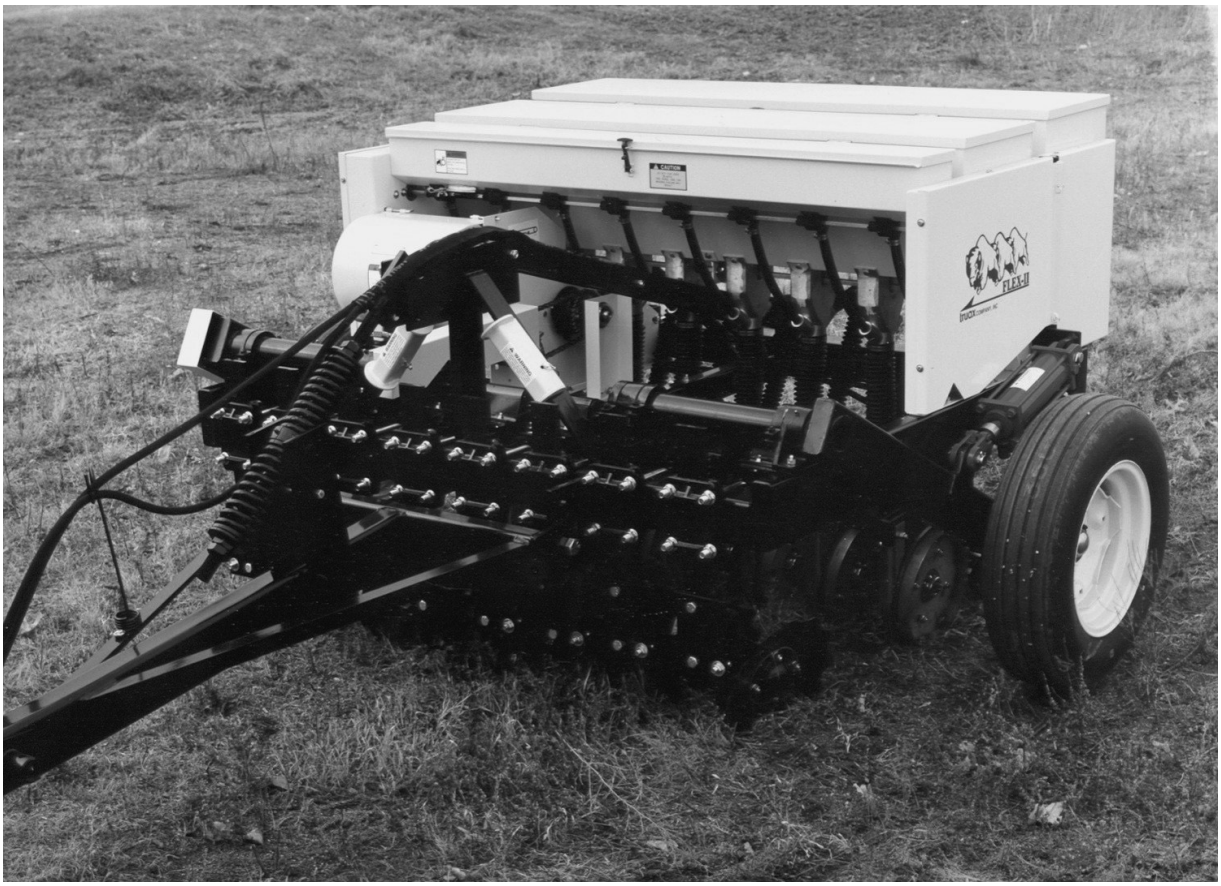
FLEXII DRILLS

OPERATOR'S MANUAL

PARTS CATALOG

MANUAL #5999

Revised February 2013



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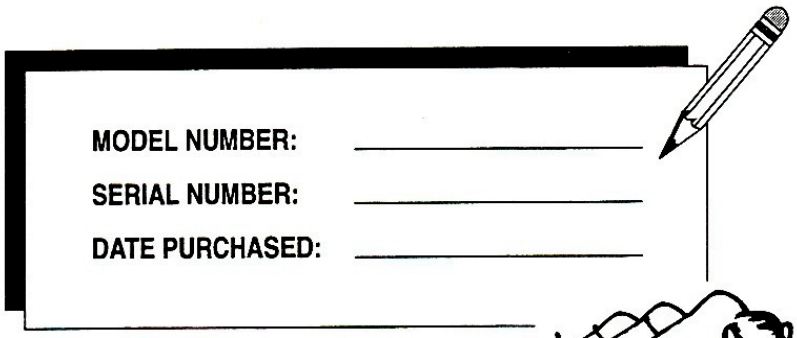
PLEASE NOTE:

Information, figures, specifications, and parts in this operator's manual are based on the latest available at the time of publication. Specifications and design are subject to change without notice. The right is reserved to make changes and updates to this manual at any time without notice.

The model and serial numbers of your new FLEXII Grass Drill are stamped on a serial plate that is mounted on your machine below the cover for the derailleur speed changer for the fluffy seed box. See Parts Catalog, Page 90-37, Item #30 for Serial Plate and location.

The model and serial numbers of your new FLEXII Grain Drill are stamped on a serial plate that is mounted on the clutch support of your machine. See Parts Catalog, Page 90-40, Item #11 for Serial Plate and location.

For your future reference and protection, we suggest that these numbers be recorded in the space provided below:



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IMPORTANT!

Be sure to complete and mail the owner's registration card located at the back of this operating manual.
It is our goal to keep you updated as new revisions become available.

LIST OF FIGURES, TABLES, & CHARTS

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INTRODUCTION

READ THIS OWNER'S AND OPERATOR'S MANUAL THOROUGHLY before operating the equipment. Follow recommended precautions and safe operating practices. Failure to do so could result in personal injury or equipment damage. **Read, understand, and follow** all safety instructions prior to uncrating and operating this equipment.

FLEX DRILL MODELS

This owner's manual provides safety, operating, maintenance, and service information on *Truax* FLEX Grass Drill and FLEX Grain Drill models as follows:

FLEX GRASS DRILLS	FLEX REAR DRIVE GRASS DRILLS	FLEX GRAIN DRILLS
FLXII-86	FLXII-86RD	
FLXII-88	FLXII-88RD	FLXIIG-88
FLXII-812	FLXII-812RD	FLXIIG-812
FLXII-816	FLXII-816RD	FLXIIG-816
FLXII-818	FLXII-818RD	FLXIIG-818
FLXII-822	FLXII-822RD	FLXIIG-822

Grass drills include a fluffy seed box with an auger agitator and a small seed or legume box. An optional cool season/grain seed box may be added if desired. Grain drills come standard with a jumbo grain box and a small seed or legume box. A fluffy seed box **can not** be added to the grain drill.

Generation "II" Style FLEX Drills have metal chain guards, derailleur style speed changer for the fluffy seed box, and a single arm press wheel assembly for models built after the fall of 1993.

Drill Model FLXII-822 is driven from both ends of the machine. In this manual the term "Non-Typical" references the left side of the drill when viewed from the back.

FLEXII Grass Drill – End Drive

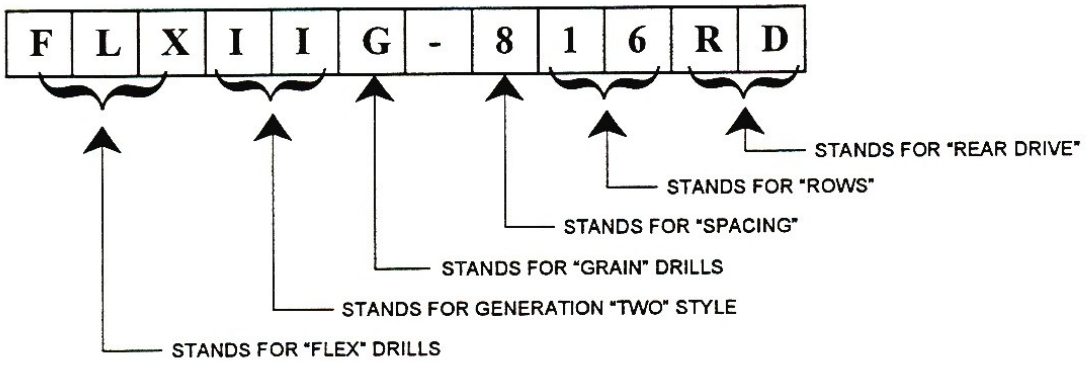
FLEXII Grass Drill – Rear Drive

FLEXII Grain Drill

PATENT NOTE

Truax equipment is covered by the following U.S. patents: #4,030,428, #4,977,841, and #5,279,236. Other U.S. and foreign patents are pending.

KEY FOR MODEL IDENTIFICATION



DRILL SIZE DESIGNATIONS

FLEX MODEL	NO. OF ROWS	ROW SPACING	PLANTING WIDTH	MACHINE WIDTH
FLXII-86	6	8 Inch	4 ft.	7 ft.
FLXII-88	8	8 Inch	5.3 ft.	8.3 ft.
FLXII-812	12	8 Inch	8 ft.	11 ft.
FLXII-816	16	8 Inch	10.7 ft.	13.7 ft.
FLXII-818	18	8 Inch	12 ft.	15 ft.
FLXII-822	22	8 Inch	14.7 ft.	17.7 ft.
FLXII-86RD	6	8 Inch	4 ft.	5 ft.
FLXII-88RD	8	8 Inch	5.3 ft.	6.3 ft
FLXII-812RD	12	8 Inch	8 ft.	9 ft.
FLXII-816RD	16	8 Inch	10.7 ft.	11.7 ft.
FLXII-818RD	18	8 Inch	12 ft.	13 ft.
FLXII-822RD	22	8 Inch	14.7 ft.	15.7 ft.
FLXIIG-88	8	8 Inch	5.3 ft.	8.3 ft.
FLXIIG-812	12	8 Inch	8 ft.	11 ft.
FLXIIG-816	16	8 Inch	10.7 ft.	13.7 ft.
FLXIIG-818	18	8 Inch	12 ft.	15 ft.
FLXIIG-822	22	8 Inch	14.7 ft.	17.7 ft.

WARRANTY

FARM EQUIPMENT LIMITED WARRANTY

TRUAX COMPANY, INC. ("Manufacturer") warrants to the original purchaser that the Farm Equipment will be free from defects in material and workmanship under normal use and condition for a period of one (1) year after the date of delivery. This warranty is limited to replacement or repair, at the Manufacturer's facilities in New Hope, Minnesota, USA, of such parts as shall under normal use and service appear to have been defective in material or workmanship. This warranty is null and void if parts other than the Manufacturer's parts are used. This warranty does not extend to Farm Equipment and parts that have been subject to misuse, accident, tampering, alteration or installation in a manner not approved by the Manufacturer in writing. **This warranty is exclusive, and the manufacturer makes no other warranty, express or implied, including but not limited to any warranty of merchantability or fitness for a particular purpose.**

Parts claimed to be defective shall be returned to the Manufacturer at New Hope, Minnesota, with transportation prepaid. If upon inspection by the Manufacturer, the part(s) are determined to have been defective, the Manufacturer will replace or repair such defective part(s) without charge except for transportation. Prior to returning any Farm Equipment or part(s) alleged to be defective, the purchaser shall notify the Manufacturer in writing of the claimed defect. **This is the exclusive remedy for any breach of warranty.** The sole purpose of this remedy shall be to provide the purchaser with the replacement or repair of defective part(s). This exclusive remedy shall not be deemed to have failed its essential purpose so long as the Manufacturer is willing and able to replace or repair the defective part(s).

No person, agent, distributor, or dealer is authorized to give any warranty other than the one herein expressed on the Manufacturer's behalf or assume for it any liability pertaining to Farm Equipment. **In no event shall manufacturer or its dealers be liable for any amount in excess of the price paid by the purchaser for the farm equipment or for any incidental or consequential damages of any kind, whether for breach of any warranty, for breach or repudiation of any other term of condition of sale, for negligence, on the basis of strict liability or otherwise.**

A defect, within the meaning of this warranty, in any part of the Farm Equipment shall not, when such part is capable of being repaired or replaced, operate to condemn the entire Farm Equipment.

This warranty is expressly in lieu of all warranties, guarantees, allegations, or liabilities expressed or implied, by the Manufacturer, its dealers or its representatives.

truax COMPANY, INC.

RECOGNIZE SAFETY INFORMATION

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, become alert, as your safety is involved.

Follow recommended precautions and safe operating practices.

SAFETY ALERT SYMBOL

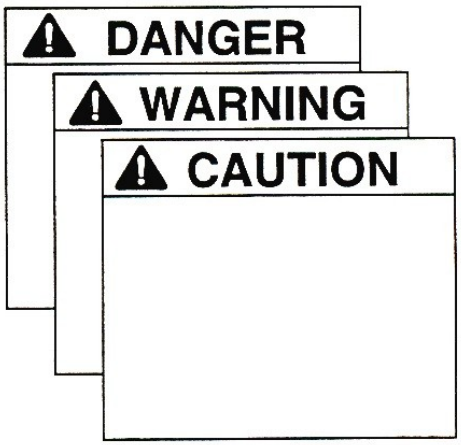
UNDERSTAND SIGNAL WORDS

These are typical safety signs that appear with the safety-alert symbol and signal words **(DANGER, WARNING, and CAUTION).** Safety signs are displayed to alert the operator and others of the risk of personal injury during normal operations and servicing.

DANGER identifies the most serious potential hazard. The sign is displayed in the area of the hazard.

WARNING identifies a serious hazard. The sign is displayed in the area of the hazard.

CAUTION is used for a general reminder of good safety practices or to direct attention to unsafe practices.



TYPICAL SAFETY SIGNS

SAFETY FIRST!

Carefully read, understand, and follow all safety instructions in each section prior to setting up, transporting, and operating your drill.

It is important that no one be allowed to operate ***Truax*** equipment until they have been properly trained on the safe operation of this equipment. All operators must clearly understand the importance of replacing **all** guards and safety devices before operating the equipment.

SAFETY DECALS

The maintenance and care given to the safety decals and features will result in a "user friendly" machine. It is important that decals be replaced if they become damaged or lost. It is also important that the decals be cleaned more frequently than the drill.

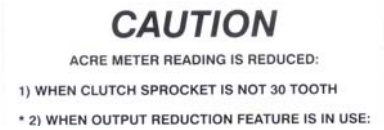
When new options are added, it is important to add **ALL** decals or safety features and to replace any decal that is hidden by the new option.

When applying decals to the equipment, be sure to clean the surface to remove any dirt or residue. Firmly adhere the decals to the cleaned surface.

Keep safety decals in good condition. Replace torn, missing, or defective decals. If replacement safety decals are needed, they may be ordered by part number from the following address:

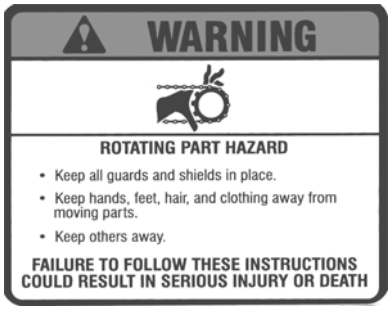
Truax Company, Inc.
4300 Quebec Avenue North
New Hope, Minnesota 55428
763-537-6639

These are the safety decals provided for Truax drills:



Part #1046C17

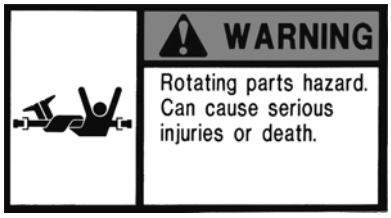
Part #1046C3-A



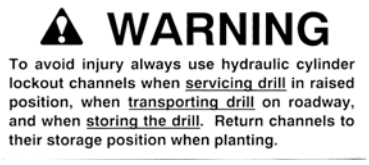
Part #1046C4-A

Part # 1046C2-A

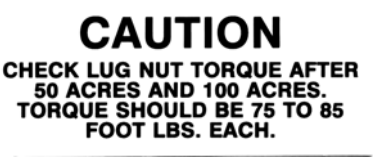
Part #1046C5-A



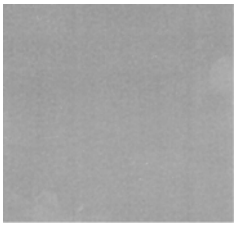
Part #1046C8



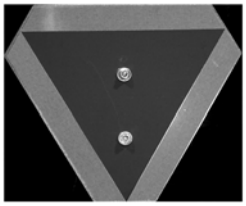
Part #1046C16



Part #1046C22



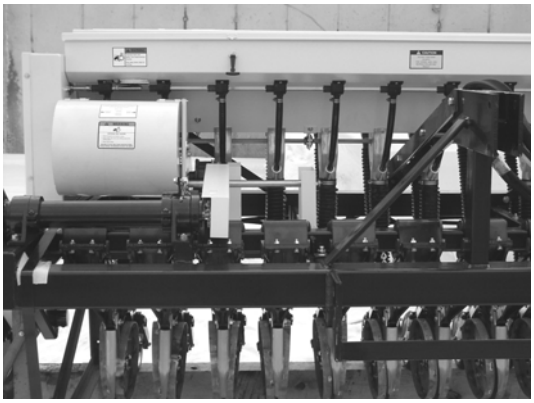
Red Reflector 5" x 5"
Part #2008C2



Slow Moving Vehicle Sign
Part #1046C72 (Metal Sign)
Part #1046C71 (Decal)

PLACEMENT OF SAFETY DECALS

The placement of the safety decals is shown in the following pictures:



Drive Side Front

Drive Side End

Main Frame Back Corners

Rear Seed Box

SAFETY PRECAUTIONS

For your own safety and to avoid harm to yourself and others, please observe the following safety precautions:

1) **DO NOT** operate this drill without reading this Operator's Manual!

2) **DO NOT** operate this drill with anyone riding on the drill!

3) **DO NOT** operate drill when other people are near the drill!

4) **DO NOT** obstruct or paint over safety decals!

5) **DO NOT** operate machinery without guards and safety devices as injury may result!

6) **DO NOT** operate drill with lids open - injury may result!

7) **DO NOT** tow over 20 m.p.h. as tire, wheel, and/or bearing failure may result!

8) **DO NOT** operate without chain guards as injury may result!

9) Use caution when operating close to fences, tree lines, ditches or streams.

10) Reduce operating speed on inclines and rough terrain and shift to a lower gear before going up or down steep slopes.

11) Slow down when turning.

12) **DO NOT** turn sharply! Check the clearance between the tractor tire and the tongue when turning.

13) Install safety chains between the drill and the towing vehicle. Follow the tractor manufacturer's instructions for proper hookup to the tractor.

14) Use extra caution when moving farm equipment on roadways.

15) Be careful of over-sized equipment on narrow bridges.

16) When moving on a trailer, over-sized equipment must be permitted, flagged, and have approved lights.

17) **NEVER** work in or near seed boxes while tractor is running!

18) When servicing the drill (when it is attached to the tractor), turn the tractor **"off"** and put it in gear or park.

19) When servicing the drill (when detached from the tractor), block both wheels (front and rear) and secure the tongue.

20) Securely support drill, block wheels (front and rear), and restrain tongue when performing the following work:

- Elevating the end of the drill to calibrate it.
- Changing a tire.
- Replacing or repacking wheel bearings.
- Changing furrow openers or no-till coulter assemblies.

21) **AVOID HIGH PRESSURE FLUIDS:**

Hydraulic systems operate under high pressure. Fluid leaking from around connections and pinholes may penetrate the skin, causing infection and serious injury. See a doctor immediately if hydraulic fluid penetrates the skin.

Relieve pressure from hydraulic systems before disconnecting or servicing hydraulic lines. Ensure that all connections are tight and that the hoses are not damaged.

22) **USE EXTREME CAUTION** when working near or handling double disc furrow openers or no-till coulters! Wear leather gloves! ***SHARP EDGES ON BLADES COULD RESULT IN SERIOUS INJURY!***

23) For safety and to reduce wear on the clevis, always install and maintain the **hitch clevis** (part #1022B2) below the **hitch body** (part #1022C2) as illustrated on Page 90-17 so the hitch body carries the tongue weight.

HIGHWAY AND TRANSPORT PRECAUTIONS

1) Adopt safe driving practices:
   - Keep the tractor brake pedals latched together at all times. **Never use independent braking with machine in tow, as loss of control and/or upset of unit may result!**
   - Always drive at a safe speed relative to local conditions and ensure that your speed is low enough for an emergency stop to be safe and secure. Keep speed to a minimum.
   - Reduce speed prior to turns to avoid the risk of overturning.
   - Avoid sudden uphill and downhill turns on steep slopes.
   - **DO NOT** coast! Always keep the tractor or towing vehicle in gear to provide engine braking when going downhill.
   - **DO NOT** eat, drink, or use a cell phone while driving!

2) Comply with state and local laws governing highway safety and movement of farm machinery on public roads.

3) Use approved accessory lighting flags, and necessary warning devices to protect operators of other vehicles on the highway during day and night transporting. Various safety lights and devices are available from your dealer.

4) The use of flashing amber lights is acceptable in most localities. However, some areas may prohibit their use. Local laws should be checked for all highway lighting and marking requirements.

5) When driving the tractor and equipment on the road or highway under 20 m.p.h. at night or during the day, use flashing amber warning lights and a slow moving vehicle **(SMV)** identification emblem.

6) Always tow with a vehicle that is heavier than the drill.

7) Implement tires are designed for field use and will not stand up under sustained highway travel.

8) Rotate jack on tongue, or remove jack from tongue.

9) Always raise the drill openers to the highest position and secure the hydraulic cylinders with the transport channel locks before transporting the drill.

10) Plan your route to avoid heavy traffic.

11) Be a safe and courteous driver. Always yield to oncoming traffic in all situations, including narrow bridges, intersections, etc.

12) Be observant of bridge loading ratings. **DO NOT** cross bridges rated lower than the gross weight at which you are operating. Know the weight of your tractor and drill.

13) Watch for overhead and side obstructions while transporting.

14) Always operate equipment in a position to provide maximum visibility at all times. Make allowances for increased length and weight of the equipment when making turns, stopping the unit, etc.

SET-UP & PREPARATION

UNCRATING AND SETTING UP

Note: Before accepting shipment from the freight carrier, check for any damage to the drill. **DO NOT** accept freight without indicating on the bill of lading if there is damage.

1) **Unloading the drill:** Use a forklift with adequate lift rating and 6 foot fork length. Slide the forks under the skid members and lift the drill from the truck bed. **Never lift a drill by the seed boxes, damage or injury will occur.**

2) **READ, UNDERSTAND, and FOLLOW** all safety and set-up instructions.

3) **REMOVE PARTS AND PACKAGES FROM SEED BOXES** before removing machine from the skid. Failure to do this may result in damage to the seed box agitator and/or shaft.

4) **Install the Tongue:** All FLEXII Drills use a "T" style tongue that is held onto the unit with two 1" bolts and a 3/4" pin or bolt through the top clevis.

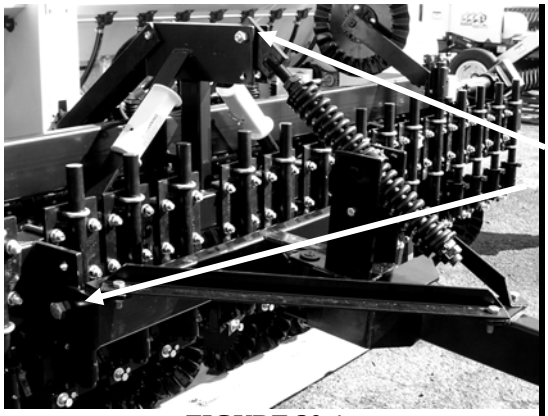


FIGURE 20-1

Install the tongue using the mounting holes on the main frame that will keep the drill frame in a near level position when the drill is attached to the tractor and in the planting position. Usually the tongue should be mounted in the bottom holes where it attaches to the main frame with the spring rod placed in the top hole of the clevis on the main frame. **See Figure 20-1 for the typical installation.** Both the folding tongue pictured in Figure 20-1 and the rigid tongue are mounted in the same holes.

After the drill has been removed from the transport skid, attach the drill to the tractor that will be used for planting, park on a smooth, level, hard surface and lower the drill to the planting position. Check to see if the drill frame is level and that the press wheels, disc openers, and no-till units contact with the ground surface uniformly. When further adjustment is necessary, see Attaching The Drill, Item #5, Page 20-5 and the section on Tongue Adjustment on Page 30-16.

5) For rear drive or rear transport drills install the wheels (the valve stem side of rim is out for drills after mid 1993). **Install the wheels so that the beveled holes of the rims are used for the beveled wheel bolts or beveled wheel nuts.** Most end wheel drills are shipped with wheels installed.

6) **Hydraulic Hookup:** Drills equipped with hydraulics have a hydraulic line "tree" bolted to the tongue. Hydraulic hoses are shipped to reach only to end of tongue. Additional hose may be needed. **If additional hydraulic hose is needed, lower to planting position to release hydraulic pressure before loosening fittings and adding hoses.**

NOTE: Tractors with multiple hydraulic ports may require the hydraulic hoses to be in a vertical alignment or in a horizontal alignment. Check the tractor operator manual for the correct hydraulic hook-up.

7) **Removing the drill from the skid:**

A tractor with hydraulic system must be available.

Tools required: Hitch pin with a cross-locking device; a tool to cut metal banding strips; and 2"x 6" blocking. A claw hammer; crescent wrench; and vice grip may also be useful.

Attach the drill to the tractor and attach the hydraulic lines. **If additional hydraulic hose is needed, see Item 6, Hydraulic Hookup.**

With a forklift, front-end or pay loader: Cut and remove the metal bands holding the drill to the skid. Lift the back of the drill main frame. Remove the diagonal bracing of skid brackets. Carefully slide the skid out from underneath the drill and lower to the ground. **Never lift a drill by the seed boxes, damage or injury will occur.**

With a tractor: Use 2"x 6" boards under each end wheel for raising the drill above the skid and/or for a ramp over the skid member. Cut and remove bands holding the drill to the skid. Lower wheels onto 2"x 6" blocking with the hydraulics. Be sure the planting units and press wheels will clear the skid, if not raise the wheels and add more blocking. Remove the diagonal bracing of skid brackets. Carefully drive forward pulling the drill off the skid or slide the skid from underneath the drill and then ramp the drill to the ground**.** For a rear drive or rear transport drill raise the drill to the transport position and slide the skid from underneath the drill.

8) **Parking Jack:** Install the parking jack onto the welded mount and secure with the pin.

9) **Press Wheels:** During assembly press wheel(s) may be left off from the **"h"** bracket to accommodate the shipping skid. In these situations the press wheel(s) are shipped in one of the seed boxes. Remove the press wheel(s) from the seed box and attach to the **"h"** frame with the bolt provided. The axle bolt must tighten and bottom against the **"h"** frame and still allow about 1/8" of end play for the press wheel.

10) Check planter assemblies to be sure that they are aligned straight with the main frame and that press wheel assemblies are aligned behind each furrow opener.

11) Check to see that the picker wheel shaft turns freely. It may be necessary to remove chain guards and chains from sprockets to verify that the shaft is turning freely. If picker wheel shaft rubs on the transitions, it is possible to rotate the box slightly by loosening the box end bolts. This will allow more clearance at the transitions. Also, the **center bearing support** (part #10316) may be moved.

12) **Check the Chains:** Chain Alignment is important and may be checked by jacking up the drive wheel and turning it to verify if any chain tries to "walk off" a sprocket. A catch, click, or snap of the chain indicates that a chain is trying to "walk off" one of the sprockets. If the problem is with one of the keyed sprockets, loosen the setscrew and move just the sprocket. If the problem is with one of the pinned sprockets, move the entire shaft (that it is attached to) and then move the keyed sprocket affected by moving the shaft to complete the alignment.

13) **Loose Bolts:** "BI-Way" style lock nuts are used in production after fall 1999. Prior to this most fasteners were treated with Loctite; therefore, nuts will be hard to remove. Check nuts on all scrapers (inside and outside).

14) **Discs:** Check all discs to ensure that they turn freely. If tight, they may have a bent outside scraper or the inside scraper may be too tight. **Check backside of depth band replacement parts for weld spatter or other deformities.**

15) **No-Till:**

Trash Plow Style No-Till Assemblies: (after spring of 1993)

Production drills use cast clamp plates, two per assembly. The two plates should be installed onto the frame with the U-bolts and 5/8" serrated flange nuts. Start two of the nuts onto the threads and lift the no-till assembly into place before installing the other nuts.

Trash Plow Style No-Till Assemblies: (before spring of 1993)

Attach no-till assemblies to the clamp plate before attaching to the drill frame. All drills after fall 1992 have an equal number of left and right hand assemblies.

Note: Start installing the no-till units by first installing the four behind the tongue and then move towards the ends of the drill. Half of the no-tills face right, and move residue to the right and the other half to the left. **Remember Trash Plows always move residue away from the center.**

Note: 18" Trash Plow units are installed with every other unit on the backside of the front 4x4-frame member to avoid interference with the chain guard.

24 Wave Caster Style No-Till Assemblies (24 Wave, 18-1/2" Blade is Standard After 01-01-04):

Attach the no-till assembly to the clamp plates using the 1/2" x 3-1/8" x 1-1/2" U-Bolt first, and then attach the complete assembly to the drill frame using the 5/8" x 5-1/4" x 4" U-Bolt.

Note: If no-till assemblies do not align with the planters, adjust them as follows:

- Check the **lift bracket** (part # 10321) as it may be bent.
- Move no-till units to align with planting units. Park the drill on a clean concrete floor. Lower the planting units to the planting position. Mark the location of each planting unit with chalk or tape. Raise the planting units from the surface, back straight up until the no-till units are over the chalk marks. Lower the drill to the planting position. Leave enough clearance to turn the no-till blades. Rotate each no-till blade until the lowest point is on the bottom and check to see if the blade is on the mark. Move no-till units right or left as needed.
- Tracking of planting units behind the no-till assemblies may be improved in some cases by installing the no-till units on the backside of the front 4x4-frame member.
- Check the rubber knuckles of the individual planter assemblies on a new drill. They may not be seated correctly. **Follow instructions for seating rubber torsion knuckles on Page 40-11, Item 4.**
- Check the urethane torsion knuckles for the individual no-till units for proper seating. If the knuckles are not seated put the drill in planting mode on a hard surface to "seat" the torsion knuckles. In extreme cases, it may be necessary to loosen the bolts holding the knuckle before running on a hard surface. Loosen only one or two bolts at a time and retighten after knuckles have shifted.

16) The hydraulic system, rephasing cylinders, and hoses have been filled at the factory. Therefore, use care when changing the hose ends. Drills are shipped with hydraulic hoses only reaching to end of tongue; therefore, additional hose may be needed. When changing hose or hose ends avoid getting air into system. After changing hydraulic hoses or fittings it will be necessary to "work" air out of system by attaching to tractor and raising and lowering the drill planting units multiple times.

Note: When adding hose, lower drill to planting position, shut off hydraulic system and run levers back and forth to release hydraulic pressure before disconnecting fittings. This "neutrals out" the system for ease in disconnecting or reconnecting the hydraulics.

SAFETY REMINDER -Avoid Contact With High Pressure Fluids!

Hydraulic systems operate under high pressure. Fluid leaking from around connections and pinholes may penetrate the skin, causing infection and serious injury. See a doctor immediately if hydraulic fluid penetrates the skin.

Relieve pressure from hydraulic systems before disconnecting or servicing hydraulic lines. Be sure that all connections are tight and the hoses are not damaged. Be sure hose protector sleeve is in place and secure.

17) Check for damaged or missing safety decals, and replace as needed. If you need decals, please contact:

Truax Company, Inc.
4300 Quebec Avenue North
New Hope, MN 55428
Telephone: (763) 537-6639
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18) Drill Model FLXII-822 is driven from both ends of the machine. In this manual the term "Non-Typical" references the left side of the drill when viewed from the back.

SET-UP & PREPARATION

PREPARING THE TRACTOR

1) Make sure all tractor "power take-off"' (PTO) guards are in place.
2) Retain drawbar in a fixed position.
3) Place tractor drawbar in a position so that the drill frame is nearly level.
4) Attach safety chain from tractor to drill.
5) Secure the tractor lift links.
6) Install tractor "slow moving vehicle" **(SMV)** emblem.

ATTACHING THE DRILL

1) Secure the drill to the drawbar with a pin that has a cross-locking device to prevent the units from separating.

2) Attach safety chain between the drill and the tractor. Safety chain is not a standard item but is available as an option.

3) Tractor drawbar height may require the tongue clevis to be raised or lowered.

4) The drill tongue will generally slope down toward the tractor. An important consideration is to have approximately equal force or pressure exerted by the planter discs and the press wheels.

5) The drill frame should be nearly level when the drill openers are in the planting position. This can be checked by positioning the drill on a flat surface with a 2" x 6" under each wheel. Lower the drill planting units to the ground surface and check to see if the disk openers and no-till coulters are touching the ground surface equally.

   If adjustment is needed proceed in the following sequence:
   1. First, check the hitch clevis and adjust up or down if possible.
   2. Second, check to insure the no till coulters are adjusted to the proper height.
   3. Third, adjust the leveling spring assembly as discussed in Item 6.

6) Adjust the leveling spring assembly in the tongue. Turning both the upper and lower sets of nuts downward toward the tongue will raise the front of the drill. Turning both the upper and lower sets of nuts upward toward the drill will lower the front of the drill.

7) Be sure the hydraulic hoses are secured and out of the way of the tongue and the tires. A hose guide is attached to the tongue to help support the hydraulic hoses.

8) Rear drive and rear transport drills require an additional pair of hydraulic hoses independently controlled. On rear drive drills a 2-1/2" x 8" hydraulic cylinder is mounted in place of the spring leveler to raise the front of the drill for transport. Care must be used when lowering the rear drive drill for planting in order to level the drill for proper penetration of both the no-till and the disc openers. **A slight miss-adjustment of the front hydraulic cylinder will dramatically effect the penetration of the discs and no-till units.**

9) Check 3/8" x 3" bolts and nuts that retains axles to legs. Loctite should be applied after tightening the bolts or pean threads. **Check these bolts periodically (every 100 acres) and tighten as necessary.** Replace the nuts with a locking style nut if they frequently become loose.

10) Check the wheel lug nuts. Torque is 75-85 lbs. and should be checked after the 1st and 2nd day of use and again after 50 and 100 acres. After that, check periodically to ensure lug nuts are tight.

IDENTIFYING THE DRILL

After setting up the drill, it is highly recommended that you mark the drill with your name or an owner's brand for identification in case of stolen equipment.

For example, your initials could be engraved in the frame with a cold chisel or burned in with a welder. It is recommended that you identify your drill in several areas. It is also recommended that several photos be taken of the drill that show these identification marks clearly. Then, file them in a safe place with other important papers.

Record Identification Numbers

Help prevent crime by properly documenting ownership. Record the model and serial numbers of the drill on all documentation papers, including insurance, financial and warranty. Keep all documentation, photographs, etc. in a safe, secure location.

HELP PREVENT CRIME!
- RECORD I.D. NUMBERS -

TRUAX COMPANY

4300 Quebec Ave. North
New Hope, MN 55428
Phone: (763) 537-6639

Model #_____ Serial #_____

TIRES

CAUTION! Never use the drill with under-inflated tires as excessive wear and tire failure may result. Inflate tires to **manufacturers' specifications as stamped on the tire** and check them on a regular basis (especially if the temperature has changed since the last tire inflation).

WARNING! Follow proper procedures when mounting or removing a tire on a rim or wheel. Failure to do so may result in a serious injury. If both tire beads are not seated when maximum inflation pressure is reached; deflate the tire, re-lubricate the bead, and re-inflate the tire.

CAUTION! Never exceed **manufactures' specification** for tire inflation, as the tire may fail or explode causing personal injury.

WARNING! Drills with ribbed implement tires **are not** meant for highway speeds. Tire manufactures specify **20 m.p.h**. or less for this type of tire.

CAUTION! Check lug nut torque before using the drill. Check again after 1st and 2nd day of use and after 50 and 100 acres of use. Check periodically to ensure lug nuts are tight. Torque should be 75 to 85 foot lbs. each.

Note: Tire pressure affects tire circumference and thus can affect seeding rates.

TRANSPORTING THE DRILL

1) Raise the drill to the highest position and install **both** hydraulic **transport channel locks**. Rear drive drills require a third **transport channel lock** (for tongue hydraulic cylinder). Be sure to install them before transporting the drill.

2) Be sure that the drill's "slow moving vehicle" **(SMV)** emblem is clean and visible.

3) Attach safety chain between the drill and the towing vehicle.

4) When roading a drill for more that 1/4 mile, it is essential to disengage the sprocket lockout hub.

5) When starting out in the transport mode, insure that the clutch is disengaging the drive and the shafts are not turning.

6) Make sure that the drill reflectors are clean and in place.

7) **NEVER** transport the drill faster than **20 m.p.h.** unless the drill is on a trailer.

8) **DO NOT** transport or haul the drill with seed in boxes, as this will cause settling and packing, which is hard on drive chains when planting is resumed.

9) **DO NOT** leave seed sacks (empty or partially full) in seed boxes as they may become entangled in the agitators during transport.

10) Be extremely cautious when crossing narrow bridges.

11) When towing the drill on roadways, it is important to watch ground clearance (especially on a crowned road or one that has low shoulders). A towed drill should be secured to the towing vehicle with a safety chain.

12) Transport on a trailer requires chaining or strapping the drill's main frame **(not the seed boxes)** to the trailer. Raise end wheels so that planters are on trailer deck. Fasten red flags to oversized units. Follow all state and local regulations when transporting a drill.

13) Secure box lids with an additional rope or rubber tie downs **(not the seed box cover lid retainers)** when moving the drill on the highway. The seed box cover lid retainers may break due to excessive bounce if hooked during transport.

INSTALLATION OF OPTIONS

Cool Season Box (drill manufactured after fall of 1993)

1) Remove **covers** from both ends of drill (parts #1036234 and #1036244).

2) Remove **end covers** (parts #1036236 and #1036245).

3) Lift box assembly onto the frame and hold the box in place as it tends to tip backwards if not supported. Install the two 3/8" x 7" bolts, heads of bolts down, 3/8" washer and nut on top. Do not tighten.

4) Install the **top 3/8" x 3/4" bolts first with a 3/8" washer on each one**. If alignment is difficult you may use a screwdriver or punch to act as lever to help align holes.

5) Install the other four 3/8" x 3/4" bolts.

6) Tighten all 3/8" bolts.

7) Install the **seed hoses** (part #34441). Liquid soap will ease the installation of hoses. Secure the seed hose to the seed cup using a **#20 hose clamp** (part #3213). Secure the seed hose to the planting assembly using a **#36 seed hose clamp** (part #1009). Watch for interference between hoses and support struts.

8) Install **sprocket** (part #1045A) with the hub out and align with the large sprocket on the cool season box by measuring the distance from the end plate.

9) Install chain and idler so that the slack side or non-driven side has the idler on it.

Note: The gates of the cool season seed cup should be dropped to the lowest or clean out position when the planting season is done. **See Figure 20-2.** The flutes **must** be shifted left to right and the dust must be blown out of the cups at the end of the season, otherwise, moisture will collect and the shaft will rust, causing sticking in the future.

FIGURE 20-2

INSTALLATION OF OPTIONS (Con't)

Output Reduction Kit (ORK) Installation on End Wheel Drive Drills:

1) Remove both the **chain guard** (part #3245CLHX1) and the original **clutch chain** (part #2040XB).

2) Install one **1" spherical bearing** (part #3007) in the **jackshaft and ORK support** (part #103161) included in this kit. This support will be positioned with the base plate pointed toward the rear of the drill. Position bearing set screw collar on the left. Position **carriage bolts** (part #CB516-.75) so **nuts** (part #N516-FN) are **outside** of support post channel for easier tightening. Do not tighten carriage bolt nuts tight at this time.

3) Install one **1" spherical bearing** (part #3007) in the available mounting hole in the **bearing and clutch support** (part # 103625). Align the bearing with setscrew on the right side. Do not tighten carriage bolt nuts tight at this time.

4) **NOTE: Before performing this step, be sure planting units are on the ground and well-supported on blocks.** Loosen and remove two **3/8" x 4" bolts** (part #B38-4), which fasten **chain hanger** (part #8955X) and parallel support member to the drill frame immediately to the right of the bearing and clutch support plate. Replace with a **3/8" x 4-1/2" bolts** (part #B38-4.5) included in the kit. Use a **3/8" washer** (part #W38) under both the head and the nut of these bolts.

5) Install the **jackshaft and ORK support** (part #103161) on top of the drill frame. Orient the support with the base plate pointed toward the rear of the drill. Do not tighten the nuts tight. Set the **1" jackshaft** (part #103165) included with the kit into the bearing, aligning the support so that the shaft is parallel with the drill frame and chain hanger. Tighten the nuts on the 3/8' x 4-1/2" bolts.

6) Install **double drive sprocket** (party #710532) on the **1" jackshaft** (part #103165). **On 8-row and 12-row drills, the double sprocket is installed with the smaller (18-tooth) sprocket to the right. On all larger drills, the smaller sprocket will be installed to the left as shown on the Chain Orientation decal included with the kit.**

7) Tighten all nuts holding bearings in **flangettes** (part #3007A) making sure the **1" jackshaft** (part #103165) is true and level. Tighten all setscrews holding the shaft in the bearings.

8) Install key in the double sprocket. Install the shorter length **chain** (part #2040K) included with the kit around the clutch sprocket and the small (18-tooth) drive sprocket, using offset and full link connectors to secure the chain.

9) Remove the original **drive sprocket** (part #1045A) on the right hand end of drive shaft going through the top of the leg. Replace this sprocket with the **double 18-tooth sprocket** (part #710531) included in the kit. Install the longer length **chain** (part #2040J) included with the kit on the **double drive sprocket** (part #710531) and the larger **sprocket** (part #710532) on the new reduction shaft, using half link or full link connectors included in the kit. When the chain is properly aligned tighten all setscrews on both double sprockets.

10) Install **drive chain idlers** (parts #1041 and #1042D). Tighten idlers so drive chain tension is properly set.

INSTALLATION OF OPTIONS (Con't)

11) Place Chain Orientation Decal on the center plate below the original decal. Remember that the **Output Reduction Kit will affect the true acreage reading on the acre meter. With Output Reduction Kit in use, acre meter reading times 2 equals actual acres planted.**

12) **REINSTALL THE CHAIN GUARD** (PART #3245CLHX1) **OVER THE CLUTCH CHAIN.**

Output Reduction Kit (ORK) Installation on Rear Wheel Drive Drills:

Note: Output Reduction Kit is not available for Model FLXII-86RD and FLXII-88RD drills.

1) Loosen chain **idler** (part #1042) and remove the original **chain** (part #2040M) from the**18 tooth sprocket** (part #1045A) on the upper end of the drive leg and the **18 tooth sprocket** (part #1045A) on the end of **jackshaft** (part #103165) that drives the clutch chain.

2) Remove both of these **18 tooth sprockets** (part #1045A).

3) Replace the leg drive **18 tooth sprocket** (part #1045A) with a **double 18 tooth sprocket** (part #710531) and install the key.

4) Replace the **18 tooth sprocket** (part #1045A) on the end of jack shaft with a **double 18/36 tooth sprocket** (part #710532) and install the key.

5) Install the longer length **chain** (part #2040I) included with the kit on the **double drive sprocket** (part #710531) and the larger **sprocket** (part #710532) on the end of jackshaft, using half link or full link connectors included in the kit. When the chain is properly aligned tighten all setscrews on both double sprockets. Proper orientation of the sprockets is shown on the Chain Orientation decal included with the kit.

6) Tighten the chain **idler** (part #1042) so the drive chain tension is properly set.

7) Remember that the **Output Reduction Kit will affect the true acreage reading on the acre meter. With Output Reduction Kit in use, acre meter reading times 2 equals actual acres planted.**

OPERATING THE DRILL

SEED PLACEMENT

OPENER PENETRATION

Truax drills are equipped with depth bands on all disc openers. Depth bands help control the penetration of the discs into the soil surface and thus control planting depth. The standard size provided since 1/1/98 is 12" in diameter, allowing 3/4" of penetration of the blade. Seeds will drop into the seed slot, about half the amount of disc penetration, for a planting depth of approximately 3/8". For most conditions when planting grasses and legumes the **12" band diameter** (part #1097C) is all that will be necessary.

Optional depth bands are available in diameters of: 9-1/2" (part #1097F), 10-1/2" (part #1097D), 11-1/2" (part #1097), and 12-1/2" (part #1097A).

PRESS WHEELS

RUBBER "V" PRESS WHEEL (1.75" x 10"):

These are the standard press wheels used in most field situations. This press wheel firms the seeds into the sides of seed slot by crushing loose soil crumbs down on top of newly planted seed. This press wheel does the best job of locking out air from around the seed and locking in any available moisture. The semi-pneumatic feature resists mud buildup and therefore is the best all-around press wheel. **Rubber press wheel assembly** (part #1034A1-Black) or (part #1034A-Yellow) includes the assembled press wheel and mounting frame.

CAST IRON PRESS WHEEL (1" x 12"):

The angular mounted iron press wheel is used for planting seed deeper (1-1/2" to 2") and would typically be used for planting larger seeded crops like soybeans. This press wheel may also be useful when planting in **hard, cloddy soils** to break up the soil crumbs enough to allow soil covering. It is especially useful in hard, crusty soils where there isn't sufficient loose soil to cover the seed. It is successfully used in some no-till applications on clay or clay loam soils. **Cast iron press wheel assembly** (part #1034A3) includes the assembled press wheel and mounting frame.

LEADING PRESS WHEEL (4" x 16"):

A semi-pneumatic press wheel interchanges with a caster style no-till to pack loose soil before the double disc places the seed. **Leading press wheel assembly** (part #0422031) includes the assembled press wheel and mounting frame.

WEIGHT TRANSFER

The end wheels hydraulically raise, placing weight from the drill on the furrow openers and tongue. The amount of weight transfer to the furrow openers versus the end wheels determines the penetration force of the disc openers. Adding cylinder stops to the two rephasing cylinders that lift the drill for transport can control weight transfer. Adding cylinder stops places additional weight on end wheels when planting and limits weight on discs.

Rear drive drills use a third hydraulic cylinder on the tongue that raises the front of the drill and also transfers the drill weight and therefore increases or decreases penetration of the discs.

OPERATING THE DRILL

DOUBLE DISC OPENERS

The disc openers create a "V" groove in the soil surface for the seed to be dropped. Discs are 13-1/2" in diameter when new. **Disc blades should be replaced when wear reduces the diameter to 13".** Refer to Service and Maintenance instructions for disc opener maintenance and replacement.

Bearing failure will result if fertilizer is placed into one of the seed boxes and comes into contact with the discs.

Critical soil to seed contact is a major function of the disc openers. Therefore, daily inspection and service is required to maintain the disc openers.

SEED CALIBRATION AND METERING

SEED CALIBRATION PROCEDURE:

1) Truax drills have been designed to operate using all three boxes (fluffy, small seed, and cool season/grain) simultaneously or in any combination desired.

2) When using the drill, it is important to remember that when the clutch is engaged, the mechanisms in all seed boxes operate and deliver seed through the seed hoses.

3) To avoid errors during calibration, **calibrate each seed box individually**. Changing the calibration of one box does not affect the other boxes.

4) First, calibrate the small seed box, then the cool season box (when installed), and finally the fluffy box.

5) All Truax drills can be calibrated using the same procedure. **Refer to "Calibration Procedures" for more detail.**

METHODS OF CALIBRATION:

1) Weight/Acre in Grams
2) Weight/Acre in Ounces
3) Seeds Per Row Foot
4) Trial Seeding/Bag

OPERATING THE DRILL

FACTORS AFFECTING SEEDING RATE CALIBRATION

Several factors will affect the seeding rate. These include humidity, seed density, seed purity (inert matter in seed lot), seed germination, mixing of seed types, seed box used, site conditions, and speed of travel.

For more precise calibration, two or more of the calibration methods should be used, and repeated several times a day. It is **not recommended** that suggested procedures be used when controlled "plot planting" is being done.

The procedures provided for the calibration of Truax drills are to be used as a guide only - as several factors could affect the rate at which the seed will flow through the seedway passages.

The operator of the equipment must constantly monitor the seed delivery and placement!

SEEDING RATE VARIABLES:

1) Different bags of seed weighing the same amount may contain different amounts of pure live seed, due to seed germination, seed purity and inert material, unfilled kernels, moisture content, or seed size.
2) The drill wheels may slip due to seedbed condition, soil type, lay of the land (i.e. slope), and speed of drilling.
3) The tire size, type, pressure and tire wear will affect the seeding rates. Note: The standard tire is a 7.60x15 Rib Implement style.
4) Leaving a gap wider than the drill row spacing between drill passes, overlapping drill passes, and failure to fully stop and lift the drill when turning at the end of the field will affect uniform seed distribution.
5) The operator may have false information as to the land area.

IMPORTANT: Remember that the feed cups meter volume, not weight!

PRELIMINARIES TO CALIBRATION (WEIGHT/ACRE)

1) Attach the drill to a tractor or other vehicle, park on a level surface, set parking brake, and shut off engine.
2) Lower the drill to the planting position. Drill cannot be calibrated in transport position because clutch is disengaged.
3) Block the non-drive end wheel (both front and rear.).
4) Using a jack under the pad welded to the bottom front side of the drive leg (production after 01-01-2000), lift drill frame so that the drive end wheel is lifted off the ground. On drills produced before 01-01-2000 place a jack stand under the front, right corner (drive side) of the drill when in the transport position. This will raise the drive wheel off the ground when lowered to planting position and ease calibration.
5) Remove seed hoses from three aluminum transitions.
6) **Only** place seed in drill box compartment over the three seed tubes previously removed. Use enough seed to fill to the top of agitators in the box being calibrated.
7) Turn the drive wheel and check to be sure that all mechanisms are working. Check to see that seed falls from the three transitions.

CALIBRATION PROCEDURE FOR 8" ROW SPACING (GRAMS)

1) Disconnect the front and rear seed box hoses from three aluminum transitions. Place a bag or can to catch the seed under each of the three (3) aluminum transitions and the three (3) seed cups from the front and rear seed boxes if used.

2) Measure the circumference of the drive wheel in feet. Divide 96 by the wheel circumference in feet to determine the number of wheel revolutions. Example: Wheel circumference is 7.25 ft.; 96 divided by 7.25 equals 13 ¼ wheel revolutions.

3) Use the valve stem or a paint mark on the wheel to keep track of the revolutions. Turn the drive wheel the required number of revolutions determined in step #2.

4) Combine the seed from the three rows of each seed box into separate containers.

5) Weigh the collected seed in grams.

6) Divide the weight by two (2).

7) The result equals the seeding rate in **bulk pounds per acre**. This is not Pure Live Seed (PLS).

8) Repeat at least three (3) times and determine an average output per box.

9) See Pages 30-9 and 30-10 for adjusting seed flow from each seed box.

CALIBRATION PROCEDURE FOR 8" ROW SPACING (OUNCES)

1) Disconnect the front and rear seed box hoses from three aluminum transitions. Place a bag or can to catch the seed under each of the three (3) aluminum transitions and the three (3) seed cups from the front and rear seed boxes if used.

2) Measure the circumference of the drive wheel in feet. Divide 217.80 by the wheel circumference in feet to determine the number of wheel revolutions. Example: Wheel circumference is 7.25 ft.; 217.80 divided by 7.25 equals 30 wheel revolutions.

3) Use the valve stem or a paint mark on the wheel to keep track of the revolutions. Turn the drive wheel the required number of revolutions determined in step #2.

4) Combine the seed from the three rows of each seed box into separate containers.

5) Weigh the collected seed in ounces.

6) Multiply the results by 6.25.

7) The result equals the seeding rate in **bulk pounds per acre**. This is not Pure Live Seed (PLS).

8) Repeat at least three (3) times and determine an average output per seed box.

9) See Pages 30-9 and 30-10 for adjusting seed flow from each seed box.

CALIBRATION PROCEDURE FOR 10" ROW SPACING (GRAMS)

1) Disconnect the front and rear seed box hoses from three aluminum transitions. Place a bag or can to catch the seed under each of the three (3) aluminum transitions and the three (3) seed cups from the front and rear seed boxes if used.

2) Measure the circumference of the drive wheel in feet. Divide 77 by the wheel circumference in feet to determine the number of wheel revolutions. Example: Wheel circumference is 7.25 ft.; 77 divided by 7.25 equals 10 ½ wheel revolutions.

3) Use the valve stem or a paint mark on the wheel to keep track of the revolutions. Turn the drive wheel the required number of revolutions determined in step #2.

4) Combine the seed from the three rows of each seed box into separate containers.

5) Weigh the collected seed in grams.

6) Divide the weight by two (2).

7) The result equals the seeding rate in **bulk pounds per acre**. This is not Pure Live Seed (PLS).

8) Repeat at least three (3) times and determine an average output per box.

9) See Pages 30-9 and 30-10 for adjusting seed flow from each seed box.

CALIBRATION PROCEDURE FOR 10" ROW SPACING (OUNCES)

1) Disconnect the front and rear seed box hoses from three aluminum transitions. Place a bag or can to catch the seed under each of the three (3) aluminum transitions and the three (3) seed cups from the front and rear seed boxes if used.

2) Measure the circumference of the drive wheel in feet. Divide 174.25 by the wheel circumference in feet to determine the number of wheel revolutions. Example: Wheel circumference is 7.25 ft.; 174.25 divided by 7.25 equals 24 wheel revolutions.

3) Use the valve stem or a paint mark on the wheel to keep track of the revolutions. Turn the drive wheel the required number of revolutions determined in step #2.

4) Combine the seed from the three rows of each seed box into separate containers.

5) Weigh the collected seed in ounces.

6) Multiply the results by 6.25.

7) The result equals the seeding rate in **bulk pounds per acre**. This is not Pure Live Seed (PLS).

8) Repeat at least three (3) times to determine an average output per seed box.

9) See Pages 30-9 and 30-10 for adjusting seed flow from each seed box.

CALIBRATION PROCEDURE (SEED PER ROW FOOT)

To calculate the number of seeds per row foot/pound of a specified crop, determine the number of seeds per pound from Table #1. Then, use the following formula:

When:

1 acre = 43,560 square feet
A = number of seeds per pound (from Table #1)
B = number of seeds per square foot/pound per acre
C = planting width of drill
D = number of seeds per one (1) row foot per pound
E = number of rows planted by drill

A/43,560 = B
(C/E) x B = D

For Example: Using big bluestem, which has 165,000 seeds per pound and a FLXII-812 Drill, which has an eight (8) foot planting width and plants twelve (12) rows.

A = 165,000 seeds per pound
C = 8 feet
E = 12 drill openers or rows

B = 165,000/43,560 = 3.8 seeds per square foot
D = (8 ft/12) x 3.8 = 2.5 seeds per one (1) row foot/pound

This figure is actual or bulk seeds per row foot/pound. When planting Pure Live Seed (PLS), divide "D" by the PLS percent of your seed lot.

For Example: Your seed lot of big bluestem has a PLS percent of 60% (0.60).

2.5/0.60 = 4.2 actual or bulk seeds per row foot/pound

This figure represents one PLS pound of seed. Multiply by the desired planting rate per acre to obtain the correct number of seeds per foot of row.

For Example: Your desired planting rate for big bluestem is 8 PLS pounds per acre.

4.2 x 8 = 33.6 actual or bulk seeds per row foot for an eight (8) PLS pound seeding rate.

In the above example, 34 seeds per row foot would be required to achieve the desired seeding rate.

CALIBRATION PROCEDURE (SAMPLE BAG PER LAND AREA)

1) Select or measure a known field area (1-2 acres).
2) Put the proper quantity of seed (PLS) in the seed boxes and drill the known field area.
3) Check periodically while drilling to see if there is enough material to seed the area.
4) Adjust the drill to achieve the desired seeding rate.

TABLE 1 - SEED INFORMATION[1]

SPECIES	NUMBER SEEDS PER POUND	SEEDS PER SQUARE FOOT @ 1 POUND PER ACRE[2]
Native Warm Season		
Alkali sacaton	1,758,000	40.4
Big bluestem	165,000	3.8
Blue grama	825,000	18.9
Buffalograss (Burs)	56,000	1.3
Eastern gamagrass	7,280	0.17
Indiangrass	175,000	4.0
Little bluestem	260,000	6.0
Prairie cordgrass	183,000	4.2
Prairie sandreed	273,000	6.3
Sand bluestem	113,000	2.6
Sand dropseed	5,289,000	121.4
Sand lovegrass	1,300,000	29.8
Sideoats grama	191,000	4.4
Switchgrass	389,000	8.9
Native Cool Season		
Canada wildrye	115,000	2.6
Green needlegrass	181,000	4.2
Needle-and-thread	115,000	2.6
Reed canarygrass	533,000	12.2
Slender wheatgrass	159,000	3.7
Western wheatgrass	110,000	2.5
Introduced Cool Season		
Creeping foxtail	750,000	17.2
Creeping red fescue	615,000	14.1
Crested wheatgrass	175,000	4.0
Hard fescue	680,000	15.6
Intermediate wheatgrass	88,000	2.0
Kentucky bluegrass	2,177,000	50.0
Meadow bromegrass	71,000	1.6
Orchardgrass	654,000	15.0
Perennial Ryegrass	227,000	5.2
Pubescent wheatgrass	100,000	2.3
Red top	4,990,000	114.6
Russian wildrye	175,000	4.0
Smooth bromegrass	136,000	3.1
Tall fescue	227,000	5.2
Tall wheatgrass	79,000	1.8
Timothy	1,230,000	28.2

TABLE 1 (CON'T) - SEED INFORMATION

SPECIES	NUMBER SEEDS PER POUND	SEEDS PER SQUARE FOOT @ 1 POUND PER ACRE[2]
Legumes		
Alfalfa	200,000	4.6
Alsike clover	700,000	16.1
Birdsfoot trefoil	375,000	8.6
Cicer milkvetch	130,000	3.0
Crownvetch	109,000	2.5
Hairyvetch	20,000	0.50
Purple vetch	10,000	0.23
Korean lespedeza	225,000	5.2
Sericea lespedeza	350,000	8.0
Crimson clover	149,700	3.4
Ladino clover	871,650	20.0
Red Clover	275,000	6.3
Strawberry clover	300,000	6.9
Sweetclover	260,000	6.0
White clover	800,000	18.4
Forbs		
Maximillian sunflower	150,000	3.4
Purple prairieclover	275,000	6.3
Pitcher sage	150,000	3.4
Roundhead lespedeza	151,000	3.5
Thickspike gayfeather	110,000	2.5
Dotted gayfeather	141,000	3.2
Shell-leaf penstemon	272,200	6.3
Cereal Grain		
Barley	14,000	0.32
Oats	13,000	0.30
Regreen	11,000	0.25
Rye	18,000	0.41
Wheat	15,000	0.34

1. Source - Grass, USDA Yearbook of Agriculture 1948
2. Seeds Per Sq. Ft @ 1 LB Per Acre - Number of Seeds Per Pound divided by 43,560 Sq. Ft Per Acre

ADJUSTING THE CALIBRATION

SMALL SEED BOX:

The shift lever on the bottom left end of the box exposes or closes the flutes to control the seeding rate. The exposed flute area for each cup (inside the box) should equal at least twice the diameter of the largest seed being seeded from the box. **Carefully control the exposed flute so that no seeds are crushed or ground.** When very low seeding rates are desired from the small seed box, replace the original **sprocket** (part #1055) on the end of the box with a larger **sprocket** (part #1054A). If reduced seeding rates are desired from all seed boxes on the drill add an **Output Reduction Kit** as discussed on page 30-13.

If seed cup shaft walks (moves) left or right when in use, ensure that there is no free play in the shaft. A **machine bushing** (part #MB12-.15 or JD #N160437) next to the **shifter spool** (part #1130) reduces shaft movement. By taking up free play in the shaft and preventing the start of shaft movement, it is easier for the retaining wing nut to hold the shaft in place.

To Correct Irregular Feeding From Different Cups:

First, with the seed cup shaft shifted fully to the left, check if the drive **coupler** (part #1010) is touching the roll pin preventing full movement to the left. When there is contact between the coupler and the roll pin it will be necessary to loosen the set screws of the two bearings holding the coupler and move the coupler slightly to the left. The small seed box chain will then need to be realigned.

Second, if further adjustment is needed loosen up the cup mounting bolts and move the cups so that the exposed flute is the same on all seed cups. This will result in equal feeding from the seed cups. **See Figure 30-1.**

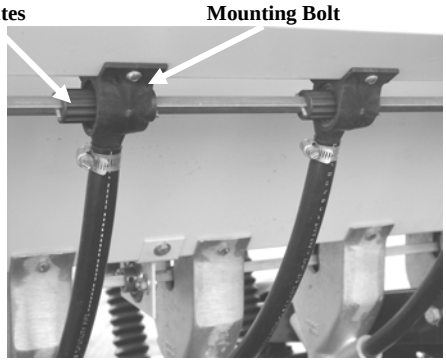


FIGURE 30-1

COOL SEASON OR GRAIN BOX:

Raise the clean-out levers on the left side of the cups to the highest position. Like the small seed box, exposing more of the flutes will result in a higher seeding rate. If irregular feeding is occurring from different cups, adjustment may be made by loosening up the cups and moving them so the exposed flute is the same on all seed cups to produce equal feeding.

If the seeding rate changes during planting, it may be caused from the **feed shaft** (part #3013) moving. This may be caused by a loose or worn **bolt** (part #B38-ISQ), a lost or broken **spring** (part #TS-72M), lost or broken **spring pin** (part #RP18-1.25), a worn or loose **shifter lever** (part #3205), a worn **shifter bearing** (part #M608621), or a worn **thrust washer** (part #TM60826).

When the output of the cool season box can not be reduced low enough, the **double sprocket** (part#3095X) on the drive end of the box can be changed to the **low output sprocket** (part #3095X1). If reduced seeding rates are desired from all seed boxes on the drill, add an **Output Reduction Kit** as discussed on page 30-13.

If the **feed shaft** (part #3103) is difficult or impossible to shift left or right, it may be caused from dust and dirt in the cups or by seed jammed in the flutes. It may be necessary to clean the box and cups before shifting the feed shaft. Application of WD-40 or liquid graphite on contact points will help. Turn **feed shaft** (part #3103) with a 5/8" wrench while shifting.

When planting large seed (such as corn or beans), move the clean-out lever (on the left side of each cup) to the middle or bottom setting to prevent crushing or chipping of the seed, which could result in an irregular seeding rate.

We do not recommend the application of fertilizer with Truax drills.

LARGE (FLUFFY) SEED BOX:

One of the most distinguishing features of the FLEXII style drills is the means to control output from the fluffy seed box. Unlike, earlier production drills which used a double cone gear speed changer to control the output from the fluffy box, the FLEXII drills use a very simple derailleur to vary the RPM of the picker wheel shaft of the fluffy box and thereby the output of seed from the box.

The derailleur controls the output only from the fluffy seed box.

The derailleur consists of (two) five-step sprockets and a spring tension idler that takes the slack from the roller chain between the two stepped sprockets. The idler is on top of the upper chain. There are five settings for seed output from the fluffy seed box. To change output settings, lift the idler and move the chain from one set of sprockets to another. The rear sprocket is the drive and the sprocket closest to the tongue is the driven one. The lowest output RPM, and therefore the lowest seed output is achieved when the chain is on the furthest to the right combination of sprockets (when standing at the tongue looking back). As the chain is moved to different combinations to the left, the drive sprocket diameter increases in relation to the driven and therefore increases the RPM and the seed output.

Additional changes in output from the large, fluffy box can be achieved by:

1) Adding **seed gaskets** (part #1005) and **retainer plates** (part #1006) inside the seed box to restrict output.

2) Increasing the size of the picker wheel sprocket located under the end cover on the drive side. The standard is a **30 tooth** (part #1055A1) square holed sprocket, and can be changed to a **36 tooth** (part #1055A2) or a **42 tooth** (part #1055A212) sprocket to further reduce output.

3) Increasing the clutch sprocket size can reduce the fluffy box output. The standard is a **30 tooth** (part #1044) and can be changed to a **48 tooth** (part #1144E), a **54 tooth** (part #1144A) or a **60 tooth** (part #1144B) sprocket to reduce output.

4) Reduced seeding rates from all seed boxes on the drill can be achieved by adding the **Output Reduction Kit** discussed on Page 30-13.

5) After adding the seed gaskets and retainer plates, the Output Reduction Kit and/or changing sprockets, if further reduction is needed, it is possible to try one of several fillers such as rice hulls, cotton hulls, bran, or ground corncobs.

Note: Changing the sprocket on the clutch or the leg will affect the acre meter reading.

OPERATING THE DRILL

NOTE: Because of the wide variation in quality and texture of different lots and mixtures of grass seed, it is impractical to supply a seeding rate chart with the drill. With a little experience, each user can work out a chart for the materials used, by calibrating the drill for the job at hand. Follow calibration procedures located inside the fluffy box lid.

The rates shown in the charts are only to be used as a guide. Refer to Box Calibration Procedure in this section for more detail.

The charts are based on original equipment sprockets. Changing sprockets or using the Output Reduction feature will affect drill output.

The charts are based on a drill equipped with 7.60 x 15 inch tires.

Some seeds, such as soybeans and wheatgrass vary widely in size. For such seed types (at a given pound per acre rate), the number of seeds planted per acre will vary according to the size of the seed.

SEEDING CHARTS FOR TRUAX DRILLS
FLUTED FEED ROLL – SMALL SEED BOX

TYPE OF BOX	TYPE OF SEED	EXPOSED FLUTE	BULK SEED LBS/ACRE
SMALL SEED BOX Original equipment sprockets. Exposed fluted feed roll measured on inside of cup.	**CAVE-IN ROCK SWITCHGRASS P-99.78%, G-84%, PLS-84%**	**1/2"**	**6.0**
		1/8"	**1.5**
		1/32"	**0.8**
SMALL SEED BOX Changed driven sprocket to a 30-tooth from original 20-tooth sprocket.	**SAME SEED AS ABOVE**	**1-1/16"**	**7.5**
		1/2"	**3.2**
		1/4"	**1.78**
		1/8"	**0.78**
SMALL SEED BOX Original equipment sprockets. Exposed fluted feed roll measured on inside of cup.	**ALFALFA & LADINO CLOVER**	**1/2"**	**27.1**
		3/8"	**18.9**
		1/4"	**14.2**
		1/8"	**7.7**
	BIRDSFOOT TREFOIL & CRIMSON CLOVER	**1/2"**	**24.3**
		3/8"	**17.8**
		1/4"	**11.8**
		1/8"	**6.6**
	TIMOTHY & RED TOP	**1/2"**	**16.3**
		3/8"	**11.5**
		1/4"	**8.1**
		1/8"	**4.4**

The "Sample Feed Rates" provided are to be used as a guide only - as several factors could affect the rate at which the seed will flow through the seedway passages. The operator of the equipment must constantly monitor the seed delivery and placement.

SPEED CHANGER VARIABLES – FLUFFY SEED BOX

TYPE OF BOX	TYPE OF SEED	OUTPUT SETTING	BULK SEED LBS/ACRE
FLUFFY SEED BOX Original equipment sprockets on leg shaft and clutch. **DERAILLEUR STYLE SPEED CHANGER** **When standing in front of drill facing the speed changer:** For lowest output, chain should be to the right side of the cone sprockets. The 16-tooth sprocket will be driving the 50-tooth sprocket. Any stepping of the chain to the left increases the output. Each step will increase the output between 40%-60% depending on the purity and germination of the seed. A higher purity will have a greater change in output with each step. Debearded seed will have the same effect.	**SHARP'S COMMON MIX BIG BLUESTEM, SIDEOATS GRAMA, & LITTLE BLUESTEM**	**50 drive 16**	**54.7**
		44 drive 26	**28.4**
		36 drive 36	**16.8**
		26 drive 44	**10.7**
		16 drive 50	**5.3**
	STOCK'S COMMON MIX BIG BLUESTEM, INDIANGRASS, & LITTLE BLUESTEM	**50 drive 16**	**27.8**
		44 drive 26	**15.9**
		36 drive 36	**9.1**
		26 drive 44	**5.6**
		16 drive 50	**3.1**
	CAMPER LITTLE BLUESTEM P-86%, G-54%, PLS-46.6%	**50 drive 16**	**54.3**
		44 drive 26	**27.0**
		36 drive 36	**15.9**
		26 drive 44	**9.4**
		16 drive 50	**4.5**
	BIG BLUESTEM (Debearded Seed)	**50 drive 16**	**59.5**
		44 drive 26	**33.9**
		36 drive 36	**19.4**
		26 drive 44	**11.0**
		16 drive 50	**6.3**

SEEDING CHARTS FOR TRUAX FLEX DRILLS FLUTED-FEED ROLL COOL SEASON/GRAIN SEED BOX			
TYPE OF BOX	**TYPE OF SEED**	**EXPOSED FLUTE**	**BULK SEED LB'S/ACRE**
COOL SEASON/GRAIN BOX Original equipment sprockets with gates in full up position. Exposed fluted feed roll measured on inside of cup.	**PUBESCENT WHEATGRASS P-97.5%, G-86%, PLS-84%**	**1-7/8"**	**28.4**
		1"	**16.4**
		1/2"	**8.95**
		1/4"	**3.28**
	BUTTE SIDEOATS GRAMA P-90%, G-73%, PLS-65.5%	**1-7/8"**	**6.5**
		1"	**3.4**
		1/2"	**1.5**
	LODORM OATS	**1-7/8"**	**38.0**
		1"	**21.0**
		1/2"	**11.4**
		1/4"	**4.8**
	WHEAT	**1-7/8"**	**276.5**
		1"	**161.9**
		1/2"	**78.3**
		1/4"	**42.5**
	SOYBEANS Move all cup levers to the middle notch setting for medium to small soybeans. Use the lowest notch setting for large soybeans.	**1-7/8"**	**460.1**
		1"	**227.5**
		1/2"	**99.3**
		1/4"	**47.1**
	SMOOTH BROMEGRASS	**1-7/8"**	**121.6**
		1"	**71.1**
		1/2"	**36.1**
		1/4"	**16.1**

OUTPUT REDUCTION KIT:

An **Output Reduction Kit** is available for FLEXII model drills manufactured after mid 1996. This kit slows driven sprockets and reduces the seed output from **all** seed boxes by 50%. The **Output Reduction Kit** can only be used with the original clutch sprockets. Select the **Output Reduction Kit** part number for your drill from the following table:

OUTPUT REDUCTION KIT PART NUMBER	FLXII DRILL MODEL
71054	**All end wheel models except FLXII-822**
71056	**End wheel drive model FLXII-822**
710541	**Rear wheel drive models FLXII-812, 816, 818**
710561	**Rear wheel drive model FLXII-822**

Note - Output Reduction Kit is not available for Rear Drive Models FLXII-86 and FLXII-88.

FLUTED FEED ROLLS AND SAW-TOOTHED PICKER WHEELS

Fluted feed rolls and saw-toothed picker wheels meter the seed from the bottom of the seed boxes. The amount of exposed flutes of the cool season/grain and small seed feed rolls controls the amount of seed delivered with each revolution of the seed box shafts. Shift levers on the outside bottoms of these boxes control the amount of exposed flute. A 5/16" wide picker wheel that is controlled by the speed changer meters the large seed box for fluffy, chaffy seed. The faster the RPM of the picker wheel shaft the higher the output of bulk seed. The derailleur is used to change RPM on the FLEXII drills

SEED PASSAGEWAY

Seed passageways for all boxes should be cleaned of cobwebs, etc. at the beginning of the season and checked periodically during use. Both the fluffy box and the cool season grain box use convoluted rubber hoses that are subject to plugging from small stems and chaff getting caught in the convolutions. Care must be taken when planting trashy, fluffy seed to watch for plugging of the seed tubes.

Generally, if plugging occurs when planting fluffy seed, it may be prevented by stepping the RPM of the speed changer down several notches. This will reduce the seeding rate. Before proceeding to drill after a plug, be sure to clean all debris from the seed passageway down to and including the furrow opener.

CAUSES OF PLUGGING

Backing the drill up with the planters down in the working position may cause a plug to occur. **DO NOT BACK THE DRILL UP WHEN THE OPENERS ARE IN THE PLANTING POSITION.** Plugging will also occur when a hose is kinked for a period of time and then straightens (which allows a slug of seed down the seed tube all at once).

Generally, hand collected seed must be cleaned before planting through a double disc drill. A broadcast planter such as the Truax Trillion, Pull Type Broadcast Seeder, or Seed Slinger can plant extremely dirty seed.

Sun and heat will at times collapse seed tubes and thereby cause plugging.

OPERATING SPEED

Operate the drill at a ground speed of 4-5 mph. Some field conditions may allow 5-7 mph ground speed. The field conditions and speed of operations may affect flow of the seed through the drill and seed to soil contact. It is important to re-check seeding rates and seed placement at operating speed. Small, hard seeds flow easily through the small seed box, permitting faster speeds, but do not exceed 6 mph. **Seeds tend to be "tossed" out of the furrow when the drill is operated too fast.** When no-tilling, reduce the ground speed of the drill by 1/3.

DRILL SEEDING CAPACITY

The theoretical field capacity for a drill can be estimated with the following formula:

$$\frac{\text{Drill Width (feet)} \times \text{Speed (mph)}}{8.25} = \text{Acres per Hour}$$

The actual field efficiency or amount of fieldwork accomplished is somewhat less than this theoretical calculated rate due to turns at the end of the fields, time spent filling seed boxes, other down time, etc. Field efficiency may be between 65% and 80%. For estimating purposes use the lower end (65%) for small fields, low quality seed, steep terrain, etc. and the higher end (80%) for larger fields, high quality seed, leveler fields, etc.

THREE-POINT HITCHES

The three-point hitch feature is standard on the FLXII-86, FLXII-88, and FLXII-812 drills. Use Category #3 pins. **DO NOT** move a drill that is larger than the lifting capacity of the tractor.

After attaching the hitch to the tractor, adjust the center link on the tractor until the drill is as level as possible for planting. No-till penetration is controlled in part by adjustment of the center link.

NO-TILL

CONTROL OF PENETRATION:

No-tills on all FLEXII Drills are attached to the main frame of the drill.

Remember to run the no-till blades only deep enough to cut the surface residue and scratch the soil surface.

DO NOT dig a furrow with the no-till blades.

Park the drill on a level site, with the drill wheels on boards equal to the depth desired for the no-till blades to penetrate. Lower the planting units to the ground surface. Check to ensure that all no-till blades are touching the ground surface with a similar contact point and make adjustments as needed.

No-till assemblies must be positioned so that the double disc assembly tracks behind and plants in the newly created seed slot.

24 WAVE CASTER STYLE ADJUSTMIENT (24 Wave, 18-1/2" Blade is Standard After 01-01-04):

Loosen the U-bolt nuts on the 1-1/2" **shanks** (part #42201X1) of the torsion knuckles and allow the no-till blades to contact the ground. Retighten the U-bolt nuts. The collars on each shank have a "knob" on them, which fits into a recess in the **torsion knuckle base** (part #42203, 422033, and 422034) that controls the swing of the assembly.

Before tightening the collars, be sure the assemblies **will not** swing in such a way as to contact the main frame structure when in use. Adjustment can be made by rotating the 1-1/2" shank before tightening the U-bolt nuts.

TRASH PLOW ADJUSTMENT: (1/2" x 3" spring steel shanks with cast clamp plates)

The 1/2" x 3" spring **steel shanks** (part #52201X2) can be easily adjusted by loosening up the (4) 5/8" **nuts** (part #N58-FN) on each assembly and move the shanks up or down and left or right to equalize their position. Remember to tighten the nuts in the same sequence on each assembly.

TONGUE ADJUSTMENT:

Install the tongue using the set of holes in the main frame that allows the drill to be in its most level position.

Install the tongue clevis to allow the drill frame to be in a near level position when the drill is attached to the tractor and is in the planting position.

The leveling spring assembly on the tongue is the means to fine-tune the drill's no-till penetration. Adjustment is achieved by turning the upper and lower sets of nuts. When both the upper and lower sets of nuts are turned down, towards the tongue, the front of the drill will raise. This lessens the amount of penetration. When the upper and lower sets of nuts are turned upward toward the drill the front of the drill will lower. This results in greater penetration. **See Figure 30-2.**

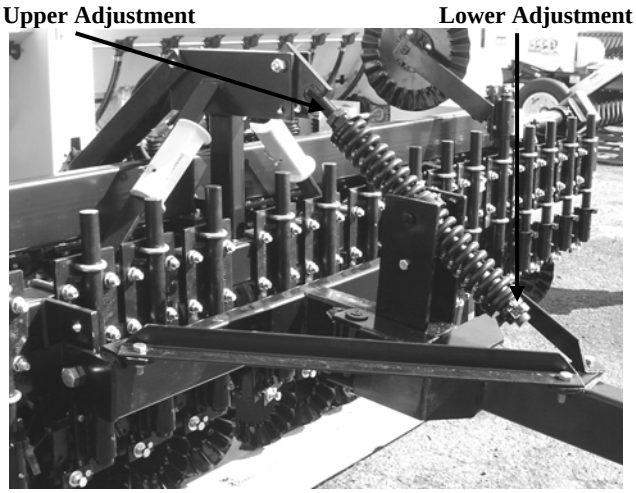


FIGURE 30-2

The leveling spring assembly serves three functions:

1) The drill can be leveled so that the no-till coulters, double discs and press wheels are in the same plane. **On some tractors, particularly smaller models, it may be necessary to position the leveling spring in the bottom hole of the clevis on the main frame.**

2) Adjusting the leveling spring can control critical penetration of the no-till units. Refer to adjustment procedure.

3) The spring assembly controls flexing action of the drill. If the springs are tightly compressed by the adjusting nuts, then there will be less flexing as the unit moves over rough sites and the no-till units (if used) will tend to cut in more. If the springs are loose and the adjusting nuts are tight, then the drill will tend to float over the rough areas. After getting correct penetration, back the top set of nuts off 2 turns, this will allow for more flexing.

REAR DRIVE - TONGUE HYDRAULIC CYLINDER:

Rear Drive drills require a hydraulic cylinder on the tongue in place of the spring leveler assembly to assist in raising the drill for transport. When the transport wheels are lowered for travel on the rear drive drill, the front of the drill tends to "nose" down and contact the ground. Therefore, an additional hydraulic cylinder is installed on the tongue to fold and raise the front of the drill up sufficiently to transport the drill without ground interference. This cylinder is not a rephasing style cylinder and requires a separate hookup with the tractor hydraulics. Cylinder stops on this cylinder are a good idea to help return the drill to the same position each time that you go from transport to the planting position.

ACRE METERS

NON-RESETTABLE, HUB STYLE, ACRE METER:

This acre meter is calibrated and sealed with the sprocket combination on the face of the meter. Field change is not possible. If sprockets are field changed, calculate the ratio between actual area covered and the reading on the counter and use this **"factor"** to determine acreage readings in the future. Changing tire sizes from the standard rib implement tire will affect the acre meter reading.

Using the Output Reduction feature will result in the acre meter reading 1/2 the actual acres planted. When using the Output Reduction feature the acre meter reading times 2 is the actual acres planted.

CAUTION

ACRE METER READING IS REDUCED:

1) WHEN CLUTCH SPROCKET IS NOT 30 TOOTH

*** 2) WHEN OUTPUT REDUCTION FEATURE IS IN USE:**

DIGITAL ACRE METER:

The Danaher acre meter is a "State of the art" meter which is field programmable. Your Truax drill with the digital acre meter option has already been programmed to the specific specifications of your drill. However, should the need arise to reprogram the meter due to changes in seed rates or tires, the following is a guide to help you arrive at the programmed number which is the amount of revolutions the clutch shaft will rotate when planting one acre.

Step 1: Determine the circumference (in feet) of the drive wheel

Measure the diameter (D) of the drive wheel in inches of your drill. Enter this number into the formula for the circumference (C) $C = (3.14X D)/12$

Example: for a 29" wheel diameter

$C=(3.14X 29)/12$ which equals 7.588 ft

Step 2: Determine the distance (in feet) your drill needs to travel to plant one acre

To determine this distance look at the table below

Drill Model	Planting width	Distance drill needs to travel to plant one acre
FLXII -86	4.0 FT	10,890 FT
FLXII -88	5.3 FT	8,218.868 FT
FLXII -812	8.0 FT	5,445 FT
FLXII-816	10.7 FT	4,071.028 FT
FLXII-818	12.0 FT	3,630 FT
FLXII-822	14.7 FT	2,963.265 FT
OTG-7508	5.0 FT	8,712 FT
OTG-7512	7.5 FT	5,808 FT
OTG-7516	10.0 FT	4,356 FT
OTG-7518	11.25 FT	3,872 FT
OTG-7522	13.75 FT	3,168 FT
TR-96	8.0 FT	5,445 FT
TR-120	10.0 FT	4,356 FT
TR-144	12.0 FT	3,630 FT

Note: The distance drill needs to travel to plant one acre is determined by taking the square feet in one acre (43,560 sq ft) and dividing it by the planting width.

Example: For FLXII -88 model

Distance to cover one acre = 43,560 sq ft divided by 5.3 feet

Which equals 8,218.868 feet

Step 3: Determine the number of revolutions the drive wheel will rotate when planting one acre.

To determine this number, take the distance drill needs to travel to cover one acre from the table above and divide it by the circumference (C) of the drive wheel (determined from step 1)

Example: For FLXII -88 model (with 29” drive wheel)

The number of drive wheel revolutions in one acre= 8,218.868 feet divided by the circumference 7.588 feet which equals 1,083.14 revolutions

Step 4: Determine the number of revolutions the clutch shaft will rotate when planting one acre.

From the table below determine the decimal fraction number of your drill. Take this number and multiply it by the number of revolutions the drive wheel rotates when planting one acre (determined from step 3).

Drill Model	Decimal fraction number	Sprockets that determine decimal fraction number
FLXII MODELS	0.52	26 tooth sprocket at drive wheel drives 30 tooth sprocket located on the outside of the leg shaft- on same leg shaft there is an 18 tooth sprocket located towards the inside of drill driving a 30 tooth sprocket on clutch 26/30 x 18/30= 0.52
OTG MODELS	0.33333333	26 tooth sprocket at drive wheel drives another 26 tooth sprocket located just above it on the drive shaft- on the other end of the drive shaft is a 18 tooth sprocket driving a 54 tooth sprocket located on the clutch 26/26 x 18/54= 0.333333333
TRILLION MODELS	0.5	15 tooth sprocket located at the roller drives a 30 tooth sprocket located towards the front of the drill -on same shaft as 30 tooth sprocket is an 18 tooth sprocket driving another 18 tooth sprocket located at the clutch 15/30 x 18/18=0.5

Example: For FLXII -88 model

Number of revolutions the clutch shaft will rotate when planting one acre= 0.52(from table above) x1,083.14 (number of drive wheel revolutions from step 3) which equals 563.23

The number of revolutions of the clutch shaft per one acre of planting is the number to program into the digital acre meter (rounded to the nearest tenth which is 563.2)

If the **Output Reduction Kit** was taken as an option for your drill then reduce the number of revolutions of the clutch shaft per one acre of planting by half. To determine if your drill was equipped with an output reduction kit, **one** of the following equipment configurations would have been installed:

Configuration #1- There would be a larger sprocket, either a 54 or 60 tooth, replacing the OEM(Original Equipment Manufacturer) 30 tooth sprocket on the clutch.

Configuration #2- There would be a jackshaft installed in front of the clutch shaft that has a double 18/36 tooth sprocket which is driven by a double 18 tooth sprocket on the leg shaft. Note: If the double 18 tooth sprocket on the leg shaft is driving the 36 tooth sprocket the drill is seeding at half the rate, hence output reduction, but if the double 18 sprocket on the leg shaft is driving the 18 tooth sprocket the drill is seeding at the standard rate (no output reduction).

Example : For FLXII -88 model

Take the number 563.23 and reduce by half which equals 281.62 (to the nearest tenth 281.6)

Follow the instructions from the Danaher digital acre meter info sheet to program meter

MAINTENANCE & SERVICE

PROPER MAINTENANCE & SERVICE

Proper maintenance and service of the drill will save time and increase the life of the drill.

Drill Model FLXII-822 is driven from both ends of the machine. In this manual the term "Non-Typical" references the left side of the drill when viewed from the back.

SEED BOXES AND LID HINGES

Check seed box lid hinges frequently for accumulation of dirt and debris. Clean as needed and apply an LPS silicone lubricant, WD-40, or any equivalent lubricant to the hinges to keep them operating freely. Replacement brass hinge pins (part #1038HP) and two 1/16" x 1/2" cotter pins (part #CP116-.5) are available.

The box integrity including welds and bolted assemblies must be inspected and maintained. All seed, debris (such as seed sacks), and unused material must be removed before transport and storage.

DO NOT use any Truax equipment with the lids of the seed boxes open.

LARGE (FLUFFY) SEED BOX

Problems caused by shaft interference between the **picker wheel shaft** (part #2003) and the **transitions** (part #1033) can be repaired by loosening **bolts** (part #B38-.750) that hold the box to the end plates and slightly rotate the box. The bearings holding the picker wheel shaft can also be loosened and the shaft can be moved slightly. The center bearing of the picker wheel shaft is held to the fluffy box bottom by a **bearing support bracket** (part #10316) that can be loosened and moved for increased shaft clearance. Also, each transition can be moved in either direction.

When removing or adjusting the **picker wheels**, (part #2002) remove the set screws entirely, as they tend to screw themselves in and tighten up again during shaft removal. Use a plastic or lead hammer when removing the shafts from the drill so the shaft ends do not become marred.

SMALL (LEGUME) SEED BOX

Irregular seeding rates can be corrected by adjusting the individual cups. After loosening the cup mounting bolts it is possible to move each cup about 1/8" and thereby change the cup output in relation to the others. If a plastic seed cup is broken, a field repair can be made with **"super glue"** (if all the parts can be found). All plastic seed tubes **should** be removed annually and cleaned thoroughly.

If the seed cup shaft tends to "walk" left or right when in use, the cause is usually wear of the shifter spool. This problem can be corrected by installing a thin **spacer** (part #MB 12-.15 or JD #N160437) over the 3/8" shaft between the roll pins and the shifter spool.

COOL SEASON SEED BOX

On a daily basis when planting dense seed that tends to settle and compact, before starting to drill it is a good idea to turn the feed shaft with a wrench in the direction it normally turns. If it turns hard, remove the drive chain to the box and apply a dry silicone based lubricant to each cup while turning feed shaft with a wrench.

When moving the shifter to a new position when the box is filled with seed, it may be necessary to turn the feed shaft with a 5/8" wrench while moving the lever.

COOL SEASON SEED BOX (Con't)

If the feed shaft continues to **"walk"** after checking the above items, then check each seed cup. Loosen the two retaining bolts on each cup and tap (lightly) with a plastic hammer to check the alignment. Retighten and proceed to the next one.

Check the **shifter bearing** (part #M60862) for excess endplay. When excessive endplay is present, install a new **thrust washer kit** (part #TM60820) on drills manufactured between 1975 and mid 1998. Drills manufactured after mid 1998 have a Delrin® **thrust washer** (part #TM60826) and **shifter bearing** (part #M608621). This helps prevent the **5/8" shaft** (part #3103) from "walking". On drills manufactured after mid 1998 replace worn parts as needed. **See Figure 40-1** for an illustration of the assembly.

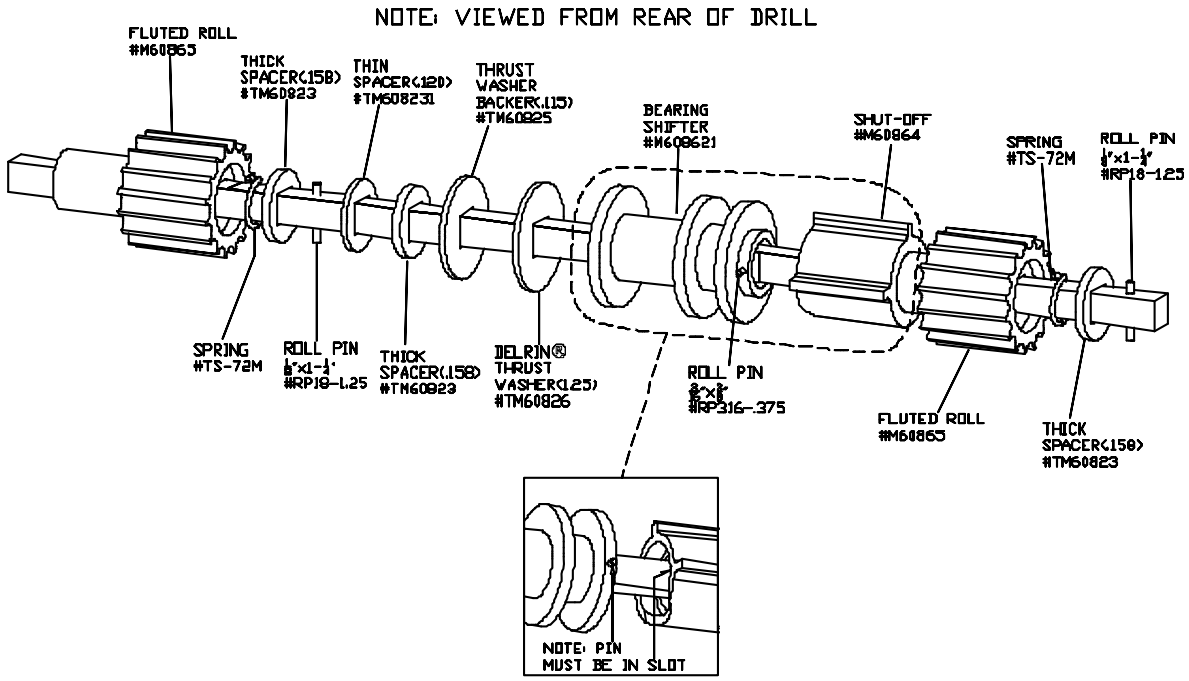


FIGURE 40-1

Drills manufactured after February 1994 have a heavy-duty **shifter** (part #3205). When installing this shifter on older drills it is necessary to move the **shifter quad** (part #3229) on the seed box.

COOL SEASON FLUTED FEED CUPS

The feed gate latch on the right side of the cool season cup serves as an adjustment for seed size and as a means to clean out the cup. The setting may need to be changed when drilling larger seeds (such as soybeans) to prevent them from crushing. Fluted Roll (After Serial# 2925 use part # 731865) Shut-off (After serial # 2925 use part # 731864). A repair kit (AN161511)is available to repair broken latch or gate.

SERVICING THE COOL SEASON FLUTED FEED CUPS

It may be necessary to service the feed cups whenever the shaft becomes difficult to shift, the rolling torque is too high, or when one or more of the cups have been removed. **See Figure 40-2 for diagram of part identified below.**

1) Open the **feed gate levers**.

2) Start at the end of the drill near the shifter lever and loosen the bolts holding the **seed cups** to the bottom of the box.

3) Move the **seed cup** until the end of the **fluted feed roll** is flush with the inside surface of the seed retainer ring on the lower radius of the seed reservoir.

4) Reset all the **seed cups** in the same manner (beginning with the cups next to the shifter) working alternately in both directions.

5) Tighten the bolts on each **seed cup** as soon as resetting is complete.

   Note: The cup retaining bolts require a **washer** (part #W14) between the bolt head and the seed cup.

6) Recheck the adjustment by moving the feed shaft shifter back and forth. Recheck all **fluted feed rolls** to insure that they are flush at the lower radius of each seed cup.(After Serial#2925 use part # 731865). Shut-off (After Serial#2925 use part # 731864). Seed cup (After Serial#2925 use part # 731003A).
7) Close the **feed gates** to the desired setting, making sure that all gates are in identical positions.

Note: During installation, if the cup retaining bolts pull through the plastic cup, it will be necessary to place a **washer** (part #W14) on the bolt before installation.

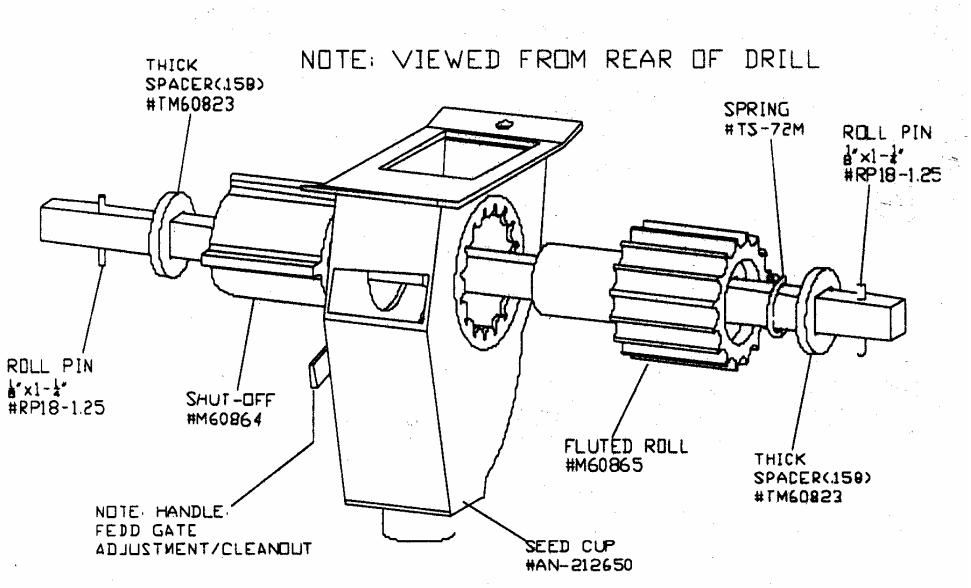


Figure 40-2

SERVICING THE SCRAPERS

Disc openers utilize three sets of scrapers on the disc blades and depth bands to prevent a buildup of soil that will affect disc operation and proper seed placement. For effective operation of the scrapers inspect frequently and adjust or repair as needed.

- The **inside scraper assembly** (part #AM11828) is a kit attached to the **boot (shoe) casting** (part #0888 - black) with a square headed full thread 1/4" x 2" **bolt** (part #B14-2sq.h) and self-locking **nut** (part #N14-FNL). Scrapers have a **right-hand** (part #50919A) and a **left-hand** (part #50919B) designation and are joined by a **clip** (part #50919D). Place the bolt through the boot casting. Place the clip, with scrapers attached, on the bolt; followed by a **concave plastic wedge** (part #JDN213158); followed by a "U" shaped flat **metal spring** (part #JDN213159); followed by a **convex plastic wedge** (part #JDN213160); followed by the self-locking nut. Tighten the nut leaving one thread exposed. **See Page 90-20, Item #58 for a diagram.**

  Inside scrapers must be positioned prior to installing the disc blades.

- The **outside scraper assembly** is attached to the boot (shoe) casting. There is a groove in the casting where the upper flange of the scraper sits. When facing the drill from the back, the 5/16" x 4 1/2" carriage **bolt** (part #CB516-4.5) is inserted through the **right side scraper**; through the **boot (shoe) casting** (part #0888 - black); through the **left side scraper**; through a 5/16" flat **washer** (part #W516); and through a **compression spring** (part #50919). A 5/16" flanged self-locking **nut** (part #N516-FNL) holds the assembly in place. Adjust the tension so the scrapers clean the disc blades (usually tighten so that one thread is exposed).

  The depth bands, outside scraper assembly, right-hand scrapers, and left-hand scrapers each have a unique part number. Refer to the chart below to determine the correct part numbers.

DEPTH BAND SIZE AND (PART #)	EXPOSED BLADE EDGE	PLANTING DEPTH	SCRAPER ASSEMBLY #	RIGHT-HAND SCRAPER #	LEFT-HAND SCRAPER #
9 1/2" (#1097F)*	2"	1"	10845FA	10845F-RH	10845F-LH
10 1/2" (#1097D)	1 1/2'	3/4"	10845DA	10845D-RH	10845D-LH
11 1/2" (#1097)*	1"	1/2"	10845A	10845	10845
12" (#1097C)*	3/4"	3/8"	10845CA	10845C-RH	10845C-LH
12 1/2" (# 1097A)*	1/2"	1/4"	10845BA	10845B-RH	10845B-LH

*** With bearing case (part # M1677685) and bearing (part #JD85205) or bearing and case (part #AM1128675) depth band requires a center hole diameter of 3-3/4".**

IMPORTANT: The ability of the double disc blades to penetrate is affected by mud build-up on the blades. **Keep outside scrapers in good working condition.**

- The **depth band scraper assembly** (part #10995A) is attached to the **boot (shoe) casting** (part #0888-black) with a 1/2" x 3" **bolt with welded collar** (part #1201); and a self-locking **nut** (part #N12-CL). **Scrapers** (part #10995 & part #109953) are attached to the assembly with 5/16" x 1-1/4" **bolts** (part #B516-1.25), 5/16" **washers** (part #W516), and self-locking flanged **nuts** (part #516-FNL). After 2/02 standard equipment is the **plastic scraper** (part #10995) with a **hardened metal scraper** (part #109953) as a backing to stiffen the depth band scraper. The scraper blades can be adjusted to the depth band as the scrapers wear. Scraper blades should touch the depth band without applying pressure that will prevent the disc blade from turning. Depth band scrapers should be checked regularly and adjusted or replaced as needed.

IMPORTANT: Bent depth bands affect scraper effectiveness and life. Straighten or replace any bent depth bands.

SERVICING THE DISC BLADES

It is necessary to remove disc blades to perform several maintenance functions as well as replacing and greasing bearings in the double disc blades. Use the following procedure for removing or re-assembling disc blades:

1) Remove the outside scrapers by loosening the nut on the 5/16"x 4-1/2" carriage bolt. Remove the compression spring and flat washer. Badly worn scrapers need to be replaced. There are right and left side scrapers for all depth bands except for scrapers on 11-1/2" depth bands. The left and right side scrapers on the 11-1/2" depth band are interchangeable. The slant edge, or cut side, is placed on the depth band face. When reassembling the outside scraper, tighten the 5/16" flanged self locking nut until one thread is exposed.

2) Remove the depth band scrapers by loosening the 5/16" nuts on each scraper. Replace scrapers if existing pieces are badly worn.

3) Remove the disc blades. When facing the drill from the backside, the **right-hand disc blade 5/8" bolt** (part #K300M) has right-hand threads and the **left-hand disc blade 5/8" bolt** (part #K301M) has left-hand threads. Remove the **dust cap** (part #3095 or #4095) and **spacer** (part #1100 or JD#M15226). **These part numbers are for disc blade assemblies 1998 or later. For part numbers before 1998, see Table on Page 40-6.**

4) Replacing the **blade** (part #K202M or #K202M5).
   - **Blade Part #K202M has a rivet hole spacing of 2-1/2". Blade Part #K202M5 has a rivet hole spacing of 3-1/8".**
   - Remove rivets by grinding off heads on the backside of the blade.
   - The case can be reused if the bearing fits tightly into it. Clean the case and press in a new bearing.
   - Re-rivet the blade, using a press to set all six rivets at once, if possible.

5) When reassembling use Loctite on the disc blade bolt threads. Wipe the threads clean of all grease or oil, as Loctite **will not** adhere properly when grease is present. Place the **5/8" bolt** (part #K300M and K301M) through the **dust cap** (part #3095 or #4095), through the **disc blade** (part #K202M or #K202M5), through the **spacer** (part #1100 or JD#M15226), into the threaded **boot (shoe**) **casting** (part #0888-Black). Torque the 5/8" bolts to 125 foot pounds.

6) After installing the blades, the tips of disc blades should uniformly touch as the blades are rotated. Add or remove **spacers** (part #1100) as necessary. You should be able to slip two sheets of paper (20-pound weight) between the blades. Any wider gap than that is too much and you need to remove **spacers** (part #1100).

7) Reassemble the inside and outside disc blade scrapers. When installing **inside scraper assembly** (part #AM11828), they must be positioned prior to installing disc blades.

8) Reassemble the depth band scrapers.

CAUTION: DO NOT hold edge of disc blade with your hand as serious injury may result! It is a good idea to hold onto the blade with a vice grip or similar tool and wear gloves.

IMPORTANT: Disc blades should just make contact at the closest point. Add or remove **spacers** (part #1100 or JD#M15226) as needed.

SERVICING THE DISC BLADES (Con't)

NOTE: The **blade, case, and bearing assembly** and individual components are listed below with associated part numbers. These assemblies do not include the depth band.

The correct assembly is determined by the method the dust cap is attached to the disc blade. Disc assemblies marketed before 1998 have a force style dust cap. On assemblies marketed in 1998 and later the dust cap is held in place by the RH or LH threaded bolt passing through the dust cap.

ITEM	BEFORE 1998	1998 TO 6/30/2006	07/01/2006 OR LATER
Assembly-Blade, Case, Bearing	KK-254M5	KK-254M53	KK-254M55
Boot Seal	M17520	None	None
Spacer	1100	1100	1100
Blade	K202M	K202M	K202M5
Bearing	JD8573	JD85204*	JD85205
Spacer	JD8573A	None	None
Case	M167768	M1677683	M1677685
Rivets	16H630 (1/4" x 7/16")	16H630 (1/4" x 7/16")	16H630 (1/4" x 7/16")
Bolt – RH Thread	K200M**	K300M**	K300M**
Bolt – LH Thread	K201M**	K301M**	K301M**
Dust Cap	2095**	3095**	4095**

*** Truax Part #JD85204 is the same as John Deere Part #AA21480**
**** Part required but not included with assembly KK-254M5, KK254M53 or KK254M55**

NOTE: The **blade, depth band, case and bearing** are available as an assembly. This assembly does not include the **bolt** (part #K300M or K301M) or the **dust cap** (part #3095 or #4095). **See table below for part # when ordering unit assembly including depth band:**

DEPTH BAND SIZE*	PART # FOR (BLADE, DEPTH BAND, CASE, AND BEARING)
11 1/2" – Before 10/98	12545
11 1/2" – After 10/98	125453
12" –Before 10/98	12545C
12" – After 10/98	12545C3
12 1/2"	12545A3

*** All depth bands for bearing cases after 07/01/2006 require a center hole of 3-3/4" Diameter.**

IMPORTANT: Warping of disc blades may be caused by mud being forced behind the depth bands. This may be prevented by proper scraper alignment. On production after spring of 1996, scraper assembly will clean both the blades and the horizontal depth bands.

NOTE: Production after the spring of 1993 has a **locking spring washer** (part #W38LS) pressed onto the **depth band retaining bolts** (part #B38-.75) which prevents the bolts from dropping out of place when the depth band is removed.

NOTE: Production after midsummer of 1993 uses an **"E-Z" OFF Depth Band** (part #1097, #1097A, #1097C, or #1097F) that is keyed to be placed over the loosened **depth band retaining bolts** (part #B38-.75) and turned into position before tightening the bolts. This allows easier replacement of depth bands.

SPEED CHANGER AND CLUTCH ASSEMBLY

The derailleur style speed changer only provides power to the large, fluffy box. Power is passed through it, via the input shaft, to the small box; however, no reduction in speed or output is achieved. The clutch controls the **"go"** or **"no-go"** function for all the boxes on the drill.

The roller clutch assembly can be serviced by loosening the set screw in the **shaft collar** (part #1124) and sliding the clutch hub to the right. If the **bronze bushing** (part #1121) is worn, remove the hub from the shaft and replace the bushing.

When installing a new clutch assembly (after the shaft collar has been aligned and tightened), be sure that the clutch will free wheel when the dog lever is held down. If it catches and will not free wheel, loosen the shaft collar, slide it to the right, and check for interference. Several things may have occurred:

1) A bushing may be installed on the 1" shaft between the two halves of the clutch. A different thickness may be tried, such as .050", .030" to provide clearance between the **"bosses"** on the clutch housing and the dog lever.

2) The three **"bosses"** in the hub may be interfering with the dog roller. Slight grinding may be required on the face of the three **"bosses".** If problems persist, apply a small amount of paint or chalk to the inside of the clutch assembly to determine from the wear pattern where the interference is occurring.

3) If any shaft shifts, it can be retained by removing a set screw from each shaft bearing, drilling a 1/8" detent (using the set screw hole as a guide), and reinstalling the set screws. Apply blue or green color Loctite to the set screws.

4) If either speed changer **shaft bearing bracket** (part #103626) bends or breaks, it may be caused by overloading of seed boxes. Some seed will need to be removed from the seed boxes. Also, debris left in the boxes will cause problems. Additional torque created by dense, heavy seed may be reduced by increasing the size of the driven sprockets on the box ends.

   Drills manufactured after 1996 have an additional **bearing support** (part #10316) to the right of the clutch when facing the drill. This prevents bending part #103626. This bearing support will retrofit drills manufactured after 1988. **See Figure 40-3.**

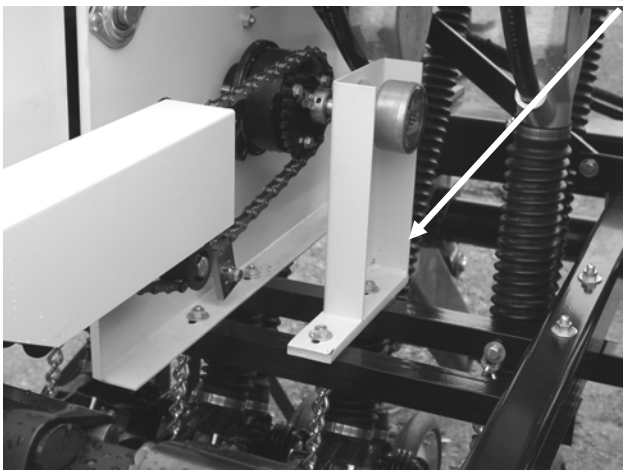


FIGURE 40-3

CLUTCH SPROCKET

Large adjustments in seeding rates can be achieved by changing the size of the clutch sprocket. This **affects the seeding rate from all** of the seed boxes. The larger the sprocket on the clutch, the lower the seed rate. The smaller the sprocket on the clutch, the higher the seeding rate. See table below for alternative sprockets and associated part number.

SPROCKET SIZE	PART NUMBER
30 Tooth (Standard)	1044
48 Tooth	1144E
54 Tooth**	1144A
60 Tooth**	1144B

When the Output Reduction Kit is installed, the 54 and 60 tooth sprockets will not fit.

CLUTCH TRIPPER

The **clutch tripper assembly** (part #1118) is attached to and moved by the **drive leg** (part #1037LDX). The tripper assembly serves to disengage the clutch when turning within the field or during transport. When the drive leg is lowered the clutch tripper rod assembly will move the clutch trip engager into contact with the clutch dog causing the clutch to disengage. **To avoid excessive wear in the clutch hub (part #1120), always lower the wheels (raise the drill) to the fullest extent possible when turning within the field or when transporting the drill.**

Before adjusting the tripper, it is important to check the rephasing cylinder to insure that it is moving freely in the **sliding float mount** (part #1037FEX). Also, check the spring in the **clutch tripper rod assembly** (part #1118X) to insure that it is compressing. The spring in the rod assembly acts as a safety, in case the engager is misaligned and contacts the clutch dog at the wrong point.

The length of the rod assembly from center to center of yoke ends measures 26 inches. With the drive leg hydraulic cylinder retracted and all free travel of the float removed (full up), the clutch tripper rod should be mounted to the **clutch tripper collar** (part #1037CLX1 – all models except FLXII-822). Rotate the tripper collar clockwise, from the drive end of the drill, and tighten the collar bolt. At this point the **clutch trip engager** (part #1119BBX) should be away from the clutch dog.

With the drive leg hydraulic cylinder extended, the **clutch trip engager** (part #1118BBX) should be within 1/16" to 1/8" of the **clutch housing with dog trip** (part #1119). The two pieces should not touch to avoid wear of the housing, but must be close enough to fully engage the dog trip.

In the event that the clutch tripper will not rotate enough before contacting the **bearing mount** (part #1037BHX), it will be necessary to grind off the interference.

CLUTCH TRIPPER (Con't)

On **<u>end wheel drive drills</u>** the **clutch tripper rod assembly** (part #1118X) attaches to the drive leg at the front of the drill and near the top of the **clutch trip engager** (part #1118BBX). The pivot point for the clutch trip engager is on the bottom. **See Figure 40-4.**

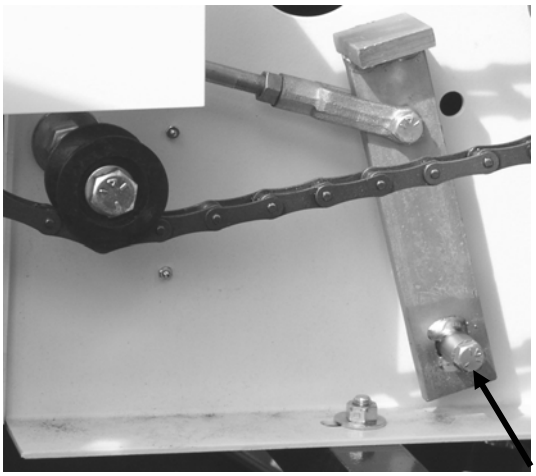


FIGURE 40-4

On **<u>rear drive drills</u>** the **clutch tripper rod assembly** (part #1118X) attaches to the drive leg at the back of the drill and to the bottom of the **clutch trip engager** (part #1118BBX1). The pivot point for the clutch trip engager is in the center. **See Figure 40-5.**

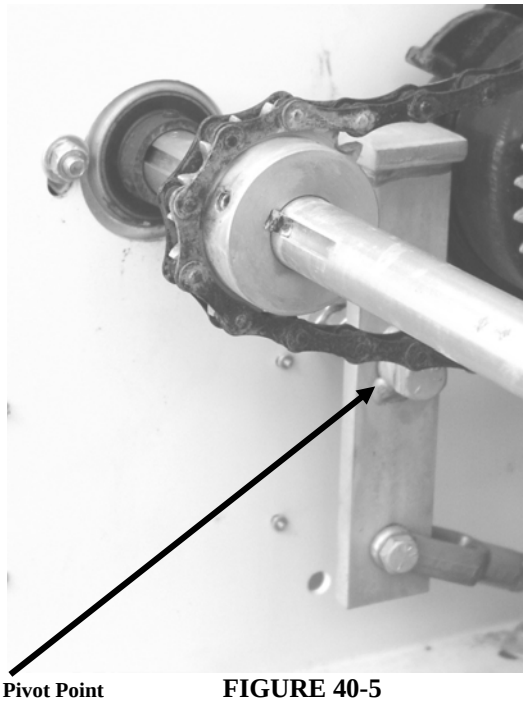


FIGURE 40-5

IDLER ASSEMBLIES

NOTE: See **"Idler Assemblies"** located in the parts catalog for additional information.

The idler assemblies put tension on the chains to prevent them from "walking" off the sprockets. All idlers, using plastic rolls, are installed on the slack side of the chain. The following procedure should be followed when servicing idlers:

1) Before servicing chain idlers, be sure that the sprockets are in alignment and that the chain runs freely.

2) Raise the drive wheel from the ground and block the other drill wheel and tongue.

3) Start with the end wheel chain and check to see whether the chain is installed per decal. The bottom of the chain is the tight, non-slack, side and it must be installed as per the decal. The two idlers provide chain tension and control interference with the leg and float mount bolts. Without proper adjustment, the chains may walk off the sprockets and/or cause the sprocket shear pins to break. Ensure that the 1/4" chain guard bolts do not interfere with end wheel chain.

4) The chain from the sprocket on the rock shaft to the clutch requires two idlers to maintain proper tension. These two idlers must be installed at the same time as the chain guard in order to get proper tension on the chain. See **Idler Decal** (part #1046C10), mounted on **clutch support** (part #103625) for proper positioning of these idlers.

5) The idler for the fluffy seed box agitator and picker wheel **must be positioned on the slack side in such a way as to allow the 3/8" bolt holding the derailleur idler assembly** (part #15-7116A) **to be installed in the end plate** (part #103625) and still allow clearance for the chain. **See Figure 40-6 for chain and idler orientation.**

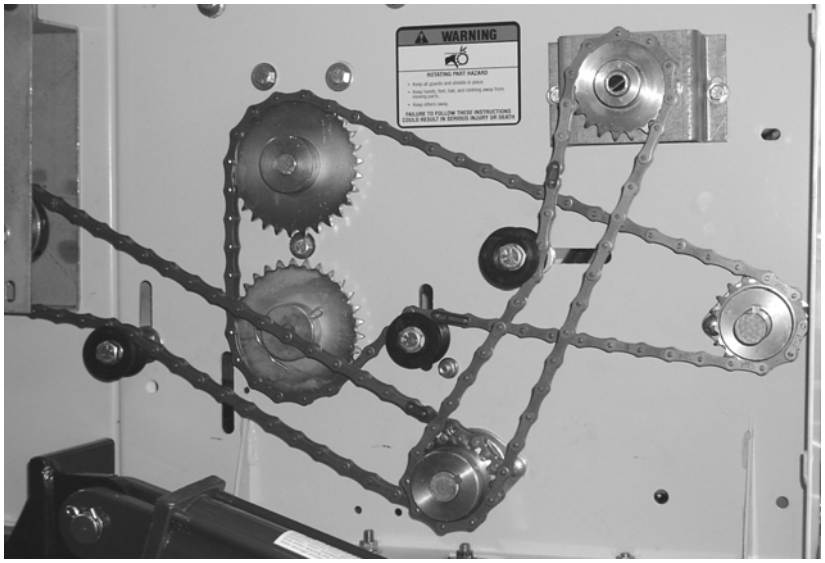


FIGURE 40-6

6) The two **idler brackets** (part #3237X) on the leg tend to bend when under heavy load; therefore an additional support has been added and can be used to retrofit drills manufactured after 1988.

MAIN FRAME

IMPORTANT: Clean drain holes in the main frame at least annually. Any water in the frame tubes may cause bulges to occur if it freezes. Drain holes are located on the bottom corners of the main frame and the bottom of all cross members.

1) The main frame has few moving parts; therefore it requires little maintenance.

2) The **flex torsion knuckles** are not meant to be field serviced; however, they can be adjusted to retain equal torsion forces and change alignment.

3) Down pressure on the torsion knuckles can be adjusted on the planters by loosening the four 1/2" **bolts** (part #B12-1.5) that hold the **lift bracket support** (part #10321) to the **knuckle casting** (part #10323). Loosen **jam nut** (Part #JN12) on **jack bolt** (part #JB12-2) and turn bolt to force part #10321 down. Place the lift bracket tight against the jack bolt. Retighten jam nuts and four bolts (part #B12-1.5). Use two 3/4" open-end wrenches.

4) Alignment can be changed by loosening the four **bolts** (part #B38-1.25) that hold the **clamp half** (part #10322) to the **knuckle casting** (part #103211). If possible, do not remove the nuts completely before again attempting to move the knuckle left or right. If nuts are completely removed or when installing new **rubber cords** (part #42202X) it may be necessary to use a large "C" clamp to bring the parts together. Install back bolts first, pull the front together with "C" clamp and install front ones. A threaded rod 3/8" diameter or smaller may be used to pull it together and then change to the standard bolts. Be sure the **rubber cords** (part #42202X) are centered on the four sides of the rock shaft as the **clamp half** (part #10322) and the **knuckle casting** (part #103211) are drawn together.

NOTE: Drill production prior to spring of 2002 used a **planter support chain** (part #8955XA) that may become tangled in use. Production in 2002 and later uses a twisted link **planter support chain** (part #8955XA). This new chain will retrofit drill models back to 1988.

5) Refer to the **"Clutch Tripper Section"** for information on the adjustment of the clutch tripper assembly.

6) Drill main frames require two rephasing cylinders to raise and lower the drill from planting to transport position. Rear drive drills require a third cylinder on the tongue. A standard 2-1/2" x 8" cylinder is mounted from the tongue to the top of the three-point mount of the drill. Separate hydraulic connections are made to the tractor hydraulics.

7) The drill can be converted to a three-point style from a tongue-style by removing the tongue and installing Category #3 pins. **DO NOT** use the drill in three-point mode unless the tractor is large enough to handle the weight of the drill. See Specifications Section (pages 80-1 through 80-3) for weight of the drill **without seed**. Check your tractor owner's manual for weight capacity of three-point hitch.

8) The **float guide** (part #1037FEX) for the drive end rephasing cylinder may be aligned by several **shims** (part #1037FEX1). Anytime the float guide is serviced; the shims may have to be positioned so that the cylinder end will slide up and down the float guide. Drills manufactured after 1999 have a welded style leg and float guide; therefore no adjustment is necessary. After making any adjustments to the **float guide** (part #1037FEX), be sure that the **clutch trip engager** (part #1118BBX) is within 1/16" to 1/8" of the **clutch housing with dog trip** (part #1119). The two pieces should not touch to avoid wear of the housing, but must be close enough to fully engage the dog trip.

LUBRICATION SCHEDULE & RECOMMENDED LUBRICANTS

Moving parts and bearings on all drills require regular lubrication. For optimum life of the drill it is recommended that synthetic **grease** (such as Kerr-McGee Mystik JT-Truax part #9991) be used every 4 hours on all the zirks.

At points requiring lubrication that do not have a grease zirk, it is recommended that a light lubricant, such as LPS Silicone lubricant be applied on a daily basis.

Sliding surfaces, such as the idler in the speed changer, should have a silicone-based lubricant applied frequently.

LUBRICATION TYPE - QUICK CHECK

PARTS REQUIRING LUBRICATION	TYPE OF LUBRICATION
All Chains	LPS Silicone Lubricant
Feed Rolls	LPS Silicone Lubricant
Press Wheel Bearings	LPS Silicone Lubricant
Idler Bushings	LPS Silicone Lubricant
Clutch Zirk	Synthetic Grease
FLEX Bearing Mount Zirks	Synthetic Grease
Spring Leveler Zirk	Synthetic Grease
No-Till Hub Zirks	Synthetic Grease
No-Till Swivel Mount Zirks	Synthetic Grease
Leading Press Wheel Hub Zirks	Synthetic Grease
Box Hinges	LPS Silicone Lubricant
Bronze Bushings	LPS Silicone Lubricant
Double Disc Seals	Synthetic Grease

REMEMBER: The first rule of good lubrication and maintenance is **common sense!**
Keep it clean and keep it oiled!

It is recommended that lubrication be done immediately after drill usage (while the surfaces are still warm). This will allow the grease to cover the bare metal parts before cooling and condensation has begun to form.

Axles are retained to main frame by 3/8" x 3" bolts and nuts. Check daily to be sure that they are in place and tight.

Check wheel lug nuts periodically to ensure they are tight. Lug nut torque should be 75 to 85 foot lbs each.

LUBRICATION SCHEDULE:

ITEM	SCHEDULE
Chains	Apply LPS Silicone Lubricant, WD-40, or equivalent. At the end of the season, remove the chains and soak them in light oil for storage purposes.
Seed Boxes (all styles)	Check frequently and clean as needed. Apply LPS Silicone Lubricant, WD-40, or an equivalent lubricant to the hinges.
Speed Changer	The derailleur style of speed changer for the fluffy box requires lubrication maintenance. LPS Silicone should be applied to the idler bushing that retains tension on the chain between the two cone sprockets once a day. Also, LPS Silicone should be applied to the derailleur chain and clutch tripper rod pivot points on a daily basis.
Clutch	Grease daily with synthetic grease such as **JT-6 synthetic grease** (part #9991).
Idlers	All idlers have a steel bushing that should be lubricated weekly with a silicone lubricant.
Furrow Openers	On drills built before mid 1998, the **double disc bearings** (part #JD-8573) are sealed; however **seals** (part #M-17520) should be serviced on a regular basis. After removing the disc blades, take the seals from the **boot** (part #0999-yellow or #0888-black) and clean and check for wear. **It is recommended seals be replaced when servicing the bearings.** Place clean seal (cup edge down on a clean surface) and inspect the contact surface of the lip. If the lip contacts the surface uniformly, the seal may be reused. With the cup edge up slip it onto the boot casting and fill the lip of the seal with **JT-6 synthetic grease** (part #9991). Continue to reinstall the double discs. After mid 1998, **disc bearings** (part #JD-85204) do not use a **seal** (part #M-17520).
Press Wheel Bearings	Press wheels do not have a zirk in the **press wheel bearing** (part #1092Al). These should have a silicone lubricant applied several times per day for optimum life of the bearing. The **bearing** (part #1092Al) has been hardened to Rockwell-40 and will have slight wearing if the lubricant is not applied. There will be more wearing on the **axle bolt** (part #B12-4) if it a silicone lubricant is not applied several times per day.
Wheel Bearings	The wheel bearings on all drills use a tapered roller bearing. When servicing these bearings, clean, check for wear, and use synthetic grease, such as **JT-6** (Truax part #9991) or equivalent. Check seals for leaking.
Main Frames	The main frames on all drills have zirk fittings on the four **bearing mounts** (part #1037BHX). They should be greased several times a day.
Lockout Hub	Grease daily with synthetic grease such as **JT-6 synthetic grease** (part #9991).
Spring Leveler Assembly Pivot	The **spring leveler assembly pivot** (part #4027 and #G024-5116) on the tongue of all drills has a zirk that requires daily service.
No-Till	The no-till hubs have a zirk on the back that should be greased daily. Do not over grease as it may cause the seals to be forced out of position. Swivel mounts on the dura-flute knuckle bases have a zirk that should be greased twice a day.

THREE-POINT HITCHES

The **lift pins** (part #2051) should be checked for metal fatigue and looseness before each use. Replace the pins if they show any indication of bending.

SPRING LEVELER

The two sets of double nuts on the spring leveler must be free to tighten against the two springs. Movement of the nuts in one direction will move the front of the drill in the opposite direction. **That is, if both sets of nuts are moved downward then the front of the drill will move upward.**

A bent **spring rod** (part #4217B1) or broken **springs** (part #4217A) must be replaced because they will affect the penetrating force of the drill.

HYDRAULIC CYLINDERS

The hydraulic cylinders on all drill end drive and rear drive wheels are the rephasing type. The cylinder on the drive side (next to the speed changer) is (3-1/4") and the cylinder on the non-drive side (3-1/2"). It is important that any time the cylinders are removed or the hoses disconnected, that the proper procedure be followed when reconnecting them. **After reconnecting the hoses, bleed the air from the system by cycling the system through the tractor hydraulics several times. Do not try to bleed air from the system by loosening fittings.**

The objective is to get both cylinders fully retracted. When cylinders stay in a fully retracted position it will mean there is no air or leaks in the system.

1) First, secure the drill tongue to tractor drawbar and block the wheels (both front and back).

2) After hooking up the hydraulic system, cycle the system so that the wheels of the drill raise and lower until they go up or down together. If this does not happen, it may be caused by either an air bubble in the system, low hydraulic fluid in the system, poor hydraulic connection, or incompatible hydraulic connectors.

3) After checking the hydraulic fluid level, continue to cycle the system. If after a period of time the system does not level out, there may be a problem with the cylinders or the pumping unit. The rephasing cylinders have a bypass point to allow oil to flow to the other side and there may be a stoppage at this bypass. Something as small as a tiny chip of paint may be the cause or there may be a leaking "O" ring or seal. **The hydraulic system is filled with Anti Wear ISO Viscosity 46 hydraulic fluid during manufacture of the drill.**

4) After servicing the cylinders, reconnect them and recycle them until the air within them is removed.

5) Check the hose disconnects for malfunction, or incorrect match with tractor. **See Important Note #1 and Note #2 on page 40-15.**

HYDRAULIC CYLINDERS (Con't)

Bleeding the air from the hydraulic system is one of the most difficult maintenance projects. DO NOT remove fittings or change hoses unless necessary! Only remove fillings or hoses after drill has been lowered to planting position.

If one cylinder does not retract equal to the other, ensure that both cylinder ends are screwed on equally.

Hydraulic hose quick disconnect couplers look similar - they must be an exact matched set to work properly. If there is a problem, it may be necessary to remove both male and female ends from the hoses.

On rear drive drills, if one leg does not fully extend or retract, it will be necessary to remove the cylinder clevis and the spacers from the cylinder rod. Then cycle the hydraulic to remove air from the system.

The removal of spacers allows full retraction of cylinders and will force the air out.

During this procedure, DO NOT disconnect any hydraulic fittings.

HYDRAULIC HOSES

Hydraulic hose part numbers and hose lengths for FLEXII drills are listed below:

HYDRAULIC HOSE		MASTER CYLINDER 3-1/2"	SLAVE CYLINDER 3-1/4"	CYLINDER CROSS OVER	REAR DRIVE TONGUE
Model 86	End Wheel	4222X18 - 18 Ft.	4222X19 - 19 Ft.	4222X8 - 8 Ft.	None
	Rear Drive	4222X14 - 14 Ft.	4222X15 - 15 Ft.	4222X4 - 4 Ft.	Note Below
Model 88	End Wheel	4222X19 - 19 Ft.	4222X20 - 20 Ft.	4222X9 - 9 Ft.	None
	Rear Drive	4222X14 - 14 Ft.	4222X15 - 15 Ft.	4222X5 - 5 Ft.	Note Below
Model 812	End Wheel	4222X20 - 20 Ft.	4222X21 - 21 Ft.	4222X12 - 12 Ft.	None
	Rear Drive	4222X15 - 15 Ft.	4222X16 - 16 Ft.	4222X6 - 6 Ft.	Note Below
	Rear Transport	4222X15 - 15 Ft.	4222X16 - 16 Ft.	4222X6 - 6 Ft.	None
Model 816	End Wheel	4222X21 - 21 Ft.	4222X22 - 22 Ft.	4222X14 - 14 Ft.	None
	Rear Drive	4222X16 - 16 Ft.	4222X17 - 17 Ft.	4222X8 - 8 Ft.	Note Below
	Rear Transport	4222X16 - 16 Ft.	4222X17 - 17 Ft.	4222X8 - 8 Ft.	None
Model 818	End Wheel	4222X21 - 21 Ft.	4222X22 - 22 Ft.	4222X16 - 16 Ft.	None
	Rear Drive	4222X17 - 17 Ft.	4222X18 - 18 Ft.	4222X10 - 10 Ft.	Note Below
	Rear Transport	4222X17 - 17 Ft.	4222X18 - 18 Ft.	4222X10 - 10 Ft.	None
Model 822	End Wheel	4222X21 - 21 Ft.	4222X22 - 22 Ft.	4222X19 - 19 Ft.	None
	Rear Drive	4222X18 - 18 Ft.	4222X19 - 19 Ft.	4222X12 - 12 Ft.	Note Below
	Rear Transport	4222X18 - 18 Ft.	4222X19 - 19 Ft.	4222X12 - 12 Ft.	None

Note: Rear Drive requires both 4222X6 - 6 ft. and 4222X7 - 7 ft. hydraulic hoses for the tongue cylinder.

CHECKING BOLT TORQUE

The table shown below provides the correct values for various bolts and cap screws. Tighten all bolts to the torque specified in the chart unless otherwise noted. Check tightness of bolts periodically, using bolt torque chart as a guide. Replace hardware with same strength bolt.

TORQUE SPECIFICATIONS

BOLT DIAMETER	BOLT TORQUE			
	SAE 5		SAE 8	
	lb-ft	(N.m)	lb-ft	(N.m)
1/4"	9	(12)	12	(17)
5/16"	19	(25)	27	(36)
3/8"	33	(45)	45	(63)
1/2"	80	(110)	115	(155)
5/8"	160	(215)	220	(305)
3/4"	290	(390)	400	(540)
1"	630	(850)	970	(1320)

Torque figures indicated above are valid for non-greased or non-oiled threads and heads unless otherwise specified. Therefore, do not grease or oil bolts or cap screws unless otherwise specified in this manual. When using locking elements, increase torque values by 5%. SAE type for bolts and cap screws are identified by their head markings.

CHAINS

Chains listed below for FLEXII Drills are Industry Standard #2040A.

Chain Name	Chain Part #	Connector Link(s)	Connector Link(s) Part #
Chains Common To Both End Wheel And Rear Wheel Drive Drills			
Drive Chain on Leg (77 Links)	2040XA	Offset and Full Links	2040L, 2040L1
Speed Changer (39 Links)	2040D	Offset and Full Links	2040L, 2040L1
Small Seed Box (37 Links)	2040E	Half Link	2040L2
Picker Wheel (51 Links)	2040C	Full Link	2040L1
Cool Season Box Agitator (17 Links)	2040F	Offset and Full Links	2040L, 2040L1
Cool Season Box Drive (51 Links)	2040XG	Full Link or Offset and Half Links	2040L1 or 2040L, 2040L2
Chains Unique To End Wheel Drive Drills			
Leg Drive Shaft 18-Tooth Sprocket To Clutch (73 Links)	2040XB	Half Link	2040L2
Output Reduction Kit 18-Tooth Side of 18/36 Double Sprocket to Clutch (25 Links)	2040K	Offset and Full Links	2040L, 2040L1
Output Reduction Kit Leg Drive Shaft 18-Tooth Double Sprocket to 36-Tooth Side of 18/36 Double Sprocket (61 links)	2040J	Half or Full Link	2040L2 or 2040L1
Chains Unique To Rear Wheel Drive Drills			
Jackshaft to Clutch (25 Links)	2040K	Offset and Full Links	2040L, 2040L1
Leg Drive Shaft 18-Tooth Sprocket to 18-Tooth Sprocket on Input Jackshaft (69 Links)	2040M	Half or Full Link	2040L2 or 2040L1
Output Reduction Kit Leg Drive Shaft 18-Tooth Double Sprocket to 36-Tooth Side of 18/36 Double Sprocket on Input Jackshaft (75 links)	2040I	Half or Full Link	2040L2 or 2040L1

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
CHAINS:		
Chains come off.	Misaligned sprockets.	Align sprockets and tighten set screws in the keyed sprockets and bearings.
	Misaligned idler.	Straighten idler.
		If the shaft moves after installation, drill detents in the shaft for the bearing set screws.
	Bent or damaged sprocket.	Replace the sprocket.
	Loose shaft bearings.	Tighten flangettes.
	Rusty or dirty chain.	Remove from the drill and soak overnight in light oil or silicone lubricant or apply WD-40.
	Overload in one of the boxes.	Increase the size of the driven sprocket when compared to the one that drives it. For Example: the sprocket that drives the agitator in the fluffy box may have to be increased in size, in relation to the sprocket that drives it. An overloaded sprocket then overloads the chain and causes it to walk off the sprockets.
Planter support chain failure.	Incorrect **chain** (part #8955XA) used.	Use only "twisted link" style of **chain** (part #8955XA). Correct chain has 9 Links (8 Twisted and 1 Straightened)
	Tangled chain.	Replace with "twisted link" style **chain** (part #8955XA).
ROLL PINS:		
Breaking roll pins in the speed changer and sprockets.	Agitator is catching the picker wheels.	Bend agitator so it does not catch on picker wheel.
	Rusty and worn sprockets.	Straighten and apply silicone lubricant.
	Picker wheels catching debris in the seed.	Clean the seed before using.
	Picker wheel shaft rubbing on transition.	Loosen fluffy seed box and rotate it. Align the shaft and retighten the seed box. Check **bearing support** (part #10316) for alignment.
	Binding chain.	Align the sprockets. Start with the drive wheel chain and work toward the seed boxes. Re-align and tighten each chain and its idlers.
	Overfilled seed box or seed settling.	Remove seed when transporting drill or stir seed in box prior to seeding. **Leave a 2" empty space at the top of the fluffy box for the seed to churn.**

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
Breaking roll pins in the speed changer and sprockets.	Binding idlers.	Clean and lubricate the steel bushings of each idler. Be sure the idler is on the correct side of each chain. The idlers must be on the slack or non-drive side of the chain. In particular, the double idlers on the drive leg and the double idlers on the chain going to the clutch must be installed as per the attached decals. See decals 1046C10 and 1046C11.
	High torque load.	Slow down when planting. **DO NOT** seed at speeds greater than 7-8 m.p.h., even on the best sites. Reduce the amount of seed in the boxes. Check the sprocket ratio. To reduce the torque load on the chains, sprockets, and other drive parts, allow a small drive sprocket to drive a larger driven sprocket. **In particular, the agitator sprockets must be larger than the sprockets that drive them.**
	Fertilizer in box.	**DO NOT apply fertilizer with this equipment.**
CLUTCH:		
Clutch will not function.	Worn clutch bushings.	Replace **bushings** (part #1121).
	Clutch shaft key (part #1110) missing.	Replace.
	Lever in **clutch housing** (part #1119) is stuck.	Tap lightly with hammer and apply silicone lubricant.
	Roller dog of clutch housing is contacting the detents in the clutch hub.	Grind a small amount off the corner of the three machined bosses on the **clutch hub** (part #1120).
	Clutch tripper assembly is loose or positioned wrong.	Tighten the clutch tripper assembly bolts. **See Pages 40-8 and 40-9 for additional information.**
	Shaft collar has moved.	Loosen set screw, reposition, and retighten.
Clutch not getting grease.	Zirk will not take grease.	Replace zirk.
	Bronze bushing in clutch has rotated so that grease holes do not align.	Rotate the bushing.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
Clutch will not disengage.	The tripper rod is too long or too short.	Rod length, clevis to clevis, on slide style floats is 26".
	Bronze bushing worn.	Replace.
	Bosses on inside of clutch housing worn (part #1120).	Replace.
	Clutch tripper collar (part #1037CLX1) is loose.	Position and retighten.
	Clutch tripper collar contacting **bearing mount** (part #1037BHX).	Grind off interference or rotate tripper collar.
DISCS:		
Loose discs.	Worn bearings.	Service and replace.
	Incorrect number of **spacers** (part #1100 or JD#M15226).	Add or remove spacers until disc blades just make contact at closest point. A piece of paper should barely slide between the two blades.
	Loose rivets.	Replace and reset the rivets.
	Stretched or broken bearing case.	Replace with new case and bearing.
	Disc bolts lack Loctite.	Clean threads and apply medium strength (blue) Loctite.
	Drill was backed up with the planters in the down position.	**DO NOT back up the drill** when the planters are in contact with the ground!
	Disc bolts worn (part #K300M or K301M).	Replace if shoulder diameter of the bolt is smaller than 0.615".
Short double disc bearing life (part #JD8573, #JD85204, or #JD85205).	Missing **dust cap** (part #2095 Drills before 1998, #3095 Drills 1998-06/30/06, and #4095 07/01/06 -).	Replace the cap.
	Damaged **boot seal** (part #M17520) on drills before 1998.	Replace the boot seal.
	Incorrect grease.	Use synthetic grease type **JT-6** (part #9991) or equivalent.
	Loose **disc bolt** (part #K300M & #K301M on 1998 and later models or #K200M & K201M on pre 1998).	Apply Loctite when installing.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
Short double disc bearing life (part #JD8573, #JD85024, or #JD85205).	Worn **disc bolt** (part # K300M & # K301M on 1998 and later models or #K200M & K201M on pre 1998).	Replace if diameter is smaller than 0.615 inches.
	Missing **spacer** (part #1100 or #JD8573A).	Replace the spacer.
	Broken **case** (part #M167768, #M1677683, or # M1677685).	Replace the case.
	Loose rivets in disc blade.	Replace rivets.
	Bent depth band.	Straighten or replace the depth band.
Discs wobble.	Buildup of mud on depth bands backside between blade and depth band.	Install **depth band scrapers** (part #10745A) for drills with **yellow** boot casting and (part #10995C) for drills with **black** boot casting. The scrapers will clean both horizontal bands and disc blades.
	Bent depth bands.	Straighten or replace the depth bands.
	Worn or loose bearings.	Replace the **bearing** (part #JD8573, #JD85204, or # JD85205).
	Bent or cracked blade.	Replace the blade.
	Loose disc bolt. The K300M bolt has right-hand threads and the K301M has left-hand threads. The shoulder diameter of the bolt should be no smaller than 0.615 inches; otherwise it should be replaced.	When reinstalling the disc bolts, it is important to clean both the bolt threads and the threads in the boot casting with solvent (such as toluene or ether). Apply a medium strength #242 Loctite to the boot threads before installing the bolt into the boot casting.
	Defective inside scraper assembly.	Replace with new **Assembly** (part #AM11828)
Discs not turning.	Bent disc guard.	Replace **disc guard** (part #38880)
	Scrapers are adjusted too tight (either inside or outside).	Loosen scraper nuts.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
Discs not turning.	Drill was rolled backward when it was in the down or working position. This would cause dirt to jam between the disc blades.	Using extreme care! Hold one disc blade at a time with a vise grip, while turning its matching blade to remove the dirt between each assembly.
	Insufficient space between double discs.	Add **spacers** (part #1100 or JD#M15226) as needed.
	Dirt behind the depth bands.	Remove the depth band, clean, and reinstall. Service the scrapers.
Disc opener does not track.	Loose or bent assembly. The **lift bracket** (part #10321) may be bent. The flex knuckle may have walked or moved from its original position.	Align the lift brackets on 7-13/16" centers. Replace bent brackets as needed. Boot casting will break when removing LH bolts. RH- Bolts turn right LH- Bolts turn left
	The rubber cords may have deteriorated. Look for cracking or softness on the ends of cords.	Soft rubber cords should be replaced.
Boot (shoe) failure.	Casting breakage.	Replace and slow down on rocky sites.
	Loose subassemblies.	Check for loose, worn-out **disc assemblies** (part #125453C) daily and **replace**. Check for loose and worn Connex **bushing** (part #10252).
Boot Breaks	When removing LH Bolts	RH- TURN RIGHT LH- TURN LEFT
<u>SCRAPERS:</u> **Short scraper life.**	Bent depth band.	Straighten or replace the depth band.
	"Ears" form on scrapers.	Break off "ears" daily with pliers.
	Excessive wear.	Reduce spring preload by backing off the nuts. This will reduce the friction of the scraper against the disc blade.
	Lost scraper assemblies.	Use **locking flanged nuts** (part #N14-FNL & part #FN516-FNL) on the scraper assemblies or apply Loctite to the installed parts.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
PRESS WHEELS:		
Press wheel springs fail.	Press wheels support too much weight.	Lower the front of the drill at the tongue clevis. Change spring leveler on the tongue by running both sets of double nuts toward the main frame. When used in three-point mode, shorten the length of the third link between the drill and the tractor. Drills built after Fall 1993 having **press wheel torsion springs** (part #10961) may have different preload by changing the spring position on the boss of the **boot casting** (part #0888).
Press wheel tires come off the rims.	Excessive load on press wheel tires.	Raise the drill on sharp turns. Slow down on rocky sites. Lower the front of the drill to reduce forces on the press wheels. Change the tongue clevis position or adjust the spring leveler.
	Press wheel rim is bent.	Straighten rim or replace press wheel. Use drag chains in rocky conditions.
	Axle bolt tightens into the **"h" frame** (part #10251) which locks the press wheel bearing and prevents the press wheel from turning. This results in the self-destruction of the press wheel and tire.	Refer to "Set-Up & Preparation Section" for correct procedure to install the axle bolts and machinery bushings. Failure to follow correct procedure will result in continued press wheel failure. Increase frequency of application of WD-40 to 4-6 times/day when drilling in extreme dust.
SEED BOXES:		
Fluted-feed roll shifter levers on the small seed or cool season/grain box difficult to move.	Dirt or rust on the exposed fluted feed or cut-off rolls.	Clean and lubricate with a dry silicone based lubricant.
	Locked in toque on either feed shaft.	Turn feed shafts back and forth with a wrench while moving handle left and right.
	Bent roll pins on the shaft.	Replace as needed.
	Seed jammed in flutes.	Drop cup gates and clean with air hose.
	Worn knob on shifter handle. Knob or boss on cool season/grain shifter should be no less than 5/8" in diameter.	Replace the **shifter handle** (part #3205).
	Bolt in shifter quad of cool season box is jammed.	Correct **bolt** is 3/8" x 1" square head (part #B38-1SQ).

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
SEED BOXES (Con't):		
Fluted-feed roll shifter levers on the small seed or cool season/grain box difficult to move.	Seed cup gates are jammed with debris.	Move gate levers up and down and clean debris from the gate area with an air hose.
	Coated seed and its dust not cleaned after use from either the small seed or cool season/grain box.	First, try to remove seed from each cup with an air hose. Second, try to clean cups with high-pressure washer. When all else fails, remove the two bolts retaining each cup and one roll pin from each unit. This will allow you to move the cup aside to clean material from each flute and feed roll.
	Fertilizer applied from either cool season/grain or small seed box.	**Never apply fertilizer** from drill unless it is equipped with a fertilizer box attachment. Follow procedure in above item for cleaning coated seed from seed boxes.
	Worn shifter bearing on cool season box.	Replace with new **thrust bearing kit** (part #TM60820) used on all production after 1998.
	Missing **spring** (part #TS-72M).	Replace **spring** (part #TS-72M).
	Coupler alignment.	Small seed box **coupler** (part #1010) not in alignment with seed box shaft. Loosen drive end bearing and end box bolts. Align coupler with box shaft and retighten bolts and bearing.
Irregular quantities of seed coming from seed boxes.	Small seed box emptying unevenly.	Seed cups may have moved because of loose mounting bolts. Reposition and retighten.
	Feed roll flutes may be plugged.	Clean.
	Coated seed may have plugged cup.	Clean.
	Seed hoses may be kinked or plugged with debris.	Clean.
	Cool season/grain box emptying unevenly.	Seed cups may have moved because of loose mounting bolts. Reposition and retighten.
	Bridging of uncleaned seed.	Use only clean seed.
	Fluffy seed box emptying unevenly.	Tighten agitators. Tighten picker wheels. Clean transitions, seed hoses, and boot castings. Check and replace seed gaskets and seed gasket plates.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
Irregular quantities of seed coming from seed boxes.	Small seed box **coupler** (part #1010) moved.	Reposition and tighten.
Clogging of seed passages.	Dirty seed.	Use only clean seed.
		Dirty cool season mixes may be planted from the fluffy seed box. A dirty fluffy seed mix may sometimes be handled by lowering the output ratio of the warm season speed changer.
	Wet seed.	If the drill is left with seed in it overnight, it must be put into a shed or covered with a tarp. The picker wheels are less likely to handle stems and awns if the seed gets wet or moist as they will bend and then snap back, rather than break in two as they pass through the picker wheels.
	Bent seed hose.	On rough sites, one or more seed hoses may become bent for a short distance. This allows the seed to buildup and then is released in a "slug". This may result in a plugged seedway passage.
	Storage litter.	During storage, a buildup of cobwebs and mice nests will plug hoses. Remove and clean all hoses before use.
Cool season seed box feed shaft "walks".	Excessive wear on the shifter bearing.	Order a replacement **thrust washer kit** (part #TM60820) for drills built 1975 to mid 1998. For drills built after mid 1998, order replacement parts as needed. See Page 40-2 for a detailed drawing.
<u>FLUFFY SEED BOX:</u> **Too little seed from the fluffy seed box.**	Wrong setting of the speed changer.	When standing at the tongue looking at the drill, the lowest output is when the speed changer chain is to the **far right**. Each step to the left increases the output.
	Restriction in the seed box.	If seed gaskets and retainer plates are in place, **remove them**.
		Use only commercially cleaned seed. Hand collected seed should be cleaned.
	Wrong sprocket.	Reduce the size of jackshaft sprocket (the end above the ground wheel). OEM is 30 tooth.
	Restriction in the seed passageway.	Clean the seed hose.
		Clean the transition.
		Clean the dirt from between the discs and within the boot casting.

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
FLUFFY SEED BOX: **Too much seed from the fluffy seed box.**	Excessive seed feed rate.	Add seed gaskets and retainer plates to fluffy seed box.
		Add the optional **Output Reduction Kit** to the drill. This will reduce output from all seed boxes on the drill by 50%. **See Page 30-13 for part #.**
	Wrong sprocket.	Increase the size of the jack shaft sprocket (the end above the ground wheel). OEM is 30 tooth.
		Increase the clutch sprocket size. OEM is 30 tooth.
		Increase the picker wheel shaft sprocket size. OEM is 30 tooth.
	Seed too fine.	Use a different seed box. Place seed in the cool season/grain seed box.
		Add inert filler, such as ground corncobs, cottonseed hulls, bran, etc.
		Add seed gaskets and retainer plates.
		Place tape on the bottom of the box to restrict the slot next to the picker wheels.
		Remove chain to the agitators in the fluffy box.
COOL SEASON/GRAIN BOX: **Too little seed from the cool seed box.**	Plugged seedway passage.	Straighten kinked hose.
		Remove debris from the seed hose.
		Clean bent or plugged metal seed tube (on drills built prior to September 1993).
	Green seed cup.	Lower the gate for larger size seeds.
		Clean the flutes.
		Adjust flutes to the maximum open position.
	Dirty seed.	Clean the seed or try using the fluffy seed box.
Too much seed from the cool season box.	Excessive seed feed rate.	Add the optional **Output Reduction Kit** to the drill. This will reduce output from all seed boxes on the drill by 50%. **See page 30-13 for part #.**
	Double sprocket on end of box is too small.	Change the double sprocket. Use **double sprocket** (part #3095X1 in place of part #3095X).

TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
SMALL SEED BOX:		
Too little seed from the small seed box.	Plugged seedway passage.	Clean cup assembly.
		Clean seed hose.
		Clean seed.
		Use only dry seed.
		Check hose for collapse.
		Adjust flutes to the maximum open position.
		Check for loose cup that may have moved to a more closed position.
Too much seed from the small seed box.	Excessive seed feed rate.	Adjust flute opening to a smaller or more closed position.
		Add the optional **Output Reduction Kit** to the drill. This will reduce output from all seed boxes on the drill by 50%. **See Page 30-13 for part #.**
		Increase the size of the sprocket on the end of the small seed box. OEM is 20 tooth.
MAIN FRAME:		
Main frame or axle breakage.	Many possible causes.	Slow down when seeding on slopes and ditch banks.
		Correct preload on axle nut.
		DO NOT tow drill at posted highway speeds. **TOW AT A SPEED OF 20 MPH OR LESS.**
		Service wheel bearings (i.e. check and repack) on a regular basis.
		Check wheel lug nuts for tightness. Torque wheel lug nuts to 75 to 85 Foot Lbs.
HYDRAULICS:		
Flex hydraulic failure.	Improper hose connection to hydraulic cylinders.	See Parts Catalog – Hydraulic Assemblies.
	Improper hose connection to tractor hydraulics.	See Parts Catalog – Hydraulic Assemblies.

SYMPTOM	CAUSE	SOLUTION
HYDRAULICS (Con't): **Flex hydraulic failure.**	Incorrect quick disconnects on either tractor or drill.	Check compatibility as many disconnect brands do not interconnect. Also, different models of the same brand **do not** always interconnect. Relieve pressure from the tractor hydraulics before attempting to connect to the drill. It may be necessary to relieve hydraulic pressure (without disconnecting hydraulic fitting) prior to connecting the hydraulic quick disconnects.
	Dirty or damaged hydraulic quick disconnects.	Keep all hydraulic quick disconnect fittings clean and covered when not in use. Wipe clean before connecting and **do not** pound or hammer on the "ball fitting" on the "male" disconnect to relieve pressure on the line. Be aware of hydraulic pressure. Use extreme caution when working with hydraulic fluids.
	Damaged, frayed, or bent hydraulic hoses.	Hydraulic hoses that are routed between the drill from the front tower to the rear of the drill must be covered with **hose guard** (part #42221). This will protect and prevent hose damage in areas where they come in contact with the drill frame parts.
	Hydraulic system is air-locked.	Follow procedures outlined in the Maintenance and Service Section of this manual.
NO- TILL: **No-till units do not penetrate.**	Insufficient weight transfer to no-till units.	Change clevis position. Rear drive drills have 3-1/2" of spacers on the non-drive side and 4-1/2" of spacers on the drive side to prevent full retraction. If the drill does not raise and lower evenly these may have to be removed temporarily to allow full movement of the hydraulics to clear air from the system. After cycling the hydraulics, reinstall the spacers and clevis. Change the position of the tongue mounting point to the drill frame to lower the front of the drill. Adjust spring leveler. **Refer to adjustment procedure on Page 20-5, Item #6.** Change draw bar position on the tractor. Check for loose or worn disc blades or no-till blades.

SYMPTOM	CAUSE	SOLUTION
NO- TILL (Con't): **No-till units do not penetrate.**		Change style and size of no-till blades. Lower shanks of no-till assemblies. Adjust **jackscrew** (part #B12-2TH) on no-till torsion assembly.
	Insufficient weight transfer to no-till units.	Remove stroke control blocks on rephasing cylinders, if installed.
	Excessive field speed for field conditions.	Reduce ground speed.
	Seedbed requirements **do not** match equipment.	Sod seeding will require the 13-1/2" notched no-till blade. Fields with loose residue cover, such as winter wheat or corn residue may require the 18" notched blade. The larger blade will help prevent "snow plowing" the litter. In soybean residue or corn residue from very high yields the 17", 25-wave blade may perform better. Drilling along ditches, roadsides, swales, and other site specific conditions may require a narrower drill to allow the majority of disc openers to contact the ground at all times.
No-till planting units are not tracking.	Disc openers are out of alignment.	Straighten **lift bracket** (part #10321), if bent. Check alignment from back of drill. Rubber torsion knuckle may have moved left or right. Loosen the four **retaining bolts** (part #B38-1.25) and carefully move the knuckle back into position.
	No-till units are out of alignment.	**Clamp plates** (part #4211 or #5211) are not equally spaced. **Clamp plates** (part #4211 or #5211) may be broken or twisted. Inspect and replace as needed. **Shanks** (part #42201X, #4220X1, and #52201X) are bent or twisted. **Caution! Shanks** (part #52201X! are made from spring steel and will not straighten. If bent, **they must be replaced**. This includes all production after early 1993.

SYMPTOM	CAUSE	SOLUTION
ACRE METER: **Acre meter tallying incorrectly.**	Double tracking or leaving too wide a space between rows on each trip across the field.	Leave the same amount of space between each seeded strip as the furrow opener spacing on the drill.
	Land area contains more or less area than assumed.	Double-check the **"facts"**.
	One or more sprockets between the ground wheel and the acre meter have been changed.	If sprocket combination has been changed from the OEM standard, then calculate the area covered. **See procedure on Page 30-17.**
	Circle drilling with the drive wheel on the outside of the turn will give a false reading from the acre meter.	
	Output reduction feature in use.	Acre meter will read 1/2 of actual acres planted. Multiply acre meter reading by 2 for actual acres planted.

DRILL STORAGE

STORAGE & PLACING THE DRILL BACK INTO SERVICE

1) Store the drill on a flat, level surface, preferably in a shed. See Page 90-53, Miscellaneous Parts for a source of custom made drill covers.

2) Raise planting units to the highest road position and install **transport channel locks** on the hydraulic cylinders and their retaining pins. Then, lower the unit so that the transport channel locks support the weight of the drill.

3) Block the wheels and detach the drill from the tractor.

4) Vacuum the seed boxes.

5) Remove the convoluted seed hoses, clean and store them in a cardboard box.

6) Slide the cool season and small box shifter back and forth.

7) Remove the cool season box row dividers where installed and clean the bottom of the cool season box.

8) Drop the gates on the cool season seed cups to its lowest level. The lever is located on the left side of the seed cup as you face the back of the drill. **See Figure 60-1.**

Figure 60-1

9) Using an air hose, blow the seed **(all of it)** from the boxes, especially the small seed box cups and flutes.

10) Using a screwdriver, clean stems from the transitions.

11) Clean the drill with a high-pressure washer. **Do not direct spray on bearings or hubs that have bearings installed such as the no-till hubs. Greaseable bearings should have grease applied before and after washing to prevent water from entering the bearing and to purge water from the bearings after washing.**

12) Using an air hose, blow **all the water** from the drill, including the inside of the boxes.

13) Paint all bare metal and rust spots. Use Ford Automotive Paint (Tampico Yellow - 1972) or Krylon (Warm Yellow Gloss #1941) and RUST-OLEUM Professional High Performance Enamel (Gloss Black #7579) for a close match to original paint color.

STORAGE & PLACING THE DRILL BACK INTO SERVICE (con't)

14) Spray all moving parts (sprockets, hinges, chains, press wheel bearings, etc) with a silicone based lubricant. **Check seed box lid hinges for accumulations of dirt and debris.** Clean as needed and apply an LPS Silicone Lubricant, WD-40, or an equivalent lubricant. Replacement brass hinge pins (part #1038HP) and two 1/16" x 1/2" cotter pins (part #CP116-.5) can be ordered.

15) Grease clutch, tongue pivot, lockout, leg bearings, and no-till hubs as applicable. Castor style no-till units have a zirk on the 1-1/2" round shank.

16) Repack wheel bearings.

17) Torque wheel lug nuts to 75-85 lbs.

18) Slide clutch collar aside and oil the clutch tripper.

19) Remove mud from the depth bands, particularly the blade side of the band and straighten or replace bent bands.

20) Check the drill for bent or broken parts and remove or replace them as needed. Pay particular attention to safety decals and the parts of the drill they reference. Repair or replace them as needed so that the drill is safety-conditioned.

OPTIONAL ACCESSORIES

OPTIONAL ACCESSORIES - FLEXII *GRASS* DRILLS*

ITEM	DESCRIPTION
Cool Season/Grain Seed Box with Seed Box Agitator	A third seed box for some grass species, small grains, or soybeans.
Row Dividers for Cool Season/Grain Seed Box	Seed box dividers to aid in keeping seed distributed across the drill.
Output Reduction Kit	A speed reduction kit that permits planting very low seeding rates. Seed output from all seed boxes on the drill is reduced by 50%. **Not available on rear drive models FLXII-86RD and FLXII-88RD.**
No-Till 13 ½" Concave Notched Blade	Angular mounted Trash Plow for use in interseeding into sod or cover crops.
No-Till 18" Concave Notched Blade	Trash Plow for use in interseeding into moderate levels of non-fragile, loose residue (corn stalks).
No-Till 18-1/2" - 24 Wave Blade (Caster Style)	Single wavy coulter for use in fragile residues (soybean or small grain). **(24 Wave, 18-1/2" Blade is Standard After 01-01-04)**
Depth Bands	Standard size is 12". Optional sizes available include 12-1/2", 11-1/2", or 9-1/2". Changing depth band size also requires changing the outside scrapers.
Covering Chains (3 Ring Loop Style)	**Replaces standard press wheel.** Used in place of press wheels in extremely rocky conditions.
Folding Tongue	Tongue folds back against the front of the drill for transport on a trailer or during storage.
Acre Meter – Mechanical Acre Meter - Electronic	Record acreage planted by the drill. The Mechanical acre meter is not available for Drill Models 86, 86U, 88U, 86UG, or 88UG.
Walk Board Brackets w/o Boards	Brackets for mounting walk boards along the back of the seed boxes.
Open Grid Grate Walk board	Open grate metal walk board with step mounted on the back of the drill.
Dual Rear Transport Wheel Kit	Sets of dual wheels mounted behind the drill for road transport. Requires a second hydraulic hook-up. Includes legs, wheels, tires, and hydraulics.
Front Caster Wheel	Fifty percent of the drill weight is on the tongue. This caster wheel carries the tongue weight in planting and transport. Used for Rear Drive Models 816, 818, and 822. May also be used on End Wheel drills that have rear transport wheels.
Highway Tires	ST225/75R15 – Load Rating E
Flotation Tires	9.5L Rib Implement 8-ply tire.
Spare Tire on Rim	Spare tire mounted on a rim for the drill.
Spare Tire Mount (Lockable)	Bracket for mounting a spare tire on the drill that can be locked.
Rear Jack Stand	**Used on drills without no-till or rear transport options.** Used when parking these drills in the transport position. Use two jacks on Models FLXII 816, 818, & 822.
Toolbox (Lockable)	Toolbox with a lockable latch mounted on the drill.
Safety Chains	Chain for connecting the drill to the tractor.
Tail Lights	Trailer type taillights (4 prong, flat plug style) with wiring harness the length of the tongue.
Scale (Pesola 93628-M)	Hand held scale that weighs both in grams and ounces. Used in drill calibration.

Rear Drive Drills - Options are same as for end wheel drills except rear transport wheels are not applicable.

OPTIONAL ACCESSORIES - FLEXII *GRAIN* DRILLS

ITEM	DESCRIPTION
Row Dividers for Grain Seed Box	Seed box dividers to aid in keeping seed distributed across the drill.
No-Till 13 ½" Concave Notched Blade	Angular mounted Trash Plow for use in interseeding into sod or cover crops.
No-Till 18" Concave Notched Blade	Angular mounted Trash Plow for use in interseeding into moderate levels of non-fragile, loose residue (corn stalks).
No-Till 17" 25 Wave Blade (Caster Style)	Single wavy coulter for use in fragile residues (soybeans or small grain).
Depth Bands	Standard size is 12". Optional sizes available include 12-1/2", 11-1/2", or 9-1/2". Changing depth band size also requires changing the outside scrapers.
Press Wheel (Iron Angular Mount) (not used after 1-1-04)	Cast iron press wheel for use with deeper planted seeds such as soybeans.
Covering Chains (3 Ring Loop Style)	**Replaces standard press wheel.** Used in place of press wheels in extremely rocky conditions.
Folding Tongue	Tongue folds back against the front of the drill for transport on a trailer or during storage.
Acre Meter – Mechanical Acre Meter - Electronic	Record acreage planted by the drill. The Mechanical acre meter is not available for Drill Models 86, 86U, 88U, 86UG, or 88UG.
Walk Board Brackets w/o Board	Brackets for mounting walk boards along the back of the seed boxes.
Open Grid Grate Walk board	Open grate metal walk board with step mounted on the back of the drill.
Dual Rear Transport Wheel Kit	Dual wheels mounted behind the drill for road transport. Requires a second hydraulic hook-up. Includes legs, wheels, tires, and hydraulics.
Highway Tires	ST225/75R15 – Load Rating E
Flotation Tires	9.5L Rib Implement 8-ply tire.
Spare Tire on Rim	Spare tire mounted on a rim for the drill.
Spare Tire Mount (Lockable)	Bracket for mounting a spare tire on the drill that can be locked.
Tool Box (Lockable)	Toolbox with a lockable latch mounted on the drill.
Safety Chains	Chains for connecting the drill to the tractor.
Tail Lights	Trailer type taillights (4 prong, flat plug style) with wiring harness the length of the tongue.
Scale (Pesola 93628-M)	Hand held scale that weighs both in grams and ounces. Used in drill calibration.

SPECIFICATIONS

FLEX STYLE GRASS DRILLS – END WHEEL DRIVE STYLE

	FLXII 86	FLXII 88	FLXII 812	FLXII 816	FLXII 818	FLXII 822
Number of Openers	6	8	12	16	18	22
Spacing of Openers (Precise measurement is 7-13/16")	8 in.	8 in.	8 in.	8 in.	8 in.	8 in.
Machine Width	7.0 ft.	8.3 ft.	11.0 ft.	13.7 ft.	15.0 ft.	17.7 ft.
Planting Width	4.0 ft.	5.3 ft.	8.0 ft.	10.7 ft.	12.0 ft.	14.7 ft.
Length (front to back, excluding tongue and cool season/grain box)	5.6 ft.	5.6 ft.	5.6 ft.	5.6 ft.	5.6 ft.	5.6 ft.
Length (front to back, including tongue)	11 ft.	11 ft.	11 ft.	11 ft.	11 ft.	11 ft.
Length (front to back, including tongue and cool season/grain box)	12 ft.	12 ft.	12 ft.	12 ft.	12 ft.	12 ft.
Machine Weight (standard drill, no options)	1,700 lbs.	2,000 lbs.	2,200 lbs.	3,000 lbs.	3,600 lbs.	4,800 lbs.
Machine Weight (including cool season box)	2,000 lbs.	2,440 lbs.	2,940 lbs.	3,965 lbs.	4,545 lbs.	5,430 lbs.
Machine Weight (including no-till option)	2,200 lbs.	3,000 lbs.	3,780 lbs.	5,085 lbs.	5,800 lbs.	6,970 lbs.
BOX CAPACITIES (Bu/Ft):						
Small Seed/Legume Box	0.25	0.25	0.25	0.25	0.25	0.25
Fluffy Seed Box	1.01	1.01	1.01	1.01	1.01	1.01
Cool Season/Grain Box	1.10	1.10	1.10	1.10	1.10	1.10
TRACTOR REQUIREMENTS:						
Standard Drill	25 h.p.	30 h.p.	40 h.p.	50 h.p.	60 h.p.	75 h.p.
Drill (including cool season/grain box)	25 h.p.	30 h.p.	40 h.p.	50 h.p.	60 h.p.	75 h.p.
No-Till, 3-Point Mount (requires tractor counterweights)	40 h.p.	60 h.p.	80 h.p.	100 h.p.	150 h.p.	175 h.p.
No-Till, Towed	30 h.p.	40 h.p.	50 h.p.	60 h.p.	75 h.p.	100 h.p.

SPECIFICATIONS

FLEX STYLE GRASS DRILLS – REAR WHEEL DRIVE STYLE

	FLXII 86RD	FLXII 88RD	FLXII 812RD	FLXII 816RD	FLXII 818RD	FLXII 822RD
Number of Openers	6	8	12	16	18	22
Spacing of Openers	8 in.	8 in.	8 in.	8 in.	8 in.	8 in.
Machine Width	5.0 ft.	6.3 ft.	9.0 ft.	11.7 ft.	13.0 ft.	15.7 ft.
Planting Width	4.0 ft.	5.3 ft.	8.0 ft.	10.7 ft.	12.0 ft.	14.7 ft.
Length (front to back, excluding tongue and cool season/grain box)	9.0 ft.	9.0 ft.	9.0 ft.	9.0 ft.	9.0 ft.	9.0 ft.
Length (front to back, including tongue)	15.0 ft.	15.0 ft.	15.0 ft.	15.0 ft.	15.0 ft.	15.0 ft.
Length (front to back, including tongue and cool season/grain box)	15.0 ft.	15.0 ft.	15.0 ft.	15.0 ft.	15.0 ft.	15.0 ft.
Machine Weight (standard drill, no options)	1,800 lbs.	2,100 lbs.	2,500 lbs.	3,100 lbs.	3,700 lbs.	4,900 lbs.
Machine Weight (including cool season box)	2,100 lbs.	2,540 lbs.	3,040 lbs.	4,065 lbs.	4,645 lbs.	5,530 lbs.
Machine Weight (including no-till option)	2,300 lbs.	3,100 lbs.	3,880 lbs.	5,185 lbs.	5,900 lbs.	7,070 lbs.
BOX CAPACITIES:						
Small Seed/Legume Box	0.25	0.25	0.25	0.25	0.25	0.25
Fluffy Seed Box	1.01	1.01	1.01	1.01	1.01	1.01
Cool Season/Grain Box	1.10	1.10	1.10	1.10	1.10	1.10
TRACTOR REQUIREMENTS:						
Standard Drill	25 h.p.	30 h.p.	40 h.p.	50 h.p.	60 h.p.	75 h.p.
Drill (including cool season/grain box)	25 h.p.	30 h.p.	40 h.p.	50 h.p.	60 h.p.	75 h.p.
No-Till, 3-Point Mount (requires tractor counterweights)	40 h.p.	60 h.p.	80 h.p.	100 h.p.	150 h.p.	175 h.p.
No-Till, Towed	30 h.p.	40 h.p.	50 h.p.	60 h.p.	75 h.p.	100 h.p.

SPECIFICATIONS

FLEX STYLE GRAIN DRILLS – END WHEEL DRIVE

	FLXII 88G	FLXII 812G	FLXII 816G	FLXII 818G	FLXII 822G
Number of Openers	8	12	16	18	22
Spacing of Openers	8 in.	8 in.	8 in.	8 in.	8 in.
Machine Width	8.5 ft.	11 ft.	13.5 ft.	15 ft.	18 ft.
Planting Width	5.3 ft.	8 ft.	10.7 ft.	12 ft.	15 ft.
Length (front to back, excluding tongue)	5.7 ft.	5.7 ft.	5.7 ft.	5.7 ft.	5.7 ft.
Length (front to back, including tongue)	11.7 ft.	11.7 ft.	11.7 ft.	11.7 ft.	11.7 ft.
Machine Weight (standard drill, no options)	1,500 lbs.	2,000 lbs.	2,500 lbs.	3,000 lbs.	3500 lbs.
Machine Weight (including no-till option)	2,060 lbs.	2,840 lbs.	3,620 lbs.	4,260 lbs.	5040 lbs.
BOX CAPACITIES (Bu/Ft):					
Small Seed/Legume Box	0.25	0.25	0.25	0.25	0.25
Grain Box	2.00	2.00	2.00	2.00	2.00
TRACTOR REQUIREMENTS:					
Standard Drill	30 h.p.	40 h.p.	50 h.p	60 h.p.	75 h.p.
No-Till, 3-Point Mount (requires tractor counterweights)	60 h.p.	80 h.p.	100 h.p.	150 h.p.	200 h.p.
No-Till, Towed	40 h.p.	50 h.p.	60 h.p	75 h.p	100 h.p.

PARTS CATALOG

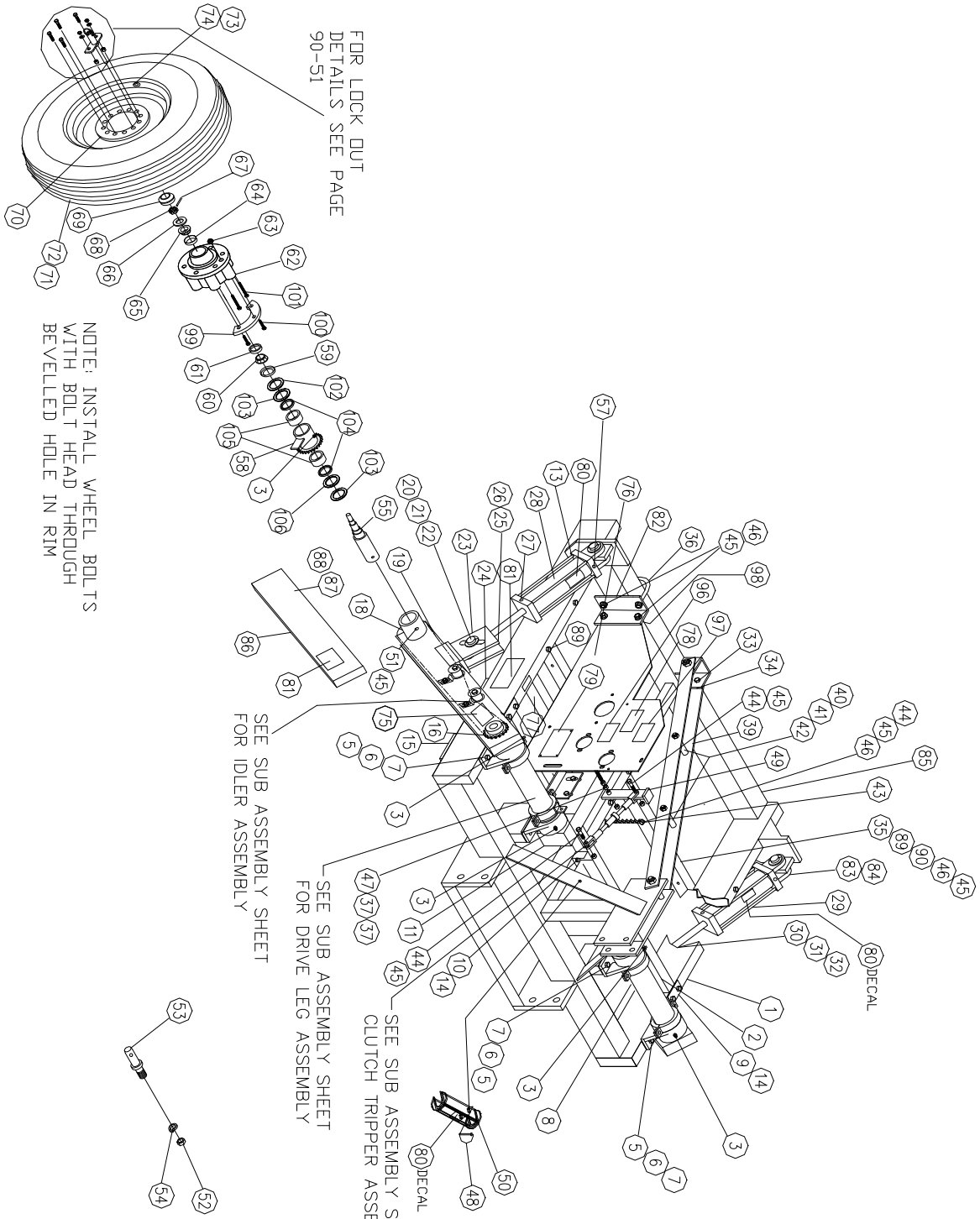
ALWAYS ORDER BY PART NUMBER – NOT BY ITEM NUMBER

INDEX TO PARTS CALALOG

OPTIONS

NOTE: Drill Model FLXII-822 is driven from both ends of the machine. In this manual the term "Non-Typical" references the left side of the drill when viewed from the back.

MAIN FRAME END WHEEL DRIVE – PAGE 1 OF 5



MAIN FRAME END WHEEL DRIVE – PAGE 2 OF 5		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	PMCK-AM-2562	Packing Kit, 3-1/2"x 8" Hydraulic Cylinder
	PMCK-AM-2568	Packing Kit, 3-1/4"x 8" Hydraulic Cylinder
	PMCK-10600382	Piston Rod, Hydraulic Cylinder Replacement (Both Sizes)
1	1036X1 (Mdl 812) 1036EX1 (Mdl 88) 1036FX1 (Mdl 816) 1036GX1 (Mdl 1012) 1036HX1 (Mdl 610) 1036IX1 (Mdl 818) 1036JX1 (Mdl 86) 1036KX1 (Mdl 822) 1036LX1 (Mdl 810)	Main Frame, FLXII
2	8956BX (Mdl 812) 8956BEX (Mdl 88) 8956BFX (Mdl 816, R.H.) 8956BFX1 (Mdl 816, L.H.) 8956BGX (Mdl 1012) 8956BHX (Mdl 610) 8956BIX (Mdl 818, R.H.) 8956BIX1 (Mdl 818, L.H.) 8956BJX (Mdl 86) 8956BKX (Mdl 822, R.H.) 8956BKX1 (Mdl 822, L.H.) 8956BLX (Mdl 810)	Planter Support Tube
3	1093DD	Zirk, 1/4"-28
5	B12-7.5GRD8	Bolt, 1/2"x 7-1/2" Grade 8
6	W12H	Washer, 1/2" Hardened
7	N12GRD8	Nut, 1/2" Grade 8
8	1037LNDX (Mdl 88,810,812) 1037LNDX0 (Mdl 88,810,812) 1037LNDX2 (Mdl816,818,822,1012) 1037LNDX3 (Mdl816,818,822,1012) 1037LNDX6 (Mdl 86)	Non-Drive Leg, FLXII 1990-92 Welded Axle Non-Drive Leg, FLXII 1992- Removable Axle Non-Drive Leg, FLXII 1990-92 Welded Axle Non-Drive Leg, FLXII 1992- Removable Axle Non-Drive Leg, FLXII 1994- Removable Axle
9	B58-7.5GRD8	Bolt, 5/8"x 7-1/2" Grade 8
10	B58-4.5	Bolt, 5/8"x 4-1/2"
11	3245CLHX1 (After Spring '93) 3245CLHX2	Clutch Chain Guard Mdl. 822 Non - Typical
13	4224A2	45 degree - 3/8" O-Ring, Hydraulic Fitting, 3/8" N.P.T.
14	N58-FN	Nut, 5/8" - Flanged
15	1037BHW	Bearing Mount Bar (1/4"x 2" - Two 1/2" Holes)
16	1054	Sprocket, 40B30, 1" Bore with 3/16" Cross Hole
18	1037LDX (Mdl 88 & 812) 1037LDX0 (Mdl 88,810,812) 1037LDX2 (Mdl 816,818,822,1012) 1037LDX3 (Mdl 816,818,822,1012) 1037LDX4 (Mdl 822 Non-Typical) 1037LDX6 (Mdl 86)	Drive Leg, FLXII 1990-92 Welded Axle Drive Leg, FLXII 1992- Removable Axle Drive Leg, FLXII 1990-92 Welded Axle Drive Leg, FLXII 1992 Removable Axle Drive Leg, FLXII Mdl 822 Non-Typical,1992,Removable Axle Drive Leg, FLXII 1994 Removable Axle
Note: Legs prior to 1992, all sizes, were machined to have 1-1/8" cylindrical bearings inserted into the ends of the 3" round tubes (1"x 1-1/4" bushing). After 1992, the round tubes were machined for 1" cylindrical bearings.		
19	2040XA	Chain, Wheel Drive, FLXII - 77 Links with Offset Link & Full Link Connectors

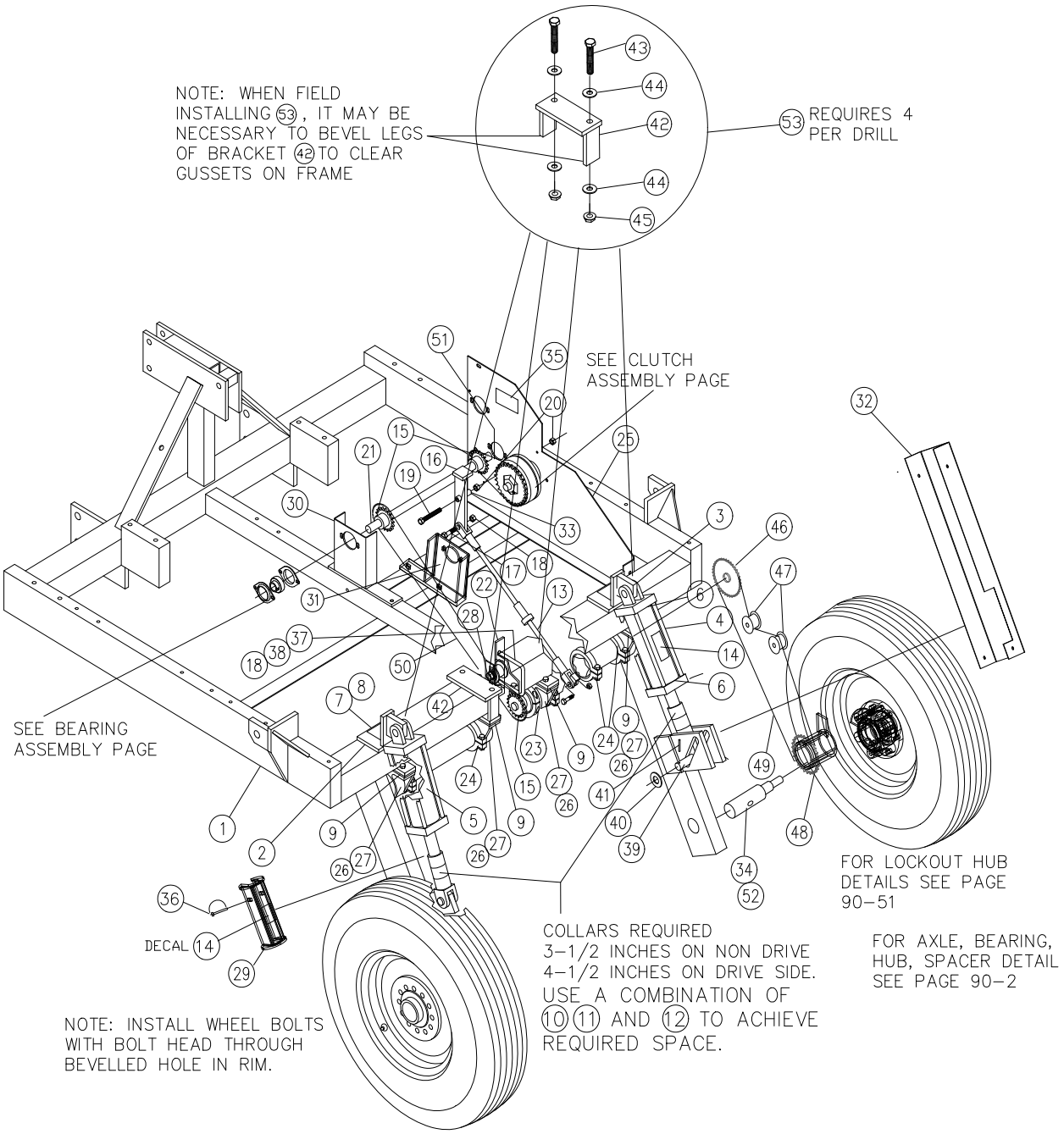
MAIN FRAME END WHEEL DRIVE – PAGE 3 OF 5		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
20	801112	Pin, Hydraulic FLXII 1"x 4-1/8" Manufactured
21	W1	Washer, 1"
22	RP316-2.5	Roll Pin, 3/16" x 2-1/2"
23	1037FEX1 (Mdl 816,818,822) 1037FEX (Mdl 86,88,812) 1037FEX2 (Mdl. 822 Non-Typical)	Sliding Float Mount (-98). After 1998 Becomes part of leg.
24	8956BRX1	Planter Support Bar (1/4"x 2" - Two 5/8" Holes)
25	1037GGX1	End, Hydraulic Cylinder (For 1-1/8" Shaft)
26	SC38-16-.250	Set Screw, 3/8" x 1/4"
27	4224A1	90 Degree - 3/8" O-Ring, Hydraulic Fitting, 3/8" N.P.T.
28	4226XD (PMS-AF-1062)	Hydraulic Cylinder, 3-1/4"x 8" Rephase, (Drive Side)
29	4226XND (PMS-AF-1068)	Hydraulic Cylinder, 3-1/2"x 8" Rephase, (Non Drive Side)
30	1037FF3	Collar, Hydraulic Cylinder (2" OD x 1-1/4" ID x 2" L)
31	4226X2	Clevis, Hydraulic Cylinder (1-1/8" ID)
32	B38-2	Bolt, 3/8"x 2"
33	B12-1.5	Bolt, 1/2"x 1-1/2"
34	N12-CL	Nut, 1/2" Clincher Nut
35	8955X (Mdl. 812) 8955EX (Mdl. 88) 8955FX (Mdl. 816) 8955GX (Mdl. 1012) 8955HX (Mdl. 610) 8955IX (Mdl. 818) 8955JX (Mdl. 86) 8955KX (Mdl. 822) 8955KX1 (Mdl. 810)	Chain Hanger, Angle Iron
36	UB38-4.5-4 (3139X)	U-Bolt, 3/8"x 4-1/2"x 4"
37	N38-FN	Nut, 3/8" Flanged Nut
39	20671 (1993-) 20672 (Mdl 822) 20673 (Mdl 822, 11/01-)	Support Arm
40	B12-5	Bolt, 1/2"x 5"
41	2067A	Spacer
42	N12-CL	Nut, 1/2" Clincher Nut
43	8955XA	Chain, Planter Support - 9 Links (8 Twisted and 1 Straightened)
44	B38-1.25	Bolt, 3/8"x 1-1/4"
45	N38-CL	Nut, 3/8" Clincher Nut
46	W38	Washer, 3/8"
47	B38-2.5	Bolt, 3/8"x 2-1/2"
48	4226XG0	Retainer, Hydraulic Transport
49	1118BBX 1118BBX3 (Not Illustrated) 1118BBX5 (Not Illustrated)	Clutch Trip Engager, FLXII (End Drive) Clutch Trip Engager, FLXII (Mdl.822End Drive Non-Typical) Clutch Tripper Angle Bracket (Mdl.822 Non-Typical) Requires B38-1.25, Two W38, N38-CL.

MAIN FRAME END WHEEL DRIVE – PAGE 4 OF 5		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
50	4226XG3	Hydraulic Transport Guard, 8-1/4"
51	B38-3.25 (Not Illustrated)	Bolt, 3/8" x 3-1/4"
52	N1.125-NF N78-NF	Nut, 1-7/16" National Fine Thread Nut, 1-1/8" National Fine Thread
53	2052 2051	Lift Pins, Cat 3 - 1-7/16" Lift Pins, Cat 2 – 1-1/8"
54	LW1.125 LW78	Lock Washer, 1-7/16" Lock Washer, 1-1/8"
55	2036B (Mdl. 86, 88, 812) 2036B0 (Mdl. 816, 818, 822) 2036B1 (Mdl. 86, 88, 812) 2036B2 (Mdl. 816, 818, 822) 2036C1 (Mdl. 86, 88, 812) 2036C2 (Mdl. 816, 818, 822)	Axle, 6-Bolt (Welded), - 1992 Axle, 6-Bolt (Welded), - 1992 Axle, 6-Bolt (Welded), 1992- Axle, 6-Bolt (Welded), 1992- Axle, 6-Bolt (Pinned), 1992- (Cold Rolled Steel) Axle, 6-Bolt (Pinned), 1992- (Cold Rolled Steel)
57	4224A2	45 Degree - 3/8" O-Ring, Hydraulic Fitting, 3/8" N.P.T.
58	1085B20	Housing, Lock-Out Hub - Standard on all models after 1/1/03
59	1138B (Prior to Early '93) 1138C (After Early '93)	Seal, 6-Bolt Hub Industry Number - CR18823
60	1077B (Prior to Early ‘93) 1077C (After Early '93)	Inner Bearing, 6-Bolt Hub Industry Number - LM501349
61	1077CB (Prior to Early '93) 1077CC (After Early '93)	Cup, 6-Bolt Hub, Inner Industry Number – M501310
62	1085B (Prior to Early '93) 1085C (After Early '93) 1085C1 (After Early '93)	Hub, 6-Bolt, Both Sides Hub, 6-Bolt, Non-Drive Side (Not Illustrated) Hub, 6-Bolt, Drive Side For Lock - Out Hub
63	WN12-20	Wheel Nut,1/2"- 20 With 45^0 Bevel From Centerline
64	1076CB (Prior to Early '93) 1076CC (After Early '93)	Cup, 6-Bolt Hub, Outer Industry Number - LM67010
65	1076B (Prior to Early '93) 1076C1 (After Early '93)	Outer Bearing, 6-Bolt Hub Industry Number - LM67048
66	W78 (1080B)	Washer, 7/8"
67	CP316-1.75 (1110B)	Cotter Pin, 3/16" x 1-3/4"
68	CN78-NF (1073B)	Castle Nut, 7/8" National Fine Thread
69	1082B	Cap, Dust For 6-Bolt Hub
70	1072B 1072B1 (After Early '93)	Rim, 15" Wheel, Offset, 6-Bolt Rim, 15" Wheel, Offset, 6-Bolt (Valve Stem Reversed)
71	1072BA 1072BA1 (After Late '93) 1072BA2 (Optional) 107204 (Optional) 107214 (Optional)	Tire, 7.60" x 15/6 Rib Implement Tire and Rim Tire, 7.60" x 15SL 8 ply Rib Implement. Tubeless Style Tire, ST225/75R15 Load Rating D Highway Truck Tire Tire, ST225/75R15 Load Rating E Heavy Duty Truck Tire Tire, 9.5L-15SL, 8 Ply Rib Implement Flotation Tire
72	1072BB	Tube, 7.60" x 15"
73	1072BC	Valve Stem Protector (Not Used on Tubeless)
74	1072BC1	Valve Stem, Tubeless Style
75	1046C10	Decal, Chain Orientation, Drive Leg

MAIN FRAME END WHEEL DRIVE – PAGE 5 OF 5		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
76	103625 1036251 (Not Illustrated) 1036252 (Not Illustrated) 1036253 (Not Illustrated) 1036254 (Not Illustrated)	Support, Bearing and Clutch - FLXII Style Support, Bearing and Clutch - Mounted Style (W/Part #103626) Support, Bearing and Clutch – Mounted Style (Typical) Support, Bearing and Clutch - (Non-Typical Mdl.822) Support, Bearing and Clutch - Mounted Style (W/O #103626)
77	8956 89561 (Mdl.86)	Angle Iron, Speed Changer Mount
78	1046C12	Patent ID
79	1075	Serial Plate
80	1046C13	Decal - Transport Lock
81	1046C4-A	Decal - Do Not Operate without Guards
82	1036222 1036223	Angle Iron Support Angle Iron Support - Mdl.822 Non Typical
83*	CP316-2	Cotter Pin, 3/16" x 2"
84*	80112	Pin, Hydraulic FLXII 1"x 3-1/2" Standard
85	1046C22	Decal - Lug Nut Torque
86	3245ENDX 3245ENDX2	Chain Guard, End Wheel Chain Guard, End Wheel (Used on Mdl.822, Non-Typical)
87	B14-.5 (Not Illustrated)	Bolt, 1/4" x 1/2"
88	W14 (Not Illustrated)	Washer, 1/4"
89	B38-7 (Not Illustrated)	Bolt, 3/8" x 7" (Used in 2" x 6" Frame Tube)
90	B38-4 (Not Illustrated) B38-4.5 (Not Illustrated)	Bolt, 3/8" x 4" (Used in 2" x 3" Frame Tube) Bolt, 3/8" x 4-1/2" (Used in 2" x 3" Frame Tube with Output Reduction Kit)
95	20679 (Not Illustrated)	Support Beam FLXII-822
96	1046C14	Decal, Output Reduction Kit End Wheel Drive (When Used)
97	1046C11	Decal, Clutch Chain
98	B38-1	Bolt, 3/8"x 1"
99	1085B27	Rim Bracket, Lock-Out Hub
100	SCH12-1.25	Socket Head Bolt, 1/2" x 1-1/4"
101	SCH12-2 B12-2.5-NF (After 4/l/97)	Socket Head Bolt, 1/2" x 2" Bolt, 1/2" x 2-1/2", National Fine Thread
102	1085B284	Spacer, Lock-Out, Metal, .118"
103	1085B28	Spacer, Lock-Out, Plastic, .062"
104	1085B23	Seal, Lock-Out Industry Number - CR19753
105	1085B21	Bearing, Roller Industry Number - BR324-120
106	1085B281	Spacer, Lock-Out, Plastic, .125"
107	1046C71 (Not Illustrated) 1046C72 (Not Illustrated)	Slow Moving Vehicle Decal – Used when obstructions prevent use of metal sign. Slow Moving Vehicle Sign – Used when no obstructions are present
108	UB38-4.75-4 (Not Illustrated)	U-Bolt, 3/8"x 4-3/4"x 4"
109	W38 (Not Illustrated)	Washer, 3/8"
110	N38-TL (Not Illustrated)	Nut, 3/8" Top Lock
111	1037BHW (Not Illustrated)	Bearing Mount Bar – 1/4"x 2"x 6-1/2" (two 1/2" Holes)

*** Items #83 and #84 are used on both ends of the hydraulic cylinder on the non-drive side and the upper cylinder end of the drive side.**

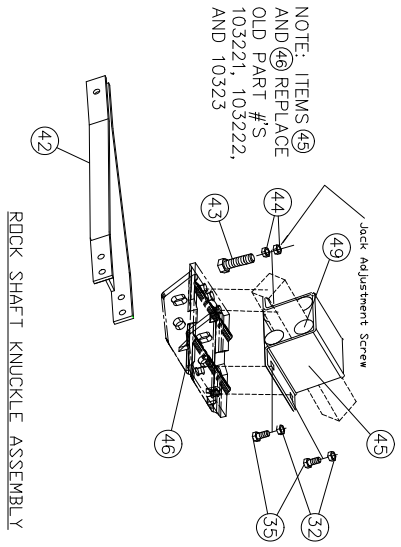
MAIN FRAME REAR WHEEL DRIVE – PAGE 1 OF 3



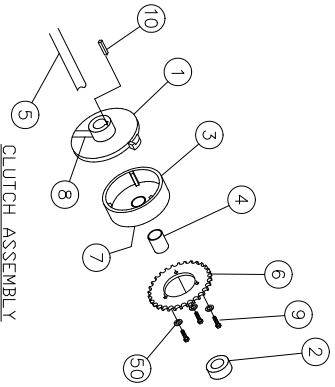
MAIN FRAME REAR DRIVE DRILL – PAGE 2 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	PMCK-AM-2562	Packing Kit, 3-1/2"x 8" Hydraulic Cylinder
	PMCK-AM-2568	Packing Kit, 3-1/4"x 8" Hydraulic Cylinder
	PMCK-10600382	Piston Rod, Hydraulic Cylinder Replacement (Both Sizes)
1	1036X4 (Mdl.812RD) 1036X4E (Mdl.88RD) 1036X4J (Mdl.86RD) 1036X4F (Mdl.816RD) 1036X4I (Mdl.818RD) 1036X4K (Mdl.822RD)	Main Frame (Note: Frame has upper cylinder mounts welded to rear tube, & leg bearing mounts welded to bottom of frame after 1/l/96.)
2	1036X5	Upper Cylinder Mount, LH (After 1/l/96, part of frame weld)
3	1036X50	Upper Cylinder Mount, RH (After 1/l/96, part of frame weld)
4	4226XD (PMS-AF-1062)	Hydraulic Cylinder, 3-1/4"x 8" Rephase, (Drive Side)
5	4226XND (PMS-AF-1068)	Hydraulic Cylinder, 3-1/2"x 8" Rephase, (Non Drive Side)
6	4224A1	90 Degree 3/8" O-Ring Hydraulic Fitting, 3/8" N.P.T.
7	UB58-4-5.5 (4228) (Not Illustrated)	U-Bolt, 5/8"x 4"x 5-1/2" (Used Before 1/l/96)
8	N58-FN (Not Illustrated)	Nut, 5/8" Flange Nut
9	1036X51	Spacer, 1/4" Thick (between Bearing Mount & Frame)
10	1036FF2	Spacer, Cylinder Arm - 1-1/4" ID x 1-1/2" L
11	1036FFX	Spacer, Cylinder Arm - 1-1/4" ID x 1" L
12	1036FF3	Spacer, Cylinder Arm - 1-1/4" ID x 2" L
13	1118X	Clutch Tripper Rod Assembly (See Page 90-10 For Detail)
14	1046C13	Decal, Transport Lock Channel
15	1045A	Sprocket, 40B18, KY & SS
16	1118BBX1 1118BBX2 (Not Illustrated)	Clutch Trip Engager, FLXII (Rear Drive) Clutch Trip Engager, FLXII (Mdl.822 Rear Drive Non -Typical)
17	B38-2.5	Bolt, 3/8"x 2-1/2"
18	N38-CL	Nut, 3/8" Clincher Nut
19	B12-3	Bolt, 1/2"x 3"
20	N12	Nut, 1/2"
21	103165	Jack Shaft - RD (Also used on End Wheel Output Reduction Kit)
22	10401 (Mdl.88RD & 812RD) 10402 (Mdl.86RD)	Idler Bracket
23	1037CLX1	Collar, Split, Leg w/ Mount Bracket
24	1037CLX	Collar, Split
25	103625 1036251 1036252	Support, Bearing and Clutch - FLXII Style Support, Bearing and Clutch - Mounted Style Support, Bearing and Clutch - Mounting Brackets
26	1037FLB	FLXII Bearing, 3-1/4"x 3"x 2" (NOTE: Bearing is installed inside of each Bearing Mount Casting)
27	1037BHX (Mdl.88, 812) 1037BHX2 (Mdl.88, 812) 1037BHX3 (Mdl.816, 818, 822) 1037BHX4 (Mdl.816, 818, 822)	Bearing Mount, Casting Bearing Mount, Casting - Zirk Repositioned (RD) Bearing Mount, Casting - 5/8" Bolt Holes In Casting (RD & RT) Bearing Mount, Casting - 5/8" Bolt Holes In Casting & Zirk Repositioned (RD & Mdl. 822 Non-Typical)
28	1042	Idler Assembly, 1/2"x 3-1/2"

MAIN FRAME REAR DRIVE DRILL – PAGE 3 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
29	4226XG4	Hydraulic Transport Guard, RD 3-1/2"
30	103161 103161A	Jack Shaft and Output Reduction Kit Support, RD Jack Shaft and Output Reduction Kit Support, Mdl.822 RD Non-Typical
31	3017 3233A 3233B 3233C	Clutch Support, R.H. Clutch Shaft Support, Mdl.822 Clutch Shaft Support, Mdl.822 Non-Typical Clutch Shaft Support Notched, Mdl.86
32	3245ENDX1 3245ENDX3 (Not Illustrated) 1046C4-A (Not Illustrated)	Chain Guard, Rear Drive Chain Guard, Rear Drive Mdl.822 Non-Typical Decal on Chain Guard – Do Not Operate Without Guards
33	1125	Collar, Shaft - 1/2" Bore
34	2036B (Mdl. 86, 88, 812) 2036B0 (Mdl. 816, 818, 822) 2036B1 (Mdl. 86, 88, 812) 2036B2 (Mdl. 816, 818, 822) 2036C1 (Mdl. 86, 88, 812) 2036C2 (Mdl. 816, 818, 822)	Axle, 6-Bolt (Welded), - 1992 Axle, 6-Bolt (Welded), - 1992 Axle, 6-Bolt (Welded), 1992- Axle, 6-Bolt (Welded), 1992- Axle, 6-Bolt (Pinned), 1992- (Cold Rolled Steel) Axle, 6-Bolt (Pinned), 1992- (Cold Rolled Steel)
35	1046C11	Decal, Clutch Chain Orientation
36	4226XG0	Retainer, Hydraulic Transport
37	UB38-3.375-2.5 UB38-3.375-4.5	U-Bolt, 3/8"x 3-3/8"x 2-1/2" (RD 86) U-Bolt, 3/8"x 3-3/8"x 4-1/2" (RD 88. 812, 816, 818, 822)
38	W38	Washer, 3/8"
39	801112	Pin, Hydraulic FLXII 1"x 4-1/8" Manufactured
40	W1	Washer, 1"
41	RP316-2.5	Roll Pin 3/16"x 2-1/2"
42	10365	Bracket, Support on RD and RT
43	B58-7GRD8	Bolt, 5/8"x 7" Grade 8
44	W58H	Washer, 5/8" Hardened
45	N58-TL	Nut, 5/8", Top Lock Nut
46	1054	Sprocket, 40B30, 1" Bore with 3/16" Cross Hole
47	1043	Idler Assembly, Leg Chain (See Idler Assembly Page 90-13 For Detail)
48	1015B (Prior to Early '93 - Not Shown) 1015C (After Early '93 - Not Shown) 1085B20	Sprocket Hub (6-Bolt) Standard on all models EXCEPT 88 Sprocket Hub (6-Bolt) Standard on all models EXCEPT 88 Housing, Lock-Out Hub - Standard on Model 88 -03. Standard on all models 03-. (See Page 90-51 For Detail)
49	2040XA	Chain, Wheel Drive, FLXII (77 Links with Offset Link and Full Link Connectors)
50	2040M	Chain, Leg Drive 18-Tooth Sprocket to 18-Tooth Sprocket on Input Shaft, Rear Drive (69 Links with Half Link or Full Link Connector)
51	2040K	Chain, Clutch for Rear Drive (25 Links with Offset Link and Full Link Connectors)
52	B38-3.25 (Not Illustrated)	Bolt, 3/8"x 3-1/4"
53	10365A	Bracket, Support - Assembly w/Hardware (Requires 4 per drill)

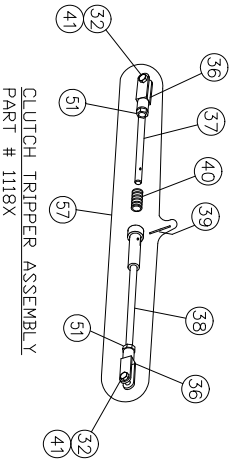
MAIN FRAME SUB-ASSEMBLIES - PAGE 1 OF 3



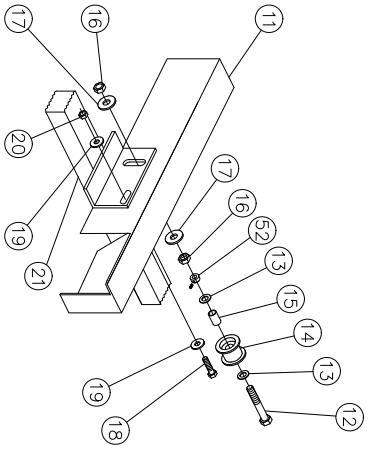
ROCK SHAFT KNUCKLE ASSEMBLY



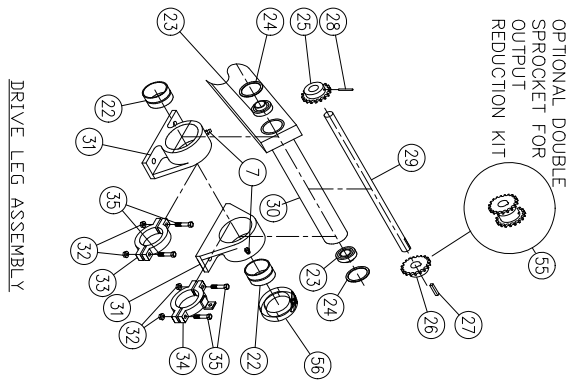
CLUTCH ASSEMBLY



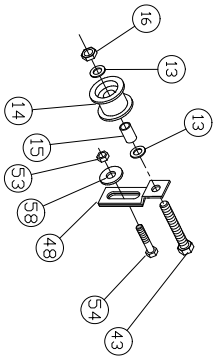
CLUTCH TRIPPER ASSEMBLY
PART # 1118X



CHAIN GUARD ASSEMBLY



DRIVE LEG ASSEMBLY



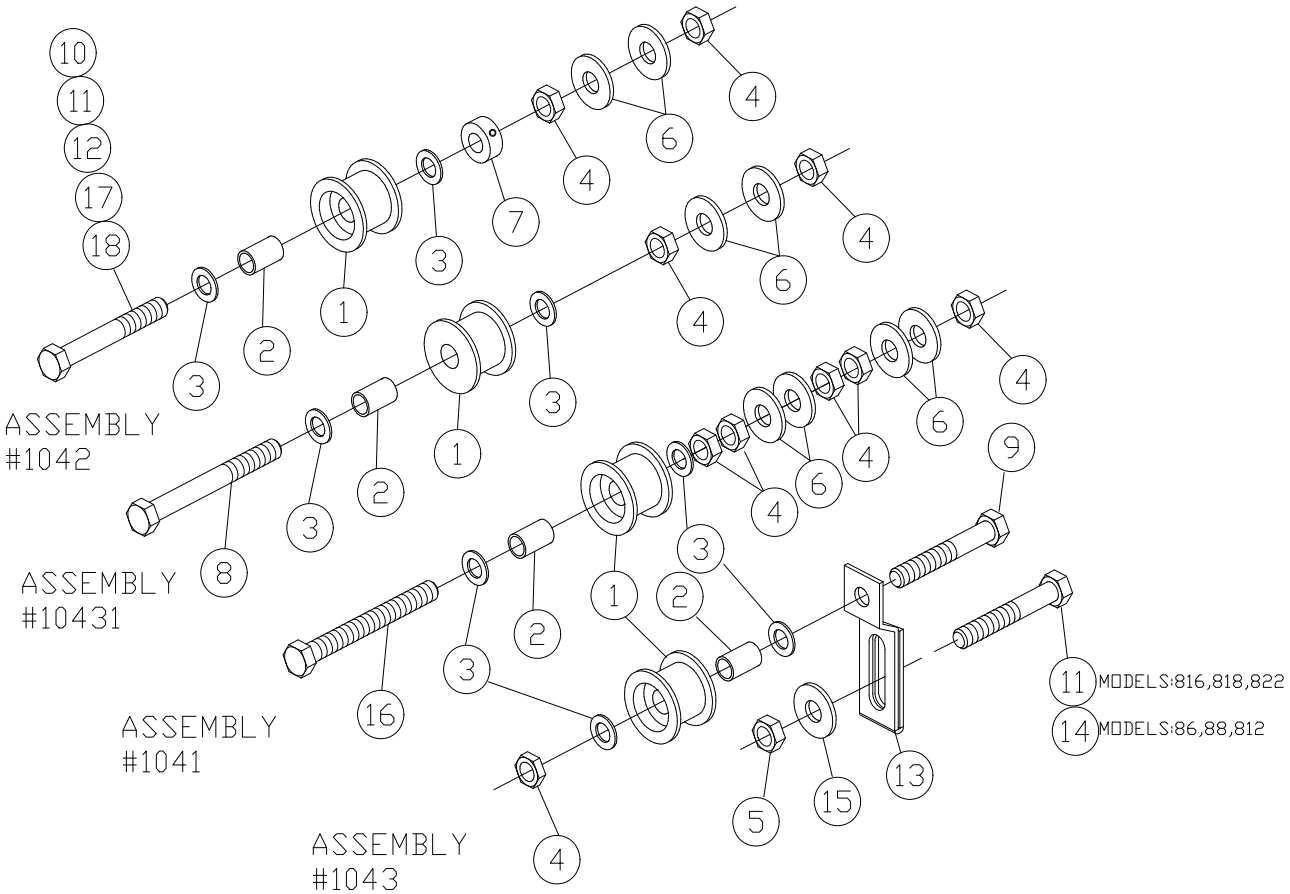
IDLER ASSEMBLY-DRIVE LEG
PART #1043

MAIN FRAME SUB-ASSEMBLIES – PAGE 2 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	1119	Clutch, Housing w/Dog Trip
2	1124	Collar, Shaft, 1" Bore
3	1120	Clutch, Hub
4	1121	Bushing, Clutch, 1" Bore
5	15-710	Shaft, Input
6	1044 1144A 1144B	Sprocket, 40A30 - Standard Sprocket Sprocket, 40A54 - Optional Sprocket Sprocket, 40A60 - Optional Sprocket Special order sprockets are available.
7	1093DD	Zirk, 1/4"-28
8	SC38-16-.250	Set Screw, 3/8"x 1/4"
9	B516-1	Bolt, 5/16"x 1"
10	1110	Key, Sq. 1/4"x 1-1/4"
11	3245CLHX1 3245CLHX2 (Not Illustrated)	Clutch Chain, Guard Clutch Chain, Guard (Mdl 822, Non-Typical)
12	B12-3	Bolt, 1/2"x 3"
NOTE: When the Output reduction Kit is installed, Item #12 requires B12-4TH (Bolt, 1/2"x 4" Thread to Head): W38 (Washer 3/8" - Requires 4); and JN12 (Jam Nut 1/2" - Requires 5)		
13	MB12-.062	Machine Bushing, 1/2" ID x 3/4" OD x .062" Thickness
14	1041A	Spool, Plastic
15	1041A2	Bushing, Idler Spool
16	N12-JN	Nut, 1/2" Jam Nut
17	W12	Washer, 1/2"
18	B38-1.25	Bolt, 3/8"x 1-1/4"
NOTE: When the Output reduction Kit is installed, Item #18 requires B38-2.25TH (Bolt, 3/8"x 2-1/4" Thread to Head); W38 (Washer 3/8"- Requires 4); and N38-FL (Nut, 3/8" Flanged - Requires 3)		
19	W38	Washer, 3/8"
20	N38-CL	Nut, 3/8" Clincher Nut
21	8956BX (Mdl. 812) 8956BEX (Mdl. 88) 8956BFX (Mdl. 816, R.H.) 8956BFX1 (Mdl. 816, L.H.) 8956BGX (Mdl. 1012) 8956BHX (Mdl. 610) 8956BIX (Mdl. 818, R.H.) 8956BIX1 (Mdl. 818, L.H.) 8956BJX (Mdl. 86) 8956BKX (Mdl. 822, R.H.) 8956BKX1 (Mdl. 822, L.H.) 8956BLX (Mdl. 810)	 (Replaces Part #8966BFX) (Replaces Part #8976BGX) (Replaces Part #8986BHX) **Planter Support Tube**
22	1037FLB	FLXII Bearing, 3-1/4"x 3"x 2"
23	1037DBX1 (After 1992)	Bearing, 1" Bore Cylindrical OD
24	3000X206ST (After 1992)	Retaining Ring, Drive Leg, (1" Bearing)
25	1054	Sprocket, 40B30, 1” Bore with 3/16” Cross Hole
26	1045A	Sprocket, 40B18-KY & SS
27	1110	Key, Sq. 1/4"x 1- 1/4"

MAIN FRAME SUB-ASSEMBLIES – PAGE 3 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
28	RP316-2	Roll Pin, 3/16"x 2"
29	10375 (Mdl 88,810,812) 103751 (Mdl 816,818,822,1012)	Drive Shaft, Leg
30	1037LDX (Mdl 88,812) 1037LDXO (Mdl 88,810,812) 1037LDX2 (Mdl 816,818,822,1012) 1037LDX3 (Mdl 816,818,822,1012) 1037LDX6 (Mdl 86) 1037LDX7 (Mdl 88RD)	Drive Leg, FLXII, 1990-92, Welded Axle Drive Leg, FLXII, 1992-, Removable Axle Drive Leg, FLXII, 1990-92, Welded Axle Drive Leg, FLXII, 1992-, Removable Axle (Cold Rolled) Drive Leg, FLXII, 1992-, Removable Axle (Cold Rolled) Drive Leg, FLXII, 1994-, Removable Axle (Cold Rolled)
Note: Legs prior to 1992, all sizes, were machined to have 1-1/8" cylindrical bearings inserted into the ends of the 3" round tubes (1" x 1-1/4" bushing). After 1992, the round tubes were machined for 1" cylindrical bearings.		
31	1037BHX (Mdl.88, 812) 1037BHX2 (Mdl.88, 812) 1037BHX3 (Mdl.816, 818, 822) 1037BHX4 (Mdl.816, 818, 822)	Bearing Mount, Casting Bearing Mount, Casting - Zirk Repositioned (RD) Bearing Mount, Casting - 5/8" Bolt Holes In Casting (RD & RT) Bearing Mount, Casting - 5/8" Bolt Holes In Casting & Zirk Repositioned (RD & Mdl.822 Non-Typical)
32	N38-CL	Nut, 3/8" Clincher Nut
33	1037CLX	Collar, Split
34	1037CLX1 1037CLX2 (Not Illustrated)	Collar w/ Mount Bracket Collar w/ Mount Bracket, Non-Typical for Mdl. 822
35	B38-1.5	Bolt, 3/8"x 1-1/2"
36	3069	Yoke, Clevis, 3/8" National Fine Thread
37	1118X2	Clutch Tripper, Male
38	1118Xl	Clutch Tripper, Female
39	RP18-.875	Roll Pin, 1/8" x 7/8"
40	S-38	Spring, Clutch Tripper
41	B38-1.25	Bolt, 3/8"x 1-1/4"
42	10321	Lift Bracket, 1992-
43	B12-2	Bolt, 1/2"x 2"
44	N12-JN	Nut, 1/2" Jam Nut
45	10322 103220 103221 103222	Clamp Half, Knuckle, Fabricated 1992-2004 Clamp Half, Knuckle, Ductile Iron 2005- Clamp Half, Upper, -1992 (Replaced by 10322, 103211) Clamp Half, Lower, -1992 (Replaced by 10322, 103211)
46	103211	Support Lift Channel (96-)
48	3237X	Idler Support, FLXII Leg
49	42202X	Rubber, 1.375" Cord - 80 duro
50	LW516	Lock Washer, 5/16"
51	N38-NF	Nut, 3/8" National Fine Thread
52	1040C	Collar, 1/2" With Set Screw
53	N12-CL	Nut, 1/2" Clincher Nut
54	B12-3	Bolt, 1/2" x 3" (FLXII Mdls. 816, 818, 822 require B12-4)
55	3096 3097	Sprocket, DBL 1818 Sprocket, DBL 3618
56	1037CLX2	Collar, Shaft - 3"
57	1118X	Clutch Tripper Rod Assembly
58	W12H	Washer, 1/2" Hardened

IDLER ASSEMBLIES – PAGE 1 OF 2

(10) 1042: FRONT CLUTCH CHAIN, 3½" BOLT(W/O OUTPUT REDUCTION KIT)
(11) 1042A: COOL SEASON BOX CHAIN, 4" BOLT
(12) 1042C: REAR CLUTCH CHAIN, 5" BOLT(W/O OUTPUT REDUCTION KIT)
(17) 1042B: SMALL SEED BOX CHAIN, 4½" BOLT
(18) 1042D: REAR CLUTCH CHAIN, 5½" BOLT(W/ OUTPUT REDUCTION KIT)



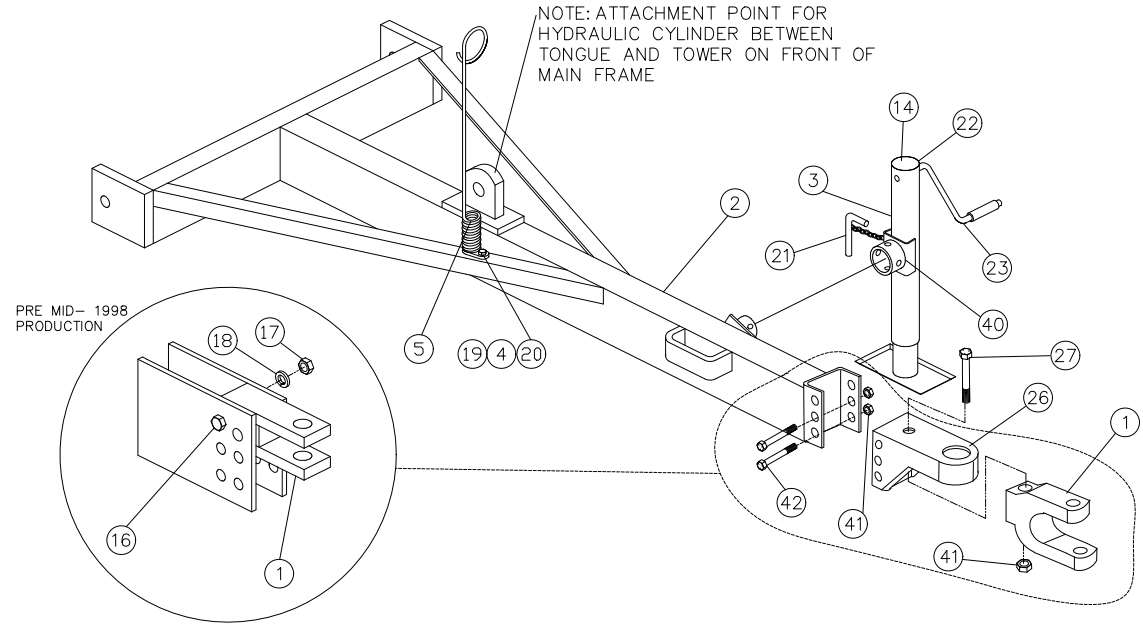
IDLER ASSEMBLIES – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	01041	Idler, Clutch Chain, Front - With Output Reduction Kit Assembly: 1041A, 1041A2, 1040B(2), B12-4TH, W12(4), N12-CL(5)
	01042	Idler, Clutch Chain, Front - Without Output Reduction Kit Assembly: 1041A, 1041A2, 1040B(2), 1040C, B12-3.5, W12(2), N12-CL(2)
	01042A	Idler, Cool Season Seed Box Chain Assembly: 1041A, 1041A2, 1040B(2), 1040C, B12-4, W12(2), N12-CL(2)
	01042B	Idler, Small Seed Box Chain Assembly: 1041A, 1041A2, 1040B(2), 1040C, B12-4.5, W12(2), N12-CL(2)
	01042C	Idler, Clutch Chain, Rear - Without Output Reduction Kit Assembly: 1041A, 1041A2, 1040B(2), 1040C, B12-5, W12(2), N12-CL(2)
	01042D	Idler, Clutch Chain, Rear - With Output Reduction Kit Assembly: 1041A, 1041A2, 1040B(2), 1040C, B12-5.5, W12(2), N12-CL(2)
	01043	Idler, Leg Chain Assembly: 1041A, 1041A2, 1040B(2), 3237X, B12-2, N12-CL, B12-3 (Mdl 86,88,812), or B12-4 (Mdl 816,818,822), W12H, JN12
	010431	Idler, Fluffy Seed Box Chain Assembly: 1041A, 1041A2, 1040B(2), B12-2.5, W12(2), N12-CL(2)
1	1041A	Spool, Plastic
2	1041A2	Bushing, Idler Spool
3	1040B	Bushings, 1/2" ID - 3/4" OD
4	N12-CL	Nut, 1/2" Clincher Nut
5	N12-JN	Nut, 1/2" Jam Nut
6	W12	Washer, 1/2"
7	1040C	Collar, 1/2" (With Set Screw)
8	B12-2.5	Bolt, 1/2"x 2-1/2"
9	B12-2	Bolt, 1/2"x 2"
10	B12-3.5	Bolt, 1/2"x 3-1/2"
11	B12-4	Bolt, 1/2"x 4"
12	B12-5	Bolt, 1/2"x 5"
13	3237X	Idler Support, FLXII Leg
14	B12-3	Bolt, 1/2"x 3"
15	W12H	Washer, 1/2" Hardened
16	B12-4TH	Bolt, 1/2"x 4" Thread-To-Head
17	B12-4.5	Bolt, 1/2"x 4-1/2"
18	B12-5.5	Bolt, 1/2"x 5-1/2"

MAIN FRAME HYDRAULIC ASSEMBLIES – PAGE 1 OF 2

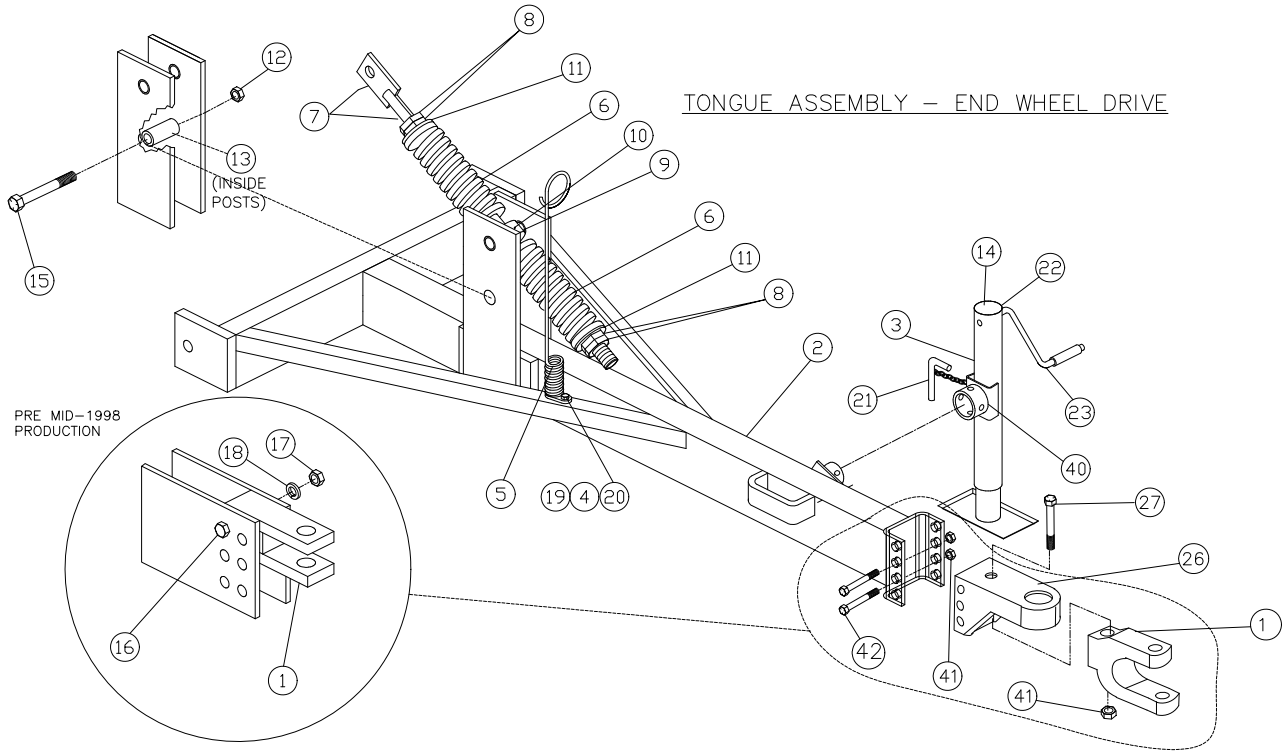
HYDRAULIC ASSEMBLIES (MAIN FRAME) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	4222X8 (Model 86, 8 Ft.) 4222X4 (Model 86RD, 4 Ft.) 4222X9 (Model 88, 9 Ft.) 4222X5 (Model 88RD, 5 Ft.) 4222X12 (Model 812, 12 Ft.) 4222X6 (Model 812RD, RT, 6 Ft) 4222X14 (Model 816, 14 Ft.) 4222X8 (Model 816RD, RT, 8 Ft.) 4222X16 (Model 818, 16 Ft.) 4222X10 (Model 818RD, RT, 10Ft.) 4222X19 (Model 822, 19 Ft.) 4222X12 (Model 822RD, RT, 12Ft.)	Hose, Hydraulic, FLXII, 3/8" Male, NPT- **Cross over hose** connecting cylinder to cylinder. Connects ram end of drive end cylinder to mount end of non-drive end cylinder.
2	4222X18 (Model 86, 18 Ft.) 4222X14 (Model 86RD, 14 Ft.) 4222X19 (Model 88, 19 Ft.) 4222X14 (Model 88RD, 14 Ft.) 4222X20 (Model 812, 20 Ft.) 4222X15 (Model 812RD, RT, 15 Ft) 4222X21 (Model 816, 21 Ft.) 4222X16 (Model 816RD, RT, 16Ft.) 4222X21 (Model 818, 21 Ft.) 4222X17 (Model 818RD, RT, 17Ft.) 4222X21 (Model 822, 21 ft.) 4222X18 (Model 822RD, RT, 18Ft.)	Hose, Hydraulic, FLXII, 3/8" Male, NPT & 1/2" male - Connects mount end of **drive/master cylinder** (3-1/2") to up valve on tractor.
3	4222X19 (Model 86, 19 Ft.) 4222X15 (Model 86RD, 15 Ft.) 4222X20 (Model 88, 20 Ft.) 4222X15 (Model 88RD, 15 Ft.) 4222X21 (Model 812, 21 Ft.) 4222X16 (Model 812RD, RT, 16 Ft) 4222X22 (Model 816, 22 Ft.) 4222X17 (Model 816RD, RT, 17Ft.) 4222X22 (Model 818, 22 Ft.) 4222X18 (Model 818RD, RT, 18Ft.) 4222X22 (Model 822, 22 Ft.) 4222X19 (Model 822RD, RT, 19Ft.)	Hose, Hydraulic, FLXII, 3/8" Male, NPT &1/2" male - Connects mount end of **non-drive/slave cylinder** (3-1/4") to down valve on tractor.
4	4224A1	90 Degree, O-Ring Style Adapter
5	4224A2	45 Degree, O-Ring Style Adapter
6	4222A	Tie, Plastic-Short
7	4222B	Tie, Plastic-Long
8	4226XD	Hydraulic Cylinder, 3-1/4"x 8" (Slave) Rephasing , Tie Rod: PMS-AF-1062
9	4226XND	Hydraulic Cylinder, 3-1/2"x 8" (Master) Rephasing , Tie Rod: PMS-AF-1068
10	42221	Sleeve, Hose Protector
11	42220	Hydraulic Quick Disconnect (Male)
12	422201 (Not Illustrated)	Bushing, Hydraulic, 3/8"x 1/2" – Used when Items #2 &3 are not 1/2".

TONGUE ASSEMBLIES – PAGE 1 OF 3

TONGUE ASSEMBLY – REAR DRIVE



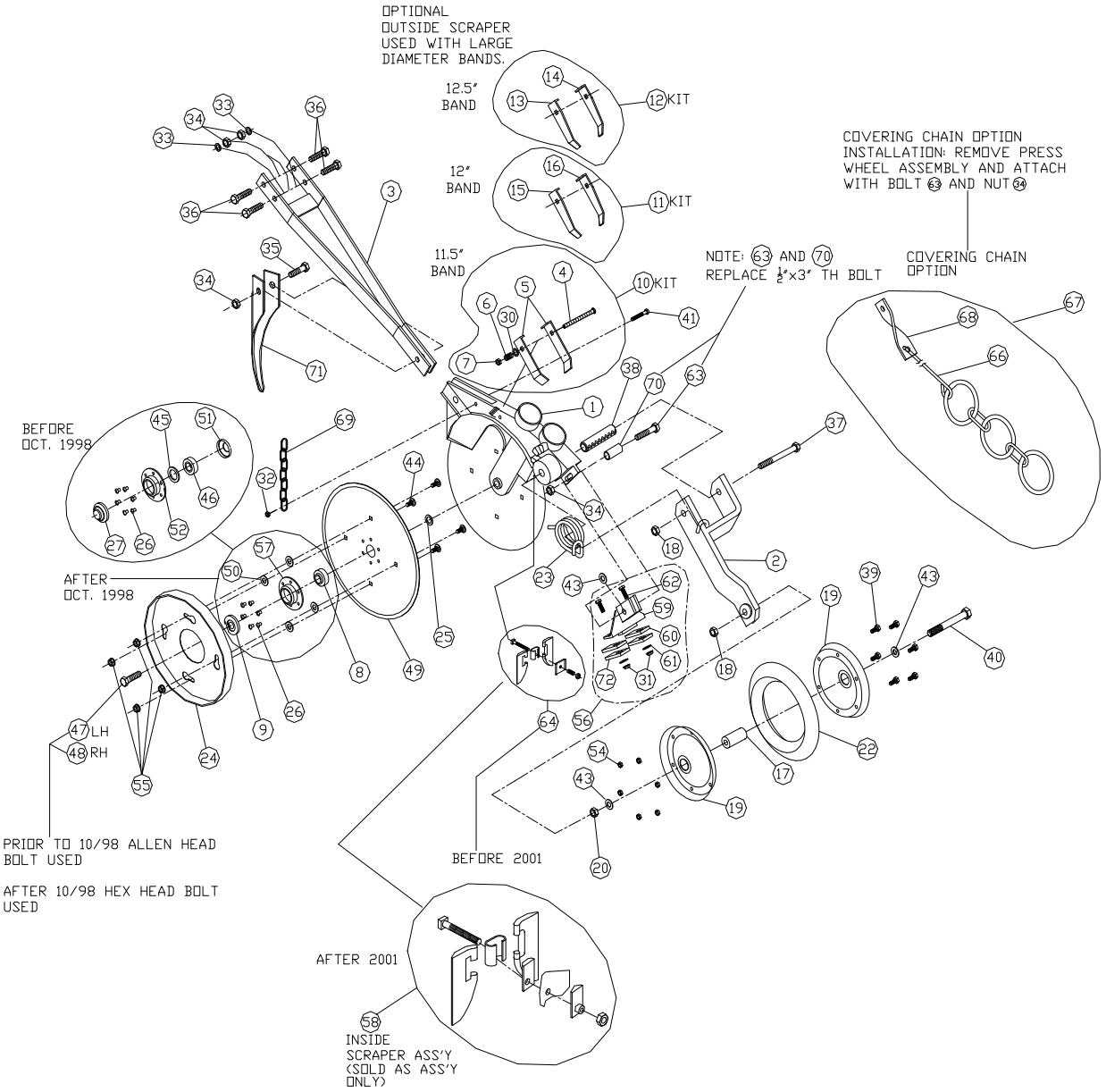
TONGUE ASSEMBLY – END WHEEL DRIVE



TONGUE ASSEMBLY (FLXII DRILLS) – PAGE 2 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	4213X (Mdl 86,88,810,610,812) 4213XF (Mdl 816,818,822) 4213XG (Mdl 1012) 42132 (Mdl 86,88,812 RD) 42133 (Mdl 88,812 RD Short)	Tongue Assembly, FLXII (-99)
	4213X1 (Mdl 86,88,810,610,812) 4213XF1 (Mdl 816,818,822) 4213XG1 (Mdl 1012) 421321 (Mdl 86,88,812 RD) 421331 (Mdl 88,812 RD Short)	Tongue Assembly, FLXII (99-)
1	1022B 1022B1 1022B2	Hitch Clevis (-99) Hitch Clevis, Rear Drive (-99) Hitch Clevis (99-)
2	4213A (Mdl 86,88,810,812) 4213A1 (Mdl 86,88,812 RD) 4213A2 (Mdl 88,812 RD Short) 4213AF (Mdl 816,818,822) 4213AG (Mdl 1012)	Tongue Weldment (-99)
	4213A10 (Mdl 86,88,810,812) 4213A11 (Mdl 86,88,812 RD) 4213A21 (Mdl 88,812 RD Short) 4213AF1 (Mdl 816,818,822) 4213AG1 (Mdl 1012)	Tongue Weldment (99-)
3	10691 10691A 10691B	Parking Jack Assembly, Pin Style(-95) Parking Jack Assembly, Pipe Style(95-) 2500 Lb. Capacity Parking Jack Assembly, Pipe Style(6/02-) 5000 Lb. Capacity
4	W38 (Not Illustrated)	Washer, 3/8"
5	4214	Hose Guide, 18"
6	4217A	Spring (All Models)
7	4217B1	Rod, Spring
8	N1.25-JNNC (4217D1)	Nut, 1-1/4" Jam Nut National Coarse Thread
9	4207	Trunnion, Pivot
10	1093DD	Zirk, 1/4"-28
11	4232A	End Guides
12	N12	Nut, 1/2"
13	4232	Spacer, Spring Assembly
14	1069A7	Cap, Jack (Not Serviced)
15	B12-5.5	Bolt, 1/2"x 5-1/2"
16	B34-5	Bolt, 3/4"x 5"
17	N34-TL	Nut, 3/4" Top Lock Nut
18	LW34	Lockwasher, 3/4"
19	N38-FN (Not Illustrated)	Nut, 3/8" Flange Nut
20	B38-1.25	Bolt, 3/8" x 1-1/4"
21	1069A5	L-Pin (Not Serviced)

TONGUE ASSEMBLY (FLXII DRILLS) – PAGE 3 OF 3			
ITEM NO.	**PART NUMBER**		**DESCRIPTION**
22	1069A4	(Not Illustrated)	Gear, Worm (Not Serviced)
23	1069A3		Jack Handle Assembly (Not Serviced)
26	1022C1 1022C2		Hitch Body, Standard (99-) Hitch Body, Heavy Duty (Used On Limited Production In 2000)
27	B34-6GRD8		Bolt, 3/4"x 6" Grade 8
28	42260	(Not Illustrated)	Cylinder, Hydraulic 3"x 8" (Rear Drive)
29	4222X6	(Not Illustrated)	Hose, Hydraulic - 6' (Rear Drive)
30	4222X7	(Not Illustrated)	Hose, Hydraulic - 7' (Rear Drive)
31	4224A1	(Not Illustrated)	90 Degree – 3/8" Non O-Ring, Hydraulic Fitting, 3/8" N.P.T.
32	1037GGX1	(Not Illustrated)	End, Hydraulic Cylinder 1-1/8" (Used on Rear Drive Only) (Includes bushing 1" OD, 3/4" ID, 3/4" L)
33	4222A	(Not Illustrated)	Tie, Plastic-Short
34	4222B	(Not Illustrated)	Tie, Plastic-Long
35	42220	(Not Illustrated)	Hydraulic Quick Disconnect (Male)
36	422201	(Not Illustrated)	Hydraulic Bushing, 3/8"x 1/2"
37	4226XG3	(Not Illustrated)	Guard, Hydraulic, Transport, 8-1/4"
38	4226XG0	(Not Illustrated)	Retainer, Hydraulic Transport
39	1046C13	(Not Illustrated)	Decal, Transport Lock
40	1069A		Jack Mount Bracket
41	N34-TL		Nut, 3/4" Top Lock Nut
42	B34-5GRD8		Bolt, 3/4"x 5" Grade 8

PLANTER ASSEMBLY (AFTER 8/93) – PAGE 1 OF 4

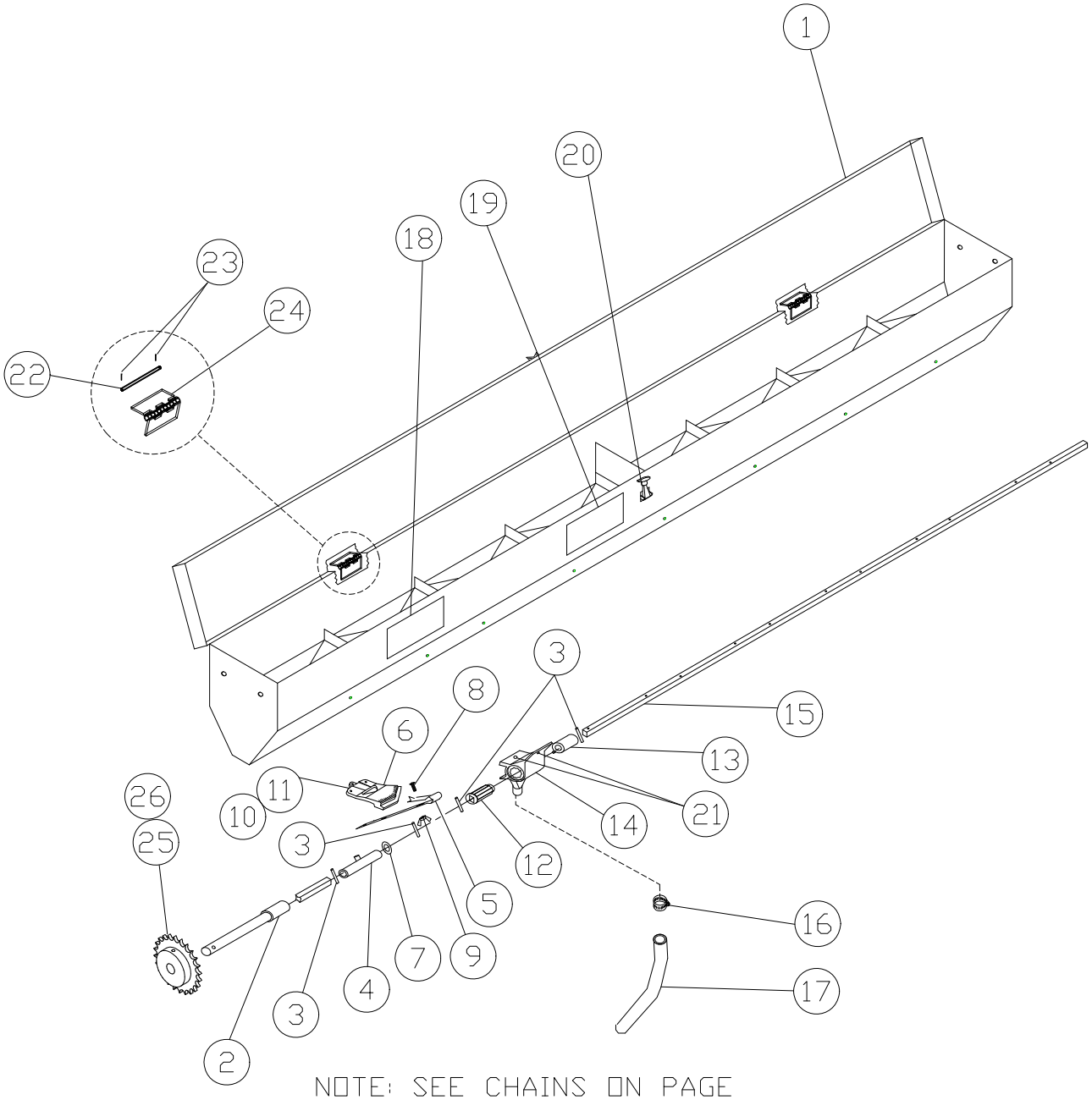


PLANTER ASSEMBLY (AFTER 8/1/93) – PAGE 2 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	125453 (11 1/2" Band - After 10/98) (Standard -98)	Blade, Band, Case, Bearing - Assembled Includes: K202M, 1097, M1677683, JD85204*, 16H630
	12545C3 (12" Band - 10/98-06/30/06) (Standard 98-06/30/06)	Blade, Band, Case, Bearing - Assembled Includes: K202M, 1097C, M1677683, JD85204*,16H630
	12545C5 (12" Band – Standard after 07/01/06)	Blade, Band, Case, Bearing - Assembled Includes: K202M5, 1097C, M1677685, JD85205*, 16H630
	12545A3 (12 1/2" Band - Fits Blades 74-)	Blade, Band, Case, Bearing - Assembled Includes: K202M, 1097A, M1677683, JD85204*,16H630
	KK-254M53	Blade, Case, Bearing Assembly (98-006/30/06) Includes: K202M, M1677683, JD85204*, 16H630
	KK-254M55	Blade, Case, Bearing Assembly (07/01/06) Includes: K202M5, M1677685, JD85205*, 16H630
	AM1128673 AM1128675	Case & Bearing Assembly: (98-06/30/06) JD85204*, M1677683 (07/01/06 -) JD85205, M1677685
	12700 (98 – 06/30/2006) 12800 (07/01/2006 -)	Planter Assembly: Furrow Opener w/0888 Boot (Black) Includes Press Wheel Assembly #1034A1
	1034A1	Press Wheel Assembly w/ Spring and "h" Frame - **Black** Used with Black Boot #0888 Includes: 10251, 1093A1, B12-4, JN12, MB12
	1093A1 (After 8/93 w/Axle Bolt)	Press Wheel Assembly (8/93-) Includes: 1094, 1093AC, 1092A1, B14-.625(6), N14-FN(6) B12-4, MB12, JN12
1	0888	Boot (Shoe) - Black
2	10251	"h" Frame - Black
3	10321	Lift Bracket
4	CB516-4.5 (1081)	Carriage Bolt, 5/16"x 4-1/2"
5	10845 10845F-RH (Not Illustrated) 10845F-LH (Not Illustrated)	Scraper, Left or Right Hand (11-1/2" Depth Band) Scraper, Right Hand (9-1/2" Depth Band) Scraper, Left Hand (9-1/2" Depth Band)
6	1087	Spring, Scraper
7	N516-FNL (1088)	Nut, 5/16" Flanged Locking Nut
8	JD8573 Bearing.(74-98). JD85204* JD85205	Bearing, (98-06/30/06) – Deere#AA21480 Bearing, (07/01/06 -) – Great Plaines #188-001V
9	3095 4095	Cap, Bolt Style (10/98-06/30/06) Cap, Bolt Style (07/01/06 -)
***NOTE: Truax Part #JD85204 is equivalent to John Deere Part #AA21480 JD85205 equivalent to GP#188-001V**		

PLANTER ASSEMBLY (AFTER 8/1/93) – PAGE 3 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
10	10845A	Scraper Assembly, Outside (11-1/2" Depth Band)
11	10845CA	Scraper Assembly, Outside (12" Depth Band)
12	10845BA	Scraper Assembly, Outside (12-1/2" Depth Band)
13	10845B-LH	Scraper, Left Hand (12-1/2" Depth Band)
14	10845B-RH	Scraper, Right Hand (12-1/2" Depth Band)
15	10845C-LH	Scraper, Left Hand (12" Depth Band)
16	10845C-RH	Scraper, Right Hand (12" Depth Band)
17	1092A1	Bearing , Non Regreasable (Regreasable Not Available)
18	N12-CLJN	Jam Nut, 1/2" Clincher Jam Nut
19	1093AC	Rim, Press Wheel
20	N12-JN	Nut, 1/2" Jam Nut
22	1094	Tire, Press Wheel (1.75"x 10")
23	10961	Spring, Torsion
24	1097 (Standard, -98) 1097C (Standard, 98-06/30/06) 1097C* (Standard 07/01/06 -) 1097A (Optional) 1097F (Optional)	Depth Band, 11-1/2" Diameter Depth Band, 12 Diameter Depth Band, 12 Diameter with 3-3/4" Center Hole Diameter Depth Band, 12-1/2" Diameter Depth Band, 9-1/2" Diameter
25	1100 (or JD#M15226)	Spacer - 5/8" ID, 3/4" OD
26	16H630	Rivets, 1/4"x 3/8" (-6/00) Rivets, 1/4"x 7/16" (6/00-)
27	2095	Cap, Force Style (-10/98)
30	W14	Washer, 1/4"
31	N516-FN	Nut, 5/16" Flange Nut
32	N516-CL	Nut, 5/16" Clincher Nut
33	W12	Washer, 1/2"
34	N12-CL	Nut, 1/2" Clincher Nut
35	B12-2.5	Bolt, 1/2"x 2-1/2"
36	B12-1.5	Bolt, 1/2"x 1-1/2"
37	B12-5.25	Bolt, 1/2"x 5-1/4"
38	10252	Bushing, Connex - Boot Casting - 3/4" OD, 1/2" ID, 3-1/4" L
39	B14-.625	Bolt, 1/4"x 5/8"
40	B12-4	Bolt, 1/2"x 4" Press Wheel Axle
41	B516-1.5GRD8	Bolt, 5/16"x 1-1/2" Grade 8
43	MB12-.125	Machine Bushing, 1/2"x .0125 Thickness (serrated washer between casting ears)
44	CB38-.75	Carriage Bolt, 3/8"x 3/4" Sht-N
45	JD8573A	Spacer (Obsolete 01/01/98)
46	JD85204 JD85205	Bearing (98-06/30/06) Bearing (07/01/06 -)
47	K301M	Hex Head Cap Screw 5/8"-11 x 1-3/8" L.H. (98-)
48	K300M	Hex Head Cap Screw 5/8"-11 x 1-3/8" R.H. (98-)
49	K202M	Blade Only (0.137 thickness after 6/00 requires 7/16" rivet)

PLANTER ASSEMBLY (AFTER 8/1/93) – PAGE 4 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
50	LW38-PN	Lockwasher, 3/8" Push Nut (Pal Nut)
51	M-17520	Seal (Required before 10/98), (Optional after 10/98)
52	M167768	Case, For Bearing JD8573 (Old Production Before 10/98)
54	N14-FN	Nut, 1/4" Flange Nut
55	N38-FN	Nut, 3/8" Flange Nut
56	10995A 10995B 10995C	Scraper Assembly, Depth Band (Plastic Scraper) , (1/96-) Scraper Assembly, Depth Band (Hardened Metal Scraper) , (2/02-) Scraper Assembly, Depth Band (Plastic Scrapers and Hardened Metal Scraper) , (2/02-)
57	M1677683 M1677685	Case - For Bearing JD85204 (10/98-06/30/06) Case - For Bearing JD85205 (07/01/06 -)
58	AM11828	Scraper Assembly - Inside
59	10996A	Scraper, Bracket, Cast Iron (1/96-)
60	10995	Scraper, Plastic
61	W516	Washer, 5/16"
62	B516-1.25	Bolt, 5/16"x 1-1/4"
63	1201	Bolt, 1/2"x 3" With Welded Collar
64	AM50919	Assembly, Scraper Kit (Replaced by Part #AM11828)
66	1093C	Drag Chain Kit
67	1093CC	Drag Chain Assembly - 0888 (92-)
68	1093C2	Drag Chain Mount - 0888
69	8955XA	Chain, Planter Support - 9 Links (8 Twisted and 1 Straightened)
70	1200 1201	Spacer, "h" Frame (Obsolete) Bolt, 1/2"x 3" With Welded Collar
71	38880	Disc Guard
72	109953	Scraper, Hardened Steel (After 2/15/02)

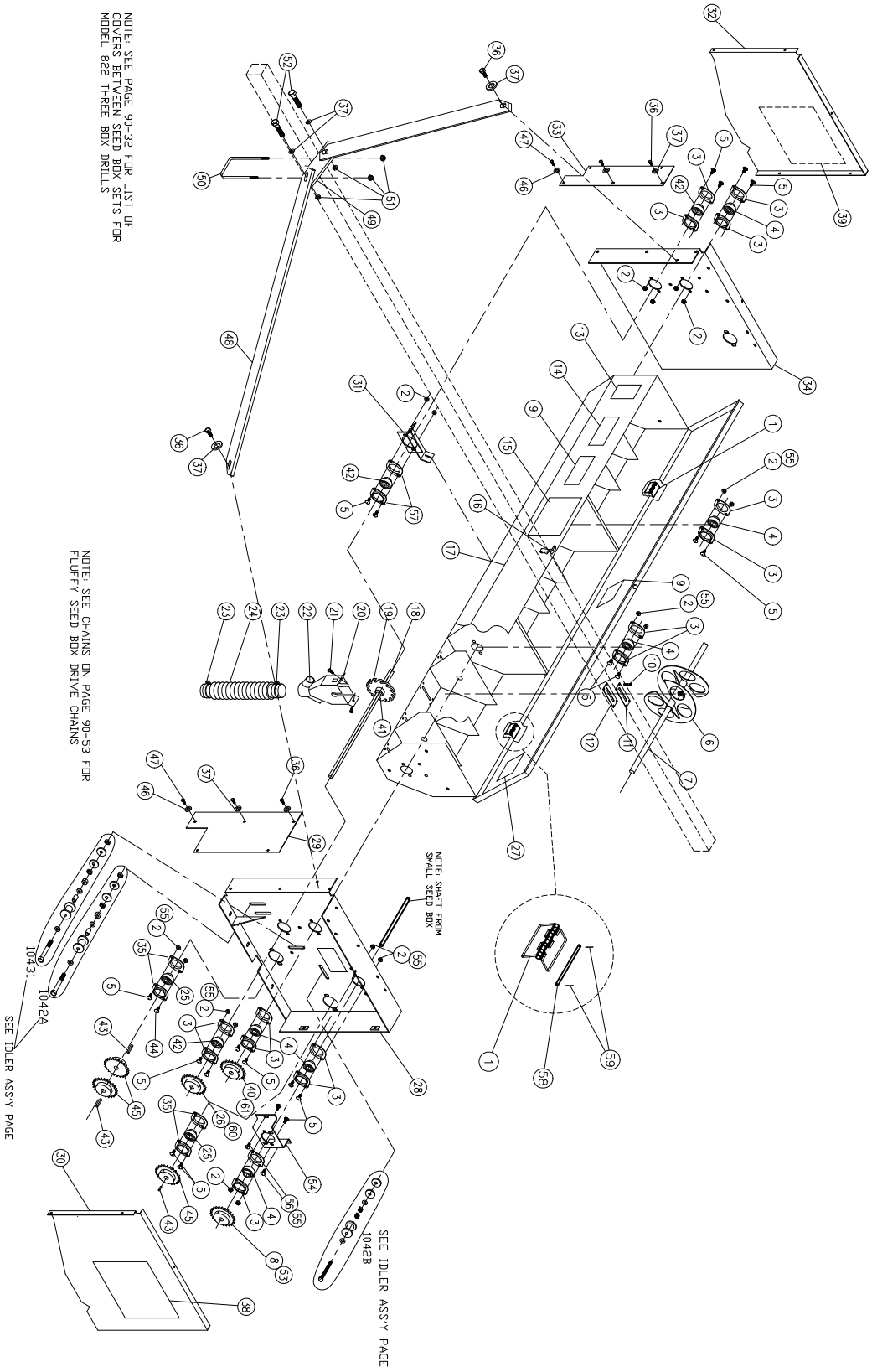
SMALL SEED BOX – PAGE 1 OF 2



NOTE: SEE CHAINS ON PAGE 90-51 FOR SMALL SEED BOX DRIVE CHAIN

SMALL SEED BOX – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	1038 (12 Row, 8" Sp.) 1038E (8 Row, 8" Sp.) 1038F (16 Row, 8" Sp.) 1038G (12 Row, 10" Sp.) 1038I (18 Row, 8" Sp.) 1038J1 (6 Row, 8" Sp.) 1038K (22 Row, 8" Sp.) 1038K1 (22 Row, 8" Sp.)	Small Seed Box Mdl.822 Non-Typical Mdl.822 Typical
2	1010	Coupler
3	RPl8-.875	Roll Pin, 1/8" x 7/8"
4	1130	Shifter Spool
5	1131	Lever, Shifter
6	1129	Mount, Shifter
7	MB12-.15 (or JD#Nl60437)	Spacer, .015 Thick, (Use as Needed)
8	CB14-.75	Carriage Bolt, 1/4" x 3/4"
9	WN14	Wing Nut, 1/4"
10	B14-1 (Not Illustrated)	Bolt, 1/4" x 1"
11	N14-FNL (Not Illustrated)	Nut, 1/4", Flanged Locking Nut
12	M10274	Roll, Feed (After Serial #2909 use part # 731274)
13	M10017	Cut-Off, Feed (After Serial#2909 use part # 731017)
14	AN-162555	Cup Assembly w/Snap Ring (After Serial#2909 use part # 73102A)
15	1048 (12 Row, 8" Sp.) 1048E (8 Row, 8" Sp.) 1048F (16 Row, 8" Sp.) 1048G (12 Row, 10" Sp.) 1048I (18 Row, 8" Sp.) 1048J (6 Row, 8" Sp.) 1048K (11 Row, 8" Sp.)	Shaft, 3/8" Square Mdl. 822 - Requires 2
16	1013	Clamp, Hose, #10 or #12
17	1012A	Hose, Small, Black Plastic, 1991-
18	1046C2	Decal, Chain Drive Keep Clear
19	1046C5	Decal, Do Not Tow Over 20 MPH
20	1038J	Lid Retainer
21	SCH14-.5	Socket Head Cap Screw 1/4" - 20 x1/2"
22	1038HP	Hinge, Pin - Brass 7/32"x 3-1/4"
23	CP116-.5	Cotter Pin, 1/16"x 1/2"
24	1038H	Hinge, Lid
25	1055 (40B20) Standard 1054A (40B30) Optional	Sprocket, 3/4" Round Bore
26	RP316-2 (Not Illustrated)	Roll Pin, 3/16"x 2"

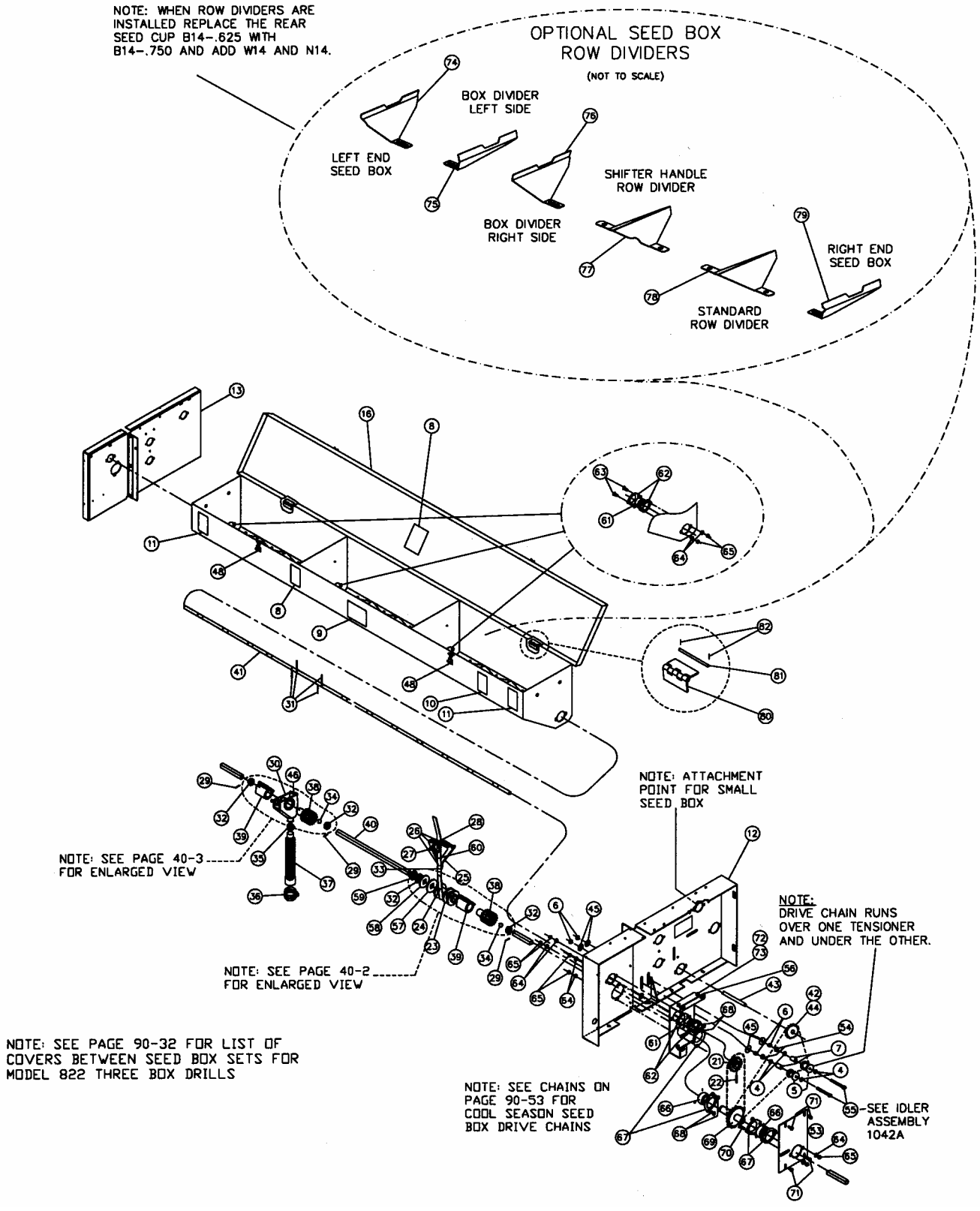
LARGE (FLUFFY) SEED BOX ASSEMBLY – PAGE 1 OF 3



LARGE (FLUFFY) SEED BOX ASSEMBLY – PAGE 2 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	1038H	Hinge, Lid
2	N516-CL	Nut, 5/16" Clincher Nut
3	1007A	Flangettes, Bearing 47 MST
4	1007	Bearing, 3/4" Spherical
5	CB516-.75	Carriage Bolt, 5/16" x 3/4"
6	1049A	Agitator, Auger
7	1004 (12 Row - 8" Sp.) 1004E (8 Row - 8" Sp.) 1004F (16 Row - 8" Sp.) 1004G (12 Row - 10" Sp.) 1004I (18 Row - 8" Sp.) 1004J (6 Row - 8" Sp.) 1004K (11 Row - 8" Sp.)	Shaft, 3/4" Round Mdl. 822 - Requires 2
8	1055 (40B20) Standard 1054A (40B30) Optional	Sprocket, 3/4" Round Bore
9	1046C8	Decal, Warning Rotating Parts
10	2010	Screw, Hex Head, 6-32 ST
11	1005	Retainer Plates
12	1006	Seed Gaskets
13	2008C2	Reflector, 5" x 5"
14	1046C3-A	Decal, DO NOT Ride (DANGER)
15	1046C7	Decal, Truax Buffalo
16	1038J	Lid Retainer (Rubber Strap Bracket)
17	1001 (12 Row - 8" Sp.) 1001E (8 Row - 8" Sp.) 1001F (16 Row - 8" Sp.) 1001G (12 Row - 10" Sp.) 1001I (18 Row - 8" Sp.) 1001J (6 Row - 8" Sp.) 1001K (11 Row - 8" Sp.) 1001K1 (11 Row - 8" Sp.)	Seed Box, Large (Fluffy) Mdl. 822 - Non-Typical Mdl. 822 - Typical
18	2003 (12 Row - 8", Sp.) 2003E (8 Row - 8" Sp.) 2003F (16 Row - 8" Sp.) 2003G (12 Row - 10" Sp.) 2003I (18 Row - 8" Sp.) 2003J (6 Row - 8" Sp.) 2003K (11 Row - 8" Sp.)	Shaft, 1/2" Square Mdl. 822 - Requires 2
19	2002	Picker Wheel, 1/2" Square Bore
20	1033	Transition
21	B14-.625	Bolt, 1/4" x 5/8"
22	1033A	Plug, Transition (No Longer OEM)
23	1009	Clamp, Seed Hose, #36
24	1018	Seed Hose, Convoluted 2-1/4"
25	3007	Bearing, 1" Spherical
26	1055A (40B20, Prior to 6/l/93) 1055A1 (40B30, After 6/l/93)	Sprocket, 1/2" Square Bore

LARGE (FLUFFY) SEED BOX – PAGE 3 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
27	1046C1	Decal, Calibration, 8" & 10"
28	103624 1036235 (Not Illustrated)	End Plate, RH - FLXII End Plate, RH - FLXII (Mdl.822 Non-Typical/Non-Drive End)
29	1036245	Cover, End RH – FLXII (Has hole for acre meter)
30	1036243	Cover, Front RH - FLXII
31	10316	Bearing Support, FLXII
32	1036233	Cover, Front LH - FLXII
33	1036236	Cover, End LH - FLXII
34	103623 1036221 (Not Illustrated)	End Plate, LH - FLXII End Plate, LH - FLXII (Mdl.822 Non-Typical/Drive End)
35	3007A	Flangettes, 52 MST
36	B38-.75	Bolt, 3/8" x 3/4"
37	W38	Washer, 3/8"
38	1046C78	Decal, FLXII (RH)
39	1046C77	Decal, FLXII (LH)
40	1054A (40B30)	Sprocket, 3/4" Round Bore
41	SC516-18-.375	Set Screw, 5/16" x 3/8"
42	2007	Bearing, 1/2" Square Bore
43	1110	Key, 1/4" Square - 1-1/4"
44	CB516-1	Carriage Bolt, 5/16" x 1"
45	1045A (40B18)	Sprocket, 1" Round Bore - KY & SS
46	W14	Washer, 1/4"
47	B14-.625	Bolt, 1/4" x 5/8"
48	1036-1005 1036-10051	Strut, Frame - FLXII Strut, Frame - FLXII Mdl.86
49	1036-1006	Strut, Mount Bracket
50	UB38-3.75-2	U-Bolt, 3/8"x 3-3/4"x 2"
51	N38-CL	Nut, 3/8" Clincher Nut
52	B38-1.25	Bolt, 3/8"x 1-1/4"
53	RP316-2 (Not Illustrated)	Roll Pin, 3/16"x 2"
54	103626	Support, Bearing
55	W516 (Not Illustrated)	Washer, 5/16"
56	B516-.750	Bolt, 5/16"x 3/4"
57	1007B	Flangettes, 47 MST (Flattened Edge)
58	1038HP	Hinge, Pin - Brass 7/32"x 3-1/4"
59	CP116-.5	Cotter Pin, 1/16"x 1/2"
60	CP532-3 (Not Illustrated)	Cotter Pin, 5/32"x 3"
61	RP316-2.5 (Not Illustrated)	Roll Pin, 3/16"x 2-1/2"
62	344410 (Not Illustrated) 344411 (Not Illustrated)	Hose Protector RH – Model 822 Hose Protector LH – Model 822

COOL SEASON/GRAIN SEED BOX (USED W/FLUFFY BOX) – PAGE 1 OF 4

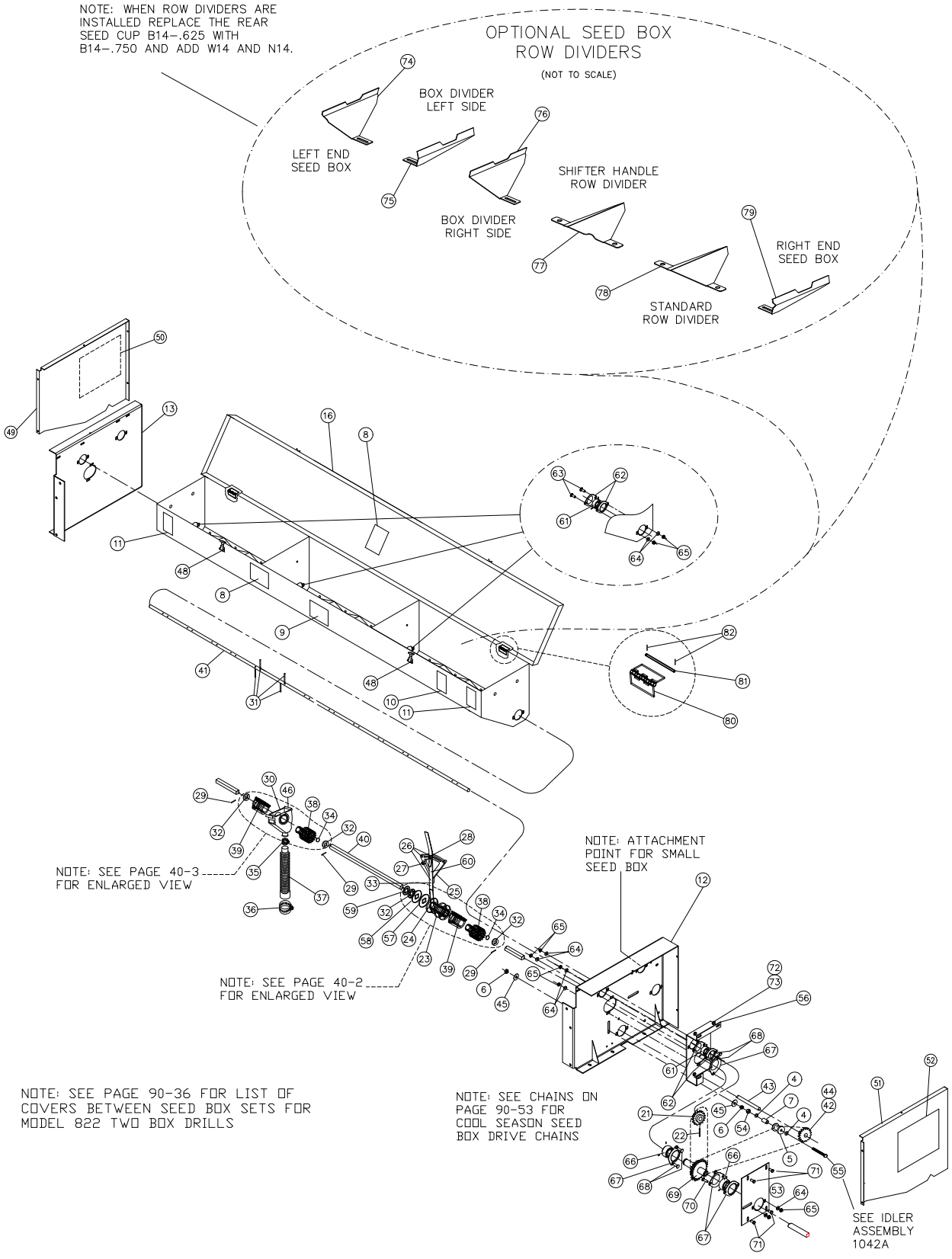


COOL SEASON/GRAIN SEED BOX (USED W/FLUFFY BOX) – PAGE 2 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
4	MB12-.62 (1040B)	Bushing, 3/4" OD, 1/2" ID, 0.062" Thickness
5	1041A	Spool, Plastic
6	N12	Nut, 1/2"
7	1041A2	Bushing, Idler Spool
8	1046C8	Decal, Rotating Parts
9	1046C7	Decal, Truax Buffalo
10	1046C3-A	Decal, DO NOT Ride (Danger)
11	2008C2	Reflector, 5"x 5"
12	1036241 1036242 (Not Illustrated)	End Plate, RH CS, FLXII End Plate, RH CS, FLXII (Mdl.822 Non-Typical/Non-Drive End)
13	1036231 1036232 (Not Illustrated)	End Plate, LH CS, FLXII End Plate, LH CS, FLXII (Mdl.822 Non-Typical/Drive End)
14	1036234 (Not Illustrated)	Cover, Rear, LH, FLXII
15	1036244 (Not Illustrated)	Cover, Rear, RH, FLXII
16	3001 (FLXII-812) 3001E (FLXII-88) 3001F (FLXII-816) 3001G (FLXII-1012) 3001H (FLXII-610) 3001I (FLXII-818) 3001J (FLXII-86) 3001K (FLXII-822) 3001K1 (FLXII-822) 3001L (FLXII-810)	Box, Cool Season/Grain Seed, FLXII Mdl. 822 Non-Typical Mdl. 822 Typical
20	3169 (Not Illustrated)	Collar, Shaft, 1-1/4" (Not Used After 1/1/96)
21	1055	Sprocket, 40B20, 3/4" Bore (Standard)
22	RP316-2	Roll Pin, 3/16" x 2"
23	M60862 (Not Illustrated) M608621	Bearing Shifter - Before Mid 1998 (Replaced by #M608621) Bearing Shifter - After Mid 1998
24	3205	Shifter, Handle
25	3229	Shifter Quad
26	B12-1	Bolt, 1/2" x 1"
27	NH38	Nut Handle, 3/8" (Replaces Wing Nut 3/8" in 98-)
28	B38-1SQ	Bolt, 3/8"x 1" Square Head
29	RP18-1.25	Roll Pin, 1/8"x 1-1/4"
30	AN-212650	Seed Cup, Cool Season Box (After Serial #2925 use double spout seed cup: part # 731003A)
31	3225	Agitator, 3/16"x 3-1/2"
32	TM60823	Spacer, 5/8" Square Hole - 0.158" Thickness
33	SC14-20-.375	Set Screw, 1/4" x 3/8"
34	TS-72M	Spring
35	3213	Clamp, Hose, #20
36	1009	Clamp, Seed Hose, #36 (Used w/34441)

COOL SEASON/GRAIN SEED BOX (USED W/FLUFFY BOX) – PAGE 3 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
37	34441	Hose, Seed, Convoluted (After 1993)
38	M60865	Fluted Roll (After Serial#2925 use part # 731865)
39	M60864	Shut-Off (After Serial#2925 use part # 731864)
40	3103 (12 Row-8"sp) 3103E (8 Row-8"sp) 3103F (16 Row-8"sp) 3103G (12 Row-10"sp) 3103H (10 Row-6"sp) 3103I (18 Row-8"sp) 3103J (6 Row-8"sp) 3103K (11 Row-8"sp) 3103L (10 Row-8"sp)	Shaft, 5/8" Square Mdl. 822 - Requires 2
41	3221 (12 Row-8"sp) 3221E (8 Row-8"sp) 3221F (16 Row-8"sp) 322IG (12 Row-10"sp) 3221H (10 Row-6"sp) 3221I (18 Row-8"sp) 3221J (6 Row-8"sp) 3221K (11 Row-8"sp) 3221L (10 Row-8"sp)	Shaft, 3/4" Round Mdl. 822 - Requires 2
42	1045A	Sprocket, 40B18KY & SS
43	15-710	Shaft, Input
44	1110	Key, Square, 1/4" x 1-1/2"
45	W12	Washer, 1/2"
46	B14-.625	Bolt, 1/4" x 5/8"
48	1038J	Lid Retainer Rubber
49	1036233 (Not Illustrated)	Cover, Front (LH) - FLXII
50	1046C77 (Not Illustrated)	Decal, FLXII (LH)
51	1036243 (Not Illustrated)	Cover, Front (RH) - FLXII
52	1046C78 (Not Illustrated)	Decal, FLXII (RH)
53	3177	Bearing Support Plate
54	1040C	Collar, 1/2" ID x 3/4" OD (with Set Screw)
55	B12-4	Bolt, 1/2"x 4"
56	3176 3178 (Not Illustrated)	Bearing Support, Cool Season Bearing Support, Cool Season (Mdl. 822 Non-Typical)
57	TM60826	Thrust Washer, Delrin® - 0.125" Thickness
58	TM60825	Thrust Washer Backer - 0.115" Thickness
59	TM608231	Spacer, 5/8" Square Hole - 0.120" Thickness
60	B38-.750	Bolt, 3/8"x 3/4"
61	1007	Bearing, 3/4" Spherical
62	1007A	Flangettes, Bearing - 47MST
63	CB516-.75	Carriage Bolt, 5/16"x 3/4"
64	W516	Washer, 5/16"
65	N516-CL	Nut, 5/16" Clincher Nut

COOL SEASON/GRAIN SEED BOX (USED W/FLUFFY BOX) – PAGE 4 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
66	3175	Bearing, 1-1/4" Spherical
67	3181	Flangette, MS-62
68	CB516-1	Carriage Bolt, 5/16"x 1"
69	3095X 3095X1 (Optional Sprocket)	Sprocket, Double 30/20 (93-) Sprocket, Double 42/20 (96-)
70	B516-1	Bolt, 5/16"x 1"
71	B38-1	Bolt, 3/8"x 1"
72	W38	Washer, 3/8"
73	N38-CL	Nut, 3/8" Clincher Nut
74	30012D	Row Divider, Cool Season Box - Left Box End
75	30012E	Row Divider, Cool Season Box - Left Side Box Divider
76	30012F	Row Divider, Cool Season Box - Right Side Box Divider
77	30012B	Row Divider, Cool Season Box - Over Shifter Handle
78	30012A	Row Divider, Cool Season Box - Standard
79	30012C	Row Divider, Cool Season Box - Right Box End
80	1038H	Hinge, Lid
81	1038HP	Hinge, Pin - Brass 7/32"x 3-1/4"
82	CP116-.5	Cotter Pin - 1/16"x 1/2"
83	1036246B (Not Illustrated)	Cover, Rear Plate Between Seed Box Sets For Model 822 (3 Box Drill)
84	1036249 (Not Illustrated)	Cover, Top Plate Between Seed Box Sets For Model 822 (3 Box Drill)
85	1036246A (Not Illustrated)	Cover, Front Plate Between Seed Box Sets For Model 822 (2 or 3 Box Drills)
86	B14-.625 (Not Illustrated)	Bolt, 1/4"x 5/8"
87	W14 (Not Illustrated)	Washer, 1/4"
88	MB38 (Not Illustrated)	Machine Bushing, 3/8" ID x .032 Thickness

COOL SEASON/GRAIN SEED BOX (NOT FITTED W/FLUFFY BOX) – PAGE 1 OF 4

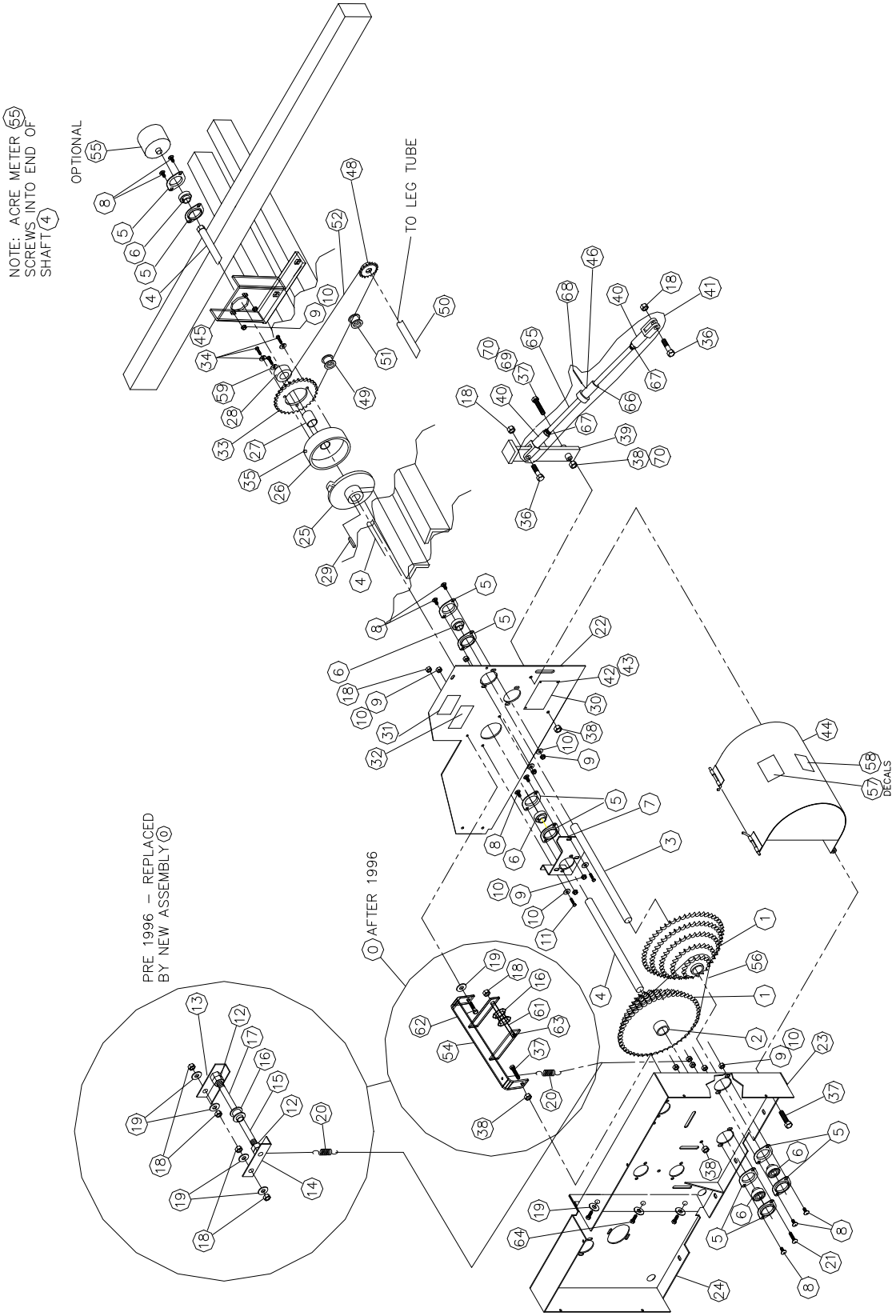


COOL SEASON/GRAIN SEED BOX (NOT FITTED W/FLUFFY BOX) – PAGE 2 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
4	MB12-.062 (1040B)	Bushing, 3/4" OD, 1/2" ID, 0.062" Thickness
5	1041A	Spool, Plastic
6	N12	Nut, 1/2"
7	1041A2	Bushing, Idler Spool
8	1046C8	Decal, Rotating Parts
9	1046C7	Decal, Truax Buffalo
10	1046C3-A	Decal, DO NOT Ride (Danger)
11	2008C2	Reflector, 5"x 5"
12	10362301 10362303 (Not Illustrated)	End Plate, RH CS, FLXII End Plate, RH CS, FLXII (Mdl.822 Non-Typical/Non-Drive End)
13	1036230 10362302 (Not Illustrated)	End Plate, LH CS, FLXII End Plate, LH CS, FLXII (Mdl.822 Non-Typical/Drive End)
14	1036234 (Not Illustrated)	Cover, Rear, LH, FLXII
15	1036244 (Not Illustrated)	Cover, Rear, RH, FLXII
16	3001 (FLXII-812) 3001E (FLXII-88) 3001F (FLXII-816) 3001G (FLXII-1012) 3001H (FLXII-610) 3001I (FLXII-818) 3001J (FLXII-86) 3001K (FLXII-822) 3001K1 (FLXII-822) 3001L (FLXII-810)	Box, Cool Season/Grain Seed, FLXII Mdl. 822 Non -Typical Mdl. 822 Typical
20	3169 (Not Illustrated)	Collar, Shaft, 1-1/4" (Not Used After 1/1/96)
21	1055	Sprocket, 40B20, 3/4" Bore (Standard)
22	RP316-2	Roll Pin, 3/16"x 2"
23	M60862 (Not Illustrated) M608621	Bearing Shifter - Before Mid 1998 (Replaced by # M608621) Bearing Shifter - After Mid 1998
24	3205	Shifter, Handle
25	3229	Shifter Quad
26	B12-1	Bolt, 1/2"x 1"
27	NH38	Nut Handle, 3/8" (Replaces Wing Nut 3/8" in 98-)
28	B38-1SQ	Bolt, 3/8"x 1" Square Head
29	RP18-1.25	Roll Pin, 1/8"x 1-1/4"
30	AN-2126501 (AN-280091 - 01/01/04)	Seed Cup, Cool Season Box – (After Serial #2925 use part # 731003A)
31	3225	Agitator, 3/16"x 3-1/2"
32	TM60823	Spacer, 5/8" Square Hole - 0.158" Thickness
33	SC14-20-.375	Set Screw, 1/4"x 3/8"
34	TS-72M	Spring
35	3213	Clamp, Hose, #20

COOL SEASON/GRAIN SEED BOX (NOT FITTED W/FLUFFY BOX) – PAGE 3 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
36	1009	Clamp, Seed Hose, #36 (Used w/#34441)
37	34441	Hose, Seed, Convoluted (After 1993)
38	M60865	Fluted Roll (After Serial#2925 use part # 731865)
39	M60864	Shut-Off (After Serial#2925 use part # 731864)
40	3103 (12 Row-8"sp) 3103E (8 Row-8"sp) 3103F (16 Row-8"sp) 3103G (12 Row-10"sp) 3103H (10 Row-6"sp) 3103I (18 Row-8"sp) 3103J (6 Row-8"sp) 3103K (11 Row-8"sp) 3103L (10 Row-8"sp)	Shaft, 5/8" Square Mdl. 822 – Requires 2
41	3221 (12 Row-8"sp) 3221E (8 Row-8"sp) 3221F (16 Row-8"sp) 322IG (12 Row-10"sp) 3221H (10 Row-6"sp) 3221I (18 Row-8"sp) 3221J (6 Row-8"sp) 3221K (11 Row-8"sp) 3221L (10 Row-8"sp)	Shaft, 3/4" Round Mdl. 822 – Requires 2
42	1045A	Sprocket, 40B18KY & SS
43	15-710	Shaft, Input
44	1110	Key, Square, 1/4" x 1-1/2"
45	W12	Washer, 1/2"
46	B14-.625	Bolt, 1/4" x 5/8"
48	1038J	Lid Retainer Rubber
49	1036233	Cover, Front (LH) - FLXII
50	1046C77	Decal, FLXII (LH)
51	1036243	Cover, Front (RH) - FLXII
52	1046C78	Decal, FLXII (RH)
53	3177	Bearing Support Plate
54	1040C	Collar, 1/2" ID x 3/4" OD (with Set Screw)
55	B12-4	Bolt, 1/2"x 4"
56	3176 3178 (Not Illustrated)	Bearing Support, Cool Season Bearing Support, Cool Season (Mdl. 822 Non Typical)
57	TM60826	Thrust Washer, Delrin® - 0.125" Thickness
58	TM60825	Thrust Washer Backer – 0.115" Thickness
59	TM608231	Spacer, 5/8" Square Hole – 0.120" Thickness
60	B38-.75	Bolt, 3/8"x 3/4"
61	1007	Bearing, 3/4" Spherical
62	1007A	Flangettes, Bearing - 47MST
63	CB516-.75	Carriage Bolt 5/16"x 3/4"

COOL SEASON/GRAIN SEED BOX (NOT FITTED W/FLUFFY BOX) – PAGE 4 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
64	W516	Washer, 5/16"
65	N516-CL	Nut, 5/16" Clincher Nut
66	3175	Bearing, 1-1/4" Spherical
67	3181	Flangette, MS-62
68	CB516-1	Carriage Bolt, 5/16"x 1"
69	3095X 3095X1 (Optional Sprocket)	Sprocket, Double 30/20 (93-) Sprocket, Double 42/20 (96-)
70	B516-1	Bolt, 5/16"x 1"
71	B38-1	Bolt, 3/8"x 1"
72	W38	Washer, 3/8"
73	N38-CL	Nut, 3/8" Clincher Nut
74	30012D	Row Divider, Cool Season Box - Left End Of Box
75	30012E	Row Divider, Cool Season Box - Left Side Of Box Divider
76	30012F	Row Divider, Cool Season Box – Right Side Of Box Divider
77	30012B	Row Divider, Cool Season Box – Over Shifter Handle
78	30012A	Row Divider, Cool Season Box – Standard
79	30012C	Row Divider, Cool Season Box – Right End Of Box
80	1038H	Hinge, Lid
81	1038HP	Hinge, Pin - Brass 7/32"x 3-1/4"
82	CP116-.5	Cotter Pin – 1/16"x 1/2"
83	1036246B (Not Illustrated)	Cover, Rear Plate Between Seed Box Sets For Model 822 (2 Box Drill)
84	1036250 (Not Illustrated)	Cover, Top Plate Between Seed Box Sets For Model 822 (2 Box Drill)
85	1036246A (Not Illustrated)	Cover, Front Plate Between Seed Box Sets For Model 822 (2 or 3 Box Drills)
86	B14-.625 (Not Illustrated)	Bolt, 1/4"x 5/8"
87	W14 (Not Illustrated)	Washer, 1/4"
88	MB38 (Not Illustrated)	Machine Bushing, 3/8" ID x .032 Thickness

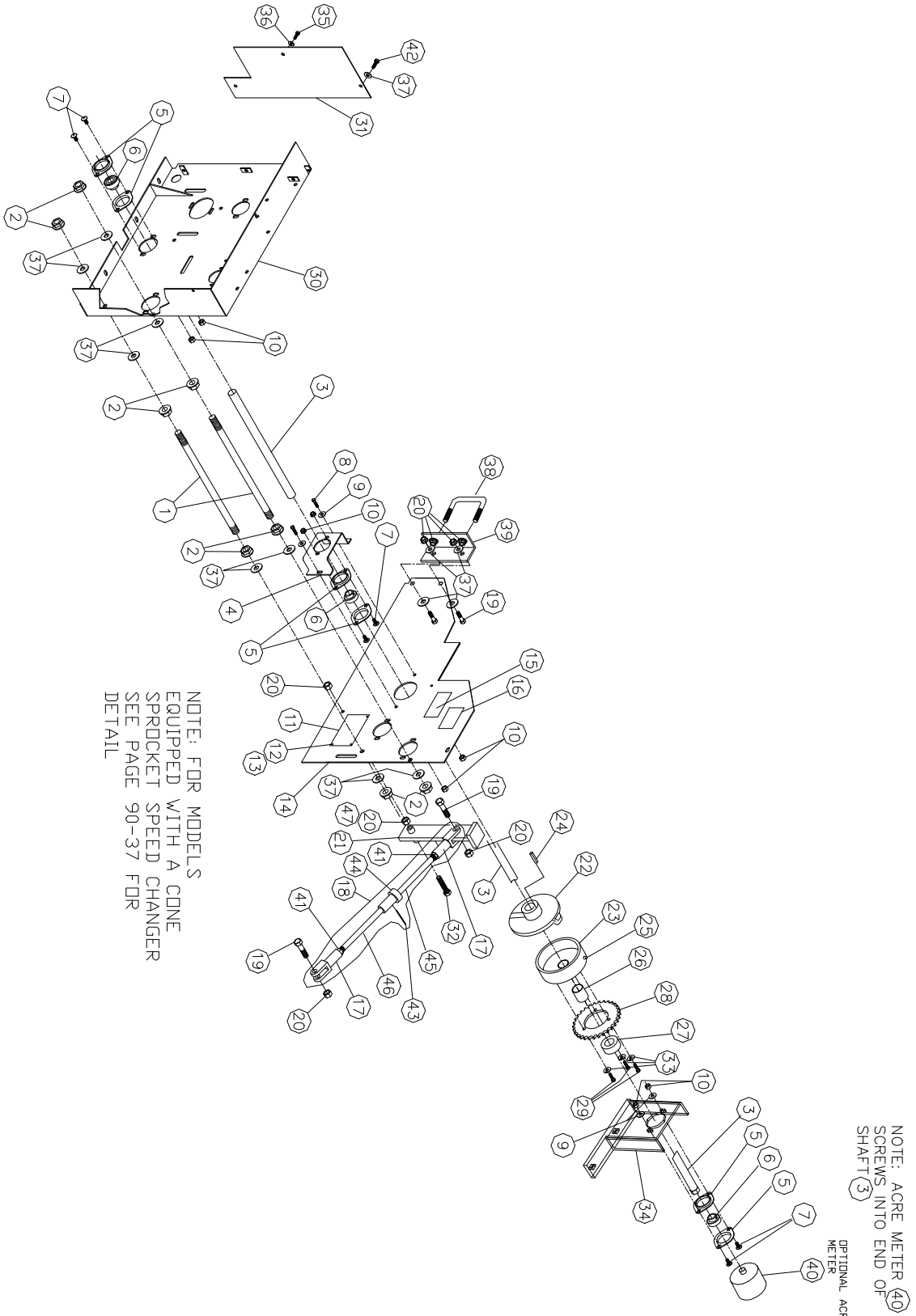
SPEED CHANGER DERAILLEUR STYLE – PAGE 1 OF 3



SPEED CHANGER DERAILLEUR STYLE – PAGE 2 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	015-7116A	Derailleur, Idler Assembly (97-) Assembly: 1041A, 15-7115, 15-7117, B38-6, N38-CL
1	13-201	Sprocket Cone, 5-Step
2	RP316-1.25	Roll Pin, 3/16" x 1-1/4"
3	15-711	Shaft, Output
4	15-710	Shaft, Input (Drilled both ends for acre meter on outside)
5	3007A	Flangette, 52MST
6	3007	Bearing, 1" Spherical
7	103626	Support, Bearing
8	CB516-.75	Carriage Bolt, 5/16" x 3/4"
9	N516-CL	Nut, 5/16" Clincher Nut
10	W516	Washer, 5/16"
11	B516-1	Bolt, 5/16"x 1"
12	N12-JN	Nut, 1/2" Jam Nut
13	15-7112	Derailleur Bracket, RH (-96) (Not Serviced)
14	15-7113	Derailleur Bracket, LH (-96) (Not Serviced)
15	15-7114	Derailleur Rod (-96) (Not Serviced)
16	1041A	Spool
17	15-7115	Derailleur Rod Sleeve (-96) (Not Serviced)
18	N38-CL	Nut, 3/8" Clincher Nut
19	W38	Washer, 3/8"
20	10462	Spring, Derailleur
21	CB516-1.5	Carriage Bolt, 5/16" x 1-1/2"
22	103625	Support, Bearing & Clutch FLXII
23	103624	End Plate, RH, FLXII
24	1036241	End Plate, CS, RH, FLXII
25	1119	Clutch Housing w/ Dog Trip
26	1120	Clutch, Hub
27	1121	Bushing, Clutch, 1" Bore
28	1124	Collar, Shaft, 1" Bore
29	1110	Key, SQ, 1/4" x 1-1/4"
30	1075	Serial Plate
31	1046C11	Decal, Clutch Chain
32	1046C12	Decal, Patent Information
33	1044	Sprocket, 40A30, Clutch Style (Standard)
34	B516-1	Bolt, 5/16" x 1"
35	1093DD	Zirk, 1/4"-28
36	B38-1.25	Bolt, 3/8" x 1-1/4"
37	B38-2.5	Bolt, 3/8" x 2-1/2"

SPEED CHANGER DERAILLEUR STYLE – PAGE 3 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
38	N38-FN	Nut, 3/8" Flange Nut (Mdl 822 Non-Typical Requires Two N38-FN)
39	1118BBX 1118BBX1 (Not Illustrated) 1118BBX2 (Not Illustrated) 1118BBX3 (Not Illustrated) 1118BBX5 (Not Illustrated)	Clutch Trip Engager, FLXII (End Drive) Clutch Trip Engager, FLXII (Rear Drive) Clutch Trip Engager, FLXII (Mdl.822Rear Drive Non -Typical) Clutch Trip Engager, FLXII (Mdl.822End Drive Non-Typical) Clutch Tripper Angle Bracket (Mdl.822 Non-Typical) Requires B38-1.25, Two W38, N38-CL.
40	3069	Yoke, Clevis, 3/8" National Fine Thread
41	1118X	Clutch Tripper, Rod Assembly
42	B540-.375	Bolt, 5/40" x 3/8"
43	N540	Nut, 5/40"
44	10596	Cover, Speed Changer, FLXII
45	10316 10316A 10316B	Bearing Support, FLXII Bearing Support, FLXII, (Mdl.822 End Drive Non-Typical) Bearing Support, FLXII, (Notched Mdl.86)
46	S-38 (Not Illustrated)	Spring, Clutch Tripper (See Page 90-10 For Detail)
48	1045A	Sprocket, 40B18, KY & SS
49	1042C	Idler Assembly, Rear Clutch Chain (See Page 90-13 For Detail)
50	10375 (Mdl.88,810,812) 103751 (Mdl.816,818,822,1012)	Drive Shaft Leg
51	1042	Idler Assembly, Front Clutch Chain (See Page 90-13 For Detail)
52	2040XB	Chain, Clutch (73 Links w/Half Link Connector)
54	15-7117	Bracket, Derailleur (96-)
55	060088X (Mdl.88) 0600812X (Mdl.812) 0600816X (Mdl.816) 0600818X (Mdl.818) 0600822X (Mdl.822)	Acre Meter
56	2040D	Chain, Derailleur Speed Changer (39 Links w/Offset Link and Full link Connectors)
57	1046C9	Decal, Speed Changer Instructions
58	1046C4-A	Decal, Safety
59	LW516	Lockwasher, 5/16"
61	1041A3	Bushing Sleeve, Derailler Idler - 5" Length
62	B38-1	Bolt, 3/8"x 1"
63	B38-6	Bolt, 3/8"x 6" (Bolt head is on the left as you face the front of the assembly and front of machine)
64	B38-.75	Bolt, 3/8"x 3/4"
65	1118X2	Clutch Tripper, Male
66	1118X1	Clutch Tripper, Female
67	N38-NF	Nut, 3/8" National Fine Thread
68	RP18-.875	Roll Pin, 1/8"x 7/8"
69	B38-6.5 (Not Illustrated)	Bolt, 3/8"x 6-1/2" (Used on Mdl.822 Non-Typical)
70	1040D (Not Illustrated)	Collar, 3/8" ID 5/8" OD (Used on Mdl.822 Non-Typical)

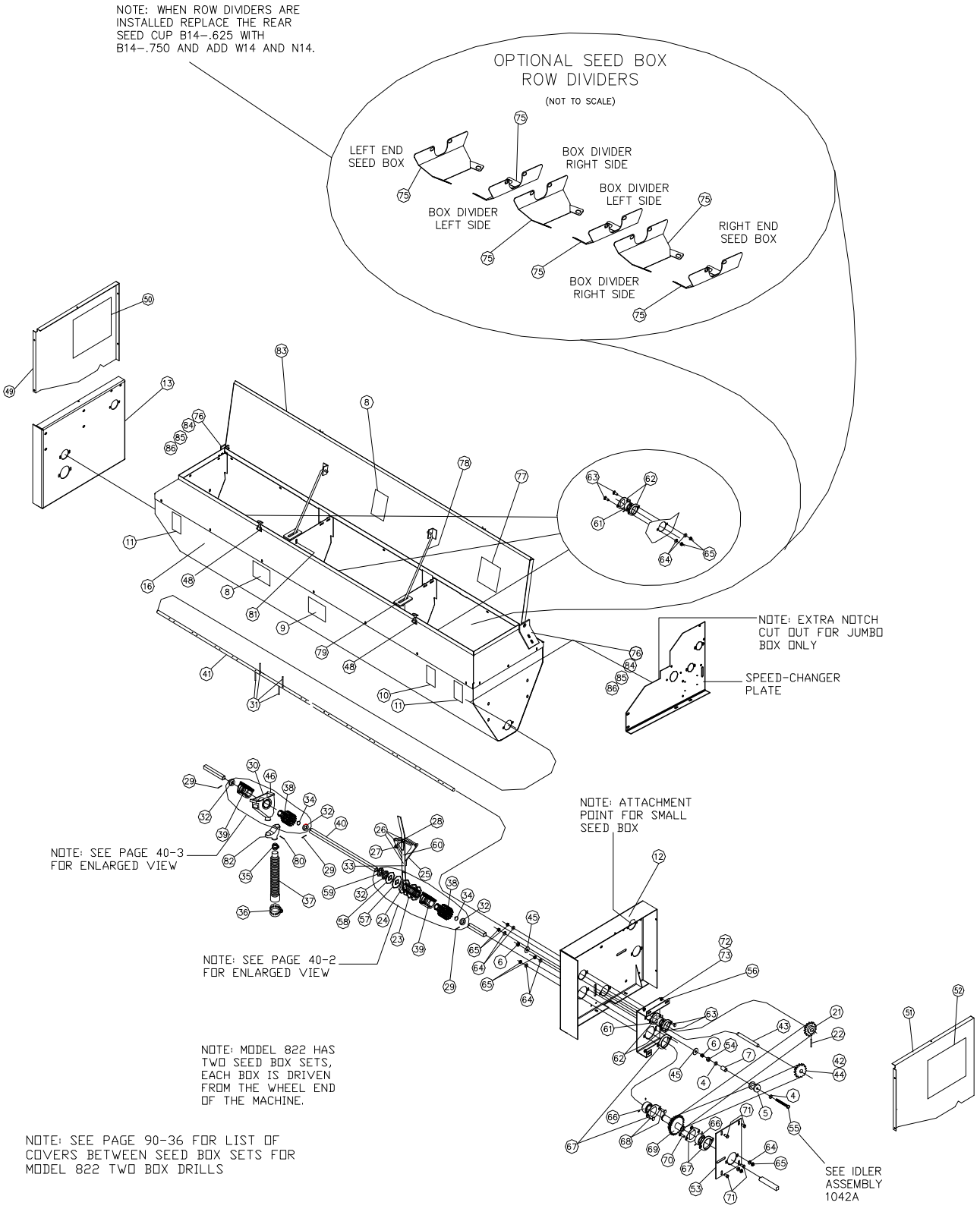
DRIVE ASSEMBLY (GRAIN DRILL) – PAGE 1 OF 3



DRIVE ASSEMBLY (GRAIN DRILL) – PAGE 2 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	15-810	Spacer Rods - Grain Drill
2	N38-FN	Nut, 3/8" Flange Nut
3	15-710	Shaft, Input
4	103626	Support, Bearing
5	3007A	Flangettes, Bearing 52MST
6	3007	Bearing, 1" Spherical
7	CB516-.75	Carriage Bolt, 5/16"x 3/4"
8	B516-1	Bolt, 5/16"x 1"
9	W516	Washer, 5/16"
10	N516-CL	Nut, 5/16" Clincher Nut
11	1075	Serial Plate
12	B540-.375	Bolt, 5/40"x 3/8"
13	N540 (Not Illustrated)	Nut, 5/40"
14	103625	Support, Bearing and Clutch FLXII, Grain Drill
15	1046C12	Decal, Patent Information
16	1046C11	Decal, Clutch Chain
17	3069	Yoke, Clevis, 3/8" National Fine Thread
18	1118X	Clutch, Tripper Rod Assembly (See Page 90-10 For Detail)
19	B38-1.25	Bolt, 3/8"x 1-1/4"
20	N38-FN	Nut, 3/8" Flange Nut (Mdl 822 Non-Typical Requires Two N38-FN)
21	1118BBX 1118BBX1 (Not Illustrated) 1118BBX2 (Not Illustrated) 1118BBX3 (Not Illustrated) 1118BBX5 (Not Illustrated)	Clutch Trip Engager, FLXII (End Drive) Clutch Trip Engager, FLXII (Rear Drive) Clutch Trip Engager, FLXII (Mdl.822 Rear Drive Non -Typical) Clutch Trip Engager, FLXII (Mdl.822 End Drive Non-Typical) Clutch Tripper Angle Bracket (Mdl.822 Non-Typical) Requires B38-1.25, Two W38, N38-CL.
22	1119	Clutch, Housing w/Dog Trip
23	1120	Clutch, Hub
24	1110	Key, SQ, 1/4"x 1-1/4"
25	1093DD	Zirk, 1/4"-28
26	1121	Bushing, Clutch 1" Bore
27	1124	Collar, Shaft 1" Bore
28	1044 1144A (Optional) 1144B (Optional)	Sprocket, 40A30, Clutch Style (Standard) Sprocket, 40A54, Clutch Style (Optional) Sprocket, 40A60, Clutch Style (Optional)
29	B516-1	Bolt, 5/16"x 1"
30	1036242	End Plate, R.H., Grain-FLXII
31	1036245	Cover, End, R.H.-FLXII
32	B38-2.5	Bolt, 3/8"x 2-1/2" (Mdl.822 Non-Typical Requires B38-6.5)
33	LW516	Lock Washer, 5/16"

DRIVE ASSEMBLY (GRAIN DRILL) – PAGE 3 OF 3		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
34	10316 10316A (Not Illustrated)	Bearing Support FLXII Bearing Support FLXII (Mdl.822 End Drive Non-Typical)
35	B14-.50	Bolt, 1/4"x 1/2"
36	W14	Washer, 1/4"
37	W38	Washer, 3/8"
38	UB38-4.5-4	U Bolt, 3/8"x 4-1/2"x 4"
39	1036251 1036252 (Not Illustrated)	Support, Bearing & Clutch Support, Bearing & Clutch (Mdl.822)
40	060088X 060812 0600812X 0600816X 0600818X 0600822X	Acre Meter, Mdl.88 FLX Acre Meter, Mdl.812 (-89) Acre Meter, Mdl.812 FLX Acre Meter, Mdl.816 FLX Acre Meter, Mdl.818 FLX Acre Meter, Mdl.822 FLX
41	N38-NF	Nut, 3/8" National Fine Threads
42	B38-.750	Bolt, 3/8"x 3/4"
43	RP18-.875	Roll Pin, 1/8"x 7/8"
44	S-38 (Not Illustrated)	Spring, Clutch Tripper (See Page 90-10 For Detail)
45	1118X2	Clutch Tripper, Male
46	1118X1	Clutch Tripper, Female
47	1040D (Not Illustrated)	Collar, 3/8" ID 5/8" OD (Used on Mdl.822 Non-Typical)

GRAIN DRILL JUMBO SEED BOX – PAGE 1 OF 4

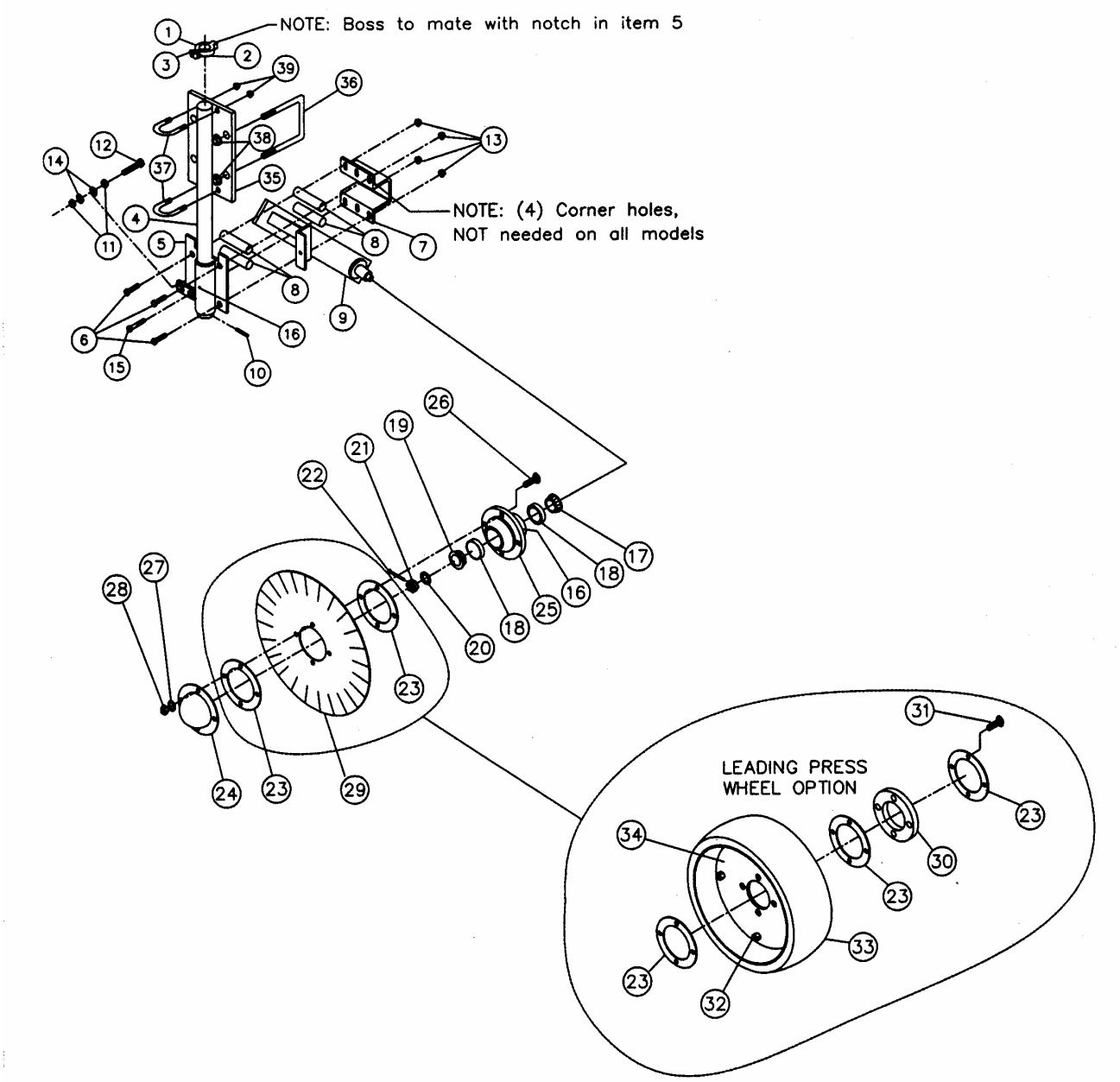


GRAIN DRILL JUMBO SEED BOX – PAGE 2 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
4	MB12-.062 (1040B)	Bushing, 3/4" OD, 1/2" ID, 0.062" Thickness
5	1041A	Spool, Plastic
6	N12	Nut, 1/2"
7	1041A2	Bushing, Idler Spool
8	1046C8	Decal, Rotating Parts
9	1046C7	Decal, Truax Buffalo
10	1046C3-A	Decal, DO NOT Ride (Danger)
11	2008C2	Reflector, 5"x 5"
12	103624J 103624J1 (Not Illustrated)	End Plate, RH Grain, Jumbo, FLXII End Plate, RH Grain, Jumbo, FLXII (Mdl. 822 Non-Typical Non-Drive End)
13	103623J 103623J1 (Not Illustrated)	End Plate, LH Grain, Jumbo, FLXII End Plate, LH Grain, Jumbo, FLXII (Mdl. 822 Non-Typical Drive End)
16	4001 (FLXII-812) 4001E (FLXII-88) 4001F (FLXII-816) 4001I (FLXII-818) 4001K (FLXII-822) 4001K1 (FLXII-822)	Box, Grain, Jumbo , FLXII Mdl. 822 Non-Typical Mdl. 822 Typical
20	3169 (Not Illustrated)	Collar, Shaft, 1-1/4" (Not Used After 1/1/96)
21	1055	Sprocket, 40B20, 3/4" Bore (Standard)
22	RP316-2	Roll Pin, 3/16"x 2"
23	M60862 (Not Illustrated) M608621	Bearing Shifter - Before Mid 1998 (Replaced by #M608621) Bearing Shifter - After Mid 1998
24	3205	Shifter, Handle
25	3229	Shifter Quad
26	B12-1	Bolt, 1/2"x 1"
27	NH38	Nut Handle, 3/8" (Replaces Wing Nut 3/8" in 98-)
28	B38-1SQ	Bolt, 3/8"x 1" Square Head
29	RP18-1.25	Roll Pin, 1/8"x 1-1/4"
30	AN-212650	Seed Cup, Cool Season Box (After Serial#2925 use part # 731003A)
31	3225	Agitator, 3/16"x 3-1/2"
32	TM60823	Spacer, 5/8" Square Hole - 0.158" Thickness
33	SC14-20-.375	Set Screw, 1/4"x 3/8"
34	TS-72M	Spring
35	3213	Clamp, Hose, #20
36	1009	Clamp, Seed Hose, #36 (Used w/#34441)
37	34441	Hose, Seed, Convoluted (After 1993)
38	M60865	Fluted Roll (After Serial#2925 use part # 731865)
39	M60864	Shut-Off (After Serial#2925 use part # 731864)

GRAIN DRILL JUMBO SEED BOX – PAGE 3 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
40	3103 (12 Row-8"sp) 3103E (8 Row-8"sp) 3103F (16 Row-8"sp) 3103I (18 Row-8"sp) 3103K (11 Row-8"sp)	Shaft, 5/8" Square Mdl. 822 Requires 2
41	3221 (12 Row-8"sp) 3221E (8 Row-8"sp) 3221F (16 Row-8"sp) 3221I (18 Row-8"sp) 3221K (11 Row-8"sp)	Shaft, 3/4" Round Mdl. 822 Requires 2
42	1045A	Sprocket, 40B18KY & SS
43	15-710	Shaft, Input
44	1110	Key, Square, 1/4"x 1-1/2"
45	W12	Washer, 1/2"
46	B14-.625	Bolt, 1/4"x 5/8"
48	1038J	Lid Retainer
49	1036233	Cover, Front (LH) - FLXII
50	1046C77	Decal, FLXII (LH)
51	1036243	Cover, Front (RH) – FLXII (has hole for acre meter)
52	1046C78	Decal, FLXII (RH)
53	3177	Bearing Support Plate
54	1040C	Collar, 1/2" (with Set Screw)
55	B12-4	Bolt, 1/2"x 4"
56	3176 3178 (Not Illustrated)	Bearing Support, Cool Season Bearing Support, Cool Season Mdl. 822 Non-Typical
57	TM60826	Thrust Washer, Delrin® - 0.125" Thickness
58	TM60825	Thrust Washer Backer - 0.115" Thickness
59	TM608231	Spacer, 5/8" Square Hole - 0.120" Thickness
60	B38-.750	Bolt, 3/8"x 3/4"
61	1007	Bearing, 3/4" Spherical
62	1007A	Flangettes, Bearing - 47MST
63	CB516-.75	Carriage Bolt 5/16"x 3/4"
64	W516	Washer, 5/16"
65	N516-CL	Nut, 5/16" Clincher Nut
66	3175	Bearing, 1-1/4" Spherical
67	3181	Flangette, MS-62
68	CB516-1	Carriage Bolt, 5/16"x 1"
69	3095X 3095X1 (Optional Sprocket)	Sprocket, Double 30/20 (93-) Sprocket, Double 42/20 (96-)
70	B516-1	Bolt, 5/16"x 1"
71	B38-1	Bolt, 3/8"x 1"
72	W38	Washer, 3/8"

GRAIN DRILL JUMBO SEED BOX – PAGE 4 OF 4		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
73	N38-CL	Nut, 3/8" Clincher Nut
75	300121	Row Divider, Jumbo Grain Box
76	1038HB	Hinge Bracket
77	1046C1	Decal, Calibration
78	1038SR	Lid Support Rod
79	1038SB	Lid Support Bracket
80	CP532-2.5	Cotter Pin, 5/32"x 2-1/2"
81	CP18-1	Cotter Pin, 1/8"x 1"
82	AN212266	Spout, Legume Delivery "Y"
83	41001 (FLXII-812) 41001E (FLXII-88) 41001F (FLXII-816) 41001I (FLXII-818) 41001K (FLXII-822)	Lid, Jumbo Grain Box, FLXII Mdls. 816, 818, and 822 Require 2
84	B516-1	Bolt, 5/16" x 1"
85	W516	Washer, 5/16
86	N516-CL	Nut, 5/16" Clincher Nut
87	103165 (Not Illustrated) 103625S (Not Illustrated)	Spacer, Seed Box 10"x 2" Spacer, Seed Box 25"x 2"

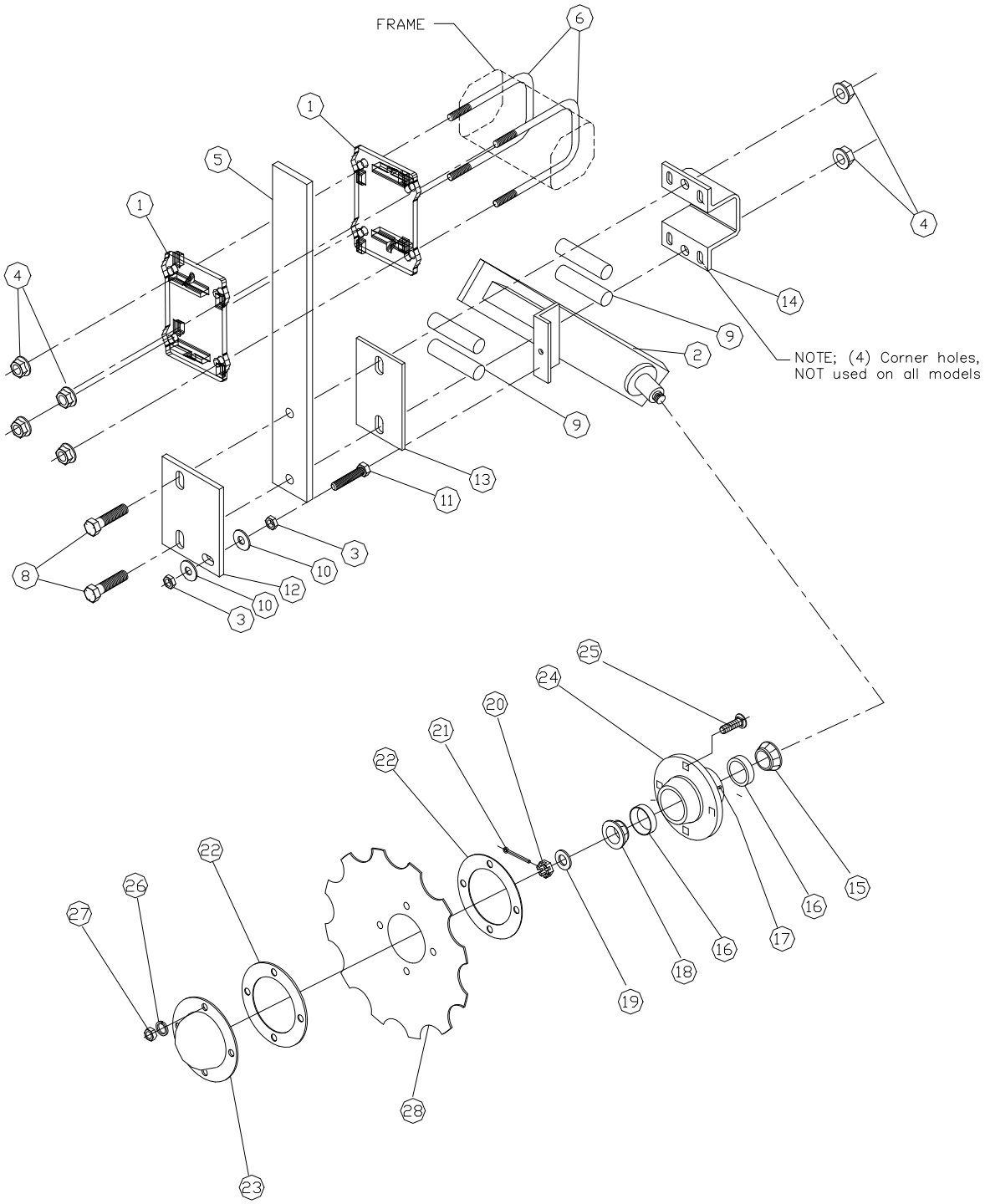
TORSION ARM – ROUND SHANK (CASTER STYLE 1993 -) – PAGE 1 OF 2



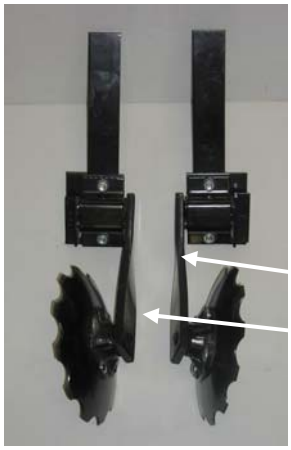
ITEM NO.	PART NUMBER	DESCRIPTION
0	042203	Torsion Assembly, Round Shank Caster Style No-Till
	0422031	Assembly, Caster Style Leading Press Wheel
1	4215	Clamp Collar (One Used After 1993)
2	B516-1.5	Bolt, 5/16"x 1-1/2"
3	N516-CL	Nut, 5/16" Clincher Nut
4	42201X1	Shank, 1-1/2"x 22"

TORSION ARM – ROUND SHANK (CASTER STYLE 1993 -) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
5	422034	Knuckle, Torsion Base Weldment, 1993-
6	B38-1.5	Bolt, 3/8"x 1-1/2"
7	4220231	Hat, Torsion, 4 or 6 Bolt, 1994-
8	42204	Urethane, 1" Cord -90 Duro
9	42201RH 422010LH	Leg, No-Till, Dura-Flute, Right Hand 1994- Leg, No-Till, Dura-Flute, Left Hand1994-
10	RP14-2	Roll Pin, 1/4"x 2"
11	N12-JN	Nut, 1/2" Jam Nut
12	B12-2.5TH	Bolt, 1/2"x 2-1/2" Thread-to-Head
13	N38-FN	Nut, 3/8" Flange Nut
14	W12	Washer, 1/2"
15	B38-1.75	Bolt, 3/8"x 1-3/4"
16	1093DD	Zirk, 1/4"-28
17	LM67000LA	Bearing, 1-1/4" (Integral Seal)
18	1077X	Cup, Bearing, No-Till Industry Number - LM67010
19	1077	Bearing, 4-Bolt Hub 1-1/4" Industry Number - LM67048
20	W58GRD8	Washer, 5/8" Grade 8
21	CN58-NF	Castle Nut, 5/8" National Fine Thread
22	CP316-1.5	Cotter Pin, 3/16"x 1-1/2"
23	42201CX	Gasket, 4-Bolt Hub - .062"
24	42201C	Cap, Dust
25	42201E	Hub, 4-Bolt, No-Till
26	CB12-1.5	Carriage Bolt, 1/2"x 1-1/2"
27	LW12	Lockwasher, 1/2"
28	N12	Nut, 1/2"
29	4302	Coulter, 18" 25-Wave
30	42211B	Spacer, Press Wheel Option (Part of 42211)
31	CB12-2	Carriage Bolt, 1/2"x 2" (Used With Leading Press Wheel)
32	B516-.750	Bolt, 5/16"x 3/4" (Used With Leading Press Wheel)
33	42211	Tire, Press Wheel Option: 4"x16" Leading Press Wheel
34	42211A	Rim, Press Wheel Option (Part of 42211)
35	42111 (42203X1) 42111R 42111L	Clamp Plate, Casting – (-06 production) (#42203X1 on Casting) Clamp Plate, Casting Notched for Frame Tower (06-) Clamp Plate, Casting Notched for Frame Tower (06-)
36	UB58-5.25-4	U-Bolt, 5/8"x 5-1/4"x 4"
37	UB12-318-1.5	U-Bolt, 1/2"x 3-1/8"x 1-1/2"
38	N58-FN	Nut, 5/8" Flanged
39	N12-FN	Nut, 1/2" Flanged

TORSION ARM – TRASH PLOW (1993 -) – PAGE 1 OF 2



TORSION ARM – TRASH PLOW (1993 -) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	05220 052201	Assembly, Trash Plow 13-1/2" Notched Coulter Assembly, Trash Plow 18" Notched Coulter
1	52111	Clamp Plate (3/l/92-)
2	422011 (LH) 422012 (RH)	Leg, No-Till, Twist (1992-)
3	N12-JN	Nut, 1/2" Jam Nut
4	N58-FN	Nut, 5/8" Flanged Nut
5	52201X2	Shank, Spring Steel 1/2"x 3"x 22" (1993-), 2 Hole
6	UB58-6.25-4	U-Bolt, 5/8"x 6-1/4"x 4"
8	B58-2.5	Bolt, 5/8"x 2-1/2"
9	42204	Urethane, 1" Cord - 90 Duro
10	W12	Washer, 1/2"
11	B12-2TH	Bolt, 1/2" x 2"Thread-To-Head
12	522022	Jack Plate, No-Till, 3 Hole
13	522021	Plate, No-Till Shank - 2 Hole
14	422023	Hat, 4-Bolt (1993-)
15	LM67000LA	Bearing, 1-1/4" (Integral Seal)
16	1077X	Cup, Bearing, No-Till Industry Number - LM67010
17	1093DD	Zirk, 1/4"-28
18	1077	Bearing, 4-Bolt Hub 1-1/4" Industry Number - LM67048
19	W58GRD8	Washer, 5/8" Grade 8
20	CN58-NF	Castle Nut, 5/8" National Fine Thread
21	CP18-1.5	Cotter Pin, 1/8"x 1-1/2"
22	42201CX	Gasket, 4-Bolt Hub .062
23	42201C	Cap, Dust
24	52201E	Hub, 4-Bolt Tapered
25	CB12-1.5	Carriage Bolt, 1/2"x 1-1/2"
26	LW12	Lockwasher, 1/2"
27	N12	Nut, 1/2"
28	5301 (13-1/2") 5302 (18")	Coulter, Notched Concave

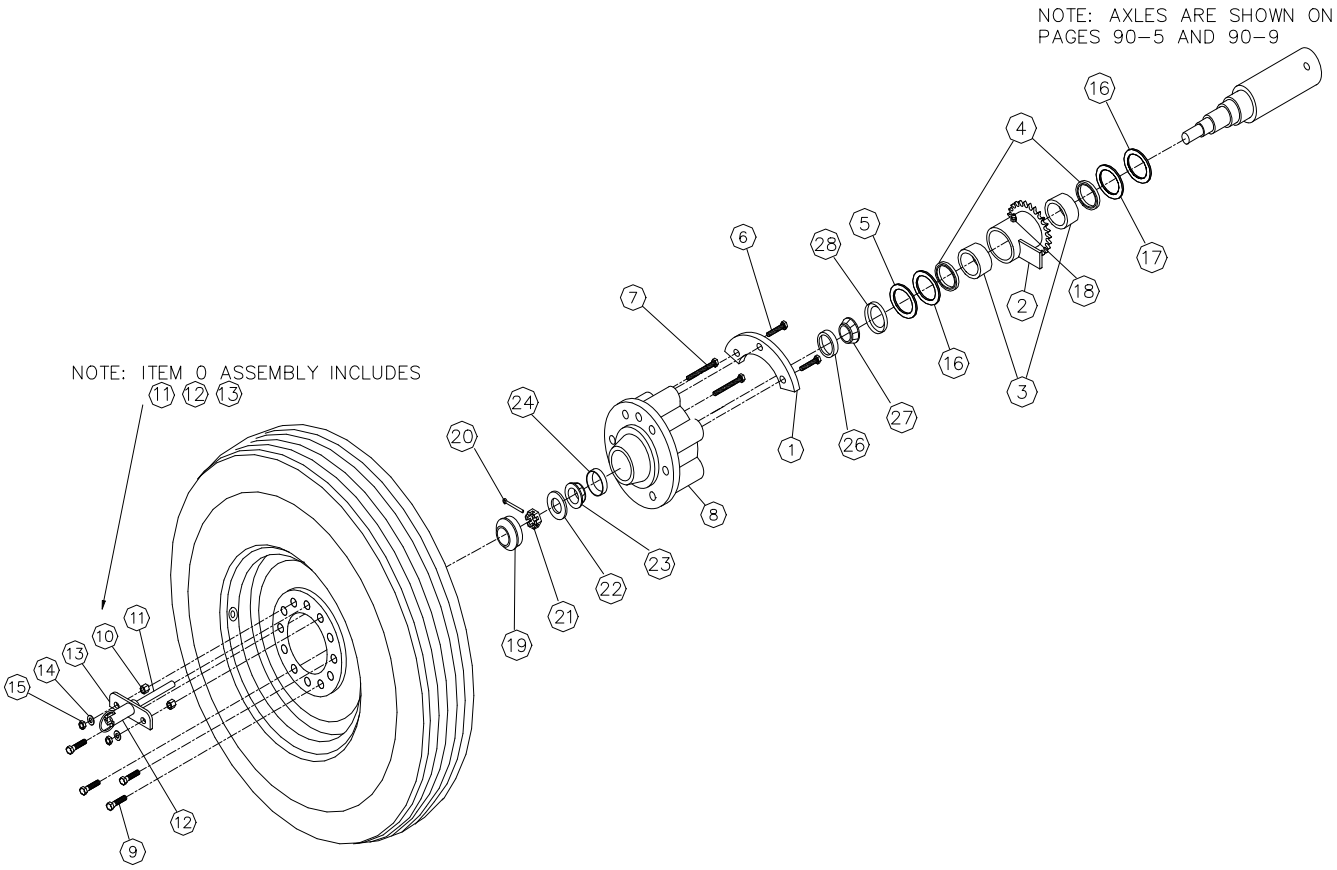


The no-till twist legs for the Trash Plow are designated as left hand (Part #422011-LH) or right hand (Part #422012-RH) when viewed from the back of the drill. **These part numbers reference the twist legs only and do not include blades or other components.** Note the leg twists shown in the photo on the left. When mounted properly half of the concave, notched blades will move residue to the left and half will move residue to the right.

Right Hand No-Till Twist Leg

Left Hand No-Till Twist Leg

LOCK-OUT HUB (STYLE B) – PAGE 1 OF 2



LOCK-OUT HUB (STYLE B) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	01085B241	Assembly: Mount, Spring, and Pin Includes :# 1085B25, #1085B26, #1085B24
1	1085B27	Rim Bracket, Lock-Out Hub
2	1085B20	Housing, Lock-Out
3	1085B21	Bearing, Roller - Requires 2
4	1085B23	Seal, Lock-Out - Requires 2
5	1085B284	Spacer, Lock-Out, Metal, .118"
6	SCH12-1.25	Socket Head Bolt, 1/2" x 1-1/4"
7	SCH12-2 B12-2.5NFTH (After 4/l/97)	Socket Head Bolt, 1/2" x 2" Bolt, 1/2" x 2-1/2", National Fine Thread, Thread-To-Head
8	1085C1	Hub, 6-Bolt Drive, 1992- Drive Side
9	WB12-20-1.25	Wheel Bolt, 1/2"-20 x 1-1/4" With 45^0 Bevel From Centerline **These are wheel bolts for agriculture equipment <u>not</u> automotive wheel bolts.**
10	WN12-20	Wheel Nut, 1/2"-20 With 45^0 Bevel From Centerline
11	1085B25	Pin, Lock-Out
12	1085B26	Spring, Lock-Out
13	1085B24	Mount, Lock-Out Pin Guide
14	MB12	Machine Bushing, 1/2"
15	N12-20-CLJN	Nut, 1/2"-20 Clincher, Jam Nut
16	1085B28	Spacer, Lock-Out, Plastic, .062"
17	1085B281	Spacer, Lock-Out, Plastic, .125"
18	1093DD	Zirk, 1/4"-28
19	1082B	Cap, Dust for 6-Bolt Hub
20	CP316-1.75 (1110B)	Cotter Pin, 3/16"x 1-3/4"
21	CN78-NF (1073B)	Castle Nut, 7/8" National Fine Thread
22	W78 (1080B)	Washer, 7/8"
23	1076B (Prior to Early '93) 1076C1 (After early '93)	Outer Bearing, 6-Bolt Hub Industry Number - LM67048
24	1076CB (Prior to Early '93) 1076CC (After early '93)	Cup, 6-Bolt Hub, Outer Industry Number - LM67010
26	1077CB (Prior to Early '93) 1077CC (After early '93)	Cup, 6-Bolt Hub, Inner Industry Number - M501310
27	1077B (Prior to Early '93) 1077C (After early '93)	Inner Bearing, 6-Bolt Hub Industry Number – LM501349
28	1038B (Prior to Early '93) 1038C (After early '93)	Seal, 6-Bolt Hub Industry Number – CR18823

CHAINS		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	2040	Chain, Box of 10 ft.
2	2040L	Connector Link, Offset
3	2040L1	Connector Link, Full Link
4	2040L2	Connector Link, Half Link
5	2040XA	Chain, Drive Chain on Leg - 77 links (Both Models)
6	2040C	Chain, Picker Wheel - 51 Links (Both Models)
7	2040D	Chain, Speed Changer - 39 Links (Both Models)
8	2040E	Chain, Small Seed Box - 37 Links (Both Models)
9	2040F	Chain, Cool Season Box Agitator - 17 Links (Both Models)
10	2040XG	Chain, Cool Season Box Drive - 51 Links (Both Models)
11	2040XB	Chain, Leg Drive Shaft To Clutch - 73 Links (End Wheel Model)
12	2040K	Chain, Jackshaft To Clutch - 25 Links (End Wheel Model)
13	2040J	Chain, Output Reduction Kit Leg Drive Shaft To 36-Tooth Side Of 18/36 Double Sprocket - 61 Links (End Wheel Model)
14	2040K	Chain, Jackshaft To Clutch - 25 Links (Rear Drive Model)
15	2040M	Chain, Leg Drive Shaft To Input Jackshaft - 69 Links (Rear Drive Model)
16	2040I	Chain, Output Reduction Kit Leg Drive Shaft To 36-Tooth Side Of 18/36 Double Sprocket - 75 Links (Rear Drive Model)

MISCELLANEOUS PARTS		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	9991	Grease, Synthetic (Tube)
2	9990	Decal, Kit - FLXII 1993-
3	5999	Owner, Operator Manual (FLXII Drill)
4	PMCK-AF-1062	Packing Kit, Prince 3-1/2" Rephasing Hydraulic Cylinder Model AF- 1062, Tie Rod Style
5	PMCK-AF-1068	Packing Kit, Prince 3-1/4" Rephasing Hydraulic Cylinder Model AF- 1068, Tie Rod Style
6	Paint (Yellow) - Not Available From Truax Company	Ford Automotive Paint (Tampico Yellow - 1972) or Krylon (Warm Yellow Gloss #1941)
7	Paint (Black) - Not Available From Truax Company	RUST-OLEUM Professional High Performance Enamel (Gloss Black #7579)
6	Drill Cover (Custom Made)	L & L Tarp 47550 254th St. Baltic SD 57003 Phone: 605/529-5264
7	Trailer – Grain Head Style	Donahue Implement Carrier The Donahue Corporation Durham, KS 67438 Phone: 316/732-2665

ACRE METER - PAGE 1 OF 1

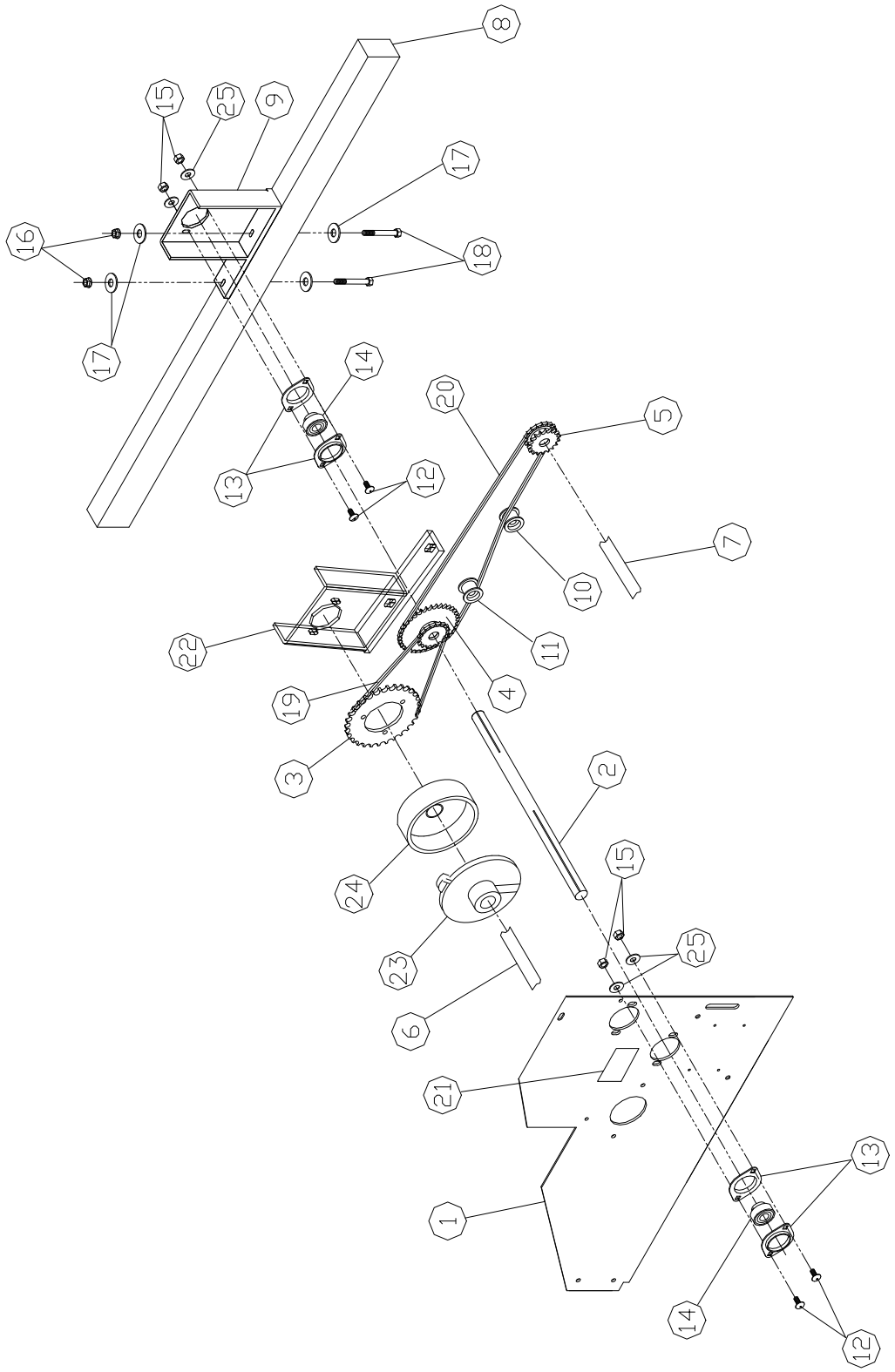
Hub Style Acre Meter - This acre meter is calibrated and sealed with the sprocket combination on the face of the meter. Field change is not possible. Acre meters are calibrated to OEM standard sprockets. If sprockets are field changed, calculate the ratio between actual area covered and the reading on the counter and use this "factor" to determine acreage readings in the future. Changing tire sizes from the standard rib implement tire will affect the acre meter reading.

Using the Output Reduction feature will result in the Hub Style Acre Meter reading 1/2 of the actual acres planted. When using the Output Reduction feature the acre meter reading times 2 is the actual acres planted.

DRILL MODEL	PART NUMBER
FLXII-86	060086E (Electronic)
FLXII-88	060088X
FLXII-812	0600812X
FLXII-816	0600816X
FLXII-818	0600818X
FLXII-822	0600822X

Electronic Acre Meter - The electronic acre meter is battery operated and records both field acres and total acres. The digits on the meter indicate acres covered since the field acre or total acre counter was last cleared. See the instructions provided with the Battery Operated Acre Meter or Pages 30-18 and 30-19 for operation of the unit. The Electronic Acre Meter is the only style available for Model FLXII-86 but can be used on any drill.

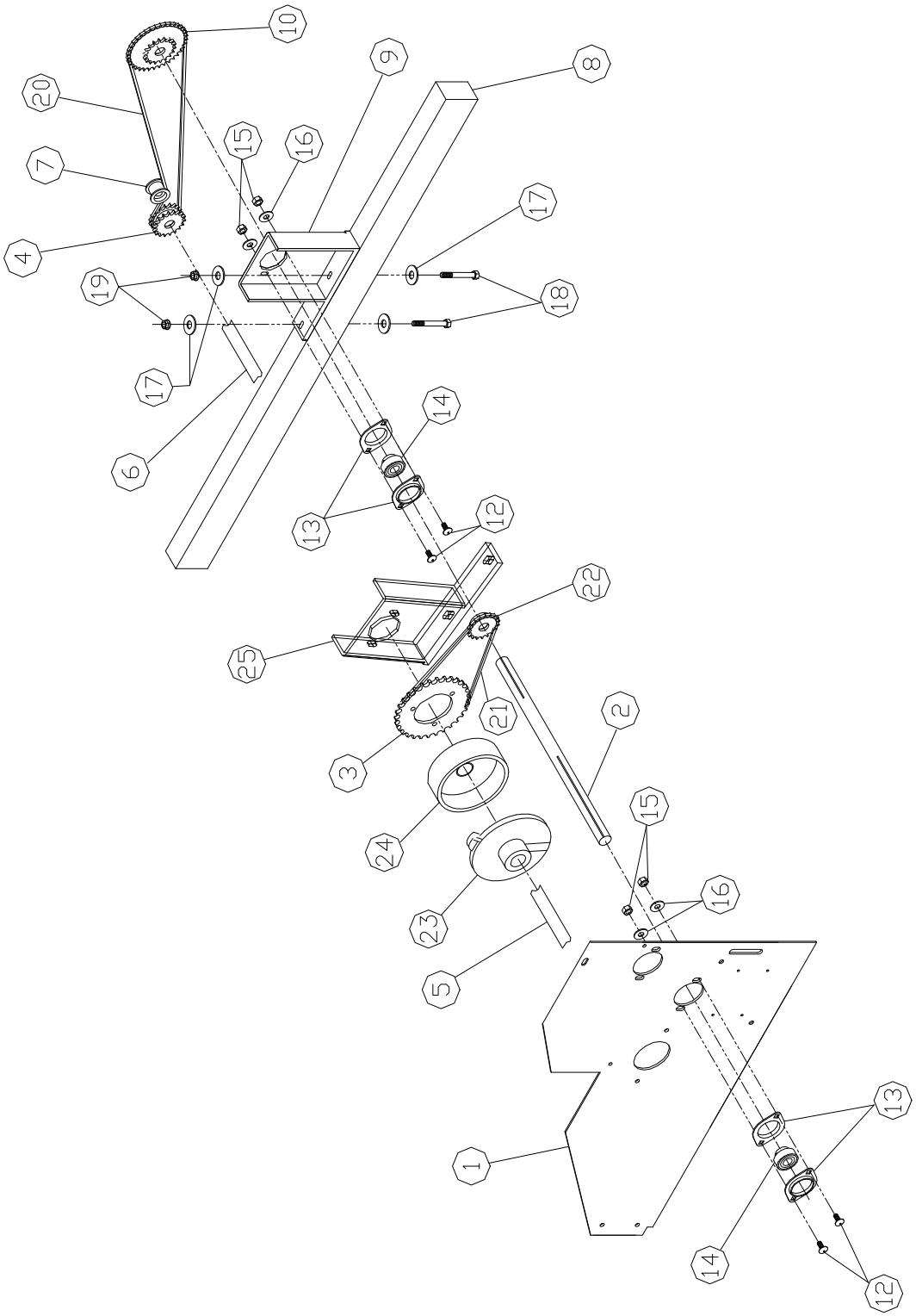
OUTPUT REDUCTION KIT END WHEEL DRIVE – PAGE 1 OF 2



OUTPUT REDUCTION KIT (END WHEEL DRIVE) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	071054 071056	Output Reduction Kit FLXII End Wheel Drive Output Reduction Kit FLXII End Wheel Drive Mdl. 822
1	103625	Support, Bearing & Clutch, FLXII
2*	103165	Jack Shaft, Output Reduction Kit
3	1044	Sprocket 40A30, Clutch Style (Standard)
4*	710532	Sprocket, Double 18/36
5*	710531	Sprocket, Double 18/18
6	15-710	Shaft, Input
7	10375 (Mdl.88, 810, 812) 103751 (Mdl.816, 818, 822, 1012)	Drive Shaft, Leg
8	Main Frame	Main Frame Support
9*	103161 103161A	Jack Shaft & Output Reduction Kit Support Jack Shaft & Output Reduction Kit Support Mdl.822 Non-Typical
10	1041	Idler Assembly, Clutch Chain -Front (See Page 90-13 For Detail)
11	1042D	Idler Assembly, Clutch Chain - Rear (See Page 90-13 For Detail)
12*	CB516-.75	Carriage Bolt, 5/16"x 3/4"
13*	3007A	Flangette (52 MST)
14*	3007	Bearing 1" Spherical
15*	N516-CL	Nut, 5/16" Clincher Nut
16*	N38-FN	Nut, 3/8" Flanged Nut
17*	W38	Washer, 3/8"
18*	B38-4.5	Bolt, 3/8"x 4-1/2"
19*	2040K	Chain, Output reduction Kit (Clutch to 18-Tooth Side Of 18/36 Double Sprocket) 25 Links w/Offset and Full Link Connectors.
20*	2040J	Chain, Output Reduction Kit (Leg Drive 18-Tooth Double Sprocket to 36-Tooth side Of 18/36 Double Sprocket) 61 Links w/Half Link or Full Link Connector.
21*	1046C14	Decal, Output Reduction Kit
22	10316	Bearing Support, FLXII
23	1119	Clutch, Housing w/Dog Trip
24	1120	Clutch, Hub
25*	W516	Washer, 5/16"

NOTE: Update kit includes all items shown above with an asterisks (*) next to the Item No.

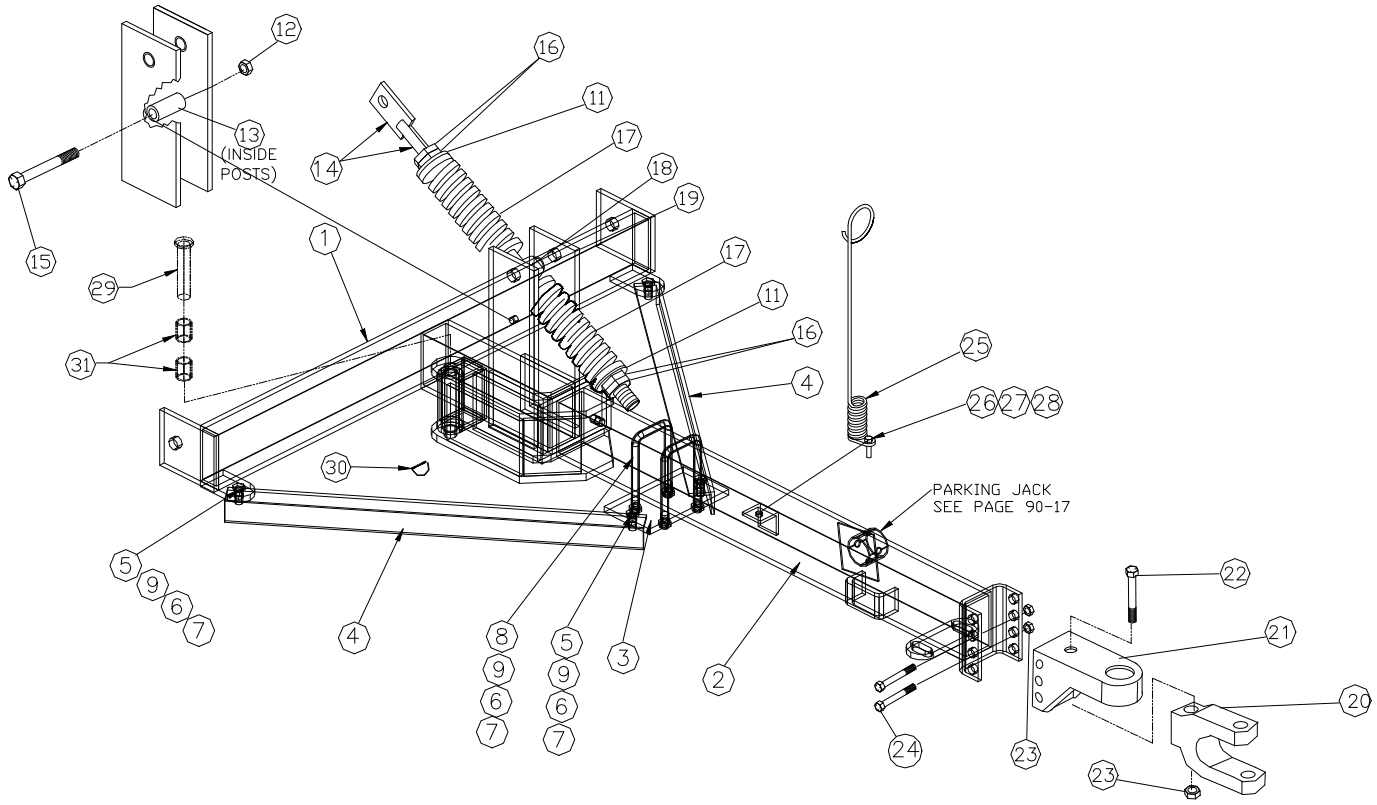
OUTPUT REDUCTION KIT (REAR WHEEL DRIVE) – PAGE 1 OF 2



OUTPUT REDUCTION KIT (REAR WHEEL DRIVE) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	0710541 0710561	Output Reduction Kit FLXII Rear Wheel Drive Mdl. 812, 816, 818. **Not available for FLXII Mdl. 86RD and 88RD.** Output Reduction Kit FLXII Rear Wheel Drive Mdl. 822
1	103625	Support, Bearing & Clutch, FLXII
2	103165	Jack Shaft, Rear Drive
3	1044	Sprocket 40A30, Clutch Style (Standard)
4**	710531	Sprocket, Double 18/18, KY & SS
5	15-711	Shaft, Output
6	10375 (Mdl.88, 810, 812) 103751 (Mdl.816, 818, 822, 1012)	Drive Shaft, Leg
7	1042	Idler Assembly, 1/2"x 3-1/2"
8	Main Frame	Main Frame Support
9	103161 103161A	Jack Shaft & Output Reduction Kit Support RD Jack Shaft & Output Reduction Kit Support RD Mdl.822 Non-Typical
10**	710532	Sprocket, Double 18/36
12	CB516-.75	Carriage Bolt, 5/16"x 3/4"
13	3007A	Flangette - 52 MST
14	3007	Bearing 1" Spherical
15	N516-CL	Nut, 5/16" Clincher Nut
16	W516	Washer, 5/16"
17	W38	Washer, 3/8"
18	B38-4.5	Bolt, 3/8"x 4-1/2"
19	N38-FN	Nut, 3/8" Flanged Nut
20**	2040I	Chain, Output Reduction Kit (Leg Drive 18-Tooth Double Sprocket to 36-Tooth side Of 18/36 Double Sprocket) 75 Links w/Half Link or Full Link Connector.
21	2040K	Chain, Clutch RD (18 Tooth Sprocket to 30 Tooth Clutch Sprocket) 25 Links w/Offset Link and Full Link Connectors.
22	1045A	Sprocket, 40B18, KY & SS
23	1119	Clutch, Housing w/Dog Trip
24	1120	Clutch, Hub
25	10316	Bearing Support, FLXII

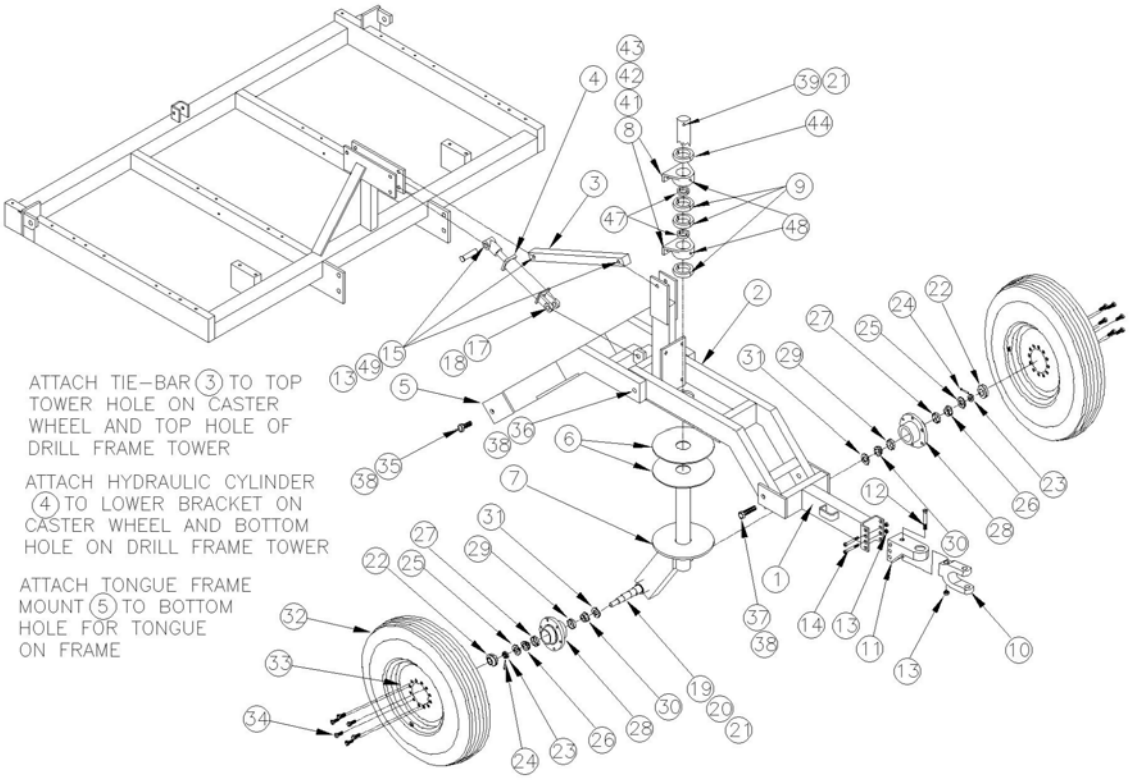
NOTE: Update kit includes all items shown above with a double asterisks (**) next to the Item No.

FOLDING TONGUE – PAGE 1 OF 2



FOLDING TONGUE - PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	04214X (Exchange On New Drill) 04214X1 (Exchange On New Drill) 04214XF (Replace Rigid Tongue On Drill In Service) 04214XF1 (Replace Rigid Tongue On Drill In Service)	Folding Tongue Assembly, New Drill (Mdl. 86, 88, & 812) Folding Tongue Assembly, New Drill (Mdl. 816, 818, & 822) Folding Tongue Assembly, Replace Non-Folding Standard Tongue (Mdl. 86, 88, & 812) Folding Tongue Assembly, Replace Non-Folding Standard Tongue (Mdl. 816, 818, & 822)
1	4214X01 4214X101	Tongue, Frame Mount (Mdl. 86, 88, & 812) Tongue, Frame Mount (Mdl. 816, 818, & 822)
2	4214X02 4214X102	Tongue, Folding Hitch Mount (Mdl. 86, 88, & 812) Tongue, Folding Hitch Mount (Mdl. 816, 818, & 822)
3	421403	Plate, Folding Tongue
4	4214X03 4214X103	Support Arm, Folding Tongue (Mdl. 86, 88, & 812) Support Arm, Folding Tongue (Mdl. 816, 818, & 822)
5	B58-2	Bolt, 5/8"x 2"
6	LW58 (Not Illustrated)	Lockwasher, 5/8"
7	N58 (Not Illustrated)	Nut, 5/8"
8	UB58-6.5-3	U-Bolt, 5/8" x 6-1/2" x 3"
9	W58GRD8 (Not Illustrated)	Washer, 5/8" Hardened
11	4232A	End Guides
12	N12	Nut, 1/2"
13	4232	Spacer, Spring Assembly
14	4217B1	Rod, Spring
15	B12-5.5	Bolt, 1/2"x 5-1/2"
16	N1.25-JNNC (4217D1)	Nut, 1-1/4" Jam Nut National Coarse Thread
17	4217A	Spring (All Models)
18	1093DD	Zirk, 1/4"-28
19	4207	Trunnion, Pivot
20	1022B2	Hitch Clevis (99-)
21	1022C1	Hitch Body, Standard (99-)
22	B34-6GRD8	Bolt, 3/4"x 6" Grade 8
23	N34-TL	Nut, 3/4" Top Lock
24	B34-5GRD8	Bolt, 3/4"x 5" Grade 8
25	4214	Hose Guide, 18"
26	B38-1.25	Bolt, 3/8"x 1-1/4"
27	W38 (Not Illustrated)	Washer, 3/8"
28	N38-FN (Not Illustrated)	Nut, 3/8" Flanged Nut
29	421404	Pin, Pivot Folding Tongue - 31/32"x6-5/8"
30	RP316-2	Roll Pin, 3/16"x 2"
31	102521	Bushing, Connex - 1-1/4" OD, 1" ID, 1-1/2" L (Requires 2)

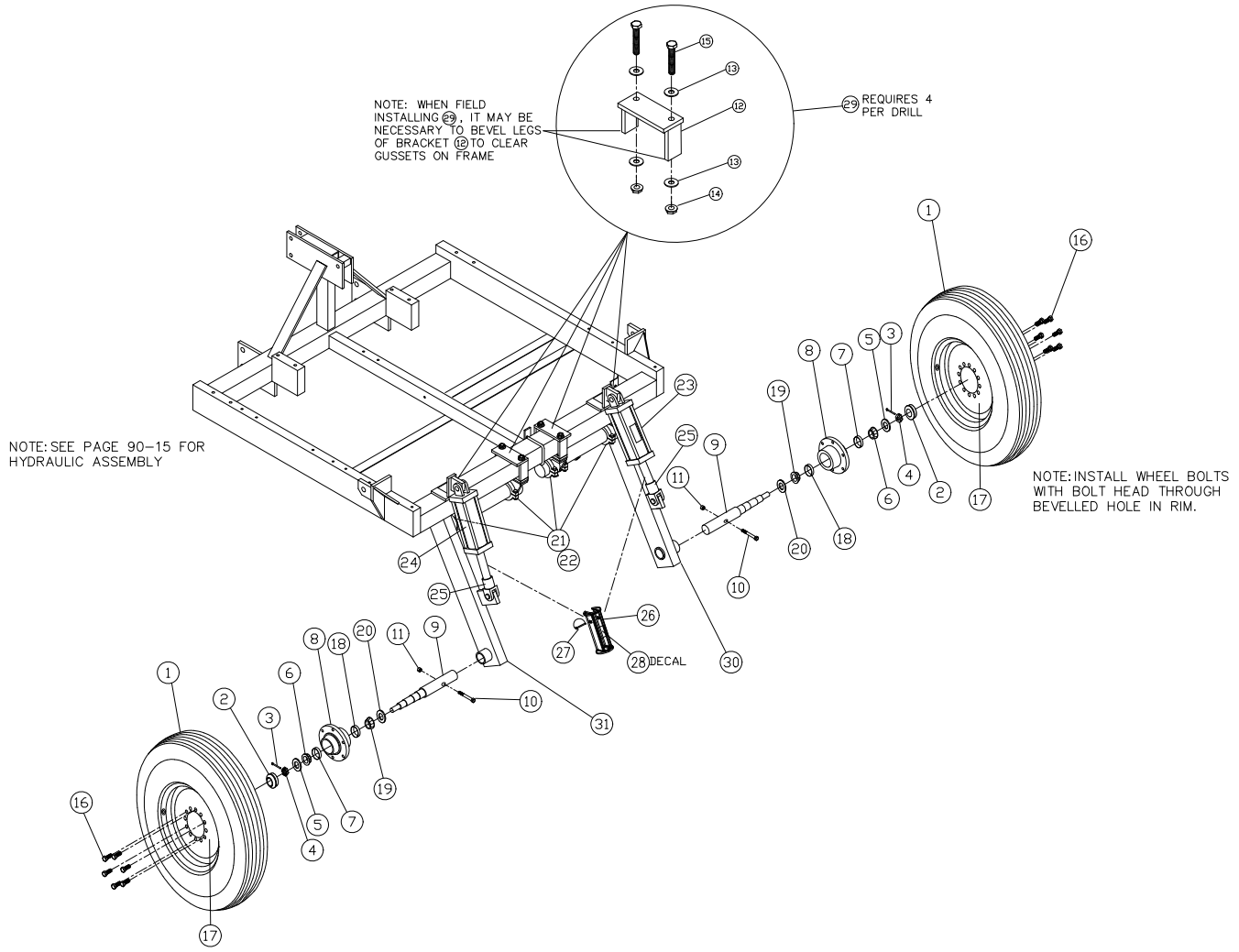
CASTER WHEEL, FRONT – PAGE 1 OF 2



ITEM NO.	PART NUMBER	DESCRIPTION
0	06001	Caster Wheel, Front Assembly
1	6001	Tongue, Caster Hitch Mount
2	6002	Tongue, Body
3	6003	Tie Bar, Upper
4	42260	Cylinder, Hydraulic 3"x 8" 2500PSI
5	6008	Tongue, Frame Mount
6	6005	Plate, Ultra High Molecular Weight Polyethylene
7	6006	Caster Mount
8	1037BHX	Bearing Mount, Casting
9	1037CLX2	Collar, Shaft 3"
10	1022B2	Hitch Clevis, (99-)
11	1022C1	Hitch Body, Standard (99-)
12	B34-6GRD8	Bolt, 3/4"x 6" Grade 8
13	N34-TL	Nut, 3/4" Top Lock

CASTER WHEEL – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
14	B34-5GRD8	Bolt, 3/4"x 5" Grade 8
15	B34-4	Bolt, 3/4"x 4"
17	80112 (Not Illustrated)	Pin, Hydraulic, FLEX
18	CP316-2 (Not Illustrated)	Cotter Pin, 3/16"x 2"
19	20360	Axle, 6-Bolt Dual Wheels (Pinned), 1992- (Cold Rolled Steel)
20	B38-3.25 (Not Illustrated)	Bolt, 3/8"x 3-1/4"
21	N38-CL (Not Illustrated)	Nut, 3/8" Clincher Nut
22	1082B	Cap, Dust for 6-Bolt Hub
23	CN78-NF (1073B)	Nut, Castle - 7/8" National Fine Thread
24	CP316-1.75 (1110B)	Cotter Pin, 3/16" x 1-3/4"
25	W78 (1080B)	Washer, 7/8"
26	1076C1	Outer Bearing, 6-Bolt Hub
27	1076CC	Cup, 6-Bolt Hub, Outer
28	1085C	Hub, 6-Bolt
29	1077CC	Cup, 6-Bolt Hub, Inner
30	1077C	Inner Bearing, 6-Bolt Hub
31	1038C	Seal, 6-Bolt Hub
32	1072BA1 (After Late '93) 1072BA2 (Optional) 107204 (Optional) 107214 (Optional)	Tire, 7.60" x 15SL 8 ply Rib Implement. Tubeless Style Tire, ST225/75R15 Load Rating D Highway Truck Tire Tire, ST225/75R15 Load Rating E Heavy Duty Truck Tire Tire, 9.5L-15SL, 8 Ply Rib Implement Flotation Tire
33	1072B1	Rim, 15" Wheel, Offset, 6-Bolt (Valve Stem Reversed)
34	WB12-20-1.25	Wheel Bolt, 1/2"-20 x 1-1/4" With 45^0 Bevel From Centerline **These are wheel bolts for agriculture equipment <u>not</u> automotive wheel bolts.**
35	B1-2.5	Bolt, 1"x 2-1/2"
36	B1-5.5	Bolt, 1"x 5-1/2"
37	B1-4	Bolt, 1"x 4"
38	N1-JN (Not Illustrated)	Nut, 1" Jam Nut (Requires Double Nut)
39	B38-3.5 (Not Illustrated)	Bolt, 3/8"x 3-1/2"
41	B12-2GRD9	Bolt, 1/2"x 2" Grade 9
42	W12GRD9	Washer, 1/2" Grade 9
43	N12GRD9	Nut, 1/2" Grade 9
44	1037CLX3	Collar, Split With Corners of tabs ground off to fit
47	1037FLB	Bearing, FLXII
48	1093DD	Zirk, 1/4"-28
49	102522	Bushing, Connex 1"OD, 3/4" ID, 3/4" L (Requires 2 at each location)
50	4224A2 (Not Illustrated)	45 degree - 3/8" O-Ring, Hydraulic Fitting, 3/8" N.P.T.
51	42220 (Not Illustrated)	Hydraulic Quick Disconnect (Male)
52	4222X6 (Not Illustrated) 4222X7 (Not Illustrated)	Hose, Hydraulic, FLXII, 3/8" Male, NPT & 1/2" male - 6 ft Hose, Hydraulic, FLXII, 3/8" Male, NPT & 1/2" male - 7 ft

REAR TRANSPORT WHEELS (SINGLE WHEEL) – PAGE 1 OF 2

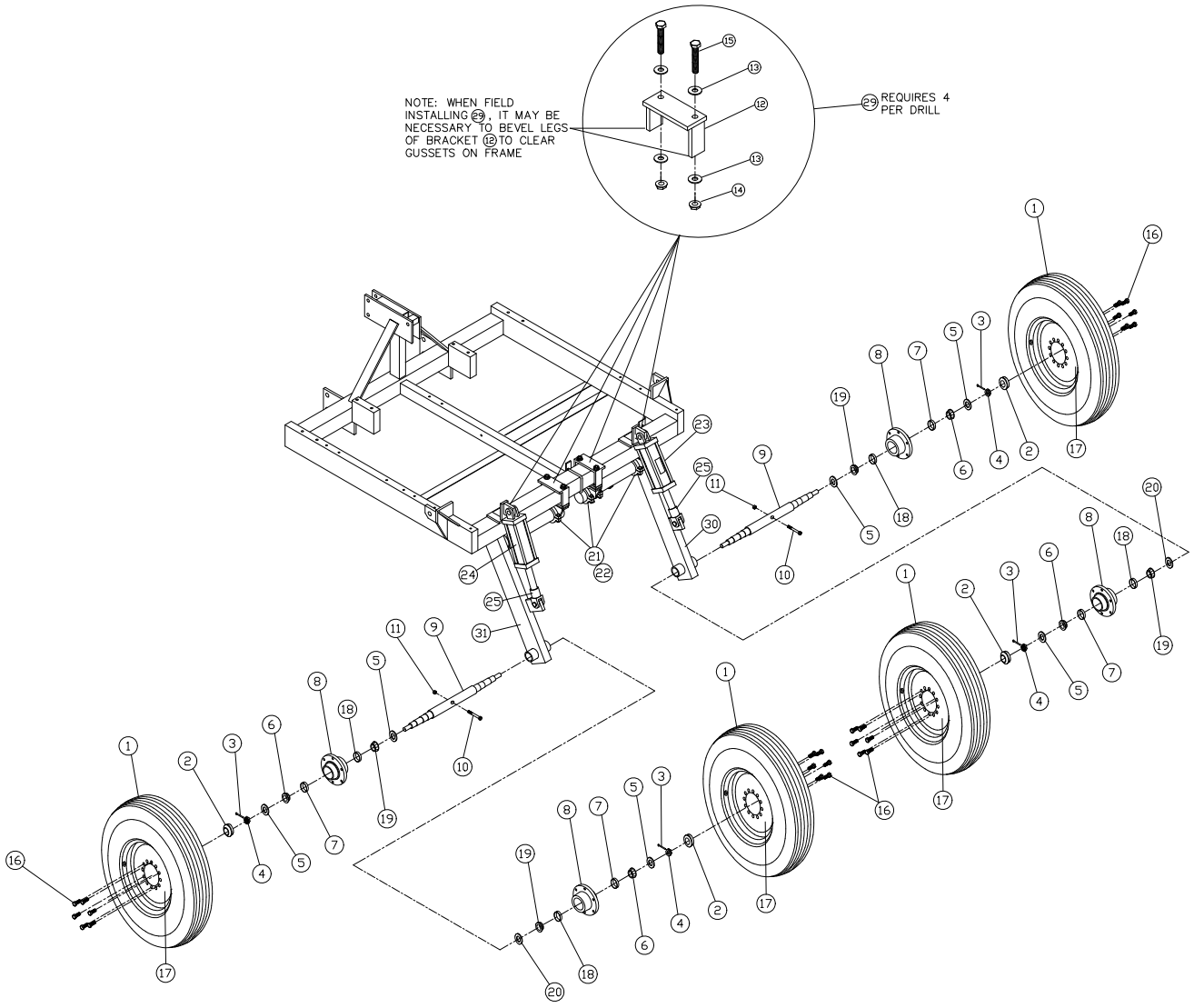


Note: Standard for rear transport tire spacing from tire centerline to tire centerline is 99". Overall outside width will depend on tire option selected.

ITEM NO.	PART NUMBER	DESCRIPTION
0	099010 (Mdl 86) 099011 (Mdl 88, 812) 099012 (Mdl 816, 818, 822)	Rear Transport Wheels, Single Wheel
1	1072BA1 (Standard) 1072BA2 (Optional) 107204 (Optional) 107214 (Optional)	Tire, 7.60" x 15/6 Rib Implement Tubeless Style Tire, 7.60" x 15/6 Hwy Tread (4-6 ply) Radial Truck Tire Tire, 7.60" x 15/8 Heavy Duty Tread (8-10 ply) Bias Truck Tire Tire, 9.5L, 8 Ply Rib Implement Flotation Tire
2	1082B	Cap, Dust For 6-Bolt Hub
3	CP316-1.75 (1110B)	Cotter Pin, 3/16"x 1-3/4"

REAR TRANSPORT WHEELS (SINGLE WHEEL) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
4	CN78-NF (1073B)	Castle Nut, 7/8" National Fine Thread
5	W78 (1080B)	Washer, 7/8"
6	1076C1 (After Early '93)	Outer Bearing, 6-Bolt Hub
7	1076CC (After Early '93)	Cup, 6-Bolt Hub - Outer
8	1085C (After '93)	Hub, 6-Bolt
9	2036C1 (Mdl. 86, 88, 812) 2036C2 (Mdl. 816, 818, 822)	Axle, 6-Bolt (Pinned), 1992- (Cold Rolled Steel) Axle, 6-Bolt (Pinned), 1992- (Cold Rolled Steel)
10	B38-3.25	Bolt, 3/8"x 3-1/4"
11	N38-CL	Nut, 3/8" Clincher
12	10365	Bracket, Support on Rear Drive & Rear Transport Legs
13	W58GRD8	Washer, 5/8" Hardened
14	N58-TL	Nut, 5/8" Top Lock
15	B58-7GRD8	Bolt, 5/8"x 7" Grade 8
16	WB12-20-1.25	Wheel Bolts, 1/2"-20 x 1-1/4" With 45^0 Bevel from Centerline **These are wheel bolts for agriculture equipment <u>not</u> automotive wheel bolts.**
17	1072B1 (After Early '93)	Rim, 15" Wheel, Offset, 6-Bolt (Valve Stem Reversed)
18	1077CC (After Early '93)	Cup, 6-Bolt Hub, Inner
19	1077C (After Early '93)	Inner Bearing, 6-Bolt Hub
20	1138C (After Early '93)	Seal, 6-Bolt Hub
21	1037BHX (Mdl.88, 812 RD,RT) 1037BHX2 (Mdl.88, 812 RD,RT) 1037BHX3 (Mdl.816, 818, 822 RD,RT) 1037BHX4 (Mdl.816, 818, 822 RD,RT)	Bearing Mount, Casting Bearing Mount, Casting - Zirk Repositioned Bearing Mount, Casting - 5/8" Bolt Holes In Casting Bearing Mount, Casting - 5/8" Bolt Holes In Casting & Zirk Repositioned
22	1037FLB	FLXII Bearing, 3-1/4"x 3"x 2" (NOTE: Bearing is installed inside of each Bearing Mount Casting)
23	4226XD - Right Side (Viewed From Rear of Drill) (PMS-AF-1062)	Hydraulic Cylinder, 3-1/4"x 8" Rephasing Tie Rod
24	4226XND - Left Side (Viewed From Rear of Drill) (PMS-AF-1068)	Hydraulic Cylinder, 3-1/2"x 8" Rephasing Tie Rod
25	1036FF2	Spacer, Cylinder Arm - 1-1/2"x 1-1/4" ID
26	4226XG3	Hydraulic Transport Guard, 8-1/4"
27	4226XG0	Retainer, Hydraulic Transport
28	1046C13	Decal, Transport Lock
29	10365A	Bracket, Support - Assembly w/Hardware (Requires 4 per drill)
30	10375A (Mdl 88, 812) 10375B (Mdl 816, 818, 822) 10375C (Mdl 86)	Transport Leg - Right Side for Single Wheel
31	1037LNDX0 (Mdl 88, 812) 1037LNDX3 (Mdl 816, 818, 822) 1037LNDX6 (Mdl 86)	Transport Leg – Left Side for Single Wheel

REAR TRANSPORT WHEELS (DUAL WHEELS) – PAGE 1 OF 2

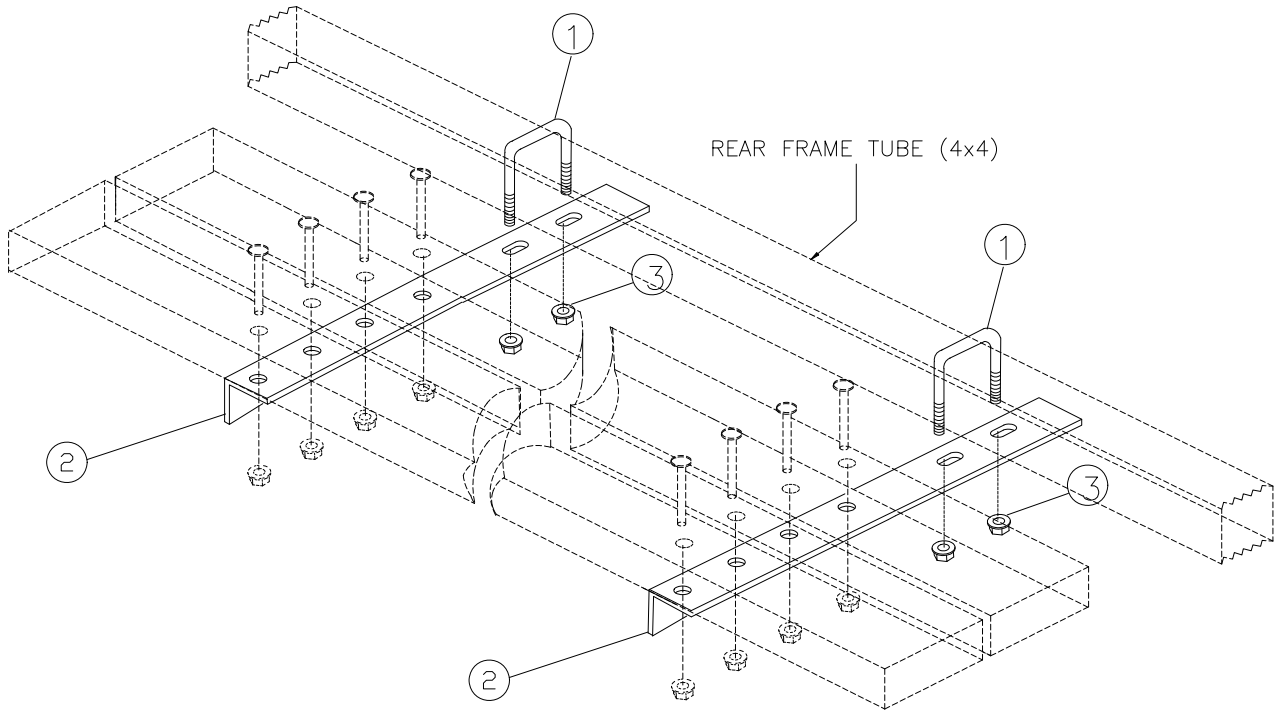


Note: Standard for rear transport tire spacing from tire centerline to tire centerline is 99"on outside dual and 53" from tire centerline to tire centerline for inside dual. Overall outside width will depend on tire option selected.

ITEM NO.	PART NUMBER	DESCRIPTION
0	09902 & 09902	Rear Transport Wheels with Dual Tires (Mdl 812, 816, 818, 822)
1	1072BA1 (Standard) 1072BA2 (Optional) 107204 (Optional) 107214 (Optional)	Tire, 7.60" x 15SL 8 ply Rib Implement. Tubeless Style Tire, ST225/75R15 Load Rating D Highway Truck Tire Tire, ST225/75R15 Load Rating E Heavy Duty Truck Tire Tire, 9.5L-15SL, 8 Ply Rib Implement Flotation Tire
2	1082B	Cap, Dust For 6-Bolt Hub
3	CP316-1.75 (1110B)	Cotter Pin, 3/16"x 1-3/4"

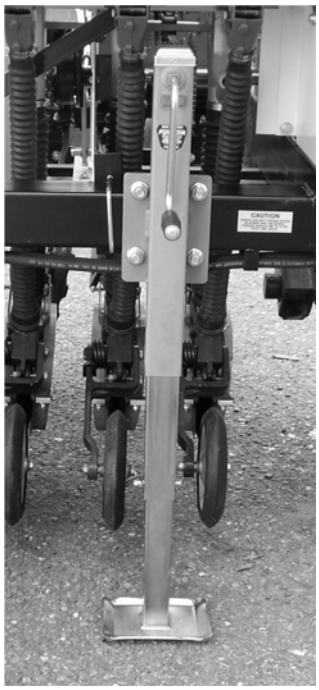
REAR TRANSPORT WHEELS (DUAL WHEEL) – PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
4	CN78-NF (1073B)	Castle Nut, 7/8" National Fine Thread
5	W78 (1080B)	Washer, 7/8"
6	1076C1 (After Early '93)	Outer Bearing, 6-Bolt Hub
7	1076CC (After Early '93)	Cup, 6-Bolt Hub - Outer
8	1085C (After '93)	Hub, 6-Bolt
9	2036C0	Axle, 6-Bolt Dual Wheels (Pinned), 1992- (Cold Rolled Steel)
10	B38-3.25	Bolt, 3/8"x 3-1/4"
11	N38-CL	Nut, 3/8" Clincher
12	10365	Bracket, Support on Rear Drive & Rear Transport Legs
13	W58GRD8	Washer, 5/8" Hardened
14	N58-TL	Nut, 5/8" Top Lock
15	B58-7GRD8	Bolt, 5/8"x 7" Grade 8
16	WB12-20-1.25	Wheel Bolts, 1/2"-20 x 1-1/4" With 45^0 Bevel from Centerline **These are wheel bolts for agriculture equipment <u>not</u> automotive wheel bolts.**
17	1072B1 (After Early '93)	Rim, 15" Wheel, Offset, 6-Bolt (Valve Stem Reversed)
18	1077CC (After Early '93)	Cup, 6-Bolt Hub, Inner
19	1077C (After Early '93)	Inner Bearing, 6-Bolt Hub
20	1138C (After Early '93)	Seal, 6-Bolt Hub
21	1037BHX (Mdl.88, 812 RD,RT) 1037BHX2 (Mdl.88, 812 RD,RT) 1037BHX3 (Mdl.816, 818, 822 RD,RT) 1037BHX4 (Mdl.816, 818, 822 RD,RT)	Bearing Mount, Casting Bearing Mount, Casting - Zirk Repositioned Bearing Mount, Casting - 5/8" Bolt Holes In Casting Bearing Mount, Casting - 5/8" Bolt Holes In Casting & Zirk Repositioned
22	1037FLB	FLXII Bearing, 3-1/4"x 3"x 2" (NOTE: Bearing is installed inside of each Bearing Mount Casting)
23	4226XD - Right Side (Viewed From Rear of Drill) (PMS-AF-1062)	Hydraulic Cylinder, 3-1/4"x 8" Rephasing Tie Rod
24	4226XND - Left Side (Viewed From Rear of Drill) (PMS-AF-1068)	Hydraulic Cylinder, 3-1/2"x 8" Rephasing Tie Rod
25	1036FF2	Spacer, Cylinder Arm - 1-1/2"x 1-1/4" ID
26	4226XG3	Hydraulic Transport Guard, 8-1/4"
27	4226XG0	Retainer, Hydraulic Transport
28	1046C13	Decal, Transport Lock
29	10365A	Bracket, Support - Assembly w/Hardware (Requires 4 per drill)
30	1037LNDX8 (Mdl 816, 818, 822)	Transport Leg - Right Side for Dual Wheels
31	1037LNDX7 (Mdl 816, 818, 822)	Transport Leg - Left Side for Dual Wheels

FOOT BOARD BRACKET OPTION – PAGE 1 OF 1		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
1	UB38-4-4.5	U-Bolt, 3/8” x 4” x 4-1/2”
2	90188 901881	Foot Board Support, Standard Foot Board Support, Lengthened for rear drive or spare tire mount
3	N38-FL	Nut, 3/8” Flanged Nut



REAR JACK STAND – PAGE 1 OF 1

ITEM NO.	PART NUMBER	DESCRIPTION
0	03202	Jack Stand, Rear – Side wind with adjustable drop leg.
1	3202	Jack With Welded Mounting Plate
2	UB58-6.25-4	U-Bolt, 5/8"x 6-1/4" x 4" (Requires 2)
3	N58-FN	Nut, 5/8" Flanged Nut
4	3203	Mounting Plate, Front mount over no-till.

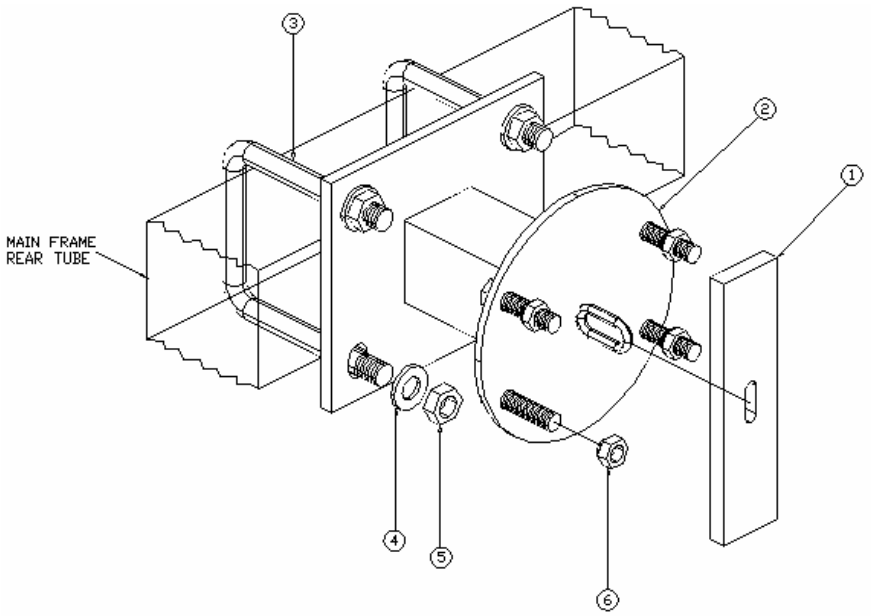


Rear Jack Extended

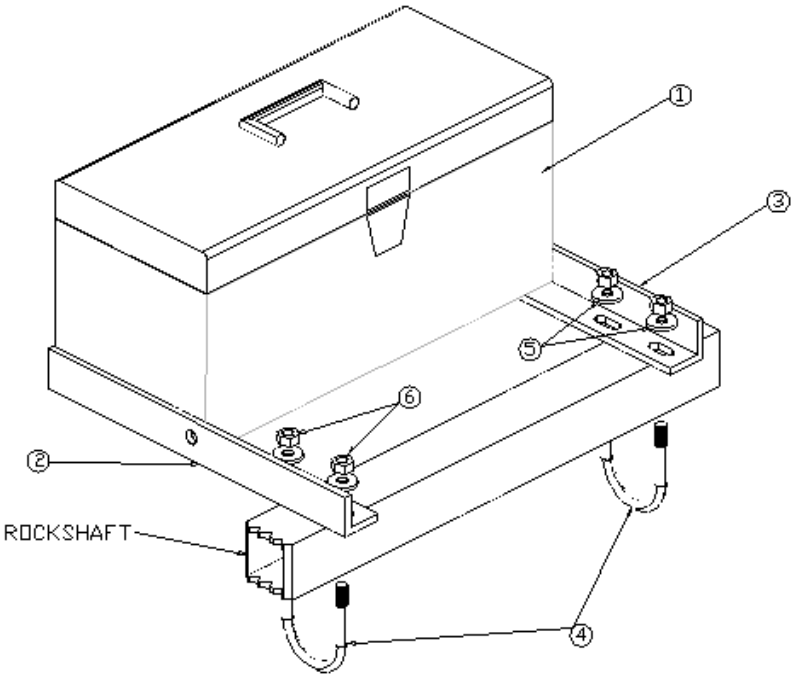
Rear Jack Retracted

Rear Jack Stand – Side wind jack with adjustable drop leg. Jack has a mounting plate welded to the jack and is attached to the rear drill frame member with two 5/8" U-Bolts. Rear jack stand is needed when a FLEXII drill does not have no-till coulters. Use one jack on Models FLXII-86, FLXII-88, and FLXII-812. Use two jacks on Models FLXII-816, FLXII-818, and FLXII-822.

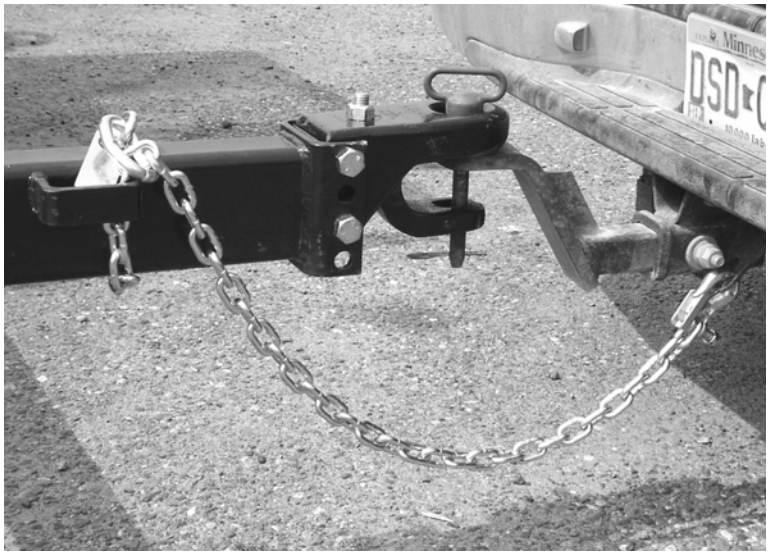
SPARE TIRE MOUNT/LOCKABLE – PAGE 1 OF 1		
ITEM	**PART NUMBER**	**DESCRIPTION**
0	1072MST	Spare Tire Mounting Bracket with Locking Bar.
1	107202MST	Locking Bar, Spare Tire Mount
2	107201MST	Bracket, Spare Tire Mount
3	UB58-6-4	U Bolt, 5/8"x 6"x 4"
4	W58GRD8	Washer, 5/8" Hardened
5	N58-FN	Nut, 5/8" Flanged Nut
6	WN12-20	Wheel Nuts, 1/2"-20 NF
Spare Tire	1072BA	Tire, 7.60-15SL 8 ply Rib Implement Tire and Rim
Spare Tire	1072BA3	Tire, ST225/75R15 8 ply Load Rating D Highway Tread Truck Tire and Rim
Spare Tire	1072041	Tire, ST225/75R15 10 ply Load Rating E Heavy Duty Tread Truck Tire and Rim
Spare Tire	1072141	Tire, 9.5L-15SL 8 ply Rib Implement Flotation Tire and Rim



TOOL BOX – PAGE 1 OF 1		
ITEM	**PART NUMBER**	**DESCRIPTION**
0	01071	Tool Box, Lockable w/Mounting Brackets and Hardware
1	107101	Tool Box, Lockable
2	107102	Bracket, Tool Box Mount Right Side **(View from rear of drill)**
3	107103	Bracket, Tool Box Mount Left Side **(View from rear of drill)**
4	UB38-2.5-3	U Bolt 3/8"x 2-1/2"x 3"
5	W38	Washer, 3/8"
6	N38-TL	Nut, 3/8" Top Lock
7	107104 (Not Illustrated)	Bracket, Tool Box Mount - **One Piece (Replaces Items 2 and 3)**

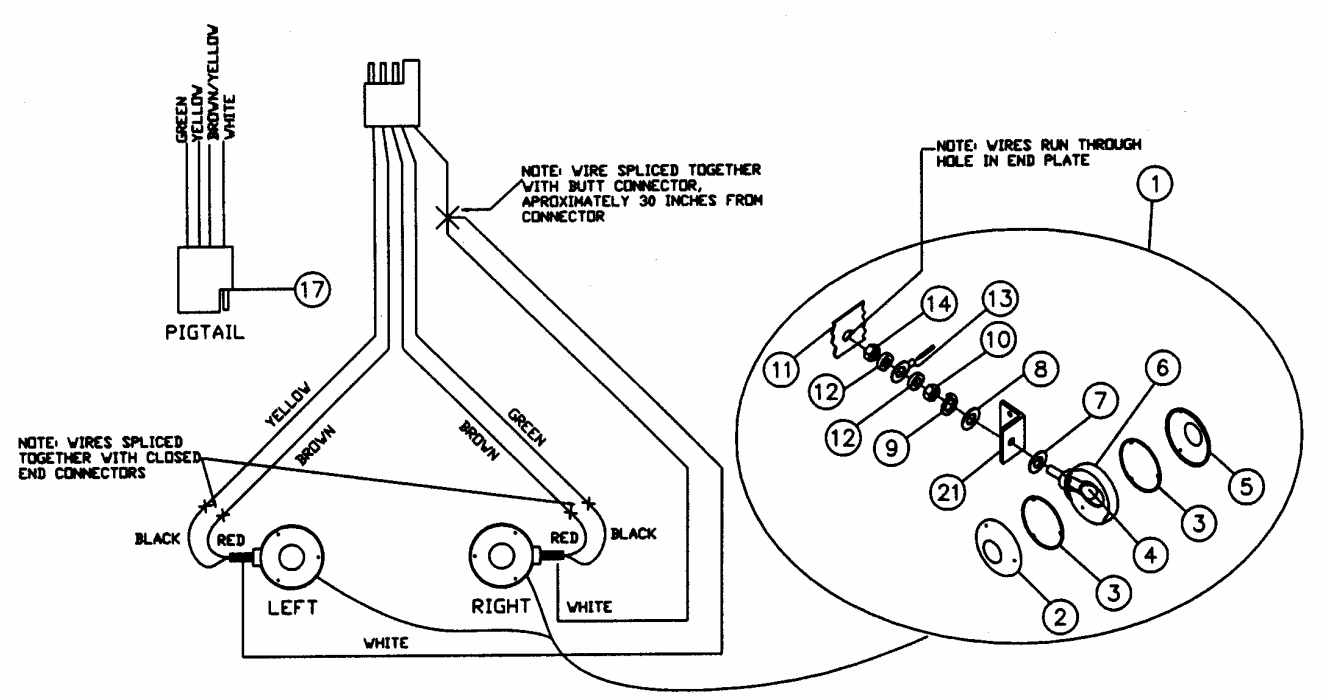


SAFETY CHAIN – PAGE 1 OF 1		
ITEM	**PART NUMBER**	**DESCRIPTION**
Safety Chain	4233A	Safety Chain, Drill Tongue to Towing Vehicle.



Attach the safety chain so there is only enough slack in the chain to permit turning.

TAIL LIGHTS – PAGE 1 OF 2



Note: "X" denotes a wire splice in the diagram (Note 5 wires splices).

Note: Wire connectors must be installed with the closed end up to prevent water from collecting in the connector and causing corrosion.

Note: Dielectric Grease is used on all wire slices and connections during assembly to reduce the possibility of corrosion in the field and subsequent malfunction of lights. It is recommended this product be used when wiring repairs are made.

Note: Some late model tow vehicles are equipped with separate circuits for the turn and brake lights. Most auto parts stores can supply a "converter' box to convert the split brake/turn signal system to a conventional "4-wire" trailer light hookup as used on the Truax drill. Contact your local tow vehicle manufacturer or dealer for additional information.

PIGTAIL WIRE FUNCTIONS	
Color	**Function**
Green	**Right Turn Signal/Brake**
Yellow	**Left Turn Signal/Brake**
Brown	**Tail Lights**
White	**Ground**

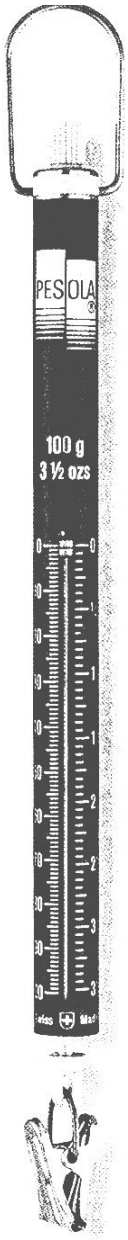
TAIL LIGHTS - PAGE 2 OF 2		
ITEM NO.	**PART NUMBER**	**DESCRIPTION**
0	1036EX2 (Mdl.88) 1036EX3 (Mdl.812) 1036EX4 (Mdl.816) 1036EX5 (Mdl.818) 1036EX6 (Mdl.822) 1036EX10 (Mdl.86)	Tail Light Kit - Complete With Wiring Harness (Includes Item 1, and Items 12 through 20)
1	1036EX8	Tail Light Assembly - For Both Right and Left Sides (Includes Items 2 through 10 Listed Below)
2**	PM33415	Lens, Red
3**	PM33415G	Gasket, Tail Light Lens
4**	2057-12V	Bulb, Tail light
5**	PM33416	Lens, Orange
6**	PM335	Tail Light Metal Standard with Socket
7**	RW12	Washer, Rubber 1/2"
8**	W12	Washer, 1/2"
9**	LW12	Lock Washer, 1/2"
10**	N12-20	Nut, 1/2"-20
11	End Plate	End Plate, Seed Box (Shown for reference)
12	MB12	Machine Bushing, 1/2"
13	GWT31207	Ring Terminal, 1/2" ID for Ground Wire
14	N12-20-CLJN	Nut, 1/2"-20 Clincher Jam Nut
15	NCP-500 (Not Illustrated)	Corrugated Loom, Non-Slit 1/2" ID - See Table below for lengths.
16	21100 (Not Illustrated)	Tee, Corrugated Loom Fitting (Joins 3 Pieces of Loom)
17	PM336	Tail Light Pigtail
18	37025 Waytec, Inc (Not Illustrated)	Closed End Connector
19	32070 Waytec, Inc (Not Illustrated)	Butt Connector, 12-10 Ga.
20	4222A (Not Illustrated)	Tie, Plastic - Short

**** Item included in Tail Light Assembly. Individual parts not sold by Truax Company.**

Tail Light Wire Requirements:

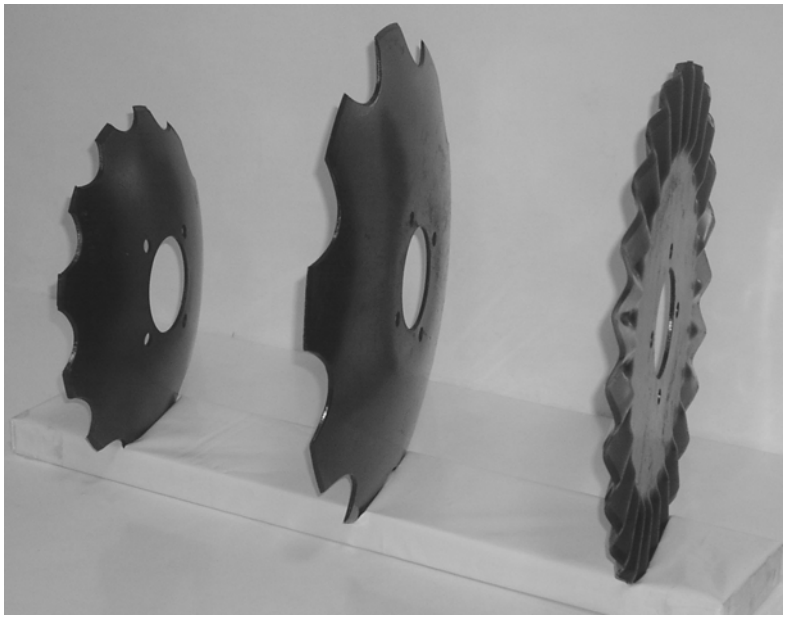
WIRE COLOR	YELLOW	BROWN	GREEN	WHITE	LOOM (3 PIECES)
Function	**Left Turn Light/Brake**	**Tail Light**	**Right Turn Light/Brake**	**Ground**	**Wire Cover**
Model #	**Lengths Shown In Feet**				
FLXII-86	**18**	**18**	**18**	**18**	**14-4-4**
FLXII-88	**20**	**20**	**20**	**20**	**14-5-5**
FLXII-812	**22**	**22**	**22**	**22**	**14-6-6**
FLXII-816	**24**	**24**	**24**	**24**	**14-7-7**
FLXII-818	**26**	**26**	**26**	**26**	**14-8-8**
FLXII-822	**28**	**28**	**28**	**28**	**14-9-9**

SCALE - PESOLA SPRING SCALE (OUNCES & GRAMS) - PAGE 1 OF 1		
ITEM	**PART NUMBER**	**DESCRIPTION**
Scale	93628M	Scale – Pesola Brand, Model 20103, Used in drill calibration procedure.



The Pesola™ Micro-Line Spring Scale with crocodile style clamp is graduated in both metric (grams) and English (ounces) graduations. The scale is available to facilitate weighing seed during the drill calibration procedure.

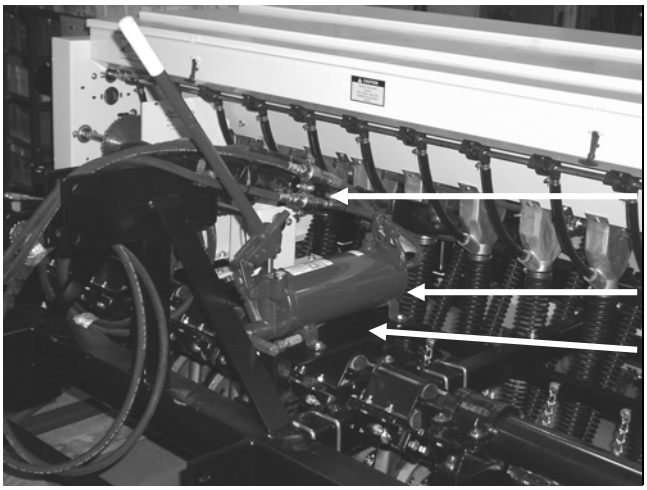
NO-TILL BLADE OPTIONS – PAGE 1 OF 1



13-1/2" Notched Concave Blade | **18" Notched Concave Blade** | **18" 25-Wave Blade**

Pictured above are the three style no-till blades available for FLEXII drills. Pictured on the left is the 13-1/2" Trash Plow blade. This is standard equipment unless another style is specified. Pictured in the middle is the 18" Trash Plow blade. Both of these blades are concave, notched blades and require the torsion arm style mount (See Page 90-49). Pictured on the right is the 18", 25-wave blade. This blade requires the round shank, caster style mount (See Page 90-47).

MANUAL HYDRAULICS - PAGE 1 OF 1			
ITEM	**PART NUMBER**		**DESCRIPTION**
0	0422601		Hydraulics, Manual Operation (Includes Items 1 through 15)
1	422610 422611		Bracket, Mounting - Manual Hydraulic (Mdl. 86, 88) Bracket, Mounting - Manual Hydraulic (Mdl. 812, 816, 818, 822)
2	422602		Pump, Manual Hydraulic (Prince PM-HP-10B)
3	422603	(Not Identified)	Fitting, 90° With Swivel End - Short (FG1501-6-6) (6MP-6FPX 90)
4	422604	(Not Identified)	Fitting, 90° With Swivel End - Long (1501-LL-06-06) (6MP-6FPX Long 90)
5	4222X1.5	(Not Identified)	Hose, Hydraulic - 1-1/2 Feet With 3/8" Male End
6	4222X3	(Not Identified)	Hose Hydraulic - 3 Feet With 3/8" Male End
7	422605	(Not Identified)	Coupler, Female Quick Disconnect - Requires 2 (NV-12-F)
8	422606	(Not Identified)	Bracket, Hose Disconnect Assembly (5006-4/ISO4250-4)
9	422607	(Not Identified)	Reducer, 1/2" to 3/8" - Requires 2 (3220-8-6) (8-6 Hex Reducer Bushing)
10	422608	(Not Identified)	Standoff, 5/16" ID x 5/8" OD x 1" L - Requires 2 (1041A2)
11	N516	(Not Identified)	Nut, 5/16" - Requires 2
12	N38	(Not Identified)	Nut, 3/8" - Requires 10
13	B38-1	(Not Identified)	Bolt, 3/8"x 1 - Requires 4
14	W38	(Not Identified)	Washer, 3/8" - Requires 14
15	UB38-2.5-3.25	(Not Identified)	U Bolt, 3/8"x 2-1/2"x 3-1/4" - Requires 3



Hydraulic Couplers Connected to Drill Hydraulic System.

Manual Hydraulic Pump

Mounting Bracket

Manual hydraulics permit raising or lowering the drill without the need for a tractor with hydraulics on site.

KEY WORD INDEX

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