MONOSEM

Enhanced precision

# MS

# MS Mini Seed

## OPERATOR & PARTS MANUAL

### INSTRUCTIONS

- Safety
- Operation
- Maintenance

# MS SERIES PLANTERS
# MOUNTED FRAMES

**(Serial No. 23A##### - )**

MONOSEM

Enhanced precision

## OPERATOR'S GUIDE

## MS SERIES PLANTERS
## MOUNTED FRAMES

**OMM900007 ISSUE A1 2023 (ENGLISH)**

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

If this product contains a gasoline engine:

**⚠ WARNING**

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

The State of California requires the above two warnings.

Additional Proposition 65 Warnings can be found in this manual.

**MONOSEM**

**North American Edition**

PRINTED IN U.S.A.

## Foreword

READ THIS MANUAL carefully to learn how to operate and service your machine correctly. Failure to do so could result in personal injury or equipment damage.

THIS MANUAL SHOULD BE CONSIDERED a permanent part of your machine and should remain with the machine when you sell it.

USE only correct replacement parts and fasteners. Metric and inch fasteners may require a specific metric or inch wrench.

RIGHT-HAND AND LEFT-HAND sides are determined by facing in the direction the implement will travel when going forward.

WRITE PRODUCT IDENTIFICATION INFORMATION in the section below. Accurately record all the numbers to help in tracing the machine should it be stolen. Your dealer also needs these numbers when you order parts.

WARRANTY is provided as part of Monosem's support program for customers who operate and maintain their equipment as described in this manual. The warranty is printed inside the back cover of this manual.

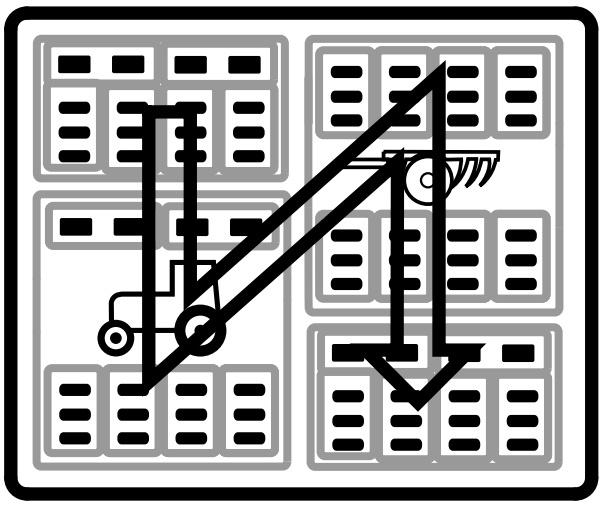
This warranty provides you the assurance that Monosem will back its products where defects appear within the warranty period. Should the equipment be abused, or modified to change its performance beyond the original factory specifications, the warranty will become void and field improvements may be denied.

If you are not the original owner of this machine, it is in your interest to contact your local Monosem dealer to inform them of this unit's serial number. This will help Monosem notify you of any issues or product improvements.

Information in this manual is divided into sections. The section names are identified in the table of contents and at the top of each page. Each section has a unique number and page count. Specific information within each section is organized into topics identified with bold headings.

The topic headings are listed in the table of contents with the section number and page number where the topic begins. Topics and information related to each topic are also referenced in the index along with the section and page number.

The topic content flows down the left-hand side, then over and down the right-hand side, and repeats on the next page. Images precede the related text in the flow.



A100767 —UN—07JUN18

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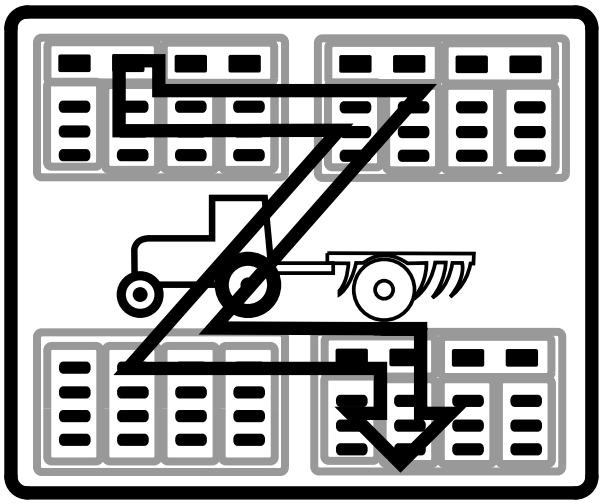
The flow can divide both before and after the images and tables that span the width of a page.

Review this manual often to learn where to look for information.

Thanks again for purchasing this machine.



A100768 —UN—07JUN18

HS35416,0000AF5 -19-28FEB19-2/2

## Machine Photo

HS35416,0000AC4 -19-12FEB19-1/1

## A Message to Our Customers

We appreciate the confidence placed in us by the purchase of this machine. To ensure that the machine performs at the highest level, countless hours were spent designing and testing, before this machine was built. To achieve the maximum performance, it is imperative that this machine is operated in accordance with the procedures outlined in this manual.

This manual has been prepared for use in operation, adjustment, and maintenance of the planter. Read this manual carefully prior to operating the planter.

The information used in compiling this manual is current, however as production changes do occur on a continual basis, Monosem Inc. reserves the right to change specifications or designs without notice and without obligation to install the same on previously manufactured machines.

HS35416,0000AF6 -19-28FEB19-1/1

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## MS PLANTER SPECIFICATIONS

**Planting Unit:**

**Version A -** Single row unit Row spacing from 8" (20cm) MS Monosem planter unit version A (1) Metering box w/agitator Clod remover Rubber front press wheel 12"x4 1/2" Narrow shoe Narrow intermediate press wheel Intermediate hillers Stainless steel flat rear press wheel w/scraper (8 1/4x4 1/2")

**Version B-** Single row unit Row spacing from 5 1/2" (14cm) MS Monosem planter unit version B (1) Metering box w/agitator Clod remover Rubber front press wheel (11x2 3/4") Concave cast iron rear press wheel with rubber tire

**Version C-** Twin line planter Row spacing, from 8" (20cm) 2"- 4" spacing between lines, MS Monosem planter unit version C (1) Metering box w/agitator Clod remover Rubber front press wheel (12x4 1/2") Twin row shoe Twin intermediate stainless-steel press wheels with scraper Intermediate hillers Wire mesh rear press wheel

**Version D-** Double row unit Row spacing 5 1/2”- 7” 3"-4 1/2" spacing between lines MS Monosem planter unit version D (2) Metering boxes / (2) agitators Clod remover Rubber front press wheel (6 1/2”x 10”) Rear press wheel (2) Narrow shoes (2) Intermediate hillers

**Version G-** Single row unit Row spacing from 8" (20cm) MS Monosem Planter unit version G (1) Metering box w/agitator Stainless steel flat rear press wheel w/scraper (8 1/4x4 1/2") Standard or narrow shoe Screw type depth adjust

**Version M-** Bed Style Planter 40”,60”, 72”, 80” Bed frame w/rollers Double hex shaft 4 Point bed height adjustment (Variable) Metering box w/agitator/shoe Double bed roller & scraper assembly Intermediate hillers

uuf6xgz,1683191919456 -19-05JUN23-1/1

## Planter Frame:

Single 5" x 5" rigid toolbar

Advanced 5" x 5" rigid toolbar

Stacking 5" x 5" or 7" x 7" toolbar

**Drive System:**

Adjustable drive wheels standard

Optional hydraulic drive

**Transmission:**

Standard gearbox

Optional end mounted single plate transmission

Optional narrow in-line transmission

**Hitch:**

3-point hitch

Optional special vegetable hitch

Optional double toolbar hitch

**Turbofan:**

450 rpm with hydraulic drive motor standard

450 or 540 rpm turbofan with PTO drive available on request

**Secondary Air System:**

For disc hole clean-out standard

Optional 5-Gallon capacity seed clean-out

**Timing:**

Optional - Available for 36-hole seed discs and less

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# Contents



**Continued on next page**

*Original Instructions. All information, illustrations and specifications in this manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.*

## OPTIONS

## Recognize Safety Information

This is a safety-alert symbol. When you see this symbol on your machine or in this manual, be alert to the potential for personal injury.

Follow recommended precautions and safe operating practices.

T81389 —UN—28JUN13

DX,ALERT -19-03OCT22-1/1

## Understand Signal Words

**DANGER**; The signal word DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING**; The signal word WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

**CAUTION**; The signal word CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION may also be used to alert against unsafe practices associated with events which could lead to personal injury.

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards. DANGER or WARNING safety signs are located near specific hazards. General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

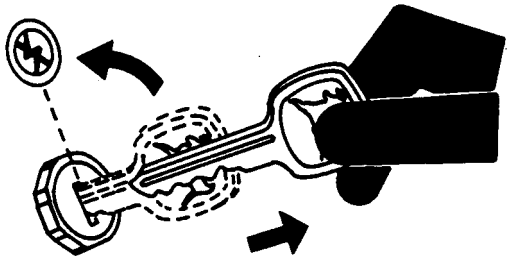

TS187 —19—30SEP88

DX,SIGNAL -19-05OCT16-1/1

## Park Machine Safely

Before working on the machine:

- Lower all equipment to the ground.
- Stop the engine and remove the key.
- Disconnect the battery ground strap.
- Hang a "DO NOT OPERATE" tag in operator station.



TS230 —UN—24MAY89

DX,PARK -19-04JUN90-1/1

## Live With Safety

Before returning machine to customer, make sure machine is functioning properly, especially the safety systems. Install all guards and shields.


TS231 —19—07OCT88

DX,LIVE -19-25SEP92-1/1

## Prevent Machine Runaway

Avoid possible injury or death from machinery runaway.

Do not start engine by shorting across starter terminals. Machine will start in gear if normal circuitry is bypassed.

NEVER start engine while standing on ground. Start engine only from operator's seat, with transmission in neutral or park.

TS177 —UN—11JAN89

DX,BYPAS1 -19-29SEP98-1/1

## Handling Batteries Safely

TS204 —UN—15APR13

Battery gas can explode. Keep sparks and flames away from batteries. Use a flashlight to check battery electrolyte level.

Never check battery charge by placing a metal object across the posts. Use a voltmeter or hydrometer.

Always remove grounded (-) battery clamp first and replace grounded clamp last.

Sulfuric acid in battery electrolyte is poisonous and strong enough to burn skin, eat holes in clothing, and cause blindness if splashed into eyes.

**Avoid hazards by:**

- Filling batteries in a well-ventilated area
- Wearing eye protection and rubber gloves
- Avoiding use of air pressure to clean batteries
- Avoiding breathing fumes when electrolyte is added
- Avoiding spilling or dripping electrolyte
- Using correct battery booster or charger procedure.

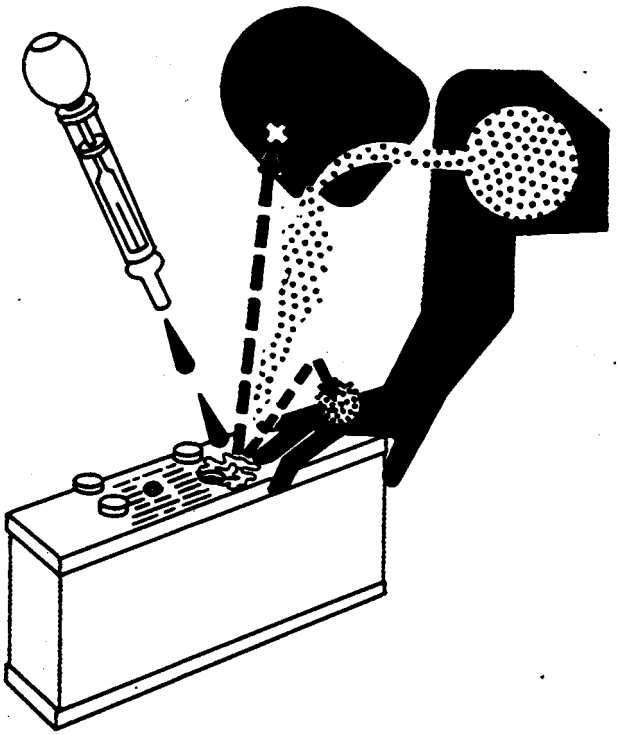
**If acid is spilled on skin or in eyes:**

1. Flush skin with water.
2. Apply baking soda or lime to help neutralize the acid.
3. Flush eyes with water for 15—30 minutes. Get medical attention immediately.

**If acid is swallowed:**

1. Do not induce vomiting.
2. Drink large amounts of water or milk, but do not exceed 2 L (2 qt.).
3. Get medical attention immediately.

**WARNING:** Battery posts, terminals, and related accessories contain lead and lead compounds, chemicals known to the State of California to cause cancer and reproductive harm. **Wash hands after handling.**



TS203 —UN—23AUG88

DX,WW,BATTERIES -19-02DEC10-1/1

## Prevent Battery Explosions

Keep sparks, lighted matches, and open flame away from the top of battery. Battery gas can explode.

Never check battery charge by placing a metal object across the posts. Use a volt-meter or hydrometer.

Do not charge a frozen battery; it may explode. Warm battery to 16°C (60°F).

TS204 —UN—15APR13

DX,SPARKS -19-03MAR93-1/1

## Operate the Machine Safely

Be careful when operating machine to avoid injury.

If the machine must be in a raised position while working on or near it, be certain service locks are installed or machine is adequately supported. Anytime hydraulic work must be done, lower the machine.

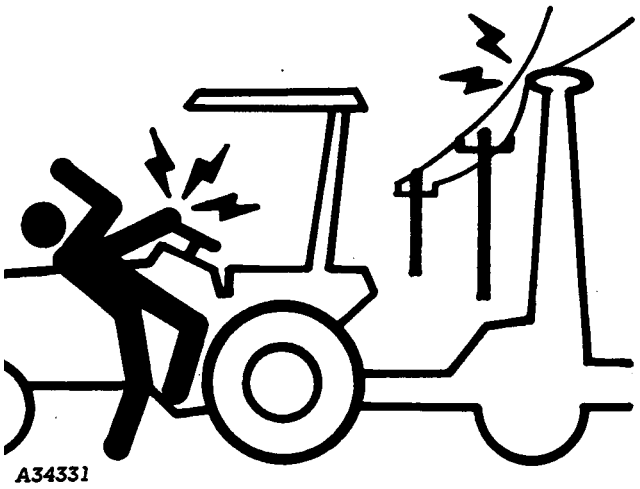
Serious injury or death can result from contact with electric lines. Use care when moving or operating this machine near electric lines to avoid contact.

Stand clear of machine when hydraulic components are being used. Mechanical or hydraulic failure can allow machine components to move rapidly.

Be sure cylinder and attaching hoses are fully charged with oil before operating system.

Be careful when operating system on hillsides; tractor can tip sideways if it strikes a hole, ditch or other irregularity.

Permit only one person, the operator, on tractor platform while tractor and machine are in operation.



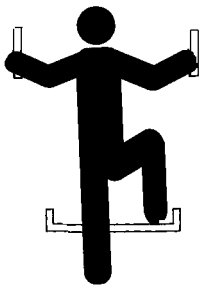

A34331 —UN—13OCT88

AG,OUO6074,1162 -19-04AUG00-1/1

## Use Steps and Handholds Correctly

Prevent falls by facing the machine when getting on and off. Maintain 3-point contact with steps, handholds, and handrails.

Use extra care when mud, snow, or moisture present slippery conditions. Keep steps clean and free of grease or oil. Never jump when exiting machine. Never mount or dismount a moving machine.



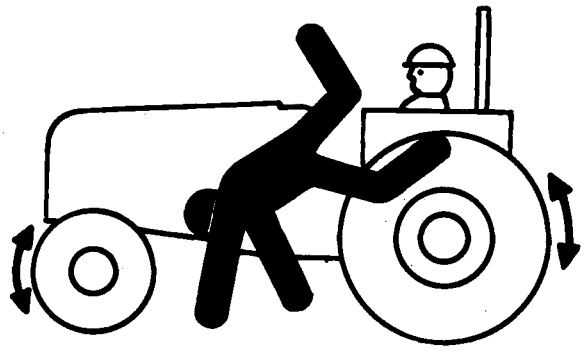
T133468 —UN—15APR13

DX,WW,MOUNT -19-12OCT11-1/1

## Keep Riders Off Machine

Only allow the operator on the machine. Keep riders off.

Riders on machine are subject to injury such as being struck by foreign objects and being thrown off of the machine. Riders also obstruct the operator's view resulting in the machine being operated in an unsafe manner.



TS290 —UN—23AUG88

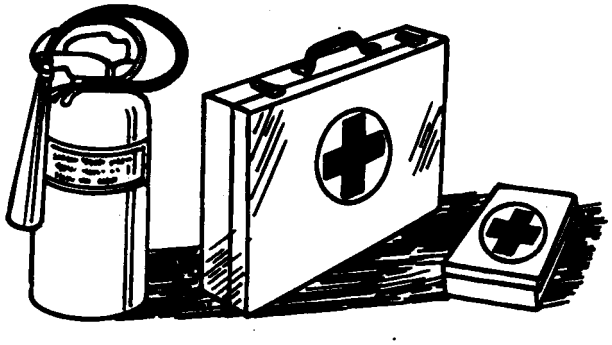
DX,RIDER -19-03MAR93-1/1

## Prepare for Emergencies

Be prepared if a fire starts.

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance service, hospital, and fire department near your telephone.



TS291 —UN—15APR13

DX,FIRE2 -19-03MAR93-1/1

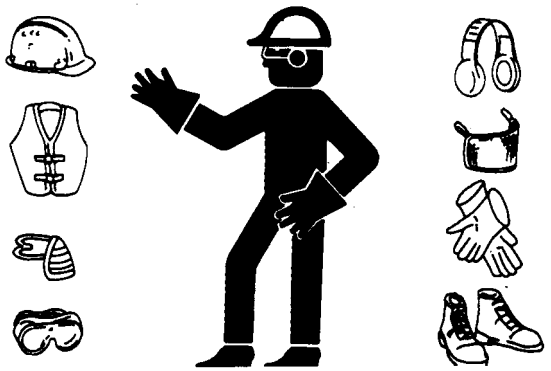
## Wear Protective Clothing

Wear close fitting clothing and safety equipment appropriate to the job.

Prolonged exposure to loud noise can cause impairment or loss of hearing.

Wear a suitable hearing protective device such as earmuffs or earplugs to protect against objectionable or uncomfortable loud noises.

Operating equipment safely requires the full attention of the operator. Do not wear radio or music headphones while operating machine.



TS206 —UN—15APR13

DX,WEAR -19-10SEP90-1/1

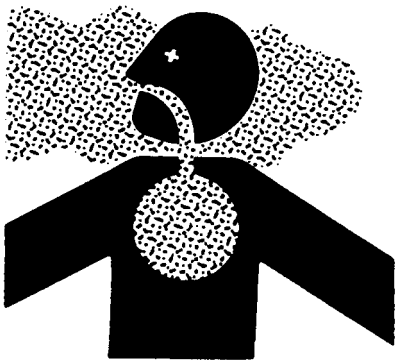
## Handle Agricultural Chemicals Safely

Chemicals used in agricultural applications such as fungicides, herbicides, insecticides, pesticides, rodenticides, and fertilizers can be harmful to your health or the environment if not used carefully.

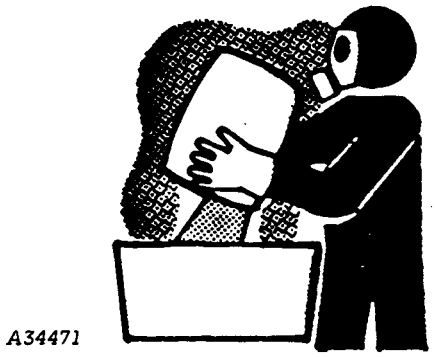
Always follow all label directions for effective, safe, and legal use of agricultural chemicals.

Reduce risk of exposure and injury:

- Wear appropriate personal protective equipment as recommended by the manufacturer. In the absence of manufacturer's instructions, follow these general guidelines:
  - Chemicals labeled **'Danger'**: Most toxic. Generally require use of goggles, respirator, gloves, and skin protection.
  - Chemicals labeled **'Warning'**: Less toxic. Generally require use of goggles, gloves, and skin protections.
  - Chemicals labeled **'Caution'**: Least toxic. Generally require use of gloves and skin protection.
- Avoid inhaling vapor, aerosol or dust.
- Always have soap, water, and towel available when working with chemicals. If chemical contacts skin, hands, or face, wash immediately with soap and water. If chemical gets into eyes, flush immediately with water.
- Wash hands and face after using chemicals and before eating, drinking, smoking, or urination.
- Do not smoke or eat while applying chemicals.
- After handling chemicals, always bathe or shower and change clothes. Wash clothing before wearing again.
- Seek medical attention immediately if illness occurs during or shortly after use of chemicals.
- Keep chemicals in original containers. Do not transfer chemicals to unmarked containers or to containers used for food or drink.



TS220 —UN—15APR13




A34471 —UN—11OCT88

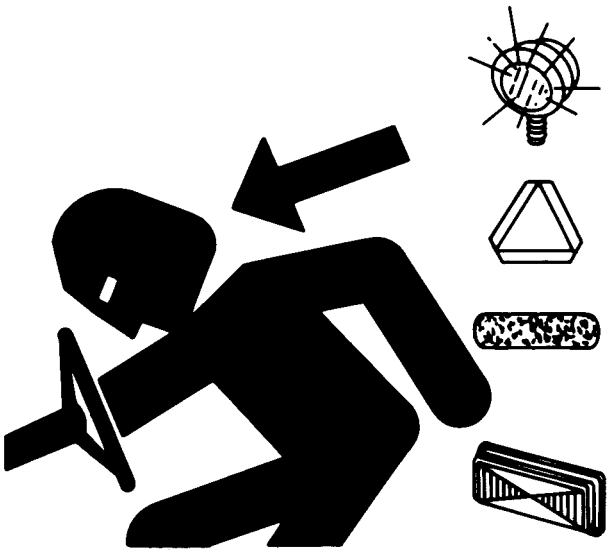
- Store chemicals in a secure, locked area away from human or livestock food. Keep children away.
- Always dispose of containers properly. Triple rinse empty containers and puncture or crush containers and dispose of properly.

DX,WW,CHEM01 -19-24AUG10-1/1

## Use Safety Lights and Devices

Prevent collisions between other road users, slow moving tractors with attachments or towed equipment, and self-propelled machines on public roads. Frequently check for traffic from the rear, especially in turns, and use turn signal lights.

Use headlights, flashing warning lights, and turn signals day and night. Follow local regulations for equipment lighting and marking. Keep lighting and marking visible, clean, and in good working order. Replace or repair lighting and marking that has been damaged or lost.



TS951 —UN—12APR90

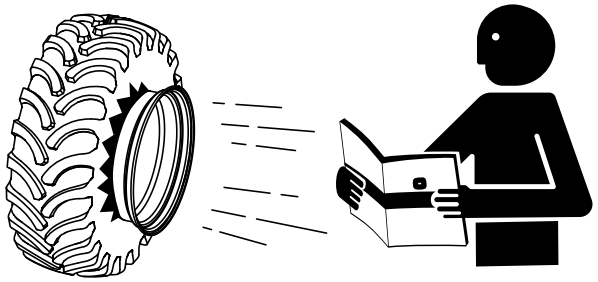
HS35416,0000A7B -19-01JAN19-1/1

## Follow Tire Recommendations

Keep your machine in proper working order.

Use only prescribed tire sizes with correct ratings and inflate to the pressure specified in this manual.

Use of other than prescribed tires may decrease stability, affect steering, result in premature tire failure, or cause other durability or safety issues.



H111235 —UN—13MAY14

DX,TIRE,INFO -19-19MAY14-1/1

## Transport Safely

Avoid serious injury or death resulting from loss of control or rear end collision while transporting the planter and any load towed behind the planter.

Always raise the parking stand before transport.

Tractor brakes must be latched together.

Attach a properly sized safety chain at each drawbar connection.

Shift the tractor into a lower gear when transporting down steep slopes or hills.

Always travel at a reasonable and safe speed (See Tow Loads Safely).

Never transport the planter when more than half full of product.

Always use the flashing warning lights, both day and night, when transporting on a public roadway.

Keep all the reflective material clean and visible.

Prevent collisions between motorists and slow moving equipment on public roads. Frequently check for traffic from the rear, especially during turns. Use the turn signals.

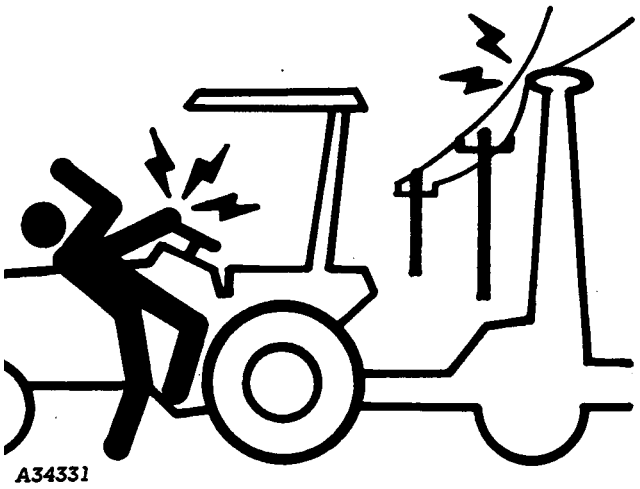
Keep everyone clear of the planter.

For stability and operator safety, the tractor must be properly ballasted.

Know the transport height and width of the planter.

Avoid serious injury or death, keep the marker arms away from overhead power lines. Proceed cautiously under overhead power lines and around utility poles. Know the transport height of the planter.

The construction of this planter may not meet all local or national requirements for transport on a public roadway. In regions or countries that have national certification requirements for roadway transport, it may be possible for this planter to be approved for such roadway transport. The customer is responsible for understanding and complying with all local, regional, and national requirements regarding roadway transport.

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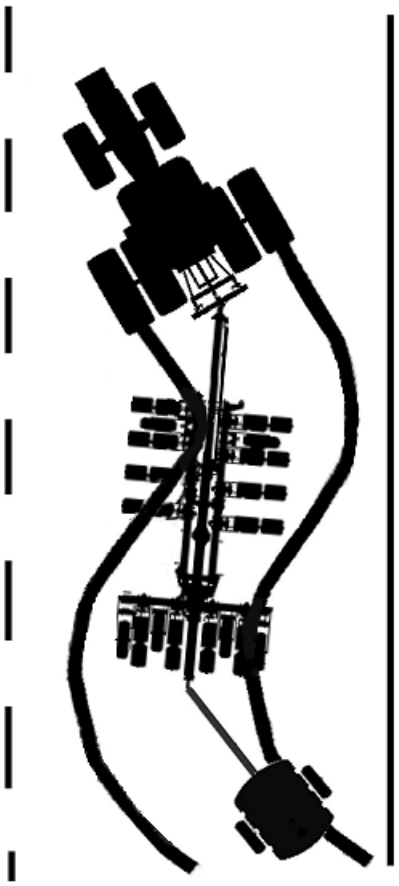

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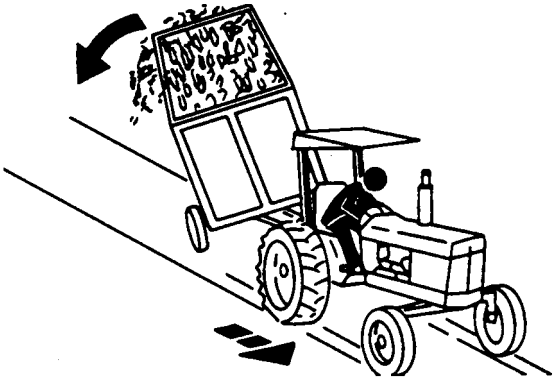
## Tow Loads Safely



TS216 —UN—23AUG88

Stopping distance increases with speed and weight of towed loads, and on slopes. Towed loads with or without brakes that are too heavy for the tractor or are towed too fast can cause loss of control. Consider the total weight of the equipment and its load.

Observe these recommended maximum road speeds, or local speed limits which may be lower:

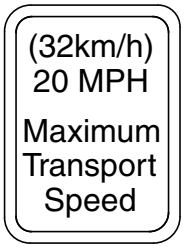
- If towed equipment does not have brakes, do not travel more than 32 km/h (20 mph) and do not tow loads more than 1.5 times the tractor weight.
- If towed equipment has brakes, do not travel more than 40 km/h (25 mph) and do not tow loads more than 4.5 times the tractor weight.

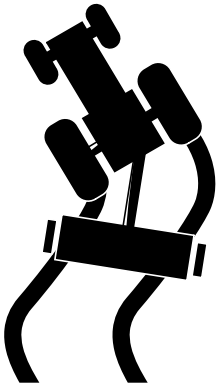
Ensure the load does not exceed the recommended weight ratio. Add ballast to recommended maximum for tractor, lighten the load, or get a heavier towing unit. The tractor must be heavy and powerful enough with adequate braking power for the towed load. Use additional caution when towing loads under adverse surface conditions, when turning, and on inclines.

DX,TOW -19-02OCT95-1/1

## Observe Maximum Transport Speed

**The maximum transport speed for this implement is 32 km/h (20 mph).**



A46805 —19—16JUL10

Some tractors are capable of operating at speeds that exceed the maximum transport speed of this implement. Regardless of the maximum speed capability of the tractor being used to tow this implement, do not exceed the implement's maximum transport speed.

Exceeding the implement's maximum transport speed can result in:

- Loss of control of the tractor/implement combination
- Reduced or no ability to stop during braking
- Implement tire failure
- Damage to the implement structure or its components

Use additional caution and reduce speed when towing under adverse surface conditions, when turning, and when on inclines.

Do not attempt transport if the fully loaded implement weighs more than 1.5 t (3 300 lb) and more than 1.5 times the weight of the tractor.

**Never tow this implement with a motor vehicle. Tow only with a properly ballasted tractor.**

DX,TOW2 -19-11APR07-1/1

## Practice Safe Maintenance

Understand service procedure before doing work. Keep area clean and dry.

Never lubricate, service, or adjust machine while it is moving. Keep hands, feet, and clothing away from power-driven parts. Disengage all power and operate controls to relieve pressure. Lower equipment to the ground. Stop the engine. Remove the key. Allow machine to cool.

Securely support any machine elements that must be raised for service work.

Keep all parts in good condition and properly installed. Fix damage immediately. Replace worn or broken parts. Remove any buildup of grease, oil, or debris.

On self-propelled equipment, disconnect battery ground cable (-) before making adjustments on electrical systems or welding on machine.

On towed implements, disconnect wiring harnesses from tractor before servicing electrical system components or welding on machine.

Falling while cleaning or working at height can cause serious injury. Use a ladder or platform to easily reach each location. Use sturdy and secure footholds and handholds.

TS218 —UN—23AUG88

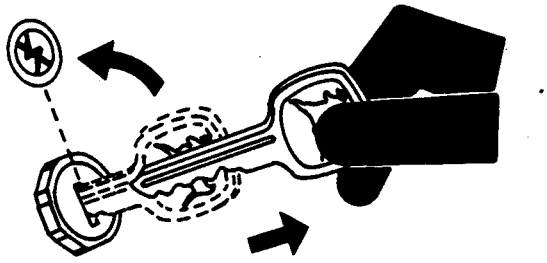
DX,SERV -19-28FEB17-1/1

## Service Machine Safely

To help prevent personal injury caused by unexpected movement, be sure to service planter on level surface.

If planter is connected to tractor, engage parking brake and/or place transmission in “PARK”, shut off engine and remove key.

If planter is detached from tractor, block wheels and use safety stands to prevent movement.



TS230 —UN—24MAY89

OM63945A,05F -19-28MAY19-1/1

## Remove Paint Before Welding or Heating

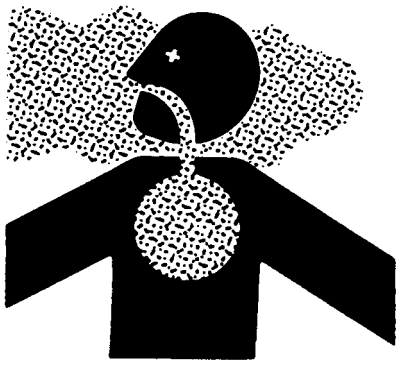
Avoid potentially toxic fumes and dust.

Hazardous fumes can be generated when paint is heated by welding, soldering, or using a torch.

Remove paint before heating:

- Remove paint a minimum of 100 mm (4 in.) from area to be affected by heating. If paint cannot be removed, wear an approved respirator before heating or welding.
- If you sand or grind paint, avoid breathing the dust. Wear an approved respirator.
- If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

Do not use a chlorinated solvent in areas where welding will take place.



TS220 —UN—15APR13

Do all work in an area that is well ventilated to carry toxic fumes and dust away.

Dispose of paint and solvent properly.

DX,PAINT -19-24JUL02-1/1

## Avoid Heating Near Pressurized Fluid Lines

Flammable spray can be generated by heating near pressurized fluid lines, resulting in severe burns to yourself and bystanders. Do not heat by welding, soldering, or using a torch near pressurized fluid lines or other flammable materials. Pressurized lines can accidentally burst when heat goes beyond the immediate flame area.

TS953 —UN—15MAY90

DX,TORCH -19-10DEC04-1/1

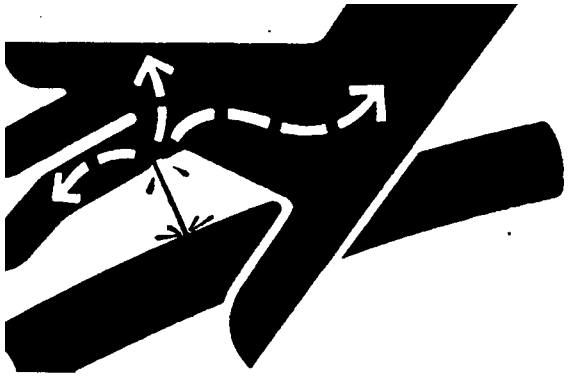
## Auxiliary Hydraulic Attachment Operation

Remote hydraulic outlet at rear of planter for auxiliary hydraulic equipment operation.

**CAUTION: Escaping fluid under pressure penetrates the skin causing serious injury. Avoid the hazard by relieving pressure before disconnecting hydraulic or other lines. Tighten all connections before applying pressure. Search for leaks with a piece of cardboard. Protect hands and body from high-pressure fluids.**

**Hydraulic hoses fail due to physical damage, kinks, age, and exposure. Check hoses regularly. Replace damaged hoses.**

**IMPORTANT: All hydraulic couplers must be clear of debris, dust, and sand. Use protective caps on fluid openings until ready to make connection. Foreign material damages the hydraulic system.**



X9811 —UN—23AUG88

HS35416,0000A75 -19-01JAN19-1/1

## Store Attachments Safely

Stored attachments such as dual wheels, cage wheels, and loaders can fall and cause serious injury or death.

Securely store attachments and implements to prevent falling. Keep playing children and bystanders away from storage area.

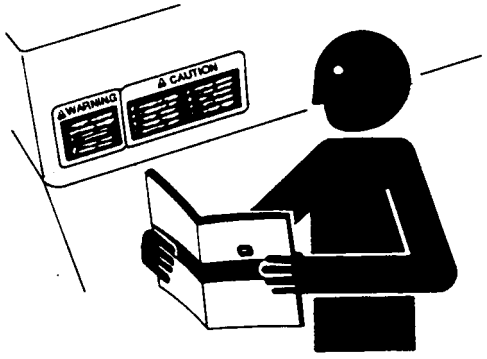
TS219 —UN—23AUG88

DX,STORE -19-03MAR93-1/1

## Replace Safety Signs

Replace missing or damaged safety signs. Use this operator's manual for correct safety sign placement.

There can be additional safety information contained on parts and components sourced from suppliers that is not reproduced in this operator's manual.




TS201 —UN—15APR13

DX,SIGNS -19-18AUG09-1/1

## FOLLOWING OPERATION

• When you stop operation of the planter, even if periodically, stop the tractor, set the tractor or towing vehicle brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition key.

T81389 —UN—28JUN13

HS35416,0000A76 -19-01JAN19-1/1

## UNHOOKING THE PLANTER

Lower the toolbar stands to support the planter. Do not stand between the tractor and the planter when connecting or disconnecting the implement.

Before unhooking the planter from the tractor, fully extend the jack stands to the point where the toolbar will remain level. Lock the stands securely in place with the locking pins.

Lower the planter to the ground. Set the tractor or towing vehicle brakes, disengage PTO and all power drives, shut off the engine and remove the ignition key.

Unhook the tractor lift arms from hitch pockets and remove center link. If a quick attach is used, position levers so that the locking mechanism is in the “unlatched” position and lower.

T81389 —UN—28JUN13

When the lift arms or quick attach arms are clear of the tractor, slowly drive the tractor away from the planter.

HS35416,0000A77 -19-01JAN19-1/1

## STORING THE PLANTER

Store the planter on a dry, level surface. An uneven surface could cause the planter to shift or fall, resulting in injury or death. Store planter in an area away from human activity.

Do not permit children to play on or around the stored planter.

The planter should be stored in a dry and dust-free location with the hydraulic cylinders closed.

Engage all safety devices for storage.

You may need wheel chocks to prevent the parked planter from rolling.

Never work under the planter while in raised position without installing safety lockup pin

T81389 —UN—28JUN13

HS35416,0000A78 -19-01JAN19-1/1

## PERFORMING MAINTENANCE

Good maintenance is your responsibility.

Make repairs in an area with plenty of ventilation. Never operate the engine of the towing vehicle in a closed building. The exhaust fumes may cause asphyxiation.

As a precaution, always recheck the hardware on equipment following every 100 hours of operation. Correct all problems.

Before working on the planter, stop the towing vehicle, set the brakes, disengage the PTO and all power drives, shut off the engine and remove the ignition keys.

Never work under the planter while it is in a raised position.

Be certain all moving parts have come to a complete stop before attempting to perform maintenance.

Always use the proper tools or equipment for the job at hand.

Never use you hands to locate a hydraulic leak. Use a small piece of cardboard or wood. Hydraulic fluid escaping under pressure can penetrate the skin. If injured by escaping hydraulic fluid, see a doctor at once. Gangrene can result. Without immediate medical treatment, serious infection and reactions can occur.

T81389 —UN—28JUN13

Replace all shields and guards after servicing and before moving.

After servicing, remove all tools, parts and service equipment from on or in the planter.

If the planter has been altered in anyway from the original design, the manufacturer does not accept any liability for injury or warranty.

Any alterations to the design of this planter may create safety hazards. Follow safe practices to avoid injury.

HS35416,0000A79 -19-01JAN19-1/1

## DRIVE LINE SAFETY

Contact with a Rotating drive line can cause death – keep away. Do not operate without all driveline shields turn freely on driveline.

TS1644 —UN—22AUG95

HS35416,0000A7A -19-01JAN19-1/1

## PREPARING THE PLANTER

For the initial preparation of the planter, lubricate the planter and row units. Make sure that all tires are evenly inflated, that all drive chains have the proper tension, alignment and lubrication.

**CAUTION: Before starting up the planter, check that all main bolts are properly tightened and that planting units are equipped with the proper seed disc. Also check that the shutters inside the metering boxes are adjusted correctly(see Row Unit section). Check daily to see if the bolts of the hitch are tight.**

T81389 —UN—28JUN13

**WARNING!** : The PTO shaft should be at a reduced angle during lifting. If the angle is too steep, reduce the PTO speed at the end of the field. (Normally the seed remains under suction even at 400 rpm)

### LUBRICATION

Frequency of lubrication for:

**Chain lubricant**

**50 hr.**

- Unit drive chains
- Wheel block drive chains
- Transmission chains & rollers
- Insecticide drive chains
- Liquid fertilizer squeeze pump drive
- Chain rollers and shafts on unit

**Grease**

**10 hr.**

- Gauge wheel arms
- Row marker hinge points

**50 hr.**

- Frame Hinges/Joints

**200 hr.**

- Wheel Hubs

*NOTE: Extreme operating conditions such as excessive dirt, temperature, or speed may require more frequent lubrication*

### LUBRICATE WHEEL BEARINGS

Wheel bearings should be repacked with clean, heavy-duty axle grease every 4-5 seasons. This applies to all drive wheels, transport wheels, and marker hubs.

### LUBRICATE GREASE FITTINGS

Those parts equipped with grease fittings should be lubricated at the frequency indicated with high-quality SAE grease. Be sure to clean the fitting thoroughly before using a grease gun. The frequency of lubrication recommended is based on the normal operating conditions. Severe or unusual conditions may require more frequent lubrication.

### CHAIN TENSION ADJUSTMENT

The drive chains are spring loaded and therefore self-adjusting. The only adjustment needed is to shorten the chain if wear stretches the chain and reduces spring tension. The pivot point of these idlers should be checked periodically to ensure they would rotate freely.

### TIRE PRESSURE

Tire pressure should be checked regularly and maintained as follows:

| | | |
|---|---|---|
| 3 pt mounted | | |
| Ground drive | 7.60 x 15 | 35 psi (7x7) |
| | 5.90 x 15 | 36 psi (5x5) |
| Pull type rigid, Wingfold | | |
| Transport | 7.50-20 | 48 psi |
| Contact drive | 4.10-6 | 10 psi |

**Continued on next page**

HS35416,0000D4A -19-25JUN19-1/2

**DANGER**

**Rim and tire servicing can be dangerous. Explosive separation of a tire and rim parts can cause serious injury or death.**

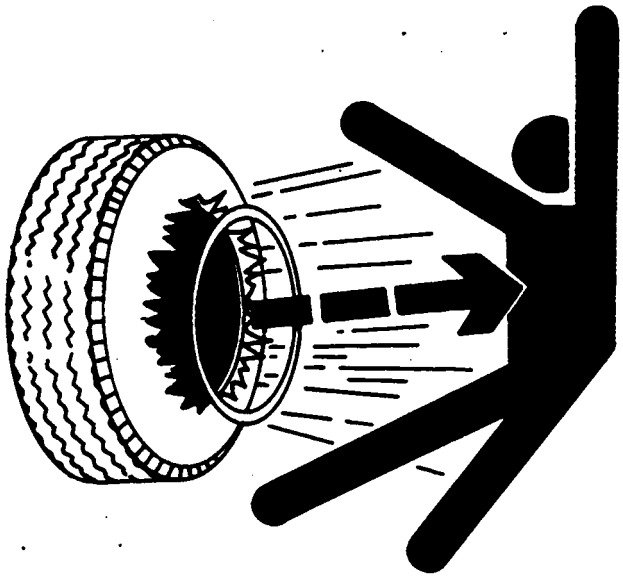
**Do not attempt to mount a tire unless you have the proper equipment and experience to perform the job. Only properly trained and equipped people should do this job.**

**Maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.**

**When inflating tires, use a slip-on air chuck and extension hose long enough to allow you to stand to one side, and not in front of or over the tire assembly. Use a safety cage to enclose the tire and assembly when inflating.**

**Inspect tires and wheels daily. Do not operate with low pressure, cuts, bubbles, damaged rims, or missing lug bolts and nuts.**

**IMPORTANT: Check daily to see if the bolts of the hitch are tight.**



TS211 —UN—15APR13

HS35416,0000D4A -19-25JUN19-2/2

## TRANSPORTING THE PLANTER

**CAUTION: Use necessary safety precautions such as safety lights and devices.**

Observe legal regulations before transporting the planter on public roads.

The Maximum transport speed for this planter is 20 mph, or 32 km/h. **DO NOT EXCEED**. Never travel at any speed that does not permit adequate control of steering and stopping.

Do not carry passengers on transported equipment.

Make sure to clear any obstructions overhead and to the side of the implement while transporting.

Make allowances for increased length and weight of the planter when making turns, stopping, etc.

HS35416,0000D4B -19-31AUG20-1/1

## OPERATING SPEED

The operating speed needs to be selected as a function of:

- The desired consistency in the row
- The ground conditions
- The density of the seed

**OPERATING SPEED**

A high speed is not conducive to accuracy, especially in rough, or rocky conditions that cause the unit to bounce.

Likewise, a high seed density may cause the disc to rotate fast, thus burdening the metering.

It should be noted that misshapen and angular seeds are difficult to sow regularly, particularly at high working speeds.

## FIELD TEST

Before the initial operation of the planter, a field test is advised. Check for the following:

- That the planter is level (front to back and side to side) (see Level Integral Machines)
- Check that the hydraulics of the 3-point hitch of the tractor is in a float position while planting.
- That all of the row units are running level and remain parallel to the ground when planting.
- Check that each metering unit is metering properly (see Row Unit section).
- Check that the seed disc has the proper number of holes and proper diameter of holes for the type of seed you will be planting (see Seed Disc chart in Row Unit section).
- Check for the proper application rates of chemicals on all rows.
- Check the desired seed depth and population. (see Row Unit section).

HS35416,0000D4D -19-25JUN19-1/1

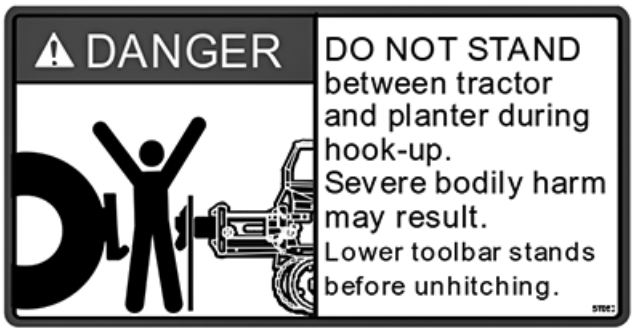
## CHECKING SEED POPULATION

1. Only one planting unit is necessary to check seed population. Tie up the sets of closing wheels on one unit with a heavy cord or light chain. It may be necessary to decrease the tension of the closing wheel arm.
2. Put seed in the seed hopper.
3. Begin planting. At the end of a short distance (for example 100 yards or 90 meters) check to see if seed is visible in the seed trench. Make adjustments to seed depth if necessary.
4. Measure off 1/200 of an acre of the test row just planted. Use the chart below to find the approximate distance. Mark this distance with flags.

Count the seeds within the distance between the flags. Multiply the number of seeds counted in this distance by 200. This will give the total number of seeds planter per acre

| Fraction Of Acre | Row Width | | | |
|---|---|---|---|---|
| | 22" | 30" | 36" | 40" |
| 1/200 | 119 | 87 | 72 ½ | 66 |

*NOTE: When viewing the test row for seed population and placement, remember that the closing wheels were tied up in a raised position. Therefore, the seeds may have rolled or bounced and will affect the seed placement for accuracy.*




APY02900 —UN—11FEB19

HS35416,0000D4E -19-25JUN19-1/1

## Use Your Tractor Operator's Manual

Always refer to your tractor operator's manual for specific detailed information regarding the operation of your equipment.

The following tractor-related information uses John Deere™ tractors to illustrate preparation, attachment, and operational procedures. Use your tractor operator's manual for detailed information, as procedures vary by equipment.

TS190 —UN—17JAN89

HS35416,000119A -19-03AUG20-1/1

## Add Weight to Tractor Front End

**CAUTION: Even with front-end ballast, stability is reduced if the tractor is driven too fast over rough ground with machine in raised position. Be safe and drive slow under these conditions.**

Install the proper amount of weight on the front of the tractor as recommended in the tractor operator's manual. For proper front end weight, see the implement code tables if available.

The implement code number represents the weight of the implement and how far rearward the weight is from the tractor.

*NOTE: Dual rear wheels may be required for stability and load capacity.*

For tractor hitch lift requirements and front ballast requirements, use the implement code method on the following pages.

A68930 —UN—30SEP10

Determine the hitch lift compatibility first to determine if lift assist wheels are needed.

**Determine the Front-End Weight without Implement Codes**

When implement code information is not available, see your tractor manual, your dealer, or qualified service provider.

## Planter Effective Weight

Normally a tractor's 3 pt. hitch lift capacity is rated with the center of gravity (CoG) of the load at 24 inches behind the lower hitch pins. If the implement has a CoG other than 24 inches, it can 'feel' lighter or heavier. A distance greater than 24 inches would make the implement 'feel' heavier and the effective weight would therefore be important to know so that the tractor is not overloaded and can be properly ballasted.

Always read and understand the tractor's operator manual when attaching a 3 pt implements. This information is suggested to be used as a guide. It is the operator's responsibility to ensure the tractor and implement are used safely, both in the field and on the road during transport.

This formula should be used for row crop tractors with a minimum rated engine power of 200 Hp. If no exact CoG can be determined for the planter, make an estimate with some safety factor included.

!! Keep in mind that product weight such as seed or fertilizer will affect scale weight and CoG. !!

!! Keep in mind that a tractor's rated lift capacity may be what it can lift in the field, but is very likely not what it's rated to safely carry on the road. !!

**EW = SW x D/61 + SWx37/61**

EW = Effective Weight ('Feels like' weight) in Lbs.

SW = Scale Weight in Lbs.

D = Center of gravity (CoG) horizontal distance to lower hitch pins (3pt) in Inches

Example: A 3pt planter fully loaded with product has a scale weight of 10,000 lbs. and a CoG horizontal distance of 48 inches to the lower hitch pins. The effective weight on the tractor would be : 10,000 x 48/61 + 10,000 x 37/61 = 7,868.8 + 6,065.6 = 13,934.4 lbs. Effective weight. Therefore, the additional CoG distance added about 39% to the scale weight of the loaded machine

HS35416,000119C -19-31AUG20-1/1

## Set the Tractor Wheel Spacing

*NOTE: On planters without drawbars, certain tire combinations require a Category 3N quick coupler to obtain wheel tread settings on 30 inch rows.*

**Single Wheels or Inner Dual Wheels** Set the wheels in, as far as possible, with the tread centers between the planter rows (typically twice the row spacing on non-split row planters).

**Outer Dual Wheels** Set the dual wheels with the tread centers as close as possible between the planter rows (typically four times the row spacing on non-split row planters).

HS35416,000119D -19-03AUG20-1/1

## Recommended Tractor Settings

See Tractors Operator's Manual for complete operating instructions

| Tractor Settings | |
|---|---|
| **Item to set** | **Planter Models** |
| Drawbar | Offset down or drawbar removed |
| Sway Blocks | On lift assist models, see Tractor Operators Manual to shim draft arms. |
| Three Point Links | Set for lateral float. See Tractor Operator's Manual. |
| Three Point Center Link | See Attaching Machine section for each configuration. |
| Hitch Control | Set to position control |
| Tire Ballast | Limit liquid or cast weight on rear tires[a,b] |
| Tractor Hydraulics | Closed Center Only<br>Minimum tractor hydraulic pressure - 15 513 kPa (155 bar) (2250 psi)<br>Working pressure - 20 684 kPa (207 bar) (3000 psi) |
| Tire Pressures | See Tractor Operator's Manual. |
| Hydraulic Controls | See HYDRAULIC CONNECTIONS RECOMMENDATIONS. |

[a] *Dual rear tractor tires are recommended for stability and for load carrying capacity, especially when the machine is folded for transport.*
[b] *To carry the machine for transport, limit liquid or cast wheel weights on rear tractor tires as tire load carrying capacity is decreased.*

HS35416,000119E -19-03AUG20-1/1

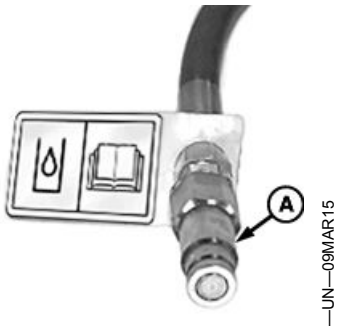
## Case Drain and Hydraulic Motor Requirements

**IMPORTANT: Most planter hydraulic configurations utilize hydraulic motors equipped with case drain connections. To avoid damage to the hydraulic motors, connect the case drain hose to the tractor with a low-pressure drain coupler. Install the coupler in a port with less than 25 psi.**

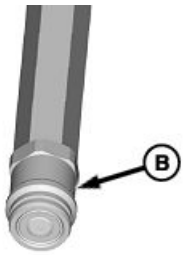
The case drain hose (A) must be attached to a low-pressure drain connection before any other hose connection.

If tractor is not equipped with case drain connector, kits are available for a John Deere™ tractor. For other tractors, see the tractor dealer for a suitable connection kit.

Some hydraulic motors are low flow, high-pressure motors. The motors are designed to operate on a closed- center hydraulic system. Connecting low flow, high-pressure hydraulic motors to an open-center system is not recommended. See your dealer or qualified service provider for more information.




A85287 —UN—09MAR15




A85597 —UN—10MAR15

**A— Machine Drain Coupler** **B—Tractor Drain Connection**

HS35416,000119F -19-03AUG20-1/1

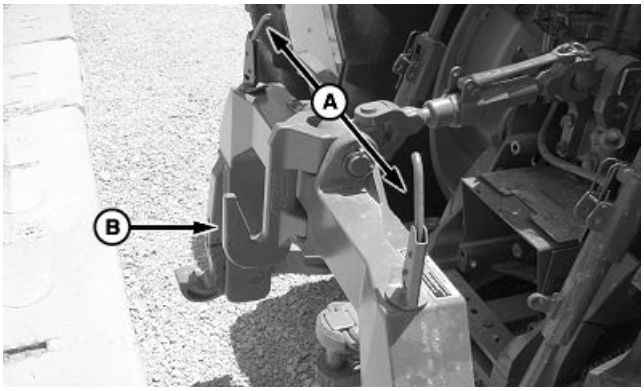
## Attach the Planter to the Tractor

**CAUTION: Do not stand between the tractor and the planter unless the tractor transmission is in Park.**

1. Place the hitch-load depth control in the Position setting for better control when hitching and during operation (Refer to the Tractor Operator's Manual).
2. Raise both quick-hitch latch control levers (A). Verify that the correct center-link top hook (B) is installed on the quick-hitch before proceeding.

**CAUTION: To prevent possible injury during tractor attachment, only use hitch controls that move with incremental steps (Refer to the Tractor Operator's Manual).**

3. Lower the rockshaft until the quick-hitch hooks are lower than the planter hitch pins. Slowly back the tractor up to the planter.




A63742 —UN—06NOV08

*8030 Series Tractor Latch Levers Shown*

**A—Latch Control Levers** **B—Category 3 Center Link Top Hook**

4. Check the drawbar clearance. If the drawbar contacts the hitch or planter, turn the drawbar offset down and in the shortest possible position.

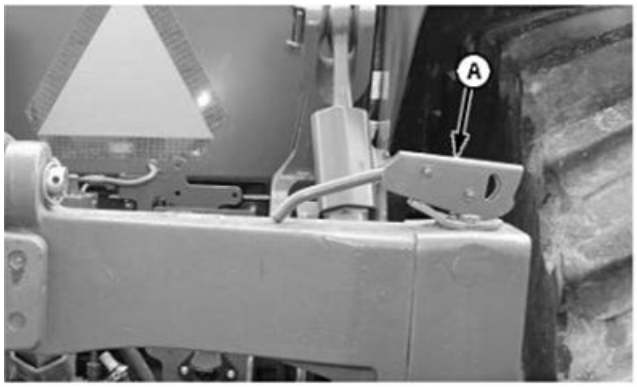
**Continued on next page**

HS35416,00011A0 -19-31AUG20-1/2

**CAUTION: When the latch control levers (A) are properly locked, the handles are horizontal and against the hitch frame.**

5. Raise the rockshaft enough to engage the planter hitch pins in the quick-hitch hooks. Push both latch control levers (A) down to lock the planter to the quick-hitch.
6. Check the tractor dual wheel tire clearance.
7. After the planter is attached to the tractor, remove the spring locking pin and drilled pin. Raise the support stands up and secure with the drilled pin and spring locking pin.

**A—Latch Control Lever**




*Locked Position*

APY02894 —UN—11FEB19

HS35416,00011A0 -19-31AUG20-2/2

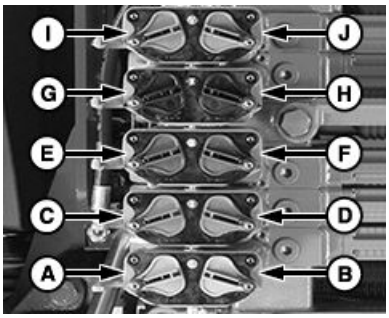
## Hydraulic Connections Recommendations

Extend and Retract symbols are on tractor selective control valve (SCV) cover.

Refer to tractor operator's manual for specific hydraulic operational details.

**CAUTION: Avoid hydraulic hose failure due to physical damage, kinks, age, and exposure. Inspect hoses regularly. Replace damaged hoses.**

**IMPORTANT: Avoid motor seal damage. Connect the case drain hose before any other hose. Connect vacuum and variable rate drive (VRD) return hoses to a tractor "extend" SCV.**




*Tractor Valves*

A82588 —UN—23MAY14

Avoid motor seal damage. Move tractor SCV lever to float (not neutral) position to shut off vacuum and VRD.

HS35416,00011A1 -19-03AUG20-1/1

## Check The Hydraulic System

**CAUTION: Escaping fluid under pressure can penetrate the skin and cause serious injury.**

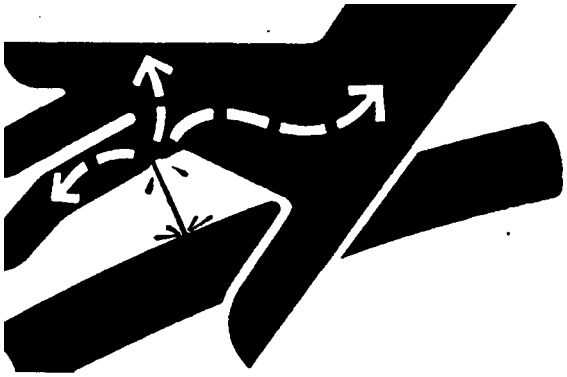
Relieve the hydraulic pressure before disconnecting the hydraulic or other lines to avoid this hazard. Tighten all of the hydraulic connections before applying pressure.

Search for leaks with a piece of cardboard. Protect your hands and your body from high-pressure fluids.

If an accident occurs, see a doctor immediately. Any fluid injected into your skin must be surgically removed within a few hours or gangrene can result. Doctors unfamiliar with this type of injury must reference a knowledgeable medical source.

Hydraulic hoses can fail due to physical damage, kinks, age, and exposure. Check the hoses regularly. Replace any damaged hoses.

After applying pressure to system, check all of the hydraulic connections and the hoses for leaks.



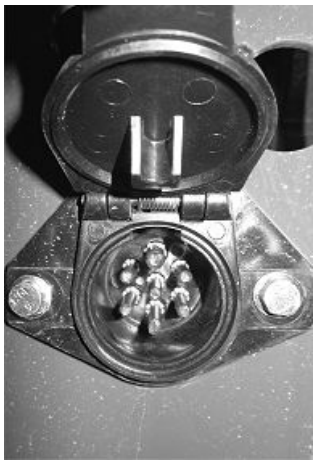
X9811 —UN—23AUG88

**IMPORTANT: The tractor hydraulic oil level can drop below the operating level when operating the machine for the first time. Check the tractor hydraulic oil level after filling the cylinders with oil for the first time.**

HS35416,00011A2 -19-03AUG20-1/1

## Attach the Warning Light Harness

Attach the warning light harness to the 7-pin connector.



A85921 —UN—25MAR15

HS35416,00011A3 -19-03AUG20-1/1

## Warning Lights and Slow Moving Vehicle Emblem

When transporting the planter on a roadway, use flashing warning lights and turn signals day and night. Prevent collisions between other road users.

**IMPORTANT: The construction of this planter may not meet all local or national requirements for transport on a public roadway. In regions or countries that have national certification requirements for roadway transport, it may be impossible for this planter to be approved for such roadway transport. The customer is responsible for understanding and complying with all local, regional, and national requirements regarding roadway transport.**

*NOTE: Keep reflective material and slow moving vehicle (SMV) emblem clean and visible.*

Keep lights visible, clean, and in working order.

Check local governmental regulations. Various safety devices are available from your John Deere dealer or qualified service provider. Keep safety items in good condition. Replace missing or damaged items.

*NOTE: Light and emblem placement vary according to local, regional, and national government regulations.*

Amber warning lights are positioned on the outer edge of each side of the planter. On integral planters, red lights are also positioned next to the amber lights.

Slow moving vehicle emblem is centralized on the rear of the planter.

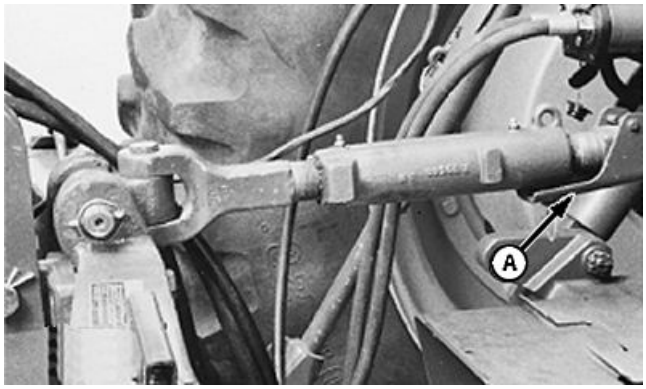
HS35416,00011A4 -19-03AUG20-1/1

## Leveling The Planter

*NOTE: Set the frame height before leveling.*

1. Drive the tractor and planter onto level soil.
2. Lower the planter while driving forward.

**IMPORTANT: With the planter lowered into the planting position, the tractor hitch must not carry any of the planter weight. The row units and the frame wheels support the planter weight. Adjust the tractor hitch links so that they do not support any of the planter weight. Level the frame front-to-rear with combined adjustments of the tractor center link (A) and the planter gauge wheels.**




A56304 —UN—11MAY05

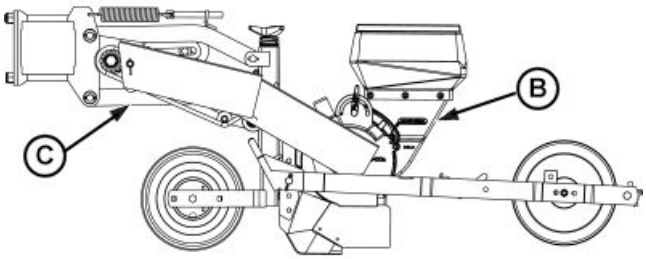
**A—Tractor Center Link**

ch177nn,1687497691573 -19-23JUN23-1/2

3. Verify that the planting units (B) are parallel with the ground. Adjust the center link and gauge wheels as needed.

   While planting, the parallel arms (C) should be parallel to ground or angle slightly upward toward the planter frame. The bottom of the toolbar should be approximately 16" above the ground.

4. Periodically verify that the toolbar and planting units are level during operation.




APY71656 —UN—08MAY23

**B—Planting Units** **C—Parallel Arms**

ch177nn,1687497691573 -19-23JUN23-2/2

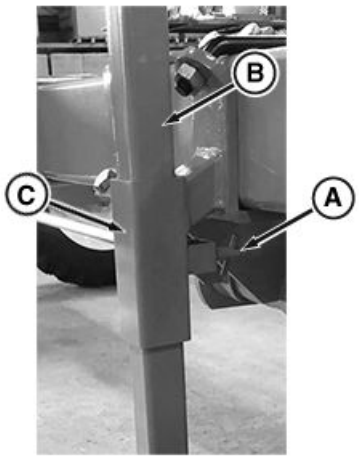
## Detach from Tractor

**IMPORTANT: Top of parking stand (B) must extend out the top of support tube (C) for stability.**

1. Lower parking stand (B) and fasten with pin (A).
2. Lower machine to ground. See tractor operator's manual.
3. Place SCV levers in “Float” position.
4. Turn tractor key switch off.

**CAUTION: Avoid injury from escaping hydraulic oil under pressure; relieve pressure in the system before removing hoses from breakaway couplers.**

5. Disconnect all hydraulic hoses.
6. Disconnect warning light harness from 7-pin connector.
7. Disconnect monitor wiring harness.
8. Attach dust covers to harness connectors.
9. Disconnect machine from tractor.




APY40820 —UN—31AUG20

*Detach from Tractor*

**A—Pin**
**B—Stand**
**C—Support Tube**

HS35416,00011A6 -19-31AUG20-1/1

## General Startup Points

**IMPORTANT: Do not put the selective control valve (SCV) lever in the float position when raising and lowering the machine. Correct procedure for raising and lowering the machine is to power up or down completely.**

1. To prevent plugging of the seed tubes or the seed openers, Do not back up with the machine lowered.

   For proper machine operation, it is important that the machine frame is lowered fully into the correct planting position. Achieving this position can be difficult with some attachment combinations, especially when planting in hard to penetrate soil conditions. If this situation is encountered, the following action is warranted:

   Reduce the attachment downforce levels. Avoid using more attachment downforce than required.

   Use recommended size tractor. (See Tractor Requirements.)
2. Verify that the tractor and the planter have been properly prepared.
3. Check the seed rates carefully.
4. Check the tire pressure before seeding.
5. Allow the tractor hydraulic oil to warm up thoroughly before seeding.
6. Use clean seed for the best results.
7. Use detailed information about your planter attachments for the function and operation.

HS35416,00011A7 -19-03AUG20-1/1

## Hydraulic Motor Operation

Connect hoses correctly.

To engage hydraulic motors, move the selective control valve (SCV) lever forward (retract function) and engage the detent.

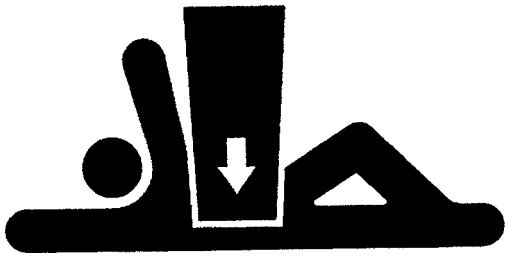
Avoid motor damage from pressure spikes in the hydraulic system. Move the SCV lever forward into "Float" position, not into “Neutral” position, to shut off hydraulic motors.

Once the hydraulic motors come to a stop, the SCV lever can be returned to “Neutral” position.

HS35416,00011A8 -19-03AUG20-1/1

## Support The Machine Before Service

**CAUTION: Avoid crushing injury or death from falling machine. Ensure service locks are installed on all cylinders and machine is supported on blocks before performing any service or adjustments.**



A44347 —UN—16DEC97

1. Raise the machine.
2. Place the support blocks under the gauge wheels.
3. Install the service locks on all of the lift cylinders.
4. Lower the machine onto the support blocks
5. Shift the tractor to “Park” and set the parking brake.
6. Stop the engine and remove the key.

HS35416,00011A9 -19-03AUG20-1/1

## Store the Machine

**CAUTION: Avoid skin, eye, and respiratory injury. Follow chemical manufacturer's precautions when handling parts coated with chemicals or treatments. Use proper skin, eye, and respiratory protection.**

**IMPORTANT: Avoid damage to electrical components, bearings, hoses, or hoppers. Avoid direct spray at sensitive components. Use caution, if power washing machine.**

When planting is completed for one season, store the machine under a cover with all parts in operating condition.

Clean the machine thoroughly to remove dirt and residue that holds moisture.

Paint all parts which are chipped or worn.

Lubricate the machine. Grease exposed cylinder rods.

Thoroughly lubricate the chains at beginning of the idle period.

Empty and clean the seed hoppers.

Clean the insecticide or herbicide hopper thoroughly as various chemicals deteriorate system components.

Clean the liquid and dry fertilizer components thoroughly as various fertilizers deteriorate system components.

Inspect the machine for worn or broken parts. See your dealer or qualified service provider during the off season to acquire parts or service when the machine is not needed in the field.

Store the machine in a clean, dry place with the wheels out of the sun.

Relieve the closing-wheel down force. Place the adjustment handle in the neutral setting.

Relieve the row unit down force.

Thoroughly flush the liquid herbicide system with clean water. Follow the chemical manufacturer's label.

**IMPORTANT: Store the seed disks away from extreme heat or direct sunlight. Do not leave the disks in the meters during the off season. Do not store the disks under heavy parts.**

Store the disks in the shipping box or hang on a wall.

Clean the meter housing, meter chamber, and seed disk with compressed air.

Clean the vacuum system.

Inspect the vacuum meter seals. Replace the seals as needed.

Check for hydraulic leaks.

HS35416,00011AA -19-31AUG20-1/1

## Remove from Storage

Before using the machine after it has been stored, inspect the seed hoppers for cleanliness and verify that the seed passages are clear.

Thoroughly inspect the machine for loose parts and adjust as necessary.

**IMPORTANT: High-pressure washers can damage electrical components, bearings, hoses, and hoppers when direct spray is applied. Use caution, if power washing the machine.**

Clean any dirt or grease that accumulated on moving parts, gears, and chains before operating the machine. Cleaning prevents abrasive action that causes excessive wear.

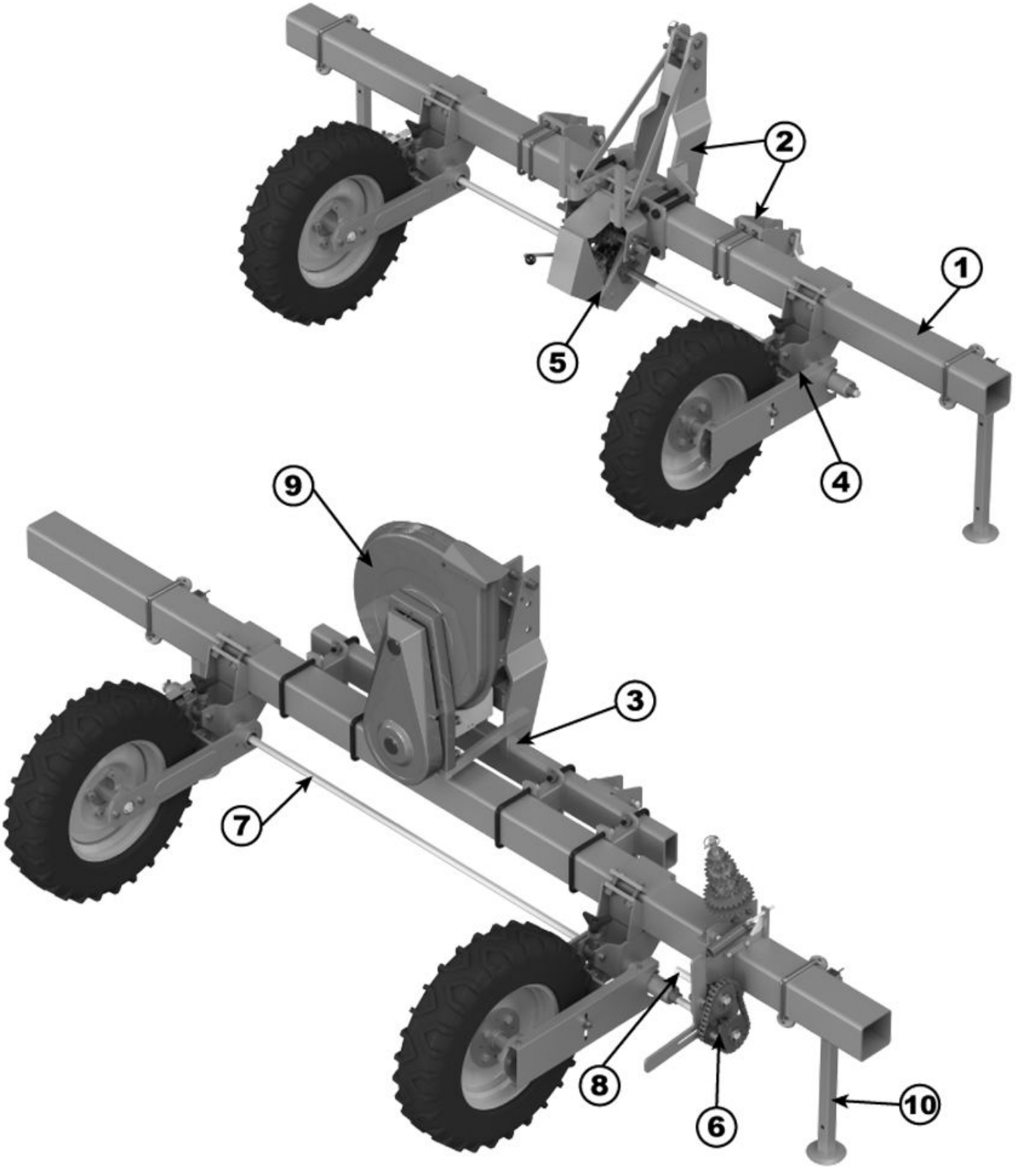
**IMPORTANT: Do not use a heavy petroleum base lubricant that causes a buildup of dust or dirt in the sprocket or gear teeth.**

*NOTE: Rust buildup can become serious enough to cause the chain joints to stiffen, restricting the normal movement. Stiffness can cause abnormal operation, disturb the smooth rotation of important meter components, and cause a deterioration in performance.*

If the machine is not used for several days or if lube has been removed from the chains during cleaning, thoroughly lubricate the chains.

HS35416,00011AB -19-03AUG20-1/1

## MS Planter Frame




APY5844375 —UN—26JUN23

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ch177nn,1687511956725 -19-26JUN23-1/2

The MS planter frame consists of:

- Toolbar (1) the length of which depends on the number of rows and the row spacing.
- 3-point hitch
  - The standard version (2) is for row spacing of more than 14" (36cm) and an even number of row units.
  - Or the special vegetable hitch (3) for easy changes of row spacing.
  - Or the double toolbar hitch for larger planters.
- Drive wheel blocks, two of them, one left block and one right block for planters of less than 12 rows; or four blocks, two left wheel blocks and two right wheel blocks for planters of 12 rows or more, which can be adjusted in height. The standard adjustable gauge wheel blocks (4) have an adjustment spindle allowing the operator to raise or lower the height of the gauge wheel block with ease. The gauge wheel blocks are equipped with 5.90 X 15" tires.
- Transmission, the frame is equipped with a standard center-mount cluster transmission (5) or optional end-mount plate transmission (6).
- Hex shafts, two, driver (7) and driven (8) (driven hex shaft not shown in top photo).
- Turbofan, 16 outlets (9) or vacuum in the toolbar for 8 rows and larger.
- Toolbar stands, two, (10).
- Row markers optional.

ch177nn,1687511956725 -19-26JUN23-2/2

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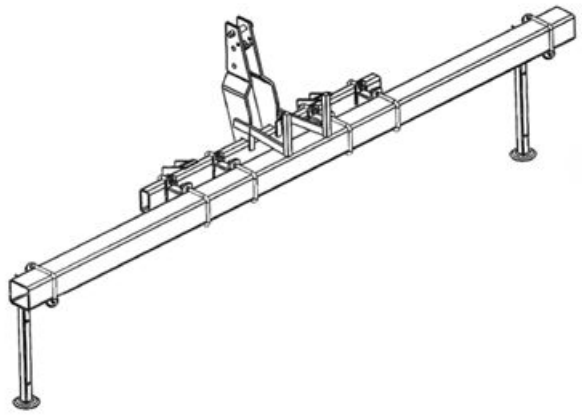
## MS TOOLBAR HITCH

CAT 2 Free Link

This hitch is generally used on planters 8 rows or less.



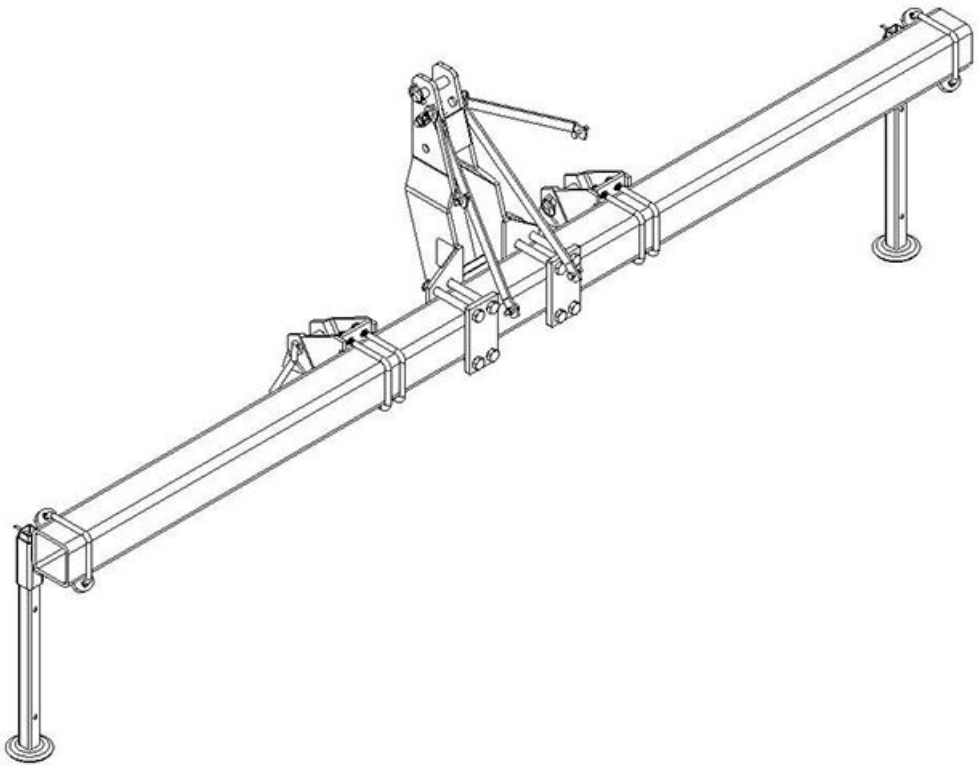
APY71658 —UN—08MAY23

*MS TOOLBAR HITCH*

ch177nn,1687774352502 -19-26JUN23-1/1

## 5" x 5" Mounted Toolbars (Hitch Configurations)

### STANDARD TOOLBAR HITCH



APY38987 —UN—03AUG20

CAT 1, 2 Free Link

This hitch is generally used on planters 8 rows or less.

If necessary, the lower mounting brackets of the standard hitch can be mounted as a counter clamp of the planting unit.

**Continued on next page**

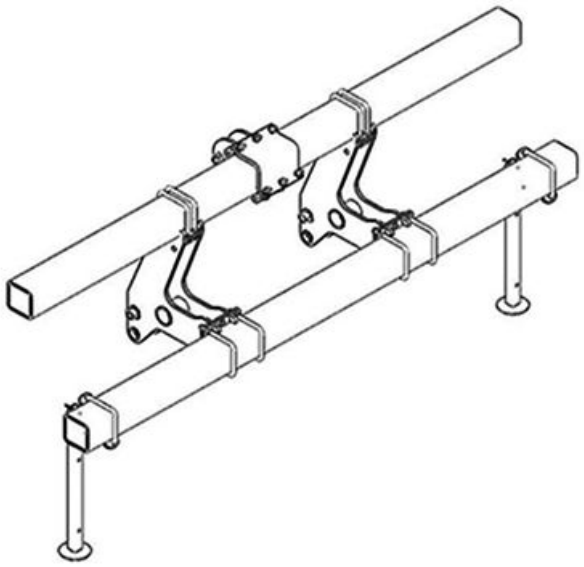
ch177nn,1687511353587 -19-23JUN23-1/7

## DOUBLE TOOLBAR HITCH

The planter hitch of the double toolbar consists of two lower hitch brackets (right and left) and one upper mounting bracket.

This tool bar works with CAT 2 & 3 Free Link, CAT 2, 3, 3N Quick Hitch.

The double toolbar hitch is generally used with two spacers for extra support.



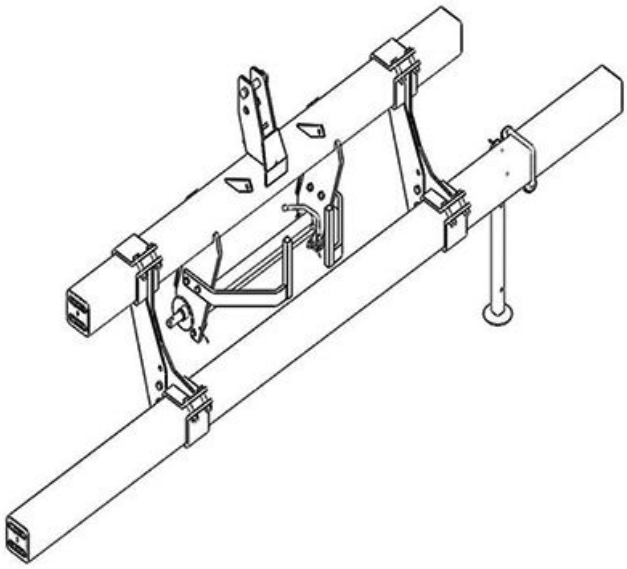
APY38988B —UN—12JUN23

*DOUBLE TOOLBAR HITCH*

ch177nn,1687511353587 -19-23JUN23-2/7

## ADVANCED TOOLBAR HITCH

This hitch allows for odd number of rows. The hitch is semi-automatic and is used with CAT 2 free link only.



APY38989B —UN—12JUN23

*ADVANCED TOOLBAR HITCH*

**Continued on next page**

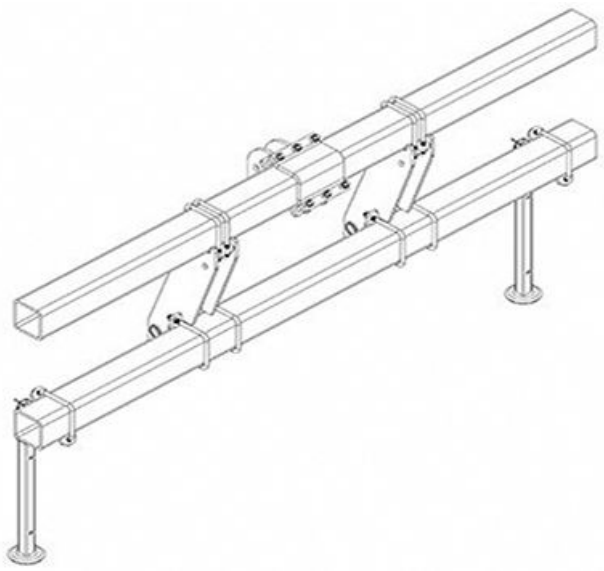
ch177nn,1687511353587 -19-23JUN23-3/7

**COMBO TOOLBAR HITCH**

This hitch consists of two lower hitch brackets (left and right) and one upper bracket.

This hitch is used with CAT 2 & 3 Free Link, and CAT 2, 3, 3N Quick Hitch.

This hitch is generally used with two added spacer brackets for extra support on 8 row and larger planters.



APY40821B —UN—12JUN23

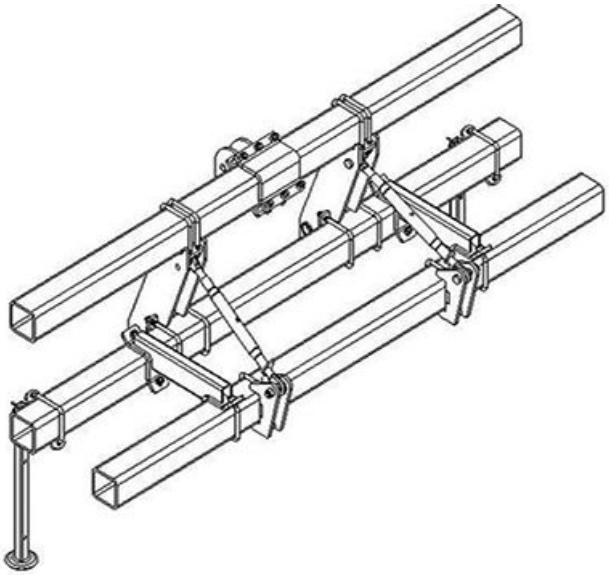
*5X5 COMBO HITCH*

ch177nn,1687511353587 -19-23JUN23-4/7

**DOUBLE TOOLBAR HITCH COMBO**

The spacer toolbar allows for the use of bed rollers or shapers on the front bar.

This toolbar uses the combo hitch, which is compatible with CAT 2 & 3 Free Link, CAT 2 & 3 Quick Hitch.



APY38990B —UN—12JUN23

*DOUBLE TOOLBAR HITCH COMBO*

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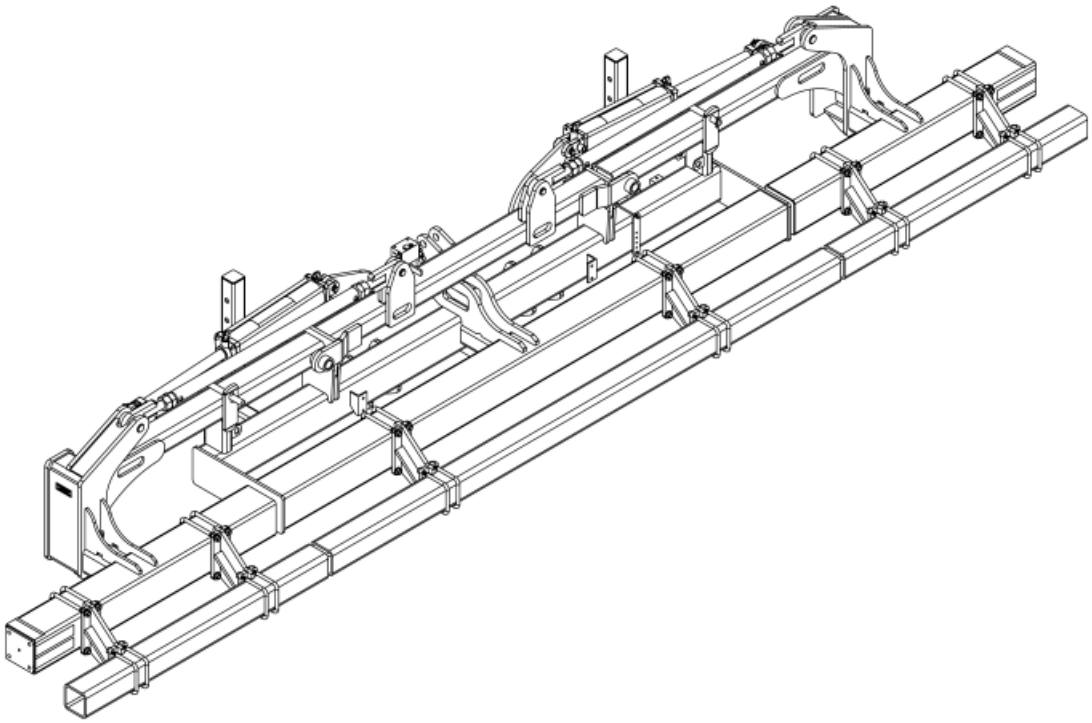
ch177nn,1687511353587 -19-23JUN23-5/7

**8R30 7 X 7 STACKING TOOLBAR WITH 5 X 5 OFFSET**



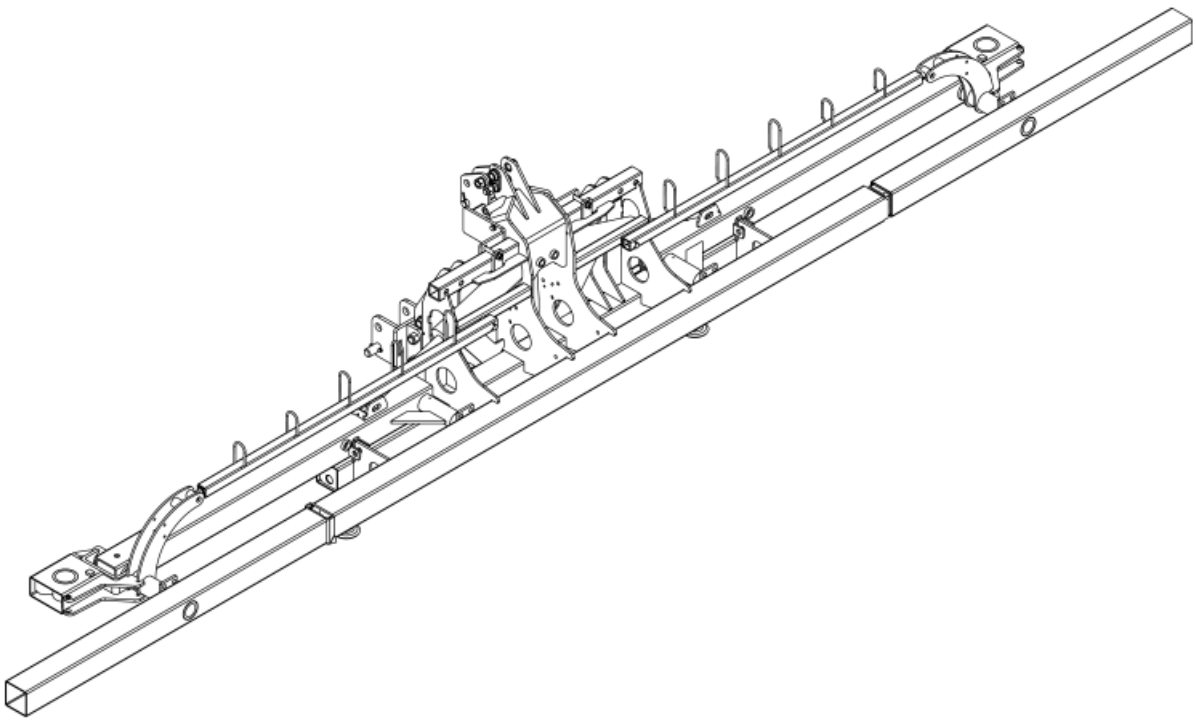
APY71659 —UN—08MAY23

*8R30 7 X 7 STACKING TOOLBAR WITH 5 X 5 OFFSET*

This toolbar works with CAT 2 & 3 Free Link, and CAT 2, 3, 3N Quick Hitch.

**Continued on next page**

**5 X 5 STACKING TOOLBAR**



APY71660 —UN—08MAY23

*5 X 5 STACKING TOOLBAR*

This toolbar works with CAT 2 & 3 Free Link.

Hitch adapters are available for CAT 2, 3, 3N Quick Hitch compatibility.

ch177nn,1687511353587 -19-23JUN23-7/7

## Hex Shaft, Couplers, Bushing Stops

It is important to visually check the hex shaft each season to make sure it is straight.

Check that bushing stops are tight to prevent the hex shaft from moving side to side.

HS35416,00011C0 -19-05AUG20-1/1

## Adjustable Wheel Blocks

**Tire Size**

Adjustable wheel blocks use the following tire and pressures:

Tire size = 5.90” x 15”

Pressure = (36 PSI) (248 kPa)

**Check tire pressure regularly. Incorrect tire pressure will affect target population.**

A periodic check of tire pressure is very important.

There is a right and left mounting for the wheel blocks.

Inspect tires and wheels daily.

Do not operate with low pressure, cuts, bubbles, damaged rims or missing lug bolts and nuts.

**IMPORTANT: Check that the chains for the drive wheel blocks are tight. If not, tighten adjustment bolt (A) in an "up" position.**

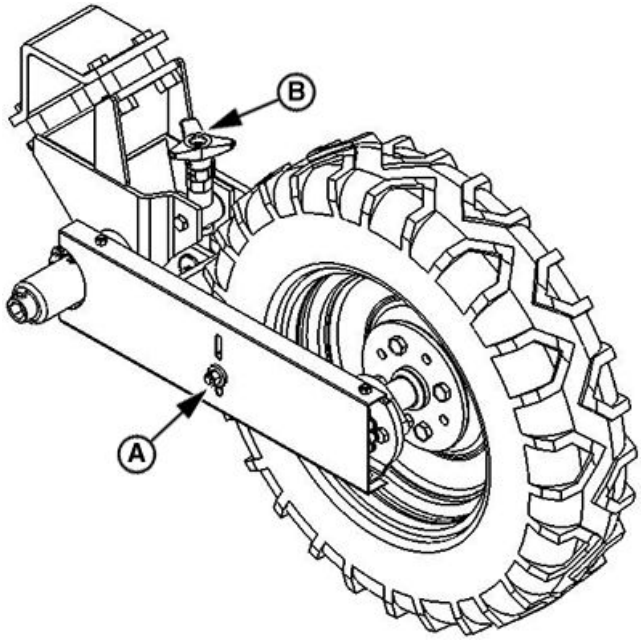
**Also, check that the bushing stops of the upper hex shaft and the bolts of the drive wheel blocks are tight. The bolts or the drive wheel blocks secure the lower hex shaft**

**Adjusting The Drive Wheel**

The adjustable drive wheel block allows for adjustment of the toolbar level and for variances in seed bed height.

There is a right and left mounting for the wheel blocks. which is determined by standing behind the planter.

**CAUTION: Rim and tire servicing can be dangerous. Explosive separation of a tire and rim parts can cause serious injury or death!**




APY38992 —UN—31AUG20

*5X5 Adjustable Wheel Block*

**A—Chain Adjustment** **B—Height Adjustment**

**CAUTION: Do not attempt to mount a tire without proper training and proper equipment to perform the job. Only properly trained and equipped people should do this job. Maintain the correct tire pressure. Do not inflate the tires above the recommended pressure.**

ch177nn,1687512110355 -19-23JUN23-1/1

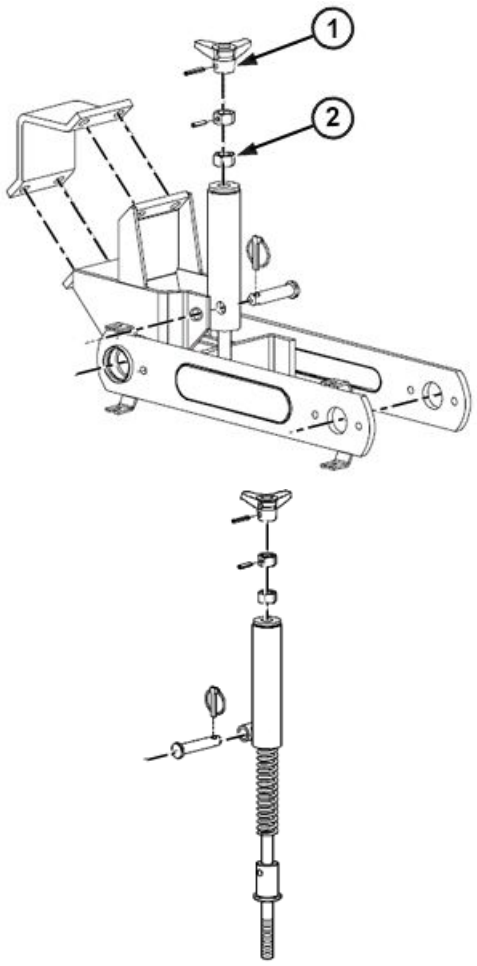
## ADJUSTABLE DRIVE WHEEL

Refer to Figure 1.

**A**: To lower the drive wheel, turn the hand wheel (1) counterclockwise.

**B**: To raise the drive wheel, turn the hand wheel (1) clockwise.

The spring-loaded drive wheel adjustment assembly is intended to act as a “shock absorber” on each drive wheel block. It will allow the drive wheel to flex up and down with variances in the seedbed, while also maintaining contact with the soil surface and let the toolbar remain at approximately the proper operating height. To make the drive wheel block rigid, tighten the nylon locknut (2) on top of the spring housing all the way down (clockwise). This will compress the spring inside the housing and minimize any upward or downward travel of the wheel block. You may still raise and lower the drive wheel by turning the hand wheel (1) in directions A and B above. The complete assembly may be ordered as part No.650610 and includes all items shown in figure 2.




APY84810 —UN—08MAY23



APY84811 —UN—08MAY23

uuf6xgz,1682661518998 -19-08MAY23-1/1

## Gearbox

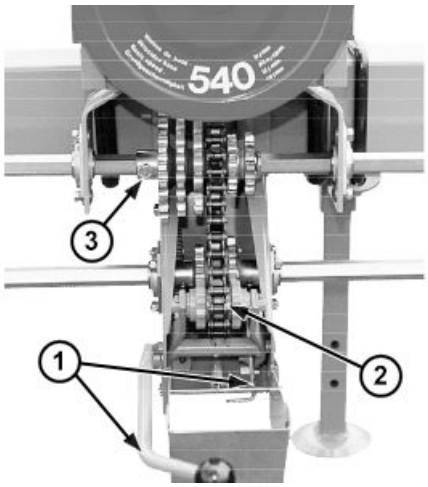
**Three different assemblies are available for the gearbox:**

1. **Standard, Central assembly:** Normal assembly for planters with an even number of rows (4, 6, 8…) and inter-row spacing of 14" or more.
2. **End Plate assembly**: For planters with an odd number of rows (5, 7, 9…) and inter- row spacing of more than 14".
3. **Narrow, Central Assembly**: For planters with row spacing less than 14" where end mounted is not possible.

**SETTING:**

**Standard, Central assembly and Offset assembly**

The standard spacing gearbox (shown below) consists of a changeable upper cluster fitted with 6 sprockets (two 3-sprocket clusters) and a lower fixed 3-sprocket cluster. This allows for 16 different gear ratios. The following gearbox chart indicates the distances possible for each distribution disc. A decal placed on the planter will provide the same information for on-the-spot reference.




APY71661 —UN—08MAY23

To change the seed spacing, push the idler lever, lock its pawl (1) then align to the proper sprocket combination (2). The small upper sprocket cluster is fitted with a set bolt (3), which should be tightened to avoid any sliding of the cluster.

ch177nn,1687512889563 -19-23JUN23-1/3

**End mounted transmission**

The end mounted transmission has two interchangeable drive sprockets. The lower driving gear (9) and the upper driven gear (7). 13 gear combinations are possible.

*NOTE: More sprocket combinations may be available with custom orders. Please consult Monosem or your Monosem dealer in case you have such special requirements.*

To change sowing distance, first select the desired spacing from the following gearbox chart. A decal placed on the planter will provide the same information for on-the-spot reference.

Next, disengage the chain by pressing down on the idler lever (8). Using the indicated sprockets on the chart, exchange the driver sprocket (A) and driven sprocket (B) to achieve the desired gear ratio. Make sure the driver and driven sprockets are well aligned and the chain sits in line with the idler roller. Once the desired gears are in place, you may reengage the tensioner handle.

The unused drive sprockets may be stored on the sprocket stack on top of the transmission.

**IMPORTANT: Position the sprockets as shown on the following gearbox chart. Check that the gearbox order.**


APY71663 —UN—08MAY23

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ch177nn,1687512889563 -19-23JUN23-2/3

**Narrow spacing, Central Assembly**

The narrow transmission has two interchangeable drive sprockets. The lower driving gear (6) and the upper driven gear inside the housing (4). 13 gear combinations are possible.

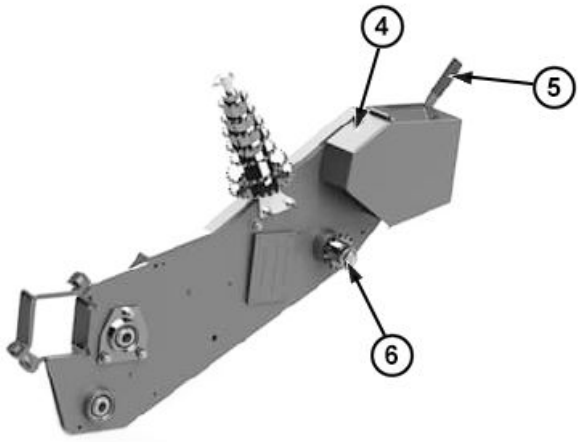
*NOTE: More sprocket combinations may be available with custom orders. Please consult Monosem or your Monosem dealer in case you have such special requirements.*

To change sowing distance, first select the desired spacing from the following gearbox chart. A decal placed on the planter will provide the same information for on-the-spot reference.

Next, disengage the chain by pressing the tensioner handle (5) forward. Using the indicated sprockets on the chart, exchange the driver sprocket (A) and driven sprocket (B) to achieve the desired gear ratio. Make sure the driver and driven sprockets are well aligned and the chain sits in line with the idler roller. Once the desired gears are in place, you may reengage the tensioner handle.

The unused drive sprockets may be stored on the sprocket stack on top of the transmission.

**IMPORTANT: Position the sprockets as shown on the following gearbox chart. Check that the gearbox lever, its lock, and the roller are in good working order.**




APY71662 —UN—08MAY23

Poor alignment of the sprockets and stiffness of the chain will cause premature wear of the sprockets. Use chain oil preferably to regular oil for proper lubrication.

ch177nn,1687512889563 -19-23JUN23-3/3

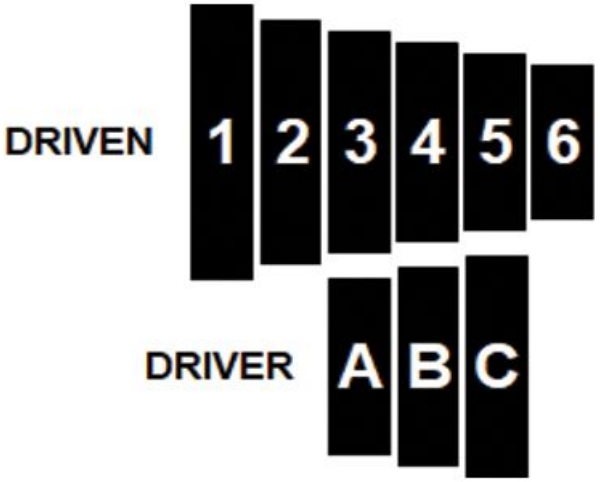
## Standard Sowing distances chart

The following planting distances were obtained with standard assembly and sprocket system. Additional settings are possible by using different combinations or special sprockets. Please consult us in case you have such special requirements.

**IMPORTANT: Poor alignment of the sprockets of the seed spacing gearbox and stiffness of the chain will cause premature side wear on the pinions. Make sure the chains are tight and properly lubricated, and the tires are properly inflated.**

**The indicated spacings are theoretical and may vary from 5-10%depending on soil conditions.**

**The chart shown reflects seed distances for a 5.9 x 15 drive wheel.**




APY71699 —UN—08MAY23

uuf6xgz,1682665573348 -19-05JUN23-1/1

## Standard Sowing distances chart

| A Driver | B Driven | | Number of holes in seed disc | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 18 | 30 | 36 | 60 | 72 | 120 | 180 |
| C | 6 | inch | 5 1/8 | 3 | 2 1/2 | 1 1/2 | 1 1/4 | 3/4 | 1/2 |
| | | cm | 13 | 7.5 | 6 | 4 | 3 | 2 | 1.2 |
| C | 5 | inch | 5 5/8 | 3 3/8 | 2 3/4 | 1 5/8 | 1 3/8 | - | - |
| | | cm | 14 | 8.5 | 7 | 4.5 | 3.5 | - | - |
| B | 6 | inch | 5 7/8 | 3 1/2 | 3 | 1 3/4 | - | 7/8 | 9/16 |
| | | cm | 15 | 9 | 7.5 | 4.5 | - | 2.2 | 1.6 |
| C | 4 | inch | 6 7/8 | 4 | 3 1/4 | 2 | 1 5/8 | 1 | - |
| | | cm | 17 | 10 | 8.5 | 5 | 4 | 2.6 | - |
| B | 4 | inch | 7 3/4 | 4 5/8 | 3 7/8 | 2 1/4 | - | - | 3/4 |
| | | cm | 19.5 | 11.5 | 10 | 5.7 | - | - | 2 |
| A | 5 | inch | 7 7/8 | 4 3/4 | 3 7/8 | 2 3/8 | 2 | 1 3/16 | - |
| | | cm | 20 | 12 | 10 | 6 | 5 | 3 | - |
| C | 3 | inch | 8 5/8 | 5 1/8 | 4 3/8 | 2 5/8 | 2 1/8 | 1 5/16 | 7/8 |
| | | cm | **22** | 13 | 11 | 6.5 | 5.5 | 3.2 | 2.2 |
| A | 4 | inch | 9 1/4 | 5 1/2 | 4 5/8 | 2 3/4 | - | - | - |
| | | cm | 23.5 | 14 | 11.5 | 7 | - | - | - |
| C | 2 | inch | 9 5/8 | 5 3/4 | 4 7/8 | 2 7/8 | 2 3/8 | 1 7/16 | 15/16 |
| | | cm | 24.5 | 14.5 | 12 | 7.5 | 6 | 3.6 | 2.4 |
| B | 3 | inch | 10 1/8 | 6 | 5 | 3 | 2 1/2 | 1 1/2 | 1 |
| | | cm | 25.5 | 15.5 | 13 | 7.5 | 6.5 | 3.8 | 2.6 |
| C | 1 | inch | 10 5/8 | 6 3/8 | 5 3/8 | 3 1/4 | - | 1 5/8 | - |
| | | cm | **27** | 16 | 13.5 | 8 | - | 4 | - |
| B | 2 | inch | 11 1/4 | 6 3/4 | 5 5/8 | 3 3/8 | 2 3/4 | 1 11/16 | 1 1/8 |
| | | cm | 28.5 | 17 | 14.5 | 8.5 | 7 | 4.2 | 2.8 |
| A | 3 | inch | 12 1/8 | 7 1/4 | 6 | 3 5/8 | 3 | 1 13/16 | 1 3/16 |
| | | cm | 30.5 | 18.5 | 15.5 | 9 | 7.5 | 4.6 | 3 |
| B | 1 | inch | 12 3/8 | 7 1/2 | 6 1/4 | 3 3/4 | 3 1/8 | 1 7/8 | 1 1/4 |
| | | cm | 31.5 | 19 | 16 | 9.5 | 8 | 4.8 | 3.2 |
| A | 2 | inch | 13 1/2 | 8 1/8 | 6 3/4 | 4 | 3 3/8 | 2 | 1 3/8 |
| | | cm | 34.5 | 20.5 | 17 | 10.5 | 8.5 | 5.2 | 3.4 |
| A | 1 | inch | 14 7/8 | 9 | 7 1/2 | 4 1/2 | 3 3/4 | 2 1/4 | 1 1/2 |
| | | cm | 38 | 22.5 | 19 | 11.5 | 9.5 | 5.6 | 3.8 |

uuf6xgz,1685960625996 -19-05JUN23-1/1

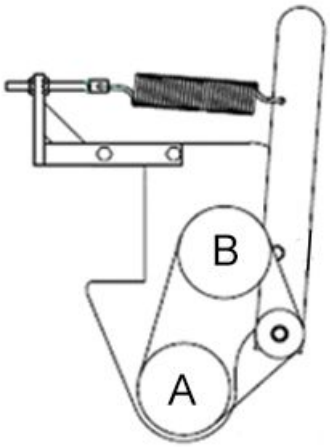
## End-Mounted Transmission

The following planting distances were obtained with standard assembly and sprocket system. Additional settings are possible by using different combinations or special sprockets. Please consult us in case you have such special requirements.

**IMPORTANT: Poor alignment of the sprockets of the seed spacing gearbox and stiffness of the chain will cause premature side wear on the pinions. Make sure the chains are tight and properly lubricated, and the tires are properly inflated.**

**The indicated spacings are theoretical and may vary from 5-10%depending on soil conditions.**

**The chart shown reflects seed distances for a 5.9 x 15 drive wheel.**

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| Transmission Sprocket Selections | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Driven B | | 17 | 17 | 19 | 23 | 23 | 24 | 26 | 26 | 23 | 24 | 23 | 26 | 28 | 26 | 28 | 28 | 24 | 26 | 28 |
| Driver A | | 26 | 24 | 23 | 26 | 24 | 23 | 24 | 23 | 19 | 19 | 17 | 18 | 19 | 17 | 18 | 17 | 14 | 14 | 14 |
| | | Seed Spacing (inches) | | | | | | | | | | | | | | | | | | |
| Number of Holes in the Seed Disc | 9 | 9.2 | 10.0 | 11.6 | 12.4 | 13.5 | 14.7 | 15.2 | 15.9 | 17.0 | 17.8 | 19.0 | 20.3 | 20.7 | 21.5 | 21.9 | 23.2 | 24.1 | 26.1 | 28.1 |
| | 12 | 6.9 | 7.5 | 8.7 | 9.3 | 10.1 | 11.0 | 11.4 | 11.9 | 12.8 | 13.3 | 14.3 | 15.2 | 15.5 | 16.1 | 16.4 | 17.4 | 18.1 | 19.6 | 21.1 |
| | 18 | 4.6 | 5.0 | 5.8 | 6.2 | 6.7 | 7.3 | 7.6 | 8.0 | 8.5 | 8.9 | 9.5 | 10.2 | 10.4 | 10.8 | 10.9 | 11.6 | 12.1 | 13.1 | 14.1 |
| | 24 | 3.4 | 3.7 | 4.4 | 4.7 | 5.1 | 5.5 | 5.7 | 6.0 | 6.4 | 6.7 | 7.1 | 7.6 | 7.8 | 8.1 | 8.2 | 8.7 | 9.0 | 9.8 | 10.5 |
| | 30 | 2.8 | 3.0 | 3.5 | 3.7 | 4.0 | 4.4 | 4.6 | 4.8 | 5.1 | 5.3 | 5.7 | 6.1 | 6.2 | 6.5 | 6.6 | 7.0 | 7.2 | 7.8 | 8.4 |
| | 36 | 2.3 | 2.5 | 2.9 | 3.1 | 3.4 | 3.7 | 3.8 | 4.0 | 4.3 | 4.4 | 4.8 | 5.1 | 5.2 | 5.4 | 5.5 | 5.8 | 6.0 | 6.5 | 7.0 |
| | 40 | 2.1 | 2.2 | 2.6 | 2.8 | 3.0 | 3.3 | 3.4 | 3.6 | 3.8 | 4.0 | 4.3 | 4.6 | 4.7 | 4.8 | 4.9 | 5.2 | 5.4 | 5.9 | 6.3 |
| | 48 | 1.7 | 1.9 | 2.2 | 2.3 | 2.5 | 2.8 | 2.9 | 3.0 | 3.2 | 3.3 | 3.6 | 3.8 | 3.9 | 4.0 | 4.1 | 4.3 | 4.5 | 4.9 | 5.3 |
| | 60 | 1.4 | 1.5 | 1.7 | 1.9 | 2.0 | 2.2 | 2.3 | 2.4 | 2.6 | 2.7 | 2.9 | 3.0 | 3.1 | 3.2 | 3.3 | 3.5 | 3.6 | 3.9 | 4.2 |
| | 72 | 1.1 | 1.2 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 | 2.1 | 2.2 | 2.4 | 2.5 | 2.6 | 2.7 | 2.7 | 2.9 | 3.0 | 3.3 | 3.5 |
| | 90 | 0.92 | 1.00 | 1.16 | 1.24 | 1.35 | 1.47 | 1.52 | 1.59 | 1.70 | 1.78 | 1.90 | 2.03 | 2.07 | 2.15 | 2.19 | 2.32 | 2.41 | 2.61 | 2.81 |
| | 120 | 0.69 | 0.75 | 0.87 | 0.93 | 1.01 | 1.10 | 1.14 | 1.19 | 1.28 | 1.33 | 1.43 | 1.52 | 1.55 | 1.61 | 1.64 | 1.74 | 1.81 | 1.96 | 2.11 |

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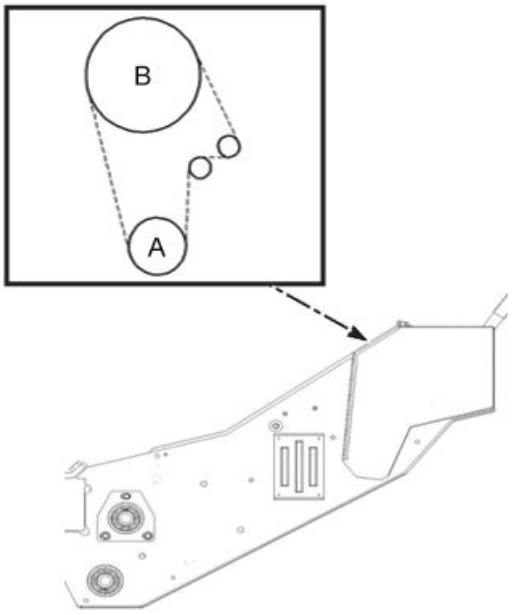
## Extended Center Transmission

The following planting distances were obtained with standard assembly and sprocket system. Additional settings are possible by using different combinations or special sprockets. Please consult us in case you have such special requirements.

**IMPORTANT: Poor alignment of the sprockets of the seed spacing gearbox and stiffness of the chain will cause premature side wear on the pinions. Make sure the chains are tight and properly lubricated, and the tires are properly inflated.**

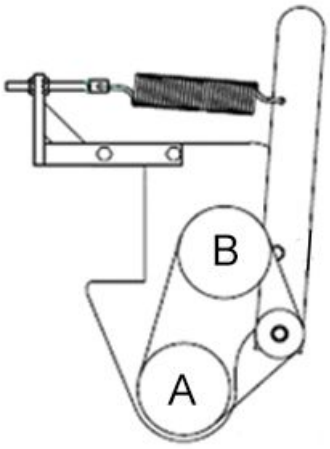
**The indicated spacings are theoretical and may vary from 5-10% depending on soil conditions.**

**The chart shown reflects seed distances for a 5.9 x 15 drive wheel.**




APY71697 —UN—08MAY23

*Center Transmission*




APY71696 —UN—08MAY23

*Wing Transmission*

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## Extended Center Transmission

| A Driver | B Driven | | Number of holes in seed disc | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 18 | 30 | 36 | 60 | 72 | 120 | 180 |
| **24** | **12** | inch | 3.5 | 2 | 1.75 | 1 | 1 | 0.5 | 0.25 |
| | | cm | 9 | 5.4 | 4.4 | 2.6 | 2.2 | 1.4 | 0.8 |
| 18 | **12** | inch | 4.75 | 2.75 | 2.25 | 1.5 | 1.25 | 0.75 | 0.5 |
| | | cm | 12 | 7.2 | 6 | 3.6 | 3 | 1.8 | 1.2 |
| **17** | **12** | inch | 5 | 3 | 2.5 | 1.5 | 1.25 | 0.75 | 0.5 |
| | | cm | 12.6 | 7.6 | 6.4 | 3.8 | 3.2 | 2 | 1.2 |
| **17** | **14** | inch | 5.75 | 3.5 | 3 | 1.75 | 1.5 | 0.75 | 0.5 |
| | | cm | 14.8 | 8.8 | 7.4 | 4.4 | 3.6 | 2.2 | 1.4 |
| **14** | **12** | inch | 6 | 3.75 | 3 | 1.75 | 1.5 | 1 | 0.5 |
| | | cm | 15.4 | 9.2 | 7.6 | 4.6 | 3.8 | 2.4 | 1.6 |
| **17** | **18** | inch | 7.5 | 4.5 | 3.75 | 2.25 | 1.75 | 1 | 0.75 |
| | | cm | 19 | 11.4 | 9.6 | 5.8 | 4.8 | 2.8 | 2 |
| **17** | **19** | inch | 8 | 4.75 | 4 | 2.25 | 2 | 1.25 | 0.75 |
| | | cm | 20 | 12 | 10 | 6 | 5 | 3 | 2 |
| **14** | **17** | inch | 8.5 | 5.25 | 4.25 | 2.5 | 2.25 | 1.25 | 0.75 |
| | | cm | 21.8 | 13 | 11 | 6.6 | 5.4 | 3.2 | 2.2 |
| **14** | **18** | inch | 9 | 5.5 | 4.5 | 2.75 | 2.25 | 1.25 | 1 |
| | | cm | 23 | 13.8 | 11.6 | 7 | 5.8 | 3.4 | 2.4 |
| **17** | **24** | inch | 10 | 6 | 5 | 3 | 2.5 | 1.5 | 1 |
| | | cm | 25.4 | 15.2 | 12.6 | 7.6 | 6.4 | 3.8 | 2.6 |
| **17** | **26** | inch | 10.75 | 6.5 | 5.5 | 3.25 | 2.75 | 1.5 | 1 |
| | | cm | 27.4 | 16.4 | 13.8 | 8.2 | 6.8 | 4.2 | 2.8 |
| **14** | **23** | inch | 11.5 | 7 | 5.75 | 3.5 | 3 | 1.75 | 1.25 |
| | | cm | 29.4 | 17.6 | 14.8 | 8.8 | 7.4 | 4.4 | 3 |
| **14** | **24** | inch | 12 | 7.25 | 6 | 3.75 | 3 | 1.75 | 1.25 |
| | | cm | 30.8 | 18.4 | 15.4 | 9.2 | 7.6 | 4.6 | 3 |
| **14** | **26** | inch | 13.25 | 8 | 6.5 | 4 | 3.25 | 2 | 1.25 |
| | | cm | 33.4 | 20 | 16.6 | 10 | 8.4 | 5 | 3.4 |
| **12** | **24** | inch | 14.25 | 8.5 | 7 | 4.25 | 3.5 | 2 | 1.5 |
| | | cm | 36 | 21.6 | 18 | 10.8 | 9 | 5.4 | 3.6 |
| **12** | **26** | inch | 15.25 | 9.25 | 7.75 | 4.5 | 3.75 | 2.25 | 1.5 |
| | | cm | 39 | 23.4 | 19.4 | 11.6 | 9.8 | 5.8 | 3.8 |

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# VACUUM

## Standard Turbofan

The standard turbofan has a plastic impeller blade and is used on smaller planters. The standard turbofan comes standard with hydraulic drive. PTO options in 450, 540, or 1000 rpm are available.

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## High Output Turbofan

The High Output Turbofan has the same housing as the Standard, but with an aluminum impeller blade, and is used on medium sized planters. The high output turbofan comes standard with hydraulic drive. PTO options in 500 or 1000 rpm are available.

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## Extra High Output Turbofan

The Extra High Output Turbofan has a larger aluminum impeller blade and a larger housing and is used on large planters. The extra high output turbofan comes standard with hydraulic drive. PTO options in 540 or 1000 rpm are available.

The vacuum hoses are attached to the inlet of the turbofan and deliver suction to the metering box of each row unit. An arrow decal on the turbofan housing indicates direction of impeller blade rotation. The top of the impeller blade will rotate towards the fan outlet. A protection shield against rain is located at the top of the turbofan, and when in an open position, indicates that the turbofan is operating.

ch177nn,1687513045033 -19-23JUN23-1/1

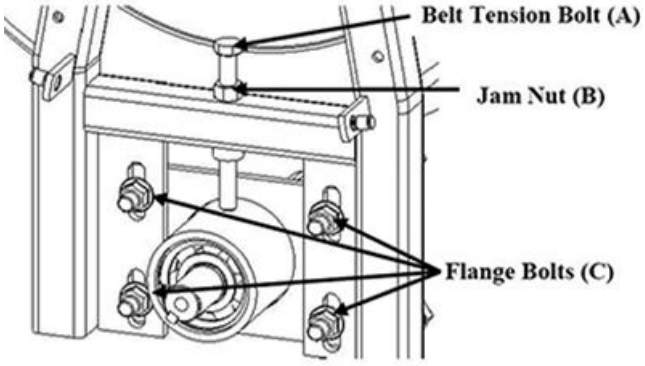
## Before Planting Checklist

- Make sure support strap hardware is tight
- Check all vacuum hoses for holes, tears, breaks or kinks
- Be sure vacuum gauge is functioning
- Inspect condition and tension of drive belt
- Grease U-Joints on PTO shafts
- Be sure top and bottom bearings spin freely
- Check condition of hydraulic hoses if equipped with hydraulic drive

**Tensioning Fan Belt with Belt Tension Bolt**

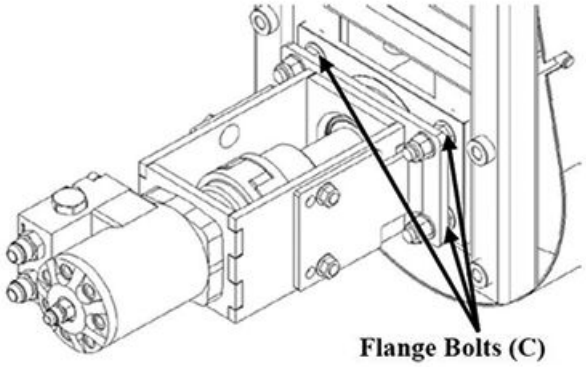
See diagrams at right for PTO and Hydraulic drive

- Loosen 4 flange nuts (C) around lower bearing housing bracket.
- Loosen jam nut (B).
- For a Standard Turbofan torque bolt (A) to 6 ft-lbs.
- For High Output and Extra High Output Turbofans torque bolt (A) to 13 ft-lbs.
- Tighten jam nut (B) and 4 flange nuts (C) around lower bearing housing bracket.




APY18001 —UN—05MAR19

*PTO Drive*

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*Hydraulic Drive*

**Continued on next page**

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**PTO (Power Take Off)**

The PTO connects the tractor to the turbofan.

Make sure you connect the proper end of the PTO to the tractor. An arrow on the PTO indicates the end that is attached to the tractor.

The following warning is placed on your PTO shaft for your safety.

DANGER Rotating drive line contact can cause death – keep away. Do not operate without all drive-line, tractor and equipment shields in place, without drive-lines securely attached at both ends, and without drive-line shields that turn freely on drive-line.

T81389 —UN—28JUN13

TS1644 —UN—22AUG95

**Hydraulic Drive**

Hydraulic Drive is standard on all turbofans.

The desired vacuum is dependent on the correct amount of oil flow to the hydraulic motor.

**Starving the motor of oil will cause the vacuum to drop. An excessive amount of oil flowing into the motor can result in damage to the motor or the turbofan.**

When attempting to shut off the turbofan, the blade must be allowed to "spin down". If the flow of oil stops abruptly, the check valve in the block on the motor will re-circulate the oil already in the motor helping to prevent damage to the fan and motor. Still, you should not allow the flow of oil to stop suddenly. You should move the remote running the fan to the float position when shutting down the hydraulic fan. Refer to your tractor's operators manual for further information.

**You can control oil flow to the motor in one of three ways:**

1. With the tractor hydraulic system controls. This is the most common and recommended method.
2. With a bypass flow control valve (part number 300954) that is optional for the hydraulic motor. For all open-center tractor hydraulic systems. Can be used with closed-center systems also.

Monosem hydraulic drives are closed center systems. Contact your Monosem dealer if you tractor has an open center hydraulic system.

**Continued on next page**

**HYDRAULIC SYSTEM SAFETY DANGER. Before applying pressure to the hydraulic system, check that all connections are tight and that the hoses and fittings have not been damaged. Hydraulic fluid escaping under pressure can penetrate the skin causing serious injury. If injured by escaping hydraulic fluid see a doctor at once. Gangrene can result.**

- **Relieve pressure on system before repairing, adjusting or disconnecting.**

T81389 —UN—28JUN13

X9811 —UN—23AUG88

**Continued on next page**

ch177nn,1687513281805 -19-23JUN23-3/4

**Hydraulic Motor Case Drain**

High Output and Extra High Output (and some Standard) fan motors are equipped with a case drain port. The case drain is plumbed into the back end of the motor, opposite the output shaft. The case drain allows excess heat and pressure to escape the body of the motor. The case drain is a flat faced coupler that plugs into a dedicated port on the tractor. This allows the oil to free flow directly to the tractor's hydraulic oil reservoir. If case drain line port is capped off this may result in damage to the motor's shaft seal.

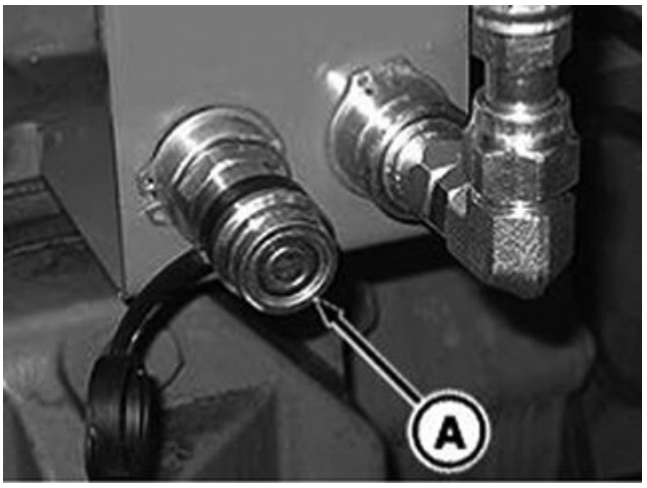
Refer to your tractor's manual or contact your dealer for further information on the tractor drain kit.

When uncoupled, the coupler has a 10psi relief pressure.

**Hydraulic flow requirements are as follows:**

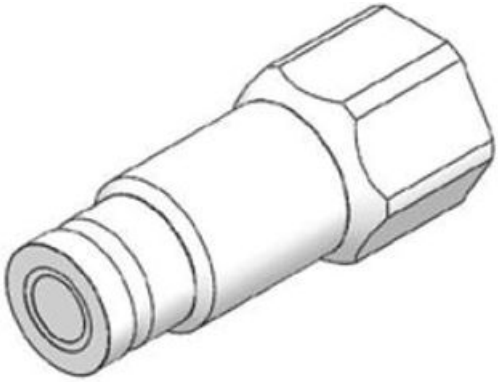
- **Standard turbofans: 6-7 gal/ minute**
- **High output & Extra high output turbofans: 10-11 gal/minute**

*NOTE: Check the labeling on your turbofan to determine if you have a standard, high output or extra high output turbofan. As a general rule, planters with 8-15 rows have a high output turbofan, 16-rows and larger use an extra high output turbofan.*



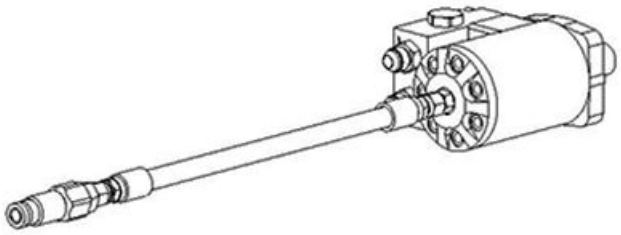

APY18003 —UN—05MAR19

*Tractor Side Female Drain Port (A)*



APY18004 —UN—05MAR19

*Planter Side Male Case Drain Coupler*



APY18005 —UN—05MAR19

*Case Drain Setup*

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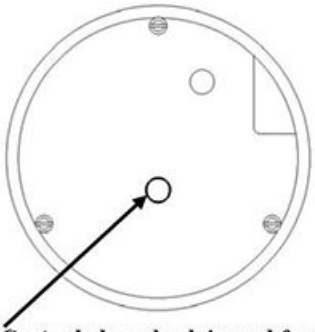
## Vacuum Gauge Settings

All Monosem planters are equipped with a vacuum gauge that allows you to read the vacuum level of the turbofan. The vacuum level should be set depending on the weight and size of the seed to be planted. Planters with 2 turbofans may be equipped with 2 vacuum gauges. Vacuum gauge settings are shown below in inches of water column.

| Seeds Examples | Vacuum Gauge Setting (inches of water column) |
|---|---|
| Carrots (Raw) | 10"-12" |
| Onions (Raw) | 10"-12" |
| Lettuce (Raw) | 10"-12" |
| Lettuce (Pelleted) | 15"-17" |
| Broccoli | 10"-12" |
| Radish | 12"-16" |
| Beets | 14"-16" |


APY18006 —UN—05MAR19



APY18007 —UN—05MAR19

Center hole on back is used for vacuum or a vented plug. Top hole is plugged

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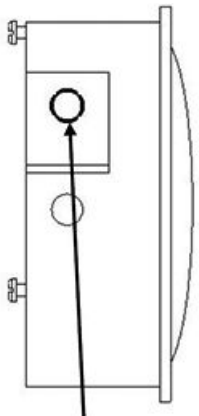
**To set the vacuum level for PTO and Hydraulic drive:**

It is not necessary to have to reset vacuum levels daily. Vacuum levels will be slightly lower during tractor and pump start-up.

1. Use the recommended vacuum settings above, or consult your Monosem dealer.
2. Engage PTO or push tractor lever/switch to start oil flow to hydraulically driven turbofan and let oil warm up.
3. With some seed in the hoppers, turn drive wheels by hand or lower planter to engage drive wheels and drive forward a short distance to fill cells on seed discs with seed. This will result in the most accurate setting for the vacuum.
4. Re-adjust the PTO speed or oil flow, if necessary, until the desired vacuum level is obtained on the vacuum gauge.



Top hole on the side used for vacuum or vented plug, bottom hole is plugged

APY18008 —UN—05MAR19

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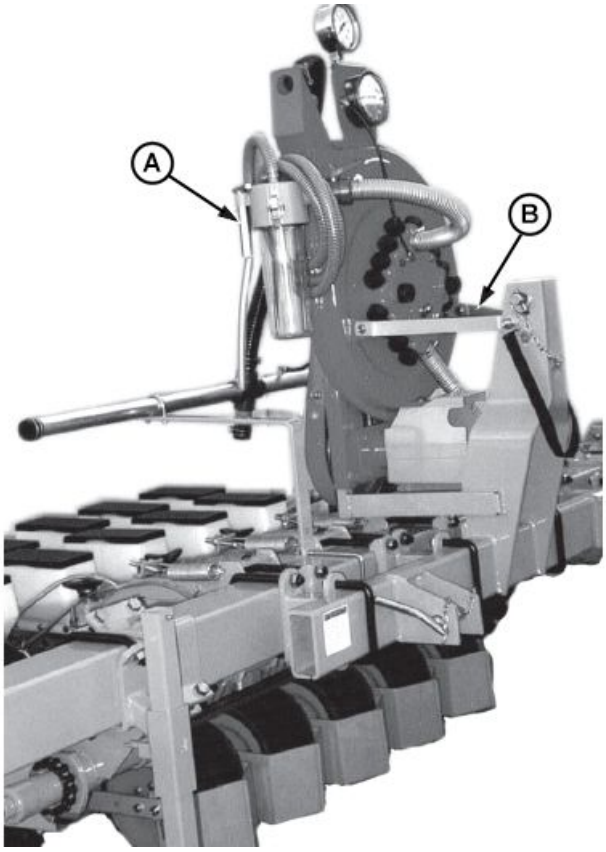
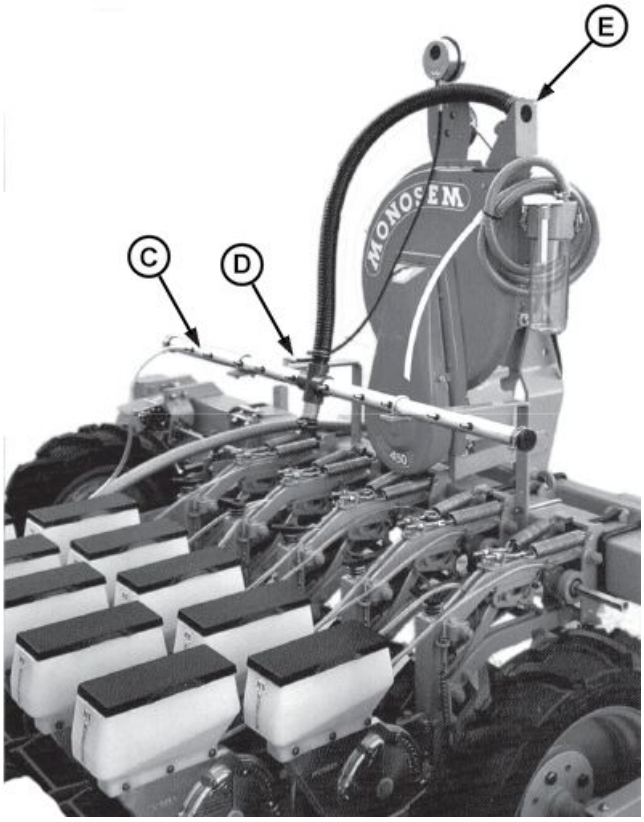
## Secondary Air System




APY71664 —UN—08MAY23




APY71665 —UN—08MAY23

**ATTENTION: The secondary air manifold has 2 outlets. One is to be used to connect the air pressure tube. The other outlet remains open as standard, but may be plugged in order to increase vacuum pressure.**

**A—Seed Collection**
**B—Support Bracket**
**C—Pressure Tube**
**D—Dust Filter**
**E—Keep one outlet fully open**

The turbofan is also equipped with a secondary air system consisting of an air pressure manifold and an air pressure tube. This system feeds pressurized air to the base of each metering unit. A nozzle blows air against the back side of the seed disc to clean out any plugged holes blocked by light and sharp pointed seeds. The pressure tube is provided with a filter whose purpose is to catch any dust blown through the system. This particle trap should be filled with about 1 ¼" of (80-90 weight) oil.

*NOTE: Inspect the filter daily and service as needed, especially in dusty conditions.*

Only use the secondary air system for seeds whose holes are smaller than 1.2mm. It is indispensable when planting small sized and light seeds (carrot, lettuce, endive…) however; it is useless when planting with bigger seed such as table beets or coated seed. When planting with bigger seed, it is necessary to disconnect or remove the pressure manifold and close the shutter so that the turbofan gives the maximum air vacuum.

**IMPORTANT: To achieve a good distribution with a vacuum planter, it is necessary to use top quality, properly sized, clean seed.**

If you are using seed containing impurities, the secondary air system will not be sufficient for cleaning the seed holes, the discs will have to be checked more often.

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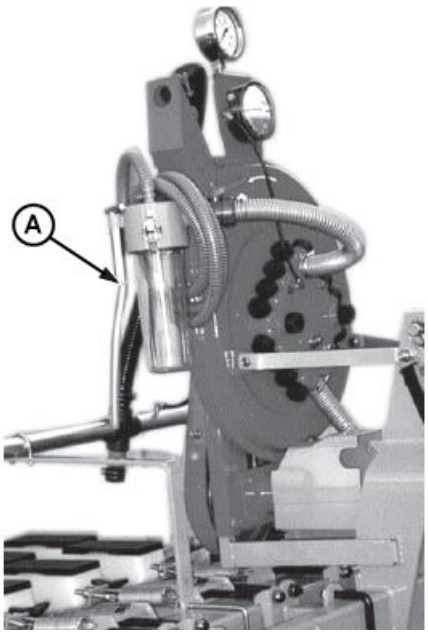
## Vacuum Seed Emptying System

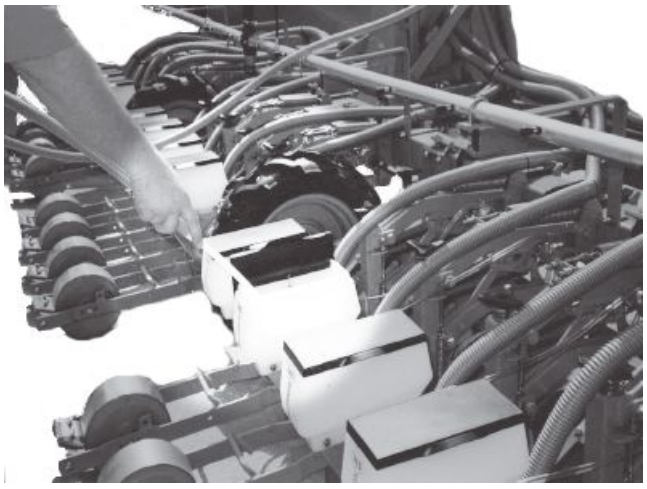
The seed collection container is mounted to the turbofan by means of a mounting bracket and is connected to one of the outlets of the manifold. To suck out the remaining seeds in each hopper and the seed meter, simply insert the flexible hose into the bottom of the hoppers and meter. The suction unit of the turbofan will collect the seed in the plastic collection container.

**IMPORTANT: Empty the container as soon as it is half-full by loosening its 2 clips. If the container becomes too full, seed may be sucked back into the turbofan, especially when dealing with light seed.**

**A—Seed collection container**




APY71666 —UN—08MAY23



APY848126 —UN—12MAY23

*Use Flexible hose attached to seed collection container to clean out hoppers*

uuf6xgz,1682665040099 -19-05JUN23-1/2

*NOTE: Optional large (5 gallon) seed collection container available for all MS style planters.*

APY71667 —UN—08MAY23

uuf6xgz,1682665040099 -19-05JUN23-2/2

## Row Unit Versions

There are 6 versions of the Mini Seed row unit available in single or twin line. Row Unit Version A, B, C, D, G, & M are shown on the following pages with standard features. Other options are available for specific conditions or uses.

uuf6xgz,1685957802163 -19-05JUN23-1/1

## Row Unit Version A

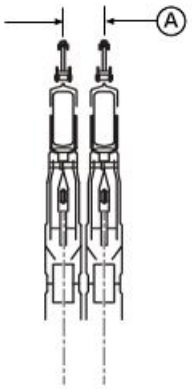
**Min. 8" (20cm) spacing between units**. Version A is suitable for the majority of planting in narrow seed lines.

**Standard features:**

- Clod remover on wheel bracket, quick adjust.
- Front rubber press wheel (4½”x 12”).
- Rear stainless steel press wheel (4”x 8”).
- Narrow shoe with cast point and regular wings.
- Narrow intermediate stainless steel press wheel.
- Intermediate hillers for closing the furrow.
- 3 L plastic hopper.
- Up pressure spring.
- Unit Lockup
- Disengage clutch

**Options available:**

- Rubber rear press wheel (5½”x 10”).
- Rear cage press wheel (4½”x 10”) with or without rubber tire.
- Flat front or rear stainless steel press wheel (4” x 10”).
- Narrow intermediate press wheel with rubber tire.
- 1.5-liter metal hopper.
- Disc opener for light residue.
- Low-profile shoe for shallow planting




APY71669 —UN—08MAY23

APY71670 —UN—08MAY23

**A—Version A Unit Spacing 8" min**

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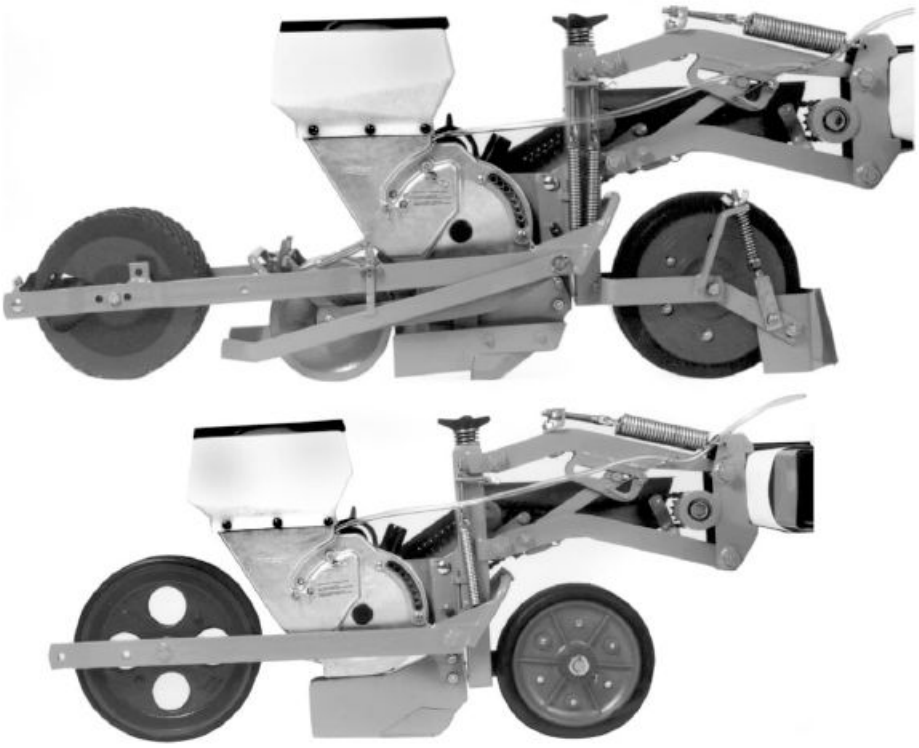
## Row Unit Version B



APY71672 —UN—08MAY23

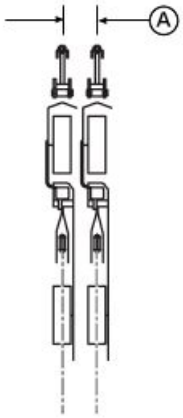
**Min. 5½" (14cm) spacing between units**. This is a simplified planter unit without the intermediate press wheel.

**Standard features:**

- Front rubber press wheel (2”x 12”)
- A concave cast iron press wheel w/ rubber tire
- 3 L plastic hopper
- Narrow shoe with cast point and regular wings
- Quick adjust clod remover
- Up pressure spring
- Unit lockup
- Disengage Clutch

**Options available:**

- Low profile shoe with short point for shallow planting.
- 1.5-liter metal hopper




APY71671 —UN—08MAY23

**A—Version B Unit Spacing 5.5" min**

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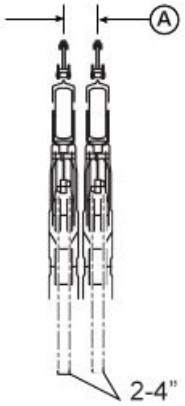
## Row Unit Version C

**Min. 8" (20cm) spacing between units Twin line unit, 2”- 4” between seed lines in the row.** Similar to Version. A, but is suited to planting double rows in well prepared soils (no clods or stones).

**Standard features:**

- A double tipped shoe which creates two furrows 2", 2-3/4" or 4" apart.
- Front rubber press wheel (5½x10”).
- Clod Removers
- Intermediate hillers.
- Double intermediate press wheel.
- Stainless steel rear press wheel (5½x10”).
- 3 L plastic hopper.
- Unit lockup
- Disengage clutch
- Metering box is equipped with a seed disc that has a double line of holes and a double line singulator. (See Metering Box on Version C)




APY71673 —UN—08MAY23

**A—Version C Unit Spacing 8" min**

**Options available:**

- Rubber rear press wheel (5½”x 10”)
- Rear cage press wheel (4½”x 10”) with or without rubber tire
- Flat front of rear stainless steel press wheel (4” x 10”)
- Wide flat front stainless steel depth wheel (5½” x 10”)
- 1.5-liter metal hopper
- Adjustable 2.25” – 4.75” split shoe
- For planting in bands of 2½"- 4” (65mm- 100mm), replace the standard shoe and the intermediate press wheel with a wide shoe and wide intermediate press wheel.

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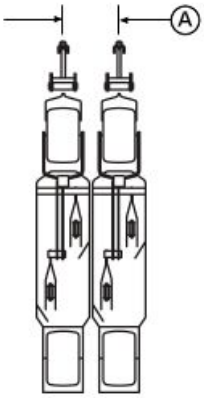
## Row Unit Version D

**Min 10” (25cm) spacing between units. Multiple combinations, 3” – 4½” between seed lines.**




APY71676 —UN—08MAY23

**A—Version D Unit Spacing 10" min**

APY71677 —UN—08MAY23

**Continued on next page**

ch177nn,1687515762419 -19-23JUN23-1/2

The Version **D** unit consists of two offset metering boxes within one unit frame. This allows for one or two seed lines per metering box, for a combination of 2, 3, or 4 seed lines within one unit frame. Adjust the row spacing between the lines by loosening the set screws and sliding the metering boxes on hex shaft as needed. Version D is ideal for crops that are planted in double lines such as onions. The staggered metering boxes and shoes allow small amounts of trash and clods to flow through easily.The adjustments on the metering system are the same as for Version **A & B**.

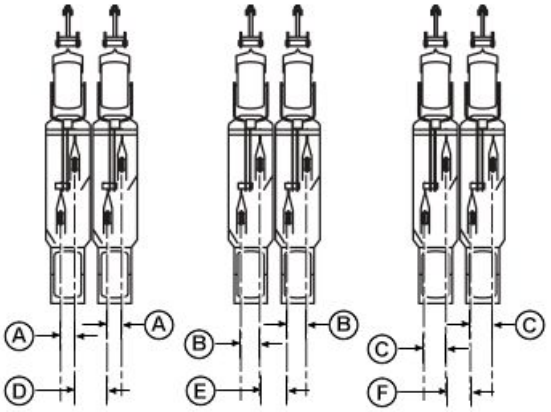
**Standard features:**

- Rubber front and rear press wheel (6½x 10”)
- Clod remover on wheel bracket, quick adjust
- Narrow shoe and a set of hillers for closing the furrow
- Unit lockup
- Disengage clutch

**Options available:**

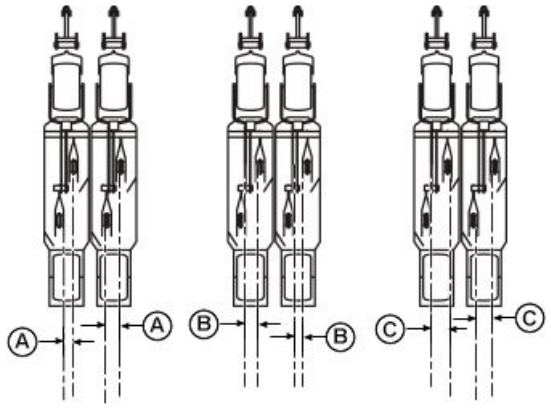
- Rear cage wheel without tire (6½x 10”)
- Stainless steel front and rear press wheel
- Flat front of rear stainless steel press wheel (6½”x 10”)
- 1.5-liter metal hopper
- 2", 2-3/4" or 4" fixed split shoes
- Adjustable 2.25" – 4.75" split shoes
- Intermediate steel press wheels
- Disc openers for light residue

**A—3.0"**
**B—4.0"**
**C—4.5"**
**D—7.0"**
**E—6.0"**
**F—5.5"**




APY71678 —UN—08MAY23

*Version D Example 1, Seed line spacing options available with 10" minimum row unit spacing and single line shoes*

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*Version D Example 2, Seed line spacing options available with 10" minimum row unit spacing and double line shoes*

ch177nn,1687515762419 -19-23JUN23-2/2

## Row Unit Version G

**Min. 8" (20cm) spacing between units.**

**Standard features:**

- Screw type depth adjust.
- Rear stainless steel press wheel (4”x 8”).
- Narrow shoe with cast point and regular wings.
- Intermediate hillers for closing the furrow.
- 3 L plastic hopper.

**Version G Adjustments**

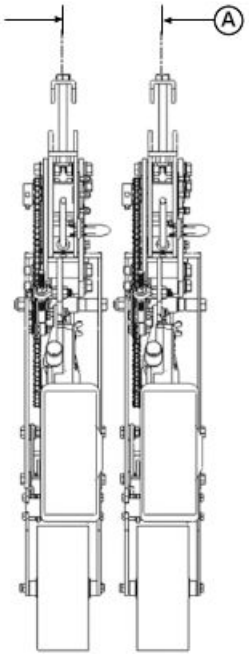
Before starting planting,

- Adjust the linkage screw according to the depth of seed desired.
- Lower the frame until the wheels touch the ground.
- Adjust pressure of rear press wheel according to preference.

**Options available:**

- Rear scraper for stainless steel press wheel.
- Large front bed style painted steel roller.
- Diamond bar mounting clamps.
- 2", 2-3/4" or 4" fixed split shoes
- Adjustable 2.25" – 4.75" split shoes

**A—Version G Unit Spacing 8" min**

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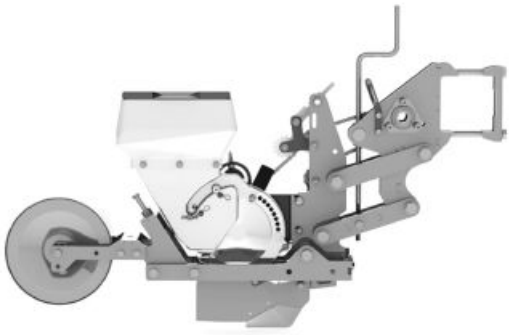

APY71675 —UN—08MAY23

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## Row Unit Version M

**For seed bed planting- multiple lines of narrow row spacing.**

Units are assembled within a fixed frame with standard front and rear painted steel rollers. This planter is ideal for high population crops requiring multiple lines of close spacing such as packaged lettuce, pine trees, carrots, etc. Down pressure of both rollers can be regulated manually.

**Min. 6" (15cm) spacing between units.**

**Standard features:**

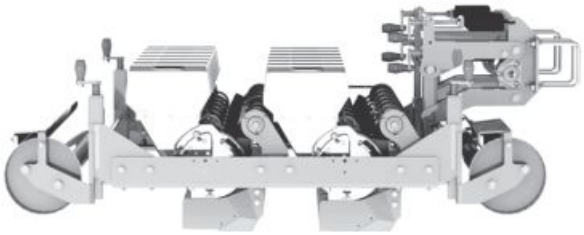
- Front and rear painted steel rollers.
- Double adjustable down-pressure springs.
- Narrow shoe with cast point and regular wings.
- 3 L plastic hopper.

**Options available:**

- Rear painted steel mesh roller.
- Intermediate hillers for closing the furrow.
- 1.5-liter metal hopper.
- Wide and Split shoes.
- Hydraulic drives.

**Version M Adjustments**

**A—Version M Unit Spacing 6" min, 1"min, 1"min**



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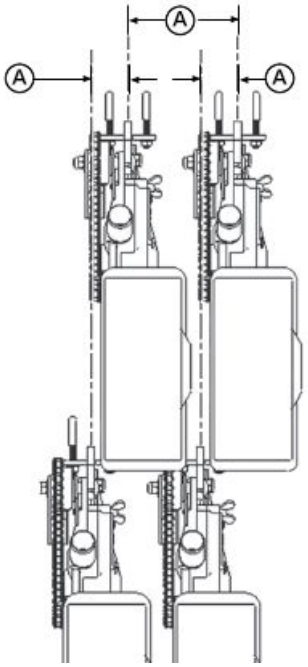


APY71681 —UN—08MAY23

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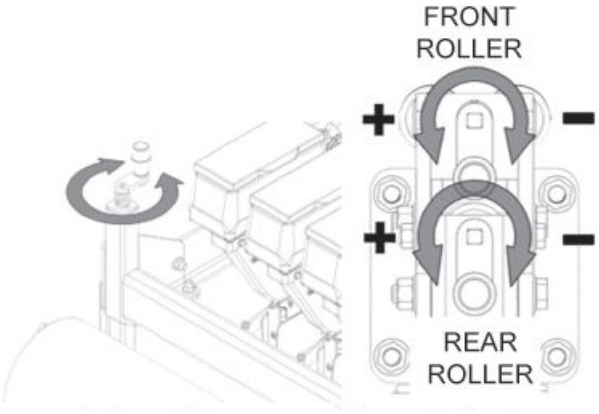
Before starting planting,

- Set the toolbar height to 16". This is the distance from the top of the bed to the bottom of the 5x5 toolbar.
- Increase/decrease front roller weight to move the desired amount of soil.
  - The top handle on the linkage adjusts front roller weight. Turn handle Clockwise to decrease weight on front roller. Turn handle Counter-Clockwise to increase weight on front roller.
  - It is recommended to push enough soil to smooth the bed top, but not too much to disturb the bed shape.
- Set seed depth with the crank handles on the four corners of each bed frame.
  - Rotating the crank handle 1-1/2 rotations clockwise will increase the seeding depth 1/8”.
  - Depth is factory set to the same position on all four corners.
  - Adjust all four hand cranks on a bed frame the same amount to maintain even planting depth across the bed.
- Increase/decrease rear roller weight to cover seed
  - The lower handle on the linkage adjusts rear roller weight.
  - Turn handle CW to decrease weight on rear roller.
  - Turn handle CCW to increase weight on rear roller.




APY71682 —UN—08MAY23

*Depth adjustment knob and Linkage adjustment knobs*

- Verify planter is functioning property.
  - Check seed spacing. Dig up 11 seeds, measure the distance between them, and divide by 10. This is your average seed spacing.
  - Check for skips and doubles.
  - Check seed depth across the entire bed.

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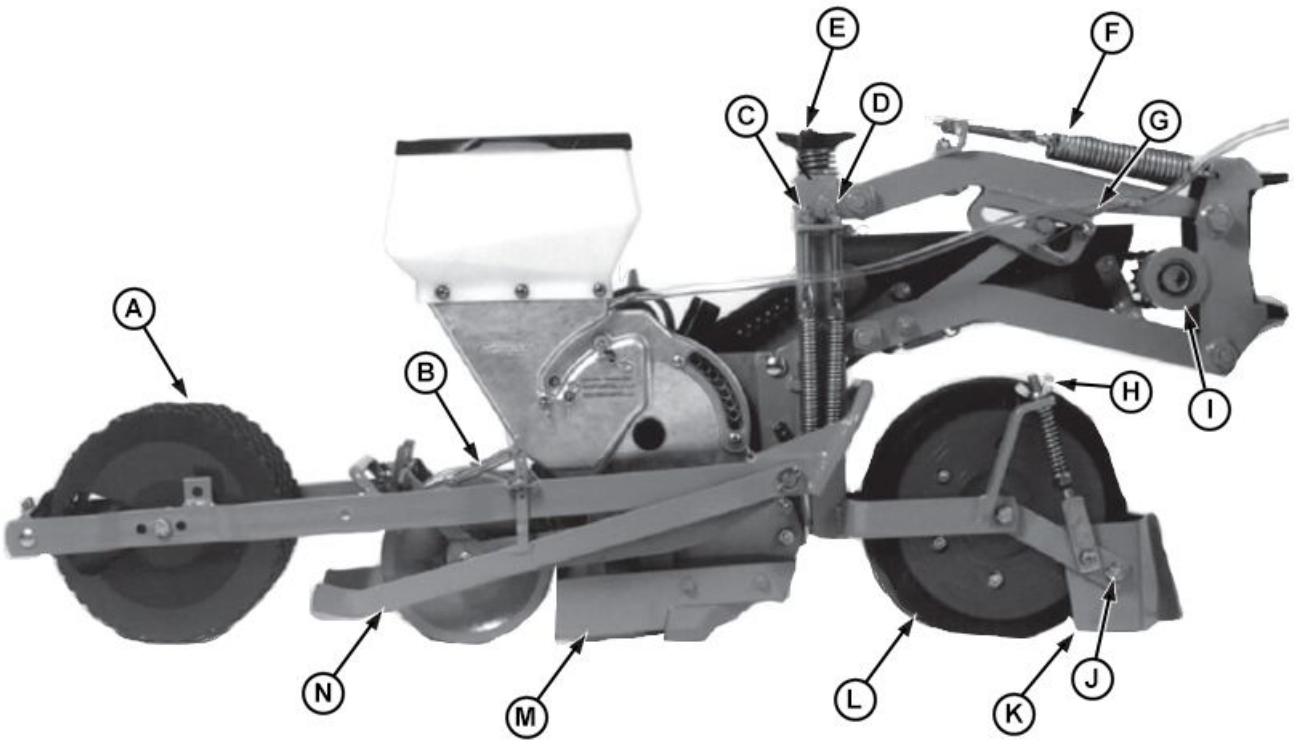
## Main Adjustments Versions A, B, C, D




APY71683 —UN—08MAY23

**A—Cage Wheel with Tire (other options available)**
**B—Intermediate Hillers Height and Pressure Adjustment**
**C—Down Pressure Intermediate Press Wheel**
**D—Down Pressure Rear Wheel Adjustment**
**E—Depth Control Hand Wheel**
**F—Up Pressure Spring**
**G—Lock-up**
**H—Wing Nut**
**I— Clutch**
**J—Adjustment Bolt**
**K—Quick Adjustable Clod Removers**
**L—Rubber Front Press Wheel**
**M—Shoe**
**N—Intermediate Hillers**

### Clod removers (Version A)

To Adjust the height of the clod removers, turn the wing nut. To straighten them up turn the adjustment bolt. Use care when adjusting the clod removers. The function of the clod removers is to clear the surface of the soil, but not plow a furrow. It is rigid and mounted in front of the disc openers that push clods away in preparation for the seed trench. The front brace of the clod remover is an independent adjustable opening knife that is used to slice open hard soil and move stones away from the track of the disc opener. The clod remover should be adjusted according to soil type. In rocky soil clod removers may create clogging or blocking. Use a flexible support bracket for the clod remover in rocky conditions.

### Seed Depth

Adjust the seed depth by turning the depth control hand wheel. Turning the knob changes the height of the front wheels in relation to the disc openers. A sticker close to the hand wheel, indicating a gradual scale, ensures the uniformity of the depth control on all row units of the planter. Be sure that all row units of the planter are set at the same adjustment.

The disc openers and ground adjustment system guarantee an accurate and regular seed depth in all types of soil and conditions because the depth wheels are positioned perpendicular to the falling point of seeds.

### Intermediate Press Wheel

To adjust the down pressure on the intermediate press wheel, either tighten the bolt to increase down pressure or loosen the bolt to decrease down pressure.

### Rear Wheels

To adjust the down pressure on the rear wheel, turn the bolt. Down pressure on the rear wheel regulates the balance between the front and rear wheels (the stability of the planter unit), the regularity and the depth.

### Intermediate Hillers

Adjust the height and pressure of the intermediate hillers. Unhook the springs if necessary. Works with the shoe to close the furrow.

### Lock-up

**Continued on next page**

When the spring is un-notched, the unit can be locked up in a raised position.

**Individual Disengaging Clutch**

To disengage the clutch, slide the cam outwards and rotate the drive gear 1/4 turn.

**Drive Chain**

**IMPORTANT: Before starting up, check the proper assembly of chains.**

The drive chain has a hardened surface that increases wear resistance and extends the life of the chain. The drive chains are spring loaded and therefore, self-adjusting. The only adjustment needed is to shorten the chain if wear stretches the chain and reduces spring tension. The pivot point of the chain idlers should be checked periodically to ensure they rotate freely. The drive chain is 5R and has 124 links with the connector link. Use a chain lubricant spray daily, or as needed.

**Seed Hopper**

A 3.0-liter plastic hopper is standard on all versions. A 1.5-liter metal hopper is optional.

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## Options – Row Unit Attachments

1. Concave cast iron wheel with rubber tire, 3" x 12-1/2" Version B

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2. 642914 - Wire Mesh Wheel, 4-1/2" x 10" Version A & C

   642467 - Wire Mesh Wheel, 6-1/2" x 10" Version D

APY84801 —UN—08MAY23

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ch177nn,1687517415920 -19-23JUN23-2/10

3. Stainless steel intermediate press wheel Version A & C

APY84802 —UN—08MAY23

ch177nn,1687517415920 -19-23JUN23-3/10

4. 6512 - Rear press wheel, rubber, 5-1/2" x 10" Version A & C

   6612 - Rear press wheel, rubber, 6-1/2" x 10" Version D

APY84803 —UN—08MAY23

ch177nn,1687517415920 -19-23JUN23-4/10

5. 6750.1CO- Complete wheel, rear, stainless steel, 4” x 8” Version A & C

APY84804 —UN—08MAY23

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ch177nn,1687517415920 -19-23JUN23-5/10

6. 6600- Stainless steel press wheel, 4” x 10” Version A & C

   642458- Stainless steel press wheel, 5½” x 10” Version C

   6581.A- Stainless steel press wheel, 6½” x 10” Version D

APY84805 —UN—08MAY23

ch177nn,1687517415920 -19-23JUN23-6/10

7. 100650- Adjustable split shoe right (standard)

   100651- Adjustable split shoe left (standard)

   100653- Adjustable split shoe right (wide)

   100654- Adjustable split shoe left (wide)

   651072- 2” Fixed split shoe

   651052- 2.75” Fixed split shoe

   6500.5S- 4” Fixed split shoe

APY84806 —UN—08MAY23

ch177nn,1687517415920 -19-23JUN23-7/10

8. 6500- Standard shoe – Required for monitoring systems

   201401- Narrow shoe

   6500.6- Low profile shoe with a short point, Version A, B, C, D

APY84807 —UN—08MAY23

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ch177nn,1687517415920 -19-23JUN23-8/10

9. 6465.A- 1.5 L metal hopper

   643508- 3 L plastic hopper with lid

APY84808 —UN—08MAY23

ch177nn,1687517415920 -19-23JUN23-9/10

10. 65030090- MS scatter shoe, 2.5” wide (67mm)

    65009476- MS scatter shoe, 4” wide (100mm)

    *Optional intermediate press wheel shown.

APY84809 —UN—08MAY23

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## Seed Metering System

**Metering box for Versions A, B, and G**

**Single row planting**

The metering box for Version A, B, and G is specially designed to meter on a single row. Use this metering box for most small seeds whose seed size is not larger than 5mm while using the appropriate seed disc.

**Metering box for Version C**

**Double line planting**

This metering box is the same as on the Version A except it is equipped with a double line scraper which is positioned over the standard scraper. This double line scraper is specially designed for metering seeds in double rows, with a seed disc that has a double row of holes in it. This metering box can be easily exchanged with that of Version A.

Use this metering box for seeds of sizes less than 3mm such as carrots and onions.

Version C also requires a special 2 seed line shoe for an inter-row spacing of 2" (5cm), 2 3/4" (7cm), or 4” (10cm).

*NOTE: For version C it is necessary to deactivate or "pull out" the 2 pins and secure with the hairpin as described in section Adjustments.*

*NOTE: Operators planting large seed above 2.2mm (such as beets or pelleted variants) may require the removal of the secondary scraper to avoid interference and early dislodgement of seed. In this scenario use adjustment pins instead. Remove the lower pin and insert the upper pin to singulate the lower set of holes on the seed disc.*

**Metering box for Version D**

Each version D unit contains two staggered metering boxes.

When planting in a single line, it is the same metering box as for version A and B. When planting a double line, it is same box as for version C.

**Metering box for Version M metering units.**

Each version M unit is hung within a fixed frame with front rear stainless-steel rollers for seed bed planting. When planting in a single line, the same metering box as for version A and B is used. When planting a double line, the same box as for version C is used.

**All versions of metering boxes:**

For each version, discs with 18 - 30 - 36 - 60 - 72 - 120 - and 180 holes are available with hole diameters from 0.5mm.

It is also possible to supply discs with groups of 2 - 3 - 4 holes, enabling to plant groups of several seeds at regular intervals (hill dropping).

It is recommended that you mark each scraper and each disc so that they can always be mounted in the same metering box. Even though they are interchangeable, they have been adjusted together as an assembly, and it is preferable to continue to run them together.

With a wide shoe, it is possible to use the discs with 1 or 2 rows of holes (according to the required population).

**IMPORTANT: Many factors can negatively influence your planting: Worn down meter box housing, seed labels in the seed, plugged holes, warped scrapers.**

**To avoid problems with the metering box in the long run it is necessary:**

- **To carefully check the position of the discs and scrapers.**
- **To carry out periodical checks of the metering unit.**
- **To clean the inside of the metering boxes at least twice a day.**
- **Blow out the metering boxes with a separate air hose, especially when planting small or difficult seeds.**
- **Make sure that the seed disc is riding flush on the meter box housing.**
  - **Make sure that no major gaps have been created due to natural wear and tear over time.**
  - **An acceptable gap is any space that is less than half the size of seed disc hole diameter.**
  - **Watch for seed leakage which could be indicative of a worn meter box housing.**

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## Meter Box Adjustments

### Main Adjustment

**The outside indicator lever on the meter box.**

The outside lever on the metering box **adjusts the height of the scraper in relationship to the holes in the seed disc.**

The " **0** " position is recommended as a starting point because in most cases, it provides the best balance between skipping and doubling.

**For Larger seed, +1 to +5**

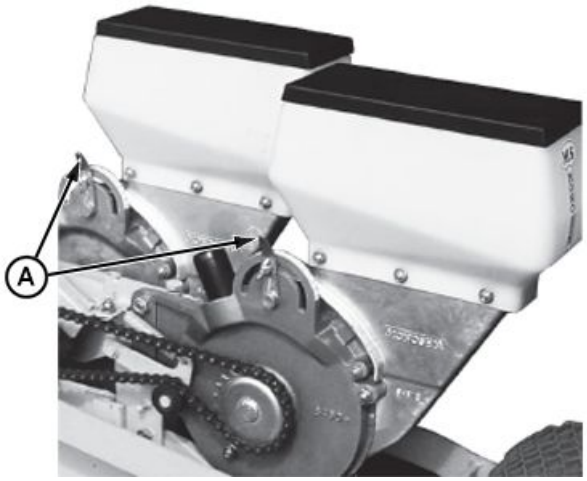
When the lever is positioned toward plus, "+" The scraper raises over the holes of the seed disc, thus reducing skips. **It may cause doubles if the indicator is raised too high.**

**For Smaller seed, -1 to -5**

When the lever is positioned toward minus, "-" The scraper lowers over the holes of the seed disc, thus reducing doubles. **It may cause skipping if the indicator is too low.**

The clear plastic control window in the cover allows you to monitor the results of the seed on the seed disc.

**A—Adjustable Lever**

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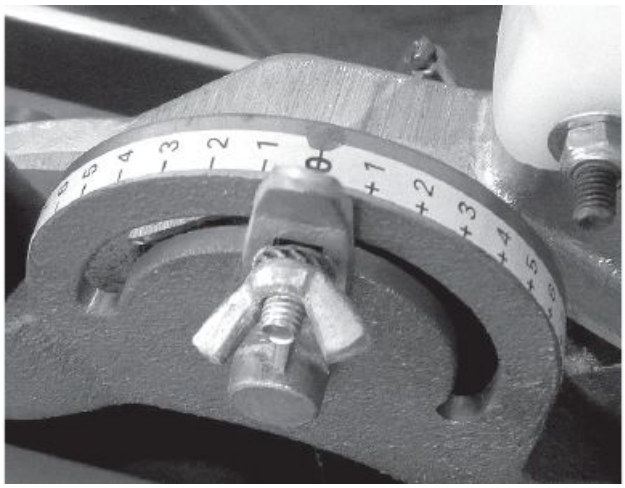

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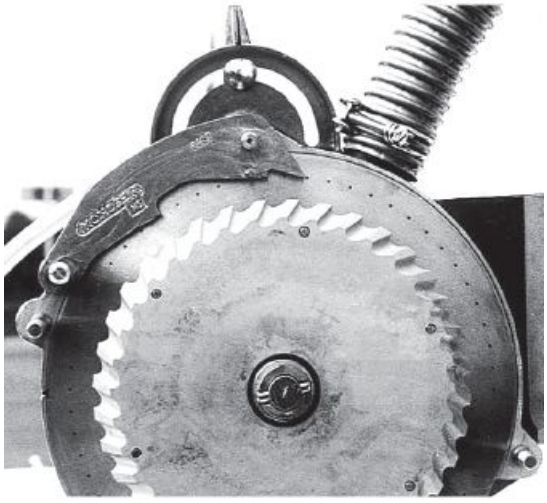
*Adjustable Lever at the " 0 " position*



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*The lever raises or lowers the scraper over the seed disc holes.*

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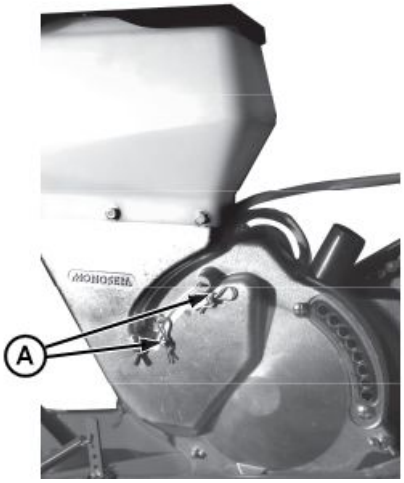
### Secondary Adjustment

#### Adjustable pins

The adjustable pins activate a secondary scraper along the bottom of the seed disc holes for use with small raw seeds.

An optional singulation method is available for small raw seeds (broccoli, carrots, cabbage) by using the 2 adjustable pins. When the 2 pins are pushed in and secured with the hairpin (through the outside hole), a secondary scraper is activated which scrapes along the bottom of the seed line. When planting pelleted or larger sized seeds (beets, spinach, coated lettuce) these 2 pins should be inactivated or in the "pulled out" position and secured with a hairpin through the inside hole.

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**A—Adjustable Pins**

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## Seed Disc

Use the proper seed disc for different seeds. Check your type of seed and use the **Seed Disc Recommendations** chart to determine the correct disc for your crop.

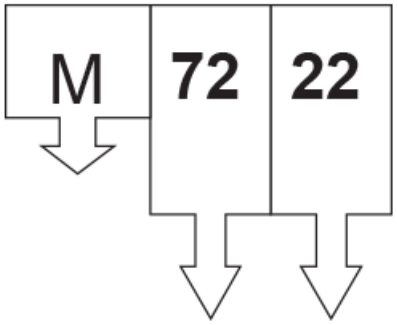
It is important to use seed discs that are clean and in good condition. Customized seed discs are not shown but are available upon special request. It is not recommended to drill out your own seed discs. Any slight burrs or imperfections in drilling will alter your metering. The precision of your seed discs must be maintained to have proper metering.

The brass agitator screws onto the seed disc with 6 special screws.

If you remove your seed discs from the metering box, to clean or use different seed discs, it would be beneficial, when re-using the seed discs, to place them back into the same metering box. You can use a marker to identify the seed disc to the metering box.

#### Seed Disc Identification

The size of the seed disc is engraved into the back of the seed disc. The first 2 numbers of a 4 number series indicate the number of holes in the seed disc. The second two numbers indicate the size (diameter) of the holes.




APY71689 —UN—08MAY23

Example, Seed disc M 7222 has 72 holes, each hole having a diameter of 2.2 mm.

#### Hole size examples

M____10 = 1.0 mm

M____12 = 1.2 mm

M____20 = 2.0 mm

M____35 = 3.5 mm

**Continued on next page**

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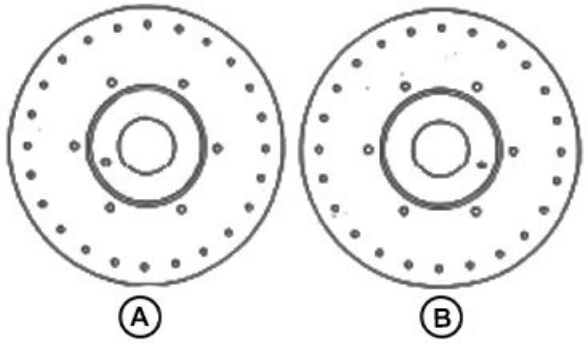
**Seed Disc Recommendations**

**Prefix M Indicates the seed plate has one row of holes, w/o agitator.**

**Prefix 2M Indicates the seed plated has two rows of holes, w/o agitator.**

**Prefix MC or 2MC Indicates seed plate is complete with agitator.**

**A—Back** **B—Front**

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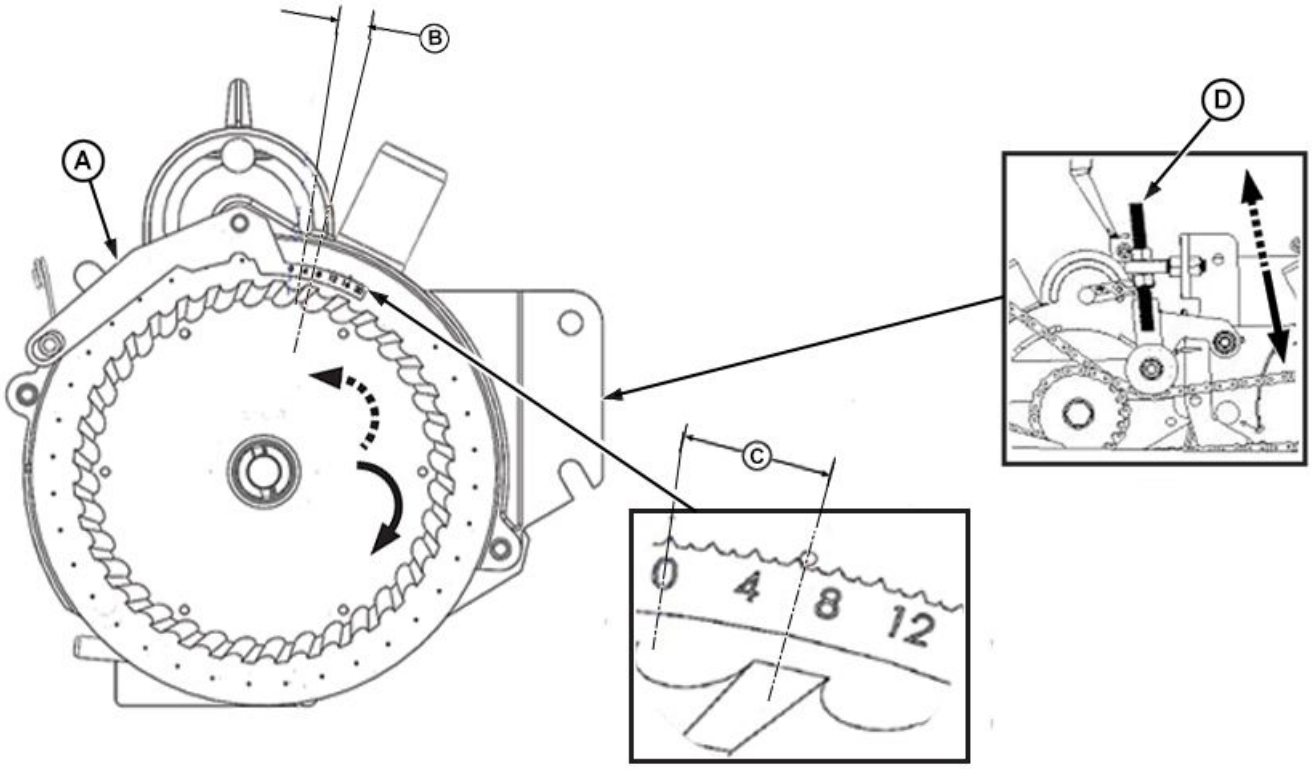
## MS Seed Disc Chart

| Crop | Hole Size (mm) | Seed Disc |
|---|---|---|
| Asparagus | 1.8 - 2.0 | M6020 , M12020 |
| Beets | 2.0 | M6020 |
| Bok choy | 0.8 - 1.0 | M3612 , M7212 |
| Broccoli | 1.2 | M3612 , M6012 , M7212 |
| Cabbage | 1.2 | M3612 , M6012 , M7212 |
| Cantaloupe | 1.8 - 2.0 | M1818 , M1820 |
| Carrots (pelleted) | 1.2 | M6012 , M12012 |
| Carrots (raw) | 0.7 | M6007 , M12007 |
| Cauliflower | 1.2 | M3612 , M6012 , M7212 |
| Chia | 0.6 | M18006 |
| Chinese cabbage | 1.2 | M3612 , M7212 |
| Chives | 0.7 | M6007 , M12007 |
| Cilantro | 1.8 - 2.5 | M1218 , M12022 , M12025 |
| Collard greens | 0.8 | M7208 |
| Cucumbers | 1.8 - 2.0 | M1818 , M1820 , M3020 |
| Douglas fir | 2.2 | M9022 |
| Endive | 0.6 | M6006 |
| Fennel | 1.2 | M3612 , M7212 |
| Guayule | 2.0 | M3620 |
| Hemp | 2.0 | M0320 , M0620 , M0920 |
| Kale | 0.8 - 2.2 | M7208 |
| Leek | 1.0 | M3610 , M7210 |
| Lettuce (film) | 0.6 - 0.7 | M6006 , M6007 |
| Lettuce (hill drop) | 2.2 | M1222 T6 |
| Lettuce (pelleted) | 2.2 | M6022 , M7222 |
| Lettuce (raw) | 0.6 | M6006 |
| Melon | 1.8 - 2.0 | M1818 , M1820 |
| Millet | 1.8 | M7218 |
| Mustard greens | 0.8 | M7208 , M12008 |
| Okra | 2.2 | M3622 , M7222 |
| Onions (encrusted) | 2.0 | M3620 , M6020 , M7220 |
| Onions (pelleted) | 2.2 | M3622 , M7222 |
| Onions (raw) | 1.2 | M3612 , M6012 , M7212 , M12012 |
| Parsley | 0.7 | M6007 , M18007 |
| Parsnips | 1.2 - 2.0 | M7212 , M7220 |
| Peppers | 1.2 | M3612 , M7212 , M12012 |
| Pine tree | 2.2 | M9022 |
| Poppy | 0.8 | M7208 |
| Radish | 1.2 - 1.8 | M7212 , M7218 |
| Sesame | 0.8 | M7208 |
| Spinach | 1.8 | M6018 , M7218 |

| | | |
|---|---|---|
| Sugarbeets | 2.0 | M4020 , M6020, M12020 |
| Swiss chard | 2.2 | M6022 , M7222 |
| Tomatoes | 1.0 | M7210 |
| Turnips | 0.9 | M7209 |
| Water melons | 2.5 | M0325 , M0625 , M0925 |

uuf6xgz,1683010916059 -19-02MAY23-2/2

## MS Version A Sync Chart and Setting Instructions For Timing Non-Staggered Units




APY71695 —UN—08MAY23

**A—Indicator Tool #804060**
**B—See Inset Below**
**C—Offset Angle**
**D—Disc Adjusting Rod**

### Timing Instructions

1. Remove meter covers and install the timing indicator #804060 on the meter that is being timed.
2. Turn the main hex shaft until all the slack is removed from the drive chains and the center of a disc hole is aligned with the end of the singulator on the non-timeable meter.
3. Locate the required offset angle in the left chart below.

   *NOTE: If consecutive meteres are being timed, the offset angle will alternate between the number listed in the chart and zero for each subsequent meter.*

4. Loosen the top locking nut on the disc adjusting rod.
5. Using your fingers, push the meter disc CCW to remove any slack while adjusting the lower nut on adjusting rod, until the disc hole center matches the required offset angle on the indicator.
6. Tighten the top locking nut on the timing meter, replace the timing indicator with the original singulator, install covers.

| Disc hole # | Offset angle |
|---|---|
| 18 | 10 |
| 24 | 7.5 |
| 30 | 6 |
| 36 | 5 |
| 40 | 4.5 |
| 60 | 3 |

*The offset angle is half the angle between the seed holes. The formula to calculate the offset angle is:

Offset angle = 180 ÷ (hole #)

**Continued on next page**

| Meter number | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Timeable meter | No | Yes | Yes | Yes |
| Offset angle | N/A | 6 | 0 | 6 |

*The table below shows an example of timing a group of 4 consecutive meters (meters are numbered starting at 1 on the left) with 30 cell seed discs. Meters 2 & 4 will require the same drop time so the offset angle will be the same.

Likewise, meter 3 is set at zero to drop seed the same time as meter #1.

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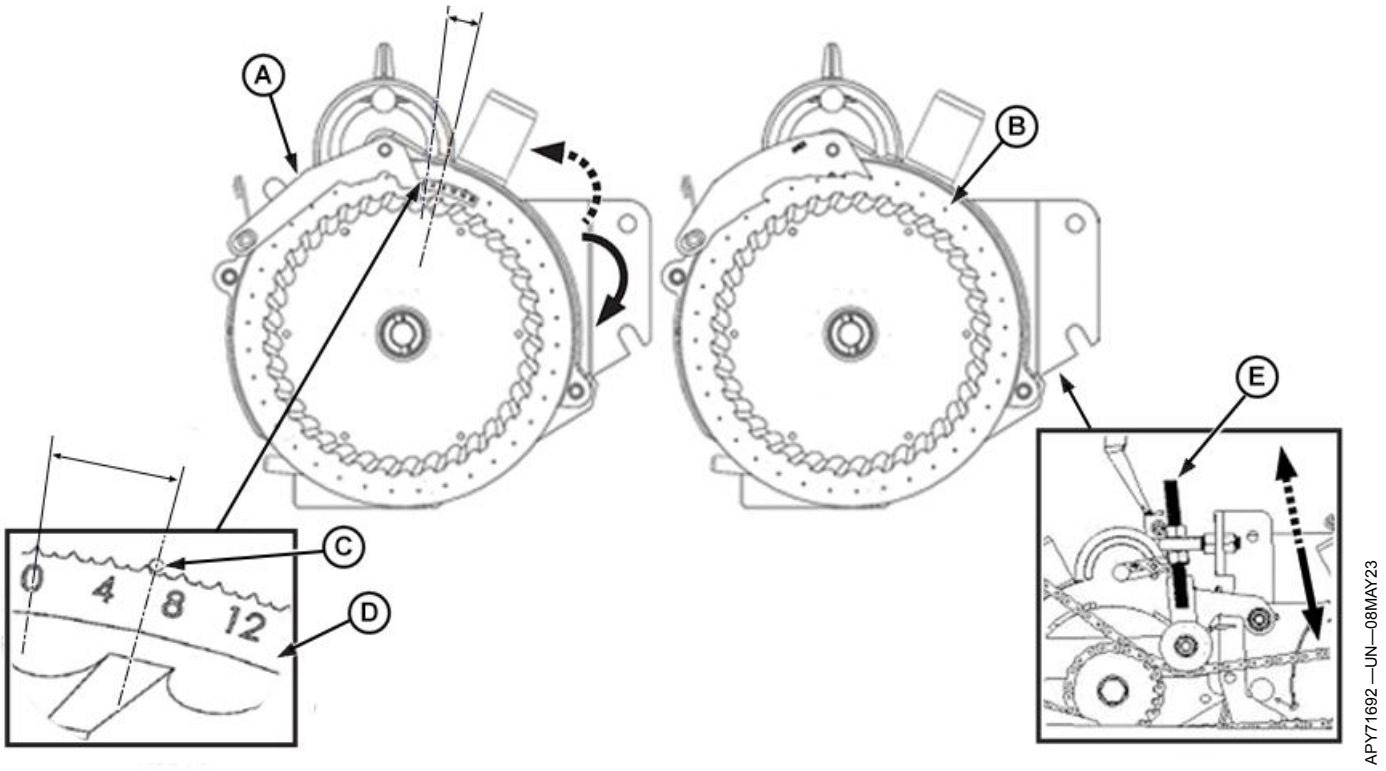
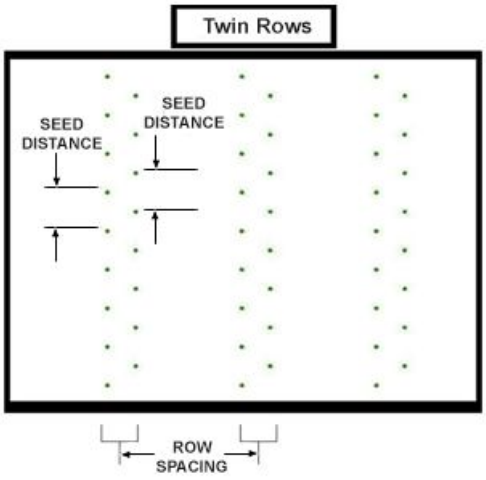
## MS Version D Sync Chart and Setting Instructions For Timing Non-Staggered Units




APY71692 —UN—08MAY23




APY71691 —UN—08MAY23

**A—Calibration Tool #804060**
**B—1. Remove all slack from chain drive system. Turn main hex until hole center is aligned with end of singulator.**
**C—2. Adjust rear seed disc hole to match correct chart number. Use number scale & points on calibration tool as a guide**
**D—3. Replace calibration tool with correct singulator , test with seed in field and fine tune as required**
**E—Disc Adjusting Rod**

Determine for each Twin-Row pair:

- What seed spacing you will be planting
- Number of seed plate cells (holes) used in the seed meter

**Continued on next page**

uuf6xgz,1683011496213 -19-08MAY23-1/2

Insure that the seed spacing you select is correct by averaging the measured distance of several planted seeds. Discrepancies can occur between theoretical (chart) distances from the owners manual and the actual planted distance due to soil type, planting speed, etc. If this does occur, use the measured seed spacing value.

| Left Row Offset (inches) | | | | | |
|---|---|---|---|---|---|
| Seed Distance (inches) | Number of Cells in Seed Disc | | | | |
| | 18 | 24 | 30 | 36 | 60 |
| | Sync Chart Number | | | | |
| 1.25 | | | | | 2.5 |
| 1.50 | | | | | 5.5 |
| 1.75 | | | | 0 | 0 |
| 2.00 | | | | 8 | 5 |
| 2.25 | | | 5.5 | 4.5 | 2.5 |
| 2.50 | | | 11.5 | 9.5 | 5.5 |
| 2.75 | | | 4.5 | 3.5 | 2 |
| 3.00 | | 10.5 | 8.5 | 7 | 4.5 |
| 3.25 | 0 | 0 | 0 | 0 | 0 |
| 3.50 | 5 | 4 | 3 | 2.5 | 1.5 |
| 3.75 | 9.5 | 7 | 5.5 | 4.5 | 3 |
| 4.00 | 13 | 10 | 8 | 6.5 | 4 |
| 4.50 | 19.5 | 14.5 | 11.5 | 9.5 | 0 |
| 5.00 | 4.5 | 3.5 | 2.5 | 2.5 | 1.5 |
| 5.50 | 8.5 | 6.5 | 5 | 4.5 | 2.5 |
| 6.00 | 12 | 9 | 7.5 | 6 | 3.5 |
| 6.50 | 15 | 11.5 | 9 | 7.5 | 4.5 |
| 7.00 | 17.5 | 13 | 10.5 | 9 | |
| 7.50 | 19.5 | 0 | 0 | 0 | |
| 8.00 | 1.5 | 1 | 1 | | |
| 8.50 | 3 | 2.5 | 2 | | |
| 9.00 | 4.5 | 3.5 | 3 | | |
| 9.50 | 6 | 4.5 | | | |
| 10.00 | 7.5 | 5.5 | | | |
| 10.50 | 8.5 | 6.5 | | | |
| 11.00 | 9.5 | | | | |

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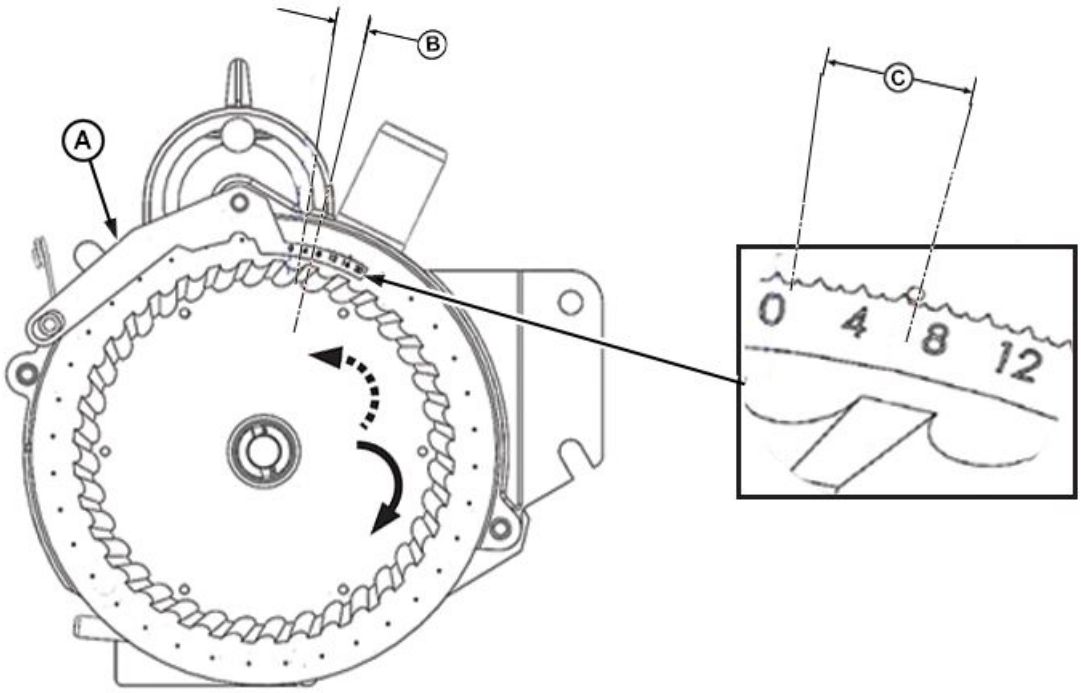
## MS Version M Sync Chart and Setting Instructions For Timing Non-Staggered Units




APY71694 —UN—08MAY23

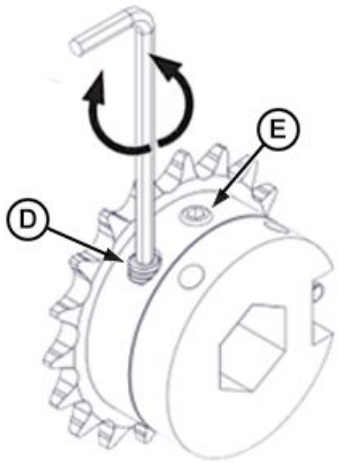
**Timeable Meter**

### Timing Instructions

1. Install the timing indicator #804060 on the meter that is being timed.
2. Turn the main hex shaft until all the slack is removed from the drive chains and the center of a disc hole is aligned with the end of the singulator on the meter without the timing sprocket.
3. Locate the required offset angle on the left chart below.

   *NOTE: If concecutive meteres are being timed, the offset angle will alternate between the number listed in the chart and zero for each subsequent meter.*

4. Loosen the locking set screws on the timing sprocket.
5. Rotate the meter disc CCW to remove any slack while adjust the timing set screw on the timing sprocket until the back of a disc hole matches the offset angle on the indicator (CW to decrease angle & CCW to increase angle).
6. Tighten the locking set screws on the timing meter and replace the timing indicator with the original singulator.




APY71693 —UN—08MAY23

**Timing sprocket # 100596**

**A—Indicator Tool #804060**
**B—Offset Angle**
**C—Offset Angle of 6°**
**D—Timing Screw**
**E—Lock Screw**

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## MS Version M Sync Chart and Setting Instructions For Timing Non-Staggered Units

| Disc hole # | Offset angle |
|---|---|
| 18 | 10 |
| 30 | 6 |
| 36 | 5 |
| 60 | 3 |
| 72 | 2.5 |
| 120 | 1.5 |

*The offset angle is half the angle between the seed holes. The formula to calculate the offset angle is: Offset angle = 180 ÷ hole #.

*The table below explains timing consecutive meters (meters are number starting at 1 on the left). Meters 2 & 4 will require the same drop time so the offset angle will be the same.

| Meter number | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Timeable meter | No | Yes | Yes | Yes |
| Offset angle | N/A | 6 | 0 | 6 |

Likewise, meter 3 is set at zero to drop seed the same time as meter #1.

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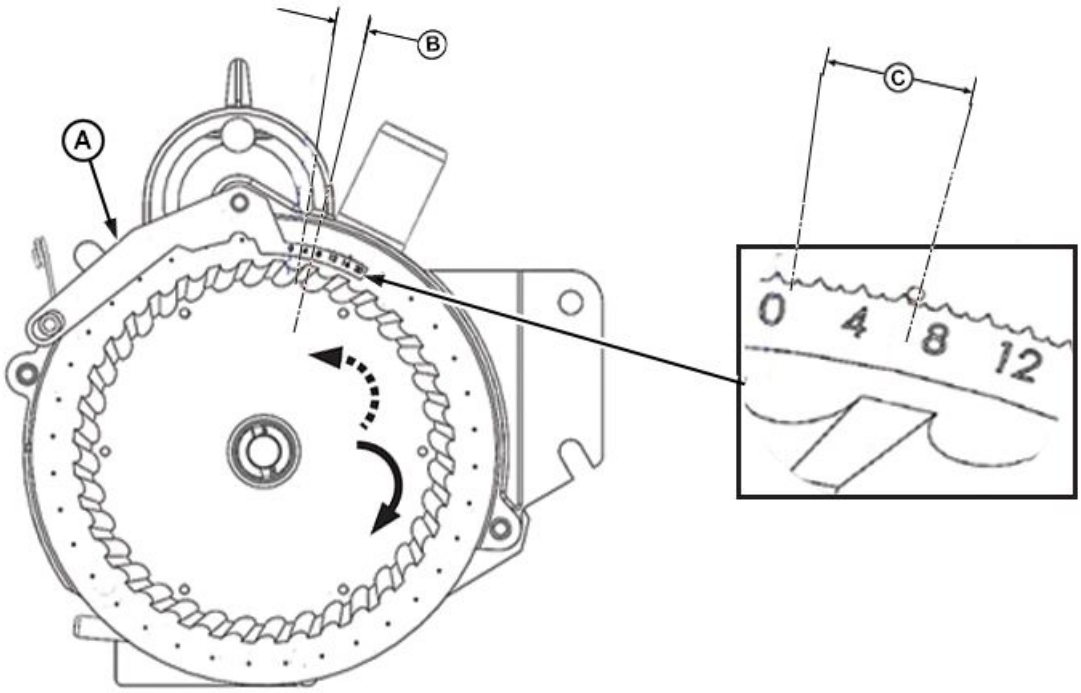
## MS Version M Sync Chart and Setting Instructions For Timing Staggered Units

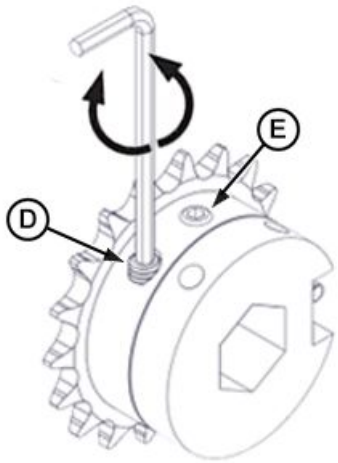



APY71694 —UN—08MAY23

**Timeable Meter**

### Timing Instructions

1. Install the timing indicator #804060 on the meter that is being timed.
2. Turn the main hex shaft until all the slack is removed from the drive chains and the center of a disc hole is aligned with the end of the singulator on the meter without the timing sprocket.
3. Locate the required offset angle, on the chart below, base off the disc hole number and desire seed spacing.
4. Loosen the locking set screws on the timing sprocket.
5. Rotate the meter disc CCW to remove any slack while adjust the timing set screw on the timing sprocket until the back of a disc hole matches the offset angle on the indicator (CW to decrease angle & CCW to increase angle).
6. Tighten the locking set screws on the timing meter and replace the timing indicator with the original singulator.




APY71693 —UN—08MAY23

**Timing sprocket # 100596**

**A—Indicator Tool #804060**
**B—Offset Angle**
**C—Offset Angle of 6°**
**D—Timing screw**
**E—Lock screw**

**Continued on next page**

| Chart below displays the offset angle required based off seed spacing and disc hole number | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Seed disc holes | Seed spacing | | | | | | | | | | | | | | | | | | | | | | | | | |
| | 1.00 | 1.25 | 1.50 | 1.75 | 2.00 | 2.25 | 2.50 | 2.75 | 3.00 | 3.25 | 3.50 | 3.75 | 4.0 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 | 7.0 | 7.5 | 8.0 | 8.5 | 9.0 | 9.5 | 10.0 | 10.5 | 11.0 |
| 18 | 15 | 6 | 13 | 7.1 | 13 | 12 | 8 | 0.9 | 12 | 0.8 | 8.6 | 15 | 1.3 | 11 | 19 | 5.5 | 11 | 15 | 19 | 2.7 | 5.6 | 8.2 | 11 | 13 | 15 | 16 | 18 |
| 30 | 9 | 3.6 | 8 | 4.3 | 7.5 | 7.3 | 4.8 | 0.5 | 7 | 0.5 | 5.1 | 9.2 | 0.8 | 6.7 | 11 | 3.3 | 6.5 | 9.2 | 12 | 1.6 | 3.4 | 4.9 | 6.3 | 7.6 | 8.7 | 9.7 | 11 |
| 36 | 7.5 | 3 | 6.7 | 3.6 | 6.3 | 6.1 | 4 | 0.5 | 5.8 | 0.4 | 4.3 | 7.7 | 0.6 | 5.6 | 9.5 | 2.7 | 5.4 | 7.7 | 9.6 | 1.3 | 2.8 | 4.1 | 5.3 | 6.3 | 7.3 | 8.1 | 8.9 |
| 60 | 4.5 | 1.8 | 4 | 2.1 | 3.8 | 3.7 | 2.4 | 0.3 | 3.5 | 0.2 | 2.6 | 4.6 | 0.4 | 3.3 | 5.7 | 1.6 | 3.3 | 4.6 | 5.8 | 0.8 | 1.7 | 2.5 | 3.2 | 3.8 | 4.4 | 4.9 | 5.3 |
| 72 | 3.8 | 1.5 | 3.3 | 1.8 | 3.1 | 3.1 | 2 | 0.2 | 2.9 | 0.2 | 2.1 | 3.8 | 0.3 | 2.8 | 4.8 | 1.4 | 2.7 | 3.8 | 4.8 | 0.7 | 1.4 | 2.1 | 2.6 | 3.2 | 3.6 | 4 | 4.4 |
| 90 | 3 | 1.2 | 2.7 | 1.4 | 2.5 | 2.4 | 1.6 | 0.2 | 2.3 | 0.2 | 1.7 | 3.1 | 0.3 | 2.2 | 3.8 | 1.1 | 2.2 | 3.1 | 3.9 | 0.5 | 1.1 | 1.6 | 2.1 | 2.5 | 2.9 | 3.2 | 3.5 |
| 120 | 2.3 | 0.9 | 2 | 1.1 | 1.9 | 1.8 | 1.2 | 0.1 | 1.8 | 0.1 | 1.3 | 2.3 | 0.2 | 1.7 | 2.9 | 0.8 | 1.6 | 2.3 | 2.9 | 0.4 | 0.8 | 1.2 | 1.6 | 1.9 | 2.2 | 2.4 | 2.7 |

APY848124 —UN—11MAY23

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## Microsem Microgranular Insecticide System

### Standard Microsem System

The microsem system meters microgranular products such as insecticide and herbicide with precision. The system is ground driven, and the distribution mechanism only engages in the forward direction. The output is set by means of a transmission that is unaffected by a change in planting speed. The microsem system is mounted to the toolbar frame with support brackets to reduce weight on the planter unit. The microsem system is equipped with a telescoping outlet, and its output starts from a minimum of 2-3 lbs/acre.

Each microsem hopper has a 33 lb. capacity and can be used with a double outlet for two row units or with a single outlet for one row unit.

The drive sprocket is mounted on the lower hex shaft. The hoses direct the granular product directly into the shoe via a tube bolted to the metering box.

### Assembly

On a planter that has wide row spacing: **(Version A & C)** Position the drive between two units as far as possible from the drive wheels. The drive sprocket is mounted on the Lower hex shaft.

On a planter that has narrow row spacing: **(Version B)** Position the drive on the outside of the planter units on the right or on the left of the drive wheel block according to available space. The drive sprocket is mounted on the intermediate shaft of the drive wheel block.

The hoses direct the granular product directly to the back of the shoe.

**IMPORTANT: Avoid moisture contamination. Moisture in the product will cause hardening that can seize up the system and lead to chain breakages. To avoid this problem, empty the hoppers and store excess granulated product in a dry place.**

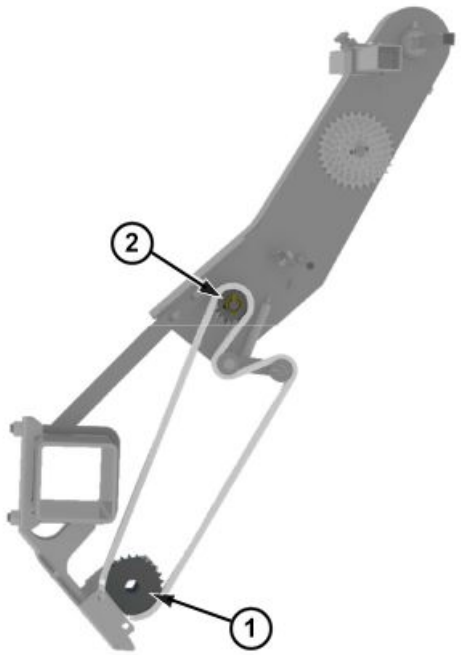
*NOTE: This unit should be used only with microgranular products and not with powders of granulates. It is possible to meter large granular products provided the inside auger is changed for a special one.*

The 2-row metering box can be changed into a 1-row box by replacing the double outlet with a single outlet and installing a shield on the inside.

**CAUTION: Agricultural chemicals can be dangerous. Improper use can result in injury to humans, animals, and the soil. Handle with care and follow instructions of the chemical manufacturer.**

### Setting the Output

The output is determined by the frequency of rotations of the metering box spindle, which is set using the double sprocket (1) and the interchangeable sprockets (2). The chart provided will assist with the setting and indicates the sprockets to be used for the principle commercial products. The provided information is a recommendation only.




APY71690 —UN—08MAY23

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## How To Test for Insecticide Rates

Measure out a distance of 328 feet (100m).

Set the sprocket combination to: A=12, B=30, C=12. (This ratio = 0.24 or the number of Microsem shaft rotations for 1 drive wheel rotation).

Remove the hoses from a 2-outlet hopper, placing a bag or other container to catch the product. Put the product into the Microsem hopper. Engage the Microsem and drive forward the pre-measured distance. Weigh the amount of product caught in the container and convert to grams.

1 kg/ha = 0.9 lb/acre

Ounces x 31.103481 = grams

Pounds x 453.59237 = grams

Inches x 2.54 = cm

Use the following formula:

*Output= ((10 x W)/(S x 2)) x (0.9) = X (lb/acre)*

Where “W” is your Quantity Weighed in grams.

“S” is your Row Spacing in centimeters.

And “X” is your Output in pounds per acre.

**Example:**

Row Spacing (S) = 60 cm (23.63")

Quantity Weighed (W) = 60 grams (1.929 oz)

Output = ((10 x 60)/(60 x 2)) x (0.9) = 5 (kg/ha) or 4.5 *(lb/acre)*

In order to determine the gear train setup, you will need to achieve the desired output rate per acre, use the following equation:

(D/5) x 0.24 = R

Where “D” is your Desired Output in Kilograms per Hectare (kg/ha). And “R” is the resultant gear ratio that you can compare to the chart on the next page.

*NOTE: If working in units of lb/acre, simply divide your desired Output by 0.9 before substituting for D.*

**Example:**

| |
|---|
| If you require 8 kg/ha or 7.2 lb/acre, choose the ratio<br>(8/5) x 0.24 = 0.384 ≈ 0.40<br>Therefore, choose sprockets: **A=12, B=18, C=12** |
| If you require 11 kg/ha or 9.9 lb/acre, choose the ratio<br>(11/5) x 0.24 = 0.528 ≈ 0.54<br>Therefore, choose sprockets: **A=12, B=22, C=20** |

From the following chart, find the closest sprocket combination to achieve appropriate lb/acre.

*NOTE: Due to the large variety of insecticides and the density and irregularity of granulated material, it is impossible to provide an exact chart. This is a close approximation only.*

**Troubleshooting and Causes**

Microsem Output varies between Chutes or Boxes:

- Foreign material mixed with product
- Moisture may be in product
- Outlet chute unit warped
- Hose clogged because it is too long or bent

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## Possible Sprocket Combinations

| Possible Sprocket Combinations | | | Ratios Obtained | |
|---|---|---|---|---|
| **A** | **B** | **C** | | |
| 12 | 35 | 12 | ----------0.21 | Less Product |
| 12 | 32 | 12 | ----------0.22 | |
| 12 | **30** | 12 | ----------0.24 | |
| 12 | **25** | 12 | ----------0.29 | |
| 12 | **22** | 12 | ----------0.33 | |
| 12 | 20 | 12 | ----------0.36 | |
| 12 | **18** | 12 | ----------0.4 | |
| 12 | 16 | 12 | ----------0.45 | |
| 12 | **15** | 12 | ----------0.48 or | |
| 12 | 25 | 20 | ----------0.48 | |
| 12 | 23 | 20 | ----------0.51 | |
| 12 | **22** | 20 | ----------0.54 | *NOTE: The bold sprocket numbers for the interchangeable B sprocket are standard.* |
| 12 | 21 | 20 | ----------0.57 | |
| 12 | **12** | 12 | ----------0.6 | |
| 12 | 24 | 12 | ----------0.63 | The remaining sprockets for the interchangeable B sprocket are available on request. (13-14-16-23-26-35) |
| 12 | **18** | 21 | ----------0.66 | |
| 25 | **22** | 12 | ----------0.68 | |
| 12 | 10 | 12 | ----------0.72 | |
| 25 | 20 | 12 | ----------0.75 | |
| 12 | **15** | 20 | ----------0.8 | |
| 25 | **18** | 12 | ----------0.83 | |
| 25 | 16 | 12 | ----------0.94 | |
| 25 | **15** | 12 | ----------1 or | |
| 12 | 12 | 20 | ----------1 | |
| 25 | **22** | 20 | ----------1.13 | |
| 12 | 10 | 20 | ----------1.2 | |
| 25 | **12** | 12 | ----------1.25 | More Product |
| 25 | **18** | 20 | ----------1.4 | |

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## Dry Fertilizer

**CAUTION: Agricultural chemicals can be dangerous. Improper use can result in injury to persons, animals, and soil. Handle with care and follow instructions of the chemical manufacturer.**

Use the fertilizer when using the Version A, C, and D for inter-row spacing of 16” or more.

The number of hopper outlets depends on the number of rows to be fed. It is possible to use one fertilizer opener for 2 rows in the case of narrow inter-row spacing.

**Deposit the fertilizer between 2” and 4” on the side of the row. If you place the fertilizer closer than 2”, it may cause the plant to burn and curb its growth**.

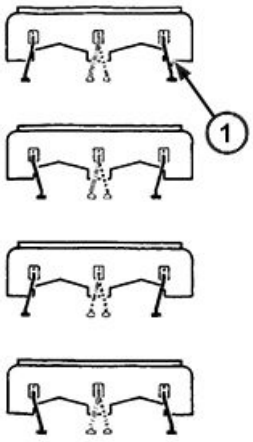
The Monosem dry fertilizer system is precisely metered by use of an auger. The standard output is adjustable from 80-350 lbs/acre and up to 600 lbs/acre using a high output auger. A non-corrosive plastic hopper with drain plug has a capacity of from 2-row 500 lbs to 12-row 2900 lbs with single, double or ripples outlet hoppers. A flexible knife opener or a double disc opener applies fertilizer from a minimum of 2" to the side of the seed line.

**Assembly and Adjustment**

The supports (1) of the fertilizer can be attached at two different widths on the hoppers and can be easily attached to available spots on the bar. See diagram as shown below.

The drive is normally mounted in the center of the machine, as close as possible to the left side of the gearbox. For narrow inter-row spacing this drive can be placed on the outside of the toolbar frame. In that case, an optional bearing (#4515) can be used.

*NOTE: If the connector tubes between the hoppers are too long, they can be cut to size.*




APY84812 —UN—08MAY23

**The primary adjustment** is set by using the lower double sprocket. **The final adjustment** is made by using one of the sprockets of the upper sprocket cluster. Outputs can thus be obtained between approximately 80 to 350 lbs/acre (80-350 kg/ha).

Different outputs can be obtained by replacing the standard auger painted blue, with a special (optional) high output auger painted red.

Because of the large variety of fertilizers and its density and irregularity of granules, it is impossible to furnish an exact setting chart.

To make an initial setting, as a guide only, an output of 80 lbs/acre, approximately between 1.2 lb for each 334 feet (600-650 grams every 100 meters) is obtained with many types of fertilizers using the small lower sprocket cluster and the big upper sprocket cluster.

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# PARTS ILLUSTRATIONS

# MS SERIES MOUNTED

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Please record you planter identification information in box below for reference when ordering replacement parts for your Monosem planter.

Planter Type:_____

Serial Number:_____

Purchase Date:_____

Dealership:_____

_____

_____

**Suggestions For Successful Planting:**

1. Choose a reasonable working speed adapted to the field conditions and desired accuracy.

2. Check proper working of the seed metering, seed placement, spacing, and density when starting up and from time to time during planting.

# Monosem Inc. Product Warranty

A. **General Provisions**. Monosem Inc. ("Monosem") warrants each new product manufactured by Monosem ("Product(s)") to be free, under normal use and service, from defects in workmanship and materials for a period of one (1) year from the date of delivery (the "Term"). Monosem makes this warranty to original purchasers of Products from the original delivery date. This warranty is transferable, provided Monosem is notified of the ownership change and Monosem approves the warranty transfer.

B. **Warranty Claims**. During the Term, this warranty shall be fulfilled by repairing or replacing free of charge any Product that shows evidence of defect in workmanship or materials. To secure warranty service, the purchaser must 1) report the Product defect to an authorized Monosem dealer (a list of authorized Monosem dealers is available on Monosem's website, http://monosemusa.com/dealer-map/), 2) present evidence of the warranty start date with valid proof of purchase, and 3) make the Product available to Monosem or an authorized Monosem dealer within a reasonable time. Parts and standard labor rates are covered by this warranty. Freight charges for defective Products are not covered by this warranty and are the responsibility of the purchaser.

C. **Exclusions**. Excluded from this warranty are: 1) Used Products; 2) repairs or replacements caused in whole or in part by parts or components not manufactured by or obtained from Monosem or by service not performed by Monosem authorized personnel or an authorized Monosem dealer; 3) any Product that has been altered or modified in ways not approved by Monosem, including but not limited to the use of unapproved attachments (including residue managers and coulters), accessories (including third-party drives and fertilizer pumps), carts or tanks; 4) depreciation or damage caused by normal wear and tear, lack of reasonable and proper maintenance, failure to follow operating instructions/recommendations, misuse, lack of proper protection during storage, vandalism, the elements, collision or accident; and 5) normal maintenance parts and/or service, including but not limited to calibrations, adjustments, inspections, and any consumables, including but not limited to tires, belts and rubber products and wear parts.

D. **No Other Express Warranty and no Implied Warranty, Representation or Condition**. No other express warranty is given and no affirmation of Monosem or an authorized Monosem dealer by words or actions, shall modify the terms or limitations of this warranty in any way. No retailer has any authority to make any warranty, representation, condition or promise on behalf of Monosem, or to modify the terms or limitations of this warranty in any way. Monsem shall not be liable for damages, including special, incidental or consequential damages or injuries (damage and repairs of equipment itself, loss of profits, rental or substitute equipment, loss of good will, etc.) arising out of or in connection with performance of the Product or its end use, and Monosem shall not be liable for any indirect, special, incidental, punitive or consequential damages arising out of or in connection with Monosem's failure to perform its obligations hereunder. Purchaser acknowledges that it is not relying on Monosem's skill or judgment to select Products for any purpose and that there are no warranties which are not contained in this warranty. In no event shall Monosem's tort, contract, or warranty liability exceed the purchase price of the Product.

TO THE EXTENT PERMITTED BY LAW, MONOSEM'S ENTIRE LIABILITY AND THE PURCHASER'S EXCLUSIVE REMEDY SHALL BE REPAIR OR REPLACEMENT OF PRODUCTS COVERED UNDER THIS WARRANTY. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO THE IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

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