
TO THE OWNER

Congratulations on the purchase of your new Art's-Way SupRaMix Vertical Tub Mixer. 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 Art's-Way SupRaMix Vertical Tub Mixer.

Even if you are an experienced operator of this or similar equipment, we ask you to read this manual before running 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 or to Art's-Way Manufacturing Co., Inc., Armstrong, Iowa 50514, (712)864-3131.

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.

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 attempts 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 on 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 & 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 SupRaMix Vertical Tub Mixer. 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. _____

Building on a
Art's-Way
Tradition of Quality

SERIAL NO.

MODEL NO.

Manufactured By
Art's-Way Manufacturing Co., Inc.
Armstrong, IA

ENTER SERIAL NUMBER & MODEL NUMBER IN SPACE PROVIDED.

(Serial Number Located on Left Front Corner of the Main Frame or Left Tongue Rail Forward of Conveyor)

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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.**
- Any improper use, and maintenance, 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.



The American Society of Agricultural Engineers has adopted this symbol as a 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 model 9420 Sugar Beet Harvester conforms to all applicable safety standards at time of manufacturing. A safety conscious equipment operator makes an effective accident-prevention program complete.

Safety features and instructions for the model 9420 Sugar Beet Harvester are detailed elsewhere in the Operators Manual. It is the responsibility of the harvester 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 annually.

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 driveline parts are used and that they are properly secured.

Install safety chain when attaching machine to the tractor.

Clear the area of bystanders, especially children, when making repairs, adjustments or performing maintenance on the mixer.

Do not allow riders.

Put all tractor and machine controls in "neutral" and disengage PTO before starting (follow starting instructions according to your tractor manual.)

Operate machine only while seated on the tractor seat.

Make sure the unit is adequately blocked before working on it.

DURING OPERATION

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

Keep all shields and guards in place and in good repair.

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

Do not allow riders while machine is in operation.

Do not attempt to unclog, clean or adjust machine while it is running.

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.

Stay away from overhead power lines. Electrocutation can occur even without direct contact.

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

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

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 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 the hydraulic circuit before servicing or disconnecting from tractor.

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

SAFETY GUIDELINES

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

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 is securely attached to the tractor and install a safety chain to the mixer. Install a retainer through the drawbar pin and attach safety chain.

Do not fail to latch the tractor brakes together.

Do not exceed 10 mph (16km/h) when transporting the mixer - reduce speed on rough roads and surfaces or when going down inclines.

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

A dealer installed Road Light Kit is available which includes warning lights that plug into your tractor's light connector. The red tail light will

illuminate whenever the tractor road lights are turned on.

The weight of the trailed machine should NEVER exceed the weight of the towing vehicle.

Check clearances carefully wherever machine is towed.

Stay away from overhead obstructions and power lines during transport. Electrocutation can occur even without direct contact.

STORAGE SAFETY

Store the mixer in an area away from human activity.

Do not permit children to play on or around the stored machine.

Make sure the mixer is stored in an area with a firm and level base to prevent the machine from tipping or sinking into the ground.

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.

Assemble the mixer in an area with sufficient space to maneuver the largest components and allow easy access to all sides of the machine.

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

Do not allow spectators in the working area.

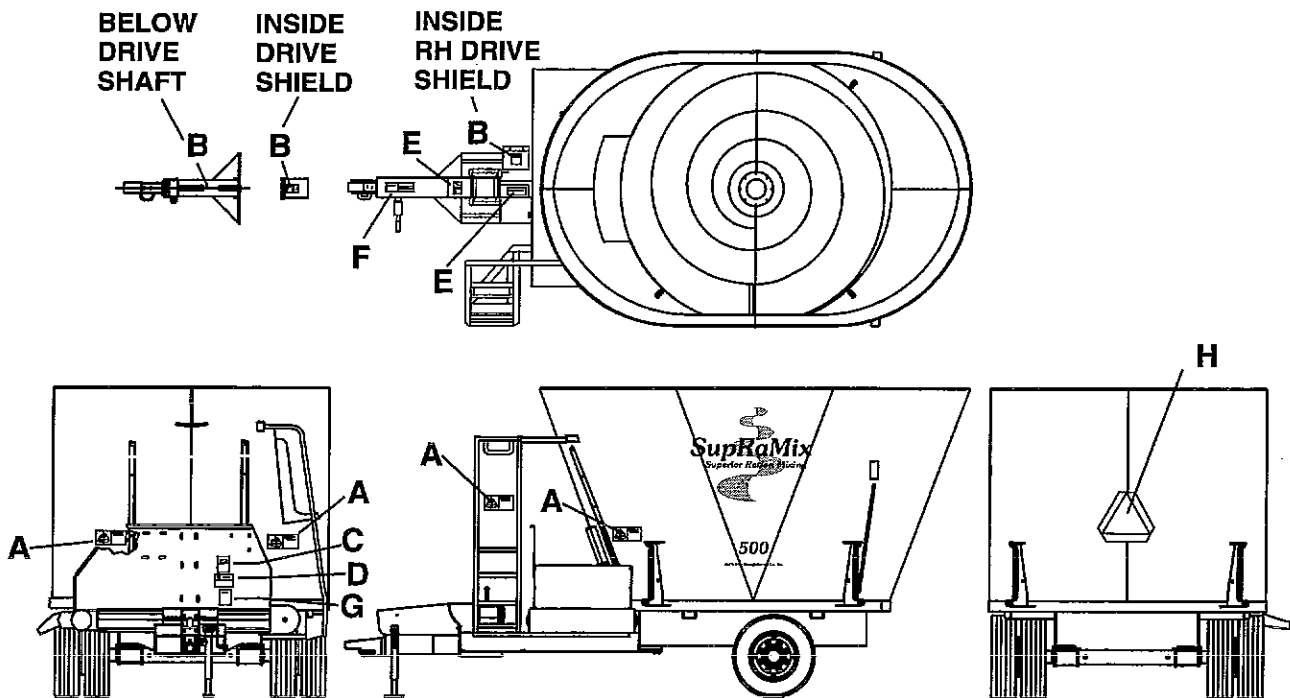
Remember:
“The Best Operator is a Safe Operator”

SAFETY DECALS

The different types of safety decals for your mixer 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 for decal locations. The number preceding the description is the part number of that decal. (This part number also appears in the lower right corner of the decal).

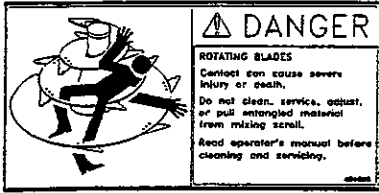
Safety awareness is the responsibility of *each* operator of the mixer. Keep safety decals and signs clean and legible and be sure that replacement parts display current safety decals and signs too. **Remember: Always replace missing, damaged or illegible safety decals. New decals and signs are available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

SUPRAMIX SAFETY DECAL LOCATIONS



Item	Qty.	Part No.	Description
A	3	401090	Decal, Danger Rotating Blades
B	3	268860	Decal, Danger Rotating Drive Line
C	1	401070	Decal, Danger Electrocutation
D	1	346310	Decal, Warning High Pressure
E	2	401100	Decal, Danger Rotating Parts
F	1	401080	Decal, Caution Hitching Instr.
G	1	368040	Decal, Caution Read
H	1	E224038	Decal, Slow Moving Vehicle Sign

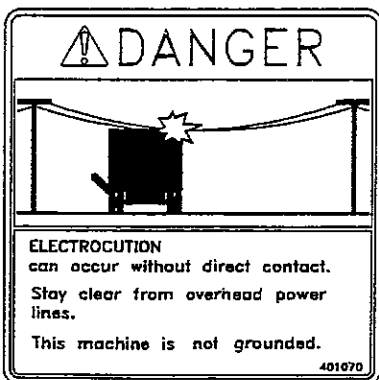
SAFETY DECALS



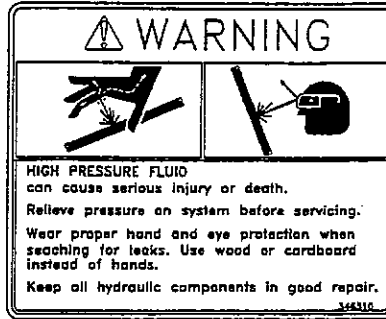
A - "DANGER" - Rotating blades. Part No. 401090.



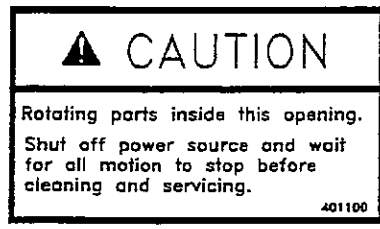
B - "DANGER" - Rotating drive line. Located on PTO. Part No. 268860.



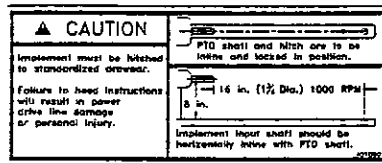
C - "DANGER" - Electrocutation. Part No. 401070.



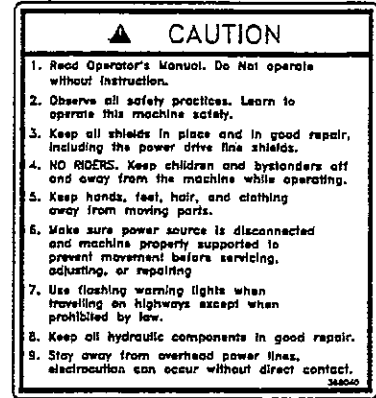
D - "WARNING" - High pressure fluid. Part No. 346310.



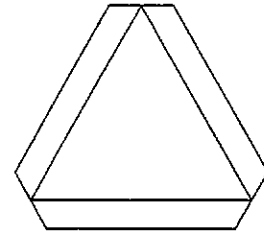
E - "CAUTION" - Rotating parts. Part No. 401100.



F - "CAUTION" - Hitching instructions. Part No. 401080.



G - "CAUTION" - Read operator's manual. Part No. 368040.



H - Slow Moving Vehicle Sign. Part No. E224038.

Note: Keep all decals clean and free of dirt for maximum visibility. Replace any and all decals that are no longer legible. Read and obey all safety decals.

PREPARING FOR FIELD OPERATION

TRACTOR

The Vertical Tub Mixer is designed to be used on large two wheel drive or front wheel assist agricultural tractors. To ensure good field performance, the following preparation must be met:

Horsepower

Considering the size and weight of the mixer, we recommend a minimum 100 PTO horsepower tractor (425, 500) & 140 PTO horsepower tractor (750) to give required stability and control during field operation and highway transportation.

Drawbar

The tractor must be equipped with a clevis hitch and an intermediate safety chain support on the drawbar. The drawbar must be capable of supporting 4,000 lbs. (1,820 kg.) hitch weight.

Distance from drawbar hitch pin to the end to PTO shaft stub should be (see figure 2):

- 16 inches for 1 $\frac{3}{8}$ " - 6 spline tractors/540 RPM
- 16 inches for 1 $\frac{3}{8}$ " - 21 spline tractors/1000 RPM

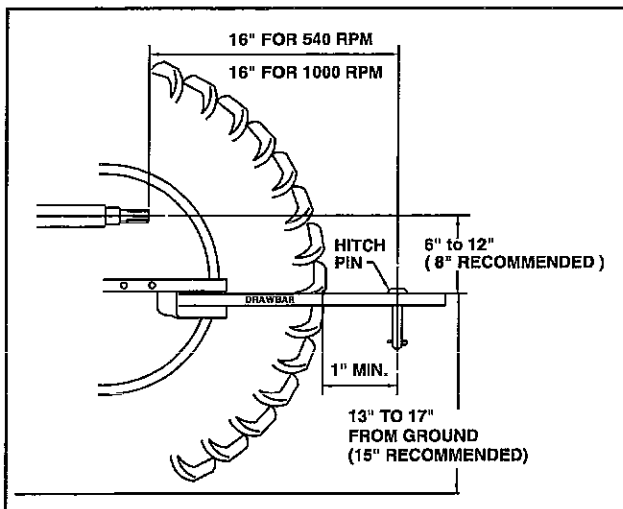


FIGURE 2 - DRAWBAR

Power Take Off (PTO)

Standard delivery for model 425 and 500 is a 540 rpm PTO shaft with a 1 $\frac{3}{8}$ " diameter - 6 spline yoke. Standard delivery for model 750 is 1000 rpm PTO with a 1 $\frac{3}{8}$ " diameter - 21 spline yoke.

Hydraulics

Your vertical screw mixer requires tractor hydraulics only (some 500 cubic foot machines contained on board hydraulics which will be addressed later).

The hydraulic system of the tractor must meet the minimum requirements of 15 GPM at 2000 psi constant flow.

The minimum tractor requirements is two hydraulic remote outlets.

- Primary remote to operate the unload conveyor hydraulic motor.
- Secondary remote to operate the unload door of the mixer tub.

One additional hydraulic remote outlet must be added for each additional hydraulic field installed option.

- 36" unload conveyor extension boom lift for unloading in bunks.
- Hydraulic operated hay restrictors.

A hydraulic tractor remote splitter may be added at the tractor remotes. If equipped with all field options be sure to hook up conveyor unload motor and the hydraulic restrictors to the same valve and the conveyor extension lift and the door opening to the other valve.

We recommend that the tractor hydraulic system be capable of independently controlling the flow rate for each remote outlet. See figure 3 for the recommended flow rates.

CIRCUIT	FLOW	PRESSURE
Unload conveyor (hydraulic restrictor)	8GPM/(30lpm)	2000 psi (13780 kPa)
Unload door (conveyor extension) or ELECTRO-HYDRAULIC VALVE BANK)	7GPM (27lpm)	2000 psi (13780 kPa)

FIGURE 3 - HYDRAULIC FLOW RATE

HYDRAULICS - 500 Cubic foot machines containing on board hydraulics.

These mixers were equipped with an Electro-Hydraulic Control System.

The Electro-Hydraulic Control System requires two hydraulic remotes:

- One for the unload conveyor drive hydraulic motor.
- One for the electro-hydraulic valve bank.

We recommend that the tractor hydraulic system be closed centered and capable of independently controlling the flow rate for each remote outlet. See figure 3 for the recommended minimum flow rates. To operate with open center hydraulics use the blue screw in the lower valve bank solenoid which replaces the red for closed center hydraulics. The alternate screw is stored in the main valve body beside the solenoid.

PREPARING FOR FIELD OPERATION

Electrical

The Vertical Tub Mixer requires a 12 volt DC power supply from the tractor for the operation of the scale indicator, optional highway safety lights and electro-hydraulic control system on early model 500 machines.

For the proper hookup of highway safety lights, a seven terminal receptacle is required on the tractor. This receptacle should conform to the SAE standard J560, Seven Conductor Electrical Connector or Truck-Trailer Jumper Cable, with the following circuit designation. See Figure 4 for circuit designation.

CONDUCTOR IDENTIFICATION	WIRE COLOR	TERMINAL NUMBER	CIRCUIT
Wht	White	*1	Ground
Blk	Black	2	Work lights
Yel	Yellow	*3	Left hand flashing and turn signal
Red	Red	4	Auxiliary
Grn	Green	*5	Right hand flashing and turn signal
Brn	Brown	*6	Tail lamp
Blu	Blue	7	Auxiliary

*As a minimum, these receptacle terminals MUST be wired for service.

FIGURE 4 - CIRCUIT DESIGNATION

The scale indicator is shipped with a tractor plug assembly. The tractor plug assembly should be wired directly to the battery with the black wire (-) and the white wire (+). Note: The scale indicator will not function on positive ground systems. The hydraulic valve control bank and/or hydraulic splitters also need to be mounted in the tractor and wired directly to the battery with the black wire (-) and the white wire (+).

MIXER

Follow these step-by-step instructions and guide-lines to prepare the machine safely and efficiently for operation.

Pictures and diagrams showing important attachment elements or drive connections are included to make assembly instructions easier to follow.

Unloading from Transport



CAUTION: The Vertical Tub Mixer weighs 10,000 to 16,000 pounds. Use extreme caution when unloading, handling, supporting and assembling the equipment. Carelessness or errors in judgement could result in slippage, causing serious injuries or death.

Note: The machine is shipped, wheels installed, on a drop deck trailer. The machine can be pulled off the trailer using an adequate loading dock.

1. Unloading should be done on a level surface; make sure unloading equipment has free access to machine on all sides.
2. Make sure safety stands, support blocks and safety straps are of sufficient strength and capacity to safely handle the equipment.
3. Have one high capacity forklift for each side of the machine to unload from the transport by forklift.
4. Raise the frame using both forklifts simultaneous; move trailer out from under the elevated machine.
5. Slowly lower machine to ground; blocking the tires and supporting the tongue with the jack provided.

Unpacking

The discharge boom (if equipped), hydraulic restrictor blades (if equipped), scale indicator arm, hydraulic hoses and electrical cables and knife kit need to be un-strapped and installed before operating.

Bolt Torque

The torque Specification Table (figure 5, page 11) gives correct torque values for various bolts and cap-screws. Tighten all bolts to the torque

PREPARING FOR FIELD OPERATION

specified in the chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque as a guide. Replace hardware with the same strength bolt.

Torque figures indicated in Figure 5 are valid for non-greased or non-oiled threads and heads unless otherwise specified. Do not grease or oil bolts or capscrews unless instructed to do so in this Manual. When using locking elements, increase torque values by 5%.

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 - 18(.375)	4,850	31 ft. lbs.	23 ft. lbs.
7/16 - 14(.4375)	6,788	50 ft. lbs.	37 ft. lbs.
1/2 - 13(.500)	9,075	76 ft. lbs.	57 ft. lbs.
9/16 - 12(.5625)	11,625	109 ft. lbs.	82 ft. lbs.
5/8 - 11(.625)	14,400	150 ft. lbs.	112 ft. lbs.
3/4 - 10(.750)	21,300	266 ft. lbs.	200 ft. lbs.
7/8 - 9(.875)	29,475	430 ft. lbs.	322 ft. lbs.
1 - 8(1.000)	36,625	644 ft. lbs.	483 ft. lbs.
1-1/8 - 7(1.125)	42,375	794 ft. lbs.	596 ft. lbs.

FIGURE 5 - TORQUE

Shields

Make sure that all shields are in place and functioning. Please contact your dealer as soon as possible to replace any missing shields when your machine is delivered. Replace shields that are removed for inspection or maintenance.

Tires

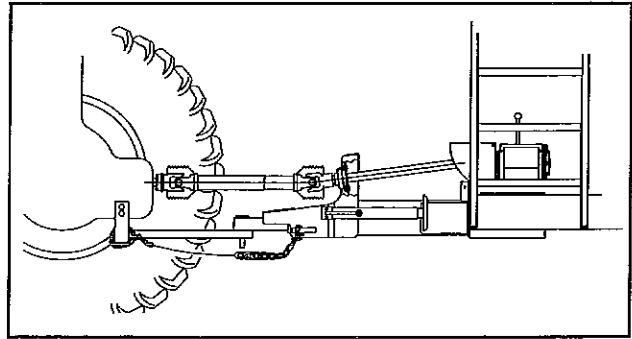
Keep tires properly inflated. Lack of pressure can result in torn valve stems, fabric breaks and uneven tread wear. Too much pressure causes undue strain on fabric, excessive tread wear and allows the tire to cut in more on wet surfaces. Recommended tire inflation pressure is 125 psi.

Lug nut torque should be checked prior to field operation and one week later. The torque must be equal on all lug nuts or they will loosen. The recommended torque is 300 ft. lbs..

Driveline Bearing

The Vertical Tub Mixer has an adjustable bearing mount for the driveline jackshaft to the single and two-speed gearbox. This adjustment is necessary to optimize the performance of the equal angle PTO driveline. Improper adjustment could result in excessive vibration when operating the mixer while turning. Excessive vibration will lead to premature universal joint failure.

FIGURE 6 - PTO DRIVELINE



To adjust the bearing mount, loosen the four bolts that attach the bearing to the frame. Move the bearing so the end of the jackshaft is the same height of the PTO on the tractor (see Figure 6). Tighten the four bolts to specified torque and replace the shield for the jackshaft.

Power Take Off

The Vertical Tub Mixer is shipped with the PTO loose. Attach the PTO with the hardware supplied and attached the shield chain to the machine. If PTO halves become separated, clean profiles free of dirt and foreign material. If the halves do not slide easily, premature failure of the universal joints could result.

Oil Levels

The Vertical Tub Mixer has three gearbox assemblies that require oil for lubrication. Check the sight plugs on the two-speed gearbox and the oil reservoir for the planetary. Check the 90° gearbox below the planetary for oil level and upper bearing grease before operation. (See Lubrication section).

ATTACHING TO TRACTOR

When hooking the mixer up to the tractor, follow this procedure (see Figure 6):

1. Clear area of bystanders, especially small children.
2. Block mixer wheels to prevent rolling.
3. Slowly back the tractor up to the machine and align hitch pin hole with draw bar.
4. Place all tractor controls in neutral, set park brake and stop engine, and remove ignition key before dismounting.
5. Install hardened hitch pin with mechanical retainer. (NOTE: Hitch pin should be a minimum of 1.25" in diameter).

PREPARING FOR FIELD OPERATION

6. Lower mixer onto tractor drawbar, pivot jack and lock into transport position.
7. Attach safety chain to the mixer hitch by inserting the large chain eyelet through the chain bracket on the tongue from the back side. Route all chain links through the large chain link and pull tight. Route chain through the intermediate chain support and secure the chain to the tractor drawbar carrier. Be certain to allow enough slack in chain for full articulation of tractor and mixer without binding.

PTO Hookup

1. Clean splines inside yoke and on the tractor shaft.
2. Be sure the driveline and guard telescope easily and that guard rotates freely.
3. Retract slide collar on PTO yoke and slide yoke over the shaft. Stop when the slide collar clicks into place. Pull on the yoke to make sure it is securely locked.
4. Be sure there is sufficient clearance between the drawbar, three-point hitch links and the driveline to allow maneuvering in the field.
5. Attach safety chain for PTO to the tractor frame to secure the PTO guard from rotating.
6. Lower tractor PTO shield over the universal joint and secure.

Hydraulic Hoses

1. The Vertical Tub Mixer is NOT furnished with the hydraulic couplers to the tractor. Couplers must be purchased by the customer and attached to the hoses. Use a quality pipe thread compound or Teflon tape to ensure a leak free connection.

Hydraulic Hookup

1. Use clean cloth or paper towel to clean dirt and build-up from around the remote receptacle and the male tips.

2. Insert the male tips into the receptacle and make sure that they are securely fastened.
3. Make sure the hydraulic hoses are properly routed along the hitch to provide adequate clearance.
4. Run the hydraulic functions of the mixer to purge the hydraulic system of the mixer. Check hydraulic oil level of tractor after purging to ensure proper level of hydraulic oil.

Belt Conveyor

Check the belt conveyor to ensure that it is free of material and is not contacting any part of the machine. The belt conveyor should be checked and adjusted according to the conditions in which the machine will be used. The belt should be checked with the heaviest ration that will be used in the machine. The discharge door should be fully opened in an unload condition. The belt tension should then be enough to move the material. A lighter ration will require less tension than a heavier ration. The tension must be equal at each adjusting bracket. The rollers must be kept square in relation to the frame. If the rollers are not kept square to the frame, the belt will not track correctly and will move to the side.

Electrical Hookup

1. Plug the seven terminal plug for the road safety lights into the receptacle on the tractor.
2. Plug the scale indicator power cord into the tractor plug assembly.
3. Mount the control into the tractor cab and route wire harness along the hitch to provide adequate clearance. The control box should be mounted to the right side of the drivers seat with the toggle switches pointing upward or toward the operator. Plug the control box power cord into the tractor plug assembly.

MACHINE OPERATION

MACHINE OPERATION

The machine you are operating is designed for mixing of complete feed rations, including total-mixed-rations (TMR) for ruminants. It allows consolidation of hay bale processing and full ingredient blending (wet or dry) by a single machine. Initial ration processing should begin in low gear on machines equipped with two-speed

transmissions to best utilize tractor power while loading ration ingredients.

LOADING

The machine has a vertical scroll with knives positioned around the outer perimeter of the flighting for processing hay from round or square bales of any size. It is recommended hay (twine removed) be one of the first, if not the first,

MACHINE OPERATION

ingredient to enter the machine. This allows time for hay bale shredding/movement down the sidewalls and subsequent cutting to desired final cut length as you continue to load remaining ingredients.

There are two or three restrictors (depending upon the size of your mixer) located near the lower edge of the tub which act as shear bars for the lower knives of the scroll. The distance these restrictors extend into the mixing tub is determined by either mechanical or hydraulic operation along with manual setting in a series of depth stop holes. *The operation of the restrictors is very important to control length of forage cut, ration consistency and power required to mix your specific ration.* The restrictor depth (individually or as a group) into the mixing tub will vary depending upon the hay and other ingredients being processed and mixed. For example, restrictors may need to be at full depth in the tub when processing longer stemmy grass hay, but need be only partially inserted for alfalfa hay slicing or ration blending. Therefore, you are encouraged to become familiar with restrictor operation and test different settings to find the optimal restrictor depth(s) for the ingredients you use in your rations.

UNLOADING

The restrictors should remain part way in the tub through the unloading cycle and may be completely removed for the final revolutions

(when the two-speed transmission machine is shifted into high gear) for tub/scroll cleanout.

The machine is equipped with an equal angle driveline to allow running the machine while moving from one location to another. This reduces your total feeding cycle time and helps eliminate ration settling while traveling from ingredient storage areas to feed discharge points. *If the machine is shut down during these movements, make sure the restrictors are set approximately half-depth in the tub at restart to help reduce drive load and replacement of shear bolts.* The shear bolt (should one shear) is located in the U-joint on the output shaft of the gearbox under the clamshell shielding. **ALWAYS** use the same size and type of shear bolt (shank or all thread) as specified in Figure #7.

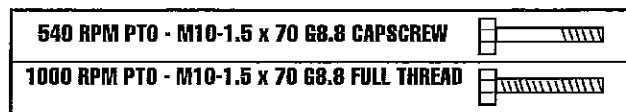


FIGURE 7 - SHEAR BOLTS

To unload the ration from the mixer, engage the conveyor motor and open the discharge door. The feed output to the conveyor can be adjusted by the door opening. The door has a gauge located on the right side to help you adjust the opening. The door will need to be opened wider for discharge of rations containing coarse or bulky ingredients. You should also match tractor ground speed with ration discharge rate to achieve an even, level flow into feed bunks.

LUBRICATION

TWO-SPEED GEARBOX

The two-speed gearbox should be filled to the oil level sight plug located on the front of the gearbox (see Figure 8). Use SAE 90 weight gear oil. Do not over fill gearbox. Over filling the gearbox produces excessive heat that may scorch the oil that will reduce the lubrication to the gear train.

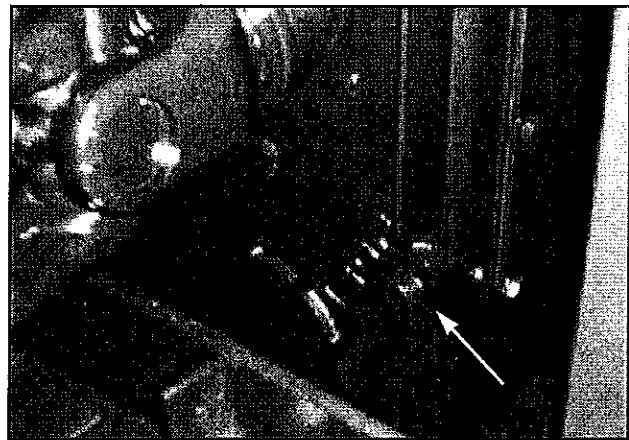


FIGURE 8 - TWO SPEED GEARBOX OIL LEVEL SIGHT PLUG

LUBRICATION

PLANETARY GEARBOX

The planetary gearbox has an oil reservoir that is mounted to the front conveyor shield or under the platform. The oil reservoir should be filled to the oil fill plug located on the back side of the reservoir (see Figure 9). The oil sight plug located on the right side of the reservoir should be used as a daily check to ensure proper oil level. Fill reservoir up to the fill plug when oil level is indicated in sight plug. Use SAE 90 weight gear oil.



FIGURE 9 - PLANETARY GEARBOX OIL LEVEL SIGHT PLUG

RIGHT-ANGLE GEARBOX

The right-angle gearbox has a grease fitting located on the upper bearing of the gearbox, between the right-angle gearbox and the planetary gearbox (see figure 10). Grease this fitting every 100 hours, approximately 10 pumps, with an SAE multi-purpose grease. In addition to the upper grease fitting, there is an oil level plug on the front just left of the input shaft looking rearward. The oil FILL plug is on the right side toward the top of the main case. Fill the gearbox to the oil level plug with SAE 90 weight gear oil.

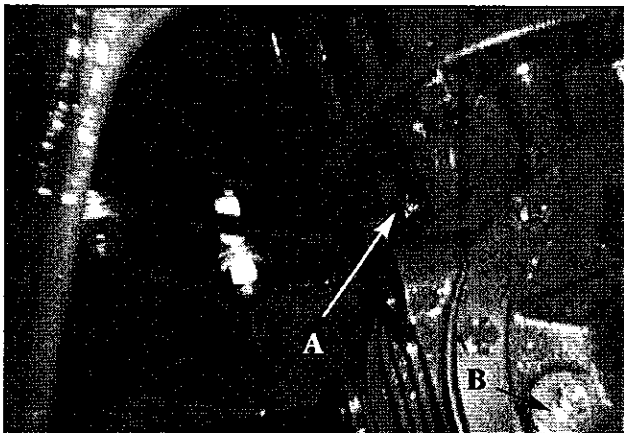


FIGURE 10 - GREASE FITTING (A) FOR UPPER BEARING OIL LEVEL PLUG (B)

SPLINED YOKE

The splined yoke is attached to the input shaft of the right-angle gearbox under the machine (see figure 11). Grease with a SAE multi-purpose grease every 50 hours.

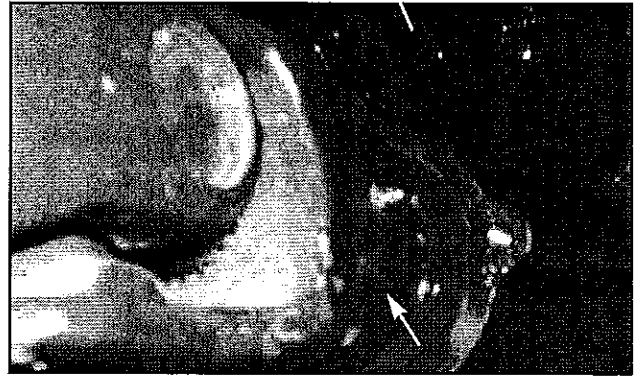


FIGURE 11 - GREASE FITTING FOR SPLINED YOKE

SPINDLE AND HUB

The spindle and hub is lubricated through the access plug in the center of the hub cap (see figure 12). Grease with a SAE multi-purpose grease every 50 hours.

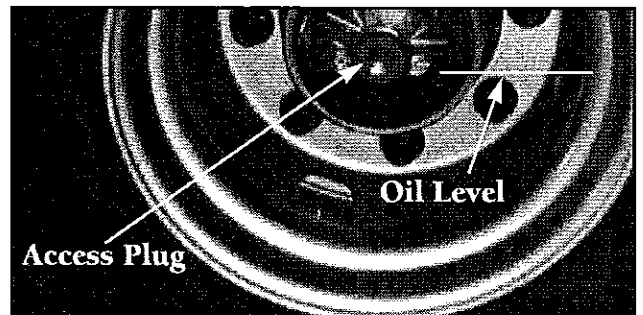


FIGURE 12 - SPINDLE & HUB ASSEMBLY

LUBRICATION

DRIVELINES

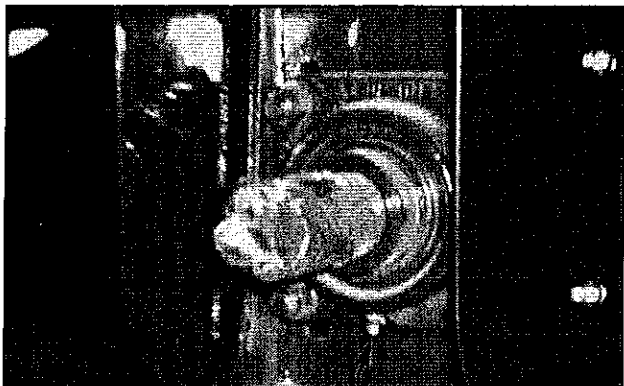


FIGURE 13 - DRIVELINE BEARING

The driveline has several universal joints (figures 13, 15 & 16) and a shaft bearing that should be lubricated every 20-25 hours with a SAE multi-purpose grease. The PTO profile (inner and outer slide tube) has a grease zerk that should be greased when the PTO is greased. A well lubricated profile ensures easy telescoping action of the PTO that will increase the life of the universal joint bearings. The PTO shielding requires greasing at the bell housing since shield does not rotate. (Fig. 14).

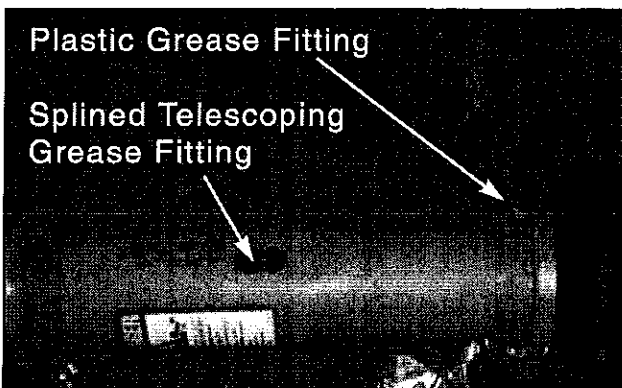


FIGURE 14 - DRIVELINES

VALVE BANK (On 500 cubic foot models)

The valve bank has a pressure relief valve and oil filter prior to the valve bank. The filter should be changed every 100 hours of operation. The pressure relief will trip if the oil filter is plugged and needs changing.

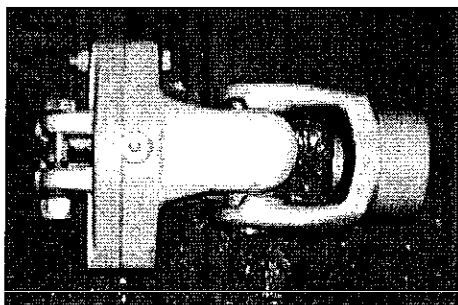


FIGURE 15 - DRIVELINES

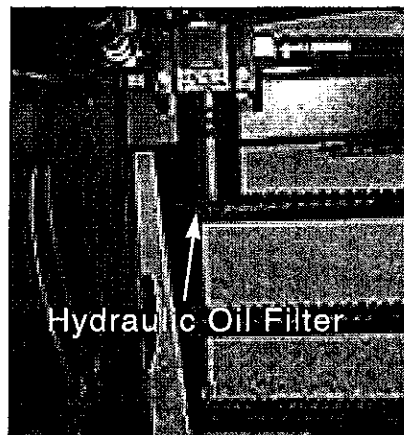


FIGURE 17 - VALVE BANK FILTER (500 MODEL)



FIGURE 16 - DRIVELINES

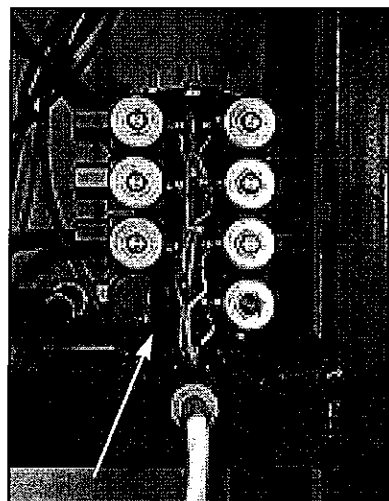
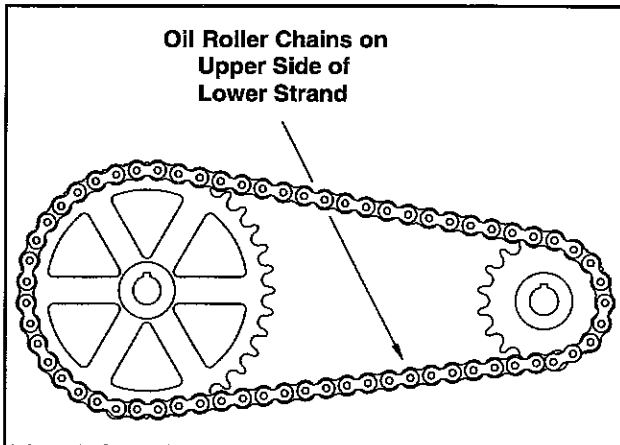


FIGURE 18 - HYDRAULIC VALVE BANK (500 MODEL)

LUBRICATION

ROLLER CHAIN

The roller chain is located at the discharge conveyor extension joint and is used to drive the discharge conveyor extension belt (if equipped). Lubricate the roller chain every 20-25 hours of operation with the discharge conveyor extension in the up (road) position. Apply chain lubricant or clean SAE engine oil inside the lower strand of chain. Rotate drive between application until the total length has been lubricated. **DO NOT APPLY WHILE MACHINE IS RUNNING!**



**FIGURE 19 -DISCHARGE CONVEYOR EXTENSION
DRIVE**

SCROLL (AUGER) TAPER ROLLER BEARING

The Taper Roller Bearing that supports the mixing auger **Does Not Require Lubrication**. The Bearings are in a sealed environment and are pack lubricated at the factory during assembly.

TROUBLESHOOTING

The Vertical Tub forage mixer is designed to chop and mix forage material. The system is simple and reliable and requires minimal maintenance.

If you encounter a problem with the mixer, check this Trouble Shooting section for a possible cause and solution. If you have a problem that is not covered in this section, please call your local dealer for assistance. Be sure to give the dealer your model and serial numbers when you call.

Problem	Possible Cause	Possible Remedy
Discharge door will not open when belt conveyor is running.	Low oil level	Check hydraulic oil level in tractor.
	Valve bank set improperly	Check field requirements for open or closed centered tractors.
	Oil supply from tractor	Check minimum field requirements for tractor oil supply.

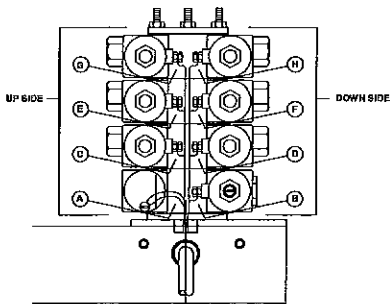
Control box (early 500 cubic foot machines) does not work. Hydraulics do not respond.

No power

Turn on power switch.

Replace fuse if blown.

Check power leads. Be sure they are connected to a 12 volt battery.



Poor connection

Check all connectors in wiring harness. Clean all terminals and reconnect.

Check continuity of solenoid valves. Replace as required.

Oil level

Check hydraulic oil level in tractor. Fill to specified level.

WIRING INSTRUCTIONS			
ITEM			ITEM
G	VIOLET	DOOR	GREY
E	GREEN	DOOR	BLUE
C	RED	BLADES	YELLOW
A	BLACK	PILDT	WHITE

Bad switch

Replace switch in control box.

FIGURE 21 -WIRING INSTRUCTIONS

Machine does not retain settings.

Oil bypassing seal in cylinder

Replace cylinder.

Damaged or failed hydraulic component

Repair any damaged or leaking hose, fitting, seal valve or cylinder. Tighten all fittings.

Electrical problem

Check all electrical switches and wiring. Repair or replace as required.

TROUBLESHOOTING

Problem	Possible Cause	Possible Remedy
Shear bolts shearing	Machine is overloaded	Shift machine to low speed.
	Foreign object in machine	Remove object.
	Rapid Engagement of PTO	Idle tractor down and engage slowly.
	Improper shear bolts	Use proper size shear bolts. See figure 7 in Machine Operation.
Material will not discharge from machine	Material is extremely dry and fluffy	Add water or liquid protein to ration. Open door wider.
	Material length is too long	Process material to shorter length by increasing restrictor depth into tub or increasing mixing time.
	Mixing auger is not rotating.	Engage mixing auger.
PTO shaft hard to telescope and hard to hook-up	Lack of grease on sliding	Lubricate sliding tubes with grease.
	Shafts twisted due to overloading	Use proper size and grade shear pins in shear clutch.
Excessive noise when turning and hard to hook-up	Turning too sharply	Tractor drawbar too short (not to ASAE specifications. Avoid sharp turns.
	Jack shaft bearing not adjusted properly for tractor	Adjust jackshaft bearing. See figure 6 in Preparing For Field Operation.
Belt conveyor will not turn	Oil flow to motor is low.	Check oil level in tractor.
	Material build-up under conveyor and belts are rubbing.	Remove belt and clean out material.
	Belts are loose	Tighten belts. See belt conveyor in Preparing For Field Operation.
	Conveyor is overloaded	Open discharge door slowly.
Two-speed Gearbox overheats	Oil level too high	Adjust oil level to leveling plug.
	No oil in gearbox	Add oil.

TROUBLESHOOTING

Problem	Possible Cause	Possible Remedy
Restrictor blades will not move.	Restrictor pin is restricting movement.	Adjust restrictor pin.
	Hydraulic flow to valve bank and electro-hydraulics is low	Check oil level in tractor and oil filter on valve bank.
Inaccurate reading on scale indicator.	Improper scale calibration	Re-calibrate indicator.
	Faulty weigh-bar	Replace weigh-bar spindle or hitch.
	Connections loose to indicator.	Tighten all connections.
Loose hay is pushed over top edge of tub.	Scroll speed too fast	2 speed needs to be in <u>low gear</u> . (Lever toward tub).
		Slow tractor throttle to approx. 2/3.
Exceed tractor power	Very wet ration	Increase restrictor depth in tub.
		Check lubrication in all gearboxes.

SPECIFICATIONS

Make:	SupRaMix	SupRaMix	SupRaMix
Model:	425	500	750
Capacity:	425 cu. ft. 340 bu.	500 cu. ft. 402 bu.	710 cu. ft. 570 bu.
Dimensions (overall):			
Length:	19'6"	19'6"	21'4"
Width:	8'8" (slide tray) 11'1" (conv ext)	8'8" (slide tray) 11'1" (conv ext)	10'3" (slide tray) 12'8" (conv ext)
Height:	8'9"	9'8"	10'5"
Ground clearance (axle):	12"	12"	12"
Discharge conveyor (belt):	36" var. spd.	36" var. spd.	36" var. spd.
Drives:			
Hvy duty planetary	yes	yes	yes
Single spd input gearbox	std	opt	---
Two spd input gearbox	opt	std	std
90 degree gearbox	540 RPM	540 RPM	1000 RPM
Horsepower (min.):	100	100	140
Hydraulic system:	2000 psi @ 15 gpm	2000 psi @ 15 gpm	2000 psi @ 15 gpm
PTO speed:	540 RPM	540 RPM	1000 RPM
Shear Pin: (shear type through)	M10-1.5x 70 gr 8.8 (shank)	M10-1.5x 70 gr 8.8 (shank)	M10-1.5x 70 gr 8.8 (all thread)
Tires (215/75R 17.5 16 ply low profile):	4	4	8
Tire pressure:	125 psi	125 psi	125 psi
Empty Wt.:	10880 lbs.	12120 lbs.	15580 lbs.
Tongue Wt.:	1560 lbs.	1980 lbs.	1540 lbs.

