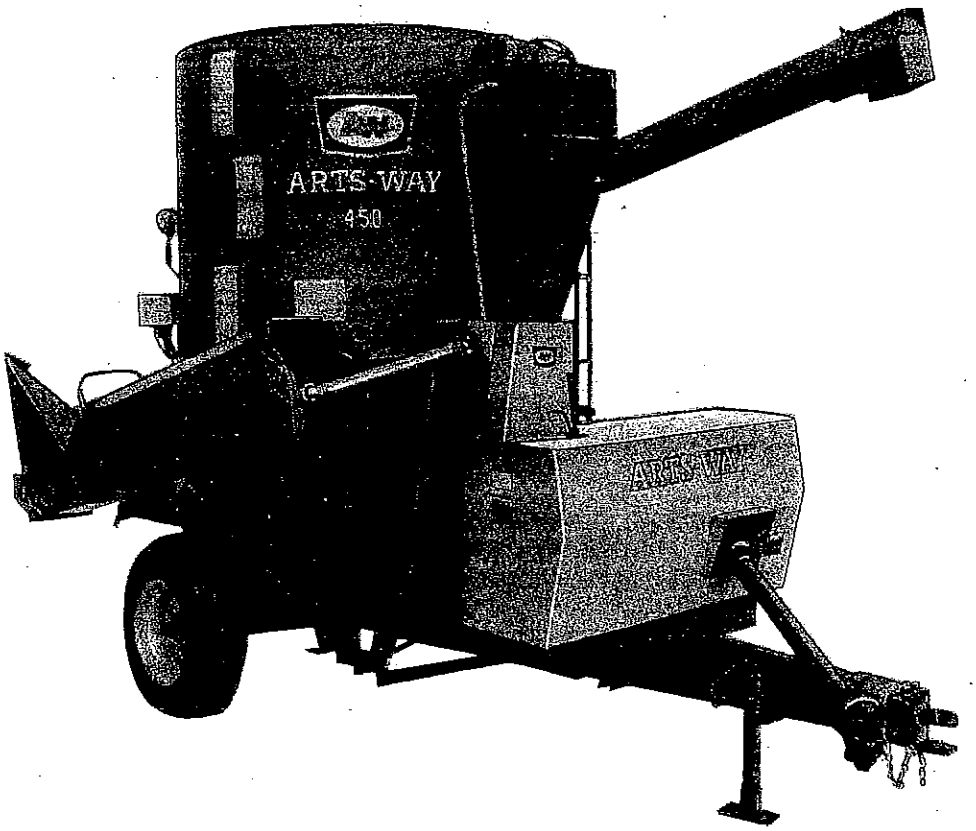
ARTS-WAY

OPERATOR'S MANUAL



Model 450

FEED MIXER AND MILL

ARTS-WAY

Mfg. Company / Armstrong, Iowa 50514 / Phone (712) 864-3131

Part No. 099-14565-0

ARTS-WAY

Manufacturing Company / Armstrong, Iowa 50514 / Phone (712) 864-3131

INFORMATION FOR ORDERING MIXER AND MILL PARTS

Refer to Model 450 Parts Manual, Part No. 099-14885-0

OWNERS NAME _____

ADDRESS _____

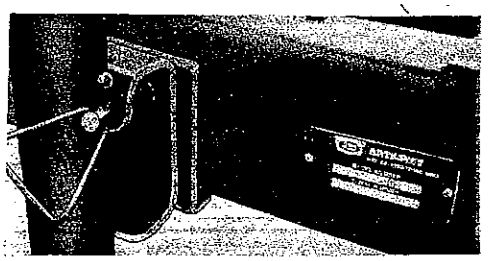
DEALERS NAME _____

ADDRESS _____

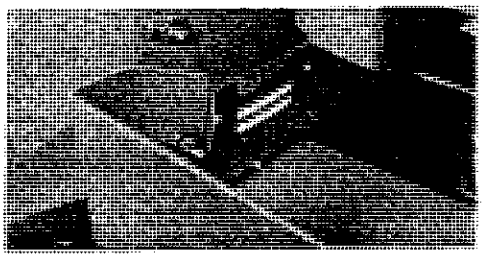
SERIAL NUMBER — Mixer _____ **Mill** _____

Drag _____ **Bale Feeder** _____

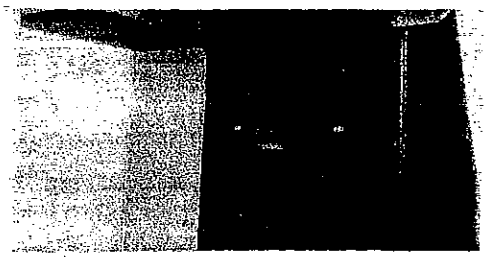
DATE PURCHASED _____



MIXER NUMBER



MILL NUMBER



DRAG NUMBER

CUT ALONG THIS LINE FIRST

DELIVERY SERVICE FOR ARTS-WAY EQUIPMENT

This form must be filled out by the dealer and signed by both the dealer and the customer at the time of delivery.

Delivered to _____ Dealer _____

R.R. No. _____ Box No. _____ Town _____ State _____

Town _____ Serial No. _____

State _____ Zip _____ Product _____

I have thoroughly instructed the buyer on the above described equipment which review included the Operator's Manual content, equipment care, adjustments, and safe operation. The warranty policy provisions were also explained and reviewed.

_____
DEALER'S SIGNATURE

Above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

_____ _____
DATE *OWNER'S SIGNATURE*

DEALER'S COPY

FOLD BACK HERE AND ADD CARBON

FOLD FORWARD HERE AND ADD CARBON

DELIVERY SERVICE FOR ARTS-WAY EQUIPMENT

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_____ _____
DATE *OWNER'S SIGNATURE*

OWNER'S COPY

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Above equipment and Operator's Manual have been received by me and I have been thoroughly instructed as to care, adjustments, safe operation and applicable warranty policy.

_____ _____
DATE *OWNER'S SIGNATURE*

ARTS-WAY OFFICE COPY

TO THE OWNER

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

WARRANTY

The material and workmanship in this unit is, to the extent manufactured and produced by the ARTS-WAY MANUFACTURING CO. and subject to the terms and conditions contained in our Sales Order, warranteed for a period of one year after shipment from our factory. Elements not manufactured in the Arts-Way factory are warranteed only to the extent warranteed by the manufacturer thereof.

WORK SAFELY — FOLLOW THESE RULES

This safety alert symbol identifies important safety messages in this manual. It means — ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! When you see this symbol, be alert to the possibility of personal injury and read the message that follows.

A CAREFUL OPERATOR IS THE BEST INSURANCE AGAINST AN ACCIDENT.

BEFORE OPERATING

Do not wear loose-fitting clothing which may catch in moving parts.

Use extreme care when making adjustments. Shut off machine before making adjustments.

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

Keep all safety shields in place.

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

Be sure that the correct power take-off parts are used and that they are properly secured.

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

DURING OPERATION

No one other than the operator should ride on the tractor.

Do not attempt to remove any obstructions while operating the machine.

Always disengage the auger drag before transporting. Do not open any covers and expose the rotor or belts while they are rotating.

Shut off the tractor engine and be sure to wait until all moving parts have come to a complete stop before adjusting, cleaning, or lubricating.

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

Use extreme care when operating over uneven or rough terrain.

Keep all shields in place and in good condition.

Keep children away from machine in operation.

ON-HIGHWAY OPERATION

Check clearance carefully before towing the grinder-mixer over bridges and into buildings.

Always place the machine in the transport position.

For daytime and nighttime, accessory light and devices should be used for adequate warning to operators of other vehicles.

Comply with your state and local laws governing highway safety, and with regulations when moving machinery on a highway.

Drive at a reasonable speed to maintain complete control of the machine at all times.

When transporting on the highway, it is recommended that a safety chain be used with the tractor and grinder-mixer.

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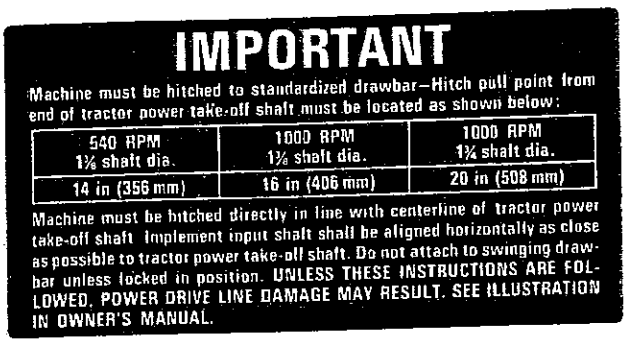
SAFETY DECALS

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

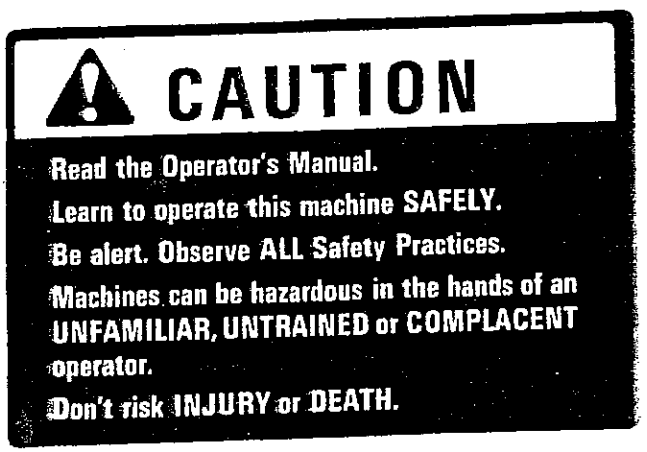
No. 1 — "IMPORTANT" — FOR 540 R.P.M./ P.T.O. OPERATION" — Part No. 447-12117-0. DO NOT operate with 1000 R.P.M./P.T.O (Located on front of main shield at bottom edge of P.T.O. opening on units with 540 rpm PTO operation.)

No. 2 — "IMPORTANT" — FOR 1000 R.P.M./ P.T.O. OPERATION" — Part No. 447-14602-0. DO NOT operate with 540 R.P.M./P.T.O. (Located on front of main shield at bottom edge of P.T.O. opening on units with 1000 rpm P.T.O. operation.)



No. 3 — "IMPORTANT" — Machine must be hitched to standardized drawbar. Unless these instructions are followed, power drive line damage may result. (Located on side of frame.) Part No. 447-11537-0.

No. 4 — "CAUTION" — Safety Shield caution decal, Part No. 447-11538-0 lists four basic rules to be observed at all times around this machine. (This is located on the top of the main drive shield.)



No. 5 — "CAUTION" — Safety caution decal Part No. 447-11543-0. (Located on the front of the main shield next to P.T.O. opening.)

No. 6 — "DANGER" — Decal, Part No. 447-11777-0 warning of the danger to stay off of machine when it is running. (Located on the top of the main shield.)

DANGER

Stay off machine when it is running. Shut off tractor engine and remove ignition key for safety while working in or around machine.

CAUTION

Always shut off tractor engine before engaging or disengaging flywheel drive pin. Refer to operator's manual.

No. 7 — "CAUTION" — Decal, Part No. 447-14563-0. Never leave tractor engine running while engaging or disengaging flywheel drive pin. (Located on the front of the main shield next to the P.T.O. opening.)

No. 8 — "CAUTION" — Decal, Part No. 447-04927-0. Never open any cover while the cutting mechanism inside is operating. (Located three places: Hammermill Door, Tank Cone Access Door, and Top Tank Lid.)

CAUTION

Do not open cover until the mechanism has stopped.

SAFETY CHAIN

TRANSPORTING GRINDER-MIXER BY ROAD

Whenever Grinder-Mixer is to be transported on a public thoroughfare, observe these instructions.

1. Always use safety chain and secure safely.
2. Keep road speed down to maximum of 10 M.P.H. especially over rough roads and when going down inclines.

MOUNTING INSTRUCTIONS

1. Mount chain on hitch channel by running chain through loop and running hook through the large ring at end of chain and pull tight as shown in Figure A.
2. Run the chain through a clevis pin bolted on the tractor drawbar, then wrap the chain around a supporting member of the tractor and hook as shown in Figure B.

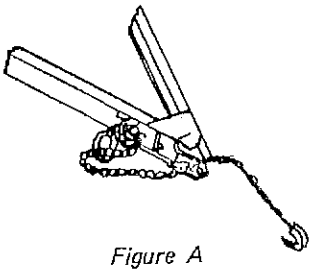


Figure A

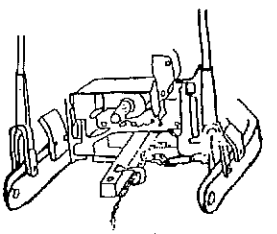


Figure B

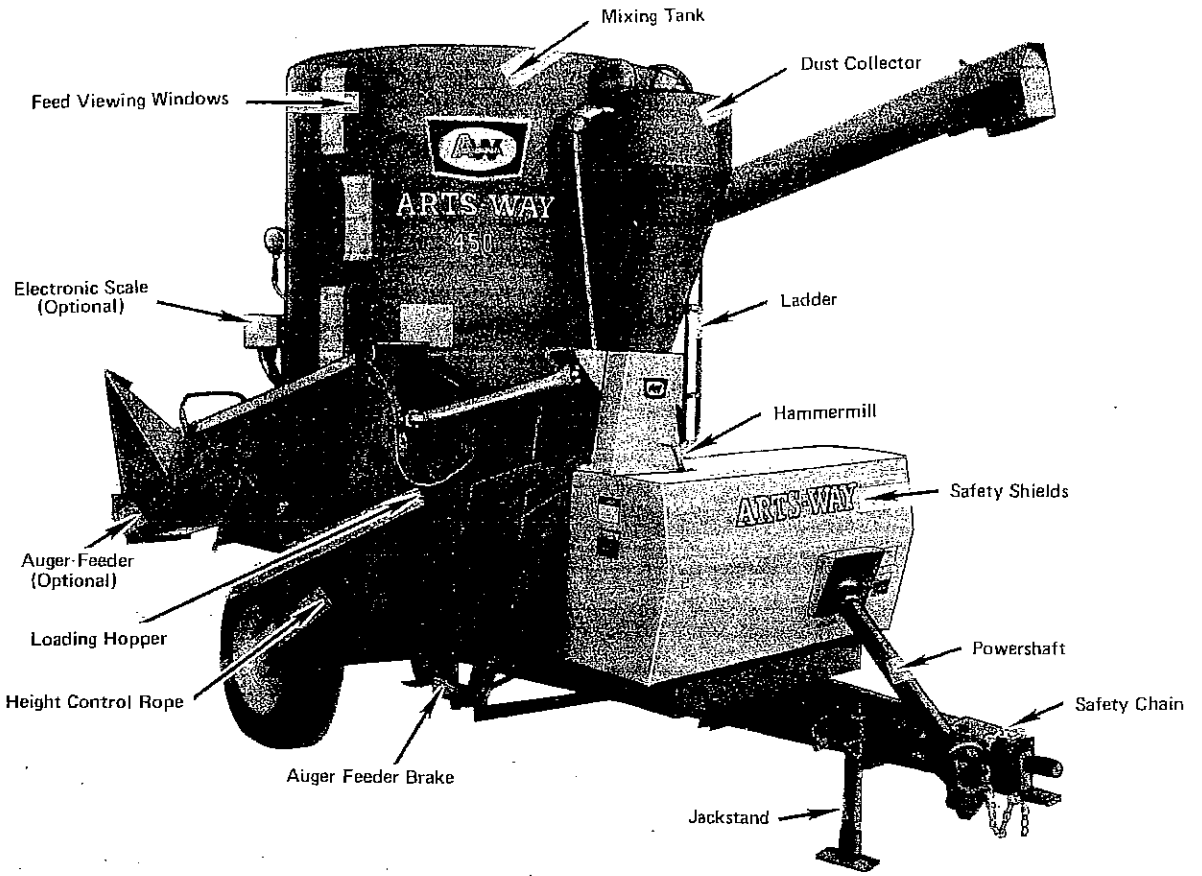


Figure 1 — Front Corner View of Model 450 Grinder-Mixer

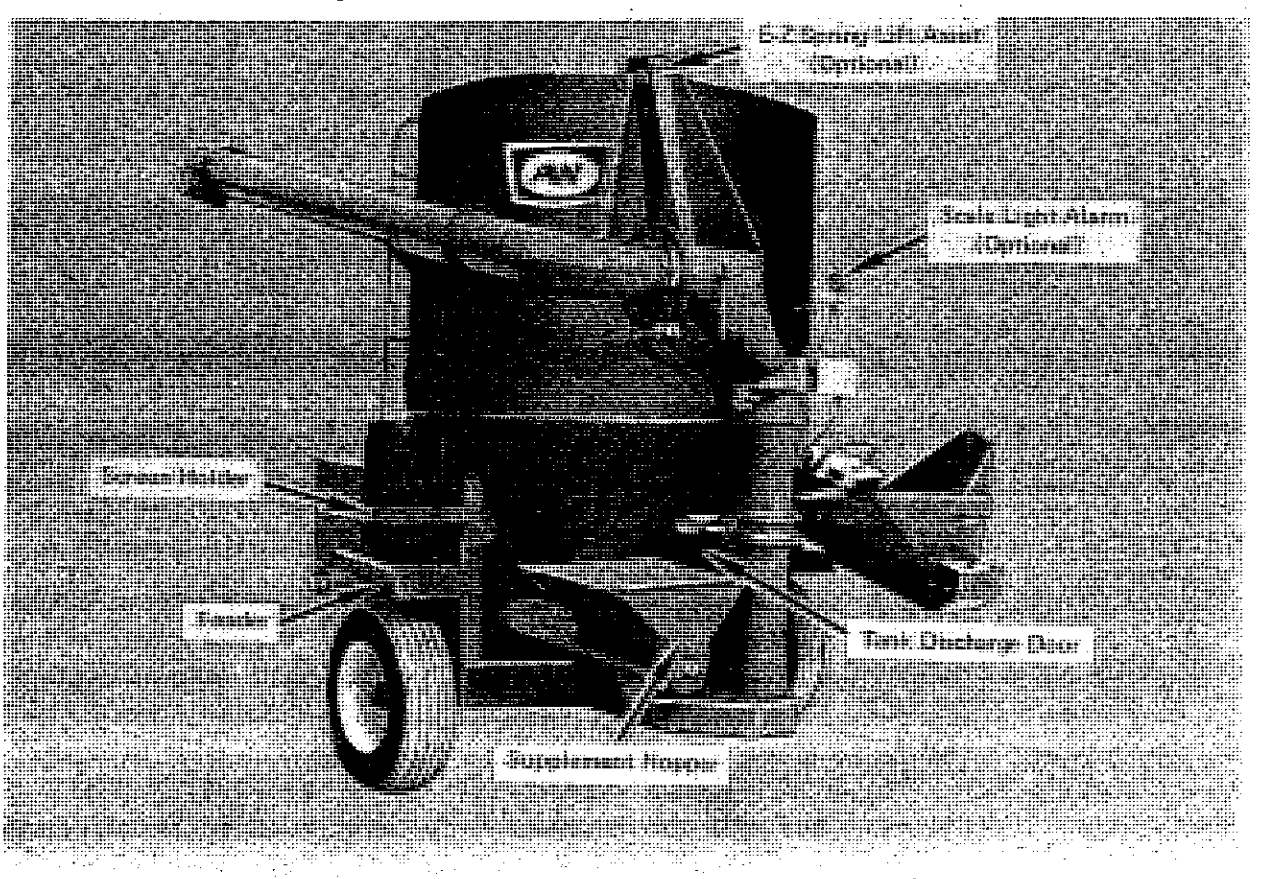


Figure 2 — Rear Corner View of Model 450 Grinder-Mixer

OPERATION

INTRODUCTION

This manual has been prepared to acquaint the new owners with the Arts-Way Model 450 Grinder-Mixer. It should help you better understand the efficient operation and care of your Portable Unit.

Whenever the terms "left" and "right" are used, it should be understood to mean from a position behind and facing the machine.

The Arts-Way 450 Grinder-Mixer is P.T.O. driven by a two to five-plow tractor and is factory-available with either a 540 or 1000 rpm P.T.O. drive. Each respective speed should be maintained as the grinder operates best at 2800 to 3000 RPM. DO NOT EXCEED 3000 RPM.

CAUTION: Never operate 540 rpm grinder-mixer with 1000 rpm tractor.

Before operating your grinder-mixer, select and install the size screen desired. Two screens are furnished with the machine and additional sizes are available from 1/8 to 2 inch openings. The screen size is determined by the fineness desired.

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

The ground feed is mixed continuously until the tractor P.T.O. is disengaged. When grinding is completed, turn off the tractor ignition and disengage the hammermill. The feed can then continue to mix without running the hammermill.

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

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

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

A number of optional attachments are available for special conditions and are illustrated on pages 28 through 31. Some of the attachments include:

1. Mechanical or hydraulic driven auger feeder.
2. Combination baled hay-grain feeder.
3. Rollfeed in mill throat.
4. Magnet in mill throat.
5. Electronic scales, either analog or digital.
6. Horn or light for electronic scales.
7. Governor for use with smaller tractors.
8. Hydraulic lift and swing unloading auger.
9. Additional vertical back auger extension.
10. Discharge auger extensions, either clamp-on or swing around type.
11. Spring lift assist for discharge auger.
12. Molasses attachment.
13. Corn Sheller attachment.
14. Double discharge tube sacker.
15. Three tire sizes.

PREPARING THE GRINDER-MIXER

Bolts and Nuts

Before starting to operate the grinder-mixer, check all nuts and bolts for tightness. Also check that all cotter pins are spread. After operating the grinder-mixer for several hours, check all bolts for proper torque. See bolt specifications in the chart on page 25.

All cap screws used in the grinder-mixer are "high-strength" and if replaced, cap screws of equal or higher strength should be used. "High-strength" cap screws are identified by three radial dashes on the hex head.

Tire Inflation

Check tires for proper inflation pressure. See Page 16 for recommended care of tires and inflation pressure.

Lubrication

Lubricate the grinder-mixer at regular intervals as instructed on pages 21 through 24.

Assembly

Install implement end of power shaft by fastening to input jackshaft with 5/16 x 3-1/2 clevis pin and cotter pin provided. Spread cotter pin.

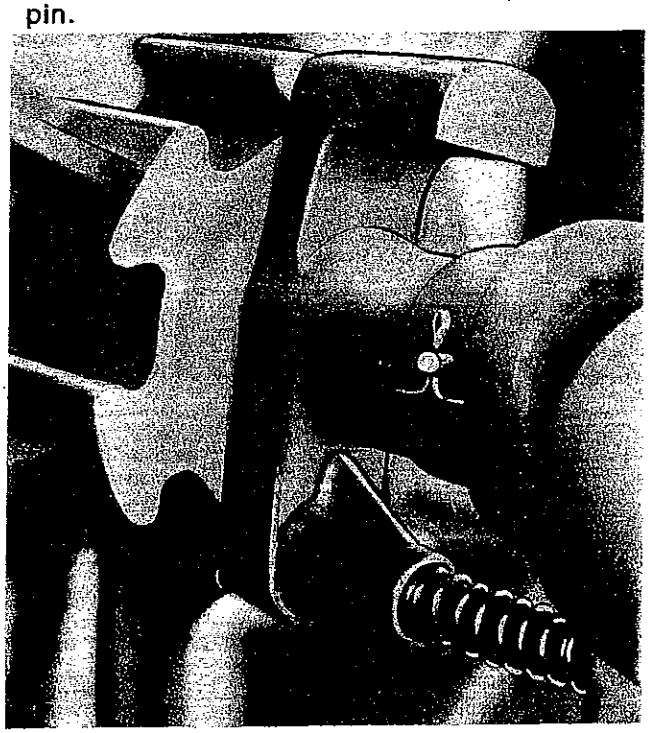


Figure 3 – Installing Powershaft

PREPARING THE TRACTOR

The grinder-mixer may be used on tractors having either 540 or 1000 rmp PTO drives provided the grinder-mixer is equipped with the same speed drive.

The 540 rmp PTO must be limited for use with tractors having a maximum of 90 horsepower. A 1000 rmp PTO can be used with tractors having a maximum of 150 horsepower.

Tractor Hitch

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

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

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

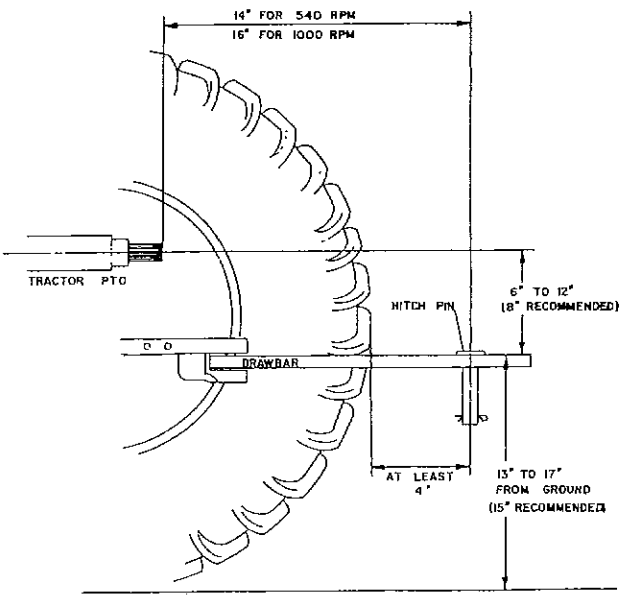


Figure 4 – Hitching Point Locations

ATTACHING TO THE TRACTOR

Back the tractor up to the hitch. Use the handle of the jackstand to raise or lower the grinder-mixer hitch into position to engage the tractor drawbar. Fasten the grinder-mixer hitch to the drawbar with a hitch pin that cannot bounce out. Raise the jackstand and lock into transport position. see Figure 5.

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

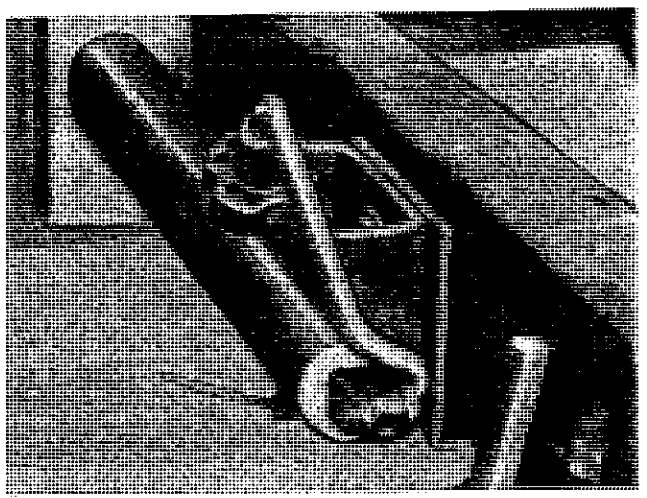


Figure 5 — Jackstand in Transport

If grinder-mixer is equipped with an electronic scale, plug the scale power supply cord into the electrical outlet on the tractor, unless scale is connected to battery on 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 grinder-mixer is equipped with a hydraulic lift and swing back auger or a hydraulic auger feeder, plug the hydraulic hoses into the tractor outlets.

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

Be sure the grinder-mixer is equipped with 1000 rpm drive when operating with a tractor equipped with 1000 rpm PTO drive.

⚠ CAUTION: Never operate 540 rpm grinder-mixer with 1000 rpm tractor.

Before engaging PTO and after making the connection, check to be sure spinner shields are free to rotate.

Before grinding, position tractor straight with frame of grinder-mixer. This will allow smoother PTO operation and prolong powershaft life.

IMPORTANT: When mixing while transporting, avoid sharp turns which may damage the powershaft.

DETACHING FROM TRACTOR

Be sure engine is shut off.

Disconnect powershaft from the tractor and place it in the PTO support bracket. See Figure 6.

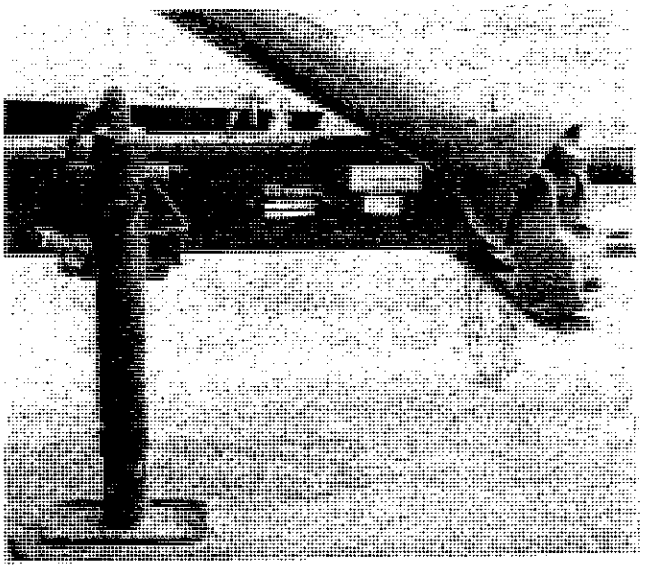


Figure 6 — PTO Support Bracket

Disconnect electronic scale power supply cord from tractor if so equipped.

Disconnect hydraulic hoses from tractor outlets if equipped with hydraulic lift and swing back auger or hydraulic auger feeder.

Block the tires. Lower the jackstand to its storage position. Turn the handle of the jackstand to raise the grinder-mixer tongue off the tractor hitch.

Remove the hitch pin. Drive the tractor away and replace the hitch pin into the grinder-mixer hitch tongue.

GENERAL OPERATION

New machines should be run in 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 will polish the cone and help prevent bridging. After several minutes of running, unload the mixture and discard. Do not feed this material to livestock.

AUGER BEARING

Located in the auger between the grinder and mixer tank is a bearing and bracket. This bearing is used for break-in purposes and only until the first few batches are finished. After this it has no use and must be removed.

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

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

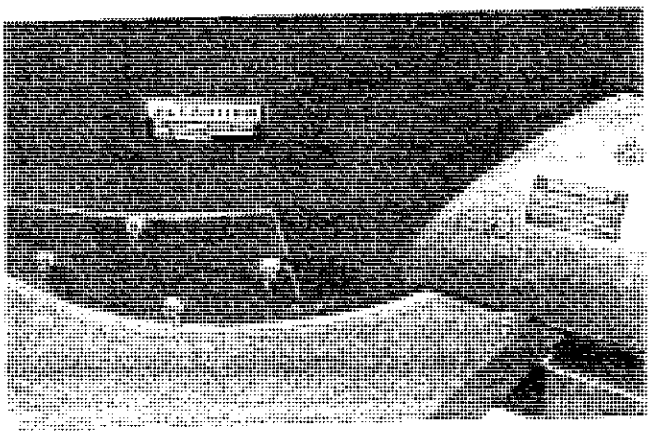


Figure 7 — Bearing Removal and Clean-Out Door

HAMMERMILL CLUTCH PIN

The hammermill clutch pin, Figure 8, is located on the front of the flywheel. Shut off tractor engine before proceeding with this step. To engage, turn the flywheel by hand and push in the pin. When the pin is engaged in one of the six slots in the flywheel, turn it in either direction to lock in place.

IMPORTANT: Always operate PTO at the speed for which machine is rated: 540 or 1000 rpm. Note the speed decal on the front cover.

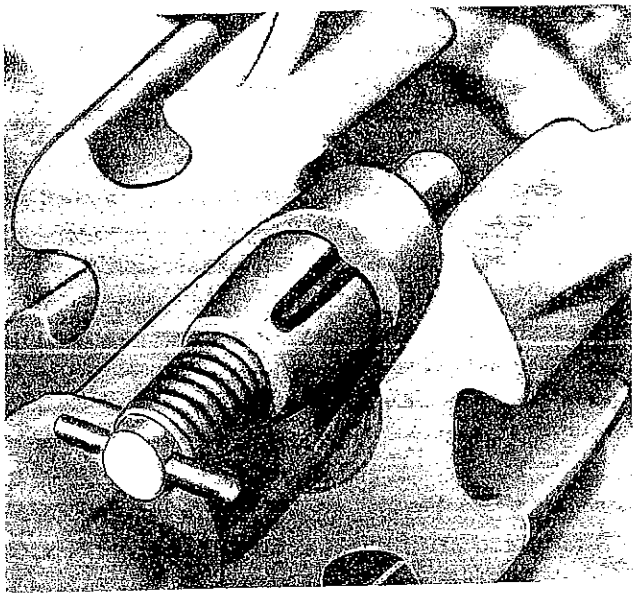


Figure 8 — Hammermill Clutch Pin

TRACTOR PTO LEVER

To operate the mill, make sure the clutch pin is engaged before engaging the tractor PTO. The mixer may be operated by engaging the PTO without engaging the clutch pin. Always engage the PTO with the tractor engine at idle speed. After is is engaged, increase engine speed gradually until operating speed is obtained.

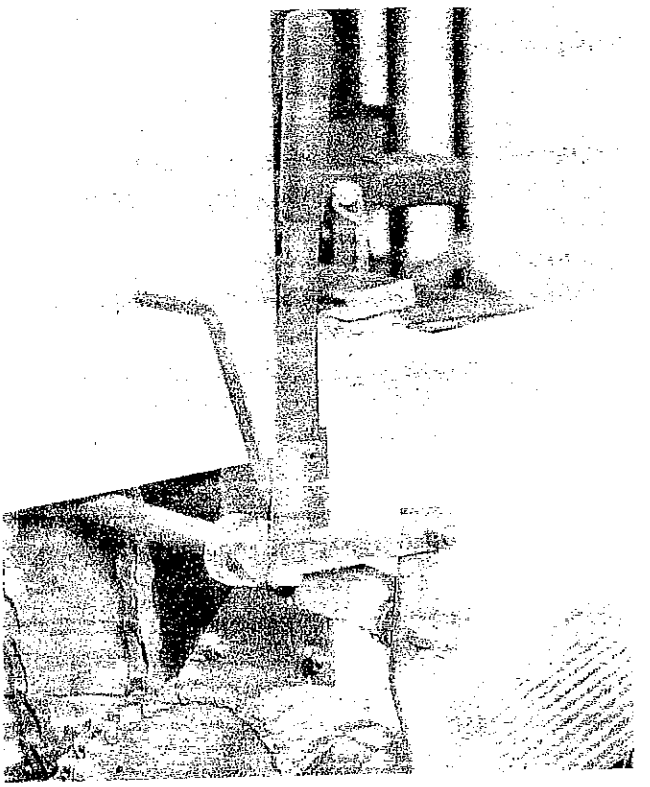


Figure 9 — Feed Control Lever [shields removed for clarity]

CLUTCH CONTROL LEVER

The clutch control lever, Figure 9, engages and disengages the feed roll in the mill throat. It also shuts off power to the auger feeder, or to the combination baled hay/grain attachment, if so equipped.

To engage clutch, lift catch lever and push on control lever. To disengage, pull on either lever at front or rear of mill body. When control lever is disengaged, catch lever will retain in disengaged position.

AUGER FEEDER CONTROL LEVER

The auger feeder attachment may also be controlled from the hopper area. A control lever is located on top of the auger housing, Figure 10. To engage auger, move catch lever in and push control lever forward. To disengage, pull control lever back.

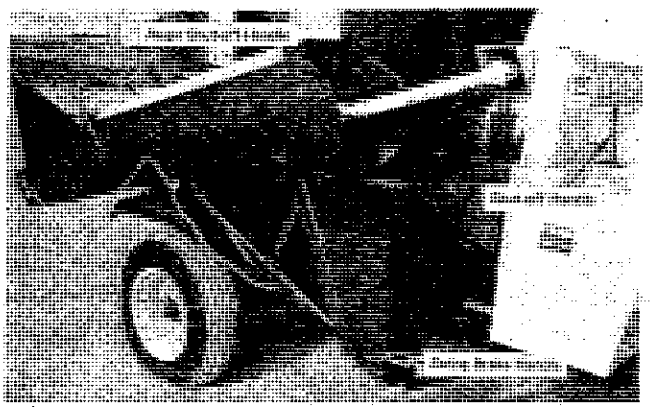


Figure 10 — Auger Feeder Controls

AUGER FEEDER SWING BRAKE

Lock the auger feeder swing brake, Figure 10, to keep the feeder housing in position while grinding. This is helpful with use of the electronic scale because the feeder housing can be held off the ground. The brake prevents the feeder housing from moving out of position.

FEED ROLL CRANK

To maintain even feeding, the feed roll may be set at a desired height by using the feed roll crank, Figure 11.

Feed roll settings will vary with the material being fed. Brief experience will indicate the best settings. Set the feed roll just high enough so that the material is being pulled in smoothly.

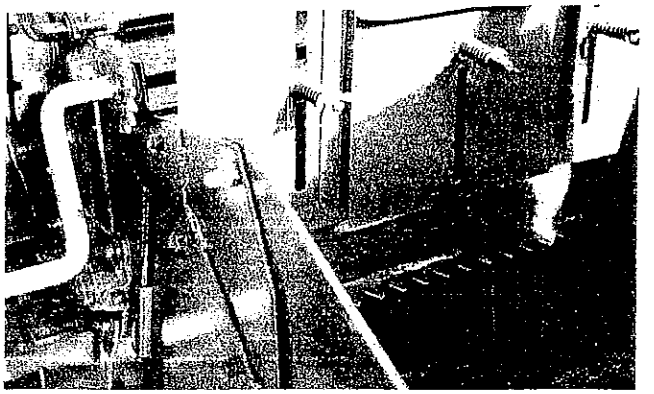


Figure 11 — Feed Roll Crank and Feed Baffles

Set the feed roll to approximately 3/4 maximum height for initial start-up with baled hay when using the combination baled hay/grain attachment. Reset, if necessary, to best working condition.

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

FEED BAFFLE

A feed baffle, Figure 11, is provided in the mill throat to control the flow of grain to the hammermill. It is especially useful if the machine is not equipped with a feed roll or auger feeder. The baffle consists of two sliding doors attached by spring tensioned bolts. The center door may be positioned separately. The feed baffle may be adjusted to any desired height.

Figure 12 — Hay Retard Bolts

HAY RETARD BOLTS

The hay retard bolts, Figure 12, will maintain uniform feeding while grinding hay. The degree of retard is adjusted by loosening the lock nuts on each of the three bolts and turning the bolts in or out to the desired position. Retarding action is increased by turning the bolts in and lessened by turning bolts out. Secure the bolts by again tightening the lock nuts.

HAMMERMILL SCREENS

Screens are available in 12 sizes ranging from 1/8 to 2 inch openings. The screen size will be determined by the type of material and the degree of fineness desired.

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

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

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

CHANGING SCREENS

⚠ CAUTION: Disengage all drives and shut off tractor engine before installing or changing hammermill screens. Never open the hammermill cover until the hammermill has completely stopped running.

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

To install or change the screen, open the hammermill door by removing the locking pin and releasing the latch. Remove the screen with the wire hook provided. The screen support bar will drop down to allow easier screen removal. Install the new screen, close the hammermill door, replace the screen hook and latch the door shut. Be sure to replace the locking pin.

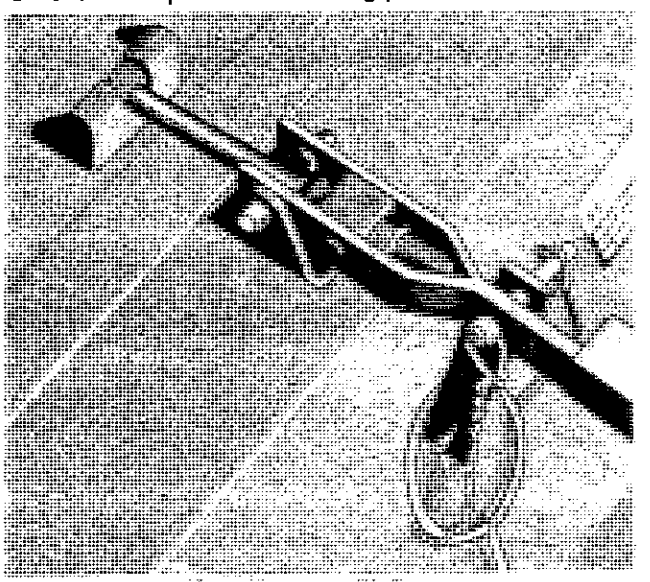


Figure 13 — Hammermill Door

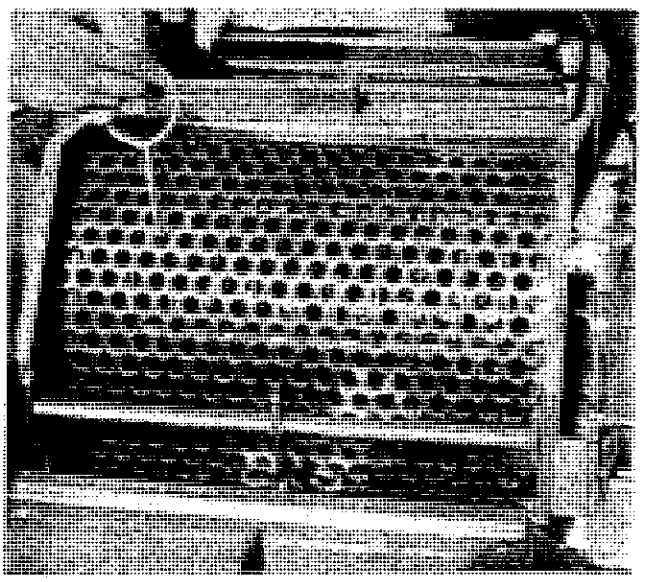


Figure 14 — Changing the Screen

ADDING CONCENTRATE OR SUPPLEMENT

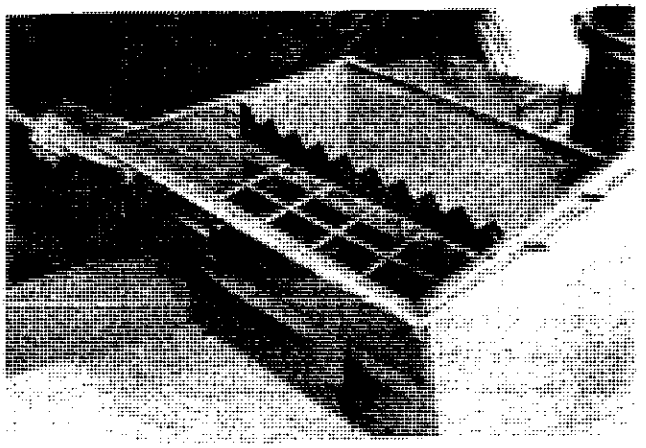


Figure 15 — Adding Supplement

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

For best results, add the concentrate or supplement at the beginning of the grinding operation or within a minute or two after grinding has begun, to insure a thorough mixing. If micro-ingredients are to be added to the feed, the best results are obtained with a premix, or by adding the supplement and the micro-ingredients simultaneously. If the micro-ingredients are desired without a premix or other supplement, open the mixing tank lid and put the ingredients into the mixer. This should be done at the beginning of the operation. Be sure to close the lid before starting. If strong additives are not wanted in the next batch, clean out the tank cone through the clean-out door (See Figure 7, Page 10). After adding concentrates, throw some feed into the hopper. This will push the remaining supplement into the mixing tank.

Close the cover over the supplement hopper when it is not in use. A latch is provided at the front edge of the cover to keep it closed.

GRINDING HAY

If hay is to be ground, grind grains first. Do not grind more than five bales of hay per tank until familiar with results. Large amounts of hay, or coarse ground hay, can cause "bridging" in the tank, resulting in difficult unloading. Add at least ten bushels of grain to each full tank which will aid in unloading. If large quantities of hay are to be ground, 3/4" or smaller screens should be used. If only hay is to be ground, run straight through the machine without filling the mixer tank.

An optional combination baled hay/grain attachment is also available for applications where high hay content rations are fed. This attachment automatically unslabs the hay bale and feeds the slabs into the millthroat. (See page 31).

GRINDING WITHOUT MIXING

To grind any material without mixing, engage the unloading auger lever (See Figure 29), open the tank discharge door (See Figure 2), 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 augered feed.

FILLING MIXER TANK

Be sure the mixing tank unloading door is closed. As the mixing tank is filling, watch the ground feed through the mixer windows. When the top window first becomes covered, the tank is not full since the mixing auger throws material away from the center of the tank. Continue grinding until the top window clears, then becomes covered again about half-way. Stop feeding material into the hammermill at this point, but continue operating until it has had time to clear. Do not overload the mixer; overloading can cause damage to the machine. See Figure 16.

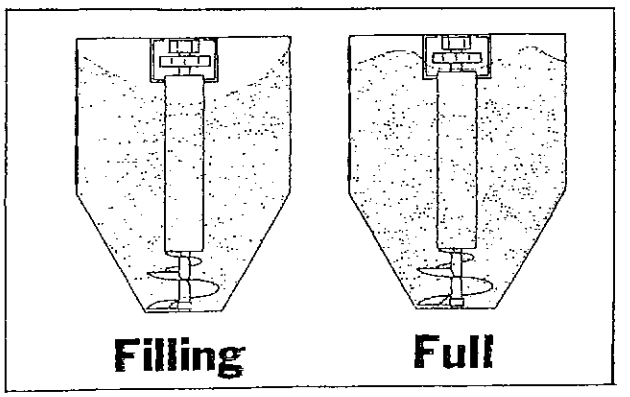


Figure 16 — Filling Patterns

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

SPRING LOADED TANK LID

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

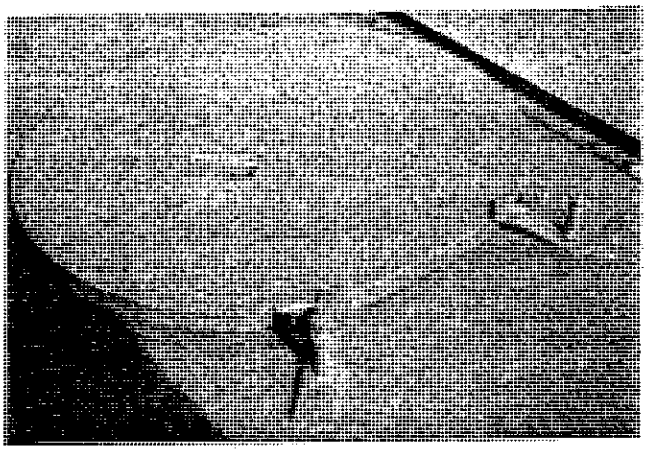


Figure 17 – Spring Loaded Tank Lid

MIXING

After the grinding is completed and the desired ration is in the mixing tank, turn off the tractor engine, disengage the P.T.O. and the hammermill clutch. Restart the engine and engage the P.T.O., allowing the mixer to operate until ready to unload. Run the mixer several minutes to insure a thorough mixing of feed and supplements.

IMPORTANT: Do not make sharp turns when mixing while transporting.

UNLOADING AUGER

After mixing, the finished feed may be unloaded into storage bins, wagons or feeders. To unload, engage unloading auger, before starting tractor, by pulling back unloading auger clutch handle. (Figure 29). Open unloading door in tank so feed fills horizontal auger housing. Tractor P.T.O. speed should be at least 200 rpm.

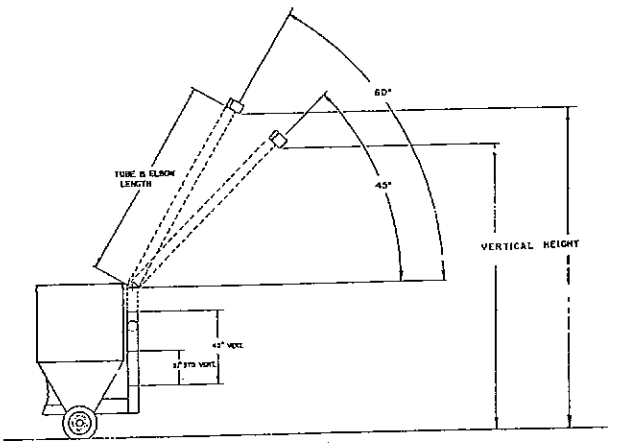


Figure 18 – Unloading Auger Heights

APPROXIMATE CAPACITY CALIBRATION - IN POUNDS

(Actual Weights Vary with Material, Moisture, Screen Size, Etc.)

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

Several optional attachments for the unloading system are available. These include 3 foot and 6 foot swing around type and 3 foot and 5 foot clamp-on type discharge auger extensions. A spring lift assist must be used with any discharge auger extension. Also available is a hydraulic lift and swing unloading auger as well as an additional two foot vertical auger extension. These options will custom tailor the grinder-mixer to almost any unloading height requirements. See chart below.

DISCHARGE AUGER HOOD

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

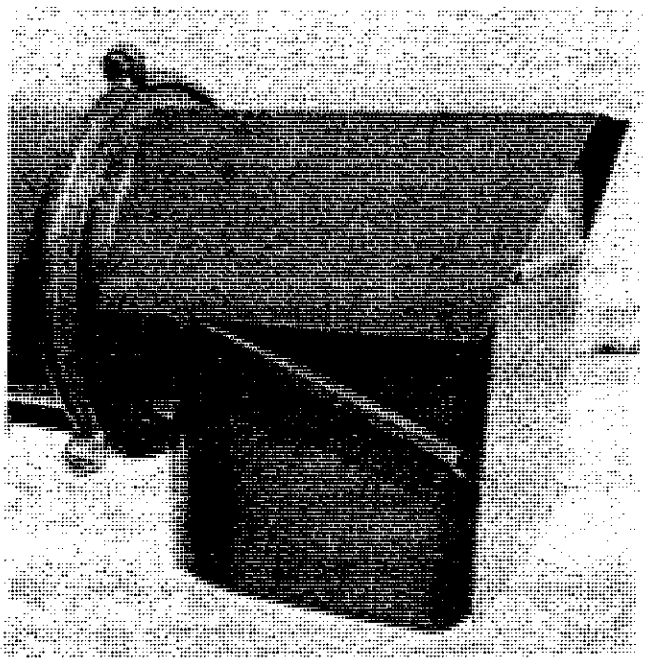


Figure 19 — Discharge Auger Hood

POSITIONING UNLOADING AUGER

The discharge unloading auger normally rests in a saddle either at the left or right side of the mixing tank. Insert the crank handle onto the worm gear shaft and crank to raise the discharge auger out of the transport saddle. Pull the discharge tube around to the desired position. The complete auger tube can be rotated and placed on the opposite side of the mixer frame. The discharge auger hood can also be rotated so that it points downward.

AUGER DRAG FEEDER SPEED

Four speeds are obtainable on the mechanical auger drag feeder attachment. Speeds are

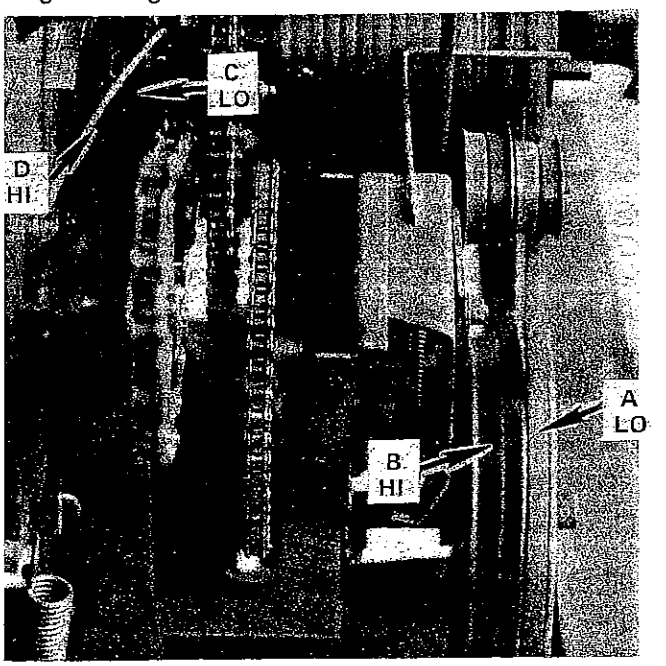


Figure 20 — Auger Drag Speed Changes

DISCHARGE UNLOADING HEIGHTS OBTAINABLE ON LEVEL SURFACE

(See Figure 18)

Discharge auger configuration	Tube and elbow combined length	Discharge at 45 degrees: Standard 21" vertical auger	Discharge at 45 degrees: Optional 45" vertical auger	Discharge at 60 degrees: Standard 21" vertical auger	Discharge at 60 degrees: Optional 45" vertical auger
Standard - no extensions	113"	12'-11"	15'-2"	14'-5"	16'-8"
3 foot clamp-on or swing around auger extension	149"	15'-0"	17'-3"	17'-0"	19'-3"
5 foot clamp-on auger extension	173"	16'-5"	18'-8"	18'-9"	21'-0"
6 foot swing around auger extension	185"	17'-2"	19'-5"	19'-7"	21'-10"

changed by switching the belt to **hi** or **lo** or switching the chain to **hi** or **lo**. The following chart shows auger speeds with the four settings of belt and chain.

AUGER DRAG FEEDER SPEEDS

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

CARE OF RUBBER TIRES

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

Recommended tire inflation pressure is:

9.5L-15,	6-PR tires—32 psi.
10.00-15,	8-PR tires—36 psi.
11L-15,	8-PR tires—32 psi.

Equal tire pressure insures against sway when towing the grinder-mixer.

TRANSPORTING

Before transporting the grinder-mixer, be sure to read and follow these instructions carefully.

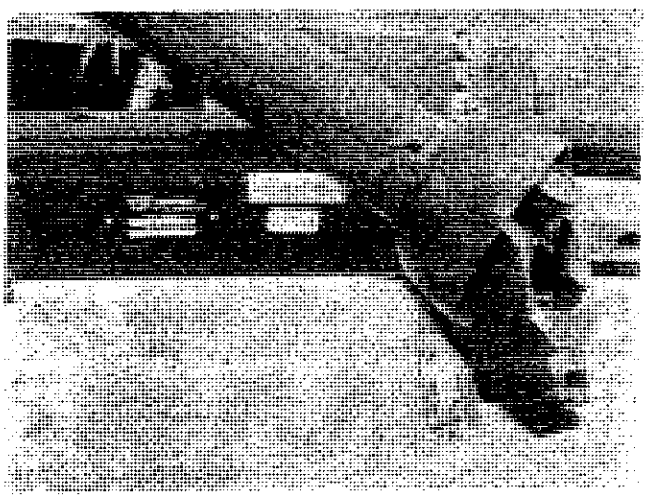


Figure 22 — Transport Position

⚠ CAUTION: Always transport a loaded grinder-mixer at slow speed [10 mph or less] and be extra careful in hilly country.

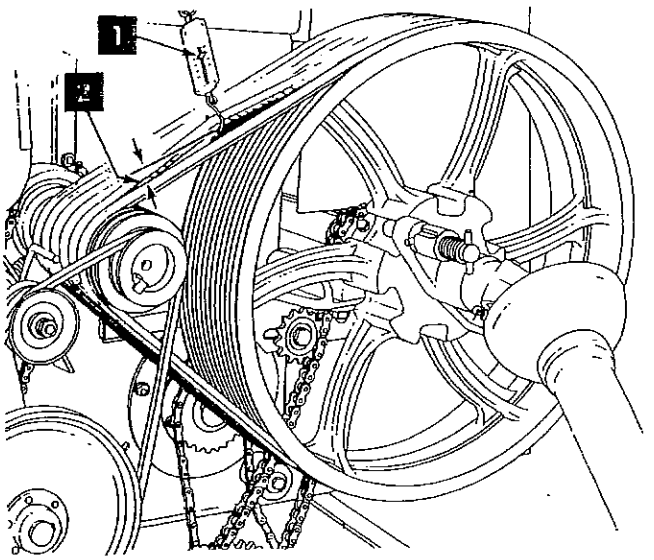
Be sure the hitch pin is locked in place and the safety chain is properly installed. Place power-shaft in transport position. Place jackstand in transport position.

Make sure unloading auger is secured in saddle. If grinder-mixer is equipped with drag feeder or combination baled hay/grain feeder, make sure they are secured with pin into transport position.

When driving tractor and grinder-mixer on a road or highway, whether at night or during day, use accessory lights and SMV identification emblem. Use of a flashing amber light is acceptable in most localities. However, some localities prohibit use of them. Local laws should be checked for all highway lighting and marking requirements.

ADJUSTMENTS

MAIN DRIVE BELTS



1 – 15 pounds
2 – 1/4 inch

Figure 23 – Checking Belt Tension
[Shield removed for clarity]

Belts on new machines have been properly tensioned at the factory. To retension belts on machines which have been in operation, the following procedure should be followed:

Loosen bolts B and C (Figure 24), place a scale at the double V-belt midway on the pulleys, adjust bolts A (Figure 24), until fifteen pounds of pull on the scale raises the top of one double V-belt approximately 1/4 inch above the top of the remaining belts. (See Figure 23). All six pairs of belts should have an average of 1/4 inch deflection at fifteen pounds. Also see Figure 25.

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

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

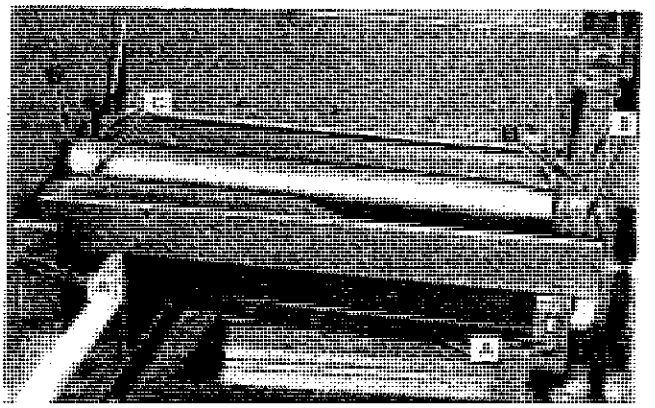


Figure 24 – Belt Tension Adjustment
[Shield removed for clarity]

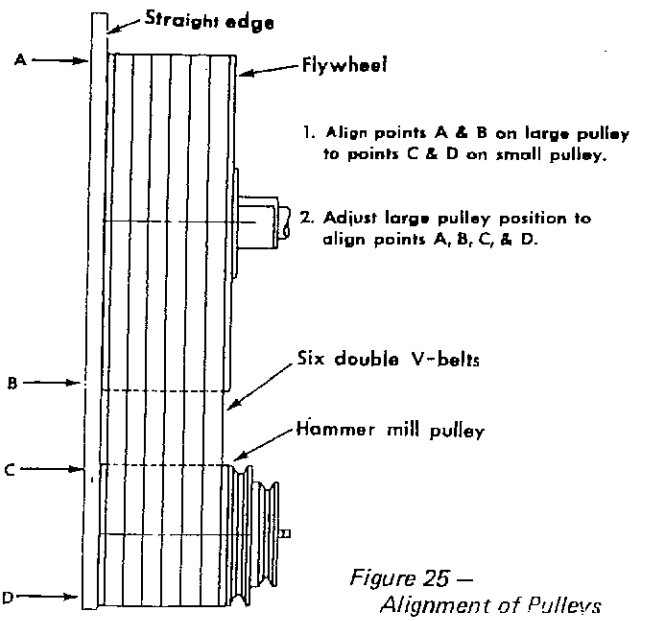


Figure 25 – Alignment of Pulleys

MAIN DRIVE CHAIN

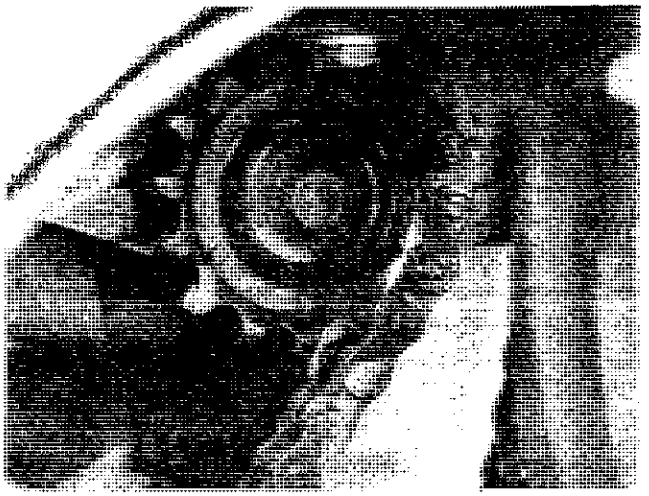


Figure 26 — Drive Chain Adjustment [Shields removed for clarity]

Adjust the tension of the main drive chain (See Figure 26), by loosening the idler sprocket bolt and sliding the idler sprocket towards the chain. Retighten idler sprocket bolt. Chain deflection should be 1/2 inch total at longest span.

AUGER DRIVE CHAINS

The mill to tank auger drive chain (1 Figure 39), and the supplement hopper drive chain (Figure 27), are tensioned with a wood block idler. Adjust the chain tension to 1/2 inch total deflection by positioning the wood block idler.

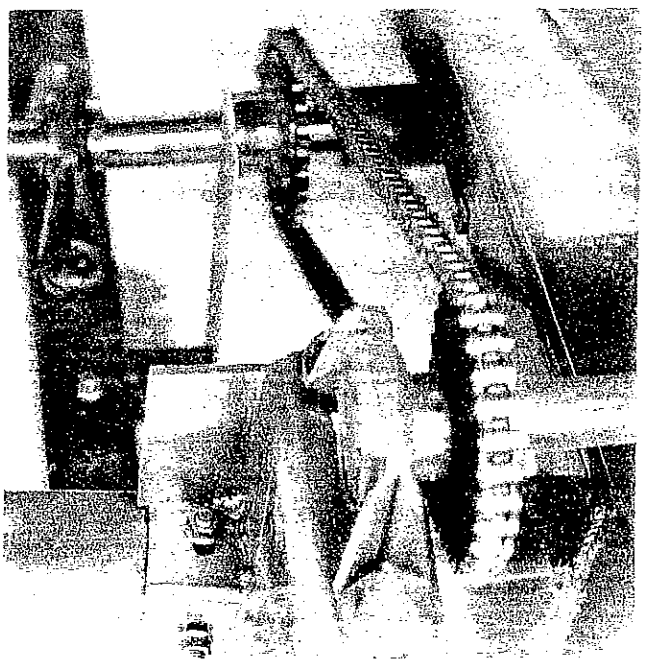


Figure 27 — Supplement Hopper Drive Chain [Shields removed for clarity]

HAMMERMILL DOOR

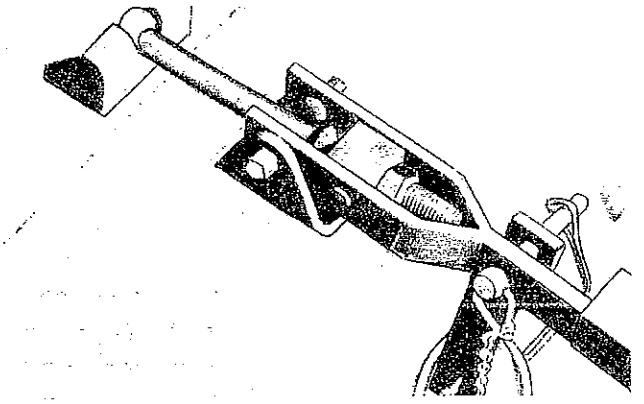


Figure 28 — Hammermill Door Tension

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

UNLOADING AUGER CLUTCH

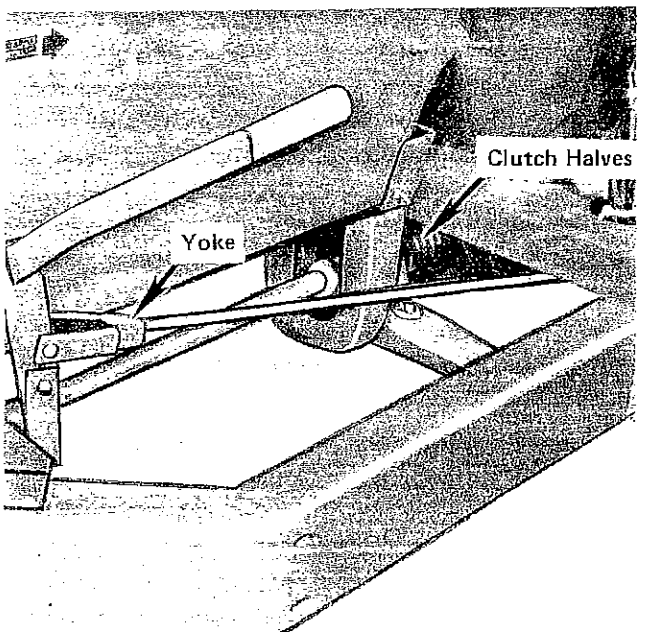


Figure 29 — Unloading Auger Clutch Adjustment [Shield removed for clarity]

The unloading auger clutch can be adjusted by turning the yoke on the threaded rod. With the auger clutch handle engaged, the clutch halves must be separated by 1/4 inch minimum.

GOVERNOR ADJUSTMENT

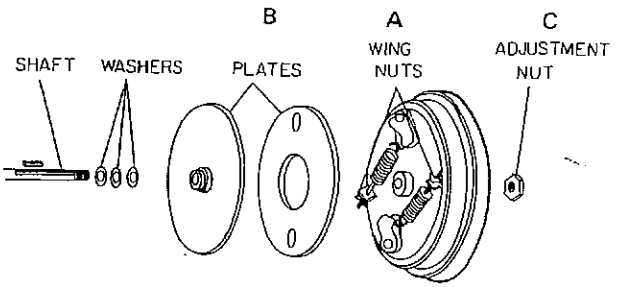


Figure 30 — Governor Adjustment

To increase the governor sensitivity, tighten wing nuts "A" (Figure 30). To decrease its sensitivity, loosen these nuts. Tighten or loosen both nuts evenly. Clearance between plates "B" (Figure 30) should be approximately 1/16 inch. If the governor disengages too quickly, loosen the set screw in nut "C" (Figure 30) and tighten the nut, decreasing the clearance between plates "B". Be sure to retighten the set screw after this adjustment is made.

The governor should be adjusted to operate at tractor PTO speed of 540 or 1,000 rpm.

FEEDROLL

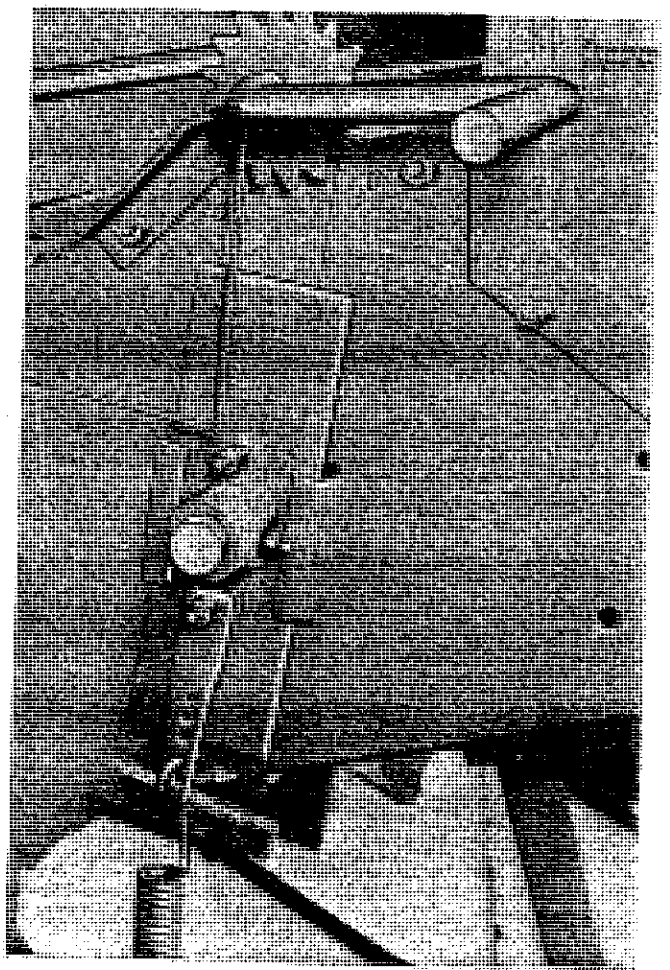


Figure 31 — Feedroll Adjustments

Five holes are provided at the upper end of the feedroll spring. Feedroll tension can be changed as desired. Generally, the top hole is used for hay.

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

Cable lengths can be adjusted by loosening the nut with special cable washer and retightening after cables are straightened.

TOP MILL CLUTCH

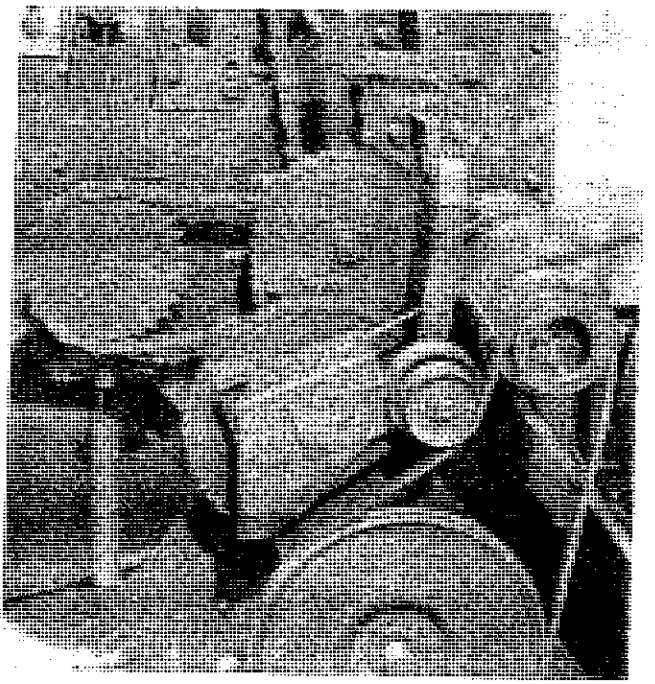


Figure 32 — Top Mill Clutch
[Shields removed for clarity]

When the top mill clutch no longer continues to engage the feedroll, auger drag feeder or baled hay/grain feeder, the side panel belt must be readjusted. The two bolts holding the side panel (Figure 32) must be loosened. Move the side panel to increase the pulley distance and retighten the bolts holding the side panel. Be sure the chain tension is maintained when moving the side panel. Chain deflection should be about 1/2 inch total or less. The belt should have a 2 inch deflection when properly adjusted and with clutch engaged.

AUGER FEEDER CLUTCH

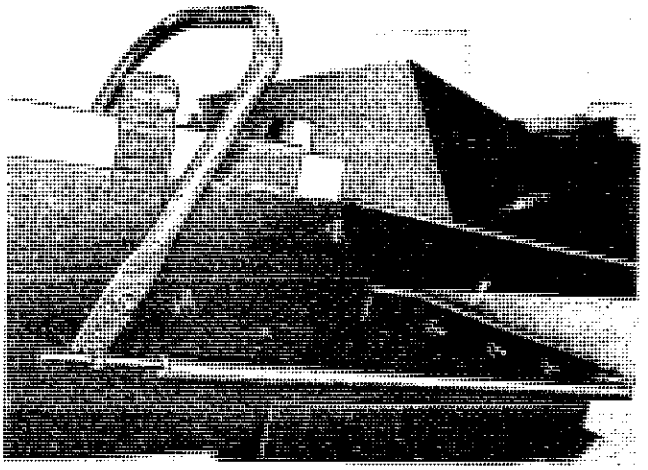


Figure 33 — Auger Feeder Clutch
[Shields removed for clarity]

The auger feeder clutch is adjusted by turning the pivot nut on the threaded rod. When properly adjusted the safety catch holds the clutch handle while the bottom clutch is disconnected from the drag feeder auger drive.

AUGER DRAG FEEDER BALANCE SPRING

Figure 34 — Auger Drag Feeder Spring Adjustment

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

WHEEL BEARINGS

Securely block up frame so that wheel turns freely. To tighten the wheel bearing, first remove the hub cap. Remove the cotter pin from the slotted nut and tighten the slotted nut until there is a slight drag on the bearing 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.

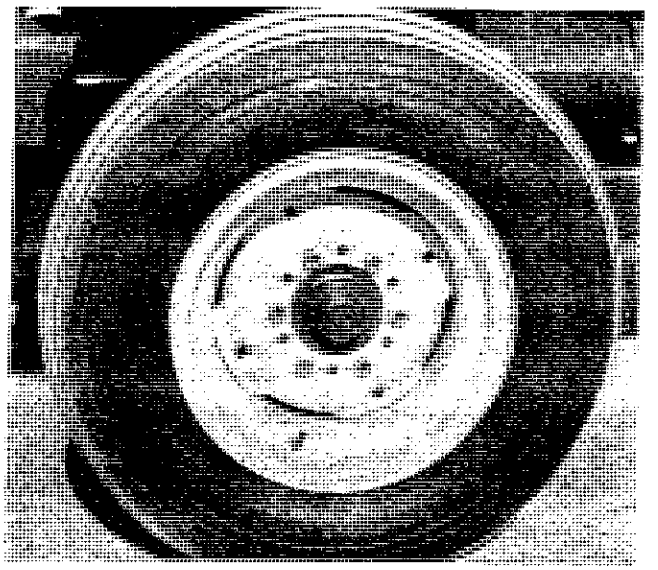


Figure 35 — Adjusting Wheel Bearings

LUBRICATION

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

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

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

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

WHEELS

Repack wheel bearings once a year or every 100 hours of operation with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease.

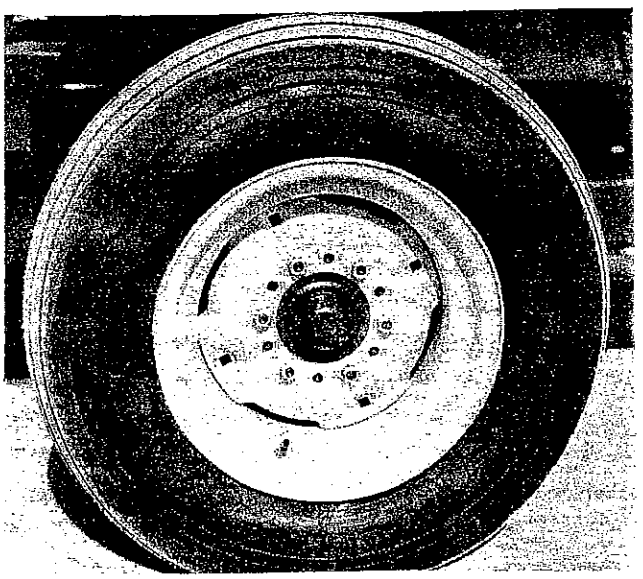


Figure 36 – Wheel Bearing Lubrication

PTO SHAFT AND SPINNER SHIELDS

Grease bearing crosses and zerk on sliding shaft weekly or every 50 hours of operation with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease.

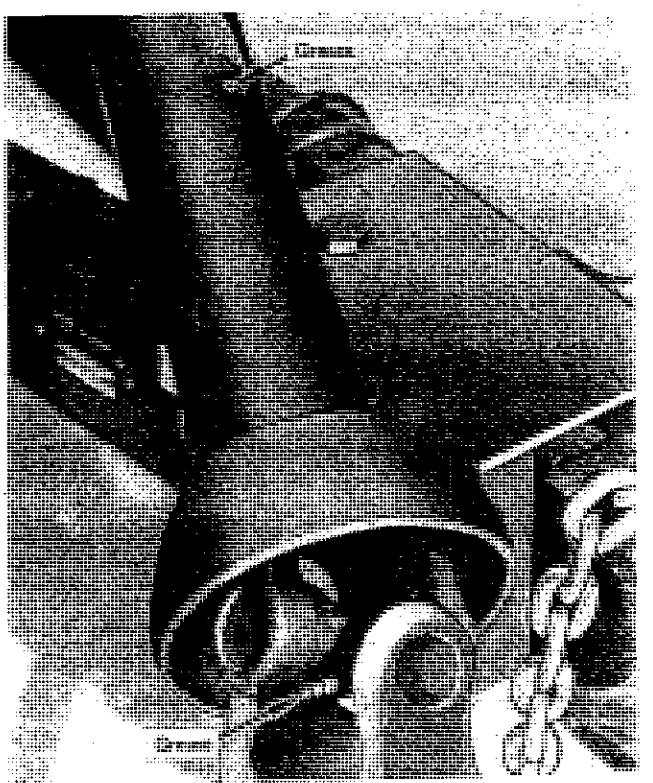


Figure 37 – PTO Lubrication

AUGER DRAG DRIVE SHAFT

Grease bearing crosses weekly or every 50 hours of operation with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease.

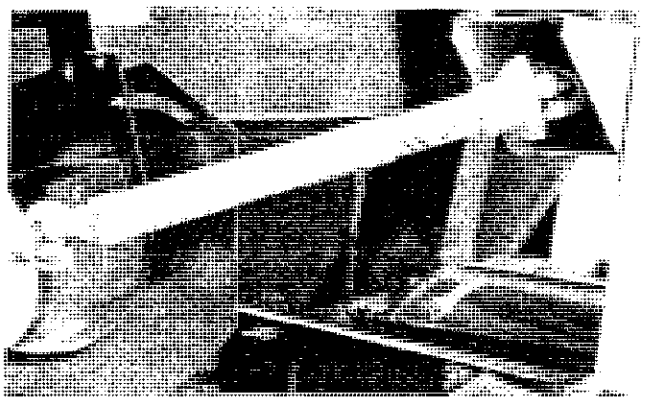


Figure 38 — Drag Drive Shaft Lubrication

AUGER DRAG BOTTOM CLUTCH

Grease bottom drag clutch through slotted side opening in drive shield located at lower end of auger drag housing. The clutch housing must be rotated so that the grease fitting can be reached through the shield slot.

DRIVE SHAFT BEARINGS

Grease two pillow block bearings (1 & 2, Figure 24) on grinder drive shaft and one pillow block bearing (2, Figure 39) on mixer drive shaft weekly or every 50 hours of operation with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease.

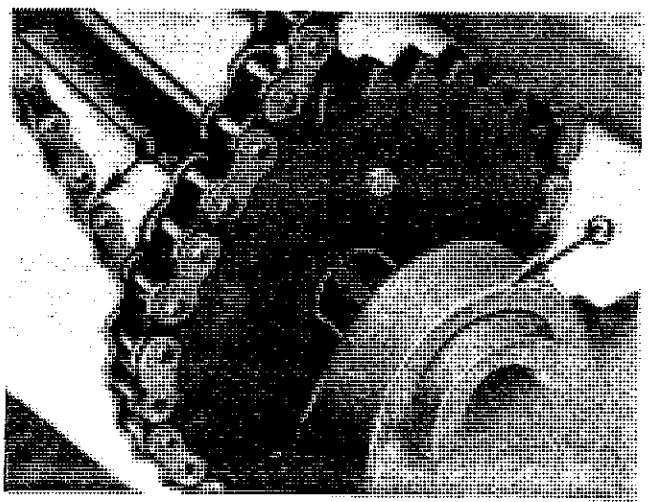


Figure 39 — Drive Shaft Bearing Lubrication

HAMMERMILL SHAFT BEARINGS

Grease front and rear (2) pillow block bearings on hammermill cylinder shaft daily of every 10 hours of operation with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease.

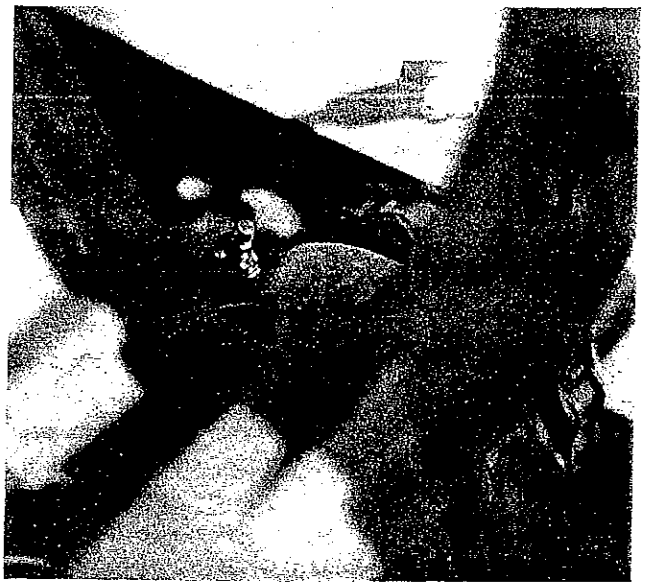


Figure 40 — Front Hammermill Shaft Bearing

Figure 41 — Rear Hammermill Shaft Bearing

LOWER VERTICAL MIXING AUGER

Repack the grease seal at the bottom of the vertical mixing auger every six months with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease. Access to this bearing is through the clean-out door in the mixing tank cone.

UPPER VERTICAL MIXING AUGER

Grease the upper vertical mixing auger brass bearing daily or every 10 hours of operation with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease. Access to this bearing is through the spring loaded tank lid at the top of the mixing tank.

Figure 42 — Top of Mixer Auger Shaft

GEARBOX

Check oil level in gearbox at base of mixer tank every 6 months by removing check plug at side of gearbox. Add SAE 90 weight gear oil, if necessary, until oil runs out of filler hole.

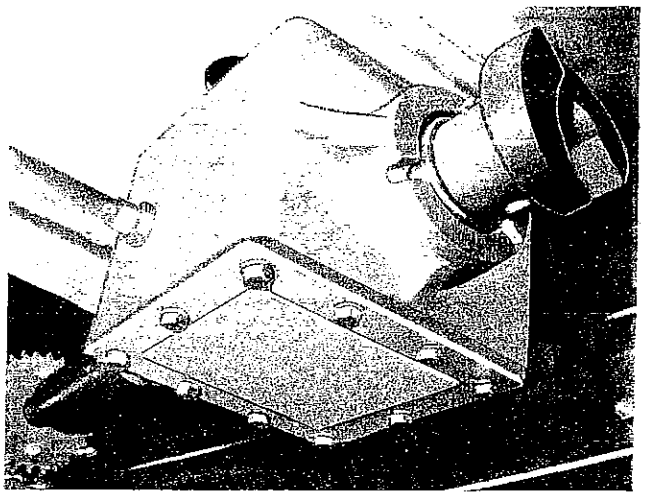


Figure 44 — Gearbox Lubrication

FEEDROLL AND CLUSTER SPROCKET

Grease front and rear (2) fittings on feedroll drive shaft bearings and on cluster sprocket shaft daily or every 10 hours of operation with Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease.

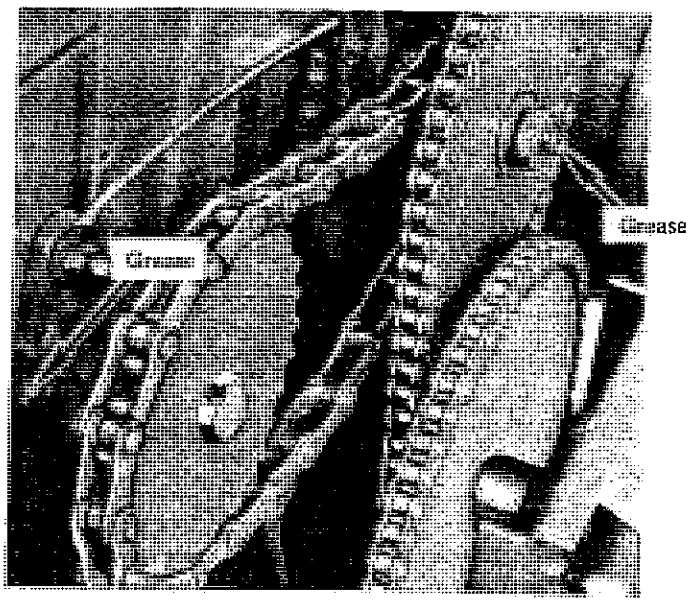


Figure 43 — Feedroll and Cluster Sprocket

GRINDER ENGAGING PIN

Periodically oil the sliding pin which engages the large hammermill drive pulley. Use a light engine oil for lubrication.

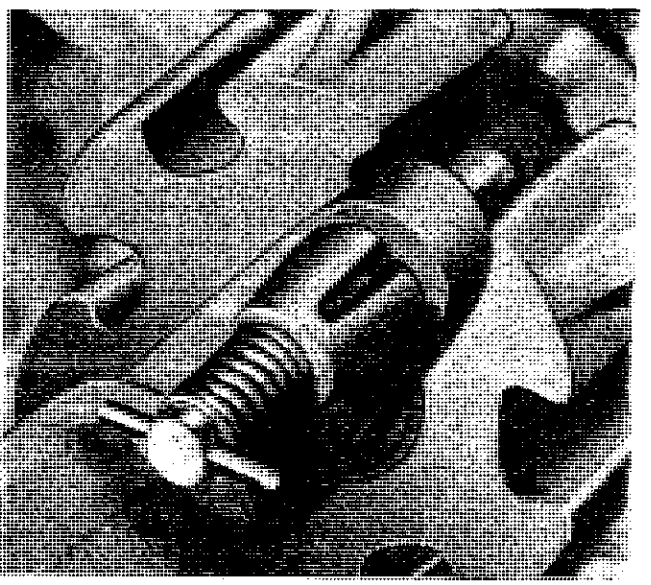


Figure 45 — Grinder Engaging Pin

RING AND WORM GEAR

Grease at two locations on large ring gear on unloading auger and wipe grease at ring gear and worm gear periodically. Use Arts-Way Super-Lube lubricant or an equivalent SAE multi-purpose type grease.

On units with hydraulic controlled back auger, keep the worm gear reservoir filled with oil up to the worm shaft. Use SAE 90 weight gear oil. Check periodically for leaks which could run reservoir dry.

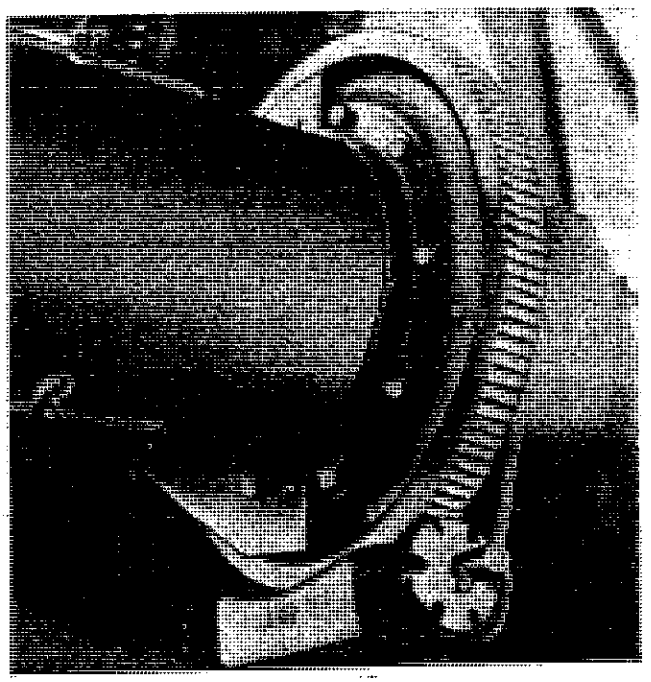


Figure 46 — Ring and Worm Gear Lubrication

CHAINS

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

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

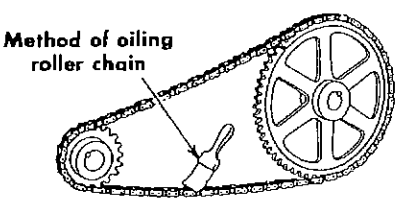


Figure 47 — Oiling Roller Chains

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

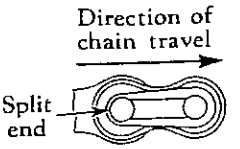


Figure 48 — Chain Spring Clip

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

UNLOADING AUGER CLUTCH

Brush shaft under sliding driven unloading auger clutch half periodically with Arts-Way Super-Lube or an equivalent SAE multi-purpose type grease.

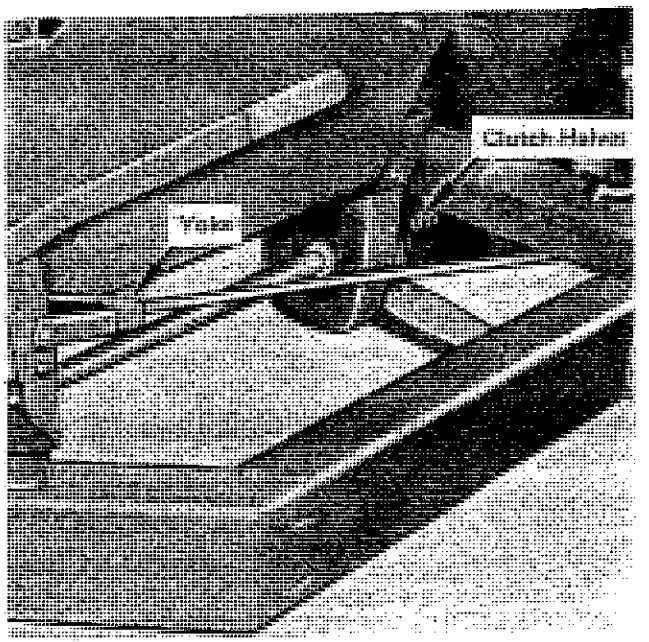


Figure 49 — Unloading Auger Clutch

GEARS

Periodically lubricate gear sets at each unloading auger transfer point. Also lubricate gear set on auger drag transfer box. Use light oil and apply with a brush.

SERVICE

SERVICE

⚠ CAUTION: Disengage all drives and shut off tractor engine before servicing grinder-mixer.

Bolt and Nut Torque Specifications

RECOMMENDED TORQUE IN FOOT POUNDS COARSE AND FINE THREADS		
	⬡	⬡
BOLT	NO RADIAL DASHED	THREE RADIAL DASHES
1/4	6	9
5/16	11	18
3/8	19	31
7/16	30	50
1/2	45	75
9/16	66	110
5/8	93	150
3/4	150	250
7/8	202	378
1	300	583

Figure 50 — Torque Chart

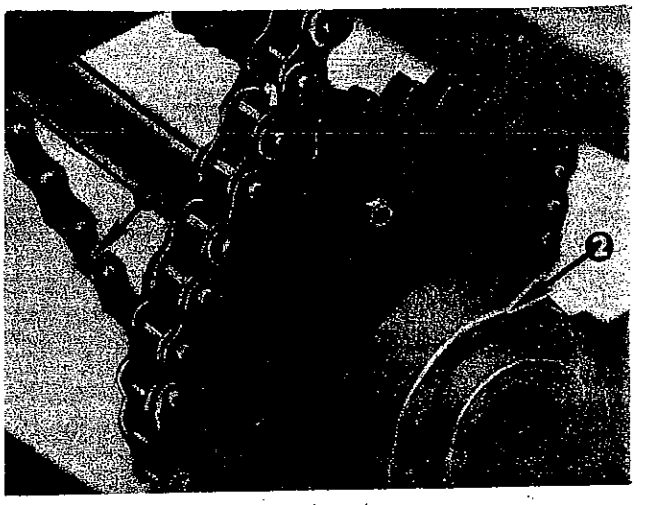


Figure 51 — Front Shear Sprockets [Shields removed for clarity]

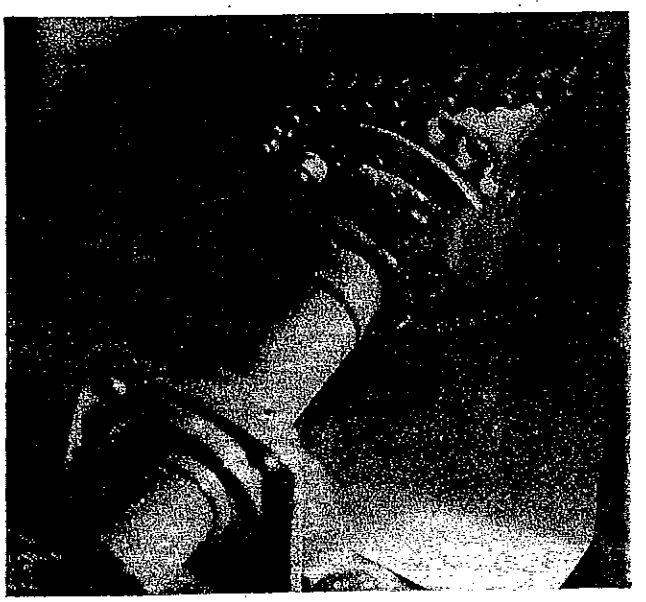


Figure 52 — Supplement Hopper Drive Shear Sprockets [Shield removed for clarity]

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; they must not be loose. The shear bolts must be of correct hardness (Grade 5 with three radial dashes) to assure proper shearing.

SPROCKET AND CHAIN ALIGNMENT

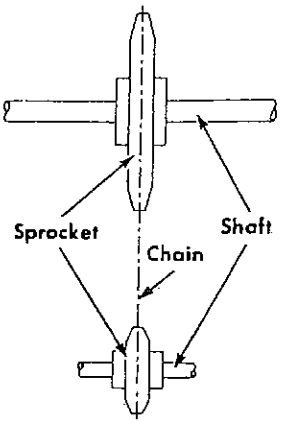


Figure 53 — Sprocket Alignment

Be sure the sprockets are in line on 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.

REPLACEMENT OF DAMAGED HAMMERS

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

REVERSING THE HAMMERS

⚠ CAUTION: Be sure hammermill has stopped rotating before opening hammermill door.

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

To remove the hammers, remove the two bolts "A" (Figure 54) from the side of the mill and plate "B" (Figure 54). Remove pins from each end of rod "C" (Figure 54A) and pull rods out, making sure that the hammers "D" (Figure 54A) are put back in the same place from which they were removed.

DO NOT pull more than one rod at a time to avoid mixup. Serious vibrations will occur if hammers are replaced in wrong position. See Figure 55 for proper hammer spacing on each of the four shafts.

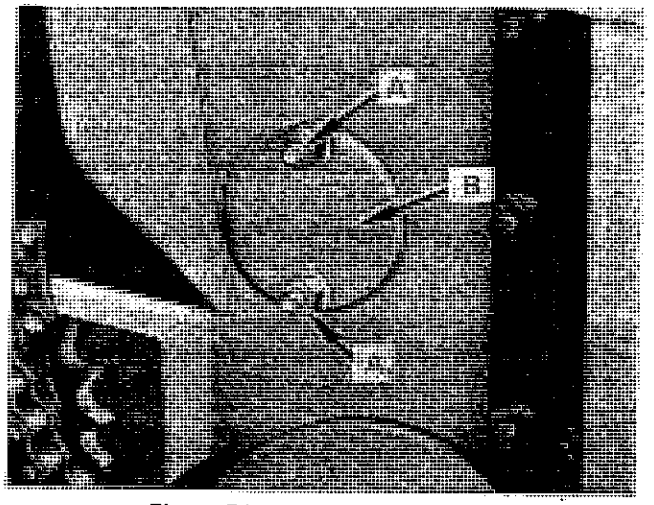


Figure 54 — Hammer Removal

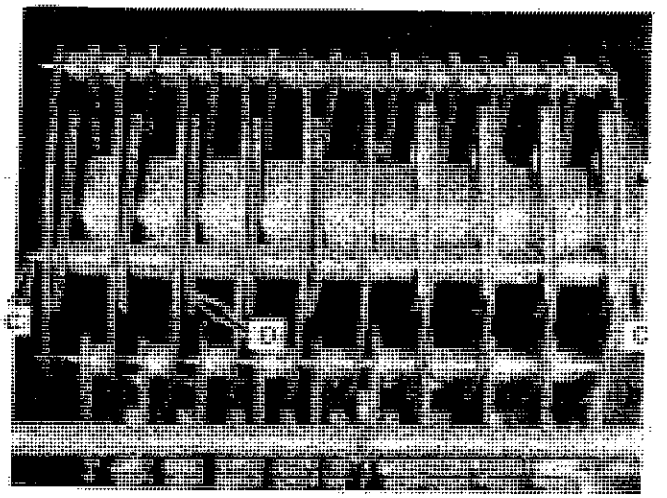


Figure 54-A — Hammer Removal

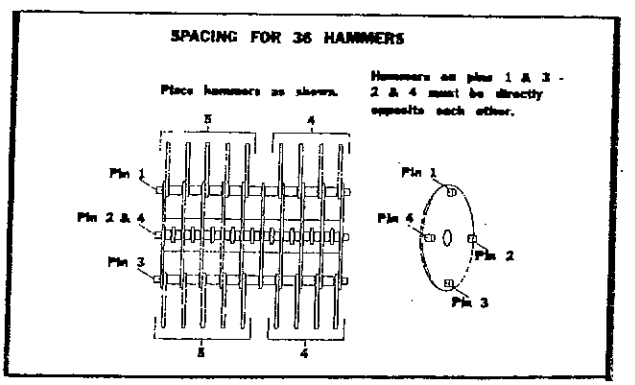


Figure 55 — Proper Hammer Spacing

MAIN DRIVE BELT REPLACEMENT

To remove the drive belts, loosen bolts B and C (Figure 56). Then relieve the belt tension by loosening bolts A (Figure 56).

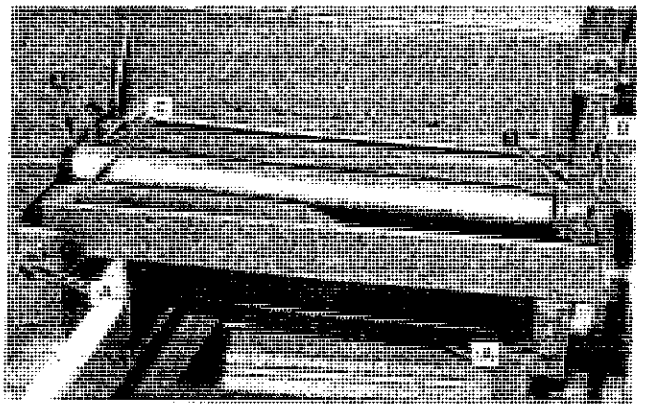


Figure 56 – Belt Removal

After the tension is off the belts, remove belts and replace with the new set and proceed as follows: With a steel tape, measure the outside length of the two center belts while they are still loose on the pulleys. Then tension the drive until the outside belt length is increased approximately 7/8 inch for 540 rpm drive and 5/8 inch for 1000 rpm drive.

Align belts as described on page 17.

STORAGE

If the grinder-mixer is to be stored for any length of time, the following points should be followed.

1. Lubricate well all points covered on pages 21-24.

2. Place a coat of light oil on the inside of the tank cone to prevent rusting.

3. If possible, store inside in a dry place. If not, cover opening in dust collector and opening in hammermill throat.

4. Block up frame to allow tires to rotate. This will prevent tires from weathering.

5. Do not store near livestock, especially when equipped with the optional electronic scale.

ATTACHMENTS

SCREENS

Screens are available in 12 sizes ranging from 1/8" to 2". Two screens are provided as standard equipment. They are the 5/16" and 3/4" sizes unless otherwise specified.

MAGNET

A magnet is available to protect livestock from metal particles getting into the feed. The magnet also provides additional protection for the mill and mixer by lessening the possibility of damage. Remove collected material from the magnet frequently. The magnet bolts to the underside of the mill throat just ahead of the feedroll.

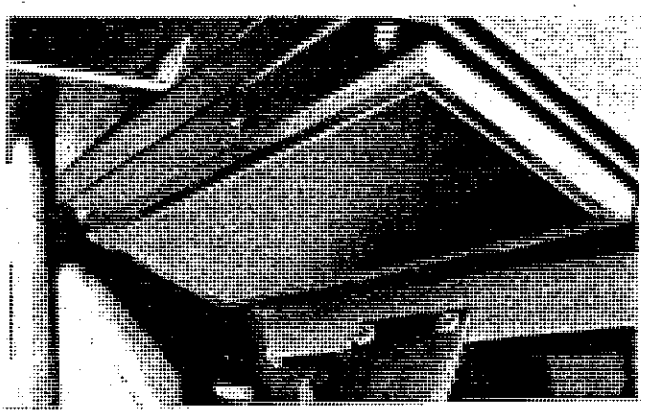


Figure 57 — Magnet

GOVERNOR

A governor attachment is available for use with tractors under a three-plow rating. It controls the feedroll, auger drag feeder and baled hay/grain feeder drives. Feeding is automatically stopped by the governor when mill speed drops below a required level. When the mill clears and speeds again reach operating range the feedroll, auger drag feeder and baled hay/grain feeder automatically resume operation. See page 19 for adjustment.

FEEDROLL

The feedroll provides easier feeding of exceptionally coarse material such as earcorn, corncobs or hay. Additional protection is provided for the operator and more even feeding is possible. The feedroll is necessary for the operation of the baled hay/grain feeder attachment.

TIRES

Three tire sizes are available for use on the grinder mixer, the 9.5L-15, 10.00-15 and 11L-15. The wider flotation tires are used on muddy ground or for supporting heavier loads.

ELECTRONIC SCALE ATTACHMENT

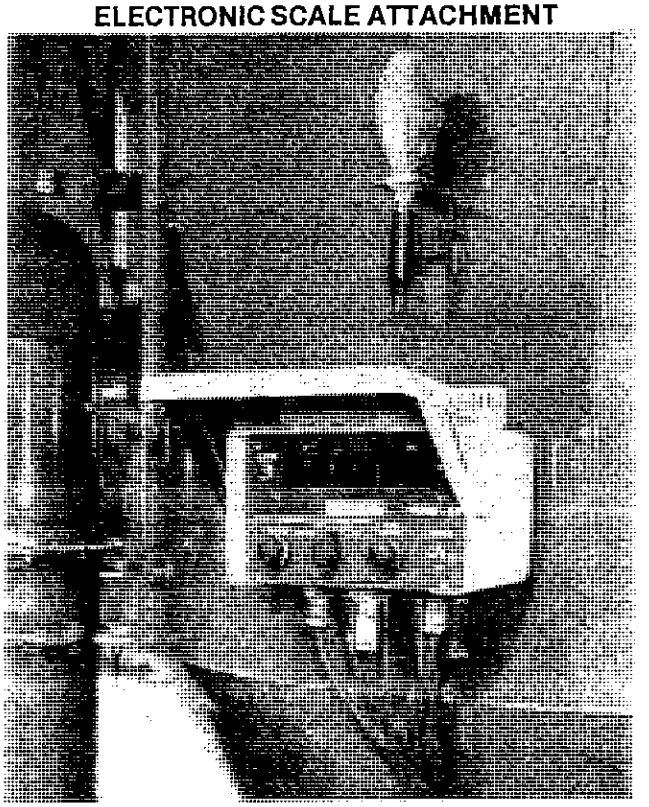


Figure 58 — Electronic Scale Attachment with Visible Alarm

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

TUBE SACKER ATTACHMENT

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

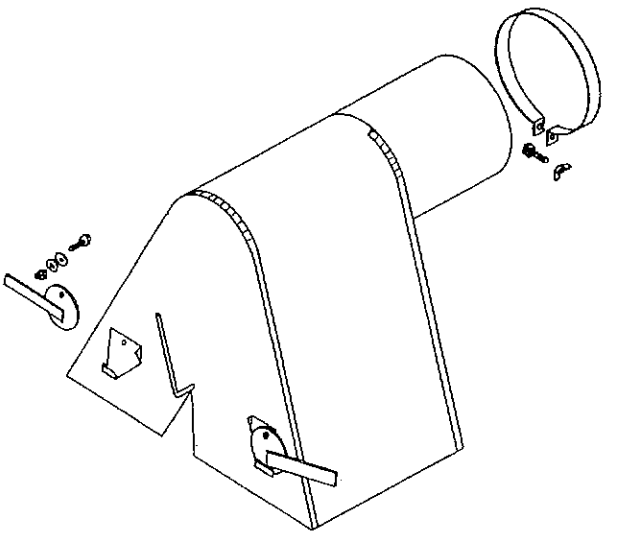


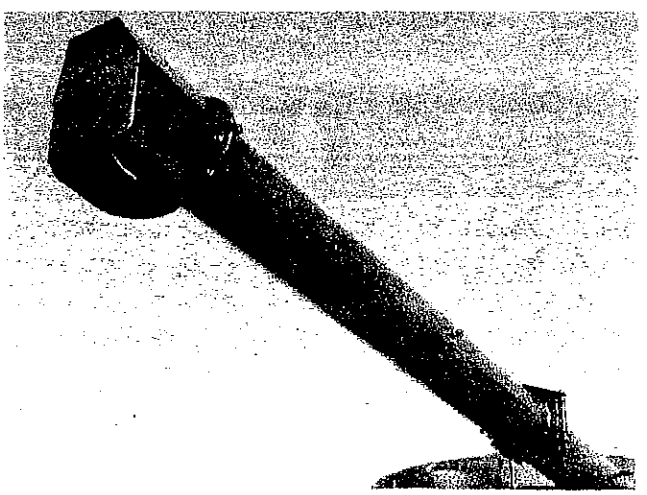
Figure 59 — Tube Sacker Attachment

VERTICAL UNLOADING AUGER EXTENSION

A 24 inch vertical extension can be added to raise the unloading auger height for special applications. See chart on page 15 for unloading heights obtainable with the 24 inch vertical extension installed.

DISCHARGE UNLOADING AUGER EXTENSIONS

3-foot and 5-foot clamp-on type or 3-foot and 6-foot swing around auger extensions are available. See chart on page 15 for unloading heights obtainable with various extensions added to the unloading auger system. Any auger extension adds considerable weight to the unloading auger system. A spring lift assist must be added when using extensions in order to relieve the extra forces on the ring and worm cranking mechanism.



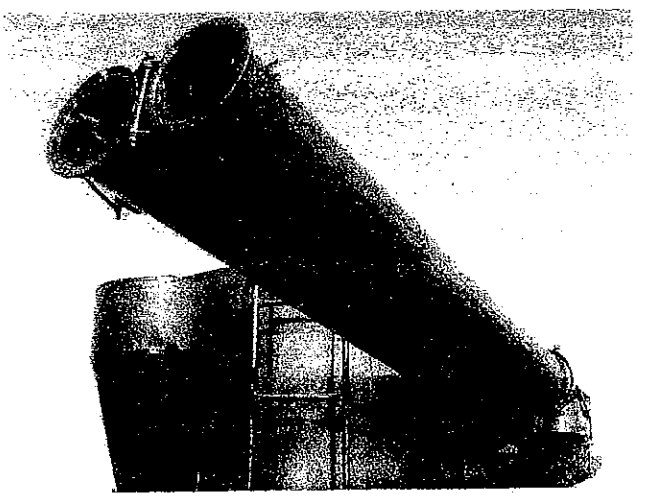


Figure 60 — Swing-around Discharge Auger Extension — Figure 60-A (6 Foot Shown)

SPRING LIFT ASSIST

The spring lift assist attachment is available for installation on the unloading auger system. It relieves forces on the ring and worm cranking mechanism and makes cranking the unloading system easier.

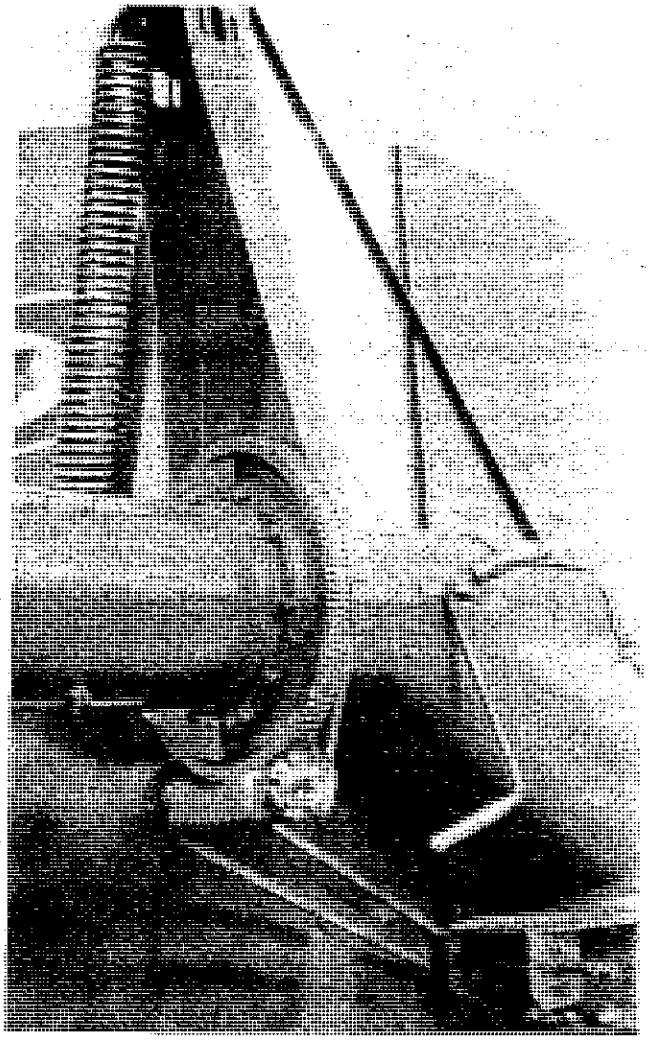


Figure 61 — Spring Lift Assist

Figure 62 — Hydraulic Back Auger with optional spring lift assist and optional 24" vertical extension

HYDRAULIC BACK AUGER

Hydraulic motors can be attached to the lift and swing functions of the unloading auger system. This allows the operator to control the position of the unloading auger from the tractor seat. The motors are connected to 4 outlets on the tractor hydraulics. For tractors with only two outlets, an optional valve can be attached to the grinder-mixer front frame. This optional valve then controls the lift and swing unloading auger operation.

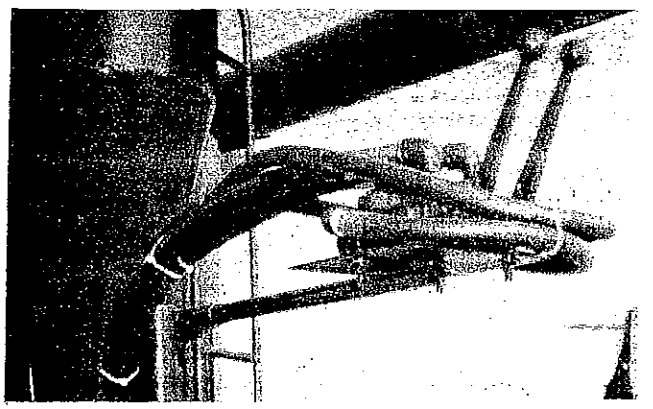


Figure 63 — Optional Control Valve

SWINGING ARM HANDLE

A handle attachment is available to clamp on the unloading auger tube. It is used to help pull around the unloading auger to help position the discharge for unloading. In storage, it latches over the handle on the unloading elbow.

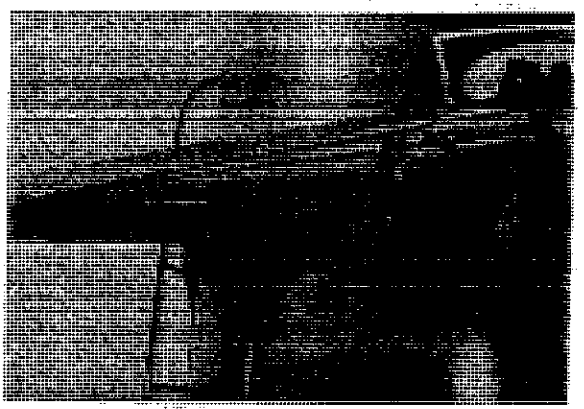


Figure 64 — Swinging Arm Handle

MOLASSES ATTACHMENT

Molasses may be mixed satisfactorily when mixer is one-third full of grain. Open valve allowing molasses to flow into mixer tank through mixer tube during the grinding process.

When adding molasses to hay, use 3/4 inch screen and add 300 to 400 pounds of shelled corn and 5 to 7 gallons of molasses to the batch. This will prevent bridging and facilitate unloading.

AUGER DRAG FEEDER— MECHANICAL OR HYDRAULIC DRIVEN

An auger drag feeder is available, mechanically or hydraulically driven, to convey small grains or ear corn into the hammermill throat. The tractor PTO speed must be maintained. The screen size and material to be ground should determine the rate at which the mill is fed.

Four auger drag speeds are obtainable with the mechanical drag. See speed chart on page 16. An infinitely variable speed range is obtainable with the hydraulic-driven drag. Maximum speed is determined by the tractor hydraulic system.

The spring counter balanced auger drag is helpful when placing the auger drag into transport or work positions. Two clutches are available to shut off the attachment if needed in emergency.

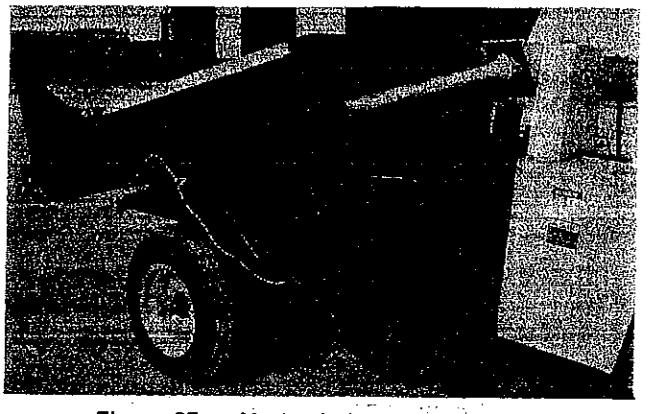


Figure 65 — Mechanical Auger Drag Feeder

BALED HAY/GRAIN FEEDER

The baled hay/grain feeder attachment mounts to the hammermill throat and swings upward for transport position. In work position, a bale chute is installed for placing the whole bale into the trough. The bale twine is cut and the feeder unslabs the bale. It takes the slabs up the conveyor trough and into the mill throat.

Four hay speeds and four additional faster grain speeds are available for a wide range of material transfer. Slats in the conveyor trough help convey any type grain.

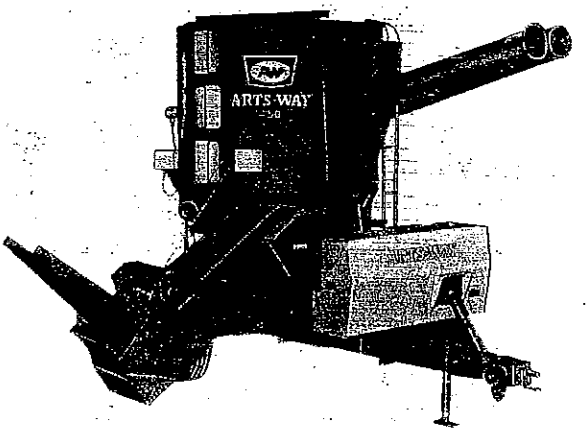


Figure 67 — Baled Hay/Grain Feeder

CORNSHELLER

A cornsheller attachment is available which will shell corn without grinding or shell and grind in one operation.

TROUBLE SHOOTING

Most difficulties are caused by improper adjustments. When you encounter trouble, make 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 Arts-Way dealer.

Problem	Possible Cause	Remedy
PTO shaft hard to telescope and hook up.	Shafts twisted due to overloading of mill.	Replace powershaft, if necessary. Load as uniformly as possible and adjust belts to prevent slipping. 1000 rpm recommended over 90 hp.
	Lack of grease on sliding halves.	Lubricate - See Page 21.
Mill vibrates excessively while operating.	PTO shaft not aligned.	Front of grinder-mixer mainshield must be parallel to tractor axle.
	PTO shaft bent.	Replace PTO shaft.
	Missing or broken hammers.	Replace hammers (in pairs).
	Tractor drawbar improperly adjusted.	Adjust tractor drawbar as shown on page 8.
Excessive noise when turning with mixer in operation.	Turning too sharply.	Avoid sharp turns.
Low volume from hammermill.	Mill not operating at optimum speed of 2800 rpm.	Before grinding, set tractor throttle speed to obtain rated PTO speed (540 or 1000 rpm).
	Screen may be worn.	Turn screen around or replace if necessary.
	Hammers worn.	Reverse or replace.
	Mill not level.	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.

Problem	Possible Cause	Remedy
Drive belt squeals when mill is engaged.	Drive belts too loose.	Tighten belts.
Drive belts wear excessively.	Belts out of alignment. Belts slipping.	Align pulleys. Adjust belts.
Material bridges in tank.	High-moisture content ear corn or hay being ground.	Grind high-moisture ear corn last. Add about 10 bushels of grain per tankful of ground hay.
Excessive amount of hay being drawn into mill.	Feeder table speed set too fast for type of material or tractor size.	Consult speed chart and adjust feeder table speed. See Operator's Manual for baled hay/grain attachment.
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 unloaded.	Mixer tank door closed.	Open door.
Unloading auger does not disengage.	Unloading auger clutch linkage out of adjustment.	Adjust clutch linkage.
Auger drag runs full but little or no grain is delivered to mill.	Auger drag speed too low.	Increase speed of auger feeder.
Auger drag stops when mill is engaged.	Clutch disengaged.	Engage clutch(es).

SPECIFICATIONS

TANK AND FRAME

Capacity of mixing tank	105 bu. (129 cu. ft.)
Height (variable with tire size)	107 inches (11L-15 tires)
Height with baled hay/grain feeder	114 inches
Width with scoopboard or baled hay/grain feeder	88-1/2 inches
Width with auger drag feeder	95 inches
Overall length	157 inches

Discharge auger: 7 inch auger with 8 inch tube; 9 foot main auger has a 14 foot discharge height at 60 degree angle; Distance from ground to main cross auger is 75 inches with an optional 24 inch vertical extension available; 324 degree horizontal operating arc; Infinite vertical operating arc.

AUGER FEEDER

Auger length	7 feet
Auger diameter	10 inches
Hopper width open	46 inches
Height of hopper from ground in down position	16-1/2 inches

Adjustable to four speeds mechanical or infinitely variable hydraulic drive.

HAMMERMILL

Width of mill	Full 20 inches
Screen area	600 sq. inches
Operating speed of PTO	540 or 1000 rpm
Operating speed of mill	2800-3000 rpm
Screen sizes available (5/16 and 3/4 standard with machine, others optional)	1/8, 3/16, 1/4, 5/16, 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.
Power required	2 to 5 plow tractor

Throw-out clutch disengages mill, but mixer continues to operate. 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.

Weight (incl. auger drag, roll feed, magnet) ..... 3,350 lbs.

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