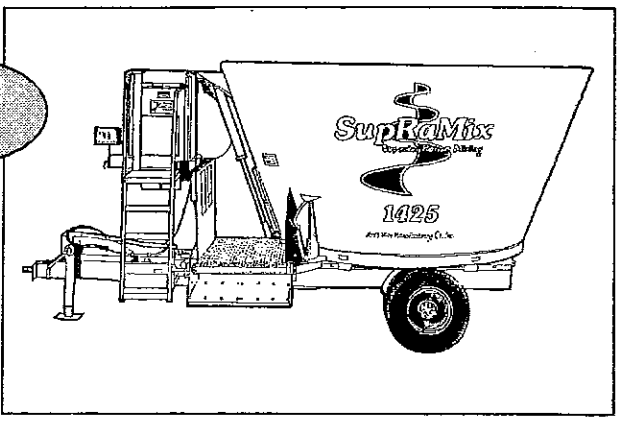
Building on a Art's-Way Tradition of Quality

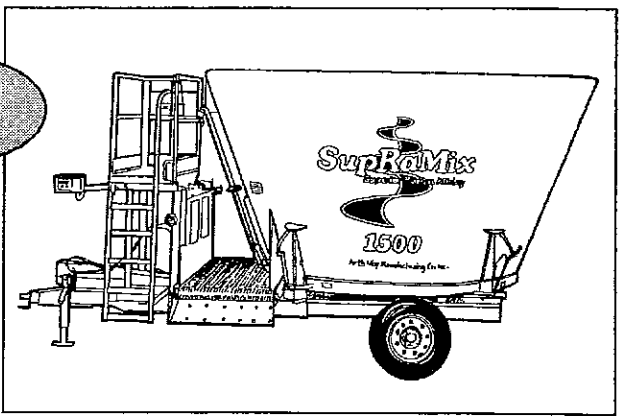
SupRaMix 1000 Series

Operator's Manual

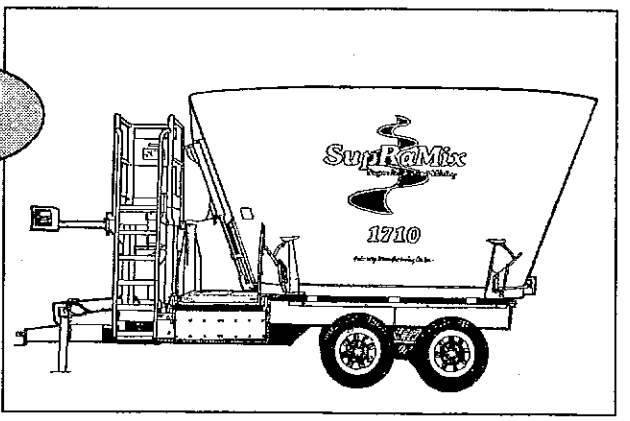
Model 1425



Model 1500



Model 1710



469360 (-)
$9.95

Art's-Way Manufacturing Co., Inc.

To the Owner

Congratulations on the purchase of your new Art's-Way SupRaMix Vertical Tub Mixer. You have selected a top quality machine that is designed and built with pride to ensure you have many years of efficient, reliable service.

Many people have worked on the design, production, and delivery of this mixer. 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 mixer.** 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 the equipment previously sold.

Because modifications to this mixer 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. Any modifications made without the written permission of Art's-Way Mfg. Co. shall void the warranty of this product.

In the interest of continued safe operation of this mixer, 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 accepted engineering practices in effect at the 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. In addition, Art's Way assumes no liability for product altered or modified in any way by users or anyone other than an authorized dealer.

Important Warranty Information

The warranty for this mixer appears on page 6 of this Manual. In order to establish proper warranty registration, the Warranty Registration and Dealer Pre-Delivery Checklist must be completed and returned to the factory. Failure to comply with this requirement may result in reduced warranty allowances.

Limitations of this Manual

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

Parts & Service

As the new purchaser of your SupRaMix, it is very important to consider 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 number, serial number, and the date of purchase, as well as your dealer's name and address.

Owner's Name _____
Owner's Address _____

Purchase Date _____

Dealership Name _____
Dealership Address _____

Dealership Phone No. _____

Enter the Serial Number & Model Number of Your Mixer In The Space Provided Above
(The Serial Number is Located on the Left Tongue Rail Forward of the Conveyor)

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Limited Warranty

Art's-Way Manufacturing Co., Inc. warrants the 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 expenses 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 the rated capacity, substitution of 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 it's 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
- can anticipate situations which may produce problems
- can make necessary corrections before problems develop.

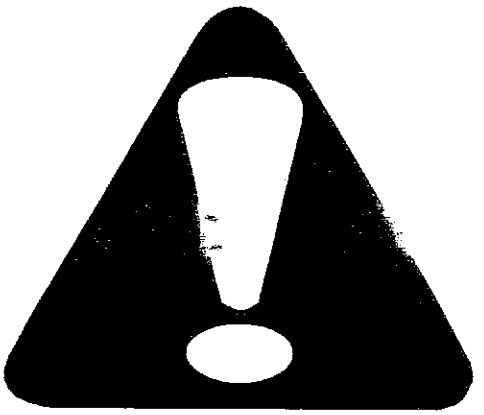


Figure 1. The Universal Safety Alert Symbol.

The American Society of Agricultural Engineers has adopted the UNIVERSAL **SAFETY ALERT SYMBOL** (Figure 1) as a way 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 mixer.***

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

Safety features and instructions for the SupRaMix Vertical Tub Mixer models are detailed elsewhere in the Operator's Manual. It is the responsibility of the mixer owner to ensure that ***all*** operators read and understand the Manual before they are allowed to operate the mixer. ***[Occupational Safety and Health Administration (OSHA) regulation 1928.57].***

Notices of Danger, Warning, and Caution

Watch for these words on mixer 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

⚠ CAUTION

Remember, a careful operator is the best insurance against an accident.

⚠ CAUTION

READ and UNDERSTAND the Operator's Manual and all the safety decals before operating the mixer. Review all 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 mixer.
- Be sure that the correct implement driveline parts are used and that they are properly secured.
- Install the safety chain when attaching the mixer to the tractor.
- Clear the area of bystanders, especially children, when making repairs, adjustments or performing maintenance on the mixer.
- **Do not** allow riders while transporting.
- Put all tractor and machine controls in "neutral" and disengage the PTO before starting. Follow the starting instructions according to your tractor Manual.
- Operate the mixer only while seated on the tractor seat.
- Make sure the unit is adequately supported with safety blocks or safety stands when changing tires or 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 mixer while in operation.
- **Do not** allow riders while the mixer is in operation.
- **Do not** attempt to unclog, clean or adjust the mixer while it is running.
- Before servicing, adjusting, repairing or unplugging the mixer, stop the tractor engine, place all the controls in neutral, set the parking brake, remove the ignition key and wait for all moving parts to stop.
- Stay away from overhead power lines. Electrocution can occur even without direct contact.
- Keep all hydraulic lines, fittings, and couplers tight and free of leaks. (See the **Hydraulic Safety** section, below.
- Be careful when ascending or descending on the mixer 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 mixer, stop the tractor engine, place all the controls in neutral, set the parking brake, remove the ignition key and wait for all moving parts to stop.
- Use only the tools, jacks and hoists that are of sufficient capacity for the job.
- Use support blocks or safety stands when changing tires or working under the machine.
- Follow the good shop practices of keeping the service area clean and dry and use adequate light for the job at hand.

Hydraulic Safety

- Before applying pressure from 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 the tractor.
- Make sure all shields/guards are in place and properly secured when maintenance work is complete.
- 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 cement. 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 the 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 the mixer is securely attached to the tractor and install a safety chain to the mixer. Install a retainer through the drawbar pin and attach the safety chain. (See Figure 11 in the **Preparing for Operation** section).
- **Do not** fail to latch the tractor brake pedals together.
- **Do not** exceed 10 mph (16km/h) when transporting the mixer. Always 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 the other traffic.
- A dealer installed Road Light Kit is available. It 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 the machine is towed.
- Stay away from overhead obstructions and power lines during transport. Electrocution 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.
- Park the mixer on firm level ground and block the tires.

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.

⚠ CAUTION

Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death. Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Have it done by your dealer or a qualified tire repair service.

Assembly Safety

- Use adequate manpower to perform assembly procedures safely.
- Assemble the mixer in a 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

Warning Decals

Decal Locations

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 mixer. Refer to Figure 2 and to Table 1 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 replacement parts display the current safety decals and signs as well. ***Remember: Always replace missing, damaged or illegible safety decals. New decals and signs are available from your dealer.***

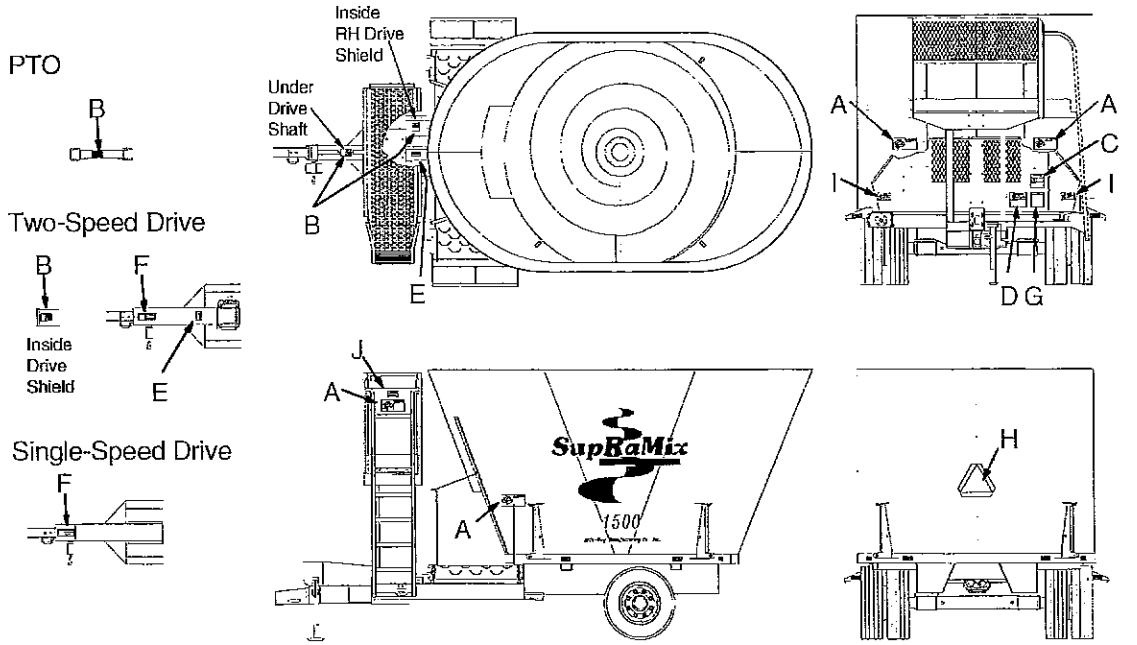


Figure 2. SupRaMix Safety Decal Locations.

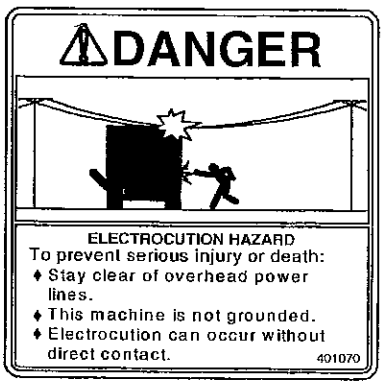
Table 1. *Safety Decal Locations*

Item	Quantity			Part No.	Description
	1-Speed 540 PTO	2-Speed 540 PTO	2-Speed 1000 PTO		
A	3	3	3	401090	Decal, Danger Rotating Blades
B	3	4	4	268860	Decal, Danger Rotating Drive Line
C	1	1	1	401070	Decal, Danger Electrocution
D	1	1	1	346310	Decal, Warning High Pressure
E	1	2	2	467450	Decal, Warning Moving Parts Hazard
F	1	1	---	457360	Decal, Caution Hitching Instructions 540
F	---	---	1	401080	Decal, Caution Hitching Instructions 1000
G	1	1	1	368040	Decal, Caution Read
H	1	1	1	E224038	Decal, Slow Moving Vehicle Sign
I	2	2	2	455090	Decal, Warning Conveyor
J	1	1	1	467420	Decal, Warning Riders Falling Hazard

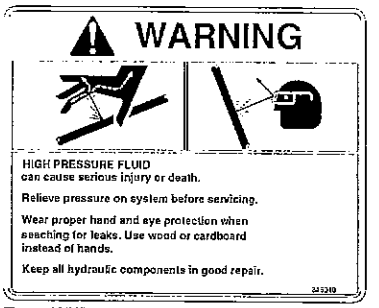
Decal Identification and Part Numbers

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

B - "DANGER" - Rotating Drive Line. Part No. 268860

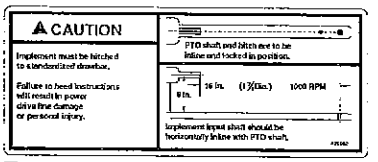


C - "DANGER" - Electrocution. Part No. 401070

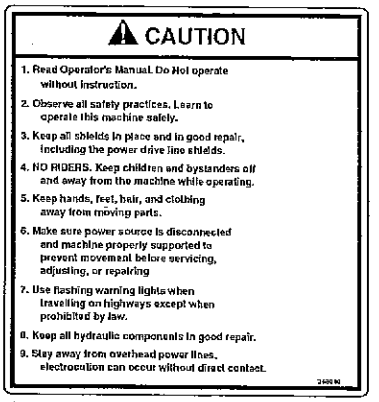


D - "WARNING" - High Pressure Fluid. Part No. 346310

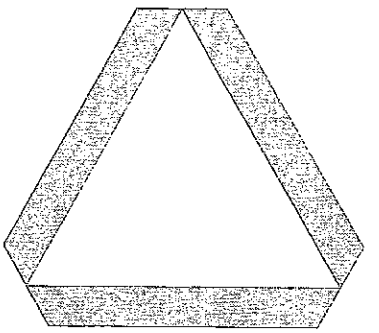
E - "WARNING" - Moving Parts Hazard. Part No. 467450



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



G - "CAUTION" - Read Operator's Manual. Part No. 368040



H - Slow Moving Vehicle Sign. Part No. E224038

I - "WARNING" - Conveyor; Belt Hazard- Part No. 455090

J - "WARNING" - Riders Falling Hazard - Part No. 467420

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 Operation

Tractor

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

Horsepower - In consideration of the size and weight of the SupRaMix mixer, we recommend that a 100 PTO horsepower tractor be used to operate the 1425 and 1500 models, and that a 140 PTO horsepower tractor be used to operate the 1710 model. This recommendation will meet the required stability and control necessary for safe operation and highway transport.

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 of the PTO shaft stub should be 16 inches for all SupRaMix Models. See Figure 3). Be sure that the hitch pin has a low profile head so that it will not interfere with the operation of the PTO over uneven ground.

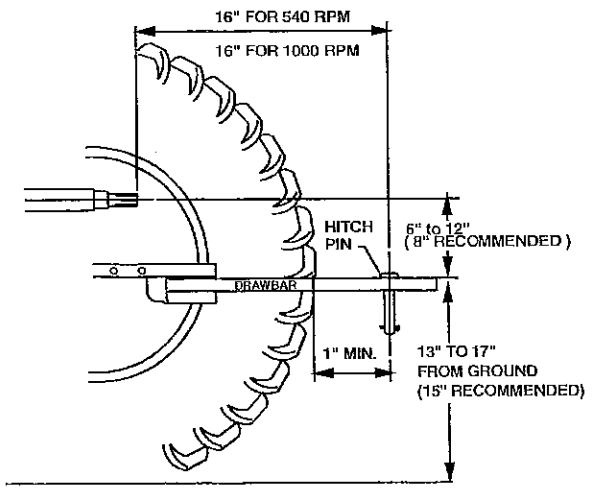


Figure 3. Drawbar Specification.

Power Take Off (PTO) - Observe the proper PTO specifications as shown in Table 2.

Table 2. PTO Specifications

Model	RPM	Shaft
1425/1500 Standard Single or 2-Speed	540	1 3/8" - 6 spline
1425/1500 with 1000 RPM Option	1,000	1 3/8" - 21 spline
1710 All	1,000	1 3/8" - 21 spline

Hydraulic System

Tractor Hydraulics - Your Vertical Tub Mixer requires tractor hydraulics only. The hydraulic system of the tractor must meet the minimum requirements of 15 GPM at 2000 psi with constant flow.

The tractor must have a minimum of two hydraulic remote outlets.

- Primary remote to operate the unloading conveyor hydraulic motor.
- Secondary remote for the door or for the optional electro-hydraulic valve bank.

Door Relief Valve - All models are equipped with a 150 psi hydraulic relief valve in the hydraulic circuit for the door. See A in Figure 4. This valve is designed to prevent damage to the mixer door, floor, and unloading conveyor that could occur if foreign objects or material prevent the door from closing properly. This valve is pre-set at the factory and should not be adjusted.

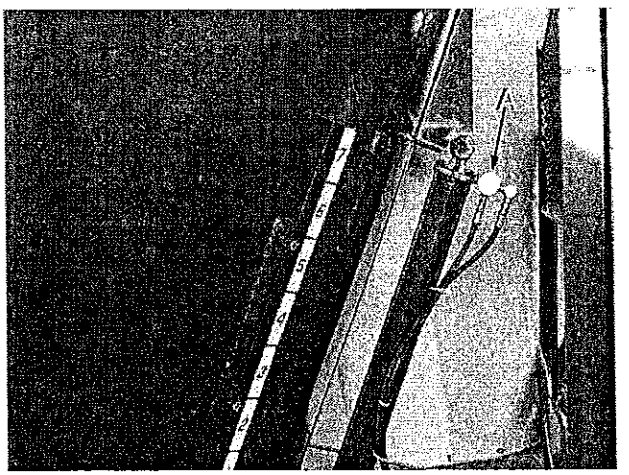


Figure 4. Relief Valve (A) for Door Hydraulics.

Electro-Hydraulic Valve Bank - Your Vertical Tub Mixer may be equipped with an optional electro-hydraulic valve bank. See Figure 5 for the electro-hydraulic layout. These systems include the discharge door (marked DOOR on the control box), plus the options of hydraulic restrictors (marked BLADES on the control box) and the conveyor extension (marked BOOM on the control box).

The decal for the control box is shipped with this manual in the manual storage tube located on the machine. It should be installed so that the function indicated on the decal is aligned with the proper color switch. See Figure 5 for proper installation.

The valve bank is activated with the 3 toggle on/off switches on the tractor mounted control box. Each switch selects a circuit. An LED on the box will indicate which circuit is active. This valve does not control, but selects the desired circuit. To operate the auxiliary hydraulics, activate the desired circuit and operate the remote lever as usual. More than one circuit may be activated at once.

⚠ CAUTION

Use caution when activating more than one circuit at a time! The lowest pressure circuit will activate first, and the others will not activate or may even become depressurized until pressure equilibrium is reached.

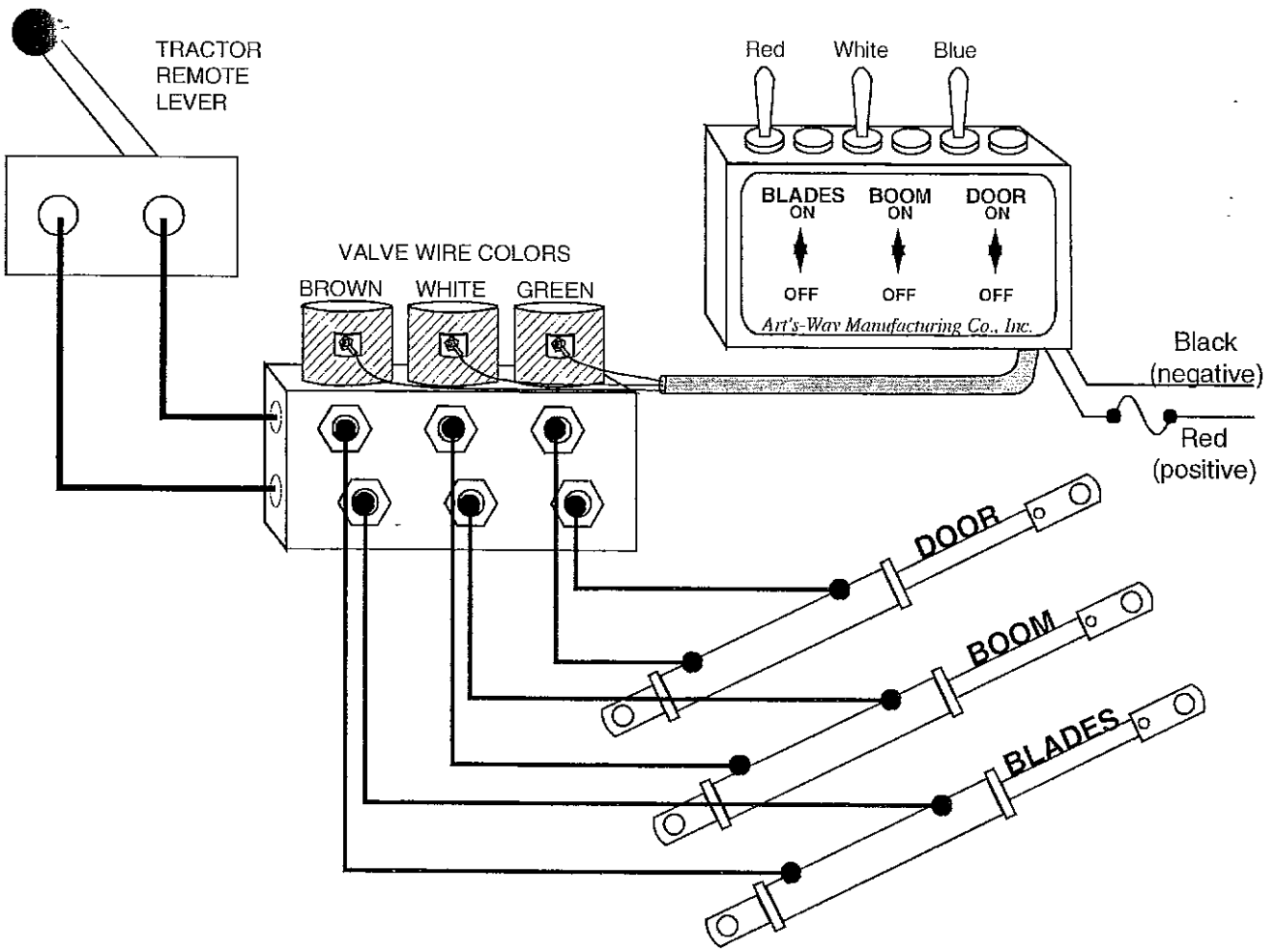


Figure 5. Valve Bank.

System Requirements - The electro-hydraulic valve will operate on a tractor hydraulic system that is closed center, open center or pressure compensated. We recommend that the tractor hydraulic system be closed center and capable of independently controlling the flow rate for each remote outlet. See Table 3 for the recommended flow rates.

Table 3. Hydraulic Pressure and Flow Requirements

Circuit	Flow	Pressure
Unload Conveyor	8 gpm (30 lpm)	2000 psig (13780 kPa)
Electro Hydraulic Valve Bank (Door, Blades, Boom)	7 gpm (27 lpm)	2000 psig (13780 kPa)

Electrical

The Vertical Tub Mixer requires a 12 volt DC, negative ground, power supply from the tractor for the operation of the scale indicator, electro-hydraulic control system, and the optional highway safety lights. Connection to any other type of electrical system will likely result in severe and immediate damage to the indicator, electro-hydraulic control box, and/or solenoids.

Scale Indicator Wiring - 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 a positive ground system. Refer to the scale's Operator's Manual.

Electro-Hydraulic Control Box - Mount the electro-hydraulic control box (if equipped) on the tractor and route the wire harness along the hitch to provide adequate clearance. The control box should be mounted to the right of the driver's seat with the toggle switches pointing upward or toward the operator.

The decal for the control box is shipped with this manual in the manual storage tube located on the machine. It should be installed on the control box so that the decal is in view of the operator and the function indicated on the decal is aligned with the proper color switch. See Figure 5 for proper switch alignment.

The control box can be wired directly to the battery or attached using a second tractor plug assembly (not provided). The power connections (red wire) must be fused to protect the wiring in case of a short. Locate the fuse as close as possible to the power source. The ground connection (black wire) should be connected directly to the frame of the tractor or the engine block. Refer to Figure 5 on page 13 for the electro-hydraulic layout. The hydraulic control box wiring (Figure 6) is provided for control box component replacement only. The control box and valve bank come pre-wired, and should not be modified. If a different control set-up is desired, the hydraulic routing in the valve should be changed, not the wiring.

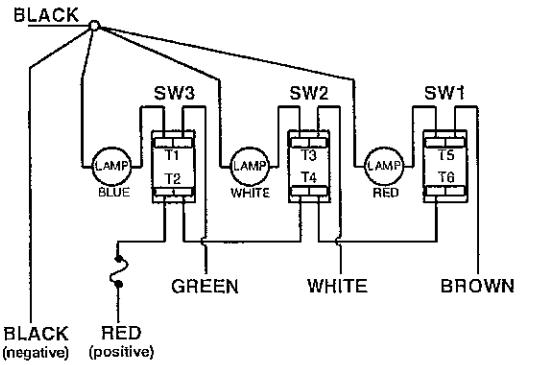


Figure 6. Hydraulic Control Box Wiring.

Highway Safety Lights - 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. See Table 4.

Table 4. Light Connector Wiring

Conductor		Terminal	Circuit
I.D.	Color	Number	
Wht	White	*1	Ground
Blk	Black	2	Work Lights
Yel	Yellow	*3	Left Turn Signal And Flasher
Red	Red	4	Auxiliary
Grn	Green	*5	Right Turn Signal And Flasher
Brn	Brown	*6	Tail Lamp
Blu	Blue	7	Auxiliary

** As a minimum, these terminals MUST be wired.*

⚠ CAUTION

Leaving the scale indicator and/or electro-hydraulic valve activated will discharge the tractor battery. To prevent this, disconnect the scale indicator and/or valve when not in use.

Mixer

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

Bolt Torque - Proper bolt torque is important for maintaining the proper assembly and safety features on this mixer. The correct torque values for various bolts and capscrews are listed in Table 5. Tighten all bolts to the torque specified in the Table unless otherwise noted. Check bolt tightness periodically, using the listed torque values as a guide. If fasteners are replaced, use items with the same ratings as the original equipment.

The torque values in Table 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 the torque values by 5%.

Table 5. Common Bolt Torque Values

Bolt Size	Clamp Load	Plain	Plated
¼ - 20 (.250)	2,025	8 ft. lbs.	76 in. lbs.
5/16 - 18 (.3125)	3,338	17 ft. lbs.	13 ft. lbs.
3/8 - 16 (.375)	4,950	31 ft. lbs.	23 ft. lbs.
7/16 - 14 (.4375)	6,788	50 ft. lbs.	37 ft. lbs.
½ - 13 (.1500)	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.
¾ - 10 (.1710)	21,300	286 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.

Shields - Make sure that all shields are in place and functioning. If shields are missing when your mixer is delivered, contact your dealer as soon as possible for replacements. 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 tire 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 Nuts - Lug nut torque should be checked prior to operation and again one week later. The torque must be equal on all lug nuts or they will loosen. The recommended torque is 300 ft. lbs.

⚠ CAUTION

Failure to follow proper procedures when mounting a tire on a wheel or rim can produce an explosion which may result in serious injury or death. Do not mount a tire unless you have the proper equipment and experience. Have it done by a dealer or qualified repair service.

Driveline Bearing - All SupRaMix models include an adjustable bearing mount (see Figure 7) for the driveline jackshaft. The bearing must be adjusted so that the PTO is level as shown in Figure 8. Proper adjustment optimizes the performance of the equal angle PTO driveline. Improper adjustment can result in excessive vibration when operating the mixer while turning, which will lead to premature universal joint failure.

Bearing Adjustment - To adjust the bearing mount, loosen the four bolts that attach the bearing to the frame. See Figure 7. Move the bearing so that the end of the jackshaft is at the same height as the PTO shaft on the tractor as shown in Figure 8. Tighten the four bolts to the specified torque and replace the shield for the jackshaft.

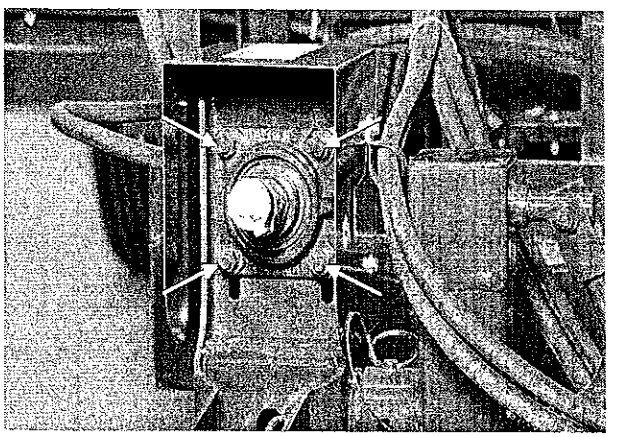


Figure 7. PTO Driveline Bearing. Arrows Indicate Mounting/Adjustment Bolts.

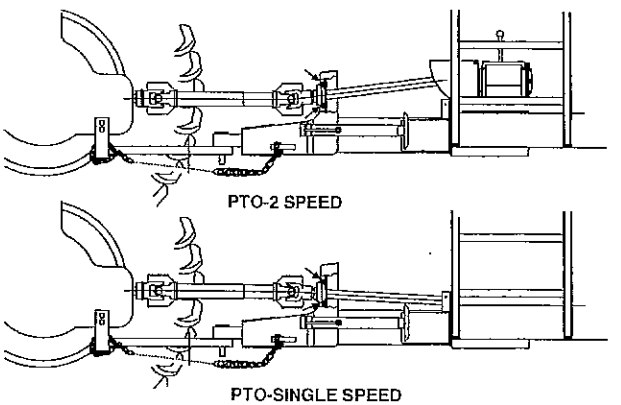


Figure 8. Proper Driveline Bearing Alignment.

Power Take Off - The Vertical Tub Mixer is shipped with the PTO and the PTO holder loose. Attach the PTO holder to the underneath side of the tongue with the supplied hardware as shown in Figure 9. Attach the PTO and attach the shield chain to the mixer. If the PTO halves become separated, clean the sliding tubes so they are free of dirt and foreign material. If the halves do not slide easily, premature failure of the universal joints could result.

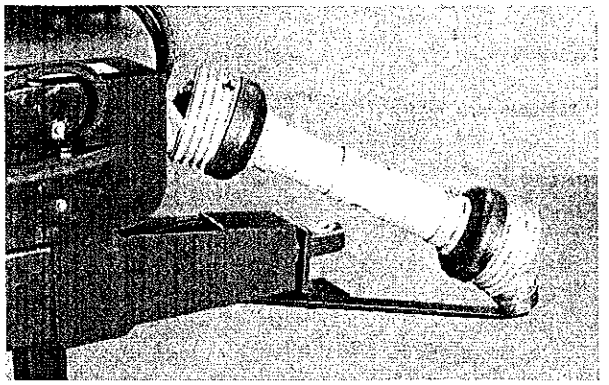


Figure 9. PTO and PTO Holder.

Oil Levels - The Vertical Tub Mixer has either two gearbox assemblies (single speed units) or three gearbox assemblies (two-speed units) that require oil for lubrication. Before operating, check the sight plug on the two-speed gearbox (if so equipped), the oil reservoir for the planetary gearbox, and the oil level for the right-angle gearbox (located below the planetary). Also ensure that the upper bearing on the right-angle gearbox has been lubricated. For details, refer to the **Lubrication** section of this Manual.

Conveyor Extension - If your Vertical Tub Mixer is equipped with a conveyor extension boom, it can be locked in the upright position by installing a transport lock pin. See Figure 10. The transport lock pin is shipped loose in the manual storage tube located under the platform on the mixer. The transport lock is designed to keep the conveyor extension boom in the upright position for storage or transporting without hydraulic hook-ups. **It is important that the transport lock pin be removed when the hydraulic system is hooked up.** Activating the extension cylinder with the transport lock pin installed will severely damage the conveyor and conveyor extension boom.

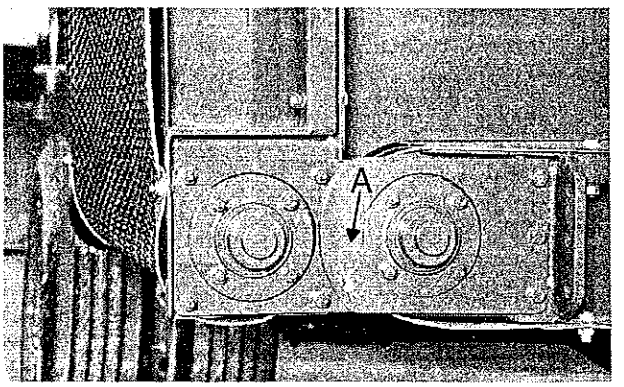


Figure 10. Conveyor Extension Lock.
A) Lock Pin

Left-Hand Discharge for Conveyor Extension - If the conveyor extension is installed as a left-hand discharge, ensure that the left front restrictor does not interfere with the operation of the extension. For a dealer installed left-hand discharge, or when changing a factory installed right-hand discharge to a left-hand discharge, a 5/8 x 1-1/2 inch bolt and lock nut (not supplied with the mixer) should be installed in the first hole of the left front restrictor on the inside of the tub. This will prevent the restrictor from extending out and interfering with the operation of the conveyor extension.

Attaching To The Tractor

When hooking the mixer up to the tractor, refer to Figure 11 and the following procedures:

1. Clear the area of bystanders, especially small children.
2. Block mixer wheels to prevent rolling.
3. Slowly back the tractor up to the mixer and align the hitch pin hole with the draw bar.
4. Place all tractor controls in neutral, set the park brake and stop the engine. Remove the ignition key before dismounting.
5. Install a hardened hitch pin with a mechanical retainer. (NOTE: The hitch pin should be a minimum of 1.25" in diameter).
6. Using the jack, lower the mixer onto the tractor drawbar, then pivot the jack into the transport position and lock it.
7. Attach the 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 the chain through the intermediate chain support and secure the chain to the tractor drawbar carrier. Be certain to allow enough slack in the chain for the tractor and the mixer to fully articulate without binding.

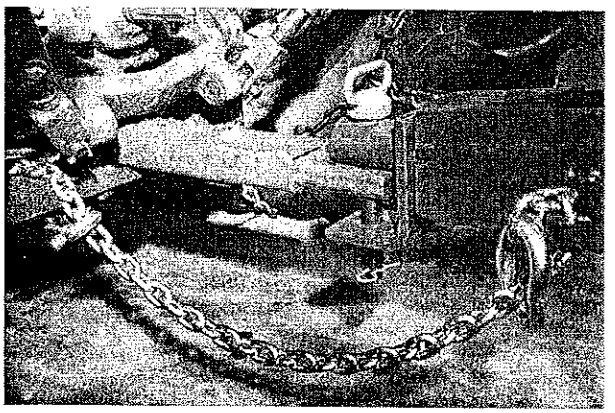


Figure 11. Proper Safety Chain Installation.

PTO Hookup

⚠ CAUTION

Never operate a 540 rpm SupRaMix with a 1000 rpm tractor. Make sure the area is clear of bystanders before operating. Always follow good shop practices.

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

Hydraulic Hoses - 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 a 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. If your SupRaMix is equipped with a conveyor extension boom, ensure that you remove the transport lock pin. Operate the hydraulic functions of the mixer to purge the mixer hydraulic system. Check the hydraulic oil level of the tractor after purging to ensure that the proper level is maintained.

Belt Conveyor & Discharge Door - Check the belt conveyor to ensure that it is free of material and is not contacting any part of the machine. The discharge door should open to the full unload position. The belt conveyor should be checked and adjusted according to the conditions in which the mixer will be used. In other words, it should be checked and the tension adjusted with the heaviest ration that will be used in the mixer. The belt should be tensioned to move the material without belt slippage. A lighter ration will require less tension than a heavier ration. Refer to the **Maintenance and Adjustment** section of this Manual for detailed adjustment information.

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. Connect the wire harness between the control box and the electro-hydraulic solenoid valve. Refer to pages 13 and 14 of the **Tractor Preparation** section of this Manual for control box installation.

Machine Operation

General

The Vertical Tub Mixer you are operating is designed to mix complete feed rations, including total-mixed-rations (TMR) for ruminants. It consolidates hay bale processing and full ingredient blending (wet or dry) with a single machine. Hay can be cut to an optimum roughage length, usually 1.5 to 6 inches, through multiple restrictor blade settings. Initial ration processing should begin in low gear on mixers equipped with two-speed transmissions to best utilize tractor power while loading ration ingredients.

The unit is capable of processing rations of hay that have been put up using standard haying practices including various sizes of round and square bales. The moisture content should be at a level suitable for prolonged storage. The conditions of the hay will affect mixer performance.

The loading sequence of the material into the mixer depends on individual operating conditions, ration, desired mix, size of load, etc. Because of this, you may need to experiment to find the procedure to best fit your individual set of conditions. The following loading sequence works well in most conditions:

1. Dry Hay/Dry Alfalfa/Straw *
2. Silage
3. Grain(s)/Supplement/Pre-Mix
4. Liquids/High-Moisture Ingredients

* It is most important that the dry forage material be loaded first.

Operating Speeds

Single Speed - The single speed system provides a direct drive from the tractor to the Right-Angle and Planetary gear boxes. This system is efficient and mixer speed can be controlled with the tractor throttle to accommodate for different mixing conditions. Slower mixer speeds are desired for cutting and processing whole bales or bulk commodities, while higher speeds can be used for mixing loose commodities, feeding, or final cleanout.

Two-Speed - The two speed gearbox provides a lower speed for the initial cutting and mixing of whole bales, tough grass hays, and/or bulk commodities, and a higher speed for final cleanout. Before changing speeds, you must first shut off the tractor PTO. For low gear, push the lever toward the tub. For high gear, pull the lever away from the tub. Refer to Figure 12. Occasionally, you may have to rotate the PTO driveline to allow the straight cut gears to mesh. Remote two-speed shift controls also require that the tractor PTO to be shut off before shifting.

⚠ WARNING

Always shut off the tractor engine if rotating the PTO shaft by hand.

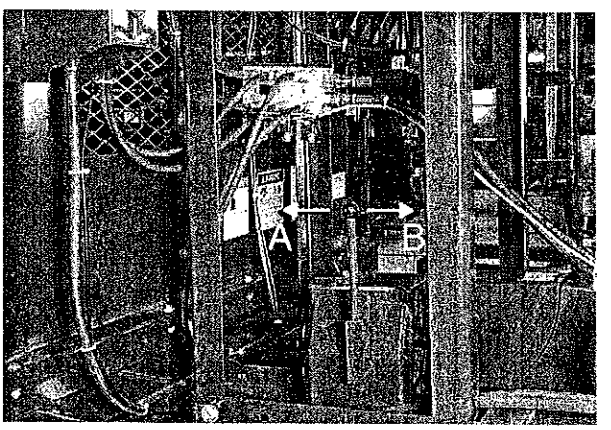


Figure 12. Two-Speed Transmission Shift.
A) Lo Speed
B) Hi Speed

Loading

The mixer should be parked on level ground at the loading area. Minimize the PTO angle by ensuring that the tractor and mixer are in a straight line. Set the tractor parking brake. Make sure the mixer is in low speed (on two-speed models) and that the discharge door is closed. Then engage the PTO. The tractor throttle should be set at the rated PTO speed.

The hay in the ration, without twine, plastic, and other bundling materials, is normally loaded first. This allows the hay to work down the sidewalls and work against the restrictors, cutting the hay to the desired length as the remaining ration ingredients are added. If excessive throwout from the top of the mixer tub is encountered, a reduced PTO speed may help (especially on the single speed units). Although reduced speeds can help to reduce throwout, throwout may not be completely eliminated with this type of mixer, depending on the type of hay being used.

After the hay has been loaded, the other rations can be added. The ration with the highest moisture content should be added last. Loading liquid rations last allows absorption into the dryer rations and results in the most even mixture.

Restrictor Adjustments

Restrictor Location and Function - Your mixer includes either two or three restrictor blades (see Figure 13-A), depending upon mixer size. The restrictors are located near the bottom of the tub. Restrictors act as adjustable shear bars for the lower knives of the auger (scroll).

The adjustment of the restrictors is very important in controlling the length of forage cut, ration consistency and the power required to mix your specific ration. The distance these restrictors extend into the mixing tub is determined by either mechanical or hydraulic operation, depending on how the mixer is equipped.

Hydraulic Restrictor Adjustment - The distance the hydraulically operated restrictors extend into the mixing tub is determined by the position of the depth stops (Figure 13-B). To adjust the restrictor depth stops, first shut off the tractor and relieve the hydraulic pressure. Remove the klik pin and the spacer from the depth stop (Figure 13-B). Remove the depth stop, install it in the desired position, and reassemble the spacer and klik pin. To reduce the cutting action, select a linkage hole closer to the tub (toward the position shown by Figure 13-D which causes the blades to be more withdrawn from the tub). For a more aggressive cut, select a hole away from the tub (toward the position shown by Figure 13-C which causes the blades to extend further into the tub).

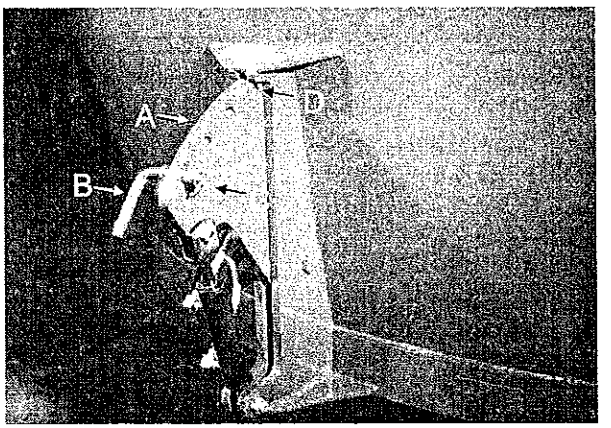


Figure 13. Hydraulic Restrictor Blade Adjustment.
A) Restrictor Blade
B) Depth Stop
C) Depth Stop Position for Finer Cut
D) Depth Stop Position for Coarser Cut

Manual Restrictor Adjustment - The distance the restrictors extend into the mixing tub is determined by the position of the adjustment pin (Figure 14-A). To adjust the restrictors, remove the adjustment pin, push or pull the restrictor adjustment handle (Figure 14-B) to the desired operating position, and replace the adjustment pin.

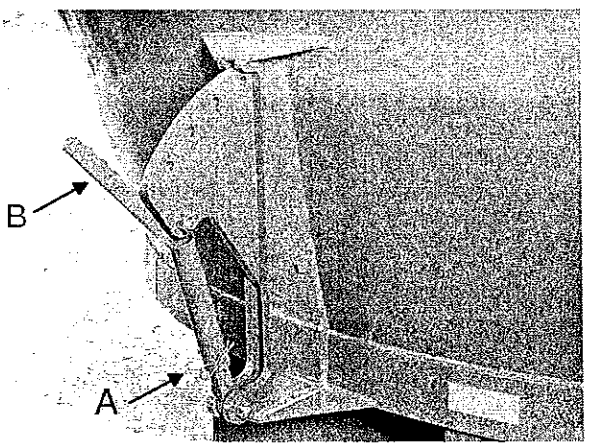


Figure 14. Manual Restrictor Blade Adjustment.
A) Restrictor Adjustment Pin
B) Restrictor Adjustment Handle

Adjusting for Specific Conditions - The ideal 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 may be only partially inserted for the best performance with 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.

Restrictor Adjustments and Transport - The Vertical Tub Mixer is equipped with an equal angle driveline that allows the machine to be operated while moving from one location to another. This feature reduces your total feeding cycle time by allowing you to mix while traveling, and helps to eliminate ration settling while traveling from commodity storage areas to feed discharge points. If the machine is shut down during these movements, ensure that the restrictors are set (manually or hydraulically) at half-depth or more into the tub during restart. This adjustment helps to reduce the start-up load and can minimize the replacement of shear bolts.

Mixer Loads and Shear Bolts - To prevent excessive loads from damaging mixer components, a shear bolt is included in the U-joint on the output shaft of the gearbox. Refer to the **Maintenance and Adjustment** section of this Manual for the location of the shear bolt and shear bolt replacement procedures.

Throwout

Throwout, or pushing of ration material over the top of the mixing chamber, may occur in this type of mixer. A high hay ration is especially susceptible to throwout because the ration is not dense enough to push itself back down into the mixer. Throwout is usually caused by using too large a bale in the smaller mixer models, by loading commodity materials in the wrong order, or by overfilling the mixer.

Possible Solutions - Throwout cannot be completely eliminated from this type of mixer; however, if you experience excessive throwout, try one of the following possible solutions:

1. **Reduce Speed.** The first is to run the mixer at a slower speed. Either put the mixer in low gear (2-speed models only) or idle the tractor back to as much as half speed.

2. **Restrictor Adjustments** - If there is excessive throwout above a particular restrictor (usually the left front or right rear), adjust the restrictor out of the tub.

3. **Material Loading Sequence** - It is important to make sure that the commodity material is loaded in the correct order as explained earlier in this operation section. Loading the dry material last will cause the dry material to be thrown out more easily and will not allow for proper mixing action.

4. **Ration** - The ration itself may be a cause of throwout. The ration size may exceed the mixer capacity, or the ration may be too dry. High density rations work better than light rations in this type of mixer. Adding moisture in some form, either as additional high moisture supplements or as water, will weigh down dry, fluffy rations so that they will work themselves back down into the mixer.

5. **Knives** - Knives may also be a problem. If the knives are worn so that they are pulling material and bunching it instead of cutting, the knives should be replaced. In addition, removing a series of knives from the top of the mixer scroll (auger) may help to reduce throwout. See mixing applications under **Knife Replacement** in the **Maintenance And Adjustment** section of this Manual.

6. **Optional Hay Deflector** - An optional hay deflector kit may be ordered for the 1425 and the 1500 Models to help reduce throwout in the left front and right rear corners of the mixer.

Unloading

General Procedures - If the mixer is equipped with a conveyor extension, remove the transport lock pin and then hydraulically lower the conveyor extension. Engage the unloading conveyor. Open the discharge door the appropriate amount, and engage the tractor PTO (if it was previously disengaged).

The tractor should start traveling at the same time. The rate at which the mixer unloads is determined by the discharge door opening and by the travel speed of the tractor. The discharge door has an indicator (Figure 15) that helps to monitor the door position. The amount of door opening that will provide the desired performance depends upon the consistency of the ration.

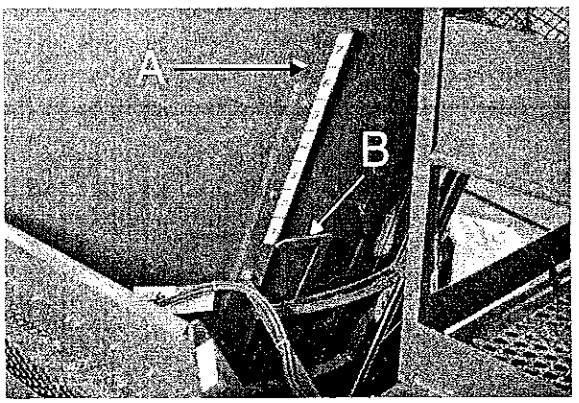


Figure 15. Discharge Door Indicator.
A) Scale
B) Indicator

Checking Conveyor Relief Areas - A common cause of field problems occurs when material works its way under the conveyer belt and interferes with proper conveyor operation. The conveyor is designed with a relief area to let this material fall from the conveyor; however, the operator must check and clean the relief area frequently. The relief area that must be checked and cleared is shown in Figure 16. Additional information and explanations are included in the **Maintenance and Adjustment** section of this Manual.

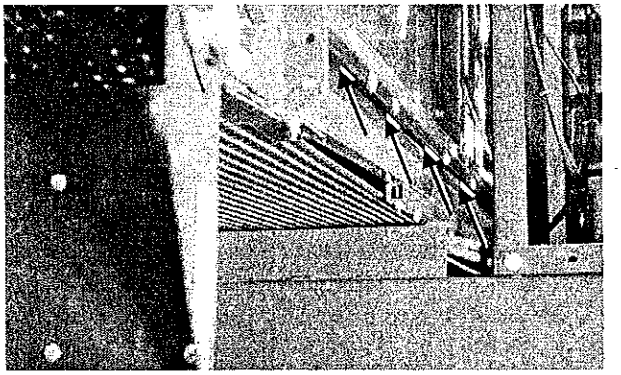


Figure 16. Relief Area That Must Be Kept Clear for Proper Conveyor Operation.

Unloading the Mixer Tub - When the mixer is nearly empty, two speed models can be shifted into high gear (see Figure 12). The higher speed results in faster unloading by throwing the ration mix off of the auger face. The single-speed model can be brought up to full rated PTO speed to achieve the same results.

Stopping the Mixer with a Partial Load - When stopping the SupRaMix with a partial load before moving from one location to another, it is very important that the operator follow this procedure.

1. Shut off the scroll (auger) with the PTO.
2. Close the discharge door.
3. Continue to operate the conveyor until the ration has cleared off *before* shutting the conveyor down.

Note that stopping the conveyor and then shutting the door while allowing the Mixer to run will cause feed to pile on the conveyor under the door. Closing the door at this point will cause the feed to bind between the door and the conveyor, which may damage the conveyor bed, mixer floor, and/or the discharge door assembly.

Stopping the Mixer When Completely Unloaded - After the mixer is unloaded, shut off the PTO, close the discharge door, stop the unloading conveyor , and raise the conveyor extension.

Lubrication

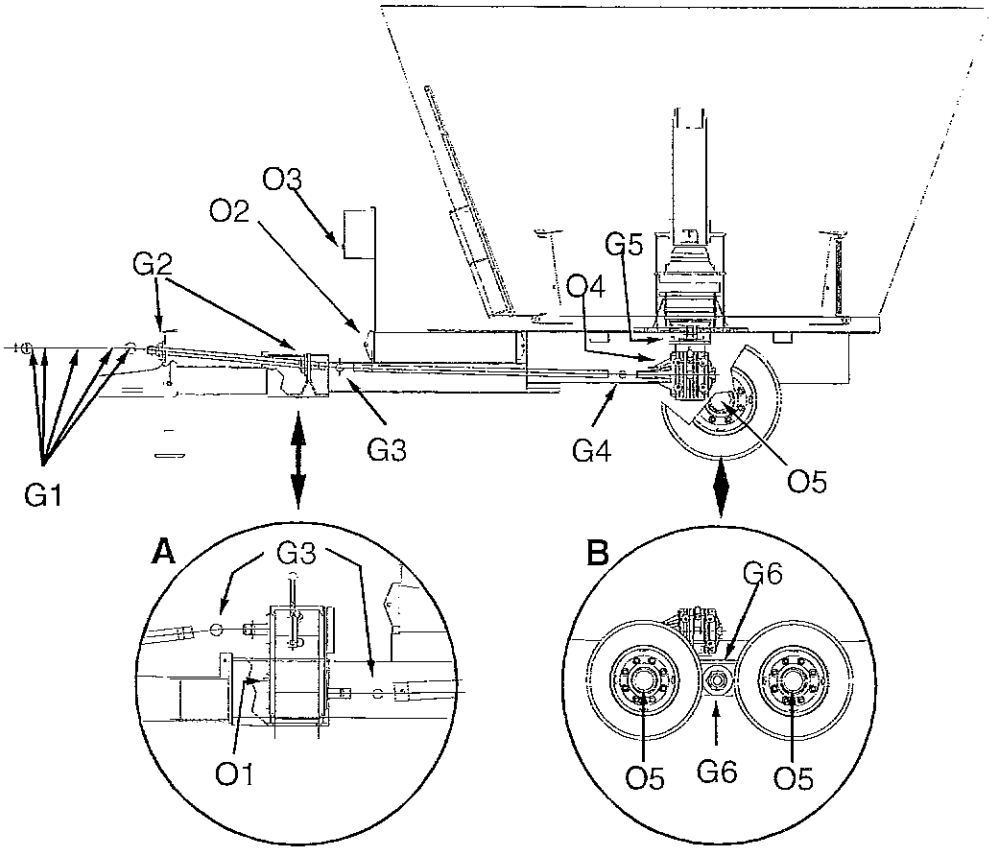


Figure 17. Overview of Lubrication Requirements. The Main Figure Shows a Single-Speed Model on a Light Chassis. The Inserts Show:
A) Additional Lubrication Points for a Two-Speed Model
B) Heavy-Duty Chassis

Lubrication Requirements

Grease Points - Table 6 below in conjunction with Figure 17 above describes the required lubrication. All points require SAE Multi-Purpose Grease.

Table 6. Grease Requirements and Intervals

Point	Item	Interval
G1	PTO Shaft	20-25 hours. 5 points. See text
G2	Drive Bearing	20-25 hours. 2 on single speed units; 1 on two-speed units
G3	Drive Yoke	20-25 hours. 1 on single speed units; 2 on two-speed units
G4	Splined Yoke	50 hours.
G5	Upper Bearing	100 hours.
G6	Bolster Bearings	50 hours. Tandem-axle units only

Oil Levels - Table 7 below in conjunction with Figure 17 above describes the oil levels that must be checked periodically.

Table 7. Oil Requirements and Intervals

Point	Item	Oil Type/Qty/Interval
O1	Two-speed gearbox oil	SAE EP 90, 3.00 Gal. Check before operating.
O2	Conveyer Extension Roller Chain	SAE Engine Oil 20-25 hours.
O3	Planetary Drive Oil	SAE EP 90, 5.00 Gal. Check before operating.
O4	Right-Angle Drive Oil	SAE EP 90, 1.64 Gal. Check before operating.
O5	Wheel hub/axle oil level	SAE EP 90, 0.25 Gal. Check before operating.

PTO - A well lubricated spline ensures an easy telescoping action of the PTO and will increase the life of the universal joint bearings. The plastic PTO shields require lubrication because they do not rotate with the shaft. Apply grease at the points that are shown in Figure 18. Note that it may necessary to rotate the outer tube to gain access to the spline lubrication zerk (Figure 18-B).

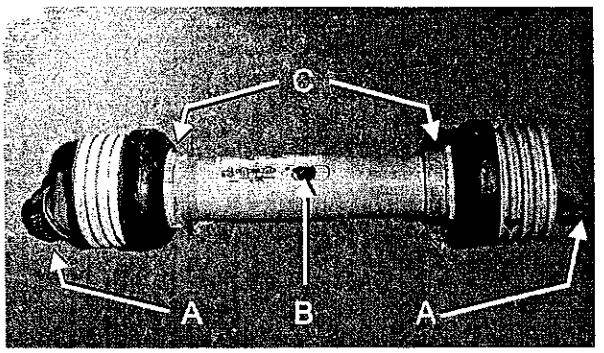


Figure 18. Driveline Shaft Lubrication Drive.
A) Drive Yokes
B) Shaft Spline
C) Shields

Shaft Bearings - Shaft bearings should be lubricated every 20-25 hours with a SAE multi-purpose grease. Refer to Item G2 in Figure 17 and to Figures 19 and 20 below.

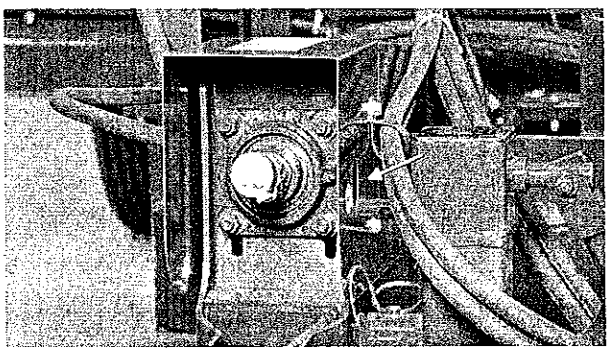


Figure 19. Driveline Bearing Zerk for All Units Arrow Indicates Grease Zerk Access Opening.

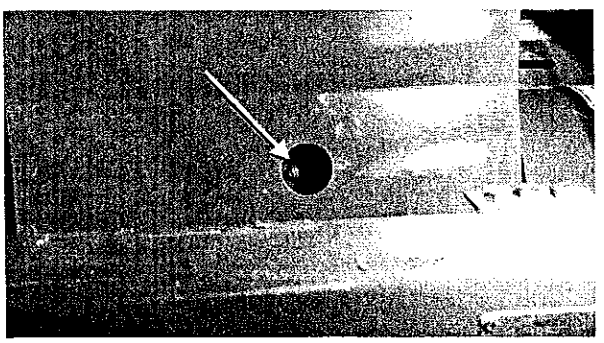


Figure 20. Second Driveline Bearing for Single Speed Units Only. The Arrow Indicates the Grease Zerk Access Opening.

Two-Speed Gearbox - The two-speed gearbox should be filled to the oil level sight plug located on the front of the gearbox. Refer to Figure 21, below, and to item O1 in Figure 17. Use SAE 90 weight gear oil. Do not over fill the gearbox. Over filling the gearbox produces excessive heat that may scorch the oil, resulting in reduced gear train lubrication.

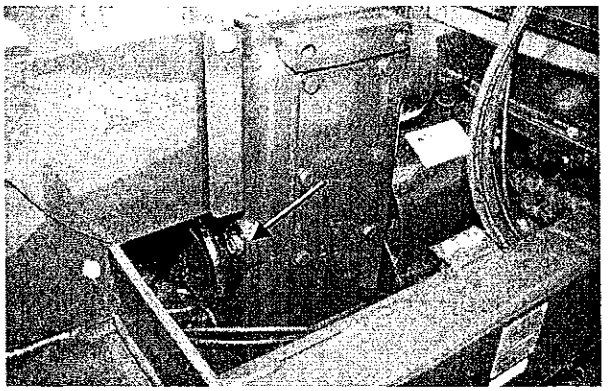


Figure 21. Two-Speed Gearbox Oil Level Sight Plug.

Planetary Gearbox - The planetary gearbox has an oil reservoir that is mounted to the front conveyor shield or to the platform assembly. The oil reservoir should be filled to the oil fill plug (refer to Figures 22/23-A). The oil sight plug (Figures 22/23-B) should be used as a daily "quick" check to ensure that a minimum oil level is maintained. Whenever the oil level is visible at the sight plug, refill the oil level to the fill plug with SAE 90 weight gear oil.

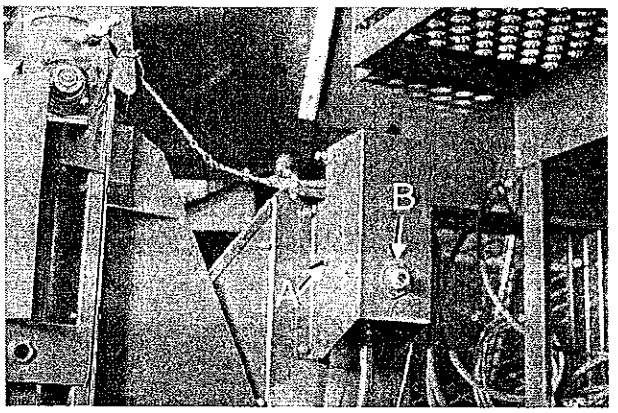


Figure 22. 1425/1500 Planetary Gearbox Reservoir.
A) Fill Plug
B) Sight Plug

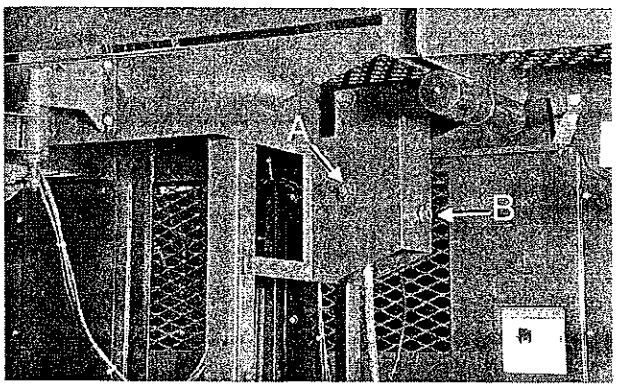


Figure 23. 1710 Planetary Gearbox Reservoir.
A) Fill Plug
B) Sight Plug

Drive Yokes - The driveline includes one or more drive yokes (universal joints) as shown by Items G3 and G4 in Figure 17. These joints should be greased every 20 to 25 hours of operation. A typical zerk is shown in Figure 24 below.

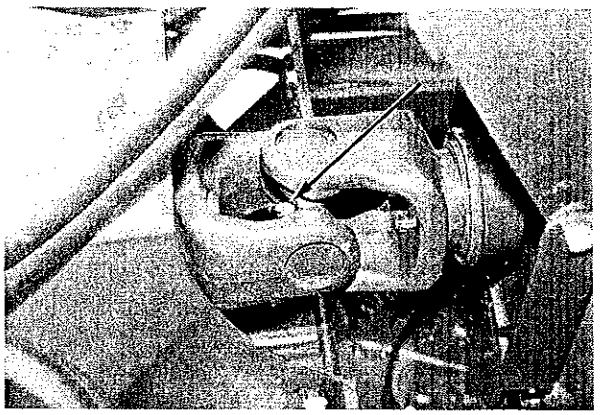


Figure 24. Drive Yoke (Universal Joint) Zerk.

Splined Yoke - The splined yoke is attached to the input shaft of the right-angled gearbox (under the machine as shown in Figure 25). Grease the yoke splines (Figure 25-A) every 50 hours with SAE multi-purpose grease. Grease the yoke (Figure 25-B) every 20 to 25 hours.

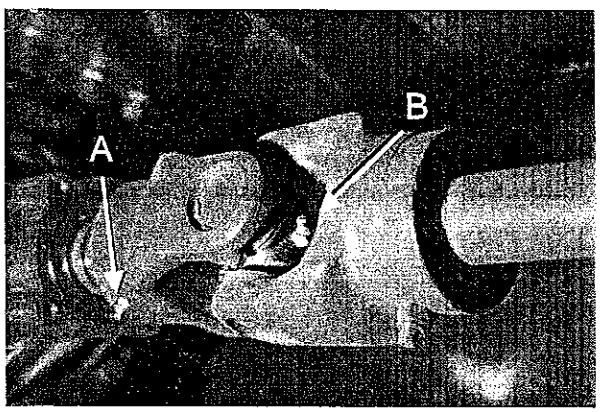


Figure 25. Grease Zerks for the Splined Yoke.
A) Spline Lubrication
B) Yoke Lubrication

Right-Angle Gearbox Bearing Lubrication - An upper bearing is located above the right-angle gearbox. The upper bearing has a grease fitting that is located between the right-angle gearbox and the planetary gearbox. Refer to Item G5 in Figure 17 and to Figure 26-A below. Grease this fitting every 100 hours with approximately 10 pumps of SAE multi-purpose grease.

Right-Angle Gearbox Oil Level - In addition to the upper bearing grease fitting; there is an oil LEVEL plug facing forward, just to the left of the input shaft as shown in Figure 26-B. This plug is also used to fill the gearbox. Fill the gearbox to the oil level plug with SAE 90 weight gear oil.

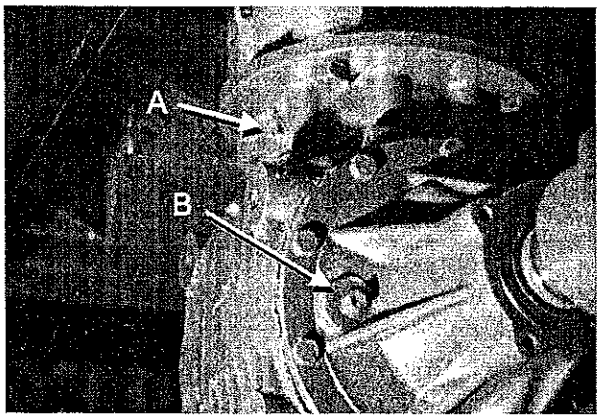


Figure 26. Right Angle Gearbox Lubrication.
A) Grease Fitting for Upper Bearing
B) Oil Level/Fill Plug

Spindle And Hub - The spindle and hub are lubricated through the access plug in the center of the hub cap (see Figure 27). Check this oil level often and fill as necessary.

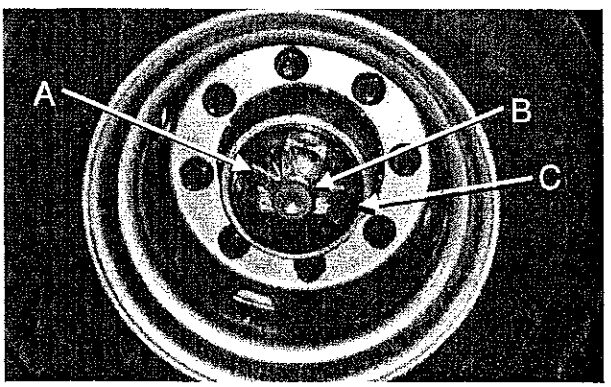


Figure 27. Wheel Hub.
A) Hub Cap
B) Access Plug
C) Visual Oil Level

Conveyer Extension 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). See Figure 28. 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 to the inside of the lower strand of the chain as shown in Figure 28. Rotate drive between applications until the total length has been lubricated.

⚠ CAUTION

Do not lubricate the chain while the mixer is running.

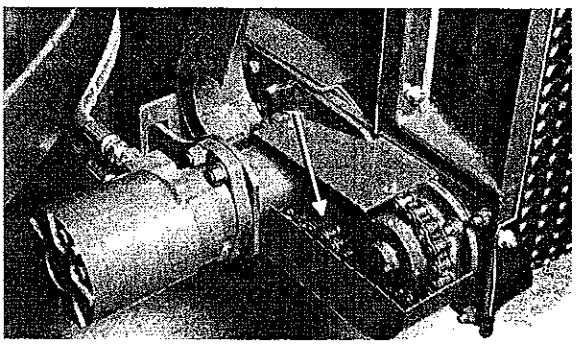


Figure 28. Discharge Conveyor Extension Drive. Apply Oil to the Upper Side of the Lower Strand (As Indicated by The Arrow in the Figure Above).

Scroll (Auger) Taper Roller Bearing - The taper roller bearings that support the mixing auger **do not** require lubrication. The bearings are in a sealed environment and are pack lubricated at the factory during assembly.

Maintenance and Adjustment

Oil Change Intervals

The SAE 90 weight gear oil in all the gearboxes and wheel hubs should be changed after the first 100 hours of operation. After the initial oil change, intervals should be every 2000 hours or once a year, whichever occurs first. Required oil quantities and gearbox sight plug locations are shown in the **Lubrication** section of this Manual.

2-Speed Gearbox - Remove the fill plug. Drain the gearbox by removing the drain plug shown in Figure 29-C. Replace the drain plug. Fill the gearbox with SAE 90 weight gear oil through the fill plug (A) until oil is visible in the front sight plug (B).

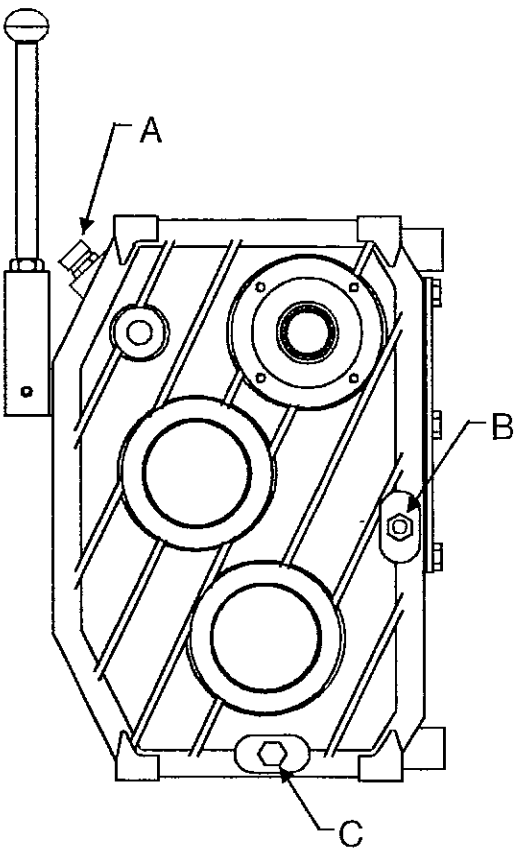


Figure 29. Two-Speed Gearbox.
A) Fill Plug
B) Sight Plug
C) Drain Plug

Planetary Gearbox - Drain the Planetary gearbox and oil reservoir by removing the 1/2" hose from the bottom of the reservoir. See Figure 30-C. Allow the planetary to fully drain. When refilling the planetary it is important to be sure that all of the air is out of the top of the planetary so that the top bearing is completely flooded. This can be done in one of two ways.

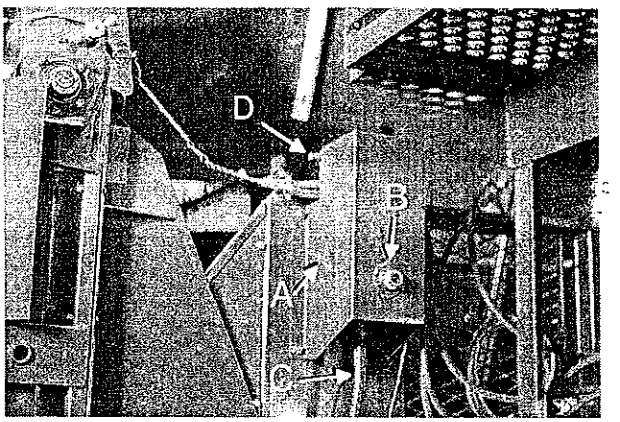


Figure 30. Planetary Gearbox Reservoir.
A) Fill Plug
B) Sight Plug
C) 1/2 Inch Drain Hose
D) Top Vent Plug

If a pressurized system is available, pump the oil into the gearbox through the 1/2" hose until oil comes out of the 1/4" bleed line at the top of the reservoir. Then reinstall the 1/2" line to the reservoir and fill the reservoir to the fill plug.

If an oil pump is not available, replace the 1/2" hose to the reservoir, and fill the reservoir to the fill plug with SAE 90 weight gear oil. The level in the reservoir should drop from this level as the air is purged from the system, and oil should be added until the level stabilizes. Always check the oil level again after you have run the mixer for the first time to ensure that the proper level was maintained.

Right-Angle Gearbox - Remove the fill plug (Figure 31-A). Remove the drain plug (Figure 31-B) and drain the right-angle gearbox. Replace the drain plug, and fill the gearbox to the fill plug with SAE 90 weight gear oil.

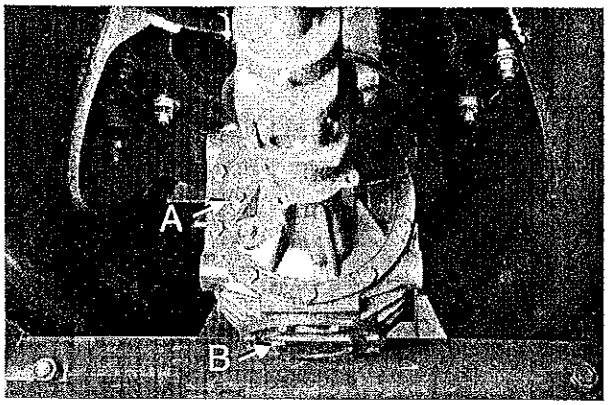


Figure 31. Right-angle Gearbox.
A) Fill Plug
B) Drain Plug

Spindle and Hub - Drain the spindle and hub assembly by unscrewing the plastic hub cap (Figure 32-A). Replace the hub cap. Fill the spindle and hub assembly with SAE 90 weight oil through the access plug (Figure 32-B) in the center of the hub cap. Normal operating level is just below the access plug.

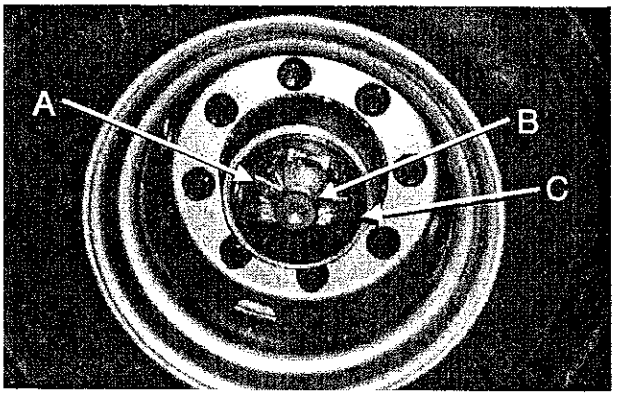


Figure 32. Wheel Hub.
A) Hub Cap
B) Access Plug
C) Visual Oil Level

Conveyor Adjustments

General - The SupRaMix transports the ration from the tub to the feed bunk through a standard main conveyor or in combination with the optional extension. It is important that all conveyor rollers are kept square in relation to the frame to ensure that the belt tracks properly and does not prematurely wear on one side.

⚠ WARNING

When adjusting the conveyor belt tension, always shut off the tractor, set the parking brake, put the machine in neutral, and remove the tractor key.

Main Conveyor Tension Adjustments - Check the belt conveyor to ensure that it is free of material and that it is not contacting any part of the machine. The discharge door should be opened to the full unload position. The belt conveyor should be checked and adjusted according to the conditions in which the mixer will be used. In other words, it should be checked and the tension adjusted with the heaviest ration that will be used in the mixer. The belt tension should be sufficient to move the material without slippage. A lighter ration will require less tension than a heavier ration. 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 one side. This could cause premature wear and slippage.

To adjust the belt tension, loosen the four bolts (Figure 33-A) on the bearing retainer at each adjuster. Loosen the retaining nut (Figure 33-B), and turn the adjusting nut (Figure 33-C) equal amounts on each side of the conveyor, until the desired tension and tracking are achieved.

⚠ CAUTION

Do not overtighten the conveyor belt! The conveyor assembly is fitted with fluted rollers, which will cause excessive wear and dramatically shorten the life of the belt if the belt tension is excessive.

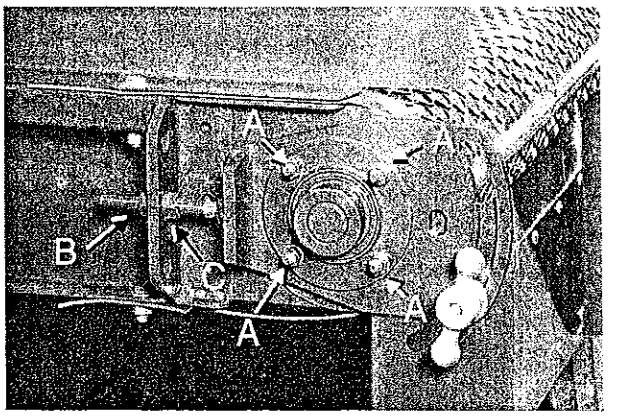


Figure 33. Main Conveyor Belt Adjustment.
A) Retainer Bolts
B) Retaining Nut
C) Tension Adjusting Nut

Extension Conveyor (If Equipped) - The tension adjustment procedure for the extension conveyor is the same as the main conveyor. The adjustment locations are shown in Figure 34. As with the main conveyor, ensure that the rollers are square to the frame.

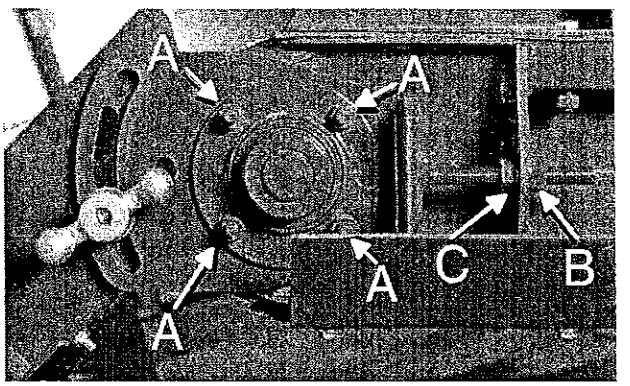


Figure 34. Extension Conveyor Belt Adjustment.
A) Bearing Retainer Bolts
B) Retaining Nut
C) Tension Adjusting Nut

Clearing Conveyor Relief Areas

The conveyors are designed with relief areas that allow excess material to fall from the edges of the conveyor bed instead of working under the belt. The relief area (Figure 35-D) is the space between the conveyor bed (Figure 35-B) and the side rails (Figure 35-C). Proper operation is shown in Figure 35-AA. If the relief area becomes plugged and material *does* work under the conveyor belt as shown in Figure 35-BB, poor performance and excessive belt wear will result.

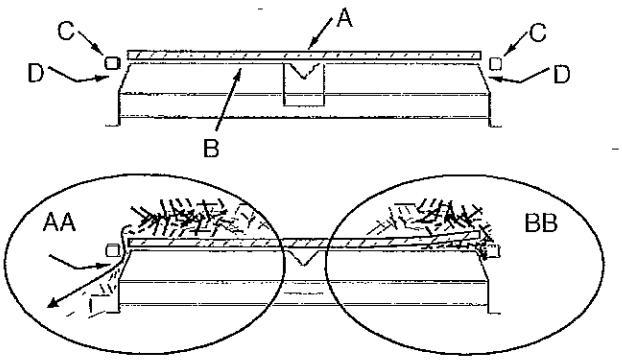


Figure 35. Conveyor End View Showing Relief Areas.
AA) Proper Operation
BB) Result of Plugged Relief Area)

The relief areas should be checked and cleaned frequently. The area to check is shown by the arrows in Figure 36.

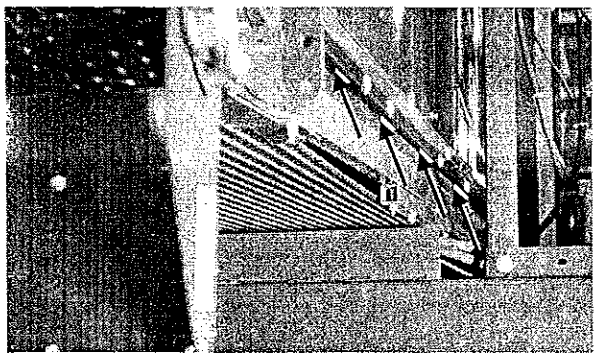


Figure 36. Conveyor Side View Showing Relief Area.

Shear Bolt Replacement

A shear bolt is incorporated in the driveline to reduce damage that can result from overloading. The use of a shear bolt assembly does not automatically guarantee that there will not be component failure. The operator must still be cautious as to what is introduced into the mixing chamber. The shear bolt (Figure 37-A) is located in the U-joint under the clamshell shielding in front of the main conveyor. Replacement shear bolts (Figure 37-B) are located beside the clamshell shield.

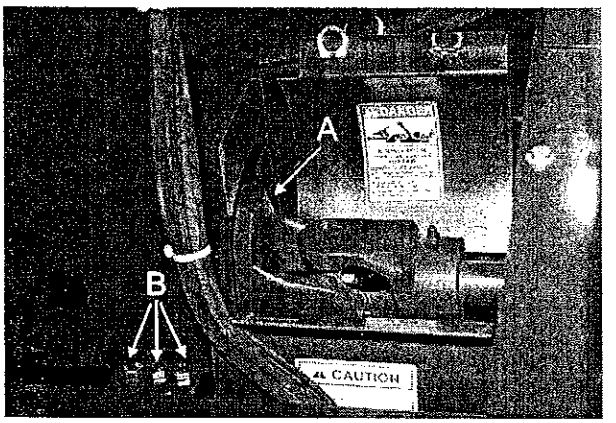
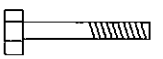


Figure 37. Shear Bolt.
A) Shear Bolt Location
B) Location of Replacement Shear Bolts

When replacing shear bolts, always use bolts that conform to the specifications that are shown in Table 8. **Never replace the shear bolt with a larger or higher grade bolt!** This will reduce the protection for the driveline components and will cause serious damage to the driveline system.

Table 8. Shear Bolt Specifications

PTO RPM	Shear Bolt	Appearance
540	M10-1.5 x 70 Gr. 8 Capscrew	
1,000	3/8-16 x 3" Gr. 8 Full Thread	

Knife Replacement

The SupRaMix is equipped with either hardened (black) or tungsten (red) knives on the mixing auger. The design life of the knives are 300 hr. and 500 hr. respectively, although different mixing conditions will affect the life of the knives. It is important that you monitor the condition of the knives because they directly affect the performance and efficiency of the mixer.

Knife Rotation - To get maximum life from the knives, it is recommended to rotate them from top to bottom, because the lower knives will wear faster than the upper knives.

Safety Concerns - Before inspecting or replacing knives, always shut off the tractor, remove the key, set the parking brake and place the mixer in neutral. Use extreme caution when replacing the knives, as they are very sharp. To prevent slipping and injury, use the proper wrench when removing and replacing the mounting bolts on each knife.

Installation - Clean the mating surfaces of the scroll, the knife, and the backup plate and install the new knife with the cutting edge forward (the scroll turns in a clockwise direction when viewed from the top). Refer to Figure 38. Tighten the 5/8" bolts to 150 ft. lbs.

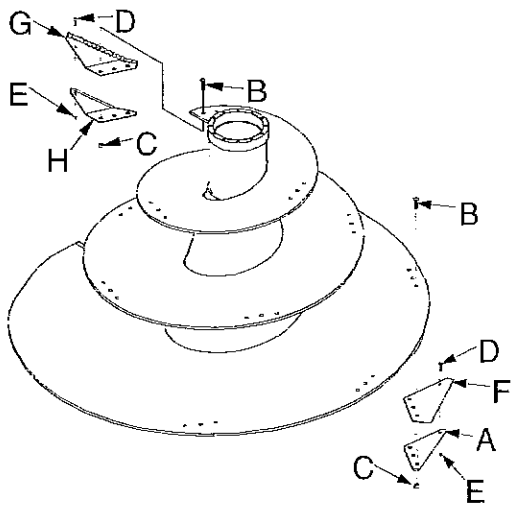


Figure 38. Knife Replacement.

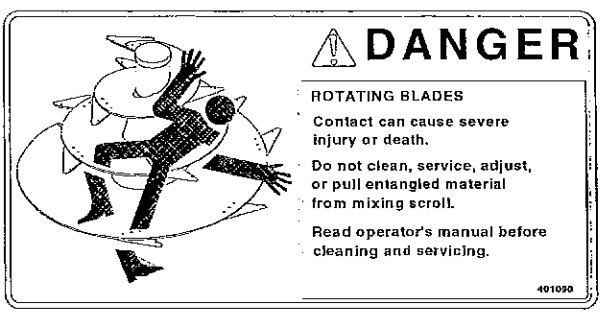
A) Straight Knife Reinforcing Plate
B) 5/8" Bolt
C) 5/8" Locknut
D) 3/8" Bolt
E) 3/8" Locknut
F) Straight Knife
G) Angled Knife
H) Angle Knife Reinforcing Plate

Angled Knife - On the 1425 and 1500 units, an angled knife is provided as part of the full knife set configuration in mixers used for cutting and breaking whole bale material. This angled knife should be installed as the top knife on the scroll (auger). The angled knife is designed to help prevent large bales from sitting and 'riding' on the top of the scroll (auger) and to break bales down quicker to decrease mixing time.

Mixing Applications - In applications where the mixer is used mainly for mixing, and not cutting or breaking whole bale material, an optional 6-pack knife configuration may have been ordered. These six knives must be installed as the lowest 6 knives on the mixer scroll (auger). If a full set of knives was purchased for the mixer, some of the upper knives may be removed. The removal of upper knives may reduce throwout from the mixer, reduce the power needed for start-up and mixing, and increase the mixing performance of the mixer, but may decrease bale break-down performance, increase length of cut, and create 'dead spots' in the mixing tub. A minimum of 6 knives must always be installed on the lowest part of the scroll (auger) for processing, mixing, unloading, and cleanout.

⚠ DANGER

Use extreme caution when replacing the knives, as they are very sharp. To prevent slipping and injury, use the proper wrench when removing and replacing the mounting bolts on each knife.



Digi-Star Junction Box

The Weigh-Tronix weighbars on the SupRaMix can be adapted for use with a Digi-Star indicator using the Digi-Star junction box. Modifications to the weighbar cords and junction box are needed to convert from Weigh-Tronix to Digi-Star. If a Digi-Star indicator is ordered from the factory, these modifications are made at the factory. Any changeover of the junction box or replacement of the junction box and/or weighbars in the field should follow these modification procedures:

1. Locate and mount the junction box on the front conveyor shield per instructions on the junction box cover (Figure 39).

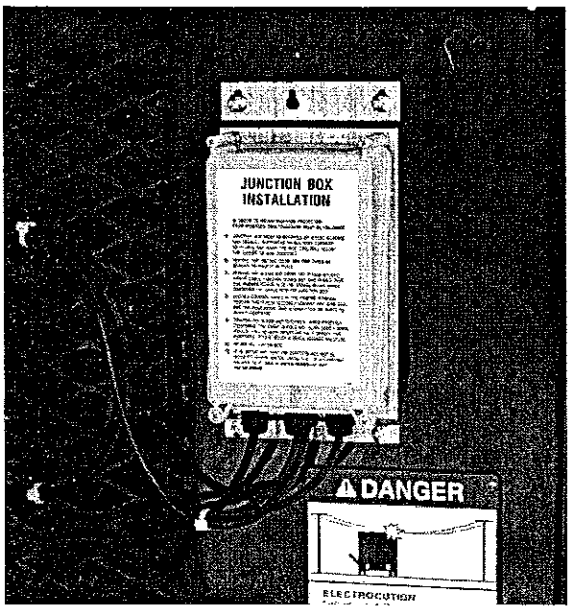


Figure 39. Digi-Star Junction Box.

2. Route the cords between the weighbars and the junction box.
3. Cut the weighbar cords to the desired lengths.
4. Insert the weighbar cords through the strain reliefs in the junction box. Remove 2 inches of the outer jacket from the weighbar cords.
5. Strip ¼-inch of insulation from the individual color coded wires. Install the wires from each weighbar cord to a terminal strip (Figure 40-A) according to the color code.
6. Locate the terminal strip for the indicator to junction box cord (Figure 40-B). Reverse the red and green wires (terminal location numbers E3 and E6) on this terminal strip only.

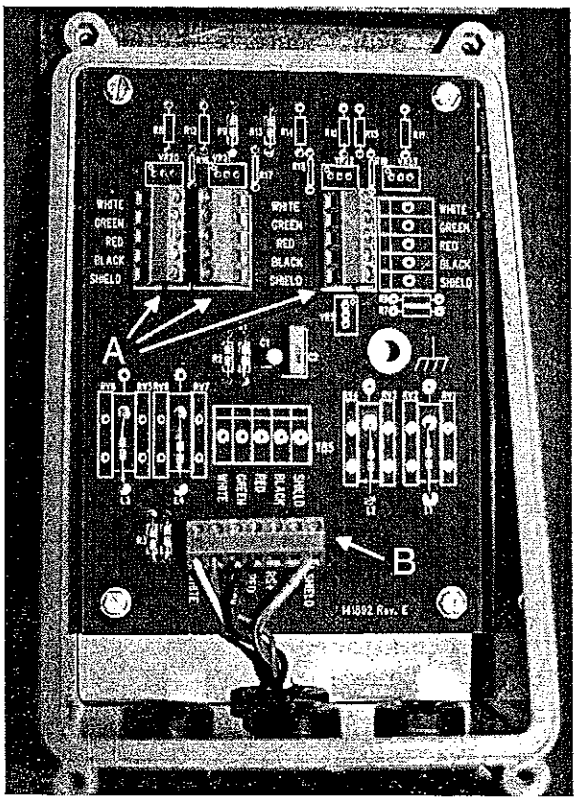


Figure 40. Terminal Strips.

1. Tighten the gland nuts on the strain reliefs and replace the junction box cover.
2. Route the indicator to junction box cord and connect to Digi-Star indicator.

Changing Tires

When changing tires on the Vertical Tub Mixer, it is important that the jack placement does not lift the mixer by the axle weighbar. Doing so will permanently damage the weighbar and render the scale system ineffective. To properly lift the mixer, the jack should be placed under the axle tube on the light chassis (see Figure 41), and under the walking tandem beam on the heavy-duty chassis (see Figure 42).

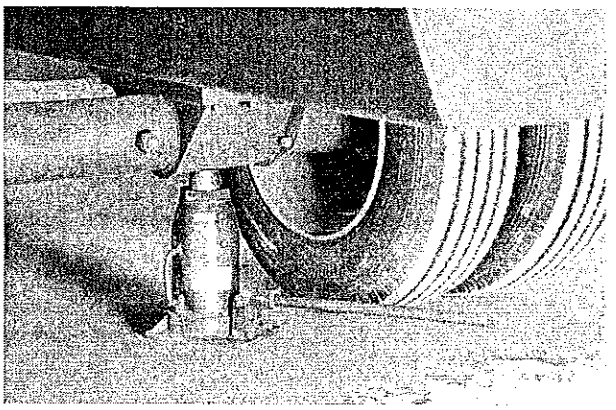


Figure 41. Jack Point for Light Chassis.

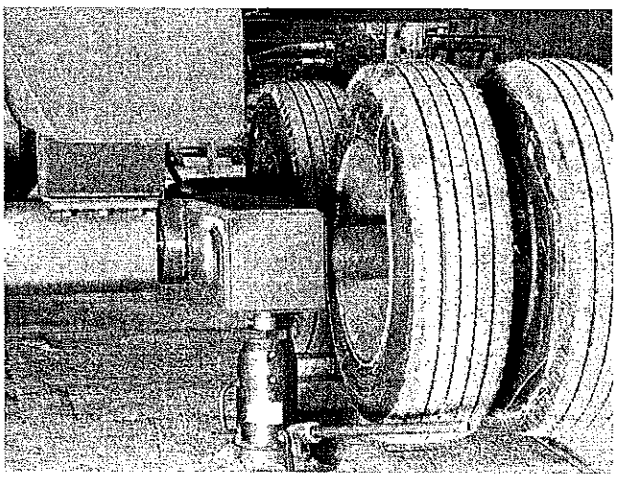


Figure 42. Jack Point for Heavy Chassis.

Welding

If any repairs or after-market modifications are performed on the Vertical Tub Mixer that require welding on the unit, there are several steps to take beforehand to ensure that the electrical systems on the unit are not damaged:

1. Disconnect the mixer from the tractor.

2. Disconnect the weighbar and power cords from the indicator, and remove the indicator from the mixer.

3. If the mixer is equipped with the electro-hydraulic valve bank, disconnect the wire harness from the tractor.

4. If the mixer has an on-board battery for the indicator power supply, disconnect the positive battery cable.

5. Ground the welder close to the work. Never draw the welder current through the electro hydraulic valve bank assembly or the hitch and axle weighbars.

Storage

When storing the mixer, it is important to follow certain steps to help ensure safety and machine continuity for future use:

1. Store the mixer in an area away from human activity.
2. **DO NOT** permit children to play on or around the stored machine.
3. Park the mixer on firm level ground and block the tires.
4. Use the jack provided with the mixer. **DO NOT** block the tongue under the hitch weighbar.
5. In colder climates, lower the tongue to allow water to drain out of the tub to prevent freezing.
6. Place the PTO in the PTO holder, and secure the hydraulic hoses and wire harness assemblies so they will not be disturbed by animals or the elements.
7. Remove the indicator and power cord from the mixer, and hang the weighbar cords with the ends pointing down so they will not be disturbed by animals or the elements. The ends of the weighbar cords may be covered with a cap, but do not wrap the ends in plastic.
8. If the mixer has an on-board battery for the indicator power supply, remove the battery.
9. If the unit is equipped with a conveyor extension, install the transport lock pin to secure the conveyor extension boom in the upright position.

Troubleshooting

The Vertical Tub Mixer is designed to cut and mix forage material. This system is simple and reliable, requiring minimal maintenance. If you do encounter a problem with the mixer, refer to the following troubleshooting guide. If you have a problem that is not covered in this section, please call your local Art's-Way dealer for assistance. Be sure to give the dealer your model and serial numbers when you call.

NOTE: For detailed troubleshooting information on the electronic scales provided with your SupRaMix mixer, check the User's Manual supplied with the electronic scale.

Problem	Possible Cause	Possible Remedy
Discharge door will not open when belt conveyor is running.	Low oil level	Check hydraulic oil level in tractor.
	Electrical	Check all electrical switches, wiring and valve solenoids. Repair or replace as required.
	Oil supply from tractor	Check minimum field requirements for tractor oil supply.
Discharge door will not close.	Door relief valve is activated	Remove objects/material from under the door. Check for proper relief valve operation.
	Low oil level	Check hydraulic oil level in tractor.
	Electrical	Check all electrical switches, wiring and valve solenoids. Repair or replace as required.
	Oil supply from tractor	Check minimum field requirements for tractor oil supply.
Control box 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 power source. Refer to Figure 6 in the **Preparing for Operation** section.
	Poor connection	Check all connections 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.
	Bad switch	Replace switch in control box.

Problem	Possible Cause	Possible Remedy
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, wiring and valve solenoids. Repair or replace as required.
Shear bolts shearing	Mixer is overloaded	Shift machine to low speed. Move in restrictor blades to ½ to full at start-up.
	Foreign object in mixer	Remove object.
	Rapid Engagement of PTO	Idle tractor down and engage slowly.
	Improper shear bolts	Use proper size shear bolts. See Table 8 in **Machine Operation** and Figure 37 in **Maintenance and Adjustment.**
	Drive train overheating	Check oil levels in all gearboxes. See **Lubrication**
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 bolt in shear clutch. Replace PTO shaft.
	PTO shaft is bent.	Check for shaft clearance over hitch pin. Check for proper jack-shaft alignment on mixer. Replace PTO shaft.
Excessive noise when turning and hard to hook-up	Turning too sharply	Tractor drawbar too short (not to ASAE specifications). See Figure 3 in **Preparation for Operation.** Avoid sharp turns.
	Jack shaft bearing not adjusted properly for tractor	Adjust jackshaft bearing. See Figures 7 and 8 in **Preparing for Operation.**

Problem	Possible Cause	Possible Remedy
Two-speed Gearbox overheats	Oil level too high	Adjust oil level to leveling plug.
	No oil in gearbox	Add oil.
Excessive Power Requirements	Very wet ration	Increase restrictor depth in tub.
	Inadequate lubrication	Check lubrication in all gearboxes.
	Ration loading problem	Check loading procedure. See **Loading** in **Machine Operation** section.
Conveyor extension boom will not extend.	Transport lock pin is installed.	Remove transport lock pin.
	Low oil level	Check hydraulic oil level in tractor.
	Electrical	Check all electrical switches, wiring and valve solenoids. Repair or replace as required.
	Oil supply from tractor	Check minimum field requirements for tractor oil supply.
Belt conveyor will not turn	Oil flow to motor is low	Check oil level in tractor.
	Material build-up under conveyor and belt is rubbing	Remove belt and clean out material. Be sure the relief area of the conveyor is free of debris. Refer to the **Maintenance and Adjustment** section.
	Belts are loose	Tighten belts. See **Conveyor Adjustments** in **Maintenance and Adjustments** section, Figure 33.
	Conveyor is overloaded	Reduce discharge door opening.
	Door is pinching the conveyor belt	Open discharge door.
Material will not discharge from mixer	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. Check shear bolts.

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.
Loose hay is pushed over top edge of tub	Scroll (auger) speed too fast	Two-speed gearbox needs to be in low gear (lever towards tub). Slow tractor throttle to approx. 2/3.
	Knives are worn	Check for wear on the knives. Rotate knives on the scroll. Remove knives from upper part of scroll.
	Restrictors too far into the tub	Adjust restrictors out of the tub.
	Material is extremely dry and fluffy.	Add water or liquid protein to ration.
	Ration/Loading	See **Throwout** in the **Machine Operation** section of this Manual.
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.
	Low voltage	Check power supply for proper voltage. Check for proper ground.
	Material buildup on the axle weighbars	Clean axle weighbars. Check for buildup under weighbar shielding.

** NOTE: For more detailed troubleshooting information on the electronic scales provided with your SupRaMix mixer, check the User's Manual supplied with the electronic scale.

Specifications

1000 Series SupRaMix Specifications Sheet

Specification	Model		
	1425	1500	1710
Capacity	425 cu. ft.	500 cu.ft.	710 cu. ft.
	341 Bu.	402 Bu.	570 Bu.
Ration weight capacity	12750 lbs.	15000 lbs.	21300 lbs.
Dimensions (overall)			
Length	233" (19'6")	237" (19'10")	257" (21'5")
Width			
Base machine	102" (8'6")	102" (8'6")	124" (10'4")
With slide tray	113" (9'5")	113" (9'5")	143" (11'11")
With conveyor extension	154" (12'10")	154" (12'10")	183" (15'3")
Height	105" (8'9")	115" (9'7")	125" (10'5")
Ground clearance	12"	12"	12"
Dimensions (mixing chamber)			
Length	152" (12'8")	160" (13'4")	180" (15')
Width	96" (8')	96" (8')	120" (10')
Height	72" (6')	82" (6'10")	86" (7'2")
Wall thickness	3/8"	3/8"	3/8"
Floor thickness	3/8"	3/8"	3/8"
Auger flighting	5/8"	5/8"	5/8"
Auger tube design	Special conical	Special conical	Special conical
Door opening	30" x 42"	30" x 42"	30" x 46"
Conveyor			
Discharge belt width	36"	36"	36"
Discharge height	26" to 30"	26" to 30"	32" to 36"
Speed	Variable	Variable	Variable
Chute distance past tire	5" and up	5" and up	10" and up
Tires			
215/75R 17.5 16 ply	4	4	8
Pressure	125 psi	125 psi	125 psi
Scale system	3 point	3 point	3 point
Input PTO speed (rpm)			
Single speed	540	540	NA
2 - speed	540 or 1000	540 or 1000	1000

(Continued)

1000 Series SupRaMix Specifications Sheet (Continued)

Specification	Model		
	1425	1500	1710
Shear bolt	M10-1.5x70 gr 8.8	M10-1.5x70 gr 8.8	3/8"x3" gr. 8
Bolt type	Shank	Shank	Full thread
PTO height	Adjustable	Adjustable	Adjustable
Horsepower			
Minimum	80	90	120
Recommended	100	100	140
Required drawbar length	16"	16"	16"
Hydraulic system			
Minimum pressure	2000 psi	2000 psi	2000 psi
Minimum flow	15 gpm	15 gpm	15 gpm
Mixer weight (empty)			
Single speed	10,660 lb.	11,540 lb.	NA
2 - speed	10,840	11,740 lb.	15,880 lb.
Tongue weight (empty)			
Single speed	1,640 lb.	1,845 lb.	NA
2 - speed	1,760 lb.	1,980 lb.	2,080 lb.
Conveyor Extension weight	180 lb.	180 lb.	180 lb.

Available Options:

- Folding conveyor extension boom
- Hydraulic restrictors
- Discharge magnet
- Road light kit
- 2-speed shifter kit
- Hay deflector kit*
- Remote indicator mount kit**

* 1425 and 1500 only
** Digistar indicator mounting kit only

Contact your local dealer for more information.

Pre-Delivery Checks

Dealer Pre-Delivery

The following items must be checked before delivering the mixer. Ensure that all the items listed on the Dealer Pre-Delivery Checklist are checked and properly adjusted during the pre-delivery process. The owner information on the Pre-Delivery Checklist form is to be filled out in the presence of the owner(s) and returned with the warranty registration after delivery.

Assembly Safety

Use adequate manpower to perform assembly procedures safely.

Assemble the mixer in a 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.

Tire safety

Should a tire require mounting, **do not** attempt to mount a tire unless you have the proper equipment and experience to do the job. Always follow proper procedures when mounting a tire on a rim to prevent an explosion which could result in serious injury. Should a tire shipped with the SupRaMix require replacement, **do not** substitute tires of lesser road rating and capacity for the original equipment tires.

Unloading the Mixer from the Transport

⚠ WARNING

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 judgment could result in slippage, causing serious injuries or death.

Note: The Vertical Tub Mixer is shipped with wheels installed, on a drop deck trailer. The Vertical Tub Mixer can be pulled off the trailer using an adequate loading dock. If an adequate loading dock is not available, the following procedure should be followed:

1. Unloading should be done on a level surface; make sure unloading equipment has free access to the Vertical Tub Mixer on all sides.
2. Make sure safety stands, support blocks and safety straps are of sufficient strength and capacity to safely handle the Vertical Tub Mixer.
3. Have one high capacity forklift for each side of the Vertical Tub Mixer to unload it from the transport by forklift. **DO NOT** lift the mixer by attaching to the hitch or the axle weighbars.
4. Raise the mixer frame using both forklifts simultaneously; then move the trailer out from under the elevated Vertical Tub Mixer.
5. Slowly lower the Vertical Tub Mixer to the ground, then block the tires and support the tongue with the jack provided.

Mixer Assembly

Unpacking - The discharge boom (if equipped), hydraulic restrictor blades (if equipped), scale indicator arm, hydraulic hoses, electrical cables and electro-hydraulic control box components (if equipped) need to be unstrapped and installed before operating. Depending on how the SupRaMix was ordered, a knife kit may already be installed or packaged with the mixer.

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

References to pictures and diagrams showing important attachment elements or drive components are included to make assembly instructions easier to follow.

Note: Dealer installed optional equipment includes assembly instructions for each option.

Bolt Torque - The Torque Specification Table (Table 5 in the **Preparing for Operation** section) provides the (non-lubricated) torque values for various bolts and cap-screws. **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%. Always replace hardware with the same strength bolt.

Wheel Nut Torque - Tighten to 300 ft. lbs. torque for 17.5x6.75-8 Bolt Hub.

Tires - Ensure that the tires are properly inflated to their specified pressure: Tire pressure for the 215/75R x 17.5 16 ply tire is 125 psi.

Shields - Make sure that all shields are in place, secured and functioning.

Power Take Off - The Vertical Tub Mixer is shipped with the PTO and the PTO holder loose. Attach the PTO holder to the underneath side of the tongue with the supplied hardware. Attach the PTO with the hardware supplied and attach the shield chain to the mixer. Ensure that the PTO sliding tube halves are free of dirt and foreign material. If the halves do not slide easily, premature failure of the universal joints could result.

Grease Points - Check that all grease fittings (including the zerks on the PTO and the upper bearing on right-angle gearbox) are in place and that all points have been lubricated. Refer to the **Lubrication** section of this Manual and to Table 9.

Table 9. Grease Points

Item	Lubricant	Reference
Right-Angle Gearbox • Input Shaft Splined Yoke Upper Bearing	SAE Multi-Purpose Grease	Table 6 Fig. 26
Drivelines: • Driveline Bearings • Multiple U-Joints • Inner/Outer Slide Tubes • PTO Shielding	SAE Multi-Purpose Grease	Table 6 Figs. 18, 19, 20, 24, & 25
Bolster Bearings	SAE Multi-Purpose Grease	Table 6 Fig. 17

Oil Levels - The Vertical Tub Mixer has either two gearbox assemblies (single speed units) or three gearbox assemblies (two-speed units) that require oil for lubrication. Check the sight plugs on the two-speed gearbox, the oil reservoir for the planetary gearbox, and the right-angle gearbox. Also check the wheel hub oil levels. Refer to the **Lubrication** section of this Manual and to the Table below.

Table 10. Oil Level Checkpoints

Item	Lubricant	Reference
Two-Speed gearbox	SAE EP 90W	Table 7 Fig. 21
Planetary gearbox	SAE EP 90W	Table 7 Figs. 22 & 23
Right-Angle gearbox	SAE EP 90W	Table 7 Fig. 26
Wheel hubs	SAE EP 90W	Table 7 Fig. 27
Roller Chain	Chain Lube or SAE Engine Oil	Table 7 Fig. 28

Belt Conveyor & Discharge Door - Check the belt conveyor to ensure that it is free of material and is not contacting any part of the machine. The discharge door should open to the full unload position. The belt conveyor should be checked and adjusted according to the conditions in which the mixer will be used. If these conditions are known, refer to the **Preparing for Operation** section of this Manual for specific procedures. For pre-delivery, the belt tension should be sufficient to move materials without slippage. The tension must be equal at each adjusting bracket. Ensure that the rollers are square in relation to the frame. If the rollers are not square to the frame, the belt will not track correctly and will move to one side. This could cause premature wear and slippage. For adjustment procedures, see the **Maintenance and Adjustment** section of this Manual.

⚠ CAUTION

Do not overtighten the conveyor belt! The conveyor assembly is fitted with fluted rollers, which will cause excessive wear and dramatically shorten the life of the belt if overtightened.

Also, check that the roller chain is aligned and properly tensioned if equipped with a conveyor extension.

Conveyor Extension - If the mixer is equipped with a factory installed conveyor extension boom, the boom can be locked in the upright position for transportation after it is unpacked. The transport lock pin and hardware are shipped loose in the manual storage tube located under the platform on the mixer. **It is important to remove the transport lock pin when the hydraulic system is hooked up.** Activating the extension cylinder with the transport lock pin installed will severely damage the conveyor and conveyor extension boom.

Left-Hand Discharge for Conveyor Extension - If the conveyor extension is installed as a left-hand discharge, ensure that the left front restrictor does not interfere with the operation of the extension. For a dealer installed left-hand discharge, or when changing a factory installed right-hand discharge to a left-hand discharge, a 5/8 x 1-1/2 inch bolt and lock nut (not supplied with the mixer) should be installed in the first hole of the left front restrictor on the inside of the tub. This will prevent the restrictor from extending out and interfering with the operation of the conveyor extension.

Transportation

When transporting the mixer from the dealership to its final destination, it may be either hauled on a trailer or truck or pulled using an appropriately sized vehicle. The weight of the mixer should NEVER exceed the weight of the towing vehicle. If the mixer is hauled, do not use the hitch or axle weighbars as a tie down point. Block the tongue of the mixer under the welded tongue frame, not under the hitch weighbar. If the mixer is pulled, be sure that all hydraulic lines and wire harness assemblies are clear of the road and hitch point, and securely tied to the mixer. If the mixer is equipped with a conveyor extension boom, lock the boom in the upright position using the transport lock pin. Upon arrival, remember to remove the transport lock pin prior to hooking up the hydraulics.

Attaching To The Tractor

When hooking the mixer up to the tractor, follow this procedure:

1. Clear the area of bystanders.
2. Always follow good shop practices.
3. Block mixer wheels to prevent rolling.
4. Slowly back the tractor up to the mixer and align hitch pin hole with draw bar.
5. Place all tractor controls in neutral, set the park brake and stop the engine. Remove the ignition key before dismounting.
6. Install a hardened hitch pin with mechanical retainer. (NOTE: The hitch pin should be a minimum of 1.25" in diameter).
7. Lower the mixer onto the tractor drawbar, pivot the jack to the transport position, and lock the jack in position.
8. Attach the 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 the chain for full articulation of tractor and mixer without binding. Refer to the **Preparing for Operation** section.

⚠ CAUTION

Never operate a 540 rpm SupRaMix with a 1000 rpm tractor. Make sure the area is clear of bystanders before operating.

PTO Hookup - When hooking the SupRaMix up to the tractor's power take off, you must first adjust the driveline bearing mount. This mount is adjustable for the driveline jackshaft on both the single and two-speed models to optimize the performance of the equal angle PTO driveline. Improper adjustment could result in excessive vibration when operating the mixer while turning.

To adjust the bearing mount for assembly / run-in, loosen the four bolts that attach the bearing to the frame. Move the bearing so the end of the jackshaft is at the same height as the PTO shaft on the tractor (see Figures 7 and 8 in the **Preparing for Operation** section). Tighten the four bolts to the specified torque and replace the shield for the jackshaft.

After the bearing mount is adjusted, follow this procedure:

1. Clean splines inside the yoke and on the tractor shaft.
2. Be sure the driveline and safety guard telescope easily and that the guard rotates freely.
3. Retract the slide collar on PTO yoke and slide the yoke over the shaft. Stop when the slide collar clicks into place. Pull on the yoke to make sure it is securely locked in place.
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 the safety chain for the PTO to the tractor frame to prevent the PTO guard from rotating.
6. Lower the tractor PTO shield over the universal joint and secure.

Hydraulic Hoses - The Vertical Tub Mixer is NOT furnished with the hydraulic couplers to the tractor. Install couplers on the hoses. Use a quality pipe thread compound or Teflon tape to ensure a leak free connection.

Hydraulic Hookup

1. Use a 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. If the mixer is equipped with a conveyor extension, remove the transport lock pin on the extension boom. Run the hydraulic functions of the mixer to purge the hydraulic system of the mixer. Check the hydraulic oil level of the tractor after purging to ensure it maintains the proper level of hydraulic oil.

Electrical

The Vertical Tub Mixer requires a 12 volt DC, negative ground, power supply from the tractor for the operation of the scale indicator, electro-hydraulic control system and the optional highway safety lights. Connection to any other type of electrical system will likely result in severe and immediate damage to the indicator, electro-hydraulic control box, and/or solenoids.

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 a positive ground system. Mount the scale on the indicator mount assembly and route the wiring harness to provide adequate clearance for the mount to swing.

If you are connecting the mixer to the owner's tractor, mount the electro-hydraulic control box (as equipped) on the tractor as noted here, and route the wire harness along the hitch to provide adequate clearance. However, for pre-delivery run-in, only temporary mounting will be necessary.

The control box should be mounted to the right of the driver's seat with the toggle switches pointing upward or toward the operator. The control box can be wired directly to the battery with the black (-) and red (+), or attached using a second tractor plug assembly (not provided). The power connections (red wire) must be fused to protect the wiring in case of a short. Locate the fuse as close as possible to the power source. The ground connection (black wire) should be connected directly to the frame of the tractor or the engine

block. See Figure 6 in the **Preparing for Operation** section of this Manual. The control box and valve bank come pre-wired, and should not be modified! If a different control set-up is desired, the hydraulic routing in the valve should be changed, not the wiring.

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. Refer to Table 4 in the **Preparing for Operation** section for a description of the circuit.

⚠ CAUTION

Leaving the scale indicator and/or electro-hydraulic valve activated will discharge the tractor battery. In order to prevent this, it is recommended that both the scale indicator and the electro-hydraulic valve bank be disconnected when the tractor/mixer are not in use.

Electrical Hookup For Run-In

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. Connect the wire harness between the control box and the electro-hydraulic solenoid valve.

Machine Run-In - With the tractor connected after assembly is completed, operate the SupRaMix to ensure it functions properly. Be certain to check and complete the following items during the final run-in process.

4. Clear the area of bystanders.
5. Check that the mixer is clear of foreign objects (nuts, bolts, stones, wood blocks, etc.).
6. On units equipped with the conveyor extension, ensure that the roller chain is aligned with the sprockets and that the chain is properly tensioned. Remove the transport lock pin from the conveyor extension boom hinge.
7. Recheck that the conveyor belt is aligned with the rollers and properly tensioned.
8. Engage the PTO and run the mixer at slow speed. Observe operation and listen for any unusual noises. Gradually speed up PTO to working speed.
9. Operate all hydraulic components (door, restrictors, conveyor motor and conveyor extension lift).
10. Check all hydraulic connections for leaks and tighten if necessary (follow hydraulic safety instructions listed on pages 8 & 9 of the Operator's Manual).
11. Complete the Dealer Pre-Delivery Checklist in the back of the Operator's Manual.