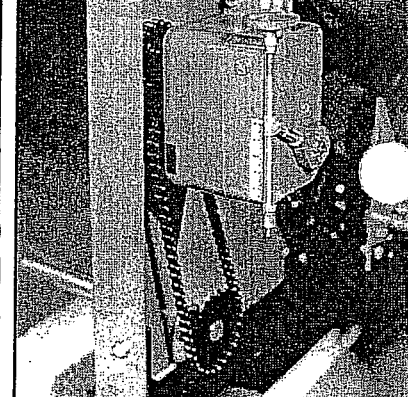
10. Attach left and right hopper mounting arms to hopper legs using 3/8 x 1" hex bolts in four holes in each leg except where 3/8 x 1-1/4" hex bolts are used in lower leg holes to accommodate tubing angle support described in Step 18. The outside leg below the Zero-Max control requires 3/8 x 1" carriage bolts. Place drive shaft housing 62853-15 on the outside of this leg. Secure mounting arms to hopper with lock washers and hex nuts.

11. Slide hopper drive shaft into housing just attached, keyway to the outside. Place 1" washer over inner end. On 21.9 & 30 cu. ft. models, follow washer with 9/16" spacer bushing, and 24T sprocket hub inward. Pin with cotter pin. On 8 & 10 cu. ft. models, follow 1" washer with 24T sprocket hub outward and pin with cotter pin. Slide washer over outer end of shaft and secure against housing with cotter pin. Place 49-link roller chain around 24T sprocket and 16T sprocket on 1/2" shaft of Zero-Max control. Secure with connector links and offset links as needed.

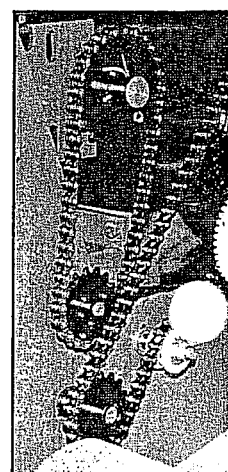
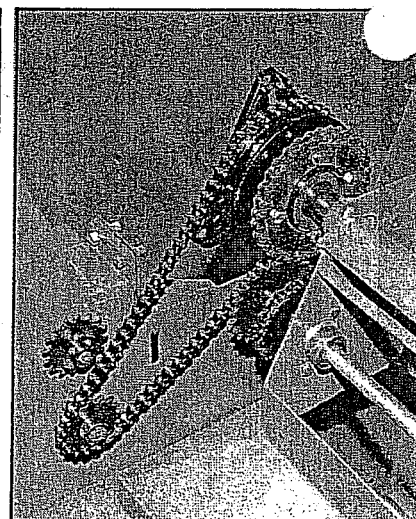
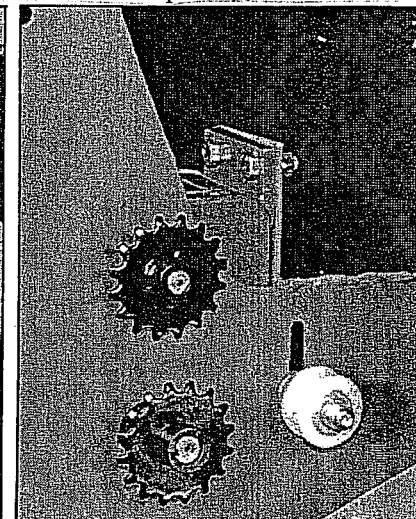
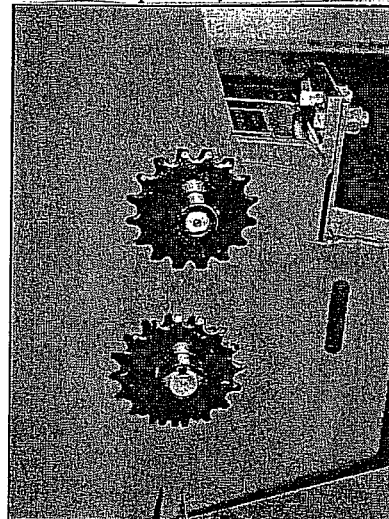
12. Attach electric clutch flange to tab on hopper mounting arm, using 3/8 x 1-1/4" hex bolt with a nut on either side of the tab. Tighten nuts. Clutch should be loose on bolt. On 8 & 10 cu. ft. models, secure clutch on end of shaft using 1" washer and collar secured to shaft with square head set screw. On 21.9 & 30 cu. ft. models, use 5/16 x 5/8" hex bolt, lock washer and retaining washer.



Zero-Max position, 8 & 10 cu. ft.



Zero-Max position, 21.9 & 30 cu. ft.



METERING DOOR ASSEMBLY

13. *On units with standard plastic metering cups*, affix cups to studs on mounting plate (door) using flange nuts. If desired, include a cleanout spout (optional) in place of a metering cup. Slide detent hole closures into slots behind cups and spout and secure in position with cupped washer, spring, and hex bolt. Place slides in *one of the two mid-positions* for metering chemical or small seeds (See charts), highest position for metering fertilizer and large seeds, closed if outlet not used.

On units with 6-outlet metal gang cups, affix cups to studs on mounting plate. Slide detent hole closures into rear of cup and secure in position with cupped washer, spring, and hex bolt. Select and place slides in *one of the two mid-positions* for metering chemical or small seeds, highest position for metering fertilizer and large seeds. If individual outlets are to be closed, use solid closures supplied in parts carton, and make sure they are in true vertical position to prevent leakage of material. Secure using lock washers and 5/16 x 1/2" hex bolts provided. *For long-term closure, be sure to seal edges of slides to prevent leakage under field stress.*

14. On 21.9 & 30 cu. ft. models, slide center plastic bearing with hex journal to center of hex shaft, followed on each side by a flangette and on model 6216, a collar. (Model 62AN18 does not require this center bearing). Slide metering wheels on hex shaft. Use **BLACK** wheels for chemicals and small seeds, **RED** wheels for fertilizer and small seeds at high rates, **WHITE** wheels for large seeds. Seat metering wheels into the metering cups. Optional **YELLOW** wheels for higher volume of fertilizer may meter more than air system can handle. On each end of shaft slide a .656 I. D. washer on Model 6212 (none on other models), followed by a flangette, plastic bearing and second flangette. Secure bearings in place by attaching both flangettes to each bracket on metering door using two hex bolts, lock washers and nuts. On Model 21.9 & 30 cu. ft models, place collars on each side of center bearing.

Secure 21T steel sprocket to right end of hex shaft of single shaft models, using cotter pin. Split shaft models have 21T steel sprockets on each end. On left end of hex shaft on single shaft models, attach magnetic hub for magnetic sensor to shaft with 3/16 x 1" spring pin.

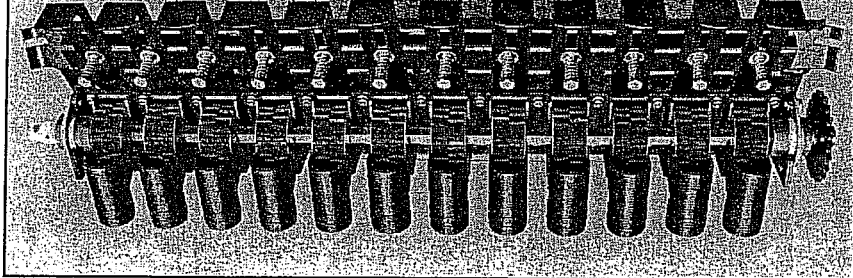
15. Place metering door on hopper bottom, securing to hopper with "J" bolts, washers and hex nuts. Be sure drive and driven gears mesh properly.

AIR CHAMBER ASSEMBLY

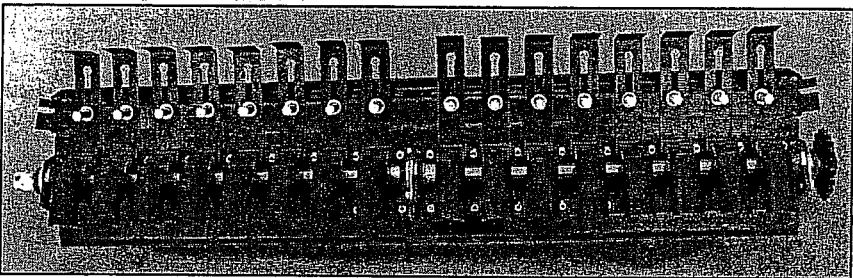
16. Attach air chamber to bottom of hopper, placing air chamber flanges to inside of hopper flanges. Secure in place on each side with 3/8 x 3/4" hex bolt, lock washer and hex nut. Attach manifold support angle to lowest hole in hopper leg using two 3/8 x 1-1/4" hex bolts noted in Step 11. Secure with lock washers and hex nuts. Attach air chamber to support angle with 3/8 x 2" hex bolt, wrought washer, lock washer and nut.

17. Attach gasket and mixing chambers over openings in manifold using 5/16 x 1" hex head thread cutting screws. On Models 6210 & 6212, attach rubber plug mounting plate to right end of manifold with four hex head tapping screws. Insert rubber plug. Attach blank plate to other end of manifold using four hex head tapping screws.

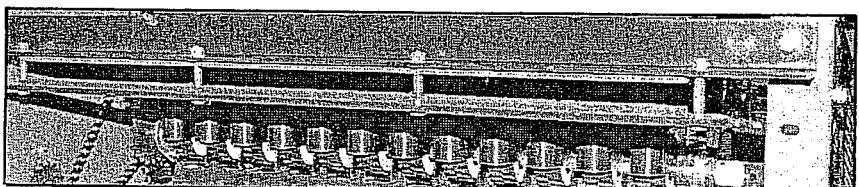
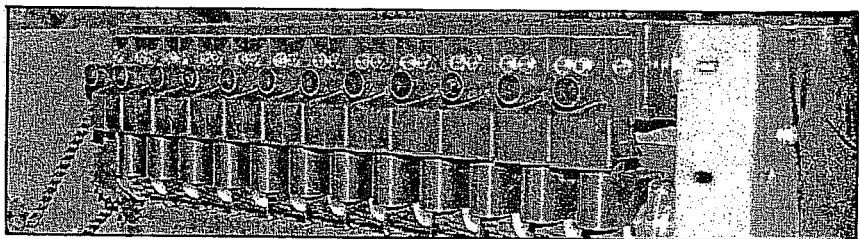
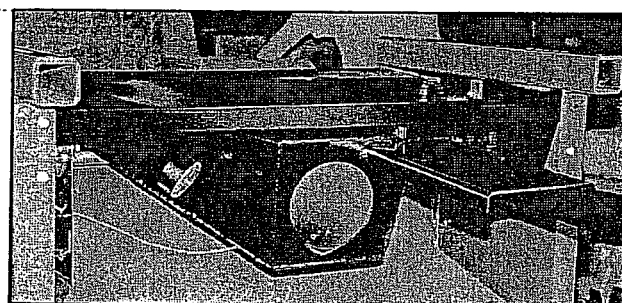
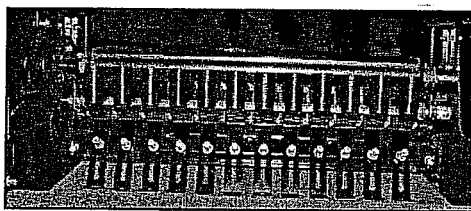
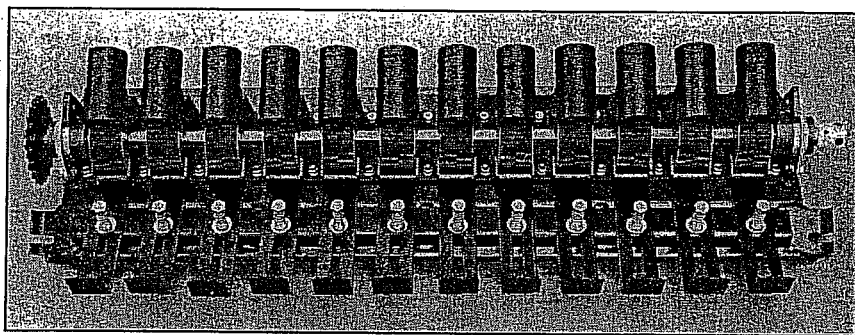
18. Attach tubing angle clamp to outside of hopper leg on mixing chamber side using holes nearest hopper base. Secure 3/8 x 1-1/4" hex bolt, lock washer and nut in each end. Attach tubing bar clamp to angle clamp using four 5/16 x 2-1/4" hex bolts and nylon nuts.



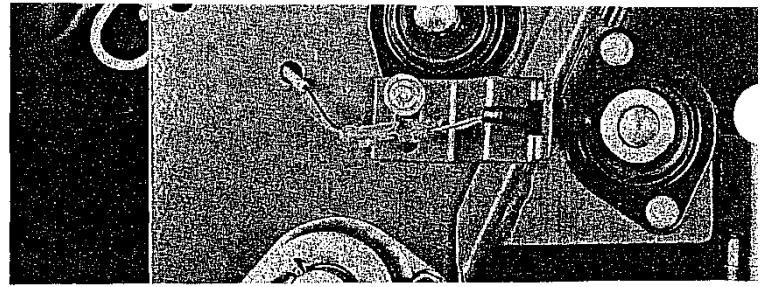
Metering shaft assembly, single shaft models



Metering shaft with center bearing, split shaft models

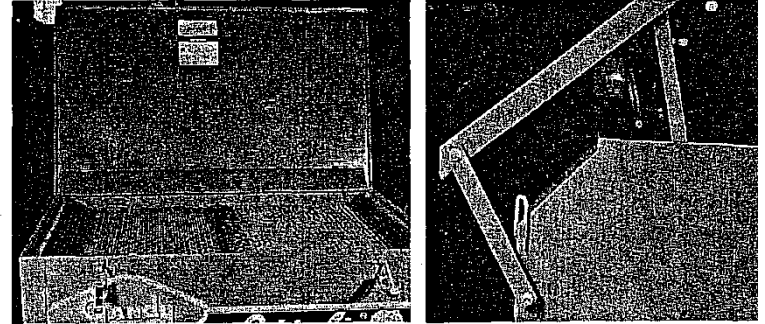


19. Attach magnetic sensor to sensor mounting bracket using whiz flange nut furnished. Make adjustments so sensor makes good contact with magnetic hub on shaft, approximately 1/8-inch clearance. Attach sensor wires to magnetic sensor. Secure sensor mounting bracket in place. Route shaft sensor wires through hole in hopper to potting box located on air chamber.

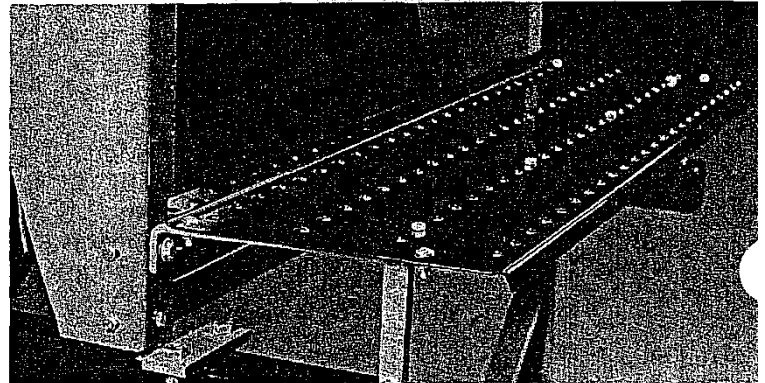


COVER

20. Place hopper upright. On 8 & 10 cu. ft. models, attach cover with spill-guard to hopper to open in desired direction using clevis pins secured with cotter pins. Place snap latches on opposite side and secure in place with cotter pin in each.



On 21.9 & 30 cu. ft. models, attach flat outer hinges to stud bolts on hopper with wrought washer and lock nut. Attach angled hinges to stud bolts inside hopper with wrought washer and lock nut. Attach hinges to cover using wrought washer and lock nut on outside hinges; hex bolt, wrought washer and lock nut on inside hinges. Insert two screens in 8 & 10 cu. ft. models; four screens in 21.9 & 30 cu. ft. models. Screens rest on rail below inside lip of hopper.



FILL PLATFORM (21.9 & 30 cu. ft. models)

21. On 21.9 & 30 cu. ft. models, attach brackets for mounting platform to upper hole in rear hopper legs using one 3/8 x 1-1/4 carriage bolt, wrought washer and whiz flange nut in each. Secure platform to mounting brackets using four 5/16 x 3/4 carriage bolts and whiz flange nuts. Attach support angle to bottom of platform using hardware furnished.

Magnetic Sensor & Console

Single Shaft Models

1. On air chamber, place gasket for potting box in position, attaching air pressure switch to air chamber with Phillips head thread cutting screws provided. Connect the air pressure switch wire to the 8" 4-contact male molded connector using wire connectors. Match yellow wire of air pressure switch to yellow wire, brown wire to brown. Connect the shaft sensor cable to this same male molded connector, matching red wire of sensor cable to green of molded connector, black wire of sensor cable to white wire of molded connector. Place potting box over air pressure switch and wire connectors and secure with Phillips pan head thread cutting screws.

2. To 4-contact male connector from potting box, attach 144" 4-contact molded connector and run to implement hitch. Plug 15-ft. Wire assembly into electric clutch connector and route both wires together to front of hitch.

3. Mount console in convenient location in vehicle cab using hardware provided. Connect 4-contact and 2-contact connectors of console wiring to 12" 4-contact and 2-contact wire assemblies and route to tractor hitch.

4. Wrap wiring in flex guard loom.

5. Connect positive (red) fork of power and ground wire to toggle switch of console. Connect negative (brown) fork of power and ground wire to ground screw on console case. Connect positive fork of electric clutch's power and ground wire to the opposite terminal of the toggle switch, negative fork to ground screw on console case. Connect 8" 4-contact female shaft sensor wire to white and brown wires to ground terminal; yellow wire to amber light with wire connector; green wire to green light with wire sensor.

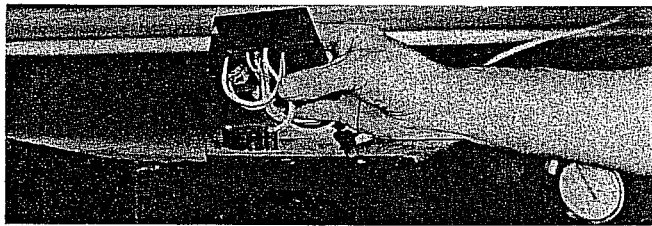
6. Place rings of power and ground wires for console and electric clutch switch on corresponding positive and negative terminals of battery.

Connect 8" 4-contact female shaft sensor wire to white and brown wires to ground terminal; yellow wire to amber light with wire connector; green wire to green light with wire connector. *Check wire to ensure that a full 12-volts is being received at clutch end of wiring.*

Split Shaft Models

1. Connect the air pressure switch wire to the 8" 4-contact male molded connector using wire connectors. Match wire of air pressure switch to yellow wire, brown wire to white wire. Connect the red wire of the second shaft sensor cable to the brown of the molded connector. The two black wires, one from each of the shaft sensor wires are connected to the white wire of the molded connector to which the brown wire is already connected.

Place potting box (shown below) over air pressure switch and wire connectors and secure with Phillips pan head thread cutting screws.



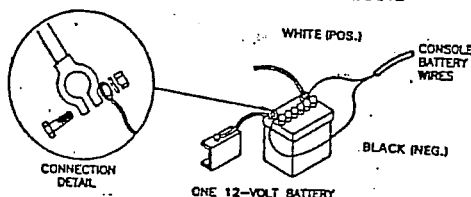
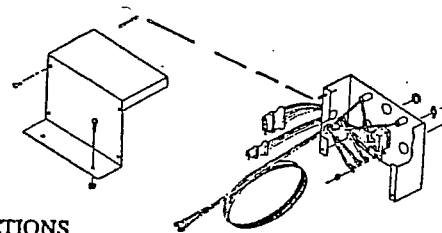
2. To 4-contact male connector from potting box, attach 144" 4-contact molded connector and run to implement hitch. Plug 12-ft. wire assembly into electric clutch connector and route both wires together to front of hitch.

3. Mount console in convenient location in vehicle cab using hardware provided. Connect 4-contact clutch wire connector to 4-contact clutch connector (labeled) of console as well as 4-contact sensor wire assembly and route to tractor hitch.

4. Wrap wiring in flex guard loom.

5. Connect positive (white) fork of power and ground wire to center toggle switch of console. Connect negative (black) fork of power and ground wire to ground screw on console case. To 8" female clutch connector, attach green wire with fork to left outer switch and the yellow wire with fork terminal to right outer switch. Attach brown and white wire with fork to ground screw. Connect 8" 4-contact female shaft sensor wire to white wire with fork to ground terminal; brown wire to right green light with wire connector; yellow wire to center amber light with wire connector; green wire to left green light with wire connector.

6. Place white ring wire of power and ground wires to positive terminal of battery, black ring wire to negative terminal. *Be sure electric clutches are receiving 12-volts of current.*



HOPPER INSTALLATION

1. With folding implement in transport position, check measurement of planned location to assure proper clearance. Determine if additional support tubing is necessary for convenient and level installation. Note that installation shown used extra square tube cross member (not provided with mounting hardware) welded to implement frame to support hopper base, allowing extra length for mounting the ground drive to the outside if necessary. Positioning of hopper should be toward rear of hitch to provide room for ground drive and clearance for tractor tires. A tube extension bolted to hopper base or implement frame might be used if desired length of extra tubing not available. Certain riser or height extension packages for specific installations may be available through your dealer as options.

2. At four corners, loosely clamp hopper to implement frame with bar clamps, stud bolts, lock washers and nuts provided.

GROUND DRIVE INSTALLATION

Installation instructions for current ground drive packages follow; however, be sure to check support materials accompanying your unit for ground drive supplied. Changes may occur to accommodate designs of parent tillage tools.

628833 Ground drive with traction tire, *32T spkt on ground drive axle*

629733 Ground drive with traction tire, *16T spkt on ground drive axle, for low rate chemical use*
(Both also offered with sealed bearings in HD packages)

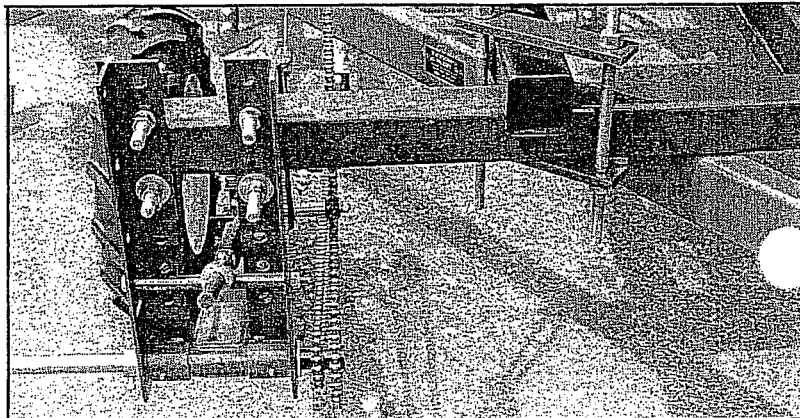
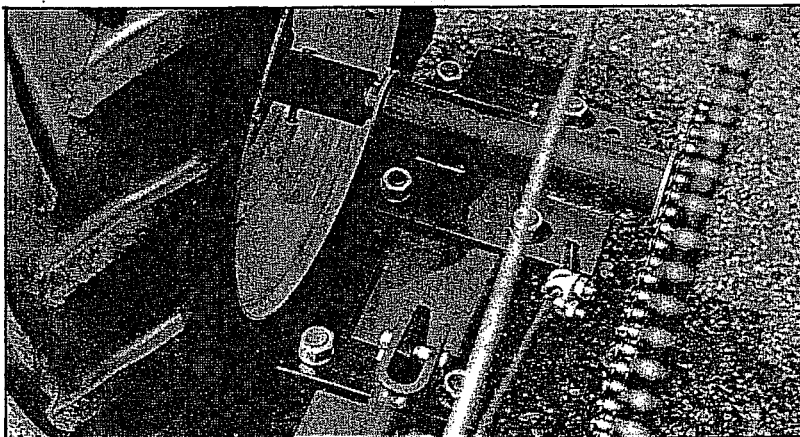
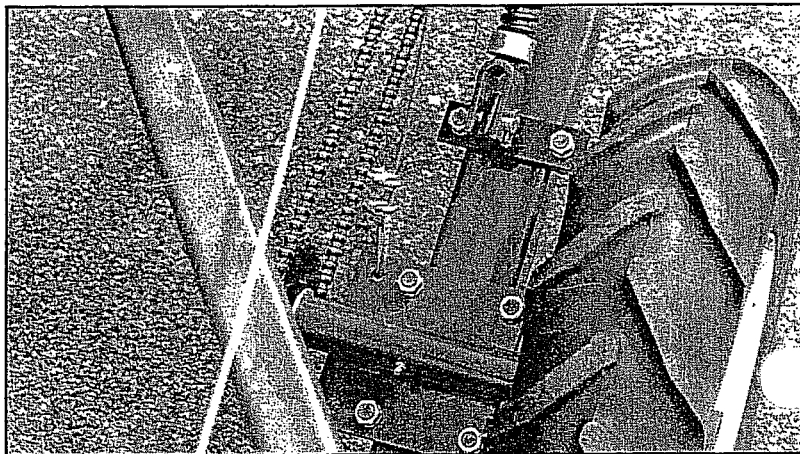
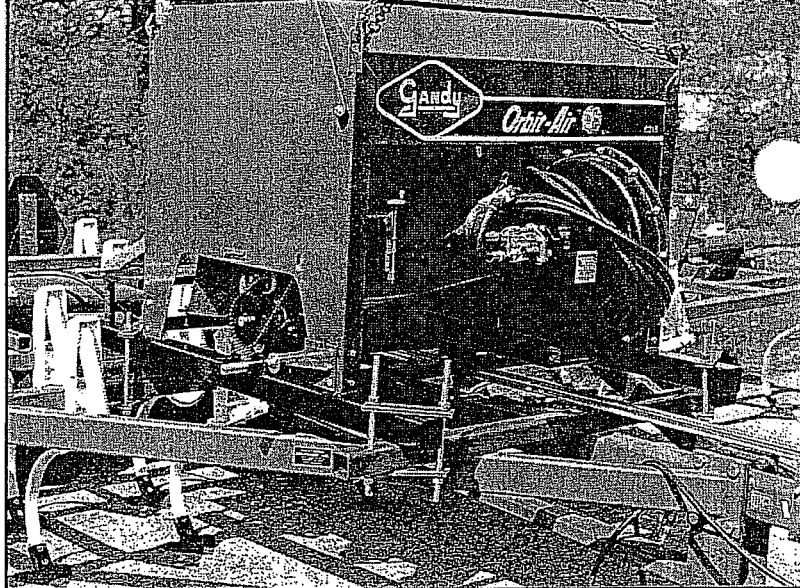
1. Lay out components of ground drive and check packing list to see that all parts have been properly shipped. Place axle housing plate on lower end of ground drive pivot arm using two "U" clamps, lock washers and hex nuts. Leave loose. Slip shaft through axle housing so single drilled end is on side opposite where wheel to be mounted. On this end, place 1" washer and 32T or 16T sprocket, depending on package ordered. Pin sprocket with spring pin.

2. Over double drilled end, place 1" washer secured with cotter pin. Slide on wheel hub and secure with clevis pin fastened by cotter pin.

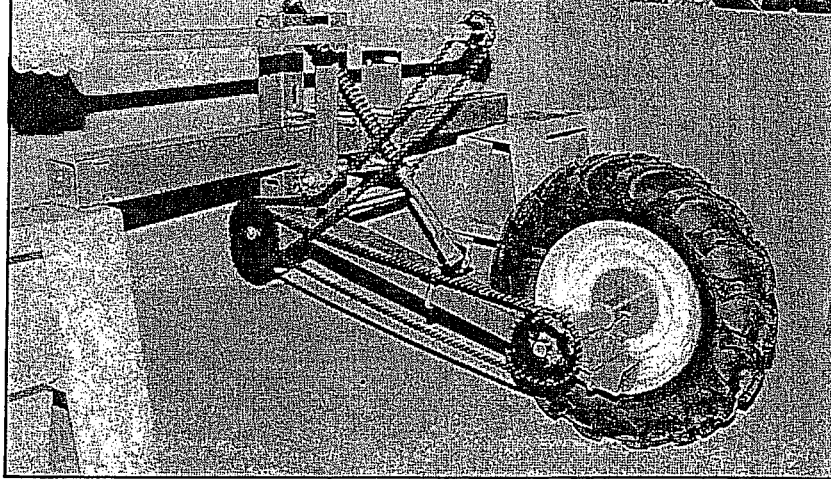
3. Attach ground wheel to hub with lug nuts provided. Tighten lug nuts securely.

4. Place keyed pivot shaft through pivot housing keyway to wheel side, then on each end, slide on pivot arm brackets, adding 1" washer to the outside. Slide 18-32T double sprocket on side opposite wheel, and using cotter pin, secure with smaller 18T sprocket toward inside. On drive wheel side, slide on locking collar and secure with set screw.

5. Adjust placement of hopper if necessary after checking positioning of ground drive. Position ground drive below hopper frame, attach pivot arm to frame members with two angle clamps, four stud bolts, two wrought washers over the two slotted openings, 8 lock washers and 8 hex nuts. Leave loose. *Note: Trailing position of wheel is preferred, but some installations require wheel in forward placement. Also relationship of angle clamps and pivot arm can be reversed.*

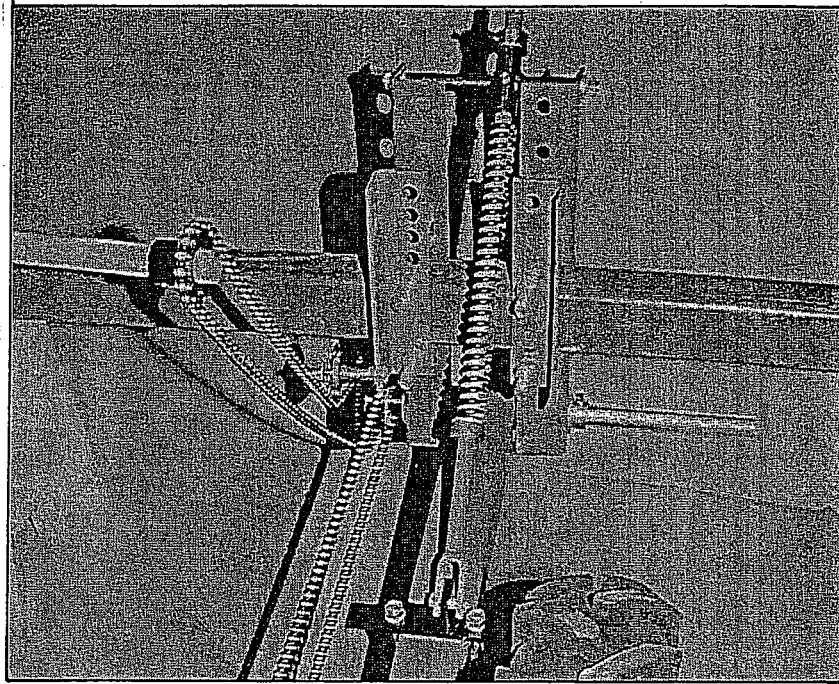


6. Place small 16T sprocket on hopper drive shaft and align with outer sprocket of double sprocket on pivot arm shaft. When aligned, secure sprocket in shaft keyway with two set screws. (Some hoppers without a shaft with keyway will require on-site drilling of indentations into shaft using set screw holes as a guide. The sprocket can then be secured to shaft using the two set screws provided).



7. Attach tab for pressure rod to pivot arm (longer tab arm toward wheel side) using "U" bolt, lock washers and nuts. Leave loose. Position pressure rod pivot arm between ground drive brackets and choice of hole to achieve desired angle, sliding 8-1/2" hex bolt through brackets and pivot arm, and secure in place with lock nut, while still allowing housing to pivot.

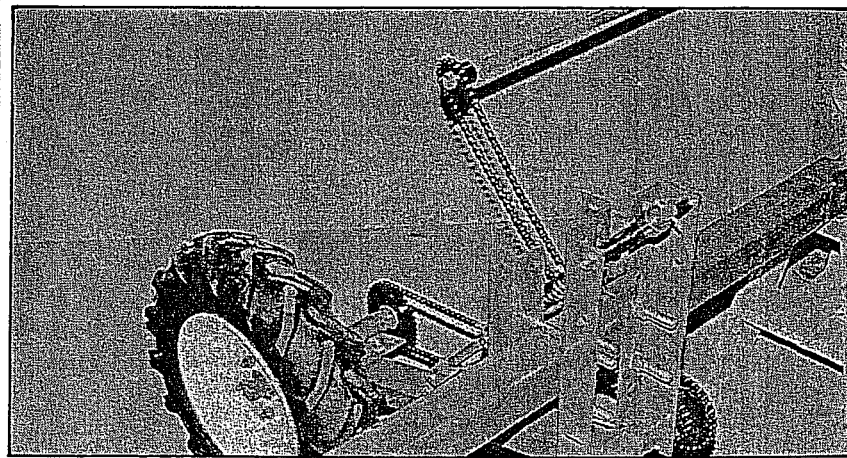
8. Place locking collar followed by pressure spring over pressure rod. Slide rod upwards through round tubing on pivot arm. Attach clevis of pressure rod to tab on pivot arm using clevis pin and cotter pin. Place locking collar over upper end of pressure rod and secure just above the pivot arm. Place cotter pin in upper end of pressure rod. Pressure rod angle should be at least 45° with the ground to reduce slippage. Adjust tension of pressure spring by securing upper and lower locking collars as desired. *(Not maintaining adequate down pressure on ground drive wheel is most common cause for rate difference. Retaining compound may be applied to collar for added security.)*



9. Attach 18T idler sprocket to lower slot of the inner angle clamp which secures ground drive pivot arm. Use 3/8 x 1/4" carriage bolt inserted through angle clamp, 3/4 x 19/16" bushing, SAE washer, 18T idler sprocket with 3/4 x 1/2" bushing insert, SAE washer, and secure assembly in place with lock washer and hex nut.

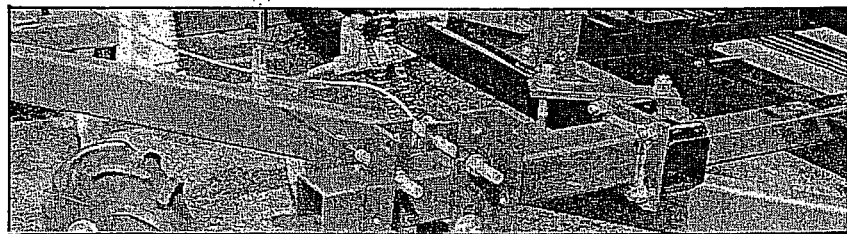
10. Place roller chain around ground wheel sprocket and inner 18T sprocket of double sprocket on pivot arm shaft. Be sure sprockets are aligned. Tighten chain by sliding drive shaft housing plate to rear and securing with lock washers and nuts.

11. Place roller chain around 32T sprocket of double sprocket, under 18T idler sprocket and around 16T sprocket on hopper drive shaft. Tighten chain by sliding idler sprocket toward rear of slot and secure in position.



12. Check and tighten all bolts used in installation.

13. Place cable thimble through hole in ground drive pivot housing plate, route cable around thimble and fold cable together, securing with two cable clips. With a repair link provided, attach cable pulley to upper slot in ground drive angle clamp or other location if pulley needs to be offset (a mounting point may need to be fabricated in some installations). Route cable through pulley. *Note: A second pulley is provided to route cable around obstructions to reach lift point. Second pulley location may be an available hole in a frame plate, or a hole drilled in frame member, or a bracket may need to be fabricated, depending on the configuration of the parent implement.*



14. Attach other end of cable to parent implement at hydraulic cylinder, rock shaft or other location so that when implement is raised from field position, the cable lifts the ground drive wheel above the field surface. Determine length of cable required.

CAUTION: Slack must be allowed for distance wheel is raised for transport, or damage may result. Secure cable end to itself with cable clips provided, cutting cable to length determined

629735 Ground drive with traction tire for conventional row crop cultivator

1. Lay out components of ground drive and check packing list to see that all parts have been properly shipped. Place axle housing plate on lower end of ground drive pivot arm using two "U" clamps, lock washers and hex nuts. Leave loose. Slip shaft through axle shaft housing so single drilled end is on side opposite where wheel is to be mounted. On this end, place 1" washer and 16T sprocket. Pin with cotter pin.

2. Over double drilled end, place 1" washer secured with cotter pin. Slide on wheel hub and secure with clevis pin fastened by cotter pin. Attach ground wheel to hub with lug nuts provided. Tighten lug nuts.

3. Place keyed pivot shaft through pivot housing keyway to wheel side, then on each end, slide on pivot arm brackets, adding 1" washer to the outside. Slide 18-32T sprocket on side away from wheel side, and using cotter pin, secure with smaller 18T sprocket toward inside. On drive wheel side, slide on locking collar and secure with set screw.

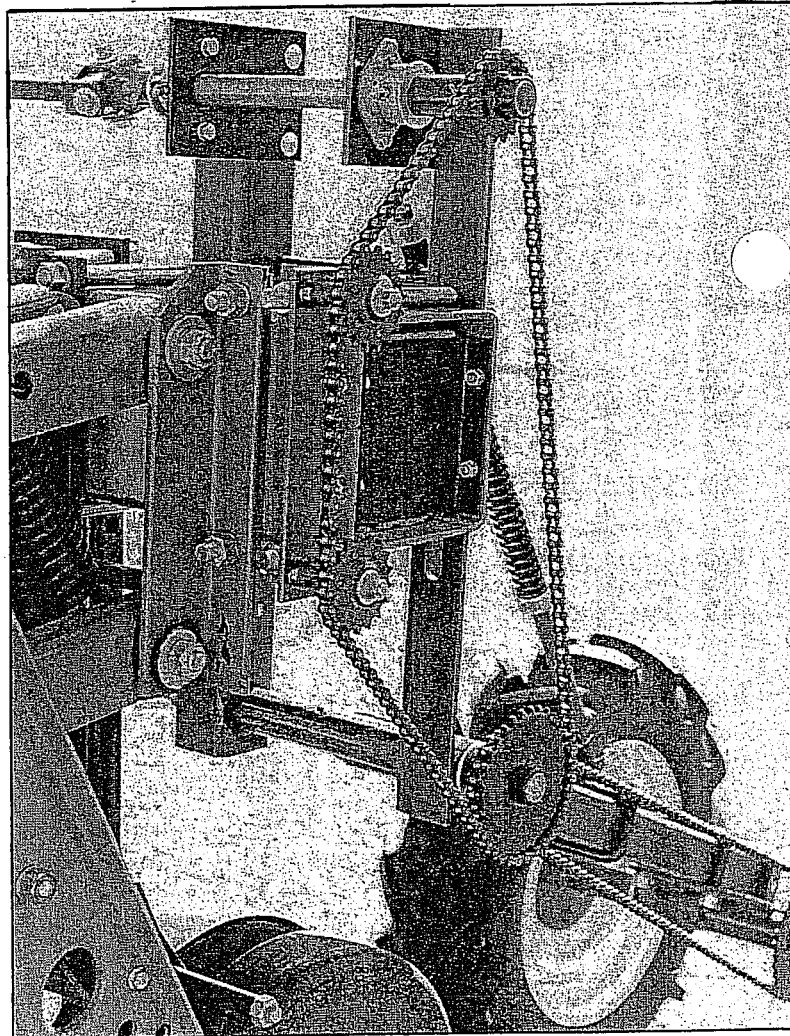
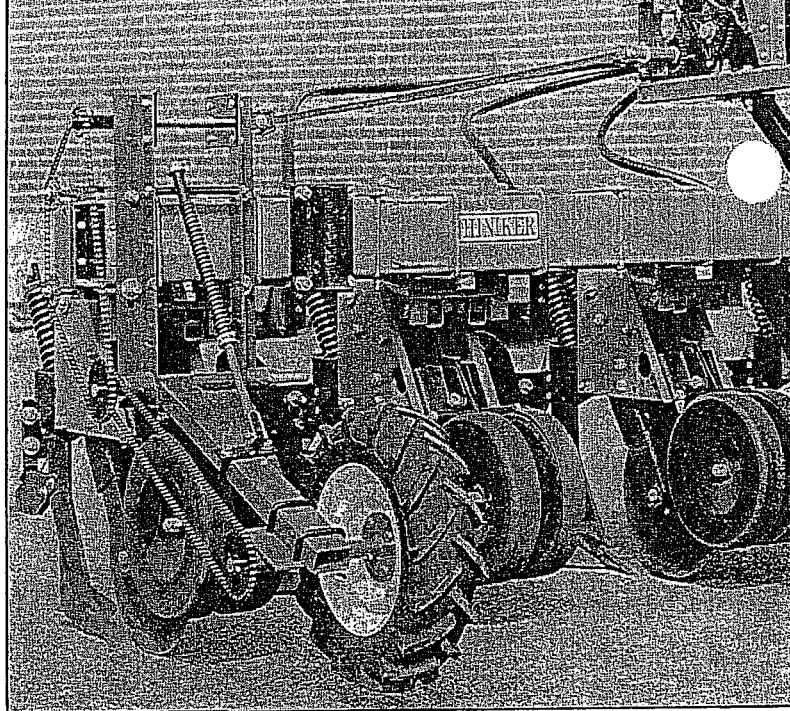
4. Replace drive shaft provided with hopper with 1 x 6-11/16" machined shaft, machined end to outside.

5. Select best location to position ground drive wheel along implement frame to line up with the hopper and drive shaft. Adjust placement of hopper if necessary. Position ground drive below hopper and attach left mounting angle to implement frame using bar clamp with two stud bolts. Secure loosely. Attach right mounting angle to implement frame using angle clamp and same hardware as above. *Note: Trailing position of wheel is preferred, but some installations may require wheel in forward placement. Also relationship of angle clamp, bar clamp and mounting angle can be reversed.*

6. Attach tab for pressure rod to pivot arm (shorter tab toward wheel side) using "U" bolt, lock washers and nuts. Leave loose. Position pressure rod pivot housing between ground drive pivot brackets at choice of hole to achieve desired angle, preferably 45 degrees or more in relationship with the ground, sliding 9" hex bolt through brackets and pivot housing, and securing in place with lock nut, while still allowing to pivot.

7. Place locking collar followed by pressure spring over pressure rod. Slide rod upwards through round tubing on pivot arm. Attach clevis of pressure rod to tab on pivot arm using clevis pin and cotter pin. Place locking collar over upper end of pressure rod and secure just above the pivot arm. Place cotter pin in upper end of pressure rod. Tension of pressure spring can be adjusted at any time by securing upper and lower locking collars as desired to maintain good wheel-soil contact.

8. Attach 18T idler sprocket to upper slot of angle clamp which secures right mounting angle. Use 3/8 x 3-1/4" carriage bolt inserted through angle clamp, slide on 3/4 x 9/16" bushing, idler sprocket with 1/2 x 3/4" insert bushing and SAE washer. Secure in place with lock washer and hex nut. Attach 18T idler sprocket to lowest hole of angle clamp using same hardware.



9. Attach bearing plate to inside of each of the mounting angles using two 3/8 x 1" carriage bolts, lock washers and nuts in the slotted openings provided. Shaft openings in bearing plates are to project away from drive wheel side. Attach bearing to each bearing plate using two 3/8 x 1" carriage bolts, lock washers and nuts.

10. Slide 1 x 16-1/4" shaft through bearings with machined end toward hopper. Over outer end place 1" washer, 1-5/8" spacer bushing, and 16T sprocket with hub inward. Secure sprocket to shaft with cotter pin. Over machined end, slide 1" washer and drive shaft knuckle. Secure knuckle to shaft with clevis pin and cotter pin.

11. Attach knuckle joint with two 9/16 x 9/16" bushings to drive shaft knuckle using 3/8 x 2-3/4" hex bolt, wrought washer on each side of drive shaft knuckle, secured with lock washer and hex nut. Attach female tumbling bar to knuckle joint using 3/8 x 2 3/4" hex bolt, wrought washer and 9/16 x 9/16" bushing on each side of joint. Secure with lock washer and nut.

12. Slide male tumbling bar into female tumbling bar and assemble knuckle joint and drive shaft knuckle onto end of male tumbling bar using similar hardware as above. Attach knuckle from tumbling bar drive shaft to hopper drive shaft using clevis pin and cotter pin.

13. Place 128-link roller chain around 32T sprocket on drive wheel shaft and 18T double sprocket using connector and offset links provided. Tighten chain by moving axle housing plate downward on pivot arm. Tighten "U" bolts. Place 125-link roller chain around 32T sprocket of double sprocket, both idler sprockets and 16T sprocket on drive shaft using connector link and offset link. Tighten by idler sprocket adjustment.

14. Check alignment of all sprockets and chains and tighten all bolts. Check movement of drive components when placed in operation. Adjust if necessary.

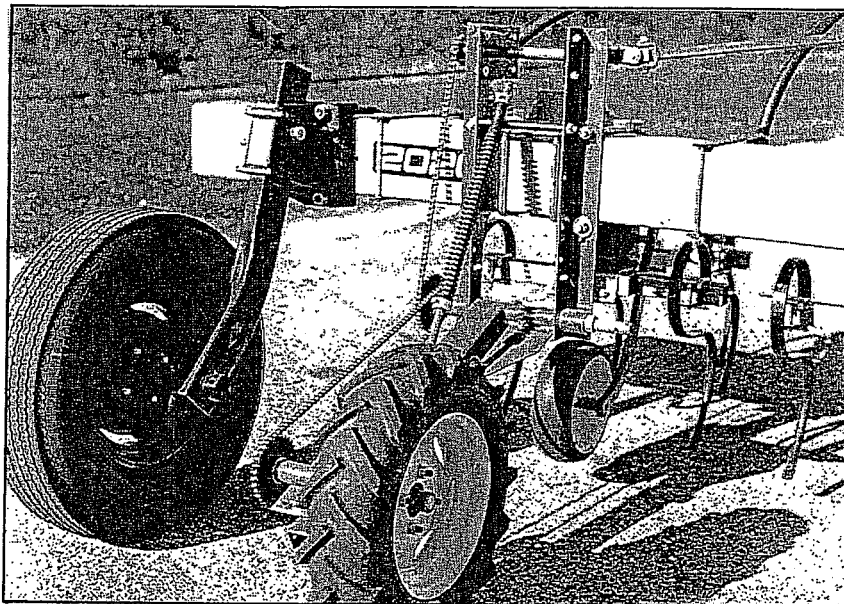
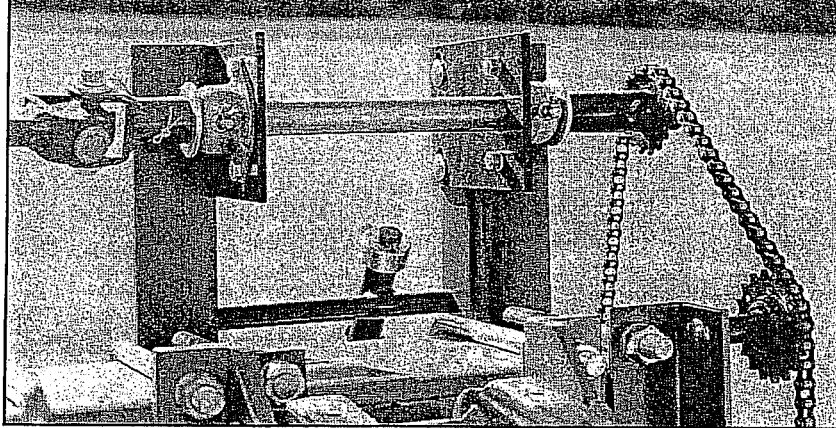
DEFLECTOR / TUBE DISCHARGE

1. Determine optimum spacing of deflectors. Deflectors should be spaced evenly at 24, 27, or 30 inches apart, center to center, using the most number of outlets possible for the implement width while keeping them spaced an equal distance apart. When all openings are not required to reach implement width, use 24-inch spacing. To empty the hopper evenly, an equal number of outlets should be used on each half of the implement.

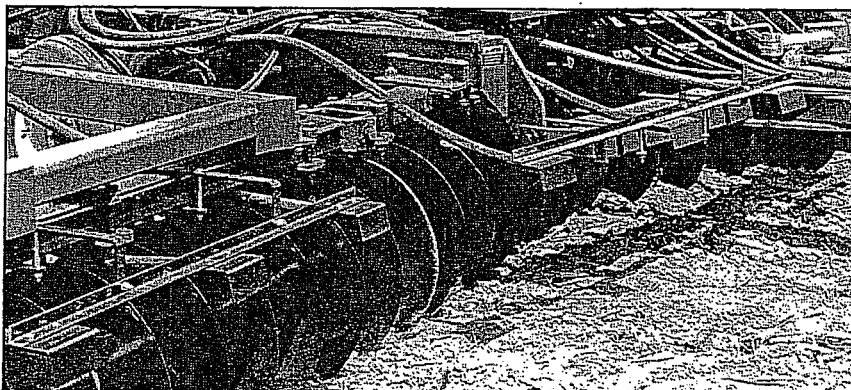
2. If not all openings are required, close equal number of individual slide shutoffs on each side of the hopper. Blank plates are furnished as well as a cleanout spout. Replace a metering cup with the cleanout spout and remove mixing chambers on outlets not used and replace with blank plates using rubber gaskets installed.

3. Angle bars are made to hold four deflectors or five deflectors at 24, 27, or 30-inch spacing. Choose the combination of bars which matches the center span and wings of your implement. (If 12-inch spacing is desired for broadcasting high rates of fertilizer, holes will need to be drilled in angle bars).

4. Using hanger strap, bar clamp and bolts provided, install angle bar-deflector assembly on front, middle, or rear of implement based upon depth of incorporation desired. Leading edge of each deflector should be the same height above the ground when the implement is at working depth between 14 and 18-inches above soil when deflectors spaced 24 inches apart, a minimum of 18-inches above soil when deflectors space 27 or 30



628935 Ground drive in forward position



inches apart. When applying exceptionally high rates of granules, such as 50 lb. per acre or more, mount the deflectors at least 18-inches above the soil.

5. Install deflector-angle bar assemblies on wings using remaining parts. Cut off any excess length of angle bar.

6. Slip plastic tubing from coil over mixing chamber outlet so tube is against rim of chamber. Ends of all tube cuts, especially at deflector end, should be cut at right angles and be free of burrs. If temperatures are cold, tubing may need to be heated with hot water for sliding over mixing chamber outlets.

7. Route plastic tubing to any deflector on same side of implement with sufficient radius to avoid kinking and to avoid tube damage when folding the implement.

IMPORTANT: Have at least a foot of tubing coming straight into the deflector. On split shaft models, be sure tubing is routed to same side of implement for each half of shaft.

8. Repeat steps 6-7 for remaining outlets and deflectors.

9. Cut tubing to length desired and insert into deflector tube flush with end of metal tube. Secure tubing to deflector tube with Phillips tapping screws provided. A tube inserted too far or not far enough not cut square or left with burrs can adversely affect the material distribution pattern.

10. Place the tube bar clamp padded with sponge rubber over the plastic tubes on each side and secure with bolts and lock nuts. Secure firmly, but do not crush tubes.

11. Fold the implement to check tube routing. Use ty-raps to secure tubes to implement frame, allowing for tube movement while folding and unfolding. Do not permit tubes to kink.

12. Tubes may be routed to injection shanks or attachments designed for deep banding fertilizer or tube holders for over-the-row discharge.

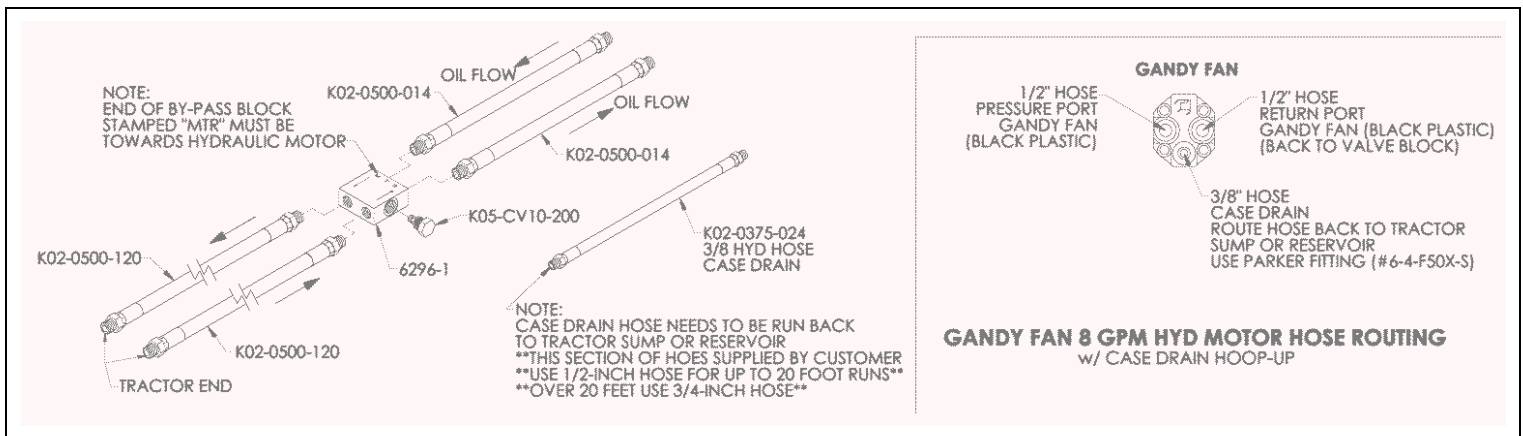
- Be sure air release is provided for injector placement.

MAINTENANCE

When unit is received, inspect immediately for damaged or missing parts. Although all units are carefully prepared for shipment at the factory, handling enroute may cause concealed damage or cause nuts, bolts, or locking collars to work loose. If concealed damage is found, call your dealer to report your findings.

Before Start up and Following Use

1. Inspect all fasteners to make sure they are secure.
 - a. Foundation bolts.
 - b. Set screws in fan, housing bearings and motor mounting bolts.
 - c. All shaft bearings.
2. Be sure to follow the directions for connection of hydraulic hoses using like-brand connectors as on towing vehicle and in regulating fluid flow for open or closed center tractors. Failure to do so may result in damage to your hydraulic system. (Cont'd next page.)



HYDRAULIC MOTOR POWER SOURCE HOOK-UP (See Parts & Packing List for hydraulic fan hook-up.)

1. The hydraulic hoses supplied require male adaptors of the same brand as the female connectors on the tractor used. **IMPORTANT:** To obtain optimum hydraulic function from some tractor systems, additional adjustments or equipment may be necessary. Consult tractor owner's manual for operation of a hydraulic motor. In some instances, especially on high gallon age tractors, installation of a hydraulic motor return line which bypasses the valve bank will eliminate heating and excessive backpressure. Use of adaptors or other than like-brand connectors may cause excessive backpressure, resulting in seal failure on the hydraulic motor. If your tractor has a remote outlet that is piped directly to the oil cooler, use it for the return hose. If the blower hydraulic motor is equipped with a case drain return, it is highly recommended that this be used to reduce back pressure and heating. If more than one hydraulic motor in operating system, they must be hooked up in parallel, not series, or back pressure may blow the seals.

2. Determine whether tractor has an open-centered or close-centered hydraulic system.

(Most new tractors have open-centered systems) (The following information for optional needle valve in flow-control block)

A. If open-centered, fully open needle valve in flow-control block. With tractor running at working rpm, engage hydraulic lever in tractor. Adjust needle valve to obtain 8 - 20 oz. air pressure on pressure gauge located on hopper. Secure needle valve with lock nut.

B. If closed-centered system, completely shut needle valve in flow-control block and tum flow-control on tractor to minimum setting. **IMPORTANT:** Failure to close needle valve may cause excessive heat, resulting in damage to hydraulic motor and tractor hydraulic pump. With tractor running, engage hydraulic lever on tractor and adjust tractor flow control to obtain 8 - 20 oz. air pressure on the pressure gauge located on the hopper.

MAINTENANCE (Continued)

Blower housing and metal parts

3. Check blower shaft bearings frequently to tighten and prevent misalignment. Replace as needed. *Failure to provide regular inspection and maintenance may cause equipment failure and unsafe operation.* After operation in dusty conditions, the air intake screen should be removed and the impeller blades cleaned to prevent accumulation of foreign matter that could interfere with fan operation. Inspect periodically for possible excessive wear or cracks and check alignment of the impeller shaft with the drive shaft. If the blower must be disassembled for any reason, follow the assembly instructions described earlier. The impeller is balanced at the factory and if it becomes out of balance, replace to prevent unsafe operation.

Bearings

4. Check and clean bearings frequently for accumulation of dust or fines. Failure to do so may cause damage to shaft or sprockets. Binding of shaft could cause a change in application rates.

5. Be sure to clear manifold of collected dust or debris by daily removing expansion plugs in manifold. *Failure to do so can cause accumulation which interferes with air passage and delivery of material.*

Lubrication

6. Grease all fittings daily as needed to assure best operation and prevent undue wear of moving parts and drive shafts. There are grease fittings on the ground drives including one on the axle housing, one on the pivot arm, and one on each pivot arm mounting bracket. Some drives also have additional bearings with grease fittings.

INSTRUCTIONAL AND SAFETY DECALS

Be sure to note all the cautionary and instructional decals on the unit. Replace if they should become worn or detached.

1. Operational

a. Be sure to match rate charts and materials being spread with proper color-coded metering wheels:

- Black- Granular chemical & small seeds at low rates
- Red- Fertilizer & small seeds at high rates
- White- Large seeds
- Yellow- Hi-volume fertilizer

b. Tighten all bolts after first two hours of field use, and check periodically thereafter.

2. Cautionary/Important

a. Keep fingers, hands, feet, and clothing out of all chains, sprockets and belts, and avoid touching hot surfaces of hydraulic motors. Failure to do so can cause personal injury. (N02-0014-010)

b. Do not ride on machine.

c. With blower and drive, keep intake screen in place to keep hands out of blower impeller. (N02-0055-010)

d. Upon first starting hydraulic motor, place SCV valve control at turtle setting--the least amount of oil being pumped to motor. Start motor, gradually increasing oil volume to desired air pressure.

IMPORTANT: Failure to follow this procedure will possibly damage motor's shaft seal. (Z11-0001-001)

FIELD OPERATION

Prepare for field operation according to the following suggested procedure:

1. Check to see that correct metering wheels are installed for material you wish to apply. If not, interchange wheels as outlined in a later section.

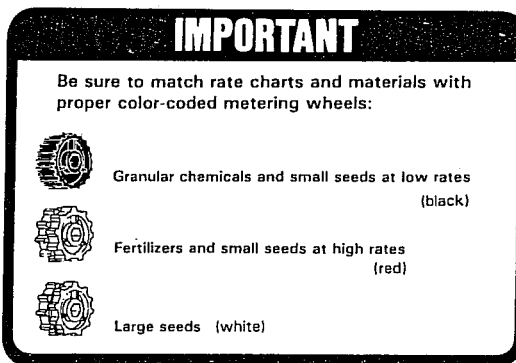
2. Check to see that all drive chains and sprockets are aligned and that hole closures are open. (*Place closure slides in mid-position for granular chemicals, top position for fertilizers and large seeds.*)

3. Set rate control to suggested setting from rate charts provided and field calibrate, using field calibration procedure outlined in following section. Lower implement to operating position.

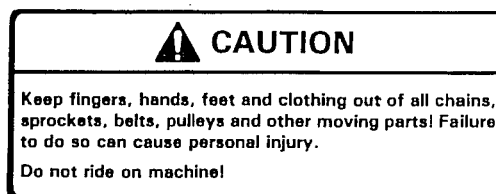
4. Start blower and adjust air pressure to recommended levels and allow fluid to warm to operation temperatures. Switch console should indicate blower is working by activating amber light. If you suspect moisture has condensed within the system, operate blower to dry out system before beginning. Recommended air pressure levels:

Granular chemicals and light seed = 8 - 12 oz./in²
Fertilizer and large seeds = 14 - 20 oz./in.²

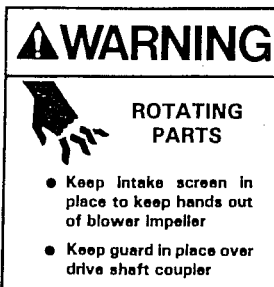
Note: The air system carrying capacity varies with number of outlets used, width of implement, speed traveled and rate used. As these variables increase, air pressure should be increased. As they decrease, reduce air pressure. Seed boots or knives which restrict flow may reduce air systems' carrying capacity. Air release must be provided for if placing in ground engaging shank. (Continued next page.)



N02-0062-040
Metering wheel decal



N02-0014-010
Caution decal



N02-0055-010
Rotating parts decal

FIELD OPERATION (Continued)

5. Switch on the electric clutch(es) and check operation by moving the Orbit-Air. Green light should flash ON and OFF as shaft rotates. Green lights will be continuously ON or OFF when shaft is not rotating.
6. Fill hopper.
7. Check application rate by following field calibration procedure. Adjust speed-control setting if necessary and re-check.
8. Make field application.
9. Keep records of materials used, speed control setting, amount applied, and acres covered for future reference.

CALIBRATION OF ORBIT-AIR APPLICATORS

1. After filling hopper, set up a test course using two stakes placed 436-feet apart.
2. Read the label and cautionary statements of the agricultural chemical, fertilizer or recommended rates for seed, you are using. Determine the rate you need to apply in pounds per acre.
3. Look up the rate chart for the material and deflector/tube spacing. CAUTION: Be sure the correct rate chart and the correct metering wheels are used for your application. Set the speed-control on the applicator for your rate according to the chart. Be sure you align the arrow by viewing gauge at eye level on Zero-Max controlled models. (If no chart is available for your material, estimate rate control setting).
4. Place a plastic bag around each deflector or tube end, securing it around the plastic tube, leaving one-half of the top open to allow air to escape. *Note: Take precaution so bags are not dragged or torn while making calibration run.*
5. Start the blower. Adjust blower speed to produce 8- 12 oz./in² of air pressure if applying granular chemicals or light seeds, 14-20 oz./in² if applying fertilizer. With heavier materials, the higher air pressures may be needed. Check to see that all the bags are still in place.
6. Travel the 436-foot course at normal speed.
7. Weigh the total contents of all the bags in pounds.
8. Divide weight collected in pounds by the width of the implement in feet and multiply by 100 to get pounds per broadcast acre.
9. Adjust the speed-control if needed and repeat Steps 4-8.

EXAMPLE: Weight of collected material from 24 deflectors on a 24" spacing is 6 pounds. Following Step 8 above, divide pounds by width of implement (48) and multiply by 100.

Shortcut Method

If you wish to collect from fewer deflectors rather than entire unit, follow the above procedures until you complete Step 7, then divide pounds collected by acres covered to get pounds per broadcast acre.

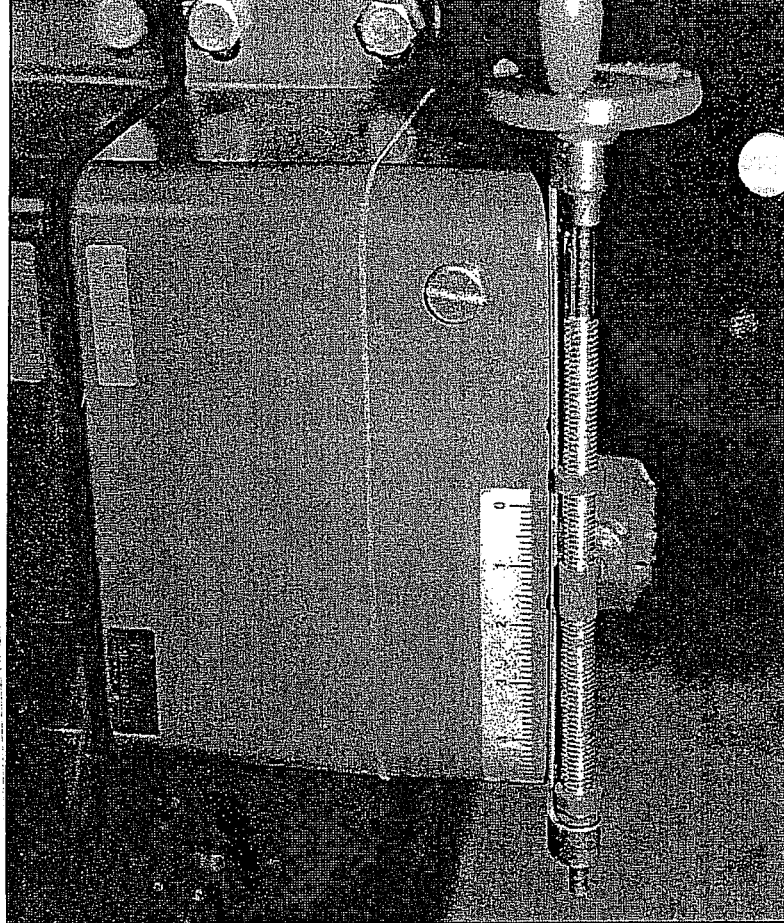
Formula to calculate acres covered:
(Collected width in feet x 436 ft.) ÷ 43,560 ft² = acres covered.

EXAMPLE: By using 3 deflectors with 24-inch spacings, you have collected .75 lb. Total width collected is 6 feet (3 deflectors x 24-inch spacing)

1) $(6 \text{ ft.} \times 436 \text{ ft.}) \div 43,560 \text{ ft.}^2 = .06 \text{ acres}$

2) $.75 \text{ lb.} \div .06 \text{ acres} = 12.5 \text{ lb./acre}$

If amount needs to be more or less, adjust speed control setting and repeat previous steps.



CLEANING

1. To drain hopper, run hopper empty or nearly so. Open clean-out chutes in hopper bottom and drain material into clearly marked container for later use.
2. To drain by removing complete metering system, have catch container ready, then detach wheel and mounting plate assembly by loosening two wing nuts securing the two "J" bolts at each end and remove from hopper. Sweep out.

INTERCHANGING METERING WHEELS

Each unit is furnished with one set of metering wheels as ordered. However, additional sets may be ordered to apply other materials. They may be interchanged according to the following procedure:

1. Loosen the two hex bolts on the flangette bearing at each end. Lift out shaft and wheel assembly or on ganged cup models, slide shaft assembly out the side after removing sprocket and bearing on drive end. Metering wheels can then be removed from shaft.
2. Slide on new set of wheels, aligning them in metering cups. Re-install flangettes and locking collar on outside of mounting plate tab. Tighten hex bolts on each flangette bearing, then lock.

Note: If your operation demands metering wheels be interchanged often, additional wheel sets and shafts can be ordered, or complete metering wheels and mounting plate assemblies can be ordered for quick interchange.

ALTERNATIVE MOUNTING

The 62 Series hoppers are set up at the factory for rear delivery of material, with tubes to the rear, the fan to the front. However, hoppers may be mounted in either direction, with delivery tubes to the front or with delivery tubes to the rear. The metering wheels will operate in the correct direction in both cases, but the Zero-Max will be turning in the non-preferred direction and will turn faster than the preferred direction which is indicated by a decal on the Zero-Max. This will in turn meter more product, giving you a higher rate. Be sure to take this into consideration and double check your rate when in field conditions.

To mount 8 & 10 cu. ft. hoppers with blower to the rear:
(See illustration to the right.)

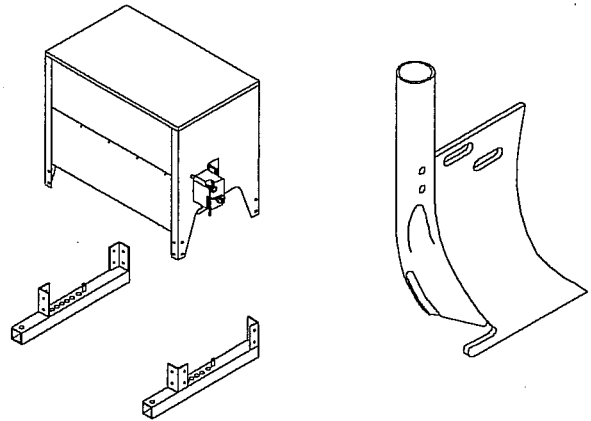
1. Remove the 3/8" x 1-1/4" hex bolt securing clutch to tab on mounting base.
2. Remove the four bolts at each corner of the mounting base.
3. Turn the mounting bases so attachment holes are on side away from the blower.
4. Reattach mounting bases, clutch(es) and drive shaft housing using existing hardware.
5. Route hydraulic hoses under or around hopper to front of implement, ensuring they do not interfere with metering.

SUGGESTED AIR RELEASE METHOD

(Illustration below, right.)

While some openers have designs that allow air to escape, it is important to determine that as much as air is released as possible so that fertilizer or other materials can drop to the base of an opener without causing "blowback." One suggested method is to drill four or more 5/16" (two each side of the opener) one inch apart. Holes should be above ground level and below the plastic delivery tube.

IMPORTANT: If two tubes are combined into one opener, remember you have to release *twice* as much air!



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MISC

TROUBLE SHOOTING

The Gandy 62 Series Orbit-Air® applicator system consists of the hopper with rate control, an air manifold and blower with ground driven, hydraulic motor-driven blower, tubing and deflector package, and a ground drive. The system has been engineered to give precise application rates with rates set by the Zero-Max® control. The Zero-Max is designed as a series of over-riding clutches with infinite setting which provides 0 to 25 per cent of the input rpm of the mechanically driven sprockets. *The Zero-Max cannot be serviced on location, but must be returned to the factory.* 63 series models use a 9-setting gearbox to set rate control. 64 series models have a Raven monitor and variable speed electric motor as part of the hopper package while the 66 series have a Raven monitor and hydraulic motor. Raven monitor controlled units do not require a ground drive since speed is sensed from a wheel magnet or radar through an interface cable. Material flow rate is entered into the monitor under meter calibration. To trouble shoot problems which might occur, please consult the following section.

PROBLEM: The application rate is lower or higher than the calibrated chart setting.

Cause	Solution
Individual shutoff slides in incorrect position	Position properly (Open, closed & 2 intermediate positions).
Mathematical error made during field calibration	Recheck calculations.
Catch sample not weighted accurately	Weigh sample again.
Actual acreage less or more than calculated	Check area covered.
Incorrect setting	Check control setting or meter calibration.
Sprockets or chains slipping	Check tightness.
Sprockets are incorrect size or ratio	Check sprocket assembly.
Ground drive slipping on 62 & 63 series	Adjust tension spring.
Density of material differs from rate chart	Field calibrate.
Binding of metering shaft	Check and clean bearings.
Zero-Max is turning in non-preferred direction	Since Zero-Max turns faster in non-preferred direction (marked by an arrow), compensate and lower the setting by checking application rate through calibration.

PROBLEM: Stripping of sprocket teeth.

Cause	Solution
Binding of metering shaft	Check and <u>clean</u> bearings.

PROBLEM: Product not coming out delivery tube(s).

Cause	Solution
Individual shutoff slides closed	Open to correct position.
Tube is kinked	Check tube routing.
Blockage at metering wheel	Check & clean.
Material has bridged in hopper or mixing chamber	Loosen & agitate.
Tube end is blocked and material is blowing back out of mixing chamber	Clear blockage. Check for tube kinking.
Manifold opening is blocked	Check & clean manifold by removing expansion plugs.
Air pressure too low	Check blower, increase rpm if gauge indicates.
Metering wheels not turning	Pin in ground drive sheared. Replace.

TROUBLE SHOOTING (Continued)

PROBLEM: Product caking in hopper, tubes, metering wheels or on deflectors.

Cause	Solution
High humidity	Clean and check periodically.
Water in hopper bottom	Clean out. Remove motor wheel mounting plate assembly.
Water in manifold	Clear mixing chambers, remove plug from manifold; run blower until system dries.

PROBLEM: Hydraulic driven blower not operating properly.

Cause	Solution
Fan surging when hydraulic fluid is warmed to operating temperature	Readjust flow controls; check filters.
Small amount of oil leaks from hydraulic motor shaft	Seal will allow passage of oil. Clean & observe to determine if excessive.
Oil pouring out at shaft seal or motor	Defective seal. Back pressure too high.
Fan won't turn	Defective motor. Hydraulic hoses not properly coupled, or routed through blocks. Wrong or defective hydraulic tips. Fan bearings seized. Replace. Adjust rabbit & turtle on closed center systems.

PROBLEM: Chattering noise coming from fan.

Cause	Solution
Bearings dry or worn	Replace.
Impeller out of balance	Check & replace.
Impeller blades striking housing	Shut down blower. Readjust or replace

SPECIFICATIONS

Hopper Capacity	8 cu. ft.	10 cu. ft.	21.9 cu. ft.	30 cu. ft.
Hopper Models*	62AN12C	6210C, 6212C & 62AN18C	6216C, 6216C-S, 6216C-D 62BN24C & 62BN24C-D	623016C, 623016C-S 623016C-D, 6230BN24C, & 6230BN24C-D
Fertilizer	480 lb.	600 lb	1300 lb.	1800 lb.
Granular chemical	360 lb.	450 lb.	1000 lb.	1350 lb.
Seeds	6.6 bu.	8.2 bu.	18 bu.	24 bu.
Control (*12,18 & 24 outlet models marked by asterisk are not recommended for fertilizer due to ganged metering cups)				
Number of outlets	12*	10,12, & 18*	16 & 24*	16, 24*
Electric clutch	1	1, 2	1, 2	1, 2
Metering shaft	single	single/split	single/split	single/split

* The first two numbers indicate rate control used: 62 Series Zero-Max control; 63 Series, gearbox control, 64 Series Raven electric motor, 66 Series Raven hydraulic motor control. The last two digits indicate number of outlets. The letter after the last digit indicates the metering wheel assembled in place at the factory: C, chemical; F, fertilizer; S, seed; V, high volume fertilizer. Models with a K after the model number, i.e. 6212CK have a 4 gpm hydraulic motor rather than 8 gpm motor and are offered for parent units with limited hydraulic capability. Internal letters, i.e. 62AN12C, 62DS12C or 62DN12C, indicate A for single shaft, B for split shaft, D for electric motor rather than ground drive, N for narrow mixing chambers, or S for Standard mixing chambers. Narrow mixing chamber units not recommended for fertilizer. If no internal letter appears, the unit has a single shaft and standard mixing chambers.

LIMITED WARRANTY

The Gandy Company warrants all material and workmanship on equipment delivered to be free of defects for a period of twelve months from date of original purchase. Products used on a commercial, rental or leased basis are warranted for 90 days. Any part or parts thought to be defective within these warranty periods are to be returned through your servicing dealer or distributor to the Gandy Company's plant. Distributor must receive authorization number will be issued and must be clearly visible on all packages returned to the factory. If found defective by Gandy Company, replacement parts will be forwarded free of charge, prepaid. No service charge or expense on the equipment will be allowed unless such expense has been previously authorized in writing by the Gandy Company. (Serial number and model of the unit involved is required by the Gandy Company on all warranty claims). Gandy Company policy is to improve products whenever it is practical to do so. It reserves the right to make such changes on products sold previously.

This warranty against defects in material and workmanship is in lieu of all other warranties, expressed or implied, and there are no other warranties of any kind whatsoever including, but not limited to, any implied warranty of merchantability or fitness for any particular purpose. In no event shall the company be liable for any incidental or consequential damages whether for breach of warranty, for breach of repudiation of any other term or condition hereof, or for negligence, on the basis of strict liability, or for any other reason.

