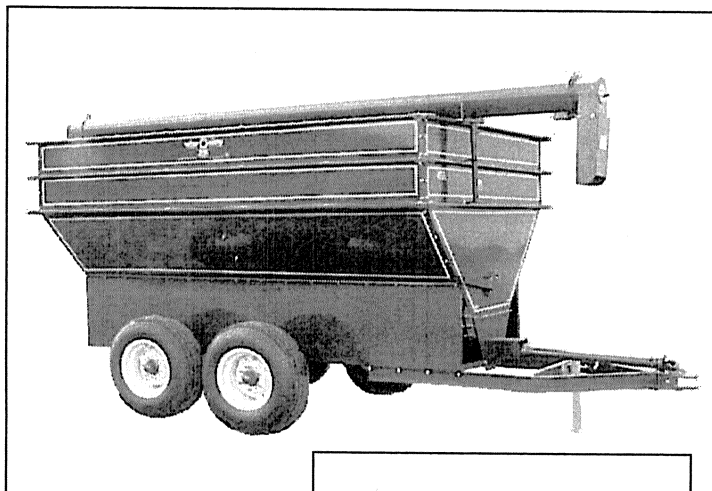


grain-O-vator

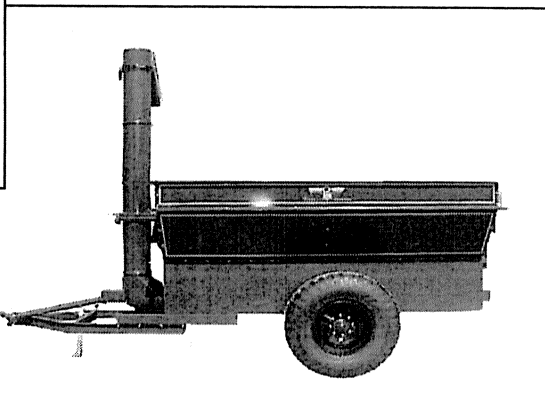
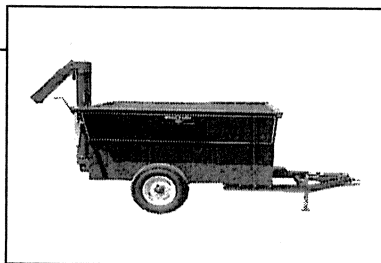
"The Original Self-Unloading Wagon"
Operating and Maintenance



★ **Bunk Feeding** ✓

★ **Creep Feeding** ✓

★ **Trough Feeding** ✓



Grainovator's legendary performance and versatility has saved farmers time and money for over 50 years!

Machine Options Include:

★ 85 - 205 Bushel Capacity

★ Manual or Remote Controlled Auger Positioning

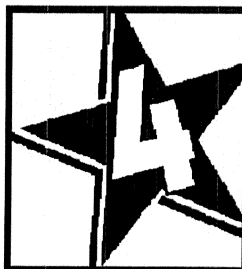
★ Single or Dual Compartment

★ Digital Scales Available for Precise Rationing

★ Single or Tandem Axles

★ NDT Military Flotation Tires Available

★ Front, Rear, and Boom Auger Systems



Four Star
Manufacturing, Inc.

P.O. Box 1196
1055 Higgs Rd.
Lewisburg, TN 37091



TO THE PURCHASER

Familiarize yourself and any operator with the machine's operating manual which points out safety precautions and danger areas. Safety precautions in operator's manual and on machine must be followed for your protection.

DANGER

1. Keep all shields in place.
2. Disengage power and shut off engine before attempting to service or unclog machine.
3. Keep hands, feet and clothing away from power drive parts.
4. Do not climb or ride on machine during operation or transport. Keep others off.
5. Make sure everyone is clear of machine before starting engine or engaging power. Keep children away at all times.
6. To prevent possible backward tipping, do not unhitch wagon from tractor when parked on a slope with front end up hill, or with partial load at rear of wagon.
7. Operate at safe speed for conditions. (Never more than 15 MPH)
8. Tow with vehicle which has as much weight as the wagon complete with load.
9. To prevent personal injury from falling into box always keep cover over box in place.
10. Never reach or poke objects into wagon box while running.
11. Serious injury or death can result from contact with electric lines. Use care when moving or operating this machine near electric lines to avoid contact.
12. Never stand under or near discharge elevator when machine is operating.
13. Should a part become worn or broken, replace immediately.
14. Do not overload or over speed machine.

This auger wagon was carefully designed and manufactured to give years of dependable service. To keep it running efficiently, read the instructions in this operator's manual. Each section is clearly identified so you can easily find the information you need — whether it is operation, lubrication, or service. Read the Table of Contents to learn where each section is located.



This safety alert symbol identifies important safety messages in this manual. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.

"Right-hand" and "left-hand" sides are determined by facing in the direction of forward travel of the auger wagon while being towed.

Record your auger wagon serial number, model and date of purchase in the space provided on page 14. Your dealer needs this information to give you prompt, efficient service when you order parts or attachments. If your auger wagon requires replacement parts, go to your Grain-O-Vator dealer.

WARRANTY

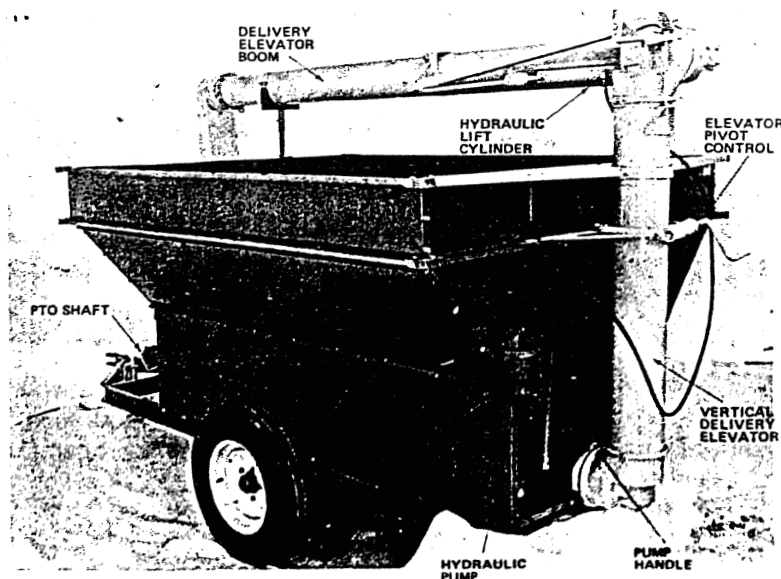
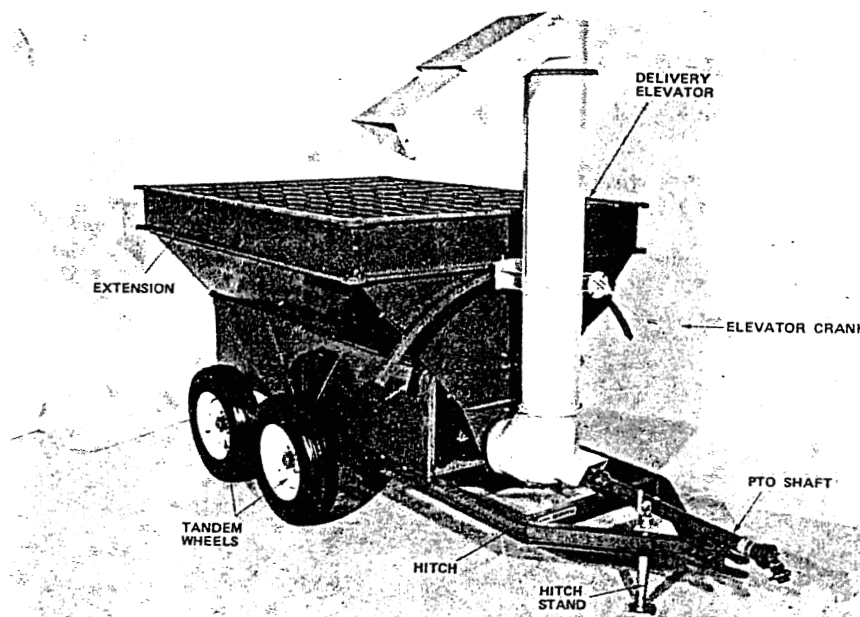
This machine is guaranteed to be free from defective material and workmanship for a period of ninety days from date of purchase as follows:

Any part returned to the factory prepaid within ninety days from date of purchase will be replaced free of charge if on inspection by the factory, it is proved defective in material or workmanship and such part has not been worked on by any other than an established factory sales and service dealer.

If any part intended as a replacement is sent out from the factory previous to factory inspection of the returned part, such part will be shipped C.O.D. unless it is sent to an appointed sales and service dealer. Then, upon factory inspection, if the returned part is proved defective, money will be refunded. Any other guarantee, either express or implied is not binding on the factory.

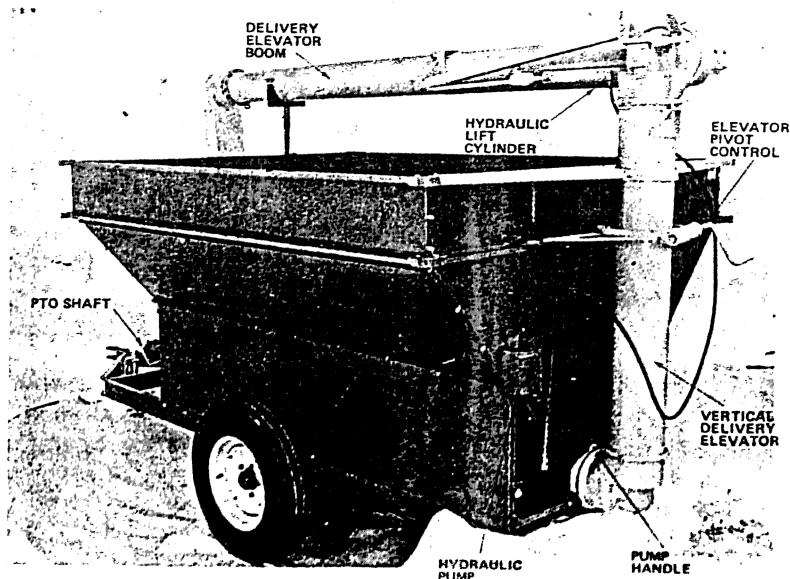
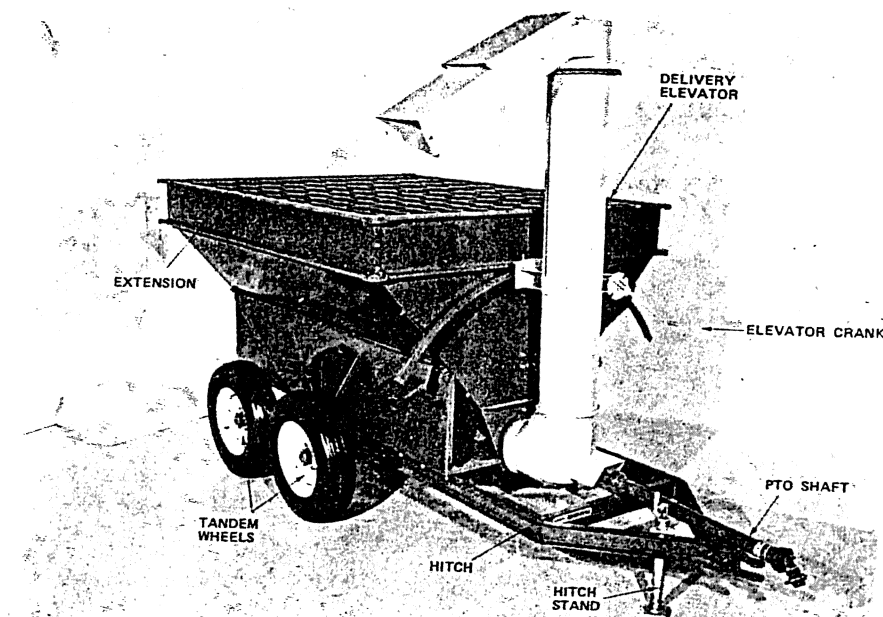
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Operation

HOW THE AUGER WAGON WORKS

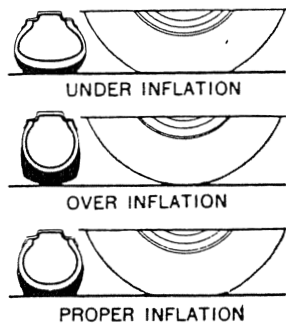
The Grain-O-Vator 10-20 Auger Wagons are designed for easy transportation and fast unloading of feed, seed, or grain. **Do not use for any type ensilage.**

The augers on the auger wagons are driven by the 540 rpm tractor PTO. On the 10 and 20 Rear-Delivery Auger Wagons, power is transmitted to the horizontal auger through a universal joint assembly, and through the gear case to the delivery auger, all of which are protected by two shear pins. On 10 and 20 Front-Delivery Auger Wagons, power is transmitted to the gear case through a universal joint assembly, through the horizontal auger, and the delivery auger, all of which are protected by two shear pins.

PREPARING THE AUGER WAGON

Check wagon for loose hardware. Tighten where necessary.

Lubricate the auger wagon as instructed in the lubrication section. (See pages 12-14)



Tire Inflation

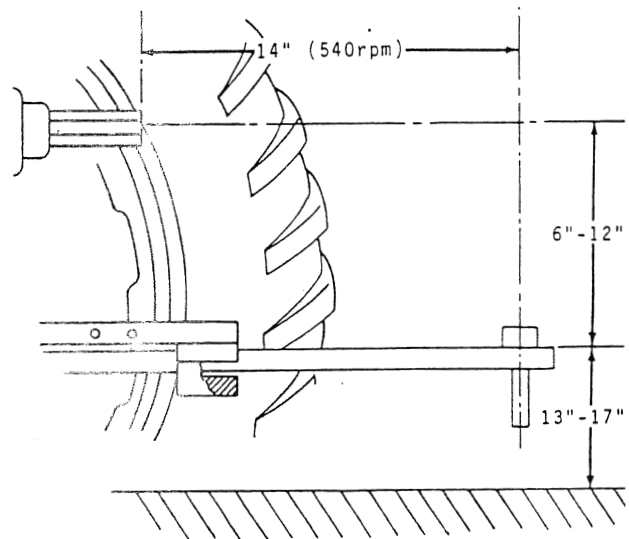
Refer to the following table and inflate tires to recommended tire pressure.

Wheel Size	Tire Size	Ply Rating	Tire Pressure
15 x 5-1/2-inch (Drop-Center)	7.00-15	6	45 psi
	7.60-15	6	36 psi
	7.75-15	4	38 psi
16 x 10-inch	11L-16 (Flotation tires)	6	28 psi
15 x 20-inch (Drop-Center)	7.50-20 (Rib implement tires)	6	32 psi

The auger wagons are designed to be driven by a tractor with a standard hitch and a PTO speed of 540 rpm.

IMPORTANT: Under no circumstances should a wagon equipped for 540 rpm PTO Drive be operated with a tractor equipped with a 1000 rpm PTO.

PREPARING THE TRACTOR



If possible, adjust the tractor drawbar so that it is 13 to 17 inches from the ground.

Extend or shorten the drawbar, if necessary, so that the horizontal distance from the end of the tractor PTO shaft to the center line of the hitch pin is 14 inches.

Adjust the drawbar so that the hitch pin hole is directly below the center line of the tractor PTO shaft. The tractor drawbar must be stationary.

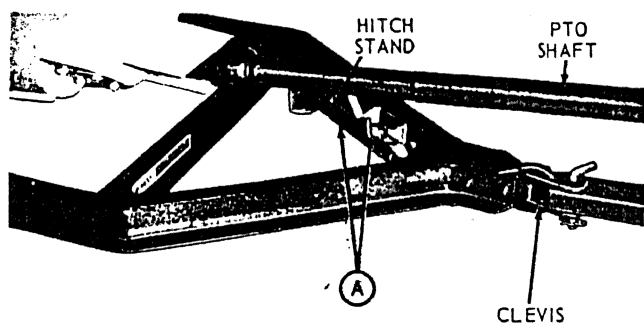
Provide sufficient weighting to stabilize the tractor when operating on hilly land or other adverse conditions. See your tractor operator's manual for front end weighting information.

Add rear wheel weights or liquid ballast to the tractor as recommended in the tractor operator's manual.

Adjust wheel spacing for maximum stability, as shown in the tractor operator's manual.

Check front and rear tires on the tractor to be sure they have been inflated according to the recommendations in the tractor operator's manual.

Hitching to Tractor



Use the crank on the hitch stand to raise or lower the auger wagon hitch into position to engage the tractor drawbar. The drawbar must be inserted between the upper and lower parts of the auger wagon hitch clevis.

Back the tractor into position and insert the hitch pin through the upper clevis, drawbar, and lower clevis. Use a hitch pin that will not bounce out during operation.

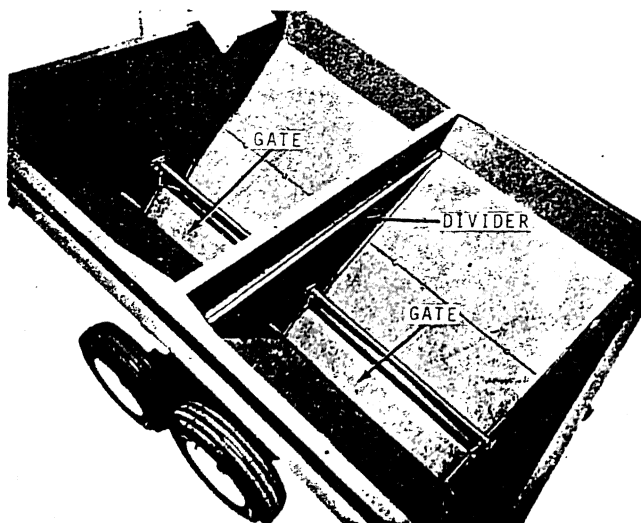
Swing the hitch stand to a horizontal position and lock in place at "A" to provide maximum ground clearance. Do not operate the auger wagon with the hitch stand in the vertical position.

Connecting Powershaft

Depress the spring-loaded pin on the PTO yoke at the tractor end of the auger wagon drive shaft. Slide the yoke onto the tractor PTO shaft and make certain the spring-loaded pin falls in the groove on the tractor splined PTO shaft.

Wagon with Divider

Before loading into a wagon with the divider, close the gate in the compartment being loaded by bring-



Auger Wagon with Divider

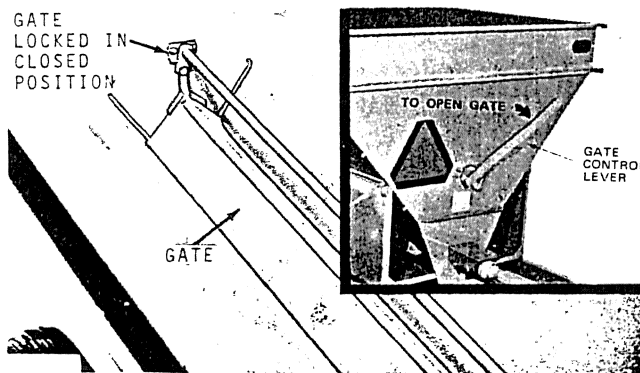
ing the gate control lever upward until the gate is locked closed. A wagon equipped with this partition will have a gate control lever on both the front and the rear of the wagon.

When the divider is used, load the feed and supplements in layers on one side of the wagon. Close the gate in the empty compartment; then engage the PTO, and unload into the empty compartment by directing the flow from the elevator into it. The material mixes while being unloaded into the empty compartment.

For more thorough mixing, circulate the material from compartment to compartment approximately two times until mixing is complete.

With a divider in your wagon, you may load a different mix into each compartment for separate feeding applications.

LOADING AND MIXING IN AUGER WAGON



Wagon Without Divider

Before loading into a wagon without the center divider, close the gate over the box auger by bringing the gate control lever upward until the gate is locked closed.

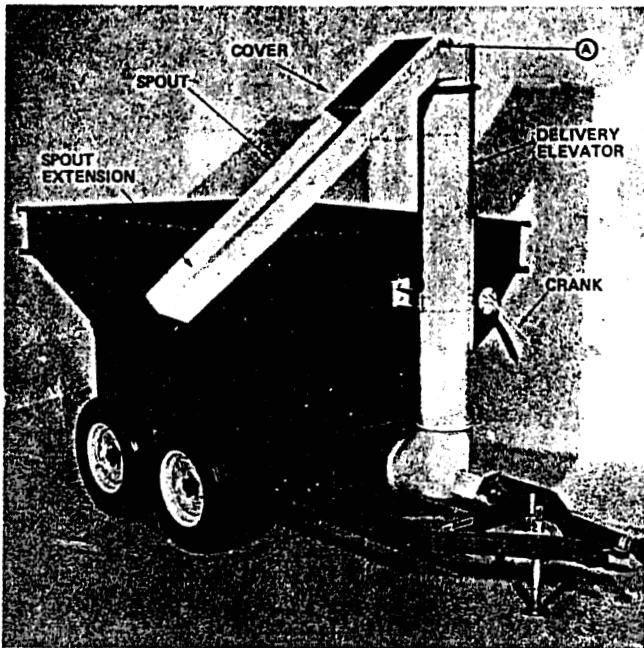
Mixing is best accomplished by loading different ingredients in layers in the wagon. Mixing results are determined by how the box is loaded. Experience in observing how the machine unloads various materials will indicate how to load the box for best results with each material.

With ground feed only, the best mix is usually obtained by putting ingredients with which there is the most bulk on the bottom; then load lesser ingredients with supplement spread evenly over entire top layer of load.

Do not add more than the one 10" high top box.
3 Axles are rated for 155 bushel capacity.

UNLOADING THE AUGER WAGON

Positioning Delivery Elevator Without Boom



Auger Wagon with 11-Inch Delivery Elevator

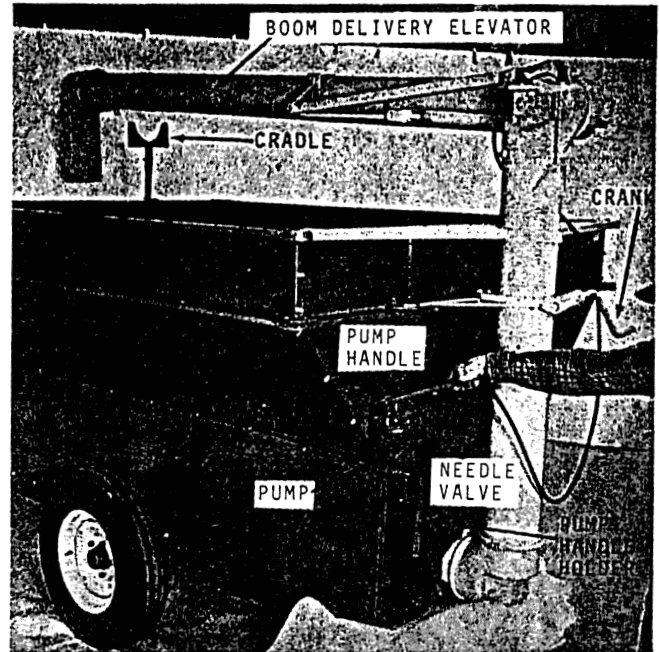
Push in on crank handle to unlatch crank and turn crank to raise or lower vertical elevator into position.

The spout may be rotated through 360 degrees by turning the spout to the desired position, after releasing the safety catch.

The spout can also be raised or lowered to change the discharge angle. It may be necessary to adjust the spout at "A" to keep it in the desired position.

The spout extension may be folded back over the spout to facilitate a shorter reach.

Positioning Delivery Elevator with Boom



Auger Wagon with Boom Delivery Elevator

Insert the handle into the hydraulic pump and raise the boom out of the cradle. Raise the boom to desired height. Then elevator boom can be swiveled 360 degrees by turning the crank.

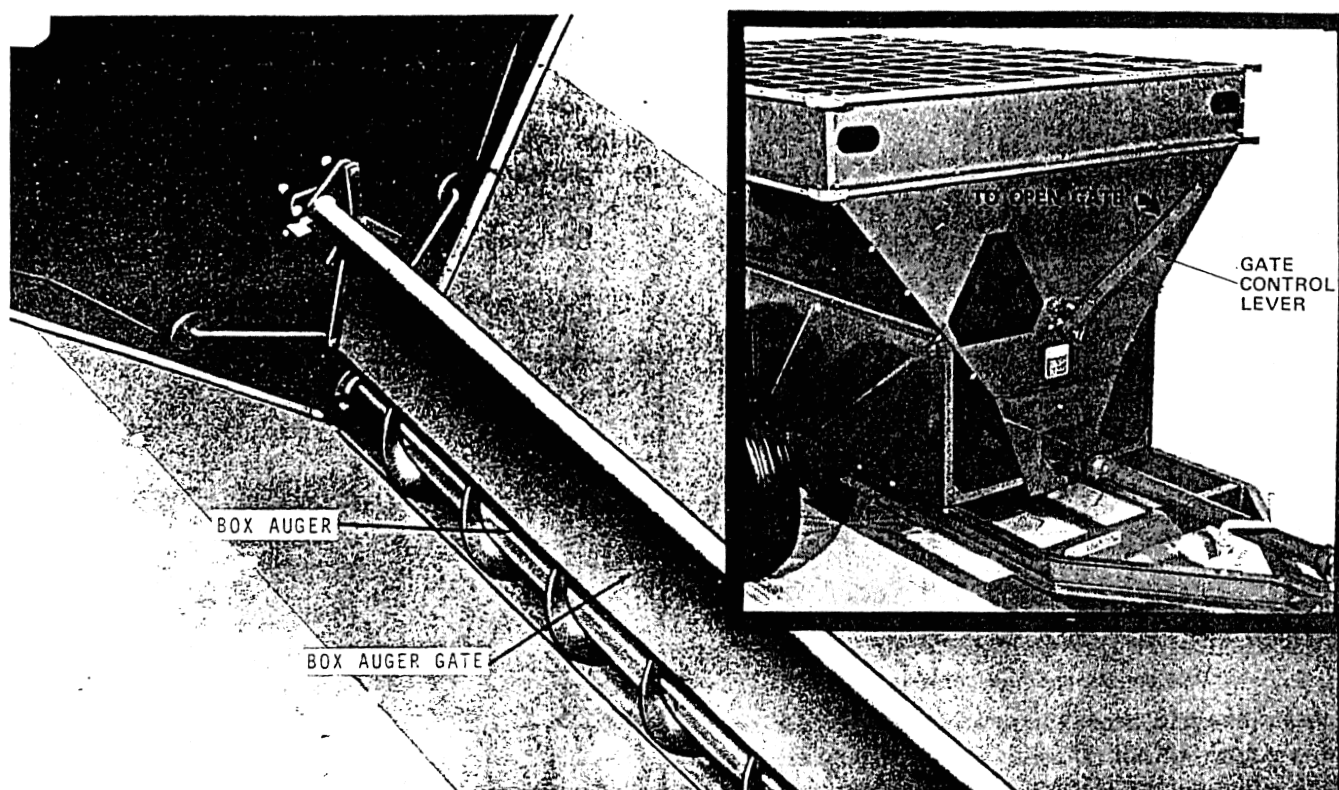
To lower the elevator boom, open needle valve and lower boom to desired height and tighten needle valve.

CAUTION: When transporting auger wagon equipped with a boom elevator, the boom must be lowered into the cradle.

Store the pump handle in the holder.

DANGER: Serious injury or death can result from contact with electrical lines. Use care when moving or operating this machine near electrical lines to avoid contact.

Inloading Material



The rate of discharge of the box auger is controlled by the PTO speed of the tractor and by the box auger gate which can be raised and lowered. (See your tractor operator's manual for complete instructions for operating the tractor PTO.)

For maximum performance, operate the box auger at a speed of 350 to 540 rpm. The tractor throttle should be set for low rpm, the power take-off engaged, and the PTO speed built up to desired unloading speed. DO NOT EXCEED 540 RPM.

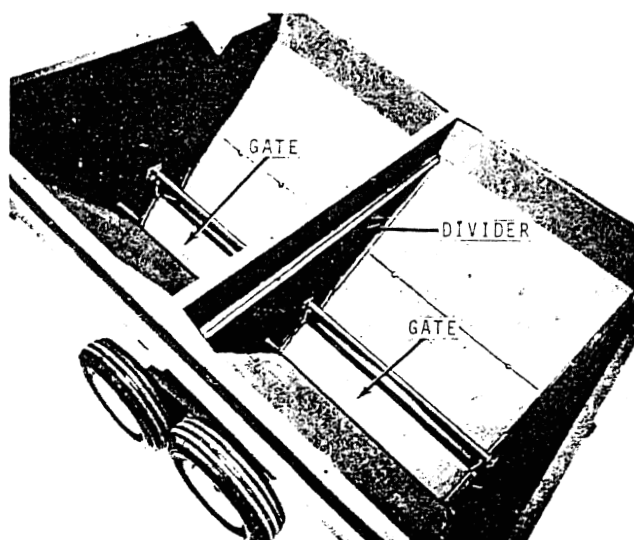
NOTE: It is important to operate in the correct PTO rpm range to maintain an even flow of material.

Before engaging the tractor PTO, make sure the auger gates are closed; then engage the tractor PTO and open the gate or gates as follows:

CAUTION: To avoid possible injury when operating gates or delivery elevator with tractor running and PTO engaged, stay clear of PTO shaft and other moving parts.

To increase the amount of material discharged through the elevator, move the gate control lever down.

To decrease the amount of material discharged through the elevator, move the gate control lever up.



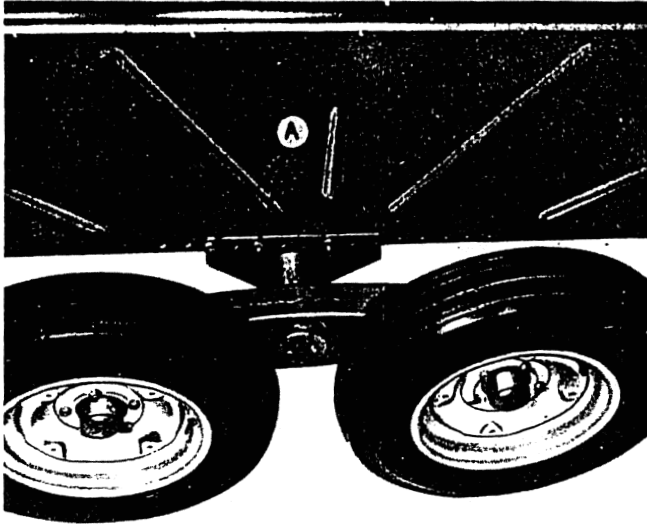
When a box divider is used, front and rear box gates may be individually raised and lowered to control amount of material discharged from the elevator.

Allow elevator to clear itself of material before disengaging the tractor PTO.

CAUTION: If material is to be left in wagon, close the auger gate while machine is running to clean all material from the unloading elevator.

DANGER: To prevent personal injury from falling into box or unauthorized entry into box, always keep cover over box in place. Never reach or poke objects into box when running.

ADJUSTING BALANCE OF AUGER WAGON



Tandem Axle on Auger Wagon

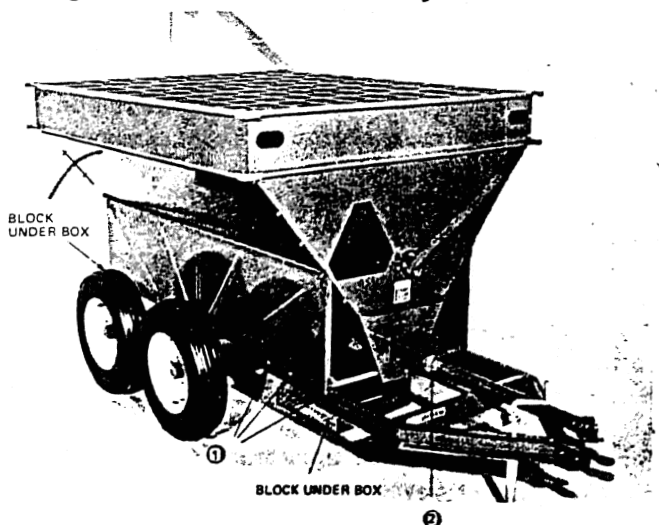
When changing from a front-delivery to a rear-delivery auger wagon or when more or less weight needs to be put on the hitch point, or when changing from rear delivery to front delivery, the wheel axle assembly can be moved forward or rearward by removing bolts at "A" and relocating the wheel axle assembly.

IMPORTANT: The axle assembly must be positioned to always maintain a minimum load on the tractor drawbar.

CAUTION: The auger wagon must be safely blocked up before removing weight from axle assembly—to prevent possible bodily injury.

CHANGING TO REAR DELIVERY OR FRONT DELIVERY

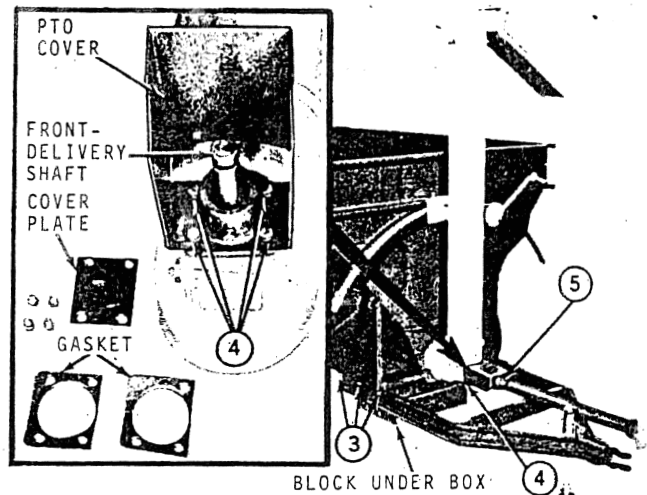
Wagon with 8-Inch Delivery Elevator



CAUTION: Block wagon box safely to prevent possible bodily injury when removing hitch.

NOTE: The following sequence is for changing from a rear-delivery wagon to a front-delivery wagon. To change from a front-delivery to a rear-delivery wagon, follow steps 1, 2, 3, and 5 only.

1. Remove hitch assembly from wagon.
2. Remove PTO shaft from drive shaft.



3. Install hitch assembly on opposite end of wagon.

4. Install a front-delivery shaft by removing cover plate and four bolts. Then install input casting and shaft assembly and PTO cover with four 3/8 x 1-1/4 inch cap screws and lock washers. Tighten the assembly. When the gear and shaft are meshed correctly, the input shaft can be turned without difficulty.

NOTE: Additional gaskets may have to be added between input casting and shaft and the vertical auger casting to correct any difficulty in turning.

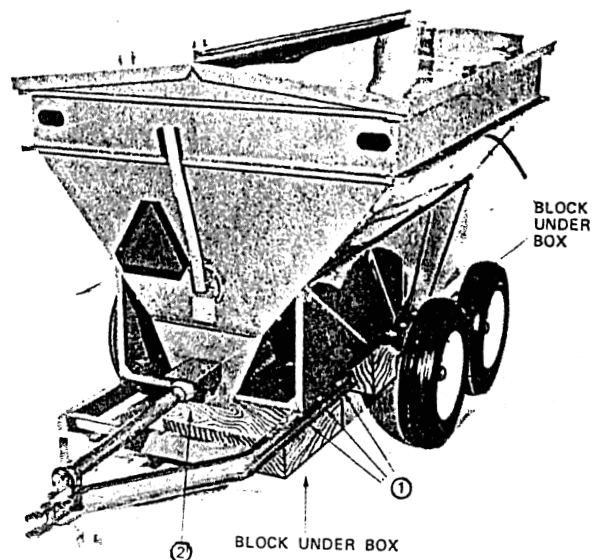
5. Install PTO shaft on the drive shaft.

Balance the wagon as described on this page.

IMPORTANT: When changing delivery positions on auger wagon, remove old SMV emblem and red reflector tape from the wagon and install new SMV emblem and red reflector tape on the rear of the wagon as shown on page 8.

Remove blocks from auger wagon.

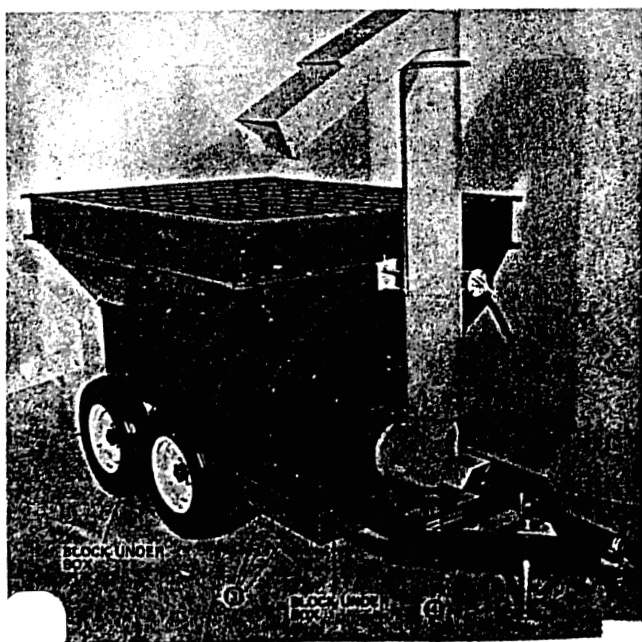
Wagon with 11-Inch Delivery Elevator



CAUTION: Block wagon box safely to prevent possible bodily injury when removing hitch.

NOTE: The illustrations for the following steps depict changing from a rear-delivery wagon to a front-delivery wagon. The procedure will be the same for changing from a front-delivery wagon to a rear-delivery wagon.

1. Remove hitch assembly from wagon.
2. Remove PTO shaft from drive shaft.



3. Install hitch assembly on opposite end of wagon.

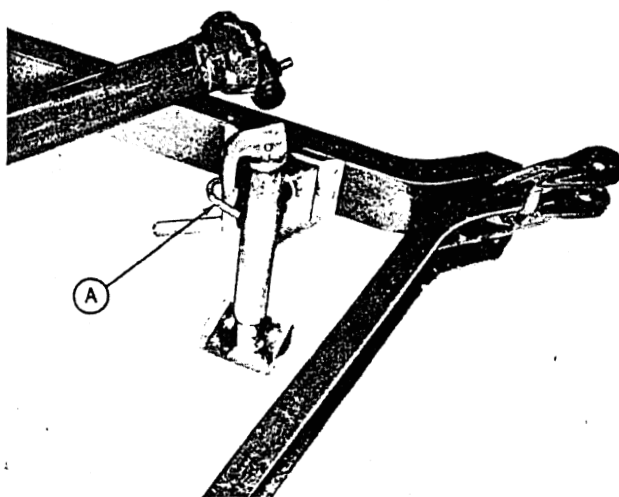
4. Install PTO shaft on delivery auger or on drive shaft.

Balance the wagon as described on page 6.

IMPORTANT: When changing delivery positions on auger wagon, remove old SMV emblem and red reflector tape from the wagon and install new SMV emblem and red reflector tape on the rear of the wagon as shown on page 8.

Remove blocks from auger wagon.

HITCH STAND



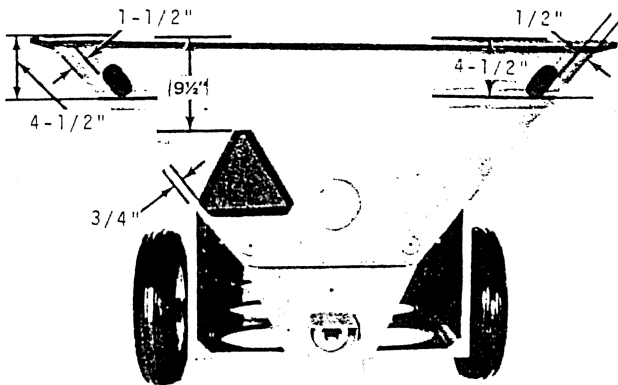
Use the hitch stand when parking the wagon. By turning the handle, the hitch can be raised or lowered for hooking to tractor.

Before moving the wagon, release the stand at "A" and position the hitch stand in its horizontal position. Do not move the auger wagon with the hitch stand in the vertical position.

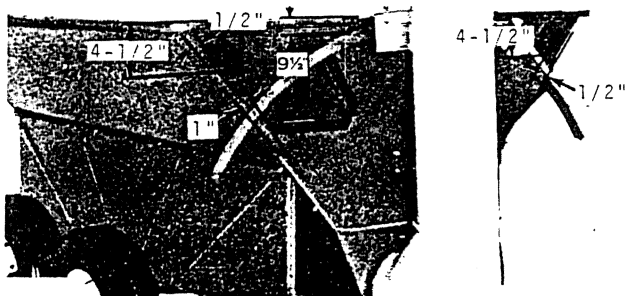
SMV EMBLEM AND RED REFLECTOR TAPE LOCATIONS

When delivery positions have been changed, it will be necessary to install a slow moving vehicle (SMV) emblem and red reflector tape on the rear of the auger wagon. Refer to the following illustrations for correct locations:

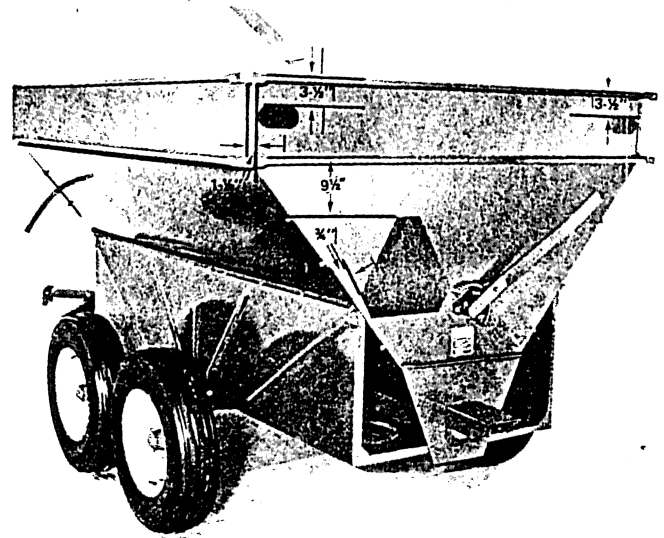
NOTE: Remove or cover SMV emblem and red reflector tape on the front of the wagon after installing new SMV emblem and red reflector tape on the rear of the wagon.



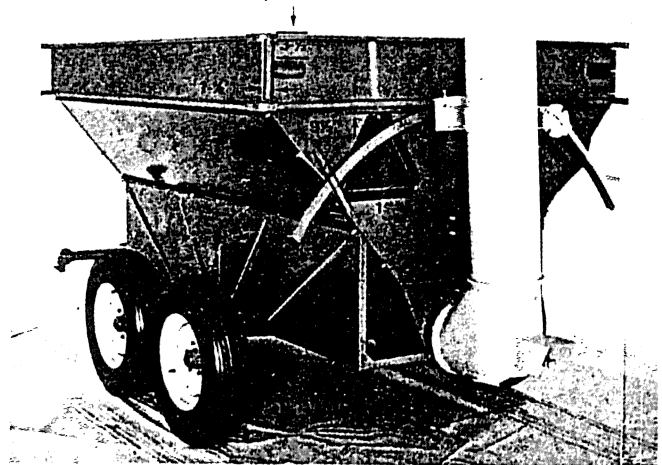
*Auger Wagon with Front-Delivery Elevator
Less Box Extensions*



*Auger Wagon with Rear-Delivery Elevator
Less Box Extensions*



*Auger Wagons with Front-Delivery Elevator
and Box Extensions*



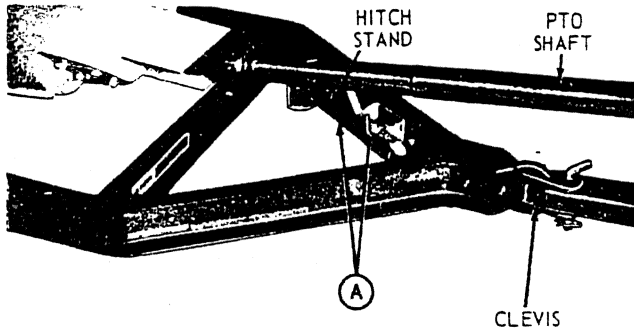
*Auger Wagons with Rear-Delivery Elevator
and Box Extensions*

TRANSPORTING

Before transporting the auger wagon, perform the following steps:

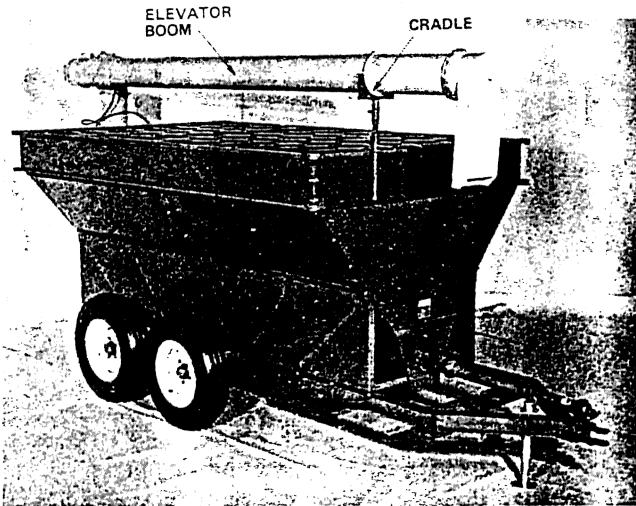
On wagon without boom elevator, locate delivery elevator in the upright position.

Close box auger gates when transporting loaded material in the auger wagon.

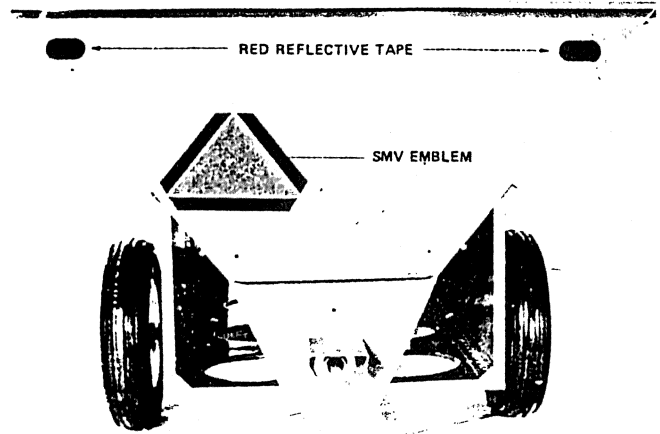


Swing the hitch stand to the horizontal position and lock in place at "A" to provide maximum ground clearance. Do not transport the wagon with the hitch stand in the vertical position.

Secure the hitch pin in the hitch with a spring locking pin.

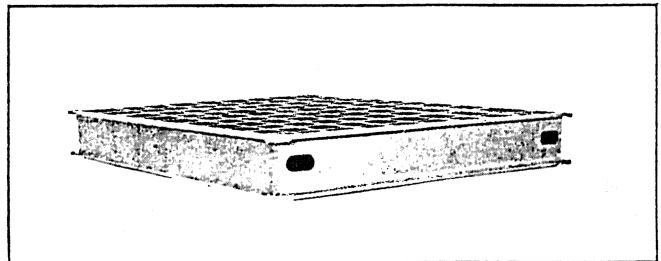


When the wagon is equipped with the boom delivery elevator, rest the boom in the cradle.



The wagon is equipped with an SMV Emblem and red reflector tape as a warning to the operators of vehicles approaching from the rear. Keep the emblem and tape clean.

CAUTION: When transporting the wagon on the road or highway at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. In this regard, check local governmental regulations.



DANGER: This wagon is furnished with a safety screen that attaches to the top of the box. This screen must be in place at all times. Do not operate machine with out safety screen in place.

End of Season Service

If possible, store the wagon in a dry place.

Clean the wagon thoroughly with water.

Paint all parts from which paint was worn.

When the wagon is dry, oil all vital parts. Use the oil liberally to protect all surfaces.

Lubricate the complete wagon. (See pages 11 and 12.)

Block the wagon, taking the load off tires. Do not deflate tires. If stored, remove wheels and tires and store them in a cool, dark place.

List the replacement parts that will be needed before the next season and order them early. Your dealer can give better service during the off season. Also, replacement parts can be installed in your spare time—no delay at time of need.

Beginning of the Season Service

Take the wagon out of storage and carefully check before starting the use season. By making certain that your wagon is in excellent condition, you avoid costly breakdowns during the season.

Replace wheels if they were removed and remove blocking.

Clean the wagon thoroughly inside and out.

Lubricate the wagon completely. (See pages 11 and 12.)

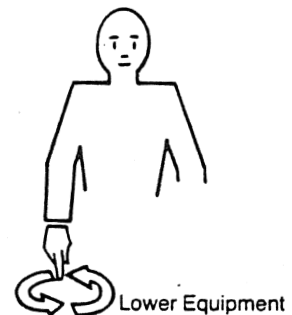
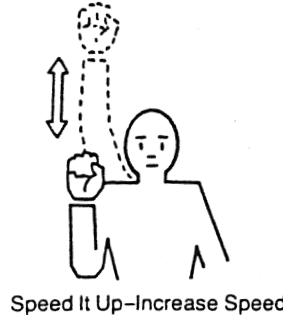
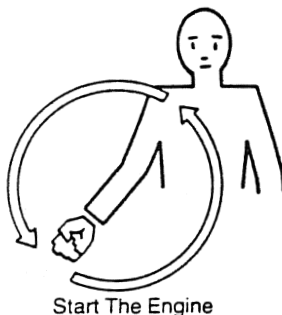
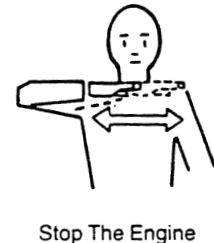
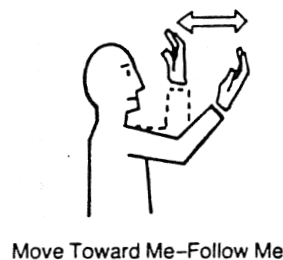
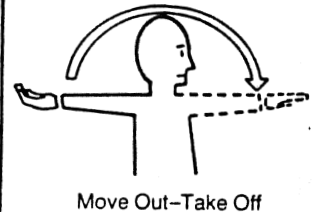
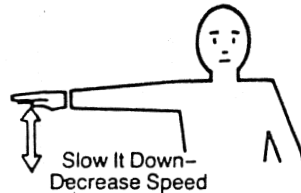
Check tires for proper inflation. (See page 2.)

Go over the complete auger wagon and see that all bolts are tight and all drives are aligned.

Review your operator's manual.

HAND SIGNALS

Use when noise or distance does not allow normal voice communication.



Safety Suggestions



The safety of the operator was one of the prime considerations in the design of this auger wagon. Proper shielding, convenient controls, simple adjustments, and other safety features have been built into this auger wagon.

You can avoid many accidents by observing the following safety rules. Insist that they be followed by those working with you and for you.

Only one person—the operator—should be allowed on the tractor when tractor and auger wagon are in operation.

Keep guards and shields in place at all times while the auger wagon is operating. Always disengage tractor PTO and shut off engine before removing any of the guards.

Never ride, or permit others to ride on the tractor drawbar or auger wagon hitch.

Use a stationary tractor drawbar only.

Avoid operating under power in sharp turns.

The tractor drawbar must be adjusted to specified recommendations.

To avoid possible bodily injury when operating gates or delivery elevator with tractor running and PTO engaged, stay clear of PTO shaft and other moving parts.

Always stop the tractor engine before servicing, lubricating, or cleaning out the auger wagon.


Always keep hands, feet, and clothing away from power-driven parts.

Always keep the tractor PTO clutch lever in neutral or disengaged position — except while unloading the auger wagon or when mixing material in the auger wagon.

When transporting the auger wagon on a road or highway at night or during the day, use accessory lights and devices for adequate warning to operators of other vehicles. Various safety lights and devices are available from your dealer.

Lubrication

Economical and efficient operation of any machine is dependent upon regular and proper lubrication of all moving parts with a quality lubricant. Neglect leads to reduced efficiency, heavy draft, wear, breakdown, and needless replacement of parts.

 **CAUTION:** Disengage drive and shut off tractor before lubricating the machine.

All parts provided with grease fittings should be lubricated as indicated. If any grease fittings are missing, replace them immediately. Clean all fittings thoroughly before using grease gun.

SYMBOLS



Lubricate with SAE multipurpose-type grease at hourly intervals indicated on the symbols.

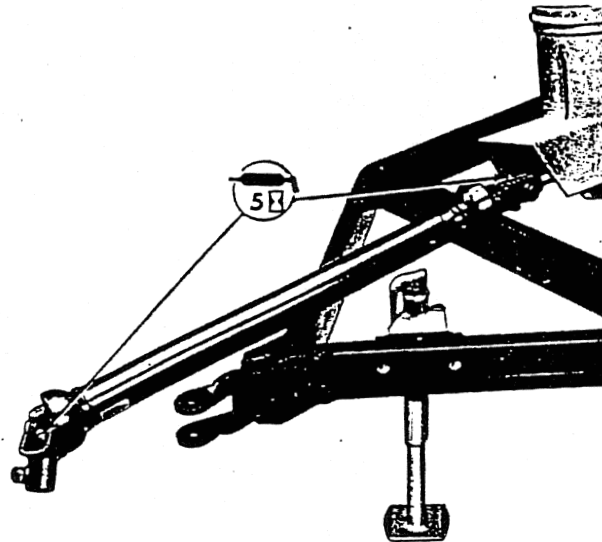


Lubricate periodically with SAE 10 oil at hourly intervals indicated on the symbols.

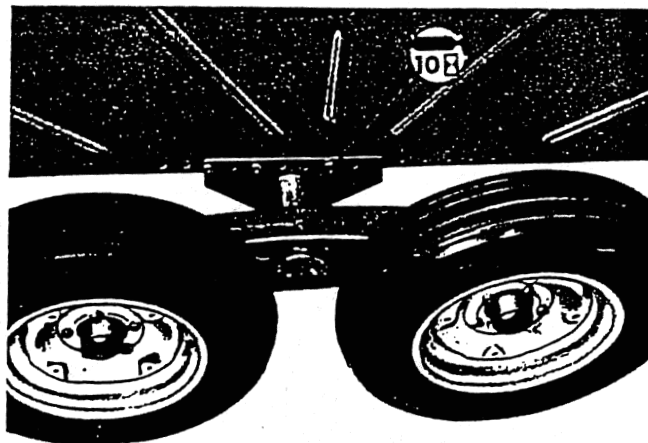


Brush periodically with SAE multipurpose-type grease.

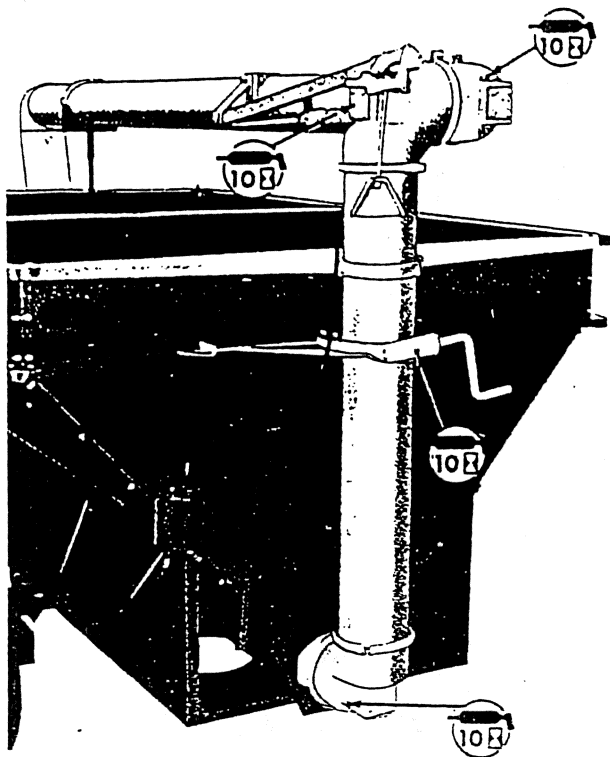
5-HOUR SERVICE



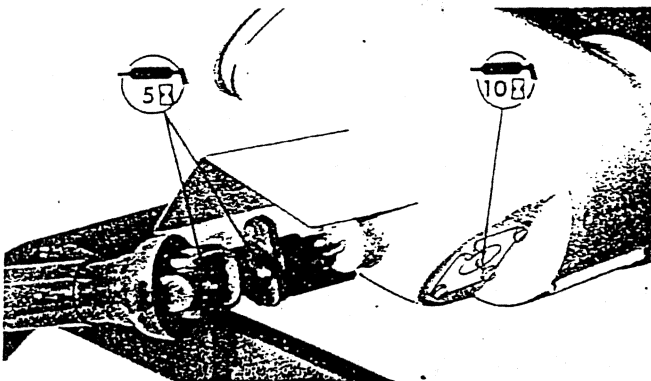
10-HOUR SERVICE



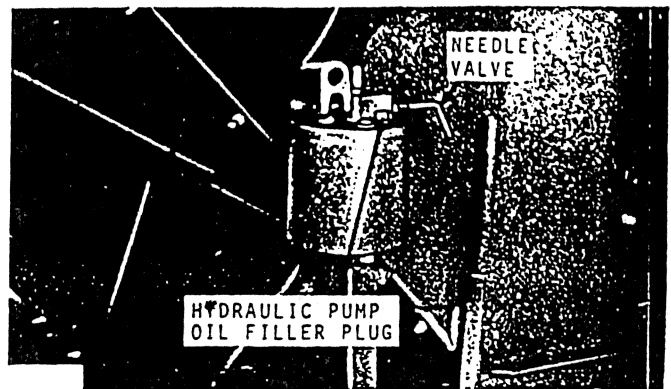
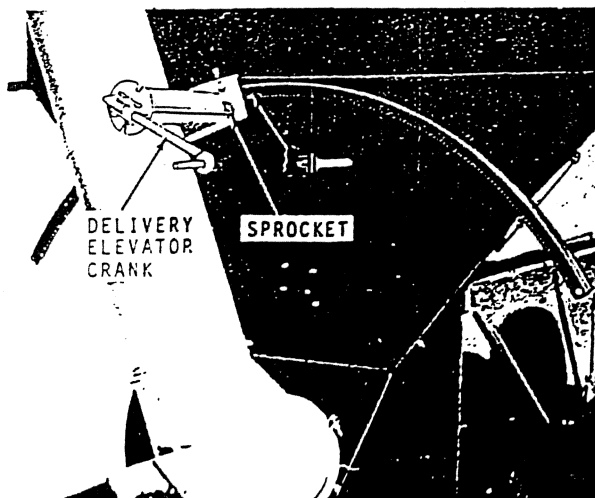
Tandem Wheels



Delivery Elevator with Boom



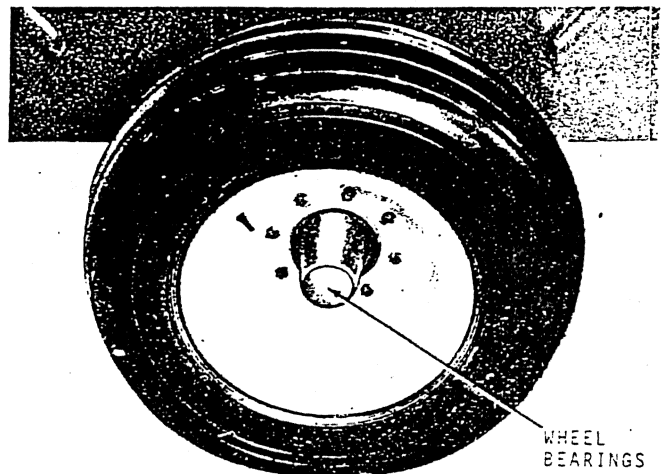
11-Inch Delivery Elevator



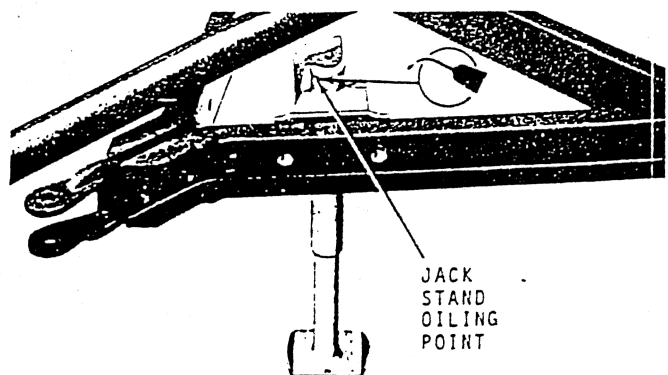
Hydraulic Pump for Boom Delivery Elevator

For continuous trouble-free operation, check hydraulic oil level periodically. Maintain approximately one quart of hydraulic oil in reservoir. (Approximately 1/2-inch from top of filler plug when boom is in lowered position.)

1500 HOUR SERVICE



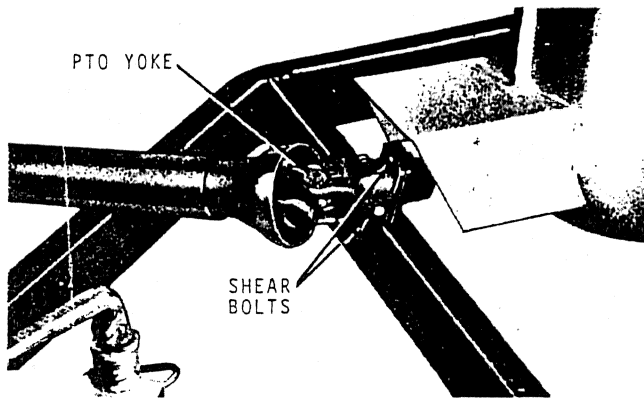
Check and repack wheel bearings every 1500 hours.



Oil jack stand periodically.

Service

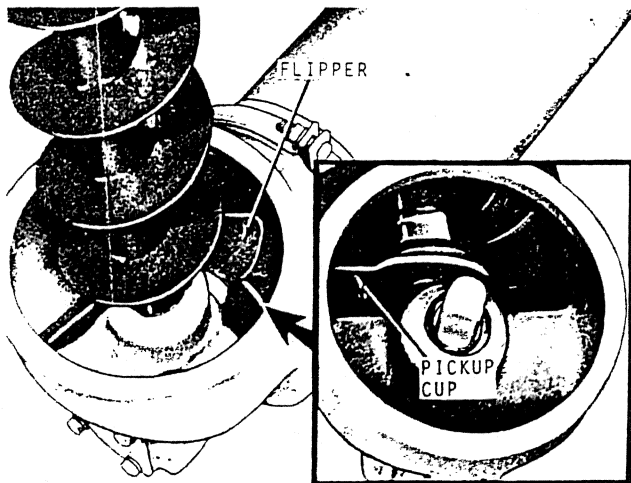
SHEAR BOLTS



Shear bolts located through the PTO yoke and shear hub protect the auger system and drive from damage.

When the bolts shear, remove the damaged shear bolts and install two new Grade 2 5/16 x 1-inch cap screws, lock washers, and nuts.

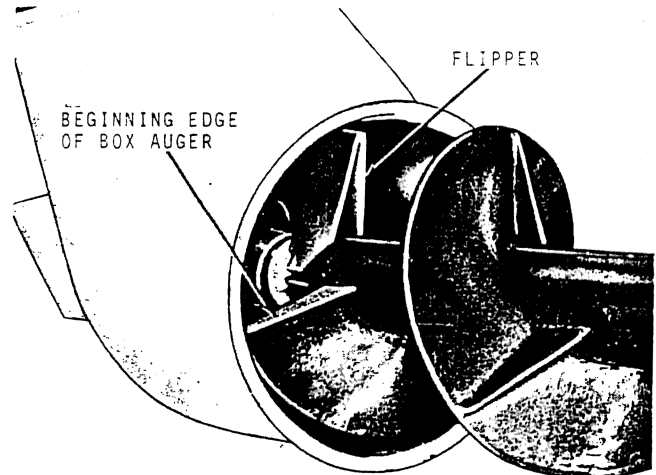
TIMING BOX AUGER WITH 8-INCH DELIVERY AUGER



For the best flow of material from the box auger to the delivery auger, the augers must be timed.

Time the augers by positioning the box auger so the flipper on the auger will deliver material directly onto the pickup cup of the auger in the delivery elevator.

TIMING BOX AUGER WITH 11-INCH DELIVERY AUGER



For the best flow of material from the box auger to the delivery auger, the beginning edge of the box auger must be placed at a right angle to the flipper.

SEE INSERT PAGE FOR DECALS

Trouble Shooting

Trouble	Possible Cause	Possible Remedy	Page
Reduced discharge of material	Bent auger flighting	Straighten auger flighting	—
	Dirty augers	Clean auger assembly	—
	Low PTO rpm	Operate at correct PTO rpm	2
PTO shear pin shears	Object caught in auger	Clean auger system	—
	Excessive load put on auger system	Operate at correct PTO rpm	2
		Adjust auger gates	
Vibration in auger system	Bent auger flighting	Straighten the auger flighting	—
Tandem axles not oscillating properly	Lack of lubrication	Lubricate	11-12
Packing of material in discharge end of wagon	Bent discharge auger flighting	Straighten flighting	—
	When 8-inch discharge auger is used, auger may not be timed	Time 8-inch discharge auger	13
Auger wagon is front-heavy	Wheel assembly located improperly	Move the wheel assembly toward the hitch end of the wagon until desired balance is obtained	6
Auger wagon is rear-heavy	Wheel assembly located improperly	Move the wheel assembly toward the rear end of the wagon until desired balance is obtained	6

SERIAL NUMBERS

The serial number plate is located on the left-hand lower end of the box.

When ordering parts, always bring with you the model and serial number as given on the serial number plate. By doing so, you will assist your Grain-O-Vator dealer in giving you prompt, efficient service. For your convenience, a space is provided to the right for recording this information.

GRAIN-O-VATOR 10 & 20 SERIES AUGER WAGONS

Model _____

Serial No. _____

Date Purchased _____

(To be filled in by purchaser)

For the best flow of material from the box auger to the delivery auger, the augers must be timed. To time the augers stand behind the machine.

Start with the box auger. There are two flippers on the box auger. Place flipper with flighting welded to it straight up. Place gear box on with bowl toward flippers. Insert vertical auger so that where cup is welded to flighting is on right hand side.

Vertical auger to transfer auger. Mount gear box with bowl down on vertical auger. Flipper on vertical auger should be to the right hand side. Transfer auger where flighting is welded to cup should be turned toward back of machine.

Transfer auger to delivery auger. Place gear box with bowl toward transfer auger. Flipper on transfer auger should face front of machine. Cup, where flighting is welded to it, should be straight up.

