# **ROTO GRIND** 6-1994 to 9-1997 Serial Numbers 1056084 through 1398097

# **OPERATOR AND PARTS MANUAL TUB GRINDER**



BURROWS ENTERPRISES, INC. 2024 East 8th Street Greeley, Colorado 80631 970 – 353 – 3769 \* Fax 970 – 353 - 0839

# TABLE OF CONTENTS

LIMITED WARRANTY	2
TO THE OWNER	3
SAFETY DECALS	5
SAFETY DECAL LOCATIONS	6
GENERAL OPERATION	7
MAINTENANCE	10
BOLT AND NUT TORQUE SPECIFICATIONS	11
GOVERNOR WIRING DIAGRAM	11
PARTS LISTING	
MAIN DRIVE ASSEMBLY	12
HYDRAULICS AND GOVERNOR	13
TUB AND SHIELDS	14
ROTOR ASSEMBLY	15
WHEEL AND HUB ASSEMBLY	16
STANDARD SPOUT ASSEMBLY w/swivel & extension (Includes Short Discharge)	17
PTO DRIVE LINE ASSEMBLY (OLD STYLE -SERIAL #906053 & PRIOR) (CURRENT STYLE SERIAL #907053 AND LATER)	18 18 19
MILL HOUSING PARTS AND ACCESSORIES	20
CORN AND GRAIN ATTACHMENTS	21

### LIMITED

### WARRANTY

The **Burrows Enterprises Incorporated** warrants products sold by it to be free from defects in material and workmanship for a period of one (1) year for agricultural applications and for a period of ninety (90) days for industrial applications after the date of delivery to the first purchaser subject to the following conditions:

1. Burrows Enterprises Incorporated's obligation and liability under this warranty is to repair or replace at the company's option, any parts which upon manufacture were defective in material or workmanship.

2. All parts and repairs under this warranty shall be supplied at an authorized Burrows Enterprises Incorporated dealer or at the factory at the option of Burrows Enterprises Incorporated.

3. Burrows Enterprises Incorporated's warranty does not extend to parts and elements not manufactured by Burrows Enterprises Incorporated and which carry the warranty of the other manufacturer.

4. Transportation or shipping to an authorized dealer for necessary repairs is at the expense of the purchaser.

5. Burrows Enterprises Incorporated MAKES NO OTHER WARRANTY EXPRESS OR IMPLIED AND MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE BEYOND THAT EXPRESSLY STATED IN THIS WARRANTY. Burrows Enterprises Incorporated's LIABILITY IS LIMITED TO THE TERMS SET FORTH IN THIS WARRANTY AND DOES NOT INCLUDE ANY LIABILITY FOR DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR EXPENSE OF DELAY AND THE COMPANY'S LIABILITY IS LIMITED TO REPAIR OR REPLACEMENT OF DEFECTIVE PARTS AS SET FORTH HEREIN IN THE WARRANTY.

6. Any improper use, including operation after discovery of defective or worn parts, operation beyond rated capacity, substitution or parts not approved by Burrows Enterprises Incorporated, or any alteration or repair by other than an authorized Burrows Enterprises Incorporated dealer which affects the product materially and adversely, shall void this warranty.

7. No dealer, employee, or representative is authorized to change this warranty in any way or grant any other warranty unless such change is made in writing and signed by an officer of Burrows Enterprises Incorporated at its home office.

8. Some states do not allow limitations on how long an implied warranty lasts or exclusions of or limitations on relief such as incidental or consequential damages so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may have other rights, which vary from state to state.

INFORMATION FOR	ORDERING PARTS

OWNERS NAME		
ADDRESS		
DEALERS NAME		
ADDRESS		
SERIAL NUMBER		
	(FOR LOCATION SEE PAGE 6)	
DATE PURCHASED		

Burrows Enterprises Incorporated reserves the right to make changes or add improvements to its products at any time without incurring any obligation to make such changes to products manufactured previously. Burrows Enterprises Incorporated, or its dealers, accept no responsibility for variations which may be evident in the actual specifications of its products and the statements and descriptions contained in this publication.

### TO THE OWNER

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

BURROWS ENTERPRISES INCORPORATED 2024 East 8th Street

Greeley, Colorado 80631 (970) 353-3769\*FAX (970) 353-0839

# WORK SAFELY --FOLLOW THESE RULES



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

### A CAREFUL OPERA TOR IS THE BEST INSURANCE AGAINST AN ACCIDENT.

### **BEFORE OPERATING:**

-Review this entire manual.

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

-Use extreme care when making adjustments. Shut off machine before making adjustments. Shut off tractor and put key in pocket.

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

machine.

-Keep all safety shields in place.

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

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

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

-Review all safety decals.-Securely block unit before working on it.-When working with flammable materials, be sure you do not smoke.

### **DURING OPERATION:**

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

-Do not attempt to remove any obstructions while operating the machine. First shut off the tractor and put key in pocket.

-Always -disengage -the -P. T .0. before transporting. Do not open any covers and expose the rotor or belts while they are rotating.

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

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

-Use extreme care when transporting over uneven or rough terrain.

-Keep all shields in place and in good condition. -Keep children away from machine in operation. -Have your fire extinguisher checked at regular intervals and place it in a position on the unit where it is readily accessible without reaching over or around moving parts.

-Crop materials often have an extremely high rate of flammability which increases the possibility of fires. A decrease in the risk can be attained by stopping the machine, shutting the tractor off, and removing the key from the ignition and placing it in your pocket. Then proceed to remove accumulations of material from the tractor, and the machine. Now check for any parts that may be over heating.

# **ON-HIGHWAY OPERATION-TRANSPORTING:**

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

-Always place the machine in the transport position.

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

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

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

-When transporting on the highway, always use a safety chain between the towing vehicle and the machine.

# SPECIAL PRECAUTIONS

1. Do not climb on, or stand on the unit when it is turned by the P. T. o. of the tractor. All moving parts are guarded for your protection but foreign objects such as rocks and pieces of iron can be thrown out of the tub as it runs empty of material.

2. Leave all shields and guards on the machine while operating. They are for your protection and removal of them will hinder the operation of the machine. Warranty is void if the machine is operated with any of the shields missing.

3. The **Roto Grind** is designed to be turned at 1000 R.P. M. with tractor power take off. Do not, under any circumstances, turn the mill over 1150 R. P. M. or serious damage could result to the machine.

4. The **Roto Grind** is designed to grind roughage materials either loose or baled. The machines are equipped with twine guards and will keep almost all of the sisal twine from wrapping on the rotor shaft if they are adjusted properly, however the shaft should be checked periodically for twine build up and removed if any has accumulated.

Plastic twine should not be ground because it is not only non-digestible, it is more likely to wrap on the rotor shaft. Any plastic twine build up will create heat and melt into a solid lug that can only be removed by burning it off.

5. In loose material, the Roto Grind will operate with more capacity if the size of the bites of material being loaded are small enough to fit into the tub. Do not allow material to hang over the side of the tub. This will cause a bridging effect and will slow up grinding.

## SAFETY DECALS

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



MAINTENANCE. "

Part No. 224-01

NO.8 -"HIGH PRESSURE FLUID HAZARD" Part No. 224-02

5

NO.9 -"MOVING PART HAZARD" Part No. 224-04



# A DANGER

Stay off machine when it is running. Shut off tractor engine and remove ignition key for safety while working in or around machine. NO.II -"DANGER-STAY OFF MACHINE" Part No. 224-06

NO. 10 -"KEEP SHIELD IN PLACE" Part No. 224-117



AND HANDS CLEAR OF MILL UNTIL TRACTOR IS SHUT OFF AND MILL ROTATION STOPS.



NO. 12 -"WARNING INSIDE STEP" Part No. 224-08



The terms front, rear, right side, and left side are defined as standing behind the machine and facing in the direction of forward travel.

The delivery service form in the rear of the book <u>must</u> be completed and returned to the factory in order to establish proper warranty.

### **GENERAL OPERATION**

**IMPORTANT**: BEFORE USING, WITH PTO DISENGAGED AND TRACTOR ENGINE STOPPED (KEY IN POCKET), INSPECT THE MACHINE AND REMOVE ANY FOREIGN OBJECTS WHICH MAY HAVE FALLEN INTO THE MACHINE DURING TRANSIT. CAUTION: NEVER PUT YOUR HANDS INSIDE OF THE MACHINE DURING OPERATION, OR PERFORM ANY KIND OF AN ADJUSTMENT, LUBRICATION, OR REPAIR TO THE MACHINE WITHOUT SHUTTING OFF THE TRACTOR IGNITION AND PLACING KEY IN POCKET. KEEP CHILDREN A WAY FROM MACHINE IN OPERATION.

# When corresponding with the company, distributor, or dealer regarding this machine, please specify both the model number and serial number.

**1. SHEAR PLATES.** These parts, in the mill housing assembly, control the fineness of grind of the material. They are individually adjustable and for a very fine grind it is recommended that all of the shear plates be positioned as close to the end of the hammers as possible. When coarser grinds are required, move the top plates out first.

**EXAMPLE:** Top plate all the way out, the next plate, three quarters of the way out; the next one, half way out and the fourth one down from the top, one quarter of the way Qut. Moving the top plates out before the bottom ones make the unit pull easier with less shock loads.

**2. FEED CONTROL RISERS.** There are three heights of risers that control the amount of "bite" the hammers take out of the material every time the tub is rotated. The high riser is designed for round bales, square bales, extremely wet, loose material or limited horse power. The medium riser is designed for coarse, loose material that is reasonably dry and for larger horse power tractors where high capacity is desired. The low riser is designed for dry material and high horse power tractors allowing a larger "bite" from the material.

**3. HYDRAULICS.** Tractor hydraulics are used to turn the tub. There is a dial mounted on the left front of the machine that is a pressure compensated flow divider to control the rotation speed of the tub. This is to be used in conjunction with height of risers to match the grinding speed to the tractor horse power. Try to avoid constant, very slow turning of the tub as this means that most of the oil is going through the pressure side of the flow divider and tends to heat the oil. If the tub must be turned very slowly, check the hydraulics periodically for heat. (Temperature should be kept below 150 degrees F.)

In the hydraulic circuit there is a normally open solenoid operated valve plumbed into the circuit between the two hydraulic lines that run from the flow divider to the hydraulic motor. Being a normally open valve, the oil will take the line of least resistance and will dump through this open valve and back to the tractor instead of going through the hydraulic motor which rotates the tub. The reason that the tub will always turn backwards when the direction of the flow is reversed in the tractor is because there is a check valve installed on the" out" side of this solenoid valve. The solenoid valve only works on the one direction of flow of oil and you would not be able to ever turn the tub backwards without the check valve installed. **NOTE:** Continuous grinding in the reverse tub rotation is not recommended. The flow divider is also designed to work in one direction of flow and wants to let the tub turn at maximum RPM in the reverse direction.

The function of the governor is to send an 12 volt current to the solenoid valve when the desired PTO RPM is reached. This will close the valve and force the oil flow to go through the hydraulic motor and rotate the tub in the proper clockwise rotation. When a heavy load lowers the PTO RPM, the governor will cut off the 12 volt current to the valve and allow the valve to return to its normal open position which lets the oil go through it instead of the hydraulic motor. This stops the tub rotation and allows the power unit to return to normal speed at which time the governor will reintroduce the 12 volt current to the valve to close it and the oil will again go through the hydraulic motor to start the tub rotation and resume grinding.

Since the introduction of the" ALFALFA HAMMERS" which are designed to grind good quality alfalfa at 540 RPM PTO speed instead of the normal 1000 RPM, it is necessary to reset the governor to start and stop the tub at the lower RPM. In order to make the governor work at the 540 RPM settings it is necessary to install a smaller pulley sheave on the governor to speed it up. There are some cases where the customer would like to be able to grind at both 540 RPM for alfalfa and at 1000 RPM for other feeds. This requires two front halves of the PTO to be able to switch speeds. The installation of all alfalfa hammers in the machine produces excessive" blow" a 1000 RPM. We recommend either half alfalfa hammers and half standard hammers or a set of pins to tie the standard hammers to the lead hammer. The reason that the hammers must be pinned together is that at the lower 540 RPM, the lead hammer is not heavy enough to stay extended to tear the material off of the bale. Pinning them together adds the weight of the standard hammers plus the pin to the weight momentum of the lead hammer which will keep it extended at the lower RPM's.

### **NOTE: CAUTION:**

# 540 RPM operation is not recommended for tough grass hay grinding. It will rock the hammers back to the point where the hammers will destroy the mill itself.



### ROTO GRIND HYDRAULIC SCHEMATIC

**4. POWER TAKE OFF.** The drive line is at a slight angle to the machine. Before starting the grinder, move the front of the tractor to the right to straighten it. If it is not straight at the tractor joint it will cause vibration and serious damage could result.

Always start the machine and check for operation of all parts prior to each day of operation and after transporting. Materials and dirt can pack into the mill while transporting or over a few days when it is windy. To prevent this from" locking" the mill you should step into the tub and roll the mill backwards ~ you connect the machine to the tractor. Then, after the machine has been properly connected to the tractor, set the tractor at low RPM and ~ engage the PTO clutch. If the mill is still" locked", disengage the PTO, shut off the tractor, remove key and place in pocket, or in absence of key (older model tractors), disconnect the PTO shaft from the tractor. Now step inside of the tub and clean out the mill.

After you have finished grinding and want to shut the machine down, reduce the tractor RPM slowly to an idle and wait for the mill to slow down before disengaging the PTO. Some tractors have a brake on the PTO when disengaged and if disengaged at high RPM the weight of the rotor may damage the PTO in your tractor.

### DO NOT MOVE THE MACHINE WHILE THE PTO IS IN MOTION. SHORT TURNS WHILE THE ROTOR IS TURNING MAY DAMAGE THE PTO.

**5. DISCHARGE CONTROL.** The ROTO GRIND is equipped with a discharge control to limit the volume of air discharged with the ground material. You may want the air flow limited when grinding dry material in a stock pile outside, however for wet material or grinding into self-feeders or storage buildings you will probably want the discharge control "open" to move the material farther. Select the setting for your situation.

**6. DISCHARGE SPOUT.** The discharge spout can be mounted to discharge ground material to the side of the machine or to the back of the machine. The standard spout will have 7' clearance to the ground and will allow you to build a pile about 10' high. There are 2' spout extensions available and a maximum of two can be added to the standard spout. Longer spout usage requires fairly dry material or plugging may occur. An adjustable swivel spout is available as an option. Spout extensions cannot be added to the swivel spout.

**7. EAR CORN HOOD.** This attachment is designed for ear corn to be loaded with a front end loader. It shields the mill to stop the material from being thrown out of the tub. If the grind is too fine when the hood is installed, move the bottom adjustable shear plates in the mill out. DO NOT try to reposition the hood.

Caution should be used in loading ear corn. Do not load the machine faster than it can grind. Ear corn turns very hard in the tub and as a result, you should not load the corn more than two feet deep. Over loading will cause excessive hydraulic pressure and tend to heat the hydraulic oil.

**8. GRAIN HOOD.** The grain hood is designed for loading with an auger. Remove the feed control riser and the round stabilizer hood and bolt the grain hood in place. This hood is equipped with an extra adjustable gate to control the amount of grain entering the grinding area. Adjust this gate to the horse power of the tractor. **"IMPORTANT!"** Be sure to disconnect the hydraulic hoses that turn the tub. Tub rotation is not required with this attachment and serious damage could result if it was accidentally turned with the grain hood installed.

### MAINTENANCE



CAUTION: Never put your hands inside of the machine during operation, or perform any kind of an adjustment, lubrication, or repair to the machine without shutting off the tractor ignition and Placing key in pocket. Keep children away from machine in operation.

1. **LUBRICATION.** The three bearings on the driveline and the PTO should be greased every eight to ten hours of operation. Be careful not to over grease as this pushes out the seals and allows dirt to enter the bearing shortening the bearing life. The tub roller bearings should be greased once a season or every one hundred hours, which ever occurs first.

a) Check the bearings on the driveline every time the unit is greased. If one of these bearings go out and the machine is operated, it may cause the drive line to break, causing serious damage to the machine.

2. **HAMMER REPLACEMENT.** The hammer pins have a flat side on one end to fit a "D" hole in the mill. When turning the hammers, remove the snap ring and drive the pin back out of the mill through the holes provided in the mill housing. When the hammers have been turned, replace the snap ring.

3. If for any reason the mill ever needs to be removed, it is attached to the driveline by a 5/8" shear bolt. Remove the shear bolt and apply rust remover. Loosen the lock collar on the back bearing and unbolt the front two bearings. Lock the drive line with the PTO, apply forward pressure on the driveline and turn the mill on the shaft. It is a slip fit and should come off without too much difficulty.

4. The alignment of the sprocket to the drive chain should be checked periodically. If mis-alignment occurs, remove the tub roller shields and adjust the tub rollers for proper height.

Mis-alignment will cause excessive wear in the sprocket and chain.

5. GOVERNOR ADJUSTMENT AND SERVICE: This unit is calibrated at the factory to open or close its contacts at a particular speed specified by the equipment manufacturer. As shown on the nameplate trip points on increasing speed.

**A. SPEED ADJUSTMENT**: It is normally unnecessary. However if so, loosen cap adjusting lockscrews and turn cap until desired trip speed is reached. Clockwise rotation of the cap increases trip speed and counter clockwise rotation decrease trip speed. Total range of adjustment is indicated on speed switch nameplate. **CAUTION**: Be sure to tighten hexagonal locking screw when adjustment has been completed.

**B. MAINTEANCE**: All units are furnished with <u>sealed permanently lubricated</u> ball bearings. There is no internal maintenance is required. On models GS and GT governors only, the grease should be replenished. Grease should be applied through the grease fitting with a hand gun until an overflow through the part is noted. Do not over grease or use a power gun since serious damage will result. Every 2500 hours of operation or annually, the grease supply should be replenished.

The ROTO GRIND models serial #887043 and newer have the model GSU governor Which is regreaseable. Prior serial numbers have units that are not regreaseable.

BOLT AND NUT			
TOR	TOROUE SPECIFICATIONS		
RECOMM	ENDED TORQUE IN FO	OT POUNDS	
CO	DARSE AND FINE THRE	ADS	
	GRADE 5	GRADE 8	
BOLT	THREE RADIAL	SIX RADIAL	
SIZE	DASHES	DASHES	
1/4	9	11	
5/16	18	23	
3/8	31	39	
7/16	50	63	
1/2	75	94	
9/16	110	138	
5/8	150	188	
3⁄4	250	313	
7/8	378	473	
1	583	729	

# GOVERNQR WIRING DIAGRAM



11



### MAIN DRIVE ASSEMBLY

<u>KEY</u>	PART NO.	DESCRIPTION
1	080-040	V-BELT A24
2	706-078	SHEAVE A-I
3	590-117	PLATE, BEARING MOUNTING
4	682-724	DRIVE SHAFT
5	167-920	KEY 3/8 SQ. X 2 1/2
6	072-445	BEARING, 2" FLANGE BLOCK
7	072-358	BEARING, 2" PILLOW BLOCK
8	724-248	SPACER, .105 THICK
9	724-249	SPACER, .060 THICK
10	672-346	SHEAR BOLT, 5/8 X 41/2 GRD 8



## HYDRAULICS AND GOVERNOR

<u>KEY</u>	<u>PART NO.</u>	DESCRIPTION
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	706-076 706-01 764-002 104-383 276-127 738-038 126-127 540-033 544-025 183-001 826-034 826-033 834-021 826-035 740-269 742-268 356-081 356-083 790-013 210-075 356-084	PULLEY, GOVERNOR, 1000 RPM PULLEY, GOVERNOR, 540 RPM GOVERNOR BRACKET, GOVERNOR MOUNT UNION, 90 DEGREE COUPLING SPRING, TIGHTENER HUB, QD MOTOR, HYDRAULIC MOTOR MOUNT ASSEMBLY COIL, SOLENOID VALVE VALVE, SOLENOID FLOW DIVIDER WIRE, GOVERNOR VALVE, CHECK #80 SPROCKET #60 SPROCKET (OLD STYLE) HOSE, 1/2 X 16" HOSE, 1/2 X 36" BOLT, TIGHTENER COVER PLATE HOSE, 1/2 X 96
21 22 23	356-082 104-10 104-09 738-01	HOSE, 1/2 X 30 GOVERNOR BRACKET SPRING ANGLE SPRING



### TUB AND SHIELDS

KEY	PART NO.	DESCRIPTION
1 2 3 4 5 6 7 8 9	815-002 694-363 694-380 072-458 694-364 694-361 682-654 184-042 748-011 350-05	TUB WELDMENT SHIELD, ROLLER SHIELD, PTO BEARING, 13/16 PILLOW BLOCK SHIELD, ROLLER SHIELD, HYDRAULIC MOTOR ROLLER ASSEMBLY COLLAR, LOCK JACK, HITCH (COMPLETE) CANISTER, LITERATURE
10 11 12 13	348-021 389-01 150-008 332-05	CANISTER BRACKET ONLY STABILIZER HOOD LADDER HOSE CARRIER GOVERNOR DRIVE COVER



# ROTOR ASSEMBLY

<u>KEY</u>	<u>PART NO.</u>	DESCRIPTION
1 2 3 4 5	642-055 724-214 580-207 656-068 328-001 328-004	SNAP RING BUSHING, 10 GA. MACHINE PIN, HAMMER ROTOR WELDMENT HAMMER, STANDARD HAMMER, JUWY DUTY REVELED
6 7 8 9	328-005 328-003H 328-006 580-101 656-059	HAMMER, HVY DUTY BEVELED HAMMER, BEVELED, INDUSTRIAL HAMMER, BEVELED & HARD SURFACED HAMMER, ALFALFA & MULCH HAMMER LOCKING PIN ASSEMBLY ROTOR ASSEMBLY (COMPLETE)



## WHEEL AND HUB ASSEMBLY

<u>KEY</u>	PART NO.	DESCRIPTION
1 2 3 4 5 6 7 8 9	640-017 072-322 552-006 146-026 360-040 728-025 072-427 R64435 552-030 800.01	RIM, WHEEL 15 X 6 CONE, OUTER BEARING NUT, 1/2 -20 LUG CAP, HUB HUB, 5 BOLT WI CUPS SPINDLE, WHEEL CONE, INNER BEARING SEAL, GREASE SLOTTED NUT, 7/8 UNF
10 11	800-020	TUBE, 9.5L X 15 . TIRE, 9.5L X 15,8 PLY, IMPLEMENT



### STANDARD SPOUT ASSEMBLY

(Including Extension & Short Discharge)

<u>KEY</u>	<u>PART NO.</u>	DESCRIPTION
$ \begin{array}{c} 1\\ 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 19\\ 20\\ \end{array} $	$\begin{array}{c} 348-02\\ 126-01\\ 706-01\\ 738-01\\ 348-01\\ 222-02\\ 734-06\\ 126-121\\ 210-04\\ 136-01\\ 130-01\\ 222-03\\ 036-04\\ 580-01\\ 734-050\\ 734-11\\ 348-02\\ 257-01\\ 210-081\\ 220-014\end{array}$	DEFLECTOR HOOD BUSHING PULLEY SPRING UPPER HOOD CYLINDER, HYDRAULIC 2" X 4' STROKE SPOUT BUSHING CHUTE COVER COIL CHAIN, 1/4 X 12" CABLE, 1/8 X 60 CYLINDER EAR CYLINDER STRAP CYLINDER STRAP SPOUT PIVOT ASSEMBLY SHORT DISCHARGE HOOD EXTENSION, 2 Foot COVER
20 21	265-080	HANDLE
		HYDRAULIC HOSE. 1/4 X 16' W/3/8 NPT ENDS



# PTO DRIVE LINE ASSEMBLY (OLD STYLE - SERIAL #906053 & PRIOR)

<u>KEY</u>	<u>PART NO.</u>	DESCRIPTION
1 2 3 4 5 6 7 8 9 10 11 13 14	55041-1017 55011-1001 26-10015 55031-1021 03-10050 91-15070 97-15070 99-15070 19-11104 19-11105 24-10124 11-10123 98-15070 96-15070 11-10101 262-15070 93-15070	YOKE YOKE ASM, SAFETY SLIDE LOCK REPAIR KIT, SAFETY SLIDE LOCK YOKE,SHEAR CROSS & BEARING KIT, 55R SHAFT SHEAR ASSEMBLY OUTER GUARD YOKE & SHAFT SHEAR ASSEMBLY REPAIR KIT, NYLON REPAIR KIT, NYLON RING, RETAINING WASHER YOKE, TUBE, & SLIP SLEEVE INNER GUARD SHEAR BOLT, 5/16 X 1 3/4 GRD 8 (2 req'd) PTO DRIVE LINE COMPLETE JOINT & SHAFT HALF ASSEMBLY WITH
	95-15070 92-15070	GUARD, TRACTOR END (complete halt) JOINT & SHAFT HALF ASSEMBLY JOINT & TUBE HALF ASSEMBLY WITH
	94-15070	GUARD, IMPLEMENT END (complete half) JOINT & TUBE ASSEMBLY

18



## PTO DRIVE LINE ASSEMBLY (CURRENT STYLE SERIAL #907053 AND LATER)

<u>KEY</u>	<u>PART NO.</u>	DESCRIPTION
1	55041-1017	YOKE
2	40-10002	YOKE ASM, SAFETY SLIDE LOCK
	26-10015	REPAIR KIT, SAFETY SLIDE LOCK
3	26-13804	REPAIR KIT, BALL SHEAR
4	96-15070	INNER SHIELD
5	03-10050	CROSS & BEARING KIT, 55R
6	99-16941	YOKE & SHAFT
7	97-16941	OUTER GUARD
8	19-11105	REPAIR KIT, NYLON
9	98-15070	YOKE & TUBE
10	40-10003	YOKE ASM, SAFETY SLIDE LOCK, 540 RPM SHEAR
10	11-13516	BOLT, 3/8 X 1 GRD 8 (2 req'd)
	262-16941	PTO DRIVE LINE COMPLETE, 1000 RPM
	262-17288	PTO DRIVE LINE COMPLETE, 540 RPM
	93-16941	JOINT & SHAFT HALF ASM WI GUARD, 1000 RPM
		TRACTOR END (complete half)
	95-16941	JOINT & SHAFT HALF ASM, 1000 RPM
	92-15070	JOINT & TUBE HALF ASM WI GUARD, IMPLEMENT END (complete half)
	94-15070	JOINT & TUBE ASM
	93-17288	JOINT & SHAFT HALF ASM WI GUARD, 540RPM, TRACTOR END (complete half) .
	95-17288	JOINT & SHAFT HALF ASM, 540 RPM



# MILL HOUSING PARTS AND ACCESSORIES

<u>KEY</u>	PART NO.	DESCRIPTION
1 2	590-092 590-155	SHEAR PLATE, MAIN SHEAR PLATE, STANDARD SHEAR PLATE, OLD STYLE W/ ACME BOLT BOLT, SHEAR PLATE, OLD STYLE NUT ASSEMBLY, OLD STYLE LOW RISER -6" HIGH MEDIUM RISER -7" HIGH HIGH RISER -8" HIGH DOOR, ADJUSTMENT DTSCHARGE, OLD STYLE DOOR WELDMENT DOOR, DAMPER ARM WELDMENT DAMPER TWINE GUARD
3	590-071 096-121 552-119	
4	348-015 348-017	
5	348-016 234-007 234-003	
7 8	234-006 036-213	
9 10	223-004 322-006	



## CORN AND GRAIN ATTACHMENTS

<u>KEY</u>	<u>PART NO.</u>	DESCRIPTION
1	348-05	SHELL CORN HOOD
2	348-06	FILL CHUTE
3	234-03	GATE
4	580-02	GATE PIN
5	348-08	GRAIN HOOD
6	590-03	SHEAR PLATE ASSEMBLY
7	215-260	EAR CORN SHIELD
8	215-240	SHIELD SUPPORT

# GOVERNOR FUNCTION AND SETTING:

11-2-95

We receive more calls on how to set the governor and why the tub will only turn backwards than all the other functions of the grinder combined. The following description is an attempt to improve the users understanding of our governor system.

In the hydraulic circuit there is a normally open solenoid operated valve plumbed into the circuit between the two hydraulic lines that run from the flow divider to the hydraulic motor. Being a normally open valve, the oil will take the line of least resistance and will dump through this open valve and back to the tractor instead of going through the hydraulic motor which rotates the tub. The reason that the tub will always turn backwards when the direction of the flow is reversed in the tractor is because there is a check valve installed on the "out" side of this solenoid valve. The solenoid valve only works on the one direction of flow of oil and you would not be able to ever turn the tub backwards without the check valve installed. NOTE: Continuous grinding in the reverse tub rotation is not recommended. The flow divider is also designed to work in one direction of flow also and wants to let the tub turn at maximum RPM in the reverse direction.

The function of the governor is to send a 12 volt current to the solenoid valve when the desired PTO RPM is reached. This will close the valve and force the oil flow to go through the hydraulic motor and rotate the tub in the proper clockwise rotation. When a heavy load lowers the PTO RPM, the governor will cut off the 12 volt current to the valve and allow the valve to return to its normal open position which lets the oil go through it instead of the hydraulic motor. This stops the tub rotation and allows the power unit to return to normal speed at which time the governor will re-introduce the 12 volt current to the valve to close it and the oil will again go through the hydraulic motor to start the tub rotation and resume grinding.

Since the introduction of the " ALFALFA HAMMERS " which are designed to grind good quality alfalfa at 540 RPM PTO speed instead of the normal 1000 RPM, it is necessary to reset the governor to start and stop the tub at the lower RPM. In order to make the governor work at the 540 RPM settings it is necessary to install a smaller sheave on the governor to speed it up. There are some cases where the customer would like to be able to grind at both 540 RPM for alfalfa and at 1000 RPM for other feeds. This requires two front halves of the PTO to be able to switch speeds. The installation of all alfalfa hammers in the machine produces excessive " blow " at 1000 RPM. We recommend either half alfalfa hammers and half standard hammers or a set of pins to tie the standard hammers to the lead hammer. The reason that the hammers must be pinned together is that at the lower 540 RPM, the lead hammer is not heavy enough to stay extended to tear the material off of the bale. Pinning them together ads the weight of the standard hammers plus the pin to the weight momentum of the lead hammer which will keep it extended at the lower RPM's.

### NOTE: CAUTION:

540 RPM operation is not recommended for tough grass hay grinding. It will rock the hammers back to the point where the hammers will destroy the mill itself.