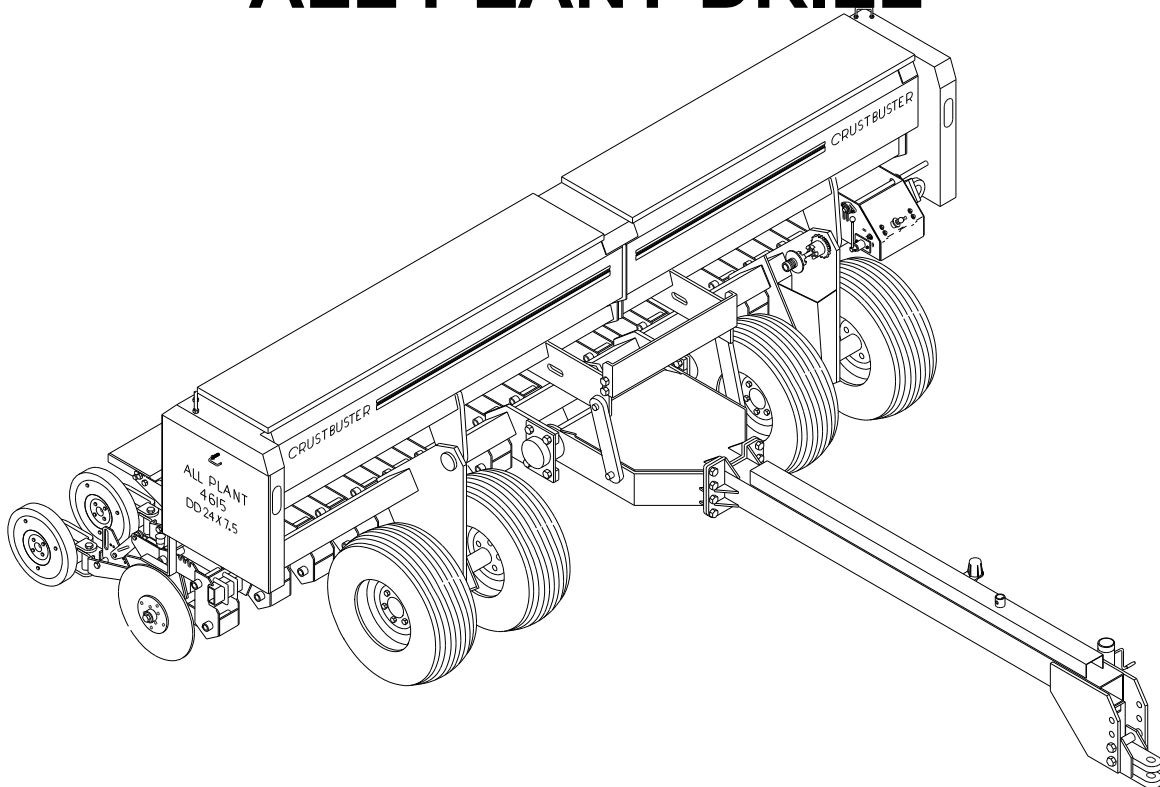




P.O. Box 526 - Spearville, Kansas 67876 - (620) 227-7106
crustbuster.com

4600 SERIES

ALL PLANT DRILL



Identification

Your CrustBuster® drill is identified by a Serial Number and Model Number. Record these numbers in the spaces provided in this manual and refer to them when ordering parts or requesting service.

Serial Number	Model Number
---------------	--------------

Warranty

WARRANTY: In addition to the implied warranties of fitness and of merchantability, CrustBuster®/Speed King, Inc. warrants new products sold by it to be free from defects in workmanship and material for a period of 12 months, from the date of delivery to the first user customer. Warranty on purchased parts (cylinder, blades, bearings, shanks, etc.) will be the same as that offered by the appropriate manufacturer of these parts.

EXCLUSIONS: No warranty of any kind is made by CrustBuster®/Speed King, Inc. with regard to new products which have been subject to operation in excess of recommended capacities, misuse, abuse, negligence, or accident, or have been altered or repaired in any manner not authorized by CrustBuster®/Speed King, Inc. CrustBuster®/Speed King, Inc. is constantly striving to improve its products. Changes in design and improvement will be made whenever CrustBuster®/Speed King, Inc. believes the efficiency of its products will be improved thereby, but without incurring any obligation to incorporate such improvements in any products which have been shipped or are in service. No obligation exists for compensation of unauthorized repairs or modifications without prior approval. And in no event will CrustBuster®/Speed King, Inc. be liable for consequential damages, such as but not limited to: downtime, delayed or late tillage or planting, etc.

WARRANTY REGISTRATION: This warranty is not valid unless registered with CrustBuster®/Speed King, Inc. within 10 days from the date of purchase. It is the sole responsibility of the selling retail dealer to fill out the registration forms and see that they are properly filed with CrustBuster®/Speed King, Inc. This can be done at crustbuster.com.

WARRANTY PROCEDURE: Should any part fail to conform with this warranty, CrustBuster®/Speed King, Inc. will repair or replace the part or parts which do not conform. If a part is defective, take it to your authorized CrustBuster® Farm Equipment Dealer immediately, along with your warranty registration, and complete the proper forms requesting a warranty adjustment. Our representative will pick up the part to be returned to the factory for examination. If the customer (first user) requests that a new part be substituted for the old part, a new part will be charged to the dealer who will in turn charge the customer. If the part is found by us to be defective, a credit for the part will be given to the dealer to be passed on to the customer. If the dealer or customer wishes to repair the part, this will be done only if authorized by CrustBuster®/Speed King, Inc. This warranty procedure is in addition to all remedies authorized by law.

CRUSTBUSTER®/SPEED KING, INC.
Box 526
Spearville, KS 67876

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**BE A SAFE OPERATOR
BY THINKING BEFORE ACTING
AND
BY READING
YOUR OWNER'S MANUAL**

Avoid Accidents

Most accidents, whether they occur in industry, on the farm, at home, or on the highway, are caused by the failure of some individual to follow simple and fundamental safety rules or precautions. For this reason most accidents can be prevented by recognizing the real cause and doing something about it before the accident occurs.

Regardless of the care used in the design and construction of any type of equipment, there are many conditions that cannot be completely safeguarded against without interfering with reasonable accessibility and efficient operation.

**A CAREFUL OPERATOR
is the Best Insurance Against an
Accident.**

The complete observance of one simple rule would prevent many thousands of serious injuries each year.

That rule is:

**Never Attempt to
Clean, Oil, or Adjust
A Machine While It Is In Motion.**

To Our Customers

The following pages and illustrations are printed to help supply you with the knowledge to better operate and service your new CrustBuster equipment.

We are proud to have you as a customer and feel you will be proud to be a CrustBuster owner.

Any piece of equipment needs, and must have, a certain amount of service and maintenance to keep it in top running condition. We have attempted to cover all the adjustments required to fit most conditions; however, there may be times when special care must be taken to fit a condition.

Study this owner's manual carefully and become acquainted with all the adjustments and operating procedures before attempting to operate your new equipment. Remember, it is a machine and has been designed and tested to do an efficient job in most operating conditions and will perform in relation to the services it receives.

If special attention is required for some condition, ask your CrustBuster dealer; he will be glad to help and answer any questions on operations and service of your new machine.

TAKE TIME FOR SAFETY

Before Operating This Equipment

Read and understand this owner's manual.



Safety & Set-Up Instructions

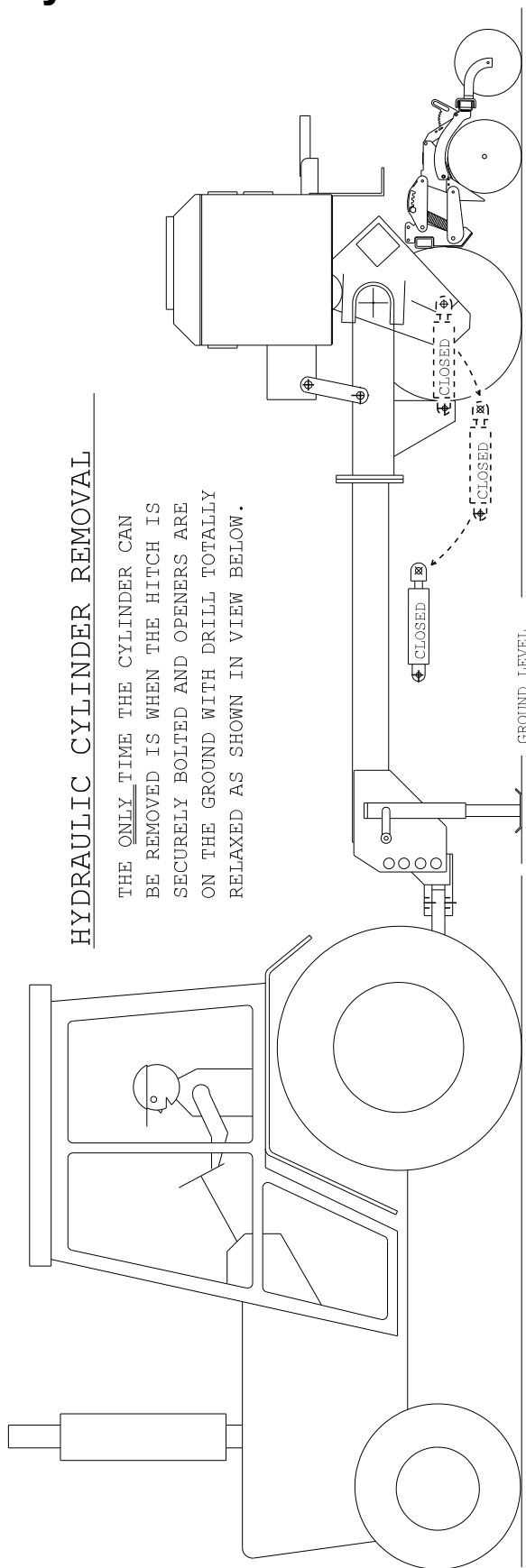


- If your drill is delivered with a shipping bracket, DO NOT install hitch or operate hydraulics until bracket is completely removed. Damage to drill will result.
- Dealer Installation of Hitch - Be sure hitch bolts are **torqued equally**. DO NOT tighten one side completely before the other. Failure to follow these instructions could cause hitch to be off center and drill will not run straight.
- Secure implement to tractor drawbar using as large a hitch pin as will allow. A large bolt with locking nut or castle nut is recommended. DO NOT use a hairpin or wire to secure hitch pin. Residue may catch and remove these devices. **ALWAYS SECURE DRILL TO TRACTOR USING THE SUPPLIED SAFETY CHAIN.**
- Make sure 3-point linkages are raised completely to clear hitch.
- **DO NOT attempt to remove the hydraulic cylinder unless you have taken the precautions described on page 4 of this manual. Serious injury or death could occur if the correct procedure is not followed!**
- If your tractor does not already have a lighting receptacle, install one. Always plug in the drill lighting system to a correctly wired tractor and USE for transport safety.
- Your drill may weigh more than the towing vehicle. The drill is not equipped with brakes. **EXERCISE EXTREME CAUTION !** Maximum allowable speed - **25 mph**.
- If your drill is equipped with hydraulic markers, always attach safety chains before transporting.
- Always install transport lock to hydraulic cylinder before transporting.
- Remove transport lock from lift cylinder before attempting field operation.
- Never have more than **391 lbs.** per section on the walkboards without drill securely attached to tractor or towing vehicle.
- Check lug nuts or bolts. Torque to 100 ft. lbs. after approximately one mile and periodically after.
- After approximately 10 hours, make sure tool bar bolts, wheel bolts, presswheel bolts, etc. are tight. Check tool bar bolts every 10 to 15 hours. **Tool bar bolts must stay tight.** Failure to comply could cause damage to tool bar and main frame in the form of egg shaped holes.
- **NEVER ALLOW ANYONE TO RIDE THE DRILL!**

Safety Instructions

HYDRAULIC CYLINDER REMOVAL

THE ONLY TIME THE CYLINDER CAN BE REMOVED IS WHEN THE HITCH IS SECURELY BOLTED AND OPENERS ARE ON THE GROUND WITH DRILL TOTALLY RELAXED AS SHOWN IN VIEW BELOW.

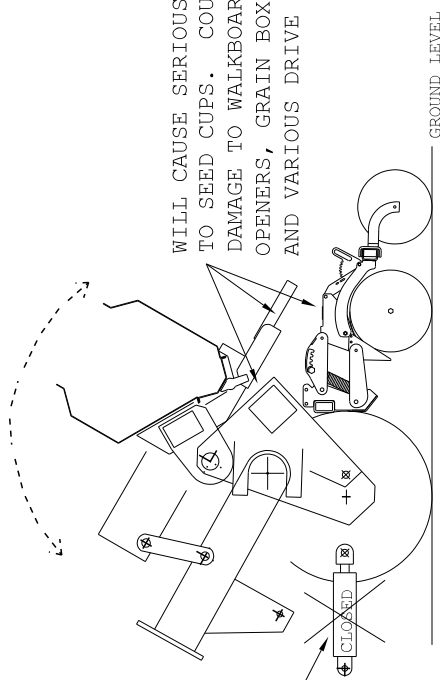


WARNING

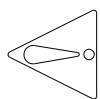
DRILL WILL ROTATE BACK.

NEVER REMOVE HYDRAULIC CYLINDER WITHOUT HITCH SECURELY BOLTED ON AND OPENERS RESTING ON THE GROUND. EVEN WITH OPENERS ON THE GROUND, THE DRILL WILL SCISSOR DANGEROUSLY FORWARD OR BACKWARDS IF THE CYLINDER IS REMOVED AND THE HITCH HAS NOT REMAINED ATTACHED AND RESTING ON THE JACK OR GROUND. FAILURE TO FOLLOW THIS PROCEDURE COULD CAUSE SERIOUS INJURY OR DEATH TO YOU OR PERSONS AROUND DRILL. FAILURE TO FOLLOW THIS PROCEDURE WILL RESULT IN SERIOUS DAMAGE TO SEED CUPS, WALKBOARDS, AND OPENERS.

WILL CAUSE SERIOUS DAMAGE TO SEED CUPS. COULD CAUSE DAMAGE TO WALKBOARDS, OPENERS, GRAIN BOX, GEAR BOX, AND VARIOUS DRIVE LINE PARTS.



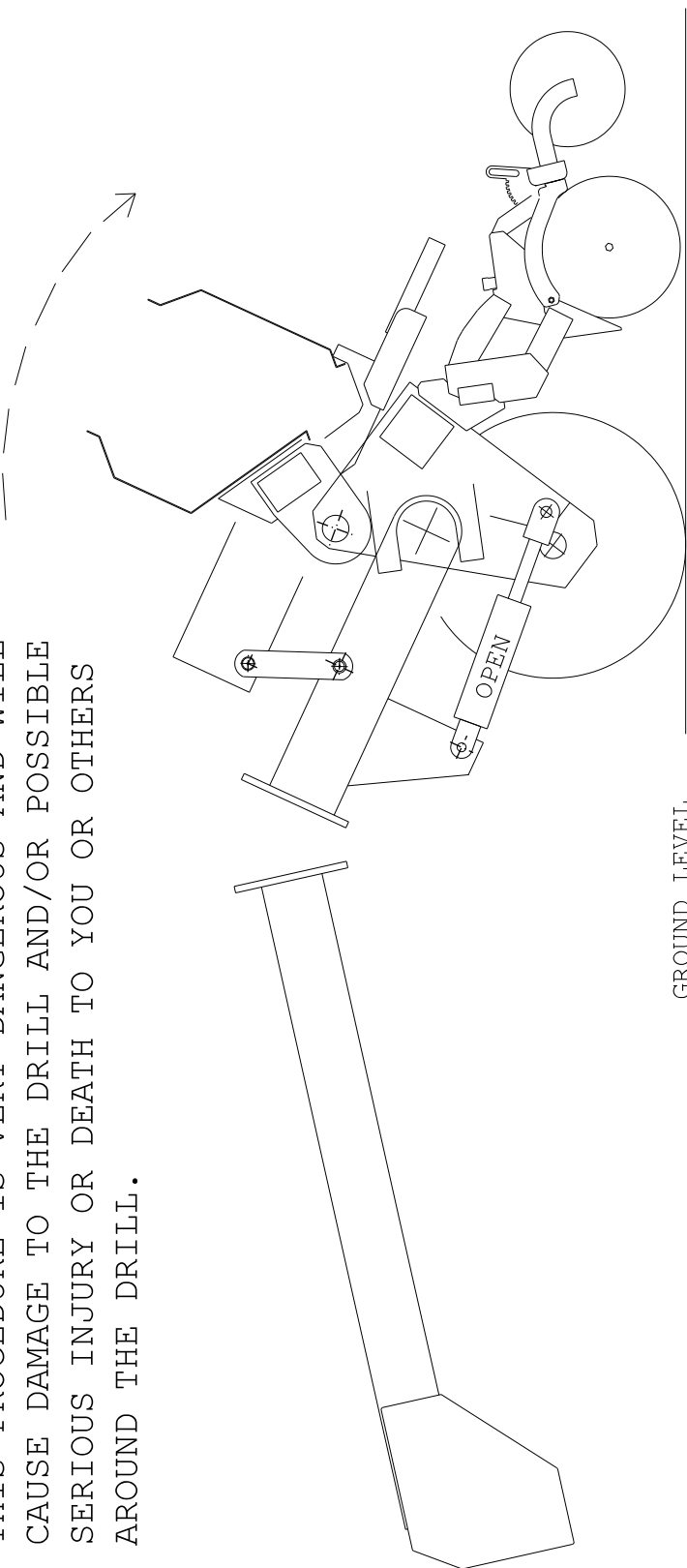
Safety Instructions



WARNING

DRILL WILL FALL BACK.

DO NOT REMOVE HITCH WITHOUT OPENERS LOWERED TO THE GROUND AND THE LIFT CYLINDER INSTALLED AND CHARGED WITH OIL. FAILURE TO COMPLY WITH THIS PROCEDURE IS VERY DANGEROUS AND WILL CAUSE DAMAGE TO THE DRILL AND/OR POSSIBLE SERIOUS INJURY OR DEATH TO YOU OR OTHERS AROUND THE DRILL.



DANGER: Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.



WARNING: Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.



NOTICE: Used to address practices not related to physical injury.



Field Operating Checklist

- _____ Inflate tires to recommended air pressure.
- _____ Lubrication as required.
- _____ Seed shafts turned manually to check for obstructions and improper chain alignment on drive sprockets.
- _____ Correct sprocket selection and slot width for seed type and size.
- _____ Calibration as required for accuracy.
- _____ Drill adjusted at hitch for level field operation.
- _____ Cylinder stop set for proper toolbar rotation.
- _____ Down pressure set for soil conditions.
- _____ Acre meter reset.
- _____ Lower drill while moving forward to avoid plugging openers.
- _____ Check seed depth and adjust accordingly.
- _____ Allow no riders.
- _____ After approximately 10 hours, check tool bar bolts, wheel bolts, presswheel swivel bolts, etc.. Make sure they are tight.

Transport Instructions

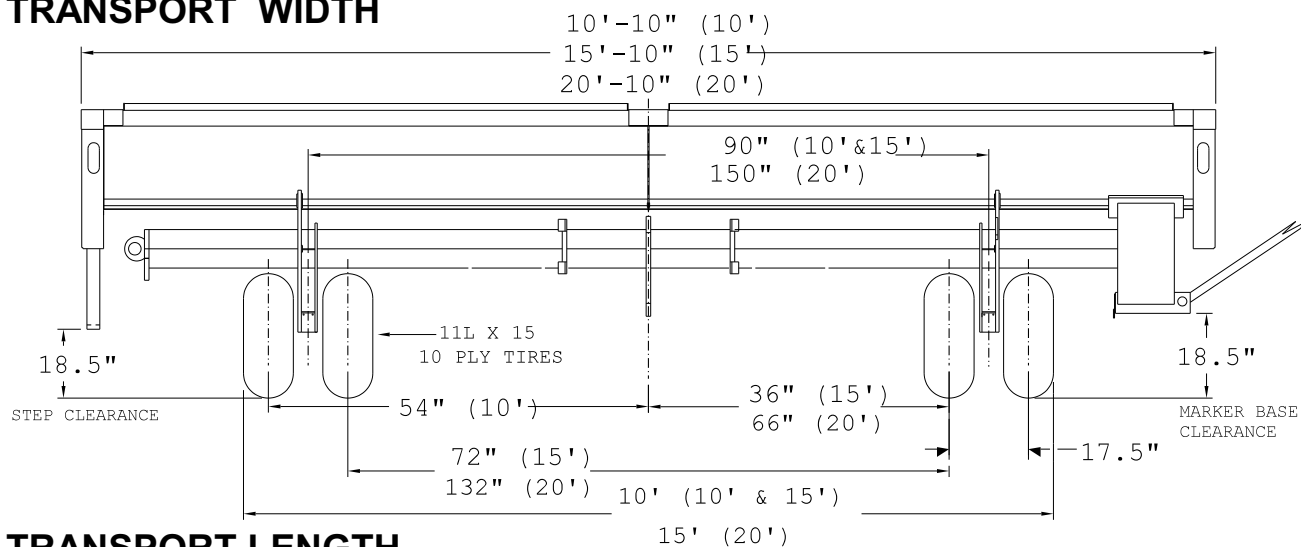
- Before attempting to operate the lift cylinder, remove transport lock. Store cylinder lock on the holder attached to the front of the weight bar bracket. When traveling long distances, it is recommended that the transport lock be installed, pressure relieved from the hydraulic hoses and hoses hooked to the tractor. If trailing behind a towing vehicle, the hydraulic hoses should be stored in the slotted storage in the tongue cover.
- **NEVER** use an unsecured pin in draw bar.
- **DO NOT** attempt to remove the cylinder at any time for transport or field operations.
- Stow the adjustable jack on top of the tongue mounting stub to avoid interference with main tractor wheels in tight turns and make sure 3-pt linkages are fully raised.
- Connect the 7 pin lighting plug to the tractor receptacle and use at all times. Confirm the correct lights are operating if your tractor is not wired by industry standard code. Standard 7 pin receptacles are available through your dealer, local truck supply stores, and auto parts facilities.
- Always attach the safety chain to the tractor drawbar system.
- Disconnect drive chain and store on the "dummy" sprocket when traveling long distances.
- If your drill is equipped with hydraulic markers, the safety chains should be attached to the marker to avoid catastrophic injury to oncoming vehicles.
- Maximum allowable speed; **25 mph**.



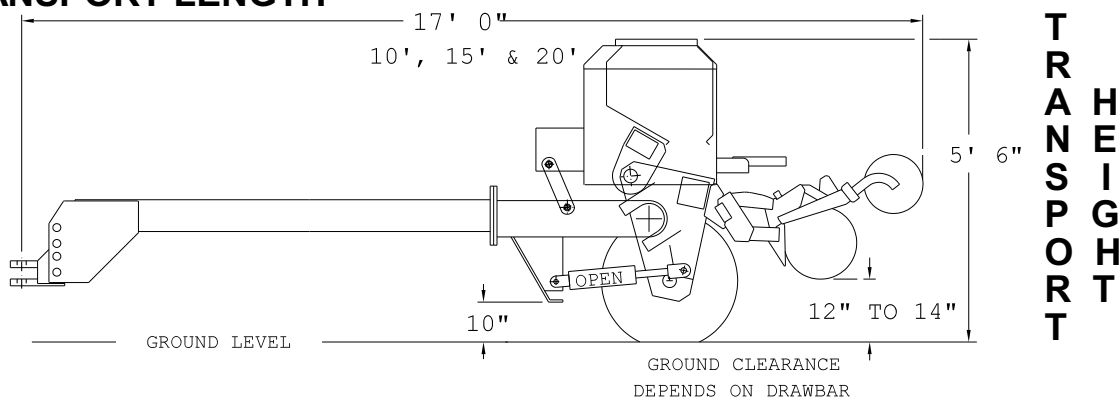
CAUTION! Your drill may weigh more than the towing vehicle. The drill is **NOT** equipped with brakes. Exercise extreme caution!

Dimensions & Specifications

TRANSPORT WIDTH



TRANSPORT LENGTH



10', 15' & 20' Drill Weights

Size & Spacing	Number of Openers	Presswheels			
		Single 2 x 13 Flat	Single 2 x 13 Peaked	Single 3 x 13 Center Rib	Single 3 x 14 V-Type
10' x 7½"	16	NA	NA	NA	NA
10' x 10"	12	NA	NA	NA	NA
15' x 7½"	24	7600	7672	7936	
15' x 8"	22	7420	7486	7728	
15' x 10"	18	6890	6950	7144	
20' x 7½"	32	8690	8784	9200	
20' x 8"	30	8515	8574	8964	
20' x 10"	24	7920	7943	8255	

Field Operation

Recommended Operating Speed

Operating speeds of **4-7 mph** will provide optimum results from your All Plant drill. Conventional field conditions can warrant speeds in the upper end of the range. High levels of "tough" residue due to morning dew or recent moisture, rough field conditions, rocky fields, or hard ground may require lower speeds for adequate performance.

Recommended Adjustment Procedure

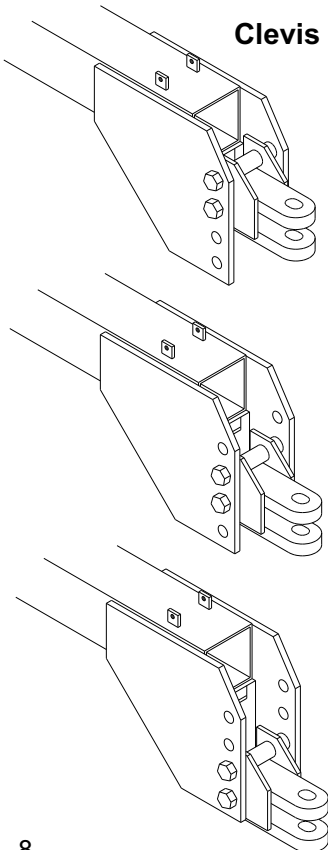
Setting your All Plant drill requires adjustments be made in a particular order to ensure the opener will work properly. You will find it much easier to set the drill if adjustments are made in the following order:

1. **Level the drill**
2. **Set toolbar rotation**
3. **Set down pressure**
4. **Set seed depth**

Leveling the Drill

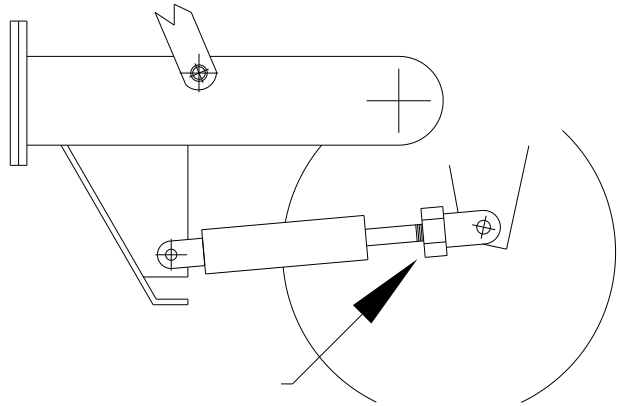
It is important to level the drill from front to back first. The tongue and box should be as close to level as you can get it by changing the drawbar height on the tractor (on offset drawbars), or by repositioning the clevis or mono hitch mounting. Any time a different tractor is hooked to the drill you should recheck level.

Clevis Positions



Toolbar Adjustment

After the drill is leveled, rotation of the toolbar must be set. Using the screw adjustable stop on the lift cylinder, adjust rotation of the toolbar until the 2" x 4" tubing the openers are mounted on is perpendicular to the ground. Adjustment range of the presswheel depth quadrant will be affected if the toolbar does not rotate far enough or goes beyond perpendicular. If the toolbar is not set correctly, the opener travel range will not allow for penetration into low areas or provide clearance when meeting obstructions.



Setting Down Pressure

The parallel linkage opener design assures the operator the opener blades and presswheel operate on the same level throughout the range of up and down travel. Due to the location of the down pressure spring, the pressure applied to the opener remains relatively constant in the entire range of travel. Changing the spring position from the first (top) notch to the last (bottom) notch provides 5 different levels of force. Each notch represents approximately these amounts of down pressure:

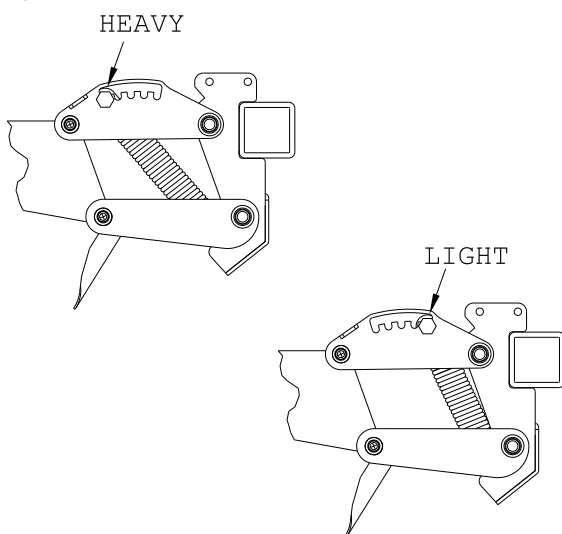
		1	2
		Spring	Springs
NOTCHES	Notch 1 (top)	120#	200#
	Notch 2	160#	260#
	Notch 3	200#	330#
	Notch 4	240#	400#
	Notch 5	260#	500#

Field Operation

Setting Down Pressure - (cont.)

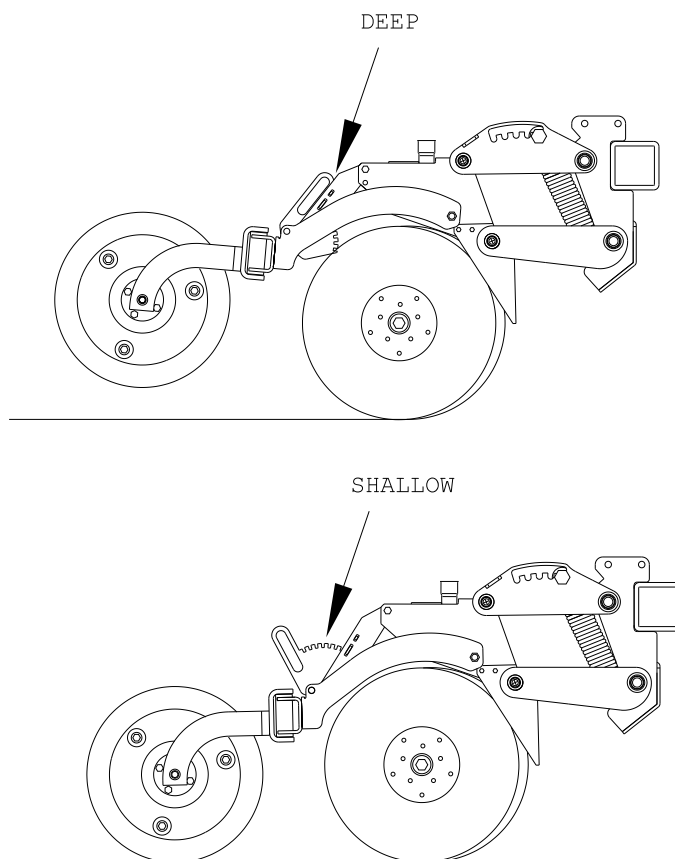
It may be necessary to add ballast to the drill in the third or fourth notch. In order that all the opener springs are able to achieve the down pressure selected, the total weight of the drill must equal that amount of pressure times the number of row units on the drill. The parallel linkage arms should have a "live working action" during field operation. Setting the drill for too much down pressure without adequate weight will reduce the ability of the opener to flex and give good performance.

To determine the correct amount of down pressure, begin with the unit set in the lightest setting and the presswheel adjusted all the way up (or deepest setting). Put the openers in the ground and pull forward 50-100 feet. Stop and check opener penetration. If the opener is not penetrating to the depth you wish to plant, rotate toolbar upwards until clear of the ground, and add one more notch of down pressure. Repeat the process until the opener will penetrate to at least the depth you wish to plant.



Setting Seed Depth

Depth settings are achieved by moving the depth quadrant to effect the presswheel relationship to the opener. Changes are made by releasing the spring-loaded lock handle and moving the quadrant up or down with the hand slot. **LOWERING** the quadrant will set seed depth **shallow** --**RAISING** the quadrant will set seed depth **deeper**. Irregular seed placement can be caused by excessive field speed, residue hairpinning, rocky conditions, and cloddy or wet soil conditions.



Field Operation

Conventional Field Conditions

For tilled field conditions, the lightest spring setting (top notch) is recommended. More weight will be transferred to the carrying wheels of the drill when the toolbar is rotated. Behind tractor and drill tires it may be necessary to adjust individual row units for extra down pressure or different depth setting. **Setting the drill in conventional tillage will be easier if the tillage trips are kept shallow (2" - 4").**

If the first notch presents too much down pressure, the down pressure spring assembly can be removed. With the spring assembly removed, the effective down pressure of the opener is approximately 60#.

To remove spring, rotate tool bar until openers are clear of ground. This will release tension on spring allowing the removal of ½" x 6" bolt at the top of the spring. Unhook spring from rod at bottom of opener mount. When replacing spring, make sure the long hook end of spring is down.

Minimum Tillage Conditions

The most challenging condition is often presented when a high level of residue is present in a "loose" soil environment. The opener blades will not cut residue cleanly and can often have a tendency to push or "bulldoze" residue ahead of the opener discs.

For minimum tillage operations, the lightest spring (top notch) is recommended. Firming the ground using a culti-packer or similar tool can aid in packing the residue for better cutting and blade penetration with less hairpinning.

The All Plant drill will work well in minimum tillage conditions if a "stale seedbed" is created. Soil worked at an earlier date, and allowed to firm and crust over can give the opener more resistance, allow for better cutting action, and create a firmer seed furrow. The first or second notch will usually provide enough down pressure to penetrate the soil.

No-Till Conditions

No-till presents many different conditions. Residue level and condition, previous tillage strips (ridges, plow dead furrows), soil type, soil moisture and rocky conditions all increase the demands on the no-till drill. Many variables and conditions not removed by tillage trips require greater attention to settings and speed. In some circumstances, it may be desirable to drill at a slight angle to existing rows. This will also randomize the opener disc wear and extend the maintenance interval for new blades.

As a general rule, less than ideal conditions will require slower speeds, to reduce hairpinning, improve opener penetration and residue cutting, reduce rock damage, and maintain good furrow formation and seed placement.

It is recommended you set the drill beginning with light down pressures and work your way up to heavier settings. If the presswheel presses firmly on the seed slot and control depth evenly, it is unnecessary to add more pressure. When increased down pressure does not improve penetration, or carrying wheels lose ground contact (and seed drive shaft stops), begin adding ballast with weight bars and/or suitcase weights.

Calibration, Seed Rates and Sprocket Box

Calibration/Drilling Rates

Planting the right rate can be frustrating. Sometimes the end result is not what the rate chart indicates. Seeding rate is affected by seed size, seed treatments, foreign material, test weight, and tire air pressure.

1. Always plant clean seed.
2. Check tire air pressure.
3. Seed treatments vary by type and time of application.

Some seeds are treated at the processor. Drill box treatments are common methods of application. Each of these can "gum" up the wobble slot cup halves and reduce final seeding rate. Treated seed often flows differently than non-treated seed.

A general method for checking quantities drilled is as follows:

1. Set drill for desired seeding rate.
2. Fill the box level; then pull drill for a short distance to settle seed. Refill box exactly level full.
3. Drill a calculated one acre.
4. Carefully weigh the seed required to refill the box level full.
5. Compare the amount used versus that stated on the rate chart.
6. Adjust seeding rate by changing the sprocket combination or wobble slot width.

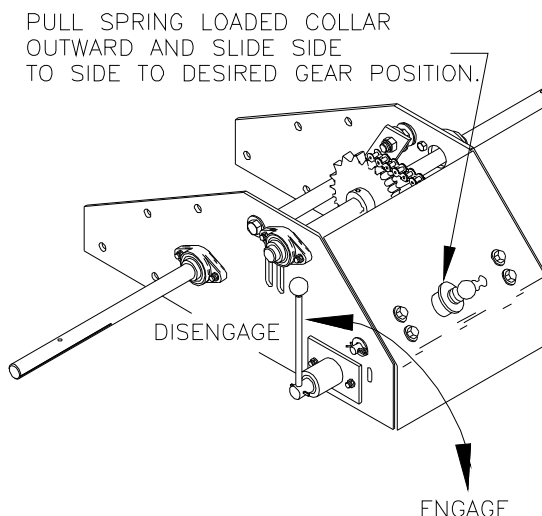
One method involves catching seed from one or more seed cups and utilizing a density scale to determine actual rates. These scales are commercially available, inexpensive and very easy to use. Information can be obtained from CrustBuster®/Speed King, Inc.

Sprocket Box Operation

The sprocket box design will enable the operator to set a wobble slot width once for a given seed size and change rates by changing the speed of the seed shaft. Choose a range of seeding rates that you wish to operate in, set the slot width as indicated by the chart and simply change knob position with the slide handle to effect seed rate. A narrow slot width will produce more even distribution and spacing in the row.

When changing derailleur, be sure openers are rotated out of ground.

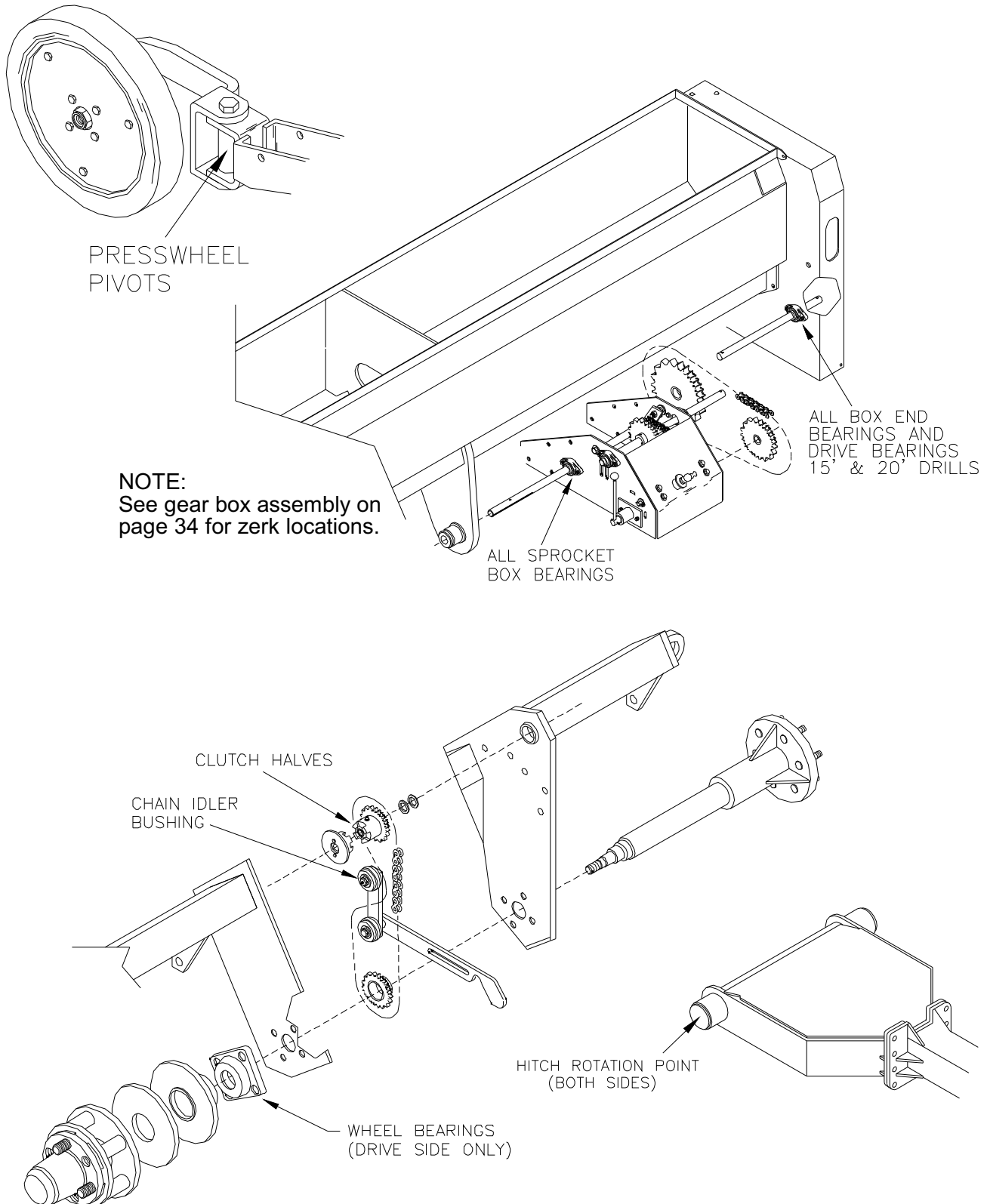
To change position, move throw-out lever toward the rear to disengage the chain from the lower sprocket. Pull the spring loaded collar outward with two fingers and slide side to side to the desired gear position. Pull throw-out lever forward to re-engage the chain.



Lubrication and Service

Proper maintenance will extend the life of your drill. Refer to the drawings below for lubrication requirements. Use a high quality grease in bearings and pivot points. On greaseable sealed bearings, be careful not to over grease and

destroy the dirt seal. Oil chains with a chain lube. A light penetrating oil or liquid graphite should be used on seed cups initially and at the end of each season.

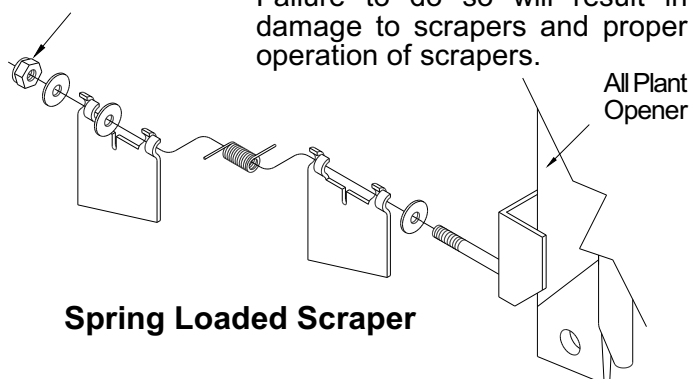


Lubrication and Service

Scraper Adjustment

Opener blade inside scrapers are spring loaded and require no adjustment. To replace the scraper blades, remove the rear lock nut and slide both blades from the stem. Assemble with new blades and replace onto stem being careful not to overtighten lock nut.

NOTE: Do not over tighten lock nut. Be sure scrapers move freely. Failure to do so will result in damage to scrapers and proper operation of scrapers.

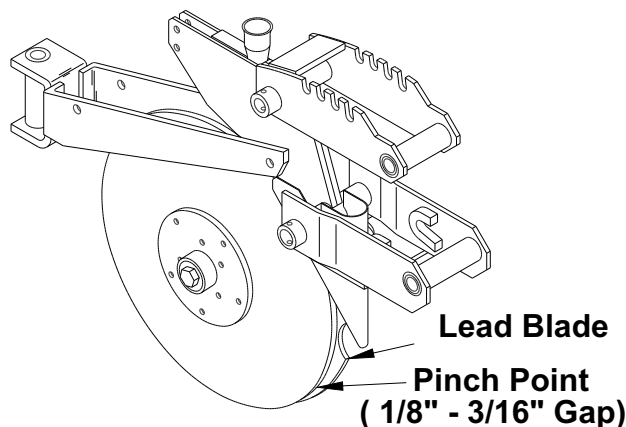


Spring Loaded Scraper

Blade Gap Adjustment

Offset blade designs form better seed furrows and penetrate and cut in tougher planting conditions. As the blades wear, the gap between blades will increase. Removing each blade from the opener bracket allows the operator to take shim washers from behind the bearing and re-adjust the blade gap for better performance. Maintain a 1/8" - 3/16" clearance between blades, measuring at the pinch point. Inadequate clearance will increase wear on the inside of the lead blade and mean quicker replacement.

NOTE: The right blade is installed with a right hand threaded bolt. The left blade is installed with a left hand threaded bolt. The lead blade is reversed on each half of the drill.



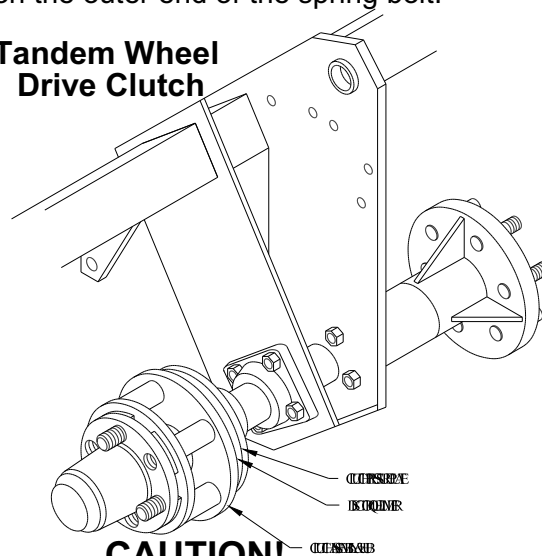
Tandem Wheel Drive Clutch

Tandem wheels that drive a seed shaft are manufactured with a friction disc type clutch. If the drive wheel encounters a hole, ridge, or other situation that may cause a delay in adequate ground contact, the other wheel will "take over" driving the seed shaft. During turns, or in the folding operation, it is necessary that the non-drive wheel can free wheel. This clutch should require no adjustment.

The tire is bolted to the hub using four stud bolts and four through bolts with tapered nuts for thread protection. If the wheel must be removed for service, tighten the four lock nuts on the rubber springs to snug. Remove the tapered nuts on the stud bolts coming through the hub, and remove all eight stud bolts to remove tire. The wheel hub may now be removed by removing dust cap and castellated nut on spindle.

After replacing wheel hub and tightening onto spindle for proper bearing drag, install longer stud bolts in hole aligning clutch and replace tapered nuts. Release spring pressure by loosening the four lock nuts, leaving two threads on the outer end of the spring bolt.

Tandem Wheel Drive Clutch



CAUTION!



At the start of a new drilling season, or anytime the drill is going to be used, especially if the drill has been stored out in the weather all winter long, make sure the clutch drive is not frozen up. Failure to do this will result in damage to the clutch assembly.

To make sure the clutch is not frozen up, tighten up the clutch bolts. This should free the disc torque limiter. If not, use a knife to free the torque limiter from one or the other. Reset clutch back to where it was. **DO NOT** use any oil or penetrating oil of any kind.

Wobble Slot Seed Cup Adjustments and Service

The wobble slot seed cups should be checked against the slot gauge initially and anytime service has been performed on the seed shaft or individual seed cups. Refer to the drawing below for proper adjustment if repairs have been made.

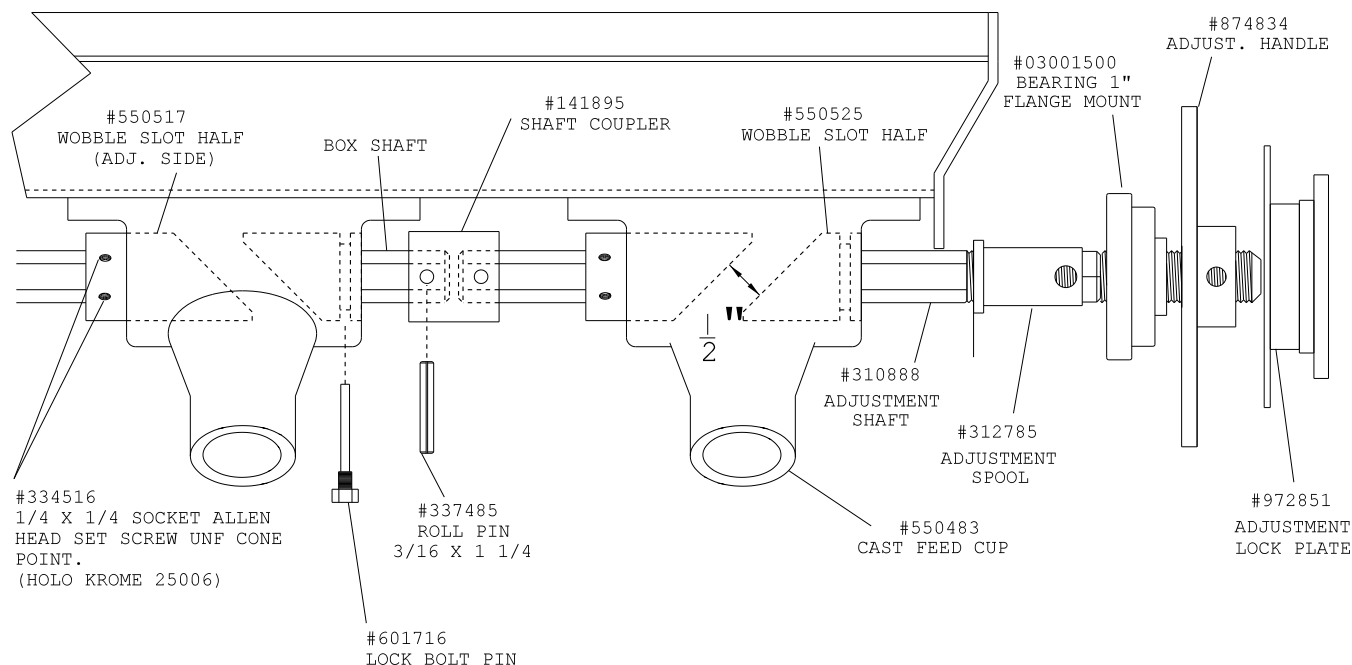
To verify that all seed cups are set the same on the shaft, start with all cups fully closed. A slight crack between the cup halves would be considered normal tolerance. If any individual cup is not "zeroed out," open the slot width using the adjusting handle, loosen allen set screws and adjust to equal others on shaft.

To determine if the gauge is reflecting the correct seed cup slot width, open the seed cups using the adjusting handle. Notice that wobble slot halves are positioned differently on the hex shaft. Identify a cup that will accept a piece of $\frac{1}{2}$ " keystock or other measuring device comfortably and give solid contact against each half. It may be necessary to

turn the hex shaft slightly to position the particular seed cup correctly. Close the slot width firmly against the measuring device. At the cup next to the wobble slot adjusting handle, position the gauge to equal the slot width you have just measured with the keystock by loosening with a screwdriver and sliding in or out.

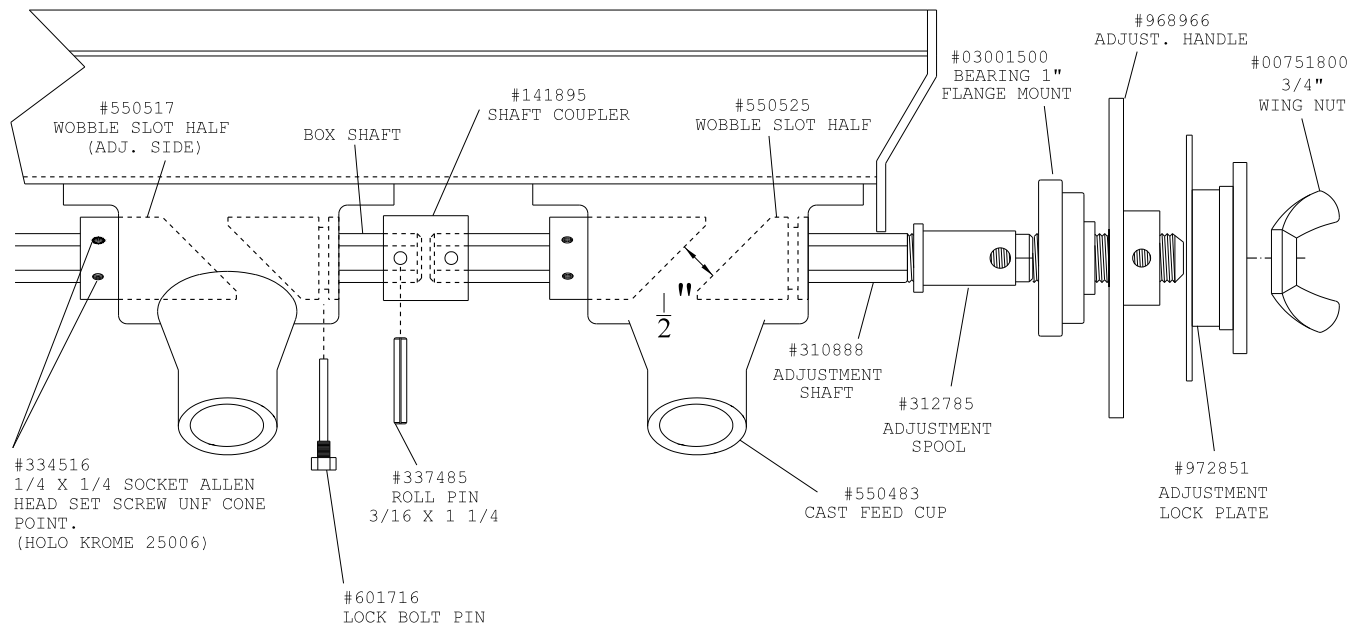
Small changes in rate can be made by opening or closing slot width. To close the slot width with grain in the box, close the slot down a maximum of $\frac{1}{8}$ " and then rotate the shaft on turn to clear the slot. Repeat this process until the desired slot width is selected.

Seeding rate is affected by seed size, seed treatments, foreign material, and test weight. Refer to seed rate charts as guidelines for desired seeding rates.



Wobble Slot Seed Cup Adjustments and Service

For Legume Boxes



Chain Tension on Drive Shaft

When making sprocket changes to the seed shaft, tighten chain to leave approximately 1/2" of flex. The final sprocket must be allowed to slide on the shaft when the adjusting lever is moved. If the chain is too tight, the spring will not keep the sprocket in the proper location and chain misalignment will occur. Lightly lubricate the shaft where the sprocket will slide. **DO NOT OVERTIGHTEN CHAIN.**

Meter Man Acreage Counter (Option)

Calibration

Use the formulas below to determine your implement calibration factor or refer to the predetermined factors listed when using CrustBuster drills.

DT = Distance traveled with one counter shaft rotation
(when using two magnets, divide DT by 2).

WW = Working Width of implement (in inches).

$$\frac{WW \times DT/2}{6272640} = \text{Calibration factor}$$

NOTE: Whenever a gear change is made on the shaft being monitored, you will need to enter a new calibration factor.

Entering Calibration Factor

1. Depress ON/C
2. Round off factor to 5 digits
3. Enter factor (remember decimal point)
4. Depress + key
5. Depress = key
6. Depress decimal point (screen display 0)

CrustBuster Drill Meter Man Factors by Model

4615 Drill / 3400 Drills

Spacing	10'	15'	30'	42'
6"				
7 ½"	.00095	.00143	.00286	.00399
8"	.00091	.00126	.00257	.00360
10"	.00069	.00103	.00206	.00274

4620 Drill / 4000 Drills

Spacing	25' Drill	20' Drill
6"	.00307	.00265
7 ½"	.00246	.00212
8"	.00224	.00191
10"	.00177	.00152

Sprocket Box Adjustment

The sprocket box design will enable the operator to set a wobble slot width once for a given seed size and change rates by changing the speed of the seed shaft.

Choose a range of seeding rates that you wish to operate in, set the slot width as indicated by the chart and simply change knob position with the

slide handle to select seed rate.

A narrow slot width will produce more even distribution and spacing in the row.

For round seeds, the ideal slot width can be determined by measuring seed size. To attain singular file flow of seeds from the wobble slot seed cup, the slot width should be greater than one and one half (1 ½) times the average seed size, but less than two (2) times the average size.

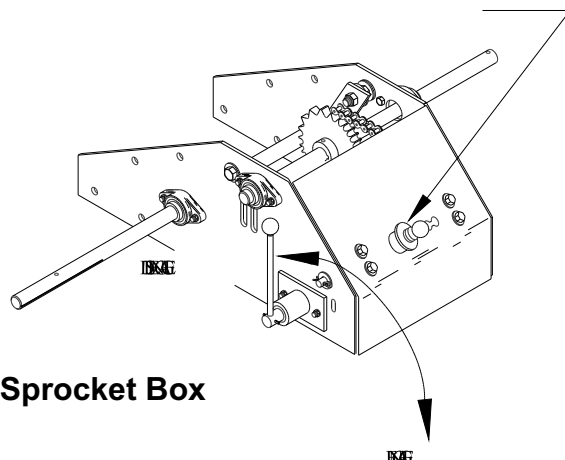
Ideal Slot Width =
Greater than (>) 1½ times seed size
Less than (<) 2 times seed size

To determine average seed size, lay out 20-30 seeds in single file, each seed touching each other. A short piece of angle iron can help align the seeds evenly. Measure distance from end to end with a ruler. Divide that measurement by the number of seeds to equal the average seed size. Multiply average seed size times 1½ to find the minimum width. Multiply average seed size times 2 to find the maximum width. The slot width should be ideal when set between these values.

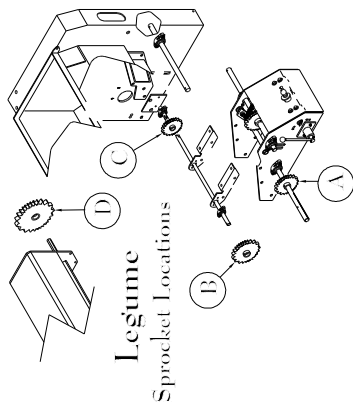
Example: 30 seeds measure 9 inches.
9 " divided by 30 seeds = .30"
.30" times 1.5 = .45"
.30 times 2 = .60"
Ideal slot width is greater than .45", less than .60"
Ideal slot width = ½"

Refer to seed chart ½" column as a starting point for setting final seed rate.

To change position, move throw-out lever toward the rear to disengage the chain from the lower sprocket. Pull the spring loaded collar outward with two fingers and slide side to side to the desired gear position. Pull throw-out lever forward to re-engage the chain.

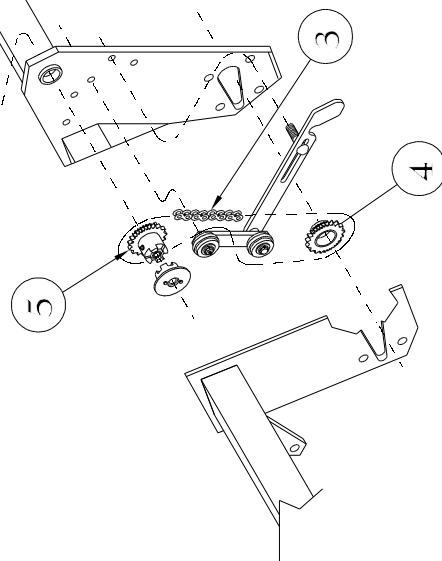


Sprocket Locations



NOTE: EXTRA SPROCKETS
DEPENDENT ON SET-UP RIDE
OF SPROCKET CARRIER.

- 1- GEARBOX
#431239 2050 CHAIN X 27 LINKS WITH
30T-25T (1) CONN & (1) OFFSET
18T-44T (2) CONN & (1) 3 LINK CHAIN
25T-44T (2) CONN, (1) OFFSET & (1) 3 LINK CHAIN
30T-44T (2) CONN, (2) OFFSET & (1) 3 LINK CHAIN
- 2- SLIFT TO GRIN BOX
#431023 2050 CHAIN X 41 LINKS W/CONN AND
25T-44T (4) OFFSETS
30T-44T (5) OFFSETS
25T-30T (6) OFFSETS
44T-18T (2) OFFSETS
- 3- CLUTCH TO WHEEL
#431825 2050 CHAIN X 47 LINKS W/CONN
7.5" SPACING (3) OFFSETS
8" SPACING (2) OFFSETS
10" SPACING (3) OFFSET
- 4- WHEEL SPROCKET
7.5" & 8" #954370- 18T
10" #953216- 25T
- 5- CLUTCH SPROCKET
7.5" #863795- 20T
8" #863787- 18T
10" #863795- 20T



Seed Rate Charts

ALFALFA

Sprockets				Slot Width			
		Derailleur		Box End		Pounds/Acre	
C	D	E	F	G	H	1/8"	1/4"
18	44	16	30	25	44	5	8
18	44	17	30	25	44	5	9
18	44	18	30	25	44	5	9
18	44	19	30	25	44	6	10
18	44	20	30	25	44	6	11
18	44	21	30	25	44	6	11
18	44	22	30	25	44	7	12
18	44	23	30	25	44	7	12
25	44	16	30	25	44	7	12
25	44	17	30	25	44	7	12
25	44	18	30	25	44	8	13
25	44	19	30	25	44	8	14
25	44	20	30	25	44	8	15
25	44	21	30	25	44	9	15
25	44	22	30	25	44	9	16
25	44	23	30	25	44	10	17
30	44	16	30	30	44	10	17
30	44	17	30	30	44	10	18
30	44	18	30	30	44	11	19
30	44	19	30	30	44	12	20
30	44	20	30	30	44	12	21
30	44	21	30	30	44	13	22
30	44	22	30	30	44	13	23
30	44	23	30	30	44	14	24
30	25	16	30	25	44	14	25
30	25	17	30	25	44	15	26
30	25	18	30	25	44	16	28
30	25	19	30	25	44	17	29
30	25	20	30	25	44	18	31
30	25	21	30	25	44	19	32
30	25	22	30	25	44	20	34
30	25	23	30	25	44	21	35
30	25	16	30	25	30	21	36
30	25	17	30	25	30	22	38
30	25	18	30	25	30	24	41
30	25	19	30	25	30	25	43
30	25	20	30	25	30	26	45
30	25	21	30	25	30	28	48
30	25	22	30	25	30	29	50
30	25	23	30	25	30	30	52

BARLEY

Sprockets						Slot Width		
		Derailleur		Box End		Pounds/Acre		
C	D	E	F	G	H	1/2"	5/8"	3/4"
30	25	16	30	25	44	31	38	45
30	25	17	30	25	44	33	40	48
30	25	18	30	25	44	34	43	51
30	25	19	30	25	44	36	45	54
30	25	20	30	25	44	38	47	57
30	25	21	30	25	44	40	50	60
30	25	22	30	25	44	42	52	63
30	25	23	30	25	44	44	54	65
30	25	16	30	25	30	45	56	67
30	25	17	30	25	30	48	59	71
30	25	18	30	25	30	51	63	75
30	25	19	30	25	30	53	66	79
30	25	20	30	25	30	56	69	83
30	25	21	30	25	30	59	73	88
30	25	22	30	25	30	62	76	92
30	25	23	30	25	30	65	80	96
30	25	16	30	30	25	65	80	96
30	25	17	30	30	25	69	85	102
30	25	18	30	30	25	73	90	108
30	25	19	30	30	25	77	95	114
30	25	20	30	30	25	81	100	120
30	25	21	30	30	25	85	105	126
30	25	22	30	30	25	89	110	132
30	25	23	30	30	25	93	115	138
25	30	16	30	44	18	92	113	136
25	30	17	30	44	18	97	120	144
25	30	18	30	44	18	103	127	153
25	30	19	30	44	18	109	134	161
25	30	20	30	44	18	114	141	170
25	30	21	30	44	18	120	149	178
25	30	22	30	44	18	126	156	187
25	30	23	30	44	18	132	163	195

Seed Rate Charts

CANOLA

		Sprockets		Slot Width				
		Derailleur		Box End		Pounds/Acre		
C	D	E	F	G	H	3/16"	1/4"	3/8"
18	44	16	30	25	44	5	7	10
18	44	17	30	25	44	5	8	11
18	44	18	30	25	44	5	8	11
18	44	19	30	25	44	6	8	12
18	44	20	30	25	44	6	9	13
18	44	21	30	25	44	6	9	13
18	44	22	30	25	44	7	10	14
18	44	23	30	25	44	7	10	14
25	44	16	30	25	44	7	10	14
25	44	17	30	25	44	7	10	15
25	44	18	30	25	44	8	11	16
25	44	19	30	25	44	8	12	17
25	44	20	30	25	44	8	12	17
25	44	21	30	25	44	9	13	18
25	44	22	30	25	44	9	13	19
25	44	23	30	25	44	10	14	20
30	44	16	30	30	44	10	14	20
30	44	17	30	30	44	10	15	21
30	44	18	30	30	44	11	16	23
30	44	19	30	30	44	12	17	24
30	44	20	30	30	44	12	18	25
30	44	21	30	30	44	13	19	26
30	44	22	30	30	44	13	19	28
30	44	23	30	30	44	14	20	29
30	25	16	30	25	44	14	21	29
30	25	17	30	25	44	15	22	31
30	25	18	30	25	44	16	23	33
30	25	19	30	25	44	17	25	35
30	25	20	30	25	44	18	26	37
30	25	21	30	25	44	19	27	39
30	25	22	30	25	44	20	28	41
30	25	23	30	25	44	21	30	42
30	25	16	30	25	30	21	30	43
30	25	17	30	25	30	22	32	46
30	25	18	30	25	30	24	34	49
30	25	19	30	25	30	25	36	51
30	25	20	30	25	30	26	38	54
30	25	21	30	25	30	28	40	57
30	25	22	30	25	30	29	42	59
30	25	23	30	25	30	30	44	62
30	25	16	30	30	25	30	44	62
30	25	17	30	30	25	32	46	66
30	25	18	30	30	25	34	49	70
30	25	19	30	30	25	36	52	74
30	25	20	30	30	25	38	55	78
30	25	21	30	30	25	40	57	82
30	25	22	30	30	25	42	60	86
30	25	23	30	30	25	44	63	89

CORN

		Sprockets		Slot Width				
		Derailleur		Box End		Pounds/Acre		
C	D	E	F	G	H	1/2"	5/8"	3/4"
18	44	16	30	25	44	6	8	10
18	44	17	30	25	44	6	8	10
18	44	18	30	25	44	6	9	11
18	44	19	30	25	44	7	9	11
18	44	20	30	25	44	7	10	12
18	44	21	30	25	44	7	10	13
18	44	22	30	25	44	8	11	13
18	44	23	30	25	44	8	11	14
25	44	16	30	25	44	8	11	13
25	44	17	30	25	44	8	12	14
25	44	18	30	25	44	9	12	15
25	44	19	30	25	44	9	13	16
25	44	20	30	25	44	10	14	17
25	44	21	30	25	44	10	14	18
25	44	22	30	25	44	11	15	18
25	44	23	30	25	44	11	16	19
30	44	16	30	30	44	11	16	19
30	44	17	30	30	44	12	17	20
30	44	18	30	30	44	13	18	22
30	44	19	30	30	44	13	19	23
30	44	20	30	30	44	14	20	24
30	44	21	30	30	44	15	21	25
30	44	22	30	30	44	15	22	26
30	44	23	30	30	44	16	23	28
30	25	16	30	25	44	17	23	28
30	25	17	30	25	44	18	25	30
30	25	18	30	25	44	19	26	32
30	25	19	30	25	44	20	27	34
30	25	20	30	25	44	21	29	35
30	25	21	30	25	44	22	30	37
30	25	22	30	25	44	23	32	39
30	25	23	30	25	44	24	33	41
30	25	16	30	25	30	26	34	42
30	25	17	30	25	30	27	36	44
30	25	18	30	25	30	28	38	47
30	25	19	30	25	30	29	40	50
30	25	20	30	25	30	31	42	52
30	25	21	30	25	30	32	44	55
30	25	22	30	25	30	34	46	58
30	25	23	30	25	30	35	48	60
30	25	16	30	30	25	35	48	60
30	25	17	30	30	25	37	52	64
30	25	18	30	30	25	40	55	68
30	25	19	30	30	25	42	58	72
30	25	20	30	30	25	44	61	75
30	25	21	30	30	25	46	64	79
30	25	22	30	30	25	48	67	83
30	25	23	30	30	25	51	70	87

Seed Rate Charts

COTTON

		Sprockets		Slot Width				
		Derailleur		Box End		Pounds/Acre		
C	D	E	F	G	H	1/2"	5/8"	3/4"
18	44	16	30	25	44	8	9	12
18	44	17	30	25	44	8	10	12
18	44	18	30	25	44	9	10	13
18	44	19	30	25	44	9	11	14
18	44	20	30	25	44	10	12	14
18	44	21	30	25	44	10	12	15
18	44	22	30	25	44	11	13	16
18	44	23	30	25	44	11	13	17
25	44	16	30	25	44	11	13	16
25	44	17	30	25	44	11	14	17
25	44	18	30	25	44	12	14	18
25	44	19	30	25	44	13	15	19
25	44	20	30	25	44	13	16	20
25	44	21	30	25	44	14	17	21
25	44	22	30	25	44	15	18	22
25	44	23	30	25	44	15	19	23
30	44	16	30	30	44	15	19	23
30	44	17	30	30	44	16	20	24
30	44	18	30	30	44	17	21	26
30	44	19	30	30	44	18	22	27
30	44	20	30	30	44	19	23	29
30	44	21	30	30	44	20	24	30
30	44	22	30	30	44	21	26	32
30	44	23	30	30	44	22	27	33
30	25	16	30	25	44	23	27	34
30	25	17	30	25	44	24	29	36
30	25	18	30	25	44	26	31	38
30	25	19	30	25	44	27	32	40
30	25	20	30	25	44	28	34	42
30	25	21	30	25	44	30	36	44
30	25	22	30	25	44	31	37	46
30	25	23	30	25	44	33	39	49

FESCUE

		Sprockets		Slot Width				
		Derailleur		Box End		Pounds/Acre		
C	D	E	F	G	H	3/8"	1/2"	5/8"
18	44	16	30	25	44	4	6	7
18	44	17	30	25	44	5	6	8
18	44	18	30	25	44	5	6	8
18	44	19	30	25	44	5	7	9
18	44	20	30	25	44	5	7	9
18	44	21	30	25	44	6	7	10
18	44	22	30	25	44	6	8	10
18	44	23	30	25	44	6	8	11
25	44	16	30	25	44	6	8	10
25	44	17	30	25	44	6	8	11
25	44	18	30	25	44	7	9	11
25	44	19	30	25	44	7	9	12
25	44	20	30	25	44	8	10	13
25	44	21	30	25	44	8	10	13
25	44	22	30	25	44	8	11	14
25	44	23	30	25	44	9	11	15
30	44	16	30	30	44	9	11	15
30	44	17	30	30	44	9	12	16
30	44	18	30	30	44	10	13	16
30	44	19	30	30	44	10	14	17
30	44	20	30	30	44	11	14	18
30	44	21	30	30	44	11	15	19
30	44	22	30	30	44	12	16	20
30	44	23	30	30	44	12	16	21
30	25	16	30	25	44	13	17	22
30	25	17	30	25	44	14	18	23
30	25	18	30	25	44	14	19	24
30	25	19	30	25	44	15	20	26
30	25	20	30	25	44	16	21	27
30	25	21	30	25	44	17	22	28
30	25	22	30	25	44	18	23	30
30	25	23	30	25	44	18	24	31
30	25	16	30	25	30	19	25	32
30	25	17	30	25	30	20	26	34
30	25	18	30	25	30	21	28	35
30	25	19	30	25	30	22	29	37
30	25	20	30	25	30	23	31	39
30	25	21	30	25	30	25	32	41
30	25	22	30	25	30	26	34	43
30	25	23	30	25	30	27	35	45
30	25	16	30	30	25	27	35	45
30	25	17	30	30	25	29	38	48
30	25	18	30	30	25	30	40	51
30	25	19	30	30	25	32	42	54
30	25	20	30	30	25	34	44	57
30	25	21	30	30	25	35	46	60
30	25	22	30	30	25	37	49	62
30	25	23	30	30	25	39	51	65

Seed Rate Charts

MILLET

Sprockets				Slot Width					
		Derailleur		Box End		Pounds/Acre			
C	D	E	F	G	H	3/16"	1/4"	3/8"	
18	44	16	30	25	44	4	6	8	
18	44	17	30	25	44	4	6	8	
18	44	18	30	25	44	4	7	9	
18	44	19	30	25	44	4	7	9	
18	44	20	30	25	44	5	7	10	
18	44	21	30	25	44	5	8	10	
18	44	22	30	25	44	5	8	11	
18	44	23	30	25	44	5	8	11	
25	44	16	30	25	44	5	8	11	
25	44	17	30	25	44	5	9	12	
25	44	18	30	25	44	6	9	12	
25	44	19	30	25	44	6	10	13	
25	44	20	30	25	44	6	10	14	
25	44	21	30	25	44	7	11	15	
25	44	22	30	25	44	7	11	15	
25	44	23	30	25	44	7	12	16	
30	44	16	30	30	44	7	12	16	
30	44	17	30	30	44	8	12	17	
30	44	18	30	30	44	8	13	18	
30	44	19	30	30	44	9	14	19	
30	44	20	30	30	44	9	14	20	
30	44	21	30	30	44	10	15	21	
30	44	22	30	30	44	10	16	22	
30	44	23	30	30	44	11	17	23	
30	25	16	30	25	44	11	17	23	
30	25	17	30	25	44	11	18	25	
30	25	18	30	25	44	12	19	26	
30	25	19	30	25	44	13	20	28	
30	25	20	30	25	44	13	21	29	
30	25	21	30	25	44	14	22	31	
30	25	22	30	25	44	15	23	32	
30	25	23	30	25	44	15	24	34	
30	25	16	30	25	30	16	25	34	
30	25	17	30	25	30	17	26	36	
30	25	18	30	25	30	18	28	39	
30	25	19	30	25	30	19	30	41	
30	25	20	30	25	30	20	31	43	
30	25	21	30	25	30	21	33	45	
30	25	22	30	25	30	22	34	47	
30	25	23	30	25	30	23	36	49	
30	25	16	30	30	25	23	36	49	
30	25	17	30	30	25	24	38	53	
30	25	18	30	30	25	26	40	56	
30	25	19	30	30	25	27	43	59	
30	25	20	30	30	25	28	45	62	
30	25	21	30	30	25	30	47	65	
30	25	22	30	30	25	31	49	68	
30	25	23	30	30	25	33	52	71	

MILO

Sprockets				Slot Width					
		Derailleur		Box End		Pounds/Acre			
C	D	E	F	G	H	3/16"	1/4"	3/8"	
18	44	16	30	25	44	4	6	11	
18	44	17	30	25	44	5	6	12	
18	44	18	30	25	44	5	7	13	
18	44	19	30	25	44	5	7	14	
18	44	20	30	25	44	5	8	14	
18	44	21	30	25	44	6	8	15	
18	44	22	30	25	44	6	8	16	
18	44	23	30	25	44	6	9	16	
25	44	16	30	25	44	6	8	16	
25	44	17	30	25	44	6	9	17	
25	44	18	30	25	44	7	10	18	
25	44	19	30	25	44	7	10	19	
25	44	20	30	25	44	8	11	20	
25	44	21	30	25	44	8	11	21	
25	44	22	30	25	44	8	12	22	
25	44	23	30	25	44	9	12	23	
30	44	16	30	30	44	9	12	23	
30	44	17	30	30	44	9	13	24	
30	44	18	30	30	44	10	14	26	
30	44	19	30	30	44	10	14	27	
30	44	20	30	30	44	11	15	29	
30	44	21	30	30	44	11	16	30	
30	44	22	30	30	44	12	17	32	
30	44	23	30	30	44	12	18	33	
30	25	16	30	25	44	13	18	34	
30	25	17	30	25	44	13	19	36	
30	25	18	30	25	44	14	20	38	
30	25	19	30	25	44	15	21	40	
30	25	20	30	25	44	16	22	42	
30	25	21	30	25	44	17	23	44	
30	25	22	30	25	44	17	25	46	
30	25	23	30	25	44	18	26	48	

Seed Rate Charts

OATS

		Sprockets		Slot Width				
		Derailleur		Box End		Pounds/Acre		
C	D	E	F	G	H	1/2"	5/8"	3/4"
30	25	16	30	25	44	15	20	27
30	25	17	30	25	44	16	21	28
30	25	18	30	25	44	17	23	30
30	25	19	30	25	44	18	24	32
30	25	20	30	25	44	19	25	33
30	25	21	30	25	44	20	26	35
30	25	22	30	25	44	21	28	37
30	25	23	30	25	44	22	29	38
30	25	16	30	25	30	22	29	39
30	25	17	30	25	30	23	31	42
30	25	18	30	25	30	25	33	44
30	25	19	30	25	30	26	35	47
30	25	20	30	25	30	28	37	49
30	25	21	30	25	30	29	39	51
30	25	22	30	25	30	30	40	54
30	25	23	30	25	30	32	42	56
30	25	16	30	30	25	32	42	56
30	25	17	30	30	25	34	45	60
30	25	18	30	30	25	36	48	64
30	25	19	30	30	25	38	50	67
30	25	20	30	30	25	40	53	71
30	25	21	30	30	25	42	56	74
30	25	22	30	30	25	44	58	78
30	25	23	30	30	25	46	61	81
25	30	16	30	44	18	45	60	80
25	30	17	30	44	18	48	64	85
25	30	18	30	44	18	51	67	90
25	30	19	30	44	18	53	71	95
25	30	20	30	44	18	56	75	100
25	30	21	30	44	18	59	79	105
25	30	22	30	44	18	62	82	110
25	30	23	30	44	18	65	86	115
30	25	16	30	44	18	65	86	115
30	25	17	30	44	18	69	92	122
30	25	18	30	44	18	73	97	129
30	25	19	30	44	18	77	102	137
30	25	20	30	44	18	81	108	144
30	25	21	30	44	18	85	113	151
30	25	22	30	44	18	89	119	158
30	25	23	30	44	18	93	124	165

PINTO BEANS

		Sprockets		Slot Width				
		Derailleur		Box End		Pounds/Acre		
C	D	E	F	G	H	1/2"	5/8"	3/4"
30	25	16	30	25	44	20	27	32
30	25	17	30	25	44	21	28	34
30	25	18	30	25	44	22	30	36
30	25	19	30	25	44	24	31	38
30	25	20	30	25	44	25	33	40
30	25	21	30	25	44	26	35	42
30	25	22	30	25	44	27	36	44
30	25	23	30	25	44	29	38	46
30	25	16	30	25	30	29	39	46
30	25	17	30	25	30	31	41	49
30	25	18	30	25	30	33	44	52
30	25	19	30	25	30	35	46	55
30	25	20	30	25	30	37	49	58
30	25	21	30	25	30	38	51	61
30	25	22	30	25	30	40	53	64
30	25	23	30	25	30	42	56	67
30	25	16	30	30	25	42	56	67
30	25	17	30	30	25	45	60	71
30	25	18	30	30	25	47	63	75
30	25	19	30	30	25	50	67	79
30	25	20	30	30	25	53	70	84
30	25	21	30	30	25	55	74	88
30	25	22	30	30	25	58	77	92
30	25	23	30	30	25	61	81	96
25	30	16	30	44	18	60	79	95
25	30	17	30	44	18	63	84	101
25	30	18	30	44	18	67	89	107
25	30	19	30	44	18	71	94	112
25	30	20	30	44	18	75	99	118
25	30	21	30	44	18	78	104	124
25	30	22	30	44	18	82	109	130
25	30	23	30	44	18	86	114	136
30	25	16	30	44	18	86	114	136
30	25	17	30	44	18	91	121	145
30	25	18	30	44	18	97	128	153
30	25	19	30	44	18	102	135	162
30	25	20	30	44	18	107	143	170
30	25	21	30	44	18	113	150	179
30	25	22	30	44	18	118	157	187
30	25	23	30	44	18	124	164	196
44	25	16	30	44	18	126	167	200
44	25	17	30	44	18	134	178	212
44	25	18	30	44	18	142	188	225
44	25	19	30	44	18	150	199	237
44	25	20	30	44	18	158	209	250
44	25	21	30	44	18	165	220	262
44	25	22	30	44	18	173	230	275
44	25	23	30	44	18	181	241	287

Seed Rate Charts

RICE

Sprockets				Slot Width		
		Derailleur		Box End		Pounds/Acre
C	D	E	F	G	H	1/2" 5/8" 3/4"
30	25	16	30	25	44	27 34 40
30	25	17	30	25	44	29 36 42
30	25	18	30	25	44	31 38 45
30	25	19	30	25	44	32 40 47
30	25	20	30	25	44	34 43 50
30	25	21	30	25	44	36 45 52
30	25	22	30	25	44	37 47 54
30	25	23	30	25	44	39 49 57
30	25	16	30	25	30	40 50 58
30	25	17	30	25	30	42 53 62
30	25	18	30	25	30	45 56 65
30	25	19	30	25	30	47 59 69
30	25	20	30	25	30	50 63 73
30	25	21	30	25	30	52 66 76
30	25	22	30	25	30	55 69 80
30	25	23	30	25	30	57 72 84
30	25	16	30	30	25	57 72 84
30	25	17	30	30	25	61 77 89
30	25	18	30	30	25	65 81 94
30	25	19	30	30	25	68 86 99
30	25	20	30	30	25	72 90 105
30	25	21	30	30	25	75 95 110
30	25	22	30	30	25	79 99 115
30	25	23	30	30	25	83 104 120
25	30	16	30	44	18	81 102 118
25	30	17	30	44	18	86 108 126
25	30	18	30	44	18	91 115 133
25	30	19	30	44	18	97 121 141
25	30	20	30	44	18	102 127 148
25	30	21	30	44	18	107 134 155
25	30	22	30	44	18	112 140 163
25	30	23	30	44	18	117 146 170
30	25	16	30	44	18	117 146 170
30	25	17	30	44	18	125 155 181
30	25	18	30	44	18	131 164 191
30	25	19	30	44	18	139 174 202
30	25	20	30	44	18	147 183 213
30	25	21	30	44	18	154 192 224
30	25	22	30	44	18	161 201 234
30	25	23	30	44	18	168 210 245

RYE

Sprockets				Slot Width		
		Derailleur		Box End		Pounds/Acre
C	D	E	F	G	H	1/2" 5/8" 3/4"
30	44	16	30	30	44	27 34 44
30	44	17	30	30	44	28 36 46
30	44	18	30	30	44	30 38 49
30	44	19	30	30	44	32 40 52
30	44	20	30	30	44	33 43 55
30	44	21	30	30	44	35 45 57
30	44	22	30	30	44	36 47 60
30	44	23	30	30	44	38 49 63
30	25	16	30	25	44	39 50 64
30	25	17	30	25	44	41 53 68
30	25	18	30	25	44	44 56 72
30	25	19	30	25	44	46 59 76
30	25	20	30	25	44	49 62 80
30	25	21	30	25	44	51 66 84
30	25	22	30	25	44	54 69 88
30	25	23	30	25	44	56 72 92
30	25	16	30	25	30	57 73 94
30	25	17	30	25	30	61 78 100
30	25	18	30	25	30	64 82 106
30	25	19	30	25	30	68 87 112
30	25	20	30	25	30	71 92 117
30	25	21	30	25	30	75 96 123
30	25	22	30	25	30	78 101 129
30	25	23	30	25	30	82 105 135
30	30	16	30	30	25	82 105 135
30	30	17	30	30	25	87 112 144
30	30	18	30	30	25	92 119 152
30	30	19	30	30	25	98 125 161
30	30	20	30	30	25	103 132 169
30	30	21	30	30	25	108 138 178
30	30	22	30	30	25	113 145 186
30	30	23	30	30	25	118 152 195

Seed Rate Charts

SOYBEANS

		Sprockets				Slot Width			
		Derailleur		Box End		Pounds/Acre			
C	D	E	F	G	H	3/8"	1/2"	5/8"	3/4"
30	25	16	30	25	44	18	26	34	43
30	25	17	30	25	44	19	27	37	45
30	25	18	30	25	44	20	29	39	48
30	25	19	30	25	44	21	31	41	51
30	25	20	30	25	44	22	32	43	53
30	25	21	30	25	44	23	34	45	56
30	25	22	30	25	44	24	36	47	59
30	25	23	30	25	44	25	37	50	61
30	25	16	30	25	30	26	38	51	63
30	25	17	30	25	30	27	40	54	67
30	25	18	30	25	30	29	43	57	71
30	25	19	30	25	30	31	45	60	75
30	25	20	30	25	30	32	47	63	78
30	25	21	30	25	30	34	50	66	82
30	25	22	30	25	30	35	52	70	86
30	25	23	30	25	30	37	55	73	90
30	25	16	30	30	25	37	55	73	90
30	25	17	30	30	25	39	58	77	96
30	25	18	30	30	25	42	61	82	102
30	25	19	30	30	25	44	65	87	107
30	25	20	30	30	25	46	68	91	113
30	25	21	30	30	25	49	72	96	119
30	25	22	30	30	25	51	75	100	124
30	25	23	30	30	25	53	79	105	130
25	30	16	30	44	18	52	77	103	128
25	30	17	30	44	18	56	82	109	136
25	30	18	30	44	18	59	87	116	144
25	30	19	30	44	18	62	92	122	152
25	30	20	30	44	18	65	97	129	160
25	30	21	30	44	18	69	101	135	168
25	30	22	30	44	18	72	106	142	176
25	30	23	30	44	18	75	111	148	184
30	25	16	30	44	18	75	111	148	184
30	25	17	30	44	18	80	118	158	196
30	25	18	30	44	18	84	124	166	206
30	25	19	30	44	18	89	132	176	219
30	25	20	30	44	18	94	139	185	230
30	25	21	30	44	18	99	146	195	242
30	25	22	30	44	18	103	153	204	253
30	25	23	30	44	18	108	160	213	265

SUNFLOWERS

		Sprockets				Slot Width			
		Derailleur		Box End		Pounds/Acre			
C	D	E	F	G	H	1/2"	5/8"	3/4"	
18	44	16	30	25	44	5	7	8	
18	44	17	30	25	44	5	7	9	
18	44	18	30	25	44	6	8	9	
18	44	19	30	25	44	6	8	10	
18	44	20	30	25	44	6	8	10	
18	44	21	30	25	44	7	9	11	
18	44	22	30	25	44	7	9	11	
18	44	23	30	25	44	7	10	12	
25	44	16	30	25	44	7	9	11	
25	44	17	30	25	44	8	10	12	
25	44	18	30	25	44	8	11	13	
25	44	19	30	25	44	9	11	13	
25	44	20	30	25	44	9	12	14	
25	44	21	30	25	44	9	12	15	
25	44	22	30	25	44	10	13	16	
25	44	23	30	25	44	10	14	16	
30	44	16	30	30	44	10	14	16	
30	44	17	30	30	44	11	14	17	
30	44	18	30	30	44	12	15	18	
30	44	19	30	30	44	12	16	19	
30	44	20	30	30	44	13	17	20	
30	44	21	30	30	44	14	18	21	
30	44	22	30	30	44	14	19	22	
30	44	23	30	30	44	15	20	23	
30	25	16	30	25	44	15	20	24	
30	25	17	30	25	44	16	21	25	
30	25	18	30	25	44	17	22	27	
30	25	19	30	25	44	18	24	28	
30	25	20	30	25	44	19	25	30	
30	25	21	30	25	44	20	26	31	
30	25	22	30	25	44	21	27	33	
30	25	23	30	25	44	22	29	34	
30	25	16	30	25	30	22	29	35	
30	25	17	30	25	30	24	31	37	
30	25	18	30	25	30	25	33	39	
30	25	19	30	25	30	26	35	42	
30	25	20	30	25	30	28	37	44	
30	25	21	30	25	30	29	38	46	
30	25	22	30	25	30	31	40	48	
30	25	23	30	25	30	32	42	50	

Seed Rate Charts

WHEAT

Sprockets				Slot Width		
		Derailleur		Box End		Pounds/Acre
C	D	E	F	G	H	1/2" 5/8" 3/4"
25	44	16	30	25	44	21 26 31
25	44	17	30	25	44	22 27 33
25	44	18	30	25	44	23 29 35
25	44	19	30	25	44	25 31 37
25	44	20	30	25	44	26 32 39
25	44	21	30	25	44	27 34 41
25	44	22	30	25	44	28 36 43
25	44	23	30	25	44	30 37 45
30	44	16	30	30	44	30 37 45
30	44	17	30	30	44	32 40 47
30	44	18	30	30	44	33 42 50
30	44	19	30	30	44	35 44 53
30	44	20	30	30	44	37 47 56
30	44	21	30	30	44	39 49 59
30	44	22	30	30	44	41 51 61
30	44	23	30	30	44	43 53 64
30	25	16	30	25	44	44 55 65
30	25	17	30	25	44	46 58 70
30	25	18	30	25	44	49 61 74
30	25	19	30	25	44	52 65 78
30	25	20	30	25	44	55 68 82
30	25	21	30	25	44	57 72 86
30	25	22	30	25	44	60 75 90
30	25	23	30	25	44	63 78 94
30	25	16	30	25	30	64 80 96
30	25	17	30	25	30	68 85 102
30	25	18	30	25	30	72 90 108
30	25	19	30	25	30	76 95 114
30	25	20	30	25	30	80 100 120
30	25	21	30	25	30	84 105 126
30	25	22	30	25	30	88 110 132
30	25	23	30	25	30	92 115 138
30	25	16	30	30	25	92 115 138
30	25	17	30	30	25	98 122 147
30	25	18	30	30	25	104 130 156
30	25	19	30	30	25	109 137 164
30	25	20	30	30	25	115 144 173
30	25	21	30	30	25	121 151 182
30	25	22	30	30	25	127 158 190
30	25	23	30	30	25	133 166 199

Legume Box Charts

ALFALFA

Sprockets				Slot Width	
Gear Box		Box End		Pounds/Acre	
A	B	C	D	1/8"	1/4"
16	30	18	44	8	15
16	25	18	44	10	18
16	20	18	44	13	22
16	18	18	44	14	25

CANOLA

Sprockets				Slot Width		
Gear Box		Box End		Pounds/Acre		
A	B	C	D	3/16"	1/4"	3/8"
16	30	18	44	8	12	17
16	25	18	44	10	15	21
16	20	18	44	13	19	26
16	18	18	44	14	21	29

FESCUE

Sprockets				Slot Width		
Gear Box		Box End		Pounds/Acre		
A	B	C	D	3/8"	1/2"	5/8"
16	30	18	44	8	10	13
16	25	18	44	9	12	16
16	20	18	44	11	15	19
16	18	18	44	13	17	22

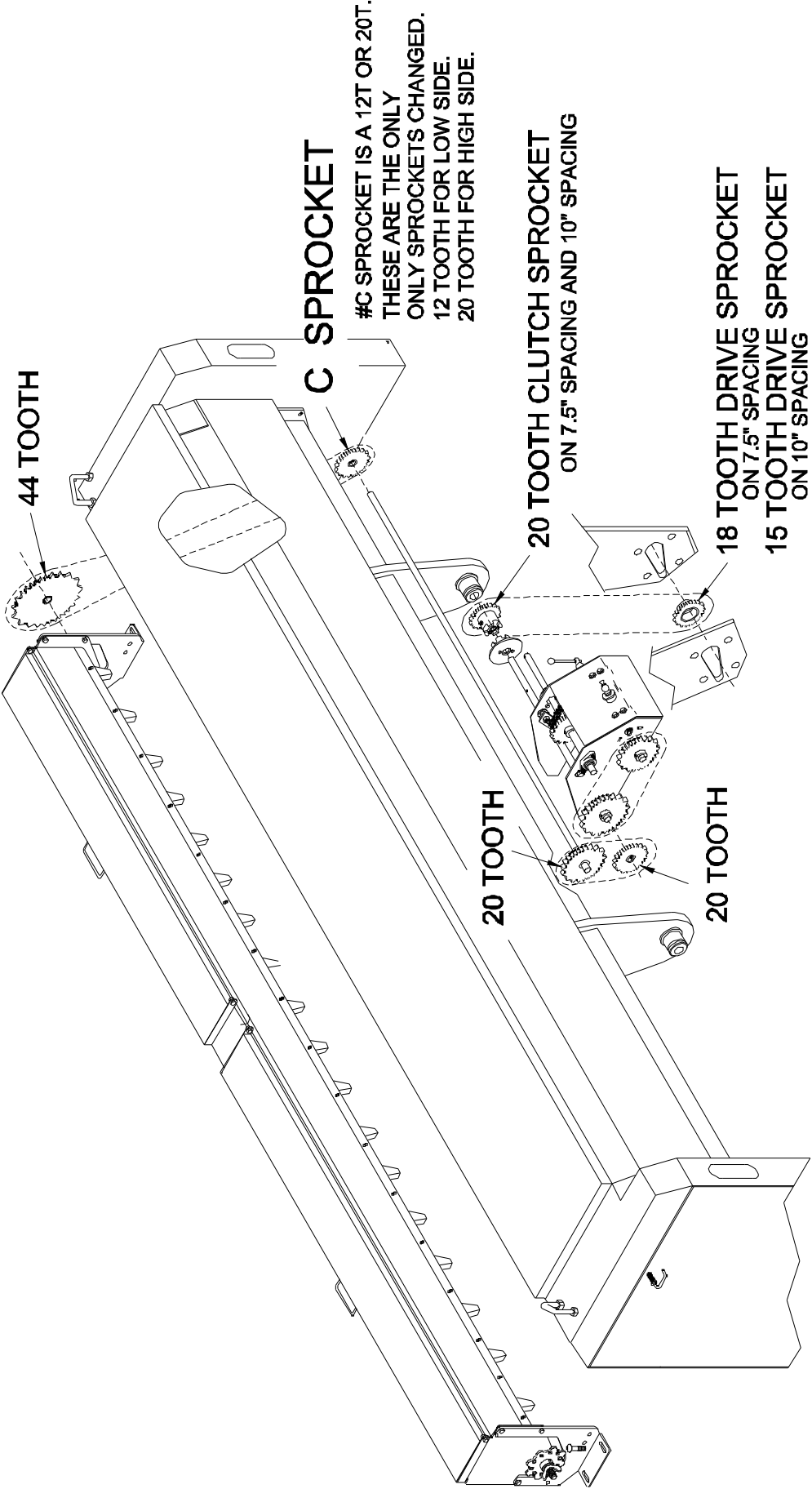
MILLET

Sprockets				Slot Width		
Gear Box		Box End		Pounds/Acre		
A	B	C	D	3/16"	1/4"	3/8"
16	30	18	44	6	10	14
16	25	18	44	8	12	17
16	20	18	44	10	15	21
16	18	18	44	11	17	23

MILO

Sprockets				Slot Width		
Gear Box		Box End		Pounds/Acre		
A	B	C	D	3/16"	1/4"	3/8"
16	30	18	44	8	11	20
16	25	18	44	9	13	24
16	20	18	44	11	16	30
16	18	18	44	13	18	34

Sprocket Locations for Small Seed Hopper

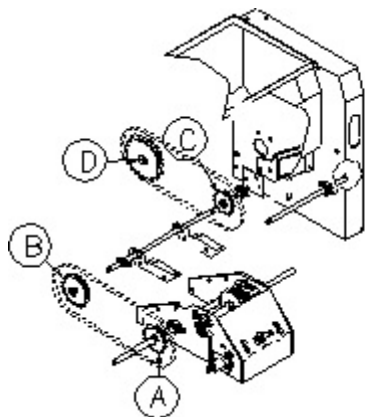


Seed Rate Charts for Small Seed Hopper Row Spacing 7½" & 10"

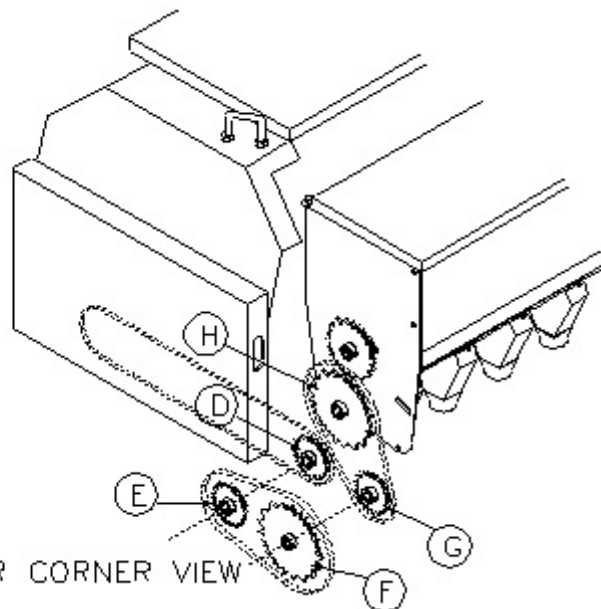
Rate Chart for reference only. Use calibration for exact seed rate.

Seed Type	Seed Rate	C Sprocket Teeth #	Turns of Adjusting Handle / Meter Opening															
			5/8	1 1/4	2	2 1/2	3 1/8	3 3/4	4 3/8	5	5 3/8	6 1/4	7	7 1/2	8 1/8	8 3/4	9 3/8	10
			1/16"	1/8"	3/16"	1/4"	5/16"	3/8"	7/16"	1/2"	9/16"	5/8"	11/16"	3/4"	13/16"	7/8"	15/16"	1"
Alfalfa	Low	12		2	3	5	6	8	9	11	12	14	15	17	19	21	23	24
	High	20		3	5	8	11	13	16	19	21	24	27	29	33	37	40	43
Alfalfa Coated	Low	12		2	4	6	8	9	11	12	14	17	17	18	20	23	24	26
	High	20		3	7	11	13	16	19	21	25	29	31	32	36	40	43	45
Bahia Grass	Low	12	1	2	2	3	5	6	8	9	10	11	12	14	14	15	17	18
	High	20	1	3	4	5	8	11	13	16	17	19	21	24	25	27	29	32
Bentgrass	Low	12	1	1	2	2	3	4	4	5	5	6	6	7	7	8	8	9
	High	20	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	15
Bermuda Grass	Low	12		2	4	6	8	9	11	12	14	15	17	20	21	23	24	26
	High	20		3	7	11	13	16	19	21	24	27	31	35	37	40	43	45
Canola	Low	12		1	3	4	6	7	9	10	11	13	14	16	17	18	20	21
	High	20		2	5	8	10	13	15	18	20	22	25	28	30	32	35	37
Centipede	Low	12		2	3	5	7	9	11	12	14	15	17	18	20	21	23	24
	High	20		3	5	8	12	16	19	21	24	27	29	32	35	37	40	43
Clover Alsike	Low	12	1	2	4	5	7	8	10	11	13	15	16	18	19	21	22	24
	High	20	1	4	6	9	12	15	17	20	23	26	29	32	34	37	39	42
Clover Red	Low	12	1	2	4	6	7	9	11	13	15	17	18	20	22	24	25	27
	High	20	1	4	7	10	13	16	19	23	26	29	32	36	39	42	45	48
Kentucky Bluegrass	Low	12		1	1	2	2	3	4	4	5	6	6	7	8	8	9	10
	High	20		1	2	3	4	5	6	7	9	10	11	12	13	15	16	17
KY31 Fescue	Low	12				2	2	3	3	4	4	5	5	5	6	6	7	7
	High	20				3	4	5	6	7	7	8	9	9	10	11	12	13
Love Grass	Low	12	2	3	5	6	8	9	11	12	14	15	16	17	18	20	20	21
	High	20	3	5	8	11	13	16	19	21	24	27	28	29	32	35	36	37
Lespedeza	Low	12	1	2	2	3	4	5	5	6	7	8	8	9	10	11	11	12
	High	20	1	3	4	5	7	8	9	11	12	13	15	16	17	19	20	21
Lespedeza Unhulled	Low	12		2	4	6	8	9	11	14	16	18	20	23	25	27	29	32
	High	20		3	7	11	13	16	20	24	28	32	36	40	44	48	52	56
Millet	Low	12		2	3	5	5	6	8	9	11	12	13	14	15	17	17	18
	High	20		3	5	8	9	11	13	16	19	21	23	24	27	29	31	32
Rape Seed	Low	12		3	5	6	7	8	9	11	12	14	15	17	19	21	23	26
	High	20		5	8	11	12	14	17	19	21	24	27	30	33	37	41	46
Ryegrass Annual	Low	12		1	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	High	20		1	2	4	5	7	9	11	12	14	16	18	19	21	23	24
Ryegrass Perennial	Low	12		1	1	2	3	4	5	6	7	8	9	10	11	12	13	14
	High	20		1	2	4	6	7	9	11	13	15	16	18	20	21	23	24
Sudan Grass	Low	12	1	3	4	6	8	10	12	14	15	17	19	20	22	24	26	28
	High	20	1	5	8	11	14	17	21	24	27	31	33	36	39	43	46	49
Switchgrass	Low	12		2	3	4	5	6	8	11	12	14	15	16	18	20	22	24
	High	20		3	5	7	9	11	15	19	21	24	26	28	31	35	39	43
Wheatgrass Tall	Low	12						1	1	2	2	2	2	2	3	3	4	5
	High	20						1	2	3	3	4	4	4	5	6	7	9

Sprocket Locations for Native Grass



FRONT LEFT CORNER VIEW

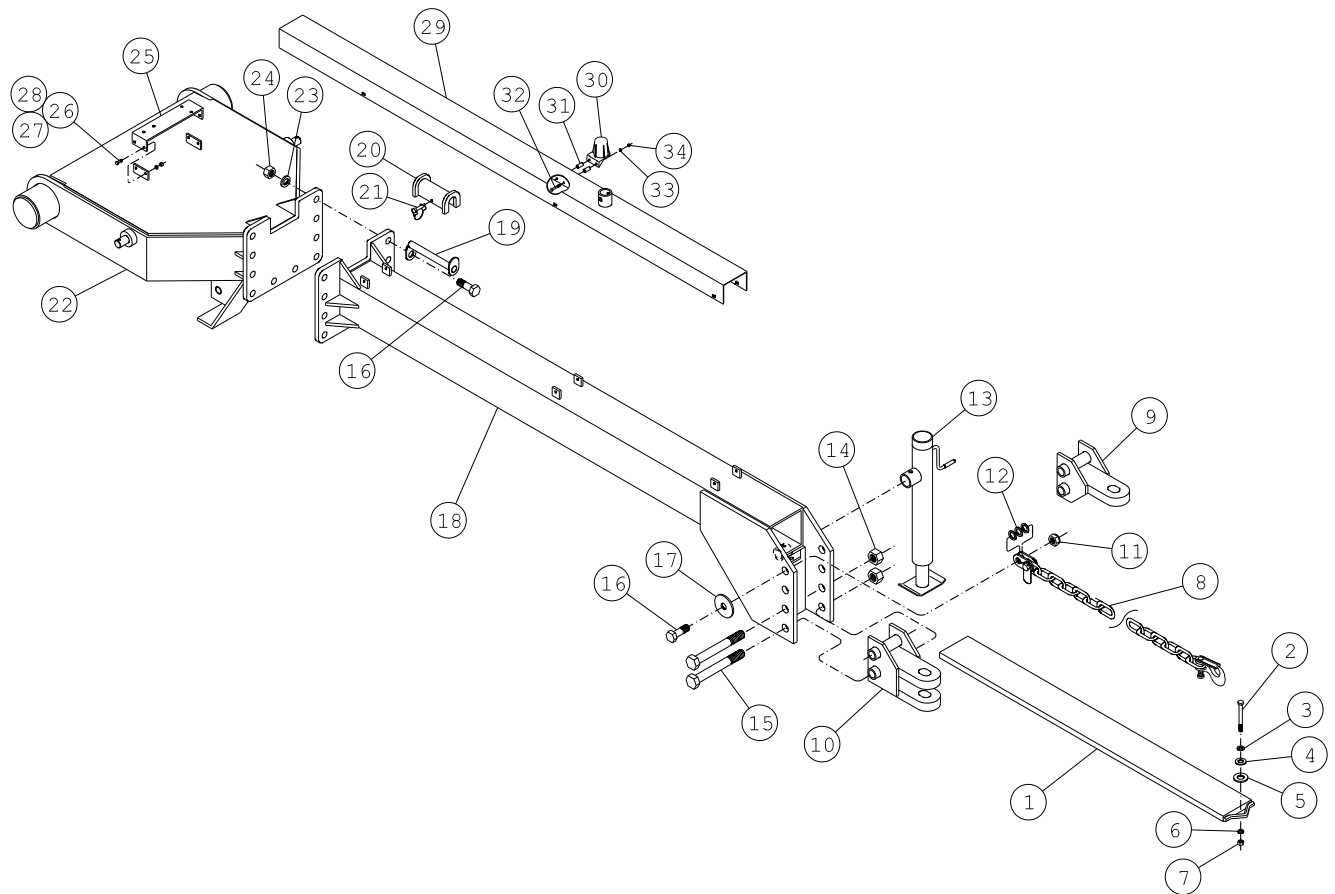


LEFT REAR CORNER VIEW

A	B	C	D	E	F	G	H		
20	30	20	20	12	44	16	44	.07	SLOWEST RATIO
20	30	20	20	12	30	16	44	.10	1.43 x FASTER
20	30	20	20	20	44	16	44	.111	1.58 x FASTER
20	30	20	20	20	30	16	44	.161	2.3 x FASTER
20	30	20	20	20	30	16	30	.237	3.39 x FASTER
20	30	20	20	20	30	16	20	.356	5.09 x FASTER
20	30	20	20	20	20	16	20	.533	7.61 x FASTER
20	30	20	20	30	20	16	20	.799	11.4 x FASTER

A	B	C	D	E	F	G	H		
20	30	12	20	12	44	16	44	.04	SLOWEST RATIO
20	30	12	20	12	30	16	44	.06	1.50 x FASTER
20	30	12	20	20	44	16	44	.07	1.75 x FASTER
20	30	12	20	20	30	16	44	.10	2.50 x FASTER
20	30	12	20	20	30	16	30	.14	3.50 x FASTER
20	30	12	20	20	30	16	20	.21	5.25 x FASTER
20	30	12	20	20	20	16	20	.32	8.00 x FASTER
20	30	12	20	30	20	16	20	.48	12.00 x FASTER

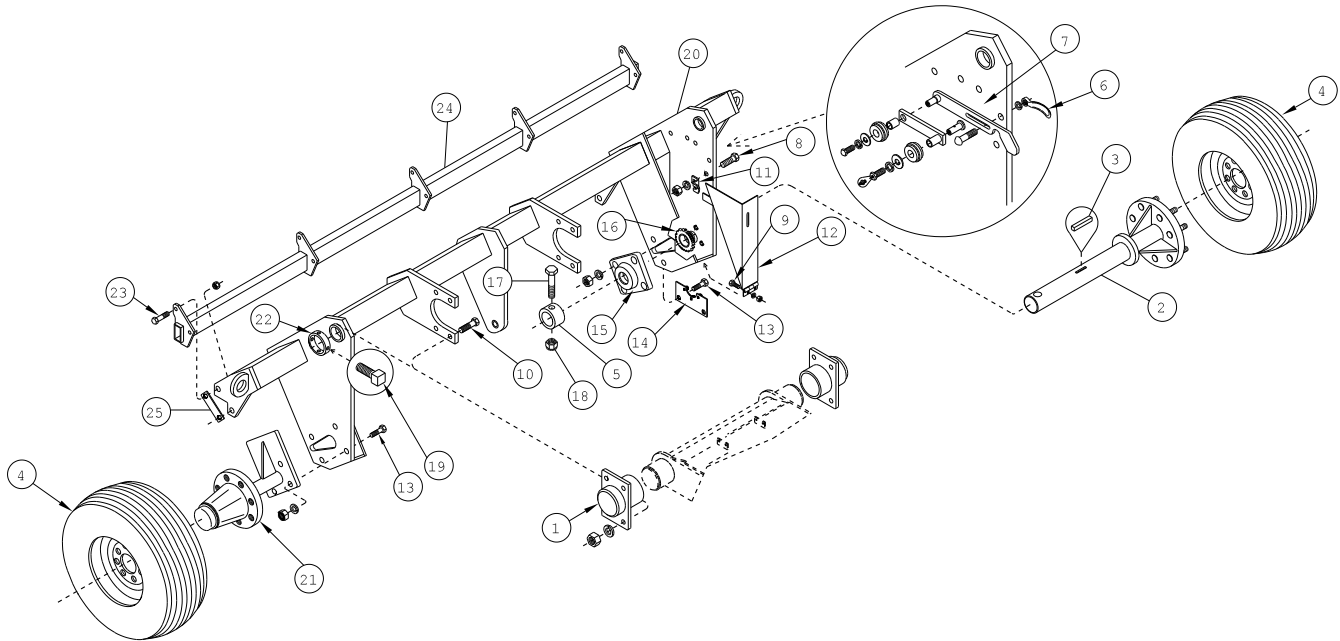
Hitch



Item	Part No.	Description
1	955492	Weight Bar 10' - 20'
2	955260	Weight Bar 13' - 15'
3	01225200	HHCS 1/2" x 5"
4	330159	Flat Washer 1/2"
5	330340	Flat Washer 3/4"
6	330407	Flat Washer 1"
7	330142	Lock Washer 1/2"
8	330134	Hex Nut 1/2"
9	433946	Safety Chain 21,000#
10	968958	Mono Hitch Option
11	955385	Hitch Clevis
12	330597	Nylock 1"
13	335166	Machine Bushing 1" x10ga
14	530733	Jack Side Crank 2000#
15	331454	Hex Nut 1 1/4"
16	337360	HHCS 1 1/4" x 10"
17	334987	HHCS 1" x 3"
18	20442000	Safety Chain Washer
19	965095	Front Hitch 10'
20	955443	Front Hitch 13'-15 -20'

Item	Part No.	Description
21	957183	Transport Lock Carrier
22	964742	Cylinder Lockout Bracket
23	00233700	Wire Lock Pin 5/16" x2 3/4
24	956508	Rear Hitch
25	330399	Lock Washer 1"
26	330381	Hex Nut 1"
27	214981	Valve Bracket
28	01010800	HHCS 5/16" x 1"
29	330845	Lock Washer 3/16"
30	330852	Hex Nut 3/16"
31	965111	Cover Shield 10'
32	956516	Cover Shield 13'-15'-20'
33	605501	Plug Holder
34	145144	Bushing
35	335133	HHCS 1/4" x 1 3/4"
36	330050	Lock Washer 1/4"
37	332205	Hex Nut 1/4"

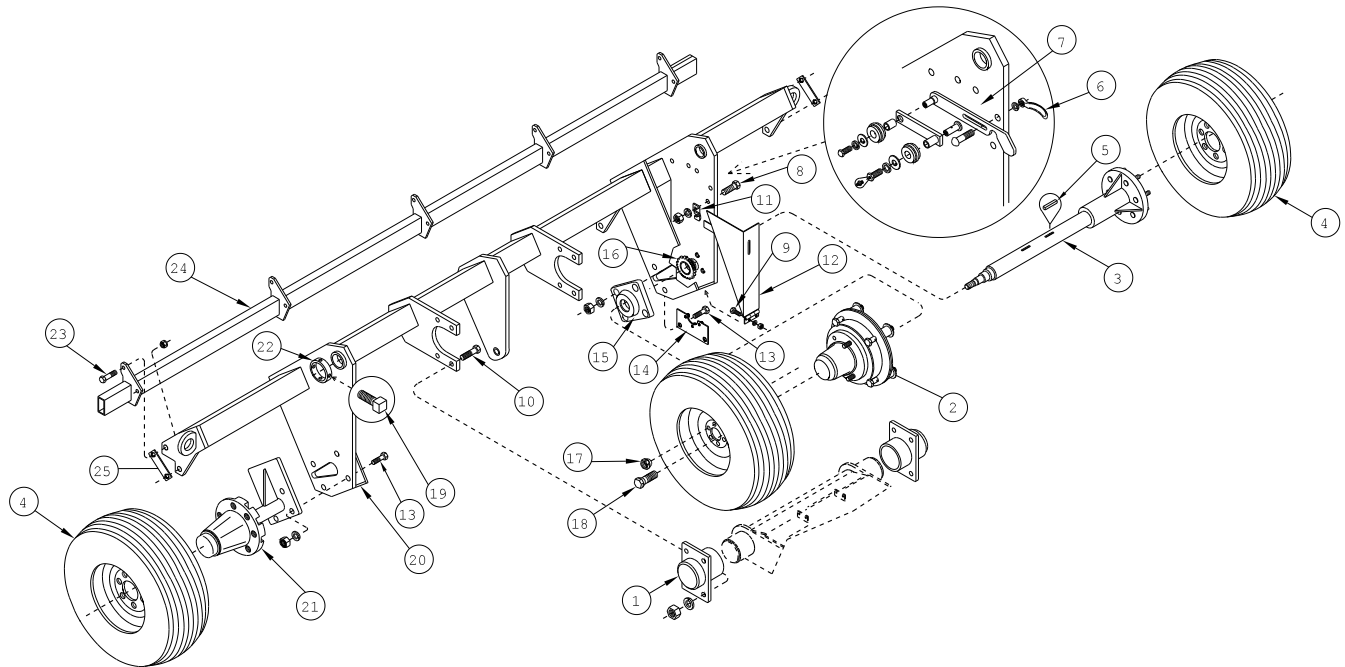
Main Frame 10'



Item	Part No.	Description
1	955377	Rocker Cap
2	964288	Wheel Spindle
3	605576	Key 3/16" x 1 1/4"
4	032862	Tire 12.5L x 15" F
Includes:		
	02990000	Decal Check Wheel Lugs
	530584	Wheel 8 Bolt 15x10
	530287	Tire Valve Stem
	530931	Tire 12.5L x 15 "F"
5	145623	Spindle Bushing
6	337352	Handle Nut 1/2-13 x 4 1/2
7	864157	Wheel Idler Assembly
8	331926	HHCS 1/2 x 2
	330142	Lock Washer 1/2
	330134	Hex Nut 1/2
9	01010800	HHCS 5/16 x 1
	330845	Lock Washer 5/16
	330811	Hex Nut 5/16
10	334987	HHCS 1" x 3"
	330399	Lock washer 1"
	330381	Hex Nut 1"

Item	Part No.	Description
11	216200	Latch Plate
12	956722	Shield Plate
13	336321	HHCS 5/8" x 2 1/4"
	330878	Lock washer 5/8"
	330571	Hex nut 5/8"
14	961557	Chain Holder
15	403279	Bearing 2" 4B (5 1/8"center)
	403287	Insert for #403279
16	954370	Drive Sprocket 2050 18T
		7 1/2" & 10" Spacing
17	330092	HHCS 1/2" x 4"
18	331363	Hex Nylock Nut 1/2"
19	334748	Set Screw 5/16" x 1/2"
		Sq Head Cup
20	964189	4610 Main Frame
21	870576	Spindle & Hub Assembly
22	149765	Lock Collar
23	02307700	HHCS 3/4" x 3"
	330316	Hex Nylock Nut 3/4"
24	964221	4610 Tool Bar
25	232322	Tool Bar Strap

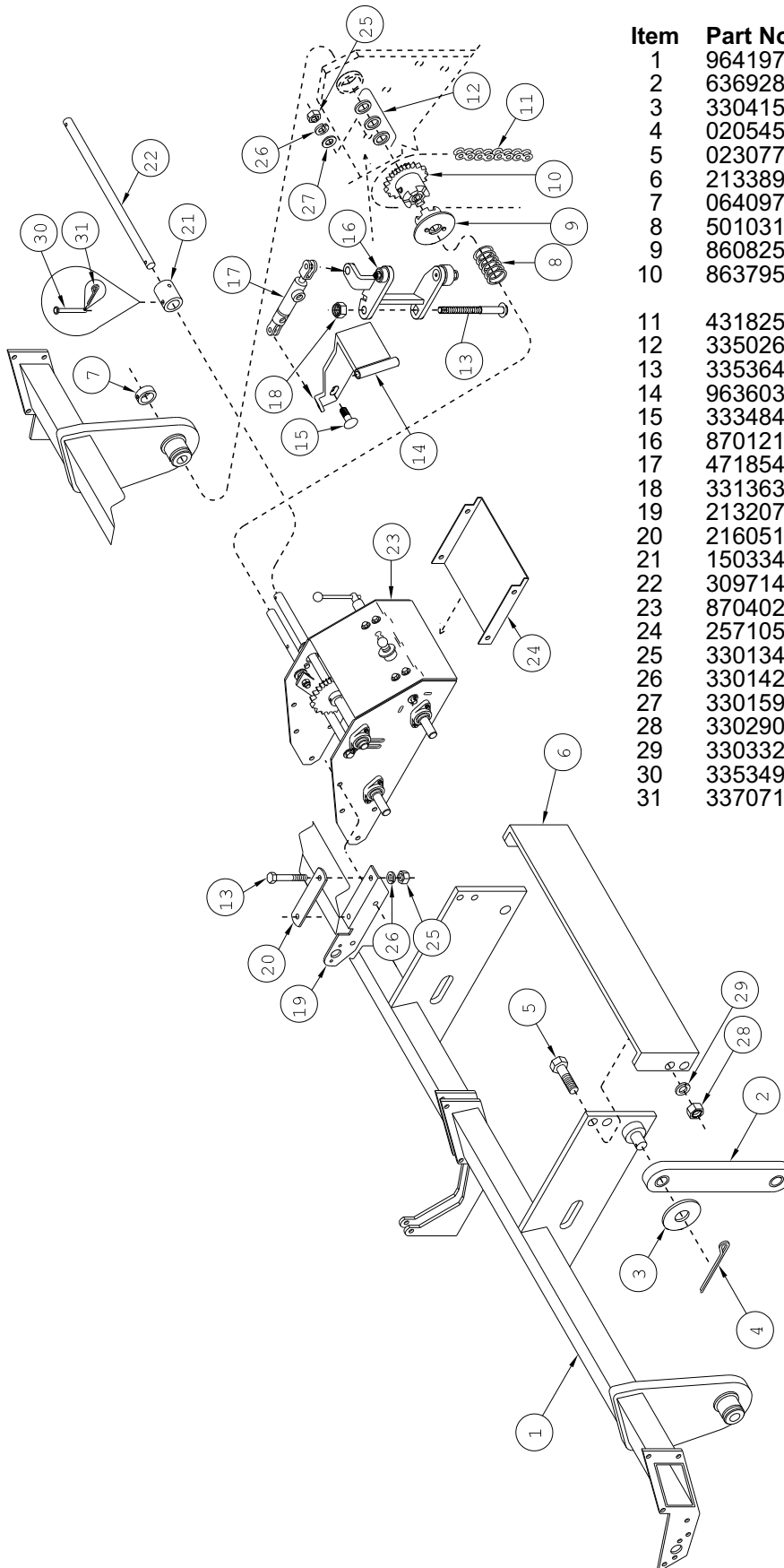
Main Frame 13', 15' & 20'



Item	Part No.	Description
1	955377	Rocker Cap
2	870196	Clutch Assembly
3	961532	Wheel Spindle
4	815175	Tire 11L 8 Ply Mounted
	Includes:	
	02990000	Decal Check Wheel Lugs
	530147	Wheel 6 Bolt 15x10
	530287	Tire Valve Stem
	530329	Tire 11L x 15 8Ply
5	605576	Key 3/16 x 1 1/4
6	337352	Handle Nut 1/2-13 x 4 1/2
7	864157	Wheel Idler Assembly
8	331926	HHCS 1/2 x 2
	330142	Lock Washer 1/2
	330134	Hex Nut 1/2
9	01010800	HHCS 5/16 x 1
	330845	Lock Washer 5/16
	330811	Hex Nut 5/16
10	334987	HHCS 1" x 3"
	330399	Lock washer 1"
	330381	Hex Nut 1"
11	216200	Latch Plate
12	956722	Shield Plate
13	336321	HHCS 5/8" x 2 1/4"
	330878	Lock washer 5/8"
	330571	Hex nut 5/8"

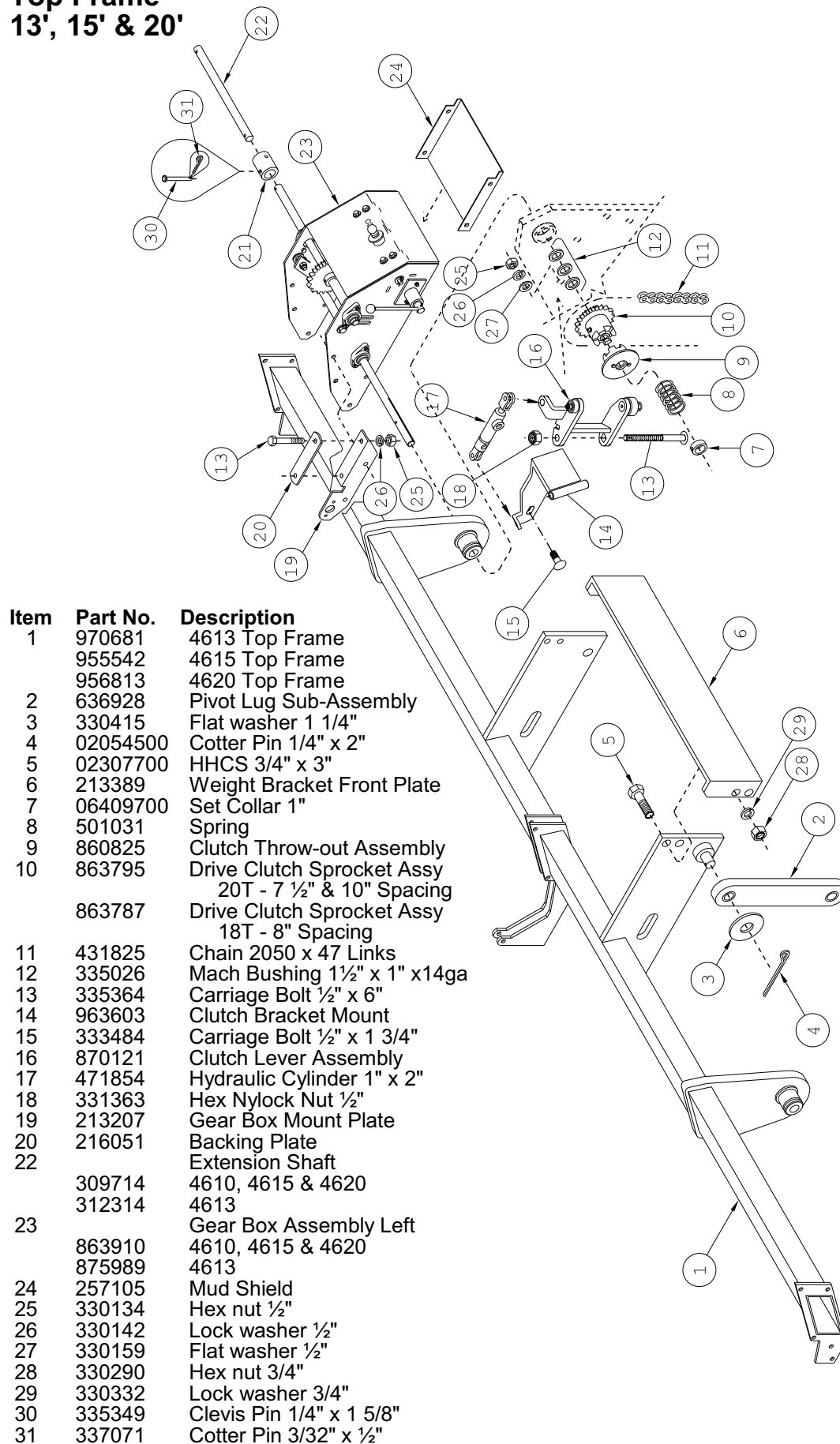
Item	Part No.	Description
14	961557	Chain Holder
15	403279	Bearing 2" 4B (5 1/8" center)
	403287	Insert for #403279
	400739	Bearing 2" 4B (4 3/8" center)
	400994	Insert for #400739
16	954370	Drive Sprocket 2050 18T
		7 1/2" & 8" Spacing
	953216	Drive Sprocket 2050 25T
		10" Spacing
17	331314	Wheel Nut 1/2"-20 90°
18	330464	Wheel Bolt 1/2" x 1 3/4" SAE
19	334748	Set Screw 5/16" x 1/2"
		Sq Head Cup
20	970673	4613 Main Frame
	961516	4615 Main Frame
	961524	4620 Main Frame
21	868711	Spindle Assembly (5 1/8" center)
	863902	Spindle Assembly (4 3/8" center)
22	149765	Lock Collar
23	02307700	HHCS 3/4" x 3"
	330316	Hex Nylock Nut 3/4"
24	970699	4613 Tool Bar
	955476	4615 Tool Bar
	956920	4620 Tool Bar Right
	957001	4620 Tool Bar Left
25	232322	Tool Bar Strap

Top Frame 10'



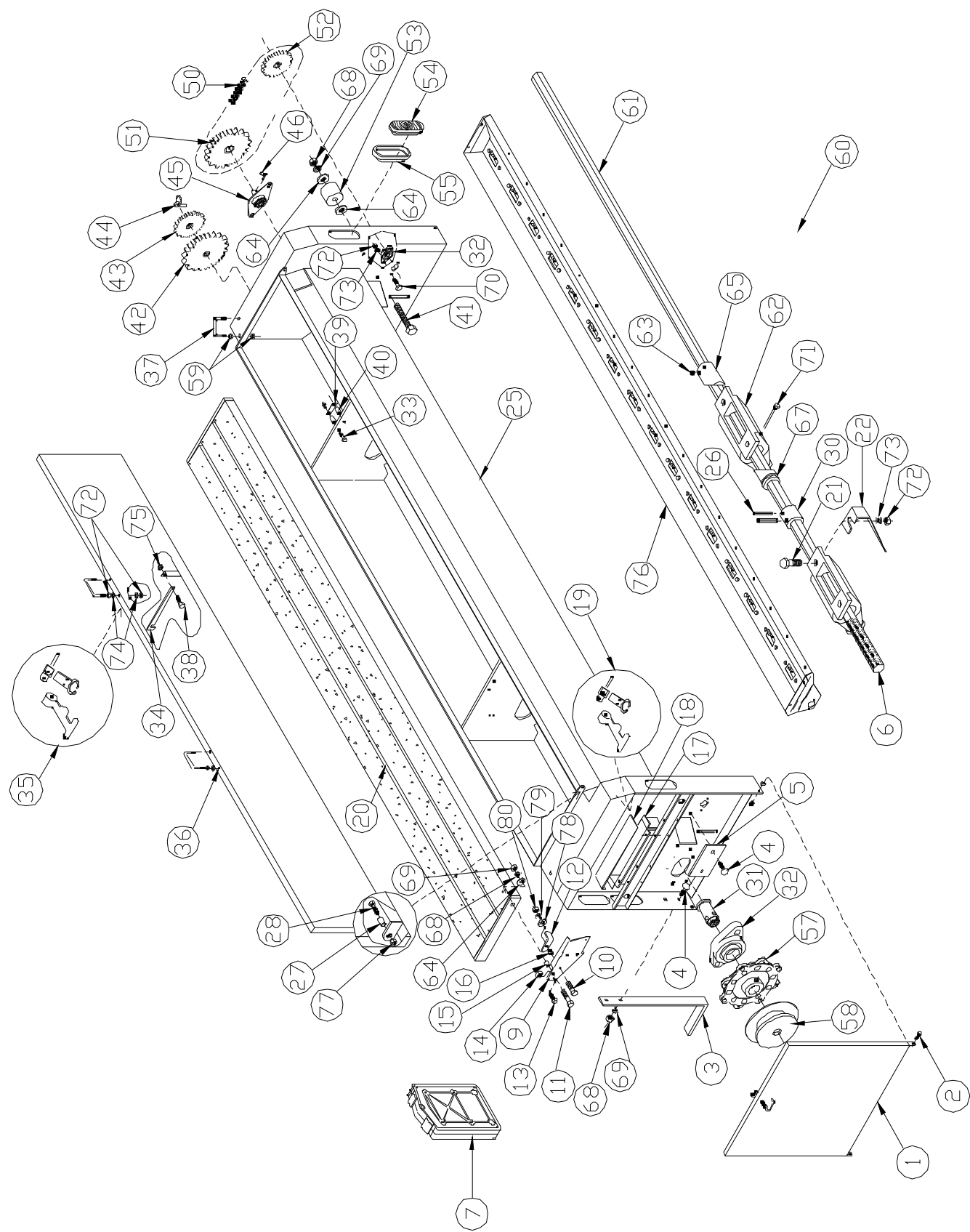
Item	Part No.	Description
1	964197	4610 Top Frame
2	636928	Pivot Lug Sub-Assembly
3	330415	Flat washer 1 1/4"
4	02054500	Cotter Pin 1/4" x 2"
5	02307700	HHCS 3/4" x 3"
6	213389	Weight Bracket Front Plate
7	06409700	Set Collar 1"
8	501031	Spring
9	860825	Clutch Throw-out Assembly
10	863795	Drive Clutch Sprocket Assy 20T - 7 1/2" & 10" Spacing
11	431825	Chain 2050 x 47 Links
12	335026	Mach Bushing 1 1/2" x 1" x14ga
13	335364	Carriage Bolt 1/2" x 6"
14	963603	Clutch Bracket Mount
15	333484	Carriage Bolt 1/2" x 1 3/4"
16	870121	Clutch Lever Assembly
17	471854	Hydraulic Cylinder 1" x 2"
18	331363	Hex Nylock Nut 1/2"
19	213207	Gear Box Mount Plate
20	216051	Backing Plate
21	150334	Adapter Sleeve
22	309714	Extension Shaft
23	870402	4610 Gear Box Assembly
24	257105	Mud Shield
25	330134	Hex nut 1/2"
26	330142	Lock washer 1/2"
27	330159	Flat washer 1/2"
28	330290	Hex nut 3/4"
29	330332	Lock washer 3/4"
30	335349	Clevis Pin 1/4" x 1 5/8"
31	337071	Cotter Pin 3/32" x 1/2"

Top Frame **13', 15' & 20'**



Item	Part No.	Description
1	970681	4613 Top Frame
	955542	4615 Top Frame
	956813	4620 Top Frame
2	636928	Pivot Lug Sub-Assembly
3	330415	Flat washer 1 1/4"
4	02054500	Cotter Pin 1/4" x 2"
5	02307700	HHCS 3/4" x 3"
6	213389	Weight Bracket Front Plate
7	06409700	Set Collar 1"
8	501031	Spring
9	860825	Clutch Throw-out Assembly
10	863795	Drive Clutch Sprocket Assy
		20T - 7 1/2" & 10" Spacing
	863787	Drive Clutch Sprocket Assy
		18T - 8" Spacing
11	431825	Chain 2050 x 47 Links
12	335026	Mach Bushing 1 1/2" x 1" x14ga
13	335364	Carriage Bolt 1/2" x 6"
14	963603	Clutch Bracket Mount
15	333484	Carriage Bolt 1/2" x 1 3/4"
16	870121	Clutch Lever Assembly
17	471854	Hydraulic Cylinder 1" x 2"
18	331363	Hex Nylock Nut 1/2"
19	213207	Gear Box Mount Plate
20	216051	Backing Plate
22		Extension Shaft
	309714	4610, 4615 & 4620
	312314	4613
23		Gear Box Assembly Left
	863910	4610, 4615 & 4620
	875989	4613
24	257105	Mud Shield
25	330134	Hex nut 1/2"
26	330142	Lock washer 1/2"
27	330159	Flat washer 1/2"
28	330290	Hex nut 3/4"
29	330332	Lock washer 3/4"
30	335349	Clevis Pin 1/4" x 1 5/8"
31	337071	Cotter Pin 3/32" x 1/2"

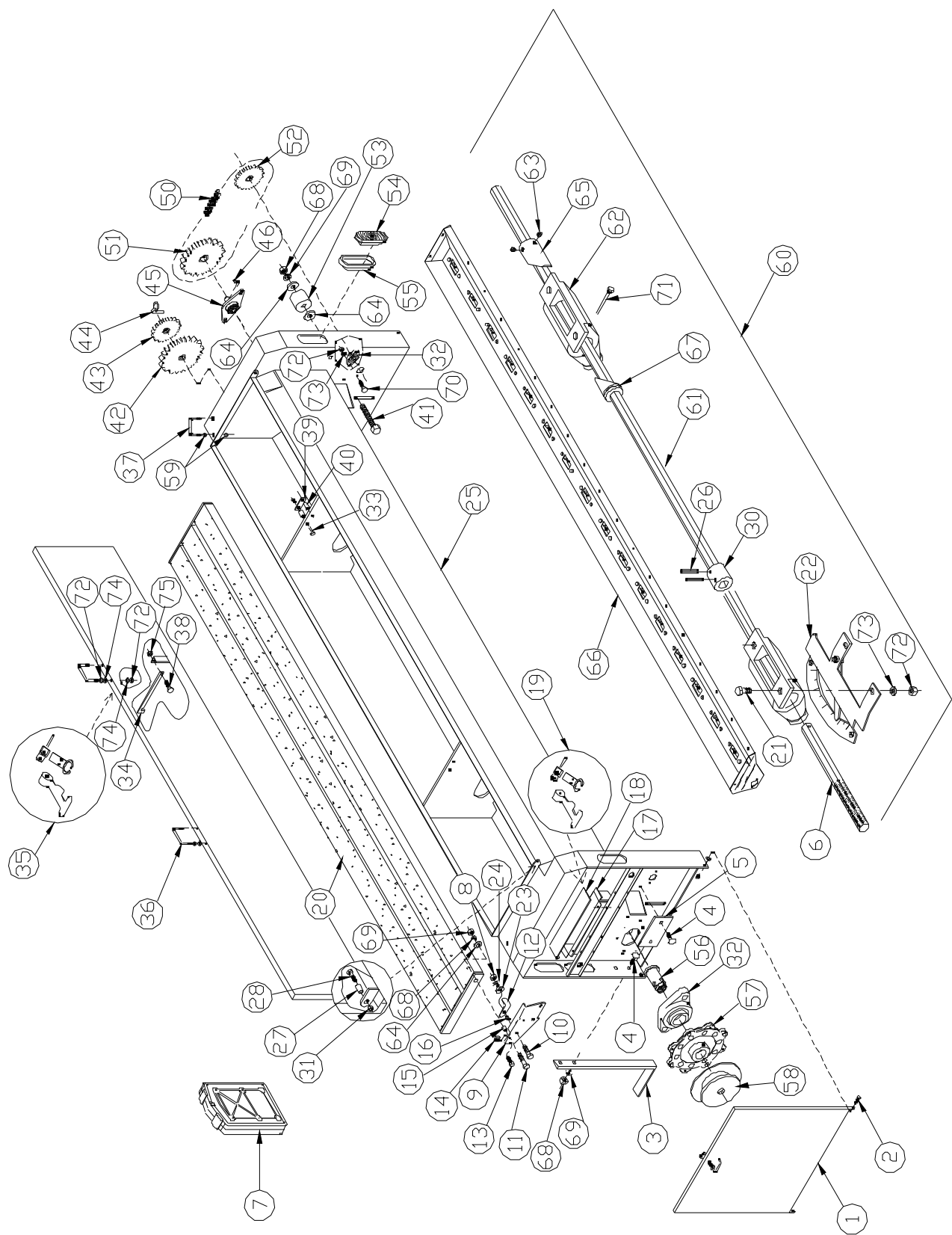
Grain Box 10'



Grain Box 10'

Item	Part No.	Description	Item	Part No.	Description
1	864140	Cover Shield Assembly	45	880971	Bearing Bracket Assembly
2	01158500	HHCS 3/8" x 1 1/4"	46	338392	Klik Pin 1/4"
3	215376	Ladder Step Plate	47		
4	01212000	Carriage Bolt 1/2" x 1 1/2"	48		
5	214239	Weight Door Plate	49		
6	310888	Hex Adjustment Shaft	50	431023	Chain 2050 x 41 Links
7	607416	Manual Holder	51	935106	Sprocket 2050 30T w/1" bore
8			52	935098	Sprocket 2050 25T w/1" bore
9	213702	Walkboard Bracket Right	53	571273	Nylon Idler
	213868	Walkboard Bracket Left	54	605527	Amber Light
10	01017300	HHCS 3/8" x 1"		605535	Red Light
11	335240	HHCS 1/2" x 1 3/4"	55	605709	Light Grommet
12	213645	Walkboard Lock Handle	56		
13	01029800	HHCS 1/2" x 1"	57	874834	Adjustment Handle
14	332197	Square Nut 1/2"	58	972851	Adjustment Lock Plate
15	150086	Walkboard Bushing	59	02016400	Flat washer 1/4"
16	149393	Quadrant Bushing	60		Box Bottom Assembly 10' Drill
17	257147	Tool Box		870519	10' x 7 1/2"
18	257154	Tool Box Lid		870535	10' x 10"
19	570606	Legume Lid Latch	61	311126	Hex Shaft
20	972760	Walkboard 10' Drill	62	550483	Cast Seed Cup
	Prior 2010		63	334516	Set Screw 1/4-28 x 1/4 Cone Pt
	956854	Walkboard 10' Drill	64	330159	Flat Washer 1/2"
21	01144500	HHCS 5/16" x 3/4"	65	550517	Wobble Slot Adj. Side Long
22	261883	Gauge Plate Mount	66		
23	330332	Lock Washer 3/4"	67	550525	Wobble Slot Half w/Groove
24			68	330134	Hex Nut 1/2"
25	964148	Grain Box 10' Drill	69	330142	Lock Washer 1/2"
26	337485	Roll Pin 3/16" x 1 1/4"	70	01010800	HHCS 5/16" x 1"
27	149385	Lid Bushing	71	601716	Wobble Slot Lock Bolt Pin
28	335703	HHCS 3/8" x 1 1/2"	72	330811	Hex Nut 5/16"
29	964403	Box Lid 10' Drill	73	330845	Lock Washer 5/16"
30	141895	Shaft Coupler	74	330852	Flat Washer 5/16"
31	312785	Adjustment Spool	75	331611	Hex Nylock Nut 5/16"
32	03001500	Bearing 1" Flange	76		Box Bottom Weldment
33	335133	HHCS 1/4" x 1 3/4"		964437	10' x 7 1/2"
34	221317	Lid Latch Bracket		964445	10' x 10"
35	570341	Drill Lid Latch w/Hook	77	330837	Hex Nylock Nut 3/8"
36	308122	Handle	78	330894	Flat Washer 3/8"
37	335737	U-bolt 5/8" x 4" x 3"	79	330043	Lock Washer 3/8"
38	01011600	HHCS 5/16" x 1 1/4"	80	330035	Hex Nut 3/8"
39	190942	Lid Latch			
40	145144	Lid Latch Spool			
41	333427	Bolt 1/2" x 3 1/2" All Thread			
42	954362	Sprocket 2050 44T w/1" bore			
43	954131	Sprocket 2050 18T w/1" bore			
44	330456	Klik Pin 3/16"			

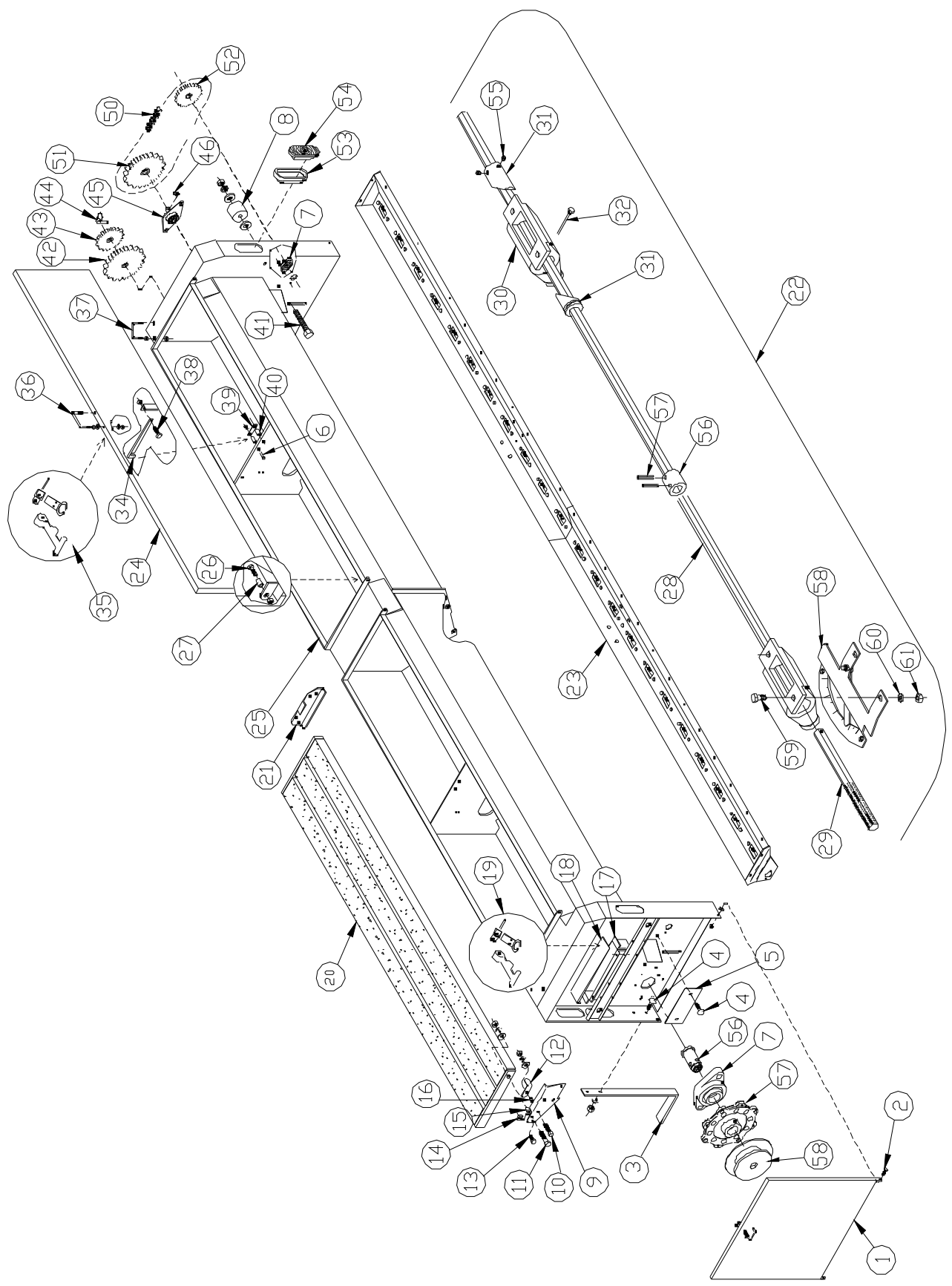
Grain Box
13'



Grain Box 13'

Item	Part No.	Description	Item	Part No.	Description
1	864140	Cover Shield Assembly	41	333427	Bolt ½" x 3½" All Thread
2	01158500	HHCS 3/8" x 1 1/4"	42	954362	Sprocket 2050 44T w/1" bore
3	215376	Ladder Step Plate	43	954131	Sprocket 2050 18T w/1" bore
4	01212000	Carriage Bolt ½" x 1½"	44	330456	Klik Pin 3/16"
5	214239	Weight Door Plate	45	880971	Bearing Bracket Assembly
6	310888	Hex Adjustment Shaft	46	338392	Klik Pin 1/4"
7	607416	Manual Holder	47		
8	330035	Hex Nut 3/8"	48		
9	213702	Walkboard Bracket Right	49		
	213868	Walkboard Bracket Left	50	431023	Chain 2050 x 41 Links
10	01017300	HHCS 3/8" x 1"	51	935106	Sprocket 2050 30T w/1" bore
11	335240	HHCS ½" x 1 3/4"	52	935098	Sprocket 2050 25T w/1" bore
12	213645	Walkboard Lock Handle	53	571273	Nylon Idler
13	01029800	HHCS ½" x 1"	54	605527	Amber Light
14	332197	Square Nut ½"		605535	Red Light
15	150086	Walkboard Bushing	55	605709	Light Grommet
16	149393	Quadrant Bushing	56	312785	Adjustment Spool
17	257147	Tool Box	57	874834	Adjustment Handle
18	257154	Tool Box Lid	58	972851	Adjustment Lock Plate
19	570606	Legume Lid Latch	59	330571	Hex Nut 5/8"
20	972786	Walkboard 13' Drill	60		Box Bottom Assembly 13' Drill
	Prior 2010:			875997	13' x 7 ½"
	970798	Walkboard 13' Drill		876003	13' x 10"
21	01144500	HHCS 5/16" x 3/4"	61	312298	Hex Shaft 141"
22	874552	Seed Gauge Assembly	62	550483	Cast Seed Cup
23	330894	Flat Washer 3/8"	63	334516	Set Screw 1/4-28 x 1/4 Cone Pt
24	330043	Lock Washer 3/8"	64	330159	Flat Washer ½"
25	970756	Grain Box 13' Drill	65	550517	Wobble Slot Adj. Side Long
26	337485	Roll Pin 3/16" x 1 1/4"	66		Box Bottom
27	149385	Lid Bushing		970764	13' x 7 ½"
28	335703	HHCS 3/8" x 1½"		970772	13' x 10"
29	970749	Box Lid 13' Drill	67	550525	Wobble Slot Half w/Groove
30	141895	Shaft Coupler	68	330134	Hex Nut ½"
31	330837	Nylock 3/8"	69	330142	Lock Washer ½"
32	03001500	Bearing 1" Flange	70	01010800	HHCS 5/16" x 1"
33	335133	HHCS 1/4" x 1 3/4"	71	601716	Wobble Slot Lock Bolt Pin
34	221317	Lid Latch Bracket	72	330811	Hex Nut 5/16"
35	570341	Drill Lid Latch w/Hook	73	330845	Lock Washer 5/16"
36	308122	Handle	74	330852	Flat Washer 5/16"
37	335737	U-bolt 5/8" x 4" x 3"	75	331611	Hex Nylock Nut 5/16"
38	01011600	HHCS 5/16" x 1 1/4"			
39	190942	Lid Latch			
40	145144	Lid Latch Spool			

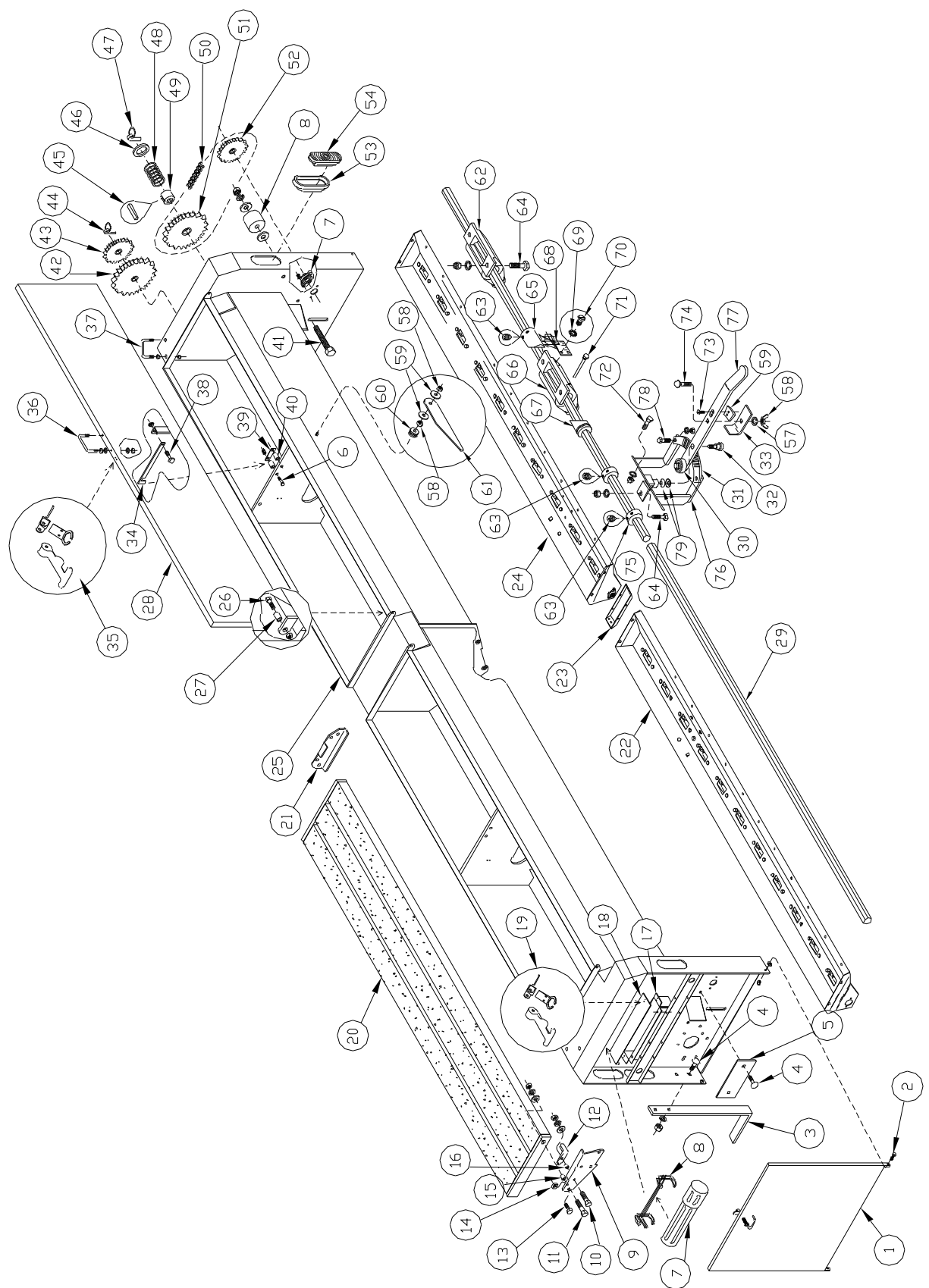
Grain Box
15'



Grain Box 15'

Item	Part No.	Description	Item	Part No.	Description
1	864140	Cover Shield Assembly	29		Hex Shaft
2	01145200	HHCS 3/8" x 3/4"		314039	7½" & 8" Spacing -175 53/64"
3	215376	Ladder Step Plate		314047	10" Spacing -175 1/64"
4	01212000	Carriage Bolt ½" x 1½"	30	550483	Cast Seed Cup
5	214239	Weight Door Plate	31	550517	Wobble Slot Adj. Side Long
6	335133	HHCS 1/4" x 1 3/4"	32	550525	Wobble Slot Half w/Groove
7	03001500	Bearing 1" w/2 bolt flange	33	601716	Wobble Slot Lock Bolt Pin
8	571273	Nylon Idler	34	221317	Lid Latch Bracket
9	213702	Walkboard Bracket Right	35	570341	Drill Lid Latch w/Hook
	213868	Walkboard Bracket Left	36	308122	Handle
10	01017300	HHCS 3/8" x 1"	37	335737	U-bolt 5/8" x 4" x 3"
11	335240	HHCS ½" x 1 3/4"	38	01011600	HHCS 5/16" x 1 1/4"
12	213645	Walkboard Lock Handle	39	190942	Lid Latch
13	01029800	HHCS ½" x 1"	40	145144	Lid Latch Spool
14	332197	Square Nut ½"	41	333427	Bolt ½" x 3½" All Thread
15	150086	Walkboard Bushing	42	954362	Sprocket 2050 44T w/1" bore
16	149393	Quadrant Bushing	43	954131	Sprocket 2050 18T w/1" bore
17	257147	Tool Box	44	330456	Klik Pin 3/16"
18	257154	Tool Box Lid	45	880971	Bearing Bracket Assembly
19	570606	Legume Lid Latch	46	338392	Klik Pin 1/4"
20	972745	Walkboard 15' Drill	47	312785	Adjustment Spool
	Prior 2010:		48	874834	Adjustment Handle
	956425	Walkboard 15' Drill	49	972851	Adjustment Lock Plate
21	213892	Walkboard Bracket Center Rt	50	431023	Chain 2050 x 41 Links
	214221	Walkboard Bracket Center Lt	51	935106	Sprocket 2050 30T w/1" bore
22		Box Bottom Assembly 15' Drill	52	935098	Sprocket 2050 25T w/1" bore
	863878	15' x 7½"	53	605709	Light Grommet
	863886	15' x 8"	54	605527	Amber Light
	863894	15' x 10"		605535	Red Light
23		Box Bottom Weldment	55	334516	Set Screw 1/4-28 x 1/4 Cone Pt
	956680	15' x 7½"	56	141895	Hex Shaft Coupler
	956698	15' x 8"	57	337485	Roll Pin 3/16" x 1 1/4"
	956706	15' x 10"	58	874552	Seed Gauge Assembly
24	957274	Box Lid 15' Drill	59	01144500	HHCS 5/16" x 3/4"
25	956771	Grain Box 15' Drill	60	330845	Lock Washer 5/16"
26	335703	HHCS 3/8" x 1½"	61	330811	Hex Nut 5/16"
27	149385	Lid Bushing			
28		Adjustment Shaft			
	314054	7½" & 8" Spacing -11 5/16"			
	314062	10" Spacing -12 1/8"			

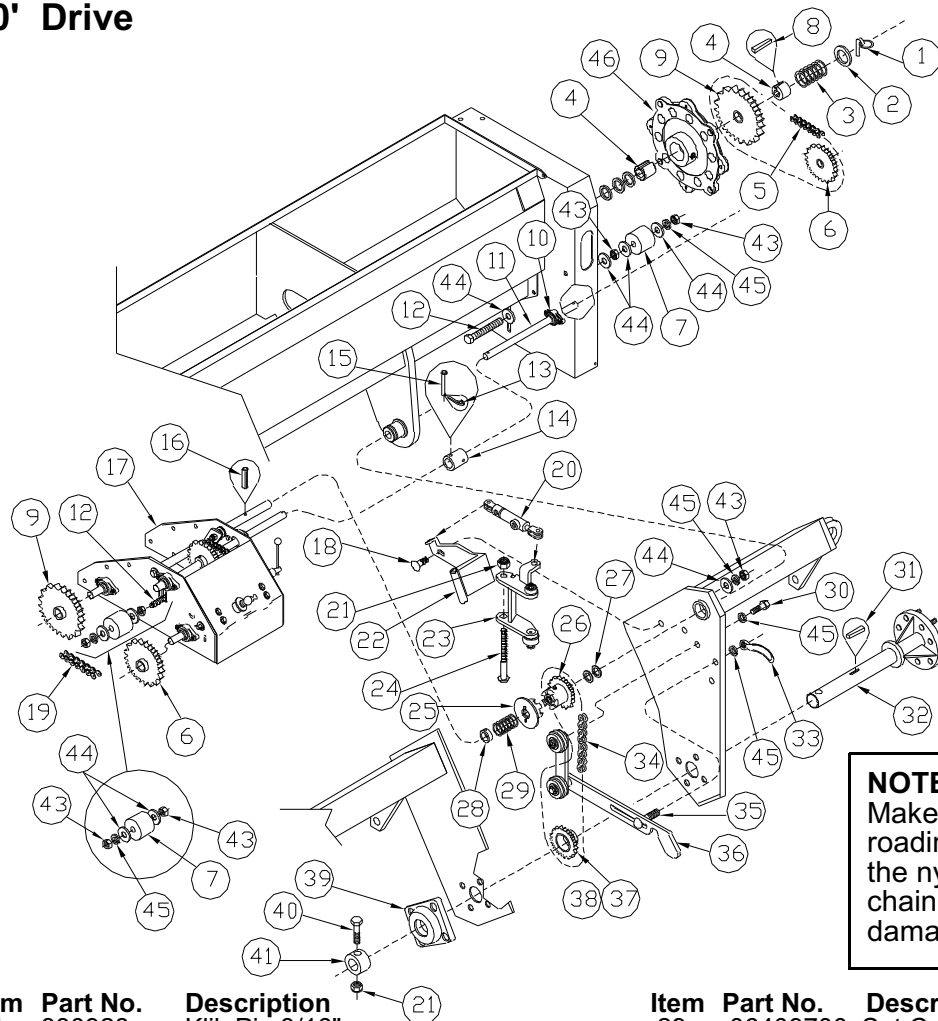
Grain Box
20'



Grain Box 20'

Item	Part No.	Description	Item	Part No.	Description
1	864140	Cover Shield Assembly	33	198903	Shifter Lever Hold-Down
2	01145200	HHCS 3/8" x 3/4"	34	221317	Lid Latch Bracket
3	215376	Ladder Step Plate	35	570341	Drill Lid Latch w/Hook
4	01212000	Carriage Bolt 1/2" x 1 1/2"	36	308122	Handle
5	214239	Weight Door Plate	37	335737	U-bolt 5/8" x 4" x 3"
6	335133	HHCS 1/4" x 1 3/4"	38	01011600	HHCS 5/16" x 1 1/4"
7	03001500	Bearing 1" w/2 bolt flange	39	190942	Lid Latch
8	571273	Nylon Idler	40	145144	Lid Latch Spool
9	213702	Walkboard Bracket Right	41	333427	Bolt 1/2" x 3 1/2" All Thread
	213868	Walkboard Bracket Left	42	954362	Sprocket 2050 44T w/1" bore
10	01017300	HHCS 3/8" x 1"	43	954131	Sprocket 2050 18T w/1" bore
11	335240	HHCS 1/2" x 1 3/4"	44	330456	Klik Pin 3/16"
12	213645	Walkboard Lock Handle	45	602367	Key 1/4" x 1"
13	01029800	HHCS 1/2" x 1"	46	332528	Mach Bushing
14	332197	Square Nut 1/2"			1 1/4" x 3/4" x 18ga
15	150086	Walkboard Bushing	47	330928	Klik Pin 7/16"
16	149393	Quadrant Bushing	48	500330	Spring
17	257147	Tool Box	49	309062	Hex Sprocket Adapter
18	257154	Tool Box Lid	50	431023	Chain 2050 x 41 Links
19	570606	Legume Lid Latch	51	935106	Sprocket 2050 30T w/1" bore
20	972760	Walkboard 20' Drill	52	935098	Sprocket 2050 25T w/1" bore
	Prior 2010:		53	605709	Light Grommet
	956854	Walkboard 20' Drill	54	605527	Amber Light
21	213892	Walkboard Bracket Center Rt		605535	Red Light
	214221	Walkboard Bracket Center Lt	55	330043	Lock washer 3/8"
22		Box Bottom Assembly 20' Drill	56	334847	Wing Nut 3/8"
	868977	20' x 7 1/2" Right	57	550772	Slot Match Plate
	863985	20' x 8" Right	58	332205	Hex Nut 1/4"
	863993	20' x 10" Right	59	02016400	Flat washer 1/4"
		Box Bottom Weldment	60	605659	Grommet 1/4 x 5/8 x 11/32
	956862	20' x 7 1/2" Right	61	961961	Seed Gauge Pointer
	956888	20' x 8" Right	62	550483	Cast Seed Cup
	956904	20' x 10" Right	63	334516	Set Screw 1/4-28 x 1/4 Cone Pt
23	257279	Center Brg Mount Plt 20' Drill	64	01144500	HHCS 5/16" x 3/4"
24		Box Bottom Assembly 20' Drill	65	550517	Wobble Slot Adj. Side Long
	864165	20' x 7 1/2" Left	66	550616	Cast Seed Cup for Gauge Plt
	864173	20' x 8" Left	67	550525	Wobble Slot Half w/Groove
	864181	20' x 10" Left	68	601724	Seed Slot Adj. Gauge Plate
		Box Bottom Weldment	69	334565	Lock washer #8 Internal Tooth
	956870	20' x 7 1/2" Left	70	334557	Machine Screw #8 x 1/4 Round
	956896	20' x 8" Left	71	601716	Wobble Slot Lock Bolt Pin
	956912	20' x 10" Left	72	333542	HHCS 5/16" x 5/8"
25	956839	Grain Box 20' Drill	73	334490	Machine Screw 1/4" x 5/8"
26	335703	HHCS 3/8" x 1 1/2"	74	332940	Carriage Bolt 3/8" x 2"
27	149385	Lid Bushing	75	146090	Wobble Slot Adj. Collar
28	957282	Box Lid 20' Drill	76	956672	Slot Adjustment Bracket
29	309799	Hex Shaft 122 1/4" 20' Drill	77	957084	Slot Adj Bracket Handle
30	401042	Bearing	78	01011600	HHCS 5/16" x 1 1/4"
31	550764	Slot Rack Plate	79	501320	Belleville Washer Springs
32	335299	Shoulder Bolt 1/2" x 1/2" Socket Head			

10' Drive



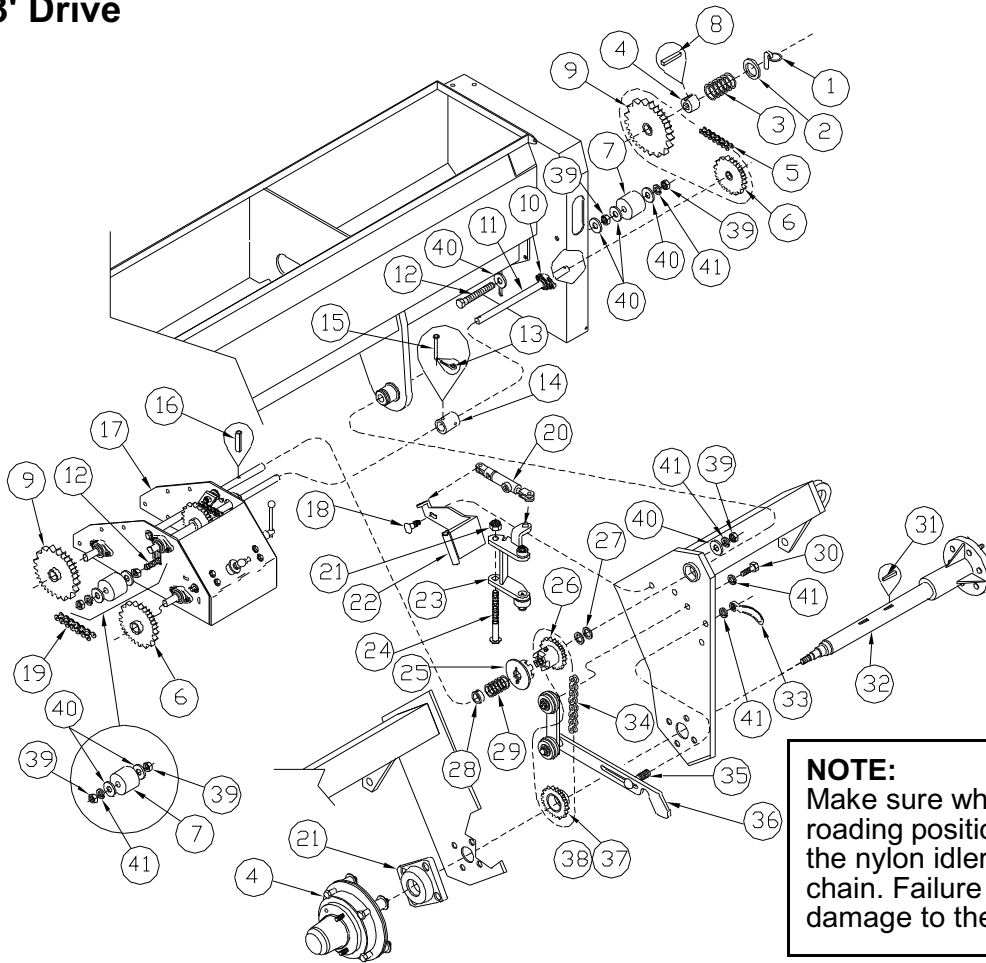
Item	Part No.	Description
1	330928	Klik Pin 3/16"
2	332528	Machine Bush 1 1/4" x 3/4 x 18ga
3	500330	Spring 1 1/2"
4	309062	Hex Sprocket Adapter
5	431023	Chain 2050 41 Links (See Page 17)
6	935098	Sprocket 2050 25T w/1" bore
7	571273	Nylon Idler
8	602367	Key 1/4" x 1"
9	935106	Sprocket 2050 30T w/1" bore
10	03001500	Bearing 1" 2 bolt Flange
11	309714	Extension Shaft
12	333427	All Thread Bolt 1/2" x 3 1/2"
13	337071	Cotter Pin 3/32" x 1/2"
14	150334	Adapter Sleeve
15	335349	Clevis Pin 1/4" x 1 5/8"
16	334813	Roll Pin 5/16" x 1 1/2"
17	870402	10' Gear Box Assembly
18	333484	Carriage Bolt 1/2" x 6"
19	431239	Chain 2050 27 Links (See Page 17)
20	471854	Cylinder 1" x 2"
21	331363	Hex Nylock Nut 1/2"
22	963603	Clutch Bracket Mount
23	870121	Clutch Lever Assy
24	335364	Carriage Bolt 1/2" x 6" Gr 5
25	860825	Throw-out Clutch Half Assembly
26	863795	Drive Clutch Sprocket Assy-20T (7 1/2" & 10" Spacing)
27	335026	Machine Bushing 1 1/2" x1 x14ga
28	501031	Spring 2 3/4"

Item	Part No.	Description
29	06409700	Set Collar 1" Steel
30	01147800	HHCS 1/2" x 1 1/2" Gr 5
31	310656	Key 3/16" x 1 1/2"
32	964288	10' Wheel Spindle
33	337352	Handle Nut 1/2"-13 x 4 1/2"
34	431825	Chain 2050 47 Links (See Page 17)
35	01140300	Carriage Bolt 1/2" x 2 Gr 5
36	864157	Wheel Idler Assy (See Page 41)
37	954370	Hub Drive Sprocket 2050 18T (7 1/2" 10" Spacing)
38	334516	Set Screw 1/4-28 x 1/4 Cone Point
39	403279	Bearing 2" 4B (5 1/8"center)
	403287	Insert for #403279
40	330092	HHCS 1/2" x 4"
41	145623	Spindle Bushing
42	331363	Hex Nylock Nut 1/2"
43	330134	Hex Nut 1/2"
44	330159	Flat washer 1/2"
45	330142	Lock washer 1/2"
46	874834	Adjustment Handle

Sensor Replacement Parts

607119	Bin Sensor Kit
607135	Shaft Sensor Kit
609115	4610, 4613 & 4615 Branch Cable
609107	25' 10 Pin Cable
607218	Console Mount Kit
607127	Monitor Console
609123	4610, 4613 & 4615 Sensor Kit

13' Drive



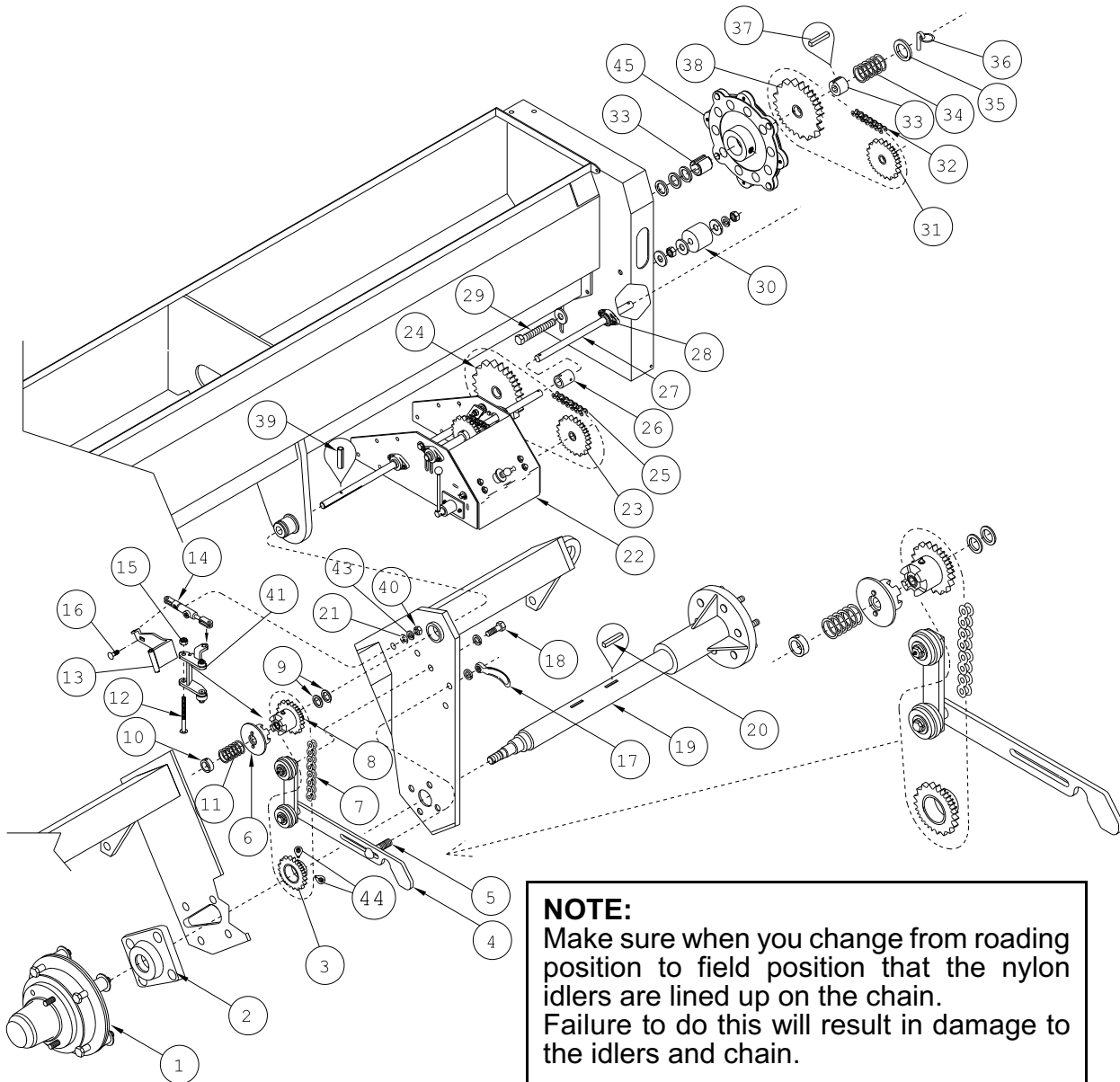
Item	Part No.	Description
1	330928	Klik Pin 3/16"
2	332528	Machine Bush 1 1/4" x 3/4 x 18ga
3	500330	Spring 1 1/2"
4	870196	Clutch Assembly
5	431023	Chain 2050 41 Links (See Page 17)
6	935098	Sprocket 2050 25T w/1" bore
7	571273	Nylon Idler
8	602367	Key 1/4" x 1"
9	935106	Sprocket 2050 30T w/1" bore
10	03001500	Bearing 1" 2 bolt Flange
11	312314	Extension Shaft
12	333427	All Thread Bolt 1/2" x 3 1/2"
13	337071	Cotter Pin 3/32" x 1/2"
14	150334	Adapter Sleeve
15	335349	Clevis Pin 1/4" x 1 5/8"
16	334813	Roll Pin 5/16" x 1 1/2"
17	875989	13' Gear Box Assembly
18	333484	Carriage Bolt 1/2" x 6"
19	431239	Chain 2050 27 Links (See Page 17)
20	471854	Cylinder 1" x 2"
21	403279	Bearing 2" 4B (5 1/8" center)
22	403287	Insert for #403279
23	963603	Clutch Bracket Mount
24	870121	Clutch Lever Assy
25	335364	Carriage Bolt 1/2" x 6" Gr 5
26	860825	Throw-out Clutch Half Assembly
27	863795	Drive Clutch Sprocket Assy-20T (7 1/2" & 10" Spacing)
28	335026	Machine Bushing 1 1/2" x 1 x 14ga

Item	Part No.	Description
28	501031	Spring 2 3/4"
29	06409700	Set Collar 1" Steel
30	01147800	HHCS 1/2" x 1 1/2" Gr 5
31	310656	Key 3/16" x 1 1/2"
32	961532	Wheel Spindle
33	337352	Handle Nut 1/2"-13 x 4 1/2"
34	431825	Chain 2050 47 Links (See Page 17)
35	01140300	Carriage Bolt 1/2" x 2 Gr 5
36	864157	Wheel Idler Assy (See Page 41)
37	954370	Hub Drive Sprocket 2050 18T (7 1/2" 10" Spacing)
38	334516	Set Screw 1/4-28 x 1/4 Cone Point
39	330134	Hex Nut 1/2"
40	330159	Flat washer 1/2"
41	330142	Lock washer 1/2"
42	331363	Hex Nylock Nut 1/2"

Sensor Replacement Parts

607119	Bin Sensor Kit
607135	Shaft Sensor Kit
609115	4610, 4613 & 4615 Branch Cable
609107	25' 10 Pin Cable
607218	Console Mount Kit
607127	Monitor Console
609123	4610, 4613 & 4615 Sensor Kit

15' Drive



15' Drive

Item	Part No.	Description	Item	Part No.	Description
1	870196	Clutch Assembly (Shown below)	23	935098	Sprocket 2050 25T w/1" bore
2	403279	Bearing 2" 4B (5 1/8" center)	24	935106	Sprocket 2050 30T w/1" bore
	403287	Insert for #403279	25	431239	Chain 2050 27 Links (See Page 17)
	400739	Bearing 2" 4B (4 3/8" center)	26	150334	Adapter Sleeve
	400994	Insert for #400739	27	309714	Extension Shaft
3	954370	Hub Drive Sprocket 2050 18T (7 1/2" & 8" Spacing)	28	03001500	Bearing 1" 2B Flange
	953216	Hub Drive Sprocket 2050 25T (10" Spacing)	29	333427	All Thread Bolt 1/2" x 3 1/2" Gr 5
4	864157	Wheel Idler Assy (See Page 41)	30	571273	Nylon Idler
5	01140300	Carriage Bolt 1/2" x 2 Gr 5	31	935098	Sprocket 2050 25T w/1" bore
6	860825	Throw-out Clutch Half Assembly	32	431023	Chain 2050 41 Links (See Page 17)
7	431825	Chain 2050 47 Links (See Page 17)	33	309062	Hex Sprocket Adapter
8	863795	Drive Clutch Sprocket Assy-20T (7 1/2" & 10" Spacing)	34	500330	Spring 1 1/2"
	863787	Drive Clutch Sprocket Assy-18T (8" Spacing)	35	332528	Machine Bush 1 1/4" x3/4 x18ga
9	335026	Machine Bushing 1 1/2" x1 x14ga	36	330928	Klik Pin 3/16"
10	06409700	Set Collar 1" Steel	37	602367	Key 1/4" x 1"
11	501031	Spring 2 3/4"	38	935106	Sprocket 2050 30T w/1" bore
12	335364	Carriage Bolt 1/2" x 6" Gr 5	39	334813	Roll Pin 5/16" x 1 1/2"
13	963603	Clutch Bracket Mount	40	330134	Hex Nut 1/2"
14	471854	Cylinder 1" x 2"	41	870121	Clutch Lever Assy
15	331363	Nylock Nut 1/2"	42	334110	Hex Jam Nylock Nut 1/2"
16	333484	Carriage Bolt 1/2" x 1 3/4"	43	330142	Lock washer 1/2"
17	337352	Handle Nut 1/2-13" x 4 1/2"	44	334516	Set Screw 1/4-28 x1/4 Cone Point
18	01147800	HHCS 1/2" x 1 1/2" Gr 5	45	874834	Adjustment Handle
19	961532	Wing Spindle (Stress Proof)			
20	310656	Key 3/16" x 1 1/2"			
21	330159	Flat washer 1/2"			
22	863910	Gear Box Assembly			

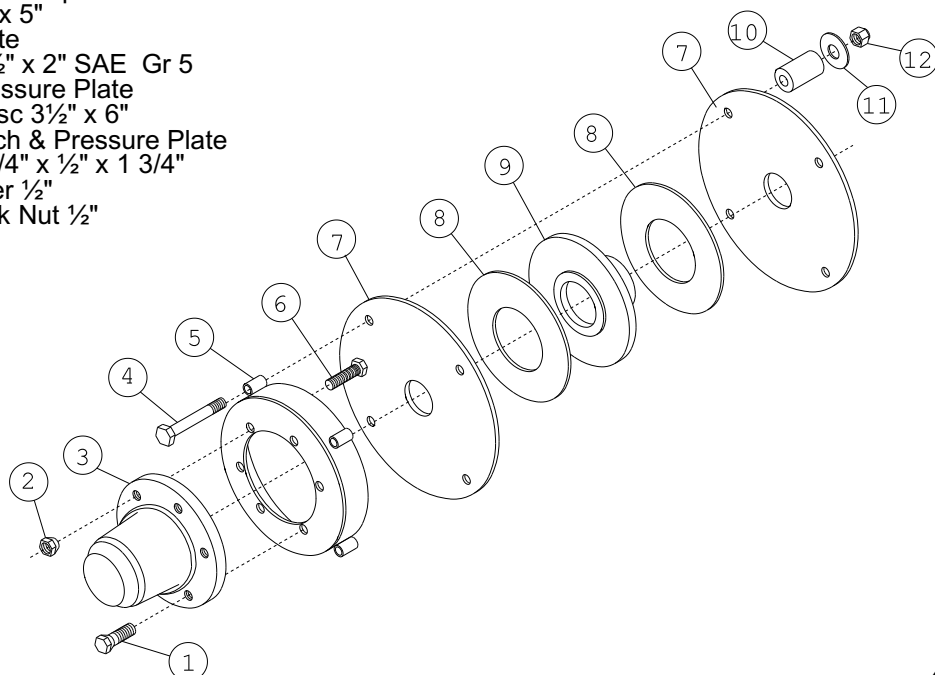
Sensor Replacement Parts

607119	Bin Sensor Kit
607135	Shaft Sensor Kit
609115	4610, 4613 & 4615 Branch Cable
609107	25' 10 Pin Cable
607218	Console Mount Kit
607127	Monitor Console
609123	4610, 4613 & 4615 Sensor Kit

Clutch Assembly #870196

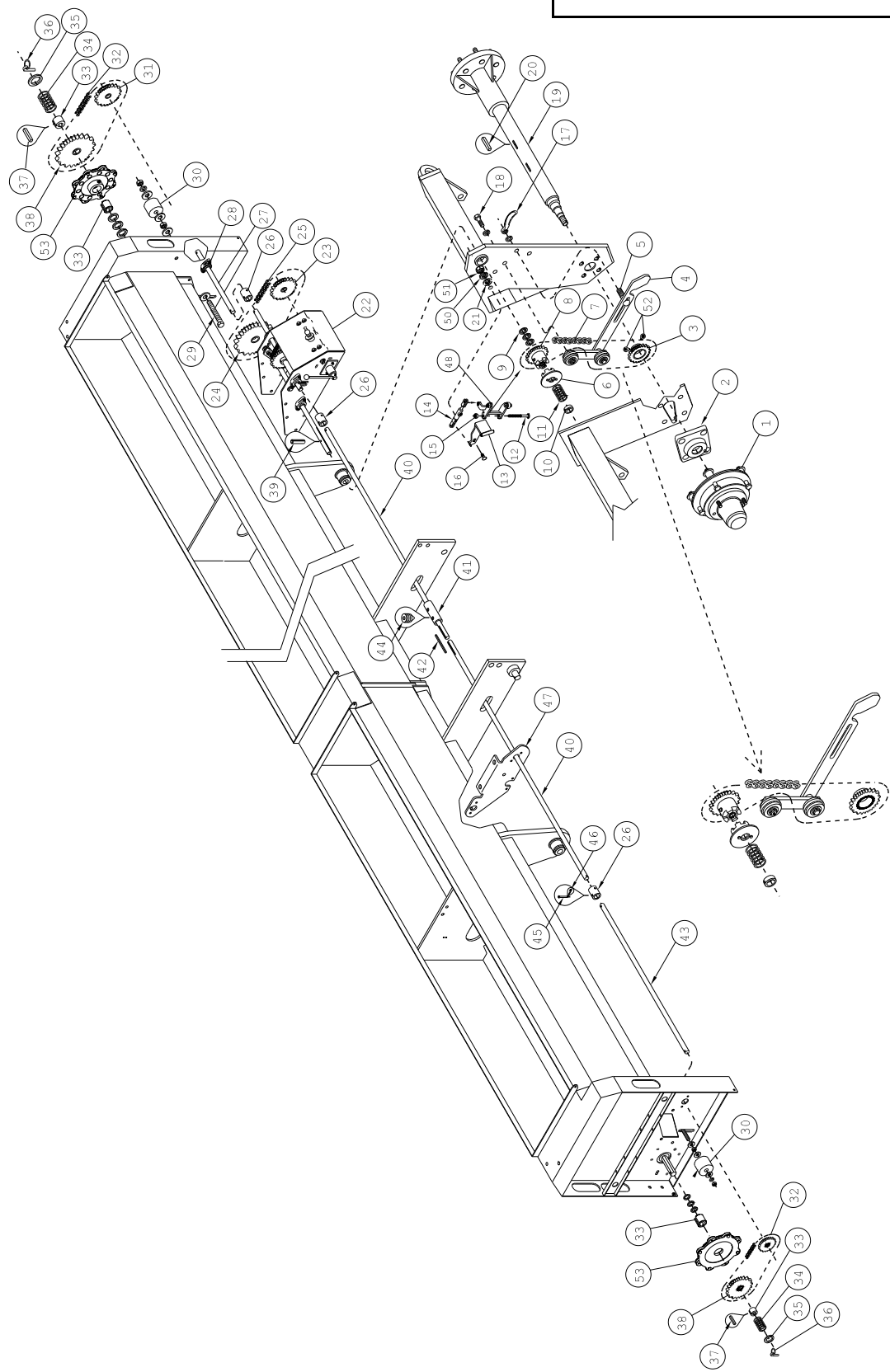
Item	Part No.	Description
*1	330464	Wheel Bolt 1/2" x 1 3/4" SAE
*2	331314	Wheel Nut 1/2"-20 90°
3	551291	Q783 Hub Complete less bolts
4	01225200	HHCS 1/2" x 5"
5	963835	Clutch Plate
6	337139	Tap Bolt 1/2" x 2" SAE Gr 5
7	222612	Clutch Pressure Plate
8	08476400	Friction Disc 3 1/2" x 6"
9	963827	Drive Clutch & Pressure Plate
10	502286	Spring 1 1/4" x 1/2" x 1 3/4"
11	330159	Flat washer 1/2"
12	331363	Hex Nylock Nut 1/2"

*Not included in assembly



20' Drive

NOTE:
Make sure when you change from roading position to field position that the nylon idlers are lined up on the chain.
Failure to do this will result in damage to the idlers and chain.

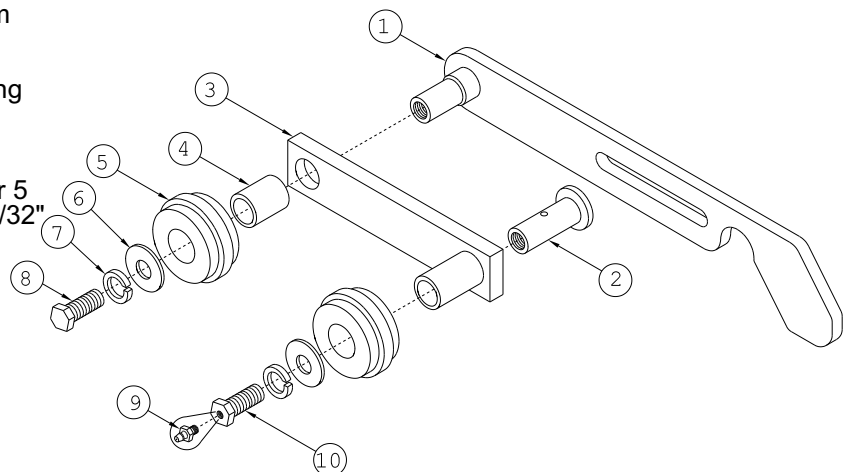


20' Drive

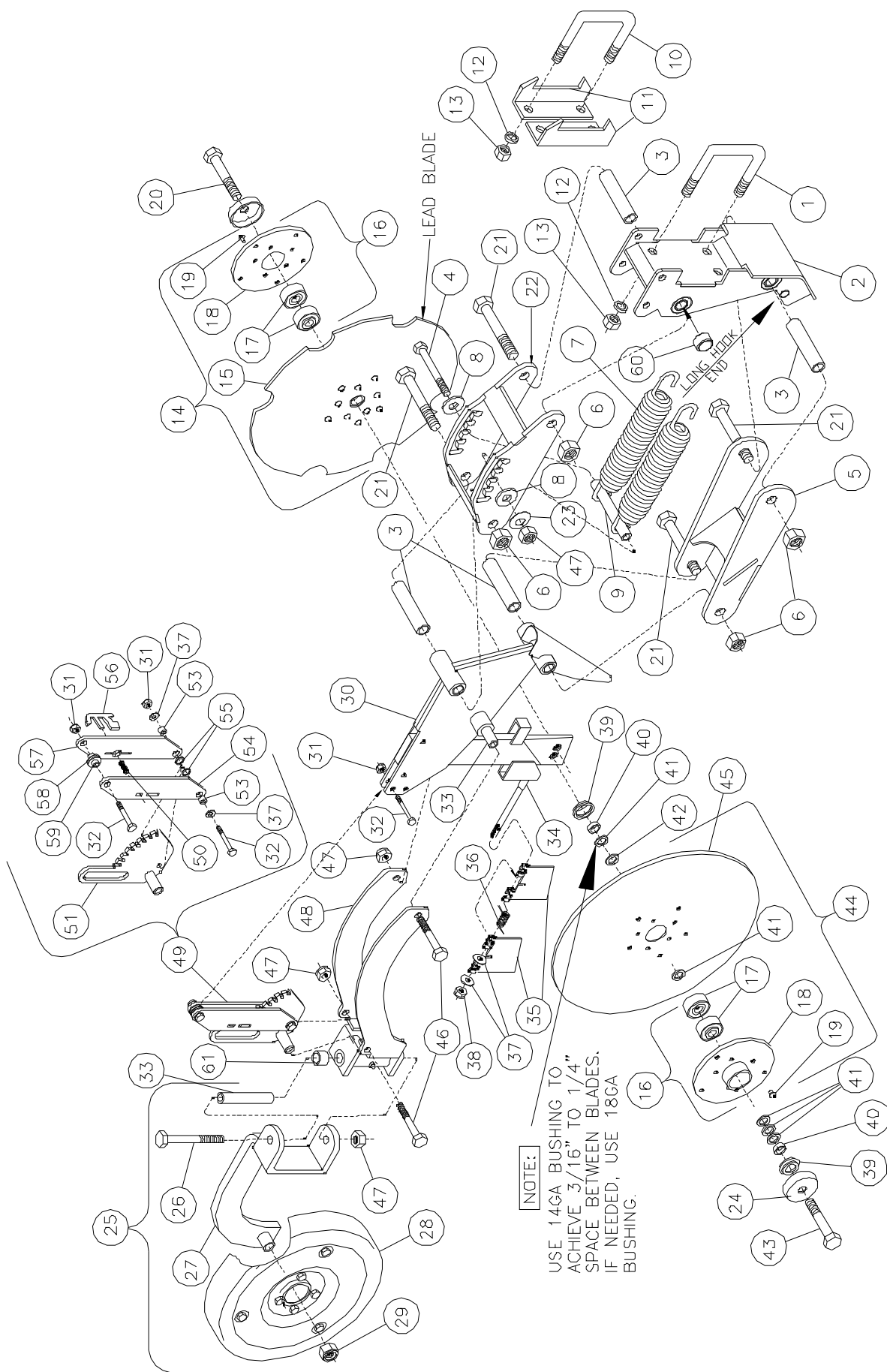
Item	Part No.	Description	Item	Part No.	Description
1	870196	Clutch Assembly (<i>Shown below</i>)	27	309714	Extension Shaft
2	403279	Bearing 2" 4B (5 1/8" center)	28	03001500	Bearing 1" 2B Flange
	403287	Insert for #403279	29	333427	All Thread Bolt 1/2" x 3 1/2" Gr 5
	400739	Bearing 2" 4B (4 3/8" center)	30	571273	Nylon Idler
	400994	Insert for #400739	31	935098	Sprocket 2050 25T w/1" bore
3	954370	Hub Drive Sprocket 2050 18T (7 1/2" & 8" Spacing)	32	431023	Chain 2050 41 Links (<i>See Page 17</i>)
	953216	Hub Drive Sprocket 2050 25T (10" Spacing)	33	309062	Hex Sprocket Adapter
4	864157	Wheel Idler Assy (<i>See Page 41</i>)	34	500330	Spring 1 1/2"
5	01140300	Carriage Bolt 1/2" x 2 Gr 5	35	332528	Machine Bush 1 1/4" x 3/4 x 18ga
6	860825	Throw-out Clutch Half Assembly	36	330928	Klik Pin 3/16"
7	431825	Chain 2050 47 Links (<i>See Page 17</i>)	37	602367	Key 1/4" x 1"
8	863795	Drive Clutch Sprocket Assy-20T (7 1/2" & 10" Spacing)	38	935106	Sprocket 2050 30T w/1" bore
	863787	Drive Clutch Sprocket Assy-18T (8" Spacing)	39	334813	Roll Pin 5/16" x 1 1/2"
9	335026	Machine Bushing 1 1/2" x1 x14ga	40	309765	Drive Shaft 75 1/2"
10	06409700	Set Collar 1" Steel	41	150342	Connector Spool
11	501031	Spring 2 3/4"	42	605683	Key 1/4 x 4 1/2"
12	335364	Carriage Bolt 1/2" x 6" Gr 5	43	309773	Drive Shaft 54 1/8"
13	963603	Clutch Bracket Mount	44	01139500	Set Screw 3/8-16 x 3/8" Star Cup
14	471854	Cylinder 1" x 2"	45	335349	Clevis Pin 1/4" x 1 5/8"
15	331363	Nylock Nut 1/2"	46	337071	Cotter Pin 3/32" x 1/2"
16	333484	Carriage Bolt 1/2" x 1 3/4"	47	215871	20' Bearing Plate
17	337352	Handle Nut 1/2-13" x 4 1/2"	48	870121	Clutch Lever Assy
18	01147800	HHCS 1/2" x 1 1/2" Gr 5	49	334110	Hex Jam Nylock Nut 1/2"
19	961532	Wing Spindle (Stress Proof)	50	330142	Lock washer 1/2"
20	310656	Key 3/16" x 1 1/2"	51	330134	Hex nut 1/2"
21	330159	Flat washer 1/2"	52	334516	Set Screw 1/4-28 x 1/4 Cone Point
22	863910	Gear Box Assembly	53	874834	Adjustment Handle
23	935098	Sprocket 2050 25T w/1" bore	Sensor Replacement Parts		
24	935106	Sprocket 2050 30T w/1" bore	607119	Bin Sensor Kit	
25	431239	Chain 2050 27 Links (<i>See Page 17</i>)	607135	Shaft Sensor Kit	
26	150334	Adapter Sleeve	609149	4620 Branch Cable	
			609107	25' 10 Pin Cable	
			607218	Console Mount Kit	
			607127	Monitor Console	
			609131	4620 Sensor Kit	

Wheel Idler Assembly # 864157

Item	Part No.	Description
1	957134	Wheel Slotted Arm
2	309740	Rear Shaft Idler
3	957126	Wheel Idler Arm
4	150235	Front Shaft Bushing
5	571075	Nylon Chain Idler
6	330159	Flatwasher 1/2"
7	330142	Lockwasher 1/2"
8	01029800	HHCS 1/2" x 1" Gr 5
9	600346	Zerk 1/4"-28 x 17/32"
10	337394	HHCS 1/2" x 1" w/zerk hole



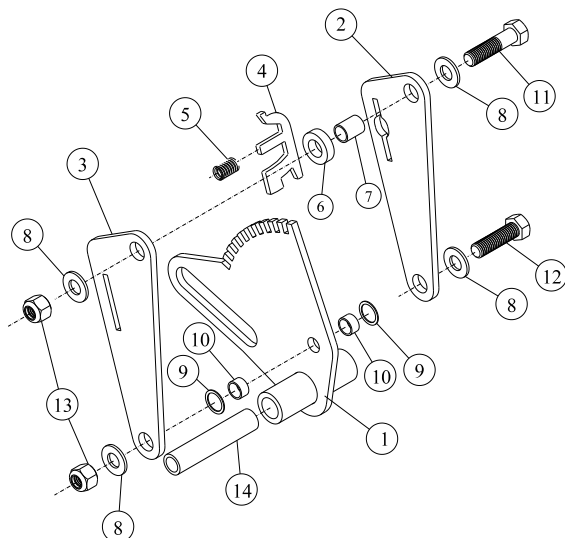
All Plant Opener Assembly



All Plant Opener Assembly

Item	Part No.	Description	Item	Part No.	Description
	871004	Right Short Opener Assembly	28	531095	Presswheels
	871012	Left Short Opener Assembly		530667	2" x 13" w/Smooth Sides (shown)
	871020	Right Long Opener Assembly		531111	2" x 13" Peaked w/Smooth Sides
	871038	Left Long Opener Assembly		531483	3" x 13" Center Rib
		Items #10,11,13,24-29 & 61-65 are NOT included in assembly		531541	3" x 15" V-Type
1		U-Bolt w/Lock washer & Hex nut	29	01572700	3" x 13" Dual Rib
	335737	U-Bolt 5/8" x 4" x 3" (2x4 Tube)			Hex Nylock Nut 5/8"
	337147	U-Bolt 5/8" x 4" x 5" (4x4 Tube)	30	964817	Long Opener -- Left (shown)
2	964692	Opener Mounting Bracket		964809	Long Opener -- Right
3	152561	Opener Arm Bushing		964791	Short Opener -- Left
4	337972	HHCS 1/2" x 6"		964783	Short Opener -- Right
5	964726	Lower Arm	31	330837	Hex Nylock Nut 3/8"
6	01015700	Center Lock Nut 3/4"	32	338624	HHCS 3/8" x 1 3/4" Gr 8
7	502294	Opener Extension Spring			W/Hex Nylock Nut
8	330159	Flat Washer 1/2"	33	148999	Bushing 3 19/32"
9	152611	Spring Bushing	34	150045	Scraper Bushing 1 3/8"
10	337469	U-Bolt 5/8" x 4" x 6 1/2"	35	257048	Scraper Plate
11	243857	Offset Mounting Plate	36	502146	Scraper Spring - Left (shown)
12	330878	Lock Washer 5/8"		502153	Scraper Spring - Right
13	330571	Hex Nut 5/8"	37	330852	Flat Washer 5/16"
14	845925	Double Disc Blade Assy- 6 notch	38	336909	Hex Nylock Jam Nut 3/8"
		Includes #15,16, & 19	39	400747	Neoprene Dust Seal
15	502633	Blade 16" x 4mm Notched	40	606558	Bushing 1" OD
16	636761	Bearing & Flange Sub-Assembly	41	330720	Machine Bush 1 1/8 x 5/8 x 14ga
		Includes #17 & 18	42	333351	Machine Bush 1 1/8 x 5/8 x 18ga
17	401042	Bearing	43	335620	HHCS 5/8" x 3" Gr 5
18	980037	Bearing Flange	44	845917	Double Disc Blade Assy -- Plain
19	601351	Rivet 5/16" x 1/2" Button Head			Includes 16,19, & 45
20	335596	HHCS 5/8" x 3" Gr 8 Left Hand	45	502641	Blade 16" x 4mm Plain
21	334466	HHCS 3/4" x 6"	46	337865	HHCS 1/2" x 4 1/2" Gr 8
22	964718	Upper Arm			w/Hex Nylock Nut
23	502302	Curved Spring Washer	47	03223500	Reversible Lock Nut 1/2" Gr 8
24	278317	Dust Seal Cap	48	964908	Presswheel Swivel Bracket
25		Presswheel Arm Assembly	49	871061	Quadrant Sub-Assembly 2006
		Includes #26-29, 33,47		881631	Quadrant Sub-Assembly 2018
	859967	Single 3x14 V-Type	50	502310	Quadrant Spring 1 1/4
	874362	Single 3x13 Center Rib	51	964874	Quadrant Handle
	874354	Single 3x13 Dual Rib	52		
	859991	Single 2x13 Peaked	53	149393	Bushing 5/16"
	860007	Single 2x13 (Shown)	54	224014	Quadrant Strap Right
26	338053	HHCS 1/2" x 5" Gr 8	55	337063	Nylon Washer 11/16"OD x 1/2"ID
27	954636	Presswheel Arm	56	224030	Quadrant Lock Latch
			57	224022	Quadrant Strap Left
			58	604504	Rubber Grommet 1/2" ID x 1" OD
			59	149385	Quadrant Bushing 3/4"
			60	606699	Spring Bushing 1" ID
					Included in #964692
			61	605907	Spring Bushing 3/4" ID
					Included in #964908

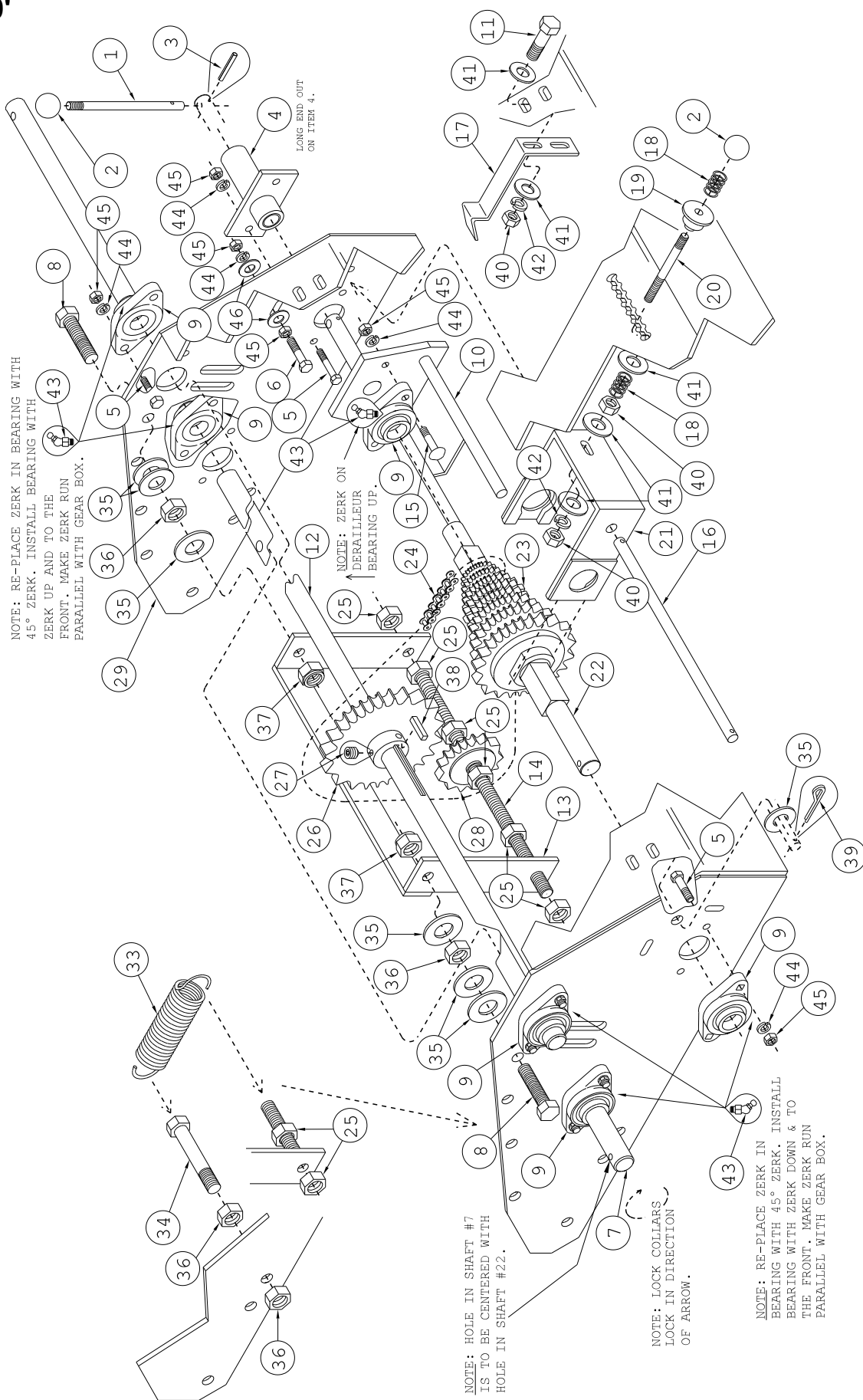
#881631 Quadrant 2018



Item	Part No.	Description
1	979450	Quadrant Handle
2	249201	Quadrant Strap Right
3	249219	Quadrant Strap Left
4	224030	Quadrant Lock Latch
5	502310	Quadrant Spring
6	615740	Rubber Grommet 5/8" IDx5/16
7	615724	Bushing 1/2"ID x 25/32"
8	330159	Flat Washer 1/2"
9	615732	Bushing 1/2"ID x .33
10	572503	Nylon Bushing
11	331926	HHCS 1/2" x 2"
12	335240	HHCS 1/2" x 1 3/4"
13	331363	Nylock 1/2"
14	148999	Bushing 1/2"ID x 3 19/32

Gear Box Assembly

10'



Gear Box Assembly 10'

Item	Part No.	Description	Item	Part No.	Description
1	309088	Handle Shaft	17	211896	Derailleur Spring Catch Plate
2	604611	Plastic Ball Knob 3/8" -16 T.P.I.	18	502161	Knob Spring
3	334581	Roll Pin 5/32" x 7/8"	19	309138	Shift Lock
4	860908	Derailleur Clutch Mount Assy	20	309104	Adjustment Handle Shaft
5	01010800	HHCS 5/16" x 1" Gr 5	21	954347	Sprocket Cluster Bracket
	330845	Lockwasher 5/16"	22	309054	Cluster Shaft
	330811	Hex Nut 5/16"	23	432708	Sprocket Cluster
6	02300200	HHCS 5/16 x 2" Gr 5	24	432542	Chain #40 x 64 Pitches Complete
	330845	Lockwasher 5/16"	25	330571	Hex Nut 5/8"
	330811	Hex Nut 5/16"	26	954149	Sprocket #40 30 Tooth w/1" bore
	330852	Flatwasher 5/16"	27	334516	Allen Set Screw 1/4"-28 x 1/4" Cone
7	312272	Clutch Shaft			
8	337212	Tap Bolt 1/2" x 2" Gr 5	28	430603	Sprocket 17 Tooth Idler
	330134	Hex Nut 1/2"	29	957092	Gear Box Shell
	330159	Flatwasher 1/2"	33	500173	Idler Spring
	331363	Hex Nylock 1/2"	34	335422	HHCS 1/2" x 2 1/2" Gr 5
9	03001500	Bearing 1" Flange Mount		330134	Hex Nut 1/2"
10	954339	Derailleur Bracket	35	330159	Flatwasher 1/2"
11	01017300	HHCS 3/8" x 1" Gr 5	36	330134	Hex Nut 1/2"
	330035	Hex Nut 3/8"	37	331363	Hex Nylock 1/2"
	330894	Flatwasher 3/8"	38	10490100	Key 1/4" x 1/4" x 1 1/4"
	330043	Lockwasher 3/8"	39	330936	Cotter Pin 1/8" x 1"
12	311100	Box End Drive Shaft	40	330035	Hex Nut 3/8"
13	954941	Idler Arm	41	330894	Flatwasher 3/8"
14	309112	Idler Arm All-thread Shaft	42	330043	Lockwasher 3/8"
15	01261700	Carriage Bolt 5/16" x 1 1/2" Gr 5	43	01162700	Zerk 1/4" -28 45°
	330845	Lockwasher 5/16"	44	330845	Lock Washer 5/16"
	330811	Hex Nut 5/16"	45	330811	Hex Nut 5/16"
16	309070	Gear Box Shaft	46	330852	Flat Washer 5/16"

Gear Box Assembly 13'

NOTE: RE-PLACE ZERK IN BEARING WITH 45° ZERK. INSTALL BEARING WITH ZERK UP AND TO THE FRONT. MAKE ZERK RUN PARALLEL WITH GEAR BOX.

LONG END OUT ON ITEM 4.

NOTE: ZERK ON DERAILLEUR BEARING UP.

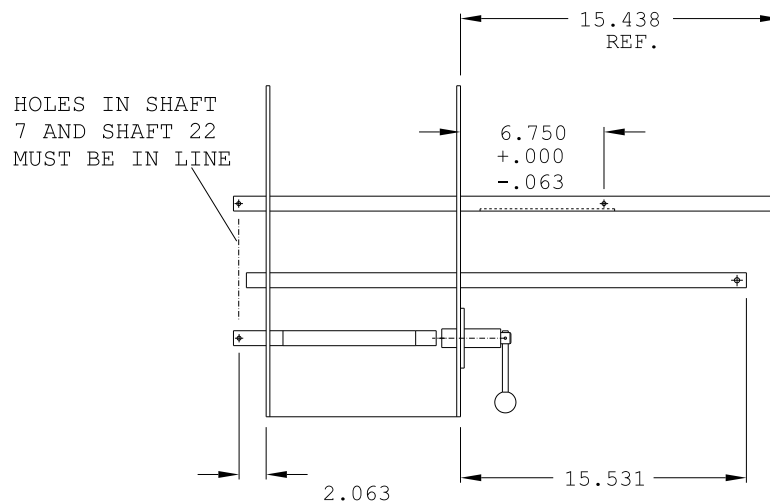
NOTE: HOLE IN SHAFT #7 IS TO BE CENTERED WITH HOLE IN SHAFT #22.

NOTE: LOCK COLLARS LOCK IN DIRECTION OF ARROW.

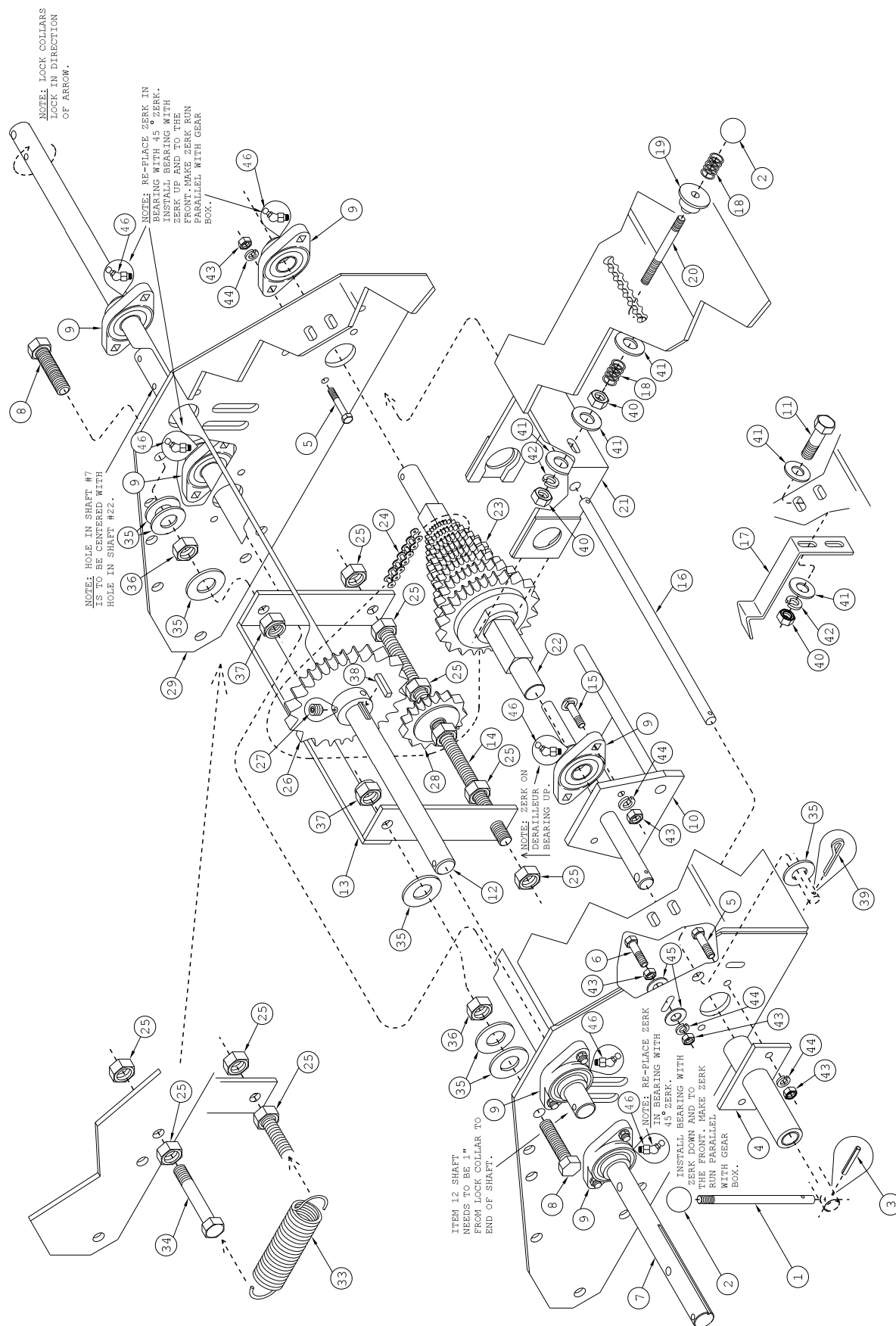
NOTE: RE-PLACE ZERK IN BEARING WITH 45° ZERK. INSTALL BEARING WITH ZERK DOWN & TO THE FRONT. MAKE ZERK RUN PARALLEL WITH GEAR BOX.

Gear Box Assembly 13'

Item	Part No.	Description	Item	Part No.	Description
1	309088	Handle Shaft	16	309070	Gear Box Shaft
2	604611	Plastic Ball Knob 3/8" -16 T.P.I.	17	211896	Derailleur Spring Catch Plate
3	334581	Roll Pin 5/32" x 7/8"	18	502161	Knob Spring
4	860908	Derailleur Clutch Mount Assy	19	309138	Shift Lock
5	01010800	HHCS 5/16" x 1" Gr 5	20	309104	Adjustment Handle Shaft
	330845	Lockwasher 5/16"	21	954347	Sprocket Cluster Bracket
	330811	Hex Nut 5/16"	22	309054	Cluster Shaft
6	02300200	HHCS 5/16 x 2" Gr 5	23	432708	Sprocket Cluster
	330845	Lockwasher 5/16"	24	432542	Chain #40 x 64 Pitches Complete
	330811	Hex Nut 5/16"	25	330571	Hex Nut 5/8"
	330852	Flatwasher 5/16"	26	954149	Sprocket #40 30 Tooth w/1" bore
7	312272	Clutch Shaft	27	334516	Allen Set Screw 1/4"-28 x 1/4" Cone
8	337212	Tap Bolt 1/2" x 2" Gr 5	28	430603	Sprocket 17 Tooth Idler
	330134	Hex Nut 1/2"	29	957092	Gear Box Shell
	330159	Flatwasher 1/2"	33	500173	Idler Spring
	331363	Hex Nylock 1/2"	34	335422	HHCS 1/2" x 2 1/2" Gr 5
9	03001500	Bearing 1" Flange Mount		330134	Hex Nut 1/2"
10	954339	Derailleur Bracket	35	330159	Flatwasher 1/2"
11	01017300	HHCS 3/8" x 1" Gr 5	36	330134	Hex Nut 1/2"
	330035	Hex Nut 3/8"	37	331363	Hex Nylock 1/2"
	330894	Flatwasher 3/8"	38	10490100	Key 1/4" x 1/4" x 1 1/4"
	330043	Lockwasher 3/8"	39	330936	Cotter Pin 1/8" x 1"
12	312280	Box End Drive Shaft	40	330035	Hex Nut 3/8"
13	954941	Idler Arm	41	330894	Flatwasher 3/8"
14	309112	Idler Arm All-thread Shaft	42	330043	Lockwasher 3/8"
15	01261700	Carriage Bolt 5/16" x 1 1/2" Gr 5	43	01162700	Zerk 1/4" -28 45°
	330845	Lockwasher 5/16"	44	330845	Lockwasher 5/16"
	330811	Hex Nut 5/16"	45	330811	Hex Nut 5/16"
			46	330852	Flatwasher 5/16"



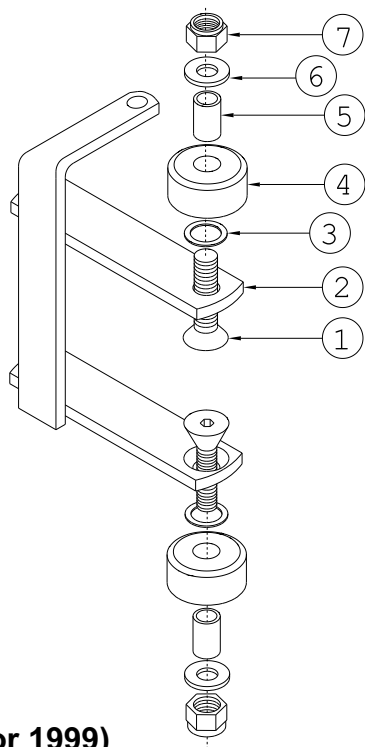
Gear Box Assembly 15' & 20'



Gear Box Assembly 15' & 20'

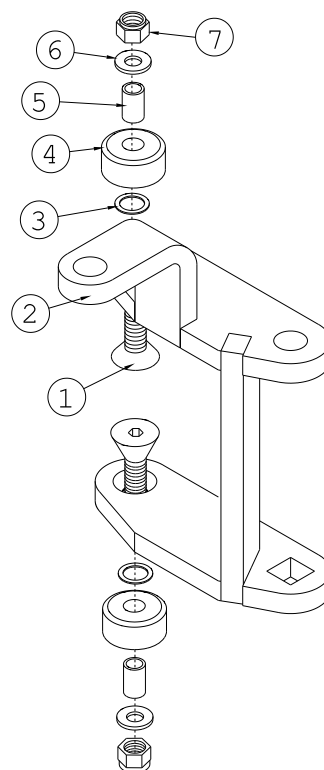
Item	Part No.	Description	Item	Part No.	Description
1	309088	Handle Shaft	16	309070	Gear Box Shaft
2	604611	Plastic Ball Knob 3/8" -16 T.P.I.	17	211896	Derailleur Spring Catch Plate
3	332452	Roll Pin 5/32" x 1 1/4"	18	502161	Knob Spring
4	860908	Derailleur Clutch Mount Assy	19	309138	Shift Lock
5	01010800	HHCS 5/16" x 1" Gr 5	20	309104	Adjustment Handle Shaft
	330845	Lockwasher 5/16"	21	954347	Sprocket Cluster Bracket
	330811	Hex Nut 5/16"	22	309054	Cluster Shaft
6	02300200	HHCS 5/16 x 2" Gr 5	23	432708	Sprocket Cluster
	330845	Lockwasher 5/16"	24	432542	Chain #40 x 64 Pitches Complete
	330811	Hex Nut 5/16"			
	330852	Flatwasher 5/16"	25	330571	Hex Nut 5/8"
7	309682	Clutch Shaft	26	954149	Sprocket #40 30 Tooth w/1" bore
8	337212	Tap Bolt 1/2" x 2" Gr 5	27	334516	Allen Set Screw 1/4"-28 x 1/4" Cone
	330134	Hex Nut 1/2"			
	330159	Flatwasher 1/2"	28	430603	Sprocket 17 Tooth Idler
	331363	Hex Nylock 1/2"	29	957092	Gear Box Shell
9	03001500	Bearing 1" Flange Mount	33	500173	Idler Spring
10	954339	Derailleur Bracket	34	335422	HHCS 1/2" x 2 1/2" Gr 5
11	01017300	HHCS 3/8" x 1" Gr 5		330134	Hex Nut 1/2"
	330035	Hex Nut 3/8"	35	330159	Flatwasher 1/2"
	330894	Flatwasher 3/8"	36	330134	Hex Nut 1/2"
	330043	Lockwasher 3/8"	37	331363	Hex Nylock 1/2"
12	309252	Box End Drive Shaft	38	10490100	Key 1/4" x 1/4" x 1 1/4"
13	954941	Idler Arm	39	330936	Cotter Pin 1/8" x 1"
14	309112	Idler Arm All-thread Shaft	40	330035	Hex Nut 3/8"
15	01261700	Carriage Bolt 5/16" x 1 1/2" Gr 5	41	330894	Flatwasher 3/8"
	330845	Lockwasher 5/16"	42	330043	Lockwasher 3/8"
	330811	Hex Nut 5/16"	46	01162700	Zerk 1/4" -28 45°

Clutch Lever Assemblies



863829 (Prior 1999)

Item	Part No.	Description
1	337311	Screw 3/8" x 1 3/4" Flat Head Socket
2	956490	Clutch Lever Right
3	337063	Nylon Washer 1/2" ID x 11/16" OD x 1/32"
4	309641	Clutch Lever Bushing
5	149385	Bushing
6	330894	Flat washer 3/8"
7	330837	Nylock Hex Nut 3/8"



#870121

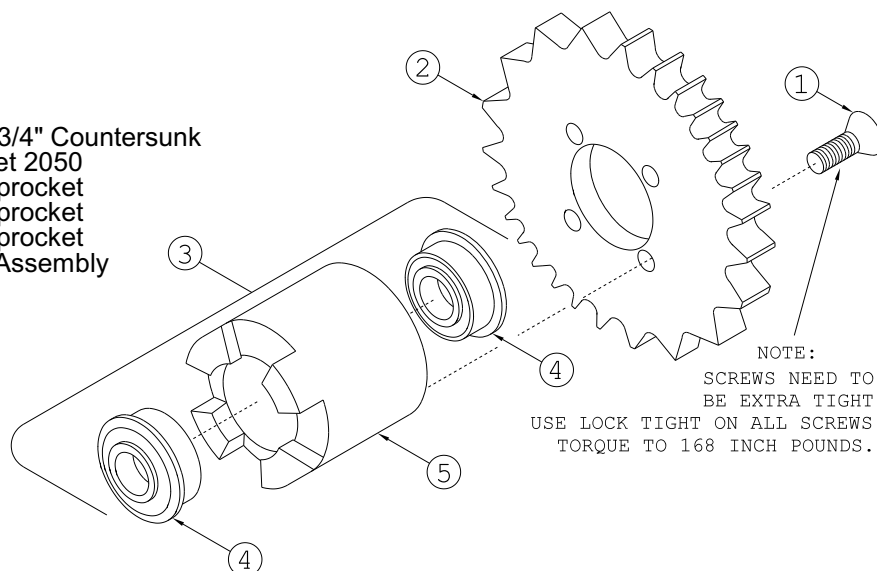
Item	Part No.	Description
1	337311	Screw 3/8" x 1 3/4" Flat Head Socket
2	963629	Clutch Lever Right
3	337063	Nylon Washer 1/2" ID x 11/16" OD x 1/32"
4	309641	Clutch Lever Bushing
5	149385	Bushing
6	330894	Flat washer 3/8"
7	330837	Nylock Hex Nut 3/8"

Drive Clutch Sprocket Assembly

#863787 18 Tooth
#863795 20 Tooth
#863803 25 Tooth

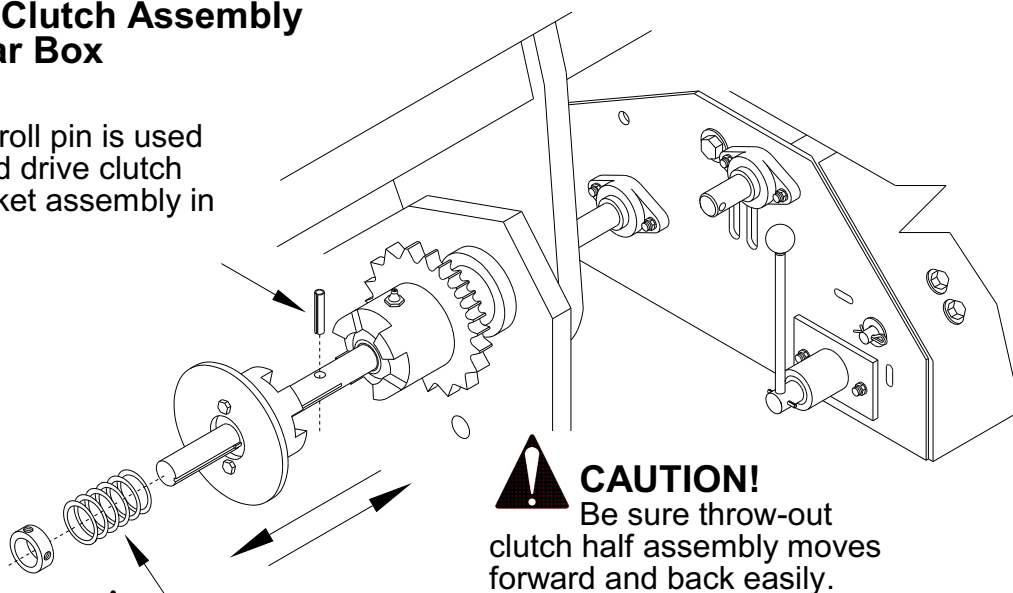
Item	Part No.	Description
1	337733	Screw 1/4" x 3/4" Countersunk
2	432450	Drive Sprocket 2050 18 Tooth Sprocket
	431700	20 Tooth Sprocket
	432500	25 Tooth Sprocket
* 3	863779	Drive Clutch Assembly
4	401000	Bearing 1"
5	551218	Clutch Drive

* Includes Items #4 & #5.



Clutch Half & Drive Clutch Assembly to Gear Box

5/16" roll pin is used to hold drive clutch sprocket assembly in place.



WARNING!

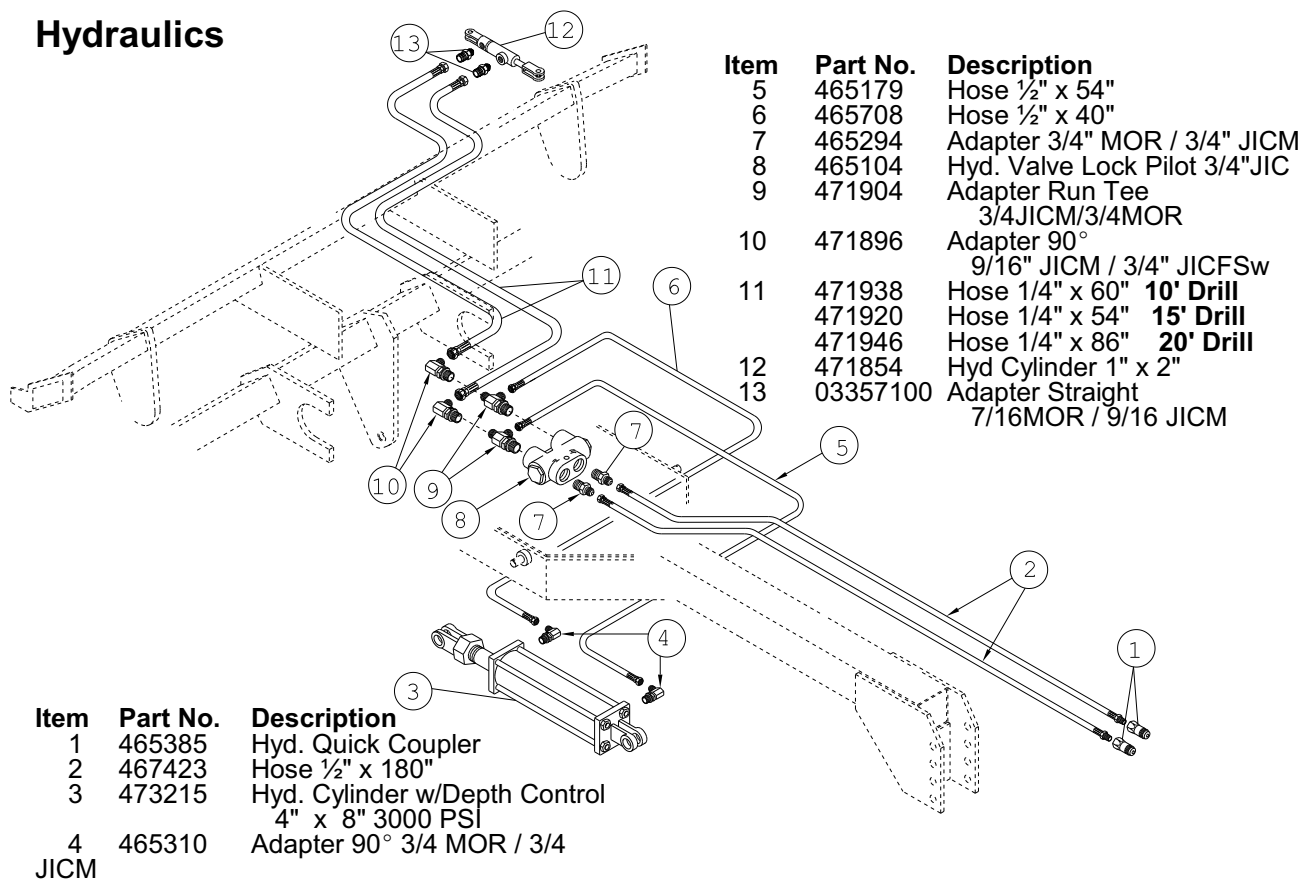
When you re-adjust clutch lever, make sure spring does not totally collapse. If spring totally collapses, pressure could force set collar off, resulting in loss of throw-out clutch half causing drill to stop seeding.



CAUTION!

Be sure throw-out clutch half assembly moves forward and back easily.

Hydraulics



Spindle & Hub Assembly

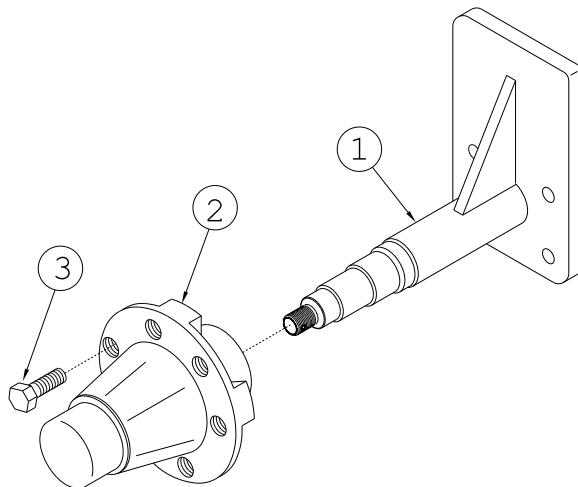
#870576 - 10' Drill

#868711 - 13', 15' & 20' Drills (5 1/8" centers)

#863902 - 15' & 20' Drills (4 3/8" centers)

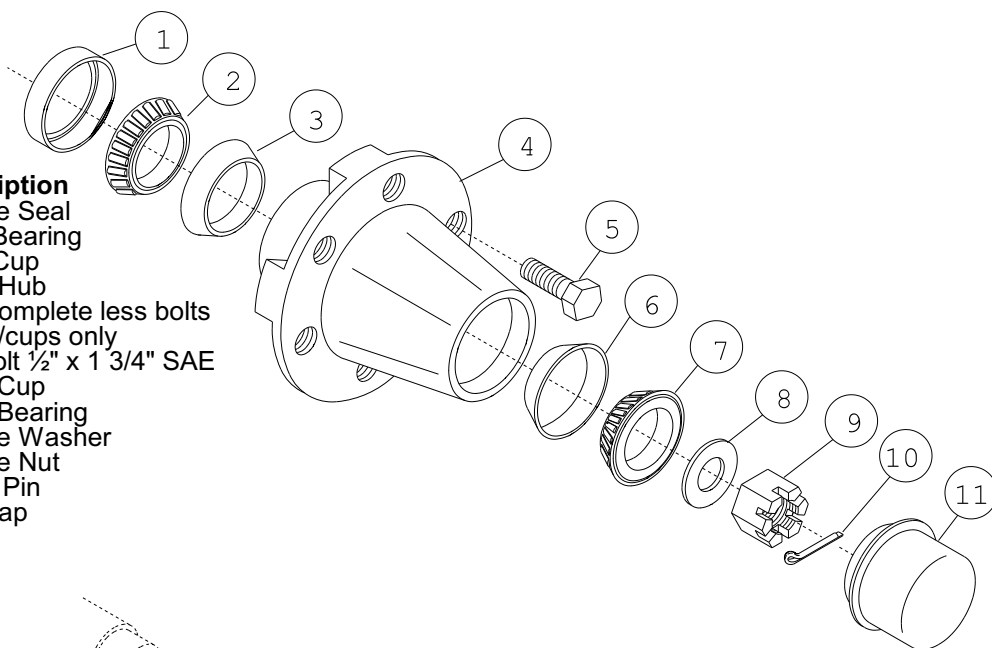
Item	Part No.	Description
1	964528	Spindle 10' Drill
	961847	Spindle 13', 15' & 20' Drill (5 1/8")
	956730	Spindle 15' & 20' Drill (4 3/8")
2	550897	8 Bolt Hub 10' Drill
	551291	6 Bolt Hub less bolts 13', 15' & 20' Drill
* 3	330464	Lug Bolt for 6 Bolt Hub

*Lug Bolts are not included in hub #551291



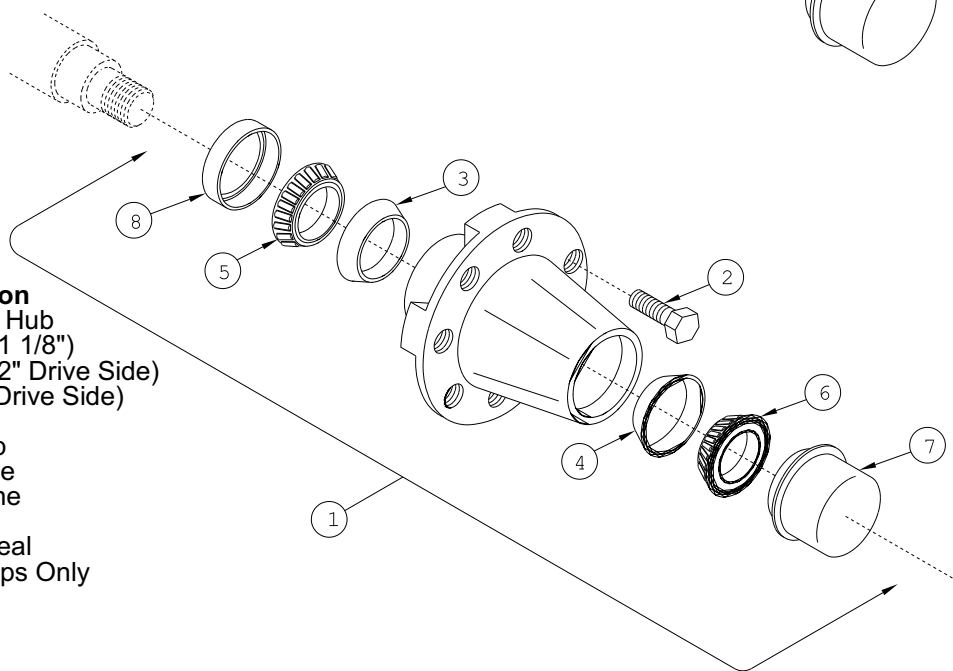
6 Bolt Hub #551291

Item	Part No.	Description
1	400861	Grease Seal
2	400853	Inner Bearing
3	400846	Inner Cup
4	551291	Hub Complete less bolts
	550707	Hub w/cups only
5	330464	Lug Bolt 1/2" x 1 3/4" SAE
6	05742200	Outer Cup
7	05741400	Outer Bearing
8	02080000	Spindle Washer
9	331801	Spindle Nut
10	02154300	Cotter Pin
11	05703400	Hub Cap



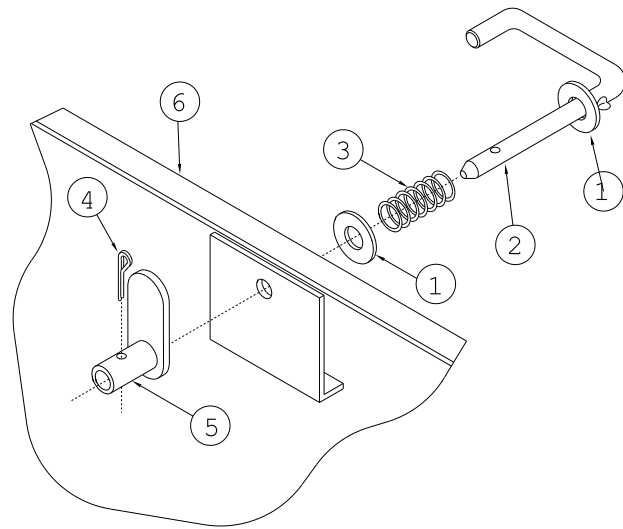
8 Bolt Hub #550897

Item	Part No.	Description
1	550897	Complete Hub
2	336297	Lug Bolt (1 1/8")
	336867	Lug Bolt (2" Drive Side)
	336859	Lug Nut (Drive Side)
3	401661	Inner Cup
4	401679	Outer Cup
5	401653	Inner Cone
6	401687	Outer Cone
7	603613	Hub Cap
8	401646	Grease Seal
-	55097	Hub w/Cups Only



Cover Shield # 864140

Item	Part No.	Description
1	257428	Washer 15/16" x 16 ga
2	309724	Handle Pin
3	501205	Quadrant Spring
4	330936	Cotter Pin 1/8" x 1"
5	957068	Shield Latch
6	956789	Cover Shield

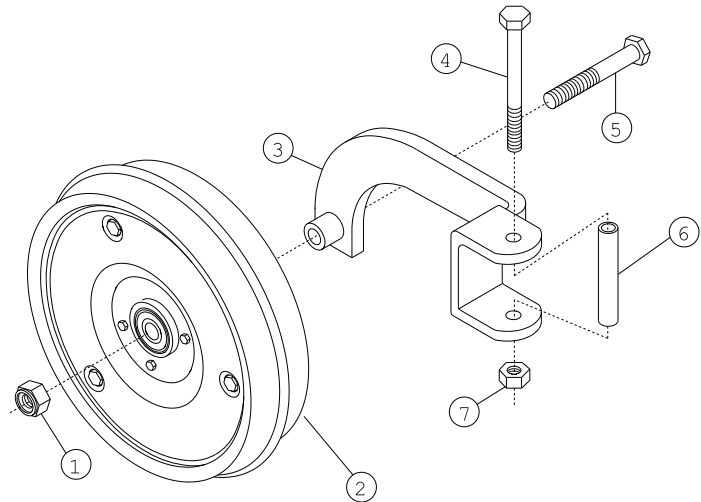


All Plant Presswheel Arm Assemblies

#874362 (Hammer)

3" x 13" Center Rib

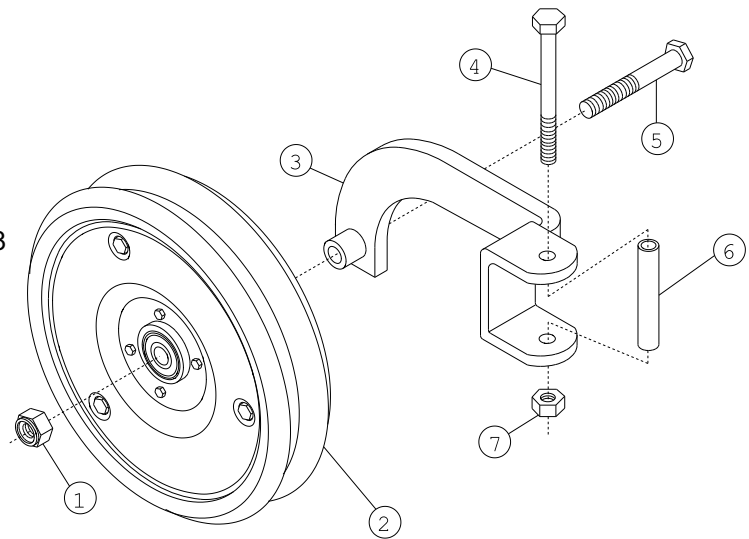
Item	Part No.	Description
1	01572700	Hex Nylock Nut 5/8"
2	531111	Presswheel 3 x 13 Center Rib
3	954636	Presswheel Arm
4	337873	HHCS 1/2" x 5 1/2" Gr 8
5	331983	HHCS 5/8" x 4"
6	148999	Bushing .747 x .532 x 3.594
7	03223500	Reversible Lock Nut 1/2" Gr 8



#877852 (Carlisle)

3" x 13" Dual Rib

Item	Part No.	Description
1	01572700	Hex Nylock Nut 5/8"
2	531541	Presswheel 3 x 13 Dual Rib
3	954636	Presswheel Arm
4	337873	HHCS 1/2" x 5 1/2" Gr 8
5	335182	HHCS 5/8" x 4 1/2"
6	148999	Bushing .747 x .532 x 3.594
7	03223500	Reversible Lock Nut 1/2" Gr 8

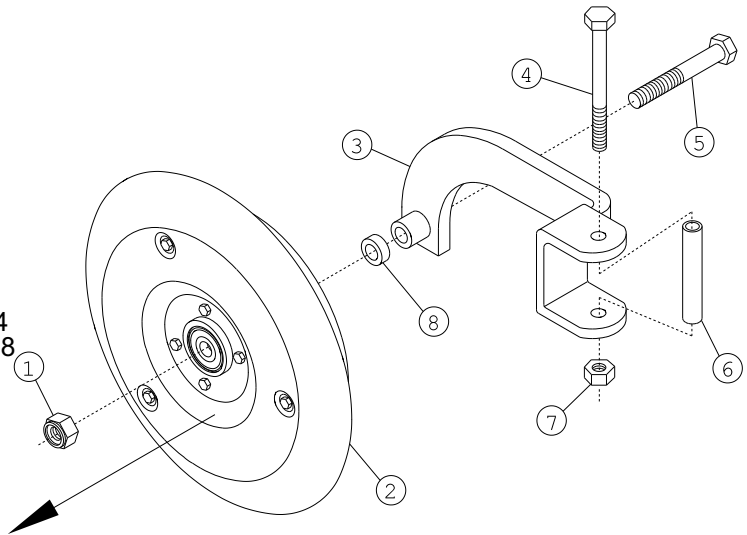


All Plant Presswheel Arm Assemblies

#859991 (Hammer)

**2" x 13" Peaked
w/Smooth Sides**

Item	Part No.	Description
1	01572700	Hex Nylock Nut 5/8"
2	530667	Presswheel 2 x 13 Peaked w/Smooth Sides
3	954636	Presswheel Arm
4	337873	HHCS 1/2" x 5 1/2" Gr 8
5	331983	HHCS 5/8" x 4"
6	148999	Bushing .747 x .532 x 3.594
7	03223500	Reversible Lock Nut 1/2" Gr 8
8	151472	Presswheel Shim

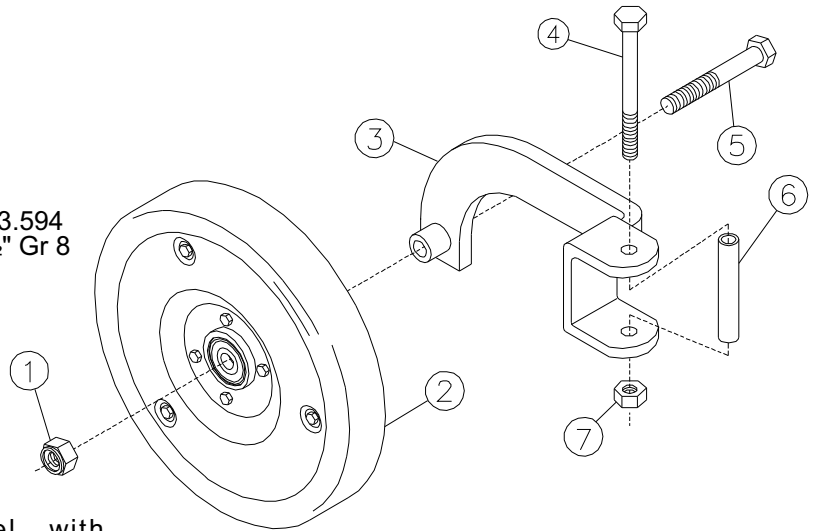


Assemble wheel with
extended race of bearing in
direction of arrow.

#860007 (Carlisle)

**2" x 13"
w/Smooth Sides**

Item	Part No.	Description
1	01572700	Hex Nylock Nut 5/8"
2	531095	Presswheel 2 x 13 w/Smooth Sides
3	954636	Presswheel Arm
4	337873	HHCS 1/2" x 5 1/2" Gr 8
5	331983	HHCS 5/8" x 4"
6	148999	Bushing .747 x .532 x 3.594
7	03223500	Reversible Lock Nut 1/2" Gr 8

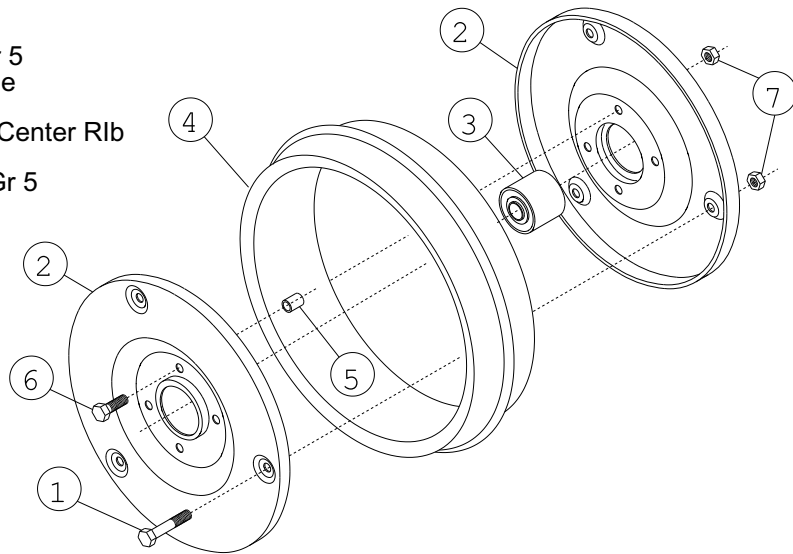


Assemble wheel with
extended race of bearing in
direction of arrow.

Presswheel Assemblies

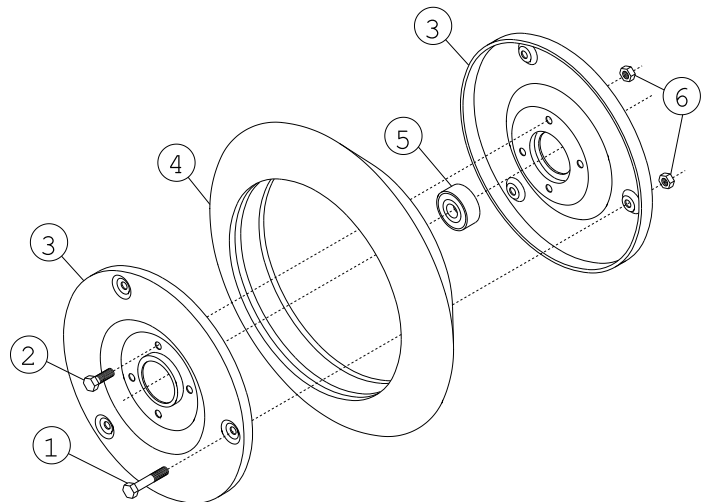
#531111 (Hammer) 3" x 13" Center Rib

Item	Part No.	Description
1		HHCS 3/8" x 2.5" Gr 5
2	531145	3x13 Presswheel Side
3	403188	Bearing
4	531152	Presswheel 3" x 13" Center Rib
5	606152	Bushing
6	337857	HHCS 3/8" x 1 3/8" Gr 5
7		Hex Locknut 3/8"



#530667 (Hammer) 2" x 13" Peaked w/Smooth Sides

Item	Part No.	Description
1		HHCS 3/8" x 1 5/8" Gr 5
2		HHCS 3/8" x 5/8" Gr5
3	530758	2x13 Smooth Presswheel Side
4	530766	2x13 Peaked Presswheel
5	401042	Bearing
6		Hex Locknut 3/8"



Presswheel Assemblies

#531095	2 x 13	Carlisle
#531483	3 x 15 V-Type	Carlisle
#531707	Presswheel Half	
#531723	Presswheel Tire	
#531541	3 x 13 Dual Rib	Carlisle
#531764	Presswheel Rim	

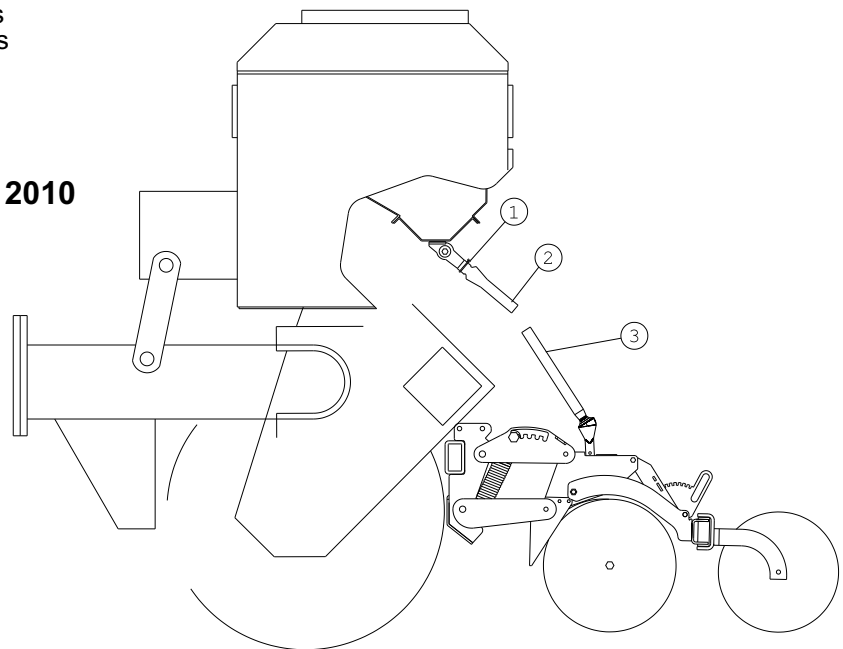
Feed Tube Assembly

Item	Part No.	Description
1	604777	Clamp 1 3/8" x .162 (A-22)
2	571018	Upper Seed Tube-18" Long Opener
	571059	Upper Seed Tube- 17" Short Opener
3		Bottom Tube
	571984	33"-Long Openers
	571992	32"-Short Openers

Bottom Tube Assembly - Prior 2010

#872036	571364	Feed Tube 14 5/8"
	571323	16" Tube
	603027	Hose Clamp

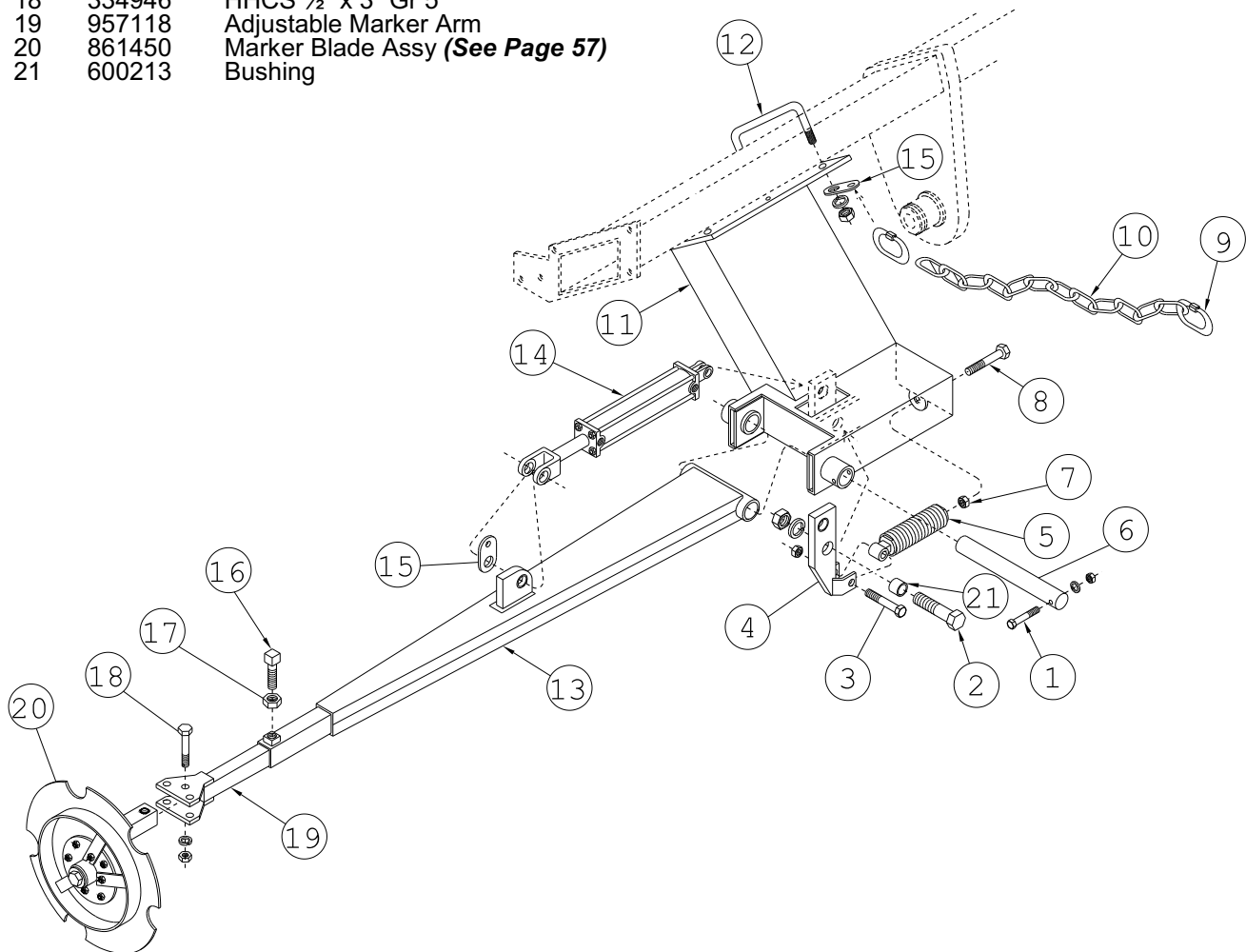
#876235	571364	Feed Tube 14 5/8"
	570945	14 1/2" Tube
	603027	Hose Clamp



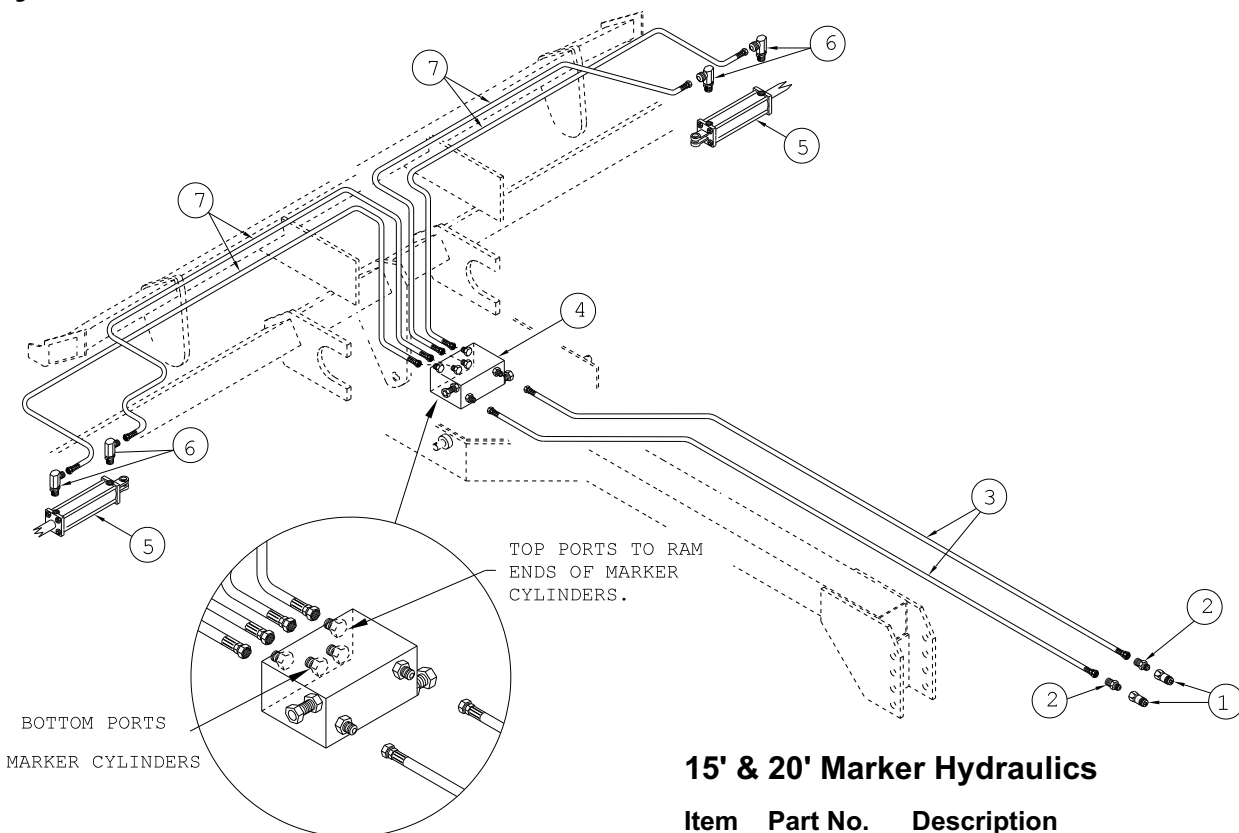
Hydraulic Markers

15' & 20' Marker

Item	Part No.	Description
1	331710	HHCS 5/16" x 2 1/2" Gr 5
2	334789	HHCS 1" x 3 1/2" Gr 5
3	335620	HHCS 5/8" x 3" Gr 5
4	956946	Base Lug Spring Mount
5	842906	Opener Spring Assembly
6	309708	Marker Pin
7	332262	Jam Nut 1/2"
8	335612	Screw 1/2" x 2 1/2" Hex Fl Gr 8
9	332593	Chain Connector Link 5/16"
10	432765	Chain 1/4 Proof x 12 Links
11	956961	Base Mount - Right
	956953	Base Mount - Left
12	334185	U-bolt 3/4" x 6" x 5 1/2"
13	956938	Marker Arm
14	463703	Cylinder 2" x 8" w/o DC
15	215152	Safety Chain Mount Plate
16	331223	Set Screw 5/8" x 1 3/4" Sq Hd
17	331538	Jam Nut 5/8"
18	334946	HHCS 1/2" x 3" Gr 5
19	957118	Adjustable Marker Arm
20	861450	Marker Blade Assy (See Page 57)
21	600213	Bushing



Hydraulic Markers

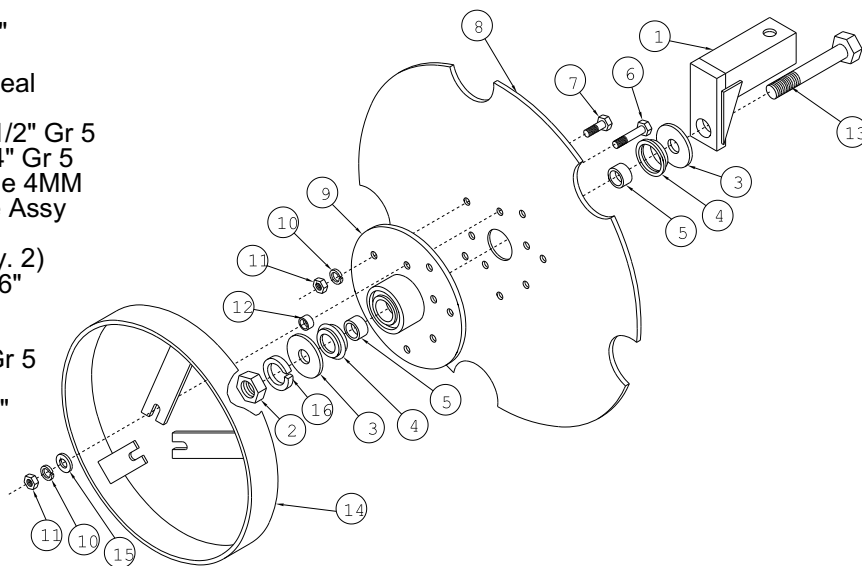


15' & 20' Marker Hydraulics

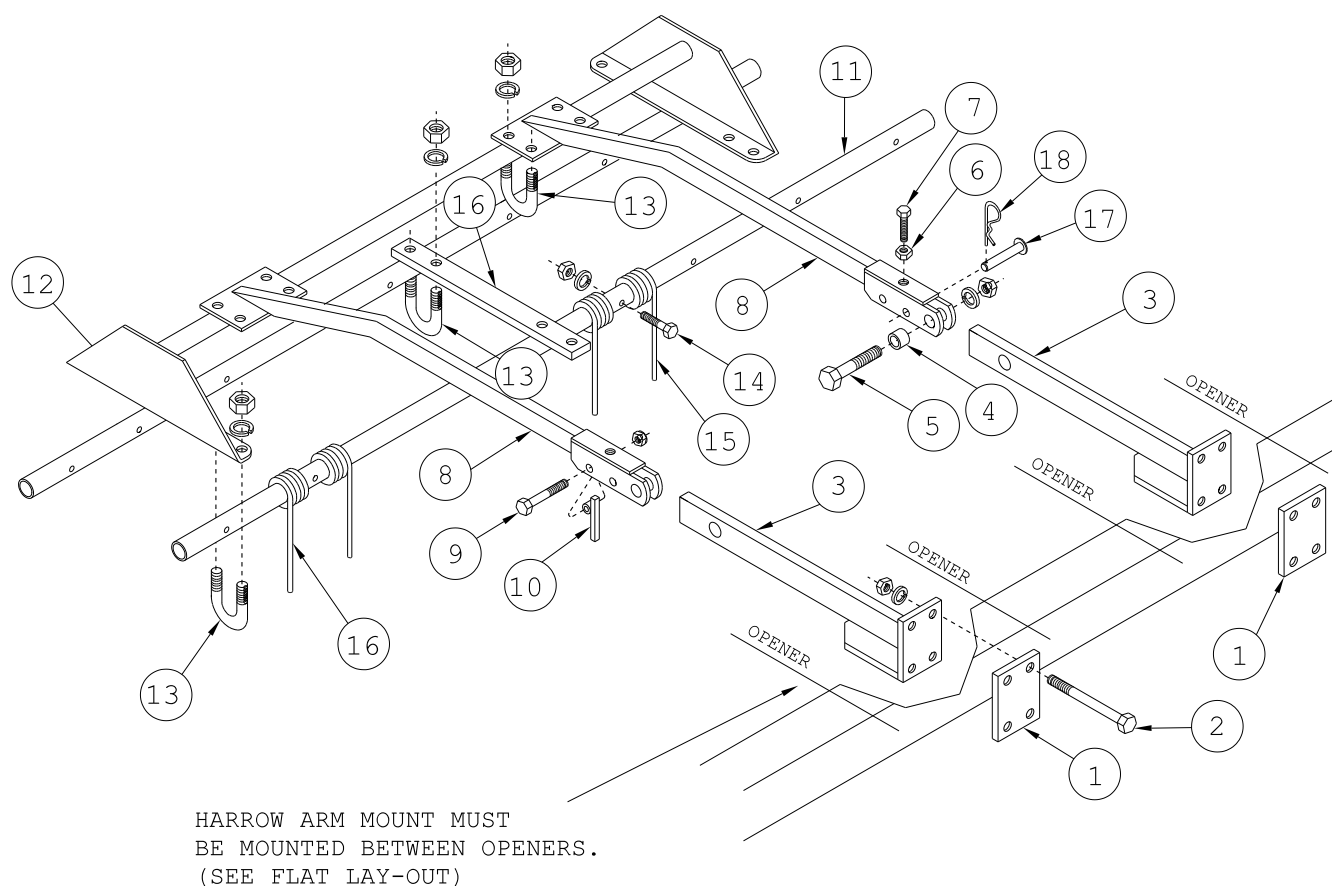
Item	Part No.	Description
1	465385	Hyd. Quick Coupler
2	465294	Adapter 3/ 4" MOR / 3/4" JICM
3	469668	Hose 3/8" x 170"
4	470179	Sequence Valve (6 Ports)
5	463703	Hyd. Cylinder 2" x 8"
6	00563700	Adpt 90° 3/8 NPTM / 9/16 JICM
7	469650	Hose 1/4" x 125" 15' Drill
	469684	Hose 1/4" x 155" 20' Drill

Marker Blade Assembly #861450

Item	Part No.	Description
1	956086	Marker Angle Adjusting Tube
2	330571	Hex Nut 5/8"
	330878	Lock Washer 5/8"
3	330183	Flat Washer 5/8"
4	400747	Neoprene Dust Seal
5	606558	Bushing
6	335448	HHCS 5/16" x 1 1/2" Gr 5
7	01144500	HHCS 5/16" x 3/4" Gr 5
8	501437	16" Notched Blade 4MM
9	633891	Bearing & Flange Assy
	551200	Flange Only
	401042	Bearing Only (Qty. 2)
10	330845	Lock Washer 5/16"
11	330811	Hex Nut 5/16"
12	923631	Bushing
13	331983	HHCS 5/8" x 4" Gr 5
14	928564	Depth Band
15	330852	Flat Washer 5/16"



Spring Tine Harrow

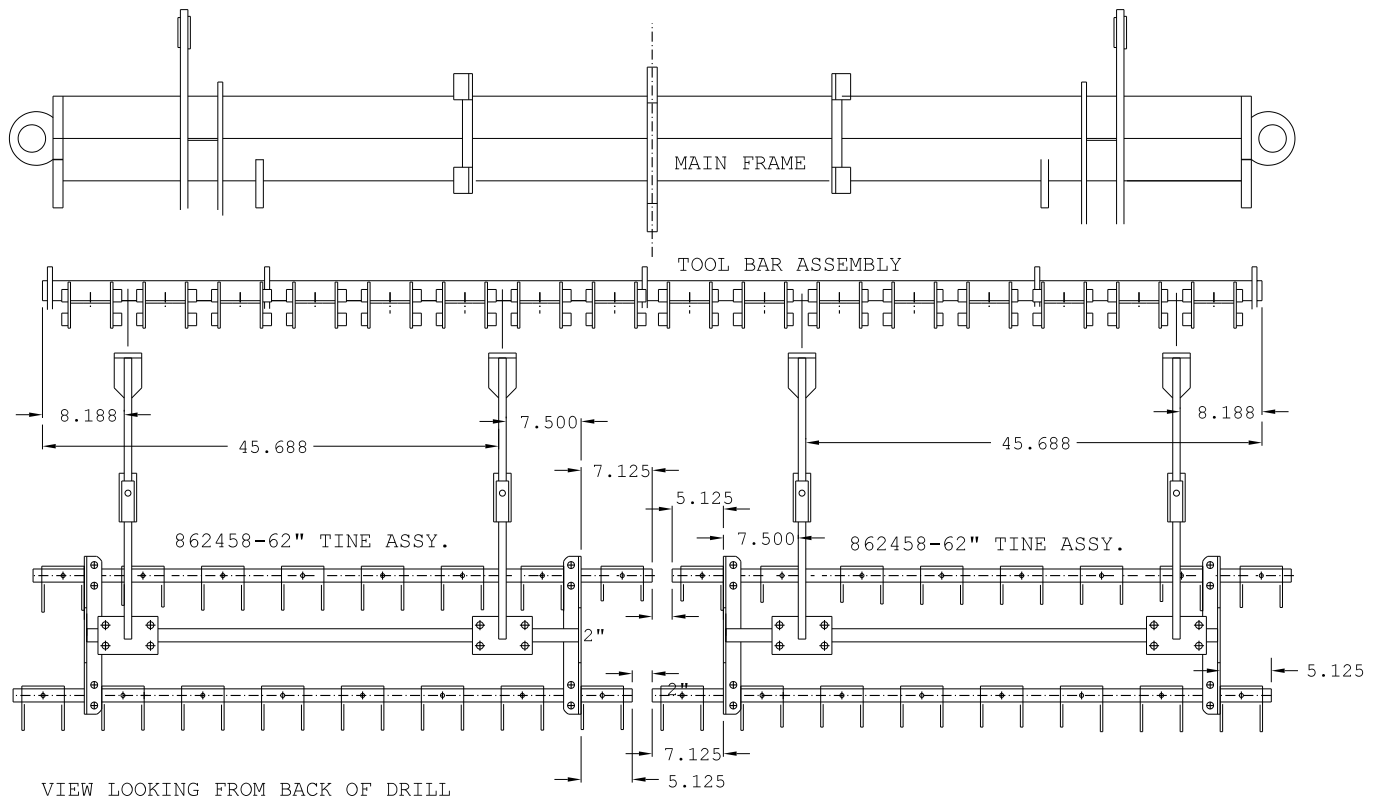


Item	Part No.	Description
1	959288	Bolt Plate
2	334458	HHCS 1/2" x 6" Gr 5
	330142	Lock washer 1/2"
	330134	Hex nut 1/2"
3	976910	Harrow Arm Mount
	959254	(Prior 2006)
4	151050	Bushing
5	336321	HHCS 5/8" x 2 1/4" Gr 5
	330878	Lock washer 5/8"
	330571	Hex nut 5/8"
6	331538	Jam nut 5/8"
7	337584	Harrow Adj Bolt 5/8" x 2" Gr 8
8	959262	Harrow Arm Weldment
9	334243	HHCS 3/8" x 2" Gr 5
	330837	Hex Nylock 3/8"
10	959270	Harrow Lock Weldment

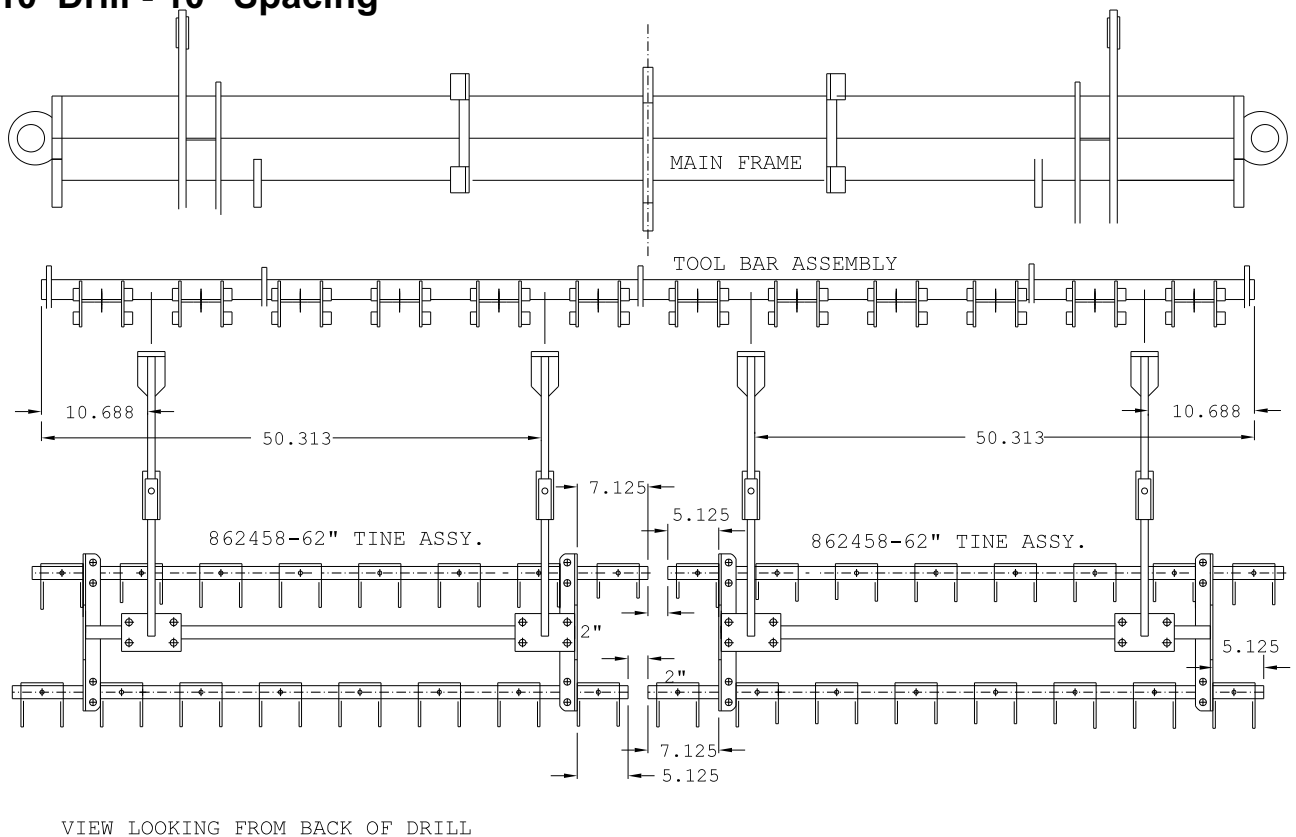
Item	Part No.	Description
11	149849	Harrow Pipe 94"
		(Center & Outside Wings)
	149476	Harrow Pipe 78"
		(Inside Wings Only)
12	956987	Tine Gang Bar
13	336032	U-bolt 5/8" x 1 3/8" x 2 9/16"
	330878	Lock washer 5/8"
	330571	Hex nut 5/8"
14	334243	HHCS 3/8" x 2" Gr 5
	330043	Lock washer 3/8"
	330035	Hex nut 3/8"
15	501544	Harrow Tine 11"
16	202226	Adjustment Plate
17	954024	Transport Pin
18	330860	Hairpin 5/32"

Harrow Layouts

10' Drill - 7½" Spacing

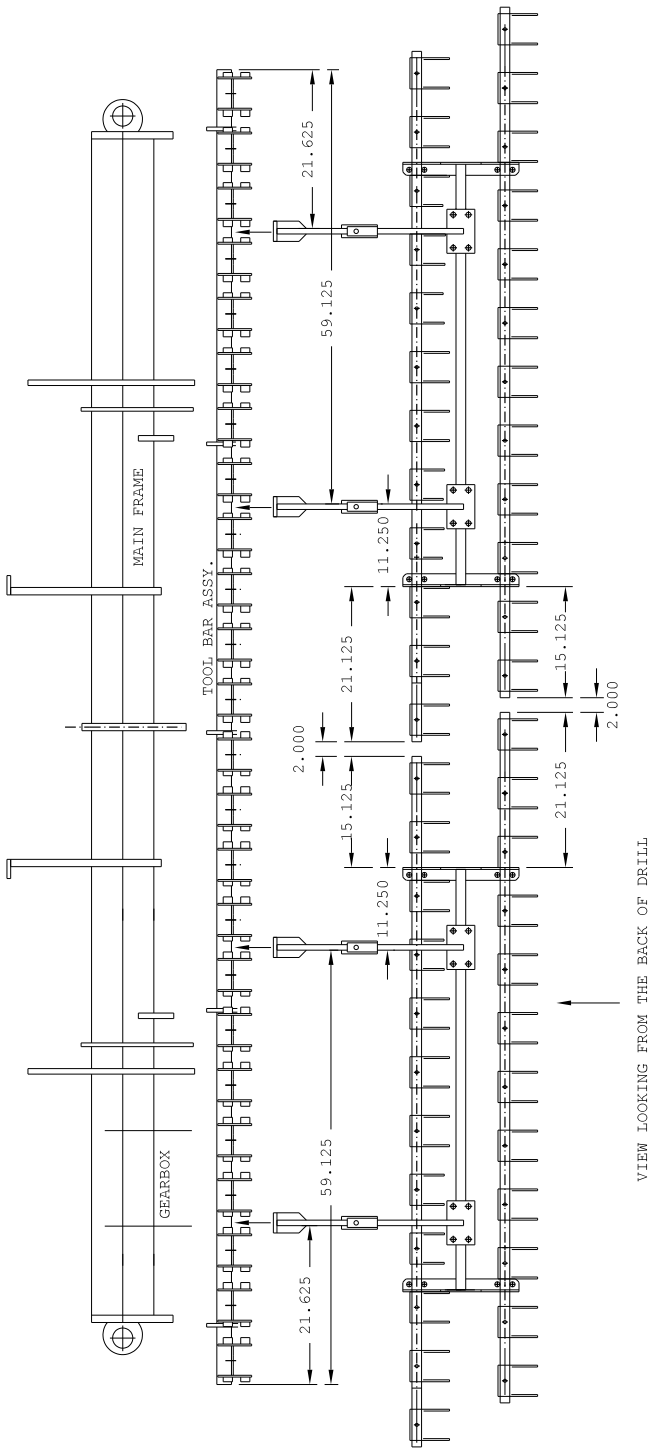


10' Drill - 10" Spacing

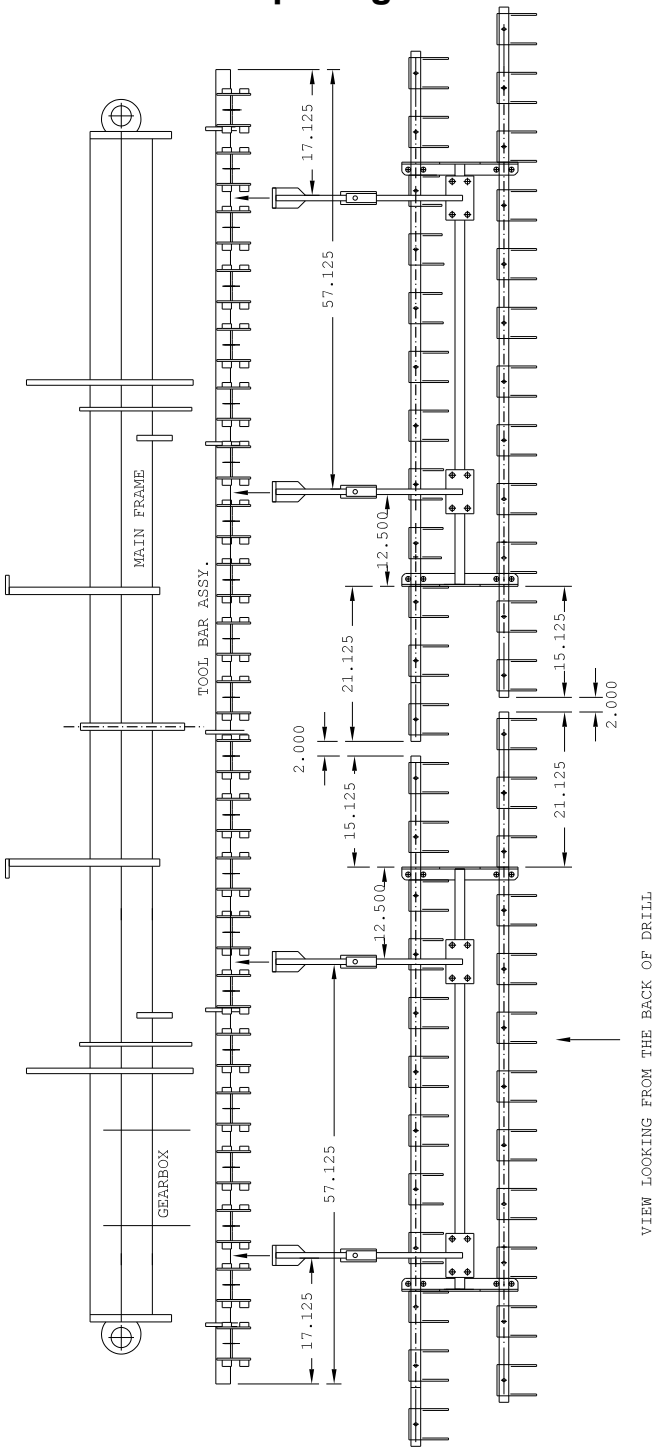


Harrow Layouts

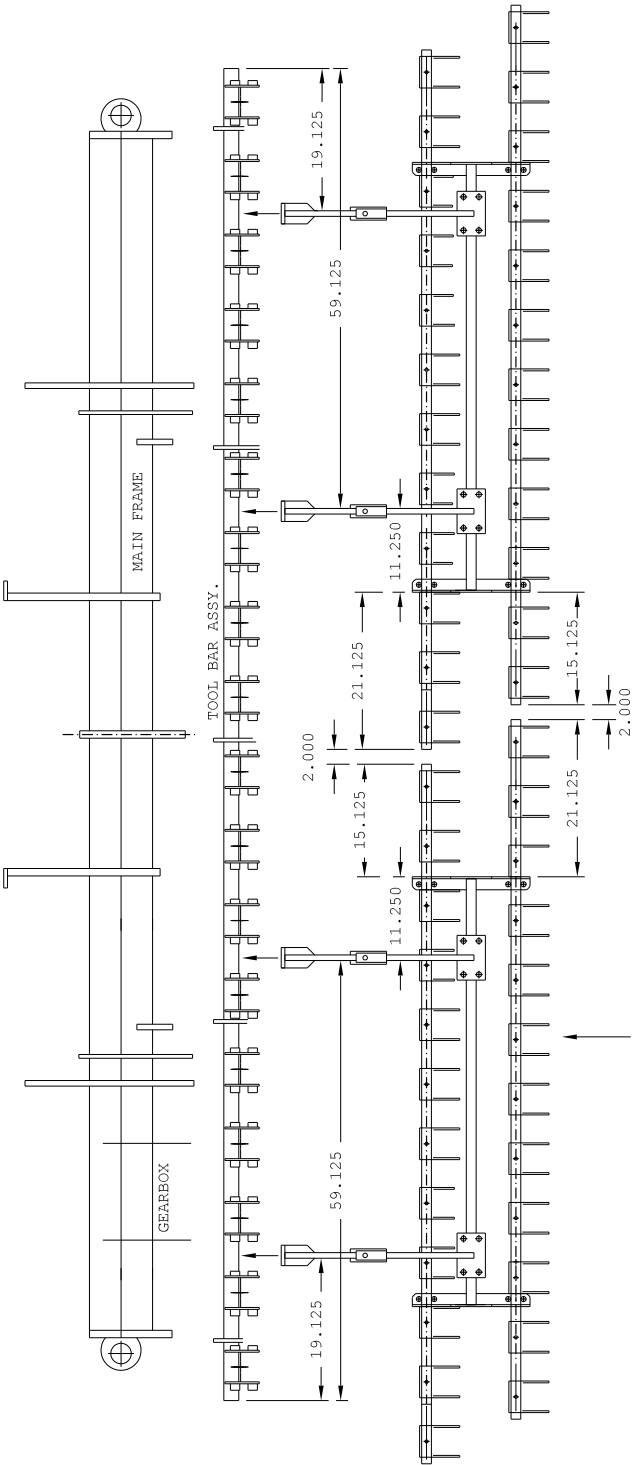
15' Drill - 7½" Spacing



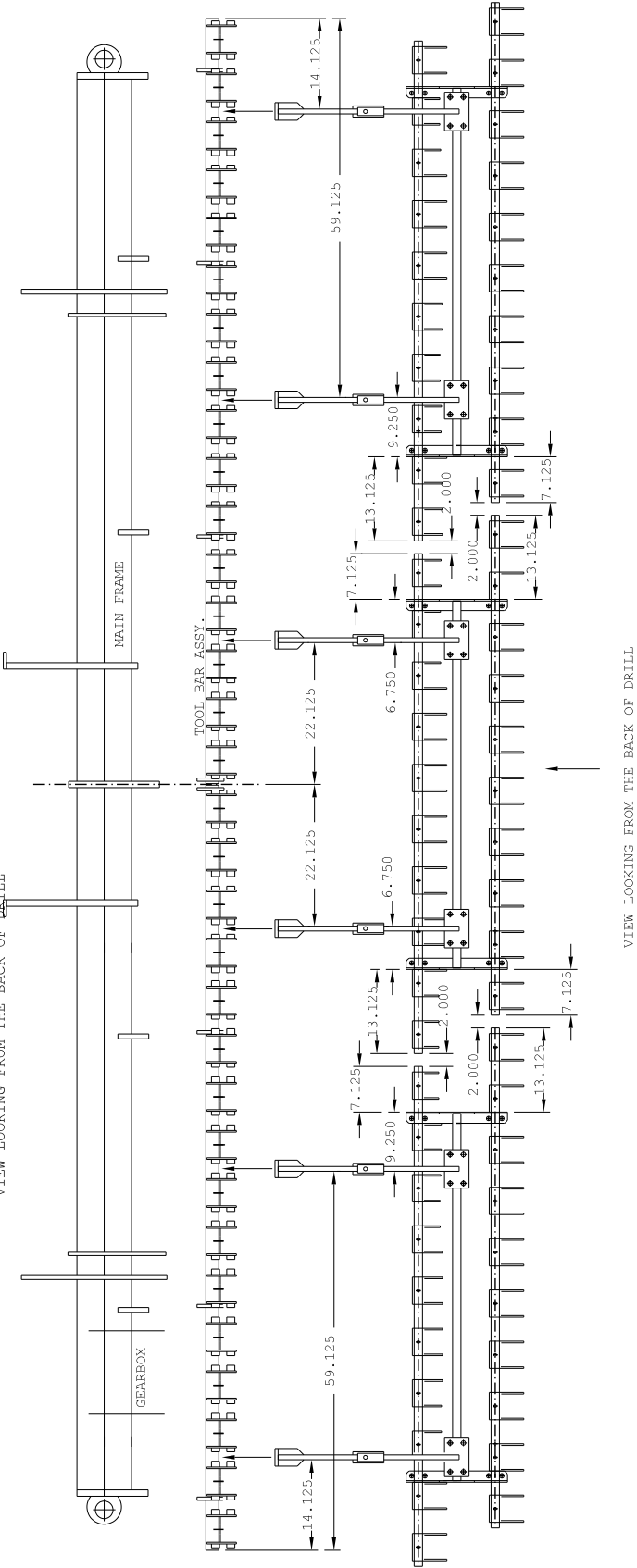
15' Drill - 8" Spacing



Harrow Layouts **15' Drill - 10" Spacing**

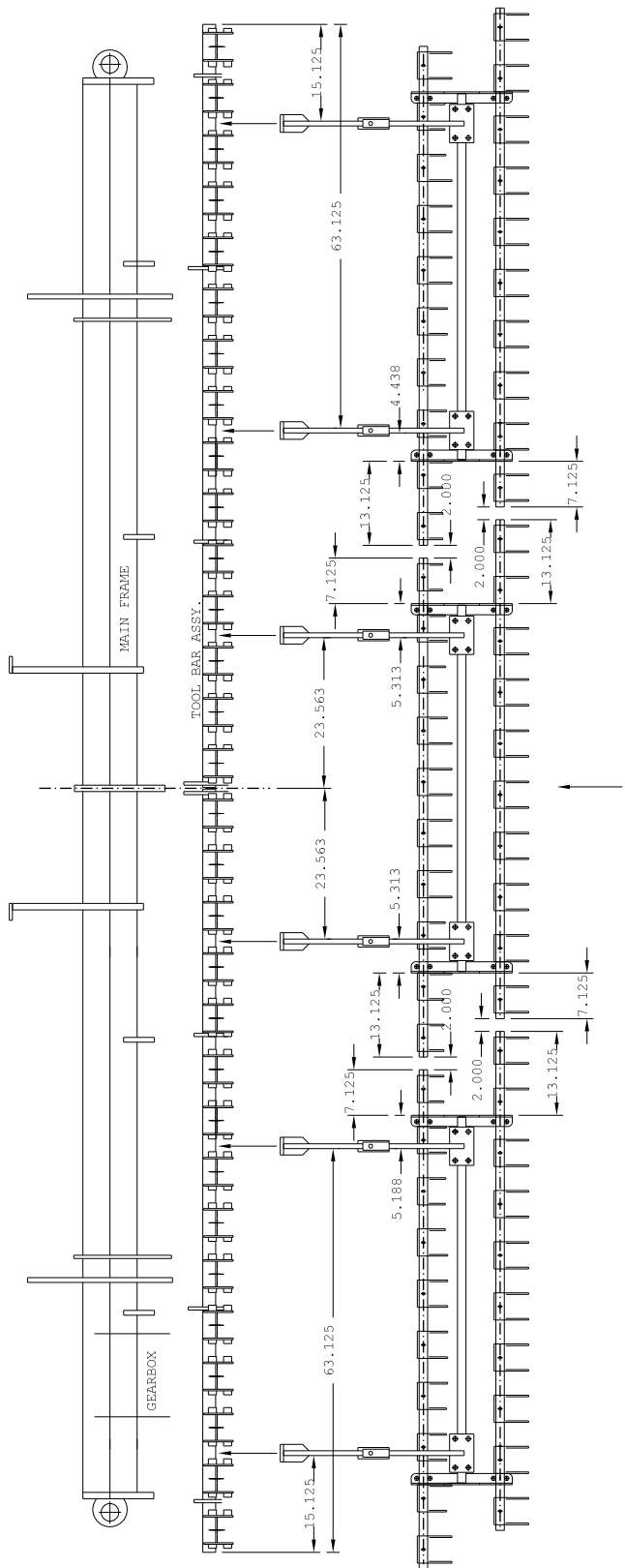


20' Drill - 7½" Spacing

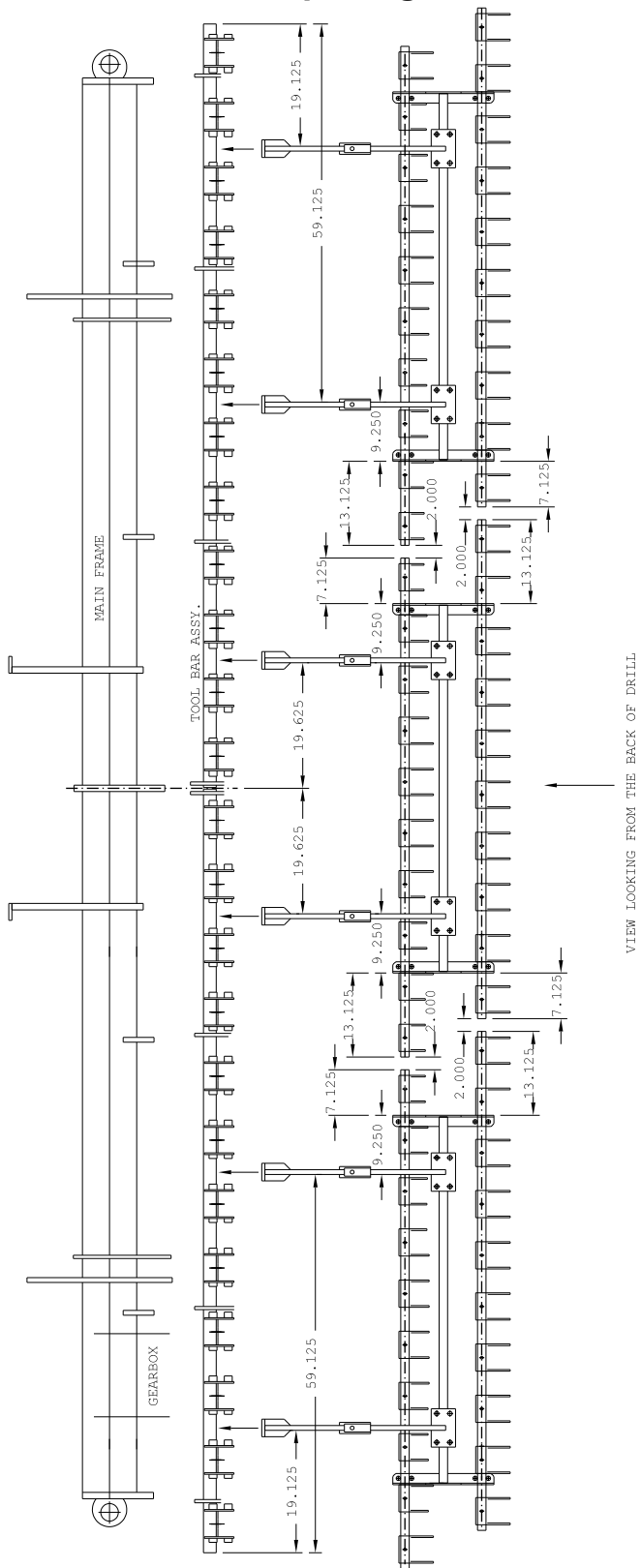


Harrow Layouts

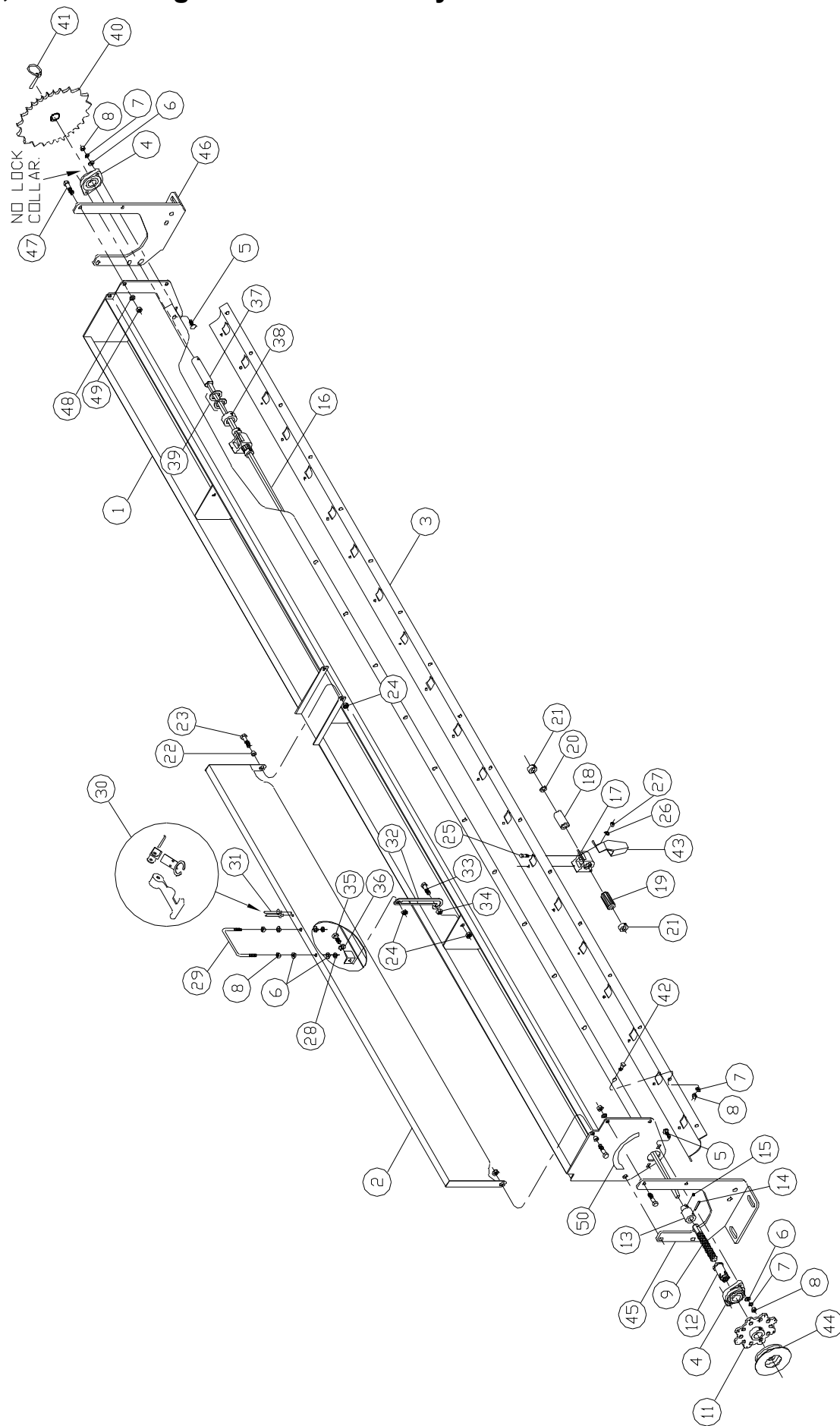
20' Drill - 8" Spacing



20' Drill - 10" Spacing



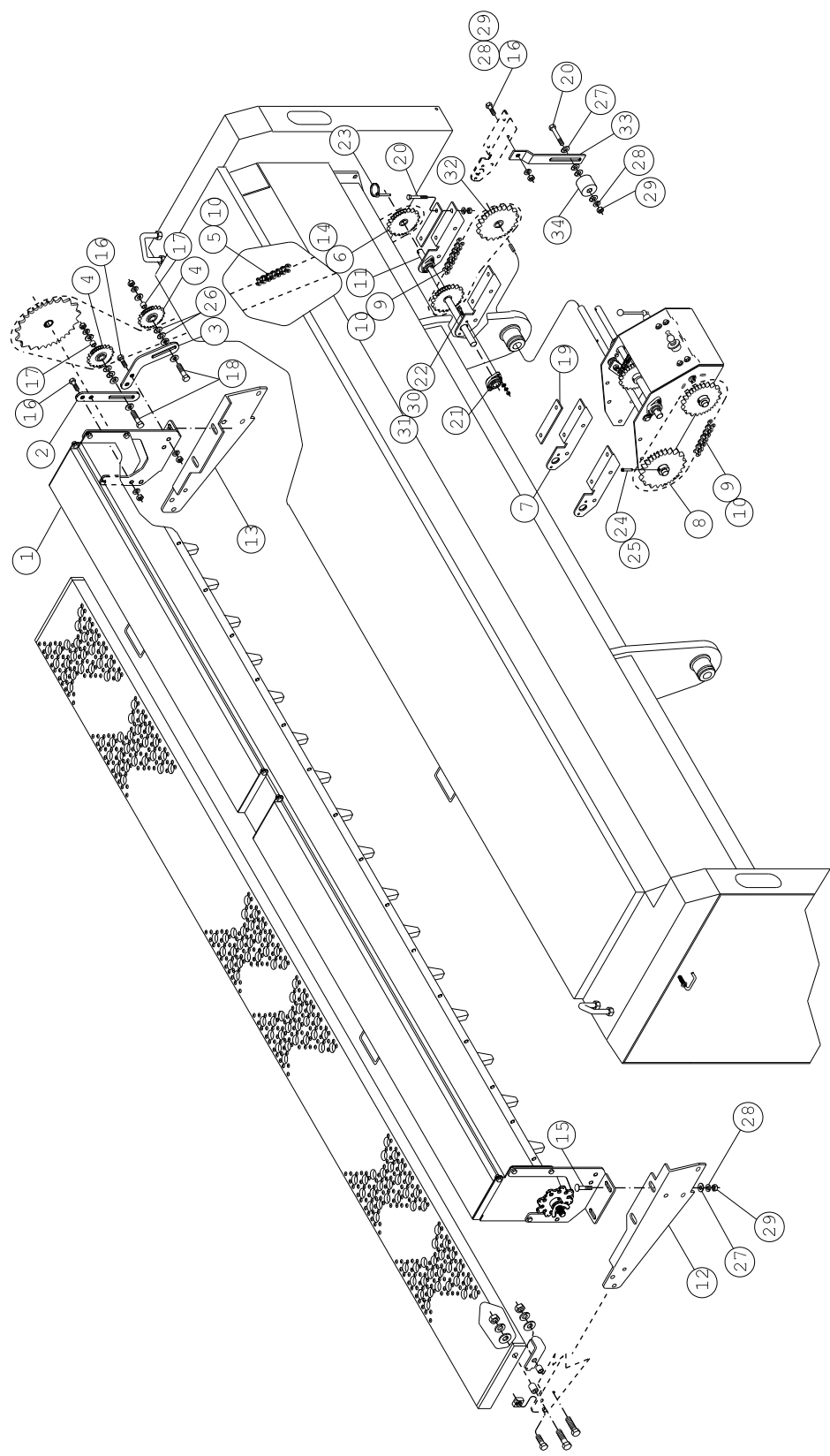
10', 13' & 15' Legume Box Assembly



10', 13' & 15' Legume Box Assembly

Item	Part No.	Description	Item	Part No.	Description
1	977371	Legume Box 4610	20	571604	Feed Cut-off Washer
	970939	Legume Box 4613	21	02625200	Lock Collar 1/2"
	972604	Legume Box 4615	22	149393	Bushing 1/2" x 3/8" x 5/16"
2	977397	Legume Box Lid 4610	23	335703	HHCS 3/8" x 1 1/2"
	970947	Legume Box Lid 4613	24	330837	Nylock 3/8"
	972596	Legume Box Lid 4615	25	01057900	HHCS 1/4" x 3/4"
3		Legume Box Bottom	26	330050	Lock Washer 1/4"
	277400	4610 x 7 1/2"	27	332205	Hex Nut 1/4"
	277129	4610 x 10"	28	331611	Nylock 5/16"
	269662	4613 x 7 1/2"	29	308122	Lid Handle
	269688	4613 x 10"	30	570341	Lid Latch
	972620	4615 x 7 1/2"	31	600635	Pop Rivet 1/8"
	972638	4615 x 10"	32	267153	Lid Holder
4	03001500	Bearing 1"	33	01158500	HHCS 3/8" x 1 1/4"
5	01047000	Carriage Bolt 5/16" x 1"	34	330035	Hex Nut 3/8"
6	330852	Flat Washer 5/16"	35	01017300	HHCS 3/8" x 1"
7	330845	Lock Washer 5/16"	36	330894	Flat Washer 3/8"
8	330811	Hex Nut 5/16"	37	311852	Shaft 1" x 4"
9	311878	Hex Shaft 5/8" x 5 1/2"	38	06409700	Lock Collar 1"
10	608760	Decal "Slot Adjustment"	39	335166	Machine Bushing 1" x 1 1/2" x 10ga
11	968966	Adjustment Handle	40	954362	Sprocket & Hub 2050 44T
12	312785	Adjustment Spool	41	338392	Klik Pin 1/4" w/1 3/4" Ring
13	969048	Feed Shaft Coupler	42	01144500	HHCS 5/16" x 3/4"
14	337485	Roll Pin 3/16" x 1 1/4"	43	969204	Seed Tube Extension
15	334516	Set Screw 1/4-28 x 25	44	972851	Adjustment Lock Plate
16	314146	Drive Shaft 3/8 x 112" 4610	45	232595	Box Mount Right
	312363	Drive Shaft 3/8" x 136" 4613	46	232660	Box Mount Left
	311944	Drive Shaft 3/8" x 35 1/2" 4615	47	01029800	HHCS 1/2" x 1"
	311951	Drive Shaft 3/8" x 142 1/2" 4615	48	330142	Lock Washer 1/2"
17	571570	Feed Cup	49	330134	Hex Nut 1/2"
18	571588	Feed Roll			
19	571596	Feed Cut-off			

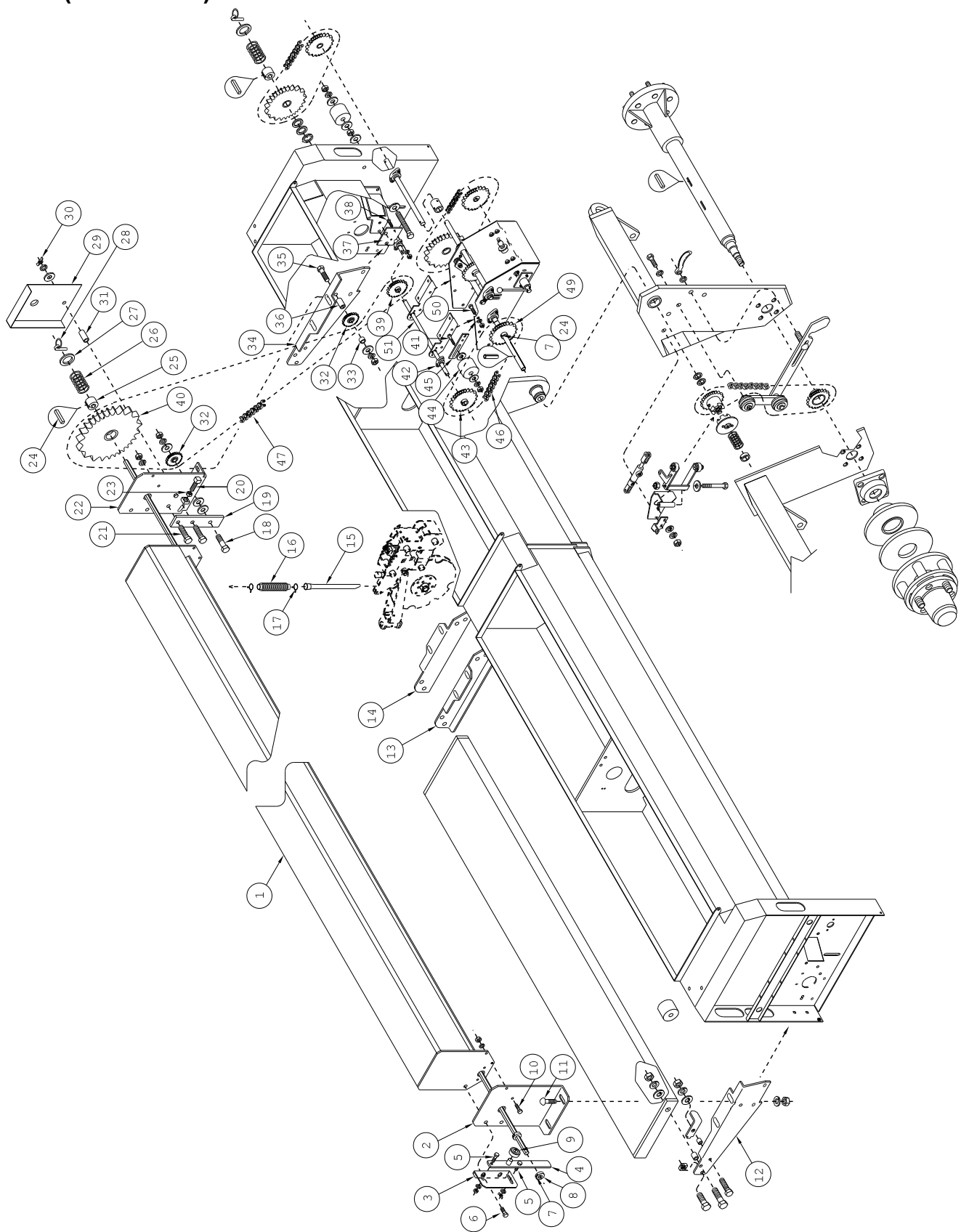
10', 13' & 15' Legume Drive



10', 13' & 15' Legume Drive

Item	Part No.	Description	Item	Part No.	Description
1		Legume Box Assembly	15	01136100	Carriage Bolt ½" x 1 1/4"
	880344	4610 x 7½"	16	01180900	HHCS ½" x 1 1/4"
	880351	4610 x 10"	17	151779	Idler Bushing
	876045	4613 x 7½"	18	335422	HHCS ½" x 2½"
	876052	4613 x 10"	19	216051	Backing Plate
	877332	4615 x 7½"	20	330126	HHCS ½" x 5½"
	877340	4615 x 10"	21	03001500	Bearing 1"
2	232678	Idler Plate Rear	22	01010800	HHCS 5/16" x 1"
3	232686	Idler Plate Front	23	338392	Klik Pin 1/4" w/1 3/4" Ring
4	431726	Sprocket Idler #50 13T	24	335349	Clevis Pin 1/4" x 1 5/8"
5	432666	Chain 2050 x 55 Links	25	337071	Cotter Pin 3/32" x ½"
6	954933	Sprocket 2050 20T -1" Bore	26	333351	Machine Bushing 5/8" x 1 1/8" x 18ga
7	213207	Gear Box Mount Plate	27	330159	Flat Washer ½"
8	935106	Sprocket 2050 30T -1" Bore	28	330142	Lock Washer ½"
9	431841	Chain 2050 x 37 Links	29	330134	Hex Nut ½"
10	430983	Chain 2050 Connector Link	30	330845	Lock Washer 5/16"
11	313122	Drive Shaft 1" x 10" 4610	31	330811	Hex Nut 5/16"
	312371	Drive Shaft 1" x 20 3/4" 4613	32	954933	Sprocket 2050 20T -1" Bore
	312751	Drive Shaft 1" x 37 3/16" 4615	33	233114	Idler Plate
12	213355	Walkboard Bracket Right	34	571273	Nylon Idler
13	213371	Walkboard Bracket Left			
14	935072	Sprocket 2050 12T -1" Bore			

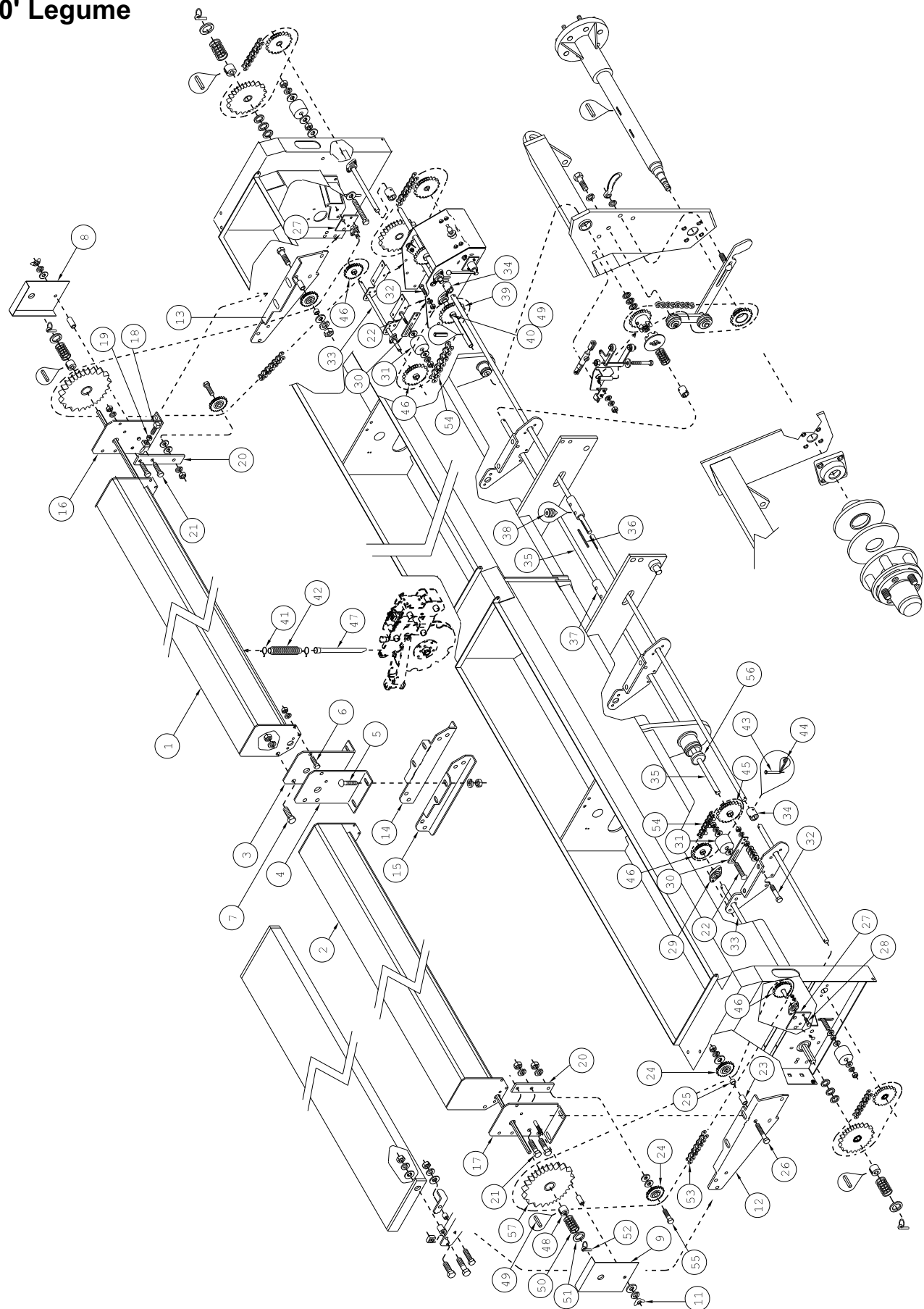
15' Legume (Prior 2010)



15' Legume (Prior 2010)

Item	Qty	Part No.	Description	Item	Qty	Part No.	Description
1	1	864934	Legume Box Assembly	21	2	01180900	HHCS 1/2" x 1 1/4" Gr 5
	1	864983	15' x 7 1/2"	22	1	956573	Legume Mount Plt Brkt Lt.
	1	864991	15' x 8"	23	1	331538	Jam Nut 5/8"
	1	864991	15' x 10"	24	2	602367	Key 1/4" x 1"
2	1	215095	Legume mount Plate	25	1	309062	Hex Sprocket Adapter
			Right	26	1	500330	Spring
3	1	215103	Handle Mount Plate	27	1	332528	Machine Bushing 1 1/4"
4	1	956565	Legume Box Handle	28	1	330928	Klik Pin 3/16"
5	2	01017300	HHCS 3/8" x 1" Gr 5	29	1	257097	Legume Box Shield Plt Lt.
6	2	01029800	HHCS 1/2" x 1" Gr 5	30	2	334847	Wing Nut 3/8"
7	6	334516	Set Screw 1/4-28" x 1/4"	31	1	119438	Shield Spacer Bushing
			Cone Point	32	2	431726	Sprocket #50 13T Idler
8	2	146090	Wobble Adjustment	33	1	143750	Bushing Idler 11/16"
			Bushing	34	1	213371	Walkboard Bracket Lt.
9	1	401042	Bearing				Long End
10	4	01144500	HHCS 5/16" x 3/4" Gr 5	35	1	334300	HHCS 1/2" x 3 1/2" Gr 5
11	4	01212000	Carriage Bolt	36	1	957571	Bushing Idler 1 1/2"
			1/2" x 1 1/2" Gr 5	37	1	215129	Legume Bearing Plate
12	1	213355	Walkboard Bracket Right	38	6	01011600	HHCS 5/16" x 1 1/4" Gr 5
			Long End	39	1	935080	Sprocket 2050 20T
13	1	213140	Walkboard Bracket Right				w/1" Bore
14	1	213298	Walkboard Bracket Left	40	1	935106	Sprocket 2050 30T
15			Opener Tube				w/1" Bore
	24	954123	7 1/2" Spacing	41	2	335323	Carriage Bolt 1/2" x 3" Gr 5
	22	954123	8" Spacing	42	3	03001500	Brg 1" 2B Flange w/ LC
	18	954123	10" Spacing	43	1	935098	Sprocket 2050 25T
16			Feed Tube (59 Conv.)				w/1" Bore
	24	571091	7 1/2" Spacing	44	1	571273	Nylon Idler
	22	571091	8" Spacing	45	1	184952	Idler Bracket
	18	571091	10" Spacing	46	1	431833	Chain 2050 x 25 Links
17			Feed Tube Clamp	47	1	432674	Chain 2050 x 57 Links
	48	600106	7 1/2" Spacing	49	1	957423	Sprocket & Hub 2050 16T
	44	600106	8" Spacing	50	1	331926	HHCS 1/2" x 2" Gr 5
	36	600106	10" Spacing	51	1	309658	Legume Countershaft
18	1	335620	HHCS 5/8" x 3" Gr 5				
19	1	216630	Legume End Idler Plate				
20	1	331223	Set Screw 5/8" x 1 3/4"				
			Square Head				

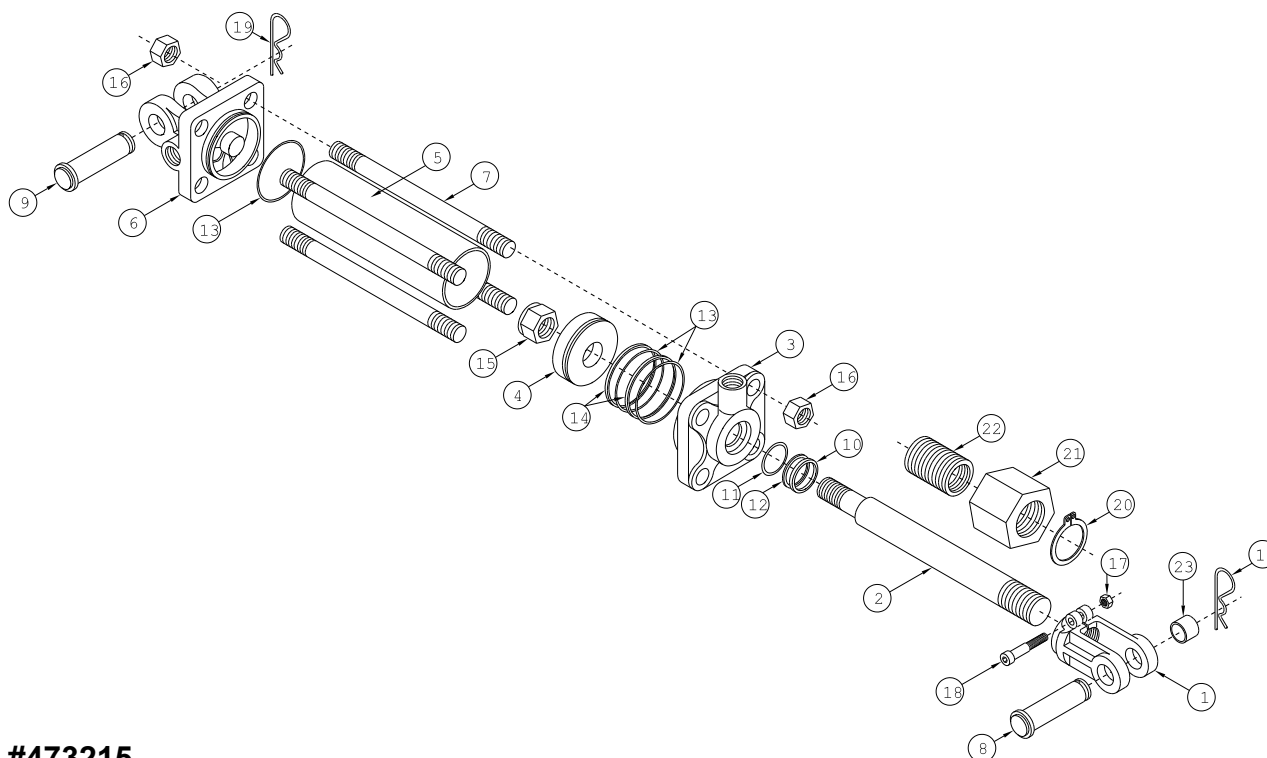
20' Legume



20' Legume

Item	Qty	Part No.	Description	Item	Qty	Part No.	Description
1	1	864926	Legume Box Assembly Lt.	33	2	309658	Legume Countershaft
	1	865014	20' x 7 1/2"	34	1	150334	Adapter Sleeve
	1	865030	20' x 8"	35	2	309765	Drive Shaft 75 1/2"
2	1	865030	20' x 10"	36	1	605683	Key 1/4" x 4 1/4"
	1	864918	Legume Box Assembly Rt.	37	1	150342	Connector Spool
	1	865006	20' x 7 1/2"	38	2	01139500	Set Screw 3/8-16 x 3/8
	1	865022	20' x 8"				Star Cup
	1	865022	20' x 10"	39	1	957423	Sprocket 2050 16T
3	1	215095	Legume mount Plate Right				w/1" Bore & 1/4" KW
4	1	216606	Legume Mount Plate Left	40	2	334516	Set Screw 1/4" x 1/4"
5	8	01212000	Carriage Bolt 1/2" x 1 1/2" Gr 5				Socket Allen Head
6	8	01144500	HHCS 5/16" x 3/4" Gr 5	41			Feed Tube Clamp
7	4	01029800	HHCS 1/2" x 1" Gr 5	64	600106		7 1/2" Spacing
8	1	257097	Leg. Box Shield Plate Left	60	600106		8" Spacing
9	1	257527	Leg. Box Shield Plate	48	600106		10" Spacing
			Right	42			Feed Tube (59 Conv.)
10	2	119438	Shield Spacer Bushing	32	571091		7 1/2" Spacing
11	2	334847	Wing Nut 3/8"	30	571091		8" Spacing
12	1	213355	Walkboard Bracket Right	24	571091		10" Spacing
			Long End	43	6	335349	Clevis Pin 1/4" x 1 5/8"
13	1	213371	Walkboard Bracket Left	44	6	337071	Cotter Pin 3/32" x 1/2"
			Long End	45	2	935098	Sprocket 2050 25T
14	1	213140	Walkboard Bracket Right				w/1" Bore
			Long Center	46	2	954131	Sprocket 2050 18T
15	1	213298	Walkboard Bracket Left				w/1" Bore
			Long Center	47			Opener Feed Tube
16	1	957431	Leg Mt. Plate Brkt Right	32	954123		7 1/2" Spacing
17	1	956573	Leg Mt. Plate Brkt Left	30	954123		8" Spacing
18	2	331223	Set Screw 5/8" x 1 3/4"	24	954123		10" Spacing
			Square Head	48	2	309062	Hex Sprocket Adapter
19	2	331538	Nut 5/8" Hex Jam	49	3	602367	Key 1/4" x 1"
20	2	216630	Legume End Idler Plate	50	2	500330	Spring 1 1/2"
21	4	01180900	HHCS 1/2" x 1 1/4" Gr 5	51	2	332528	Machine Bushing
22	3	335323	Carriage Bolt 1/2" x 3" Gr 5				1 1/4" x 3/4" x 18 ga
23	2	143750	Bushing Idler 11/16"	52	2	330928	Klik Pin 3/16"
24	4	431726	Sprocket 13T Idler	53	2	432674	Chain 2050 x 57 Links
25	2	957571	Bushing Idler 1.5"	54	2	431833	Chain 2050 x 25 Links
26	2	334300	HHCS 1/2" x 3 1/2" Gr 5	55	2	335620	HHCS 5/8" x 3" Gr 5
27	2	215129	Legume Bearing Plate	56	1	401000	Bearing 1" Don Dye
28	18	01011600	HHCS 5/16" x 1 1/4" Gr 5				w/o Ext. Race
29	9	03001500	Bearing 1" Flange Mt.	57	2	954362	Sprocket 2050 44T
30	2	184952	Idler Bracket				w/1" bore
31	2	571273	Nylon Idler				
32	2	331926	HHCS 1/2" x 2" Gr 5				

Hydraulic Cylinders



#473215

4" x 8" Hyd Cylinder

w/Depth Control

1 1/4" Ram w/ 3/4-16 SAE Ports 3000PSI

Item	CBI No.	Description
1	461095	Rod Clevis w/bushings
2	473256	Rod
3	473322	Head
4	473314	Piston
5	461293	Tube
6	473306	Clevis Base
7	473330	Tie Rod
8	463133	Clevis Pin
10	460329	Seal (wiper lip type)
16	461442	Nut
17	460691	Nut
18	460477	Cap Screw
	473280	Stop Collar Assembly
	473348	Seal Kit

#471854

1" x 2" Hyd Cylinder

(Not Shown)

472043 Seal Kit

#463703

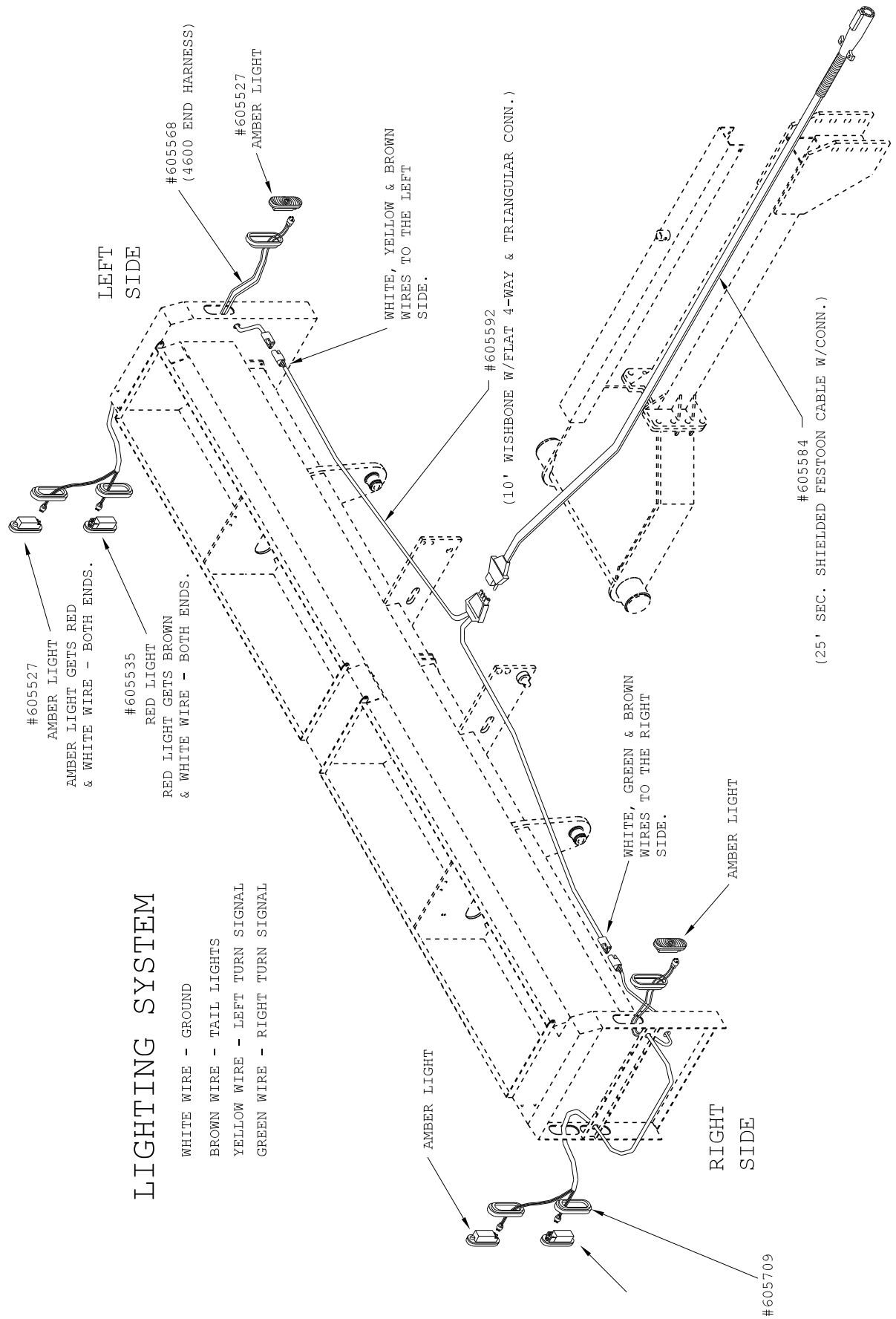
2" x 8" Hyd Cylinder

w/o Depth Control

1 1/16" Ram

Item	CBI No.	Description
1	460295	Clevis
2	464420	Rod 1 1/16" x 8"
3	460626	Head
4	460683	Piston
5	460725	Tube
6	460741	Clevis Base
7	460758	Tie Rod
8	460451	Clevis Pin
9	460451	Clevis Pin
10	460634	Seal (wiper lip type)
11	460659	O-ring 2"
12	463034	Backup Washer
13	460642	O-ring 1 1/16"
14	460709	Backup Seal
15	460394	Piston Nut
16	460691	Tie Rod Nut
17	460691	Clevis Nut
18	460477	Cap Screw
19	460469	Clip Pin
	460782	Seal Kit

Light System

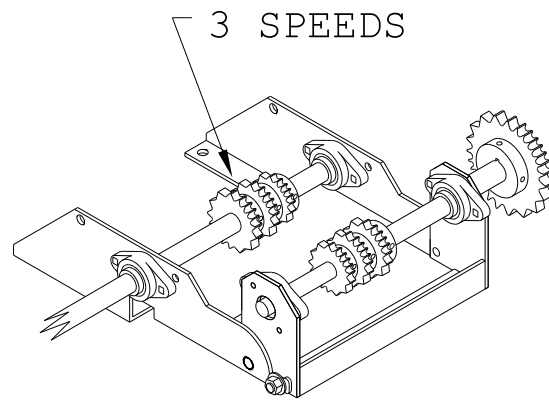


Fertilizer Unit

Fertilizer Feed Shaft Speed

Speed is determined by sprocket combinations. There are three (3) different speeds available in the fertilizer gear box along with six (6) speeds on the drive ends of the drill. See pages 60 and 61.

- Use a slow speed combination whenever possible for maximum efficiency and to minimize wear.
- Use a fast speed combination for drilling larger quantities.



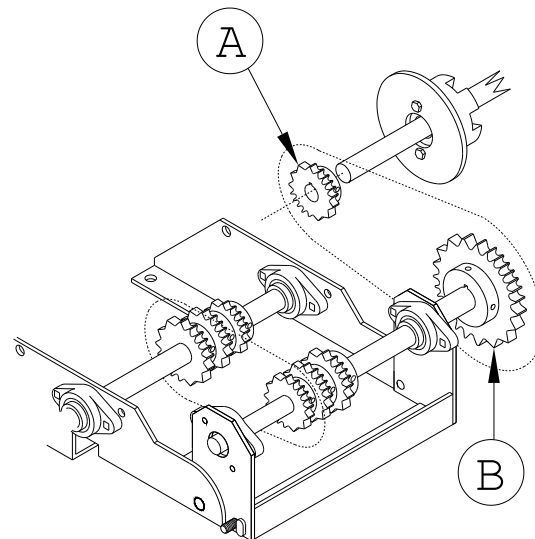
Fertilizer Drive Settings

The different types of fertilizer you apply will all have different delivery rates. Samples need to be caught to determine your particular material's delivery rate per rotor revolution in ounces per revolution.

To determine your rate, see page 61 and use example with your delivered ounces per 10 revolutions to find your rate column.

Determine how many pounds per acre you wish to apply and then find it on the chart page. Move over to the sprockets **A** through **F** on the same line to find the sprockets you need to apply the poundage you have selected. Locations of these sprockets can be found on page 60.

NOTE: When you are not distributing fertilizer, remove the chain between the 14 tooth sprocket **A** and the 40 tooth sprocket **B**.

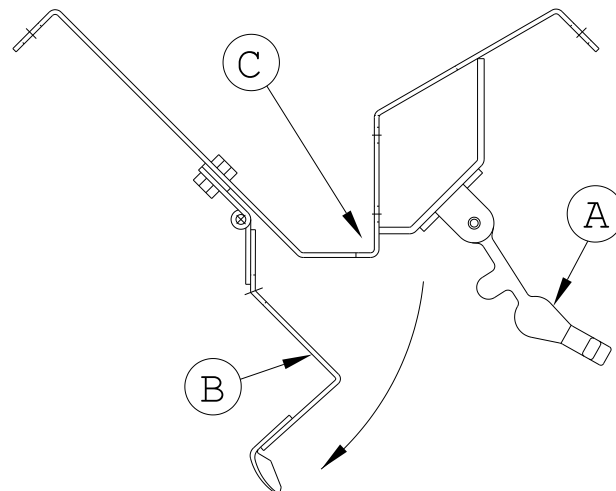


Cleaning Fertilizer Box

- Release all door latches **A** to drop both bottom doors **B** as shown.
- Clean out fertilizer through clean out holes **C**.
- Relatch fertilizer doors.

IMPORTANT:

If drill is not used for several days, empty and clean out thoroughly. Fertilizer can corrode. Coat the box with diesel fuel but do not allow fuel to come in contact with the rubber seed tubes.



Fertilizer Unit Storage



CAUTION:

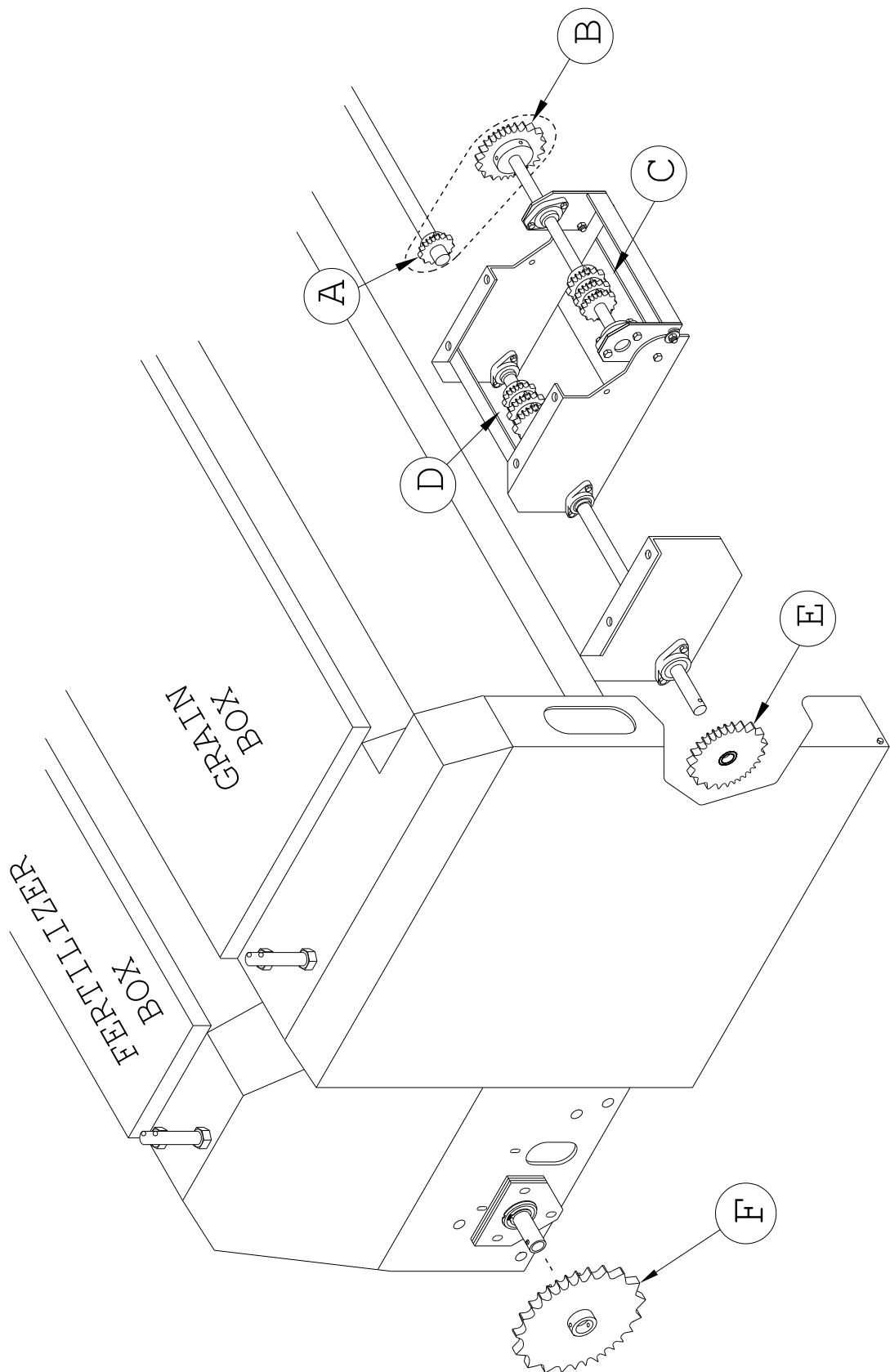
Be careful when using diesel fuel so that it does not ignite. Serious injury or death to you or others can result. Use only in well ventilated areas away from any sparks or flames.

IMPORTANT:

DO NOT allow diesel fuel (or any other petroleum product) to come in contact with the rubber tubes as it will cause deterioration.

1. Locate a flat level surface to store drill, then follow safe detaching procedures.
2. Store in transport position with lift cylinder lockouts in place.
3. If setting drill on ground, place a wood board under openers so that openers do not penetrate the ground. Lower openers and remove pressure from hydraulic system.
4. Coat opener disks with oil or grease. Then lower on to board for storage.
5. Open the feed cups to their largest or wide open setting. Jack the drill up and rotate the drive wheel to remove any material left in the cup rotors.
6. Paint all bare metal and rust spots. Matching paint can be ordered from your local CrustBuster dealer.
7. Spray all moving parts with diesel fuel or lubricating oil. Move adjuster lever back and forth while spraying. Spray each feed cup, inside and outside. Work the adjustment levers back and forth while spraying. The cost of the fuel or oil is insignificant, when the alternative is considered.
8. For drills that have used fertilizer and/or treated seed (both highly corrosive materials), coat the entire box, inside and outside, with diesel fuel. DO NOT allow fuel to contact rubber seed tubes.
9. Lubricate the drill. See lubrication, maintenance, and service page.
10. Clean chains with diesel fuel. Apply new oil before storing the drill.
11. For row markers, if drill is stored with the cylinder rod extended, apply light coat of grease to exposed area of rod.

**4615 Sprocket Locations
Fertilizer Unit**



**Fertilizer Box
Capacity
21¼ bushels per
box**

**REFER TO NOTE BELOW TO DETERMINE RATE, THEN
REFER TO THIS CHART.
Fertilizer delivery rate per revolution determined from sample
of material you will apply of:**

Sprockets						.55 oz of fertilizer per rotor revolution will yield application rate in lb/acre of:	.6 oz of fertilizer per rotor revolution will yield application rate in lb/acre of:	.65 oz of fertilizer per rotor revolution will yield application rate in lb/acre of:	.7 oz of fertilizer per rotor revolution will yield application rate in lb/acre of:	.75 oz of fertilizer per rotor revolution will yield application rate in lb/acre of:
A	B	C	D	E	F					
14	40	14	21	18	44	28	30	33	35	38
14	40	15	20	18	44	31	34	37	40	43
14	40	16	19	18	44	35	38	41	45	48
14	40	14	21	18	30	41	44	48	52	55
14	40	15	20	18	30	46	50	54	58	62
14	40	16	19	18	30	51	56	61	65	70
14	40	14	21	25	30	56	62	67	72	77
14	40	15	20	25	30	64	69	75	81	87
14	40	16	19	25	30	71	78	84	91	97
14	40	14	21	30	25	81	89	96	104	111
14	40	15	20	30	25	92	100	108	116	125
14	40	16	19	30	25	103	112	121	131	140
14	40	14	21	30	18	113	123	134	144	154
14	40	15	20	30	18	127	139	150	162	173
14	40	16	19	30	18	143	156	169	182	195
14	40	14	21	44	18	166	181	196	211	226
14	40	15	20	44	18	186	203	220	237	254
14	40	16	19	44	18	209	228	247	266	285

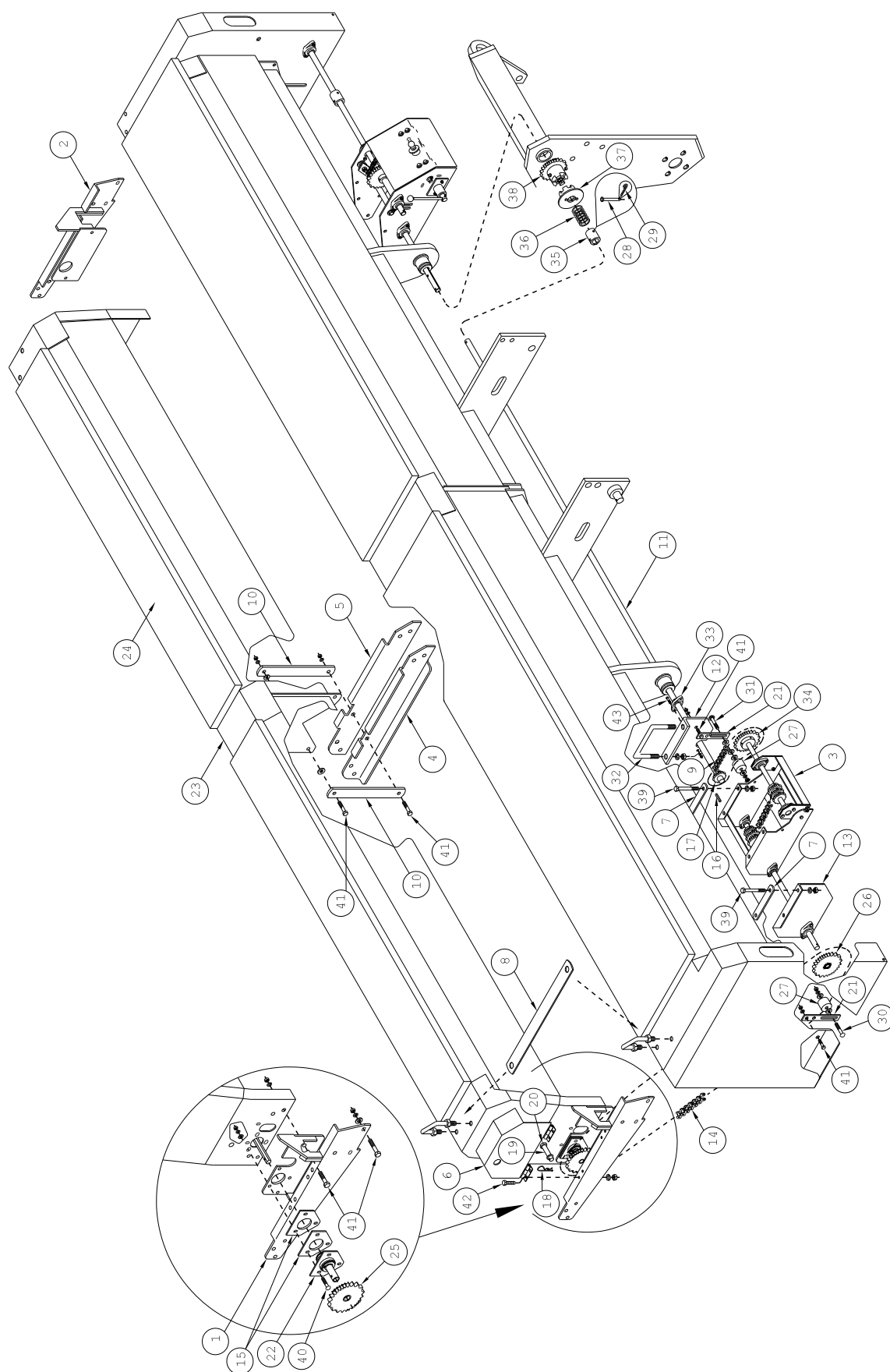
NOTE: The different types of fertilizer you apply will all have different delivery rates. Samples need to be caught to determine your particular material's delivery rate per rotor revolution in ounces per revolution. A minimum of 10 turns is recommended because of the small amounts involved.

Example: If 10 revolutions from one cup delivers 6.5 ounces, divide 6.5 by 10 to find ounces per revolution.

$$6.5 \div 10 = .65$$

Refer to chart using the column for .65 ounces.

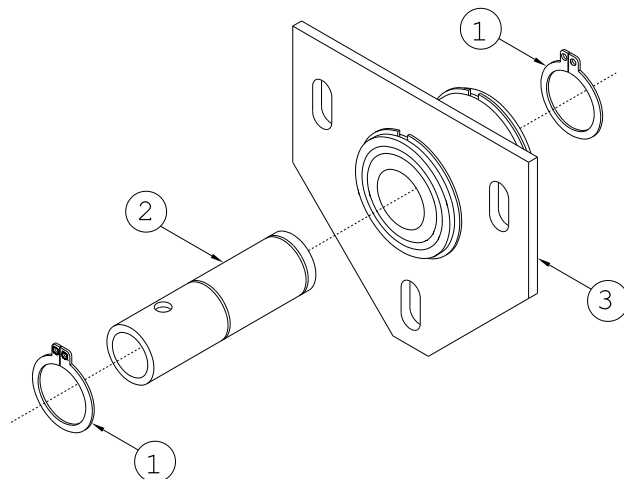
4615 Drive Assembly Fertilizer Unit



4615 Drive Assembly Fertilizer Unit

Item	Part No.	Description
1	960732	Walkboard Mount Right
2	960740	Walkboard Mount Left
3	867754	Gearbox
4	220566	Walkboard Brkt Center Plt Right
5	220574	Walkboard Brkt Center Plt Left
6	960757	Shield
7	220731	Backing Plate
8	259648	Box Strap
9	433052	Chain Assy #40 x 71P Complete
10	220723	Center Walkboard Strap
11	310540	Drive Shaft
12	220699	Bearing Plate
13	220665	Bearing Hanger Plate
14	432674	Chain 2050 x 57 links
15	220467	Bearing Assy Spacer Plate
16	10490100	Key 1/4" x 1 1/4"
17	433037	Sprocket #40 14T 1/2" Pitch Cone Pt Set Screw
18	330860	Hair Pin 5/32"
19	958363	Shield Latch Pin
20	330985	Hex Jam Nut 3/4"
21	184952	Idler Plate
22	866442	Drive End Bearing Bracket Assy
23	959213	Welded Fertilizer Box
24	957928	Fertilizer Box Lid
25	935106	Sprocket 30T w/1" bore
26	935098	Sprocket 25T w/1" bore
27	571273	Nylon Idler
28	335349	Clevis Pin 1/4" x 1 5/8"
29	337071	Cotter Pin 3/32" x 1/2"
30	333310	Carriage Bolt 1/2" x 3 1/2"

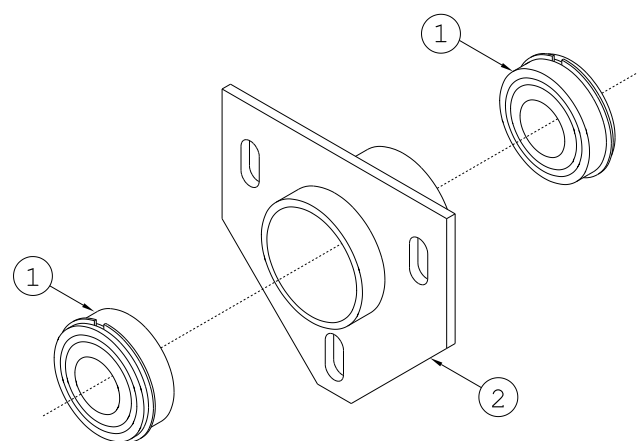
Item	Part No.	Description
31	335323	Carriage Bolt 1/2" x 3"
	330159	Flat washer 1/2"
	330142	Lock washer 1/2"
	330134	Hex nut 1/2"
32	334185	U-bolt 3/4" x 6" x 5 1/2"
	330332	Lock washer 3/4"
	330290	Hex nut 3/4"
33	03001500	Bearing 1" 2B Flange w/lock collar
34	433003	Sprocket 40T RC40
35	150334	Adapter Sleeve
36	501031	Spring
37	860825	Clutch Throw-out Assembly
38		Drive Clutch Sprocket Assy 7 1/2" & 10" Spacing 8" Spacing
39	332007	HHCS 5/8" x 5 1/2"
	330878	Lock washer 5/8"
	330571	Hex nut 5/8"
40	337766	Carriage Bolt 5/16" x 2 1/4"
	330852	Flat washer 5/16"
	330845	Lock washer 5/16"
	330811	Hex nut 5/16"
41	01180900	HHCS 1/2" x 1 1/4"
	330142	Lock washer 1/2"
	330134	Hex nut 1/2"
42	01144500	HHCS 5/16" x 3/4"
	330845	Lock washer 5/16"
	330811	Hex nut 5/16"
43	01010800	HHCS 5/16" x 1"
	330845	Lock washer 5/16"
	330811	Hex nut 5/16"



**Drive End Bracket
& Bearing**

#866442

Item	Part No.	Description
1	605766	External Snap Ring
2	310235	Seed Shaft Drive Adaptor
3	866434	Drive End Bracket/Brg Assy

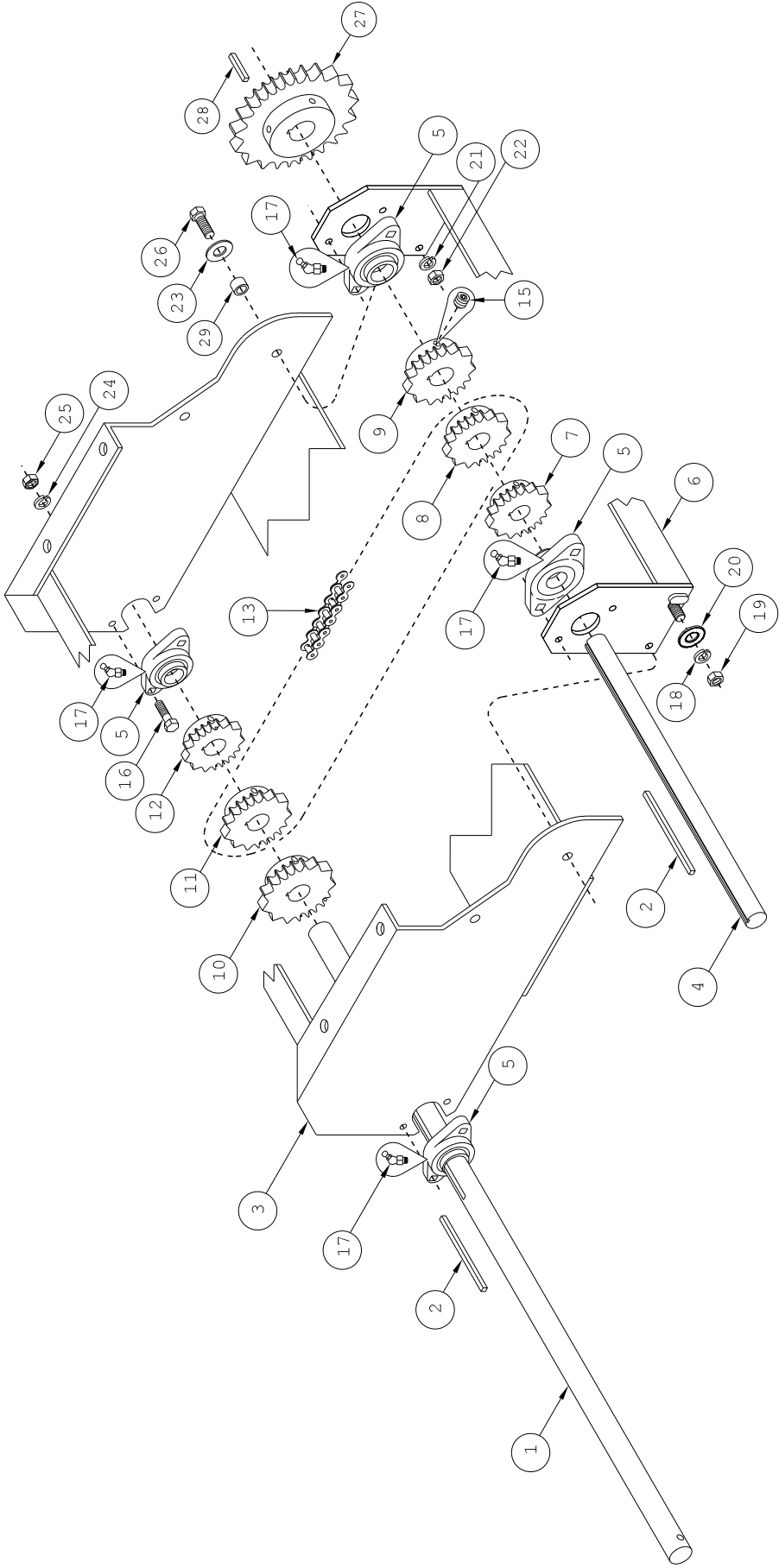


Drive End Bracket

#866434

Item	Part No.	Description
1	03003100	Bearing 1" w/Spring
2	959130	Drive End Bracket

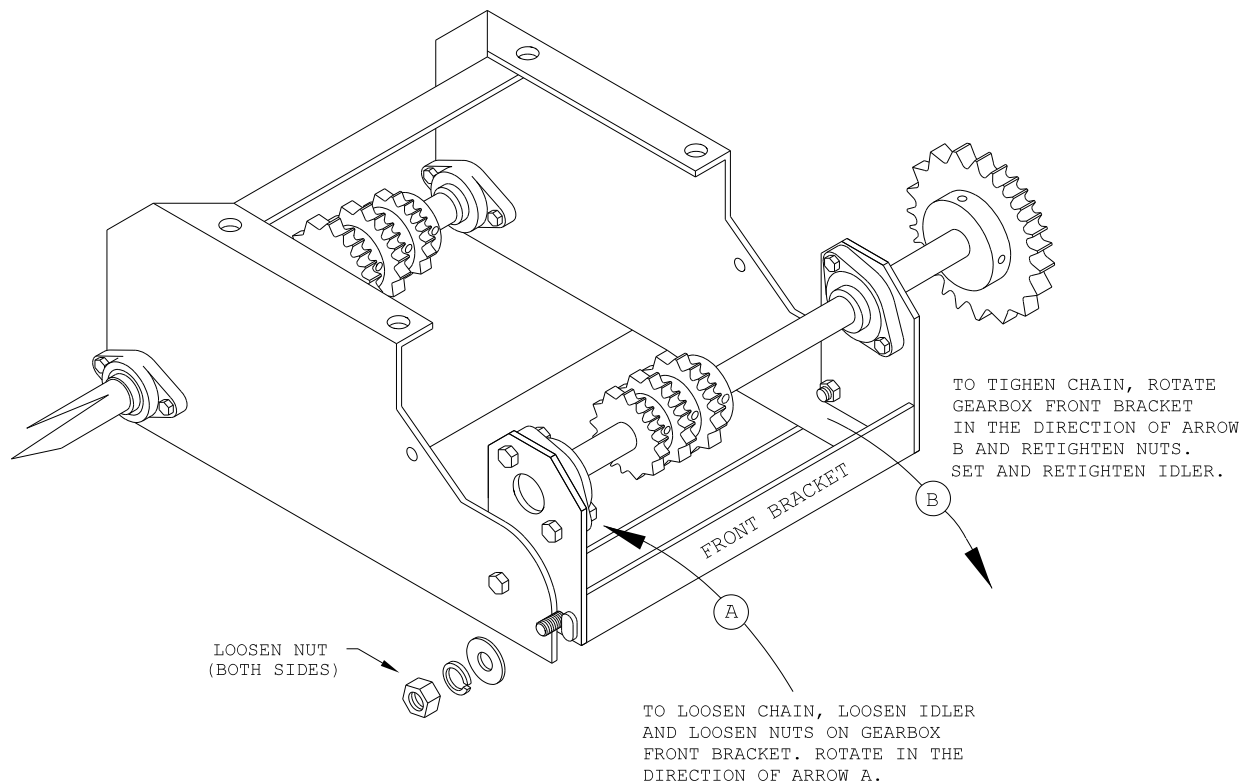
**4615 Gear Box
Fertilizer Unit**



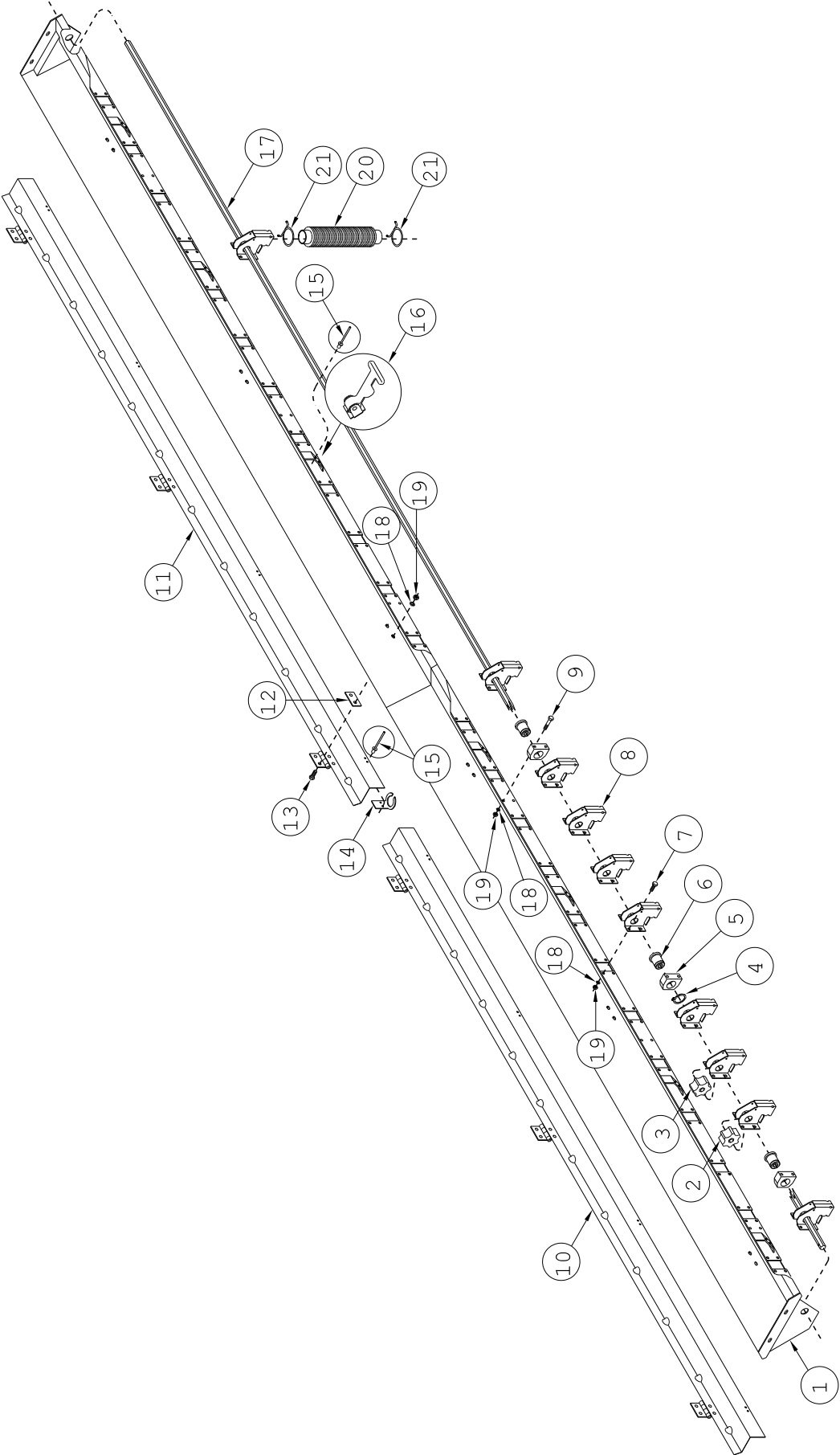
4615 Gear Box Fertilizer Unit

Item	Part No.	Description	Item	Part No.	Description
1	309039	Box End Drive Shaft	13	433045	Chain Assy #40 x 91 Pitches Complete
2	220616	Key 1/4" x 1/4" x 3 1/2"	15	01100700	Set Screw 5/16" x 5/16"
3	960724	Fertilizer Gear Box	16	01011600	HHCS 5/16" x 1 1/4"
4	310524	Fertilizer Drive Shaft	17	01162700	Zerk 1/4-28" x 45°
5	03001500	Bearing 1" Flange Mount	18	330142	Lock Washer 1/2"
6	960682	Fertilizer Gear Box Front Bracket	19	330134	Hex Nut 1/2"
7	432948	Sprocket 14T RC Non-Stock 1/2" Pitch	20	330159	Flat Washer 1/2"
8	432955	Sprocket 15T RC Non-Stock 1/2" Pitch	21	330043	Lock Washer 3/8"
9	05237300	Sprocket 16T RC Non-Stock 1/2" Pitch	22	330035	Hex Nut 3/8"
10	432997	Sprocket 21T RC Non-Stock 1/2" Pitch	23	330894	Flat Washer 3/8"
11	432989	Sprocket 20T RC Non-Stock 1/2" Pitch	24	330845	Lock Washer 5/16"
12	432971	Sprocket 19T RC Non-Stock 1/2" Pitch	25	330811	Hex Nut 5/16"
			26	01158500	HHCS 3/8" x 1 1/4"
			27	433003	Sprocket 40T RC Non-Stock 1/2" Pitch
			28	10490100	Key 1/4" x 1 1/4"
			29	149393	Spacer

Fertilizer Gear Box Chain Tightening Instructions



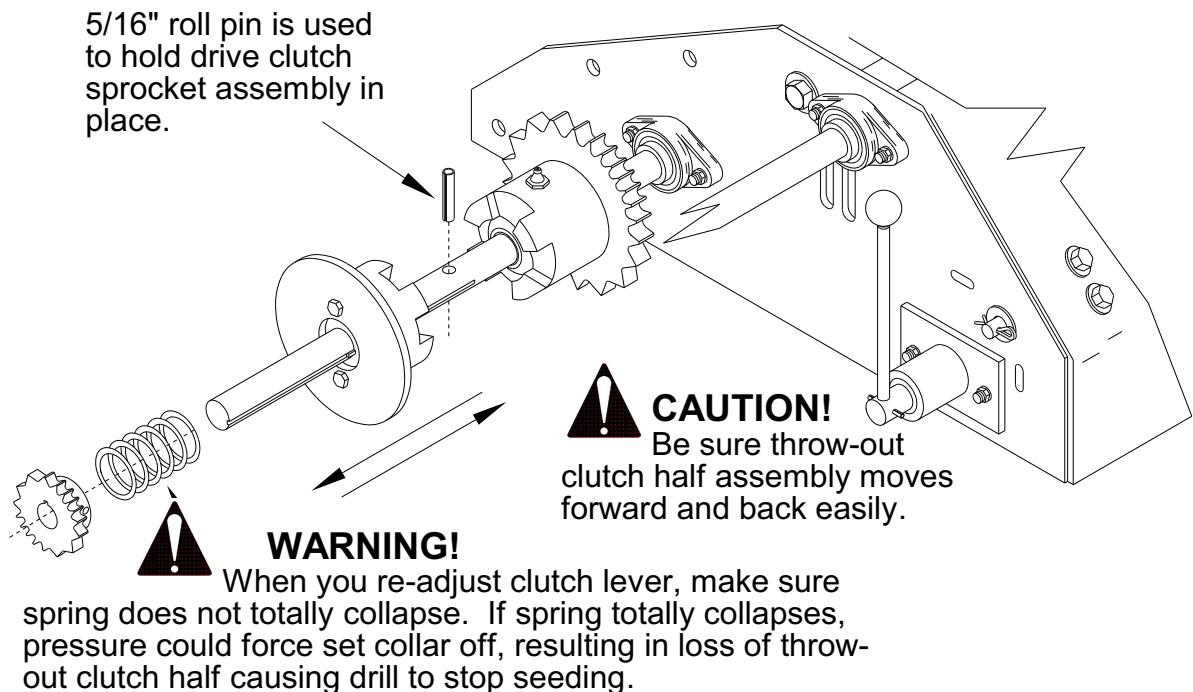
**4615 Box Bottom Assembly
Fertilizer Unit**



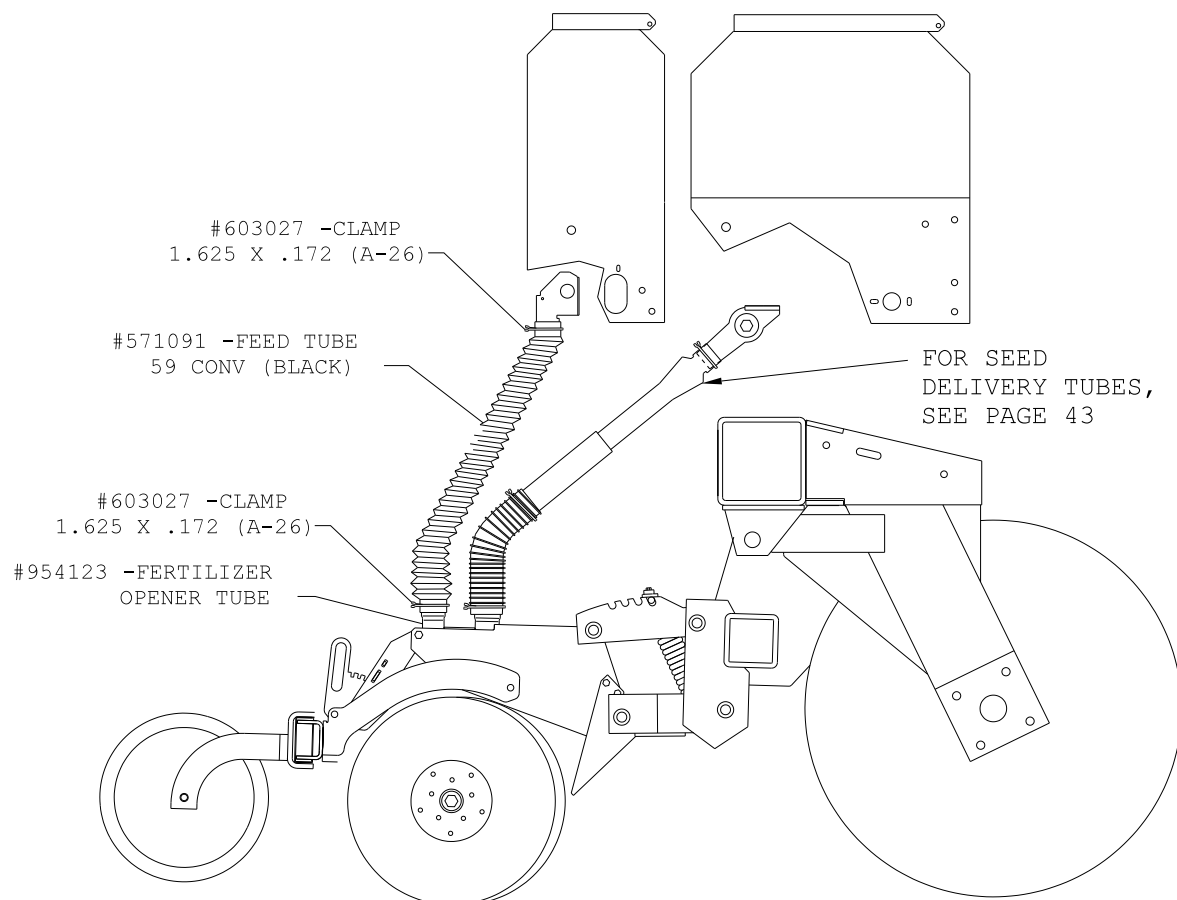
4615 Box Bottom Assembly Fertilizer Unit

Item	Part No.	Description	Item	Part No.	Description
	867598	Box Bottom Assemblies	9	337741	HHCS 1/4" x 2" SS
	867614	30' x 7½"	10	960690	Fertilizer Door Left
	867697	30' x 8"	11	960708	Fertilizer Door Right
1		30' x 10"	12	259523	Door Hinge Spacer Plate
	960633	Box Bottom Weldment	13	02226900	HHCS 1/4" x 3/4" SS
	960641	30' x 7½"	14	570341	Lid Latch
	960658	30' x 8"			(Includes hook #16)
2	571240	30' x 10"	15	601989	Pop Rivet 3/16" x 1/4" Aluminum
3	571257	Nylon Fertilizer Rotor	16	570341	Lid Latch Hook
		30° Hex Rotation			(Includes latch #14)
4	605766	External Snap Ring	17	310532	Hex Shaft 5/8" x 171"
5	571232	Fertilizer Bearing	18	337550	Lock Washer 1/4" SS
6	310508	Fertilizer Hex Bearing Shaft	19	01507300	Hex Nut 1/4" SS
7	01245000	HHCS 1/4" x 1/2" SS	20	571091	Feed Tube 59 Convolutions
8	960625	Fertilizer Cup Weldment	21	603027	Hose Clamp 1 5/8" x 11/64"

Clutch Half & Drive Clutch Assembly to Gear Box for Fertilizer



4600 All Plant Feed Tubes Fertilizer Unit



Troubleshooting

Problem	Solution
Reached limits on depth quadrant	Reposition top bolt in depth quadrant to remaining hole (up or down). Level drill front to back.
Unable to penetrate hard ground	Increase down pressure. Add weight to frame or suitcase weights to the weight bracket.
Press wheels ineffective	Add weight to frame or suitcase weights to the weight bracket. Level drill front to back with adjustable screw or hydraulic tongue cylinder.
Hairpinning residue	Residue tough due to wet soil or damp air. Wait for better conditions. Reduce speed (recommended speed 4-6 m.p.h.)
Opener pitching excessive dirt from seed zone.	Soil too damp. Wait for better conditions. Reduce speed.
Trash plugging ahead of openers	Remove nosepieces to avoid catching long pieces of residue.
Openers pushing and plugging in minimum tillage or conventional	Loose residue in loose soil may require less down pressure. Reduce pressure. Remove spring. Till at shallower depth. Firm soil with packer or roller.
Unable to hold depth in worked soil	Till at shallower depth. Use wider press wheels for more surface contact.



P.O.Box 526

Spearville, Kansas 67876

(620) 227-7106

All Grain Drills Final Assembly Check List

Drill Model # _____

Drill Serial # _____

SR. NO.	DESCRIPTION	CHECKED		INITIALS
		Yes	No	
1	Check console, Light kit, Chain bag			
2	No missing nuts & bolts and that all nuts & bolts are tight.			
3	Center lug bolts torque to 120 ft. lbs.			
4	All bearing zerks are greased.			
5	No hydraulic leaks			
6	All decals on and in proper place.			
7	Paint touched up and good overall appearance.			
8	Sprockets aligned properly & chains adjusted visually or with the laser check tool.			
9	Chains are not very tight and have some slack.			
10	Wobble slot open to $\frac{3}{4}$ " and then close at $\frac{3}{8}$ ".			
11	Gauge in store position.			
12	Test shaft trak. Box monitor and shaft.			
13	Final check on opener assembly.			
14	All lock out brackets in place			
15	Manual in box.			
16	No hardware left in box assemblies. (Bolts, Nuts, Tools)			
17	Walk boards aligned and evenly spaced.			
18	Lower seed tubes good and not smashed.			
19	If opener bars off, then seed tubes and extra parts in drill.			
20	Center drive properly aligned (For 4700 drills only).			
21	Center drive in road position (For 4700 drills only).			

Remarks: _____

Signature: _____

Date: _____