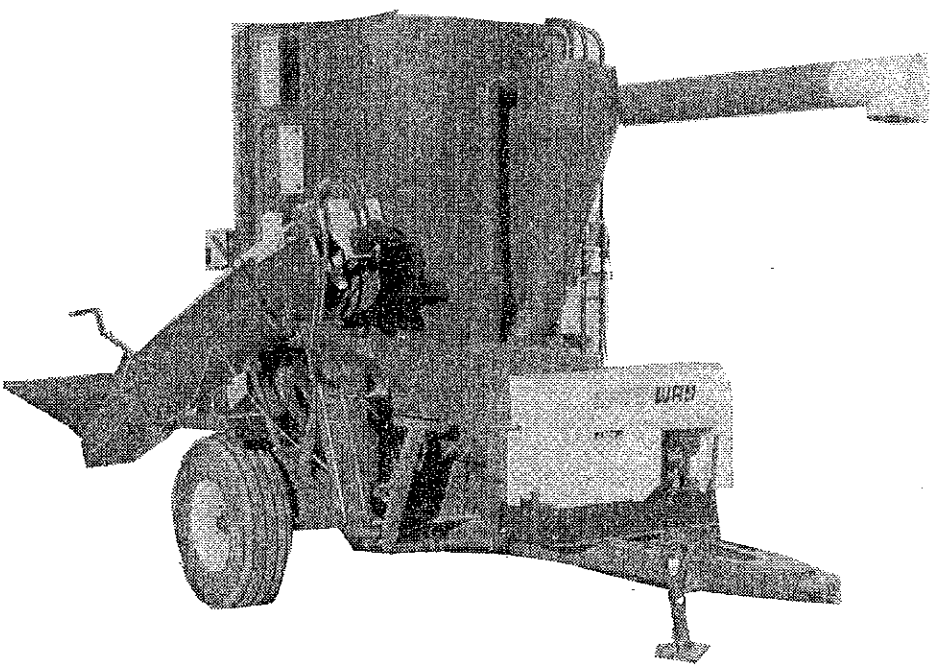
ART'S-WAY

MODEL 475

FEED MIXER AND MILL

OPERATOR'S MANUAL



ART'S-WAY MANUFACTURING CO., INC.
ARMSTRONG, IOWA 50514
(712) 864-3131

212380 (C)
1091

TO THE OWNER

This Art's-Way unit is another one of the fine products made and the purpose of this manual is to assist you in realizing the benefits you anticipated when you purchased this unit. Many people have contributed to the production of this product. They all have an interest in its successful performance and we are providing the operators manual to give you the benefit of the experience we have gained through years of building and testing this equipment. The way you operate and the care you give this unit will have much to do with the successful performance of this unit. The operators manual has been carefully prepared and illustrated to make it as easy as possible for you in the operation of your unit. It will pay you to read the entire manual carefully and familiarize yourself with all operations "before operating" this unit. Keep this manual handy for reference. We will be glad to answer any questions you may have. For further information call or write Art's-Way Manufacturing Co., Inc. (712) 864-3131, Armstrong, IA 50514.

LIMITED WARRANTY

The **ART'S-WAY MANUFACTURING CO., INC.** warrants products sold by it to be free from defects in material and workmanship for a period of one(1) **YEAR** after the date of delivery to the first purchaser subject to the following conditions:

(1) **ART'S-WAY MANUFACTURING CO., INC.'S** obligation and liability under this warranty is to repair or replace at the company's option, any parts which upon manufacture were defective in material or workmanship.

(2) All parts and repairs under this warranty shall be supplied at an authorized **ART'S-WAY MANUFACTURING CO., INC.** dealer or at the factory at the option of **ART'S-WAY MANUFACTURING CO., INC.**

(3) **ART'S-WAY MANUFACTURING CO., INC.'S** warranty does not extend to parts and elements not manufactured by **ART'S-WAY MANUFACTURING CO., INC.** and which carry the warranty of the other manufacturer.

(4) Transportation or shipping to an authorized dealer for necessary repairs is at the expense of the purchaser.

(5) **ART'S-WAY MANUFACTURING CO., INC. MAKES NO OTHER WARRANTY EXPRESSED OR IMPLIED AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE BEYOND THAT EXPRESSLY STATED IN THIS WARRANTY. ART'S-WAY MANUFACTURING CO., INC.'S LIABILITY IS LIMITED TO THE TERMS SET FORTH IN THIS WARRANTY AND DOES NOT INCLUDE ANY LIABILITY FOR DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR EXPENSE OF DELAY AND THE COMPANY'S LIABILITY IS LIMITED TO REPAIR OR REPLACEMENT OF DEFECTIVE PARTS AS SET FORTH HEREIN IN THE WARRANTY.**

(6) Any improper use, including operation after discovery of defective or worn parts, operation beyond rated capacity, substitution or parts not approved by **ART'S-WAY MANUFACTURING CO., INC.**, or any alteration or repair by other than an authorized **ART'S-WAY MANUFACTURING CO., INC. dealer which affects the product materially and adversely, shall void this warranty.**

(7) No dealer, employee or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of **ART'S-WAY MANUFACTURING CO., INC.** at its home office.

(8) Some states do not allow limitations on how long an implied warranty lasts or exclusions of or limitations on relief such as incidental or consequential damages so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

ACCIDENTS
can be prevented

A large number of accidents can be prevented by the operator anticipating the result before it happens and doing something about it. No power-driven equipment can be safer than the man at the controls.

The manufacturer is striving to make the equipment safe, but one careless act by the operator can void all such efforts.

The best kind of a safety device is a careful operator. **BE THAT KIND OF AN OPERATOR,** as no accident-prevention program can be a success without the co-operation of the operator of the equipment.

INFORMATION FOR ORDERING PARTS

OWNERS NAME _____

ADDRESS _____

DEALERS NAME _____

ADDRESS _____

SERIAL NUMBER _____

DATE PURCHASED _____

A Careful Operator

IS THE BEST INSURANCE

AGAINST AN ACCIDENT

National Safety Council

THE IMPORTANCE OF ADEQUATE PARTS AND SERVICE

The wise purchaser of a new machine gives consideration to the following factors:

1. **ORIGINAL QUALITY**
2. **AVAILABILITY OF SERVICE PARTS**
3. **AVAILABILITY OF ADEQUATE SERVICE FACILITIES**

In many cases the machine becomes the only means of performing certain tasks that must be done in a limited period of time. Wear and even breakage of parts are to be expected due to operating conditions. However, the user can still be assured of getting his work done on time if service parts and adequate service facilities are available.

Foresighted Art's-Way dealers make every effort to provide good service and maintain a completely adequate stock of service parts.

NOTICE TO CUSTOMER

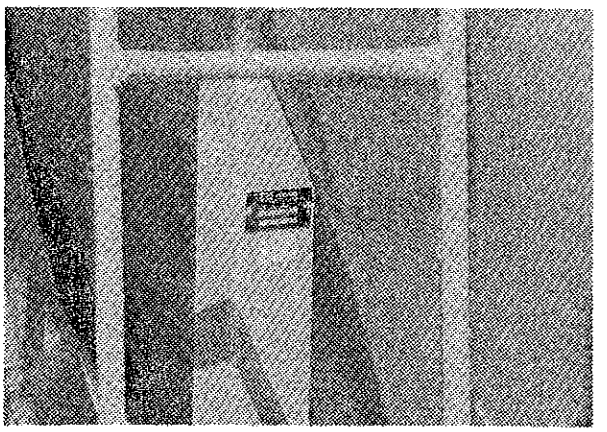
The illustration and data used in this manual were current at the time of printing, but due to possible in-line production changes, your machine may vary slightly in detail. We reserve the right to redesign and change the machine as may be necessary without notification.

The warranty for this machine appears on page 2 of this manual. Record the model and serial number of your Grinder Mixer in the spacer provided on previous page.

The warranty registration form in the Parts Manual must be completed and returned to the factory in order to establish proper WARRANTY.

Whenever you correspond with the company, distributor or dealer concerning this machine, please specify model number and serial number.

This manual contains operating instructions for the Model 475 Grinder-Mixer unit. This manual does not replace any other manual.



MACHINE SERIAL NO. LOCATION
(BEHIND LADDER LEFT HAND SIDE)

NOTES

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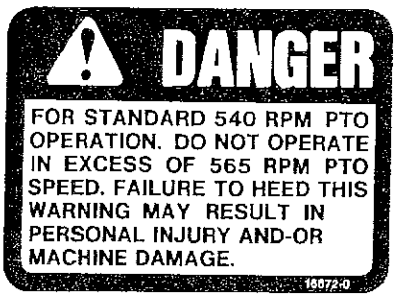
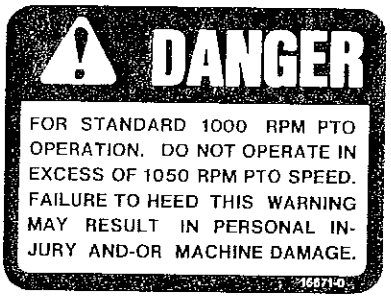
SAFETY DECALS

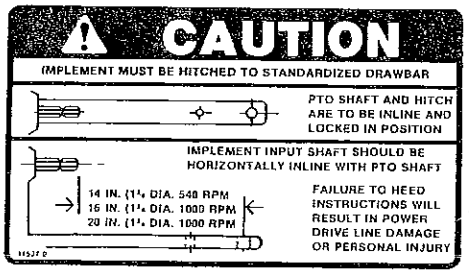
Located at strategic points on this machine are safety decals. These decals warn you of potential danger if the warnings on the decals are not followed.



"DANGER" - FOR 540 RPM PTO OPERATION, DO NOT OPERATE IN EXCESS OF 565 RPM PTO SPEED. LOCATED ON THE FRONT OF THE MAIN SHIELD NEAR PTO. PART NO. 166720.



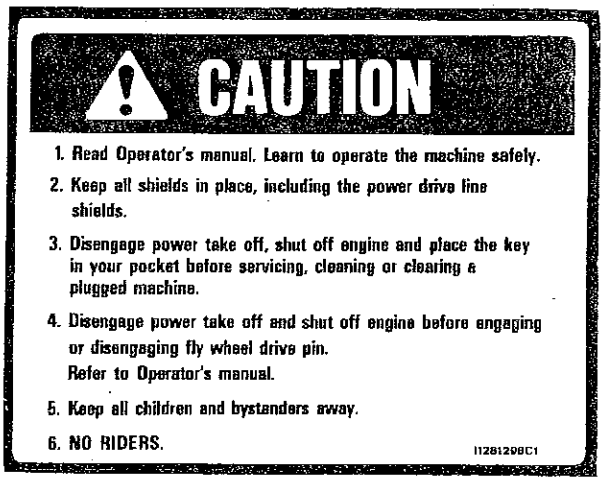
"DANGER" - FOR 1000 RPM PTO OPERATION, DO NOT OPERATE IN EXCESS OF 1050 RPM PTO SPEED. LOCATED ON THE FRONT OF THE MAIN SHIELD NEAR THE PTO. PART NO. 166710.



"CAUTION" - IMPLEMENT MUST BE HITCHED TO STANDARDIZED DRAWBAR. LOCATED ON THE FRONT OF THE FRAME NEAR HITCH POINT. PART NO. 115370.

"CAUTION" - KEEP SHIELD IN PLACE. LOCATED ON JACK SHAFT SHIELD AND OTHER OPTIONAL SHIELDS. PART NO. 148190.

"DANGER" - ROTATING DRIVE LINE. LOCATED ON PTO. PART NO. 151100.

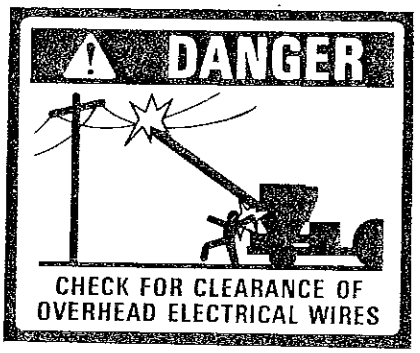


"CAUTION" - LISTS SIX ITEMS TO FOLLOW AND OBSERVE WHILE OPERATING THIS MACHINE. LOCATED ON THE FRONT OF THE MAIN SHIELD NEAR PTO. PART NO. I1281298C1.

"CAUTION" - LISTS FOUR ITEMS TO FOLLOW AND OBSERVE WHILE OPERATING THIS MACHINE. LOCATED AT THE REAR OF THE MACHINE ON THE TANK. PART NO. 115380.

SAFETY DECALS

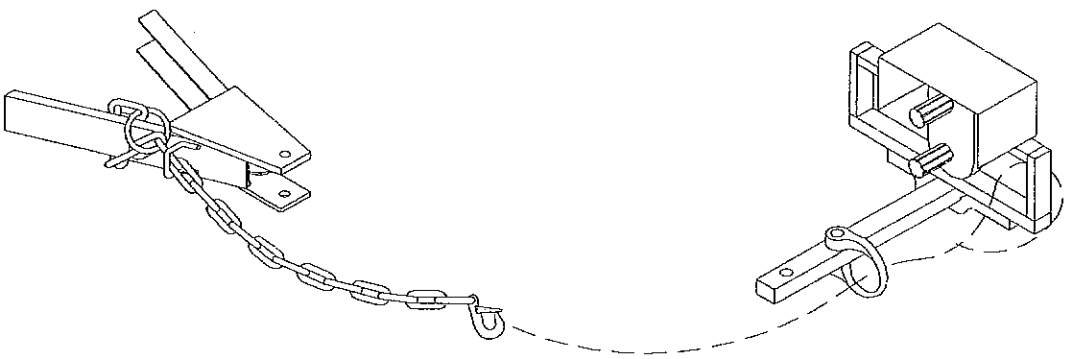
"CAUTION" - LISTS FIVE ITEMS TO FOLLOW AND OBSERVE WHILE OPERATING THIS MACHINE. LOCATED AT THE REAR OF THE MACHINE ON THE TANK. PART NO. 115430.



"DANGER" - AVOID SERIOUS ELECTRICAL SHOCK. LOCATED AT THE REAR OF THE MACHINE ON THE TANK. PART NO. 164300.

"DANGER" - TO PREVENT PERSONAL INJURY, FOUR ITEMS CONCERNING AUGER FEEDER OPERATION. LOCATED ON AUGER FEEDER COVER. PART NO. 212540.

"CAUTION" - DO NOT OPEN COVER. LOCATED AT THREE PLACES: HAMMERMILL DOOR, TANK CONE CLEAN-OUT

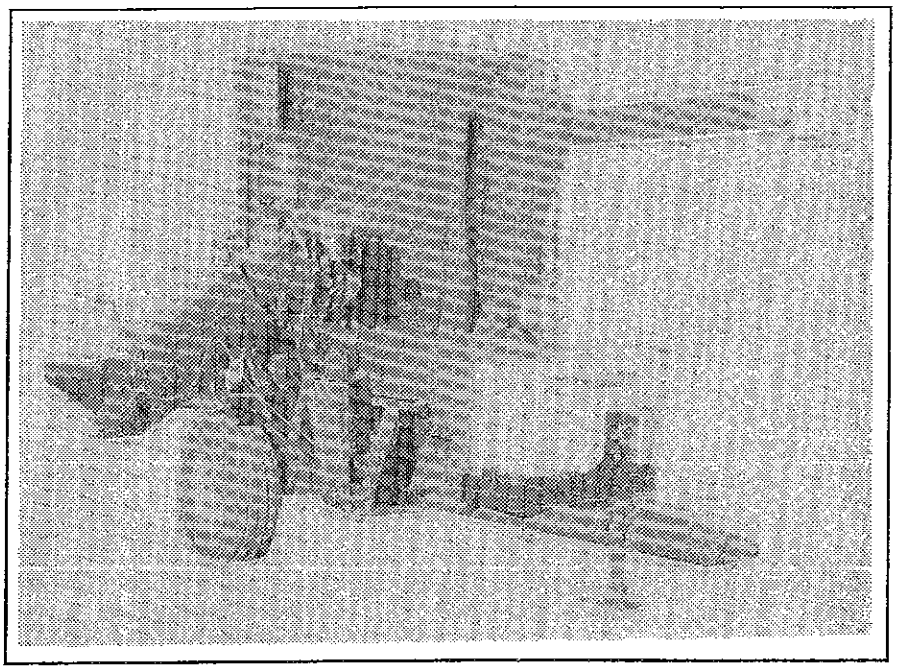


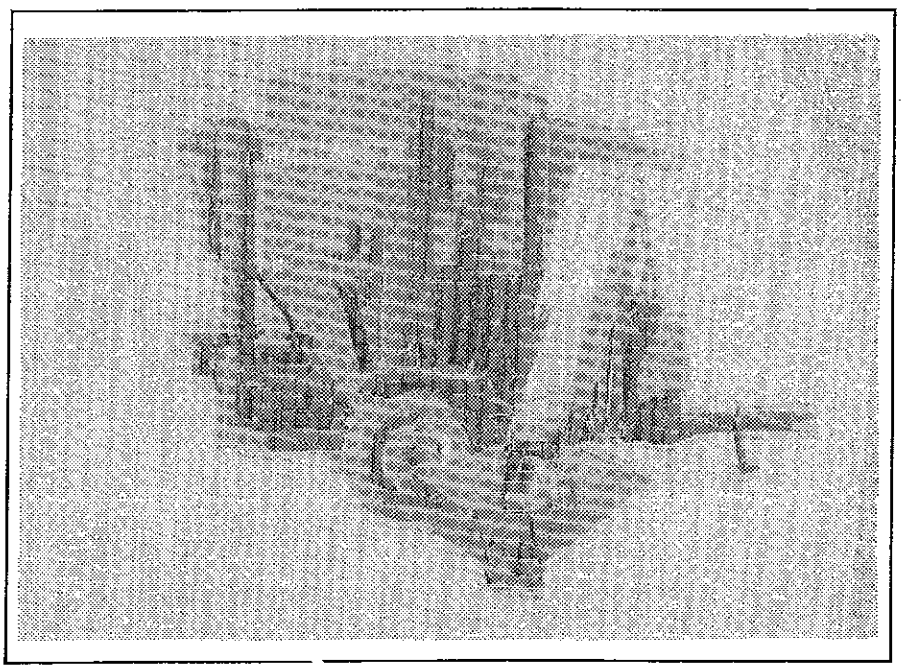
SAFETY CHAIN MOUNTING INSTRUCTIONS
(See above figure)

1.
Mount chain on hitch channel by running chain through loop and running hook through the large ring at end of chain and pull tight as shown in figure.

2. Run the chain through a clevis bolted on the tractor drawbar, then wrap the chain around a supporting member of the tractor and hook as shown in figure.

IDENTIFICATION VIEWS
MODEL 475





INTRODUCTION

This manual has been prepared to acquaint you with the proper operation, adjustment, lubrication and service of the Grinder-Mixer. Take time to be careful and better understand the efficient operation and care of your machine.

Whenever the terms "Left" and "Right" are used, it should be understood to mean standing behind the machine and facing the direction of the forward travel.

The Art's-Way 475 Grinder-Mixer is PTO driven by 40 hp to 100 hp tractors and is factory available with either a 540 or 1000 rpm PTO drive. Each respective speed should be maintained as the hammermill operates best at 2800 to 3000 rpm. DO NOT EXCEED 3000 RPM.

CAUTION: Never operate 540 rpm Grinder-Mixer with 1000 rpm tractor.

Before operating your Grinder-Mixer, select and install the size screen desired. Sizes are available from 1/8 to 2 inch openings. The screen size is determined by the fineness desired. See page 13 for screen selection guidelines.

All types of grain, as well as hay, can be ground with the Grinder-Mixer. Material is fed into the hammermill where it is ground until it can pass through the screen size selected. From the hammermill, the material is augered into the mixing tank. A suction fan takes air pressure out of the hammermill system and delivers feed fines into the dust collector. The fines are separated and then dropped into the mill to mixer auger.

If supplement is to be added to the ration, a hopper with sack cutter is located at the left rear of the mixing tank. Best mixing will result if supplement is added before grinding, but it can be added during or after the grinding operation.

The ground feed is mixed continuously until the tractor PTO is disengaged. When the mixer has come to a complete stop, turn off the tractor engine and disengage the hammermill. When PTO is engaged the feed can then continue to mix and be unloaded without running the hammermill.

The unloading auger pivots at the rear center of the mixing tank and can swing 324 degrees in a horizontal arc and in a vertical arc to the limit of the lift assist spring. The unloading auger tube can be positioned either to the right or left side of the tank for transport. Unloading rates up to 25 bushels per minute can be obtained depending on the type of material processed.

Three viewing windows are located at the front right corner on the mixing tank to observe the feed level while grinding and mixing. A ladder is located at the front left corner of the mixing tank to obtain access to the spring-loaded tank lid on top of the mixing tank.

A number of optional attachments are available:

1. 540 or 1000 rpm PTO.
2. Auger feeder, mechanical or hydraulic.
3. Electronic scale with digital readout. Microprocessor model is also available.
4. Horn, light or horn and light for electronic scale.
5. Battery box or battery box kit without battery for scale.
6. Unloading auger extension; 3 foot or 6 foot folding auger.
7. Hydraulic or mechanical roll feed in mill throat.
8. Double discharge tube sacker.
9. Mechanical discharge auger positioning with manual swing brake.
10. Hydraulic discharge auger positioning with limited slip swing adjustment.
11. Road light kit.

Many convenient features are standard equipment on the Art's-Way 475 Grinder-Mixer:

1. 10.00-15 tires.
2. Magnet in hammermill throat.
3. Lift assist, brake, and mechanical swivel for easy positioning of unloading auger with manual crank.
4. Positioner to enable the hopper on the auger feeder to be moved in or out 6 inches to properly position.
5. Fenders.

PREPARING FOR FIELD OPERATION

PREPARING THE GRINDER-MIXER FOR FIELD OPERATION

Remove the shipping banding or wire from the auger feeder (if so equipped), rear discharge cover and unloading tube to saddle at the side of the tank.

Remove the bag from supplement hopper. Place the screen hook in the hammermill door pin. If equipped with mechanical lift and swing, the crank for the unloading auger is in the bag, place it in the hanger near crank position for lift swing. Install the PTO storage bracket under front hitch with 1/2" x 1-1/2" bolt and lock nut (see figure 4).

Install any option that was ordered with the machine and shipped loose. See instructions packaged with options for installation.

Install the implement end of the PTO (see figure 1) by fastening to the input jack shaft with the 5/16" x 3-1/2" clevis pin and cotter pin provided. Spread cotter pin, MAKE SURE THE PROPER PTO IS USED. The large pulley on the PTO shaft is 22 inch diameter for 540 RPM drive and is 12-5/16 inch diameter for 1000 RPM drive.

Hydraulic drive ring and worm gear, for controlling back auger, should be filled with SAE 90 weight gear oil up to the worm shaft (see figure 62, page 30).

NOTE: Height of the unloading auger tube needs to be checked. Move the saddle on the side of the mixing tank so tube properly clears tractor and cab.

If equipped with tractor hydraulic auger feeder or roll feed (see pages 19,21) for special instructions.

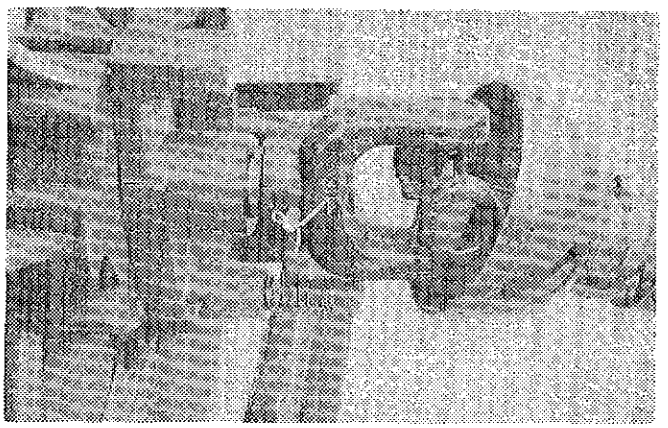


FIGURE 1 - INSTALL THE PTO SHAFT (Shields removed for clarity)

TIRES

Keep tires properly inflated. Lack of pressure can result in torn valve stems, fabric breaks and uneven tread wear. Too much pressure causes undue strain on the fabric, excessive tread wear and allows the tire to cut in more on wet surfaces.

RECOMMENDED TIRE INFLATION PRESSURE IS:

10:00-15 8-PR tires - 40 psi.
11L-15 8-PR tires - 35 psi.

Equal tire pressure reduces sway when towing the Grinder-Mixer.

SHIELDS

Make sure that all shields are in place and functioning.

BOLTS AND NUTS

Before starting to operate the Grinder-Mixer, check all nuts and bolts for tightness. Also check that all cotter pins are spread. After operating the Grinder-Mixer for several hours, check all the bolts for proper torque. See bolt specifications in the chart on page 32 .

Cap screws, except for shear bolts, used in the Grinder-Mixer are Grade 5 and if replaced cap screws of equal or higher strength should be used. Grade 5 cap screws are identified by three radial dashes on the hex head. Shear bolts must be replaced with bolts of same grade.

Lubricate the Grinder-Mixer at regular intervals as instructed in lubrication section.

TRANSPORTING

Before transporting the Grinder-Mixer, be sure to read and follow these instructions carefully.

CAUTION: Always transport a loaded Grinder-Mixer at slow speed (10 MPH or less) and be extra careful in hilly country.

Be sure the hitch pin is locked in place and the safety chain is properly installed (see page 6). Place jack in transport position.

Make sure the unloading auger is secured in the saddle. If Grinder-Mixer is equipped with an auger feeder, make sure it is secured with the hairpin into the transport bracket on the fender.

When driving the tractor and Grinder-Mixer on a road or highway, whether, at night or during the day, use accessory lights and SMV identification emblem. Local laws should be checked for all highway lighting and marking requirements.

PREPARING FOR FIELD OPERATION

CAUTION: Never operate 540 RPM Grinder-Mixer with 1000 RPM tractor.

PREPARING THE TRACTOR

The tractor must be equipped with a 540 or 1000 rpm PTO to match the Grinder-Mixer as described in the previous section. Make sure the Grinder-Mixer and tractor are set up for the proper rpm.

TRACTOR HITCH

The hitch of the Grinder-Mixer is designed to attach to any SAE-ASAE standardized tractor drawbar. Adjust the drawbar so that it is 13 to 17 inches above the ground. Extend or shorten the tractor drawbar so that the horizontal distance from the end of the tractor power take-off shaft to the center of the hitch pin hole is 14 inches for 540 rpm and 16 inches for 1000 rpm drives. Use an adapter plate, if necessary, to secure the proper distance.

Lock the drawbar in its crossbar, parallel with the centerline of the powershaft. Place locking pins on each side of the drawbar. If the tractor has an offset drawbar, the offset should be down for PTO work.

IMPORTANT: An improperly located hitch point may cause damage to the universal joints of the power take-off.

ATTACHING TO THE TRACTOR

NOTE: Height of the unloading auger needs to be checked. Move the saddle on the side of the mixing tank so the tube properly clears tractor and cab.

Back the tractor up to the hitch. Use the crank of the jack to raise or lower the Grinder-Mixer hitch into position to engage the tractor drawbar. Fasten the Grinder-Mixer hitch to the drawbar with a hitch pin that cannot bounce out. Raise the jack and lock into transport position (see figure 3). Install safety chain (see page 6).

IMPORTANT: Never transport the Grinder-Mixer until the hitch pin is secured into position and the safety chain is properly installed.

If the Grinder-Mixer is equipped with an electronic scale, plug the scale power supply cord into the electrical outlet on the tractor or to battery on the mixer frame.

IMPORTANT: ON ELECTRONIC SCALE APPLICATIONS, IF A BOLT AND NUT ARE USED IN PLACE OF A HITCH PIN, THE NUT MUST NOT BE TIGHTENED SUCH THAT IT HITS AGAINST THE UNDERSIDE OF THE WEIGHBAR CLEVIS.

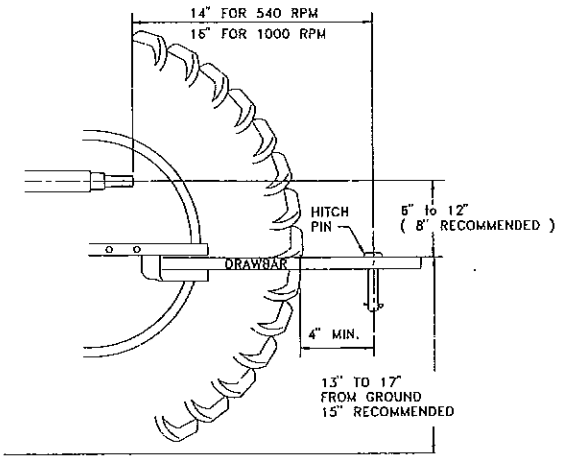


FIGURE 2 - HITCHING POINT LOCATIONS.

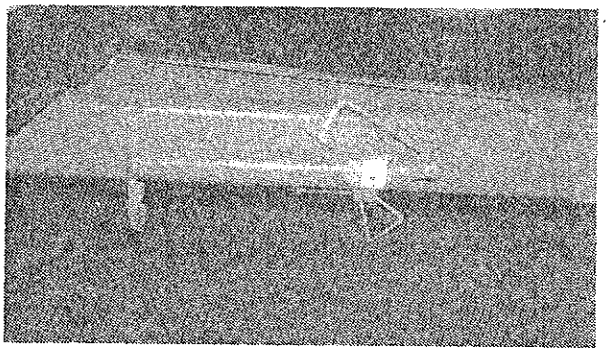


FIGURE 3 - JACK TRANSPORT POSITION

If the Grinder-Mixer is equipped with a tractor hydraulic function, install the proper male ends on the hoses and plug the hydraulic hoses into the tractor outlets. See page 20 & 27 for open and closed center instructions.

Connect the powershaft to the tractor power take-off shaft. The PTO operating speed of the tractor and Grinder-Mixer must be the same. The tractor half of the powershaft is equipped with six splines for 540 rpm operation and 21 splines for 1000 rpm operation.

Be sure the Grinder-Mixer is equipped with 1000 rpm drive when operating with a tractor equipped with 1000 rpm PTO drive. The diameter of the pulley on the PTO shaft must be 12-5/16 inches for 1000 rpm operation.

PREPARING FOR FIELD OPERATION

CAUTION: Never operate 540 rpm Grinder-Mixer with 1000 rpm tractor.

After connecting PTO to tractor, check to be sure shields are free to slip.

Before grinding, position the tractor straight with the frame of Grinder-Mixer. This will allow smoother PTO operation and prolong PTO life.

IMPORTANT: If mixing during transport avoid sharp turns which may damage the powershaft.

BEFORE GRINDING

New machines should be operated before feed preparation. A few hundred pounds of coarse material, such as shelled corn or ground corn cobs, should be run through the mixer. This will remove the protective oil coating from the mixer cone and any metal particles that may be in the machine. This also helps polish the cone and prevent bridging. After several minutes of running, unload the mixture and discard. Do not feed this material to livestock.

DETACHING FROM TRACTOR

Be sure the tractor engine is shut off.

Disconnect the powershaft from the tractor and place it on the PTO support bracket.

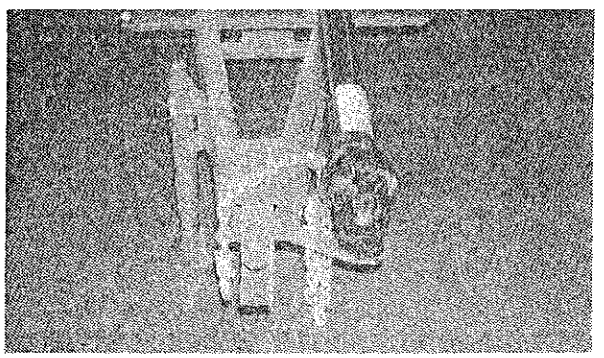


FIGURE 4 - PTO SUPPORT

Disconnect the power cord from the tractor if so equipped.

Disconnect the hydraulic hoses from the tractor outlets if equipped with tractor hydraulic functions.

Block the tires. Lower the jackstand to the ground. Be sure discharge auger is in saddle. Turn the handle of the jackstand to raise the Grinder-Mixer tongue off the tractor hitch. Remove the hitch pin.

AUGER BEARING

Located in the auger between the hammermill and the mixing tank is a nylon bearing. This bearing is used for break-in purposes only. After the first few batches are finished it has no use and must be removed (see figure 5).

IMPORTANT: Do not grind hay until this bearing is removed.

To remove the nylon bearing, remove the two retaining bolts and take the bearing out through the clean-out door. Reinstall the bolts, washers, and nuts to cover the mounting holes.

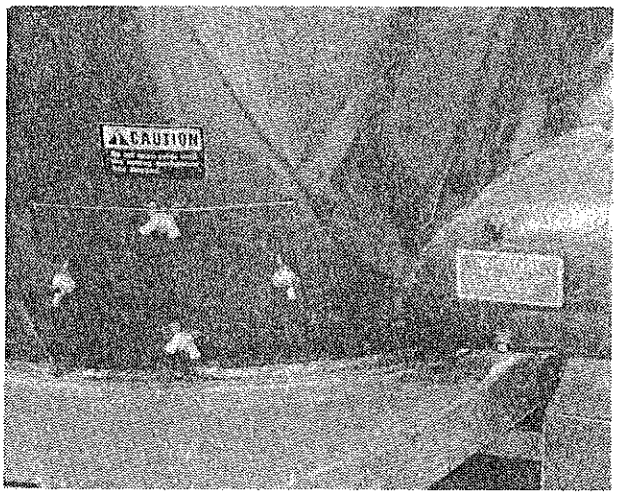


FIGURE 5 - BEARING REMOVAL AND CLEAN-OUT DOOR

HAMMERMILL CLUTCH PIN

The hammermill clutch pin, (see figure 6) is located on the front of the fly-wheel. Make sure the machine has come to a complete stop and shut off the tractor engine before proceeding with this step. To engage the hammermill; turn the fly-wheel by hand to align one of the six slots in the fly-wheel with the pin then push the pin in and turn 1/4 turn either direction to lock in position. To disengage the hammermill; push the pin in, turn 1/4 turn and release.

CAUTION: Always operate PTO at the speed for which the machine is equipped; 540 or 1000 RPM. Note the speed decal on the front shield.

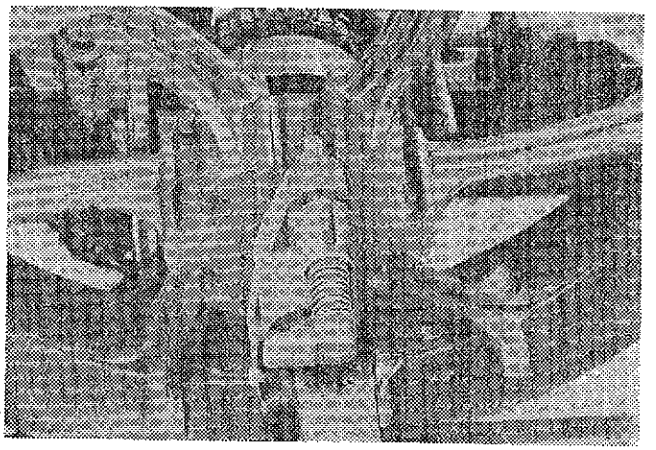


FIGURE 6 - HAMMERMILL CLUTCH PIN
(Shields removed for clarity)

TRACTOR PTO ENGAGEMENT

To operate the hammermill, make sure the clutch pin is engaged before engaging the tractor PTO.

The mixer may be operated by engaging the PTO without engaging the hammermill clutch pin. Always engage the tractor PTO with the tractor engine at an idle speed. After it is engaged, increase the engine speed gradually until operating speed is obtained.

FEED GATE

A feed gate (see figure 7), is provided in the mill throat to control the flow of small grain to the hammermill. It is especially usefull if the machine is not equipped with a roll feed or auger feeder. It may be adjusted to any desired height by using the spring tensioned bolts.

Behind the gate is a rubber anti-kickback for grinding small grain without roll feed. (Removed for roll feed installation.)

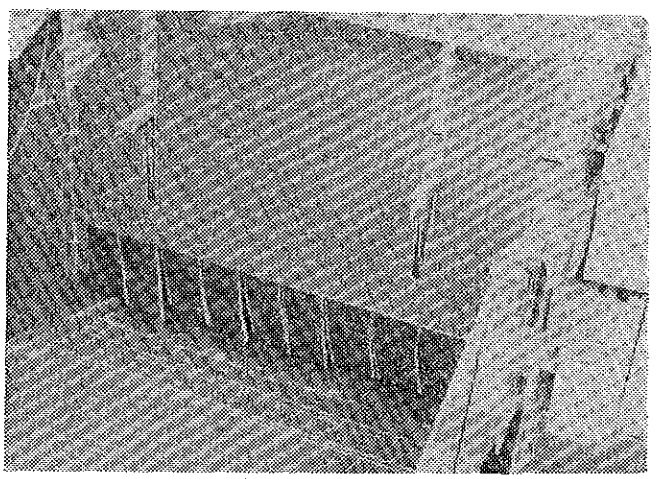


FIGURE 7 - FEED GATE THROAT OF HAMMERMILL

HAY RETARD BOLTS

The hay retard bolts, (see figure 8) will help maintain uniform feeding while grinding hay. The degree of retard is adjusted by loosening the lock nuts on each of the three bolts and turning the bolts in or out to the desired position. Retarding action is increased by turning the bolts in and lessened by turning bolts out. Secure the bolts by tightening the lock nuts.

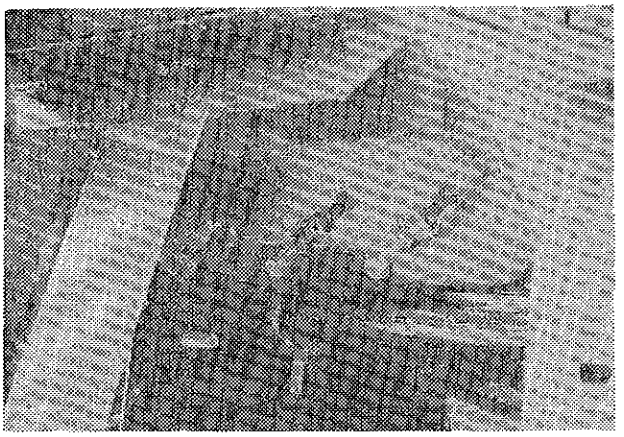


FIGURE 8 - HAY RETARD BOLTS

HAMMERMILL SCREENS

Screens are available in sizes ranging from 1/8 to 2 inch openings. The screen size will be determined by the type of material and the degree of fineness desired.

The following suggested screen sizes may be used as a guide for grinding different types of feed.

SCREEN SIZE	TYPE OF GRIND	MATERIAL	LIVESTOCK AND NORMAL RESULTS
1/8 5/32	Fine Small Grain	Oats, Milo, Corn	Chickens, Pigs, Fine
3/16	Medium Small Grain	Oats, Milo, Corn, Hay	Chickens, Pigs, More Hulls
1/4	Coarse Small Grain	Oats, Milo, Corn, Hay	Hogs, Sheep, More Coarse
5/16	More Coarse Small Grain	Oats, Corn, Hay	Hogs, Fine Cattle Feed
3/8	Coarse Shelled Corn	Corn, Hay Ear Corn	Cattle Feed, No Whole Kernels In Ear Corn
1/2	Coarse Ear Corn	Ear Corn, Hay	Cattle Feed, Will Leave Some Whole Kernels In Ear Corn Grind
5/8	More Coarse Ear Corn	Ear Corn, Hay	Cattle, Will Leave Some Whole Kernels
3/4	Coarse or High Moisture Ear Corn	Ear Corn, Hay	Cattle, Nice Cob Grind But Whole Kernels
1 and 1-1/4	Very Coarse	Corn Cobs, Hay	Medium Bedding, Cattle Screen for Corncobs
1-1/2 and 2	Very Coarse	Corn Cobs, Hay	Recommended for Bedding, Cattle, Uniform Grind

Do not use finer screens than needed since they require more power and reduce mill capacity. Never grind wet corncobs or wet hay. This can cause auger problems in loading and unloading.

CHANGING SCREENS

CAUTION: Disengage all drives and shut off tractor engine before installing or changing hammermill screens. Never open the hammermill cover until the hammermill has come to a complete stop.

Extra screens are carried in the screen rack located over the left fender.

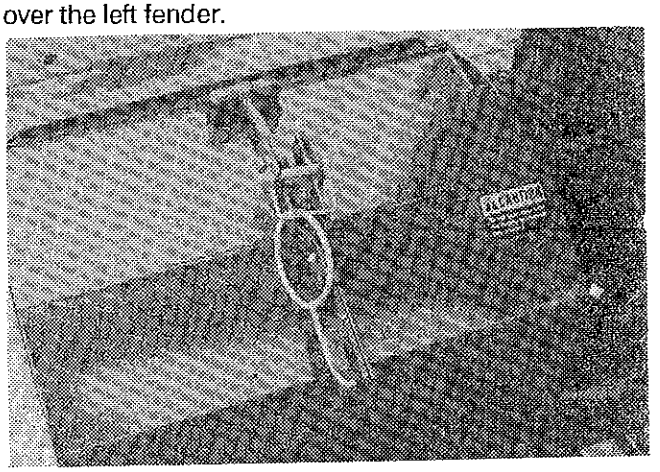


FIGURE 9 - LOCKING PIN & LATCH ON HAMMERMILL DOOR

To install or change the screen, open the hammermill door by removing the locking pin and releasing the latch. Remove the screen with hook provided. The screen support rack will drop down to allow easier screen removal. Install the new screen, close and latch the hammermill door, replace the screen hook and locking pin. (See page 23 for door latch adjustment)

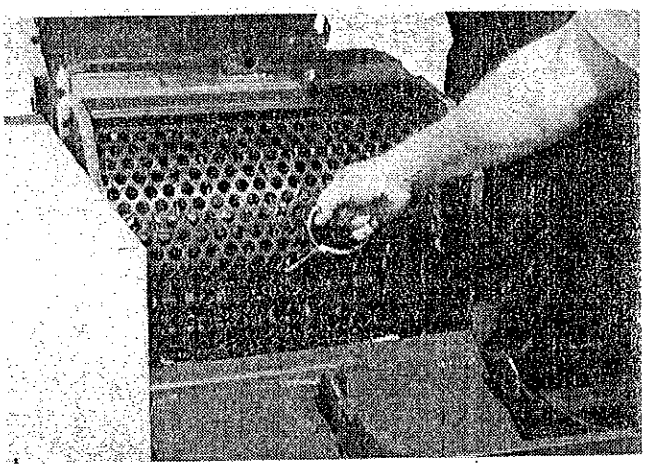


FIGURE 10 - CHANGING SCREENS

OPERATION

ADDING CONCENTRATE OR SUPPLEMENT

Concentrate or supplement should be added to the ground feed through the supplement hopper located at the left rear corner of the Grinder-Mixer. A serrated sack cutter is located in the hopper opening. A grate is positioned below the sack cutter to keep the bag from dropping into the auger.

CAUTION: Keep hands and feet clear of auger. Make sure grate is always in place.

For best results, add the concentrate or supplement at the beginning of the grinding operation or within a minute or two after grinding has begun. If micro-ingredients are to be added to the feed, the best results are obtained with a premix, or by adding the supplements and micro-ingredients simultaneously. If the micro-ingredients are desired without a premix or other supplement, open the mixing tank lid and put the ingredients into the mixer. This should be done at the beginning of the operation. Be sure to close the lid before starting. If strong additives are not wanted in the next batch, clean out the tank cone and unloading augers through clean-out doors.

Close the cover over the supplement hopper when it is not in use.

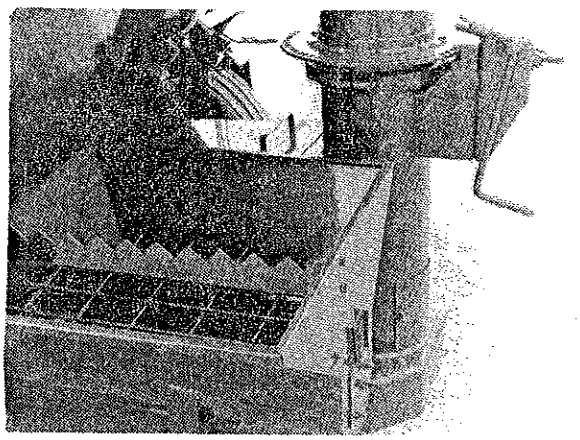


FIGURE 11 - SUPPLEMENT HOPPER

CAUTION: Disengage all drives and shut off tractor engine before opening mixing tank lid or opening clean-out doors.

GRINDING HAY

If hay is to be ground, grind grain first. Do not grind more than five bales of hay per tank until familiar with the results. Large amounts of hay, or coarse ground hay, can cause "Bridging" in the tank and difficulty in unloading. If large quantities of hay are to be ground, 3/4" or smaller screens should be used. If only hay is to be ground, run straight through the machine without filling the tank.

GRINDING WITHOUT MIXING

To grind any material without mixing, engage the unloading auger lever, open the tank unloading door and start the grinding operation. The feed will be augered into the mixing tank cone and then out through the unloading augers without mixing. Position the unloading auger tube as needed to direct the feed.

FILLING MIXER TANK

Be sure the mixing tank unloading door is closed. As the mixing tank is filling, watch the ground feed through the mixing tank windows. When the top window first becomes covered, the tank is not full since the mixing auger throws material away from the center of the tank. Continue grinding until the top window clears (feed drops), then becomes covered again about half-way. Stop feeding material into the hammermill at this point, but continue operating until the hammermill has had time to clear. Do not overload the mixer: overloading can cause damage to the machine.

For best mixing results, always add lightweight or bulky materials last. Always add high moisture corn or grain last. Excessive amounts of wet material or bulky material may cause bridging in the mixing tank.

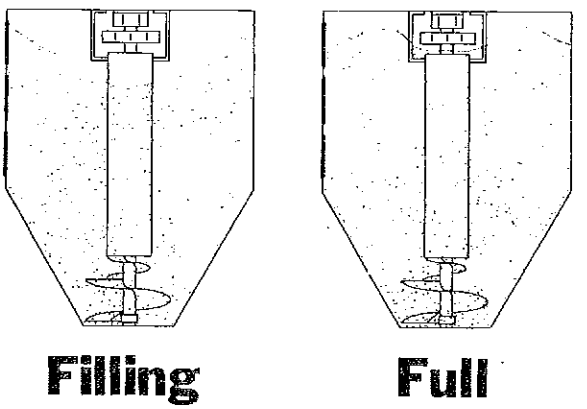


FIGURE 12 - FILLING PATTERNS

OPERATION

APPROXIMATE CAPACITY CALIBRATION–IN POUNDS
(Actual Weights Vary with Material,Moisture,Screen Size, Etc)

Window number	Ground oats 22.5 lbs./bu.	Ground barley 36 lbs./bu.	Ground milo 56 lbs./bu.	Ground shelled corn 50 lbs./bu.	Ground ear corn 38 lbs./bu.	Unground shelled corn 56 lbs./bu.
Full	2346	3754	5839	5213	3962	5839
9	2219	3549	5521	4930	3747	5521
8	2046	3274	5092	4547	3456	5092
7	1874	2998	4664	4164	3165	4664
6	1659	2654	4129	3687	2802	4129
5	1487	2379	3701	3304	2511	3701
4	1315	2103	3272	2921	2220	3272
3	1100	1760	2737	2444	1857	2737
2	928	1484	2308	2061	1566	2308
1	756	1208	1880	1678	1276	1880

ABOVE WEIGHTS ARE APPROXIMATE; TO BE USED AS A GUIDE ONLY. LARGE VARIATIONS MAY OCCUR DUE TO TEST WEIGHT OF GRAIN, SLOPE THAT MACHINE MAY BE ON, MOISTURE CONTENT, OR SCREEN SIZE. FOR BEST RATION CONTROL USE AN ELECTRONIC SCALE.

SPRING LOADED TANK LID

If the tank is accidentally overfilled, it is equipped with a spring loaded tank lid. This lid also allows access to the inside of the mixing tank. Keep the lid latched down at all times.

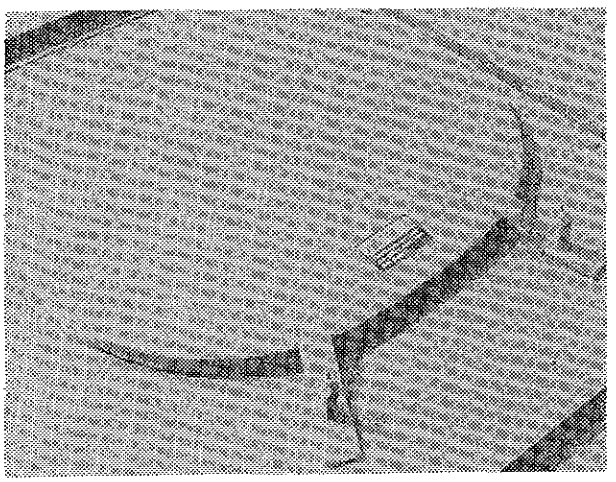


FIGURE 13 - SPRING LOADED TANK LID

CAUTION: If entering tank, make sure tractor engine is shut off and place key in your pocket or disconnect PTO.

After the grinding is completed and the desired ration is in the mixing tank, turn off the tractor engine, disengage the PTO and the hammermill clutch restart the engine and engage the PTO, allowing the mixer to operate until ready to unload. Run the mixer 2 - 3 minutes to insure a thorough mixing of feed and supplements.

IMPORTANT: Do not make sharp turns with PTO running while transporting.

UNLOADING AUGER POSITIONING

After mixing, the finished feed may be unloaded into storage bins, wagons or feeders. Positioning (Lift and Swing) of the unloading auger and drive for the unloading auger may be controlled in two ways.

1. MANUAL CRANK: (See figure 14) insert crank on the shaft next to channel to lift and on the shaft at the rear of lower auger housing to swing the unloading auger. A brake is provided to prevent movement after positioned.

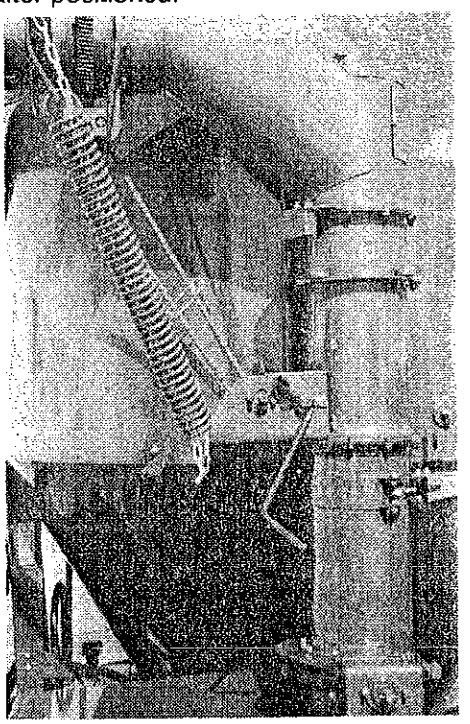


FIGURE 14 - MANUAL LIFT & SWING

2. TRACTOR HYDRAULIC LIFT & SWING:
Hydraulic lift and swing using tractor hydraulic system valves. If a hydraulic auger feeder is present, a double selector valve is required to direct the flow of hydraulic oil. Either the swing motor or the auger feeder may be operated independently, but not at the same time (see figure 15). Position the selector valve control "in" to direct oil to discharge swing function.

Connect four hydraulic hoses with appropriate male connectors to the tractor. Make sure the proper hoses are paired to same tractor hydraulic circuit. Activate the appropriate tractor valve to lift the unloading auger then using the other valve swing the unloading auger to the desired position.

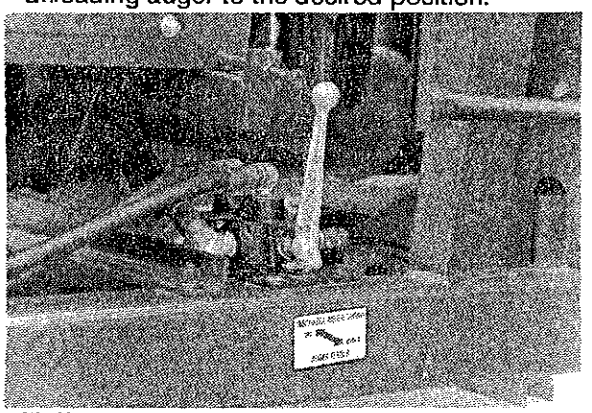


FIGURE 15 - HYDRAULIC SELECTOR VALVE

UNLOADING AUGER

Operate tractor at a minimum of 2/3 throttle for unloading

MECHANICAL CLUTCH DRIVE: (see figures 16 & 17) Move the clutch handle ahead and down to engage the augers. Open the unloading door, the eccentric may be used to hold open. When tank is unloaded, reverse procedure.

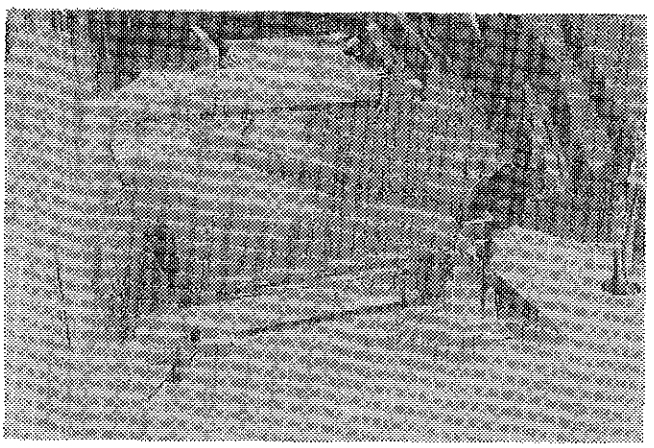


FIGURE 16 - MECHANICAL CLUTCH OPERATION

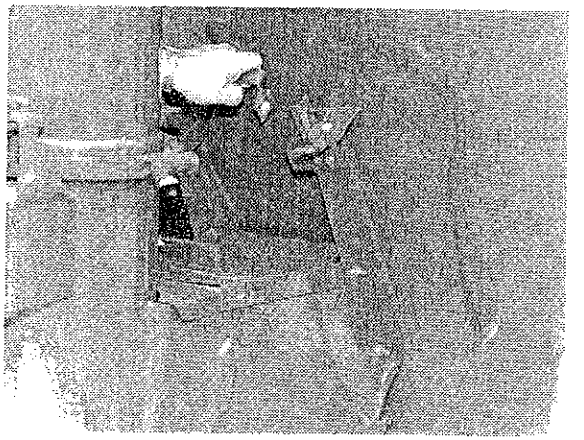


FIGURE 17 - MANUAL DOOR

IF UNLOADING IN MORE THAN ONE LOCATION, CLOSE DISCHARGE DOOR AND EMPTY AUGERS BEFORE MOVING THE MACHINE.

Optional extensions for the unloading auger include a 3 foot and 6 foot folding extension. See chart page 17 for discharge heights with these extensions.

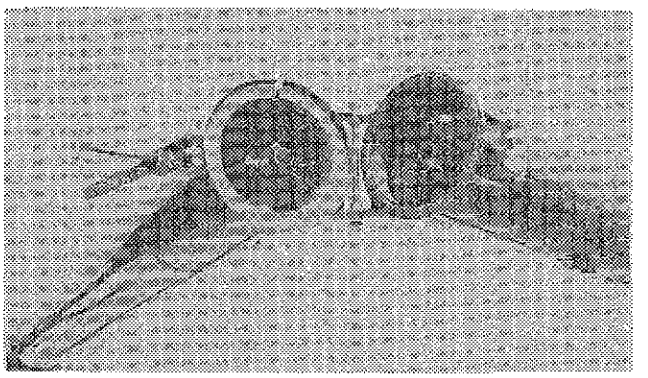


FIGURE 18 - FOLDING AUGER EXTENSION

UNLOADING AUGER HOOD

When the unloading auger tube becomes overloaded, a spring-loaded door opens on the end to prevent damage to the drive.

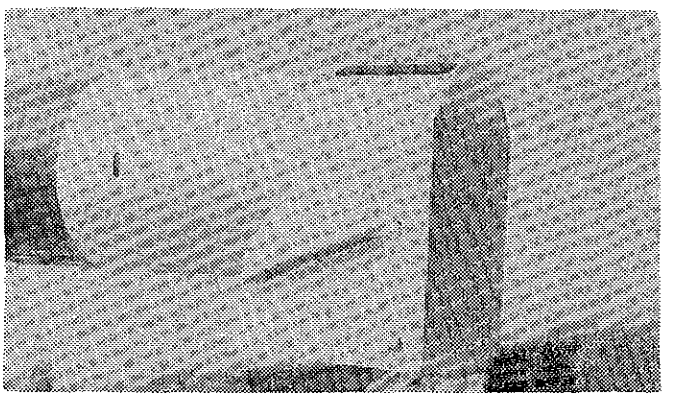


FIGURE 19 - UNLOADING AUGER HOOD

POSITIONING THE UNLOADING AUGER TO OPPOSITE SIDE OF MACHINE

The unloading auger normally rests in a saddle at the left side of the mixing tank. To change to the right side, lift the unloading auger until it is straight up and comes down the opposite side. Rotate the hood downward. Move the saddle to the right side of the mixing tank. On the mechanical unit move the sprockets and chain on the worm shaft and crank shaft to opposite side to eliminate possible interference with the spring.

Note: Place discharge auger tube in side saddle before transporting.

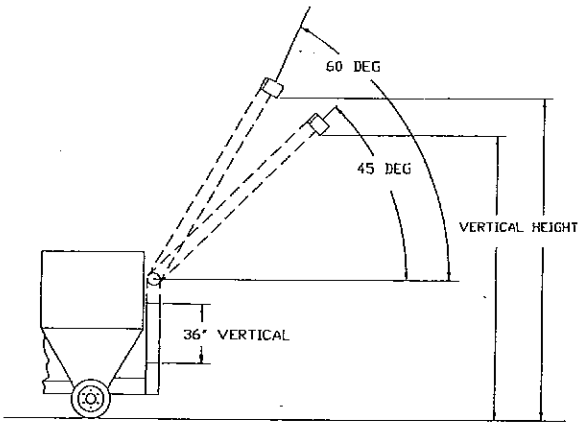


FIGURE 20 - UNLOADING AUGER HEIGHTS

An unloading auger swivel stop (see figure 21) prevents the unloading auger from contacting the mixing tank when moved 180 degrees from the storage position. Relocate the swivel stop so it contacts the bracket before anything contacts the tank.

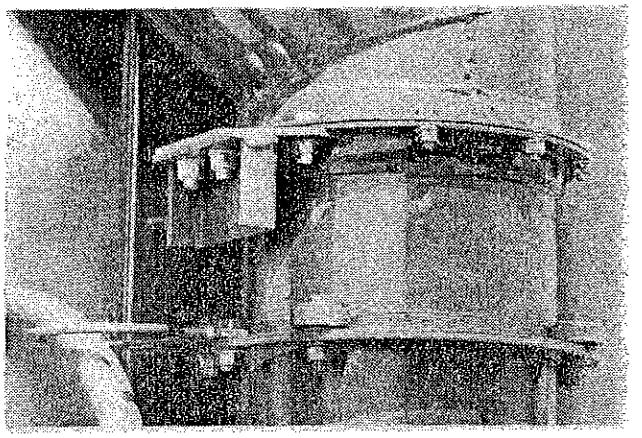


FIGURE 21 - SWIVEL STOP

UNLOADING HEIGHTS OBTAINABLE ON LEVEL SURFACE (SEE FIGURE 20)

UNLOADING AUGER CONFIGURATION	TUBE AND ELBOW COMBINED LENGTH	DISCHARGE 45 DEG 36" TUBE	DISCHARGE 60 DEG 36" TUBE
STANDARD - NO	125"	14'-11"	16'-7"
3 FOOT FOLD AROUND AUGER EXTENSION	161"	17'-0"	19'-2"
6 FOOT FOLD AROUND AUGER EXTENSION	197"	19'-2"	21'-10"

AUGER FEEDER OPERATION

To position the auger feeder, remove the clip pin from the fender bracket, lift the bottom of the auger feeder slightly so that brackets clear at the fender. Swing the auger feeder out away from tank so it will clear the fender when it is lowered. Lift slightly on the auger feeder and pull on the rope. While holding the rope lower the auger feeder to the desired height. Remove the clip pin holding the auger feeder folding hopper up and swing the hopper down. Hinged grate must then be positioned down over the auger. When grinding material such as ear corn, the grate must be left in the up position. If you must grind with the grate up, use extreme care to stay clear of the auger.

DANGER: To prevent personal injury:
1. Use grate over auger at all times possible.
2. Keep hands and feet out of the hopper area and do not climb onto or over the hopper at any time.
3. Keep children and bystanders away from machine while in operation.

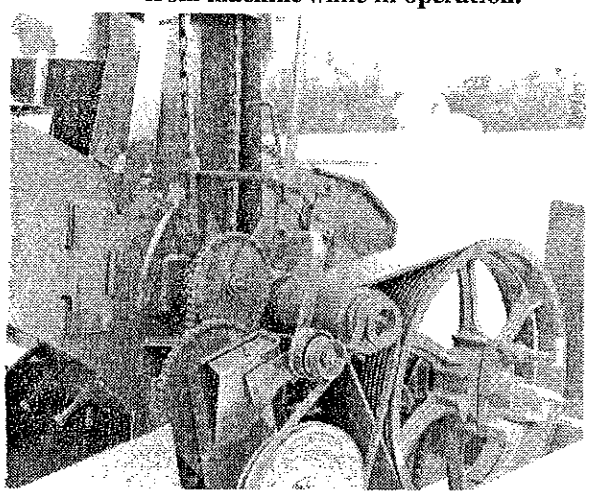


FIGURE 22 - AUGER FEEDER OPERATION

The auger feeder brake prevents the auger feeder from swinging. Tighten or loosen as desired (see figure 23).

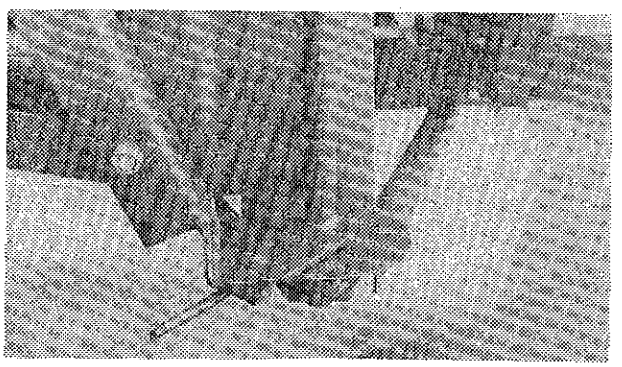


FIGURE 23 - AUGER FEEDER SWING BRAKE

The auger feeder is counter balanced by a spring (see figure 24). Adjust the spring by loosening the nut on the lower bolt, turn the bolt in, to increase the spring tension, relock nut.

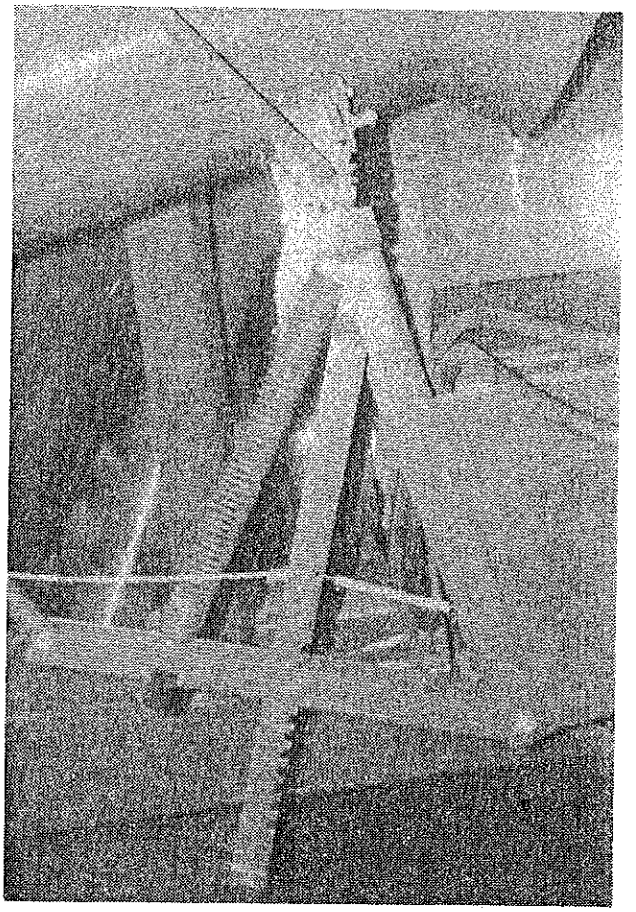


FIGURE 24 - AUGER FEEDER POSITIONER AND SPRING ADJUSTMENT

The auger feeder is equipped with a unique patented feature called a positioner (see figure 24). This enables the hopper to be repositioned approximately 6 inches in or out without moving the tractor. To operate the positioner, hold the long handle securely; release the short handle; reposition the auger feeder hopper more directly under a spout or against a building; then release handles.

NOTE: If machine is equipped with an electronic scale, to obtain a more accurate reading DO NOT rest auger feeder on the ground. Place in position and set swing brake (see figure 23).

OPERATION

The model 475 may be equipped with either a mechanically or hydraulically driven auger feeder.

MECHANICAL AUGER FEEDER

Shut off handles are provided to the front and the rear of the hammermill and at the auger feeder hopper. Any of these handles may be pulled to shut off the auger feeder (and roll feed if so equipped). To re-engage, the handle to the front of the hammermill housing must be operated by lifting the catch lever and allowing the handle to drop (see figure 25).

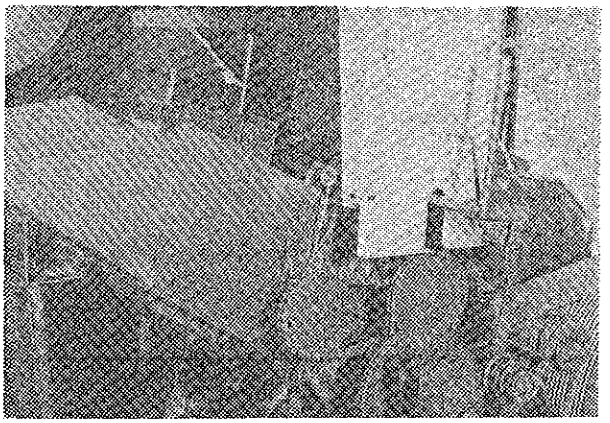


FIGURE 25 - AUGER FEEDER CONTROLS

Mechanical auger feeder speed may be varied from 57 rpm to 151 rpm (see figure 26 and table). This is done by moving the belt from low to high or by moving the drive chain to tower from high to low. This results in four different speeds.

When properly adjusted the V-Belt brake assembly should prevent the V-Belt from creeping when the clutch is disengaged. To adjust the V-Belt brake loosen the 3/8" x 1" carriage bolt that bolts the belt brake assembly to the lower drive unit and slide the belt brake up or back as required. A good place for the initial setting of the belt brake is to have approximately 1/8" clearance between the long leg of the upper rod and the main drive belts (see figure 26).

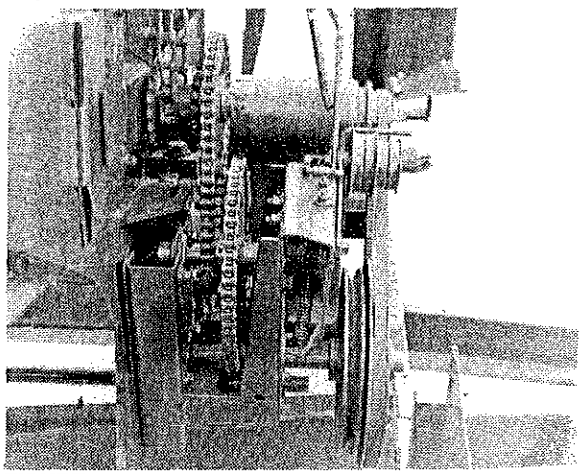


FIGURE 26 - AUGER FEEDER SPEED CHANGES
(Shields removed for clarity)

AUGER FEEDER SPEEDS

Auger rpm	Position of belt	Position of chain
57	A(Lo)	C(Lo)
84	B(Hi)	C(Lo)
103	A(Lo)	D(Hi)
151	B(Hi)	D(Hi)

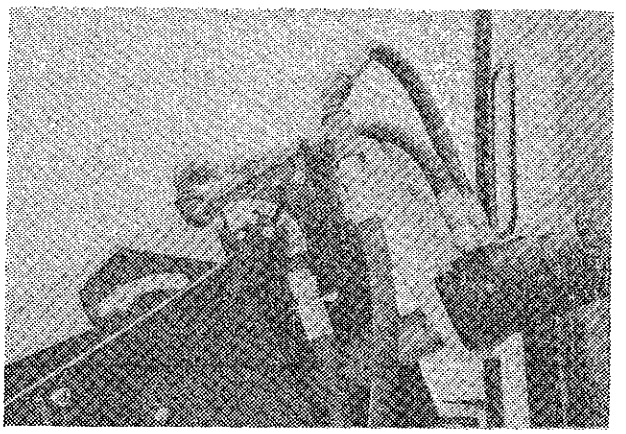


FIGURE 27 - HYDRAULIC AUGER FEEDER CONTROLS

HYDRAULIC AUGER FEEDER

Shut off handles are provided at the auger feeder hopper and at the flow control valve at the top of the auger feeder housing. To shut off the auger feeder pull the handle at hopper area or move flow control lever to off (see figure 27).

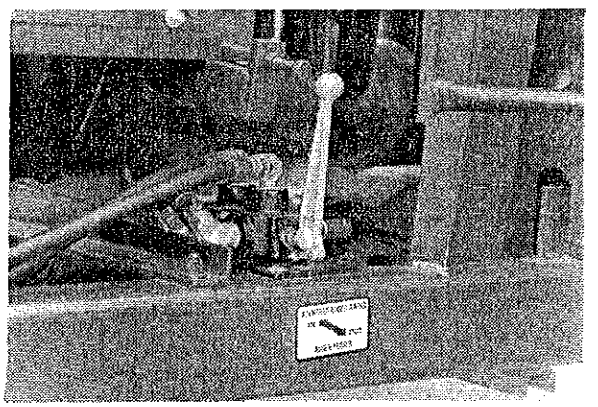


FIGURE 28 - SELECTOR VALVE

For the tractor hydraulic auger feeder, when the machine is also equipped with a hydraulic lift and swing unloading auger, a selector valve will be located to left, rear side of hammermill. The handle on this valve must be out to divert the oil to the auger feeder. If the handle of the selector valve is in, oil flows to the lift and swing function of the unloading auger (see figure 28).

OPERATION

To start the auger feeder, the flow control handle is moved forward (clockwise) until the desired speed is reached.

If the hydraulic auger feeder is operated by tractor hydraulics, there must be a minimum of 8 GPM flow and 1500 PSI pressure available.

As standard, this machine is equipped for tractor "Open Center" hydraulic operation.

If operation of the auger feeder is to be with a tractor that is equipped with a closed center hydraulic system, revision to the plumbing at the control valve by pass should be made. Refer to the tractor operators manual or consult the dealer to make sure which system the tractor has (see figure 29).

For converting to "Closed Center" do the following: At control valve upper right corner, disconnect hoses from motor and to tractor from tee and elbow; remove nipple. Install plugs in vlave and tee where nipple was removed. Reconnect hoses to tee and elbow. Tie hoses together for support (see figure 29). If the system has two control valves for auger feeder and roll feed, make the change ONLY at roll feed flow control valve tee where it returned to the tractor. When revised for "Closed Center" operation, do not use on tractor with "Open Center".

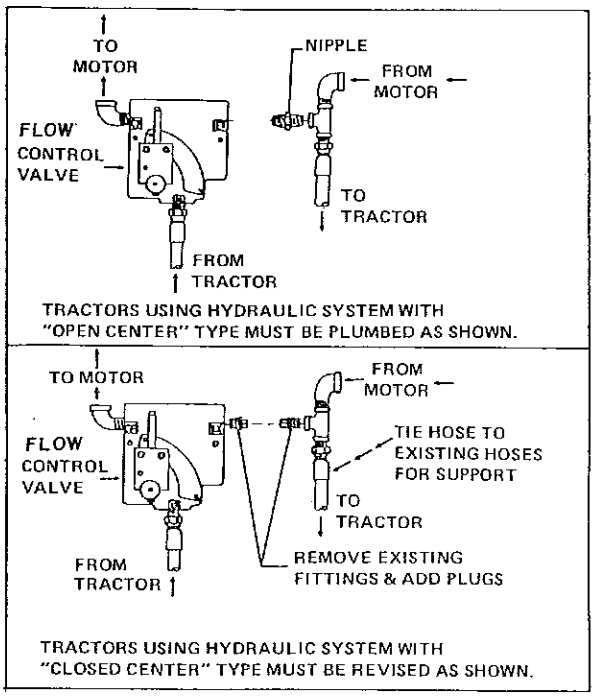


FIGURE 29 - OPEN AND CLOSED HYDRAULIC SYSTEMS

CAUTION: If cable is broken or becomes frayed or worn, replace immediately.

ROLL FEED

To maintain even feeding, the roll feed may be set at a desired height by using the roll feed crank. Roll feed settings will vary with the material being fed. Brief experience will indicate the best settings. Set the roll feed just high enough so that the material is being pulled smoothly.

CAUTION: Never force material into the roll feed with a stick or with hands. Be especially careful when feeding slices of hay, always allowing the roll feed to pull the hay into the mill.

MECHANICAL ROLL FEED

The mechanical roll feed drives from the same drive as the mechanical auger feeder, it starts and stops with the same clutching functions, see mechanical auger feeder.
The crank for raising and lowering the roll feed is to the rear of the hammermill (see figure 30).

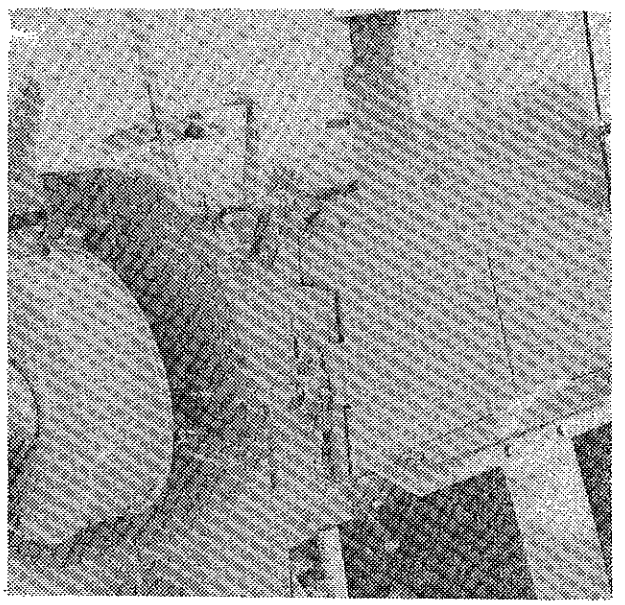
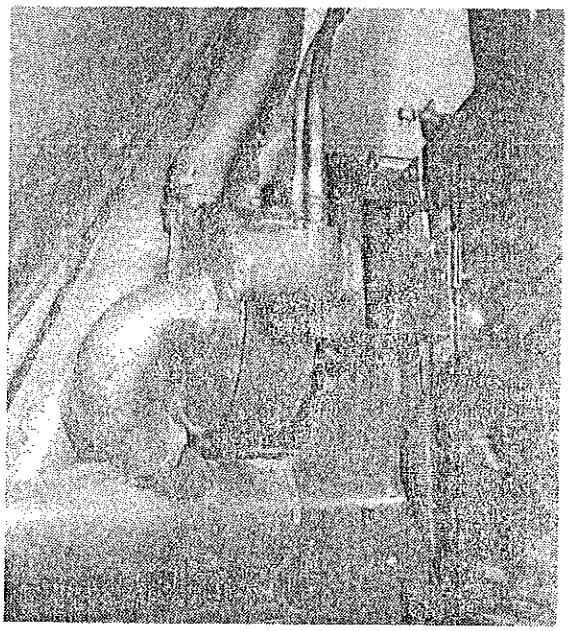


FIGURE 30 - ROLL FEED CRANK AND FEED BAFFLES

FIGURE 31 - ROLL & AUGER FEEDER
(Shields removed for clarity)



HYDRAULIC ROLL FEED

The hydraulic roll feed is connected in series with the hydraulic auger feeder, a separate flow control valve allows separate speed control for the roll feed(see figure 32). If equipped with hydraulic roll feed only, the flow control is on top of hammermill.

The crank for raising and lowering the roll feed is to the front of the hammermill housing (see figure 33).

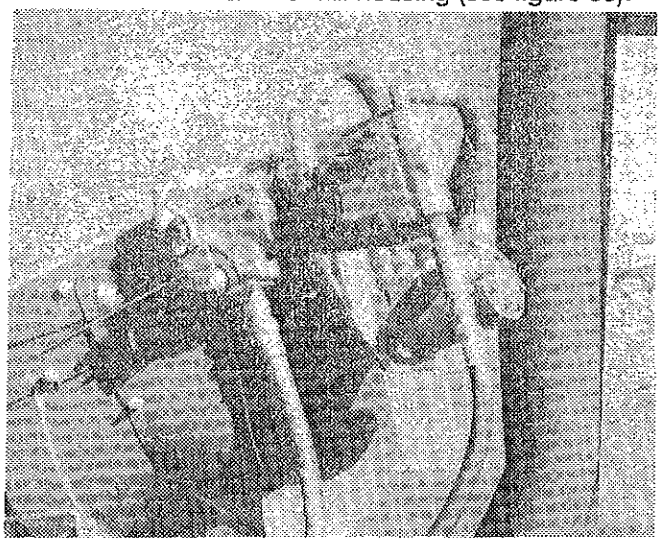


FIGURE 32 - ROLL FEED AND AUGER FEEDER FLOW CONTROL VALVES

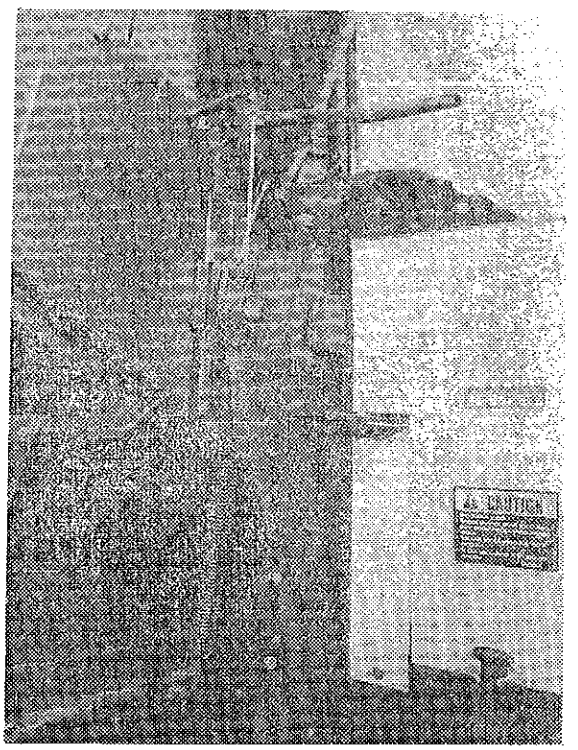


FIGURE 33 - ROLL FEED HYDRAULIC MOTOR AND ROLL FEED CRANK

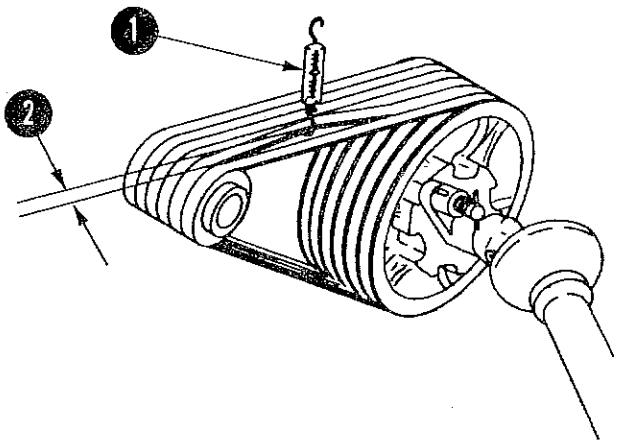
ADJUSTMENTS

CAUTION: Do not clean, lubricate or adjust your Grinder-Mixer while it is running. Shut tractor engine off and disengage tractor PTO lever.

MAIN DRIVE BELTS

Belts on new machines have been properly tensioned at the factory. To re-tension belts on a machine which has been in operation, the following procedure should be followed:

Loosen bolts B and C (see figure 35), place a scale at the double V-belt midway on the pulleys, adjust bolts A (see figure 35), until sixteen pounds of pull on the scale raises the top of one double V-belt approximately 5/16 inch above the top of the remaining belts (see figure 34). All six pairs of belts should have an average of 5/16 inch deflection at sixteen pounds. Also see figure 36, for alignment of pulleys.



1 - 15 pounds (6.8 Kg)
2 - 1/4 inch (.635 cm)

FIGURE 34 - CHECKING BELT TENSION
(Shield removed for clarity)

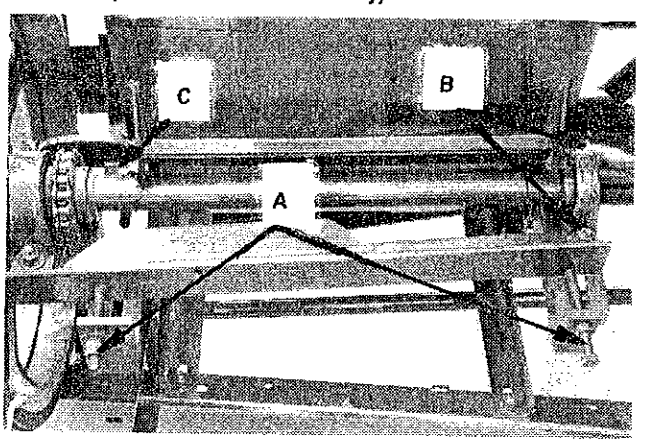


FIGURE 35 - BELT TENSION ADJUSTMENT
(Shields removed for clarity)

IMPORTANT: Proper alignment of pulleys must be maintained when adjusting belt tension.

Belts should be checked periodically for proper tension and alignment, especially when the machine is new or a new set of belts is installed. When operating, if the drive belts are very hot or smoking due to loose belts, do not shut off the machine, but stop grinding and let the mill continue to run for several minutes until the belts have cooled. Then stop the machine to re-tension the belts.

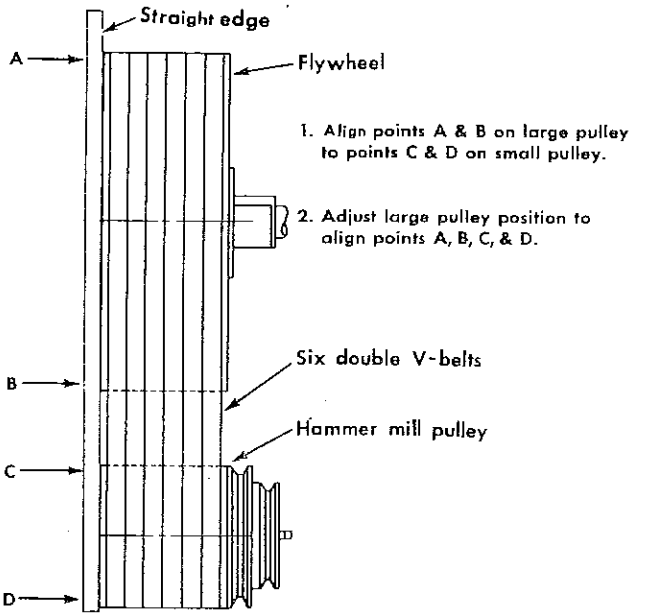


FIGURE 36 - BELT PULLEY ALIGNMENT

MAIN DRIVE CHAIN

Adjust the tension of the main drive chain (see figure 37), by loosening the idler sprocket bolt and sliding the idler sprocket towards the chain. Retighten idler sprocket bolt. Chain deflection should be 1/2 inch total at longest span. This chain should be checked and oiled weekly.

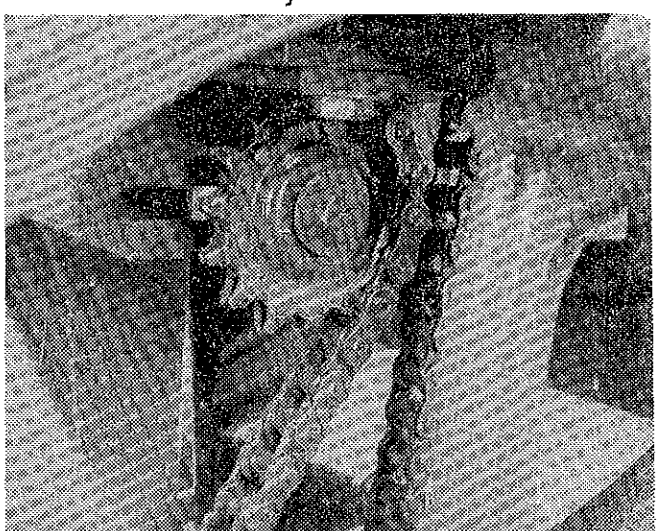


FIGURE 37 - DRIVE CHAIN ADJUSTMENT
(Shield removed for clarity)

ADJUSTMENTS

DRIVE CHAINS

The mill to tank auger drive chain (see figure 39), and the supplement hopper drive chain (see figure 38), are tensioned with a wood block idler. Adjust the chain tension to 1/2 inch total deflection by positioning the wood block idler.

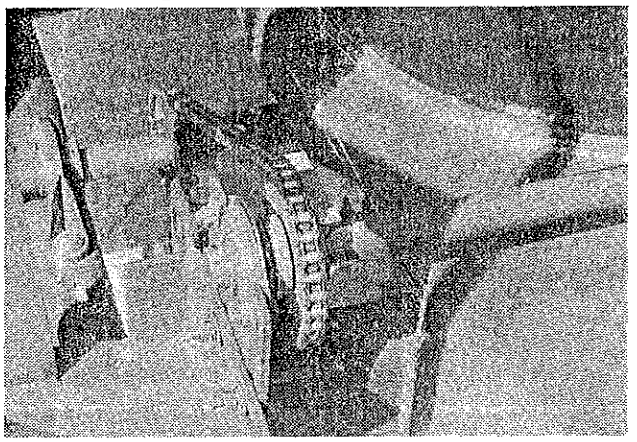


FIGURE 38 - SUPPLEMENT HOPPER DRIVE CHAIN
(Shield removed for clarity)

FIGURE 39 - AUGER DRIVE CHAIN
(Shield removed for clarity)

HAMMERMILL DOOR

To increase the hammermill door pressure on the screen, adjust the length of the T-handle threaded end. Check adjustment and tighten locking nuts in place against the pivot block (see figure 40).

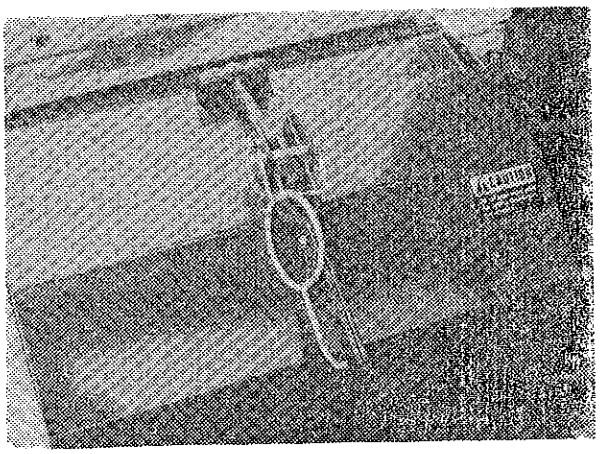


FIGURE 40 - HAMMERMILL DOOR TENSION

UNLOADING AUGER CLUTCH

The unloading auger clutch can be adjusted by moving the yoke on the threaded rod (see figure 41). With the auger clutch handle disengaged, the clutch halves must be separated by 1/4 inch minimum.

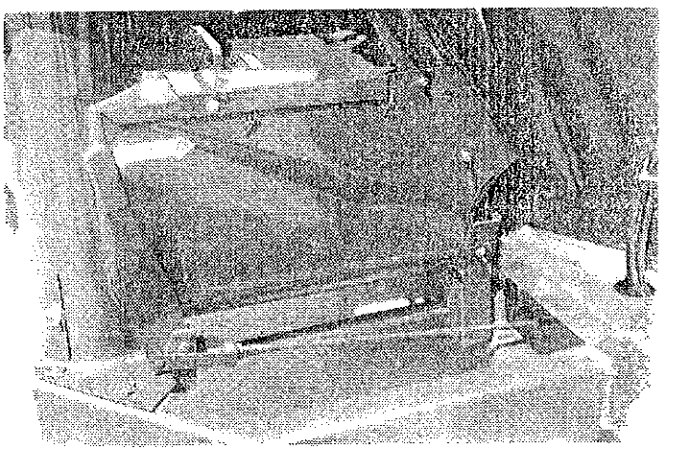


FIGURE 41 - UNLOADING AUGER CLUTCH ADJUSTMENT

MANUAL UNLOADING AUGER SWING CRANK ADJUSTMENT FOR SPROCKET ENGAGEMENT

Adjust by loosening three bolts and moving the assembly up to engage the teeth of the sprocket with the disk (see figure 42).

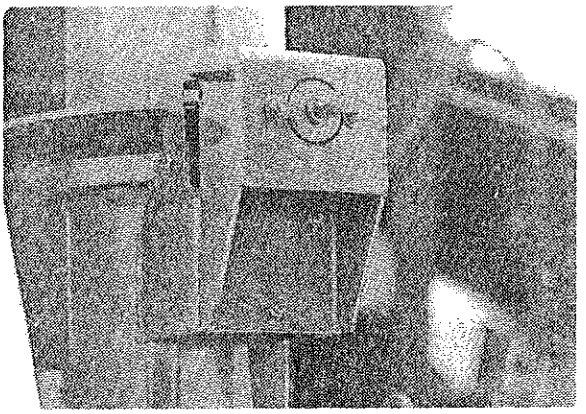


FIGURE 42 - MANUAL SWING

MANUAL UNLOADING AUGER SWING BRAKE ADJUSTMENT

Tighten or loosen nut and bolt, location A, to maintain tension to hold unloading auger (see figure 43).

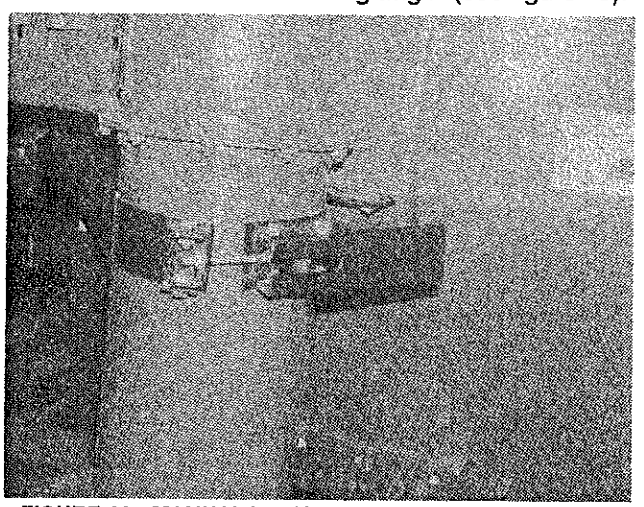


FIGURE 43 - MANUAL BRAKE

HYDRAULIC SWING ADJUSTMENT

Adjust and/or check as follows:

1. Remove #40 chain.

2. Make sure #40 chain rests in root area of sprocket through split areas and reposition sprocket halves if necessary

3. Reinstall chain drive. Check alignment of drive sprocket on hydraulic motor adjust if necessary.

4. Make sure slip band has clearance above sprocket.

5. Tighten tension spring to desired slip.

6. Reinstall shield.

NOTE: The slip band is designed to protect the discharge auger from damage in the event of striking an obstruction.

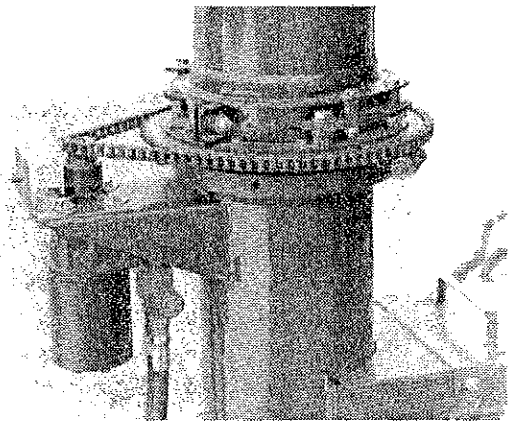


FIGURE 44 - HYDRAULIC SWING ADJUSTMENT
(Shield removed for clarity)

AUGER FEEDER BALANCE SPRING

Adjust the auger feeder balance spring by loosening the jam nut and turning the spring bolt. Turn the bolt clockwise to increase the spring tension. Tighten the jam nut when desired balance is obtained.

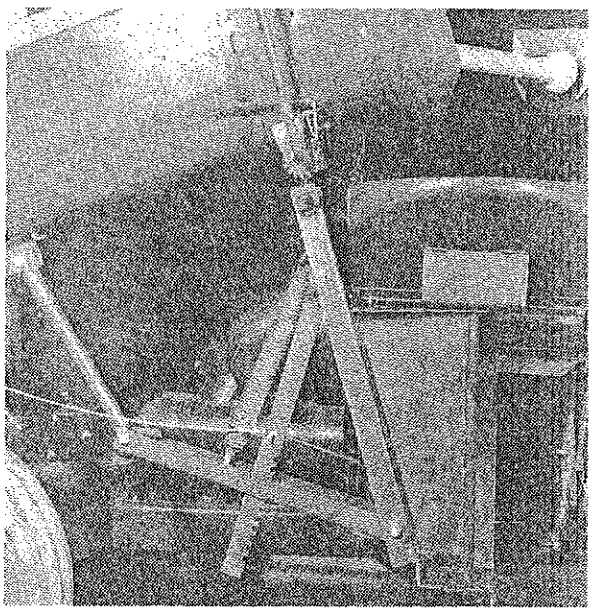


FIGURE 45 - POSITIONER AND SPRING ADJUSTMENT

ADJUSTMENTS

POSITIONER

The auger feeder is equipped with a unique feature called a positioner (see figure 45). This enables the hopper to be re-positioned approximately 6 inches in or out without moving the tractor. To operate the positioner: hold the long handle securely; release with short handle; reposition the auger feeder hopper more directly under spout or against building; release short handle, then long handle.

ROLL FEED

Five holes are provided at the upper end of the roll feed spring. Roll feed tension can be changed as desired. Generally, the top hole is used for hay (see figure 46).

If the roll feed does not crank up straight, check the cables at each side of the roll feed to see if they are both uniform on the roll feed crank shaft.

Cable lengths can be adjusted by loosening the nut with special cable washer and retightening after cables have been equalized.

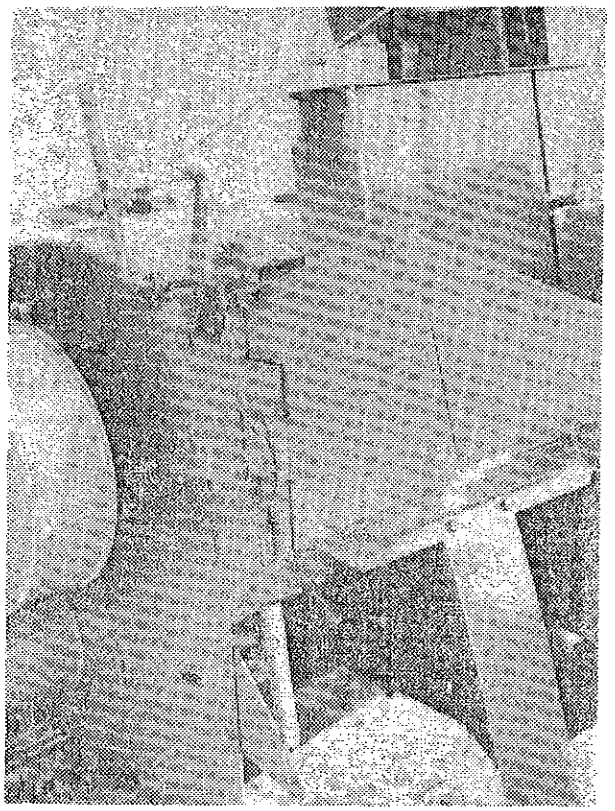


FIGURE 46 - ROLL FEED ADJUSTMENT

These same adjustments apply to both the hydraulic and mechanical roll feed.

AUGER FEEDER SWING BRAKE

The auger feeder can be secured so it does not pivot by tightening the bolt onto the disk at the base of pivot thus preventing any side to side movement (see figure 47).

This may be helpful when using the electronic scale so the auger feeder housing can be held off the ground, preventing the auger feeder housing from moving out of position.

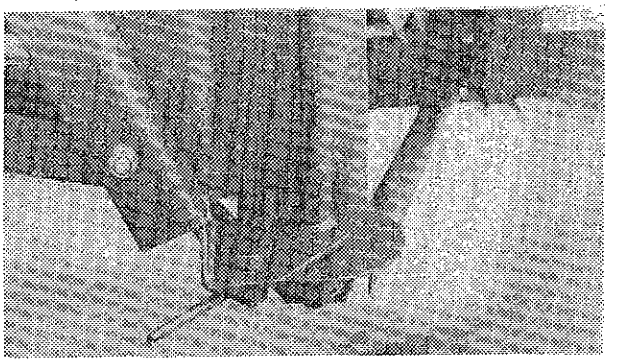


FIGURE 47 - SWING BRAKE

AUGER FEEDER CLUTCH

Make sure stop handle will stop the auger feeder. For hydraulic auger feeder, loosen cable clamps and re-adjust (see figure 48).

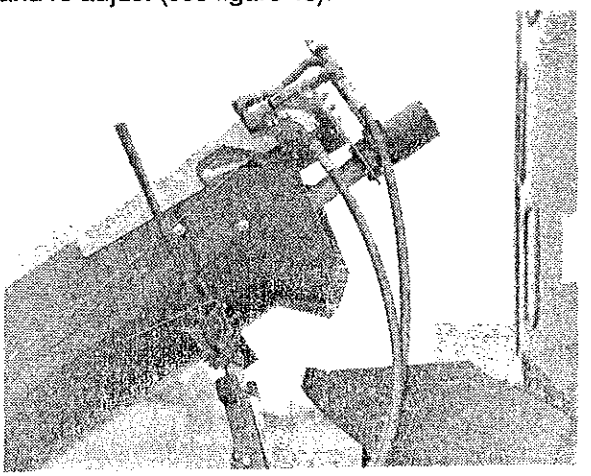


FIGURE 48 - HYDRAULIC CONTROL VALVE CABLE ADJUSTMENT

For the mechanical auger feeder, position the auger feeder on the ground to a position approximately three feet ahead of straight out, the positioner to be positioned so the auger feeder is as far away from the hopper as possible. The auger feeder clutch is to be engaged. Adjust the cable so it is snug in this position with the control handle toward the hammermill as far as possible. Position the auger feeder to the fender. (Leave positioner away from hammermill). Check to make sure the control handle will disengage the auger feeder clutch, if not adjust the cable length so it does (see figure 49).

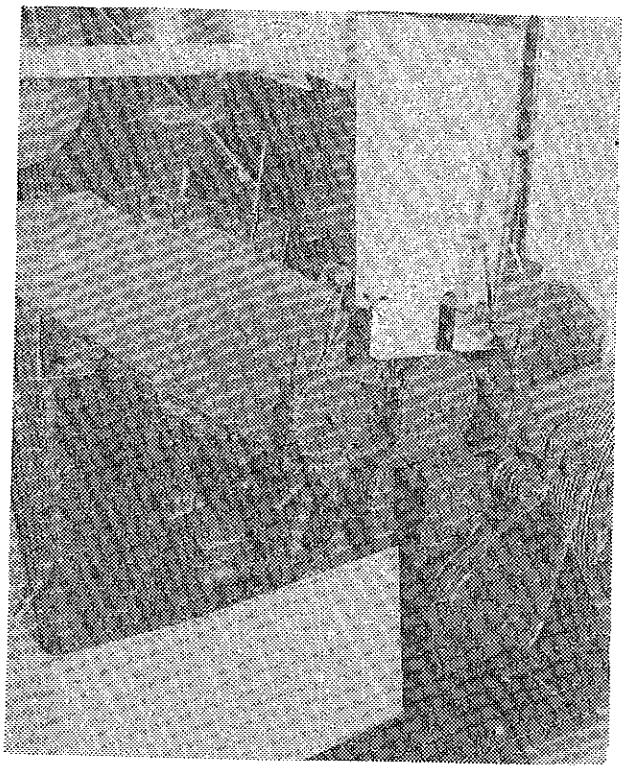


FIGURE 49 - SHUT OFF CABLE ADJUSTMENT FOR MECHANICAL AUGER FEEDER

When the top mill clutch no longer continues to engage the roll feed or auger feeder, the side panel belts must be adjusted. The two bolts holding the side panel must be loosened (see figure 50). Move the side panel to increase the pulley distance and re-tighten the bolts. Be sure the chain tension is maintained when moving the side panel. Chain deflection should be about 1/4 inch total. The belt should have a 2 inch deflection when properly adjusted and with clutch engaged. To adjust the belt brake loosen the 3/8" x 1" carriage bolt that bolts the belt brake to the lower drive unit and slide the belt brake up or back as required. A good place for the initial setting of the belt brake is to have approximately 1/8" clearance between the long leg of the upper rod (see figure 50) and the main drive belts.

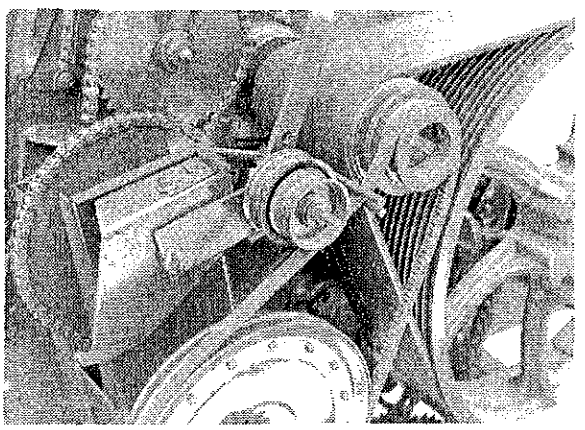


FIGURE 50 - TOP MILL CLUTCH
(Shields removed for clarity)

MANUAL LIFT ADJUSTMENT

If the chain becomes loose, loosen bolts on the cranking shaft and position chain to the proper tension (see figure 51).

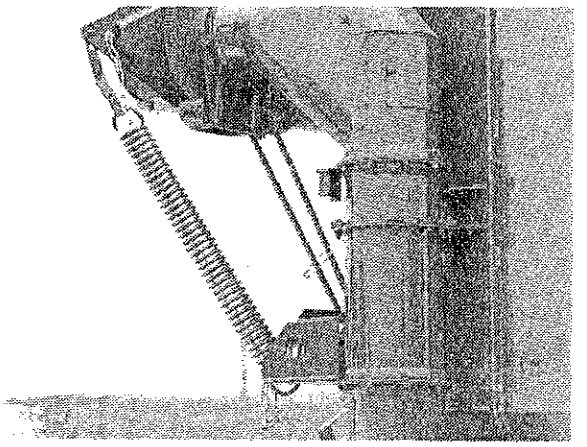


FIGURE 51 - MANUAL LIFT CHAIN ADJUSTMENT

TRACTOR HYDRAULICS

As standard this machine is equipped for tractor "Open Center" hydraulic operation.

If the operation auger feeder is to be with a tractor that is equipped with a closed center hydraulic system revision to the plumbing at the control valve bypass should be made. Refer to tractor operators manual or consult dealer to make sure which system the tractor has (see figure 52).

For converting to "Closed Center" do the following: At control valve upper right corner, disconnect hoses from motor and to tractor from tee and elbow; remove nipple. Install plugs in vlave and tee where nipple was removed. Reconnect hoses to tee and elbow. Tie hoses together for support (see figure 52). If the system has two control valves for auger feeder and roll feed, make the change ONLY at roll feed flow control valve tee where it returned to the tractor. When revised for "Closed Center" operation, do not use on tractor with "Open Center".

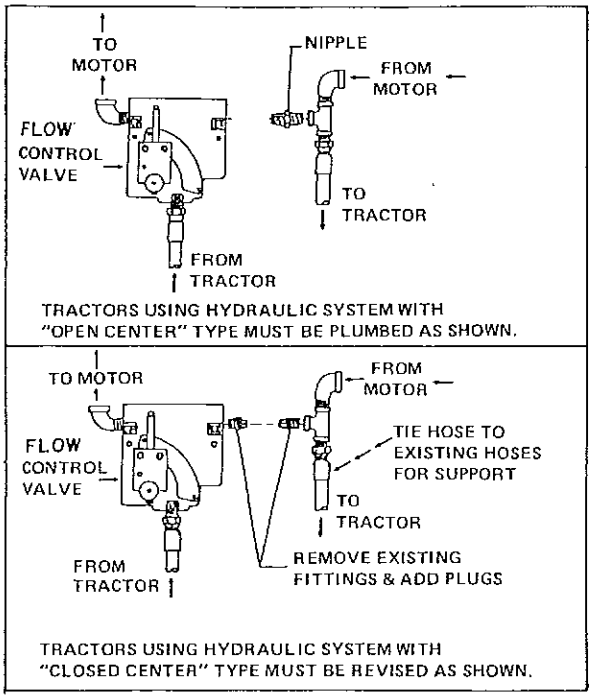


FIGURE 52 - OPEN AND CLOSED HYDRAULIC SYSTEMS

WHEEL BEARINGS

Raise and securely block the frame so that the wheel turns freely. To tighten the wheel bearing, remove the hub cap. Then remove the cotter pin from the slotted nut and tighten the slotted nut while turning the wheel. Then loosen or back off the nut to the nearest slot and insert and spread cotter pin.

There should be a slight drag on the bearing, following the adjustment. Replace hub cap (see figure 53).

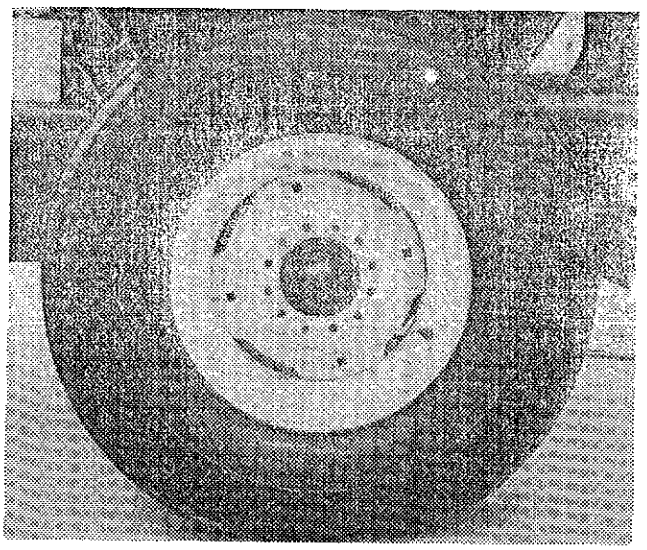


FIGURE 53 - WHEEL BEARING ADJUSTMENT

SWIVEL STOP

See page 17, figure 21. Adjust bracket so it contacts before unloading auger contacts the tank.

LUBRICATION

CAUTION: Do not clean, lubricate or adjust your Grinder-Mixer while it is running. Shut tractor engine off and disengage tractor PTO lever.

The Grinder-Mixer is designed to require a minimum amount of lubrication, however, the points that are to be lubricated should be serviced regularly at the intervals listed.

Keep your supply of lubricating oil and grease stored in clean containers and covered to protect from dust and dirt.

Keep the lubricating gun nozzle clean and wipe dirt from grease fittings before lubricating.

WHEELS

Repack the wheel bearings once a year or every 100 hours of operation with SAE multi-purpose type grease.

PTO SHAFT

Grease the bearing crosses and the zerk on the sliding shaft monthly or every 25 hours of operation with SAE multi-purpose type grease (see figure 54).

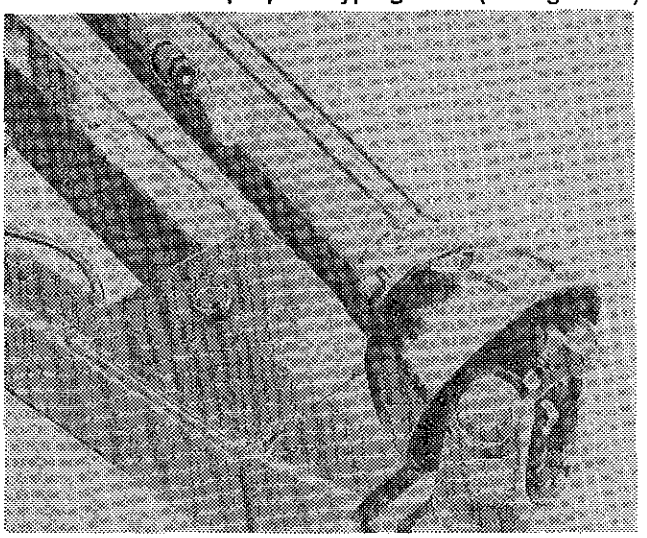


FIGURE 54 - PTO LUBRICATION

DRIVE SHAFT BEARINGS

Grease the two pillow block bearings (see figure 55) on the grinder jack shaft and one pillow block bearing, (see figure 56) on the mixer drive shaft monthly or every 25 hours of operation with SAE multi-purpose type grease.

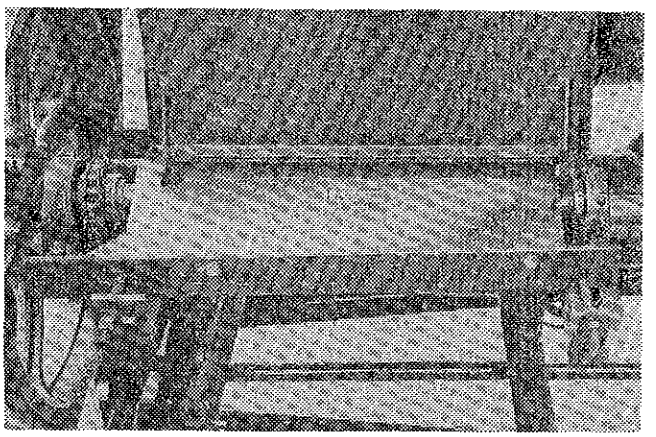


FIGURE 55 - JACK SHAFT TWO BEARINGS

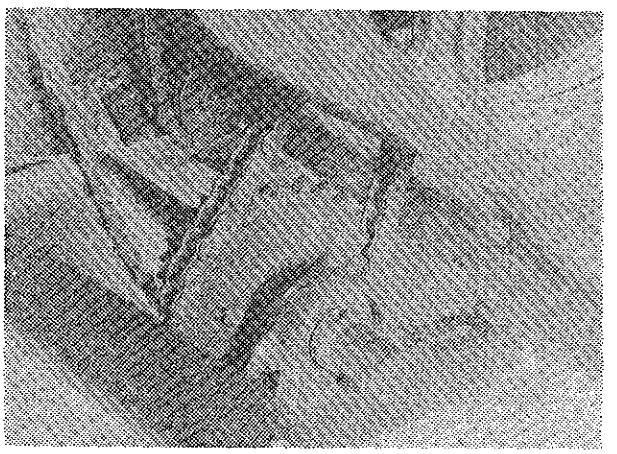
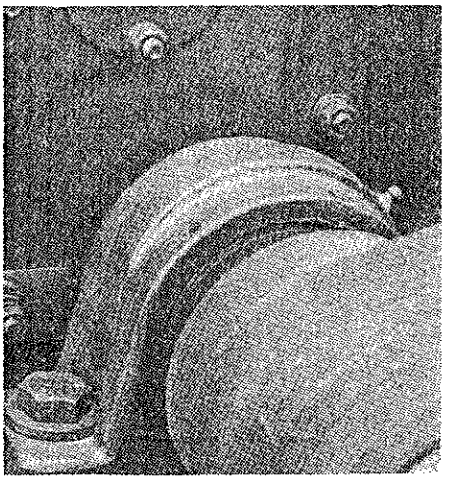


FIGURE 56 - MIXER DRIVE SHAFT BEARING

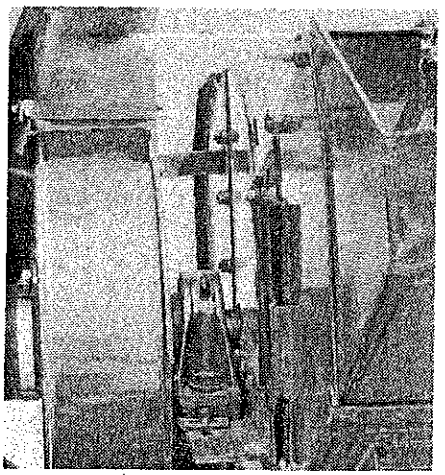
LUBRICATION

HAMMERMILL SHAFT BEARINGS

Grease front and rear pillow block bearings on the hammermill cylinder shaft (see figure 57) weekly or every 10 hours of operation with SAE multi-purpose type grease.



FRONT



REAR

FIGURE 57 - CYLINDER SHAFT BEARINGS (2)
(Shield removed for clarity)

LOWER VERTICAL MIXING AUGER

Refill the grease seal at the bottom of the vertical mixing auger every six months with SAE multi-purpose type grease. Access to this fitting is through the clean-out door in the mixing tank cone, under the large bottom flight of the mixing auger.

UNLOADING AUGER CLUTCH

Brush the shaft and groove in the under sliding (driven) unloading auger clutch half periodically with SAE multi-purpose type grease (see figure 59).

ROLL FEED

Grease the front and rear (2) fittings on roll feed drive shaft bearings and cluster sprocket shaft weekly or every 10 hours of operation with SAE multi-purpose type grease.

UPPER VERTICAL MIXING AUGER

Grease the upper vertical mixing auger brass bearing weekly or every 10 hours of operation with SAE multi-purpose type grease. Access to this bearing is through the spring loaded tank lid at the top of the mixing tank (see figure 58).

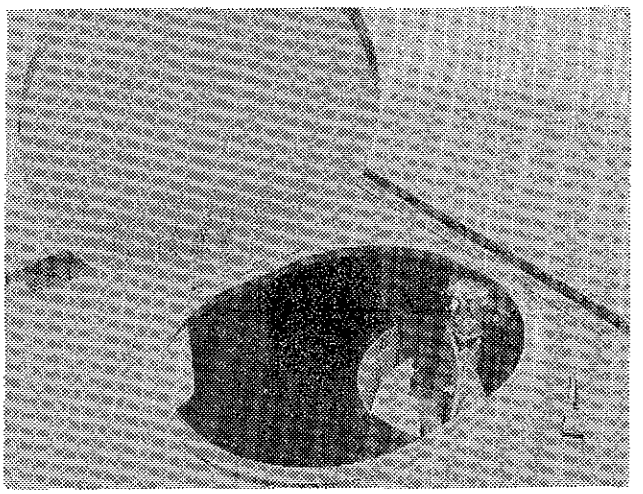


FIGURE 58 - TOP OF MIXING AUGER

GEARBOX

Check the oil level in the gearbox at the base of the mixing tank every 6 months by removing check plug at front of the gearbox. Add SAE 90 weight gear oil, if necessary, untill oil runs out of check hole (see figure 59).

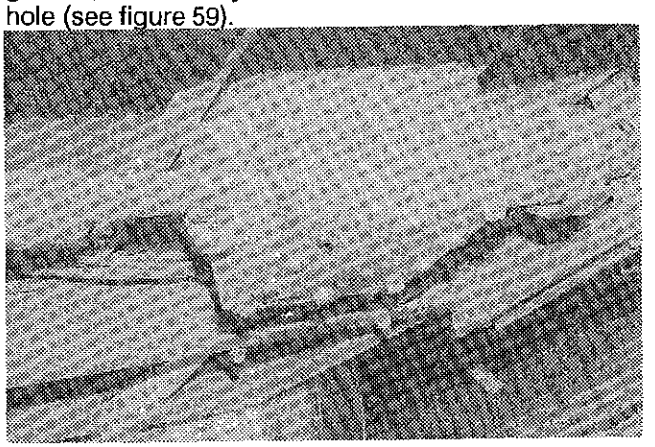


FIGURE 59 - GEARBOX LUBRICATION

LUBRICATION

GRINDER ENGAGING PIN

Periodically oil the sliding pin which engages the large hammermill drive pulley. Use a light engine oil for lubrication (see figure 60).

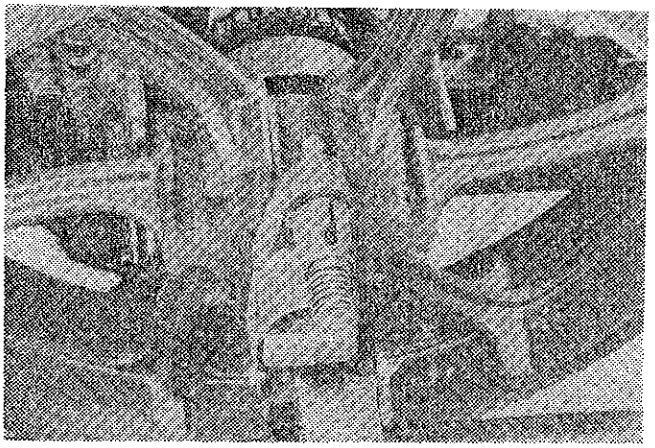


FIGURE 60 - HAMMERMILL ENGAGING PIN
(Shields removed for clarity)

RING AND WORM GEAR - MECHANICAL

Grease at two locations on large ring gear on unloading auger and wipe grease at ring gear and worm gear periodically. Use SAE multi-purpose type grease. Also every 6 months repack 3/4" dia. bearings on worm shaft (see figure 61).

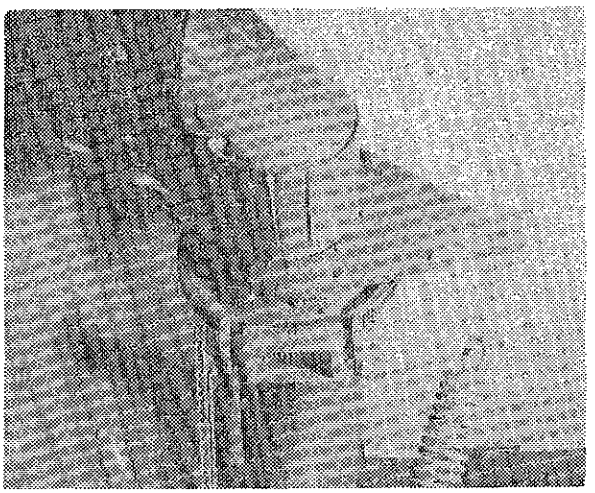


FIGURE 61 - RING AND WORM GEAR - MECHANICAL

RING AND WORM GEAR - HYDRAULIC

On units with hydraulic controlled back auger, keep the worm gear reservoir filled with oil up to the worm shaft (units shipped dry). Use SAE 90 weight gear oil. Check periodically for leaks which could run reservoir dry (see figure 62). Grease lubrication fittings and outside diameter of ring gear with SAE multi-purpose grease every 10 hours of operation (see figure 62).

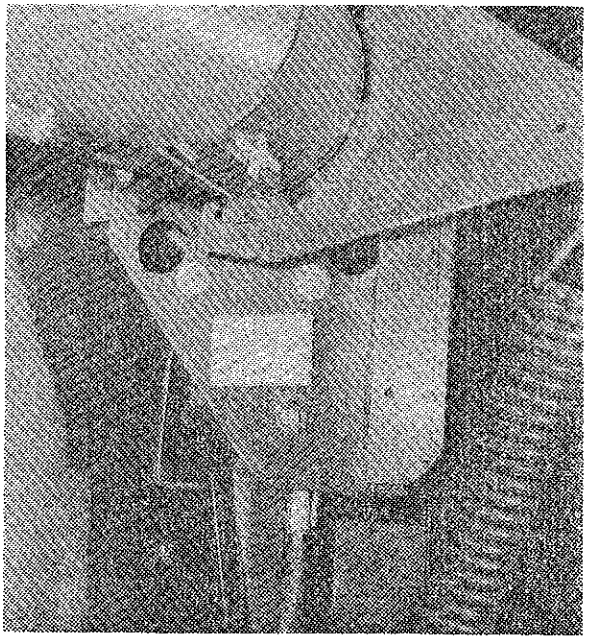


FIGURE 62 - RING AND WORM GEAR - HYDRAULIC

CHAINS

Chains should be lubricated at frequent intervals. A paint brush should be used for applying a light engine oil to the chain. Oil the chain on the inside (Upper side of lower strand) (see figure 64).

CAUTION: Disengage PTO and shut off tractor engine before lubricating the chains.

Chains should be cleaned regularly. Take the chains off and clean them well by soaking and dipping them in kerosene. Dry well and oil thoroughly.

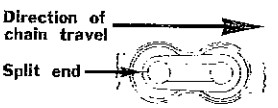


FIGURE 63 - CHAIN SPRING CLIP

The split end of the chain clip must face the direction opposite the chain travel. Be sure the clip is properly seated in the groove on the ends of the pin (see figure 63).

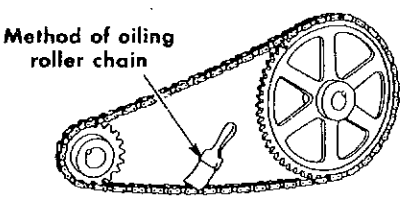


FIGURE 64 - OILING ROLLER CHAINS

LUBRICATION

SWIVEL CLAMP

Grease lower swivel clamp weekly (see figure 65).

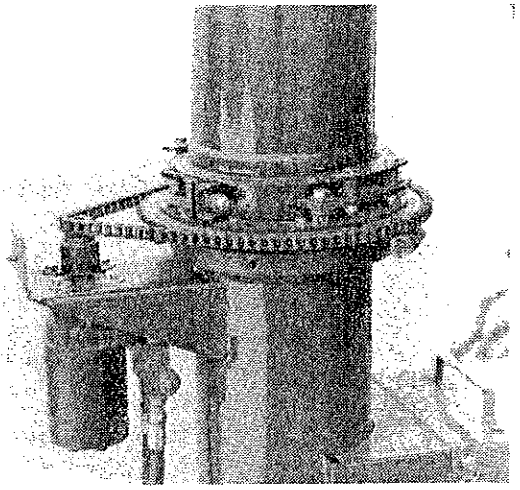


FIGURE 65 - SWIVEL CLAMP AREA, DISCHARGE AUGER (Shield removed for clarity)

REAR SUPPLEMENT HOPPER

Grease the rear supplement hopper bearing every 10 hours of operation with SAE multi-purpose type grease (see figure 66).

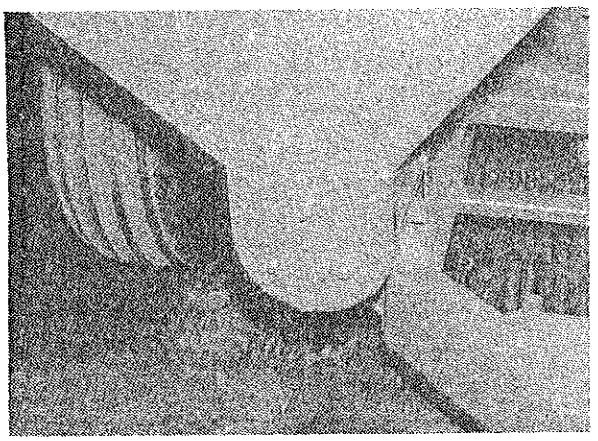


FIGURE 66 - REAR SUPPLEMENT, HOPPER BEARING GEARS

Periodically lubricate gear sets at each unloading auger transfer point. Use SAE multi-purpose type grease (see figure 67).

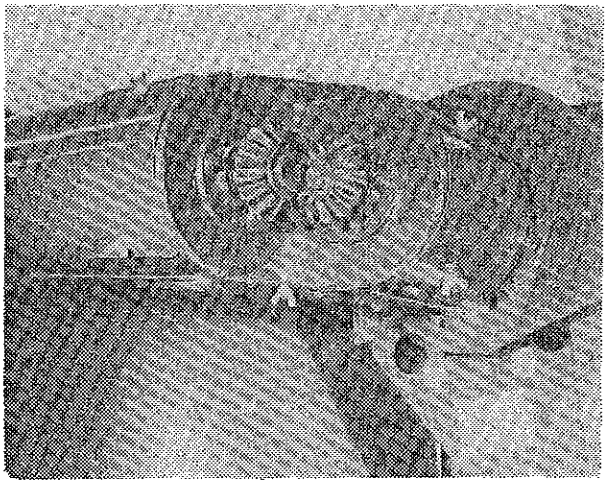


FIGURE 67 - DISCHARGE AUGER BEVEL GEARS (Shield removed for clarity)

CAUTION: Disengage all drives and shut off tractor engine before servicing Grinder-Mixer.

Bolt and Nut Grade 5
Torque Specifications

SIZE	CLAMP LOAD	PLAIN	PLATED
1/4 - 20(.250)	2,025	8 ft. lbs.	76 in. lbs.
5/16 - 18(.3125)	3,338	17 ft. lbs.	13 ft. lbs.
3/8 - 16(.375)	4,950	31 ft. lbs.	23 ft. lbs.
7/16 - 14(.4375)	6,788	50 ft. lbs.	37 ft. lbs.
1/2 - 13(.500)	9,075	76 ft. lbs.	57 ft. lbs.
9/16 - 12(.5625)	11,625	109 ft. lbs.	82 ft. lbs.
5/8 - 11(.625)	14,400	150 ft. lbs.	112 ft. lbs.
3/4 - 10(.750)	21,300	266 ft. lbs.	200 ft. lbs.
7/8 - 9(.875)	29,475	430 ft. lbs.	322 ft. lbs.
1 - 8(1.000)	38,625	644 ft. lbs.	483 ft. lbs.
1-1/8 - 7(1.125)	42,375	794 ft. lbs	596 ft. lbs.

FIGURE 68 - TORQUE CHART

SHEAR PLATES

The shear bolts make a loud noise when they shear. This is your warning to turn off the tractor ignition immediately and determine the cause of the shearing.

When replacing the shear bolts, always tighten them securely, using lock nuts. The shear bolts must be of the correct hardness: Grade 5 (3 radial dashes) or Grade 2 (plain head) (see figures 68,69). Replace with same hardness bolt as sheared bolt.

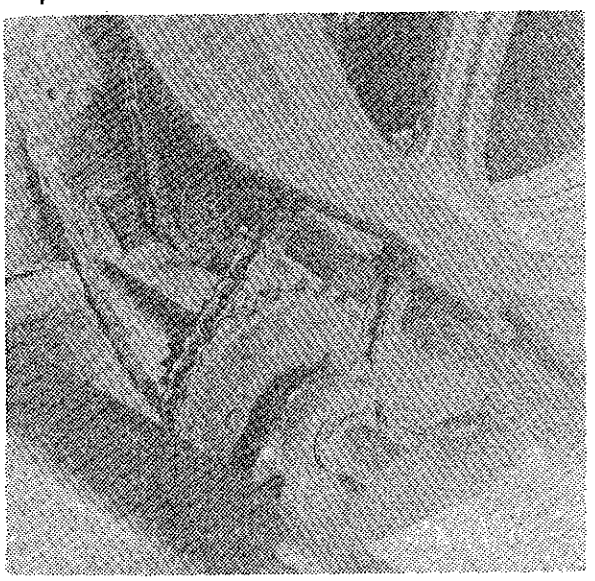


FIGURE 69 - FRONT SHEAR SPROCKETS
(Shields removed for clarity)

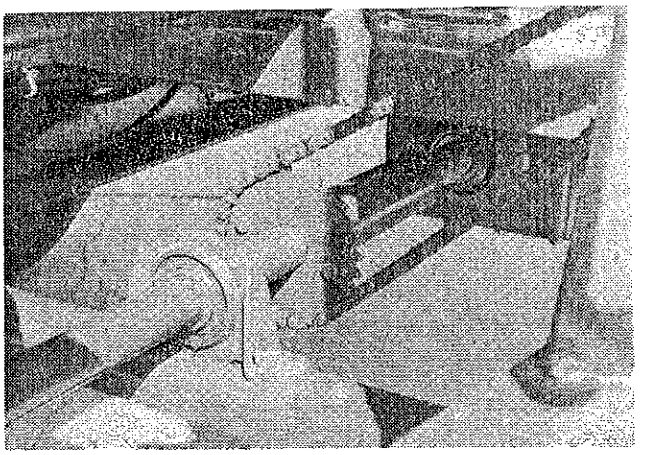


FIGURE 70 - SUPPLEMENT HOPPER DRIVE SHEAR SPROCKETS
(Shield removed for clarity)

SPROCKET AND CHAIN ALIGNMENT

Be sure the sprockets are in line of the shafts. If the sprockets are not aligned, a side pull develops which concentrates the load on the sides of the sprocket teeth and on the side of the chain. This faulty alignment results in excessive wear on both chain and sprockets.

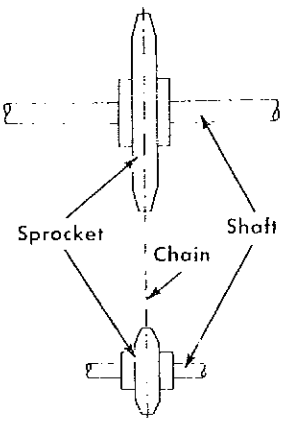


FIGURE 71 - SPROCKET ALIGNMENT

REPLACEMENT OF DAMAGED HAMMERS

Hammers must be replaced in pairs to maintain balance. This is done by replacing the hammers opposite each other (180 degrees apart) with a matched pair.

REVERSING THE HAMMERS

CAUTION: Be sure hammermill has stopped rotating before opening hammermill door. Shut off tractor engine and place key in your pocket.

There are four rows of hammers in the rotor assembly with a total of 36 hammers. The hammers are reversible, but always replace hammers in the exact sequence that they are removed to preserve the balance of these specially matched units. All four corners can be used on each hammer.

To remove the hammers, remove the two bolts from the side of the mill and round plate (see figure 72). Remove the pins from each end of the rod and pull rods out, making sure that the hammers are put back in the same place from which they were removed (see figures 73,74).

DO NOT pull more than one rod at a time to avoid mix-up. Serious vibrations will occur if hammers are replaced in wrong positions. See figure 74 for proper hammer spacing on each of the four shafts.

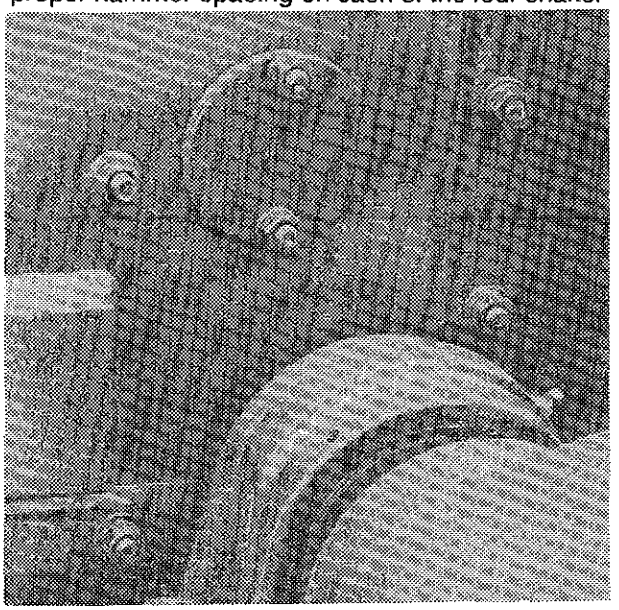


FIGURE 72 - HAMMER REMOVAL

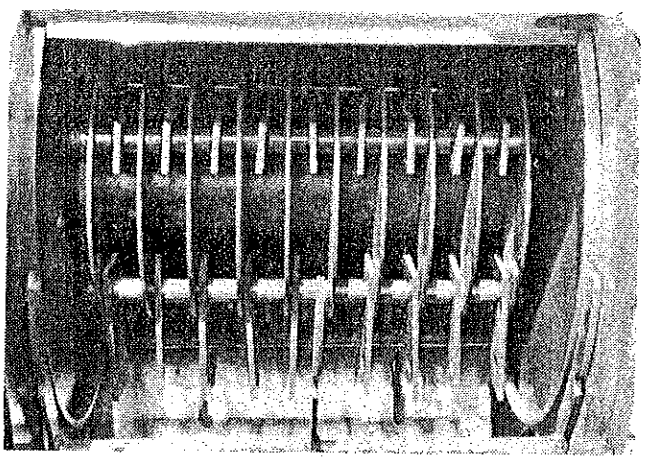


FIGURE 73 - HAMMER REMOVAL

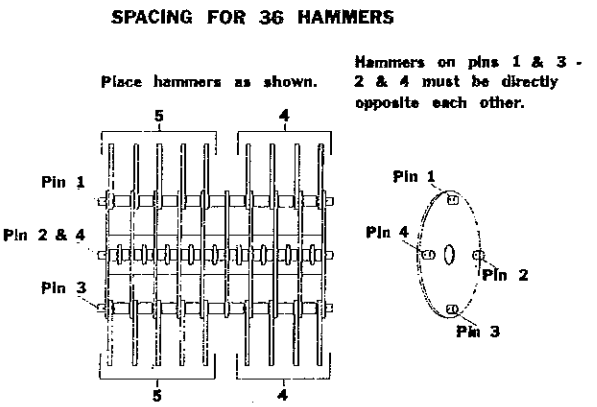


FIGURE 74 - PROPER HAMMER SPACING

MAIN DRIVE BELT REPLACEMENT

To remove the drive belts, loosen bolts at location B & C, (see figure 75) . Relieve the belt tension by loosening bolts at locations A.

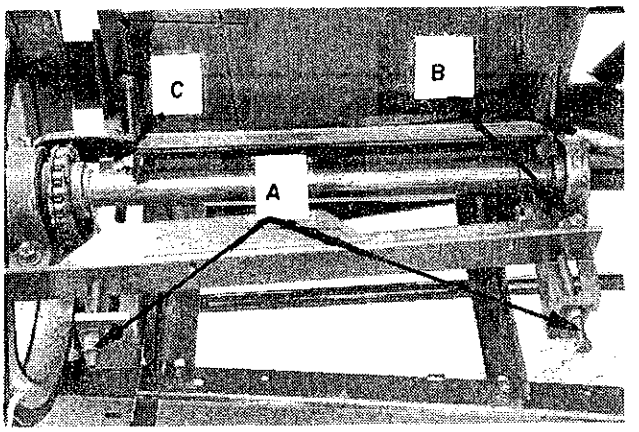


FIGURE 75 - BELT REMOVAL

After the tension is off the belts, remove belts and replace with the new set and proceed as described in adjustments section. Be sure to align.

STORAGE

If the Grinder-Mixer is to be stored for any length of time, the following points should be followed:

1. Lubricate well all points covered on pages 28 - 31.
2. Place a coat of light oil on the inside of the tank cone to prevent rusting.
3. If possible, store inside in a dry place, if not, cover opening in hammermill throat.
4. Block up frame to allow tires to rotate.
5. Do not store near livestock, especially when equipped with the optional electronic scale.

ATTACHMENTS

SCREENS

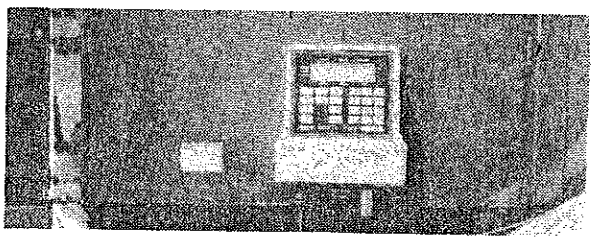
Screens are available in 12 sizes ranging from 1/8" to 2".

ROLL FEED

The roll feed provides easier feeding of exceptionally coarse material such as ear corn, corncobs or hay. Additional protection is provided for the operator and more even feeding is possible.

ELECTRONIC SCALE ATTACHMENT

A solid-state electronic scale attachment, digital type is available for your Grinder-Mixer. The scale attachment consists of weighbar sensors mounted on the Grinder-Mixer wheel spindles and hitch. They are electronically connected to the indicator box. The indicator has a variety of capabilities. A visible or audible alarm system is available with the electronic scale attachment. Scale accuracies of one percent or less are obtained. Complete installation and operating instructions are included with the attachment.



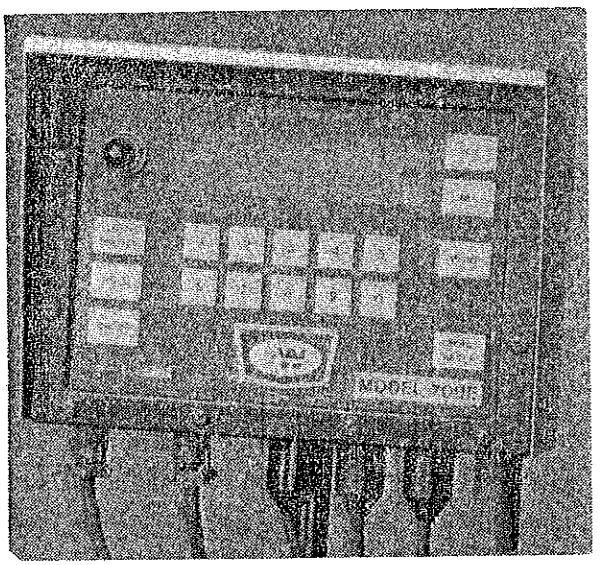


FIGURE 76 - ELECTRONIC SCALE

HYDRAULIC BACK AUGER

Hydraulic motors can be attached to the lift and swing functions of the unloading auger system. This allows the operator to control the position of the unloading auger from the tractor hydraulic valves.

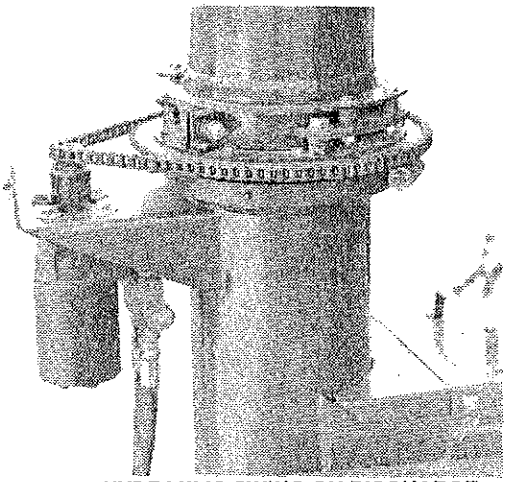


FIGURE 77 - HYDRAULIC SWING ON DISCHARGE (Shield removed for clarity)

TUBE SACKER ATTACHMENT

The double discharge tube sacker replaces the standard discharge hood for easy sacking of feed. The lever on the end of the housing permits diverting the flow of feed for continuous filling of bags (see figure 78).

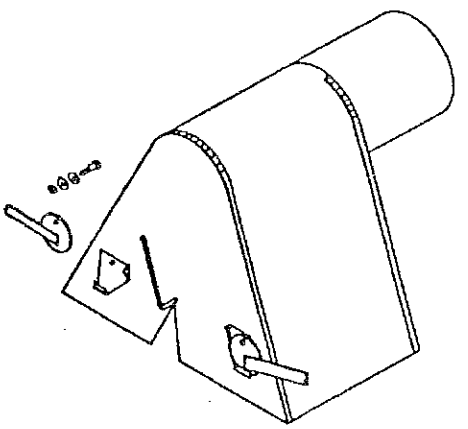


FIGURE 78 - TUBE SACKER ATTACHMENT

DISCHARGE UNLOADING AUGER EXTENSIONS

3-foot and 6-foot folding discharge auger extensions are available. See chart on page 17 for unloading height obtainable with various extensions added to the unloading auger system.

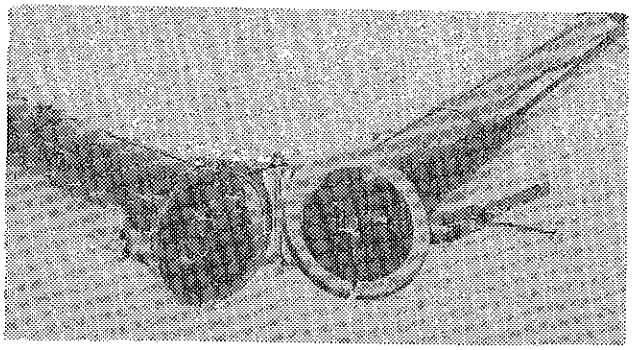


FIGURE 79 - FOLDING DISCHARGE EXTENSION

TROUBLE SHOOTING

Most difficulties are caused by improper adjustments. When you encounter trouble, make a systematic check for all adjustments, using the following chart as a guide. If the difficulties cannot be corrected by making the adjustments given in this manual, consult your dealer.

PROBLEM	POSSIBLE CAUSE	REMEDY
PTO Shaft hard to telescope and hook-up.	Shafts twisted due to overloading of mill.	Replace powershaft, if necessary. Load as uniformly as possible and adjust belts to prevent slipping. 1000 rpm recommended over 100 hp.
	Lack of grease on sliding halves.	Lubricate
Mill vibrates excessively while operating.	PTO shaft not aligned.	Front of Grinder-Mixer mainshield must be parallel to tractor axle.
	PTO Shaft bent.	Replace PTO shaft.
	Missing or broken hammers.	Replace hammers (in pairs).
	Tractor drawbar improperly adjusted.	Adjust tractor drawbar as shown on page 10.
Excessive noise when turning with mixer in operation.	Turning too sharply.	Avoid sharp turns.
Low volume from hammermill.	Mill not operating at optimum speed.	Before grinding, set tractor throttle to obtain rated PTO speed (540 or 1000 rpm).
	Screen may be worn.	Turn screen around or replace if necessary.
	Hammers worn. Mill not level.	Reverse or replace. Operate mill as near level as possible.
	Mill drive belts slipping.	Adjust drive belts.
Tractor engine rpm falls below rated PTO speed while grinding.	Overfeeding.	Reduce flow of material to mill.
	Screen size too small	Increase screen size.
	Feed gate too high.	Lower gate.
Drive belt squeals when mill is engaged.	Drive belts too loose.	Tighten belts.
Drive belts wear excessively.	Belts out of alignment. Belts slipping.	Align pulleys. Adjust belts.
Material bridges in tank.	High-moisture content ear corn or hay being ground.	Grind high-moisture ear corn last or run straight thru tank. Use smaller screen or add more grain with hay.

TROUBLE SHOOTING

PROBLEM	POSSIBLE CAUSE	REMEDY
Feed roll will not draw hay slice into mill.	Feed roll too low.	Raise feed roll. Adjust hay retard bolt.
Mill runs but unloading auger and mixing auger do not run.	Pin(s) sheared in drive.	Correct cause of sheared pin and replace.
Unloading auger runs but feed is not unloaded.	Mixer tank door closed.	Open door.
Unloading auger does not disengage.	Unloading auger clutch linkage out of adjustment.	Adjust clutch linkage.
	Clutch sticking	Lubricate rear clutch half.
Auger feeder stops when mill is engaged.	Clutch disengaged.	Engage clutch.
	Hydraulic flow control valve disengaged.	Engage flow control valve.
	Selector valve position	Change position of selector valve (out for auger feeder).

NOTES