HAYBUSTER®

Operating Instructions and Parts Reference

H-1000™

PTO Driven Tub Grinder

Serial Number FI03631 & Up

Product Information

DURATECH INDUSTRIES

0500044 • May 2014

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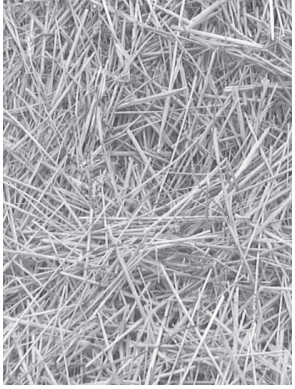
HAYBUSTER®

A Tradition of Innovation Since 1966



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PTO Driven Tub Grinder
Serial Number FI03631 & Up

Operating Instructions and Parts Reference

DuraTech Industries International Inc. (DuraTech Industries) has made every effort to assure that this manual completely and accurately describes the operation and maintenance of the H-1000 Tub Grinder as of the date of publication. DuraTech Industries reserves the right to make updates to the machine from time to time. Even in the event of such updates, you should still find this manual to be appropriate for the safe operation and maintenance of your unit.

This manual, as well as materials provided by component suppliers to DuraTech Industries are all considered to be part of the information package. Every operator is required to read and understand these manuals, and they should be located within easy access for periodic review.

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Foreword

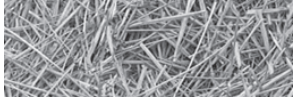
All personnel must read and understand the following sections before operating the H-1000 Tub Grinder.

- Foreword and Section 1, important safety information.
- Section 2, ”Dealer Preparation,” to verify that the machine has been prepared for use.
- Section 3, “Machine operation,” which explains normal operation of the machine.
- Section 3.1, “Pre-Operation Inspection”.

Appropriate use of unit

The H-1000 Tub Grinder is designed to grind material into more palatable or manageable rations for your operation. It has multiple uses:

1. Grind most types of hay
   - Big round bales
   - Loose hay
   - Square bales
2. Grind most types of grain
   - Ear corn
   - Shell corn
   - High moisture corn
   - Most small grains

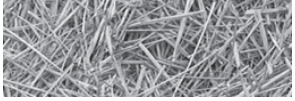


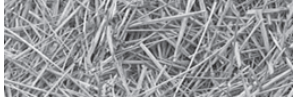
3. Grind most types of crop residue
   - Stover
   - Straw
4. Grind various sizes
   - Screens are available from 1/8” to 4”
   - Combine screen sizes to get desired cut

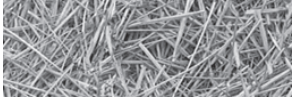
Operator protection

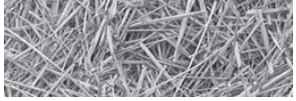
As with all machinery, care needs to be taken in order to insure the safety of the operator and those in the surrounding area.

WARNING: The **OPERATOR IS RESPONSIBLE** for the safety of the operator and those in the surrounding area. Operators and those observing the operation of the H-1000 Tub Grinder are required to wear head, eye, and ear protection, No loose clothing is allowed.









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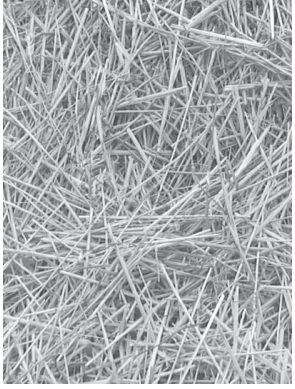

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H-1000™

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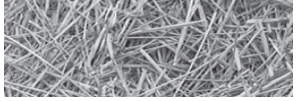
Part 1:
Operating Instructions



Introduction

The H-1000 Tub Grinder is designed to grind material into more palatable or manageable rations for your operation. It has multiple uses:

1. Grind most types of hay
   - Big round bales
   - Loose hay
   - Square bales
2. Grind most types of grain
   - Ear corn
   - Shell corn
   - High moisture corn
   - Most small grains
3. Grind most types of crop residue
   - Stover
   - Straw
4. Grind various sizes
   - Screens are available from 1/8” to 4”
   - Combine screen sizes to get desired cut

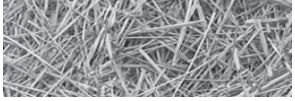
To avoid possible damage to the machine and risk of injury to the operator, consult with a DuraTech Industries International, Inc. (DuraTech Industries) representative before attempting to shred materials other than livestock forage.

Purpose

The purpose of this owner’s manual is to explain maintenance requirements and routine adjustments for the most efficient operation of your H-1000 Tub Grinder. There is also a trouble shooting section that may help in case of problems in the field. Any information not covered in this manual may be obtained from your dealer.

Special Note: When reference is made as to front, rear, left hand, or right hand of this machine, the reference is always made from standing at the rear end of the machine and looking toward the hitch. Always use serial number and model number when referring to parts or problems. Please obtain your serial number and write it below for your future reference.

MODEL: H-1000 SERIAL NO. _____



How to use this manual

Manual organization

This manual is organized into the following parts:

- **Part 1:** Operating Instructions
  - **Section 1:** Safety decals, safety instructions and information
  - **Section 2:** List the preparation required by the dealer before delivery,
  - **Section 3:** Describes the purposes of each part.
  - **Section 4:** Describes safe procedures.
  - **Section 5:** Tells how to use the H-1000 Tub Grinder.
  - **Section 6:** Describes how to maintain the H-1000 Tub Grinder.
- **Part 2:** Part's reference contains diagrams of each assembly, with the part number of each part. A key on the same or facing page contains a description of the part and the quantity used.

Dealer responsibilities

- Thoroughly review Section 2, "Dealer Preparation," and perform the tasks outlined. Also perform a daily pre-operation inspection as described in Section 3, "Operation."
- Upon delivery of the unit to the customer, it is your responsibility to conduct a training session on the safe operation of the unit for the primary operator(s). You must also conduct a "walk-around" inspection of all safety instructional decals on the machine itself. Decals are illustrated in **Part 2: Parts Reference.**
- Complete and return the Warranty Registration postcard. DuraTech Industries must receive this form before activating the warranty. Appendix A provides details of the warranty.

Operator responsibilities

- Review Section 2, "Dealer Preparation," to verify that the H-1000 Tub Grinder has been prepared for use.
- Note the important safety information in the Foreword and in Section 1, "Safety."
- Thoroughly review sections 1 and 3, which explain normal operation of the machine, and section 4, which explains maintenance requirements. These sections will function as your textbook during the dealer-conducted training course that is required before you can use the unit.
- Manuals for certain allied supplier's components are provided separately. You should also be familiar with their contents.
- Keep copies of all manuals in a readily accessible location for future reference.

Section 1: Safety

The safety of the operator is of great importance to DuraTech Industries. We have provided decals, shield and other safety features to aid you in using your machine safely. In addition, we ask you to be a careful operator who will properly use and service your Haybuster equipment.

WARNING: FAILURE TO COMPLY WITH SAFETY INSTRUCTIONS THAT FOLLOW WITHIN THIS MANUAL COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH. BEFORE ATTEMPTING TO OPERATE THIS MACHINE, CAREFULLY READ ALL INSTRUCTIONS CONTAINED WITHIN THIS MANUAL. ALSO READ THE INSTRUCTION MANUAL PROVIDED WITH YOUR TRACTOR.

THIS MACHINE IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THOSE EXPLAINED IN THE OPERATOR'S MANUAL, ADVERTISING LITERATURE OR OTHER DURATECH WRITTEN MATERIAL PERTAINING TO THE H-1000 TUB GRINDER.

1.1 Safety-alert symbols

Decals are illustrated in **Part 2: Parts Reference.**

The safety decals located on your machine contain important and useful information that will help you operate your equipment safely.

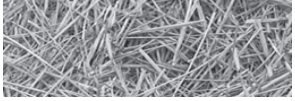
To assure that all decals remain in place and in good condition, follow the instructions below:

- Keep decals clean. Use soap and water - not mineral spirits, adhesive cleaners and other similar cleaners that will damage the decal.
- Replace all damaged or missing decals. When attaching decals, surface temperature of the machine must be at least 40° F (5° C). The surface must be also be clean and dry.
- When replacing a machine component to which a decal is attached, be sure to also replace the decal.
- Replacement decals can be purchased from your Haybuster dealer.

DuraTech uses industry accepted **ANSI** standards in labeling its products for safety and operational characteristics.

Safety-Alert Symbol

Read and recognize safety information. Be alert to the potential for personal injury when you see this safety-alert symbol.



DANGER: Indicates an imminently hazardous situation that, if not avoided, will result in death or serious injury. This signal word is to be limited to the most extreme situations, typically for machine components that, for functional purposes, cannot be guarded.

DANGER:
Signal word - White Lettering/Red Background
Safety Alert Symbol - White Triangle/Red Exclamation Point

WARNING: Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury, and includes hazards that are exposed when guards are removed. It may also be used to alert against unsafe practices.

WARNING:
Signal word - Black Lettering/Orange Background
Safety Alert Symbol - Black Triangle/Orange Exclamation Point

CAUTION: Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It may also be used to alert against unsafe practices.

CAUTION:
Signal word - Black Lettering/Yellow Background
Safety Alert Symbol - Black Triangle/Yellow Exclamation Point

This manual uses the symbols to the right to denote important safety instructions and information.

The **DANGER**, **WARNING** and **CAUTION** symbols are used to denote conditions as stated in the text above. Furthermore, the text dealing with these situations is surrounded by a box with a white background, will begin with **DANGER**, **WARNING**, or **CAUTION**.

The **INFORMATION** symbol is used to denote important information or notes in regards to maintenance and use of the machine. The text for this information is surrounded by a box with a light grey background, and will begin with either **IMPORTANT** or **NOTE.**

	**1. Yellow warning triangle/black graphical symbol, indicates what the hazard is.** **Hazard Identification**
	**2. Red circle-with-slash/black graphical symbol indicates a prohibited action to avoid the hazard.** **Prohibited Action**
	**3. Blue mandatory action circles/white graphical symbol - indicates an action to take to avoid the hazard.** **Mandatory Action**

1.2 Operator - personal equipment

THE OPERATOR

Physical Condition

You must be in good physical condition and mental health and not under the influence of any substance (drugs, alcohol) which might impair vision, dexterity or judgment.

Do not operate a **H-1000** when you are fatigued. Be alert - If you get tired while operating your **H-1000,** take a break. Fatigue may result in loss of control. Working with any farm equipment can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating

Proper Clothing

Clothing must be sturdy and snug-fitting, but allow complete freedom of movement. Avoid loosefitting jackets, scarfs, neckties, jewelry, flared or cuffed pants, unconfined long hair or anything that could become entangled with the machine.

Protect your hands with gloves when handling hammers, screens, etc.. . Heavy-duty, nonslip gloves improve your grip and protect your hands.

Good footing is most important. Wear sturdy boots with nonslip soles. Steel-toed safety boots are recommended.

To reduce the risk of injury to your eyes never operate a **H-1000** unless wearing goggles or properly fitted safety glasses with adequate top and side protection.

Tractor noise may damage your hearing. Always wear sound barriers (ear plugs or ear mufflers) to protect your hearing. Continual and regular users should have their hearing checked regularly.

1.3 Machine safety labels

The safety decals located on your machine contain important information that will help you operate your equipment. Become familiar with the decals and their locations.

DANGER: ROTATING PARTS WITHIN CAN KILL OR DISMEMBER. WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING, UNLOADING, OR INSPECTING MACHINE.

6500082

DANGER: ROTATING DRIVELINE, KEEP AWAY!

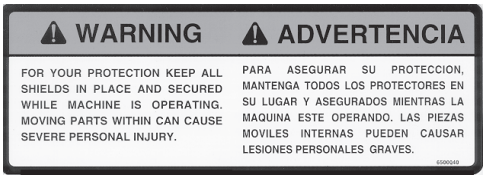
ENTANGLEMENT CAN CAUSE SERIOUS INJURIES OR DEATH.

DO NOT OPERATE WITHOUT

- ALL DRIVELINE GUARDS, TRACTOR AND EQUIPMENT SHIELDS IN PLACE
- DRIVELINES SECURELY ATTACHED AT BOTH ENDS
- DRIVELINE GUARDS THAT TURN FREELY ON DRIVELINE

6500085

WARNING: FOR YOUR PROTECTION KEEP ALL SHIELDS IN PLACE AND SECURED WHILE MACHINE IS OPERATING MOVING PARTS WITHIN CAN CAUSE SEVERE PERSONAL INJURY.



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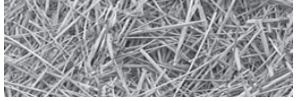


WARNING: FOR YOUR PROTECTION AND PROTECTION OF OTHERS, **PRACTICE THE FOLLOWING SAFETY RULES**.

1. BEFORE OPERATING THIS MACHINE, READ THE OPERATOR'S MANUALS SUPPLIED WITH THIS MACHINE AND YOUR TRACTOR.

2. CHECK OPERATORS MANUALS TO BE SURE YOUR TRACTOR MEETS THE MINIMUM REQUIREMENTS FOR THIS MACHINE.

3. READ ALL DECALS PLACED ON THIS MACHINE FOR YOUR SAFETY AND CONVENIENCE.

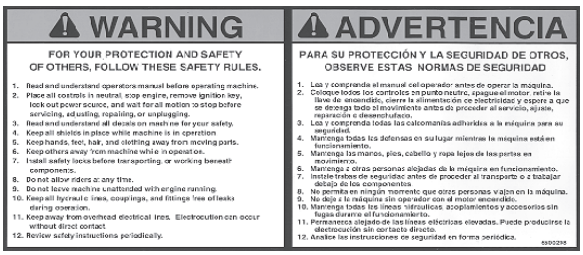
4. NEVER ALLOW RIDERS ON THIS IMPLEMENT OR THE TRACTOR.

5. KEEP OTHERS AWAY FROM THIS MACHINE WHILE IN OPERATION.

6. KEEP ALL SHIELDS IN PLACE WHILE MACHINE IS OPERATING.

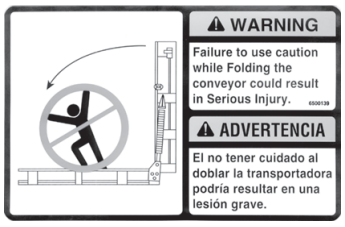
7. KEEP HANDS, FEET, LOOSE CLOTHING, ETC., AWAY FROM POWER DRIVEN PARTS.

8. ALWAYS SHUT OFF MACHINE AND ENGINE BEFORE SERVICING, UNCLOGGING, INSPECTING, OR WORKING NEAR THIS MACHINE FOR ANY REASON. ALWAYS PLACE TRANSMISSION IN PARK OR SET PARK BRAKE AND WAIT FOR ALL MOVEMENT TO STOP BEFORE APPROACHING THIS MACHINE.



WARNING: NO RIDERS
SERIOUS INJURY COULD RESULT FROM RIDING ON THE MACHINE.

WARNING: FAILURE TO USE CAUTION WHILE FOLDING THE CONVEYOR COULD RESULT IN SERIOUS INJURY.



WARNING: OVERHEAD CONVEYOR HAZARD
TO PREVENT SERIOUS INJURY OR DEATH:

DO NOT WALK UNDER CONVEYOR AT ANY TIME. STAY CLEAR OF CONVEYOR DURING OPERATION, RAISING, AND LOWERING. LOWER CONVEYOR FULLY BEFORE SERVICING.

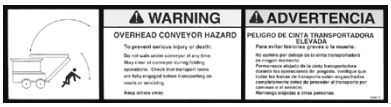
KEEP OTHERS AWAY.

6500214

WARNING: OVERHEAD CONVEYOR HAZARD
TO PREVENT SERIOUS INJURY OR DEATH:

DO NOT WALK UNDER CONVEYOR AT ANY TIME. STAY CLEAR OF CONVEYOR DURING FOLDING OPERATIONS. CHECK THAT TRANSPORT LOCKPINS ARE FULLY ENGAGED BEFORE TRANSPORTING ON ROADS OR SERVICING.

KEEP OTHERS AWAY.



6500215

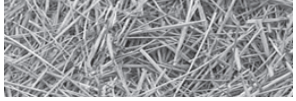
WARNING: HIGH-PRESSURE FLUID HAZARD, TO PREVENT SERIOUS INJURY OR DEATH:

- RELIEVE PRESSURE ON SYSTEM BEFORE REPAIRING OR ADJUSTING OR DISCONNECTING.

- WEAR PROPER HAND AND EYE PROTECTION WHEN SEARCHING FOR LEAKS. USE WOOD OR CARDBOARD INSTEAD OF HANDS.

- KEEP ALL COMPONENTS IN GOOD REPAIR.

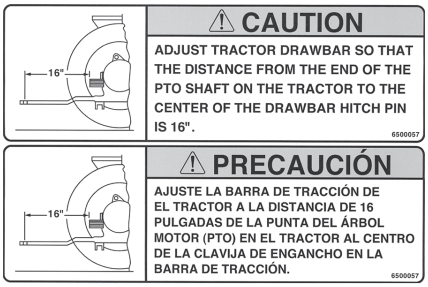
6500220



CAUTION: KEEP WHEEL BOLTS TIGHT.

6500042

CAUTION: ADJUST TRACTOR DRAWBAR SO THAT THE DISTANCE FROM THE END OF THE P.T.O. SHAFT ON THE TRACTOR TO THE CENTER OF THE DRAWBAR HITCH PIN IS 16”.



6500057

CAUTION: INSERT TRANSPORT LOCKS BEFORE MOVING ON ROADS.

6500112

1.4 Thrown objects and operator safety

An operational characteristic of all grinders is that objects may be thrown out of the hopper. Thrown objects may present a safety hazard to persons in the area. This section is to inform the operator of this characteristic, and what can be done to reduce the risk of injury to the operator and persons in the area. Keep all observers away from the machine.

Figure 1.1 shows an object being hit as the hammer is on the upswing. A general pattern for where thrown objects may land is shown in Figure 1.2.

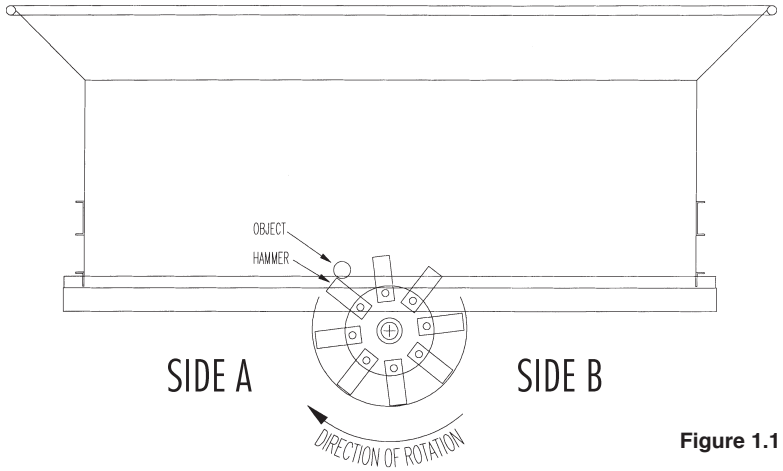


Figure 1.1

VIEWED FROM THE REAR OF THE H-1000

NOTE: The difference in the size of the area for side A versus side B. Side B is larger.

Dimensioning the size of this area is not practical. The distance a thrown object may travel is dependent on several conditions, including, but not limited to, rotor speed and diameter, condition of the hammers, style of hammers, object mass, object shape, amount of material in the tub, and how the hammer strikes the object.

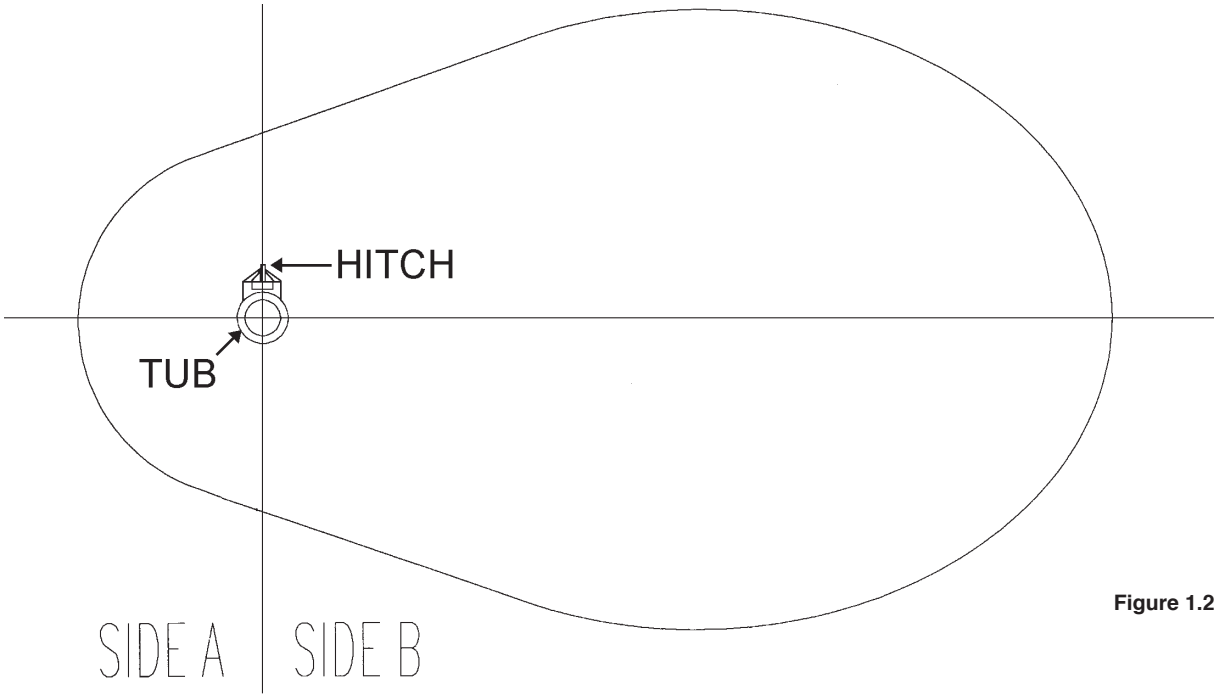
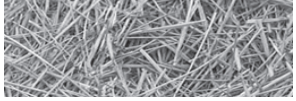


Figure 1.2



The amount of material in the tub can dampen or stop the object's potential flight. Keeping the tub full will reduce the risks. Filling the tub at least 1/2 full when starting will reduce the risk. Using a geyser plate can help reduce thrown objects. A risk may arise when the tub is being emptied, such as at the end of the grind. Running the engine at slower speeds when starting or finishing the grind will also help, especially slowing down when emptying the tub.

WARNING: To minimize the potential risk of injury or property damage, the operator must:

a) Place side B towards open areas, away from property and people.

b) Load the grinder from side A with a loader equipped with an enclosed cab.

c) Keep observers out of the area.

d) Wear a hard hat and safety glasses, at a minimum, and require that any other persons in the area are similarly equipped.

1.5 Shielding

This H-1000 Tub Grinder is equipped with shielding at all major points of potential injury. All Shields should be kept in place during operation. Bodily injury may occur if the unit is operated without shields.

WARNING: Shields are installed for your protection and to keep material off machine parts. Do not operate this PTO Driven Tub Grinder without shields in place.

1.6 Personal protection equipment

Operators and authorized observers of the H-1000 Tub Grinder are required to wear head, eye, and ear protection. No loose clothing is allowed.

1.7 Safety Review

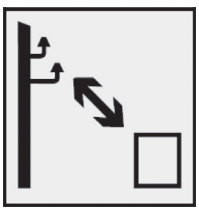
WARNING: Before attempting to operate your H-1000 Tub Grinder, carefully read and follow instructions given below and contained elsewhere in this manual.

BEFORE OPERATING

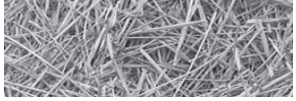
1. Read and follow all instructions contained in:
   - Operators Manual
   - Tractor Operators Manual
   - Decals placed on H-1000 Tub Grinder.

NOTE: Your dealer has additional copies of these materials.

2. Allow only properly instructed, responsible individuals to operate your machine. Carefully supervise inexperienced operators.
3. Use a tractor that meets the requirements contained in this manual. **See Appendix C, Required for Operation, page 60.**
4. Make sure the H-1000 Tub Grinder is in good operating condition and that all protective shields are in place and in proper working order. Replace damaged shields before operating.
5. Be sure all bystanders and other workers are clear before starting tractor and grinder.
6. Make no modifications to the H-1000 Tub Grinder unless specifically recommended or requested by DuraTech.
7. Check periodically for broken or worn parts and make necessary repairs.
8. Be sure the unit is securely attached to tractor during grinder operation and road transport.



Keep sufficient distance away from electrical power lines.
WARNING: Electrocution is possible when running this machine during an electric storm or heavy fog.



DURING OPERATION

1. Enforce the following safety precautions to prevent serious personal injury.
   - Keep everyone clear of work area except operator seated at tractor controls.
   - **Never work on or near grinder unless engine is off, and all motion has stopped.**
   - Disengage PTO before starting engine.
2. Power take off shafts must be locked in place with protective PTO shields in place.
3. Keep hands, feet, and clothing away from power driven parts.
4. Keep shields in place and in good condition.
5. Watch out for and avoid any object that might interfere with the proper operation of the machine.
6. Loose clothing, necklaces, and similar items are more easily caught in moving parts. Avoid the use of these items and keep long hair confined.
7. Because it is possible that your H-1000 may be used in dry areas or the presence of combustibles, special precautions should be taken to prevent fires and fire fighting equipment should be readily available.

NO SMOKING IN THIS AREA

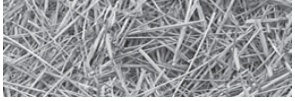
DANGER! NO OPEN FLAMES IN THIS AREA

8. Never allow riders on the machine at any time.

NORMAL SHUTDOWN PROCEDURE

WARNING: For your safety and the safety of others, you must use the following normal shutdown procedure before leaving the controls unattended for any reason, including servicing, cleaning, or inspecting. A variation of the following procedure may be used if so instructed within this manual or if an extreme emergency requires it.

1. Run H-1000 Tub Grinder until discharge conveyor is empty, and grind as much of the material in the tub as possible.
2. Reduce engine speed to idle.
3. Disengage PTO
4. Disengage hydraulics.
5. Place transmission in park and set parking brake.
6. Shut off tractor engine and remove key.



7. Wait for all movement to stop.
8. Disconnect PTO driveline from tractor.

CAUTION: At full speed, energy is stored in the rotor. **Do not use the tractor PTO brake to stop the rotor. Reduce engine speed before disengaging the PTO**

1.8 Fire Prevention

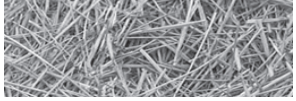
Grinding wood, hay, and other products in a tub grinder produces a large amount of potentially combustible material. The risks of fire can be significantly reduced with proper operating and maintenance procedures. This does include frequent removal of dust, debris, and other combustible materials.

Most of the products that are ground are dry and the grinding process can produce fine, dusty material. The grinding process can produce heat and the spinning rotor will circulate air within the grinding chamber. For a fire to start, fuel, oxygen and heat in sufficient quantity, must be present. During normal operation and with a properly maintained tub grinder, the material being ground will move through the grinding chamber so quickly that it doesn't have a chance to heat up sufficiently to start a fire. Also, the rapid rate that a tub grinder can pile material will quickly smother small hot spots that might occur during normal grinding operations. Keeping the material moving through the machine and across the top of the rotor is important to keep frictional heating of the material to a minimum.

NEVER leave the vicinity of the unit with the engine running**.**

PROPER OPERATION OF THE TUB GRINDER:

- Do not grind materials any finer than necessary. Finely ground materials will produce more dust and increase the risk of fire. If finely ground materials are required, it is better to grind the materials coarse first with large opening screens installed in the grinder and then regrind them to the desired consistency by installing smaller opening screens in the grinder. Be especially cautious when grinding materials that can burn easily.
- When filling the tub grinder during start-up begin by filling the rear of the tub and avoid placing materials on the spinning rotor. When material begins to fall over the rotor, set the governor control on "Manual" and rotate the tub slowly while continuing to fill the tub. Use the tub cover to control thrown objects as much as possible. When the tub is 1/2 to 2/3 full, the governor control can be set to "auto" and grinding operations can resume normally. Do not allow the tub to stop for any significant amount of time with material over the rotor to minimize frictional heating.
- Do not smoke when working with combustible materials.



REMOVAL AND CLEANING INSTRUCTIONS:

- Clean the engine compartment daily or more often if conditions require it be done more frequently. When cleaning the engine compartment, always clean the top of the engine and the areas around exhaust manifolds, exhaust plumbing and turbochargers.
- Check the rotor box for debris built up around the rotor. Remove material that may be packed tight near the bearings, on shaft or other rotating components because it will become hot due to friction.
- At shutdown, always clean and remove all dust, debris, or combustible material off the entire grinder. Use high-pressure air or water if necessary. Always move the grinder and all other equipment away from the ground material pile before leaving the job site in case of smoldering combustion in the ground material.

TUB GRINDER MAINTENANCE:

- Repair any fuel or hydraulic leaks as quickly as they are discovered. Clean up spills immediately. Fuel or oil soaked materials can contribute significantly to the rapid spreading of a fire once it has begun.
- Inspect all electrical wiring periodically. Any chafed or damaged wires should be repaired immediately. Keep all electrical connections tight to prevent arcs or sparks.
- Contact between the rotor and any stationary component of the grinding chamber such as contact between the hammers and the screens must be corrected immediately.

1.9 Fire Extinguishers:

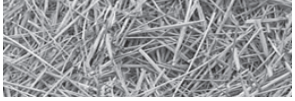
The fire extinguishers should be ABC dry chemical extinguishers that are appropriate for use with materials normally encountered on a tub grinder.

If a fire does start, CALL THE LOCAL FIRE DEPARTMENT IMMEDIATELY. Then, use the fire extinguisher if you feel confident that you can extinguish the fire. A 10# extinguisher will last about 15-20 seconds and a 20# extinguisher will last about 20-24 seconds, so they will not stop a large fire. The fire extinguishers should be at least 10#, but the preferred are 20# .

When using a fire extinguisher, use the P A S S method:

- Approach the fire with the wind at your back.
- **Pull the pin,**
- **Aim the spout,**
- **Squeeze the trigger, and**
- **Sweep along the base of the fire from about 6-8 feet away.**

Read the label on your extinguisher now, most extinguishers have descriptions of this method, and an estimated working time.



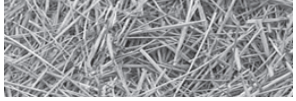
If an extinguisher is only partially used, the dry chemical will jam in the seals, allowing the extinguisher to loose its pressure charge in less than an hour, making it useless to you. It must be recharged before placing it back on the machine. Have the extinguisher recharged today; a fire will not wait for you to recharge your extinguisher tomorrow!

Fire extinguishers should be inspected and recharged by a professional at least annually to keep them at optimum performance! A "verification of service" collar that confirms the month and year of service should be attached to the neck of the container to confirm when the extinguisher was last serviced.

1.10 Towing

CAUTION: DO NOT TRANSPORT THE H-1000 TUB GRINDER without first securing the conveyor in the transport position (see 3.7.1, page 33).

1. Be sure all loose parts are securely fastened down.
2. Make sure all bystanders are clear.
3. Hitch H-1000 Tub Grinder to a tow vehicle with adequate load carrying and braking capacity. Be sure to attach safety chains between tow vehicle and H-1000 Tub Grinder. Tongue weight is 900 lbs.
4. Pull PTO apart and attach to transport bracket on the right hand side of the grinder.
5. Ensure that hitch jack is in the up position.
6. Check the turning clearance between H-1000 Tub Grinder and the towing vehicle.
7. Check local ordinances regarding restrictions for H-1000 Tub Grinder travel on your planned route.
8. Be aware of machine width at all times and do not exceed 20 miles per hour.
9. Check your state laws regarding the use of lights, slow moving vehicle signs, and other possible requirements.
10. Use good judgment and drive carefully, especially over rough and uneven roads.



1.11 Service and maintenance

WARNING: Before performing any maintenance on the machine or getting into the tub, be sure rotor and all moving parts have come to a complete stop. Shut off engine and remove the key.

Before working on or near the Tub Grinder or any reason such as servicing, inspecting or unclogging the machine:

- Follow the normal shutdown procedure found on page 14 or 30 of this manual.
- If the unit is still attached to a towing vehicle, place the towing vehicle's transmission in park and set the parking/emergency brake.
- Relieve all pressure in the hydraulic system before disconnecting hydraulic lines or performing work on the system. Make sure all connections are tight and the hoses and lines are in good condition before applying pressure to the system.

WARNING: Hydraulic fluid escaping under pressure can be invisible and have enough force to penetrate the skin. When searching for a suspected leak, use a piece of wood or a cardboard rather than your hands. If injured, seek medical attention immediately to prevent serious infection or reaction.

WARNING: FAILURE TO COMPLY WITH SAFETY INSTRUCTIONS THAT FOLLOW WITHIN THIS MANUAL COULD RESULT IN SEVERE PERSONAL INJURY OR DEATH. BEFORE ATTEMPTING TO OPERATE THIS MACHINE, CAREFULLY READ ALL INSTRUCTIONS CONTAINED WITHIN THIS MANUAL. ALSO READ THE INSTRUCTION MANUAL PROVIDED WITH YOUR TRACTOR.

THIS MACHINE IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THOSE EXPLAINED IN THE OPERATOR'S MANUAL, ADVERTISING LITERATURE OR OTHER DURATECH WRITTEN MATERIAL PERTAINING TO THE H-1000 TUB GRINDER.

Section 2: Dealer Preparation

2.1 Assembly Required

NOTE: ALL GRINDERS ARE SHIPPED WITH THE DISCHARGE CONVEYOR REMOVED.

Conveyor Assembly

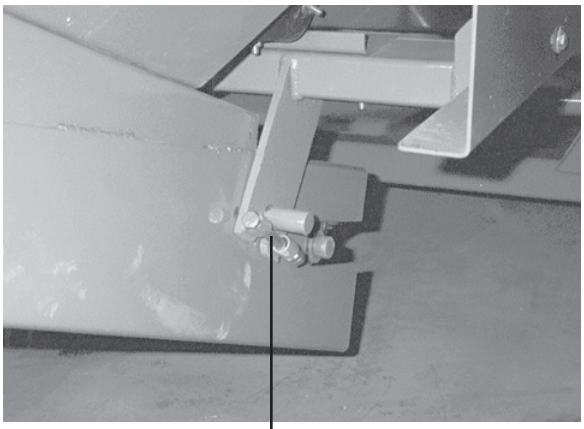
Before starting to assemble conveyor to H-1000 Tub Grinder frame, park H-1000 Tub Grinder on level ground and place conveyor behind H-1000 Tub Grinder. Review shipping kit list and verify that all small parts are in the shipping kit. Review Part Book pages on the Hydraulic Conveyor Lift to identify arrangement of parts listed below.

The hydraulic reservoir contains approximately 6 gallons of hydraulic fuel for test running only. Before operating the machine, additional oil must be added to the reservoir tank. The addition of approximately 6 gallons of hydraulic oil should bring the oil level to the sight glass on the side of reservoir.

CAUTION: Lack of proper oil level in the reservoir tank will cause system to heat under continuous running. (See section 4.2 for oil information)

STEP 1: Conveyor lift straps (4500960) and conveyor deflectors are shipped with the conveyor, and need to be bolted in place. Attach the deflectors to the bottom end of the conveyor with 3 bolts each . Attach the end of the lift strap to the upper end of the discharge conveyor see figure 2.1 on the following page.

STEP 2: Remove conveyor retaining bolts from mounting frame. Using a chain hoist or loader, lift conveyor up and slide mounting pins into slots of mounting frame. Secure conveyor by replacing the retaining bolts as shown in figure at right.



conveyor retaining bolt

STEP 3: With loader or hoist, lift conveyor so lift strap can be bolted to conveyor lift frame (4500963).

STEP 4: Attach hydraulic hoses to tractor. On a tractor with adjustable hydraulic flow rate, adjust the oil flow to a minimum rate. Engage the tractor hydraulics, this will purge air out of the line to the control valve. If the hydraulics kick out, reverse the hoses to the tractor and try again. Leave the hose charged. Go to the conveyor lift valve on the grinder. Clear the area under the discharge conveyor of objects and people. Pull the lever back to raise the conveyor. Remove the lock pins and push the lever in to lower the conveyor. This may need to be done several times until the air is purged from the cylinder

STEP 5: Loosen allen screws on sprocket of gear box. Align sprocket and square key with sprocket on discharge conveyor. Tighten allen screws and install #60 drive chain.

Figure 2.1
side view showing assembled conveyor

STEP 6: Verify the type of tractor to be used with the H-1000 Tub Grinder. John Deere series 60 and older tractors require the closed center plug option (see page 90, hydraulic valve 4000128), all other tractors use the open center plug.

Section 3: Operation

There is no substitute for a sound preventative maintenance program and a well-trained operator.

To insure long life and economical operation, learn how to operate the H-1000 Tub Grinder and how to use the controls properly. Thoroughly instruct the operator in maintenance and operation of the H-1000 Tub.

3.1 Pre-Operating Inspection

Prior to the starting the H-1000 Tub Grinder, make a visual inspection of the machine. This can be done when lubricating the machine. Any items that are worn, broken, missing or needing adjustment must be serviced accordingly before operating the H-1000 Tub Grinder.

WARNING: Before inspecting the machine, use the normal shutdown procedure found on pages 14 and 30.

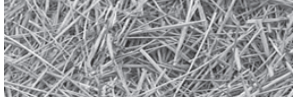
BEFORE OPERATING CHECKS

Before operating the H-1000 Tub Grinder, follow these instructions:

- ❑ Read and understand the operator's manual.
- ❑ Learn how to operate the controls properly. Do Not let anyone operate without instruction.
- ❑ Know the machine's safety features and understand the safety precautions.
- ❑ Be sure the machine is hitched properly to the tractor.
- ❑ Be sure to lubricate all lubrication points. See lubrication chart, page 45.
- ❑ Check for loose bolts.
- ❑ Make sure machine is properly adjusted.
- ❑ Check hydraulic oil level
- ❑ Check hydraulic components for leaks or damage.

WARNING: Hydraulic fluid escaping under pressure can be almost invisible and can have sufficient force to penetrate the skin. When searching for suspected leaks, use a piece of wood or cardboard rather than your hands. If injured, seek medical attention immediately to prevent serious infection or reaction.

- ❑ Visually examine rotor to see if any parts have excessive wear. These parts include shaft, plates, rods, hammers and moveable plate.



- ❑ Check screens and screen hold downs for wear and tightness.
- ❑ Check installation and condition of hammers.
- ❑ Visually examine rotor bearings and mounting bolts.
- ❑ Check all bearings for wear.
- ❑ Check chains and belts for proper tension and condition.
- ❑ Make sure all shields and guards are in place.
- ❑ Condition of decals.
- ❑ Lug nuts for tightness.
- ❑ Condition of tire rims.
- ❑ Tires for proper air pressure.
- ❑ Always grind with the machine and tractor stationary on level ground.
- ❑ In cold weather, allow five minutes for the machine to warm up before grinding.
- ❑ Start the machine and check the tub direction, speed control governor for proper operation.
- ❑ Watch for unusual or excessive vibration. If any occur, immediately shut off the power. Check to see what is wrong and correct it before starting the grinder again.
- ❑ If grinding grain, be sure proper grain attachment is in place.

3.2 Introduction to the machine

3.2.1 Description of the H-1000 Tub Grinder

The Tub Grinder is designed to grind most types of hay, grain and crop residue such as stover and straw. The unit incorporates a number of basic features including the rotating tub, the electronic governor, the rotor and hammer assemblies, the tub chain and drive assemblies, belly and discharge conveyors, and the axle and hitch assemblies.

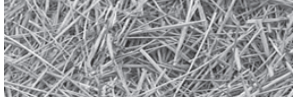
Material is fed into the tub of the unit by appropriate means, such as a wheel loader. As the tub rotates, the material is exposed to the rotating hammers. The hammers then grind the material before the material is discharged by the belly and discharge conveyors.

Figure 3.1
side view showing operator station and major system components

3.2.2 Overview of Operator's Controls

Operator controls include:

- **Electronic governor:** The electronic governor regulates tub rotational speed range.
- **Front hydraulic valve:** The front hydraulic valve controls hydraulic oil flow to tub orbit motors. Starts and stops the tub rotation.
- **Rear hydraulic valve:** The rear hydraulic valve raises and lowers discharge conveyor. One tractor hydraulic circuit is required to power this circuit. This valve can be converted to a closed center hydraulic system for older John Deere tractors.
- **Tractor engine speed:** The tractor engine speed should be set so 1000 PTO shaft is running at 1000 RPM.
- **Tractor PTO lever**: Engaging the tractor's PTO lever spins the rotor, runs both conveyor belts and powers tub hydraulic drive. The conveyor must be unfolded to working position before the PTO is engaged.



3.2.3 Electronic governor

The Model RCB93 Electronic Governor regulates the speed at which the tub rotates. The electronic governor has two modes of operation, the Engine (Auto) mode and the Tub (Manual) mode. The Engine (Auto) mode is the preferred mode of operation and should be used whenever possible.

IMPORTANT: Except when calibrating or trouble shooting the electronic governor always use the Engine (Auto) mode of the electronic governor.

Engine (Auto) Mode

When the electronic governor is switched to the Engine (Auto) mode, it is monitoring the rotation speed of the tractor engine. The hydraulic flow to the tub drive mechanism is regulated proportionally to the tractor engine speed. When the engine begins to lug down, the hydraulic oil flow is reduced which in turn slows down the tub rotation. With proper calibration, the engine will only lug down to its optimum horsepower RPM and the tub rotation will be varied proportionally to keep the engine at this RPM. The result is a nearly constant load on the tractor' engine, which will maximize grinding efficiency. **See section 3.10 (pg. 36) for calibration instructions.**

Tub (Manual) Mode

In this mode the tub speed is constant and it will not change to match varying load conditions.

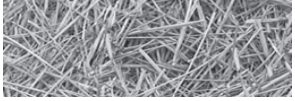
3.2.4 Rotor

The Rotor and screens are the heart of the tub grinder. The rotor on this H-1000 Tub Grinder is equipped with 64 swinging hammers. Dull edges on the hammers and/or screens will result in a loss of capacity and increased horse power requirements.

IMPORTANT: Hammer and hammer rod life can be extended by keeping the rotor rotating at 2000 RPM. **Excessive tractor horsepower and/or overfeeding the rotor can cause the hammers to lay back resulting in excessive wear on both the hammers and hammer rods.**

CAUTION: Keep all foreign objects out of the tub and away from the rotor. Foreign objects may cause personal injury or damage to the H-1000 Tub Grinder.

CAUTION: At full speed, energy is stored in the rotor. **Do not use the tractor PTO brake to stop the rotor. Reduce engine speed before disengaging the PTO.**



3.2.5 Screens

All H-1000 Tub Grinders require two screens. They come equipped from the factory with a 3” diameter hole screen and a 4” diameter hole screen. Any combination of hole sizes may be used. As a general rule, use the largest diameter screens capable of doing the job.

When using a combination, place the smallest hole diameter on the right hand side of the rotor box where the material enters the rotor.

The size of the hole in the screen determines the coarseness of grind. The larger the hole diameter, the coarser the grind. Hole sizes can vary from 1/8” diameter through 4” diameter. In general, use the larger screen sizes for grinding hay.

As a general guide, DuraTech Industries recommends the following screen sizes:

Hay	2” to 4” (5.1 cm to 10.2 cm)
Ear Corn	5/8” to 1” (1.6 cm to 2.5 cm)
Shelled Corn	3/4” (1.9 cm) dry, 5/8” (1.6 cm) high moisture
Small Grains	1/4” to 3/8” (.6 cm to .9 cm)

3.2.6 Tub

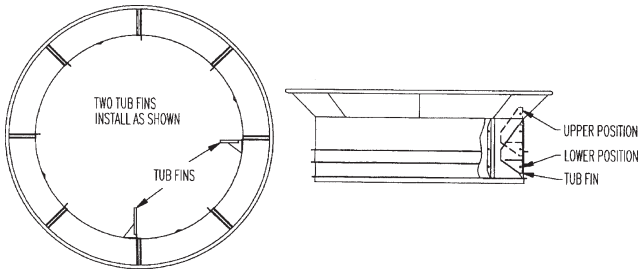
The purpose of the tub is to contain the material above the rotor, and to keep the rotor loaded

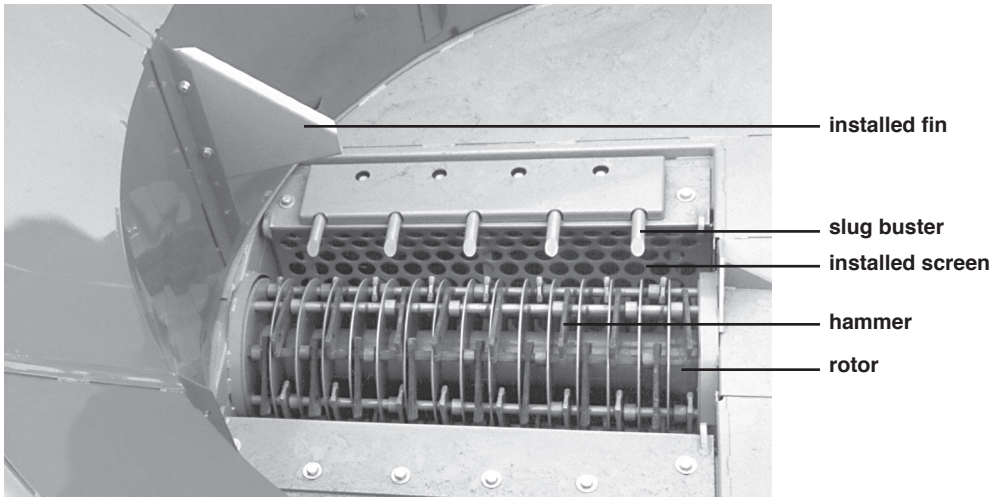
Tub Fins

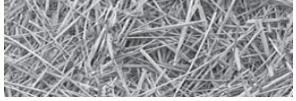
Two tub fins are furnished with the H-1000 Tub Grinder.

When grinding large round bales, use only one of the tub fins, bolted in the upper position. Two tub fins across from each other may hold the bale up and reduce capacity.

When grinding small round bales, square bales, or loose hay, use two tub fins bolted in the lower position.







3.2.7 Slug Buster and Mill Grate

A slug buster or mill grate is installed above the rotor to regulate the amount of material entering the rotor chamber. The standard slug buster is used for ideal grinding conditions (dry hay). The mill grate is used for "less than ideal grinding", (wet hay or tough grasses).

3.2.8 Conveyors, Drives & Lifting

Hydraulic Lift Discharge Conveyor

The conveyor lift is controlled by a valve on the grinder. The hydraulic oil is supplied by the tractor, and the hydraulic circuit must be activated in the tractor before the valve on the grinder will work.

A check valve (4000118) in the line prevents reverse flows. The valve will stop oil flow if the hoses are connected in reverse or if the flow rate is too high. To correct the reverse flow, either change the hoses around where they connect to the tractor, or reverse the operating lever position. On a tractor with adjustable hydraulic flow rate, adjust the oil flow to a minimum rate.

A velocity check valve (4000119) is in the hose to the hydraulic cylinder. This valve is to keep the conveyor from falling in the event of a broken hose. If this does happen, the valve will not open until the hose is repaired and pressure is applied to the hose.

3.2.9 Open and Closed Center Valves

John Deere Series 60 and older tractors require a closed center, all other tractors use an open center valve (see page 92, hydraulic valve 40000128)

To verify which valve is on your grinder:

- An "old style valve" will not have a hole drilled for item #7. This is an open center valve.
- A "new style valve" will have plug #7. Item #6 will look like a hex plug or a hex plug with a round shaft on top of it.
- The open center valve has a relief value that looks like the hex plug with a round shaft.
- The closed center valve has a hex plug.
- Option kit 3800713 contains parts to convert from an open center valve to a closed center valve.

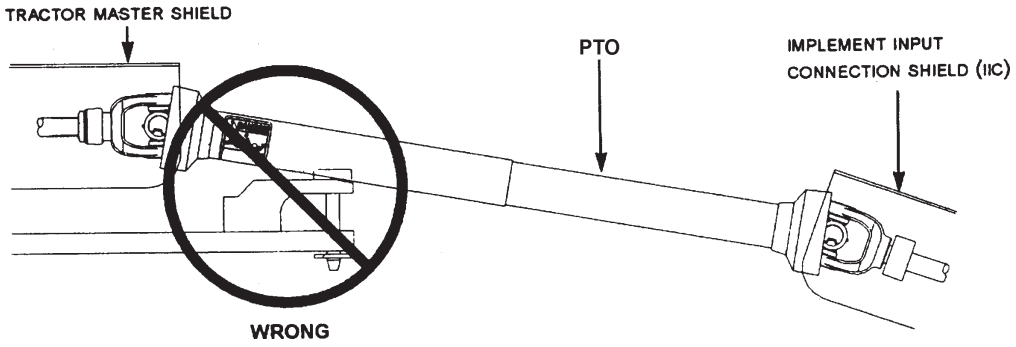
3.3 Machine Operation

3.3.1 Tractor Set Up

A tractor drawbar and 3-point arms can cause interference with the PTO driveline. This interference can cause serious damage to the PTO guarding and the PTO telescoping members.

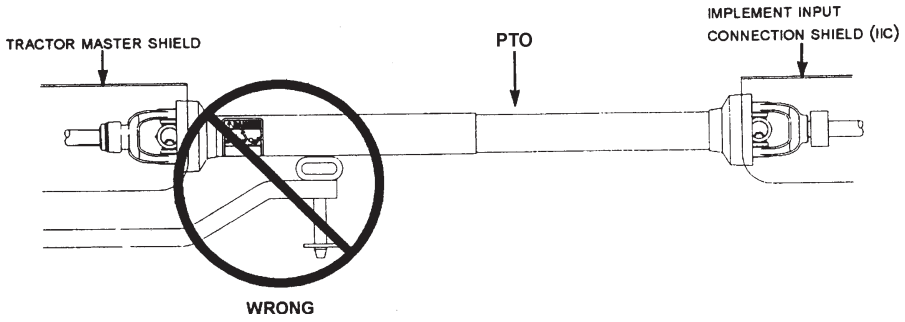
If this implement is attached to a tractor with a clevis hitch (hammer strap) style drawbar, the hammer-strap must be removed to prevent damage to the PTO guarding and the PTO telescoping members. See Figure 3.2.

Figure 3.2
incorrect clevis hitch (hammer strap) style drawbar set up

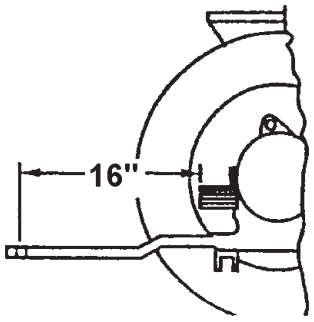


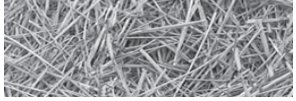
If this implement is attached to a tractor with an offset in the drawbar, be certain it is in the down position to prevent damage to the IID guarding and the IID telescoping members. See Figure 3.3.

Figure 3.3
incorrect offset style drawbar set up



If this implement is attached to a tractor with 3-point arms, the arms must be fully raised and locked in position to prevent damage to the PTO guarding and the telescoping members. Adjust the tractor drawbar so the distance from the end of the PTO shaft on the tractor to the center of the drawbar hitch pin hole is 16” (41 cm.) for a 1000 RPM shaft as shown at right.





3.3.2 How to hook up to tractor

To hitch the H-1000 to a tractor, perform the following steps:

1. To reduce wear on the PTO shaft knuckle joints, tractor PTO shaft should be in line (parallel) with the H-1000 Tub Grinder. If tractor is equipped with swinging drawbar, adjust so the tractor PTO and H-1000 Tub Grinder drive shaft are in line.
2. Connect hydraulic lines to the tractor.
3. Connect electrical lines to tractor.

CAUTION: To insure a safe hook-up, the H-1000 Tub Grinder and tractor should be connected with a 1" locking pin.

3.3.3 How to disconnect from tractor

To hitch the H-1000 to a tractor, perform the following steps:

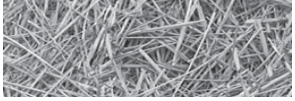
1. Park H-1000 Tub Grinder and tractor on a level spot.
2. Lower jack to ground, place blocks under jack if ground is soft.
3. Disconnect electrical wires.
4. Disconnect hydraulic lines.
5. Disconnect PTO, place shaft in shaft holder.
6. Raise hitch of H-1000 Tub Grinder to remove weight from tractor hitch by adjusting jack.
7. Remove hitch pin.
8. Drive tractor away slowly.

3.3.4 How to operate machine as a unit

INTRODUCTION

Tractor engines are designed to reach maximum power at PTO speed (1000 rpm), and most tractors are capable of engine speeds from 10 to 20 percent over PTO speed. A rotor speed of 2000 rpm is recommended. It will be necessary to operate tractor PTO at approximately 1100 rpm.

The Electronic Governor controls the feed rate to keep the tractor at its peak power point. The operator is able to select the operating range so that when the feed of material lugs down the tractor, the Electronic Governor will reduce the feed at a high enough PTO speed for the tractor to recover automatically if a slug is encountered.



GRINDING

Place materials to be ground directly into the tub. The best method for filling the H-1000 Tub Grinder is:

1. Engage rotor and increase engine speed to 1000 RPM on the P.T.O. shaft.
2. Fill the tub about half full of unground materials before starting tub rotation.
3. Start tub.
4. Place additional materials in the tub.

LOOSE HAY

The best capacity will be obtained if the tub is consistently kept no less than half full of loose hay. When loading the tub, place materials slightly to the rear rather than directly over the rotor. For best results feed the tub with small portions.

WET OR FROZEN HAY

This is the toughest material for any grinder to handle. When filling the tub with wet or frozen hay, deposit small quantities on a more frequent basis rather than filling the tub with one load.

LARGE ROUND BALES

Place large round bales in the tub on end or on the side. Try grinding bales each way to determine which method will work best for you.

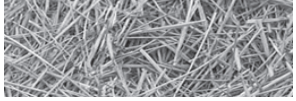
IMPORTANT: Never drop a large round bale into the tub from a high level. Ease the bale over the edge and down into the tub carefully. Dropping a large bale directly on top of the rotor will cause damage to the rotor.

CROP RESIDUE

When grinding crop residues, use the same methods as with loose hay. Extremely wet or frozen materials should be placed sparingly into the tub.

SMALL GRAINS

Grinding small grains requires special attachments. These attachments fit directly over the rotor. It is not recommended that small grains be ground without the use of one of the small grain attachments. (See Appendix B: H-1000 Tub Grinder Specifications under the heading “Options”.)



EAR CORN

Grinding ear corn requires a special attachment. This attachment fits directly over the rotor and uses crossbars in the tub to feed corncobs into the rotor. (See Appendix B: H-1000 Specifications under the heading “Options”.)

IF LODGING OCCURS

Materials may lodge against the side of the tub and not feed down to the rotor. If this occurs, reverse the tub direction briefly and then start the tub in a forward direction again. This practice normally dislodges any materials.

WARNING: Never attempt to dislodge material inside the rotor when the machine is in operation by physically pushing down on materials. **WHEN THE MACHINE IS IN OPERATION, STAY OUT OF THE TUB.**

3.4 Shutdown procedures

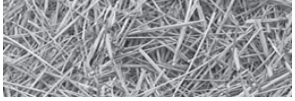
3.4.1 Normal Shutdown Procedure

CAUTION: At full speed, energy is stored in the rotor. **Do not use the tractor PTO brake to stop the rotor.**

WARNING: The stored up energy in the rotor causes it to rotate long after disengaging the tractor PTO. Before performing any maintenance on the machine or getting into the tub, be sure rotor and all moving parts have come to a complete stop.

Before working on or near the H-1000 Tub Grinder for any reason, including servicing, inspecting or unclogging machine:

1. Run H-1000 Tub Grinder until discharge conveyor is empty, and grind as much of the material in the tub as possible.
2. Reduce engine speed to idle.
3. Disengage PTO
4. Disengage hydraulics.
5. Place transmission in park and set parking brake.
6. Shut off tractor engine and remove key.
7. Wait for all movement to stop.
8. Disconnect PTO driveline from tractor.



3.4.2 Emergency Shutdown Procedure

Disengage PTO and tractor hydraulics

3.5 Storage

3.5.1 Preparing for storage

To prepare the unit for storage, perform the following steps:

1. Check the wheel bearings for lubrication requirements and adjustments at the end of the season.
2. Check the pressure roller bearings for lubrication and adjustments at the end of the season.
3. Clean the machine thoroughly to prevent rust and to make inspections easier. Clean and repaint the tub floor to prevent rust and sticking problems at start up time.
4. Check for loose or worn chains, belts, sprockets, and pulleys.
5. Check the condition of bearings.

3.5.2 Removing from storage

To prepare the unit for use after storage, perform the following steps:

1. Perform a thorough pre-operation inspection.

3.6 Installing a screen

CAUTION: Follow normal shutdown procedure before entering tub to do any service work.

1. Loosen and remove bolts on the screen holddown and slugbuster.
2. With a large hook or bar, pull the screen from its chamber.
3. Make sure material is clear from screen track.
4. Install the new screen.
5. Replace the screen holddown , slugbuster and bolts. Tighten all bolts securely.

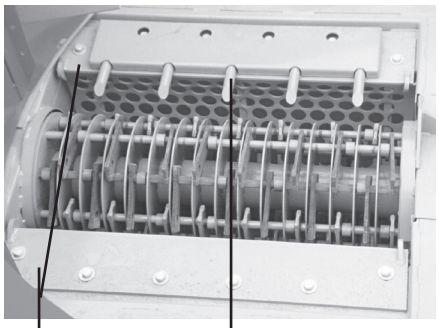


Figure 3.4
steps to folding the conveyor procedure

Step 1

Step 2

latch in fold position

Step 3

Step 4

conveyor strap

conveyor lock pin

Step 5

Step 6

transport locking pin

3.7 Road Transport

3.7.1 Folding the conveyor

To fold the conveyor, perform the following steps:

1. Lower conveyor until it is level with the ground.
2. Place latch in fold (top) position to unlock conveyor for folding.
3. Release Tension Adjusting Handles on Idler Roller.
4. Standing beside conveyor, Raise discharge conveyor end and follow it over to its folded position.
5. Lock conveyor down into folded position with straps and lock pin.
6. Raise conveyor and lock into transport position using transport locking pins.

3.7.2 Set up to transport

Inspect H-1000 Tub Grinder for any loose parts, tools, or any materials. Remove them or fasten them securely to the H-1000 Tub Grinder.

To set up the H-1000 Tub Grinder for transport, perform the following steps:

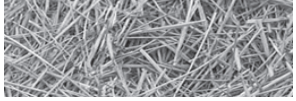
1. Fold the conveyor.
2. Check for local restrictions on towing.

3.7.3 Change back to operate

To set up H-1000 for operation, perform the following steps:

1. Connect H-1000 Tub Grinder to tractor.
2. Connect hydraulic hoses and electrical cable to tractor
3. Raise hydraulic conveyor lift.
4. Remove transport lock pin 4800215 and hair pin 4800107, place pin in bracket so it is not lost.
5. Unfold conveyor to working length.

conveyor in working position



3.8 Parts of the electronic governor

FUSE LIGHT

This light is on whenever the electronic governor is receiving power.

SENSOR LIGHT

This light is on whenever the electronic governor is receiving an adequate input signal from the sensor and the rotor is engaged.

SPEED LIGHTS

These lights provide a relative indication of how fast your tub should be turning based on the output signal that the electronic governor is sending to the electro-hydraulic valve.

MODE SWITCH

The mode switch has three possible positions. The off position which turns the electronic governor off and two other positions which correspond to the tub (manual) and engine (auto) modes of operation. In the "tub (manual)" position the tub will rotate at a constant speed based on the settings of the Tub Limit Knob (Tub Speed Knob). The "engine (auto)" position uses all the functions of the Electronic Governor. The maximum tub speed will be limited by the Tub Limit Knob (Tub Speed Knob), and the tractor engine load will be controlled by the Engine Load Knob.

TUB SPEED KNOB (TUB LIMIT KNOB)

This knob sets the maximum speed at which the tub will rotate in both the tub (manual) and engine (auto) modes. In the engine (auto) mode tub speed will vary between zero and this setting depending on the tractor engine load.

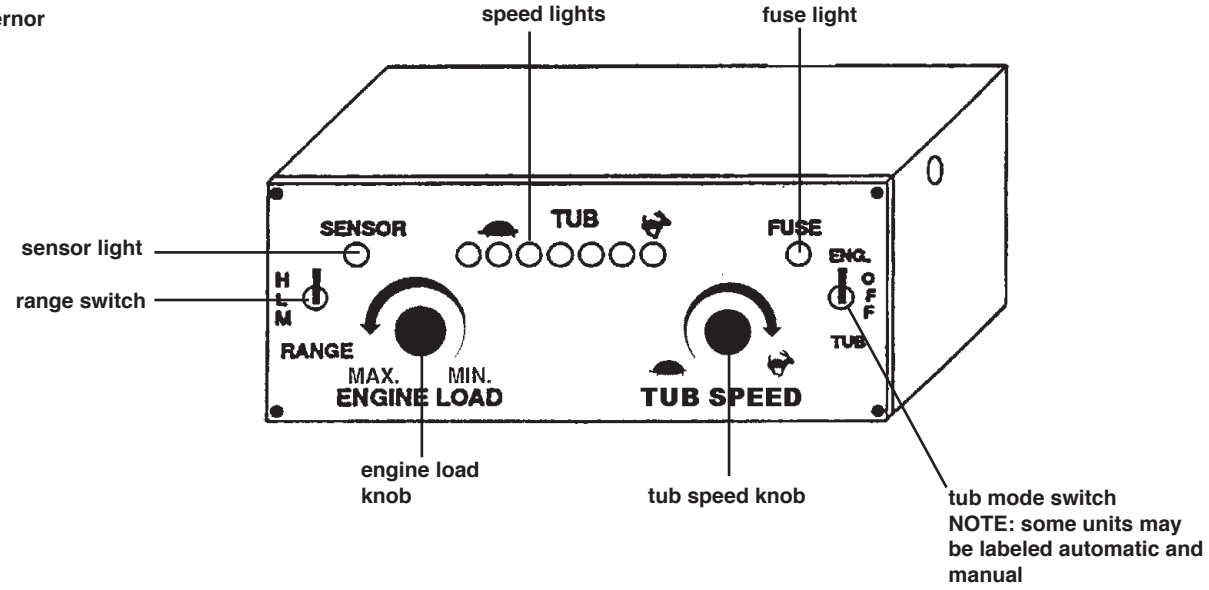
ENGINE LOAD KNOB

This knob is used only in engine (auto) mode. It controls the load placed on the tractor's engine. Turning the knob clockwise decreases engine load, and turning the knob counterclockwise increases the engine load.

RANGE SWITCH

This switch is a coarse adjustment for the engine load knob and can be switched to a H- high, M-medium or L-low setting.

Figure 3.5
electronic governor
controls



3.9 Operation of the electronic governor

Engine (Auto) mode

IMPORTANT: Except when calibrating or trouble shooting the electronic governor always use the engine (Auto) mode of the electronic governor.

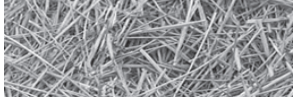
In engine (Auto) mode, the electronic governor monitors the rotation speed of the tractor's engine. The hydraulic flow to the tub drive mechanism is regulated in proportion to the tractor's engine speed. As the engine speed slows, the electronic governor decreases the hydraulic flow which slows down the tub's rotation. Conversely, as the tractor's engine speed increases, the electronic governor increases the hydraulic flow which speeds up the tub's rotation. This allows the electronic governor to automatically control the feed rate keeping the tractor's engine running within the governor's optimum power zone. When the load on the grinding rotor begins to lug the tractor's engine, the governor automatically reduces the tub's rotation speed in proportion to the load. The result is nearly a constant load on the tractor's engine, which maximizes the grinding efficiency.

The range of rotor speeds for which the electronic governor will regulate the hydraulic flow is determined by the setting of the engine load knob. For example, turning the engine load knob counter clockwise will increase the load on the engine by keeping the tub engaged to a lower engine RPM.

With proper calibration, the tractor's engine will only load down to its optimum horsepower RPM, and the tub's rotation speed will be varied proportionally to keep the tractor's engine at this RPM.

Tub (Manual) mode

In tub (manual) mode, the electronic governor performs as a simple tub speed control. In this mode the tub speed is constant and it will not change to match varying load conditions.



3.10 Calibration of the electronic governor

To calibrate the electronic governor, perform the following steps:

1. Begin calibration procedure with H-1000 Tub Grinder completely shutdown. Place the MODE switch in the OFF position and the RANGE switch in the H-High position. Rotate the TUB LIMIT KNOB fully clockwise toward the rabbit position. Turn the ENGINE LOAD KNOB fully clockwise, and switch the MODE switch to Engine (Auto) Position.

2. Verify that tub rotation lever is in neutral. Inspect machine to verify that all personnel are clear of the machine.

3. Start tractor and run the grinder at about 1/2 throttle to allow the hydraulic system to warm up before calibrating the RCB93 Electronic Governor.

4. When the system has reached operating temperature, throttle the tractor to 1000-1200 engine RPM. Engage the tub drive and throttle up to PTO speed. The FUSE light and the SENSOR light should come on. The tub should not be rotating at this time. If the tub is rotating, read section 5.1 “Troubleshooting the electronic governor system” in this manual.

5. Slowly rotate the ENGINE LOAD KNOB counter-clockwise until the tub just begins to move. The tub should begin to rotate. If it does not begin to rotate, switch the range switch to M-Medium or L-Low and repeat as necessary.

TEST: Throttle the tractor’s engine down and the tub should stop rotating, return the tractor’s engine to PTO RPM and the tub should start to rotate.

If the tub will not rotate, read section 5.1 “Troubleshooting the electronic governor system” in this manual.

3.11 Adjusting the tub’s rotation speed

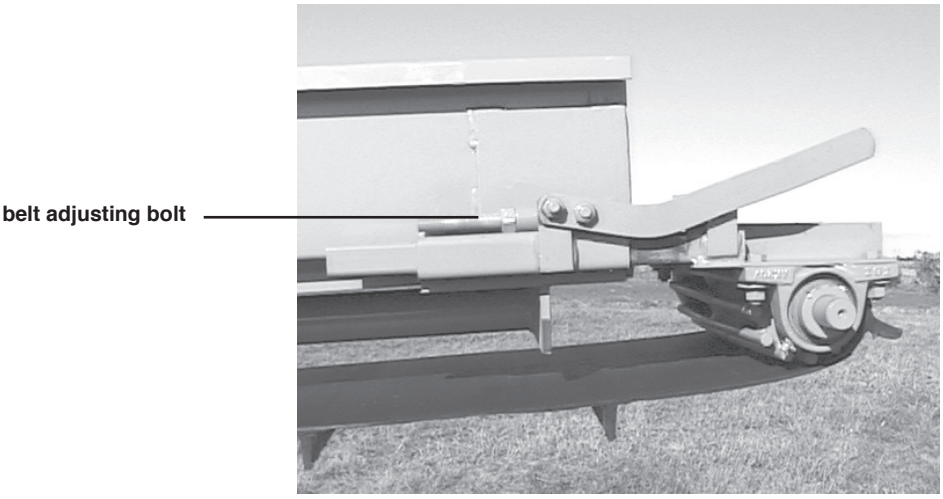
Tub rotation is controlled by two components . The tub is started, stopped and reversed by the front hydraulic valve, and the tub’s rotation speed is controlled by the tub limit knob (tub speed knob) on the electronic governor.

3.12 Adjusting the conveyor belt tension

The discharge conveyor is adjustable to allow for belt stretch and tracking. If the conveyor belt slows down or stops during operation, slippage may be the cause. To eliminate slippage, tighten the adjusting bolts on the conveyor equally. This will increase the conveyor belt's tension and help to keep the belt centered on the rollers.

IMPORTANT: Do not overtighten conveyor belts. Use only enough tension to eliminate belt slippage.

Figure 3.6
discharge conveyor belt adjusting bolt



3.13 Adjusting the conveyor belt tracking

A. When a new belt is installed: Use only genuine DuraTech Industries parts.

1. Begin by adjusting the drive roller so that the mounting bearings are the same distance from the end of the conveyor frame. This ensures that the roller centerline is square with conveyor frame. Adjust the idler roller bolts so that they are equal on both sides of the conveyor.

B. If the belt is running to the right side, perform the following steps:

1. Adjust the idler roller bolt on the right side of the conveyor. Increase tension by approximately 2 full turns of the adjusting nut.
2. Make certain that all personnel are clear of machine and the start engine. Engage the tractor PTO.

NOTE: The rotor will also be turning.

3. Observe conveyor belt tracking from a safe location.
4. If further adjustment is required, disengage tractor PTO, and shut down the machine using the normal shutdown procedure.
5. Some adjustment of the drive roller may be required if no improvement is noted by increasing the idler roller tension.
6. Repeat steps 1-5 until proper tracking is achieved.

C. If the belt is running to the left side, perform the following steps:

1. Adjust the idler roller bolt on the left side of the conveyor. Increase the tension by approximately 2 full turns of the adjusting nut.
2. Make certain that all personnel are clear of machine and start engine. Engage the tractor PTO.
3. Observe the tracking of the conveyor belt from a safe location.
4. If further adjustment is required, disengage tractor PTO and shutdown using the normal shutdown procedure.
5. Some adjustment of the drive roller may be required if no improvement is noted by increasing the idler roller tension.
6. Repeat steps 1-5 until proper tracking is achieved.

3.14 Main drive belt adjustment

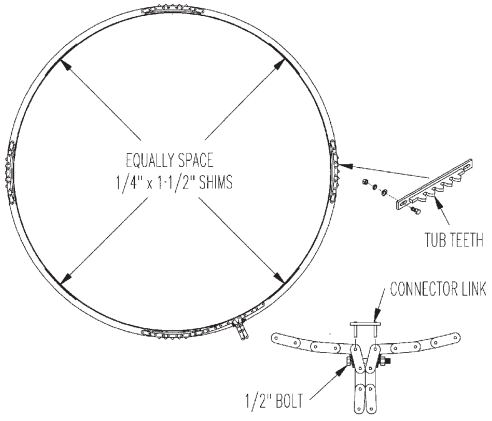
Adjustment has been provided for tightening main drive belts. Belts tend to stretch rapidly when first put into operation. Tighten regularly to prevent slippage. Belt tension should be checked at 30-minute intervals or as necessary until stretch is eliminated. Belt tension can be checked by pressing on individual belts with thumb (approximately 20 lbs.) in the center of the span. Deflection should be 1/2” or thickness of V-belt.

3.15 Sizing the tub drive chain

Tub drive chain is equipped with spring tensioned idlers which take up the slack in the chain during normal operation. Due to normal wear the tub drive chain may tend to climb on driving teeth of the tub. If this should occur, the chain should be sized to fit the tub, and the tub teeth adjusted for proper spacing in the chain.

To size the tub drive chain, perform the following steps:

1. Remove the tub drive chain from the drive sprocket. Loosen the tub teeth and wrap the chain around tub, but do not run the chain around tightener idlers or drive sprocket. Using a 1/2” bolt inserted through the chain links, draw the chain together so that the center to center measurement on link pins matches the pins on the connector link. If the distance is less than or greater than the connector link, shims must be added. Equally space shims of the same thickness and length under the chain until the proper distance is obtained. Do not add shims under the tub teeth.



2. Adjust the tub teeth so that all four sets of teeth contact the chain link on the same side of the teeth. Tighten the bolts holding the teeth in place, and return the chain to working position.

3.16 Electro-hydraulic valve coil test

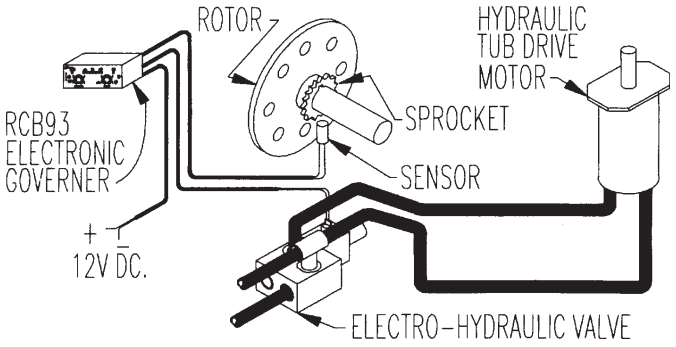
This test requires an accurate ohm meter. Disconnect the wiring harness leads at the electro-hydraulic valve coil. Check resistance of valve coil leads at the terminals. The resistance should be between 8 to 12 ohms for a 12 volt system. If the values are not within this range, replace the electro-hydraulic valve coil.

MANUAL OVERRIDE

NOTE: If there is an electrical failure with the machine, it may still be able to grind. Switch the electronic governor off. Remove the rubber end cap and loosen the jam nut on the electro-hydraulic valve. Start the machine and engage the tub drive.

CAUTION: PTO MUST BE ENGAGED AT THIS TIME. WATCH FOR MOVING PARTS

Turn the adjusting screw clockwise until the tub rotates at the desired speed. Lock the jam nut on the adjusting stud and replace the rubber end cap on the electro-hydraulic valve. When the electro-hydraulic valve is adjusted in this manner, it will function only as a manual flow control. The grinder will now operate as it would if the electronic governor were switched to the tub (manual) mode. The tub speed will be constant and it will not change to match varying load conditions.



Contact your dealer for future repairs or replacement parts. When the problems are corrected, calibrate the electro-hydraulic valve.

3.17 Electro-hydraulic valve calibration

DuraTech Industries International Inc. test runs every grinder before it leaves the factory. The electronic governor system was calibrated at this time and should not need any further adjustment. Before attempting to adjust the electro-hydraulic valve, follow the instructions below.

NOTE: With the electronic governor switched to tub (manual) mode, the tub will continue to rotate regardless of the engine RPM.

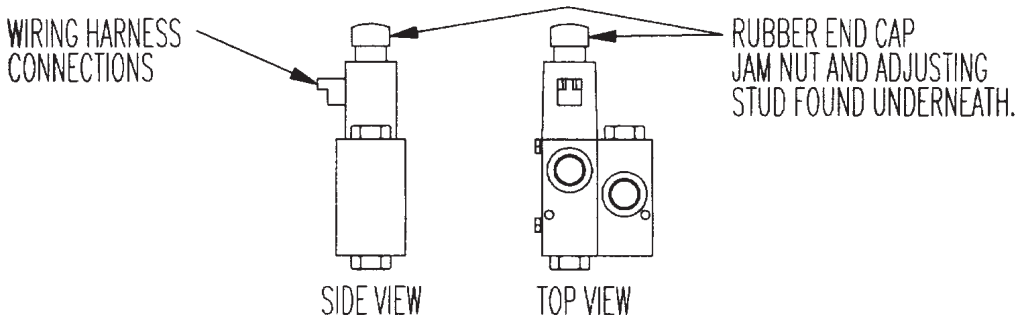
1. When first starting the machine, run at less than full throttle to allow the hydraulic system to warm up before operating.
2. With engine running at full throttle, turn the engine load knob clockwise to maximum position and set the mode switch in the engine (auto) position. Engage the tub using the tub control lever. Check the sensor light on the electronic governor before doing any adjusting! At this point, the sensor light should be lit. If the sensor light is not lit, read section 5.1 “Troubleshooting the electronic governor system” in this manual.

NOTE: Turning the engine knob clockwise will decrease the load on the engine by disengaging the tub at a higher engine RPM.

3. If tub is not turning, you are ready to proceed to the grinding section of this book. Remember the engine load knob adjusts the load placed on the engine, and under normal conditions this will be the only adjustment you will have to make.

IMPORTANT: Stay clear of all moving parts while calibrating the electro-hydraulic valve. **The tub will be rotating during this adjustment.**

Figure 3.7
electro-hydraulic valve



To calibrate the electro-hydraulic valve coil after following the three steps above, perform the following steps:

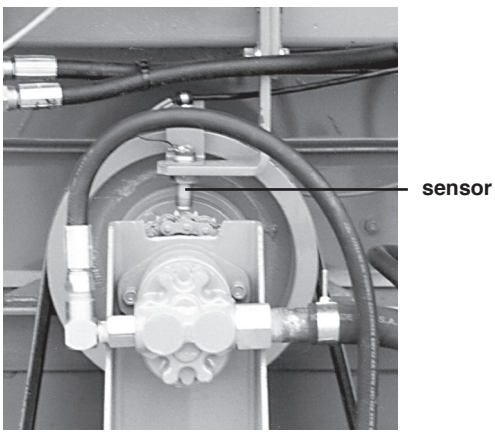
1. Remove the rubber end cap from the end of the electro-hydraulic valve. This will reveal a jam nut and an adjusting screw with a screwdriver slot.
2. Disconnect the wiring harness from the electro-hydraulic valve coil, and loosen the jam nut.
3. Start the engine, engage the tub drive in the forward direction and engage the PTO. Throttle the engine up to a fast idle.
4. If the tub is not rotating, turn the adjusting screw clockwise until it bottoms out. Turn the adjusting screw counterclockwise until the tub stops. The electro-hydraulic valve is now calibrated.
5. Lock the adjusting screw with the jam nut and replace the rubber cap. Shut down the machine using the normal shutdown procedure in this manual. Reconnect the wiring harness to the electro-hydraulic valve coil

3.18 Sensor test

Gap between sensor and sprocket tooth is 3/32” (2.4 mm)

Sensor resistance is 900 ohms +/- 10%.

Figure 3.8
speed sensor



Section 4: General Maintenance

SERVICE AND MAINTENANCE

CAUTION: If for any reason arc welding is to be done, always ground cylinder to frame of machine to prevent arcing in bearings.

1. Before working on or near the H-1000 Tub Grinder for any reason, including servicing, inspecting or unclogging machine:

    a. Run H-1000 Tub Grinder until discharge conveyor is empty, and grind as much of the material in the tub as possible.

    b. Reduce engine speed to idle.

    c. Disengage PTO

    d. Disengage hydraulics.

    e. Place transmission in park and set parking brake.

    f. Shut off tractor engine and remove key.

    g. Wait for all movement to stop.

    h. Disconnect PTO driveline from tractor.

2. When replacing any part on your H-1000 Tub Grinder, be sure to use only DuraTech Industries authorized parts.

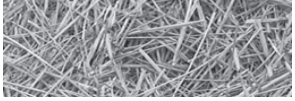
3. Relieve all pressure in the hydraulic system before disconnecting the lines or performing other work on the system. Make sure all connections are tight and the hoses and lines are in good condition before applying pressure to the system.

WARNING: Hydraulic fluid escaping under pressure can be invisible and have enough force to penetrate the skin. When searching for a suspect leak, use a piece of wood or cardboard rather than your hands. If injured, seek medical attention immediately to prevent serious infection or reaction.

4. Visually examine to see if any internal parts show excessive wear. Repair or replace needed parts. These parts include rotor plates and holes in the plates that support the rods. Enlarged holes can cause rods to break.

    Also check rods, rod locking and retaining devices, hammers, screens, screen tracks and hold downs, main shaft, hinges or anything else that could wear and perhaps fail if not properly maintained, and cause damage to the rotor and/or personnel safety. Check bearing alignment and mounting bolts to insure a firm foundation and reduced vibration.

    Keep all foreign objects out of the tub and away from the rotor. Foreign objects may result in personal injury or cause severe damage to hammers, screens, rods, and other parts that will cause rotor failure.



5. Check for loose or worn chains, belts, sprockets and pulleys.

6. Keep sprockets and pulleys aligned.

7. Inspect rotor and all rotating parts for wrapped twine or wire build up.

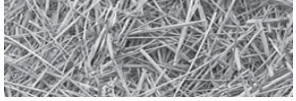
8. If machine is going to sit idle for an extended period of time, tub floor should be cleaned to prevent rust and sticking problems at start up time.

9. The proper tire pressure is 50 PSI.

10. The wheel bearings should be checked for lubrication and adjustments yearly, preferably at the end of the season.

If a generous amount of grease is on the bearing and in the housing, and if the grease is soft, the grease will not need changing.

If the lubricant is caked and the bearing seems dry, wash the bearing to remove old grease. Repack the bearing.



4.1 Lubrication

CAUTION: Follow normal shutdown procedure before adjusting or lubricating.

Hydraulic oil reservoir capacity: 12 gallons. Change hydraulic oil and filter at least once a year.

Gear Box: Check level periodically. Drain and refill with No. 90 gear lube once a year.

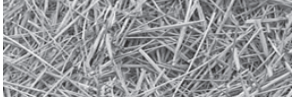
When operating the H-1000 Tub Grinder during cold weather, perform all lubrication after bearings are at operating temperatures.

BEARING LUBRICATION

Bearings operating in the presence of dust and water should contain as much grease as speed will permit, since a full bearing with a slight leakage is the best protection against entrance of foreign material. In the higher speed ranges, too much grease will cause overheating.

High-speed operation, abnormal bearing temperature may indicate faulty lubrication. Normal temperature may range from “cool to warm to the touch” up to a point. Unusually high temperatures “too hot to touch for more than a few seconds” accompanied by excessive leakage of grease indicates too much grease. High temperatures with no grease showing at the seals, particularly if the bearing seems noisy, usually indicate too little grease. Normal temperature and a slight showing of grease at the seals indicate proper lubrication.

The following chart is a general guide for relubrication. Certain conditions may require a change of lubrication periods as dictated by experience.



Lubrication Chart

REF. NO.	LOCATION	NUMBEROF GREASE FITTINGS	FREQUENCY	
1.	Tub Drive Shaft Bearings	2	40 hrs.	*
2.	Tub Rollers Bearings	8	5 hrs.	*
3.	Tub Pressure Roller	4	5 hrs.	
4.	Tub Chain Idler	1	5 hrs	
5.	Tub Chain Idler Pivot	1	40 hrs.	
6.	Hyd. Motor Pivot	1	40 hrs	
7.	Input Shaft Bearings	2	10 hrs.	*
8.	Rotor Bearings	2	10 hrs.	*
9.	Belly Pan Auger Bearings	2	10 hrs.	*
10.	Discharge Conveyor Driveline Bearings	4	40 hrs.	*
10A	Dis. Conv. Driveline U-joint, S.N. GI3757 & up	4	40 hrs.	
11.	Discharge Conveyor Bearings	4	40 hrs.	*
12.	P.T.O.	3	40 hrs.	
13	Discharge Conveyor Support Pivot	2	40 hrs.	
14	Discharge Conveyor Spring Fold	2	40 hrs	
15.	Wheel Bearings		Annually	
16.	Roller Chains		Graphite spray or oil daily in dusty conditions	
* Refer to bearing lubrication				

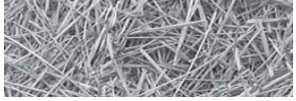
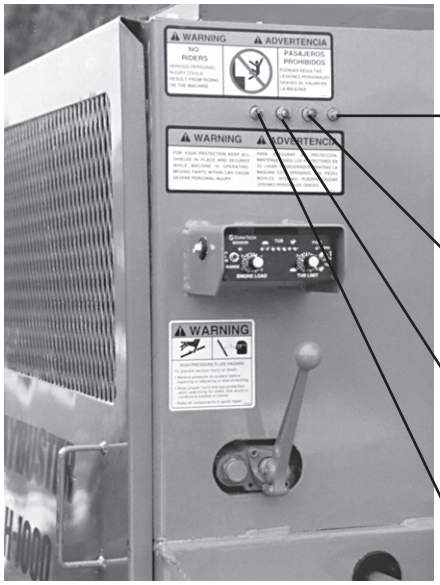


Figure 4.1
4 zerks above operator controls



tub drive shaft bearing (Ref # 1)

tub chain idler (Ref # 4)

rotor bearing (Ref # 8)

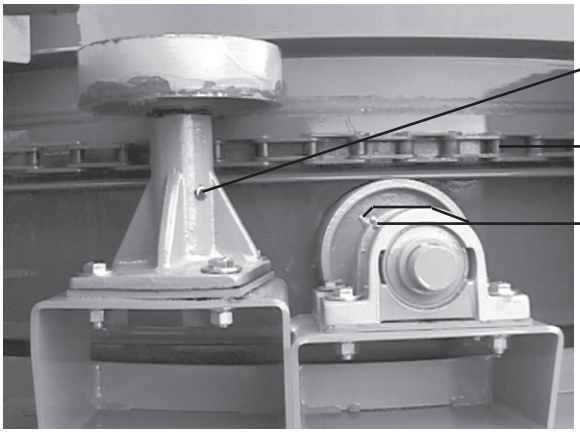
tub chain idler pivot (Ref # 5)

Figure 4.2
2 zerks on opposite side of machine from operator controls

hydraulic motor pivot (Ref # 6)

tub drive shaft bearing (Ref # 1)

Figure 4.3
tub roller, tub pressure roller and roller chain



tub pressure roller (Ref # 3)

roller chain (Ref # 16)

tub roller bearings (Ref # 2)

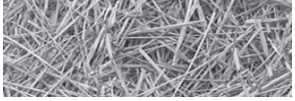


Figure 4.4
both discharge conveyor support pivots, discharge conveyor spring fold and two discharge conveyor bearings

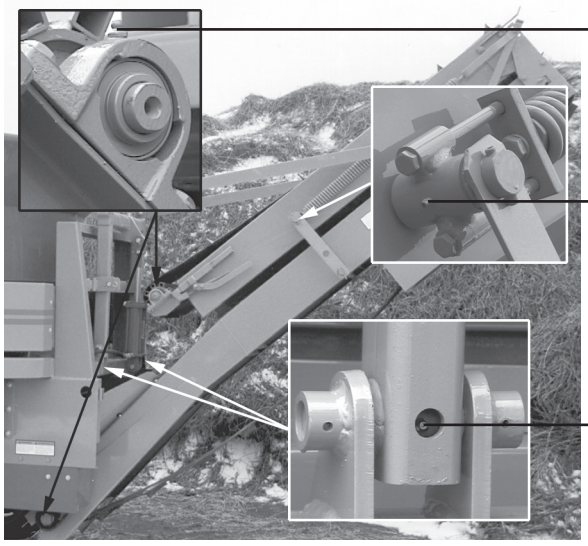


Figure 4.5
second rotor bearing lubrication point

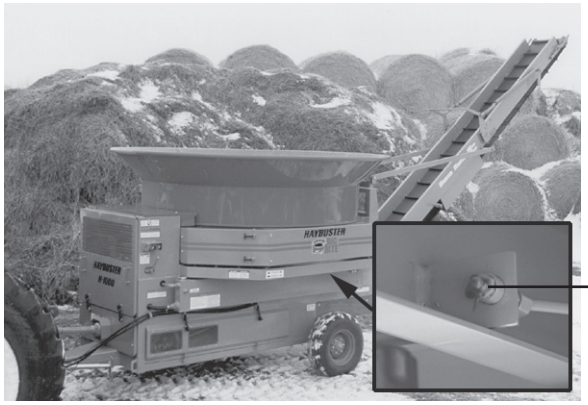
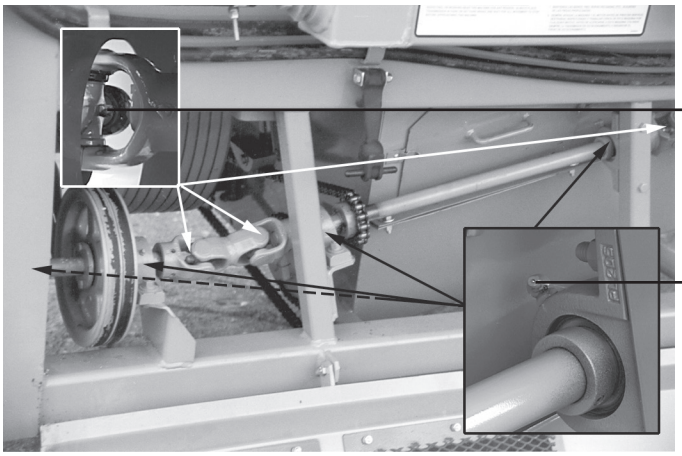


Figure 4.6
discharge conveyor driveline U-Joint and bearing lubrication points



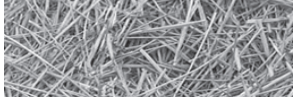


Figure 4.7
two of three PTO lubrication points

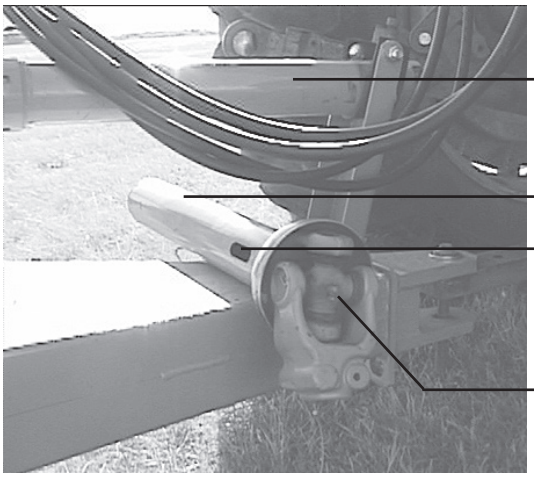
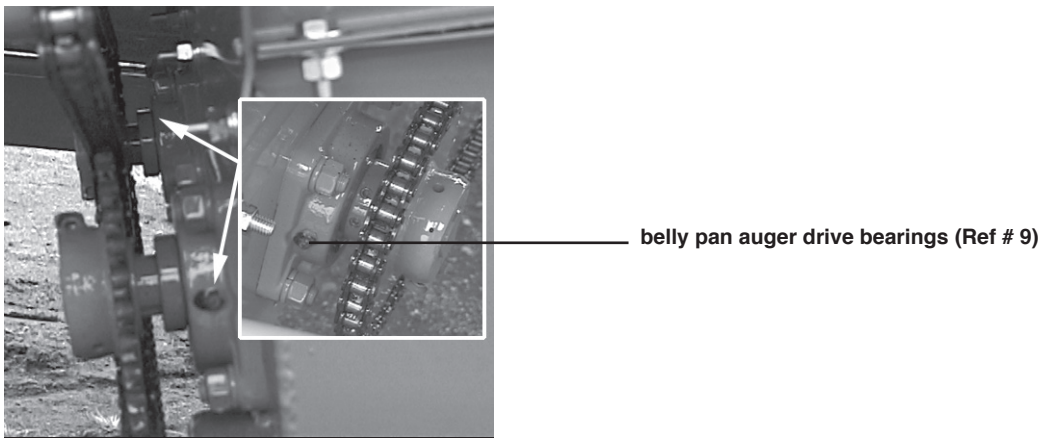


Figure 4.8
belly pan auger drive bearing lubrication points

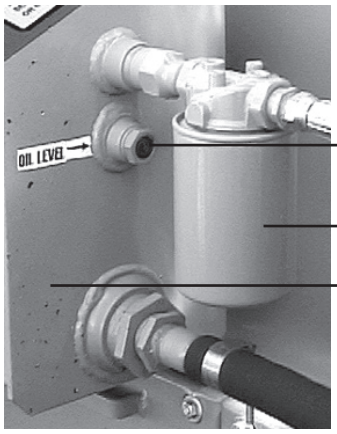


4.2 Hydraulic system

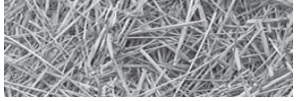
CAUTION: Lack of proper oil level in the reservoir tank will cause system to heat under continuous running. Check the hydraulic oil level daily and replace as necessary.

All machines have been pre-run at the factory to insure all functions are performing correctly. The hydraulic reservoir contains approximately 6 gallons of hydraulic oil for test running only. Before operating the machine, add additional oil to the reservoir tank. It will take approximately 6 additional gallons of hydraulic oil. This should bring the oil level to the sight glass on side of reservoir.

Check the hydraulic oil regularly, and if the oil has a burnt smell or milky appearance, change it immediately.



DuraTech Industries recommends using Cenex Qwicklift HTB if your machine has a Qwicklift decal on the hydraulic tank. Other acceptable fluids include Mobil 423, Farmland Super HTB, Conoco Hydroclear Power Tran Fluid, or other similar fluids. If the hydraulic tank does not have this decal, then all of the above fluids are acceptable.



4.3 Hammermill maintenance

Visually examine the mill to see if any of the internal parts show excessive wear. These parts should include rotor discs and the holes in the discs that support the rods. Enlarged holes can cause rods to break or bend. Also check rods, rod locking or retaining devices, hammers, screens, screen tracks and hold downs, main shaft, platform locking devices, hinges or anything else that could wear and perhaps fail and causing damage to the hammermill and/or personnel safety if not properly maintained. The bearings should also be checked along with mounting bolts to insure a firm foundation and reduced vibration.

CAUTION: Keep all foreign objects out of the tub and away from the mill. Foreign objects may result in personal injury or damage to the machine.

The hammers have been designed and manufactured to provide the best compromise between hardness for good wearing qualities and strength for dependability and resistance to breakage.

WARNING: The hammers have been heat treated, and any alteration of the hammers by heating, grinding, resurfacing or any other process can change the mechanical properties of the hammer and make it unsuitable or dangerous to use.

Because of the high capacity of the machine, the hammers will wear and must be considered expendable. Each hammer has four cutting edges. For maximum life, it is suggested that hammers be rotated periodically to even out the wear over the entire rotor. If one end of a hammer is allowed to wear too long, one of the hammer's cutting edges will be lost.

Screens also have two cutting edges. When cutting edges become rounded, the screen can be turned end for end exposing the new cutting edges. The results of badly worn hammers and screens is loss of capacity, and added horse power requirements.

Hammer rods are case hardened to maximize wearability and toughness, although hammer rods must be considered expendable.

NOTE: Hammer and hammer rod life can be extended by keeping rotor rotating at 2000 RPM. Over powering or over feeding the rotor will cause the swinging hammers to lay back resulting in excessive wear on both the hammers and the rods.

4.4 Hammer maintenance and replacement

CAUTION: Follow normal shutdown procedure before entering tub to do any service work.

When installing or changing hammers, be sure to follow hammer pattern diagram carefully (page 52). Misplacement could cause excessive vibration.

We recommend the following:

A. Always replace hammers in pairs, 180 degrees apart. (illustrations A & B below).

B. Tips placed 180 degrees apart should be the same weight

To install new hammers or change the cutting edge on existing hammers:

1. Clear tub floor of all forage to allow easy access to rotor and rear rotor bearing cover.
2. Remove rear rotor bearing cover. Item A in figure 4.9.
3. Loosen two bolts at rear of rotor which holds the movable plate in place. Item B in figure 4.9.
4. Rotate movable plate counter clockwise to align holes allowing hammer rods to be removed through rear of rotor. Item C in figure 4.9.
5. Remove one row of hammers and replace, taking note as to where spacers are located. (page 52).

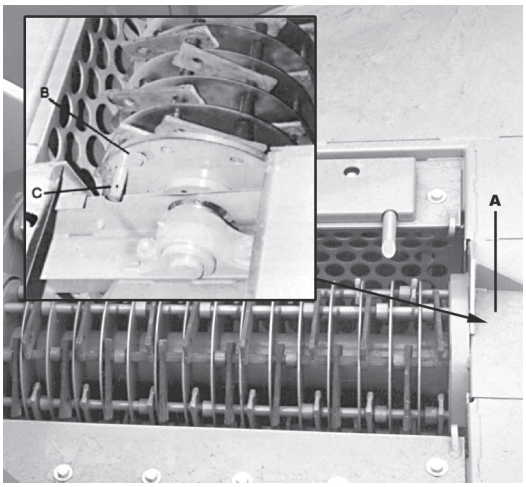


figure 4.9

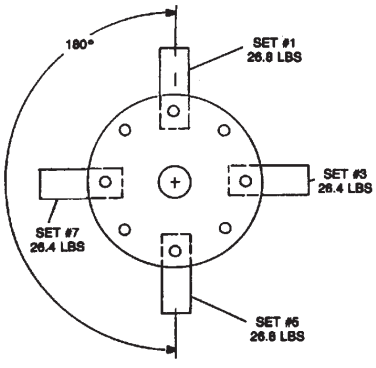


ILLUSTRATION A

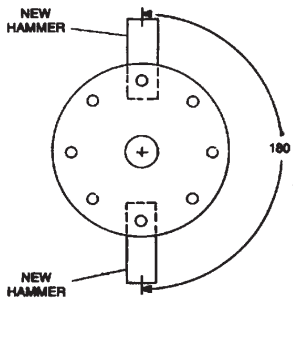


ILLUSTRATION B

6. After all hammers have been replaced or turned, reassemble movable plate and rear rotor bearing cover.
7. When starting the rotor after installing a new set of hammers or turning corners, watch for unusual or excessive vibration. If any occurs, immediately shut off the rotor. Check to see what is wrong and correct it before starting the rotor again.

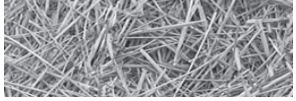
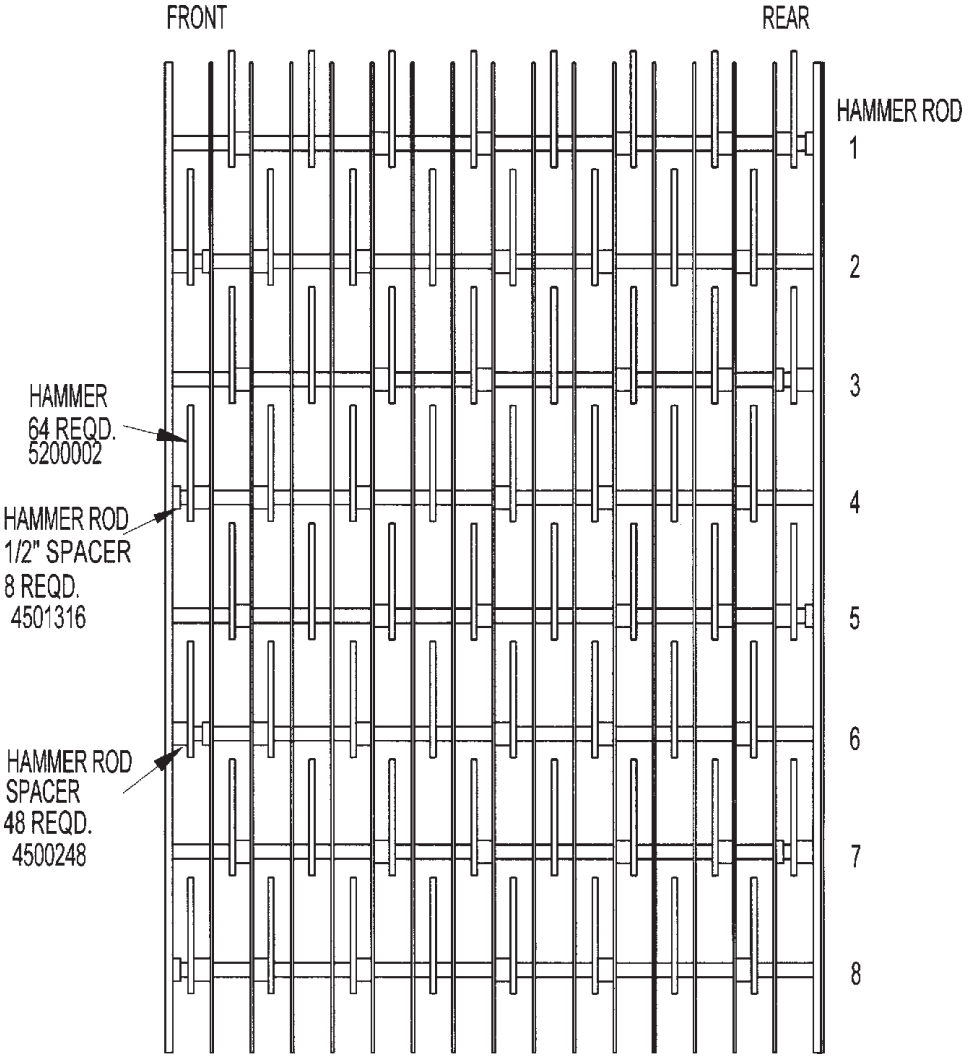
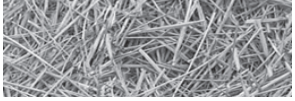


Figure 4.11
hammer spacing chart for the H-1000





Section 5: Troubleshooting the H-1000 Tub Grinder

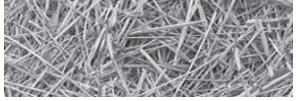
5.1 Troubleshooting the electronic governor system

1. When power is reaching the electronic governor the fuse light should be on. If this light fails to go on, check the fuse, the battery connections, the wiring harness, and the indicator lamp.

2. Checking the TUB MODE operation of the electronic governor. With the engine and hydraulic systems at operating temperature, and the tub drive control valve in the forward position, throttle the engine up to PTO speed.

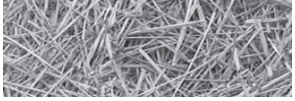
With the mode switch in the tub position, the tub should be rotating. The speed of the tub can be varied by rotating the tub limit knob. The number of tub speed lights which are lit will vary with the setting of the tub limit knob. If the number of tub speed lights lit varies as you rotate the tub limit knob, the manual portion of the controls are functioning correctly. Proceed to step 3. If the manual portion is not working properly, proceed to trouble shooting table below.

PROBLEM	CAUSE	REMEDY
1. The tub does not rotate but the electronic governor and the manual hydraulic valve are working properly. There is pressure to the orbit motor.	1. The tub is binding. 2. There is too much material in tub, or the tub is overloaded due to wet or tough grinding material. 3. The pressure relief valve in the control valve set too low or is faulty.	1. Remove the material causing problem. 2. Reduce the amount of material in the tub. 3. Check oil pressure
2. The tub does not rotate, but the valve is receiving 10 to 12 volts of DC power. There is no pressure to the orbit motor. **Note:** The valve refers to the valve where you disconnect the wiring harness. For more information see "Electronic governor hardware test" later in this section.	1. The manual hydraulic valve is not engaged. 2. The valve assembly is dirty or faulty. 3. The solenoid is faulty.	1. Engage the manual hydraulic valve. 2. Clean or replace the valve assembly. 3. Test the solenoid and replace as necessary.
3. The tub does not rotate, and there is no voltage to the valve.	1. There is no power to the electronic governor. a The electronic governor is switched off. b The fuse is blown. c The tub limit knob is set fully counterclockwise. 2. A wire in the wiring harness is broken. 3. The electronic governor is faulty.	1. a Switch the electronic governor mode switch to tub. b Replace the fuse. c Turn the tub speed knob clockwise. 2. Replace or repair the wiring harness. 3. Replace the electronic governor.
4. The tub runs with the electronic governor switch off. Disconnect the wiring harness at the valve. A. If the tub stops B. If the tub keeps turning	1A. The electronic governor is out of adjustment. 2.A The electronic governor is faulty. 1B. The valve override screw is adjusted in too far. 2.B The valve is faulty.	1.A Readjust the electronic governor. 2.A Replace electronic governor. 1.B Adjust the override screw. 2.B Replace the valve.
5. The tub speed can not be varied with the tub limit knob.	1. Valve override is not adjusted correctly. 2. The valve is stuck. 3. The solenoid is stuck. 4. The electronic governor is faulty.	1. Adjust the override screw. 2. Clean or replace the valve assembly. 3. Test the solenoid and replace as necessary. 4. Replace the electronic governor.



3. Checking the ENGINE MODE operation of the electronic governor. If the tub mode controls function correctly after following the tub mode trouble shooting check list, then follow the calibration instructions on page 36 of this manual. If the tub will not rotate, proceed to trouble shooting table below.

PROBLEM	CAUSE	REMEDY
1. The tub will not rotate, and the sensor light is not lit.	1. The sensor gap is out of adjustment. 2. There is a broken wire on the wiring harnes 3. The sensor is fault. 4. The sensor light bulb is faulty. 5. The electronic governor is faulty.	1. Readjust the sensor gap to 3/32". This is roughly the thickness of a nickel. 2. Repair or replace the wiring harness. 3. Test and replace the sensor as necessary. 4. Replace the sensor light bulb 5. Replace the electronic governor.
2. The tub will not rotate, and the sensor light is lit.	1. The tub limit knob is set to "turtle". 2. The manual hydraulic valve is in the neutral position. 3. The electronic governor is faulty.	1 Adjust the tub limit knob to a value toward rabbit. 2 Engage the manual hydraulic valve. 3. Replace the electronic governor.



ELECTRONIC GOVERNOR HARDWARE TEST

1. Power source: 12 volts DC

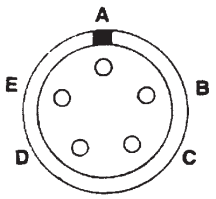
   Red wire + positive pin A wiring harness

   Black wire - Negative Pin B wiring harness

2. Test output voltage to valve DC

   Red wire + positive pin D wiring harness.

   Black wire - negative pin E. wiring harness.



A - 12 volts DC
B - Ground
C - Digital sensor signal
D - (+) to valve
E - (-) to valve

Test the electronic governor with power supplied to the governor control box and the mode switch set to the tub position. The grinder does not need to be running for this test. Disconnect the wiring harness at the valve. With a voltmeter set for 12 volts DC, connect the red lead of the voltmeter to the red lead of the wiring harness and black lead to the black wire. Turn the tub limit knob until the left speed light (turtle) is on. The voltmeter should read approximately 3 volts. Turn the tub limit knob clockwise. As more speed lights light up, the voltage should increase. Turn the knob until the right speed light (Rabbit) is lit. The volt meter should now read a minimum of 9 volts.

ELECTRONIC GOVERNOR VOLT-OHM READINGS

WIRE HARNESS CONNECTOR	ENGINE	IGNITION SWITCH	READING	INCORRECT READING INDICATES	CHECK IF INCORREC-T READING
Valve terminals, system in Manual (Wires attached)	Not Running	ON	13 volts DC	Defective wiring, control box	Wires to valve
Valve terminals, system in Auto (Wires attached)	Running 1500 to 2550 rpm	ON	1-10 volts DC varies with rpm *	Defective wiring, control box	Wires to valve
Valve terminals, (Wires removed)	Not Running	OFF	9.6 ohms	Defective valve	
Pin A to B	Not Running	ON	13 volts DC	13 volts not at control box, no ground	Wires to tractor
Pin A to Ground	Not Running	ON	13 volts DC	13 volts power not reaching box	Wires to tractor
Pin B to Ground	Not Running	OFF	Less than 5 ohms	Black wire not grounded	Ground Wire
Pin D to E	Not Running	OFF	9.6 ohms	Valve wiring or valve defective	Wires to valve, valve
Pin D to Ground	Not Running	OFF	Infinite ohms	Valve wiring or valve defective	White wire to valve, valve
Pin E to Ground	Not Running	OFF	Infinite ohms	Valve wiring or valve defective	Blue or black wire to valve

3. Output voltage of sensor AC

   red wire - Pin C wiring harness

   Black wire - Pin B wiring harness.

Set the sensor gap to 3/32”.

Remove the wiring harness from the electronic governor.

With the grinder at operating speed. Set volt meter to AC volts, connect leads to pins B and C. The volt meter should read at least 2 to 3 volts AC.

ELECTROHYDRAULIC VALVE COIL TEST

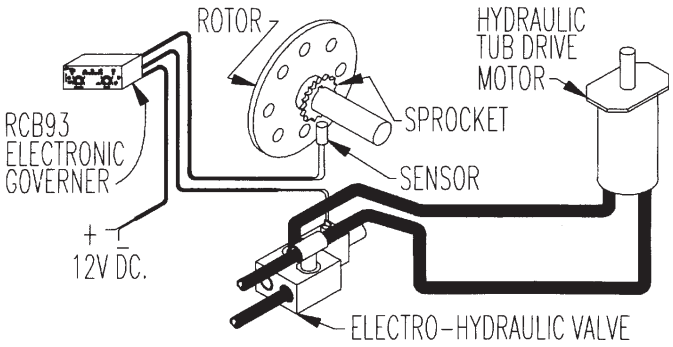
This test requires an accurate ohm meter. Disconnect the wiring harness leads at the electro-hydraulic valve coil. Check resistance of valve coil leads at the terminals. The resistance should be between 8 to 12 ohms for a 12 volt solenoid. If the values are not within this range, replace the electro-hydraulic valve coil.

MANUAL OVERRIDE

NOTE: If there is an electrical failure with the machine, it may still be able to grind. Switch the electronic governor off. Remove the rubber end cap and loosen the jam nut on the electro-hydraulic valve. Start the machine and engage the tub drive.

CAUTION: PTO MUST BE ENGAGED AT THIS TIME. WATCH FOR MOVING PARTS

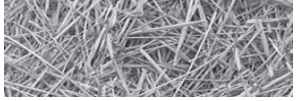
Turn the adjusting screw clockwise until the tub rotates at the desired speed. Lock the jam nut on the adjusting stud and replace the rubber end cap on the electro-hydraulic valve. When the electro-hydraulic valve is adjusted in this manner, it will function only as a manual flow control. The grinder will now operate as it would if the electronic governor were switched to the tub (manual) mode. The tub speed will be constant and it will not change to match varying load conditions.



Contact your dealer for future repairs or replacement parts. When the problems are corrected, calibrate the electro-hydraulic valve.

5.2 General Troubleshooting

1. No grinding capacity	1. The screen is plugged. 2. The hammers or screens are badly worn. 3. Materials are too light or fluffy.	1. Clean out the holes in the screen. 2. Replace or turn worn parts. 3. Mix the lighter material with heavier material. 4. Use a larger screen. 5. Use the grapple loader to force feed the material.
2. The tub slows down or turns slowly.	1. The electronic governor is not adjusted properly. 2. The electronic governor system malfunctions. 3. The hydraulic pressure is low.	1. See the sections on the electronic governor in the operations section of this manual. 2. See Troubleshooting the electronic governor in this manual. 3a. Check oil pressure. 3b. Look for internal leakage or wear in the orbit motor or pump.
3. The machine vibrates excessively.	1. A hammer is broken. 2. The rotor bearing is defective. 3. The driveline is worn or misaligned. 4. Foreign material is wrapped in the rotor. 5. The hammer pattern is incorrect.	1. Replace the broken hammer. See page 51 for more information about replacing hammers. 2. Replace the rotor bearing. 3. Replace worn part or the complete driveline. 4. Remove the foreign material. 5. See page 51 for more information about replacing hammers.
4. The engine looses excessive RPM's before the tub stops.	1. The electronic governor is not adjusted properly.	1. See the sections on the electronic governor in the operations section of this manual.
5. The tub stalls.	1. The tub hydraulic system pressure is set too low. 2. The tub is overloaded due to wet or tough grinding materials. 3. Too much material in the tub. 4. The tub is binding. 5. The hydraulic oil is too hot causing electronic governor valve to bind.	1a. Check oil pressure. 1b. Readjust the pressure relief valve to 2,000 PSI max. 2. Reduce amount of material in tub or shift the hydraulic tub drive to low range. 3. Reduce the amount of material in tub. 4. Remove material buildup between the tub and the platform framework. 5. Reduce the load on the hydraulic system, or stop and allow the hydraulic oil to cool.
6. The hydraulic oil overheats.	1. Pressure relief valve in control valve is faulty. 2. The tub is overloaded. 3. Worn pump, control valve, hyd. motors, etc.	1. Check oil pressure. 2. Reduce the amount of material in the tub. 3. Rebuild or replace the hydraulic components as necessary.



Appendix A: Warranty

DuraTech Industries International Inc. (DuraTech Industries) warrants to its authorized dealer, who in turn warrants to the original purchaser for twelve (12) months from Retail Sale Date that this product will be free from defects in material and workmanship when used as intended and under normal maintenance and operating conditions.

This warranty shall become void if in the judgment of DuraTech Industries International, Inc. the machine has been subject to misuse, negligence, alterations, damaged by accident or lack of required normal maintenance, or if the product has been used for a purpose for which it was not designed.

All claims for warranty must be made through the dealer which originally sold the product and all warranty adjustments must be made through same.

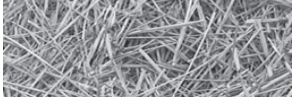
This warranty does not apply to tires or bearings or any other trade accessories not manufactured by DuraTech Industries International Inc. Buyer must rely solely on the existing warranty, if any, of these respective manufacturers.

DuraTech Industries International Inc., shall **not** be held liable for damages of any kind, direct, contingent, or consequential to property under this warranty. DuraTech Industries International Inc., cannot be held liable for any damages resulting from causes beyond its control. DuraTech Industries International Inc., shall **not** be held liable under this warranty for rental costs or any expense or loss for labor or supplies.

DuraTech Industries International Inc., reserves the right to make changes in material and/or designs of this product at any time without notice.

This warranty is void if DuraTech Industries International Inc. does not receive a valid warranty registration card at its office in Jamestown, North Dakota, USA, within 10 days from date of original purchase.

All other warranties made with respect to this product, either expressed or implied, are hereby disclaimed by DuraTech Industries International Inc.



Appendix B: H-1000 Tub Grinder Specifications

Weight	6,400 lbs. (2,903 kg)
Width	10 ft. (3 m)
Height	8 ft. (2.44 m)
Length	22 ft. (6.71 m) with conveyor
Wheels	Drop center rims, Timken bearings
Bearings	All standard size, grease sealed
Recommended Tire Size	9.5 x 14 (2)
Recommended Power	80 to 175 H.P.
Recommended Cylinder Speed	2000 rpm
Rotor - Std No. of Hammers	64
Hammer Size	2-1/2 x 7-3/4 x 3/8 (6.35 cm x 19.69 cm x 0.95 cm)
Rotor - Shaft diameter	3 in. stress proof steel
Rotor Size	44-1/2 in. long, 26 in. diameter hammers extended
Screen Area	2,403 sq. in. (6.45 sq. cm)
Screens Available (inches)	1/8" (3 mm), 3/16" (5 mm), 1/4" (6 mm), 1/2" (13 mm), 5/8" (16 mm), 3/4" (19 mm), 1" (2.5 cm), 1-1/2" (3.8 cm), 2" (5 cm), 3" (8 cm), 4" (10cm)
Feed Delivery	20 ft. folding rubber belt conveyor w/cleats 18 in. Wide
Tub size	96 in. (244 cm) I.D.
Tub Depth	44 1/2 in. (113 cm)
Tub Drive	Electro-Hydraulic

Options

AVAILABLE OPTIONS FOR HAYBUSTER H-1000 Tub Grinder:

- Ear Corn Kit
- Geyser Plate
- Grain Grinding Hopper
- Mill Grate
- Rack for loose hay
- Various Screens Sizes

Appendix C: Required for operation

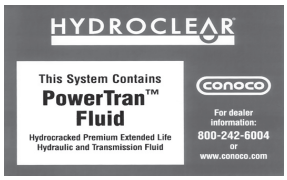
Tractor - 80 to 175 hp

1000 RPM PT0 Shaft

Dual Hydraulics, double acting control valve, 8 GPM, 1500 psi

See also Section 3.3.1, Tractor Set Up, and section 3.2.9 Open and closed center valves

Grinder



Approximately 6 gallons of hydraulic oil. DuraTech Industries recommends using Cenex Qwicklift HTB if your machine has a Qwicklift decal on the hydraulic tank. Other acceptable fluids include Mobil 423, Farmland Super HTB, Conoco Hydroclear Power Tran Fluid, or other similar fluids. If the hydraulic tank does not have this decal, then all of the above fluids are acceptable

Genuine DuraTech Parts

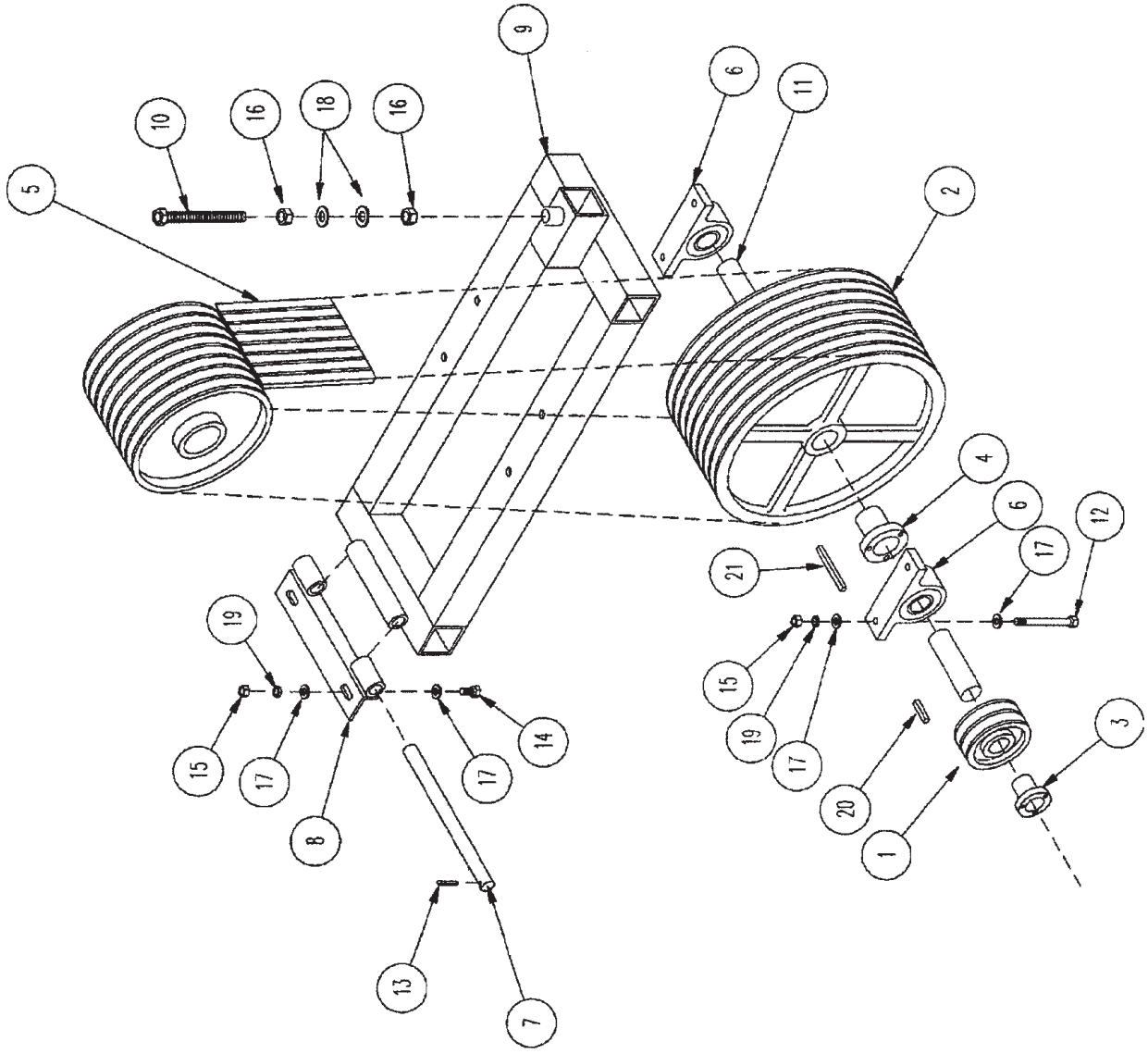
HAYBUSTER®

H-1000™

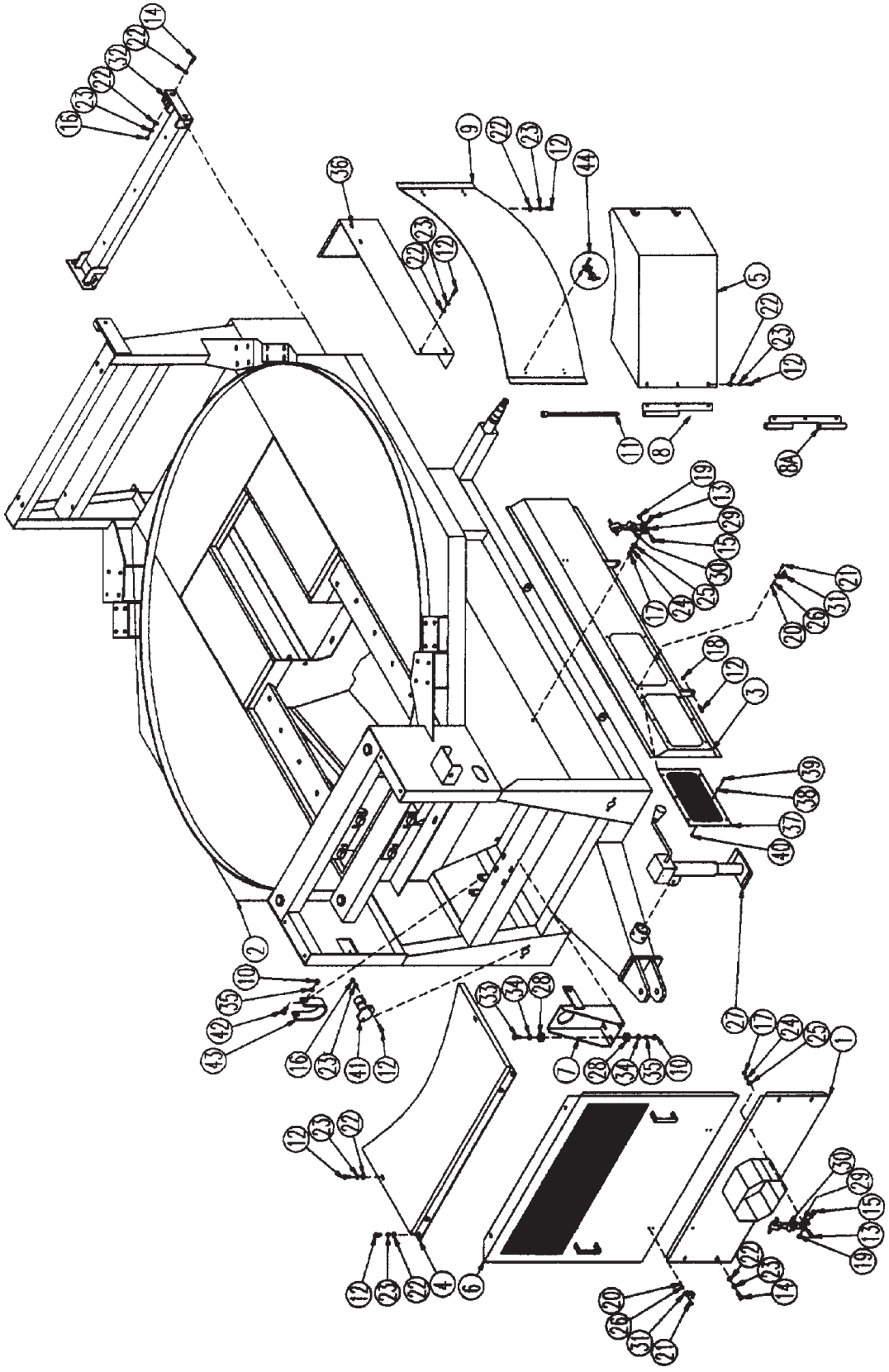
PTO Driven Tub Grinder
Serial Number FI03631 & Up

Part 2:
Parts Reference

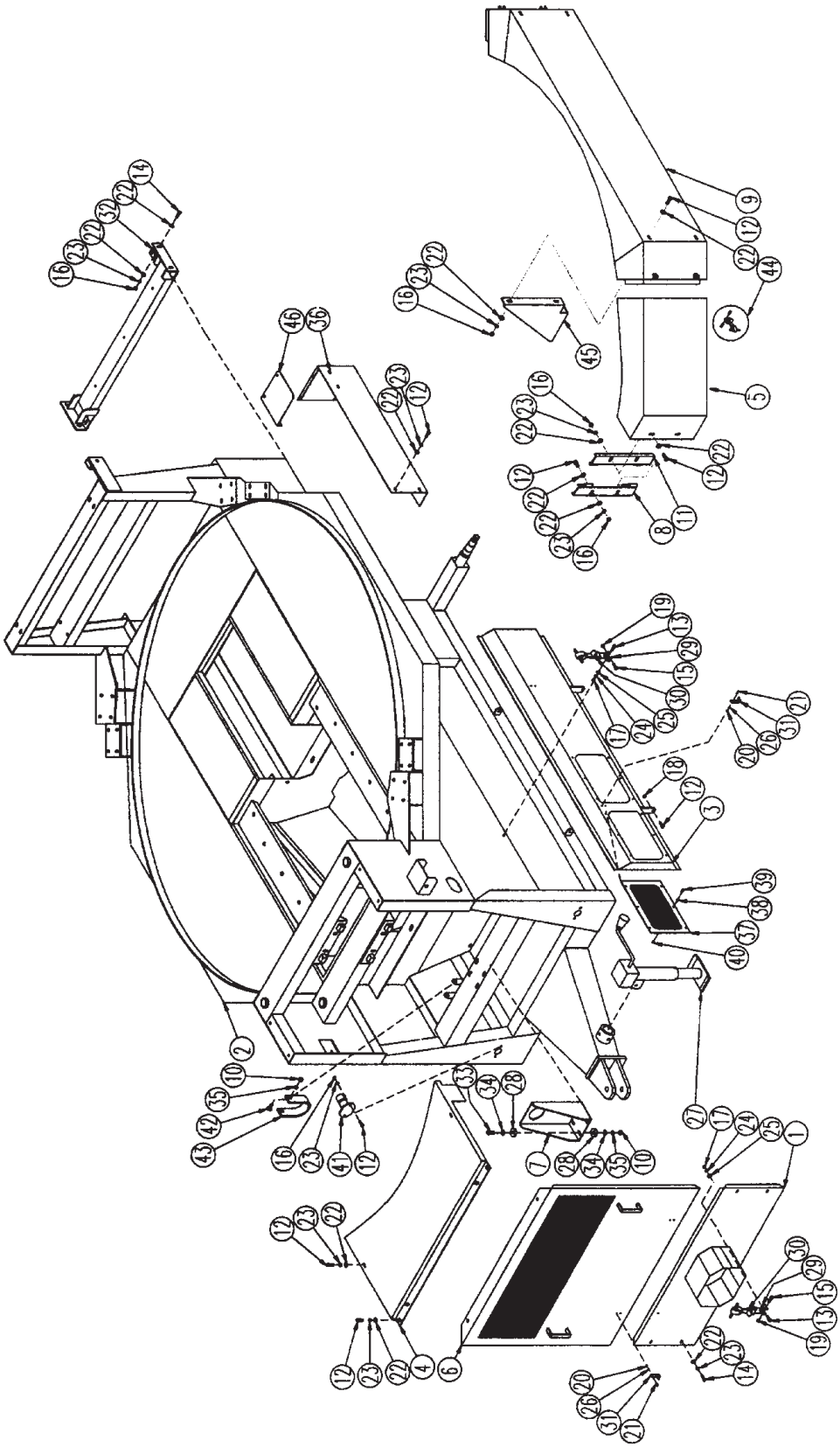
BULL WHEEL FRAME ASSEMBLY



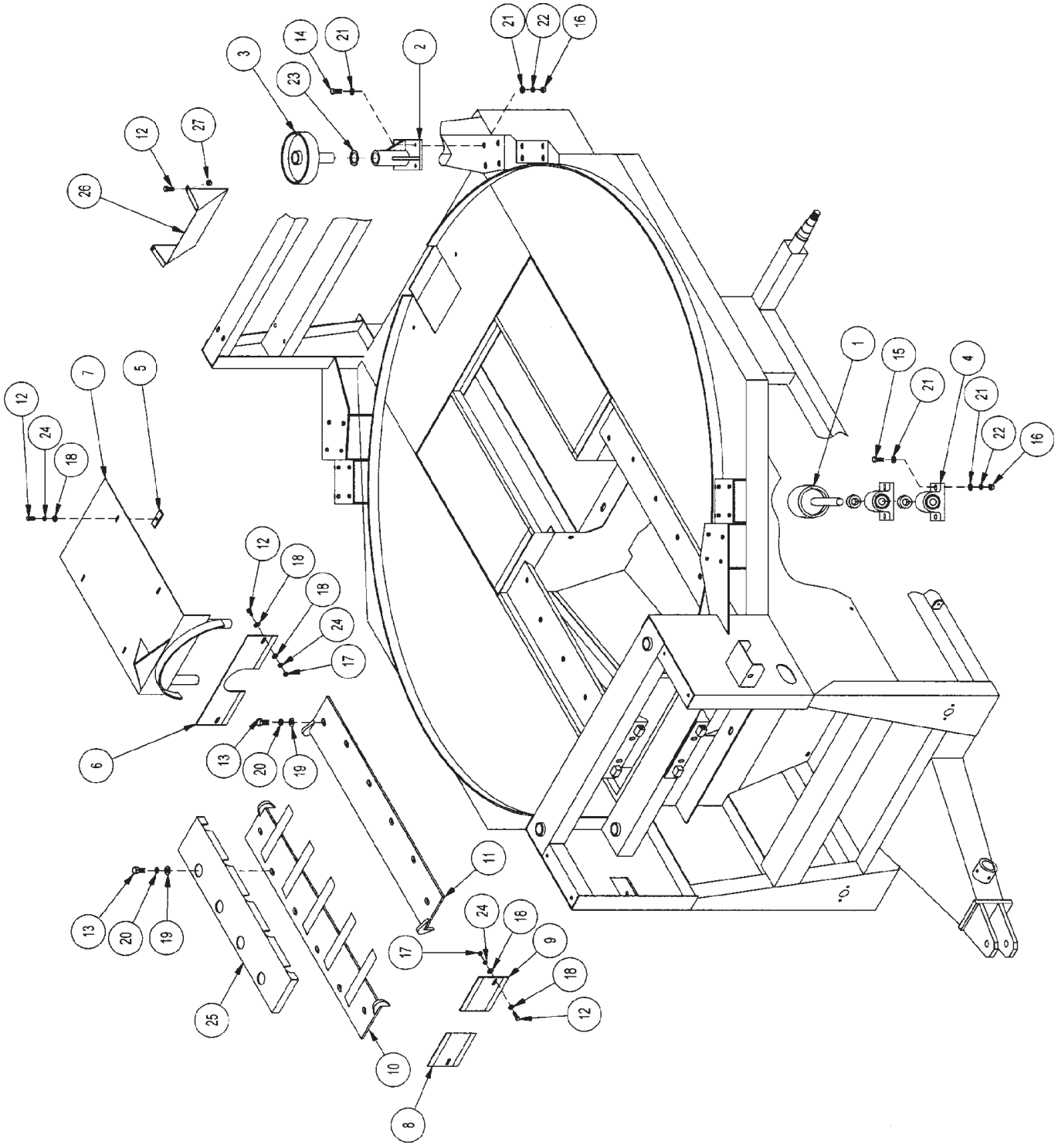
ITEM	PART	QTY.	PART DESCRIPTION
1	1400008	1	5.0-2 Cast Pulley
2	1400069	1	SHVE\B8\20.0 for SN 3807 and up
	1400017		SHVE\B8\18.4
3	1400504	1	P1-1 3/4” Hub
4	1400518	1	R2-2” Hub
5	1600030	8	V-BELT\B\85 for 1400069, SN 3807 and up
	1600084	2	V-BELT\4B\85\BANDED
	1600007		V-BELT\B\83 for 1400017
	1600045	2	V-BELT\B-4\83 for 1400017
6	2000505	2	1-3/4” Pillow Block Bearing
7	4500223	1	Pin\Rd\1x14-1/2
8	4500224	1	Hinge\Frame\Bullwheel
9	4500230	1	Frame\Bullwheel
10	4500256	1	Bolt\Wld\3/4x8
11	4500489	1	Shaft\Rd\2x22
12	4800041	4	Bolt\Hex\1/2x5
13	4800050	1	Pin\Cotter\3/16x1-1/2
14	4800082	2	Bolt\Hex\1/2x1-1/2
15	4900001	6	Nut\Hex\1/2
16	4900004	2	Nut\Hex\3/4
17	5000004	12	Wash\Flat\1/2
18	5000005	2	Wash\Flat\3/4
19	5000006	6	Wash\Lock\1/2
20	6200008	1	Key\Sq\3/8x2
21	6200016	1	Key\Sq\3/8x4-1/2



ITEM	PART	QTY.	PART DESCRIPTION
1	4500556	1	Guard\PTO\Front
2	4500557	1	Frame\Grdr\H100095
3	4500558	1	Door\Drive\Side\LH
3A	4500753	1	Door\Drive\Side\RH
4	4500563	1	Guard\Drive\Top
5	4500564	2	Guard\Roller|LH for Ser. No. 3631 to 3706
5	4500800	2	Guard\Roller\LH for Ser. No. 3707 to 3756
5A	4500624	2	Guard\Roller\RH for Ser. No. 3631 to 3706
5A	4500801	2	Guard\Roller\RH for Ser. No. 3707 to 3756
6	4500578	1	Door\Drive\Front
7	4500590	1	Brkt\Pump\15Gln
8	4500597	4	Hinge\Guard\Roller for Ser. No. 3631 to 3706
8	4500946	4	Hinge\Guard\Roller for Ser. No. 3707 to 3756
9	4500598	2	Guard \Drive\Chain for Ser. No. 3631 to 3706
9	4500784	2	Guard \Drive\Chain for Ser. No. 3707 to 3756
10	4900001	6	Nut\Hex\1/2
11	4500625	4	Pin\Hinge\Guard
12	4800003	30	Bolt\Hex\3/8x1
13	4800013	6	Bolt\Hex\5/16x1
14	4800034	12	Bolt\Hex\3/8x1\1/2
15	4800281	6	Bolt\Hex\5\16x2-24\NF
16	4900002	10	Nut\Hex\3/8
17	4900003	6	Nut\Hex\5/16
18	4900023	4	Nut\Toplock\3/8
19	4900071	6	Nut\Nyl-Loc\5/16-24NF
20	4900072	12	Nut\10/24
21	4800282	12	Screw\Panhead\10/24x3/4
22	5000001	44	Wash\Flat\3/8
23	5000019	38	Wash\Lock\3/8
24	5000022	6	Wash\Lock\5\16
25	5000023	6	Wash\Flat\5/16
26	5000063	12	Wash\ExternalStar\10/24
27	5800601	1	Jack(2SM10)12”
28	7500310	8	Grommet
29	7500347	6	Rubber Latch Mount
30	7500166	6	Rubber Latch
31	7500190	6	Rubber Latch Catch
32	4500555	1	Brkt\Cnvyr\Discharge
33	4800070	4	Bolt\Hex\1/2x2
34	5000004	8	Wash\Flat\1/2
35	5000006	6	Wash\Lock\1/2
36	4500660	1	Guard\Drive\Rear
37	4500659	4	Scrn\Door\Drive
38	5000035	24	Wash\Flat\1/4
39	4800194	24	Bolt\Flange\1/4x3/4
40	4900040	24	NNT\FLG\1/4
41	4500601	1	Brkt\PTO\Weasler
42	4800908	2	Bolt\Crg\1/2x1
43	4500754	1	Belt\Stand\PTO
44	7500038	8	Latch\Cam for Ser. No. 3631-3656
44	7500606	8	Latch\35-m\Austin 3707 and up



ITEM	PART	QTY.	PART DESCRIPTION
1	4500556	1	Guard\PTO\Front
2	4500557	1	Frame\Grdr\H100095
3	4500558	1	Door\Drive\Side\LH
3A	4500753	1	Door\Drive\Side\RH
4	4501028	1	Guard\Drive\Top
5	4501025	2	Shld\Rllr\Tub\13-1/2\LH Thru SN 4001
5A	4501026	2	Shld\Rllr\Tub\13-1/2\RH Thru SN 4001
	4501307		Shld\Rllr\Tub\LH\16 SN 4002 and up
	4501309		Shld\Rllr\Tub\RH\16 SN 4002 and up
6	4500578	1	Door\Drive\Front
7	4501020	1	Brkt\Pump\15Gal
8	4501022	2	Brkt\Hinge\Male\RH
8A	4501021	2	Brkt\Hinge\Male\LH
9	4501027	2	Shld\Chain\Tub\Side\13-1/2 Thru SN 4001
	4501308		Shld\Chain\Tub\Side\16 SN 4002 and up
10	4900001	6	Nut\Hex\1/2
11	4501024	2	Brkt\Hinge\Female\RH
11A	4501023	2	Brkt\Hinge\Female\LH
12	4800003	56	Bolt\Hex\3/8x1
13	4800013	6	Bolt\Hex\5/16x1
14	4800034	12	Bolt\Hex\3/8x1\1/2
15	4800281	6	Bolt\Hex\5\16x2-24\NF
16	4900002	42	Nut\Hex\3/8
17	4900003	6	Nut\Hex\5/16
18	4900023	4	Nut\Toplock\3/8
19	4900071	6	Nut\Nyl-Loc\5/16-24NF
20	4900009	12	Nut\Hex\1/4\Nc
21	4800024	12	Bolt\Hex\1/4x3/4
22	5000001	104	Wash\Flat\3/8
23	5000019	64	Wash\Lock\3/8
24	5000022	6	Wash\Lock\5\16
25	5000023	6	Wash\Lock\5/16
26	5000035	12	Wash\Flat\1/4
27	5800601	1	Jack(2SM10)12”
28	7500310	8	Grommet
29	7500347	6	Rubber Latch Mount
30	7500166	6	Rubber Latch
31	7500190	6	Rubber Latch Catch
32	4500555	1	Brkt\Cnvyr\Discharge
33	4800070	4	Bolt\Hex\1/2x2
34	5000004	8	Wash\Flat\1/2
35	5000006	6	Wash\Lock\1/2
36	4500660	1	Guard\Drive\Rear
37	4500659	4	Scrn\Door\Drive
38	5000035	24	Wash\Flat\1/4
39	4800194	24	Bolt\Flange\1/4x3/4
40	4900040	24	Nut\FLG\1/4
41	4500601	1	Brkt\PTO\Weasler
41	4501089		Brkt\Pto\Weasler\1-3/4\ H1000
42	4800908	2	Bolt\Crg\1/2x1
43	4500754	1	Belt\Stand\PTO
44	7500606	8	Latch\35-m\Austin
45	4500989	4	Brkt\Shld\Chain\Drv\Tub Thru SN 4001
45	4501310	4	Brkt\Shld\Chain\Tub SN 4002 and up
46	4501029	1	Cvr\Grbx\Cnvyr Drive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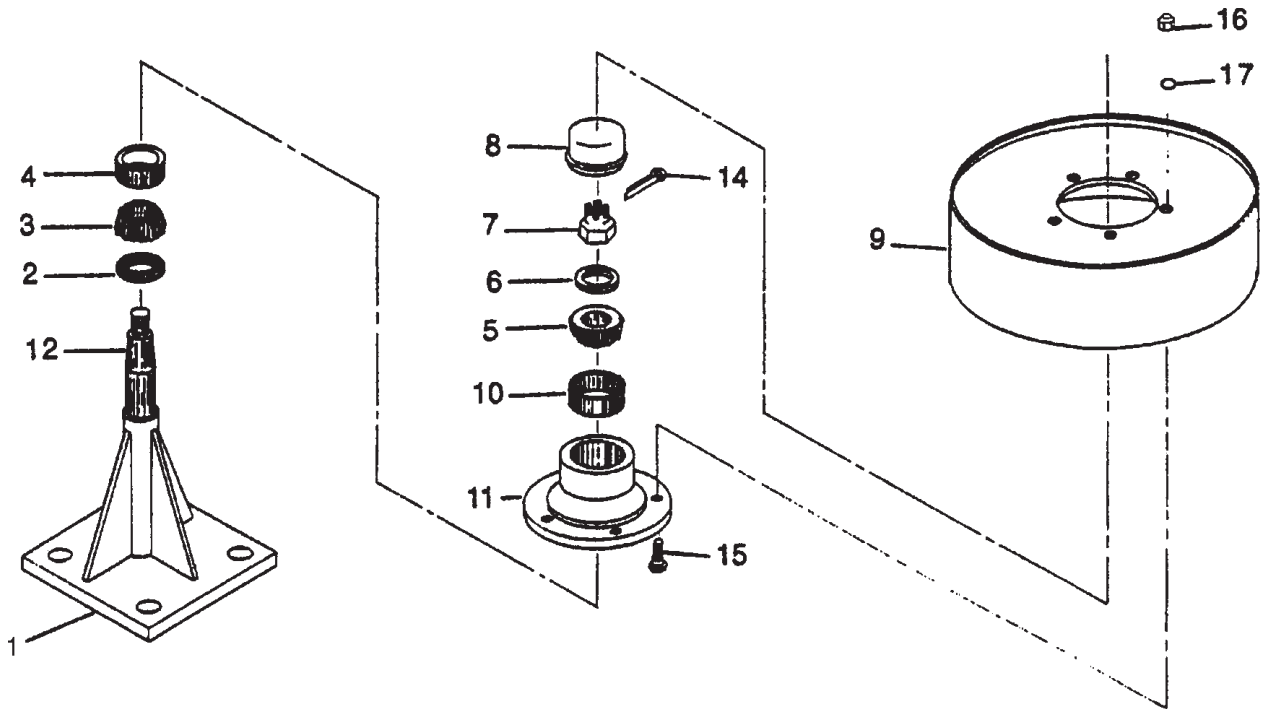
ITEM	PART	QTY.	PART DESCRIPTION
1	1200013	4	#2 Tub Roller
2	1200005	4	#44 Roller Stand Thru S/N 4001
2A	4501313	4	Rllr\Press\Stnd S/N 4002 and up-See Pressure Roller page
3	1200008	4	#5 Pressure Roller Thru S/N 4001
3A	4500088	4	Drum\Rllr\Press S/N 4002 and up-See Pressure Roller page
4	2000501	8	1-1/2 Pillow Block Bearing
5	4500094	4	Clip
6	4500182	1	Door\Rtr\Rear Brg
7	4500259	1	Cover\Rtr\Rear Brg
8	4500442	1	Door\Rtr\Front Brg RH
9	4500443	1	Door\Rtr\Front Brg LH
10	4500575	1	Holddown\Screen\5 Tooth S/N FI03651 to GI03756
10	4501034	1	Holddown\Screen\5 Tooth S/N GI03757 and up
11	4500576	1	Holddown\Scrn\7.5x44.5
12	4800003	10	Bolt\Hex\3/8x1
13	4800010	12	Bolt\Hex\5/8X2
14	4800949	16	Bolt\Flg\5/8X2\Gr8\NC SN 04082 and up
14A	4800082		Bolt\Hex\1\2x1-1/2 SN 03631 to 04081
15	4800930	16	Bolt\Flg\Serr\1/2x2\NC SN 04082 and up
15A	4800114		Bolt\Hex\1/2x2 SN 03631 to 04081
16	4900100	16	Nut\Flg\Tplck\1/2\NC (tub roller) SN 04082 and up
16A	4900178	16	Nut\Flg\Tplck\5/8\GR8\NC (pressure roller) SN 04082 and up
16B	4900001		Nut\Hex\1/2 SN 03631 to 04081
17	4900002	4	Nut\Hex\3/8
18	5000001	12	Wash\Flat\3/8
19	5000002	12	Wash\Flat\5/8
20	5000003	12	Wash\Lock\5/8
21	5000004	64	Wash\Flat\1/2 SN 03631 to 04081
22	5000006	32	Wash\Lock\1/2 SN 03631 to 04081
23	5000008	12	1-1\2 Machine Bush(NR) Thru S/N 4001
24	5000019	8	Wash\Lock\3/8
25	4501033	1	Cover\Grate\Hay\1-1/2”
26	4501321	1	Deflr\Matl\Plfrm S/N 4002 and up
	Not Shown		
	4900023	2	Nut\Tplck\3/8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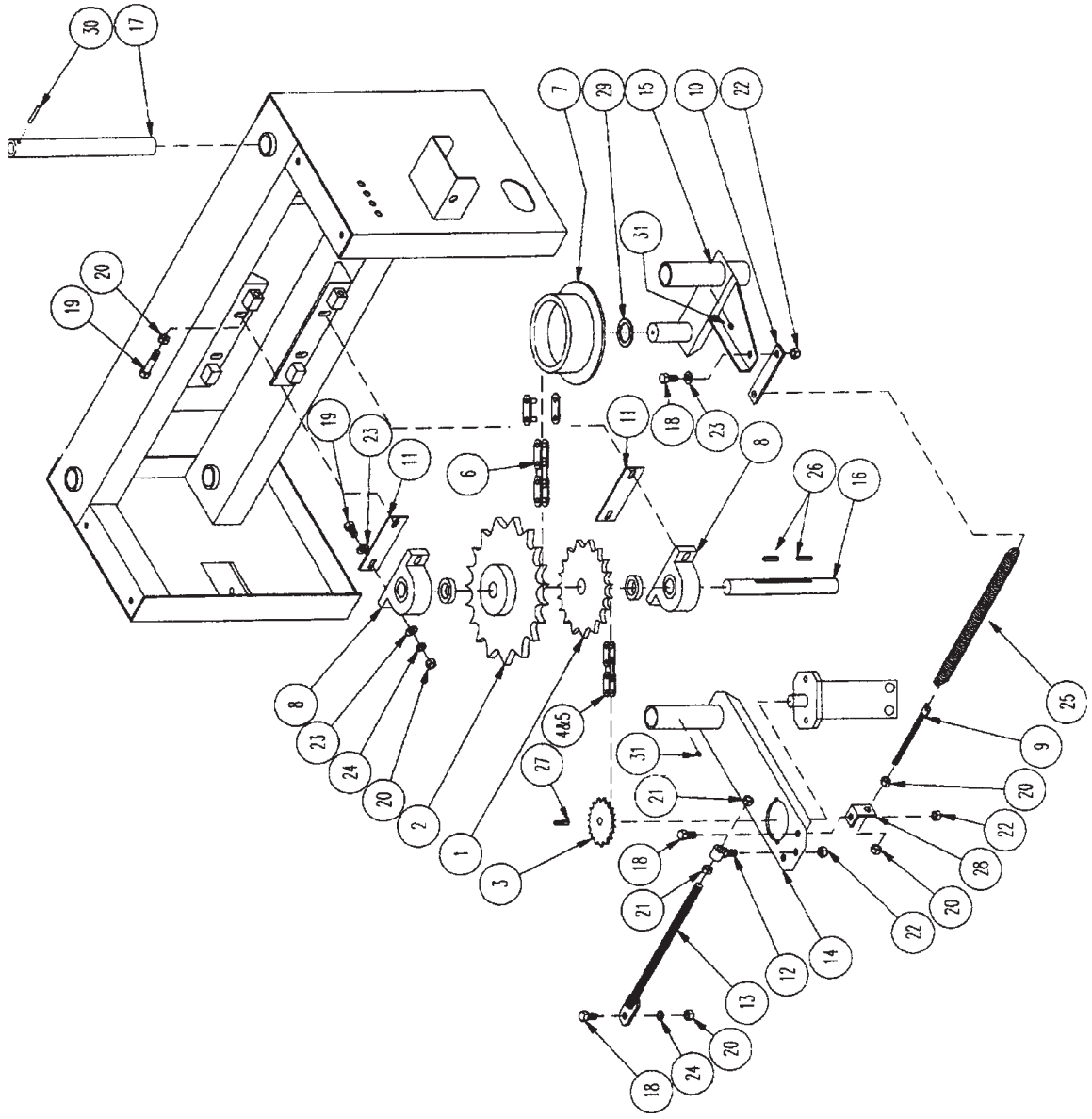
ITEM	PART	QTY.	PART DESCRIPTION
	4501317	**1**	**PRESSURE ROLLER COMPLETE**
1	4501313	1	BRKT\RLLR\PRESS
2	2900055	1	SEAL
3	2900018	1	INNER CONE
4	2900004	1	INNER CUP
5	2900061	1	OUTER CONE
6	5000094	1	5/8” WASHER\SPINDLE
7	4900112	1	NUT\SLOT\5/8\NF
8	2900064	1	DUST CAP
9	4500088	1	PRESSURE DRUM
10	2900056	1	OUTER CUP
11	NA	1	ORDER 2900057
Not Shown			
12	3000025	1	PRESSURE ROLLER SPINDLE 10”
14	4800172	1	1/8” X 2” COTTER PIN
15	2900010	5	1/2” NF X 1-1/4” WHEEL STUD BOLT
16	4900094	5	1/2” NF WHEEL BOLT 13/16” O.D.
17	5000004	5	WASH\FLAT\1/2
	2900057		HUB\5-BOLT\(985)\COMPLETE, W/BEARINGS, SEAL & DUST CAP (includes items 2,3,4,5,8,10,11,15,16)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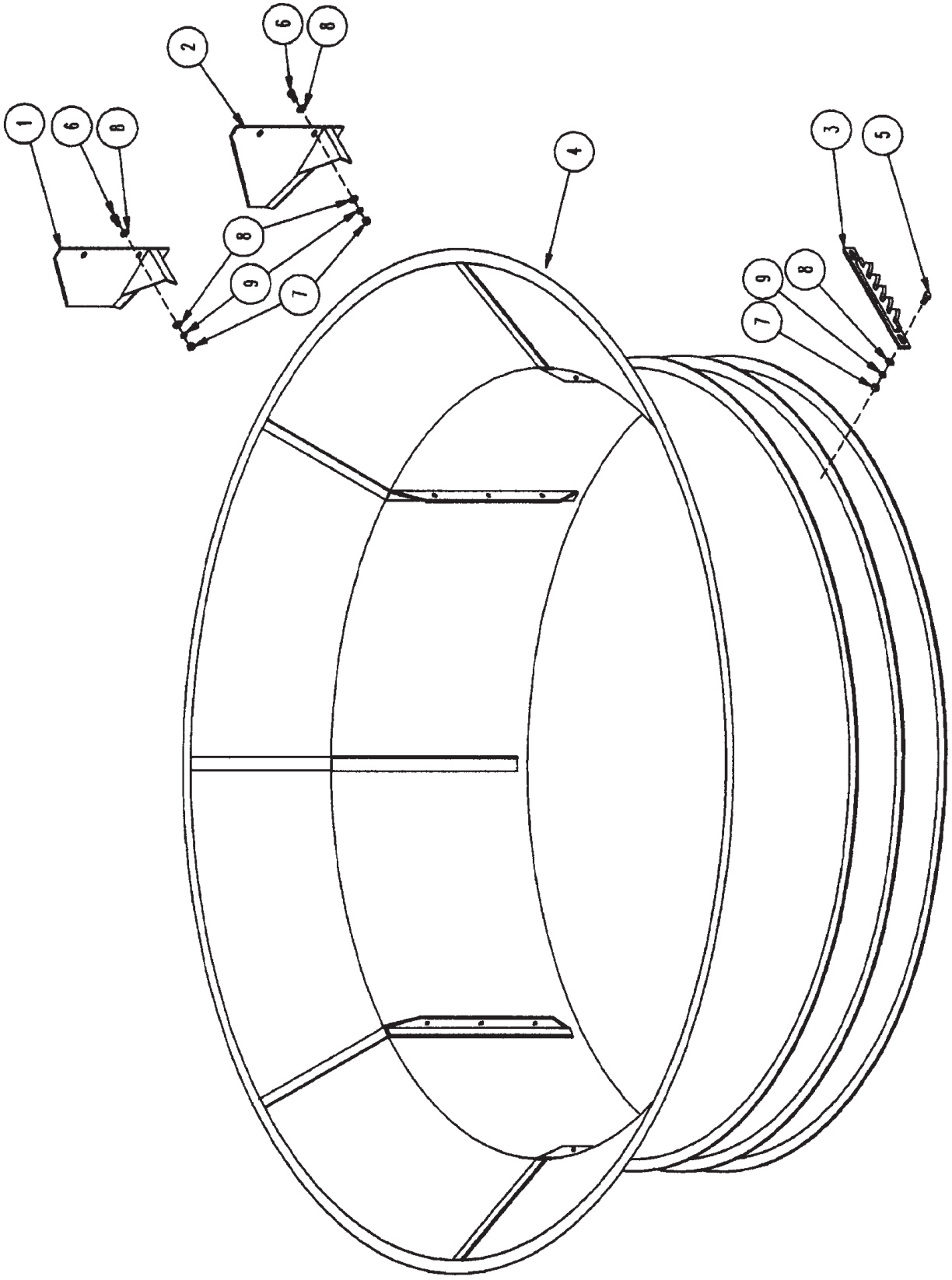
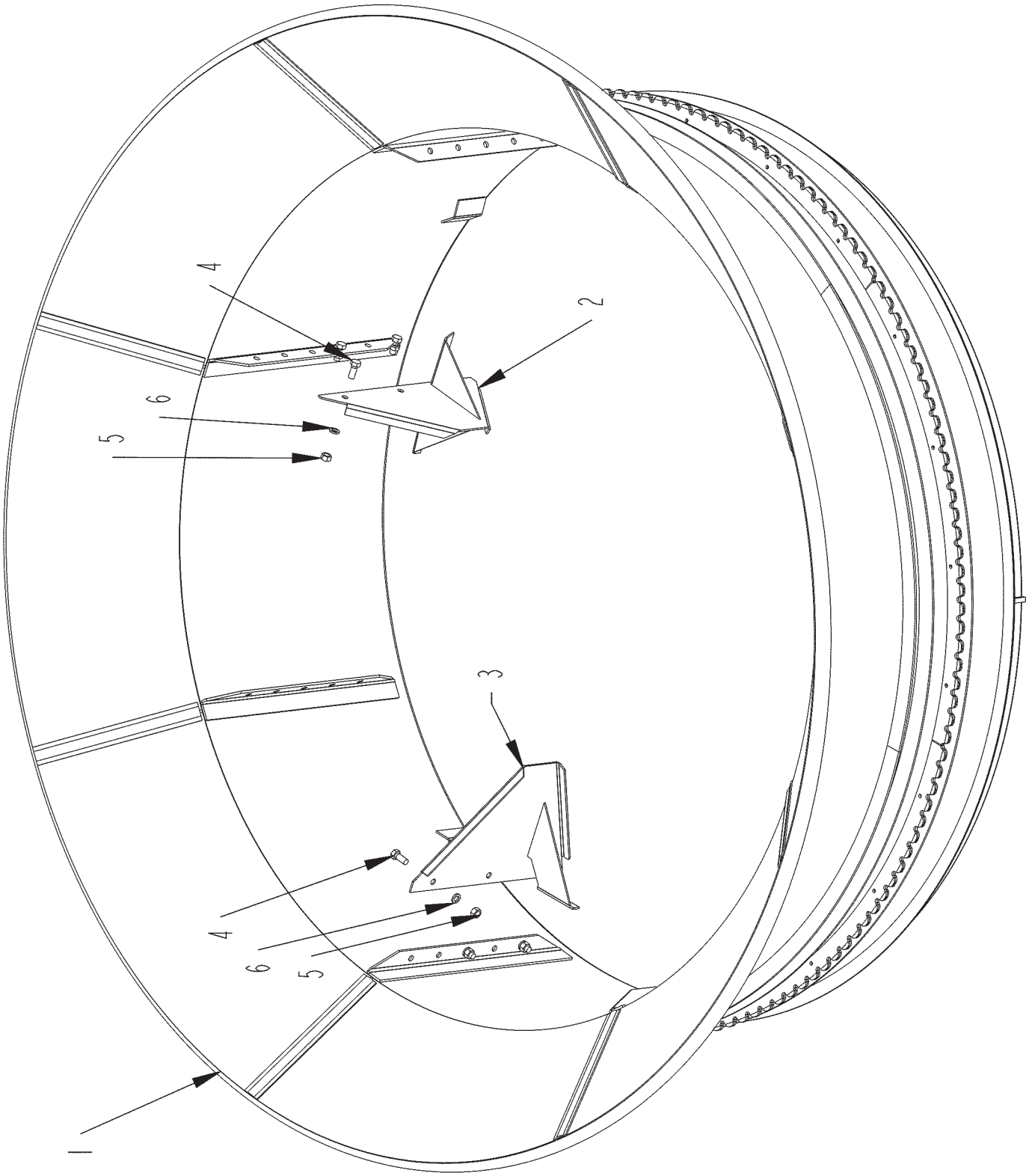
ITEM	PART	QTY.	PART DESCRIPTION
	4500566		**DR\TUB\ASSY\H1000**
1	1000033	1	Spkt\60\30\1-1/4\1/4
2	1000077	1	Spkt\80\30\1-1/4\1/4
3	1000134	1	Spkt\60\12\1-1/4\5/16
4	1100062	1	#60 Connector Link
4A	1100063		#60 Offset Link
5	1100088	1	60-43-CI Chain
6	1100094	1	2080 Chain 157 Links +OF/CL
6A	1100070		Chain\2080\Connecting Link
6B	1100071		Chain\2080\Offset Link
7	1200007	1	#6 Roller
8	2000502	2	1-1/4 Pillow Block Brg
9	4500197	1	Spring Tension Bolt
10	4500331	1	Spring Link 1-1/4x6-1/4
11	4500332	4	Bearing Shim 2x6-1/4
12	4500334	1	Orbit Motor Tighten Rod Mount
13	4500335	1	Orbit Motor Tighten Rod
14	4500587	1	Brkt\Tightener\Chain
15	4500588	1	Brkt\Arm\Swing
16	4500591	1	Shaft\Rd\Strpr\1-1/4x11
17	4500592	2	Tube\Rd\1-1/2x1x15
18	4800082	3	Bolt\Hex\1/2x1-1/2
19	4800114	6	Bolt\Hex\1/2x2
20	4900001	9	Nut\Hex\1/2
21	4900005	2	Nut\Hex\5/8
22	4900014	3	Nut\Toplock\1\2
23	5000004	9	Wash\Flat\1/2
24	5000006	5	Wash\Lock\1/2
25	6100001	1	Spring\0.156x63/64x13
26	6200005	2	Key\1/4x1-1/2
27	6200022	1	Key\5/16x1-1/2\Harden
28	4500589	1	Brkt\Sprg\Tension
29	5000008	5	1-1/2 Machine Bush(NR)
30	4800221	2	Pin\Rolled\1/4x2
31	3800082	2	1/4 Str Zerk

TUB ASSEMBLY (S.N. UP TO 4441)



ITEM	PART	QTY.	PART DESCRIPTION
	4500568		**TUB\ASSY\H1000W/CHAIN&AGTTRS**
1	4500724	1	Agttr\Tub\10 for Ser. No. FI3631 to FI3656
1	4500756	1	Agttr\Tub\10 for Ser. No. FI3657 and up
2	4500723	1	Agttr\Tub\14 for Ser. No. FI3631 to FI3656
2	4500757	1	Agttr\Tub\14 for Ser. No. FI3657 and up
3	4500561	4	Tube\Tub\Teeth
4	4500569	1	Tube\Tub\95-1/2x30
5	4800061	8	Bolt\Crg\1/2x1-1/2
6	4800082	6	Bolt\Hex\1/2x1-1/2
7	4900001	14	Nut\Hex\1/2
8	5000004	20	Wash\Flat\1/2
9	5000006	14	Wash\Lock\1/2
Not Shown			
	1100070		Chain\2080\Connecting Link
	1100071		Chain\2080\Offset Link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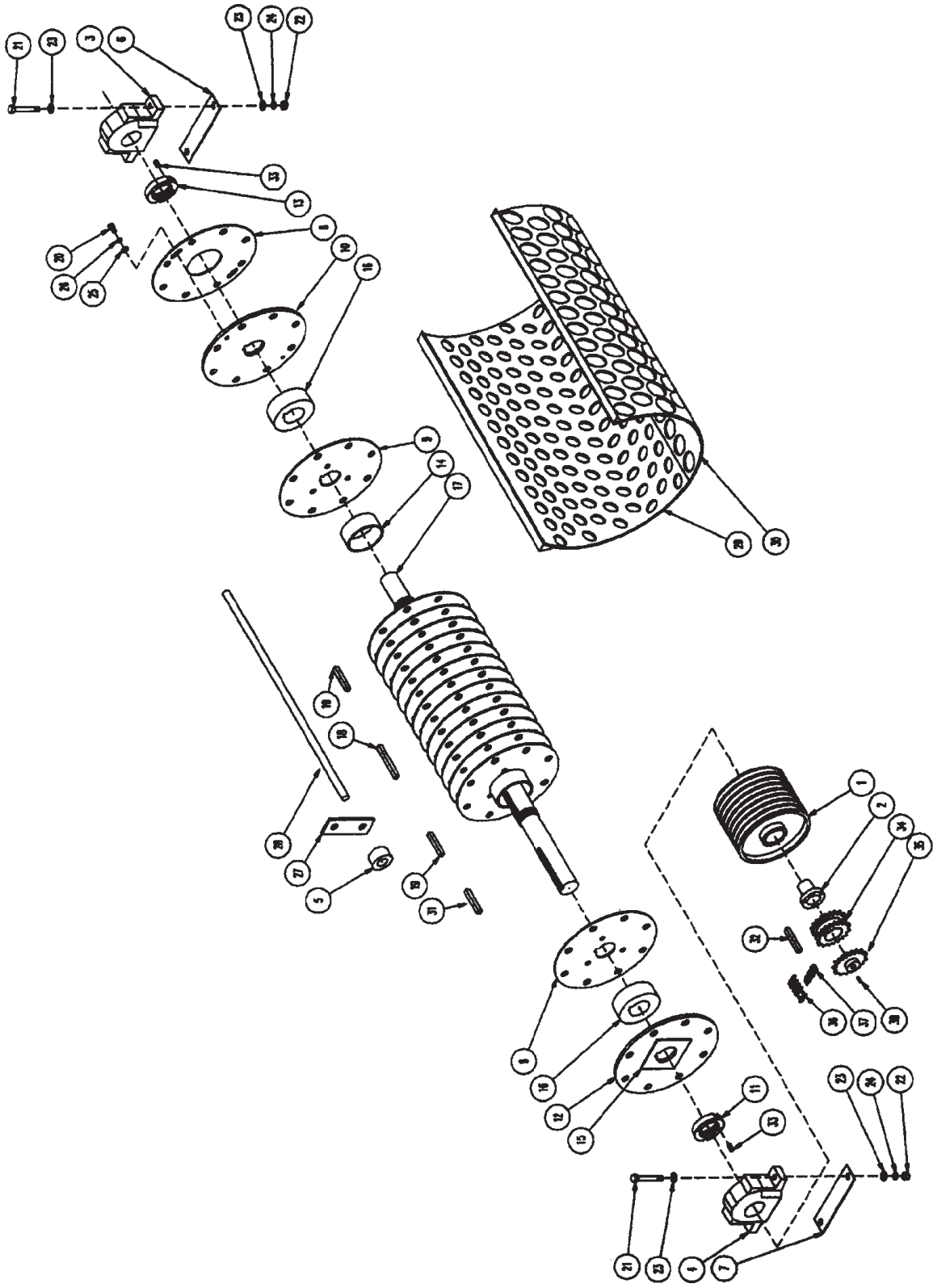
TUB ASSEMBLY (S.N. 4541 AND UP)

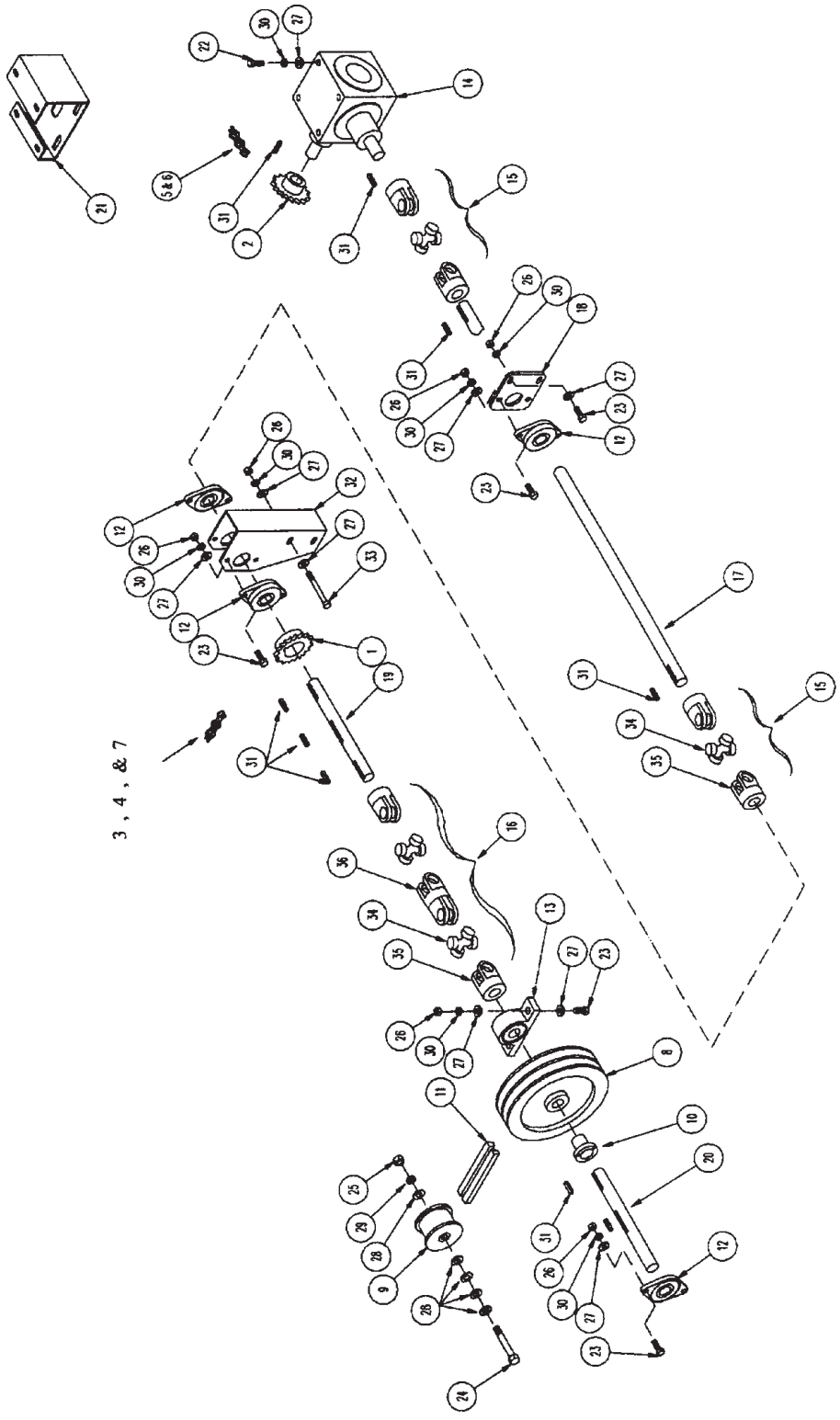
ITEM	PART	QTY.	PART DESCRIPTION
1	4502397	1	TUB
2	4502409	1	AGTTR\TUB\FIN\10
3	4502410	1	AGTTR\TUB\FIN\14
4	4800106	6	BOLT\HEX\5/8X1-1/2
5	4900005	6	NUT\HEX\5/8\NC
6	5000003	6	WASH\LOCK\5/8



ITEM	PART	QTY.	PART DESCRIPTION
1	1400016	1	Pulley\Cast\11-8B
2	1400519	1	Hub\R2-2-3/4
3	2000508	1	Brg\PillowBlock\2-7/16
4	2000509	1	Brg\PillowBlock\2-3/4
5	4500248	48	Spacer\Hammer\1-1/2X1.028X1
5A	4501316	8	Spacer\Hammer\1-1/2X1.028X1/2
6	4500444	2	Shim\Brg\10Ga\3x10-1/4
7	4500445	2	Shim\Brg\10Ga\3x11-1/4
8	4500019	1	Plate\Rotor\15-3/4x.1875T
9	4500020	15	Plate\Rotor\3/16
10	4500021	1	Plate\Rotor\1/2
11	4700267	1	Nut\Rotor\3 w/o Shoulder
12	4500023	1	Plate\Rotor\Front
13	4700266	1	Nut\Rotor\3 w/Shoulder
14	4500134	14	Spcr\Shaft\5.56
15	4500253	1	Wash\Thrst\6x3-1/8
16	4500425	2	Spcr\Cast\6-1/4x3x2-1/2
17	4500494	1	Shaft\Rotor\3x65
18	6200035	1	Key\1/2x5/8x6-1/4
19	6200043	2	Key\1/2x5\8x4
20	4800085	2	Bolt\Hex\1/2x1
21	4800100	4	Bolt\Hex\5/8x4
22	4900005	4	Nut\Hex\5/8
23	5000050	8	Wash\Flat\11/16\2OD\1/4T
24	5000003	4	Wash\Lock\5/8
25	5000004	2	Wash\Flat\1/2
26	5000006	2	Wash\Lock\1/2
27	5200002	64	3/8” AB Supreme Hammer
28	5300020	8	ROD\HMMR\15/16X43
31	6200013	1	Key\Sq\5/8x4-1/2
32	6200029	1	Key\Sq\5/8x2
33	4800323	4	Screw\Soc\SS\1/2x1
34	1000191	1	SPKT\60\20\DBL
35	1000203	1	SPKT\60\20\3/4Bore
36	1100064	1	Chain\60BL\CL
37	1100193	1	Chain\60DBL\19
38	6200052	1	Key\Sq\3/16x1
	4500206		PL/CYL\WASH\REIN
	4500446		RTR\NEW\43X15/16RD\H1000\3X65SFT 2-7/16,2-3/4BRG
	4500570		RTR\CORE\43X15/16RD H1000\3X65SFT 2-7/16,2-3/4BRG

SCREEN LIST, ITEMS 29 AND 30, all 1/4” thick

PART NO.	HOLE SIZE	PART NO.	HOLE SIZE	PART NO.	HOLE SIZE
5400094	1/8”	5400013	3/4”	5400087	3” Slotted
5400075	3/16”	5400014	1”	5400061	4”
5400009	1/4”	5400067	1-1/2”	5400088	4” Slotted
5400010	3/8”	5400015	2”	5400108	5”
5400011	1/2”	5400089	2” Slotted	5400079	Dummy
5400012	5/8’	5400016	3”		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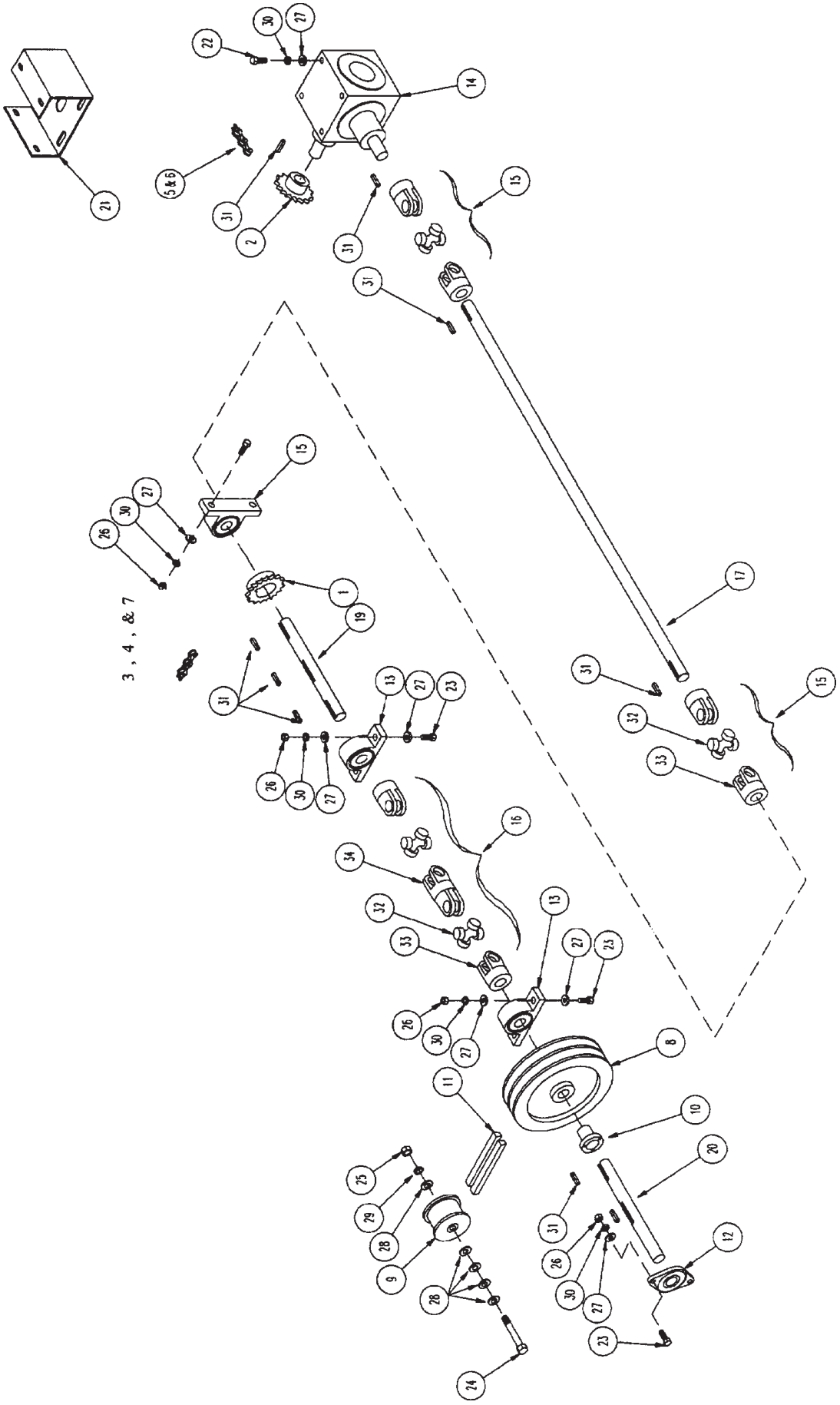
ITEM	PART	QTY.	PART DESCRIPTION
1	1000042	1	Spkt\50\15\1\1/4\Sub
2	1000128	1	Spkt\60\15\1\1/4 kw
3	1100059	1	#50 Connecting Link
4	1100060	1	#50 Offset Link
5	1100062	1	#60 Connector Link
6	1100105	1	#60 Chain Links
7	1100151	1	#50 Chain 153-Links
8	1400033	1	9” -2B (2BK90H) Pulley
9	1400204	1	312-2-12 P/Steel Pulley
10	1400503	1	1” Hub
11	1600009	2	B60 V-Belt
12	2000310	4	2-1 Cast Flg Pulley
13	2000503	1	1” P.B. Bearing
14	3100187	1	Prairie Gear Box 1:1
15	3600091	2	Single U-Joint 1” to 1” rd #10
16	3600138	1	#6 Double U-Joint Complete
17	4500582	1	Shaft\RD\CR\1X77
18	4500657	1	Brkt\Brg\Hanger\4x4-5/16
19	4500583	1	Shaft\rd\cr\1x15.625
20	4500584	1	Shaft\rd\cr\1x12
21	4500586	1	Brkt\Gearbox
22	4800003	4	Bolt\Hex\3/8x1
23	4800034	12	Bolt\Hex\3/8x1-1/2
24	4800135	1	Bolt\Hex\1/2x3-1/2
25	4900001	1	Nut\Hex\1/2
26	4900002	14	Nut\Hex\3/8
27	5000001	22	Wash\Flat\3/8
28	5000004	5	Wash\Flat\1/2
29	5000006	1	Wash\Lock\1/2
30	5000019	18	Wash\Lock\3/8
31	6200014	9	Key\Sq\1/4x1-1/4
32	4500623	1	Brkt\Brg\Drive
33	4800197	2	Bolt\Hex\3/8x3-1/2
34	3600008		#6 Cross &Bearing Kit
35	3600103		#6 Rw 1” Yoke
36	3600151		#6 Double Yoke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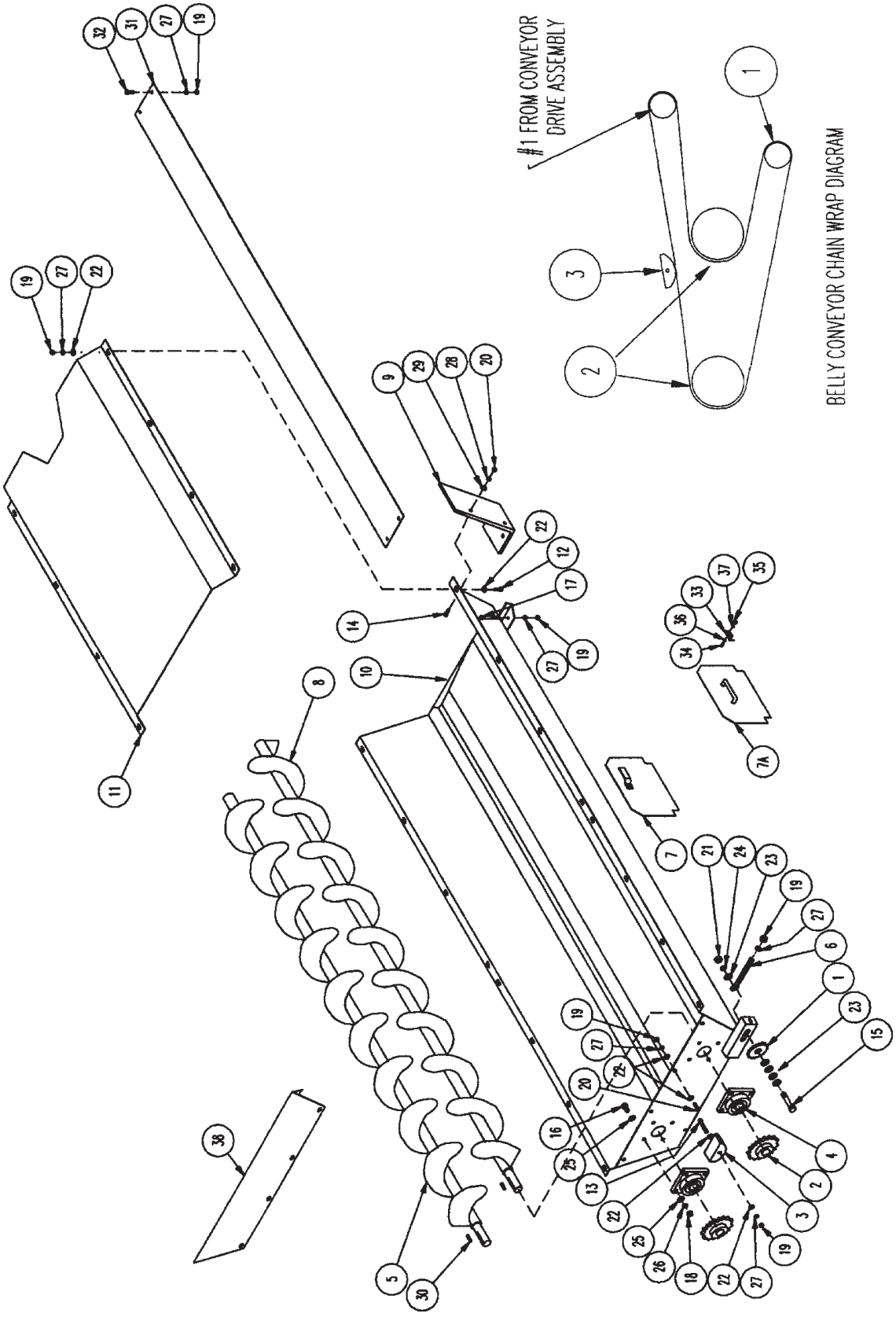
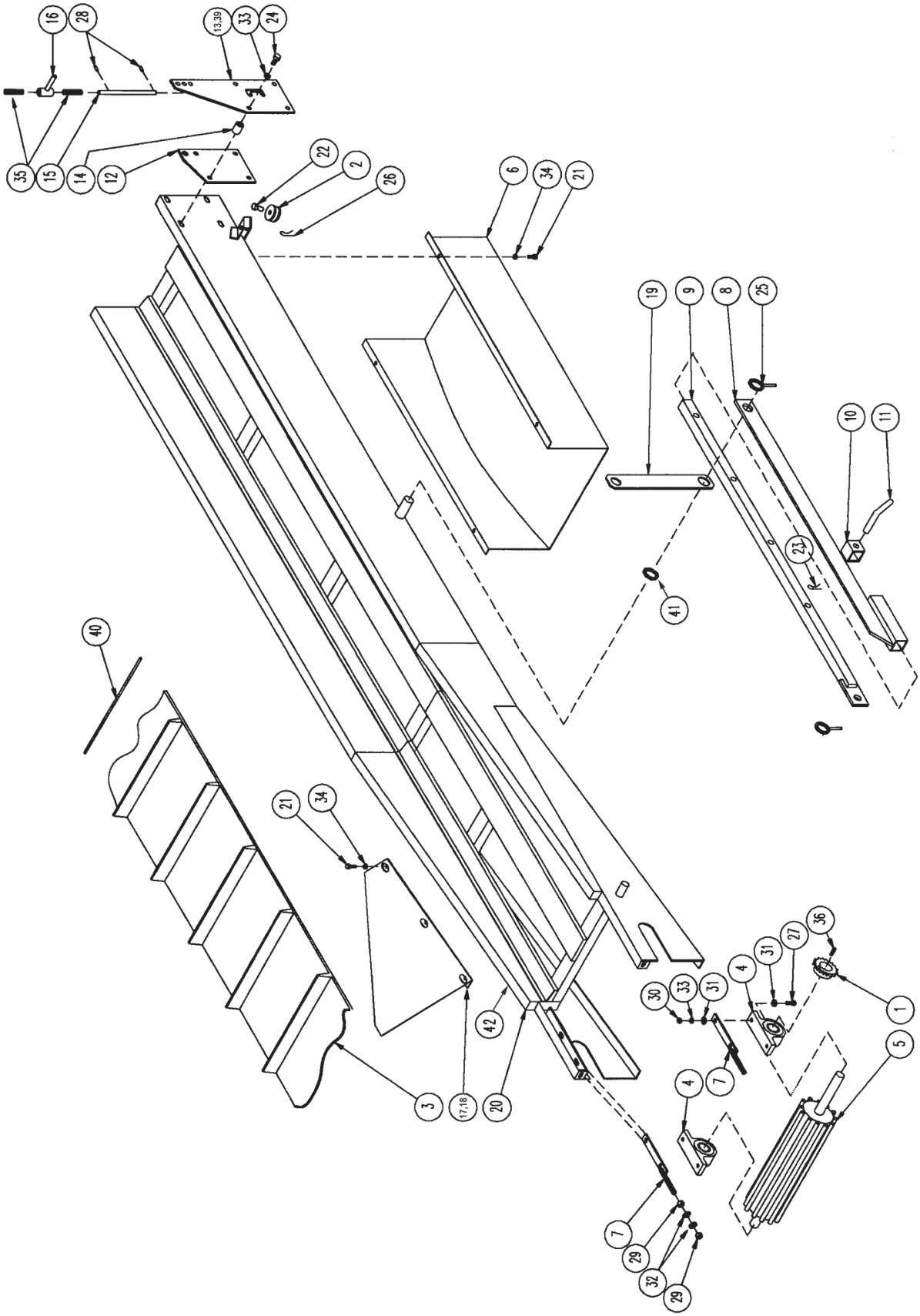
ITEM	PART	QTY.	PART DESCRIPTION
	4500585		**DR\CNVYR\ASSY\SUB**
1	1000042	1	SPKT\50\15\1\1/4KW\HRN
2	1000128	1	SPKT\60\B\15\1\1/4KW
3	1100059	1	CHAIN\50\CL
4	1100060	1	CHAIN\50\OL
5	1100062	1	CHAIN\60\CL
6	1100105	1	CHAIN\60\35
7	1100151	1	CHAIN\50\153
8	1400033	1	SHVE\B-2\9.0\2BK90H
9	1400204	1	PULY\IDLER\DBL\312
10	1400503	1	BUSH\H\1
11	1600009	2	V-BELT\B\60
12	2000310	1	BRG\FLG\CAST\1\2BOLT
13	2000503	3	BRG\PB\1
14	3100187	1	PRAIRIE GEAR BOX 1:1
15	3600091	2	SINGLE U-JOINT 1”TO1”RD#6
16	3600138	1	#6 DOUBLE U-JOINT COMPLETE
17	4501015	1	SH\DR\1X66
19	4501016	1	SH\DR\1X27
20	4500584	1	SHFT\RD\CR\1X12
21	4501017	1	BRKT\GRBX\DRIVE\CNVYR
22	4800003	4	BOLT\HEX\3/8X1
23	4800034	8	BOLT\HEX\3/8X1-1/2
24	4800135	1	BOLT\HEX\1/2X3-1/2
25	4900001	1	NUT\HEX\1/2\NC
26	4900002	10	NUT\HEX\3/8\NC
27	5000001	14	WASH\FLAT\3/8
28	5000004	5	WASH\FLAT\1/2
29	5000006	1	WASH\LOCK\1/2
30	5000019	14	WASH\LOCK\3/8
31	6200014	9	KEY\SQ\1/4X1-1/4
32	3600008		#6 CROSS &BEARING KIT
33	3600103		#6 RW1” YOKE
34	3600151		#6 DOUBLE YOKE


#1 FROM CONVEYOR DRIVE ASSEMBLY
BELLY CONVEYOR CHAIN WRAP DIAGRAM

ITEM	PART	QTY.	PART DESCRIPTION
1	1000038	1	Spkt\50\17\5/8\Idler
2	1000121	2	Spkt\50\30\1-1/4\1/4\Grip
3	2000016	1	Wood Block Idler
4	2000314	2	4 - 1-1/4 Cast Flng Brg
5	4500003	1	Auger\RH\9x96
6	4500046	1	Brkt\Drive\Idler Adjust Rd
7	4500722	2	Door\Cnvyr\Access for Ser. No. FI3631 to GI3706
7A	4500945	2	Door\Cnvyr\Access for Ser. No. GI3707 and up
8	4500173	1	Auger\LH\9x96
9	4500495	2	Belly Pan Seal
10	4500559	1	Cnvyr\Belly\Bolted
11	4500560	1	Cover\Cnvyr\Belly\BoltedFor Ser. No. up to Gi3756
11	4500955	1	Cover\Cnvyr\Belly\H1000 for Ser. No. GI3757 and up
12	4800003	20	Bolt\Hex\3/8x1
13	4800029	1	Bolt\Hex\3/8x2-1/2
14	4800071	6	Bolt\Hex\5/16x1-1/4
15	4800079	1	Bolt\Hex\5/8x2-1/2
16	4800082	8	Bolt\Hex\1/2x1-1/2
17	4800156	3	Bolt\Hex\3/8x3
18	4900001	8	Nut\Hex\1/2
19	4900002	33	Nut\Hex\3/8
20	4900003	6	Nut\Hex\5/16
21	4900005	1	Nut\Hex\5/8
22	5000001	42	Wash\Flat\3/8
23	5000002	5	Wash\Flat\5/8
24	5000003	1	Wash\Lock5/8
25	5000004	16	Wash\Flat\1/2
26	5000006	8	Wash\Lock\1/2
27	5000019	33	Wash\Lock\3/8
28	5000022	6	Wash\Lock\5/16
29	5000023	6	Wash\Flat\5/16
30	6200014	2	Key\Sq\1/4x1-1/4
31	4500658	2	Sheet\Cnvyr\Wear
32	4800053	8	Bolt\Crg\3/8x1
33	7500656	4	Fastner\snap\McMaster
34	4800574	4	Screw\Rd\Slot\#10x1/2
35	4900072	4	Nut\Hex\#10\NC
36	5000100	4	Wash\Flat\#10
37	5000104	4	Wash\Lock\#10
38	4500954	1	Guide\Matl\Cnvyr\Belly\Fr

Not shown

4500541		Brkt\Belly\Pan\Blk\Tghtr
4501312		Pl\End\Pan\Belly
4501321		Deflr\Matl\Plfrm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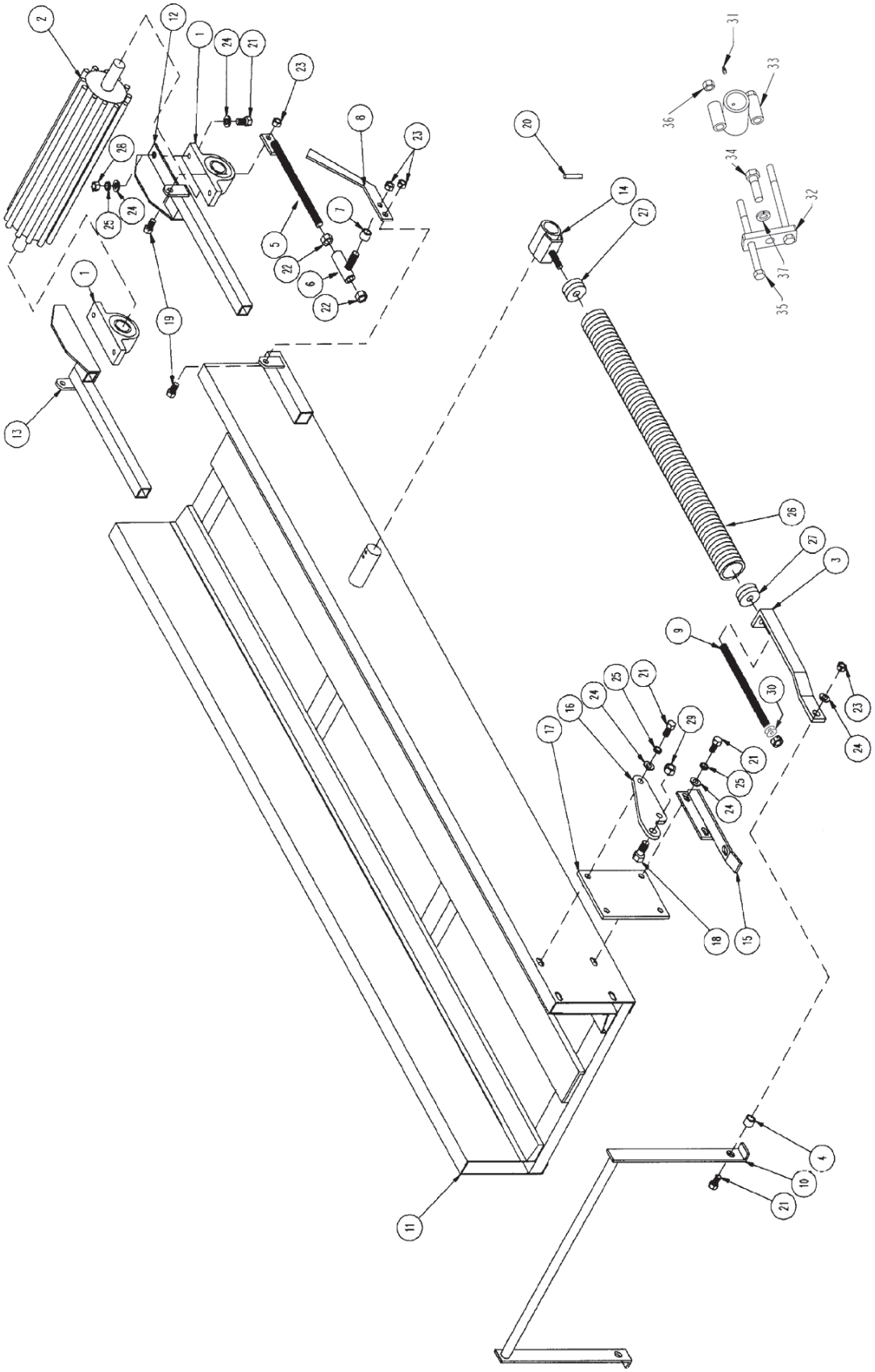
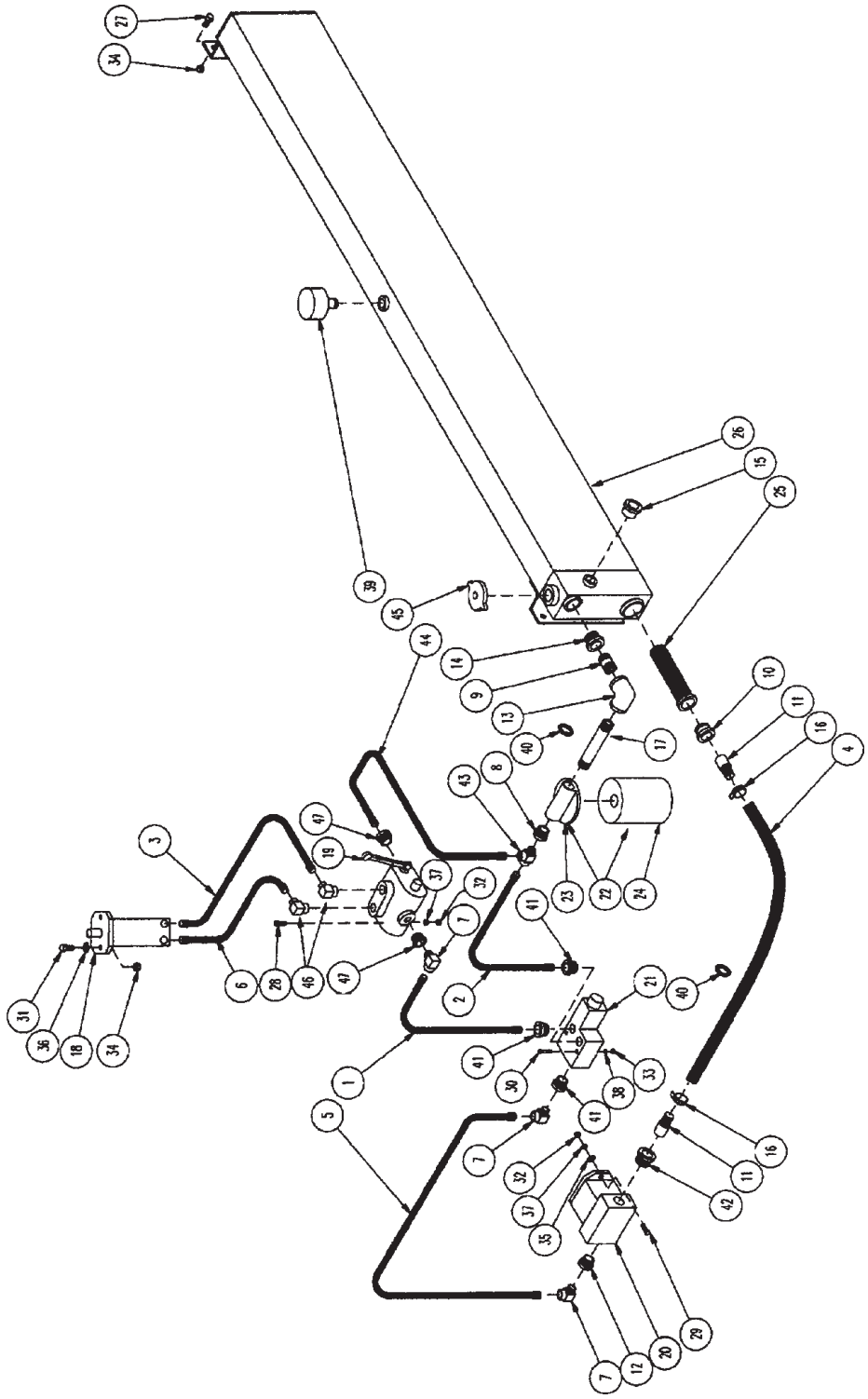
ITEM	PART	QTY.	PART DESCRIPTION
1	1000092	1	Spkt\60\20\1\1/4\Soft
2	1400082	2	Cable Sheave w\Bearings for Ser. No. up to GI3756
3	1700017	1	18x39-4Full Cleats CVB
4	2000507	2	Brg\Pillow Block\1-1/8
5	4500941	1	Rllr\Drive\Cnvyr\Dschg\6x18
6	4500159	1	Guide\Cnvyr\Belt\Bottom
7	4500180	2	Tightener Bolt Lower
8	4500382	2	Brkt\Cnvyr\Saftey Bar for Ser. No. up to GI3756
9	4500381	2	Guide\Cnvyr\Saftey Bar for Ser. No. up to GI3756
10	4500383	2	Latch\Cnvyr\Saftey for Ser. No. up to GI3756
11	4500384	2	Pin\Cnvyr\Saftey Bar for Ser. No. up to GI3756
12	4500647	2	Plate\Cnvyr\Hinge\1/4x6x7-7/8
13	4500648	1	Plate\Cnvyr\Latch\LH
14	4500649	8	Tube\Cnvyr\Latch\1x.512
15	4500650	2	Pin\Cnvyr\Latch\1/2x9-1/8
16	4500651	2	Hdl\Cnvyr\Latch
17	4500956	1	Guide\Matl\Cnvyr\LH\14x24x12GA
18	4500957	1	Guide\Matl\Cnvyr\RH\14x24x12GA
19	4500654	2	Flat\Cnvyr\Transport
20	4500655	1	Frame\Cnvyr\Disch\Lower
21	4800003	10	Bolt\Hex\3/8x1
22	4800026	2	Pin\Slv\5/8x2\w/Key for Ser. No. up to GI3756
23	4800056	2	Pin\Hair\3/16x3(#6) for Ser. No. up to GI3756
24	4800068	8	Bolt\Hex\1/2x3
25	4800076	4	Pin\Klik\5/16
26	4800123	2	Key\Cotter\1/8x1-1/2 for Ser. No. up to GI3756
27	4800114	4	Bolt\Hex\1/2x2
28	4800313	4	Pin\Rolled\3/16x3/4\Pltd
29	4900001	4	Nut\Hex\1/2
30	4900001	4	Nut\Hex\1/2
31	5000004	8	Wash\Flat\1/2
32	5000004	4	Wash\Flat\1/2
33	5000006	12	Wash\Lock\1/2
34	5000019	10	Wash\Lock\3/8
35	6100002	4	Spr\.072x.687x2-1/8
36	6200005	1	Key\Sq\1/4x1-1/2
37	4800146	2	Bolt\Hex\3/8x2
38	4900023	2	Nut\TopLock\3/8
39	4500675	1	Plate\Cnvyr\Latch\RH
40	1700028	1	Lcng\Cbl\1/8x18\Wire
40	1700052		Lcng\Cbl\1/8x18\Nylon
41	2000805	2	Cllr\Shft\1-1/4\W/Set
42	4900082	6	Nut\Insert\3/8\.027x.150g
	4500928		Cnvyr\Disch\Complete (includes upper discharge conveyor) without Belt
Not Shown			
	1700055		LCNG\ALGTR#125\W/STPLS\18



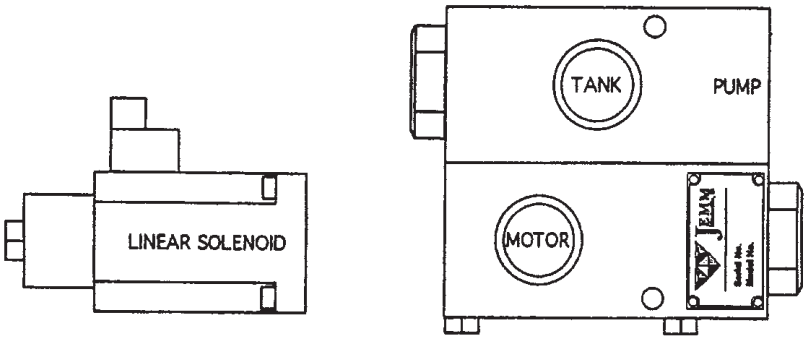
ITEM	PART	QTY.	PART DESCRIPTION
1	2000507	2	Brg\PillowBlock\1-1/8
2	4500942	1	Rllr\Idler\Cnvyr\Dschrg\6x18
3	4500196	2	Arm\Cnvyr\Spring
4	4500201	2	Tube\Cnvyr\3/4x1/2x3/4
5	4500375	2	Bolt\Cnvyr\Tension Adj
6	4500376	2	Hinge\Cnvyr\Tension Adj
7	4500377	2	Tube\Cnvyr\Tension Adj
8	4500676	2	Handle\Cnvyr\Tension Adj
9	4500380	2	Bolt\Spring Adj\5/8x11
10	4500639	1	Guide\Cnvyr\Belt\26
11	4500640	1	Frame\Cnvyr\Disch\Upper
12	4500641	1	Brkt\Cnvyr\Brg\LH
13	4500642	1	Brkt\Cnvyr\Brg\RH
14	4500643	2	Brkt\Cnvyr\Spring - replaced by items 31-37
15	4500644	1	Brkt\Cnvyr\Latch\L.H.
15A	4500783	1	Brkt\Cnvyr\Latch\R.H.
16	4500645	2	Brkt\Cnvyr\Hinge
17	4500646	2	Plate\Cnvyr\Hinge\3/8x6x7
18	4800106	2	Bolt\Hex\5/8x1-1/2
19	4800018	4	Bolt\Hex\1/2x1-1/4
20	4800022	2	Pin\Roll\3/8x2
21	4800178	14	Bolt\Hex\1/2x1-3/4
22	4900005	4	Nut\Hex\5/8
23	4900014	8	Nut\Toplock\1/2
24	5000004	18	Wash\Flat\1/2
25	5000006	12	Wash\Lock\1/2
26	6100047	2	Spring\1-1/2x33-1/2
27	7500113	4	Screw Plug
28	4900001	4	Nut\Hex\1/2
29	4900012	4	Nut\Tplck\5/8
30	5000002	4	Wash\Flat\5/8
31	3800082	2	Ftg\Lub\1/4nfxzrk\Adp
32	4501453	2	Plate\Blt\Sprg\Cnvyr
33	4501455	2	Bracket\Cnvyr\Sprg includes 3800082
34	4800010	2	Bolt\Hex\5/8x2
35	4800235	4	Bolt\Hex\1/2x6-1/2
36	4900014	4	Nut\Tplck\1/2\Nc
37	5000003	2	Wash\Lock\5/8



ITEM	PART	QTY.	PART DESCRIPTION
1	3700091	1	Hose\Hyd\1/2x22\SW-SO
2	3700110	1	Hose\Hyd\1/2x20\SW-SO
3	3700230	1	Hose\Hyd\1/2x32\SW\Oring
4	3700236	1	Hose\Hyd\1x31
5	3700328	1	Hose\Hyd\1/2x28\SW-SO
6	3700329	1	Hose\Hyd\1/2x29\SW-Oring
7	3800008	3	1/2 90Deg Street Elbow
8	3800010	1	3/4x1/2 Bushing
9	3800015	1	Nipple\3/4x2
10	3800022	1	Bushing\1-1/4x1
11	3800056	2	Nipple\King\1
12	3800115	1	7/8 str O/R x 1/2 Pipe
13	3800035	1	Elbow\90 Deg\3/4
14	3800131	1	Bushing\1x3/4
15	3800137	1	3/4 Site Glass
16	3800143	2	Hose Clamp\1-1/2\T-Bolt
17	3800034	1	Nipple\3/4x7-1/2
18	3900005	1	m-2000 14.9CI Orbit Motor
19	SEE NOTE*		
19	4000035	1	1 Spool Valve Pipe Thread w/Detent S.N. up to GI3756
19	4000095	1	1 Spool Valve O-Ring Threadw/Detent S.N. GI3757 and up
20	4200025	1	Eaton Pump RH 15 Gallon
21	4300065	1	Valve\Servo\15gpm\12vdc
22	4400006	1	Filter Complete F4E
23	4400004	1	Filter Base F4E
24	4400005	1	Filter Element F4E
25	4400007	1	Strainer
26	4500580	1	Tank\Oil\Bolted
27	4800018	6	Bolt\Hex\1/2x1-1/4
28	4800034	3	Bolt\Hex\3/8x1-1/2
29	4800098	2	Bolt\Hex\3/8x1-1/4
30	4800101	2	Bolt\Hex\1/4x2-1/2
31	4800114	2	Bolt\Hex\1/2x2
32	4900002	5	Nut\Hex\3/8
33	4900009	2	Nut\Hex\1/4
34	4900014	8	Nut\TopLock\1/2
35	5000001	2	Wash\Flat\3/8
36	5000004	2	Wash\Flat\1/2
37	5000019	5	Wash\Lock\3/8
38	5000024	2	Wash\Lock\1/4
39	3800253	1	Breather\3/4NPT
40	7500360	2	Grommet 2857 1-3/4x1/4
41	3800119	3	Ftg\1-1/16morx1/2fp\Adpt
42	3800012	1	Ftg\1-5/16morx1fp\Adpt
43	3800161	1	1/2 Male Run Tee
44	3700018	1	Hose\Hyd\1/2x18\SW-SO
45	7501030	1	Oil Cap\Unvented
46	3800008	2	1/2 90Deg Street Elbow S.N. up to GI3756
46	3800048	2	Ftg\3/4morx1/2fp\90d\St;El S.N. GI3757 and up
47	3800010	2	3/4x1/2 Bushing S.N. up to GI3756
47	3800119	2	Ftg\1-1/16morx1/2fp\adpt S.N. GI3757 and up

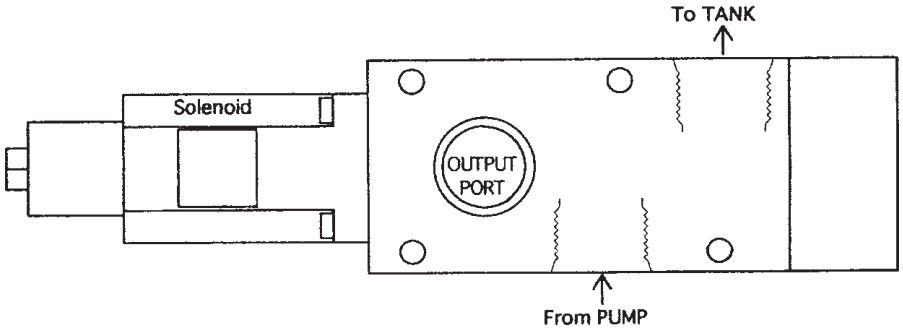
*NOTE – If replacing valve #19, check fittings 46 & 47. Valve 4000095 requires O-Ring fittings 3800048 and 3800119.

CV93



Valve 4300030

CV98



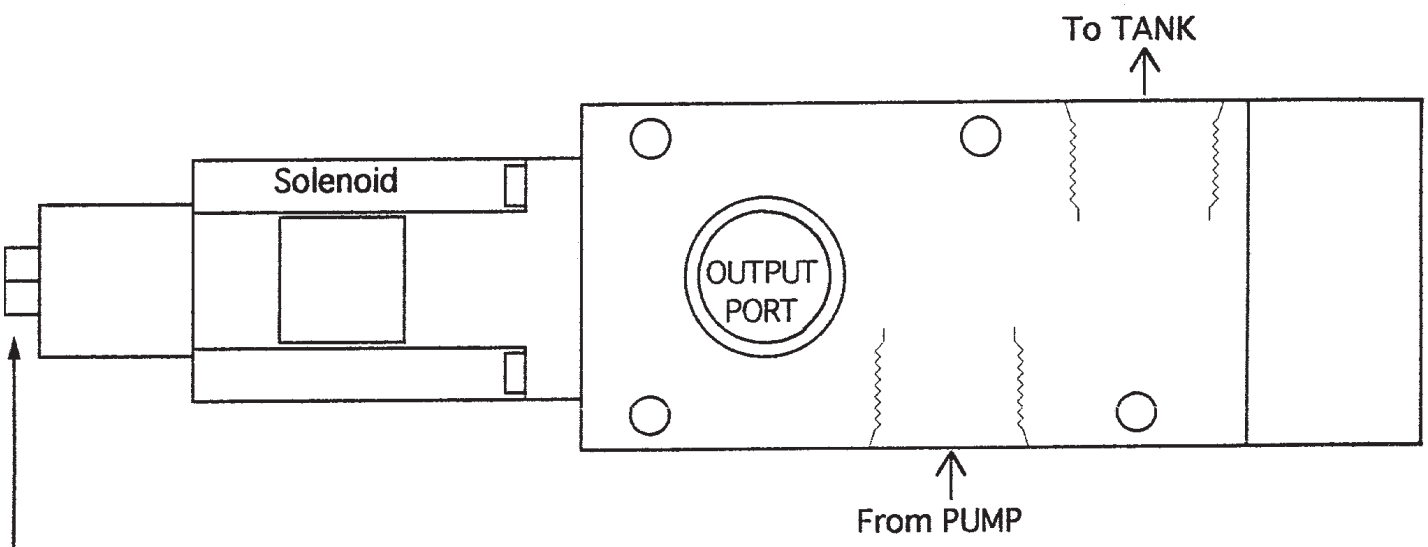
Valve 4300065

PART	QTY.	PART DESCRIPTION
		CV93
4300030	1	HYD. ELECTRIC SOLENOID VALVE 12V 20GPM
		CV98
4300065		VALVE\SERVO\15GPM\12VDC
4300010		SOLENOID\HYD VALVE\12V, SEE NOTES BELOW

NOTE: THE DIFFERENCE BETWEEN THE 12 VOLT AND 24 VOLT SOLENOID IS LISTED ON THE SERIAL NUMBER PLATES. THE SOLENOIDS ARE ELWOOD 160261--xx6 or 160261-xx9. THE 6 IS A 12 VOLT SOLENOID, THE 9 IS A 24 VOLT SOLENOID. ALSO, 12 OR 24 ARE STAMPED ON THE NEWEST SERIAL NUMBER PLATES. 12 VOLT SOLENOID RESISTANCE IS 8 TO 12 OHMS, 24 VOLT RESISTANCE IS 38-44 OHMS

NOTE: 15 GPM IS STANDARD FLOW RATE. ANY VALVES THAT ARE NOT 15 GPM ARE TO BE STAMPED IN METAL OF THE VALVE CASING NEXT TO THE SERIAL NUMBER INDICATING THE FLOW RATE, E.G. 25 INDICATES 25 GPM.

4800648	SCR\CAP\ALN\10-24X1
4800650	SCR\CAP\ALN\10-24X2-1/2



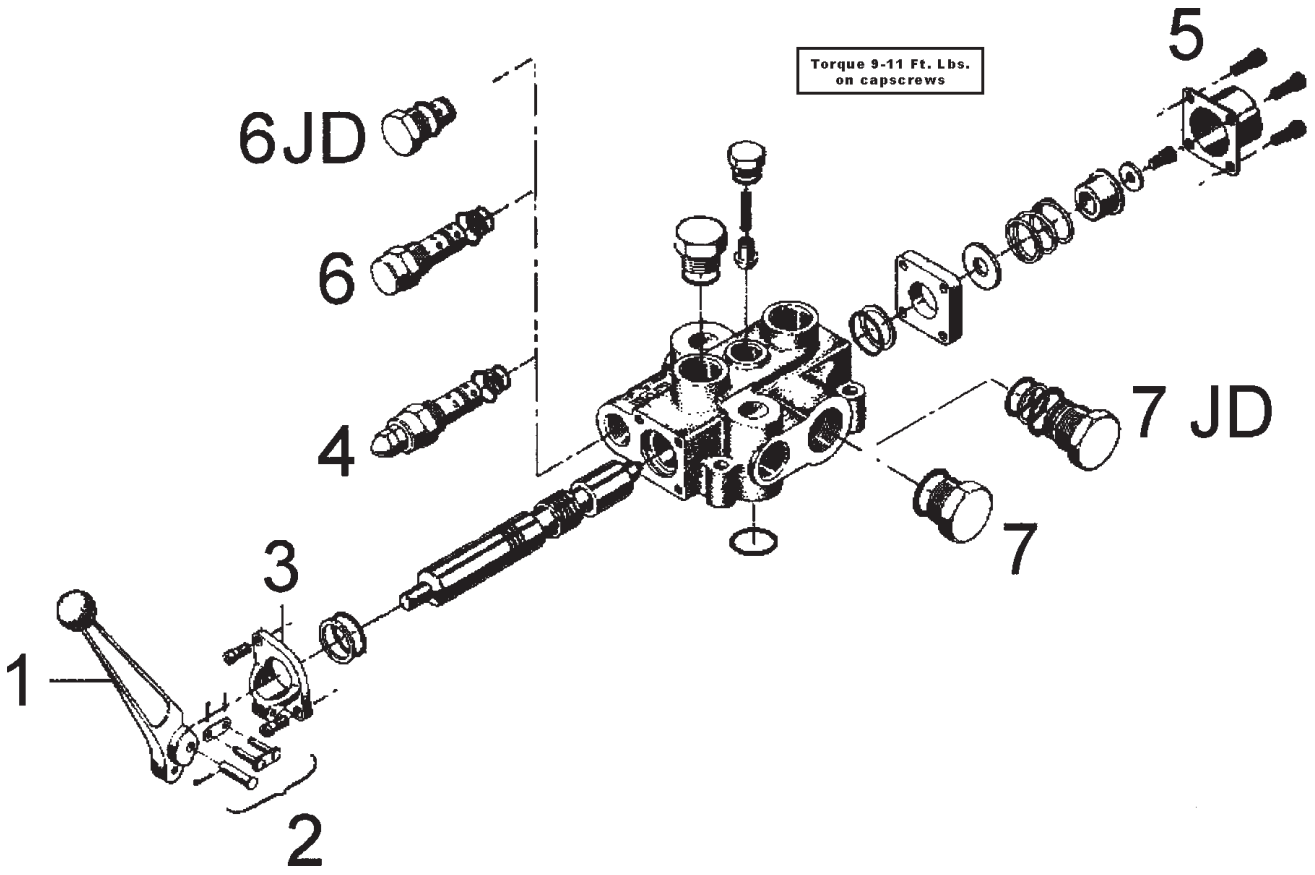
Starting Point/Manual Override Adjustment

The starting point is preset to 0 GPM. If any further adjustment is required; 1- Loosen jam nut. 2- Turn the adjusting screw clockwise to increase the flow or counter clockwise to decrease flow. 3- Gently tighten the jam nut.

WARNING- If the adjusting screw is turned to far counter clockwise, the valve will behave erratically or stop working all together. Turn the adjusting screw no more than 1/16 to 1/8 of a turn counter clockwise after flow has stopped.

For manual operation when electrical control fails, turn the adjusting screw clockwise until the desired constant flow is obtain.

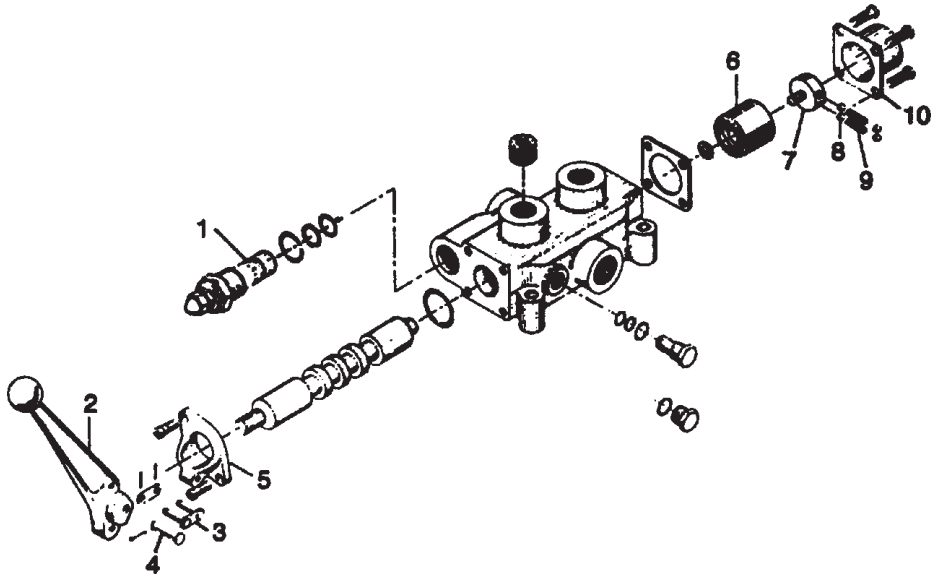
MODEL BA - one spool

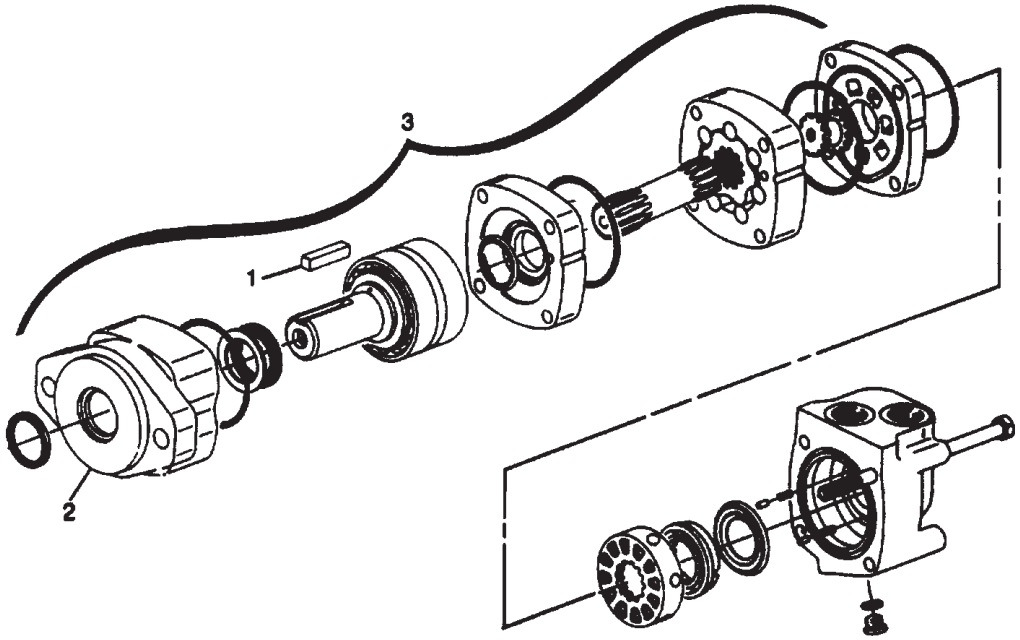


ITEM	PART	PART DESCRIPTION
1	4000001	HANDLE/HYD/VALVE BANK
2	4000002	CONNECTOR LINK W/PIN
3	4000004	BRKT/HYD/VALVE BANK
4	4000006	VALVE\ADJ\RELIEF
5	4000029	(END CAP -HYD VALVE VALVE)
	4000106	VALVE\KIT\SPRING\CENTER
	7501013	SEAL KIT
	3700713	KIT\FTG\CNVRT\CL\4000128 CONTAINS 6JD & 7JD
OLD STYLE VALVE		
6	4000065	NON ADJ.VALVE 1R003710180
7	NA	NO HOLE DRILLED IN VALVE BODY
NEW STYLE VALVE		
6	4000065	NON ADJ.VALVE 1R003710180
6JD	4000192	PLUG\NO-RELIEF\CR 1R0035
7	4000007	OPEN CENTER PLUG-HYD. VALVE
7JD	4000008	CLOSED CENTER PLUG-HYD. VALVE

NOTE: 4000008 AND 4000192 TO BE USED WITH SERIES 60 AND OLDER JOHN DEERE TRACTORS. OLDER MACHINES MUST HAVE VALVE REPLACED WITH ONE THAT HAS HOLE DRILLED FOR ITEM 7. (FOR MORE INFORMATION SEE SECTION 3.2.9 ON PAGE 26)

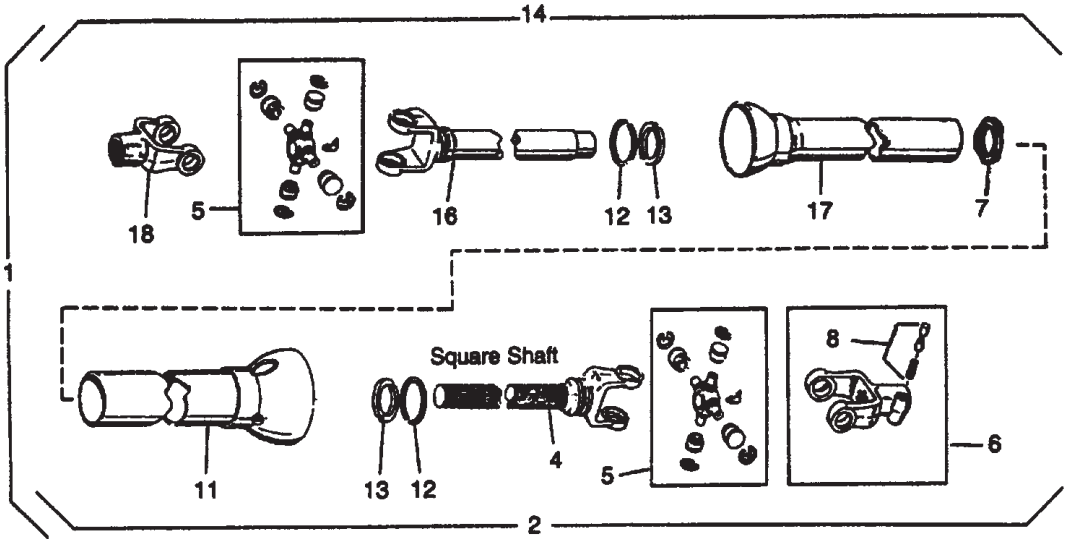
ITEM	PART	QTY.	PART DESCRIPTION
1	4000006	1	New Adj. Relief Valve
2	4000001	1	Valve Handle
3	4000002	1	Connector Links Handle
4	4000003	1	Pin Handle w/Key
5	4000004	1	Handle Bracket
6	4000025	1	Detent Sleeve
7	4000026	1	Detent Retainer (Screw)
8	4000027	2	Retent Spring
9	4000028	4	Ball (1/4 Steel)
10	4000029	1	End Cap
11	7501013	1	Seal Kit (Not Shown)
12	4000035		Valve Complete, Pipe Thread
12	4000095		VALVE\HYD\1-SPL\W/DETENT\ O-Ring\1800PSI



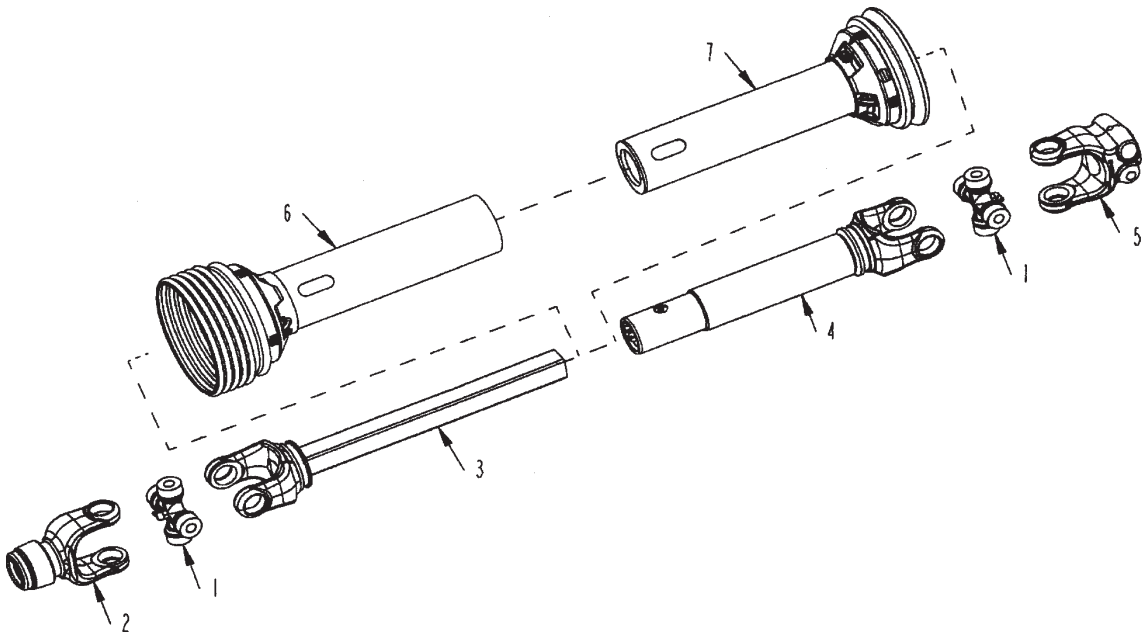


ITEM	PART NO.	QTY.	PART DESCRIPTION
1	6200004	1	5/16 X 1-1/2 Key
2	3900011	1	Flange Mount
3	3900005	1	Complete Orbit Motor-2000 Series 14.9 C.I.
4	7501005	1	Seal Kit Complete 2000 Series
5	3900010		Complete Orbit Motor-2000 Series 24 C.I.(Optional)

ITEM	PART	QTY.	PART DESCRIPTION
1	3600101	1	I-55 Univ. Joint & TelescopingShaftAssembly Comp. w/1-3/8 21-Spline Yoke
1A	3600141		PTO Complete L55 w/1-3/4 20Spline (not shown)
2	3600017	1	Joint & Shaft Half w/Guard, Tractor 1/2 Complete w/1-3/8 21-Spline Yoke
2A	3600100	1	Joint & Shaft Half w/Guard, Tractor Half Complete w\1-3/4 20-Spline Yoke (not shown)
4	3600095	1	Yoke & Shaft
5	3600013	2	Tractor Kit, L-55 Cross & Bearing
6	3600016	1	Yoke Assembly, 1-3/8 21-Spline
6A	3600064	1	Yoke Assembly, 1-3/4 20-Spline (Not Shown)
7	3600096	1	Nylon Centralizer
8	3600094	1	Saf-T-Pin and Spring Kit
11	3600076	1	Female Guard Tube, Outer Shield
12	3600097	2	Bearing Retainer
13	3600098	2	Nylon Bearing
14	3600014	1	Joint & Tube Half w/Guard, Machine Half Complete
16	3600099	1	Yoke & Tube
17	3600015	1	Male Guard Tube-Inner Shield
18	3600012	1	1-3/4 Machine Yoke



ITEM	PART	QTY.	PART DESCRIPTION
	3600474		PTO\COMP\55R\1-3/8-21CLRX1-3/4CLAMP;W/3/8KW
	3600469		PTO\COMP\55R\1-3/4-20QDX1-3/4CLAMP;W/3/8KW\PLASTC
1	3600013	2	CROSS & BEARING KIT 55W
2	3600536	1	YOKE\55\QD\CLR\1-3/4\20SP
	3600532		LOCK\SAFTY;SLID\KIT\1-3/4
2A	3600535	1	YOKE ASSY\55W\1-3/8\21-SP
	3600271		LOCK\SAFTY;SLID\KIT\1-3/8
1,2,3 & 6	3600477	1	JOINT&SHAFT\ASM\W-GRD SET FOR\3600474 (TRACTOR)
1,2A,3 & 6	3600472	1	JOINT&SHAFT\ASM\W-GRD SET FOR\3600469 (TRACTOR)
1,4,5, & 7	3600478	1	JOINT&TUBE\ASM\W-GRD SET FOR 3600474, 469 (MACHINE)
5	3600012	1	MACHINE YOKE 1-3/4" L55 W/KEYWAY
6,7	3600475	1	GUARD\SET\PTO\3600474
			NOT SHOWN
	6500085	1	DECAL\DNGR\ROTATNG;DR-LNE
	6500310	1	DECAL\DNGR\GAURD;MISSING
	3600563	2	NYLON\REPAIR\KIT\PLASTIC

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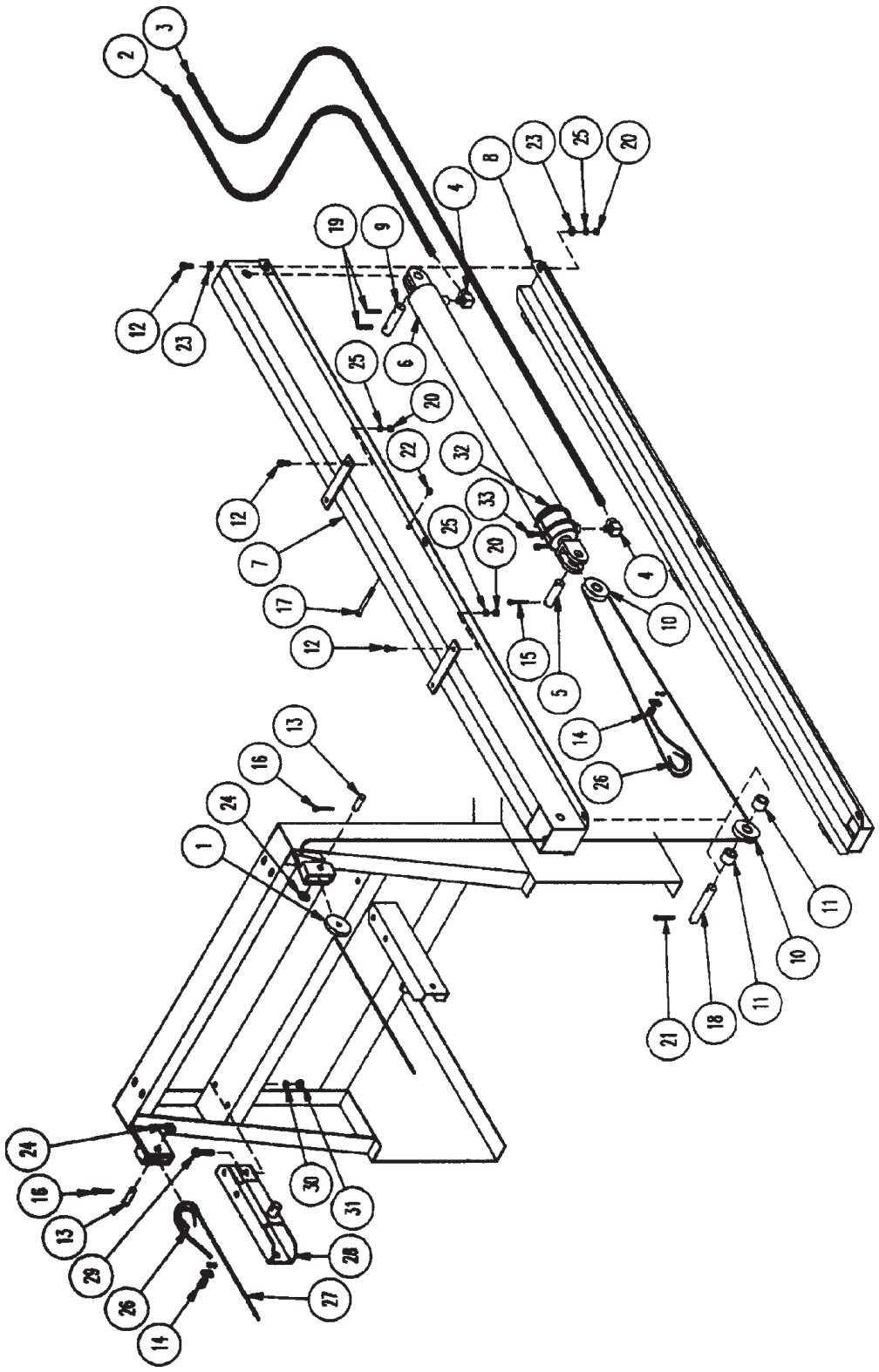
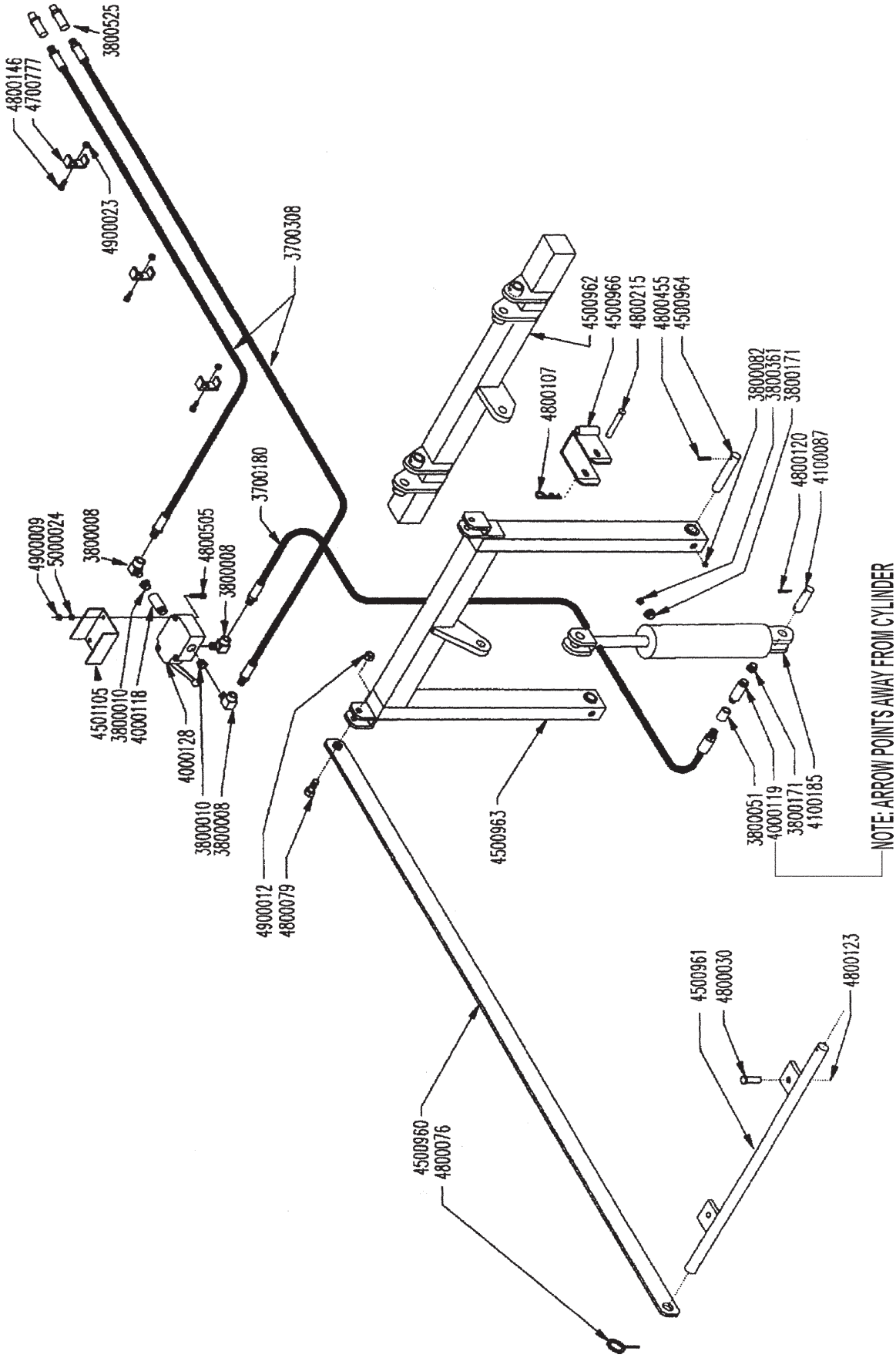


ITEM	PART	QTY.	PART DESCRIPTION
1	1400082	1	Cable Sheave w/Bearings
2	3700023	1	Hose\Hyd\1/2x96
3	3700061	1	Hose\Hyd\1/2x132\SW-SO
4	3800008	2	1/2\90 Deg Street Elbow
5	4100087	1	Pin\Cyl\Std\1x3-1/2
6	4100111	1	Cylinder\3x36\Hyd
7	4500685	1	Brkt\Hyd lift\Cnvyr for Ser. No. 3631-3706
7	4500943	1	Brkt\Hyd lift\Cnvyr for Ser. No. 3707and up
8	4500686	1	Cover\Hyd Lift\ Cnvyr for Ser. No. 3631-3706
8	4500944	1	Cover\Hyd Lift\ Cnvyr for Ser. No. 3707and up
9	4500687	1	Pin\Cyl\Cnvyr Lift\Hyd
10	1400067	2	Sheeve\Cable\Hyd Lift
11	4500743	2	Spcr\Convyr Lift\Hyd
12	4800003	7	Bolt\Hex\3/8x1
13	4800026	2	Pin\Sleeve\5/8x2\W/Key
14	4800027	4	Clamp\Cable\1/4
15	4800120	2	Pin\Cotter\3/16x1-3/4
16	4800123	2	Key\Cotter\1/8x1-1/2
17	4800152	1	Bolt\Hex\3/8x4-1/2
18	4500745	1	Pin\SheeveIRear\Hydlift
19	4800221	2	Pin\Rolled\1/4x2
20	4900002	7	Nut\Hex\3/8
21	4800103	2	Pin\Cotter\1/4x2
22	4900023	1	Nut\Toplock\3/8
23	5000001	6	Washer\Flat\3/8
24	5000002	2	Washer\Flat\5/8
25	5000019	7	Washer\Lock\3/8
26	7500121	2	Cable\Timble\1/4
27	5800309	1	Cable\1/4X32’
28	4500545	2	Brkt\Support\Lower
29	4800007	4	Bolt\Hex\1/2X2
30	5000006	4	Washer\Lock\1/2
31	4900001	4	Nut\Hex\1/2
32	4500748	1	Wrap\Cyl\Lift\Hyd
33	7500616	2	Strap\Tie\IPlstc\5/16x14
Not Shown			
	4500857		Shve\Cable\2\3ODX1.25IDX1


3800525
4800146
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4900023
3700308
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4500966
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4800455
4500964
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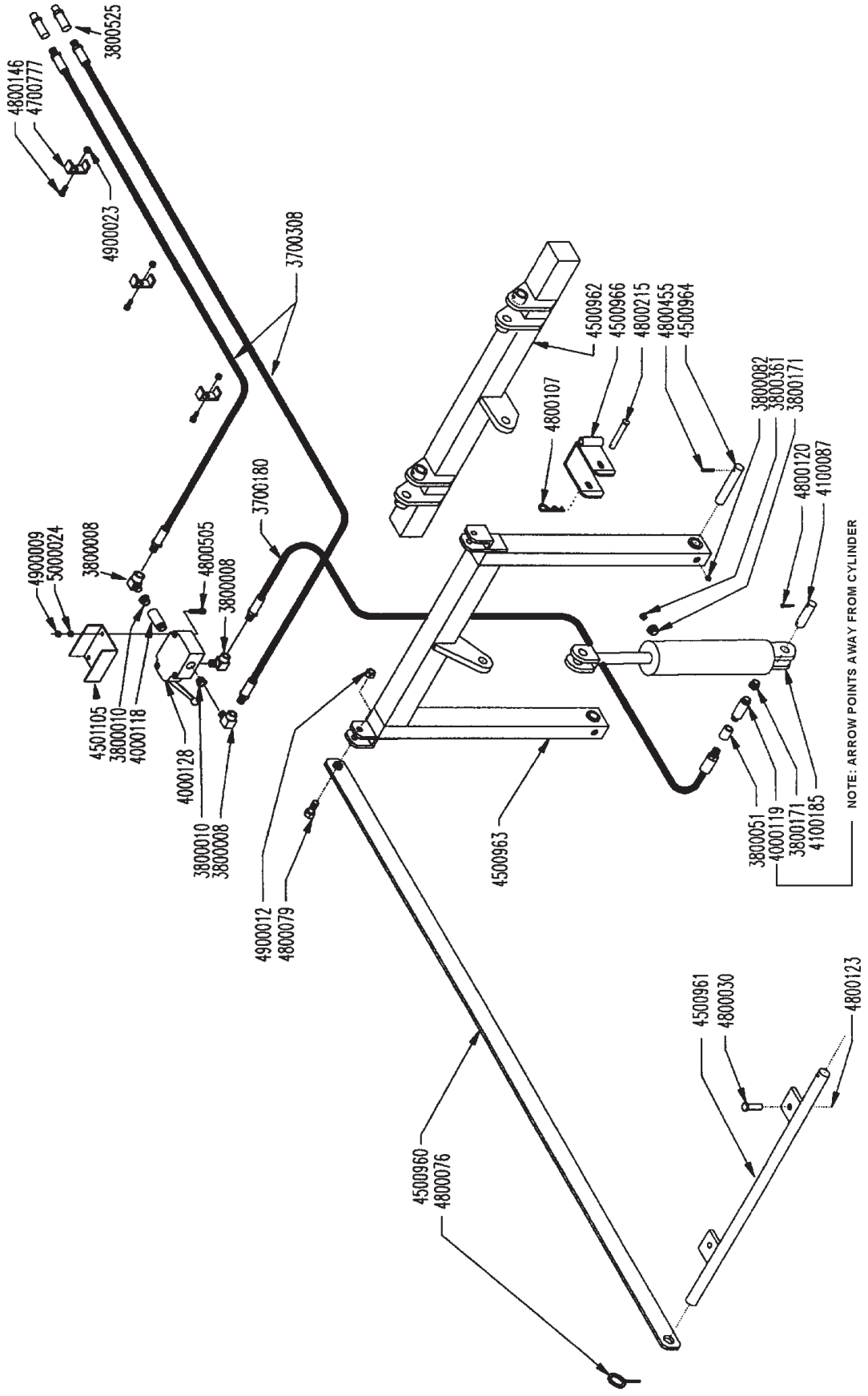
3800361
3800171
4800120
4100087
4900009
5000024
3800008
4800505
3800008
3700180
4501105
3800010
4000118
4000128
3800010
3800008
4900012
4800079
4500963
3800051
4000119
3800171
4100185
NOTE: ARROW POINTS AWAY FROM CYLINDER
4500961
4800030
4800123
4500960
4800076

PART	QTY.	PART DESCRIPTION
3700180	1	HOSE\HYD\1/2X76\SW-SW
3700308	2	HOSE\HYD\1/2X186\SW-SW
3800008	3	FTG\1/2MPX1/2FP\90D\ST;EL
3800010	2	FTG\3/4MPX1/2FP\BUSH
3800051	1	FTG\1/2FP\CPLG
3800082	2	FTG\LUB\1/4NFXZRK\ADPT
3800171	2	FTG\3/4MORX1/2FP/ADPT
3800361	1	FTG\HYD\1/2MP\VENT
3800525	2	FTG\1/2\NPTF\QUICK;CPLR
4000118	1	VALVE\CHECK\3/4X3/4
4000119	1	VALVE\CHECK\VEL\9GPM
4000128	1	VALVE\HYD\1SP\SPRG;CENT\> STARTING JJ03907, CAN ADD CLOSED CENTER PLUG
4100087	2	1 X 3 1/2 CYL. PIN STD
4100185	1	CYL\HYD\3-1/2X8\TIE\>
4500960	2	STRAP\LIFT\CNVYR\DISCH
4500961	1	BRKT\LIFT\CNVYR\DISCH
4500962	1	MOUNT\FRAME\LIFT\DISCH\
4500963	1	FRAME\LIFT\CNVYR\DISCH\
4500964	2	PIN\HINGE\FRM\LIFT\CNVYR(THRU S/N 4021)
4500966	2	MOUNT\REC\TRANSPORT
4501105	1	MNT\VLV\CNVYR\LIFT
4700777	3	CLMP\HOSE\1/2
4800030	2	PIN\CLEVIS\5/8X2
4800076	2	PIN\KLIK\5/16
4800079	2	BOLT\HEX\5/8X2-1/2
4800107	2	PIN\HAIR\1/8 (#9)
4800120	4	PIN\COT\3/16X1-3/4
4800123	2	PIN\COT\1/8X1-1/2
4800146	3	BOLT\HEX\3/8X2
4800215	2	PIN\CLEVIS\3/4X4
4800455	2	PIN\RLLD\1/4X1-1/2(THRU S/N 4021)
4800505	3	BOLT\HEX\1/4X1-1/2\NC
4800546	2	BOLT\HEX\1X5\NC
4900009	3	NUT\HEX\1/4\NC
4900012	2	NUT\TPLCK\5/8\NC
4900023	3	NUT\TPLCK\3/8\NC
4900127	2	NUT\TPLCK\1\NC
5000024	3	WASH\LOCK\1/4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3800171
4800120
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4900009
5000024
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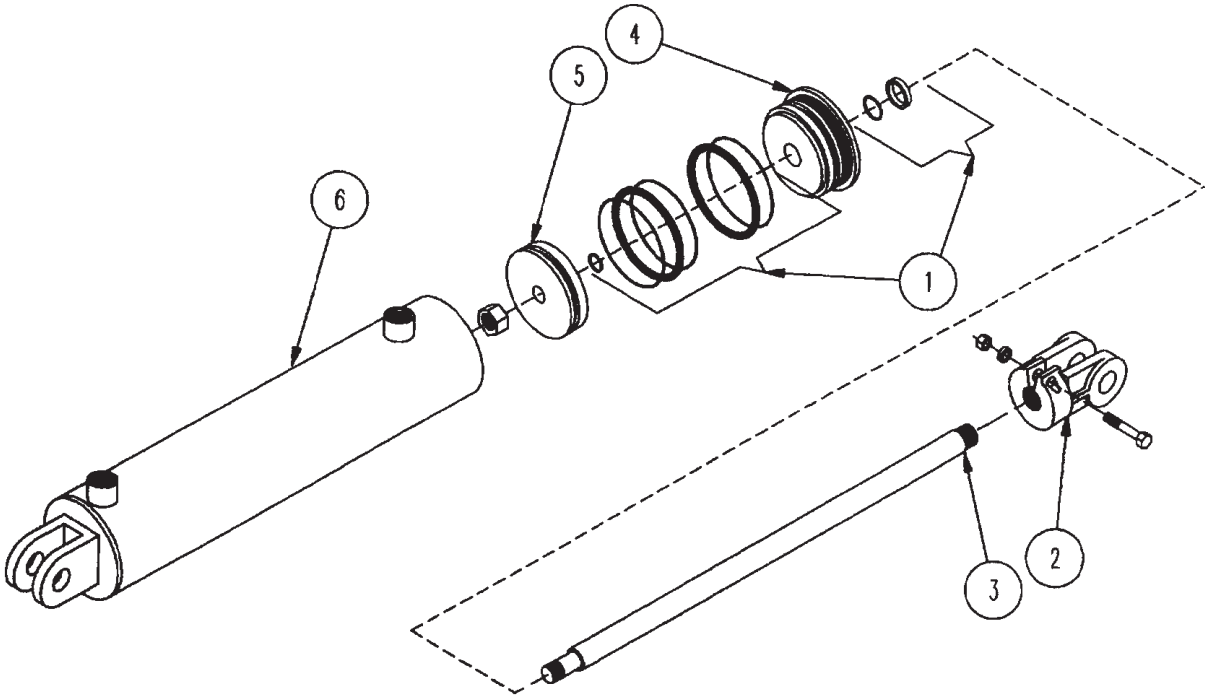
4800505
3800008
3700180
4501105
3800010
4000118
4000128
3800010
3800008
4900012
4800079
4500963
3800051
4000119
3800171
4100185
NOTE: ARROW POINTS AWAY FROM CYLINDER
4500961
4800030
4800123
4500960
4800076

PART	QTY.	PART DESCRIPTION
3700180	1	HOSE\HYD\1/2X76\SW-SW
3700308	2	HOSE\HYD\1/2X186\SW-SW
3800008	3	FTG\1/2MPX1/2FP\90D\ST;EL
3800010	2	FTG\3/4MPX1/2FP\BUSH
3800051	1	FTG\1/2FP\CPLG
3800082	2	FTG\LUB\1/4NFXZRK\ADPT
3800171	2	FTG\3/4MORX1/2FP/ADPT
3800361	1	FTG\HYD\1/2MP\VENT
3800525	2	FTG\1/2\NPTF\QUICK;CPLR
4000118	1	VALVE\CHECK\3/4X3/4
4000119	1	VALVE\CHECK\VEL\9GPM
4000128	1	VALVE\HYD\1SP\SPRG;CENT\> STARTING JJ03907, CAN ADD CLOSED CENTER PLUG
4100087	2	1 X 3 1/2 CYL. PIN STD
4100185	1	CYL\HYD\3-1/2X8\TIE\>
4500960	2	STRAP\LIFT\CNVYR\DISCH
4500961	1	BRKT\LIFT\CNVYR\DISCH
4500962	1	MOUNT\FRAME\LIFT\DISCH\
4500963	1	FRAME\LIFT\CNVYR\DISCH\
4500964	2	PIN\HINGE\FRAME\LIFT\CNVR
4500966	2	MOUNT\REC\TRANSPORT
4501105	1	MNT\VLV\CNVYR\LIFT
4700777	3	CLMP\HOSE\1/2
4800030	2	PIN\CLEVIS\5/8X2
4800076	2	PIN\KLIK\5/16
4800079	2	BOLT\HEX\5/8X2-1/2
4800107	2	PIN\HAIR\1/8 (#9)
4800120	4	PIN\COT\3/16X1-3/4
4800123	2	PIN\COT\1/8X1-1/2
4800146	3	BOLT\HEX\3/8X2
4800215	2	PIN\CLEVIS\3/4X4
4800455	2	PIN\RLLD\1/4X1-1/2
4800505	3	BOLT\HEX\1/4X1-1/2\NC
4900009	3	NUT\HEX\1/4\NC
4900012	2	NUT\TPLCK\5/8\NC
4900023	3	NUT\TPLCK\3/8\NC
5000024	3	WASH\LOCK\1/4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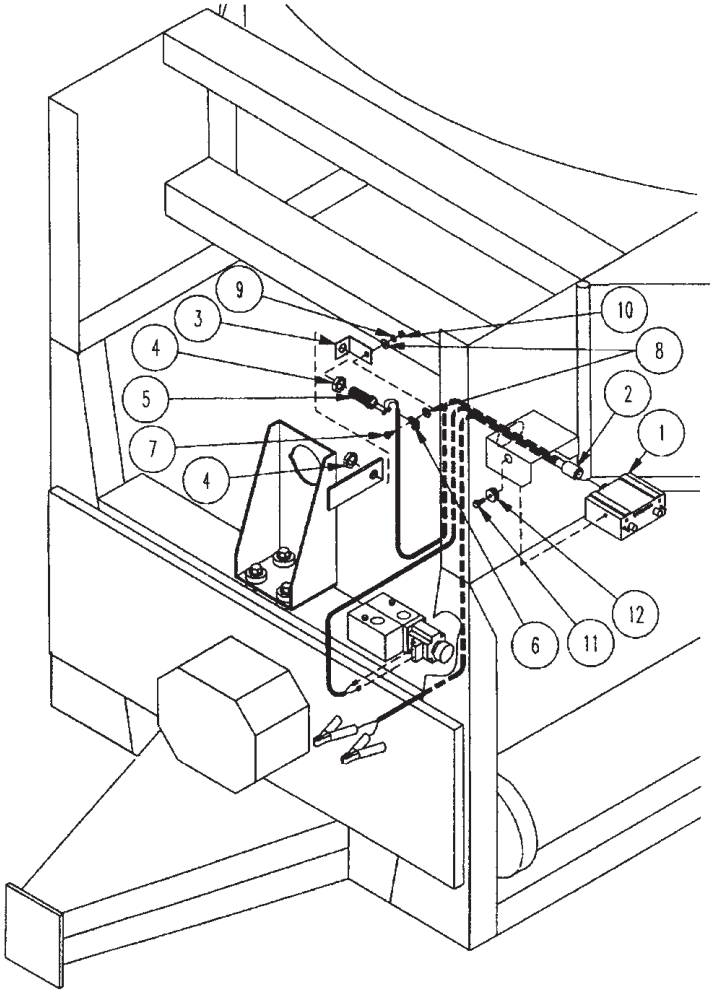
ITEM	PART	QTY.	PART DESCRIPTION
1	4100103	1	Cyl\Hyd\Kit\Seal\3\1-1/2” Rod
2	4100132	1	Cyl\Hyd\Yoke
3	4100174	1	Cyl\Hyd\Rod\1-1/2\3x36
4	4100102	1	Cyl\Hyd\Gland\1-1/2” Rod
5	4100104	1	Cyl\Hyd\Piston\3”
6	4100111	1	Cyl\Hyd\3x36

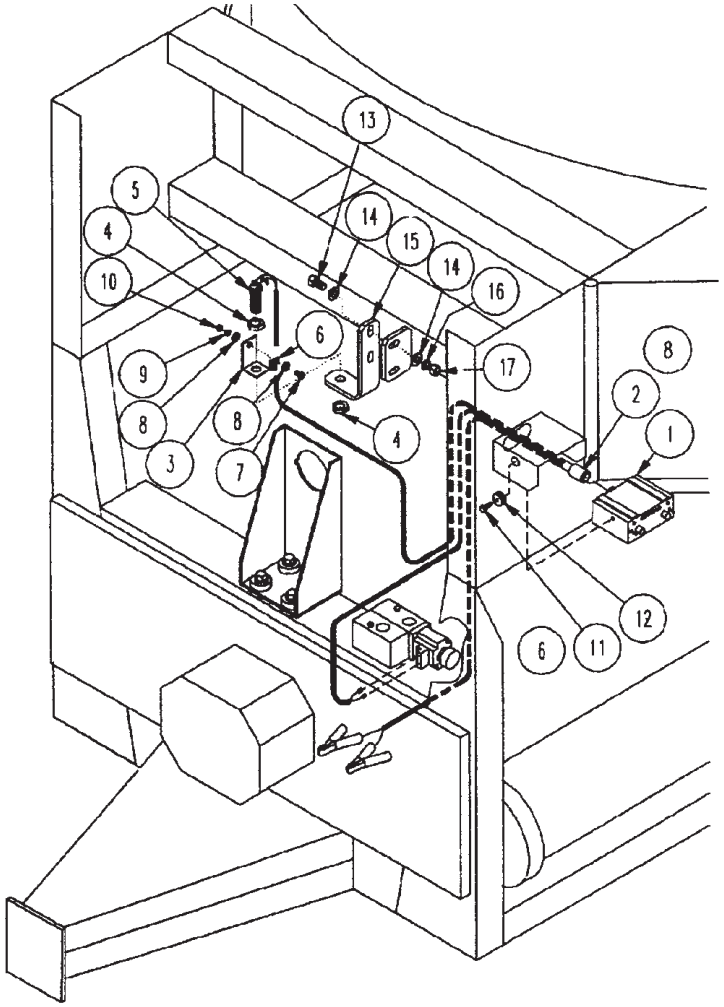
FOR CONVEYOR LIFT (FOR SN. GI3757 AND UP)

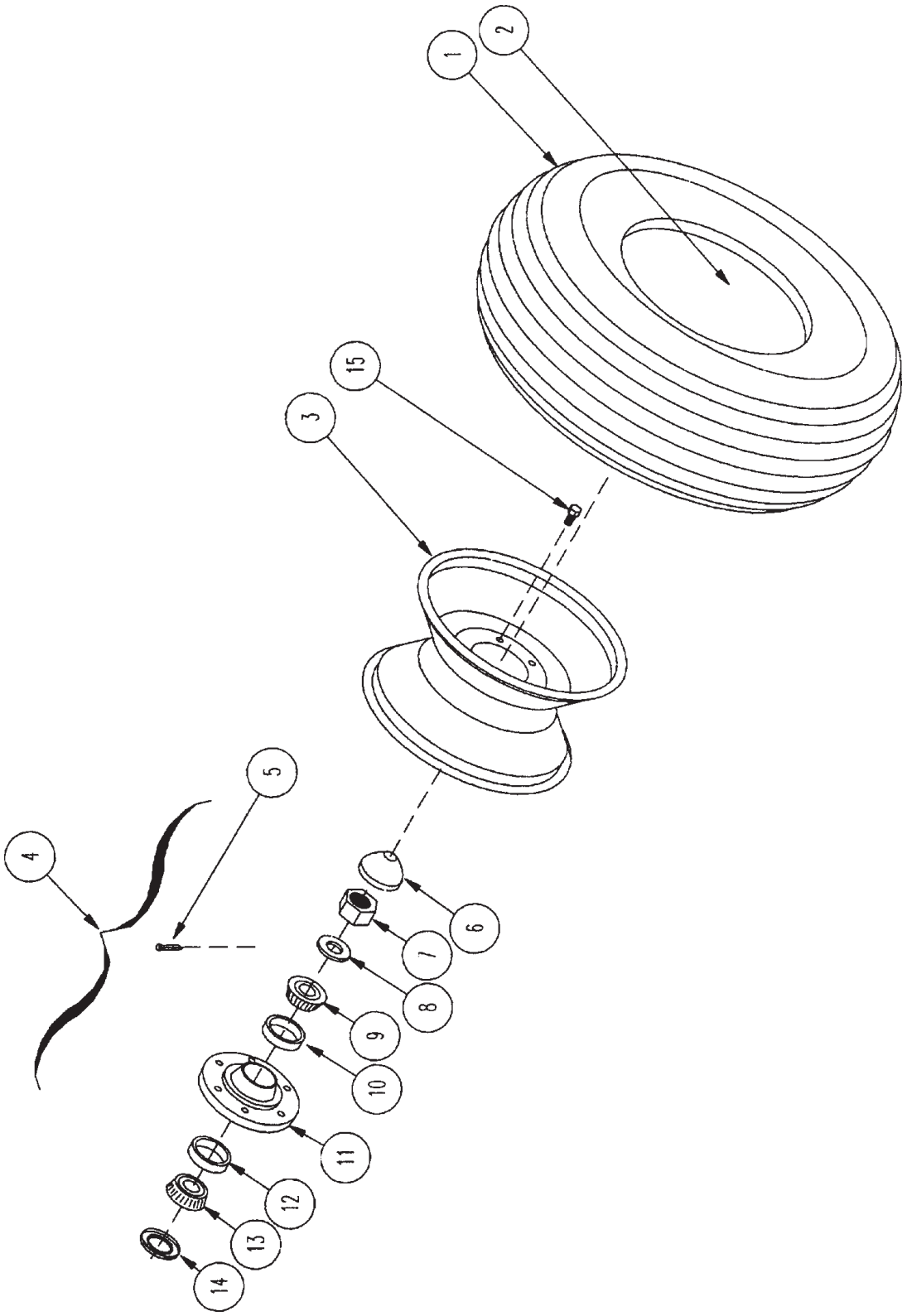
1	4100251	1	KIT\SEAL\CYL\HYD\3-1/2” CYL\1-3/8” ROD
	4100287	1	CAP\END\BUTT\CYL\HYD\3-1/2\>
6	4100185	1	CYL\HYD\3-1/2X8\TIE\3/4 O-RING PORTS



ITEM	PART NO.	QTY.	PART DESCRIPTION
1	4300034	1	New Style Contrl Box RCB93
2	4300007	1	Wiring Harness
3	4500205	1	Brkt\Sensor
4	4900057	2	Nut\Jam\3/4\NF
5	4300088	1	Magnetic Sensor
6	7500219	1	Clamp\Wire\1/4
7	4800154	1	SCR\RD\Slot\1/4x1/2\NC
8	5000035	2	Wash\Flat\1/4
9	5000024	1	Wash\Lock\1/4
10	4900009	1	Nut\Hex\1/4\NC
11	4800301	2	SCR\FLG\SERR\1/4x3/4\NC
12	7500124	2	Grommet\Rubber\2757
	4300038		REBUILT CONTR0L BOX RCB93

ITEM	PART	QTY.	PART DESCRIPTION
1	4300034	1	New Style Contrl Box RCB93
2	4300007	1	Wiring Harness
3	4500205	1	Brkt\Sensor
4	4900057	2	Nut\Jam\3/4\NF
5	4300088	1	Magnetic Sensor
6	7500219	1	Clamp\Wire\1/4
7	4800154	1	SCR\RD\Slot\1/4x1/2\NC
8	5000035	2	Wash\Flat\1/4
9	5000024	1	Wash\Lock\1/4
10	4900009	1	Nut\Hex\1/4\NC
11	4800301	2	SCR\FLG\SERR\1/4x3/4\NC
12	7500124	2	Grommet\Rubber\2757
13	4800082	2	Bolt\Hex\1/2x1-1/2
14	5000004	4	Wash\Flat\1/2
15	4500994	1	Brkt\Sensor\Governor\H1000
16	5000006	2	Wash\Lock\1/2
17	4900001	2	Nut\Hex\1/2\NC
	4300038		Rebuilt Contr0l Box Rcb93

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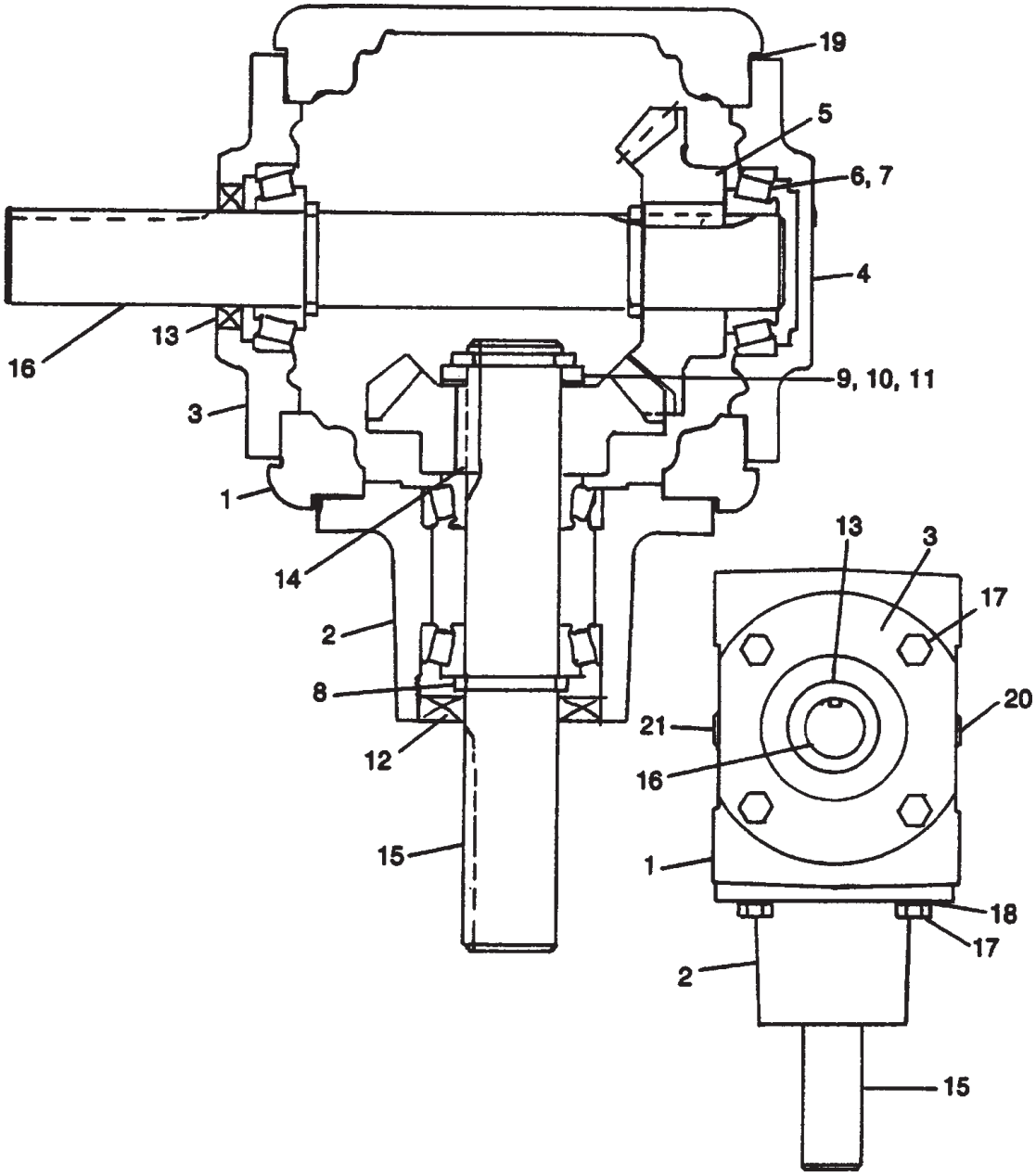
ITEM	PART	QTY.	PART DESCRIPTION
1	2600013	2	9.5X14-8Ply Tire
2	2600406	2	9.5x14-15 Tube
3	2600601	2	14x8 Wheel
1&3	2600825	2	Whl\Assy\9.5x14x8ply\Imp\Tire&Wheel
4	2900069	2	Hub\Wheel Hub(631)Complete
5	3000005	2	5/32x1-1/2 Cotter Key
6	2900013	1	Hub Cap\Wheel Hub(DC-13)
7	4900054	1	Nut\Spindle\7/8-14\NF
8	5000055	1	7/8 Washer\Spindle
9	2900018	1	Cone Inner\Wheel Hub(67048
10	2900004	1	Cup Inner\Wheel Hub(67010
11			NA
12	2900006	1	Cup Outer\Wheel Hub(501310
13	2900007	1	Cone Outer\Wheel Hub(501346
14	2900008	1	Seal\Wheel Hub(631)(18823
15	2900010	12	Wheel Bolt\Wheel Hub
Highway Transport Option			
1	2600041		Tire\31x10.5x15\Load;C
1&3	2600823	2	Whl\Assy\31x10.5x15\Mounted And Balanced
Not shown			
	8100634		Spindle\2x11-7/8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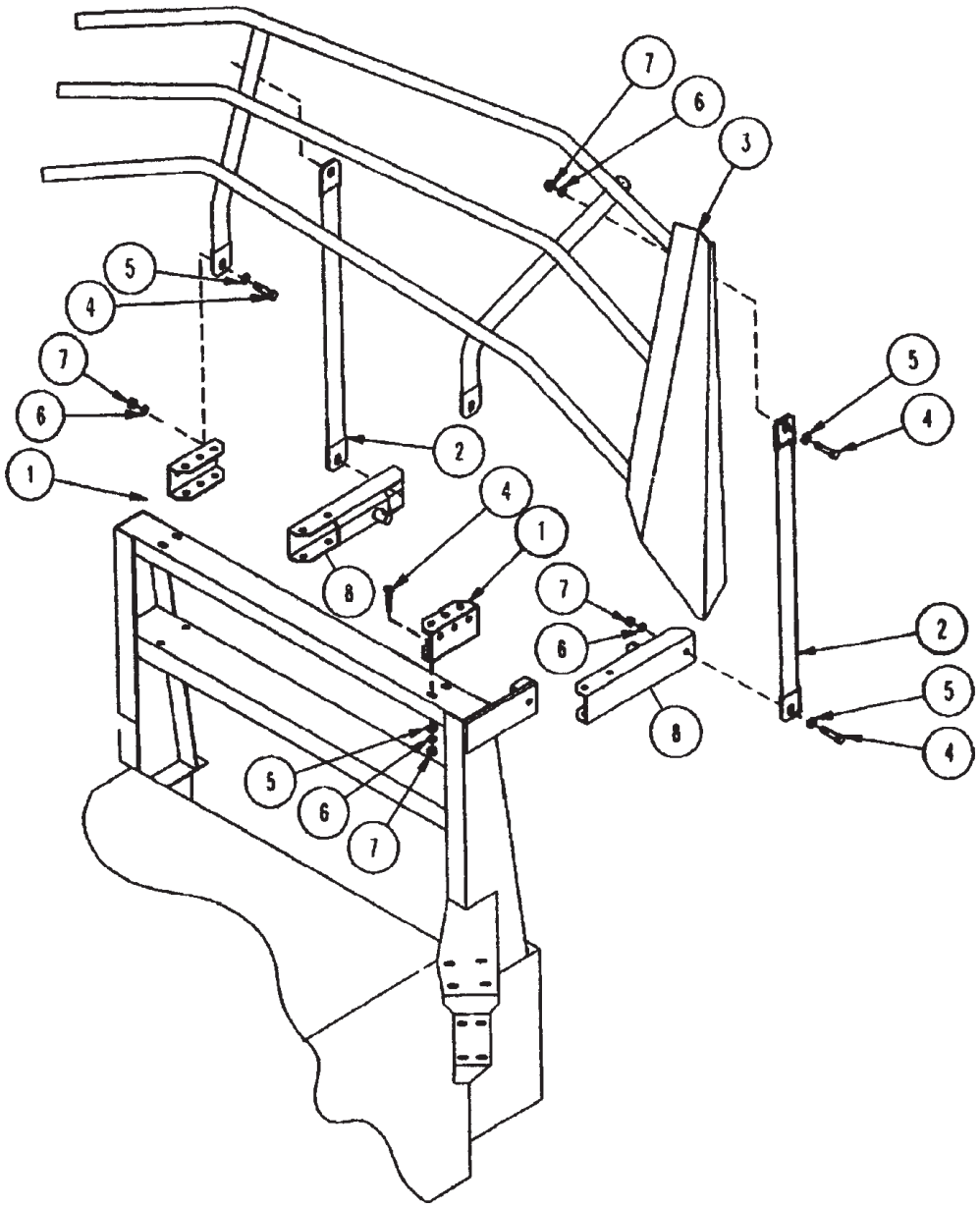
ITEM	PART	QTY.	PART DESCRIPTION
1	3100322	1	Open Center Case
2	3100323	1	Quill 1.98 Dia. Seal
3	3100324	1	Open Cover
4	3100325	1	Closed Cover
5	3100326	2	19T Gear
6	2900032	4	Cone
7	2900033	4	Cup
8	3100327	3	Snap Ring
9	3100335	Var.	Shim. .007 1809 OG
10	3100328	1	1 ID x 1-1/2 OD x .130 Washer
11	3100329	1	Snap Ring
12	3100309	1	1 x 1.98 Seal
13	3100313	1	1 x 1-1/2 Seal
14	3100330	2	1/4 x 1/4 x .93 Key
15	3100331	1	Pinion Shaft
16	3100332	1	Cross Shaft
17	3100301	12	5/16 x 7/8 Bolt
18	3100333	12	5/16 Lock Washer
19	3100336	Var.	Shim .020
	3100337	Var.	Shim .007
	3100338	Var.	Shim .005
20	3100318	1	1/4 NPT Plug
21	3100319	1	1/4 NPT Vent
22	3100334	1	Shaft (to Reverse Gear Box)
23	3100187	1	Gear Box Complete-Prairie Gear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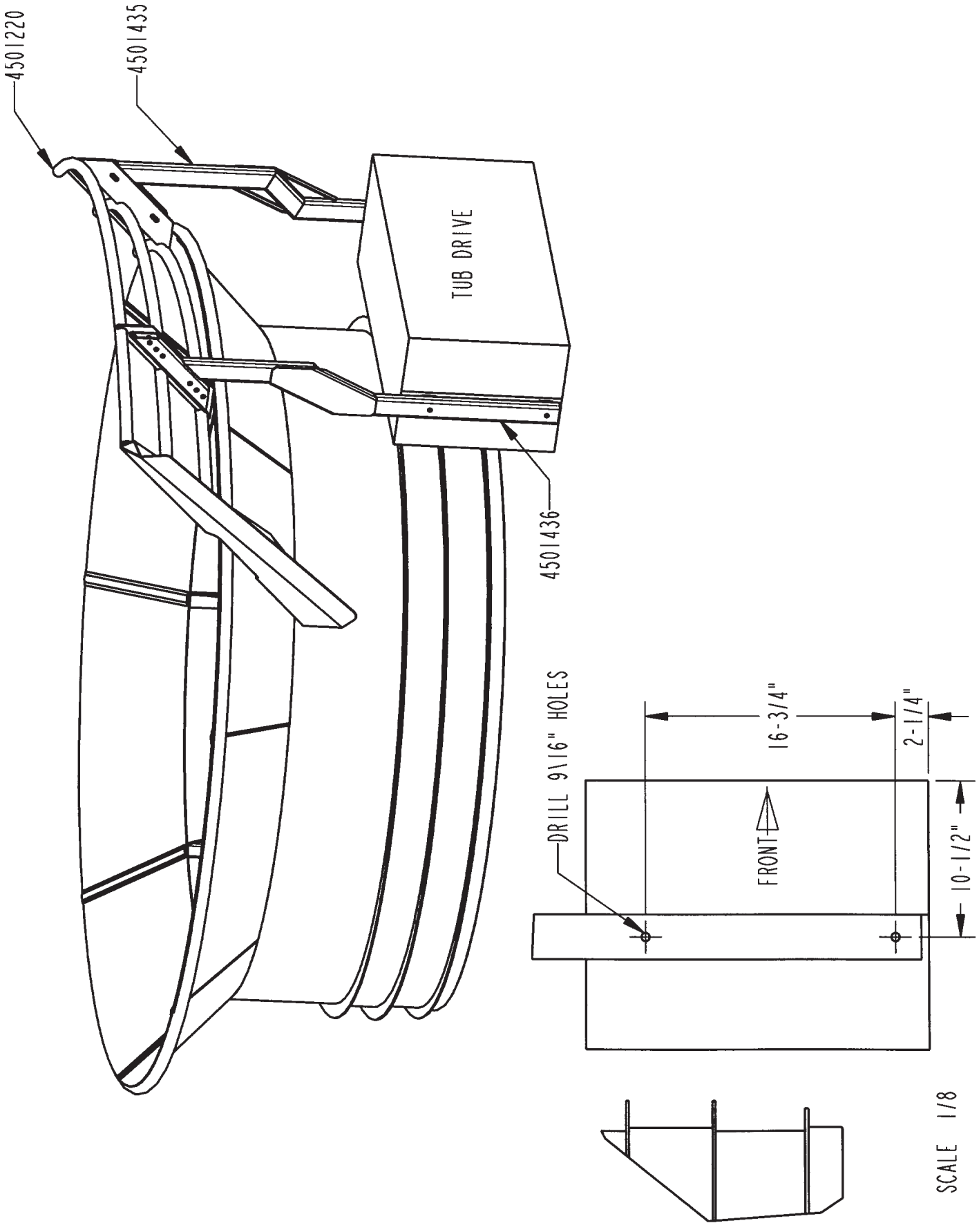
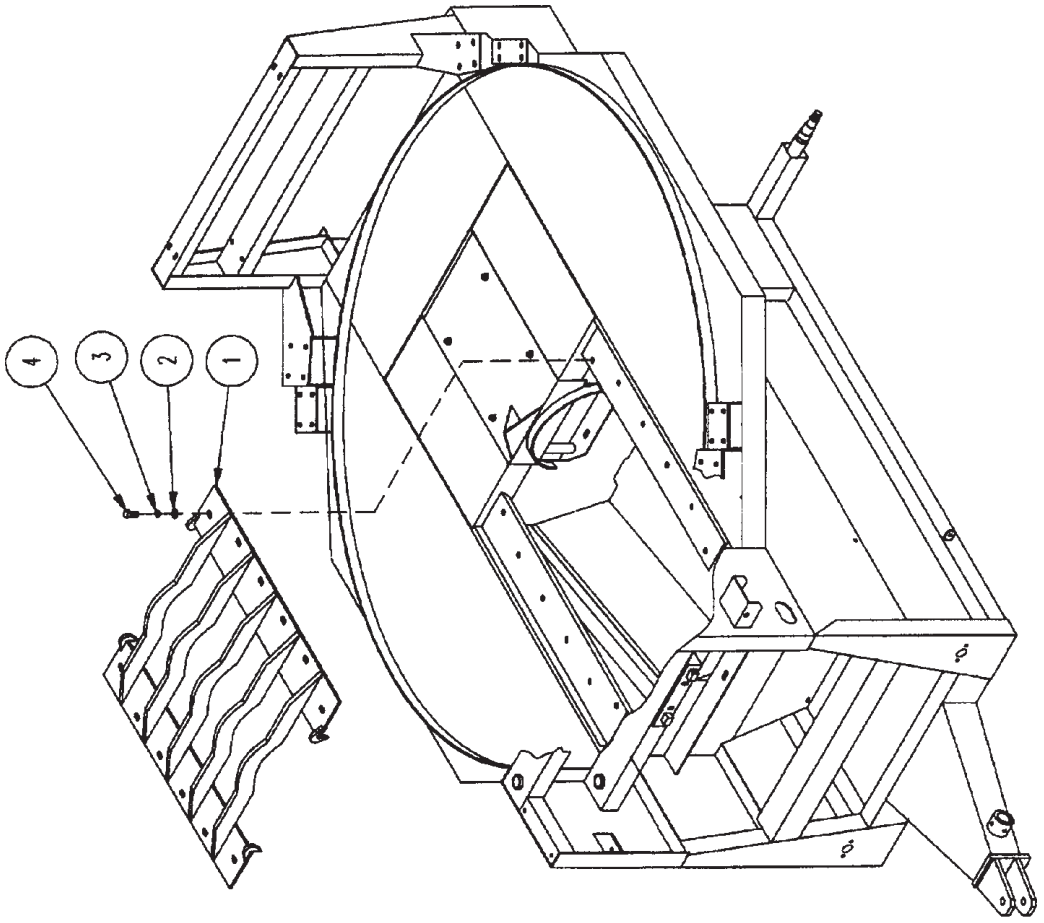
ITEM	PART	QTY.	PART DESCRIPTION
	4500670		**Option Hay Guide Complete**
1	4500920	2	Bracket \Hay Guide
2	4500671	2	Pipe\Hay Guide\36” Support
3	4500098	1	Hay Guide
4	4800114	10	Bolt\Hex\1/2x2
5	5000004	10	Wash\Flat\1/2
6	5000006	10	Wash\Lock\1/2
7	4900001	10	Nut\Hex\1/2
8	4500545	2	Bracket\Support\Lower\Conveyor\H1000

FRONT HAY GUIDE ASSEMBLY (OPTION)



PART	QTY.	PART DESCRIPTION
4501439		**GUIDE\HAY\KIT\H1000\2000**
4501220	1	FRM\GUIDE\HAY\H1000&H1100
4501435	1	BRKT\GUIDE\HAY\LH\H1000
4501436	1	BRKT\GUIDE\HAY\RH\H1000
4800068	4	BOLT\HEX\1/2X3
4800070	4	BOLT\HEX\1/2X2-1/2
4900001	8	NUT\HEX\1/2\NC
5000004	8	WASH\FLAT\1/2
5000006	8	WASH\LOCK\1/2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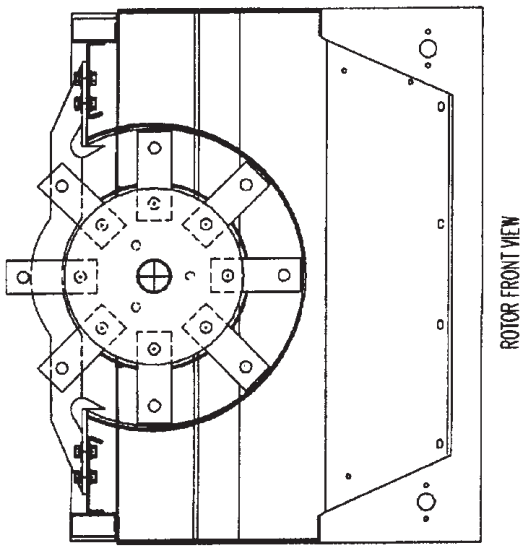
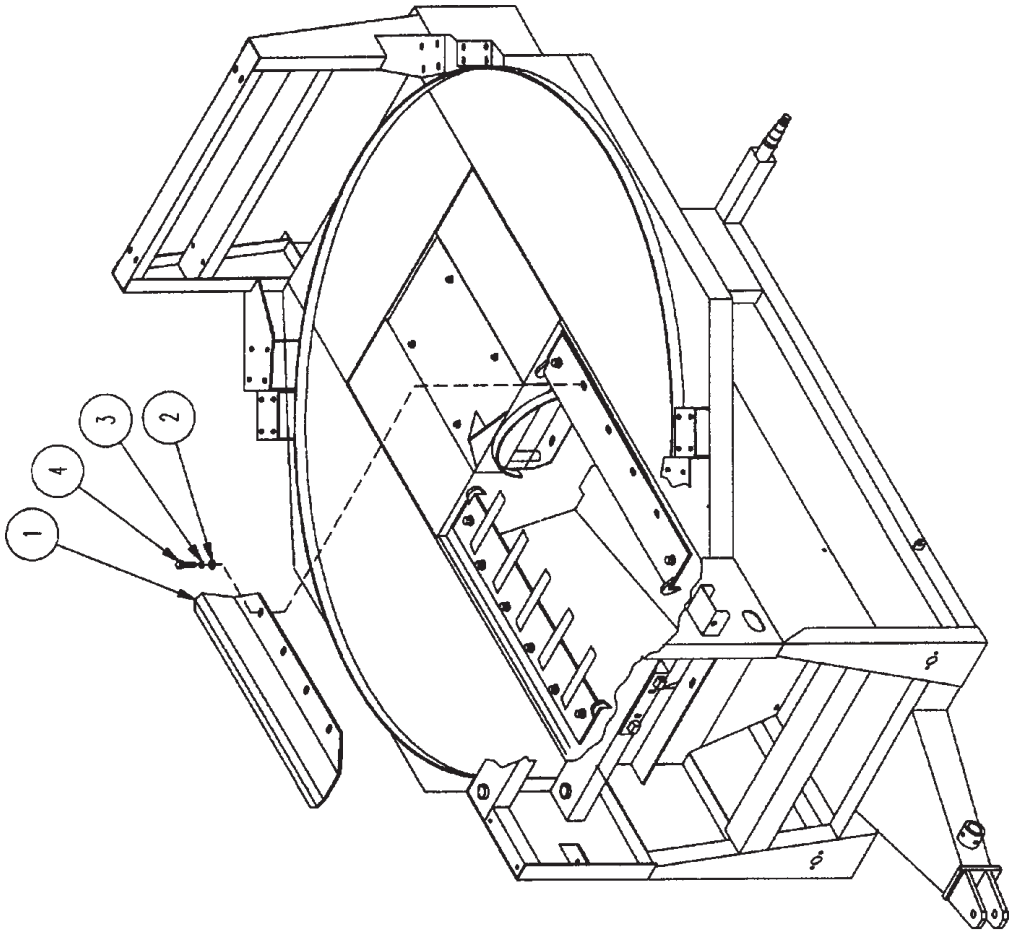

ROTOR FRONT VIEW

MILL GRATE (OPTION)

ITEM	PART	QTY.	PART DESCRIPTION
1	4500667	1	Grate\Mill
2	5000002	12	Wash\Flat\5/8
3	5000003	12	Wash\Lock\5/8
4	4800010	12	Bolt\Hex\5/8x2
	4500726		Grate\Mill\Kit
	4501282		Plate\Geyser\Slotted\H1000 - For use with the mill grate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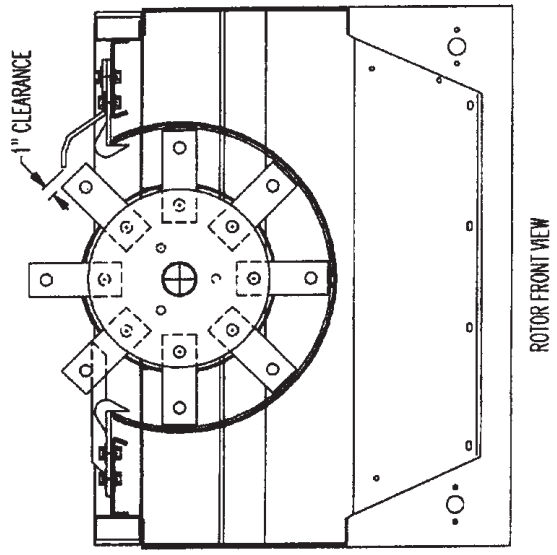
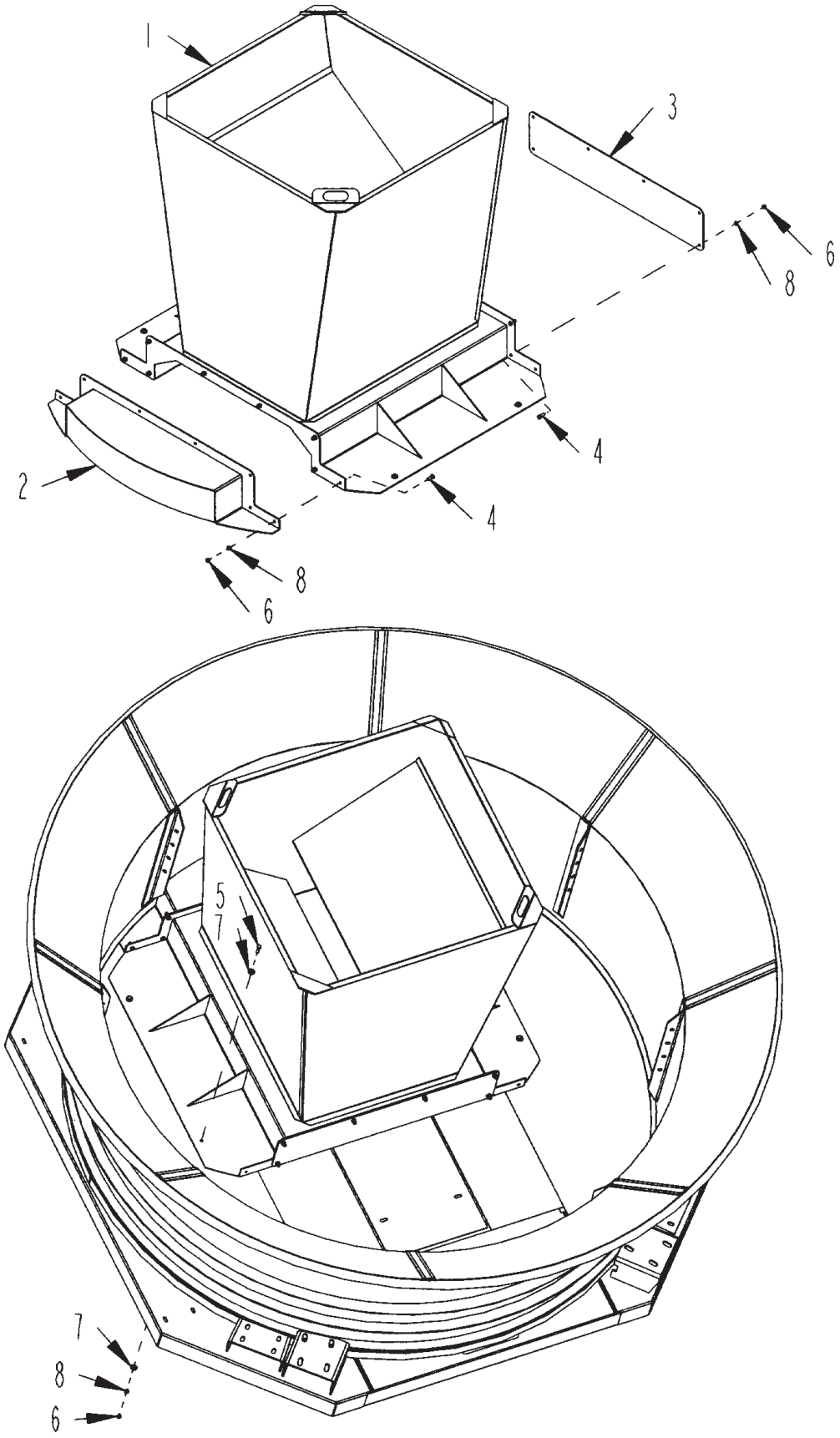

1" CLEARANCE
ROTOR FRONT VIEW

GEYSER PLATE (OPTION)

ITEM	PART	QTY.	PART DESCRIPTION
	4500673		**PI\Geyser\H1000\Kit**
1	4500672	1	Plate\Geyser\H1000
2	5000002	4	Wash\Flat\5/8
3	5000003	4	Wash\Lock\5/8
4	4800010	4	Bolt\Hex\5/8x2
1A	4501282		Plate\Geyser\Slotted\H1000 - For use with the mill grate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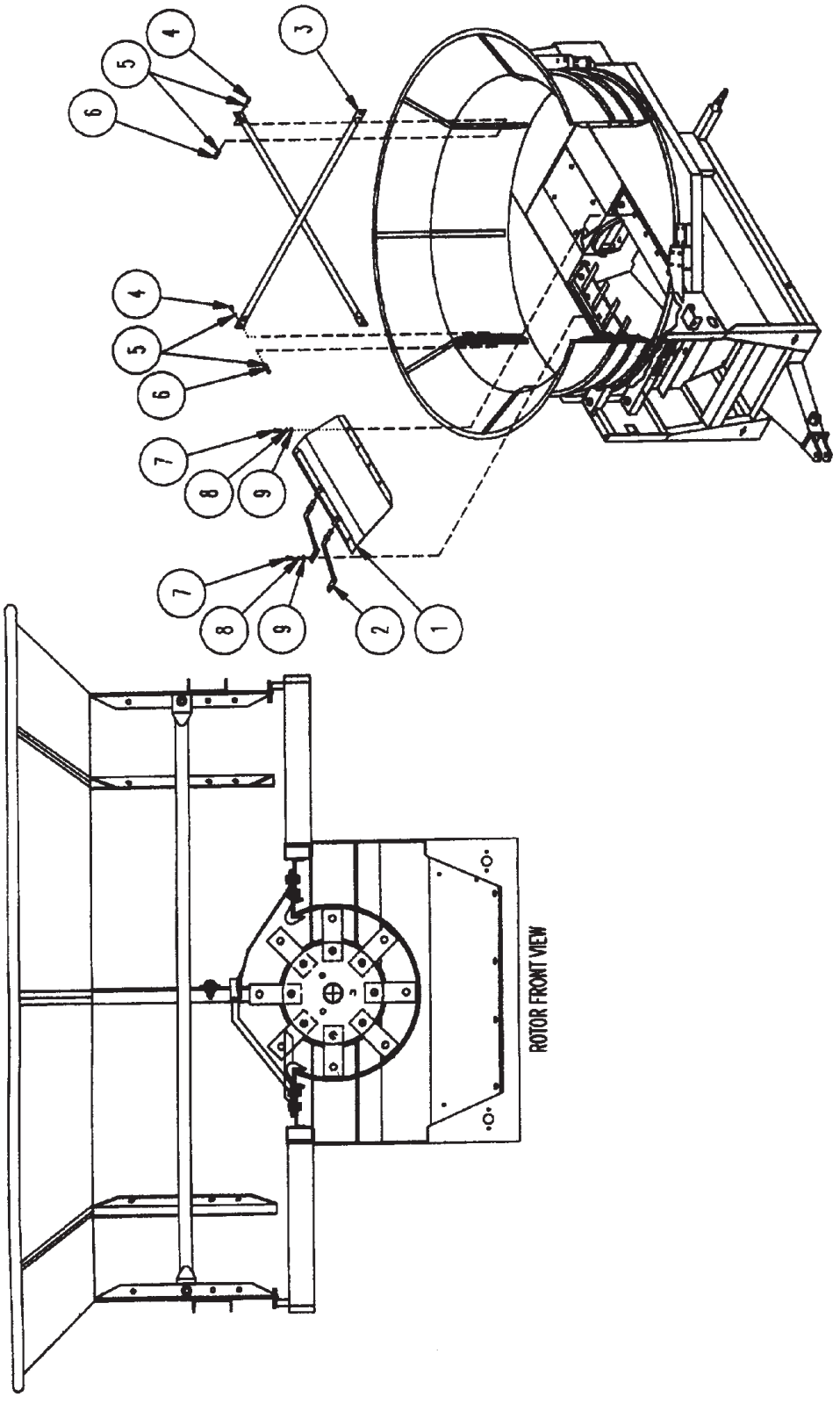
ITEM	PART	QTY.	PART DESCRIPTION
	4501349		**HPPR\GRAIN\\ASSY\COMPLETE**
1	4501335	1	HPPR\GRAIN
2	4501339	1	CVR\RTR\HPPR\GRAIN
3	4501341	1	CVR\END\HPPR\GRAIN
4	4800003	14	BOLT\HEX\3/8X1
5	4800034	4	BOLT\HEX\3/8X1-1/2
6	4900002	18	NUT\HEX\3/8\NC
7	5000001	8	WASH\FLAT\\3/8
8	5000019	18	WASH\LOCK\3/8

Grain Hopper Option Installation:

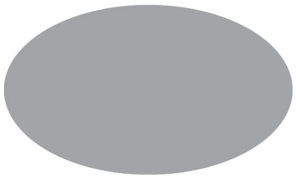
1. Orient tub so that two interior tub angles are centered in front of cylinder box.
2. Bolt front (item 2) and rear (item 3) covers to grain hopper with hardware.
   Check to see that hopper baffle orientation is correct.
3. Placerounded end ofhopper tight against the tub seal ring.
4. Check to see the hopper is centered side to side over rotor.
5. Drill four 7/16” holes through tub floor using hopper as guide.
6. Secure hopper to the floor with provided 3/8’ hardware.

IMPORTANT! DO NOT ROTATE TUB WITH HOPPER INSTALLED


ROTOR FRONT VIEW

EAR CORN KIT (OPTION)

ITEM	PART	QTY.	PART DESCRIPTION
	4500752		**Optn\Ear Corn\H-100095**
1	4500750	1	Cover\Rotor\Ear Corn
2	4500751	2	Brkt\Cover\Rotor\Ear Corn
3	4500122	2	Cross Pipes
4	4800114	4	Bolt\Hex\1/2x2
5	5000004	8	Wash\Flat\1/2
6	4900001	8	Nut\Hex\1/2\NC
7	4800010	6	Bolt\Hex\5/8x2
8	5000003	6	Wash\Lock\5/8
9	5000002	6	Wash\Flat\5/8



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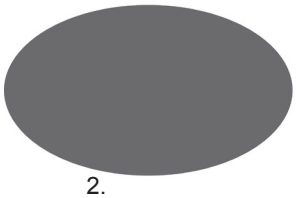


2.

HAYBUSTER

3.

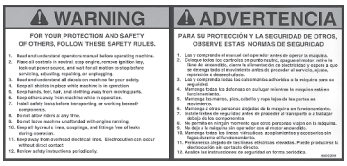
⚠ WARNING | **⚠ ADVERTENCIA**

FOR YOUR PROTECTION KEEP ALL SHIELDS IN PLACE AND SECURED WHILE MACHINE IS OPERATING. MOVING PARTS WITHIN CAN CAUSE SEVERE PERSONAL INJURY.

PARA ASEGURAR SU PROTECCION, MANTENGA TODOS LOS PROTECTORES EN SU LUGAR Y ASEGURADOS MIENTRAS LA MAQUINA ESTE OPERANDO. LAS PIEZAS MOVILES INTERNAS PUEDEN CAUSAR LESIONES PERSONALES GRAVES.

6500048

4.



5

KEEP WHEEL BOLTS TIGHT

MANTENER AJUSTADOS LOS PERNOS DE LA RUEDA

6500042

6.

7.

BIG BITE

8.

OIL LEVEL
NIVEL DE ACEITE
6500052

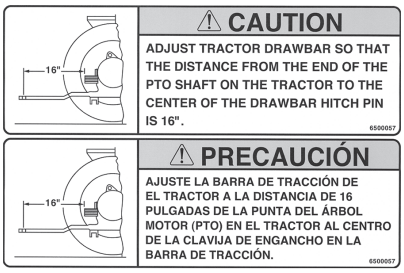
9.

H-1000

10.

ROTATION
ROTACION

11.



12.

⚠ DANGER

ROTATING PARTS WITHIN CAN KILL OR DISMEMBER
WAIT FOR ALL MOVEMENT TO STOP BEFORE SERVICING, UNCLOGGING OR INSPECTING MACHINE

6500082

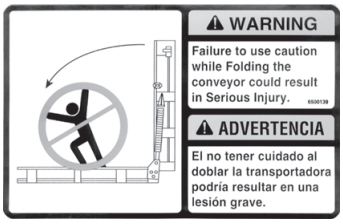
13.

14.

HAYBUSTER

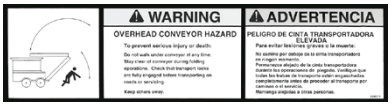
15.

16.



17.

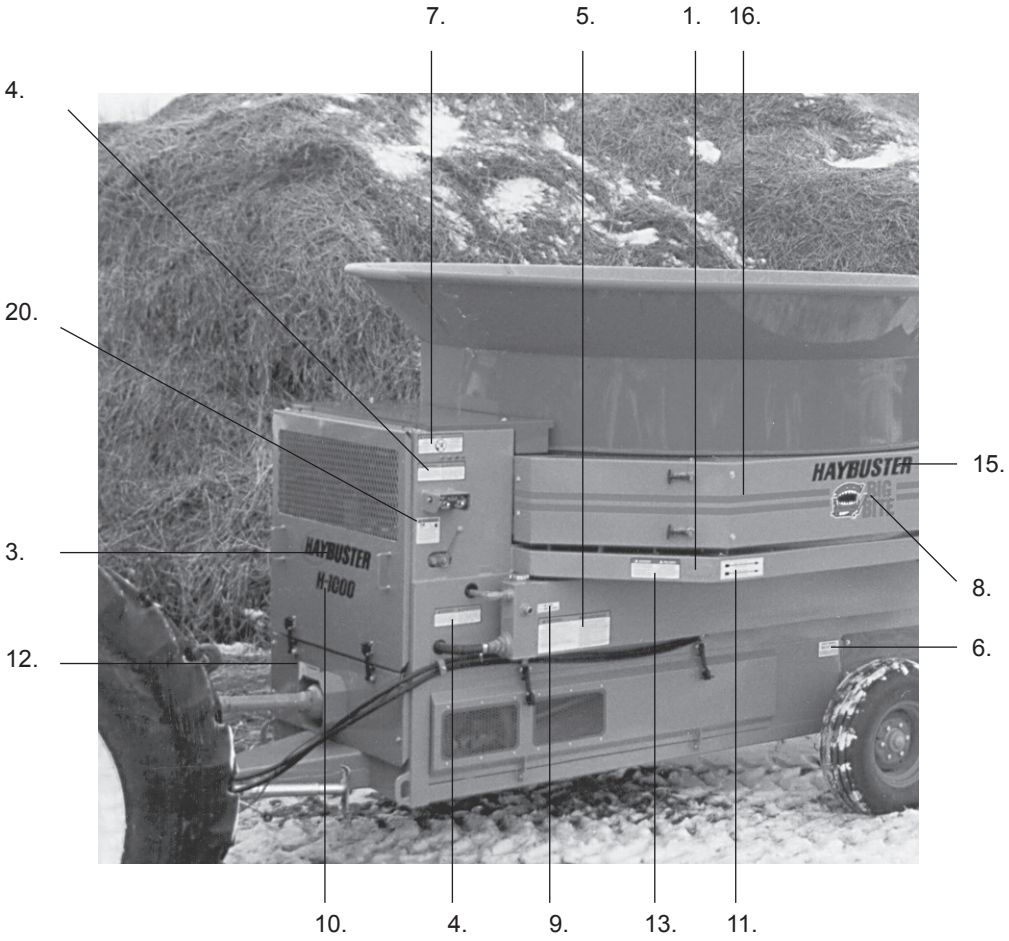
18.



19.

20.

ITEM	PART	QTY.	PART DESCRIPTION
	6500002		**Decal\Kit\H-1000**
1	5700192	2	Lamp\Reflector\Amber\4-3/8x1-7/8\Self Stick
2	5700193	2	Lamp\Reflector\Red\4-3/8x1-7/8\Self Stick
3	6500020	1	Decal\Logo\Hybstr\Sunburst
4	6500040	5	Decal\Warn\Shield;Protection
5	6500041	2	Decal\Warn\Protection
6	6500042	2	Decal\Warn\Keep;Wheel;Bolts;Tight
7	6500043	2	Decal\Warn\No;Riders
8	6500044	2	Decal\Logo\Big Bite
9	6500052	1	Decal\Info\Oil;Level
10	6500054	1	Decal\Logo\H-1000
11	6500056	1	Decal\Info\Rotation\Str
12	6500057	1	Decal\Caution\Adj.Draw;Bar
13	6500082	4	Decal\Warn\Rotating Parts Within
14	6500085	1	Decal\Danger\Rotating;Driveline
15	6500096	2	Decal\Logo\Hybstr\W/O Sunburst
16	6500102	236”	Decal\Logo\Stripe\Red
17	6500139	2	Decal\Info\Folding;Conveyor
18	6500214	2	Decal\Warn\Overhead\Conveyor\Hazard
19	6500215	2	Decal\Warn\Folding Conveyor\Hazard
20	6500220	1	Decal\Warn\High Pressure Fluid
	7500077		12 Oz Yellow Spray Paint
	7500092		Quart Yellow Paint
	7500091		Gallon Yellow Paint
	7500078		12 Oz Red Spray Paint
	7500105		Quart Red Paint
	7500104		Gallon Red Paint


7.
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HAYBUSTER
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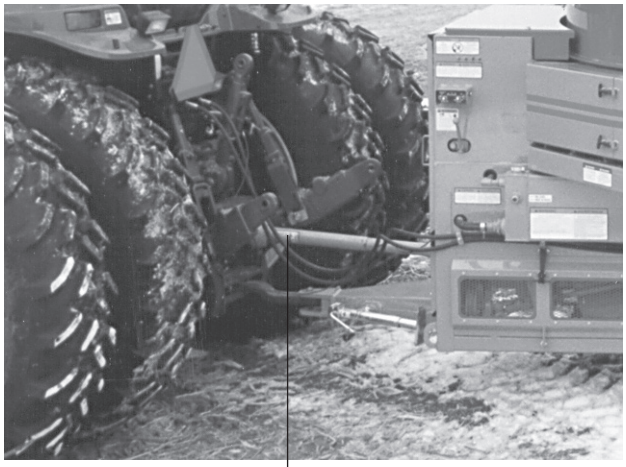
14.


2.
42.
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17.


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H-1000 Tub Grinder Documentation Comment Form

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- Did you find any errors?
- Is the information clearly presented?
- Does the manual give you all the information you need to operate the equipment safely and effectively?
- Are the diagrams and illustrations correct?
- Do you need more illustrations?
- What features do you like most about the manual? What features do you like least?

If you find errors or have specific suggestions, please note the topic, chapter and page number.

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