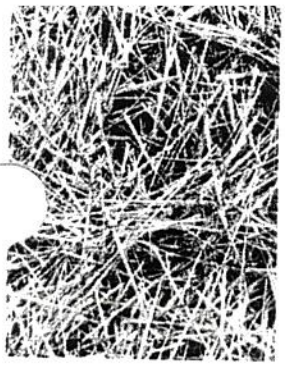


HAYBUSTER®

77C/107C DRILLS

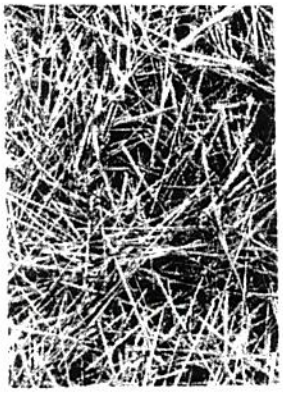
107C DRILL - S.N. 101100017C & UP

77C DRILL - S.N. 77110001C & UP

Operating Instructions and Parts Reference

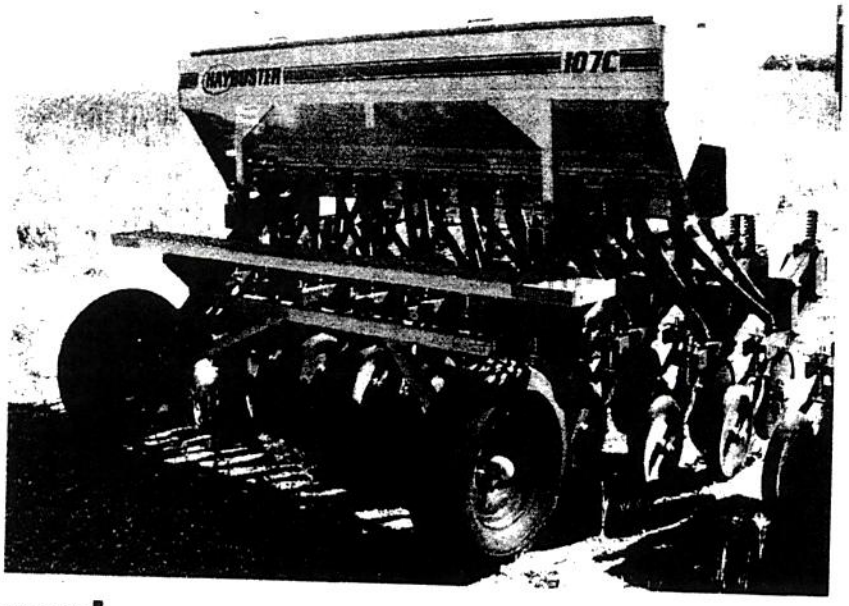
DuraTech Industries International Inc. (DuraTech Industries) has made every effort to assure that this manual completely and accurately describes the operation and maintenance of the 77C/107C DRILLS™ as of the date of publication. DuraTech Industries reserves the right to make updates to the machine from time to time. Even in the event of such updates, you should still find this manual to be appropriate for the safe operation and maintenance of your unit.

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



HAYBUSTER®

A Tradition of Innovation Since 1966



Foreword

All personnel must read and understand before operating unit

- Foreword and Section 1, important safety information.
- Section 2, "Dealer Preparation," to verify that the machine has been prepared for use.
- Section 3, "Introduction," which explain normal operation of the machine.
- Section 4.1, "Operating Instructions" Pre-Operation Inspection Check List.

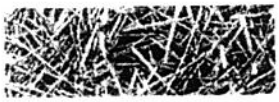
Appropriate use of the unit

The 77C / 107C Grain Drill is designed to seed No-Till, Minimum Till, or conventionally tilled fields. The two compartment hopper offers the flexibility of seeding with fertilizer, seeding alone, or planting two different seeds.

Operator protection

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

WARNING: Operators and those observing the operation of the 77C / 107C GRAIN DRILLS are required to wear head, eye, and ear protection. No loose clothing is allowed.



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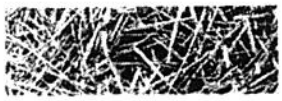
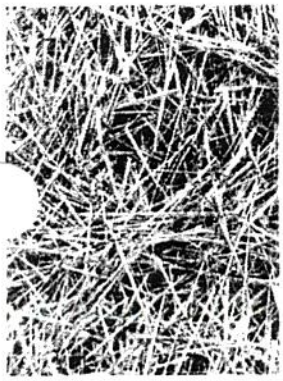




HAYBUSTER®

77C/107C DRILLS

107C DRILL - S.N. 101100017C & UP

77C DRILL - S.N. 77110001C & UP

PART 1: Operating Instructions

Introduction

The 77C/107C Grain Drills are designed to seed No-Till, Minimum Till, or conventionally tilled fields. Two 30 gallon tanks are available for added ballast to penetrate the tough no-till conditions.

The two compartment hopper offers the flexibility of seeding with fertilizer, seeding alone, or planting two different seeds. The metering system for each hopper is infinitely adjustable.

Field hitches are available for one or multiples of two, three, and four of the model 107C Drill only. A tow hitch is also available for the 107C Drill to allow the towing of two or more drills in transport.

Purpose

The purpose of this owner's manual is to explain maintenance requirements and routine adjustments for the most efficient operation of your 77C/107C Grain Drill. There is also a trouble shooting section that may help in case of problems in the field. Any information not covered in this manual may be obtained from your dealer.

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

MODEL: 77C DRILL
107C DRILL

SERIAL NO. _____

Section 1: Safety

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

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

THIS MACHINE IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THOSE EXPLAINED IN THE OPERATOR'S MANUAL, ADVERTISING LITERATURE OR OTHER DURATECH INDUSTRIES WRITTEN MATERIAL PERTAINING TO THE 77C/107C GRAIN DRILL.

1.1 Safety-alert symbols

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

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

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

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

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

Safety-Alert Symbol

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

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

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

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

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

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

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

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

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

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

1.2 Operator - personal equipment

THE OPERATOR

Physical Condition

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

Do not operate a **77C/107C DRILL** when you are fatigued. Be alert - If you get tired while operating your **77C/107C DRILL,** take a break. Fatigue may result in loss of control. Working with any farm equipment can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating

Proper Clothing

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

Protect your hands with gloves when handling discs and coulters. Heavy duty, nonslip gloves improve your grip and protect your hands.

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

To reduce the risk of injury to your eyes never operate a **77C/107C DRILL** unless wearing goggles or properly fitted safety glasses with adequate top and side protection.

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

1.3 Machine safety labels

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

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

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

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

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

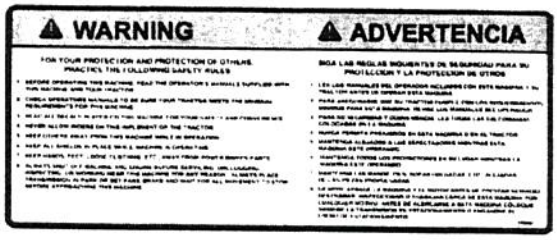
4. NEVER ALLOW RIDERS ON THIS IMPLEMENT OR THE TRACTOR.

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

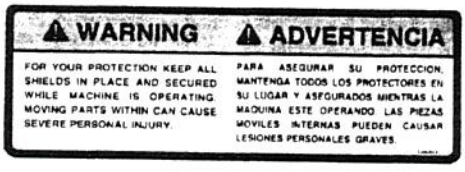
6. KEEP ALL SHIELDS IN PLACE WHILE MACHINE IS OPERATING.

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

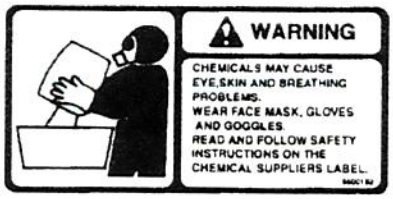
8. ALWAYS SHUT OFF MACHINE AND ENGINE BEFORE SERVICING, UNCLOGGING, INSPECTING, OR WORKING NEAR THIS MACHINE FOR ANY REASON. ALWAYS PLACE TRANSMISSION IN PARK OR SET PARK BRAKE AND WAIT FOR ALL MOVEMENT TO STOP BEFORE APPROACHING THIS MACHINE.



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

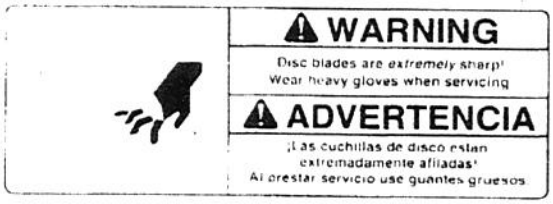


WARNING: CHEMICALS MAY CAUSE EYE, SKIN AND BREATHING PROBLEMS.
WEAR FACE MASK, GLOVES AND GOGGLES .
READ AND FOLLOW SAFETY INSTRUCTIONS ON THE CHEMICAL SUPPLIERS LABEL.



WARNING: NO RIDERS.
SERIOUS PERSONAL INJURY COULD RESULT FROM RIDING ON STEP.

WARNING: DISC BLADES ARE *EXTREMELY* SHARP!
WEAR HEAVY GLOVES WHEN SERVICING.



1.4 Shielding

Shields are installed for your protection. Keep them in place, and replace damaged shields.

1.5 Personal equipment

Operators of this machine are encouraged to wear head, eye, and ear protection. Loose clothing is discouraged.

1.6 Safety review

BEFORE OPERATING

- Read and follow all instructions contained in:
  - A. This 77C/107C DRILL Operator's Manual.
  - B. Tractor operator's manual.
  - C. Decals placed on the 77C/107C Drill and Tractor.

NOTE: Additional copies of the above mentioned materials can be obtained from your dealer.

- Be sure all safety shields and covers are securely in place when machine is running.
- Read all warning and instructional decals placed on the machine for your safety and convenience.
- Allow only responsible, properly instructed individuals to operate machine. Carefully supervise inexperience operators.
- Make no modifications to this equipment unless specifically requested or recommended by DuraTech Industries.
- Tighten or replace any loose or cracked bolts, chains, hoses or connections.
- The towing vehicle must be of equal or greater weight than the grain drill for adequate braking capacity.

DURING OPERATION

- Exercise extreme caution with operating the drill on steep slopes or grades.
- Be sure all spectators are clear of the area where the drill is in operation or raised and lowered.
- Be sure the tractor operator is the only person riding the tractor. Allow no one to ride the drill at any time.
- Remember, loose clothing, necklaces and similar items are more easily caught in moving parts. Avoid the use of these items if possible and keep long hair confined.
- Never work under the drill when the drill is lifted up unless the safety stop bar is in position.
- Watch out for and avoid any object that might interfere with the proper operation of the machine.

DURING SERVICE & MAINTENANCE

CAUTION: Before performing any maintenance or adjustments make sure machine is NOT running.

- Before working on or near drill for any reason including servicing, lubricating, cleaning, inspecting or refilling, or if working under drill or detaching from tractor, install safety stop bar (next to hydraulic cylinder).
- When replacing any part on your drill, be sure to use only DuraTech Industries authorized parts.
- Relieve all pressure in the hydraulic system before disconnecting the lines or performing other work on the system. Make sure all connections are tight and the hoses and lines are in good condition before applying pressure to the system.

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

- Be careful when using a hoist or other lifting device. Use only devices that have adequate lifting capacity and be sure the chain or cable is securely attached.

WHEN TRANSPORTING ON PUBLIC ROADS

- Use good judgment and drive carefully, especially over rough or uneven roads.
- Be sure tractor brakes are properly adjusted and foot pedals locked together.
- Check your state laws regarding the use of lights, slow moving vehicle sign, safety chain and other possible requirements.
- Do not tow drills at speeds over 20 mph. It is recommended that drills be empty of seed or fertilizer when transporting.

IMPORTANT WINCH SAFETY INFORMATION

- The winch is built for multipurpose hauling and lifting operations. It is not to be used as a hoist for lifting, supporting or transporting people, or for loads over areas where people could be present.
- Respect the winch. High forces are created when using a winch, creating potential safety hazards. It should be operated and maintained in accordance with instructions. Never allow children or anyone who is not familiar with the operation of the winch to use it. A winch accident could result in personal injury.
- Check winch for proper operation on each use. Do not use if damaged. Seek immediate repairs.
- Never exceed rated capacity. Excess load may cause premature failure and could result in serious personal injury.
- Never apply load on winch with cable fully extended. Keep at least three full turns of cable on the reel.
- Secure load properly. When winching operation is complete, do not depend on winch to support load.
- Operate with hand power only. This winch should not be operated with a motor of any kind. If the winch cannot be cranked easily with one hand, it is probably overloaded.

FAILURE TO COMPLY WITH ANY OF THE ABOVE SAFETY INSTRUCTIONS OR THOSE THAT FOLLOW WITHIN THIS MANUAL MAY RESULT IN SEVERE INJURY OR DEATH.

THIS DRILL IS NOT TO BE USED FOR ANY PURPOSE OTHER THAN THAT FOR WHICH IT IS INTENDED AS EXPLAINED IN THE OPERATOR'S MANUAL, ADVERTISING MATERIALS AND OTHER PERTINENT WRITTEN MATERIAL. PREPARED BY DURATECH INDUSTRIES.

Section 2: Dealer Preparation

2.1 Gauge Wheel Attachment

The heavy duty gauge wheels mount on the tool bar in front of the drill. The gauge wheels are adjustable to maintain a uniform planting depth when on side hills.

INSTALLATION

Step 1: Place the gauge wheel mount assembly in front of the second run assembly from either tool bar end. See the accompanying illustration.

Step 2: Mount the gauge wheel mount assembly to the tool bar by using two gauge wheel mount straps and four 5/8" x 6-1/2" hex bolts, lock washer and nuts provided. See accompanying illustration.

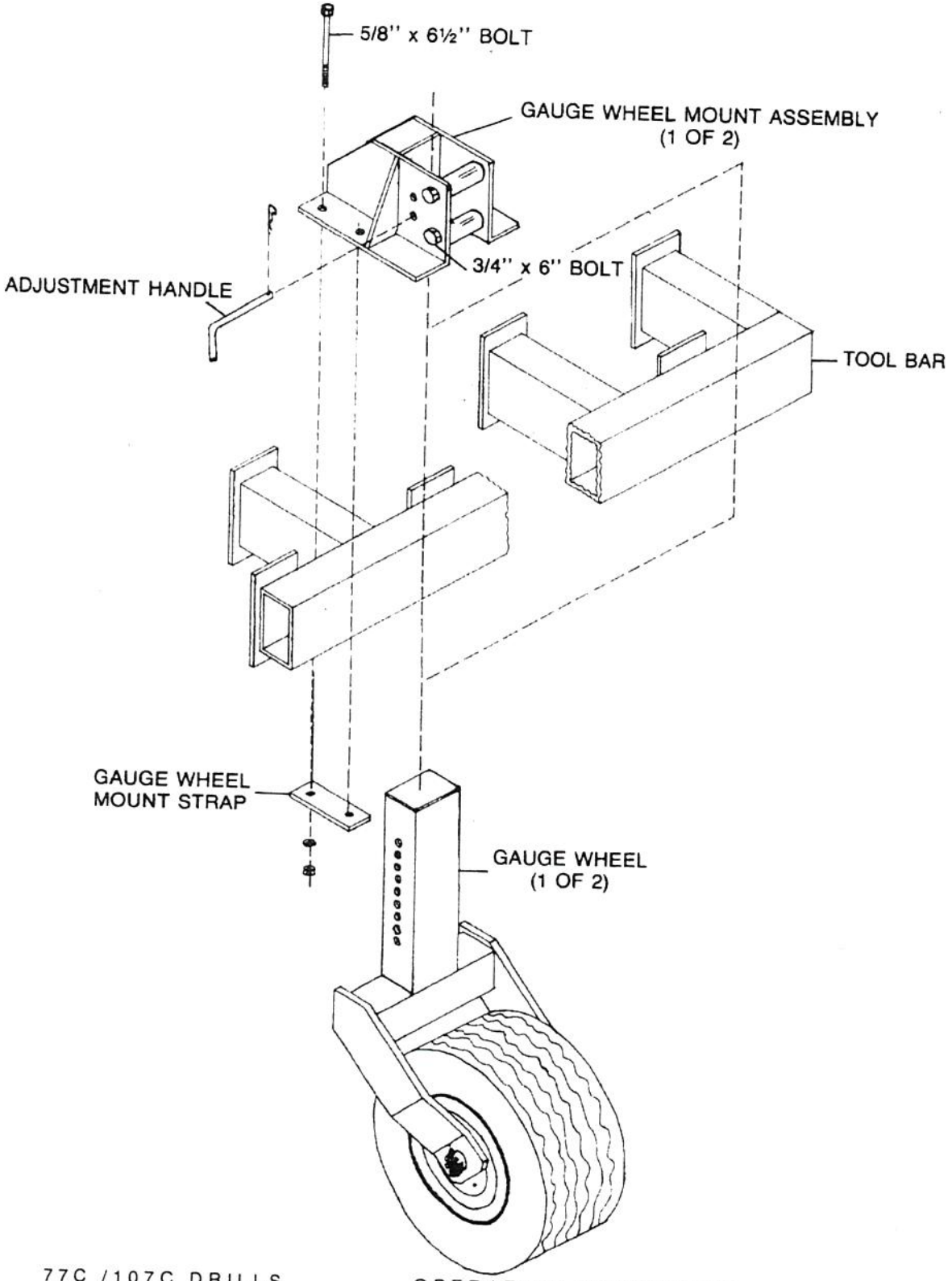
Step 3: Repeat Step 1 and Step 2 for the gauge wheel on the other side of the tool bar.

Step 4: Lift the tool bar using the drill's hydraulics and insert both gauge wheels into the bottom of the gauge wheel mount assemblies. See the accompanying illustration.

Step 5: If conditions prevent Step 4 from being done, the gauge wheels can be inserted into the front of the gauge wheel mount assemblies. To do this, remove all four bolt sleeves (two per gauge wheel mount assembly) by unbolting the four 3/4" x 6" hex bolts, lock washers and nuts and push the gauge wheels into the mount assemblies. Bolt the bolt sleeves on to the gauge wheel mount assemblies again.

Step 6: Adjust the gauge wheels to the desired position by inserting the adjustment handle through the proper gauge wheel adjustment with the hair pin. This adjustment determines the gauge wheel height that maintains the uniform planting depth on side hills. See the accompanying illustration.

Gauge Wheel (Option) Installation



2.2 Drill Legume Box Attachment

The legume box attachment features fluted-feed cups which are capable of accurately metering small seeds even at very low rates. The hopper will hold up to 150 lbs. of seed.

INSTALLATION

Step 1: Drill four 7/16" diameter holes in the front (grain) box as shown in Figure 1. Measure these holes carefully and use a good center punch to mark locations before drilling. Loosely bolt the mounting bracket to the grain box observing left hand and right hand parts.

Step 2: Remove the convoluted grain hoses and unbolt the cup assemblies from the grain tank. Replace with modified cup assemblies provided with the legume box kit. Reattach the convoluted grain hoses to the cups.

Step 3: Loosen chains, sprockets and bearings and move countershaft on grain tank. Reinstall existing bearings, sprockets and chains and install 15 tooth sprocket as shown in Figure 2.

Step 4: Bolt legume box to grain tank using the four 3/8" x 1" bolts provided. The mounts welded to the rear of the legume box should go between the mounting brackets installed in Step 1. Tighten all mounting bolts securely.

Step 5: Bolt the two bearing standards to the brackets on the legume box using six 5/16 x 3/4" carriage bolts, flat washers, lock washers and nuts. Align the bearing standards before tightening bolts. Loosely bolt the bearings to the outside of the bearing standards using the four 5/16"' x 3/4" carriage bolts. Install the 29" shaft with the 17 tooth sprocket BETWEEN the bearings as shown in Figure 2. Install two wooden block chain tightener using 3/8" x 2-1/2" bolts, two flat washers, lock washer and nuts. Tighten the drive chains.

Step 6: Cut 5/8" I.D. clear plastic hose to 22" lengths. Eighteen are required. Install hoses on the grain cups first and then on legume box cups. Dipping the ends in a liquid soap solution (one part soap to one part water) will ease installation of the hoses.

Legume Box (Option) Installation

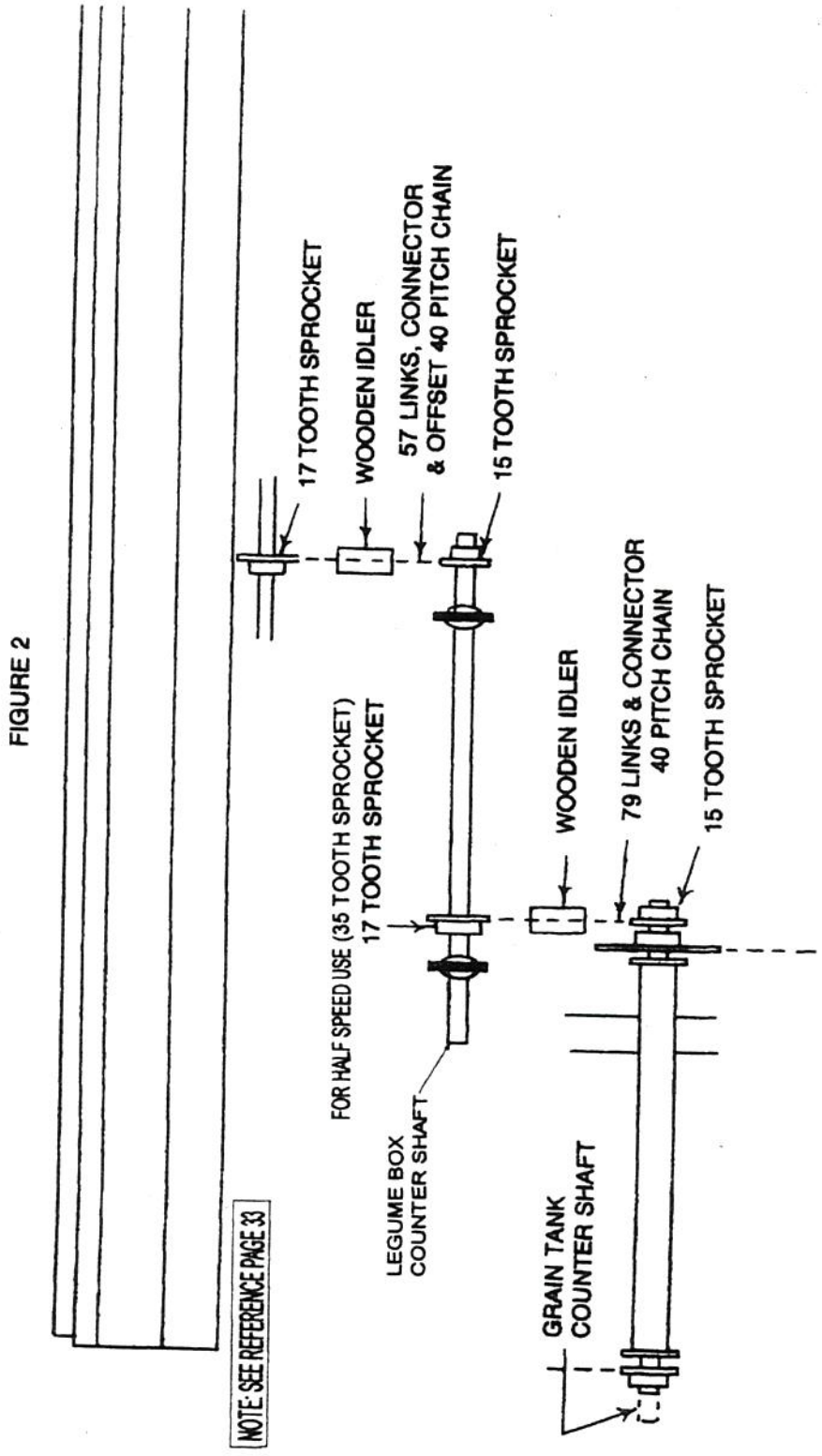


FIGURE 2

2.3 Legume Hopper Shipping Kit (Optional)

ITEM	PART NO.	QTY.	DESCRIPTION
1	8700001	1	BRKT\LEGUME\LH\LEG-BOX
2	8700002	1	BRKT\LEGUME\RH\LEG-BOX
3	8700003	4	STRAP\LEGUMEBOX
4	8700008	1	BRG\BOX\LEGUME\RH
5	8700009	1	BRG\BOX\LEGUME\LH
6	2000002	2	BRG\1" W/LOCK\COLLAR
7	2000703	4	FLGETT\1\2BOLT\PLTD
8	2000016	2	BLK\WD\IDLER
9	8700011	1	SHFT\1X29\LEGUMEBOX
10	1000111	1	SPKT\B\40\17\1\1/4KW\SOFT
11	1000112	2	SPKT\B\40\15\1\1/4KW
12	6200010	3	KEY\SQ\1/4X1
13	1100232	1	CHAIN\40NP\53
14	1100246	1	CHAIN\40NP\79
15	1100224	2	CHAIN\40NP\CL
16	1100225	2	CHAIN\40NP\OL
17	3700129	18	HOSE\PVC\5/8IDX22-1/2\CLR
18	4800098	4	BOLT\HEX\3/8X1-1/4\NC
19	4800156	4	BOLT\HEX\3/8X3
20	4800029	2	BOLT\HEX\3/8X2-1/2
21	4800003	4	BOLT\HEX\3/8X1
22	4900002	14	NUT\HEX\3/8\NC
23	5000019	14	WASH\LOCK\3/8
24	500000 1	4	WASH\FLAT\3/8
25	4800153	10	BOLT\CRG\5/16X3/4\NC
26	4900003	10	NUT\HEX\5/16\NC
27	5000022	10	WASH\LOCK\5/16

Section 3: Introduction

Every effort has been made to ensure that the information contained in this manual is correct at the date of publication; but, due to continuous improvements, DuraTech Industries reserves the right to make changes in the contents without notice or obligation.

This manual is shipped with each machine to familiarize the operator with the proper operating, maintenance and lubrication instructions to insure the best possible performance and service from the machine. Study and understand these instructions thoroughly before operating the machine. We recommend that this manual be readily available for reference at all times. Consult your DuraTech Industries dealer if any items in this manual are not understood.

DuraTech reserves the right to make changes in engineering, design and specifications, add improvements, or discontinue manufacture at any time without notice or obligation.

3.1 Ordering Parts

When ordering parts always specify your model number, serial number, and the number of the parts you wish to order.

IMPORTANT: WHEN REPLACEMENT PARTS ARE NEEDED, USE THE LISTED PART NUMBERS AND DESCRIPTIONS TO INSURE FAST AND ACCURATE SHIPMENT OF YOUR ORDER. WHEN ORDERING PARTS ALWAYS SPECIFY UNIT SERIAL NUMBER.

ONLY AUTHORIZED PARTS SHOULD BE USED FOR REPAIR AND/OR REPLACEMENT.

3.2 Serial Number Decal

The serial number and the machine model number are stamped on the decal. The model number and serial number are important when service and/or parts are required.

3.3 About your 77C/107C Grain Drill

The 77C/107C Grain Drill is designed to seed No-Till, Minimum Till, or conventionally tilled fields. Two 30 gallon tanks are available for added ballast to penetrate the tough no-till conditions.

The two compartment hopper offers the flexibility of seeding with fertilizer, seeding alone, or planting two different seeds. The metering system for each hopper is infinitely adjustable.

Field hitches are available for one or multiples of two, three, and four of the model 107C Drill only. A tow hitch is also available for the 107C Drill to allow the towing of two or more drills in transport.

Section 4: Operating Instructions

To insure long life and economical operation, we highly recommend the operator of the 77C/107C Grain Drill be thoroughly instructed in the maintenance and operation of the machine. There is no substitute for a sound, preventative maintenance program and a well-trained operator.

Prior to operating the Grain Drill, we recommend the operator make a visual inspection of the unit. This can be done as the lubrication is being carried out.

4.1 Operating Instructions

Check the following:

- ❑ Hydraulic components for leaks or damage.

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

- ❑ Lug nuts for tightness.
- ❑ Condition of tire rims.
- ❑ Tires for proper air pressure.
- ❑ Condition of rubber convoluted hoses.
- ❑ Adjustment of all chains.
- ❑ Installation and condition of shields.
- ❑ Installation of Slow Moving Vehicle (SMV) sign.
- ❑ Condition of decals.

WARNING: Before attempting to operate this machine, refer again to Section 1 (pages 3-11) for important safety information.

4.2 Grain Drill Setup

The 77C/107C Grain Drill may be shipped without the hydraulic lift cylinder, since the grain drill used a standard 3" x 8" cylinder. The retracted length must be 20-1/4", measured from the center of the mounting holes. When multiple grain drills are used, a cylinder will be required for each grain drill.

- Set the wheels on your tractor out as wide as possible for maximum stability.
- Hitch the grain drill to the tractor.
- Connect the hydraulic hoses to the tractor's hydraulic system.

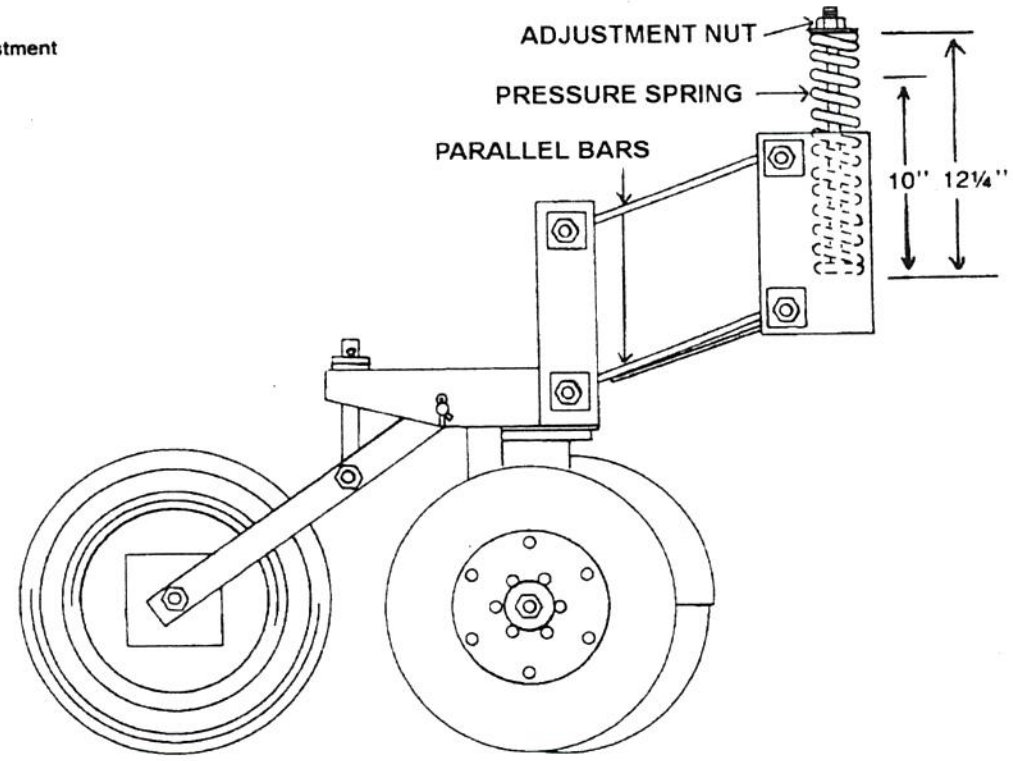
4.3 Pressure Spring Adjustment

To gain versatility for all types of terrain and soil conditions, it is important to have a considerable amount of up and down travel built into each individual run. When seeding on level terrain, adjust hydraulic cylinder stroke to lower Movable Frame so openers penetrate soil approximately two (2) inches and Parallel Bars are about level when viewed from the side. The toolbar height will be about 20" when discs are new. This will allow runs to move up or down according to terrain.

If parallel bars are not level, it will be necessary to adjust pressure spring, or press wheel adjustment.

Proper tension of the pressure spring varies with conditions. No-till seeding may require more down pressure; loose soil requires less. Since the pressure springs work together with the opener depth adjustment controlled by the hydraulic cylinder, make sure that the opener depth adjustment is set correctly.

pressure spring adjustment



In extremely loose soils such as freshly worked summer fallow, it will be necessary to lessen tension on pressure spring instead of lessening hydraulic cylinder stroke.

To adjust the pressure springs:

1. Make sure the movable frame is raised completely up and the safety stop bar is secured.
2. Using the adjustment nut on each pressure spring, adjust the spring to the desired length. See table at right showing the opener pressure obtained at various spring lengths. Under no circumstances should the spring be adjusted to less than 10 inches. This may damage the spring and related parts and will also void the warranty on these parts.

SPRING LENGTH	OPENER PRESSURE
12¼ IN.	135 LBS.
11½ IN.	180 LBS.
11 IN.	205 LBS.
10½ IN.	235 LBS.
10 IN.	300 LBS.

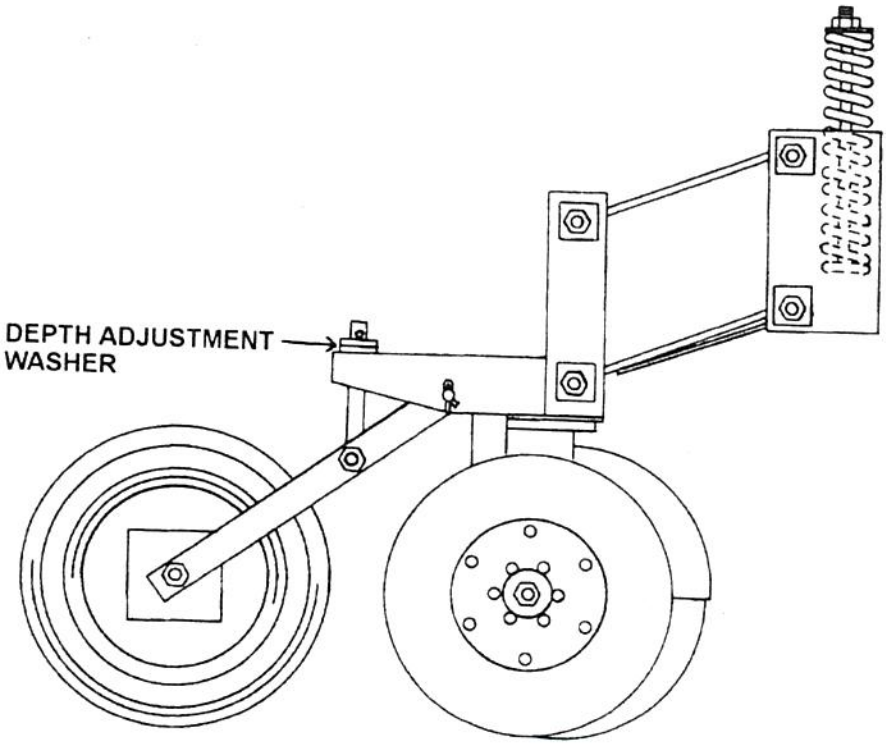
4.4 Press Wheel Adjustment

In addition to firming the soil around the seed, the press wheels serve as gauge wheels for the openers. The relationship of each press wheel and opener will remain consistent regardless of terrain or soil density. If the seed is too deep, lower the press wheel. If the seed is too shallow, raise the press wheel.

To adjust the press wheel height:

1. Remove quick attachment pin.
2. To lower the press wheel, relocate shim washers from top to bottom. To raise the press wheel, relocate shim washers from bottom to top.
3. Install quick attachment.

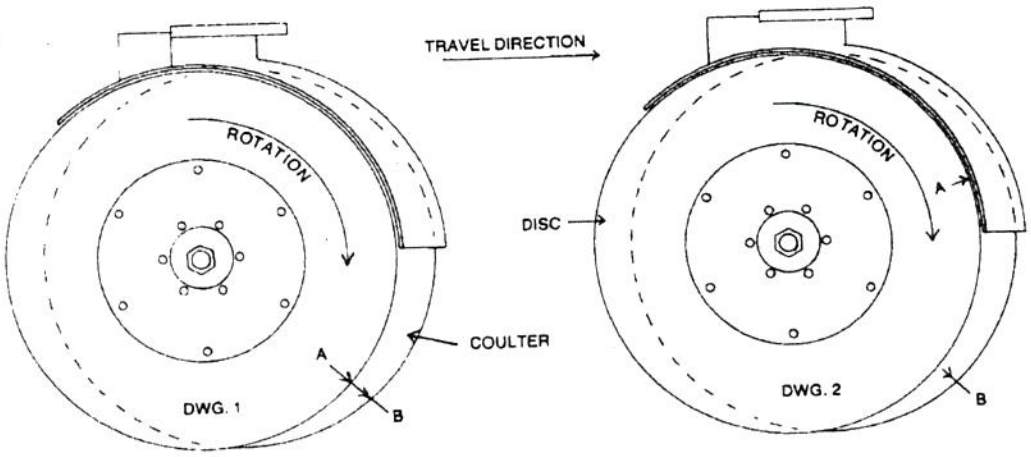
depth adjustment washer for serial numbers 401 and up



4.5 Haybuster 77C/107C Drill Opener

The 77C/107C Drill uses a coulter-disk offset opener. The coulter blade leads the disk by 1-1/2". Both blades are the same size and due to the offset, there is some sliding action where the blades contact. This sliding or scissor action provides excellent residue cutting action at ground level, especially in wet residue. The scissor action causes some wear into the coulter blade at the point of contact. This wear is normal and the heavier coulter blade is bolted to the bearing cage to allow easy replacement.

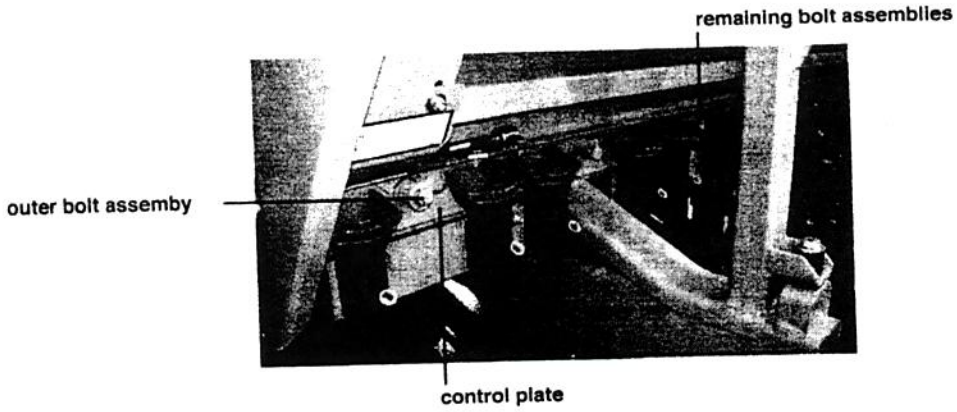
depth adjustment washer for serial numbers 401 and up

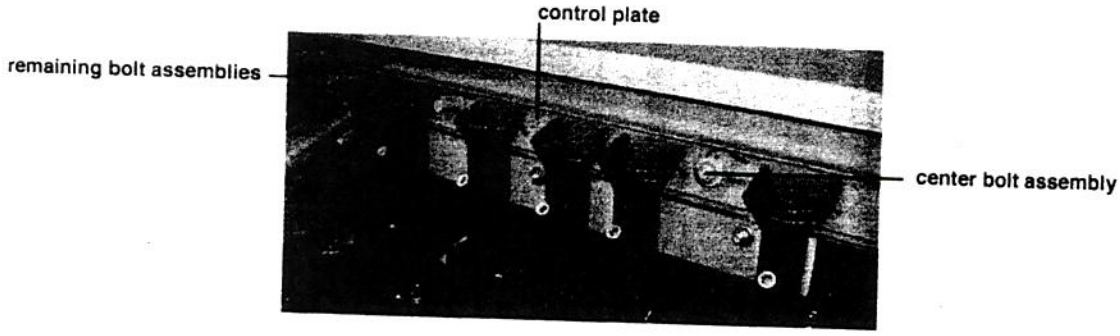


One complete turn changes points A and B (DWG. 1) the amount shown in DWG. 2. It takes 6 turns to bring points A and B back together.

4.5A Control Plates

Control plates are mounted using a spring, bolt, guide tube, washers and nut assemblies. The two outer and center assemblies use a larger washer, guide tube, washer, bolt and top locknut. When installing these assemblies, tighten the bolt until the guide tube is tight against the tank. The remaining assemblies use a spring, washers, bolt and a top locknut. On these remaining assemblies, the springs should be tightened to 1-1/16" - 1-1/8".

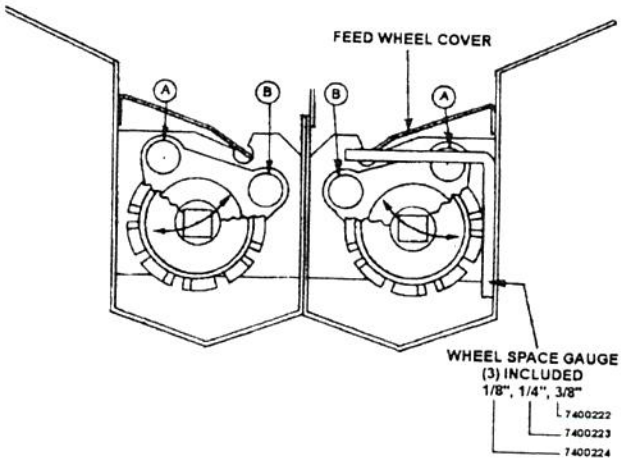




4.6 Feed Wheel Space Adjustment

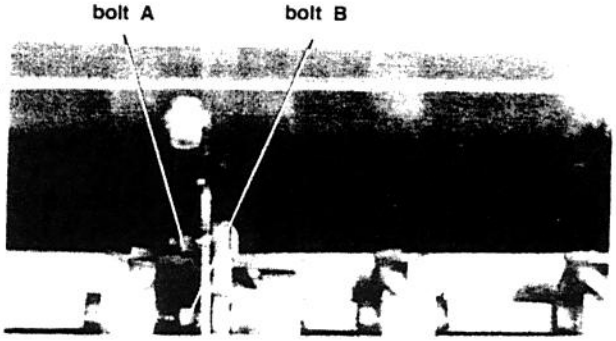
Large seeds require more space between feed wheel lugs and tank wall than small seeds to prevent cracking. Small seeds require less space to provide an even flow. Therefore each seed listed in the feed rate chart, pages 28 to 31, shows a required wheel space.

feed wheel space adjustment.



FEED WHEEL SPACE ADJUSTMENT

1. Remove the feed wheel covers.
2. Loosen the eight bolts A and B. There are four sets of bolts for each feed wheel - two on the outer end of the hopper and six inside the hopper.
3. Select the proper space gauge using the wheel space chart.
4. Install the proper space gauge as shown.
5. Slide the feed wheel toward the gauge until the feed wheel lugs, gauge and hopper are pressed together. Tighten the eight bolts.
6. Recheck the feed wheel space adjustment.
7. Install the feed wheel covers.



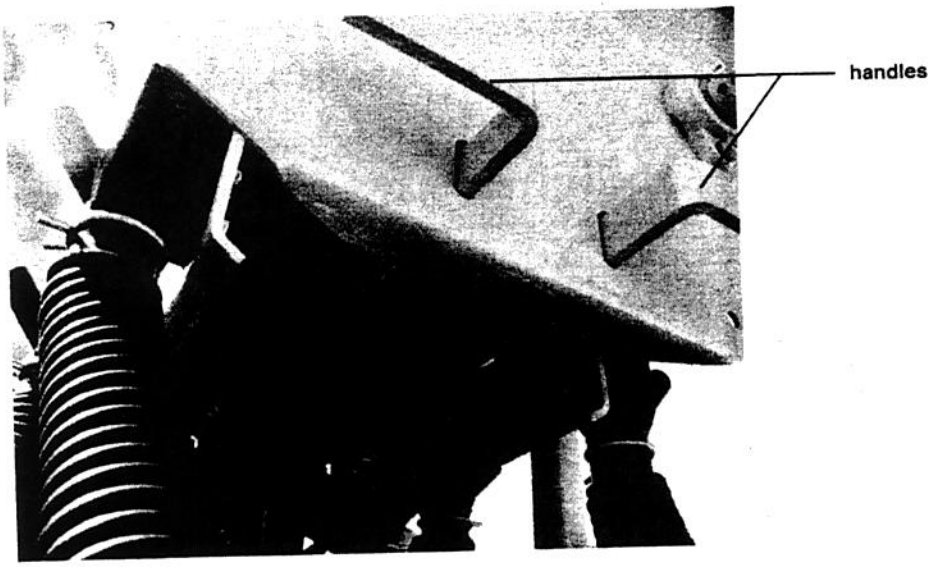
one set of feed wheel space adjustment bolts

The feed wheel space adjustment provides the proper clearance for the type of seed or fertilizer being used.

4.7 Drill Cleanout Slides

Cleanout slides are provided on both grain and fertilizer tanks. Handles for opening and closing the slides are located on the left side of the drill.

drill cleanout slides



4.8 Calibration Pointer Adjustment

Grain and fertilizer sliding gates are preadjusted at the factory. In the event any part of the calibrating mechanism is removed or replaced, it can be recalibrated in this order:

1. Place both pointer nut and anchor nut in the center of their respective thread.
2. Insert a short length of 7/16" rod or the shank end of a 7/16" drill bit into the square hole in sliding gate as shown.(figure 4.1)
3. Tighten bearing bolts securing calibration screw to end of tank.
4. Tighten bolts securing anchor nut to sliding gate.
5. Place scale plate on tank so number 8 is directly in line with top of pointer. This will insure pointer setting to coincide with chart. Scale plate must be parallel with calibration screw to allow pointer to operate smoothly along plate.

calibration pointer adjustment

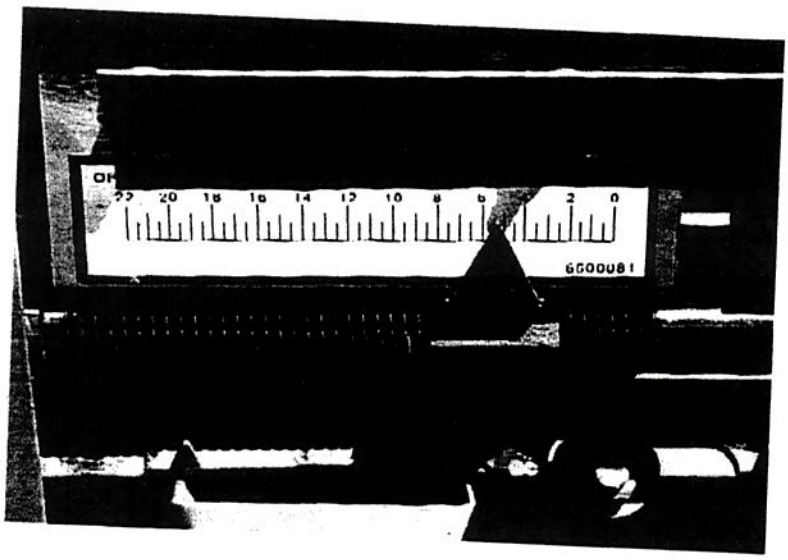
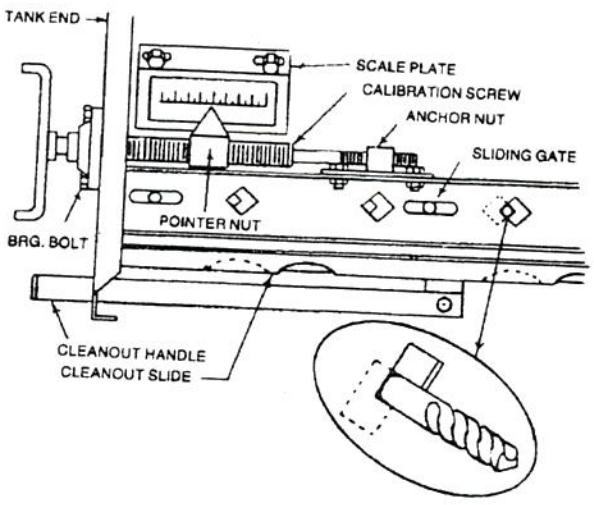
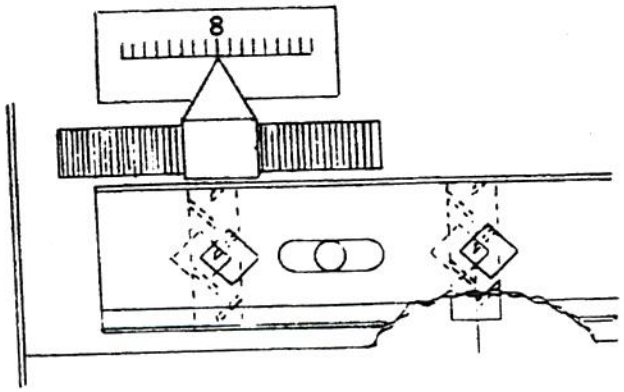


figure 4.1



4.9 SETTING AND CHECKING FEED RATE

general setting for feed wheel alignment



For most seeding, the feed wheel should be aligned as shown above. Set the pointer on number 8. The center of the feed wheel should be centered in the opening as viewed from outside of the box.

The rates shown on the charts serve only as a starting point. Due to variations in material size and density the rates may vary from the chart. The following methods may be used to determine the proper setting for your particular seed or fertilizer.

Setting and checking feed rate using wheat as an example.

1. You want to seed wheat at a rate of 95 lbs. per acre on 7" spacing.
2. Seed rate charts calls for a wheel space of 1/8" (page 28). Pointer set on 8 (see illustration above). The adjustment should be made before filling grain tank.
3. Make sure feed wheel cover is in place. Put grain in tank.
4. Seed far enough so you can visually check grain flowing into seed cups.

The addition of the single agitator to the standard drill box will prevent these seeds from bridging above the feed wheels. The single agitator may be added to all 77C/107C drills.

Alti wildrye
Bromegrass #
Intermediate wheatgrass
Killdeer sideoats #
Pubescent wheatgrass
Streambank wheatgrass
Tall wheatgrass
Western wheatgrass

Extremely trashy samples may require the double agitator.

4.10 CHECKING FEED RATE

1. Measure a distance of 415' on a drill with 7" spacing and mark. Remove one hose from seed hopper on each drill. Attach a container (cloth or plastic bag) to hopper to collect seed.
2. Operate drill at intended planting speed through entire length of test track.
3. Weigh the sample in ounces (less weight of sample container). Use the following formula to determine lbs./acre for your particular shank spacing.

7" Spacing - oz. x 11.25 = lbs./acre

EXAMPLE

Sample and container weighs	9.9 ounces
Container weighs	- 1.5 ounces
Weight of sample only	8.4 ounces

4. Use formula No. 1 to figure pounds per acre. 8.4 ounces x 11.25 = 94.5 pounds per acre.
5. To calibrate a seed not shown on the chart or a mix of different seeds, compare to a similar charted seed to obtain a trial setting. Recalibrate as necessary.
6. The same method may be used to determine fertilizer rates.

Series 100
Spacing 7"
Model No. 77C/107C

CHART FOR DRILLING GRAIN IN POUNDS PER ACRE

POINTER SETTING

POINTER SETTING	**		3		4		5		6		7		8		9		10		11		12		13		14		15		16
WHEAT	1/8					13	21	29	39	50	63	78	95	111	126	150	173	199	218	250	284								
BARLEY	1/8									22	29	36	46	55	63	74	90	104	117	133	153	176	198						
OATS	1/8										8	11	15	20	25	32	38	48	59	70	82	96	120	133	144	150	163	171	172
RYE	1/8						15	22	30	40	50	63	78	92	106	124	143	164	185	208	235								
SOYBEANS	3/8								17	20	26	35	46	58	68	82	96	115	129	145	171	186	215	243	275	306	334	357	364
BUCKWHEAT	1/8						16	22	29	38	49	62	74	87	102	120	138												
SORGHUM OR VETCH	1/8			4	5	9	13	21	27	35	44	56	67	78	93														
ALFALFA OR RAPE	1/8	3	8	13	19	27	35	48	59																				
MILLET	1/8	5	8	15	22	30	40	53	66																				
FLAX OR SUDAN GRASS	1/8			5	7	10	17	24	30	38	49	62	73																
ORCHARD GRASS	1/8						1	2	3	4	5	7	9	11	14	17	20	23	26										
FESCUE	1/8						5	6	8	12	14	19	23																
SWITCH GRASS	1/8	3	7	12	19	24																							
SUNFLOWER (#3 6500/LB.)	1/8						3	5	6	8	10	14	18	21	26	31	37												
FERTILIZER	1/8	3	6	11	17	24	35	49	62	77	93	116	138	160	185	212	240	275	306	324	353	370	384	393	406	414	420	425	
18-46-0																													

***** = indicates wheel spacing***

100 DRILL DETERMINING SEED POPULATION

The 107C Drill seeds 10.50' / 126" per pass; the 77C Drill seeds 7'/ 84" per pass.
The 107C Drill travels 4149 feet to seed 1 acre; the 77C Drill travels 6223' to seed 1 acre.

Following is the lineal feet of seeded row to seed 1 acre.

7" rows - 74,700 ft/acre

EXAMPLE:
150,000 bean plants desired per acre on 7" row spacing
150,000 divided by 74,700 = 2.0 beans per ft.
10 ft. of row - 20 beans.

Spacing 7 Inch

CHART FOR DRILLING GRAIN IN POUNDS PER ACRE

POINTER SETTING

POINTER SETTING	**		3		4		5		6		7		8		9		10		11		12		13		14		15		16
BAHIA GRASS	1/8	2.5	5.5	10.3	16.1	24.6	34.2	44.5	53.7	63.9	77.7	89.9	102.0	115.0	131.0	145.0														
BUFFALO GRASS*	1/8						2.5	3.8	5.3	6.7	8.6	10.9	13.9	16.0	18.8	21.7	26.1		34.0		42.7		54.8		65.8		73.4			
FESCUE	1/8						4.5	6.3	8.1	11.7	14.4	18.9	22.9	27.4	32.0	36.4	42.2	56.5	66.5	75.9										
GREEN	1/8			3.6	4.8	6.8	9.3	12.1	14.7	17.7	20.7	24.5	28.5	31.3	34.7	40.0	43.7	50.3	54.8	60.9	69.3								
ORCHARD GRASS	1/8						1.3	2.0	2.7	4.1	5.4	7.2	9.0	11.3	13.5	16.7	19.8	22.7	25.6	30.1	34.6	40.2	45.8							
RYEGRA55	1/8				3.1	4.5	6.7	9.4	13.5	16.6	21.1	27.0	33.7	37.7	45.4	53.0	61.1													
*FEED COVER OFF																														

** = *indicates wheel spacing*

Spacing 7 Inch

CHART FOR DRILLING GRAIN IN POUNDS PER ACRE

POINTER SETTING

POINTER SETTING	**		1		2		3		4		5		6		7		8		9		10		11
ALFALFA	1/8			0.4	1.3	3.6	8.1	13.9	19.8	27.0	35.5	48.5	57.5	71.1	85.8								
KENTUCKY BLUEGRASS	1/8					0.7	1.6	2.9	4.4	6.3	8.8	12.1	16.1	20.4	25.1	30.8	37.5	44.1	50.0	57.3	65.2		
LADINO CLOVER	1/8				1.0	3.4	8.1	15.5	25.0	35.2	46.4	59.8											
LESPEDEZA (KOREAN)	1/8					1.1	4.7	8.3	12.4	17.3	23.6	31.3	39.8	49.2									
RED CLOVER	1/8				1.3	4.3	9.5	16.4	24.3	32.8	43.4												
RED TOP	1/8					0.9	1.9	3.5	5.5	7.6	10.5	14.8	20.1	25.8	31.6	38.3	46.2	54.1	60.9	69.7	82.6		
REED CANARYGRASS	1/8						0.9	2.3	3.8	5.5	7.9	10.9	14.0	17.2	20.6	24.8	29.4	33.9	39.1	44.7	50.6		
SERECIA (UNHULLED)	1/8					1.0	2.7	4.7	7.4	10.6	14.1	19.0	25.0	30.8	37.1	45.2	54.2						
SWEET CLOVER	1/8				2.7	7.2	14.4	23.4	33.5	44.5	58.9	77.3	97.5										
SWITCHGRASS	1/8				0.9	2.7	7.2	12.1	17.5	24.3	34.1												
TIMOTHY	1/8			0.9	3.6	8.5	15.3	22.9	30.6	39.5	53.0												
LOVEGRASS	1/8			1.0	3.4	8.3	15.5	23.4	33.5	44.5	57.5												

** = *indicates wheel spacing*

Spacing 7 Inch

CHART FOR DRILLING GRAIN IN POUNDS PER ACRE

POINTER SETTING

POINTER SETTING	**	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ALTI WILDRYE	1/8					3.1	5.7	7.6	12.7	18.5	27.1	36.2	46.4	47.4	49.8
BROMEGRASS*	1/8							3.6	5.3	7.5	10.2	13.6	16.5	20.0	20.7
INTERMEDIATE WHEATGRASS	1/8					5.8	8.1	12.1	19.3	28.3	35.0	49.8	55.2		
KILLDEER SIDEOATS*	1/8					2.5	3.8	5.5	7.4	9.6	11.8	14.0	16.4	19.3	22.5
PUBESCENT WHEATGRASS	1/8					4.9	12.6	19.3	28.5	39.7	53.4	69.9	81.1	86.1	
STEAMBANK WHEATGRASS	1/8					2.9	4.5	7.1	10.3	13.4	20.0	27.2	33.4	35.1	
TALL WHEATGRASS	1/8					5.8	8.5	12.1	18.4	25.2	32.3	43.1	53.9		
WESTERN WHEATGRASS	1/8					2.7	4.4	7.3	10.8	15.3	19.9	25.0	30.4	35.5	39.8

*DOUBLE AGITATOR MAY BE REQUIRED FOR EXTREMELY TRASHY SAMPLES

** = *indicates wheel spacing*

CHART FOR DRILLING LEGUMES AND SMALL GRASSES IN POUNDS PER ACRE

LEGUME BOX ATTACHMENT FOR 77C/107C DRILL ON 7" SPACING

NOTCHES ON INDEX	LBS. BU.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
ALFALFA; RED, ALSIKE, LADINO CLOVER; VETCH	62	2.2	4.7	7.7	10.7	13.6	17.0	20.4	23.9	27.3	30.9	31.7	37.9	41.3	44.7	47.6	50.6
SWEET CLOVER	64	2.3	5.1	8.4	12.4	17.4	22.5	26.4	30.9	37.1	41.6	46.7	51.2	56.3	59.6	63.0	66.4
BIRDSFOOT TREFOIL	64	2.3	4.5	7.9	10.7	14.1	17.4	21.4	25.3	28.1	32.1	36.0	39.4	42.2	46.7	50.1	55.1
MILLIT, TIBBET CLOVER	60	2.1	4.9	7.7	10.7	14.3	17.4	21.2	26.1	28.5	30.9	35.5	39.4	42.8	46.7	51.0	55.9
UNHULLED SERICEA	36	1.1	2.8	4.5	6.8	9.6	11.8	14.6	17.4	20.3	23.1	26.4	28.7	31.5	33.8	36.0	40.5
UNHULLED LESPEDEZA	46	1.7	3.9	5.6	8.4	11.8	15.2	18.0	21.9	25.3	28.7	32.6	35.4	38.3	41.6	45.0	50.1
BAHIA GRASS	46	1.1	2.8	5.1	6.2	8.4	10.7	11.8	14.6	16.9	18.6	20.8	22.5	24.2	25.9	27.6	28.1
LOVEGRASS	64	2.3	5.1	7.9	11.3	16.3	20.3	24.2	28.7	32.6	36.6	42.2	46.7	51.2	55.1	57.9	60.2

NOTCHES ON INDEX	LBS. BU.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
TIMOTHY	50	1.7	3.9	6.2	9.6	12.9	16.9	20.9	24.8	28.1	32.6	37.1	40.5	44.4	46.7	49.5	54.6
SWITCHGRASS	55	2.3	4.5	6.8	9.6	12.4	15.8	18.6	20.8	24.2	28.1	30.9	33.8	37.1	39.9	42.2	47.8
FLAX SESAME	55	1.4	3.7	6.2	8.7	11.6	14.7	17.5	20.6	23.1	26.5	29.6	32.4	35.5	37.9	40.5	44.5
RAPE MUSTARD	53	1.7	4.2	7.4	10.2	12.9	16.4	19.2	22.5	25.6	28.2	31.8	34.9	37.7	40.5	43.3	45.9
ORCHARD GRASS	17		0.8	1.7	2.8	3.4	3.9	5.1	5.6	6.8	7.3	8.4	9.0	10.1	10.7	11.3	11.9
PERENNIAL RYEGRASS	31		2.3	3.4	5.6	7.3	9.0	10.7	11.8	13.5	15.2	16.9	18.6	20.8	21.9	23.1	24.8
FESCUE	27		1.1	2.8	3.9	5.6	6.8	8.4	9.6	11.3	12.4	13.5	15.2	16.9	18.0	19.1	21.9
COMMON BERMUDA GRASS		2.7	5.0	7.4	10.6	14.3	17.6	20.8	25.1								

SEED MIXTURES

SELECT THE SETTING FOR THE DESIRED QUANTITY OF EACH SEED.

ADD INDIVIDUAL SETTINGS.

EXAMPLE:

	LBS/ACRE	NOTCH
ALFALFA	5	2
SWEET CLOVER	5	2
TIMOTHY	2	1
TOTAL		5

WHEN USING HALF SPEED DRIVE DIVIDE CHARTED RATES BY TWO. REPLACE 17 TOOTH SPROCKET ON COUNTERSHAFT WITH 35 TOOTH. (SEE MANUAL FOR DETAILS.)

DENSITY OF THE SAMPLES USED TO PREPARE THIS CHART ARE GIVEN IN THE FIRST COLUMN TO THE RIGHT OF THE CROP NAME IN POUNDS PER BUSHEL.

Spacing 7 Inch

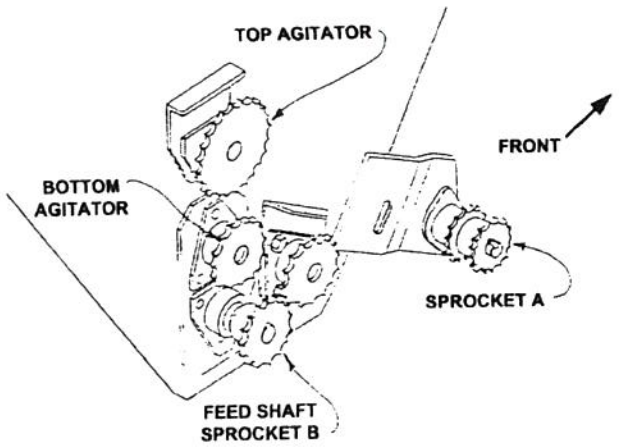
CHART FOR DRILLING GRASS IN POUNDS PER ACRE

			SPROCKET A	12	14	12	18	14	12	14	18	24	18	24	24
			SPROCKET B	24	24	18	24	18	14	12	14	18	12	14	12
			REV. PER ACRE	154	180	205	231	240	264	359	396	411	462	528	616
GRASS NAME	**DENSITY**	**WHEEL SPACE**	**POINTER**												
BLUE GRAMMA	9 LB/BU	1/8"	14	6.8	7.9	9.3	10.1	10.6	11.8	14.8	15.8	17.4	19.3	23.3	25.3
			17	9.5	11.3	13.3	14.1	15.7	16.5	19.4	19.9	22.5	24.8	27.9	31
			22	11.3	12.5	13.5	15.3	17	18.8	19.9	20.5	21.1	24.5	28.5	31.1
BIG BLUESTEM	9 LB/BU	1/8"	14	4.9	5.7	6.2	6.7	7.8	8	11.2	11.4	12.1	15	15.4	19
			17	9.3	10.8	12.5	12.6	17.4	19	24.2	25.5	26	29.4	33.3	34.1
			22	15.7	19.2	19.9	21.4	22.7	23.6	26.5	29.7	30.7	36.5	38.8	41.4
INDIANGRASS	13 LB/BU	1/8"	17	9.2	10.9	11.5	13.8	14.5	14.6	15.5	20.4	21.2	22.3	23.2	26.4
			22	17.5	20	21.4	21.8	22.9	23.8	24.4	24.5	27.3	28.8	30.1	31.1
LITTLE BLUESTEM**	9 LB/BU	1/8"	22	3.2	3.3	4.2	5.4	7.5	8.3	9.4	9.8	10.5	10.8	11.4	13.5
PRARIE SANDREED**	13 LB/BU	1/8"	22	5.5	5.6	8.5	8.6	9.2	10.5	13.3	15.8	16	18.6	20	22.1

***** = FOR BEST RESULTS OBTAIN THE MOST TRASH-FREE SEED AVAILABLE.***

Also see information in section 5.4

To obtain the desired seeding rate of the chaffy native grasses it may be necessary to adjust the feed shaft speed. The charts on page 32 list the sprocket combinations and relative speed in revolutions per acre. Use these charts as a guideline in choosing the correct sprocket combinations. On a standard drill box, sprocket A has 14 teeth and sprocket B has 18 teeth. There are 12 tooth and 24 tooth sprocket included in the shipping kit for the native grass attachment.

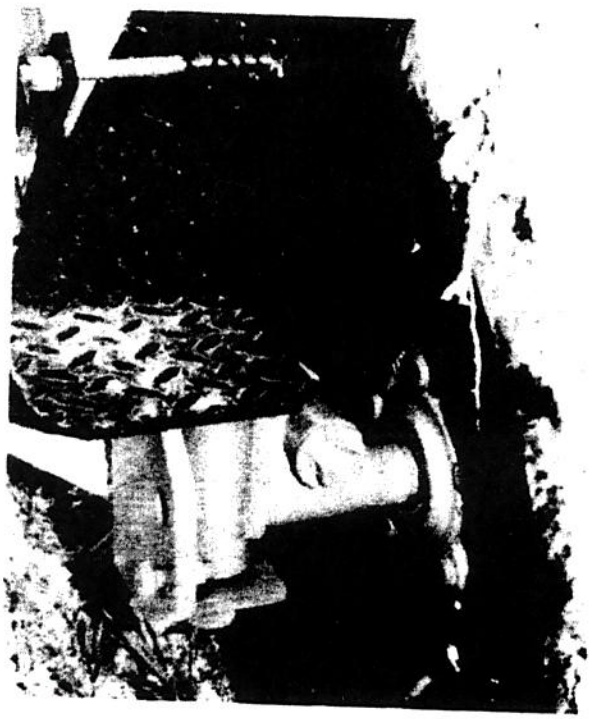


4.11 Drilling with the Grain Drill

If the grain drill was transported using the optional end hitch, the rear wheels will need to be rotated as follows:

1. Use the hydraulic system to lower the openers onto solid soil or use a jack to raise the drill frame and remove the weight from the rear wheels.
2. Remove the bolts from each wheel.

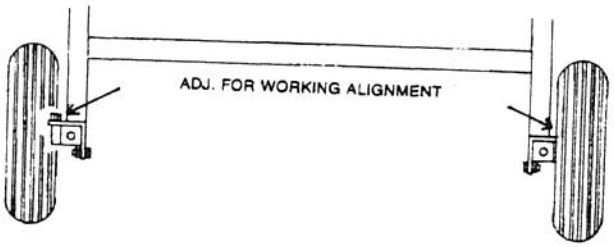
rotating the wheels for drilling (wheel shown in drilling position)



3. Rotate the wheels 90° and insert bolts.

NOTE: Step 4 covers alignment of the wheels. Once this adjustment is set, it should not normally be necessary to readjust it. Alignment of the wheels in the working position is less critical than in the transport position because of the softer surfaces and slower speeds.

4. Using a tape measure, align the wheels so that they are parallel with each other and the frame as shown. Adjust and secure the stop bolt #2.



5. Tighten the bolts.
6. Remove the jack, if used.
7. After the tractor is hitched to the front hitch, move the drill ahead slowly until the front swivel wheels are properly positioned.

At this point the grain drill should be properly set up and adjusted according to the instructions in the preceding sections.

Load the tanks with seed and/or fertilizer. Rotate the drive wheel by hand to make sure that the feed wheel shafts are free to turn. This is particularly important if the drill was transported with fertilizer and seed in the hoppers.

Start the tractor, retract the cylinder completely, and begin drilling.

Periodically check for proper seed depth and feed rate.

When the seeding operation is finished, park the drill over a sheet of plastic, canvas, etc. Pull one of the cleanout side control levers out to empty the remaining seed or fertilizer. Collect the seed or fertilizer. Repeat the procedure for the other hopper.

4.12 SUGGESTIONS

When preparing to sow damp fertilizer that has been sitting in the tank for several hours, stir the fertilizer all the way to the bottom to break up any blocks of fertilizer which have become cemented together.

The amount of fertilizer sown will vary with the moisture content and quality of the fertilizer.

4.13 REAR WHEEL SWIVEL AND ADJUSTMENT

Both rear wheels are designed to swivel 90° for the purpose of transporting drills endways. Adjusting bolts are provided for aligning wheels in transport position as well as in forward position. Transport position is most critical for tire wear due to hard surface roads and faster speeds.

CAUTION: Transporting drills with seed and fertilizer in the tanks is not recommended. If drills are moved any distance with seed or fertilizer in tanks, either in transport or field position, materials will settle around feed wheels. Before starting to seed, operator should check with a wrench on drive end of feed wheel shaft to make sure they are free to turn. Shaft may be turned either clockwise or counterclockwise with openers in raised position.

WARNING: Maximum transport speed should never exceed 20 M.P.H., and should be less where conditions demand.

4.14 TRANSPORTING THE GRAIN DRILL

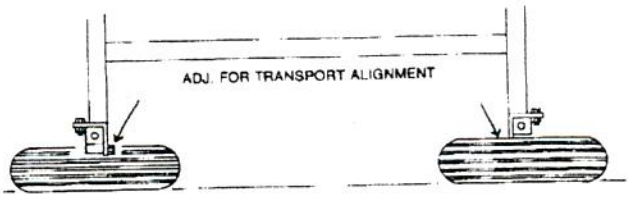
The rear wheels swivel 90° to transport the drill end ways with the optional end hitch. These wheels must be carefully aligned before transporting the drill because of the hard surfaces.

To rotate the rear wheels:

1. Use the hydraulic system to lower the openers onto solid soil or use a jack to raise the drill frame and remove the weight from the rear wheels.
2. Remove the lock bolts from each wheel.
3. Rotate the wheels 90° and insert the lock bolts.

NOTE: Step 4 covers alignment of the wheels. Once this adjustment is set, it should not normally be necessary to readjust it.

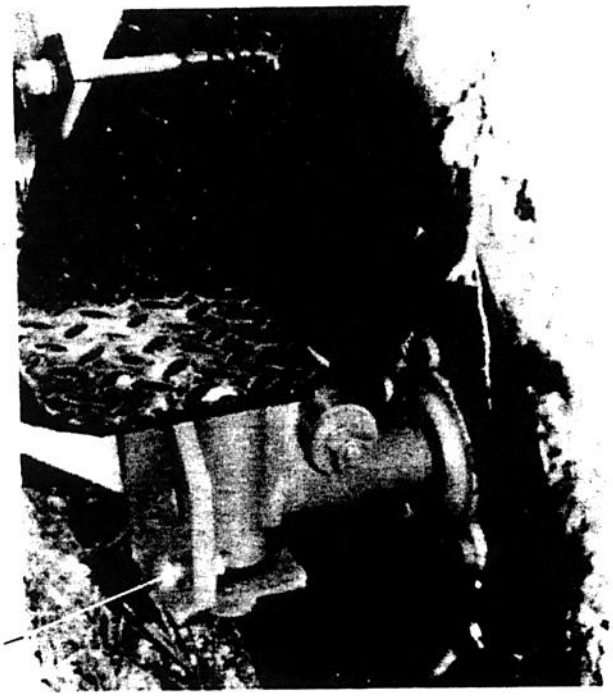
4. Using a string, align the wheels as shown. Adjust and secure the stop bolts.
5. Tighten the lock bolts.
6. Raise the openers or remove the jack. Secure the torque bar in the transport position with the safety stop bar.



rear wheel alignment - transport position

7. After the tractor is hitched to the end hitch, move the drill ahead slowly until the front swivel wheels are properly positioned.

rotating the wheels for drilling (wheel shown in drilling position)



4.15 CLEANING GRAIN TANKS AND LEGUME BOXES

CLEAN grain tanks and/or legume boxes on the 77C/107C Drill after using inoculated, treated or coated seeds. Failure to clean tanks will cause damage to moving parts. This damage is **NOT** covered by warranty. Always add graphite to treated seeds.

4.16 PREPARING FOR STORAGE

To prepare the 77C/107C Drill for storage, perform the following steps:

1. Install safety stop bar to keep planting units off the ground and to minimize rusting. Before drill is stored, clean out slides should be opened to remove as much seed and fertilizer as possible. Both tanks should be flushed out thoroughly to prevent any caking of seed or fertilizer. Open and close slides while flushing to allow any fertilizer that might be under the calibration slide to work its way free. Fertilizer can be damaging if left in contact with metal parts for a prolonged period.
2. Clean all mud, dirt, grease and other foreign material from the exterior of the machine. Wash the complete machine. Repaint places where bare metal is exposed - this will inhibit rusting.
3. After inside of the tank is thoroughly dry, apply a coat of oil or diesel fuel to calibration slide, bearings and other parts that have been in contact with fertilizer or seed.
4. Remove the chains and wash them in solvent. Using a clean cloth, wipe off the chains. Soak the chains in engine oil. Drain off the excess oil and install the chains on the grain drill.
5. Coat all chains and exposed hydraulic cylinder rod with a Valvoline Tectyl 506 oil or equivalent.
6. Lubricate machine thoroughly according to the lubrication instructions.
7. Drain water from ballast tanks, if installed.
8. If possible, store the machine in a dry, protected place. If it is necessary to store the machine outside, cover it with plastic, waterproof canvas, or other suitable protective material.
9. Check the machine for any worn or broken parts. By ordering parts now, you will avoid delays when it is time to remove the machine from storage. When ordering parts always specify machine serial number and the part number of the replacement part. Part numbers can be found in the Parts List Manual.

4.17 REMOVING FROM STORAGE

To remove the 77C/107C Drill from storage, perform the following steps:

1. Remove all protective coverings.
2. Remove all excess oil from chains and cylinder rods. Lubricate machine in accordance with lubrication instructions found in this manual.
3. Check all hydraulic hoses for deterioration and, if necessary, replace. Tighten any loose bolts, nuts and hydraulic fittings.
4. Follow prestarting inspection.

HAYBUSTER®

A Tradition of Innovation Since 1966

Section 5: Grass Seeding Reference

All Haybuster 77C/107C Grain Drills are very versatile. These base drills are capable of accurately metering most common seeds and fertilizer. The seed will be placed at the correct depth in conventional and minimum tillage and most zero-tillage situations. Through the use of special attachments, Haybuster 77C/107C Grain Drills can be used for seeding of various types of grass seeds including small-seed legumes and chaffy native grasses. When grass seeding is complete, each of these drills are capable of seeding and fertilizing your conventional crops. For more information on operating the drill, settings and procedures, please see **Section 4: Operating Instructions**.

5.1 Grass Seeding Attachments

The following attachments are available for grass seeding:

- Legume box
- Single agitator
- Double agitator
- 2" I.D. seed tubes
- Depth bands

Many grasses can be metered through the standard seed box with no additional equipment. However, some of the grasses listed below can be metered more accurately by using some of the special attachments listed on the following pages.

*Alfalfa	*Alsike clover	@Altiwild rye	*Bahiagrass
*Birdsfoot trefoil	@Bromegrass	Buffalograss	Fescue
Green needlegrass	@Intermediate wheatgrass	*Kentucky bluegrass	@Killdeer sideoats
*Ladino clover	*Lespedeza (unhulled)	*Lovegrass	Orchard grass
@Pubescent wheatgrass	Ryegrass	*Red clover	*Red top
*Reed canarygrass	*Serecia (unhulled)	*Sweet clover	*Switchgrass
@Streambank wheatgrass	*Timothy	@Tall wheatgrass	@Western wheatgrass

* See legume box section, page 40
@ See single agitator section, page 40

5.2 Legume Box Applications

The legume box attachment is designed to accurately meter the small seeds listed below.

Alfalfa	Alsike clover	Bahia grass	Birdsfoot trefoil
Fescue	Kentucky bluegrass	Ladino clover	Lesoedeza (Korean)
Lovegrass	Orchard grass	Red clover	Red top
Reed canarygrass	Rye grass	Serecia (unhulled)	Sweet clover
Switchgrass	Tibbet clover	Timothy	Vetch

For more information please see the Chart for drilling legumes and small grasses on page 31.

5.3 Single Agitator Applications

The addition of the single agitator to the standard drill box will prevent these seeds from bridging above the feed wheels.

Alti wildrye	Bromegrass #	Intermediate wheatgrass
Killdeer sideosts #	Pubescent wheatgrass	Streambank wheatgrass
Tall wheatgrass	Western wheatgrass	

 # Extremely trashy samples may require the double agitator.

For more information please see the Chart for drilling grain on page 30.

5.4 Special Instructions for Warm Season Grasses

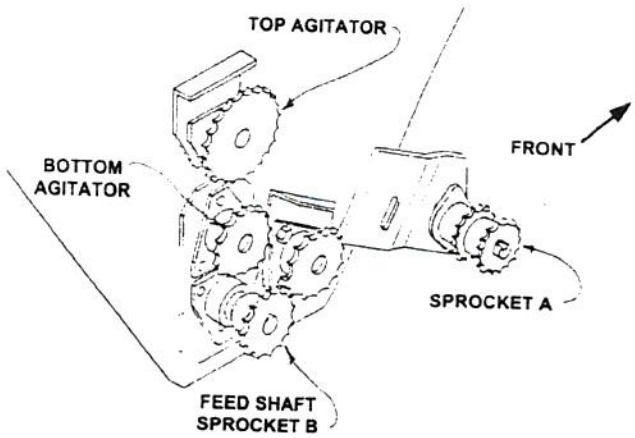
Warm season grasses tend to be very low bulk and are very trashy or chaffy in appearance. Special equipment required to properly meter these grasses is listed below.

- Double agitator (top and bottom)
- Larger opening in drill box (1-1/2 inch)
- 2 inch I.D. grass tube kit
- Sprocket set (feed shaft speed adjustment)

Obtain the best quality seed available for best results. Trashier samples may need to be blended with heavier seed to improve metering capabilities. Center the feed wheels as shown on page 23. Be sure to check the feed wheels as shown on page 23.

Blue grammagrass	Big bluestem	Indian grass	Little bluestem	Prairie sandreed

To obtain the desired seeding rate of the chaffy native grasses it may be necessary to adjust the feed shaft speed. The charts on page 32 list the sprocket combinations and relative speed in revolutions per acre. Use these charts as a guideline in choosing the correct sprocket combinations. On a standard drill box, sprocket A has 14 teeth and sprocket B has 18 teeth. There are 12 tooth and 24 tooth sprocket included in the shipping kit for the native grass attachment.



5.5 Pure Live Seed Calculations

Any sample of bulk seed always has a certain percentage of non-viable seed and inert matter. In cereal grains, this percentage is quite small and can usually be ignored when determining seeding rates. Grass seeds can have a very high percentage of dormant and non-viable seed, and inert matter. These high percentages must be considered when determining grass seeding rates.

For example: You wish to plant Big Bluestem (Chart pg 32) at a rate of 12 ponds of pure live seed (pls) per acre.

A typical grass seed tag might appear as follows:

Big Bluestem

Weed seed.....0.10%	Lot No.....83101
Noxious weed seed.....0.00%	Germ.....52.0%
Other crops.....0.05%	Date of test.....3-86
Inert matter.....40.05%	Grown.....Kansas

Step 1. Determine the total percentage of inert matter from the seed tag

Weed seed	0.10%
Noxious weed seed	0.00%
Other crops	0.05%
Inert matter	40.05%
	40.20%

Step 2. Subtract the percentage of inert matter from 100% to find pure seed percentage.

100.0% - 40.20% = 59.80%

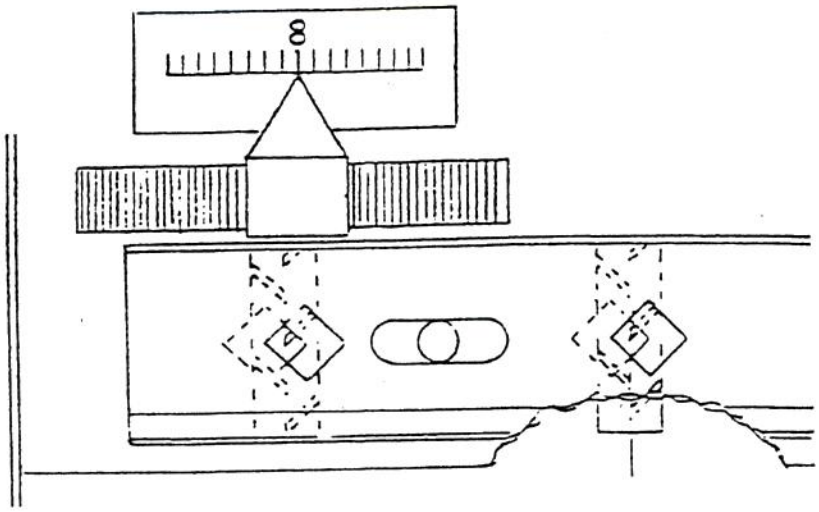
Step 3. Divide the pounds of pure live seed desired by the percent pure seed.

12 lbs pls/0.5980= 20.07 lbs pure seed

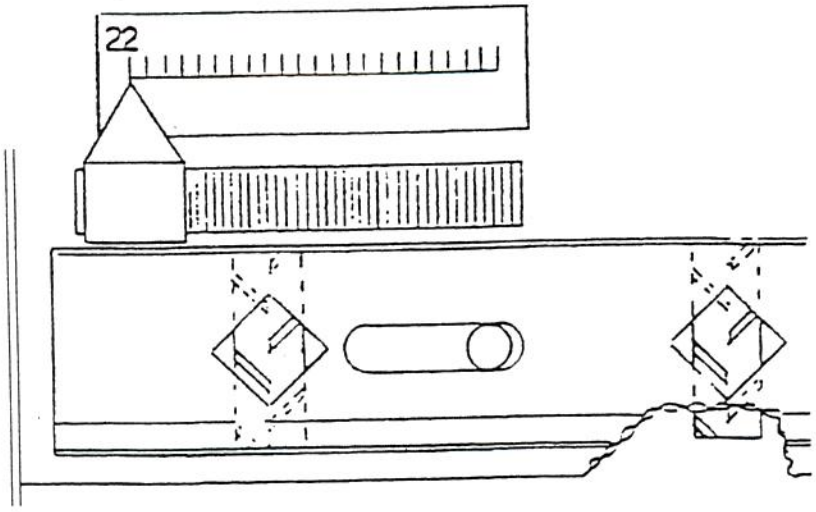
Step 4. Divide pounds of pure seed by the germination percentage to get bulk seed.

20.07/0.52 = 38.6 lbs of bulk seed

So 38.6 lbs of bulk seed per acre must be sown to get 12 lbs of pure live seed per acre.



For most seeding, the feed wheel should be aligned as shown above. Set the pointer on number 8. The center of the feed wheel should be centered in the opening as viewed from outside of the box.



When seeding the grasses listed on page 32, move the feed wheel as shown above. Set the pointer on number 22. the center of the feed wheel should be centered in the opening as viewed form outside of the box. Generally, a small screwdriver or similar tool may be inserted through the opening into the tank and used to push the wheel into position. The agitator blades inside the drill box may need to be re-centered over the feed wheels to prevent interference.

Section 6: Lubrication

All 77C/107C Grain Drills are completely serviced at the factory before shipping. However, the operator should make a check of all grease fittings on the unit before beginning to operate it so as to become familiar with their location and the correct service schedule.

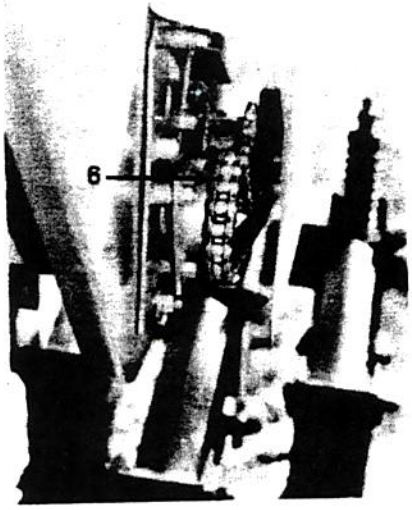
Use only a high quality, multi-purpose grease when lubricating the unit. Make sure all fittings and the nozzle of the grease applicator are clean before applying the grease. If any grease fittings are missing, replace them immediately.

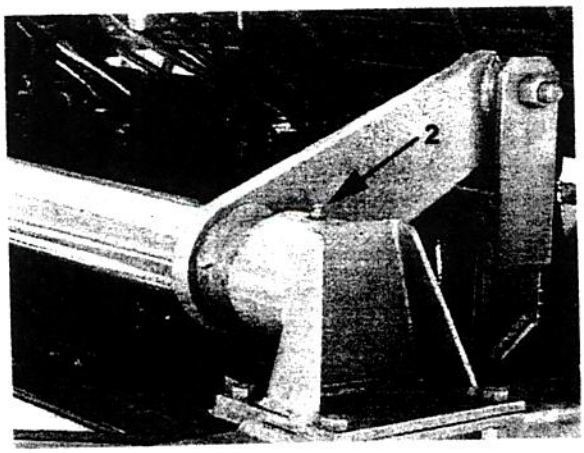
Lubricating of all pillow block and flange-type self-aligning ball or roller bearings should be done slowly to help prevent bearing seal damage. Use caution when using a high pressure, high volume gun.

Description	Type	Frequency	No. Zerks
1. Swivel Wheel Pivot	Grease	20 Hrs.	2
2. Torque Tube Bushings	Grease	40 Hrs.	2
3. Universal Joints	Grease	40 Hrs.	2
4. Square Drive Line	Grease	40 Hrs.	2
5. Feed Wheel Shaft	Grease	100 Hrs.	6
6. Roller Chains	Oil	Daily In Dusty Conditions	
7. Tool Bar Bushing	Grease	20 Hrs.	2
8. Lift Arm Bushing	Grease	20 Hrs.	2
9. Lift Arm	Grease	20 Hrs.	2
10. Drive Wheel Frame	Grease	20 Hrs.	2
11. Packer Wheel Bearings and Coulter-Disk Bearings are Non-Relubable.			
12. Cylinder Clevis Pin	Grease	20 Hrs.	1

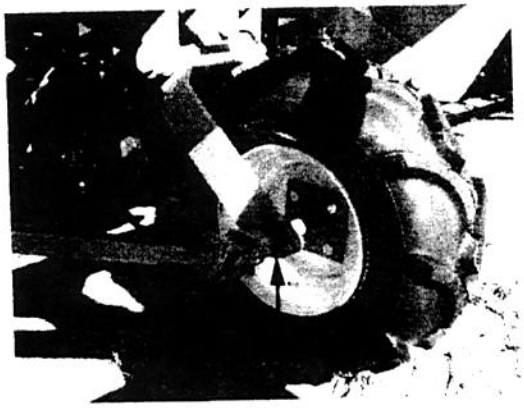
swivel wheel pivot lubrication zerk

torque tube bushings
lubrication points

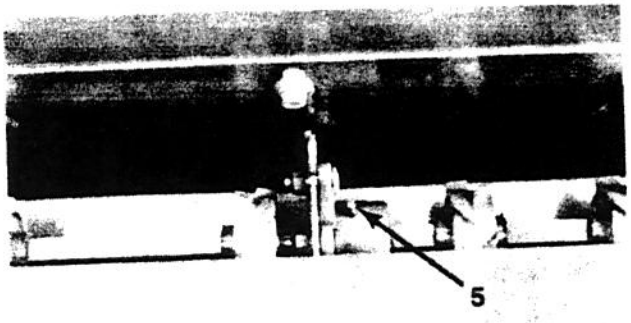




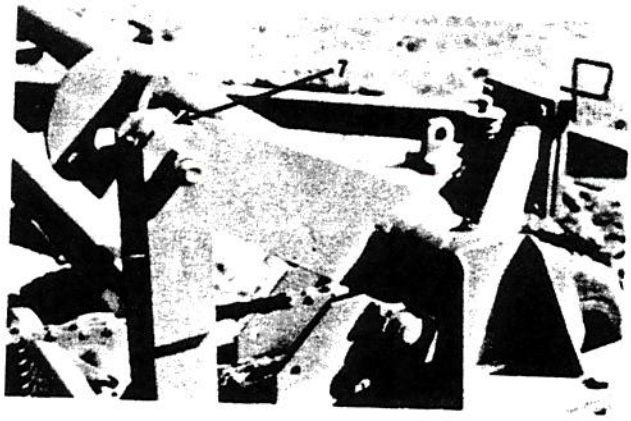
universal joints and
square drive line
lubrication zerks



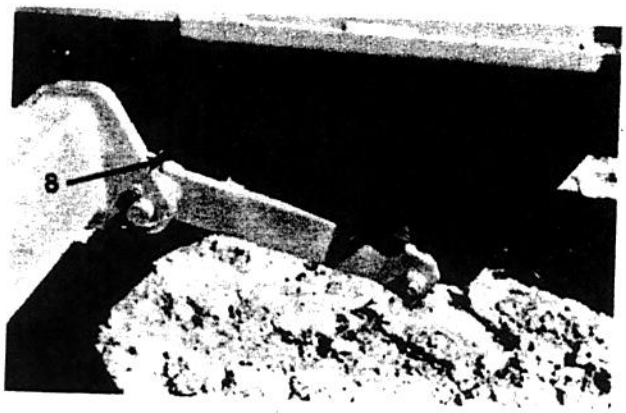
feed wheel shaft
lubrication zerk



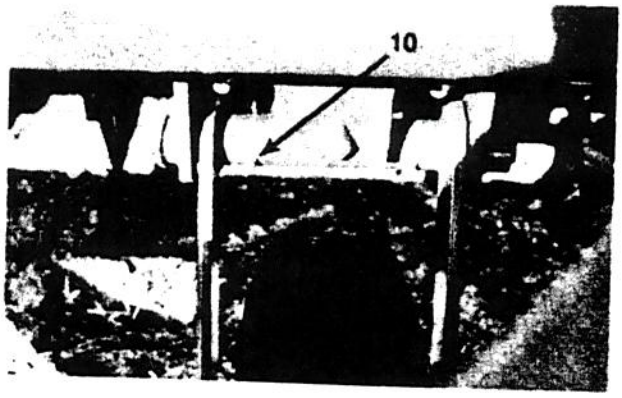
tool bar bushing
lubrication zerk



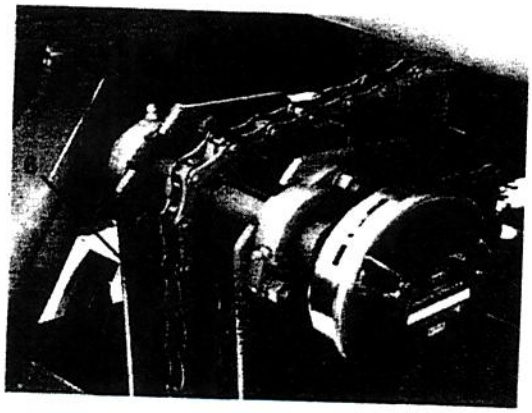
lift arm bushing
lubrication zerk



drive wheel frame
lubrication zerk



roller chains lubrication



APPENDIX A: WARRANTY

Duratech Industries International, warrants to the original purchaser for one year from purchase date that this product will be free from defects in material and workmanship when used as intended and under normal maintenance and operating conditions. This warranty is limited to the replacement of any defective part or parts returned to our factory in Jamestown, N.D., within thirty (30) days of failure.

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

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

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

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

Duratech Industries International reserves the right to make changes in materials and/or designs of this product at any time without notice.

This warranty is void if Duratech Industries International does not receive a valid warranty registration card at its office in Jamestown, N.D., within 10 days from date of original purchase.

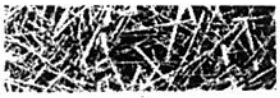
All other warranties made with respect to this product, either expressed or implied, are hereby disclaimed by Duratech Industries International.

APPENDIX B: SPECIFICATIONS

	77C Drill	107C Drill
Overall Width:	91"	125"
Seeding Width:	84"	126"
End Transport Width:		155"
Height:	73"	73"
Weight:	3,600 lbs	4,200 lbs
Tire Size- Front:	9.5x14 Implement	9.5x14 Implement
Tire Pressure	44 PSI	44 PSI
Tire Size- Rear:	7.6x15 implement	7.6x15 implement
Tire Pressure	32 PSI	32 PSI
Tire Size- Drive:	20X8-10 4-Ply	20X8-10 4-Ply
Tire Pressure	28 PSI	28 PSI
Hopper Capacity:		
Grain- Front:	12 Bu.	14 Bu.
Granulated Fertilizer:	11.5 Bu.	14 Bu.
Grain- Front & Rear:	23 Bu.	28 Bu.
Feed System:	infinitely adjustable meter	infinitely adjustable meter
Hoses:	rubber convoluted	rubber convoluted
Row Spacing:	7"	7"
Openers - Double Disc:	14"	14"
Press Wheels - Standard:	2" x 15-1/2"	2" x 15-1/2"
Press Wheels - Optional:	2" x 13"	2" x 13"

Options:

Swivel Hitch	1-2-3-4 Drill Hitch and Components
Acre Counter	Swivel Hitch
Legume Box	Acre Counter
Native Grass Kit	Hitch Winch
Ballast Tanks	Ballast Tanks
Gauge Wheels	End Hitch
	Stabilizer - Front and Rear
	Legume Box
	Native Grass Kit
	Gauge Wheels
	False Bottom



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