

OPERATING INSTRUCTIONS

Kentucky Department of Fish & Wildlife Resources
TRUAX MODEL FLXII-88 (Newer Style) NATIVE GRASS DRILLS
(Drill Width: 8 ft.; Planting Width: 5.3 ft.)
(Require minimum 40-50 HP tractor with 1 pair of hydraulic connections!)

Before transporting drill to* and from+ field:

*Attach tongue of drill to tractor.

***REMOVE JACK STAND!**

*Remove chock blocks.

*Hook up hydraulic hoses and **REMOVE HYDRAULIC SUPPORT BLOCKS** from sides of drill.

*+Be sure both sets of **DISKS** (front coulters & rear double disk openers) are **FULLY RAISED!**

*+Be sure that **WHEEL HUB DISENGAGED!**

*Fill seed boxes. (Note: **KEEP DRILL COVERED WHEN NOT IN USE!** Wet seed will spoil, swell, and clog the machine!)

While using drill in field:

ENGAGE WHEEL HUB.

OPERATE at **SLOW** speed of **3-5 MPH** (equivalent to 1-2 acres per hour).

If drill does not have 1/4 inch depth bands installed, **CHECK PLANTING DEPTH REGULARLY** and adjust as needed with hydraulics to get seed planted a **MAXIMUM** of **1/4 INCH** deep (except gamagrass, which should be planted 1 inch deep).

Do **NOT** make any **sharp turns** or **back up** with **disks lowered**; **RAISE HYDRAULICS AT END OF EACH ROW!**

Check seed tubes regularly for blockage.

GREASE DRILL DAILY!

Do **NOT** put any **lime** or **fertilizer** in seed boxes!

Upon return from field:

Replace jack stand and chock blocks.

Be sure **BOTH SETS OF DISKS** are **FULLY RAISED** and **HYDRAULIC SUPPORT BLOCKS** have been **REPLACED** on sides of drill prior to disconnecting hydraulic hoses!

Be sure **HYDRAULIC HOSES** are **SECURED** such that they will not drag on the ground or bang against anything during transport.

Unhook drill from tractor.

CLEAN any mud, grass, and other debris from **DRILL** as needed!

SAFETY PRECAUTIONS

Kentucky Department of Fish & Wildlife Resources
TRUAX MODEL FLXII-88 (Newer Style) NATIVE GRASS DRILLS

Be sure jack stand is removed prior to moving drill!

Be sure both sets of disks are fully raised prior to moving drill!

Be sure hydraulic lines are secured prior to moving drill!

Be sure wheel hub is disengaged prior to moving drill!

Do not ride on drill!

Do not operate drill with people around it!

Be careful around gears, chains, and disks while drill is in operation!

Keep hands, arms, and legs out away from drill while in operation!

Do not back up or make sharp turns with disks lowered!

Turn off tractor and place in gear while servicing drill!

Be sure towing lights and safety chains are hooked up prior to transporting drill on public roads!

Do not tow drill faster than 20 mph; bearing failure and/or loss of control may occur!

Do not tow drill at night!

Be sure to abide by all federal, state, and local laws when transporting drill on public roads!

Be careful when transporting drill on narrow roads and bridges!

Be cautious of low or soft shoulders when transporting drill on public roads!

Reduce speed prior to making turns or going down hills when transporting drill on public roads!

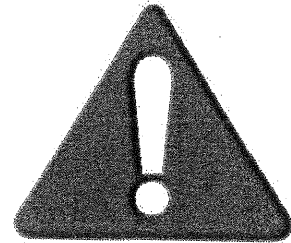


SAFETY

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

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.

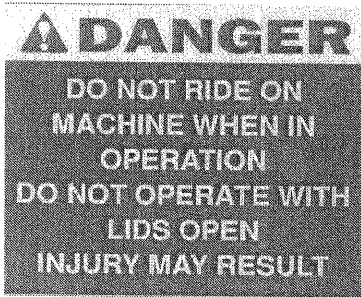
When new options are added, it is important to add **ALL** decals or safety features and to replace any decal that is hidden by the new option.

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.

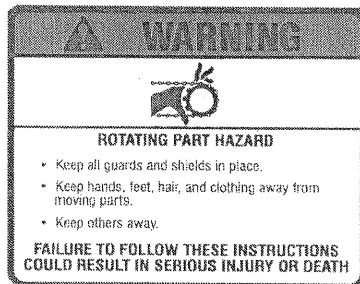
Keep safety decals in good condition. Replace torn, missing, or defective decals. If replacement safety decals are needed, they may be ordered by part number from the following address:

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

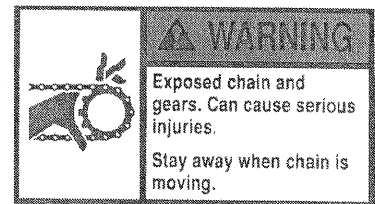
These are the safety decals provided for Truax drills:



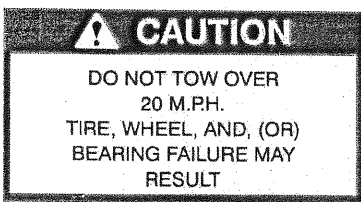
Part #1046C3-A



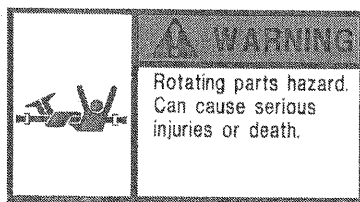
Part #1046C4-A



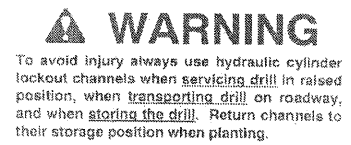
Part #1046C2-A



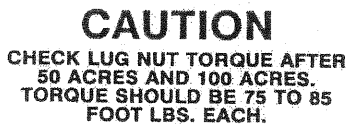
Part #1046C5-A



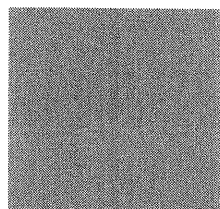
Part #1046C8



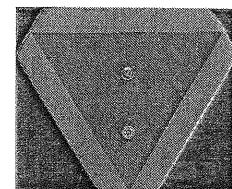
Part #1046C13



Part #1046C22



Red Reflector 5" x 5"
Part #2008C2



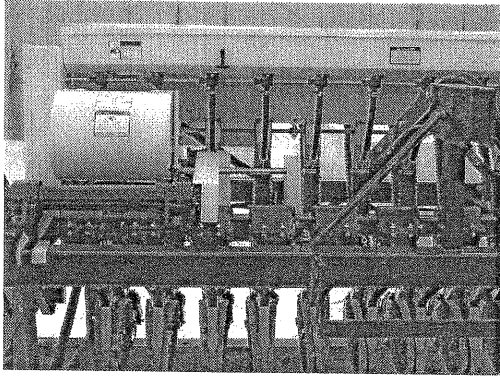
Slow Moving Vehicle Sign
Part #1046C72 (Metal Sign)
Part #1046C71 (Decal)



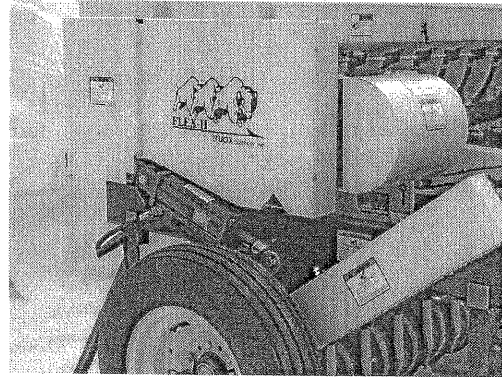
SAFETY

PLACEMENT OF SAFETY DECALS

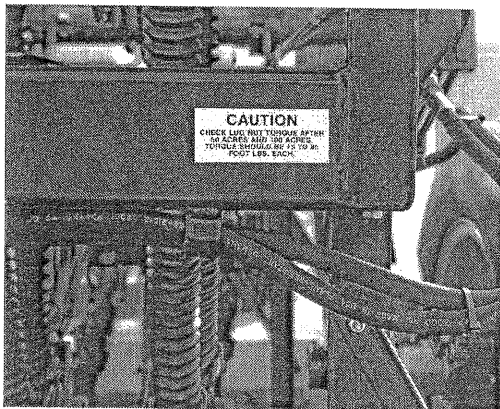
The placement of the safety decals is shown in the following pictures:



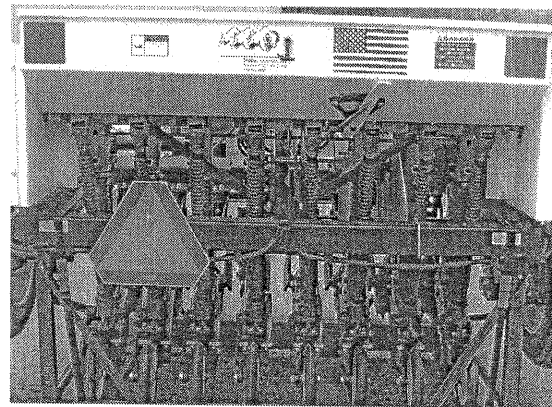
Drive Side Front



Drive Side End



Main Frame Back Corners



Rear Seed Box

The Slow Moving Vehicle Sign (SMV) is mounted on rear frame left side for most End Wheel Drive models. On End Wheel Drive Models 812 and smaller, equipped with Rear Transport, and Rear Drive models the SMV may be a decal on the rear seed box.



SAFETY

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.



SAFETY

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.



SAFETY

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.



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.



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), 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 use 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.

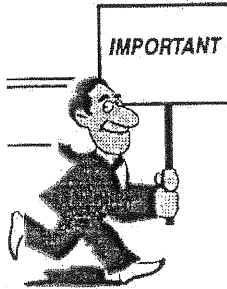


OPERATING THE DRILL

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, lift drill frame so that the drive end wheel is lifted off the ground or 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.



OPERATING THE DRILL

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.



OPERATING THE DRILL

TABLE 1 - SEED INFORMATION¹

SPECIES	NUMBER SEEDS PER POUND	SEEDS PER SQUARE FOOT @ 1 POUND PER ACRE ²
<u>Native Warm Season</u>		
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
<u>Native Cool Season</u>		
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
<u>Introduced Cool Season</u>		
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



OPERATING THE DRILL

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**.

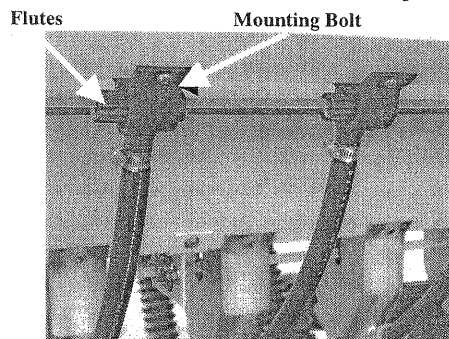


FIGURE 30-1

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.

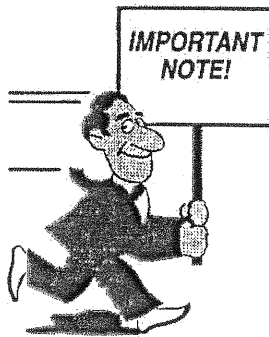
If the seeding rate changes during planting, it may be caused from the **feed shaft** (part #3013) moving. This may be caused by a loose or worn **bolt** (part #B38-ISQ), a lost or broken **spring** (part #TS-72M), lost or broken **spring pin** (part #RP18-1.25), a worn or loose **shifter lever** (part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



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 will affect drill output.

The charts are based on drill using 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



OPERATING THE DRILL

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.



OPERATING THE DRILL

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.

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.

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.



OPERATING THE DRILL

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**.

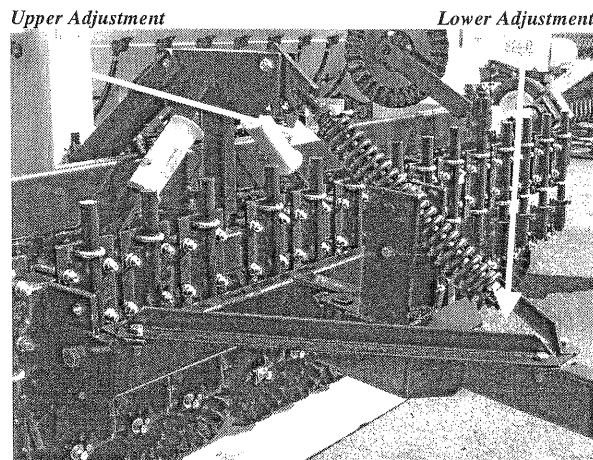


FIGURE 30-2

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 you go from transport to plant position.



TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
<p><u>CHAINS:</u> Chains come off.</p>	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.
<p>Planter support chain failure.</p>	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).
<p><u>ROLL PINS:</u> Breaking roll pins in the speed changer and sprockets.</p>	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

Clutch will not disengage

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



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.
	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).
SCRAPERS: 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	
<p>SEED BOXES (Con't): Fluted-feed roll shifter levers on the small seed or cool season/grain box difficult to move.</p>	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.	
	<p>Irregular quantities of seed coming from seed boxes.</p>	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
<p><u>FLUFFY SEED BOX:</u> Too much seed from the fluffy seed box.</p>	Excessive seed feed rate.	<p>Add seed gaskets and retainer plates to fluffy seed box.</p> <p>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 #.</p>
	Wrong sprocket.	<p>Increase the size of the jack shaft sprocket (the end above the ground wheel). OEM is 30 tooth.</p> <p>Increase the clutch sprocket size. OEM is 30 tooth.</p> <p>Increase the picker wheel shaft sprocket size. OEM is 30 tooth.</p>
	Seed too fine.	<p>Use a different seed box. Place seed in the cool season/grain seed box.</p> <p>Add inert filler, such as ground corncobs, cottonseed hulls, bran, etc.</p> <p>Add seed gaskets and retainer plates.</p> <p>Place tape on the bottom of the box to restrict the slot next to the picker wheels.</p> <p>Remove chain to the agitators in the fluffy box.</p>
<p><u>COOL SEASON/GRAIN BOX:</u> Too little seed from the cool seed box.</p>	Plugged seedway passage.	<p>Straighten kinked hose.</p> <p>Remove debris from the seed hose.</p> <p>Clean bent or plugged metal seed tube (on drills built prior to September 1993).</p>
	Green seed cup.	<p>Lower the gate for larger size seeds.</p> <p>Clean the flutes.</p> <p>Adjust flutes to the maximum open position.</p>
	Dirty seed.	<p>Clean the seed or try using the fluffy seed box.</p>
	<p>Too much seed from the cool season box.</p>	<p>Excessive seed feed rate.</p> <p>Double sprocket on end of box is too small.</p>



TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
<p><u>HYDRAULICS (Con't):</u> Flex hydraulic failure.</p>	<p>Incorrect quick disconnects on either tractor or drill.</p>	<p>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.</p>
	<p>Dirty or damaged hydraulic quick disconnects.</p>	<p>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.</p>
	<p>Damaged, frayed, or bent hydraulic hoses.</p>	<p>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.</p>
	<p>Hydraulic system is air-locked.</p>	<p>Follow procedures outlined in the Maintenance and Service Section of this manual.</p>
<p><u>NO- TILL:</u> No-till units do not penetrate.</p>	<p>Insufficient weight transfer to no-till units.</p>	<p>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.</p> <p>Change the position of the tongue mounting point to the drill frame to lower the front of the drill.</p> <p>Adjust spring leveler. Refer to adjustment procedure on Page 20-5, Item #6.</p> <p>Change draw bar position on the tractor.</p> <p>Check for loose or worn disc blades or no-till blades.</p>



TROUBLESHOOTING

SYMPTOM	CAUSE	SOLUTION
<p><u>ACRE METER:</u> Acre meter tallying incorrectly.</p>	<p>Double tracking or leaving too wide a space between rows on each trip across the field.</p> <p>Land area contains more or less area than assumed.</p> <p>One or more sprockets between the ground wheel and the acre meter have been changed.</p> <p>Circle drilling with the drive wheel on the outside of the turn will give a false reading from the acre meter.</p> <p>Output reduction feature in use.</p>	<p>Leave the same amount of space between each seeded strip as the furrow opener spacing on the drill.</p> <p>Double-check the "facts".</p> <p>If sprocket combination has been changed from the OEM standard, then calculate the area covered. See procedure on Page 30-15.</p> <p>Acre meter will read 1/2 of actual acres planted. Multiply acre meter reading by 2 for actual acres planted.</p>



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.**

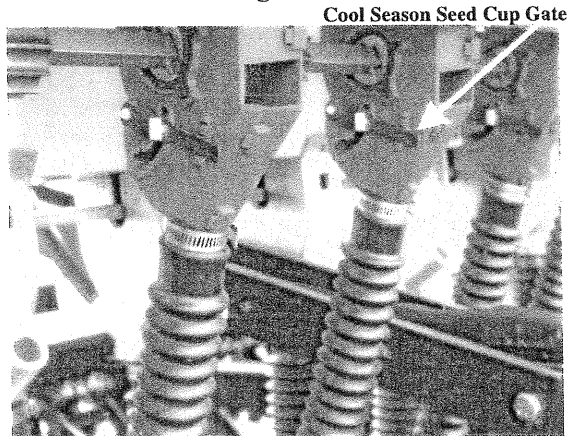


Figure 60-1

- 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.



DRILL STORAGE

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.