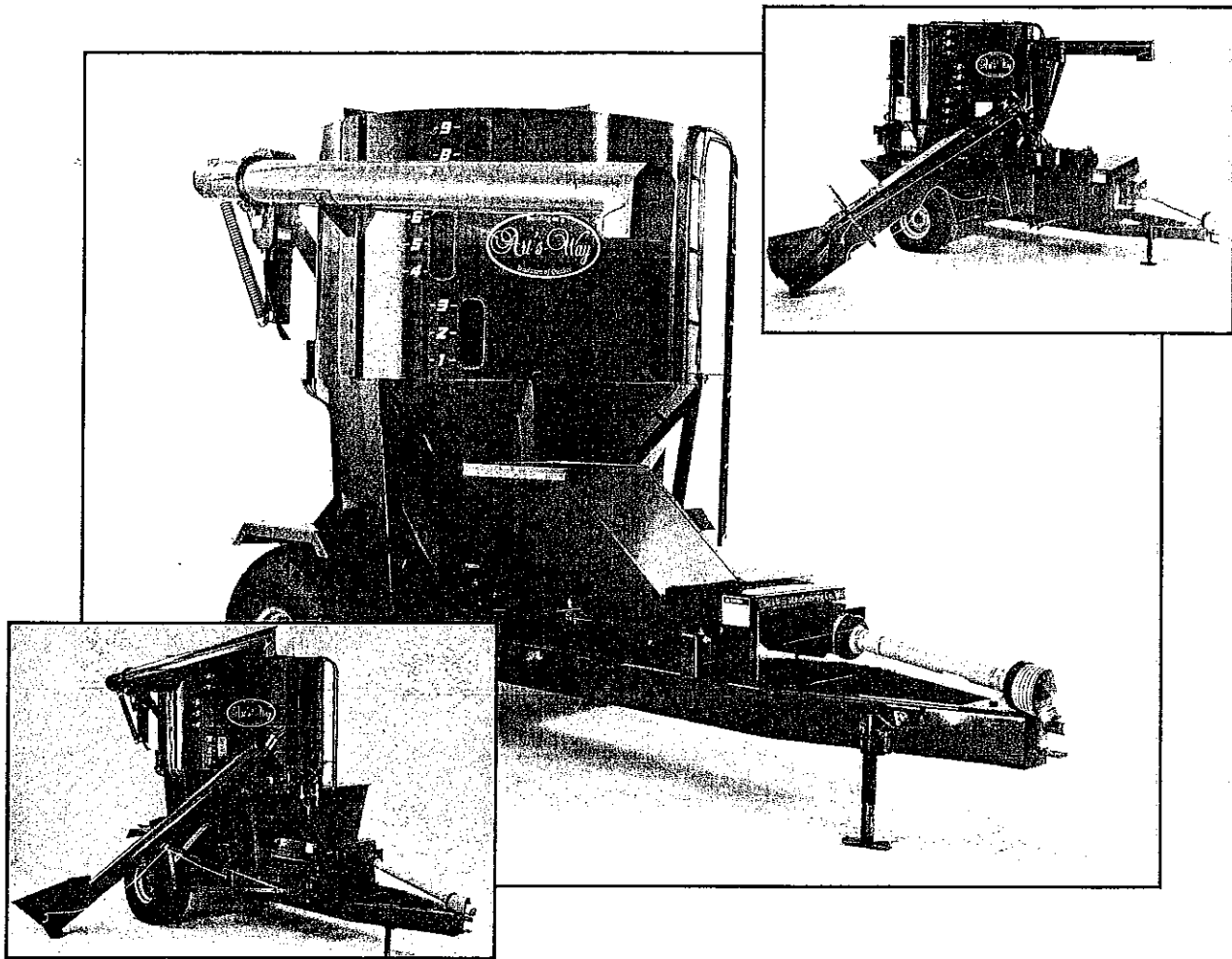


PM20 & PM30 Mixer-Processor

OPERATORS MANUAL



388980
0994

TO THE OWNER

Congratulations on the purchase of your new Art's-Way Portable Mixer-Processor. You have selected a top quality machine designed and built with pride to give you many years of efficient, reliable service.

Many people have worked on the design, production, and delivery of this machine. The information in this manual is based on the knowledge, study and experience of these people through years of manufacturing specialized farming machinery. This manual is designed to provide you with important information regarding safety, maintenance and machine operation so you can get the best possible performance from your Mixer-Processor.

Even if you are an experienced operator of this or similar equipment, we ask you to **read this manual before operating this machine.** The way you operate, adjust, and maintain this unit will have much to do with its successful performance. Any further questions you may have about this piece of Art's-Way equipment should be directed to your local Art's-Way dealer.

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE

Art's-Way Manufacturing Co., Inc. is continually making product improvements. In doing so, we reserve the right to make changes or add improvements to our products without obligation for equipment previously sold. Because modifications to this machine may effect the performance, function and safety of its operation, **no modifications are to be made without the written permission of Art's-Way Manufacturing Co., Inc.**

In the interest of continued safe operation of the machine, pay particular attention to the safety alert symbol throughout this manual and on your machine.

ART'S-WAY MANUFACTURING CO., INC. STATEMENT OF PRODUCT LIABILITY

Art's-Way Manufacturing Co., Inc. recognizes its responsibility to provide its customers with a safe and efficient product. Art's-Way makes every attempt to design and manufacture its products in accordance with all accepted engineering practices in effect at date of design. This statement should not be interpreted to mean that our products will protect against the user's own carelessness or failure to follow common safety practices as set forth in this manual, nor will Art's-Way be liable for any such act.

NOTICE TO THE CUSTOMER

The warranty for this machine appears on page 1 of this manual. **The warranty registration form inserted in this manual must be completed and returned to the factory in order to establish proper warranty. Failure to comply will result in reduced warranty allowances.**

This manual contains operating instructions for this machine only. It does not replace the manual(s) for any machine that it may be attached to or used with.

PARTS AND SERVICE

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

- A. ORIGINAL QUALITY
- B. AVAILABILITY OF SERVICE PARTS
- C. AVAILABILITY OF ADEQUATE SERVICE FACILITIES

Art's-Way Manufacturing Co., Inc. has an excellent dealership network ready to answer any questions you may have about your portable Mixer-Processor. Parts for your machine may be ordered through our dealers. When placing a parts order, please have the model and serial number ready. This will allow the dealer to fill your order as quickly as possible.

For your convenience, we have provided this space for you to record your model and serial numbers and date of purchase, as well as your dealership name and address.

Owner's Name _____

Owner's Address _____

Purchase Date _____

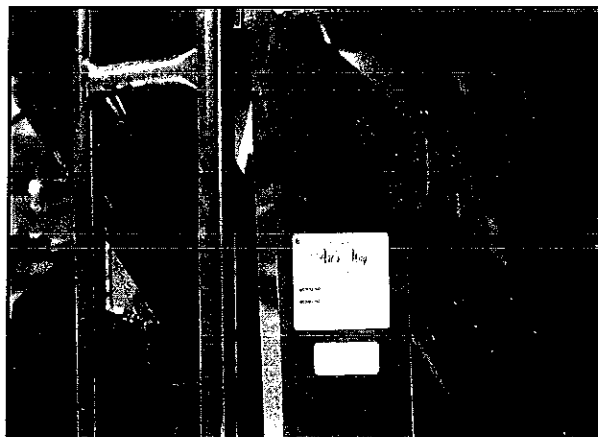
Dealer's Name _____

Dealer's Address _____

Dealer's Phone No. _____

<div>Building on a <i>Art's-Way</i> Tradition of Quality</div>	
SERIAL NO.	<input type="text"/>
MODEL NO.	<input type="text"/>
Manufactured By Art's-Way Manufacturing Co., Inc. Armstrong, IA	

ENTER SERIAL NUMBER & MODEL
NUMBER IN SPACE PROVIDED.



MACHINE SERIAL NUMBER LOCATION
(BEHIND LADDER LEFT HAND SIDE)

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LIMITED WARRANTY

Art's-Way Manufacturing Co., Inc. warrants products it sells 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:

- **Art's-Way Manufacturing Co., Inc.** 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.
- 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.**
- **Art's-Way Manufacturing Co., Inc.** 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.
- Transportation or shipping to an authorized dealer for necessary repairs is at the expense of the purchaser.
- **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.** 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 the warranty.
- 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.
- 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.
- 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.

SAFETY FIRST

“A careful operator is the best insurance against an accident.”

(National Safety Council)

Most accidents can be prevented if the operator fully understands how the machine functions and can anticipate situations which may produce problems and make necessary corrections before problems develop.

It is important that *all* individuals who will be operating the mixer-processor read this Manual carefully, paying special attention to the safety instructions which are marked by this symbol:



The American Society of Agricultural Engineers has adopted this symbol as an universal **SAFETY ALERT SYMBOL** to identify areas of potential danger if the equipment is not operated correctly. *Please be alert whenever you see this symbol in the Manual or on your machine.*

Art's-Way Manufacturing Co., Inc. strives to make our equipment as safe as it can possibly be. The Mixer-Processor conforms to all applicable safety standards at time of design. A safety conscious equipment operator makes an effective accident-prevention program complete.

Safety features and instructions for the Art's-Way Mixer-Processor are detailed elsewhere in the Operators Manual. It is the responsibility of the Mixer-Processor owner to ensure that *all* operators read and understand the Manual before they are allowed to operate the machine. (*Occupational Safety and Health Administration (OSHA) regulation 1928.57*)

***Watch for these words on machine decals and in this Manual
to alert you to important safety messages:***

- DANGER:** Immediate and specific hazard which **will** result in severe personal injury or death if proper precautions are not taken.
- WARNING:** Specific hazard or unsafe practice **could** result in severe personal injury or death if proper precautions are not taken.
- CAUTION:** A reminder of good safety practices. Personal injury **could** result if proper procedures are not followed.



SAFETY GUIDELINES



Remember, A Careful Operator is the Best Insurance Against an Accident.



Read and Understand the Operators Manual and all the safety decals before operating the machine. Review safety instructions with all operators.

Misuse or modification of this machine can cause:

- Mechanical Breakdown,
- Property Damage,
- Injury or Death.

BEFORE OPERATING

Do not wear loose fitting clothing as it may catch in moving parts.

Make sure to install and/or secure all guards and shields, including the tractor power take-off master shield, before starting or operating the machine.

Be sure that the correct implement drive line parts are used and that they are properly secured.

After servicing, be sure that all tools, parts or servicing equipment are removed from the machine.

Make sure that there is no one near the machine before starting/operating it.

Be sure the tractor power take-off is disengaged before starting the tractor engine.

DURING OPERATION

Shut off the tractor engine, put key in pocket, and be sure to wait until all rotation has come to a complete stop before opening any covers, adjusting, cleaning, or lubricating.

Do not attempt to remove any obstructions from the auger or belts while the machine is running.

Do not open any covers and expose the rotor or belts while they are rotating.

Keep hands, feet, hair and clothing away from moving parts.

Keep all shields and guards in place.

Keep all children and bystanders away from the machine while in operation.

Always disengage the auger feeder before transporting.

Shut off the tractor engine and wait for all moving parts to stop before making any adjustments.

Be careful when ascending or descending the ladder. Wet shoes or boots are slippery.

Keep all hydraulic lines, fittings and couplers tight and free of leaks. (see "Hydraulic Safety" section of this Manual).

Check for clearances of overhead electrical wires for discharge operation.

MAINTENANCE SAFETY

Follow all operating, maintenance and safety instructions found in this Manual.

Before servicing, adjusting, repairing or unplugging the machine, stop the tractor engine, place all controls in neutral, set parking brake, remove ignition key and wait for all moving parts to stop.

Use only tools, jacks and hoists that are of sufficient capacity for the job.

Use support blocks or safety stands when changing tires or working under the machine.

Follow good shop practices of keeping service area clean and dry and using adequate light for the job at hand.

Before applying pressure to the hydraulic system, make sure all lines, fittings and couplers are tight and in good condition.

Relieve pressure from hydraulic circuit before servicing or disconnecting from tractor.

Make sure all shields/guards are in place and properly secured when maintenance work is complete.

HYDRAULIC SAFETY

Make sure all components in the hydraulic system are kept clean and in good condition.

Replace any worn, cut, abraded, flattened or crimped hoses.

SAFETY GUIDELINES

Do not make any temporary repairs to the hydraulic lines, fittings or hoses by using tape, clamps or cements. The hydraulic system operates under extremely high pressure and temporary repairs may fail suddenly and create a hazardous situation.

Wear proper hand and eye protection when searching for a high-pressure hydraulic leak. Use a piece of wood or cardboard as a backstop instead of hands to identify and isolate a leak. If injured by a concentrated high-pressure stream of hydraulic fluid, seek medical attention immediately. Serious infection or toxic reaction can develop if hydraulic fluid penetrates the surface of the skin.

Before applying pressure to the system, make sure all components are tight and that lines, hoses and couplings are not damaged.

TRANSPORTATION SAFETY

Be sure to comply with all local regulations regarding transporting equipment on public roads and highways.

Make sure the SLOW MOVING VEHICLE (SMV) emblem and all lights and reflectors required by local highway and transportation authorities are in place, clean and clearly visible to all oncoming or following traffic.

Do not allow riders while transporting.

Make sure Mixer-Processor is securely attached to the tractor and install a safety chain to the Mixer-Processor.

Do not exceed 20 mph when transporting the Mixer-Processor, reduce speed to a maximum of 10 mph on rough roads and surfaces or when going down inclines.

Check for clearances of overhead electrical wires.



CAUTION: Always transport a loaded mixer at slow speed (10 mph or less).

Drive slowly when turning and always use turn signals on the tractor if applicable to indicate your turning intentions to other traffic.

The weight of the trailing machine should **NEVER** exceed the weight of the towing vehicle.

Check clearances carefully wherever machine is towed.

TIRE SAFETY

Have a qualified tire dealer or repair service perform tire repairs.

Do not attempt to mount a tire unless you have the proper equipment and experience to do the job.

Follow proper procedures when mounting a tire on a rim to prevent an explosion which could result in serious injury.

Do not substitute tires of lesser road rating and capacity for the original equipment tires.

ASSEMBLY SAFETY

Use adequate manpower to perform assembly procedures safely.

Use only forklifts, lift cranes, jacks and tools with sufficient capacity for the loads.

Do not allow spectators in the working area.

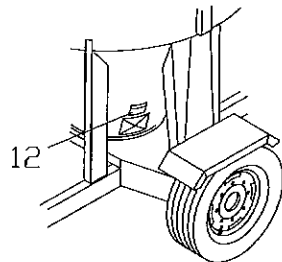
Remember: *"The Best Operator is a Safe Operator"*

SAFETY DECALS

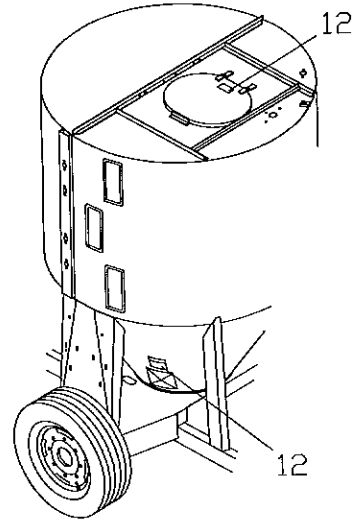
The different types of safety decals for your Mixer-Processor are illustrated on the following pages. Please familiarize yourself with the appearance of each decal, the warning it describes, and the area where it is located on the machine. Refer to the diagrams below and on page 6 for decal locations. The six digit number after the description on pages 6 and 7, is the part number of that decal.

Safety awareness is the responsibility of each operator of the Mixer-Processor. Keep safety decals and signs clean and legible and be sure that replacement parts display current safety decals and signs too. **Remember:** Always replace missing, damaged or illegible safety decals. New decals and signs are available from your Art's-Way dealer.

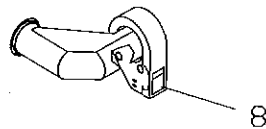
105 BU. AND 150 BU. SAFETY DECAL LOCATIONS



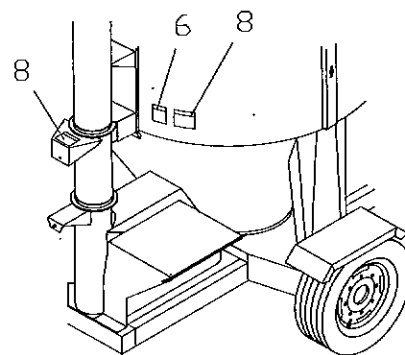
Left Front



Right Front



Left Rear (Discharge Auger)



Right Rear

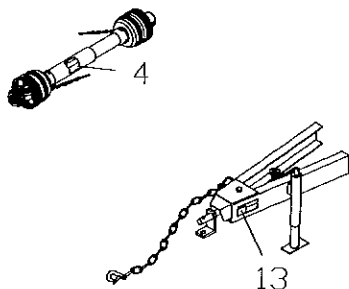
Item	Qty.	Drawing No.	Description
1	1	363000	Decal, Danger Rotating Mech.
2	4	384030	Decal, Danger 540 rpm PTO
3	1	384020	Decal, Danger 1000 rpm PTO
4	1	268860	Decal, Danger Rotating Drive Line
5	1	383990	Decal, Danger Prevent Injury
6	1	384000	Decal, Check for Clearance
7	1	368350	Decal, Warning Prevent Injury

Item	Qty.	Drawing No.	Description
8	2	384010	Decal, Warning Moving Parts
9	1	P99897	Decal, Warning Keep Hands Out
10	1	383980	Decal, Caution Keep Shields
11	1	368040	Decal, Caution 9 Safety Instr.
12	4	377280	Decal, Caution Do Not Open
13	1	383970	Decal, Caution Hitch Instructions

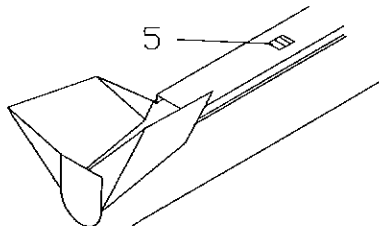
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SAFETY DECALS

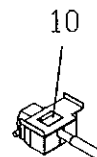
PTO & HITCH SAFETY DECAL LOCATIONS



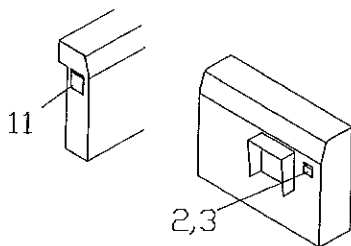
AUGER FEEDER SAFETY DECAL LOCATIONS



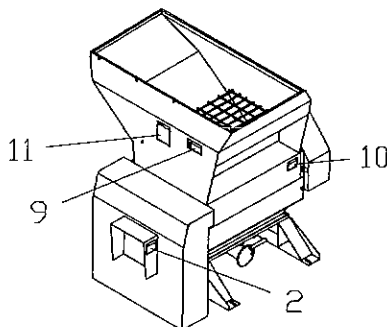
SELF-CONTAINED HYDRAULICS SAFETY DECAL LOCATIONS (HAMMERMILL VERSION SHOWN)



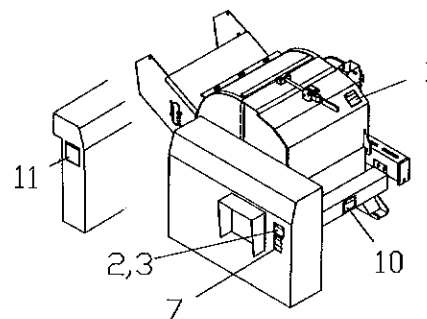
HOPPER ONLY SAFETY DECAL LOCATIONS



ROLLERMILL SAFETY DECAL LOCATIONS



HAMMERMILL SAFETY DECAL LOCATIONS

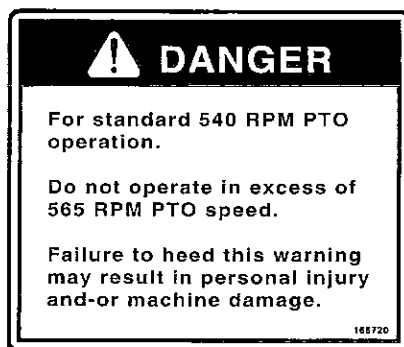


Item	Qty.	Drawing No.	Description
1	1	363000	Decal, Danger Rotating Mech.
2	4	384030	Decal, Danger 540 rpm PTO
3	1	384020	Decal, Danger 1000 rpm PTO
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5	1	383990	Decal, Danger Prevent Injury
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7	1	368350	Decal, Warning Prevent Injury

Item	Qty.	Drawing No.	Description
8	2	384010	Decal, Warning Moving Parts
9	1	P99897	Decal, Warning Keep Hands Out
10	1	383980	Decal, Caution Keep Shields
11	1	368040	Decal, Caution 9 Safety Instr.
12	4	377280	Decal, Caution Do Not Open
13	1	383970	Decal, Caution Hitch Instructions



No. 1 - "DANGER" - Rotating mechanism runs after power is shut off. Part No. 363000.



No. 2 - "DANGER" - For standard 540 rpm PTO operation. Part No. 384030.



No. 3 - "DANGER" - For standard 1000 rpm PTO operation. Part No. 384020.

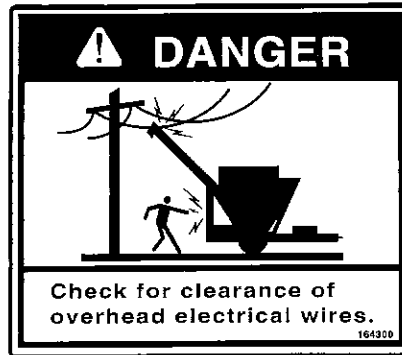
SAFETY DECALS



No. 4 - "DANGER" - Rotating drive line (located on PTO). Part No. 268860.



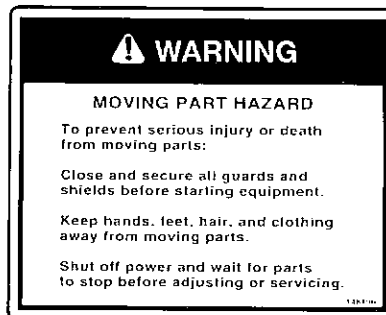
No. 5 - "DANGER" - To prevent personal injury. Part No. 383990.



No. 6 - "DANGER" - Check for clearance of overhead electrical wires. Part No. 384000.



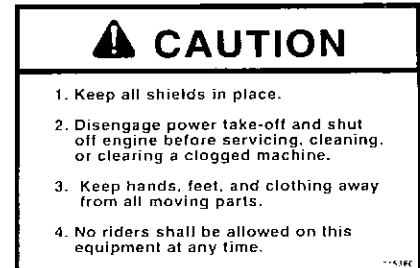
No. 7 - "WARNING" - To prevent serious injury or death. Part No. 368350.



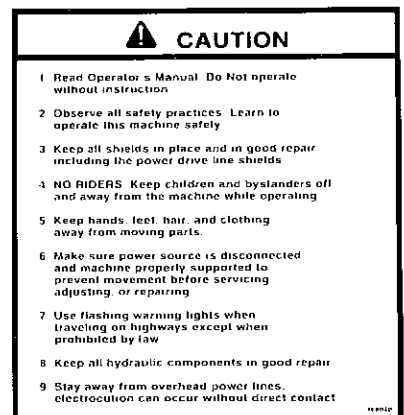
No. 8 - "WARNING" - Moving Part Hazard. Part No. 384010.



No. 9 - "WARNING" - Keep hands out of rolls. Part No. P99897.



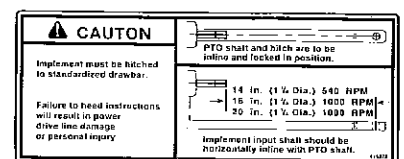
No. 10 - "CAUTION" - Keep all shields in place. Part No. 383980.



No. 11 - "CAUTION" - 9 safety instructions. Part No. 368040.



No. 12 - "CAUTION" - Do not open cover until power is disconnected Part No. 377280.



No. 13 - "CAUTION" - Hitch instructions. Part No. 383970.

INTRODUCTION: MIXER-PROCESSOR

This manual has been prepared to acquaint you with the proper operation, adjustment, lubrication and service of the Mixer-Processor. Take the 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.

Some pictorials used show guards and shields removed for easy identification. Be sure that all shields and guards are in place before operating. These are for your protection.

The Art's-Way Portable Mixer-Processor is PTO driven by 40 hp to 150 hp tractors and is factory available with either a 540 or 1000 rpm PTO drive.

If supplement is to be added to the ration, a hopper with a sack cutter is located at the right rear of the mixing tank. Best mixing will result if supplement is added before grinding.

The ground feed is mixed continuously until the tractor PTO is disengaged.

The unloading auger pivots at the rear center of the mixing tank and can swing 324° 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 tank for transport. Unloading rates up to 28 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 the front left corner of the mixing tank to obtain access to the spring-loaded mixing tank.



CAUTION: Do NOT open spring loaded mixing tank lid while PTO is engaged and tractor is running.

Art's-Way makes it easy to suit the needs of any operation with their modular design which includes the following variety of processors:

1. Hopper if no processing of materials is needed.
2. HammerMills in two sizes 20" or 26".
3. RollerMills in several varieties including: 20", 30", 20" Two High or 20" Ear Corn.

A number of optional attachments are available:

1. 540 or 1000 rpm PTO.

2. Auger feeder, hydraulic
3. Electronic scale with digital readout. Micro-processor model is also available.
4. Horn, light or horn and light for electronic scale.
5. Battery box kit without battery for scale.
6. Unloading auger extensions; 3 foot to 6 foot folding or bolt-ons.
7. Hydraulic roll feed in mill throat of HammerMills.
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. Self-contained hydraulic system.

Many convenient feature are standard equipment on the Art's-Way Mixer-Processors including:

105 bu.

1. 10.0 x 15 tires.
2. Magnet in HammerMill throat and RollerMill Hopper .
3. Lift assist, brake, and mechanical swivel for easy positioning of unloading auger with manual crank.
4. Grain inspection trough below RollerMills.
5. Positioner to enable the hopper on the auger feeder to be moved in or out 6 inches to properly position on HammerMills.
6. Fenders.
7. Screen rack.
8. Tongue jack.
9. Discharge auger hood with spring loaded relief baffle.

150 bu.

1. 13.5 x 16.1 tires.
2. Magnet in HammerMill throat and RollerMill hopper.
3. Lift assist, brake, and mechanical swivel for easy positioning of unloading auger with manual crank.
4. Grain inspection trough below RollerMills.
5. Positioner to enable the hopper on the auger feeder to be moved in ore out 6 inches to properly position on HammerMills.
6. Fenders.
7. Screen rack.
8. Tongue jack.
9. Discharge auger hood with spring loaded relief baffle.

PREPARING 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 a HammerMill (see page 25). If equipped with mechanical lift and swing, the crank for the unloading auger is in the bag, place it in the hanger near the crank position for lift and swing. Install the IID storage bracket under front hitch with 1/2" x 1-1/2" bolt and lock nut (see Figure 3, page 11). Maintain tension with locknut to allow movement with 15 lbs. pull.

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 IID by fastening to the following specifications with the 5/16" x 3-1/2" clevis pin and cotter pin provided:

- A. 105 bu. or 150 bu. Mixer only fasten the PTO to the input shaft.
- B. 105 bu. or 150 bu. with a HammerMill fasten the PTO to the input jack shaft.
- C. 105 bu. or 150 bu. with a 20" RollerMill fasten the PTO to the RollerMill shaft.
- D. 105 bu. or 150 bu. with a 30" RollerMill fasten the PTO to the input shaft.

Spread cotter pin, *Make sure the proper IID is used.*



Caution: Never operate 540 rpm Mixer-Processor with a 1000 rpm tractor.

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 36, page 21).

NOTE: Height of the unloading auger tube needs to be checked. Move the saddle to 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 17 - 18 and 44 - 45) for special instructions.

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

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

13.5 x 16.1 8-PR tires - 28psi.

SHIELDS

Make sure that all shields are in place and functioning.

BOLTS AND NUTS

Before starting to operate the Mixer-Processor, check all nuts and bolts for tightness. Also check that all cotter pins are spread. After operating the Mixer-Processor for several hours, check all the bolts for proper torque. See Torque Guide on page 50.

Cap screws, except for shear bolts, used in the Mixer-Processor 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 (see SAE Bolt Identification Chart page 50).

IMPORTANT: Shear bolts must be replaced with bolts of same grade.

Lubricate Mixer-Processor at regular intervals as instructed in lubrication sections. For lubrication see the following pages:

Lubrication: Mixers.....	page 20
Lubrication: HammerMills.....	page 30
Lubrication: RollerMills.....	page 34
Lubrication: Hopper Only	page 36
Lubrication: Self Contained	page 42



Caution: Never operate 540 rpm Mixer-Processor with a 1000 rpm tractor PTO.

PREPARING THE TRACTOR

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

TRACTOR HITCH

The hitch for the Mixer-Processor is designed to attach to any SAE-ASAE standardized tractor drawbar. Adjust the drawbar so that it is 13 to 17 inches above

PREPARING MIXER FOR FIELD OPERATION

the ground (see Figure 1). 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. 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 IID.

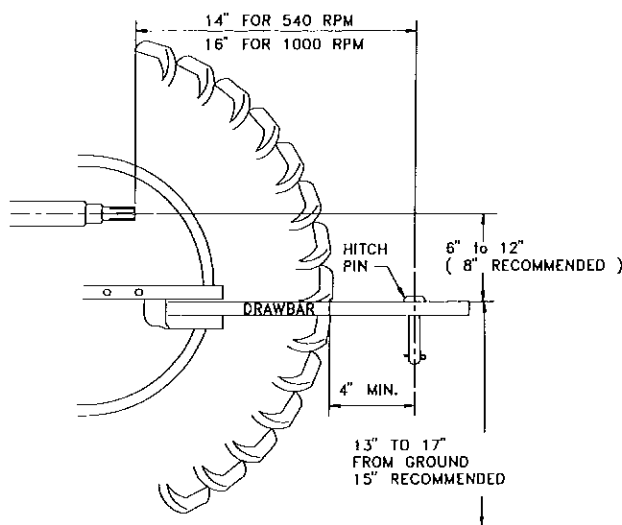


FIGURE 1: HITCH POINT LOCATIONS.

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 Mixer-Processor hitch into position to engage the tractor drawbar. Fasten the Mixer-Processor hitch to the drawbar with a hitch pin that cannot bounce out. Raise the jack and lock into transport position (see Figure 2). Install safety chain (see page 6).



CAUTION: Always follow state and local regulations regarding a safety chain when towing farm equipment on public highways.

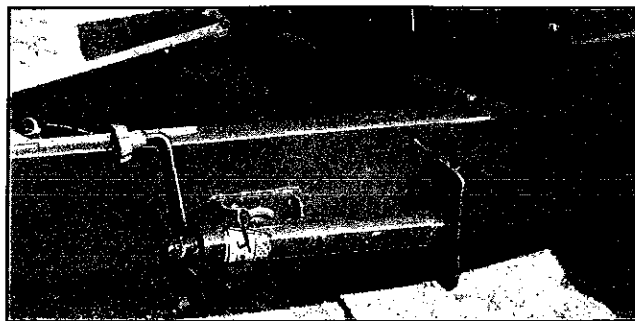


FIGURE 2: JACK IN TRANSPORT POSITION.

If the Mixer-Processor 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 weigh bar clevis.

If the Mixer-Processor 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 pages 18 and 19 for open and closed center instructions.

Connect the powershaft to the tractor power take-off shaft. The PTO operating speed of the tractor and Mixer-Processor must be the same. The tractor half of the IID is equipped with 6 splines for 540 rpm operation and 21 splines for 1000 rpm operation.

Be sure the Mixer-Processor is equipped with 1000 rpm drive when operating with a tractor equipped with 1000 rpm PTO drive. The diameter of the pulley on the Jackshaft must be 12-5/16" for 1000 rpm operation in a HammerMill application.



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

After connecting IID to tractor, check to be sure both shields are anchored with supplied chains.

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

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

PREPARING MIXER FOR FIELD OPERATION

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 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



CAUTION: Be sure the tractor engine is shut off and remove key from tractor and place in pocket.

Disconnect the powershaft and front shield anchor chain from the tractor and place it on the IID support bracket (see Figure 3). IID support should be tight enough to remain in position when rotated from storage against frame to use position.

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 jack stand to the ground. Turn the handle of the jack stand to raise the Mixer-Processor tongue off the tractor hitch. Remove the hitch pin and safety chain.

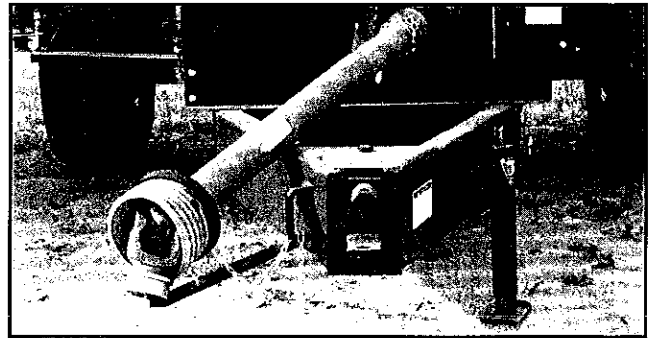


FIGURE 3 - IID SUPPORT

OPERATIONS & ADJUSTMENTS: MIXERS

TRACTOR PTO ENGAGEMENT

The mixer may be operated by engaging the PTO. 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. Reverse the engagement procedure to disengage.

ADDING CONCENTRATE OR SUPPLEMENT

Concentrate or supplement should be added to the ground feed through the supplement hopper located at the right rear corner of the Mixer-Processor. 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.

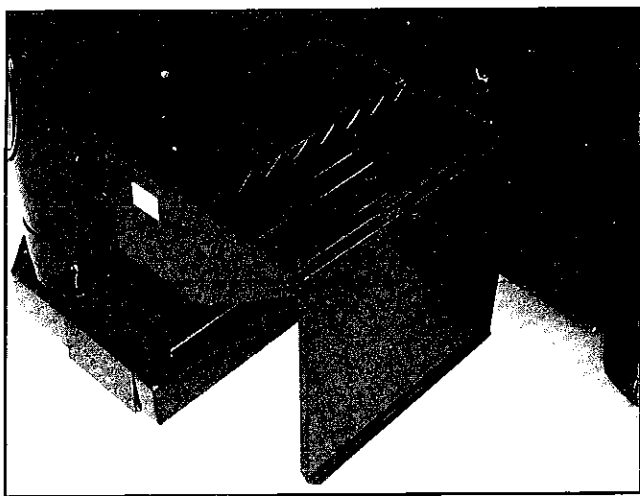


FIGURE 4 - SUPPLEMENT HOPPER LOCATED ON RIGHT HAND SIDE OF MACHINE.

For best results, add the concentrate or supplement prior to 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 the operation, supplement hopper lid should be closed when not in use. If strong additives are not

wanted in the next batch, clean out the tank cone and unloading augers through clean-out doors.

Located under the right side of frame and tank assembly is a hinged door on the bottom of the auger trough. Release two spring clamps and drop door. Keep away from opening. Run mixer slowly until trough and mixing tank are cleaned out. Keep all persons from under and around machine.



CAUTION: Make sure PTO is disengaged tractor is shut off and key is in your pocket before opening or closing clean-out door.

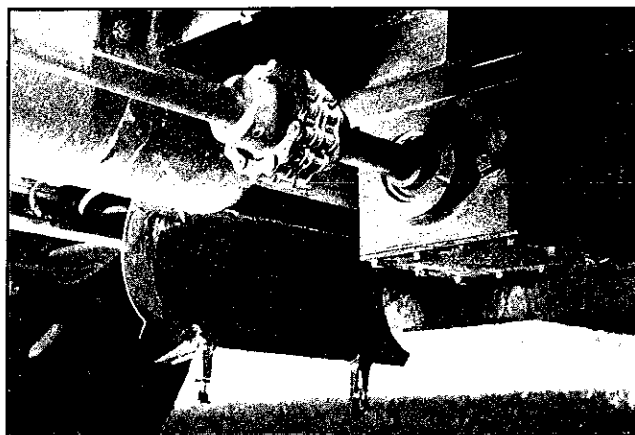


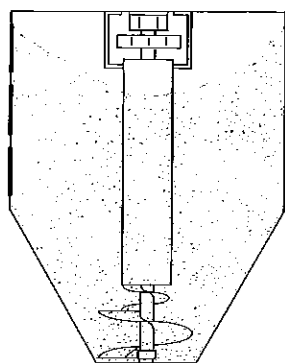
FIGURE 5 - CLEAN-OUT DOOR LOCATED UNDER RIGHT SIDE OF TANK ASSEMBLY.

FILLING MIXER TANK

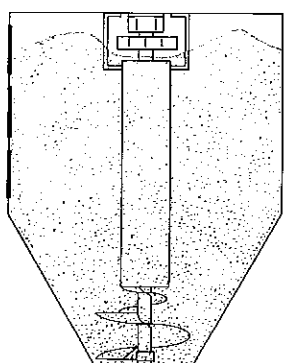
Be sure the mixing tank unloading door is closed. As the mixing tank is filling, watch the ground feed through the mixing tank windows. When the top window first becomes covered, the tank is not full since the mixing auger throws material away from the center of the tank. Continue loading until the top window clears (feed drops), then becomes covered again about half-way (see Figure 6, page 13). Stop feeding material into the processor at this point, but continue operating until the processor has had time to clear. Do not overload the mixer: overloading can cause damage to the machine. To estimate how many bushels are in the tank see Figure 7, page 13.

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

OPERATIONS & ADJUSTMENTS: MIXERS



Filling



Full

FIGURE 6 - FILLING PATTERNS

SPRING LOADED TANK LID



CAUTION: Disengage all drives and shut off tractor engine and place key in pocket before opening mixing tank lid.

If the tank is accidentally over filled, it is equipped with a spring loaded tank lid (see Figure 8). This lid also allows access to the inside of the mixing tank. Keep the lid latched down at all times.



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

105 BU. - APPROXIMATE CAPACITY CALIBRATION - IN POUNDS*

(Actual Weights Vary with Material, Moisture, Screen Size/Roll Size; ration weigh is not included and is highly variable.)

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.	Un-ground Shelled Corn 50 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	3654	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	2038	2061	1566	2038
1	756	1208	1880	1678	1276	1880

150 BU. - APPROXIMATE CAPACITY CALIBRATION - IN POUNDS*

(Actual Weights Vary with Material, Moisture, Screen Size/Roll Size; ration weigh is not included and is highly variable.)

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.	Un-ground Shelled Corn 50 lbs./bu.
Full	3427	5483	8529	7615	5787	8529
9	3254	5206	8098	7230	5495	8098
8	3002	4802	7470	6670	5069	7470
7	2747	4396	6838	6105	4640	6838
6	2468	3949	6143	5485	4169	6143
5	2228	3564	5544	4950	3762	5544
4	1987	3179	4945	4415	3355	4945
3	1685	2696	4194	3745	2846	4194
2	1444	2311	3595	3210	2440	3595
1	1204	1926	2996	2675	2033	2996

FIGURE 7 - TANK CAPACITY FOR 105 BU. AND 150 BU.

*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/Roll size. For best ration control use an electronic scale.

OPERATIONS & ADJUSTMENTS: MIXERS

After the processing is completed and the desired ration is in the mixing tank allow the mixer to operate until ready to unload. Run the mixer 2 to 3 minutes to insure a thorough mixing of feed and supplements.

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

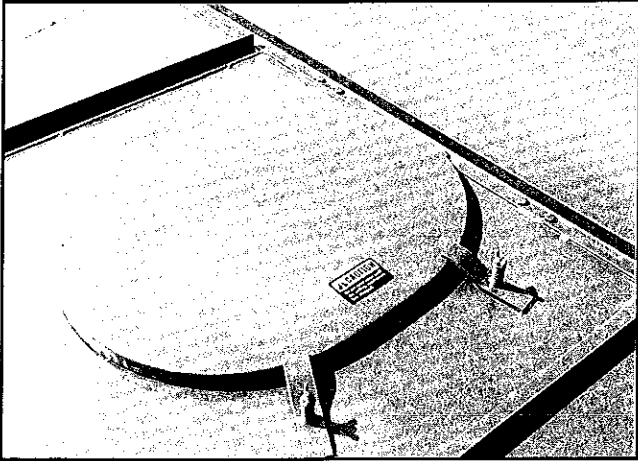


FIGURE 8 - SPRING LOADED TANK LID

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 9) 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.

Manual unloading auger swing crank adjustment for sprocket engagement:

Adjust by loosening the three bolts shown in Figure 10 and moving the assembly up to engage the teeth of the sprocket with the disk.

Manual unloading auger swing brake adjustment:

Tighten or loosen nut and bolt, to maintain tension to hold unloading auger (see Figure 11).

Manual Lift Adjustment

If the chain becomes loose, loosen bolts on the crank shaft and position chain to the proper tension (see Figure 12, page 15).



FIGURE 9 - MANUAL LIFT & SWING

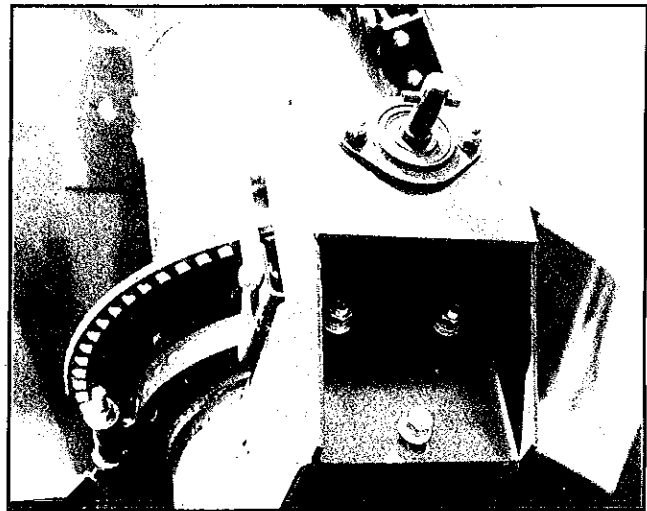


FIGURE 10 - MANUAL UNLOADING AUGER SWING CRANK ADJUSTMENT

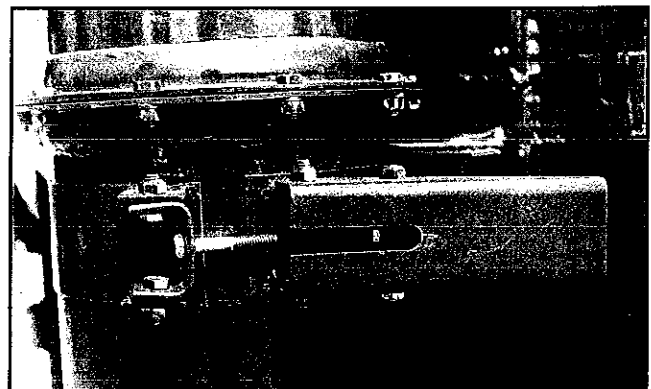


FIGURE 11 - MANUAL BRAKE ADJUSTMENT

OPERATIONS & ADJUSTMENTS: MIXERS

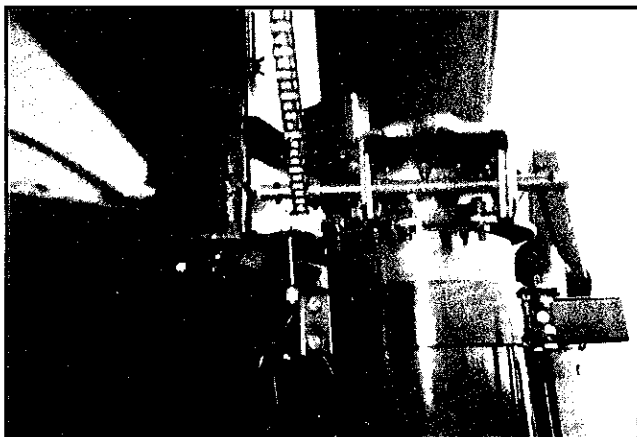


FIGURE 12 - MANUAL LIFT CHAIN ADJUSTMENT

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 13). Position the selector valve control "in" to direct oil to discharge swing function.

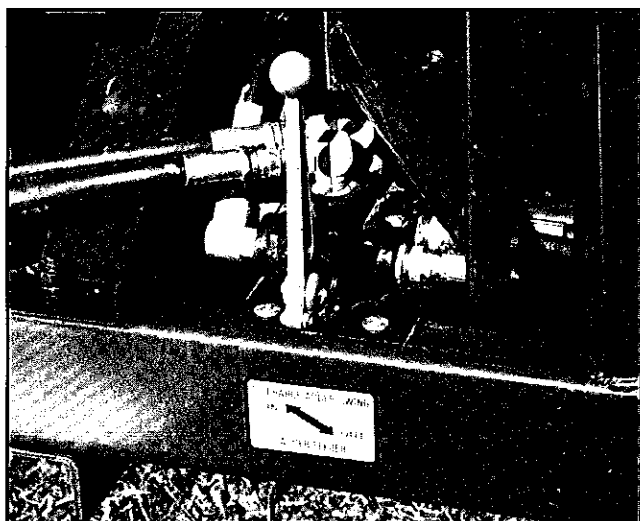


FIGURE 13 - HYDRAULIC SELECTOR VALVE

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.

Hydraulic Swing Adjustment:

If any problem is encountered with this drive, adjust and/or check as follows: (see Figure 14)

1. Loosen the four hydraulic motor bolts and remove the #40 chain.
2. Wrap #40 chain completely around 80 tooth split sprocket. Inspect the chain matching sprocket teeth in the two areas where the sprocket is split. If rollers on the chain do not seat into the root of the sprocket teeth, loosen 10 bolts holding sprocket to upper ring; holding the chain across split areas retighten bolts so the chain properly seats into sprocket teeth.
3. Retighten the hydraulic motor bolts, check alignment of sprocket. If out of line loosen set screws on the 8 tooth sprocket and realign.
4. Reinstall #40 chain and tension. *Reinstall shield.*
5. Adjust upper clamp by removing or adding washers between sections. This should slip if auger hits something solid. If it doesn't slip damage to discharge could occur.

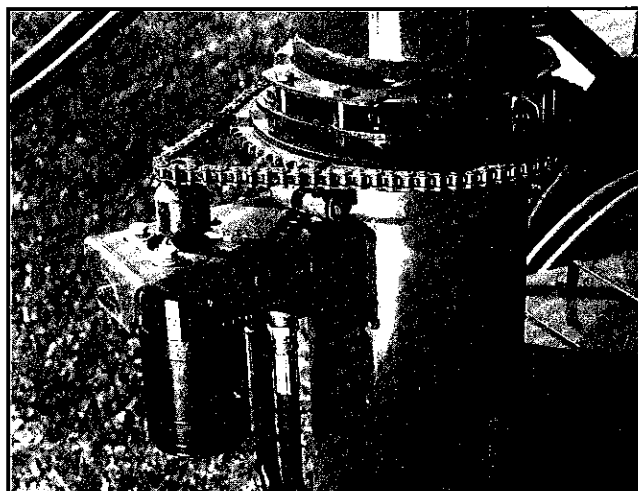


FIGURE 14 - HYDRAULIC SWING ADJUSTMENT
(Shield Removed for Clarity)

UNLOADING AUGER ENGAGEMENT

Operate tractor at a maximum of 2/3 throttle.

1. **UNLOADING CLUTCH DRIVE:** (see Figures 15 & 16, page 16) 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.

If unloading in more than one location, close discharge door and empty auger before moving machine.

OPERATIONS & ADJUSTMENTS: MIXERS

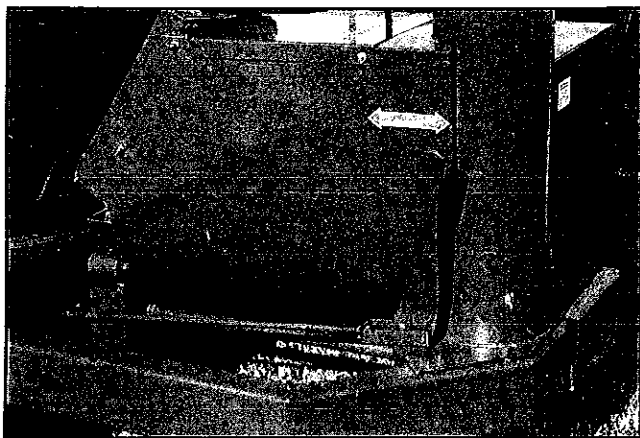


FIGURE 15 - UNLOADING CLUTCH OPERATION

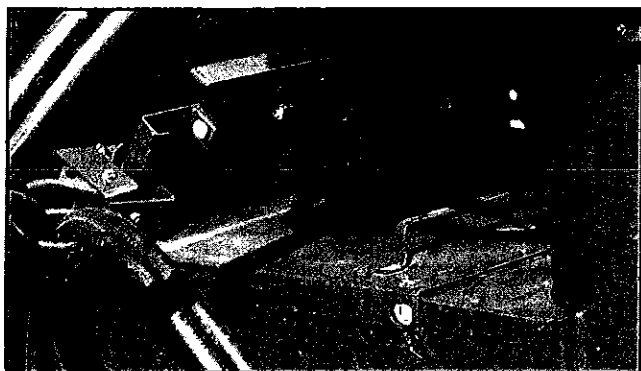


FIGURE 16 - UNLOADING DOOR

Optional extensions for the unloading auger include a 3' to 6' folding or bolt-on extension. See Figures 17, 18 & 19 for discharge heights with these extensions.



FIGURE 17 - FOLDING AUGER EXTENSION

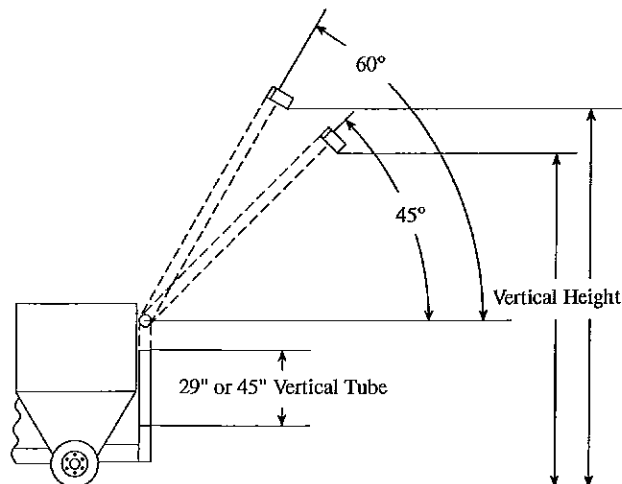


FIGURE 19 - UNLOADING AUGER HEIGHTS (SEE FIGURE 18)

UNLOADING AUGER HOOD

When the unloading auger tube becomes overloaded, a spring-loaded door opens on the end to prevent damage to the drive (see Figure 20).

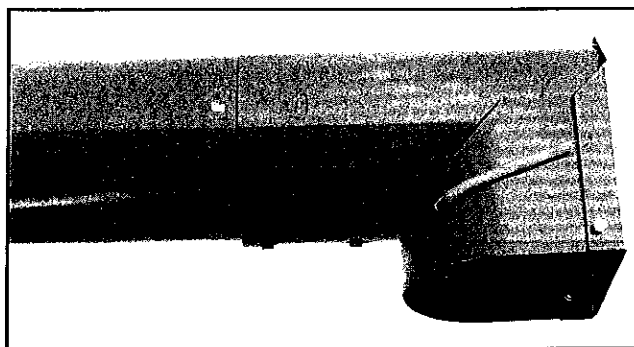


FIGURE 20 - UNLOADING AUGER HOOD

UNLOADING HEIGHTS OBTAINED ON LEVEL SURFACE

(See Figures 19)

Unloading Auger Configuration	Tube & Elbow Combined Length	Discharge 45°		Discharge 60°	
		29" Tube	45" Tube	29" Tube	45" Tube
105 bu.					
Standard - No Extensions	125"	14'-9"	NA	16'-8"	NA
3' Fold Around Auger Extension	161"	17'-0"	NA	19'-3"	NA
6' Fold Around Auger Extension	197"	19'-3"	NA	22'-0"	NA
150 bu.					
Standard - No Extensions	125"	15'-0"	15'-9"	16'-11"	17'-8"
3' Fold Around Auger Extension	161"	17'-3"	18'-0"	19'-6"	20'-3"
6' Fold Around Auger Extension	197"	19'-6"	20'-3"	22'-3"	23'-0"

FIGURE 18 - UNLOADING AUGER HEIGHTS

OPERATIONS & ADJUSTMENTS: MIXERS

POSITIONING THE UNLOADING AUGER TO OPPOSITE SIDE OF MACHINE

To change to the opposite 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 opposite side of the mixing tank.

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

Swivel Stop Adjustment:

Adjust bracket so it contacts before unloading auger contacts the tank.



FIGURE 21 - SWIVEL STOP

AUGER FEEDER OPERATION

The Mixer-Processor may be equipped with a hydraulic auger feeder.

To position the auger feeder, remove the clip pin from the fender bracket, lift the bottom of the auger feeder slightly so that the 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 over the auger. When processing 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.

Make sure the auger feeder clutch handle will stop the auger feeder. Loosen cable clamps to readjust.

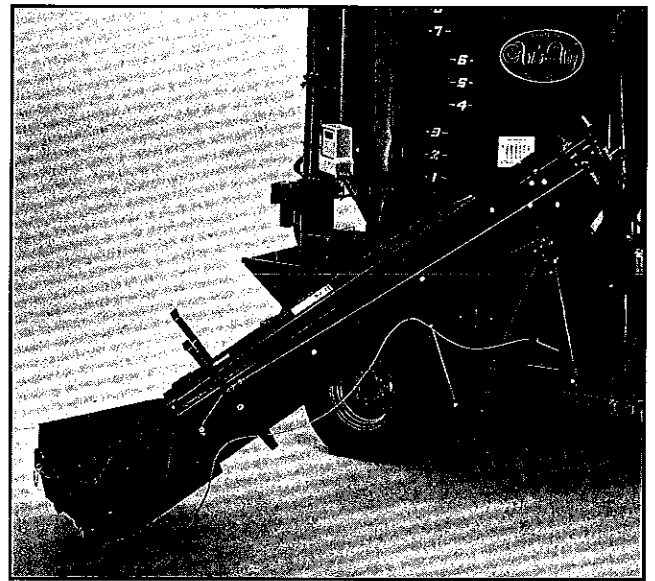


FIGURE 22 - AUGER FEEDER OPERATION

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

NOTE: If machine is equipped with and 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).

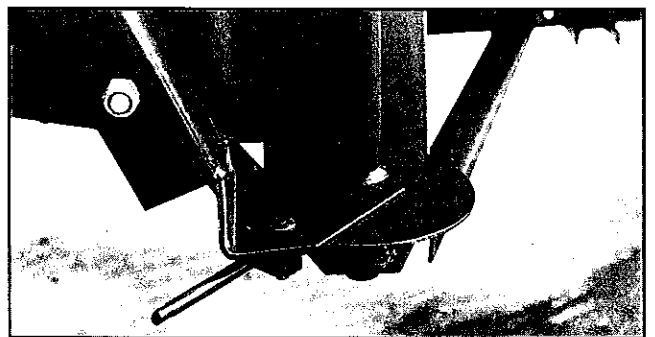


FIGURE 23 - AUGER FEEDER SWING BRAKE

The auger feeder is counter balanced by a spring (see Figure 24, page 18). Adjust the spring by loosening

OPERATIONS & ADJUSTMENTS: MIXERS

the nut on the lower bolt, turn the bolt in, to increase the spring tension, relock nut.

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" 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.

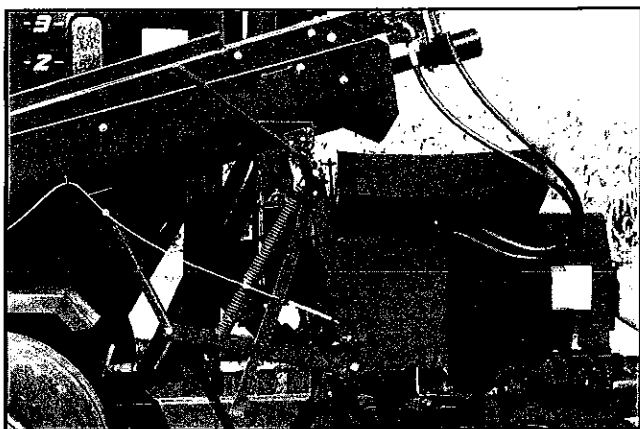


FIGURE 24 - AUGER FEEDER POSITIONER AND SPRING ADJUSTMENT (HAMMERMILL SHOWN)

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 25).

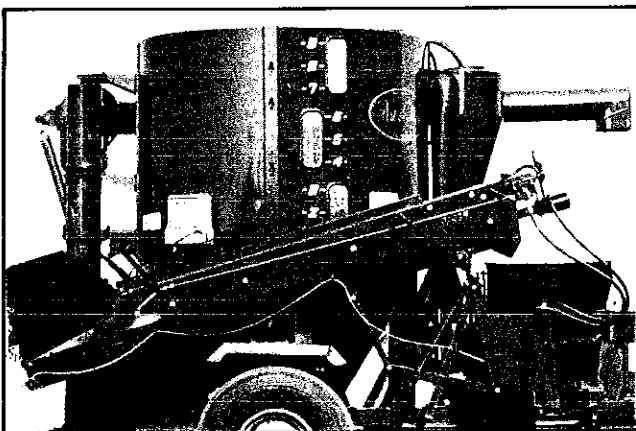


FIGURE 25 - HYDRAULIC AUGER FEEDER CONTROLS

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 the processor. The handle on this valve must be out to divert the oil to the auger feeder.

If the handle for the selector valve is in, oil flows to the lift and swing function of the unloading auger (see Figure 26).

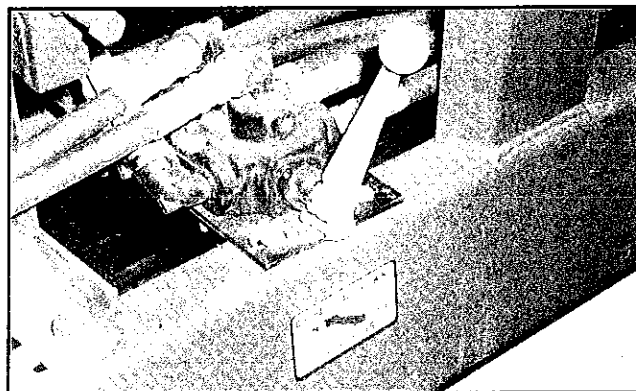


FIGURE 26 - SELECTOR VALVE

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.

OPEN & CLOSED HYDRAULICS

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 bypass should be made. Refer to the tractor operators manual or consult the dealer to make sure which system the tractor has (see Figure 27, page 19).

To convert to "Closed Center" hydraulic system revise as shown in Figure 27, page 19. If the system has two control valves for auger feeder and roll feed, change valves for auger feeder and roll feed change only at roll feed flow control valve (tee as shown). *When revised for "Closed Center" operation do not use on tractor with "Open Center".*

For converting to "Closed Center" do the following:

At the control valve upper right corner, disconnect hoses from the motor and tractor from the tee and elbow: remove the nipple. Install plugs in the valve and tee where the nipple was removed. Reconnect the hoses to the tee and elbow. Tie the hoses together for support. If

OPERATIONS & ADJUSTMENTS: MIXERS

equipped with hydraulic roll feed, do not change control valve for auger feed, but control valve for roll feed (see Figure 27).

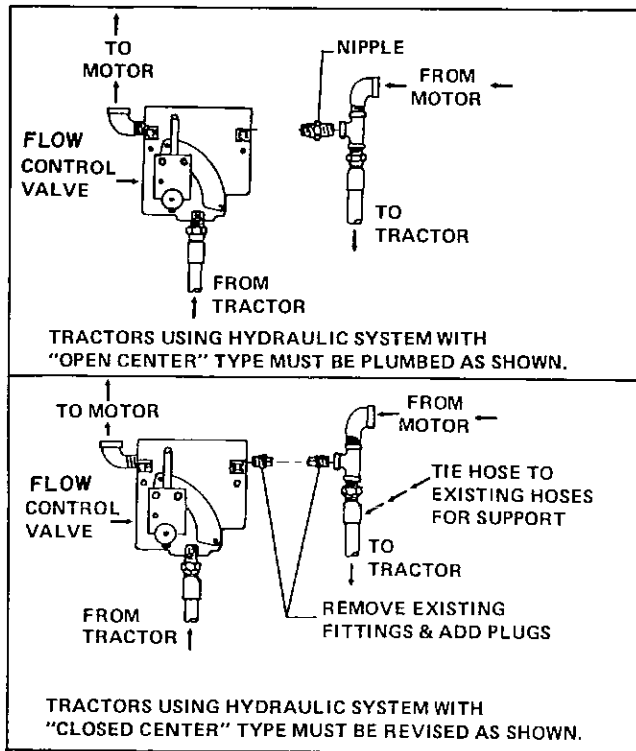


FIGURE 27 - OPEN AND CLOSED HYDRAULIC SYSTEMS

WHEEL BEARINGS

Raise and securely block the frame so that the wheel turns freely. Be sure to block wheel on opposite side. 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 28).

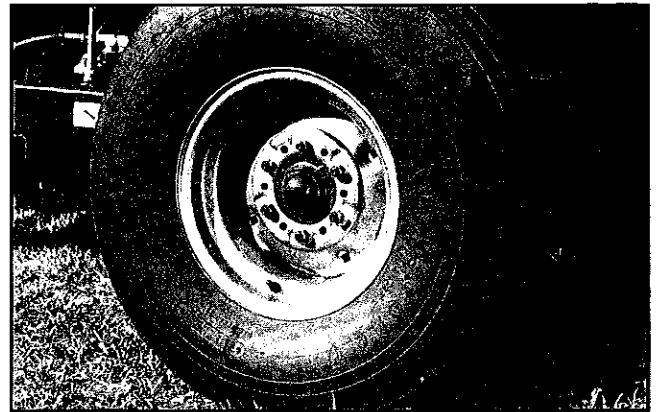


FIGURE 28 - WHEEL BEARING ADJUSTMENT

DRIVE CHAIN ADJUSTMENTS

The mill to mixer auger and supplement hopper drive chain and discharge auger drive chain (see Figures 29 & 30), are tensioned with a wood block idler. Adjust the chain tension to 1/2" total deflection by positioning the wood block idler.

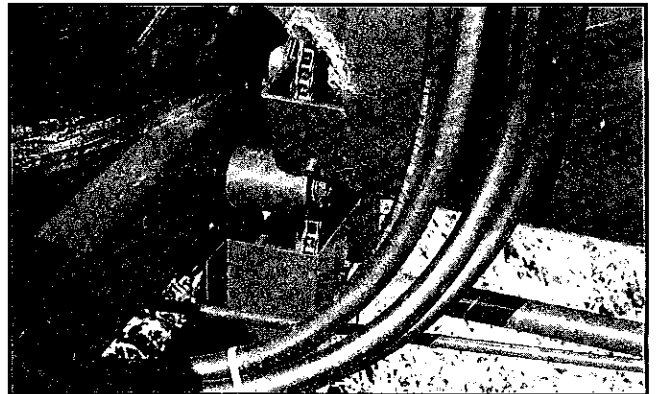


FIGURE 29 - DISCHARGE AUGER DRIVE CHAIN



FIGURE 30 - MILL TO MIXER AUGER DRIVE CHAIN

LUBRICATION: MIXERS

For other lubrication see the sections that would apply to your Mixer-Processor including: "Lubrication: HammerMills" page 30, "Lubrication: RollerMills" page 34, "Lubrication: Hopper Only" page 36 and "Service and Lubrication: Self-Contained" page 42.



CAUTION: Before Lubricating make sure tractor engine is shut off, place key in your pocket and disconnect implement input driveline.

The Mixer-Processor 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.

IMPLEMENT INPUT DRIVELINE

Grease the bearing crosses, zerk on the sliding shaft (see Figure 31) and plastic shaft bearings located by each bell (see Figure 32) every 20 hours.

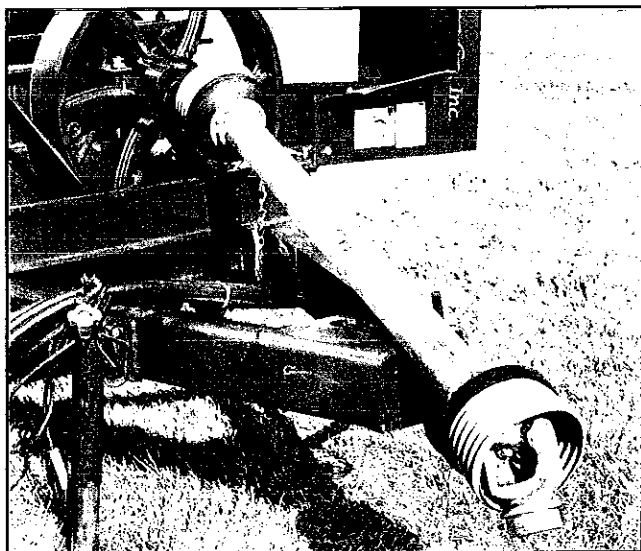


FIGURE 31 - PTO SHAFT (HAMMERMILL VERSION SHOWN)
(Shield Removed for Clarity)

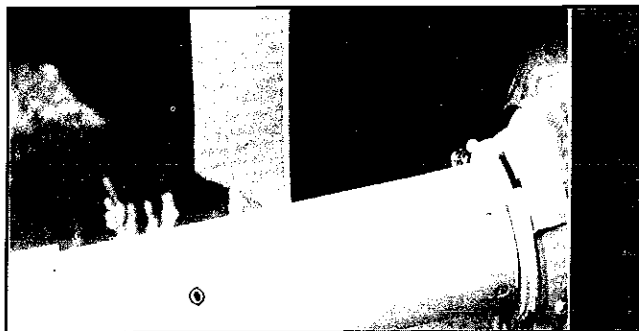


FIGURE 32 - PLASTIC SHAFT BEARINGS

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 mixer auger.

UNLOADING AUGER CLUTCH

Apply SAE multi-purpose type grease to the shaft and groove in the under sliding (driven) unloading auger clutch half periodically (see Figure 34, page 21).

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 top of the mixing tank (see Figure 33).

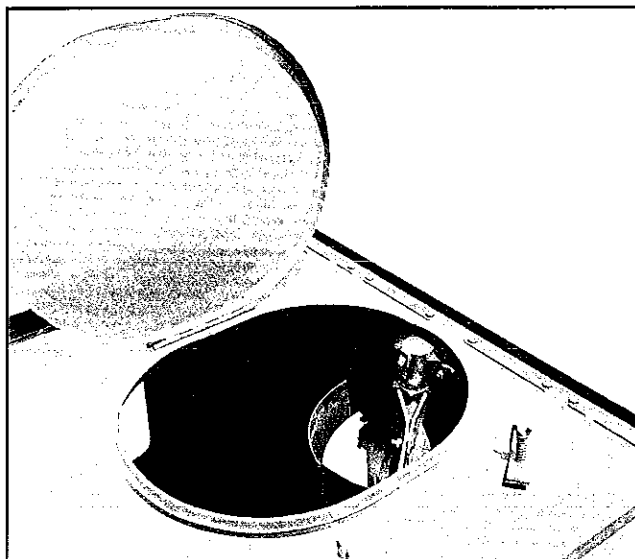


FIGURE 33 - VERTICAL MIXING AUGER BRASS BEARING

LUBRICATION: MIXERS

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, until oil runs out of check hole (see Figure 34). **DO NOT OVERFILL.**



FIGURE 34 - GEARBOX LUBRICATION, UNLOADING AUGER CLUTCH

RING AND WORM GEAR - MECHANICAL

Grease at two locations on large ring gear on unloading auger and apply 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 35).

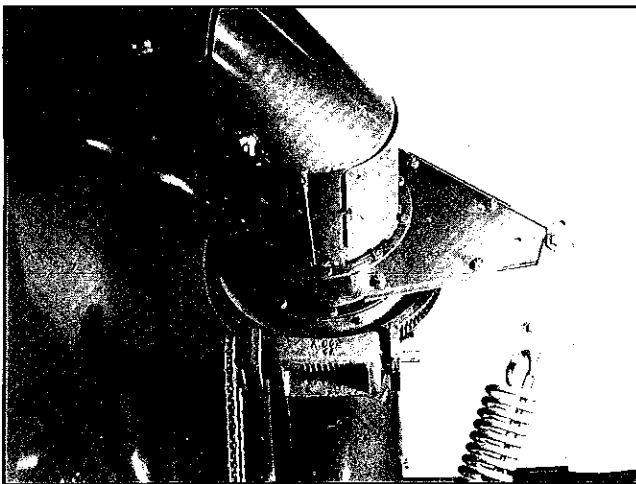


FIGURE 35 - RING AND WORM GEAR – MECHANICAL

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 36). Grease lubrication fittings and outside diameter of ring gear with SAE multi-purpose grease every 10 hours of operation (see Figure 36).

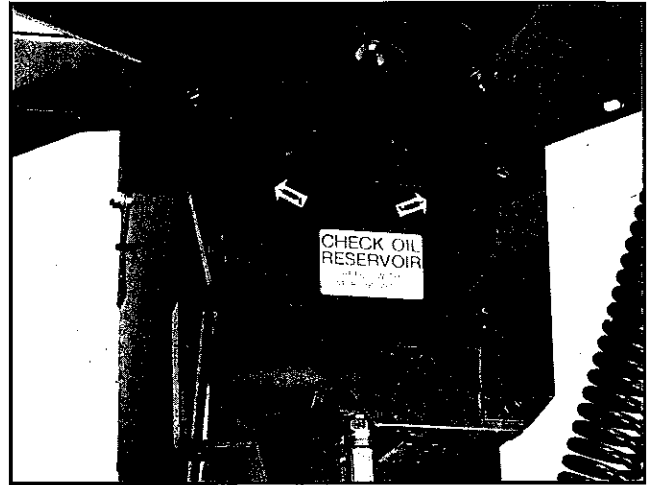


FIGURE 36 - RING AND WORM GEAR – HYDRAULIC

CHAINS

Chains should be lubricated at frequent intervals. Apply a light engine oil to the chain. Oil the chain on the inside (upper side of lower strand)(see Figure 37).

Oil Roller Chains on
Upper Side of
Lower Strand

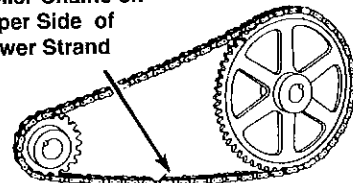


FIGURE 37 - OILING ROLLER CHAINS

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.

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 38).

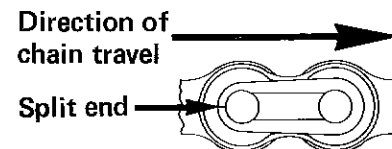


FIGURE 38 - CHAIN SPRING CLIP

LUBRICATION: MIXERS

SWIVEL CLAMP

Grease lower swivel clamp weekly (see Figure 39).

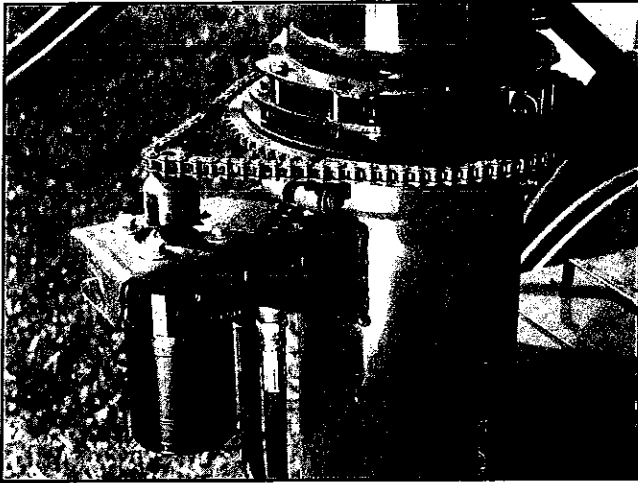


FIGURE 39 - SWIVEL CLAMP AREA, DISCHARGE AUGER (Shield Removed for Clarity)

ELBOW

Periodically lubricate gear sets at each unloading auger transfer point. Use SAE multi-purpose type grease (see Figures 40 and 41) every 20 hours.

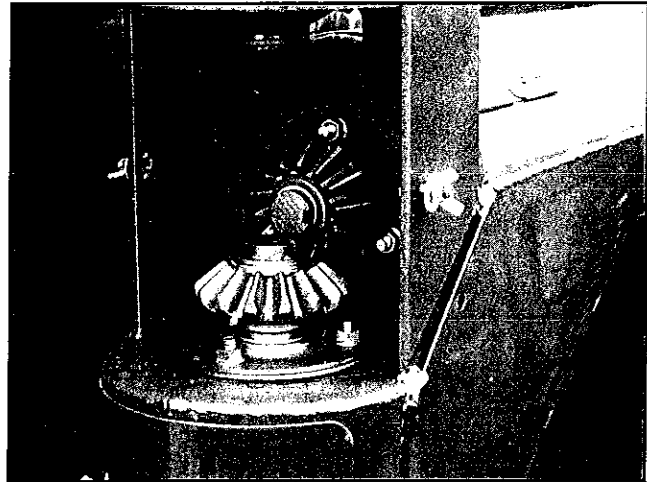


FIGURE 40 - DISCHARGE AUGER BEVEL GEARS (INNER ELBOW) (Shields Removed for Clarity)

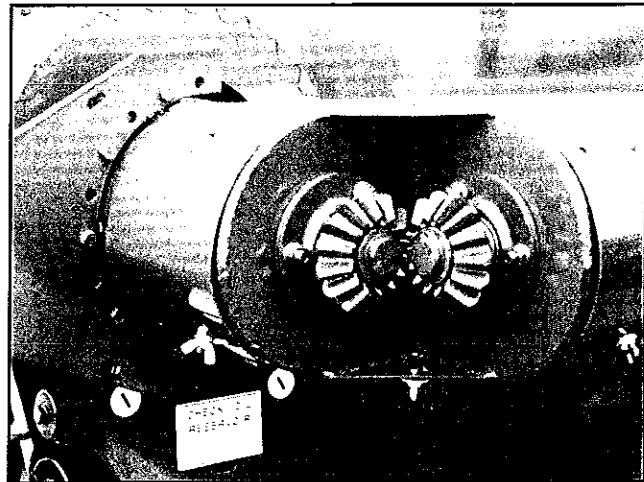


FIGURE 41 - DISCHARGE AUGER BEVEL GEARS (OUTER ELBOW) (Shields Removed for Clarity)

SERVICE: MIXERS

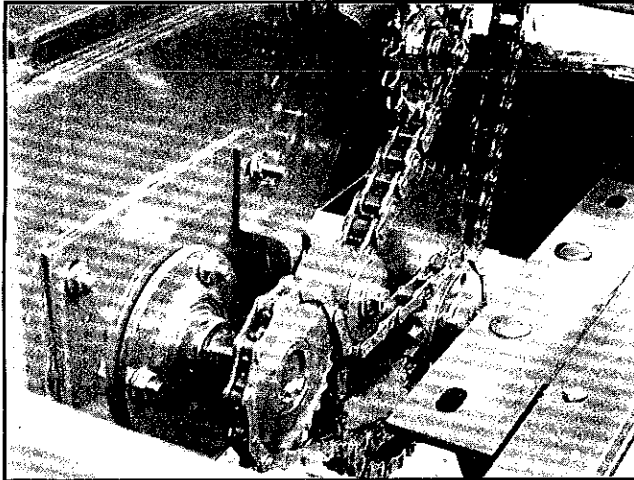


CAUTION: Disengage all drives, shut off tractor engine and place key in pocket before servicing Mixer-Processor.

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 Page 50, "Bolt Identification").



**FIGURE 42 - MIXER/SUPPLEMENT HOPPER DRIVE
SHEAR SPROCKETS (Shields Removed for Clarity)**

SPROCKET & 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 (see Figure 43 for alignment).

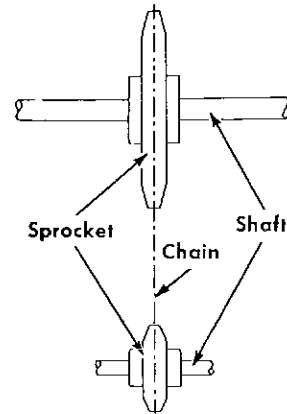


FIGURE 43 - SPROCKET ALIGNMENT

INTRODUCTION: PROCESSORS

This Section on processors has been prepared to acquaint you with the proper operation, adjustment, lubrication and service of the HammerMill or RollerMill. Take time to be careful and better understand the efficient operation and care of your processor modules. The varied size processors were modular designed to adapt to different size mixers available from Art's-Way Manufacturing Co., Inc.

Some pictorials used show guards and shields removed for easy identification. Be sure that all shields and guards are in place before operating. These are for your protection.

The Art's-Way processors are PTO driven by 40 - 150 hp tractors depending upon size and type of mill adapted to your feeding operation. The HammerMills are available in 540 or 1000 rpm drives. RollerMills are available in 540 rpm drive. The respective speed should be operated at the rated PTO speed. HammerMills respective speed should be maintained as the HammerMill cylinder operates best at 2800 to 3000 RPM. *HammerMill Cylinders do not exceed 3000 RPM.*



CAUTION: Never operate 540 RPM processor with 1000 RPM tractor.

HAMMERMILLS

Before operating your Mixer-Processor, select and install the screen size desired. Sizes are available from 1/8" to 2" openings. See page 27 for screen selection guidelines.

All types of grain can be ground with the HammerMill. Hay can be ground with a minimum of 1/3 mixer of grain. From the HammerMill, the material is augered into the mixing tank. A suction fan takes air pressure out of the HammerMill housing and delivers feed fines into the dust collector. The fines are separated and then dropped into the mill to mixer auger.

ROLLERMILLS

The RollerMills are precision built of tough cast iron construction, designed to give a high degree of control over the quality of feed produced. The rolls do require accurate adjustment. It is important you become acquainted with your RollerMill before operating at full capacity. The RollerMill will not start with grain between the rolls. If there is grain on the top of the rolls, open the eccentric roll as far as possible by raising the control handle to release the grain. When cleared, set the eccentric roll at predetermined position. Spacing between the rolls should never be closer than .005". Rolls should never touch when running.

HOPPER ONLY

A two level hopper is available to enter grain and supplement into the mixer. The upper level is offset to the right side for loading from an auger or conveyor delivery. The lower level is offset to the left side at a height that it can be manually loaded.

The material being loaded goes directly into the mill to mixer auger with *no additional* processing.

PROCESSOR OPERATIONS: HAMMERMILLS

Remove the bag from the supplement hopper. Place the screen hook in the HammerMill door pin (see Figure 44).

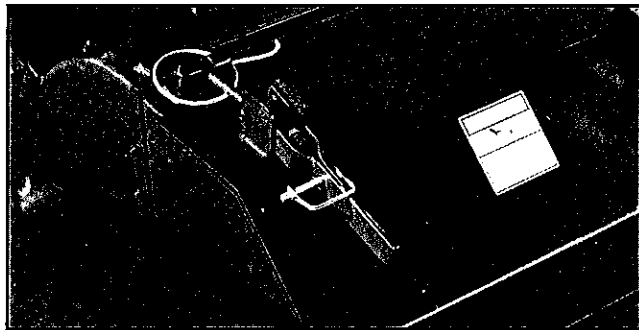


FIGURE 44 - SCREEN HOOK STORAGE

Install the implement end of the IID by fastening the input jackshaft with the 5/16" clevis pin and cotter pin provided, spread cotter pin. *Make sure the proper IID is used.*

The large pulley on the jackshaft is 22-5/8" diameter for 540 RPM drive and 12-5/16" diameter for 1000 RPM drive (see Figure 45).

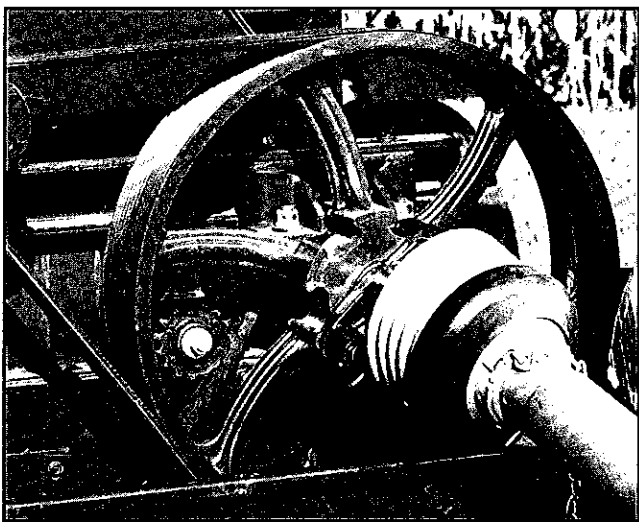


FIGURE 45 - LARGE PULLEY
(Shields Removed for Clarity)

Anchor drive line implement shield chain in main shield base slot and the tractor shield chain to tractor drawbar.



CAUTION: Never operate 540 RPM processor with 1000 RPM tractor.

IMPORTANT: *An improperly located hitch point may cause damage to the universal joints of the power take off (see page 9 and 10 for proper adjustment).*

Extend or shorten the tractor drawbar so that horizontal distance from the the end of the tractor power take-off shaft to the center of the hitch pin hole is 14" for 540 RPM and 16" for 1000 RPM drives. Drawbar should be locked with the centerline of the powershaft. If the tractor has an offset drawbar, the offset should be down for PTO work.

Before grinding, position the tractor straight with the centerline of the Mixer-Processor. This will allow smoother PTO operation and prolong IID drive line life.

HAMMERMILL CLUTCH PIN



CAUTION: Before changing positions of clutch pin, make sure tractor is shut off and place key in pocket.

The HammerMill clutch pin, (see Figure 46) 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 in either direction to lock in place. 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.

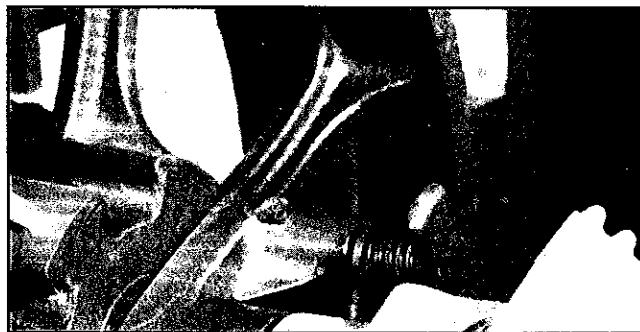


FIGURE 46 - HAMMERMILL CLUTCH PIN
(Shields Removed for Clarity)

TRACTOR PTO ENGAGEMENT

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

PROCESSOR OPERATIONS: HAMMERMILLS

The machine 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 47), is provided in the mill throat with a rubber baffle (removed for roll feed installation) behind it. The feed gate should be set to the lowest position to allow material to flow into the HammerMill evenly.

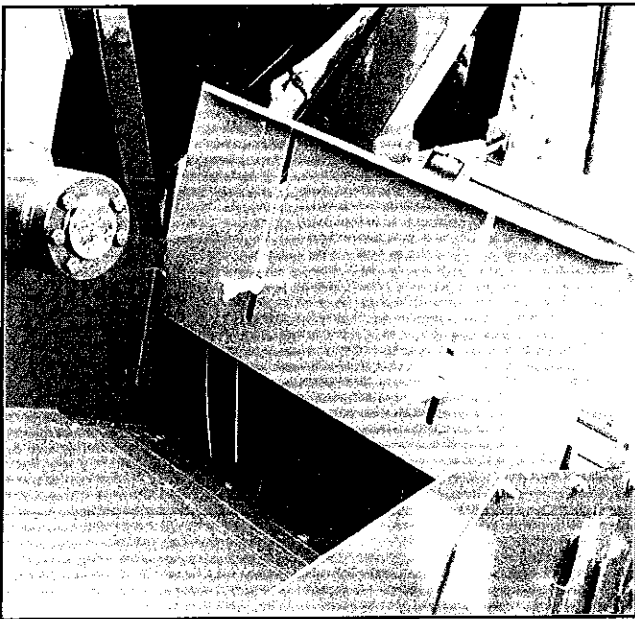


FIGURE 47 - FEED GATE THROAT OF HAMMERMILL

HAY RETARD BOLTS

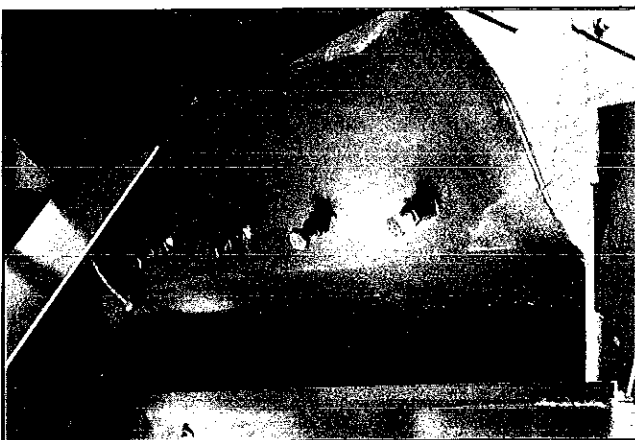


FIGURE 48 - HAY RETARD BOLTS

The hay retard bolts, (see Figure 48) will help maintain uniform feeding while grinding hay. The degree of retard is adjusted by loosening the lock nuts on each of the four 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 the bolts out. Secure the bolts by tightening the lock nuts.

HAMMERMILL SCREENS

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

The chart on the following page (Figure 50, page 27) showing screen sizes may be used as a guide for grinding different types of feed.

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

CHANGING SCREENS



CAUTION: Disengage all drives, shut off tractor engine and place key in pocket 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.

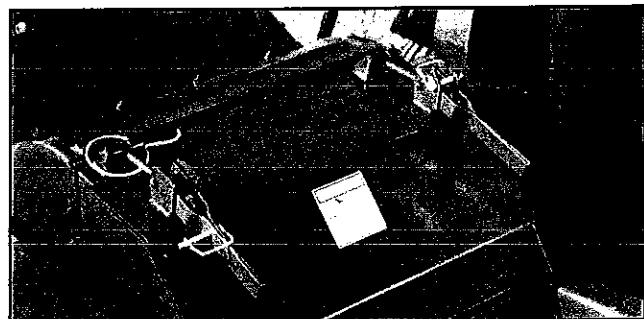


FIGURE 49 - LOCKING PIN AND LATCH ON HAMMERMILL DOOR (26" HAMMERMILL SHOWN, 20" HAMMERMILL HAS ONLY ONE LATCH)

To install or change the screen, open the HammerMill door and 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

PROCESSOR OPERATIONS: HAMMERMILLS

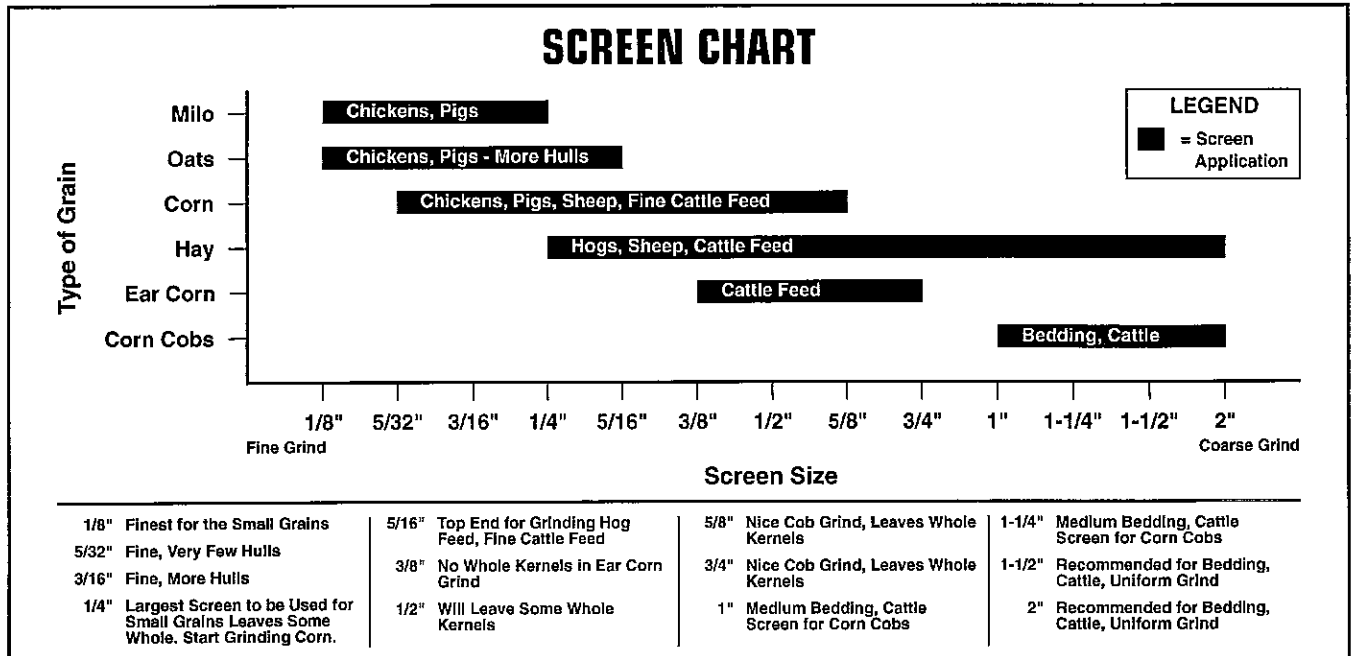


FIGURE 50 - SCREEN CHART

the HammerMill door, replace the screen hook and locking pins (see Figure 51).

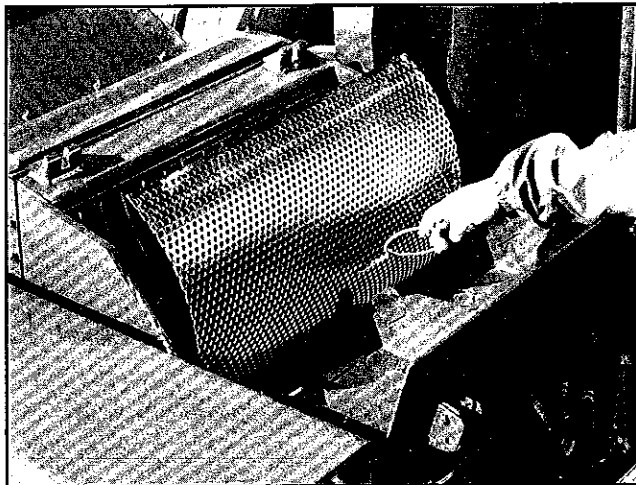


FIGURE 51 - CHANGING SCREENS

PROCESSING 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, run straight through the machine without filling the tank.*

PROCESSING 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.

PROCESSOR ADJUSTMENTS: HAMMERMILLS



CAUTION: Do not clean, lubricate or adjust your HammerMill while it is running. Disengage tractor PTO lever, shut off tractor and place tractor key in your pocket.

MAIN DRIVE BELTS



CAUTION: Do NOT make any adjustments while the machine is in operation.

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 52), place a scale at the midway point of the double V-belts on the pulleys, adjust bolts A (see figure 52), until 15 pounds of pull on the scale raises the top of one double V-belt approximately 1/4" above the top of the remaining belts (see figure 53). All six pairs of belts should have the average of 1/4" deflection at 15 pounds. Also see figure 54, for alignment of the pulleys.

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

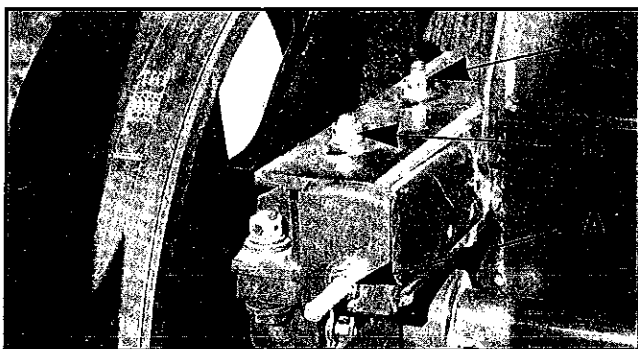
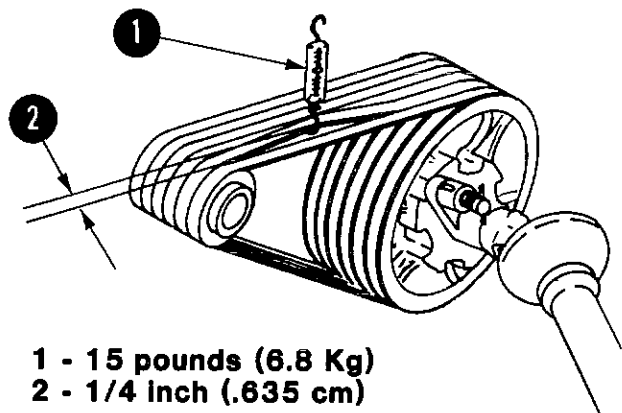


FIGURE 52 - BELT TENSION ADJUSTMENT
(Shields Removed for Clarity)



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

FIGURE 53 - CHECKING 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.

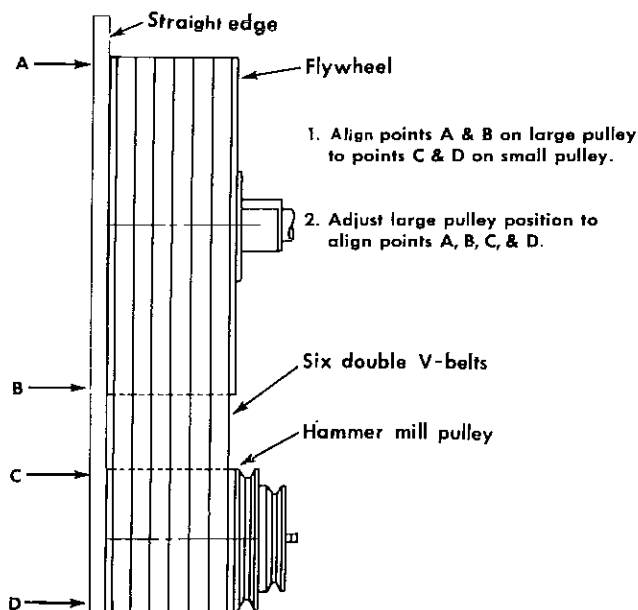


FIGURE 54 - BELT PULLEY ALIGNMENT

MAIN DRIVE CHAIN

Adjust the tension of the main drive chain (see Figure 55), by loosening the idler sprocket and bolt and sliding the idler sprocket towards the chain. Retighten idler sprocket bolt. Chain deflection should be 1/2" total at longest span. *This chain should be checked and oiled weekly.*

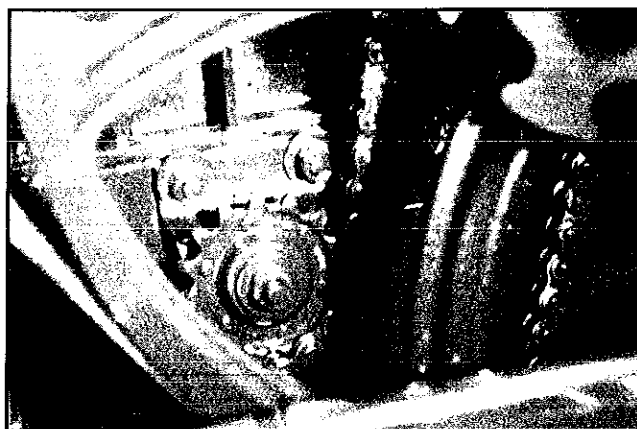


FIGURE 55 - DRIVE CHAIN ADJUSTMENT
(Shield Removed for Clarity)

PROCESSOR ADJUSTMENTS: HAMMERMILLS

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 56).

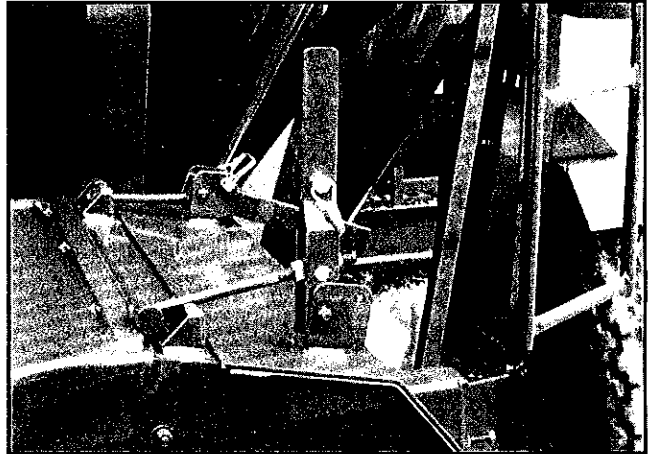


FIGURE 56 - HAMMERMILL DOOR PRESSURE

LUBRICATION: HAMMERMILLS



CAUTION: Before lubricating this piece of equipment disengage all drives, shut off tractor engine and place key in pocket.

For other lubrication see "Lubrication: Mixers" page 20 and "Service and Lubrication: Self-Contained" page 42 if equipped with self-contained hydraulics.

DRIVE SHAFT BEARINGS

Grease the pillow block bearings, front and rear bearings, (see Figure 57) on the HammerMill jack shaft and one pillow block bearing, (see Figure 58) on lower line shaft monthly or every 25 hours of operation with SAE multi-purpose type grease.



FIGURE 57 - JACK SHAFT (TWO BEARINGS)
(Shields Removed for Clarity)

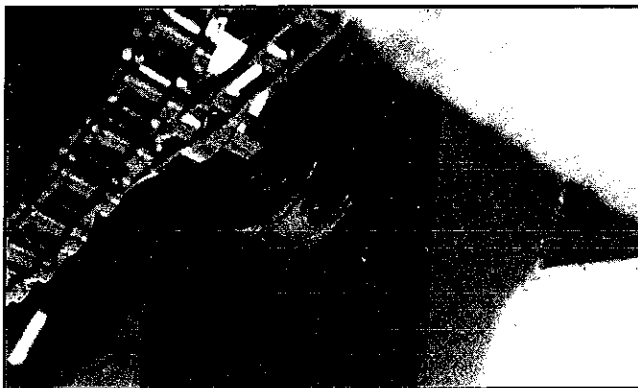


FIGURE 58 - MIXER DRIVE SHAFT BEARING

HAMMERMILL SHAFT BEARINGS

Grease front and rear pillow block bearings on the HammerMill cylinder shaft (see Figure 59A and 59B)

weekly or every 10 hours of operation with SAE multi-purpose type grease.



FIGURE 59A - CYLINDER SHAFT BEARINGS (FIRST BEARINGS) (Shields removed for clarity)



FIGURE 59B - CYLINDER SHAFT BEARING (SECOND BEARINGS) (Shields removed for clarity)

HAMMERMILL 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)

SERVICE: HAMMERMILLS



CAUTION: Disengage all drives, shut off tractor engine and place the tractor key in your pocket before servicing the Mixer-Processor

REPLACEMENT OF WORN OR DAMAGED HAMMERS

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

REVERSING THE HAMMERS



CAUTION: Be sure HammerMill has stopped rotating before opening HammerMill door. Shut off tractor engine, disengage all drives and place key in your pocket.

There are four rows of hammers in the rotor assembly with a total of 36 hammers on the 20" HammerMill (see Figure 63A) (there is also four rows of hammers in the rotor assembly with a total of 48 hammers on a 26" HammerMill (see Figure 63B)). 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.

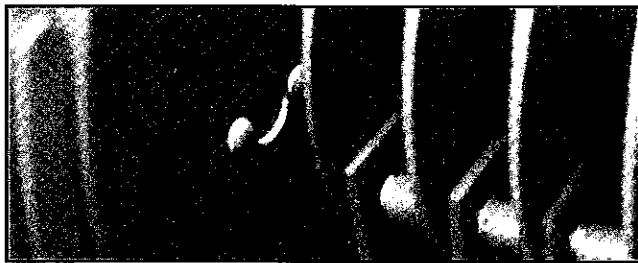


FIGURE 61 - HAMMER REMOVAL (INSIDE HAMMERMILL, HOLE TO REMOVE HAMMERMILL RODS) (Cover Removed for Clarity)



FIGURE 62 - HAMMER REMOVAL (PLATE TO REMOVE) (Shields Removed for Clarity)

To remove the hammers, remove the bolts from the side of the mill and round plate (see Figures 61 and 62). 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 63A and 63B).

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 Figures 63A and 63B for proper hammer spacing on each of the four shafts.

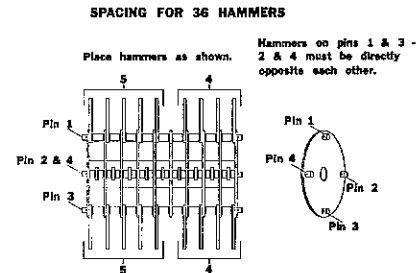


FIGURE 63A - PROPER HAMMER SPACING (20" HAMMERMILL)

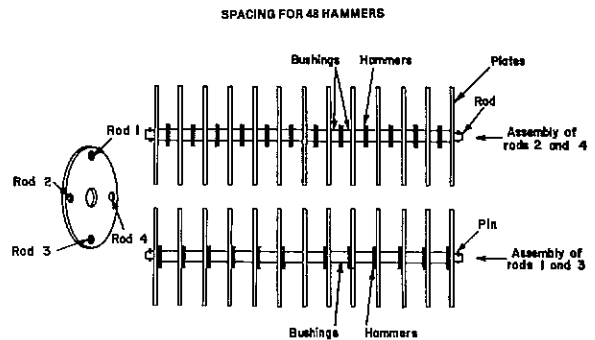


FIGURE 63B - PROPER HAMMER SPACING (26" HAMMERMILL)

MAIN DRIVE BELT REPLACEMENT

To remove the drive belts, loosen bolts at location B & C (see Figure 64). Relieve the belt tension by loosening bolts at locations A.

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 pulley and sheave.

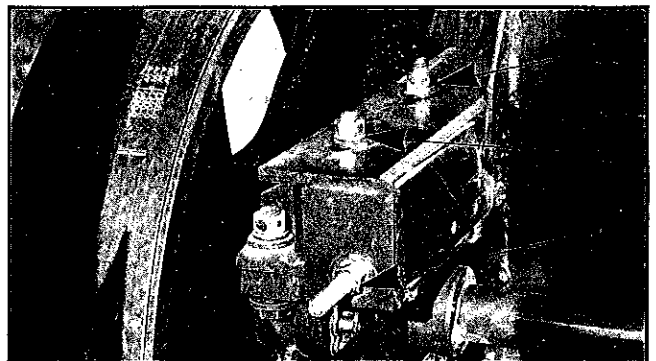


FIGURE 64 - BELT REMOVAL

PROCESSOR OPERATIONS: ROLLERMILLS

Install the implement end of the IID driveline by fastening to the input shaft with the 1/4" x 2" key and 5/16" clevis pin and cotter pin provided, spread cotter pin and tighten set screw on top of the key (see Figure 65).

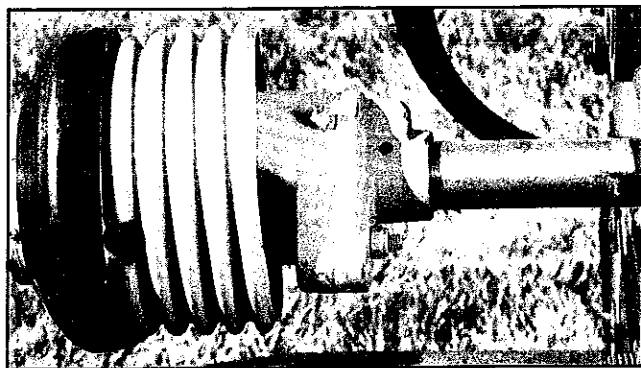


FIGURE 65 - ATTACHING THE PTO
(Shields Removed for Clarity)

Anchor shield safety chains, rear half to the mixer, front half to the tractor after hooking up the tractor PTO. These will keep the driveline shields stationary while operating.



CAUTION: Never operate a 540 RPM Mixer-Processor with a 1000 rpm tractor.

When the RollerMill is first started the rate of feed should be restricted until the operator becomes acquainted with the capacity of the unit. *Set the grain control gate to a maximum opening of 1" with set collar stops on gauge rods on a 20" mill (see Figure 66).*

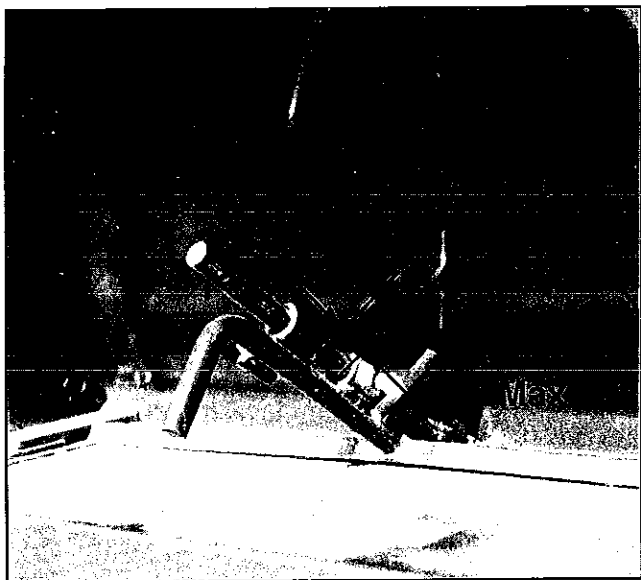


FIGURE 66 - GAUGE RODS SETTING, 20" ROLLERMILLS

Set the grain control gate lever to the fourth slot and lock with knob which will obtain a 1" opening for the 30" mills (see Figure 67).

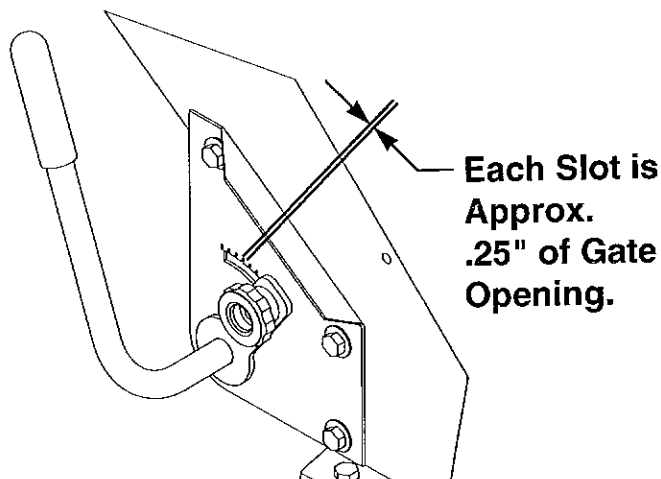


FIGURE 67 - LEVER SETTING, 20" AND 30" ROLLERMILLS

IMPORTANT: *The grain control gate should be closed before feeding grain into the hopper. Never stop the RollerMill with grain in the rolls. The RollerMill will not start if any grain is wedged in the apex of the rolls.*

Cover the full width of the hopper with grain and supplement to just above the magnet before operating the grain control gate.

The grain control gate should be opened only enough to provide the rate of rolling or grinding required up to 1" maximum for most grains.

The RollerMill is equipped with an eccentric roll release to open the gap between the rolls for tramp metal. *If the grain control gate is opened too far this could release the eccentric roll and must be reset manually on the right side of the RollerMill.* To reset or adjust for your feed requirements; loosen the two eccentric locking screws, move roll adjustment handle to the desired position (moving down puts the rolls closer together — moving up puts the rolls farther apart). Then, tighten the eccentric locking screws. There is a gauge on the front right corner of the RollerMills (20" RollerMill, the gauge is located at the eccentric roll shaft and on the 30" Roller-Mill it is by the release control handle) (see Figure 68).

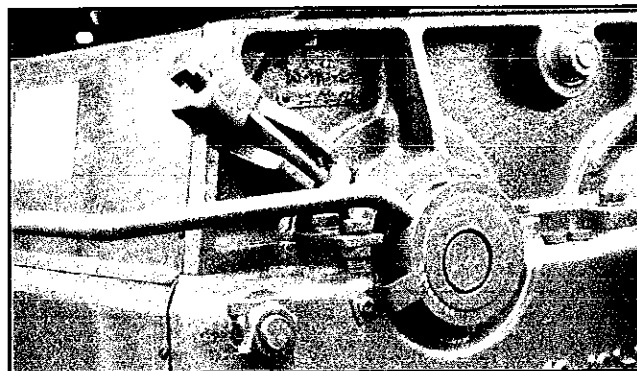


FIGURE 68 - ECCENTRIC ROLL ADJUSTMENT - 20" ROLLERMILL
(Shields Removed for Clarity)

PROCESSOR OPERATIONS: ROLLERMILLS

HIGH MOISTURE GRAIN

Rolling high moisture grain will require roll scrapers (see "Attachments" page 46). The main drive roll scrapers should be set at .006" clearance and the eccentric roll should be set at .050" clearance.

ROLL SELECTION

Match the RollerMill usage with the roll application. Different rolls are available to meet the different grinding needs of the customer. The following list is to help you select the appropriate rolls. Different grains, because of their kernel size and shape, will produce a different particle size with the same roll setting. Flat tooth designs are mainly used for cracking or rolling of grains. Art's-Way offers the following flat tooth rolls:

<u>Roll</u>	<u>Recommended for Processing</u>
10 Grooves/inch	Oats, Wheat, Barley, Milo & Corn, medium grind. (approx. 1,000 - 1,400 micron)
7 Grooves/inch	Milo, Barley, Corn-Dry and Corn-Hi Moisture, medium to coarse grind. (approx. 1,200 - 1,600 micron)
5 Grooves/inch	Corn-Dry & Corn-Hi Moisture. Just cracked to coarse grind.

Sharp tooth designs are mainly used for finer particle size due to the shearing action with a higher capacity output. Art's-Way offers the following sharp tooth rolls:

Roll Recommended for Processing

12 Grooves/inch	Oats, Wheat, Barley, & Corn-dry w/roll speed diff-fine grind (approx. 700-800 microns), with-out/roll speed diff. - medium grind, (approx. 1,000 - 1,200 microns)
10 Grooves/inch	Oats, Wheat, Barley, & Corn-dry w/roll speed diff-fine grind (approx. 800-900 microns), with out/roll speed diff - medium grind (approx. 1,100 - 1,400 microns)
7 Grooves/inch	Wheat, Barley, & Corn-Dry.
5 Grooves/inch	Barley, Corn-Dry, & Corn-Hi moisture. Cracked grind (approx. 1,500 - 2,000 microns). Without/roll speed diff. coarse grind (approx. 2,000 - 2,500 microns)

All projected particle sizes will vary depending on quality of grain, roll spacing (gap), power input, roll speed differential drive and the general operation of the mill.

EAR CORN ROLLERMILL

The ear corn RollerMill is designed to roll ear corn and other grains. Ear corn is fed past a plate magnet into a cylinder and screen where the corn is shelled, the cobs are crushed and the husks cut into pieces (see Figure 69). Ear corn is generally fed into the machine with a hydraulic auger feeder. The auger feeder controls the flow of ear corn into the machine by adjusting the auger speed using a folw control valve. After the ear corn is processed through the cylinder and screen the grain is crushed by the rollermill.

The screen in the cylinder section is the sizing screen and only controls the particle size of the cobs. Screens with 1/2" or 3/8" perforations are used with dry ear corn and screens with 3/4" or 1" perforations are used with high moisture ear corn. The screens are securely bolted into the machine and require some time to change so do not plan to change them frequently.

The ear corn Rollermill is equipped with a bypass gate in th cylinder section. The bypass gate is closed for ear corn. The bypass gate should be open for small grain processing to bypass the grain past the cylinder section of the machine directly to the Rollermill.

When processing high moisture ear corn, the machine should be equipped with roll scrapers and roll speed differential drive. The roll scrapers are located under the rolls and are adjustable from the outside of the mill. The roll speed differential drive turns one roll faster than the other to help keep rolls clean in high moisture.

Adjustment of roller scrapers should be checked if running high moisture grain and reduction of capacity occurs.

Adjust scraper bolts located at each end of RollerMill the same amount to insure roll cleaning full length. Adjust drive roll scrapper first as it should be set as close as possible without rubbing at 540 rpm.

Adjust each end the same amount and retighten jam nuts.

Set the eccentric roll in the closed position or the position for your grain and repeat the same procedure as setting the drive roll scraper. No audible sound should be in the mill from the scrapers rubbing the rollers as this will reduce life of your rolls. Adjust each end the same amount and retighten jam nuts.

Set the eccentric roll in the closed position or the position for your grain and repeat the same procedure as setting the drive roll scraper. No audible sound should be in the mill from the scrapers rubbing the rollers as this will reduce life of your rolls.

PROCESSOR OPERATIONS: ROLLERMILLS

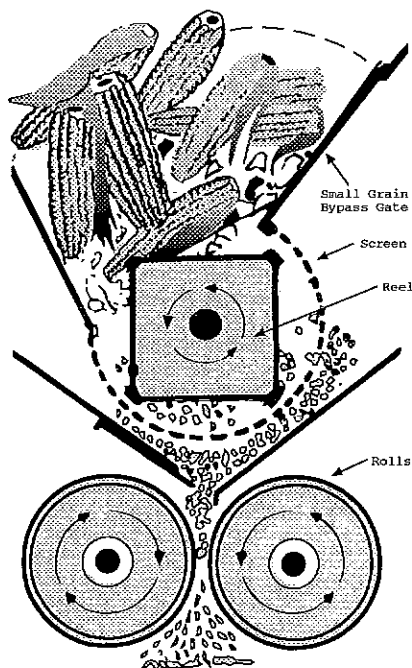


FIGURE 69 - EAR CORN ROLLERMILL OPERATION

2-HIGH ROLLERMILL

The 2-high Rollermill is designed to process the feed for 2 or more kinds of animal feed or to get a more uniform-finer particle size. The lower mill may have the roll gap opened completely if the feed is to be course ground by the upper rolls; ie: cattle feed. The top mill can be set to pregrind the feed at approx. 25-50% of the kernel size and finished with the lower mill being set to acquire the desired particle size; ie: swine feed. The normal setting to acquire the particle size of

700-800 micron is for the top mill roll gap be set at .095" with 10 grooves/inch sharp and the lower mill roll gap be set at .015" with 12 grooves/inch sharp.

CAUTION: These can be set by feeler gauges by removing the inspection door between the upper and lower mills on the right side of the machine. The mills may be equipped with 1:1 or 1.7:1 drives to provide the best quality feed and the highest capacity available from your machine and application.

ROLL SPEED DIFFERENTIAL

Your machine may be equipped with a chain drive high roll speed differential to increase capacity and reduce particle size. Care should be taken in starting and stopping of your processor. Engage PTO of tractor at low RPM and increase throttle to required PTO speed. After processing has been completed, slow tractor RPM slowly to idle before disengaging PTO to prolong drive and PTO life.

PROCESSING 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.

LUBRICATION: ROLLERMILLS



CAUTION: Before lubricating this piece of equipment disengage all drives, shut off tractor engine and place key in pocket.

NOTE: Roll bearings are sealed and permanently lubricated. Bearings without zerks are permanently lubricated.

ROLL SPEED DIFFERENTIAL CHAIN DRIVE

Lubricate with a good chain lubricant or SAE 30 non detergent oil every other grinding of the processor or each 1 hour grinding.

For other lubrication see "Lubrication: Mixers" page 20 and "Service and Lubrication: Self-Contained" page 42 if equipped with self-contained hydraulics. Lubricate the following parts on your RollerMill at the following intervals:

Universal joints &
reel shaft bearings.....Every 20 to 30 hrs.
Roller chainDaily or as necessary

SERVICE: ROLLERMILLS



Do not hand clean, service, lubricate or perform any work on this unit without shutting off the tractor engine, placing the key in your pocket and disengaging all power.

ROLL REPLACEMENT

The rolls furnished in this mill are made of heat treated cast iron. The rate of wear on the rolls is dependent upon the hardness or abrasiveness of the grain; the amount of overloading done; and damage resulting from foreign objects, tramp metal, etc. When the rolls are worn down and the surface becomes slick, the capacity of the mill will substantially reduce. Rolls can be regrooved and re-heat treated by Art's-Way.

When replacement 20" rolls are supplied from the factory they will include the roll, bearings and roll shaft assemblies. The 30" replacement rolls are supplied from the factory as rolls without bearings as they are attached to the shaft with taper lock hubs.

EAR CORN ROLLERMILL MAINTENANCE

The capacity of the ear corn rollermill is a direct relation to the cylinder adjustments and condition of ear corn. Adjusting the cylinder as shown in Figure 70 will produce the optimal capacity given the condition of the ear corn. Clean and dry ear corn will process easily with a machine that is properly adjusted. Ear corn that is extremely husky and wet processes harder and adjustment is critical to optimize the machine.

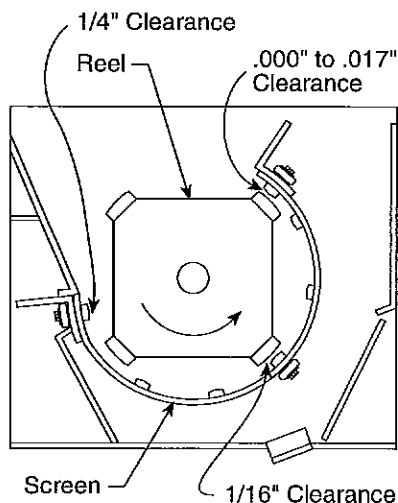


FIGURE 70 - EAR CORN ROLLERMILL OPERATION

Prior to storing the machine all high moisture residue should be cleaned from the mill. Rolling dry grain through the mill or washing with a pressure washer will reduce the deterioration of the mill.

2 HIGH ROLLERMILL

Roll gap is adjusted in the same procedure as the single high mills.



CAUTION: A feeler gage may be used to set the upper and lower roll gap through the access door on the right side of the machine.

MAKE SURE THE LOWER ROLLS ARE CLEAN BEFORE REPLACING THIS ACCESS DOOR FOR START-UP OF NEXT GRIND OPERATION.

Belt drive tension needs to be checked and reset after first 5 grind operations of your processor and each 25 hours of operation

For other lubrication see "Lubrication: Mixers" page 20 and "Service and Lubrication: Self-Contained" page 42 if equipped with self-contained hydraulics.

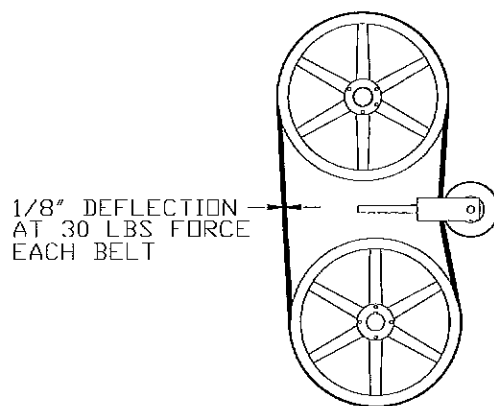


FIGURE 71



CAUTION: Before lubricating this piece of equipment disengage all drives, shut off tractor engine and place key in pocket.

Lubricate the chain drive which drives the lower mixer shaft and mill to mixer auger every 25 hours of operation by applying light engine oil to the inside lower strand (see "Lubrication Mixer", page 21).

PROCESSOR OPERATIONS: HOPPER ONLY

Install the implement end of the IID drive line by fastening the input shaft with the 5/16" clevis pin and cotter pin provided, spread cotter pin. *Make sure the proper PTO is used.*

Anchor drive line implement shield chain in main shield base slot and the tractor shield chain to tractor drawbar.



CAUTION: Never operate 540 RPM processor with 1000 RPM tractor.

IMPORTANT: An improperly located hitch point may cause damage to the universal joints of the power take off (see page 9 and 10 for proper adjustment).

Extend or shorten the tractor drawbar so that horizontal distance from the the end of the tractor power take-off shaft to the center of the hitch pin hole is 14" for 540 RPM and 16" for 1000 RPM drives. Drawbar

should be locked with the centerline of the powershaft. If the tractor has an offset drawbar, the offset should be down for PTO work.

Before processing, position the tractor straight with the centerline of the Mixer-Processor. This will allow smoother PTO operation and prolong PTO drive line life.

The two level hopper is available to auger grain and supplement into the mixer. The upper level is off to the right side for loading from an auger or conveyor deliver. The lower level is off to the left side at a height that it can be manually loaded.

The material being loaded goes directly into the mill to mixer auger with **no additional** processing.

Keep the lids closed on the hopper when they are not in use to prevent excessive moisture from getting in.

LUBRICATION: HOPPER ONLY



CAUTION: Before lubricating this piece of equipment disengage all drives, shut off tractor engine and place key in pocket.

For other lubrication see "Lubrication: Mixers" page 20 and "Service and Lubrication: Self-Contained" page 42 if equipped with self-contained hydraulics.

Lubricate the chain drive which drives the lower mixer shaft and mill to mixer auger every 25 hours of operation by applying light engine oil to the inside lower strand (see "Lubrication Mixer", page 21).

TROUBLESHOOTING: MIXERS-PROCESSORS

Most difficulties are caused by improper adjustments. When you encounter trouble, make sure a systematic check of 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.

For Troubleshooting on self-contained hydraulics see "Troubleshooting: Self-Contained", page 43.

Trouble	Possible Cause	Possible 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	IID shaft not aligned.	Front of Mixer Processor main shield must be parallel to tractor axle.
	IID shaft bent.	Replace PTO shaft.
	Missing or broken hammers.	Replace hammers (in pairs).
	Tractor drawbar improperly adjusted.	Adjust tractor drawbar as shown on pages 9 and 10.
Excessive noise when turning with mixer in operation.	Control on RollerMill grain gate is open too far.	Reduce opening.
	Turning too sharply.	Avoid sharp turns.
Low volume from HammerMill	HammerMill not operating at optimum speed.	Before grinding, set tractor throttle to obtain rated PTO speed (540 or 1000 rpm).
	HammerMills screen may be worn.	Turn screen around or replace if necessary.
	Hammers worn. HammerMill 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 belts too loose.	Tighten belts.
Drive belt squeals when mill is engaged	Drive belts too loose.	Tighten belts
Drive belts wear excessively.	Belts out of alignment.	Align pulleys.
	Belts slipping.	Adjust belts.

TROUBLESHOOTING: MIXERS-PROCESSORS

Trouble	Possible Cause	Possible Remedy
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.
Feed roll will not draw hay slice into mill.	Feed roll too low.	Raise Feed roll. Adjust hay retard bolts.
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 unloading.	Mixer tank door closed.	Open door.
Unloading auger does not engage.	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).

ROLLERMILL TROUBLESHOOTING

RollerMill drive.	Belts may be too tight.	Loosen belts.
	Pulleys may be improperly aligned.	Properly align pulleys.
RollerMill drive belts slip when starting.	Check belt tension.	Properly tension belts.
	Check if grain was left in mill	Open eccentric rolls to allow grain to flow starting. through.
	Grain may be feeding into mill at too fast a rate.	Close down the control gate.
	PTO drive may not be fast enough.	Speed up tractor rpms to 540.
Whole grain kernels in grind.	Check spacing of rolls.	Adjust gap between rolls.
	Check if adjusting handle is bent, it will cause one end of rolls to be adjusted closer than the other.	Straighten handle, if necessary order a new handle (for part number see parts manual).
	Adjusting lock nuts that are not tight.	Be sure adjusting lock nuts are tightened.

TROUBLESHOOTING: MIXERS-PROCESSORS

Trouble	Possible Cause	Possible Remedy
RollerMill loses capacity.	Rolls are adjusted closer than necessary and results in over rolling of feed. Check groove wear. Rounded, worn grooves do not have the same capacity as new or regrooved rolls.	Adjust gap between rolls. Purchase new or regrooved rolls.
Rolls making loud or unusual noises.	Rolls are touching	Check that the rolls are not touching each other.
RollerMill suddenly chokes.	Check if grain is built up on rolls. High moisture grain tends to stick to rolls. Mill to mixer auger may not be working	Clean rolls. May have to install roll scrapers and/or roll speed differential. Fix mill to mixer auger.
Shear pins break.	Check for foreign objects (bolts, nuts, etc...) in mill, mixer or unloading auger. Check mill for grain if pins shear on start-up.	Remove foreign objects. Open eccentric rolls let grain flow through.
Ear corn RollerMill loses capacity.	Check the spacing of the cylinder and breaker bars. Check for excessive wear of breaker bars.	Adjust spacing of the cylinder and breaker bars. Replace breaker bars.

INTRODUCTION: SELF-CONTAINED

This section of the manual has been prepared to acquaint you with the proper operation, adjustment, lubrication and service of the Art's-Way Self-Contained Hydraulic Option. Take time to read and understand both this manual and efficient operation of your portable unit. The best insurance from an accident is a careful and knowledgeable operator.

Some pictorials used show guards and shields removed for easy identification. Be sure that all shields and guards are in place before operating. These are for your protection.

The Self-Contained Hydraulic system features a hydraulically driven discharge positioning lift and swing, and with some models, and auger feeder with or without roll feed. Also available are electric linear actuators used to operate the discharge door and clutch. All controls, except for the auger feeder control valve, are within easy access to the operator.

This system can be used with any tractor that can maintain a rated PTO speed when grinding. There is

no hydraulic connection between the mixer and the tractor. The tractor must also provide a minimum of 12-15 volts DC and 20 amperes to operate the electrical activated flow control valve and linear actuator.



CAUTION: Never operate 540 RPM Processor with 1000 RPM tractor.



WARNING: Because the operator is allowed to operate the system without leaving the tractor, special care is needed to avoid injury or damage. When locating the discharge tube into position, stay clear of overhead power lines, farm buildings and anyone in the area.

PREPARING FOR SELF-CONTAINED FIELD OPERATION

Prepare the Mixer-Processor and tractor as instructed in the Mixer-Processor sections of this manual. Additional preparation is needed to operate the self-contained option.



WARNING: When preparing Tractor and Mixer-Processor for field operation, make sure PTO is disengaged, tractor engine is shut off and place key in your pocket.

PREPARING THE TRACTOR



CAUTION: Never operate 540 RPM processor with 1000 RPM tractor.

The tractor must be equipped with a 540 or 1000 rpm PTO to match the Mixer-Processor. ***Make sure the proper PTO is used.*** The large pulley on the Mixer-Processor PTO shaft is 22" diameter for 540 rpm drive and 12-5/6" diameter for 1000 rpm drive on HammerMill Applications. All RollerMill applications are 540 rpm drives.

Install control box in cab of tractor using mounting bracket provided. Connect the power cord to a suitable 12 VDC power supply. The tractor must be able to provide 12 - 15 volts DC and 20 ampere to operate the electrical activate control valve. See figure 71 for direct connection to battery.

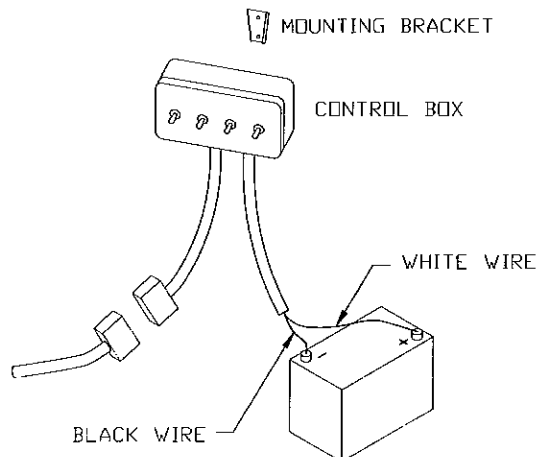


FIGURE 71 - CONTROL BOX INSTALLATION

NOTE: The electrical system of the tractor must be in good working order. If a voltage of less than 12.0 volts DC is provided to the actuator or solenoids on

PREPARING FOR SELF-CONTAINED FIELD OPERATION

hydraulic control valves, the system will not operate properly. There is a 20 amp fuse mounted on the tractor control box to provide overload protection

PREPARING THE MIXER-PROCESSOR

Electrical Components

Connect tractor control box to machine with plug provided.

Activate electric linear actuator to engage clutch. It will ratchet when actuator is fully retracted and at this point clutch should be fully engaged. Clutch arm should be loosely riding in the groove of the clutch. Adjustment can be made in rear mounting bracket by loosening bolts and sliding actuator assembly to the desired setting.

Hydraulic Components;

Check all connections and fittings for oil leaks.

Check oil level in reservoir. Oil level should be maintained 2 - 3 inches below top reservoir.

Adjustable valves to control the rate of swing are located near hydraulic motor. For a faster swing, turn valves to a higher number. Set both valves at approximately the same setting.

Run Mixer-Processor at low rpm for 5 - 10 minutes. During this time, activate all hydraulic motors (auger feed, lift & swing, roll feed) to insure that air is removed from the system.

Recheck all hydraulic connections and fittings for leaks.

Recheck oil level reservoir.

OPERATION: SELF-CONTAINED



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.

The Mixer-Processor should be run at a slow idle for a few minutes when the temperature drops below 0° F to allow the hydraulic oil to warm up.

For information on operating the auger feeder and roll feed, if your machine is so equipped, see the "Operations & Adjustments: Mixer" section - pages 17 - 18 and "Attachments" section pages 44 - 45.

Lift and Swing operations are functions of the hydraulic control valve. The control valve is electrically actuated from the control boxes either in the tractor or at the rear of the Mixer-Processor.

Manual overrides are provided on the hydraulic control valves. This allows the operator to still operate the lift and swing in case of an electrical failure. To override the control valve, press the center of the rubber cap on the solenoid (see Figure 72).

If auger feeder becomes clogged with material or foreign objects, the hydraulic motor will stall. When this occurs, the operator must disengage the tractor immediately so the pump and motor will not be damaged from excessive heat. The overloaded material and /or the obstruction must be removed before the operation can be continued.

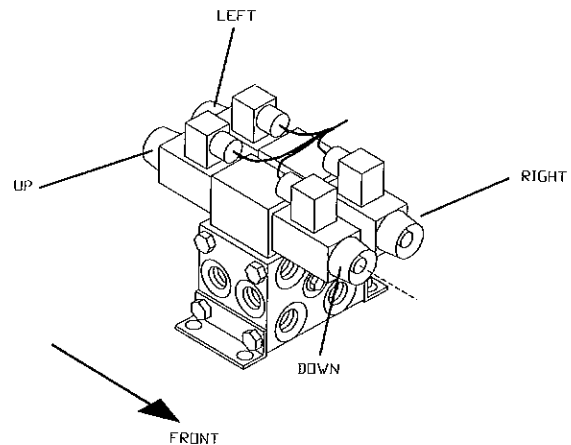


FIGURE 72 - VALVE OVERRIDE



WARNING: Before attempting to clear a blocked auger, disengage PTO, shut off tractor engine and place key in pocket. Failure to heed this warning may result in injury.

To engage the discharge auger, activate the electrical linear actuator until a "ratchet" sound is heard. This will indicate that the clutch is fully engaged. **Excessive wear of the clutch teeth will result if the clutch is not fully engaged.**

To operate the discharge door, activate the electrical linear actuator. The actuator will "ratchet" when the door is fully opened or closed.

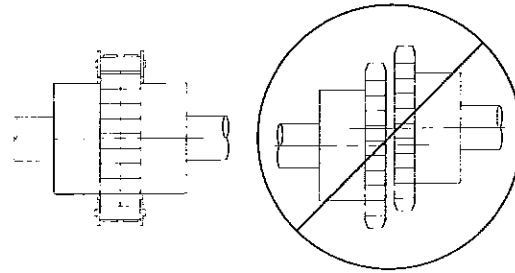
ADJUSTMENTS: SELF-CONTAINED



CAUTION: Do not clean, lubricate or adjust your Mixer-Processor while it is running. Disengage PTO, shut tractor engine off and place key in your pocket before making adjustments.

MAIN DRIVE BELTS

Remove coupler shield for hydraulic pump. Adjust main drive belts as shown in the HammerMill section of the this manual. Adjust mounting bracket of hydraulic pump so that the sprocket on the HammerMill jackshaft or the RollerMill shaft and sprocket on hydraulic pump are running on center. Tighten bearing and mounting bracket bolts and replace shield. Run Mixer-Processor slowly and observe hydraulic pump. If pump is moving in a circular motion, the pump mounting bracket is in need of further adjustment to better align sprockets; for position of the sprockets see Figure 73. Excessive wear of chain, sprockets, and hydraulic pump will result if sprockets are not centered properly.



YES

NO

CENTER SHOULD BE VIEWED FROM TOP AND SIDE OF SPROCKETS.

FIGURE 73 - SPROCKET ALIGNMENT

HYDRAULIC VALVES

All valves are preset, except for adjustable valves to control the rate of swing of the discharge auger. For a faster swing, turn valves to a higher number. One valve controls only one direction, so both may need adjustment for desired swing rate.

SERVICE AND LUBRICATION: SELF-CONTAINED



CAUTION: Disengage PTO and shut off engine before servicing, performing routine maintenance or cleaning the machine. Make certain all shields are in place before operating.

LUBRICATION

The chain on the pump coupling should be lubricated periodically with a light engine oil.

For other lubrication see the sections that would apply to your Mixer-Processor including: "Lubrication: Mixers" page 20, "Lubrication: HammerMills" page 30, "Lubrication: RollerMills" page 34 and "Lubrication: Hopper Only" page 36.

HYDRAULIC FILTRATION

The return line filter, mounted on the side of the hydraulic reservoir, traps contaminants before the oil returns to the tank. It is recommended that the element be replaced after the first 100 hours of operation and each 100 hours or yearly (which ever occurs first) thereafter.

A suction strainer is located in the suction port of the hydraulic tank. Periodically remove and clean it with compressed air, blowing from the inside out. If it is damaged or does not clean up well replace it with a new strainer.

Installed in the drain port of the hydraulic reservoir is a magnetic pipe plug. When hydraulic oil is changed, this plug should be removed and metal particles removed from it.

FILLER/BREATHING FILTER

When adding hydraulic oil back blow through the filler cap with low pressure air. If the filler screen is dirty remove the ten (10) - 5/16" whiz nuts on the access cover and flush screen with solvent and allow to dry before installing. Prior to replacing the access cover remove the old gasket material from the cover and tank, then replace gasket material using silicone blue.

If lack of pressure or flow is experienced, check strainer and/or replace filter. Regular servicing of the filter and preventing contaminants from entering the hydraulic oil is the best assurance of reliable and economic operation.

TROUBLESHOOTING: SELF-CONTAINED

Most difficulties are caused by improper adjustments. When you encounter trouble, make sure a systematic check of 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.

For other Troubleshooting on Mixer-Processor operations see "Troubleshooting: Mixer-Processors", pages 37 - 39.

Trouble	Possible Cause	Possible Remedy
Discharge auger will not lift and/or swing	Improper voltage or amperes	Use tractor that will provide 12 - 15 volts DC and 20 amperes
	Loose electrical connections	Check connections to battery Check connections from tractor to grinder Check connectors on control valve Check for severed wires Use manual override if complete electrical failure
	Low hydraulic fluid level	Fill to proper level
	Hydraulic fluid leak	Check all fittings for leaks
	Faulty relief valve (Lift only)	Replace relief valve
	Adjustable valves closed (Swing only)	Open valves
Discharge auger will not run	Actuator not operating	Check electrical connections as above Tractor not providing proper voltage or current
	Actuator out of adjustment	Adjust actuator mount bracket
Discharge door will not open	Actuator not operating	Check electrical connections as above Tractor not providing proper voltage or current
Hydraulic motors run slow	Clogged filter or strainer	Replace filter Clean strainer
	Low hydraulic fluid level	Fill reservoir
Hydraulic system runs hot	low fluid level	Fill reservoir

ATTACHMENTS

ELECTRONIC SCALE ATTACHMENT

A solid state electronic scale attachment, digital type, is available for your Mixer-Processor. The scale attachment consist of weigh bar sensors mounted on Mixer-Processor's spindles and hitch. They are electronically connected to the indicator box. The indicator 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.

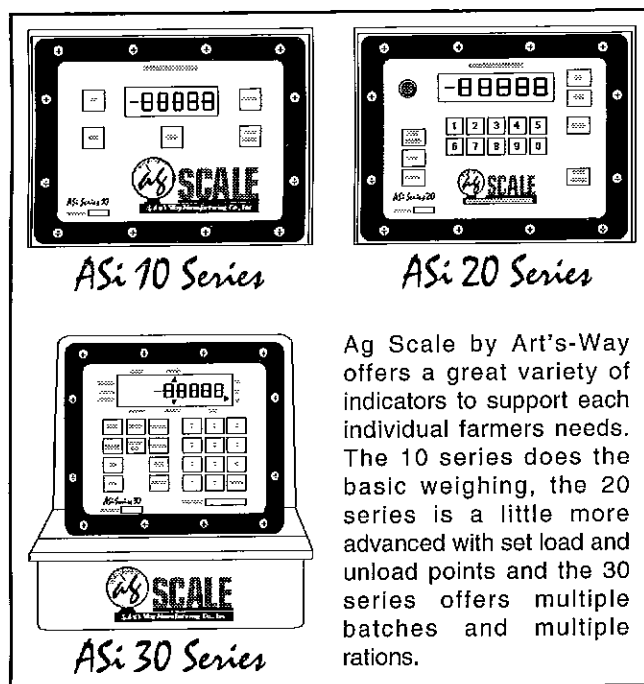


FIGURE 74 - ELECTRONIC SCALES

TUBE SACKER ATTACHMENT

The double 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 or continuous filling of bags (see Figure 75).

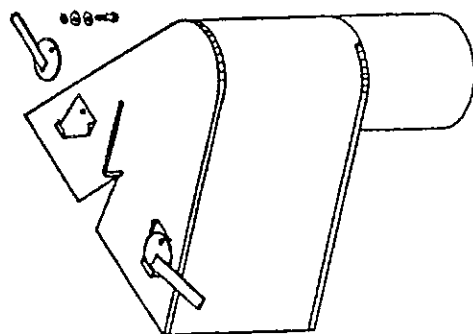


FIGURE 75 - TUBE SACKER ATTACHMENT

DISCHARGE UNLOADING AUGER EXTENSIONS

3' and 6' folding and 3' to 6' bolt on discharge auger extensions are available. See chart on page 16 for unloading height obtainable with various extensions added to the unloading auger system. See Figure 76 for folding discharge unloading auger extensions.

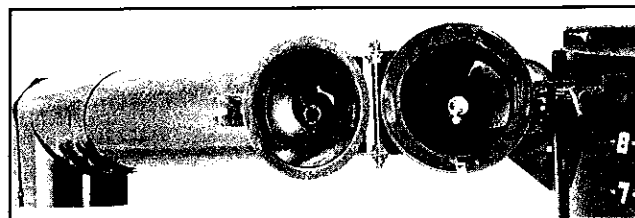


FIGURE 76 - FOLDING DISCHARGE AUGER EXTENSION

SCREENS

Screens for HammerMills are available in 12 sizes ranging from 1/8" to 2" (see chart on page 27 for recommended screen size).

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 particle size will be obtained.

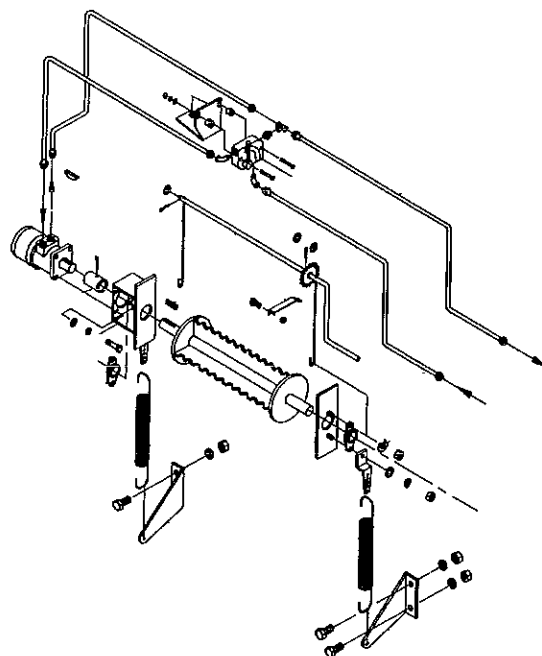


FIGURE 77 - ROLL FEED (HYDRAULIC VERSION WITH AUGER FEEDER SHOWN)

ATTACHMENTS

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.

The mechanical roll feed drives from the same drive as the mechanical auger feeder, it starts and stops with the same clutching functions.

The crank for raising and lowering the roll feed is to the rear of the HammerMill (see Figure 78).

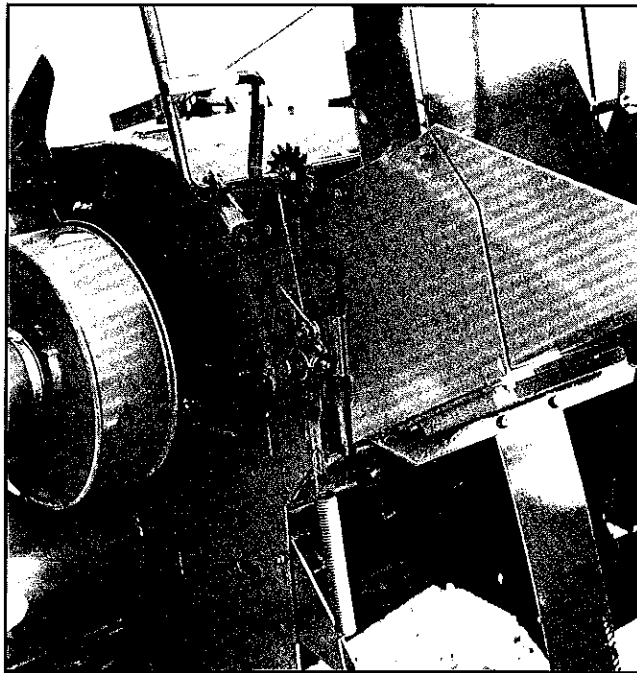


FIGURE 78 - ROLL FEED CRANK AND FEED BAFFLES

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. If equipped with hydraulic roll feed only, the flow control is on top of HammerMill.

The crank for lowering the roll feed is to the front of the HammerMill housing (see Figure 81).

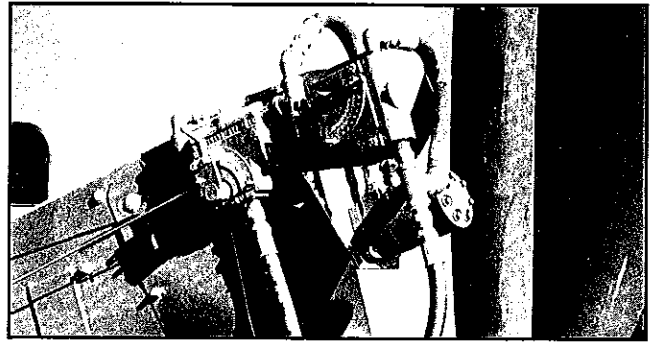


FIGURE 79 - ROLL FEED AND AUGER FEEDER FLOW CONTROL VALVES

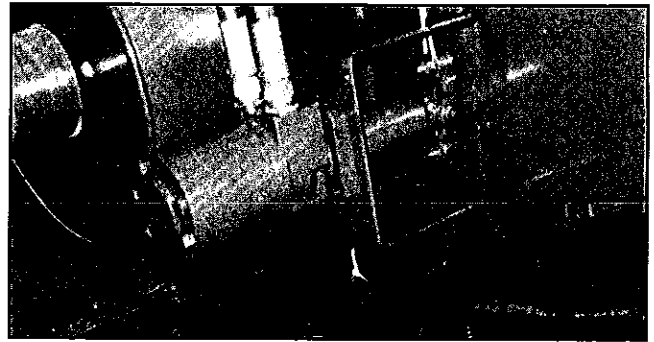


FIGURE 80 - HYDRAULIC ROLL FEED MOTOR

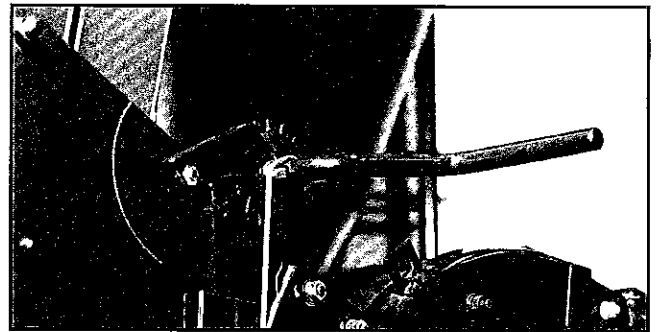


FIGURE 81 - HYDRAULIC ROLL FEED CRANK

Roll Feed Adjustment:

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 77, page 44).

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 retighten after cables have been equalized.

ATTACHMENTS

ROLLS/REPLACEMENT ROLLS

Rolls for RollerMills are available in 5, 7, 10 or 12 grooves per inch. Roll groove sizes can be mixed to meet the individuals needs.

ROLL SELECTION

Match the Rollermill usage with the roll application. Different rolls are available to meet the different grinding needs of the customer. The following list is to help you select the appropriate rolls. Different grains, because of their kernel size and shape, will produce a different particle size with the same roll setting. Flat tooth designs are mainly used for cracking or rolling of grains. Art's-Way offers the following flat tooth rolls:

<u>Roll</u>	<u>Recommended for Processing</u>
10 Grooves/inch	Oats, Wheat, Barley, Milo & Corn, medium grind. (approx. 1,000 - 1,400 micron)
7 Grooves/inch	Milo, Barley, Corn-Dry and Corn-Hi Moisture, medium to coarse grind. (approx. 1,200 - 1,600 micron)
5 Grooves/inch	Corn-Dry & Corn-Hi Moisture. Just cracked to coarse grind.

Sharp tooth designs are mainly used for finer particle size due to the shearing action with a higher capacity output. Art's-Way offers the following sharp tooth rolls:

<u>Roll</u>	<u>Recommended for Processing</u>
12 Grooves/inch	Oats, Wheat, Barley, & Corn-dry w/roll speed diff-fine grind (approx. 700-800 microns), with-out/roll speed diff. - medium grind, (approx. 1,000 - 1,200 microns)
10 Grooves/inch	Oats, Wheat, Barley, & Corn-dry w/roll speed diff-fine grind (approx. 800-900 microns), with out/roll speed diff - medium grind (approx. 1,100 - 1,400 microns)
7 Grooves/inch	Wheat, Barley, & Corn-Dry.
5 Grooves/inch	Barley, Corn-Dry, & Corn-Hi moisture. Cracked grind (approx. 1,500 - 2,000 microns). Without/roll speed diff. coarse grind (approx 2,000 - 2,500 microns)

All projected particle sizes will vary depending on quality of grain, roll spacing (gap), power input, roll speed differential drive and the general operation of the mill.

It is recommended for farmers who cannot afford to be down for a period of time to keep an extra set of rolls on hand for such a case.

Rolls can be regrooved at the factory to reduce the cost of operation. The exchange roll policy works in the following matter:

1. We ship you a set of regrooved rolls to replace the existing rolls in your mill (this policy works best if rolls are ordered through your helpful Art's-Way dealer, if ordered by an individual your new rolls will come C.O.D.)
2. When your used rolls are returned to the factory, ***Via Prepaid Freight***, we allow credit for the roll deposit. Invoice will include a roll deposit charge unless used rolls are returned in advanced.
3. Roll ***prices are for roll assemblies*** including roll, shaft and bearings through 20" rolls. 30" and 36" roll prices are for the ***roll only***, with bearings shaft and tapered bushings priced as extra items.

NOTE: Roll deposit credit will not be allowed on return rolls that are broken or have been previously reworked by others than Art's-Way.

Ship exchange rolls to factory VIA prepaid freight to:

Art's-Way Manufacturing Co., Inc.
P.O. Box 288, Highway 9 West
Armstrong, Iowa 50514-0288

ROLL SPEED DIFFERENTIALS & ROLL CLEANERS (SCRAPERS)

When rolling high moisture grain, RollerMills should be equipped with a roll speed differential for this particular reason. Also, to help in the build up of material on the rolls, roll cleaners (scrapers) may be added.

SPECIFICATIONS

MIXER-PROCESSORS

Tank and Frame

	PM20	PM30	PM30 (45" Discharge)
Capacity of mixing tank:	105 bu. (129 cu.ft.)	150 bu. (187 cu. ft.)	150 bu. (187 cu. ft.)
Height (variable with tire size):	106"	119"	119"
Width with auger feeder:	95"	111"	111"
Overall length:	170"	175"	175"
Weight			
Hopper only:	2,900 lbs.	3,680 lbs.	3,720 lbs.
20" HammerMill:	3,540 lbs.	4,320 lbs.	4,360 lbs.
26" HammerMill:	3,620 lbs.	4,400 lbs.	4,440 lbs.
20" RollerMill:	3,560 lbs.	4,340 lbs.	4,380 lbs.
30" RollerMill:	4,110 lbs.	4,890 lbs.	4,930 lbs.
20" 2-High RollerMill:	4,110 lbs.	4,890 lbs.	4,930 lbs.
20" Ear Corn RollerMill:	4,010 lbs.	4,790 lbs.	4,830 lbs.

Discharge Auger

Auger Diameter:	7"	7"	7"
Auger Tube Diameter:	8"	8"	8"
10' main auger at 60° angle:	16'7"	NA	NA
Horizontal operating arc:	324°	316°	316°
Vertical operating arc:	Infinite	Infinite	Infinite

Auger Feeder

Auger Length			
20" HammerMill:	100"	100"	100"
26" HammerMill:	100"	100"	100"
20" RollerMill:	117"	117"	117"
30" RollerMill:	117"	117"	117"
20" 2-High RollerMill:	NA	NA	NA
20" Ear Corn RollerMill:	NA	NA	NA
Auger Diameter			
20" HammerMill:	10"	10"	10"
26" HammerMill:	10"	10"	10"
20" RollerMill:	7"	7"	7"
30" RollerMill:	7"	7"	7"
20" 2-High RollerMill:	NA	NA	NA
20" Ear Corn RollerMill:	NA	NA	NA
Hopper width open			
20" HammerMill:	20"	20"	20"
26" HammerMill:	26"	26"	26"
20" RollerMill:	23"	23"	23"
30" RollerMill:	23"	23"	23"
20" 2-High RollerMill:	NA	NA	NA
20" Ear Corn RollerMill:	NA	NA	NA
Height of hopper from ground in down position			
20" HammerMill:	16-1/2"	16-1/2"	16-1/2"
26" HammerMill:	16-1/2"	16-1/2"	16-1/2"
20" RollerMill:	17-1/2"	17-1/2"	17-1/2"
30" RollerMill:	17-1/2"	17-1/2"	17-1/2"
20" 2-High RollerMill:	NA	NA	NA
20" Ear Corn RollerMill:	NA	NA	NA

SPECIFICATIONS

HAMMERMILLS*

	20"	26"
Width of Mill:	Full 20"	Full 26"
Screen area:	600 sq. in.	780 sq. in.
Operating speed of PTO:	540 or 1000 rpm	540 or 1000 rpm
Operating speed of mill:	2800 - 3000 rpm	2800 - 3000 rpm
Screen sizes available:	1/8", 5/32, 3/16", 1/4", 3/8", 1/2", 5/8" 3/4", 1", 1-1/4", 1-1/2" & 2"	1/8", 5/32, 3/16", 1/4", 3/8", 1/2", 5/8" 3/4", 1", 1-1/4", 1-1/2" & 2"
Type drive:	Six double banded 3V belts for 540 or 1000 rpm	Six double banded 3V belts for 540 or 1000 rpm
Power required:	40 to 100 hp	80 to 150 hp

*Mixer can be operated with HammerMill drive pin disengaged from input drive pulley. Hardened swinging hammers reversible four times. Heavy duty 2-1/4" main shaft with 2" self-aligning dust sealed heavy-duty pillow block bearings. Swing open door with over center latch allows quick removal and installation of screen.

ROLLERMILLS**

	20"	30"	20" 2-High	20" Ear Corn
Width of mill:	20"	30"	20"	20"
Roll diameter:	10"	10"	10"	10"
Screen area:	NA	NA	NA	NA
Operating speed of PTO:	540 rpm	540 rpm	540 rpm	540 rpm
Operating speed of mill:	540 rpm	540 rpm	540 rpm	540 rpm
Roll grooves available:	5, 7 & 10	5, 7 & 10	5, 7 & 10	5, 7 & 10
Type drive:	PTO Direct	PTO/Chain	PTO/Belt	PTO Direct
Power required:	50 hp	80 hp	80 hp	80 hp

** Rolls are regroovable.

SPECIFICATIONS, SELF-CONTAINED

PUMP (540 RPM)

Type: Gear Driven - Positive Displacement
Displacement: 3.87 cu. in. per revolution
Flow (GPM): 9.0 gallons per minute at 540 RPM
Input hp Required: 12.4 hp at 2000 psi
Pressure: 2500 psi

PUMP (1000 RPM)

Type: Gear Driven - Positive Displacement
Displacement: 2.00 cu. in. per revolution
Flow (GPM): 8.65 gallons per minute at 1000 RPM
Input hp Required: 11.9 hp at 2000 psi
Pressure: 3000 psi

HYDRAULIC RESERVOIR

Type: Fabricated pickled and oiled steel
Capacity: 12.5 Gallons
Ports: Suction: 1-1/2" NPT
Return: 3/4" NPT
Drain 3/4" NPT

FILTERS/STRAINERS/BREATHERS

Tank Mounted Suction Strainer

Flow Capacity: 15 GPM
Style: Suction Type
Screen Size: 100 Mesh
Thread Size: 1-1/2" NPT Male
1" NPT Female

Tank Mounted Filler Breather

Breather Filter: 40 Micron
Strainer Basket: 30 Mesh

Return Line Filter

Filtration: 10 Micron
Flow: 20 GPM
Internal Bypass: Relieves at 15 psi difference
Ports: 3/4" NPT

HYDRAULIC MOTORS

Auger Feeder and Lift

Type: Gear, low speed high torque
Displacement: 12.0 cu. in. per revolution
Flow: 9 gpm maximum
Pressure Rating: 1500 psi continuous, 2000 psi intermittent
Ports: 1/2" NPT

Swing

Type: Gear, low speed high torque
Displacement: 20 cu. in. per revolution
Flow Rating: 12 gpm continuous, 15 gpm maximum
Pressure Rating: 1000 psi continuous 1400 psi intermittent
Ports: 1/2" NPT

VALVES

Directional Valve Assembly: Consisting of (2) DO3 Solenoid operated 4 way 3-0position valves mounted on a common manifold.

Valves

Type: DO3 4-way 3 position
Solenoids: 12V Electric
Flow: System design 4 gpm, maximum 20 gpm
Pressure Drop: 25 psi @ 4 gpm, 150 psi @ 20 gpm
Misc: Manual overrides on each solenoid

Manifold

Type: Series
Material: Aluminum
Porting: P & T 7/8"-14 SAE "O" Ring
A & B 3/4"-16 SAE "O" Ring
Gauge 7/16"-20 SAE "O" Ring

Flow Control

Construction: Brass
Maximum
Working Pressure: 2000 psi
Flow (maximum): 8 gpm
Porting: 3/8" NPT

Flow Divider

Flow: 2-14 gpm
Controlled Flow: Preset at 4 gpm
Pressure: 3000 psi maximum
Ports: 1/2" NPT

System Relief

Relief Setting: 2000 psi
Flow: 30 gpm
Ports: 1/2" NPT

Dual Relief (Lift)

Maximum
Pressure: 3000 psi
Preset Pressure: 800 psi
Ports: 1/2" NPT

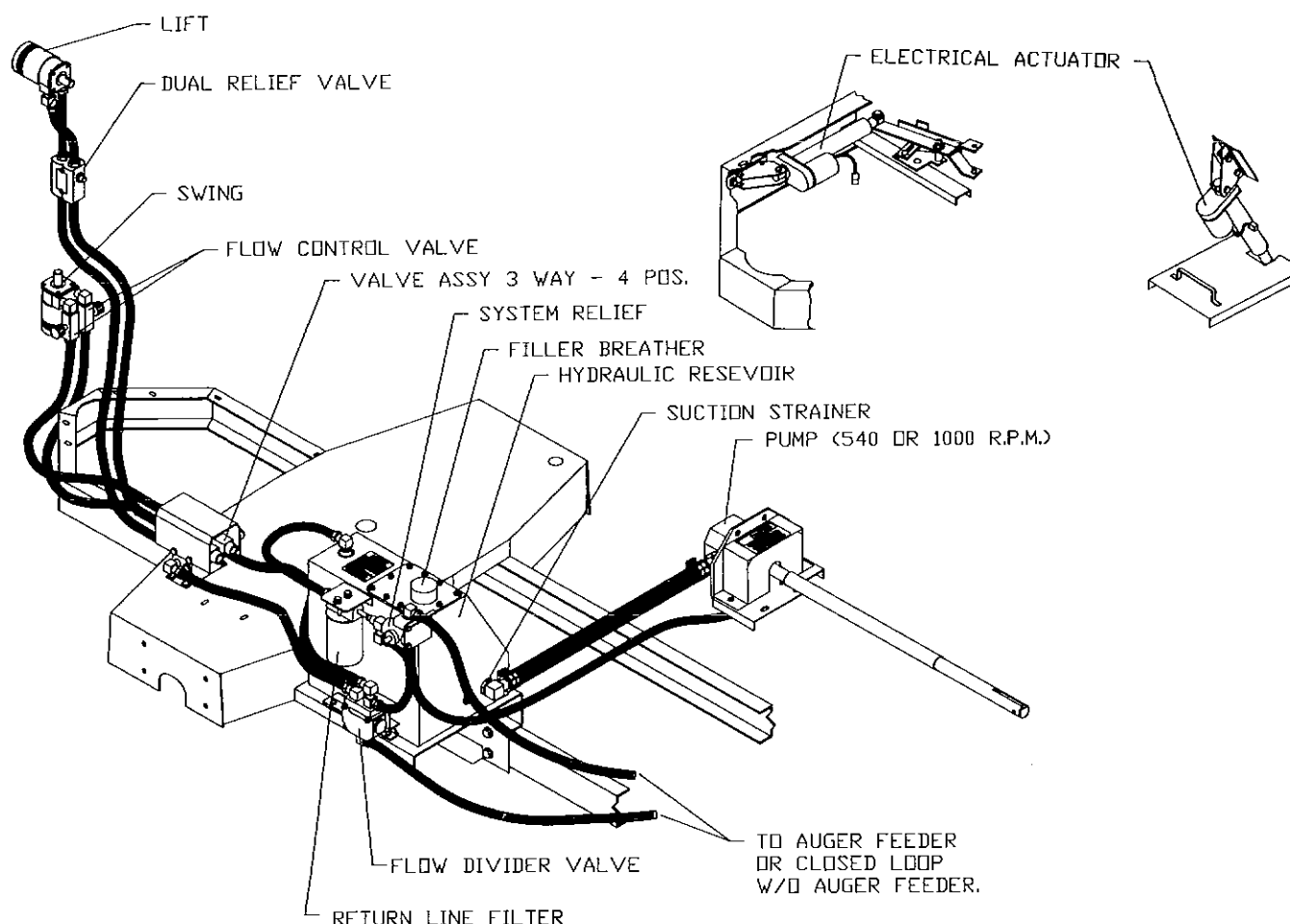
Adjustable Flow Control

Flow Range: 0-16
Maximum
Pressure: 3000 psi
Ports: 1/2" NPT

ELECTRICAL ACTUATORS

Type: 12 volt DC
Load Rating: 250 lbs.
Stroke: 8"
Overload
Protection: Ball detent overload clutch
Drive: Acme screw thread

SPECIFICATIONS, SELF-CONTAINED



TORQUE GUIDE, SAE GRADE IDENTIFICATION

TIGHTENING TORQUE GUIDE, SAE GRADE 5 - COARSE THREAD

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(1.00)	38,625	644 ft. lbs.	483 ft. lbs.
1-1/8 - 7(1.125)	42,375	794 ft. lbs.	596 ft. lbs.

IDENTIFICATION OF SAE BOLT GRADES; HEAD MARKINGS

Grades 0, 1, and 2 no markings



Grade 5: 3 radial dashes 120° apart



Grade 8: 6 radial dashes 60° apart





Quality Manufacturers of:

- **Portable Mixer-Processor**

105 bu. or 150 bu. tank sizes with optional Hopper, HammerMill (20" & 26") or RollerMill (20", 30", 20" 2-High & 20" Ear Corn).

- **GRIXXER - Mixer-Processor**

Economical portable 105 bu. Grinder Mixer with a 20" HammerMill – other options available.

- **Stationary Feed Systems for All Feed Grains**

1 Ton, 2 Ton or 3 Ton vertical mixing tank. Micro Ingredient, multiple scale, and full automation options available.

- **HammerMills**

6", 20" or 26" electrically driven mills.
20" or 26" PTO driven mills.

- **RollerMills**

10", 20", 30" or 36" PTO or electrically driven mills.

- **Silamix – Mixing/Feed Wagon**

175 bu. or 250 bu. box capacity.

- **Ag SCALE**

Indicators -- from basic weighing to a computerized system that will manage the most complex operation imaginable.

Platform Scales.

Universal Scales.

Small Animal Scales.

- **Flail Shredders**

144", 180" & 240" cutting widths.

- **Finishing Mowers and Rotary Cutters**

60" or 72" Rear Mount and Mid-Mount Mowers.

60", 72" or 84" Cutters.

- **Eversman PreSeeder**

15' to 30' tillage tool that prepares the ideal seed bed, incorporates chemicals and plants in one pass.

- **Eversman Ditchers**

43" to 84" ditch width.

20" to 33" ditch depth.

- **Eversman Land Levelers**

9'3" to 14' cutting blade width.

19" to 30" cutting blade depth.

- **Eversman Land Planes**

12', 16', 20' & 24' blade widths.

- **Eversman Scrapers**

78" cutting width.

6 to 16'6" struck capacity.

7'6" to 21' heaped capacity.

- **Sugar Beet Defoliators**

4 to 8 row defoliators with different row spacings. Optional hydraulic or mechanical scalpings.

- **Sugar Beet Harvesters**

4 to 8 row harvesters with different row spacings.

- **MEGA tater**

4-row potato harvester.

Art's-Way Manufacturing Co., Inc.

Armstrong, Iowa 50514-0288