

# MacDon

## 625 Spray System

# OPERATOR'S MANUAL

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# INTRODUCTION

Your new MacDon 625 Field Sprayer, teamed with the MacDon Turbo Windrower tractor is designed to be used to apply a wide variety of chemicals to a wide variety of crops and crop conditions. The proper use of agricultural chemicals will enhance your profitability and reduce the risks.

This sprayer attachment has been developed in response to numerous requests for additional usage of the MacDon Self-Propelled Windrower.

**NOTE:** This Manual contains information on the MacDon sprayer attachment. It is to be used in conjunction with the Operator's Manual for the Self-Propelled Windrower which provides information on the tractor.

**CAREFULLY READ BOTH MANUALS TO BECOME FAMILIAR WITH ALL RECOMMENDED PROCEDURES BEFORE ATTEMPTING TO UNLOAD, ASSEMBLE OR USE THE WINDROWER/SPRAYER ATTACHMENT.**

Use this manual as your first source of information about the sprayer attachment. If you follow the instructions given in this manual, your sprayer attachment will work well for many years.

The manual contains instruction for "Safety", "Operation", and "Maintenance/Service". Additional instructions for unloading and assembly are shipped with the machine from the factory.

Use the Table of Contents to guide you to specific areas. Study the Table of Contents to familiarize yourself with how the material is organized.

Keep this manual handy for frequent reference and to pass on to new operators or owners. Call your dealer if you need assistance, information, or additional copies of the manual.

**NOTE:** Right hand (R/H) and left hand (L/H) designations are determined from the operator's position, facing forward.

**NOTE:** All measurements are in US or metric units unless otherwise stated.

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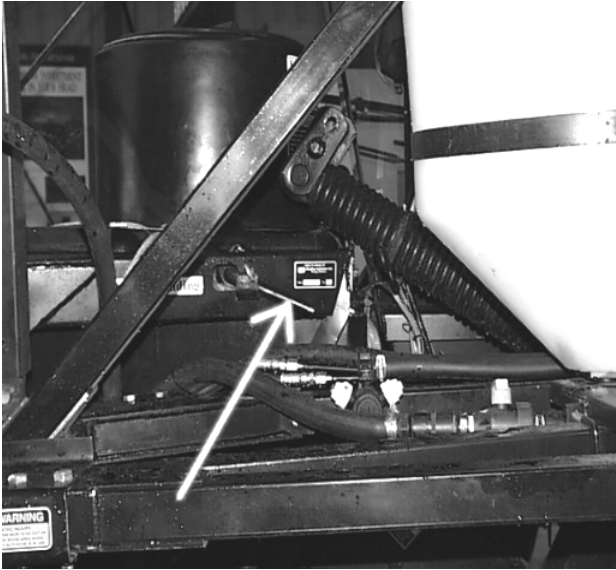
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# SERIAL NUMBER LOCATION

Record the sprayer attachment serial number below:

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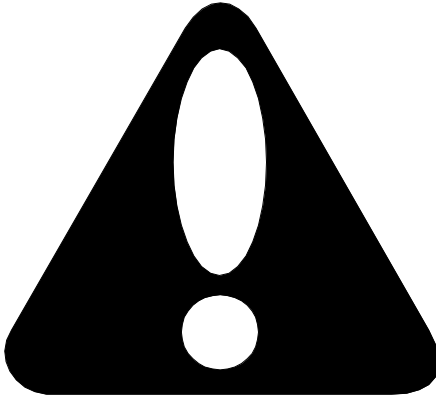
The serial number is located on the left side of the sprayer attachment below the tank fill opening.



**Sprayer Attachment Serial Plate Location**

# SAFETY

## SAFETY ALERT SYMBOL



This safety alert symbol indicates important safety messages in this manual and on safety signs on the sprayer attachment.

This symbol means:                      **ATTENTION!  
BECOME ALERT!  
YOUR SAFETY IS INVOLVED!**

Carefully read and follow the safety message accompanying this symbol.

Why is SAFETY important to you?

### 3 BIG REASONS

- ACCIDENTS DISABLE AND KILL
- ACCIDENTS COST
- ACCIDENTS CAN BE AVOIDED

---

## SIGNAL WORDS

Note the use of the signal words DANGER, WARNING and CAUTION with safety messages. The appropriate signal word for each message has been selected using the following guidelines:



Indicates an imminently hazardous situation that, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation that, if not avoided, could result in death or serious injury. It is also used to alert against unsafe practices.



Indicates a potentially hazardous situation that, if not avoided, may result in minor or moderate injury. It is also used as a reminder of good safety practices.

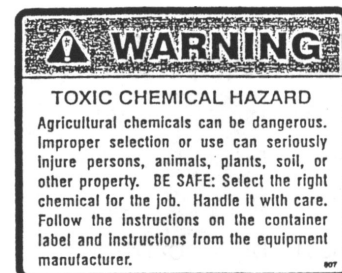
# SAFETY

## SAFETY SIGNS

- The safety signs reproduced below appear on the sprayer.
- Keep safety signs clean and legible at all times.
- Replace safety signs that are missing or become illegible.
- If original parts on which a safety sign was installed are replaced, be sure the repair part also bears the current safety sign.
- Safety signs are available from your Dealer Parts Department.

To install safety signs:





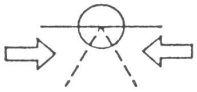
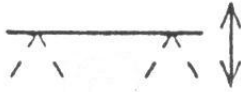



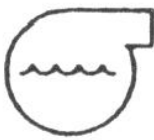
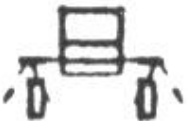

1. Be sure the installation area is clean and dry.
2. Decide on the exact position before you remove the decal backing paper.
3. Remove the smaller portion of the split backing paper.
4. Place the sign in position and slowly peel back the remaining paper, smooth the sign as it is applied.
5. Small air pockets can be smoothed out or pricked with a pin.



# SAFETY

## Symbol Definitions

The following symbols are used to depict functions or reactions at the various instruments and controls. Learn the meaning of these symbols before operating the windrower.

	- windrower mode		- HOLD control for sprayer boom
	- sprayer mode		- RUN control for sprayer boom
	- nozzle pressure		- boom lift
	- pump pressure		- boom tip lift and boom swing
	- agitation pressure		- spray system pump
	- rear boom down		
	- rear boom up		



# SAFETY

## GENERAL SAFETY



The following are general farm safety precautions that should be part of your operating procedure for all types of machinery.

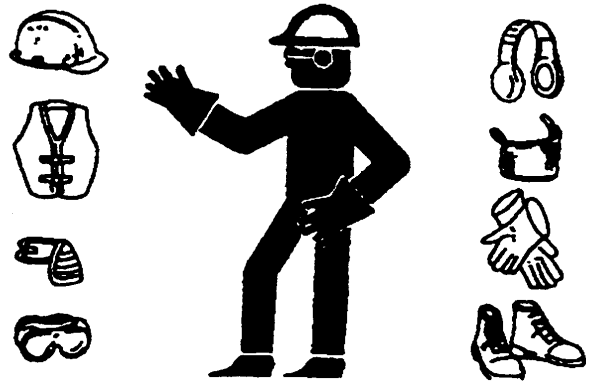
### 1. Protect Yourself

When assembling, operating and servicing machinery wear all the protective clothing and personal safety devices that COULD be necessary for the job at hand. Don't take chances. Refer to the MacDon Self-Propelled Windrower Operator's Manual for precautions during servicing.

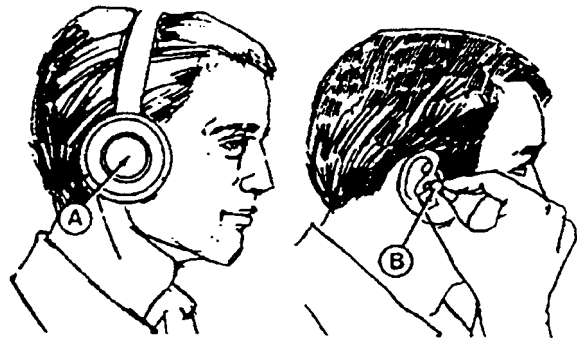
You may need:

- a hard hat
- protective shoes with slip resistant soles
- protective glasses or goggles
- unlined gloves made of rubber, polyethylene, or neoprene
- wet weather gear
- respirator or filter mask
- hearing protection. Be aware that prolonged exposure to loud noise can cause impairment or loss of hearing. Wearing a suitable hearing protective device such as ear muffs (A) or earplugs (B) protects against objectionable or loud noises.

Refer to the pesticide label for recommended protective clothing to wear.

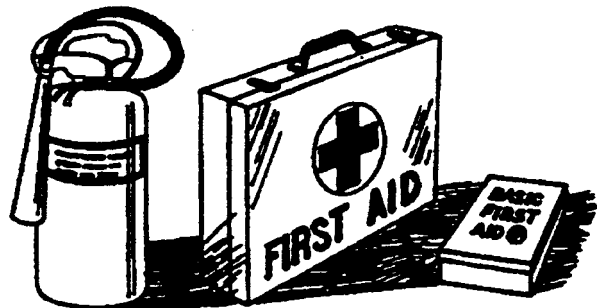


PROTECT YOURSELF



PROTECT AGAINST NOISE

2. Provide a first-aid kit for use in case of emergencies.
3. Keep a fire extinguisher on the machine. Be sure the extinguisher is properly maintained and be familiar with its proper use.
4. Keep young children away from machinery at all times.



BE PREPARED FOR EMERGENCIES

# SAFETY



## GENERAL SAFETY (continued)

5. Wear close-fitting clothing and cover long hair. Never wear dangling items such as scarves or bracelets.
6. Keep hands, feet, clothing and hair away from moving parts. Never attempt to clear obstructions or objects from a machine while the engine is running.
7. Use only service and repair parts made or approved by the equipment manufacturer. Substituted parts may not meet strength, design, or safety requirements.
8. Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.
9. An operator must always be seated in the operator's cab when the engine is running. A child or even a pet could engage an idling machine.
10. Keep the area used for servicing machinery clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.
11. Use adequate light for the job at hand.
12. Keep machinery clean. Straw and chaff on a hot engine are a fire hazard. Do not allow oil or grease to accumulate on service platforms, ladders or controls. Clean machines before storage.
13. Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.
14. When storing machinery, cover sharp or extended components to prevent injury from accidental contact.



NEVER WEAR LOOSE OR  
DANGLING CLOTHES



KEEP SERVICE AREA CLEAN AND DRY

# CHEMICAL SAFETY



**DANGER:**

Mishandling Agriculture chemicals can be deadly. Always follow the chemical manufacturer's instructions exactly. Minimize the risk of contaminating clothing, machinery, and the environment: ensure you and other personnel are aware and follow the safe handling procedures described on the pesticide label. **DO NOT** work alone. **DO NOT** allow children or unprotected workers on a contaminated sprayer.

## Transporting chemicals

1. Never transport pesticides in the passenger space of an automobile. Never allow passengers or pets to ride with the pesticides.
2. Never leave pesticides unattended in an unsecured vehicle.
3. Always transport containers in the original container with the proper label attached. Ensure the container is properly sealed and the outside of the container is not contaminated with pesticide.
4. Do not transport pesticides with fertilizer, seed, feed, drugs, clothing, and food.
5. Secure the chemical containers to prevent the load from shifting. Protect containers from objects that could puncture, tear, or ruin the packaging of the chemical.
6. If the pesticides are not to be used immediately, transfer the containers to a storage facility when you reach your destination.

## Handling

1. Rinse containers immediately after emptying. Thoroughly wash clothing and equipment contaminated by chemicals. Do not smoke or eat in the field while applying pesticides.
2. Do not breathe, touch or ingest chemicals. Always wear the protective clothing outlined by the chemical manufacturers' label and follow safe handling procedures.
3. Fill the sprayer with chemical outside, in a well-ventilated area, away from areas frequently traveled by family and other people.
4. Wash thoroughly before eating or using the washroom. Use a detergent to remove all chemical residue. Rinse carefully and dry with disposable towels.

## Pesticide Application

1. Read and follow all label instructions.
2. Select the least toxic pesticide for the application. Chemicals that display **CAUTION** or **WARNING** on the label are less harmful than chemicals that display **DANGER** on the label. Avoid using chemicals that are designated **RESTRICTED** if possible.
3. Wear the appropriate protective clothing and equipment when working with chemicals. Remove protective clothing and equipment before entering the cab to prevent contaminating the cab.
4. If possible, **DO NOT** leave the operator's cab while in the treated area. If it becomes necessary to leave the cab in the treated area, immediately put on the protective clothing and equipment required by the pesticide label upon exiting the cab.
5. Misuse, including excessive rates, uneven application, wind drift, and label violations can cause injury to crops, livestock, persons and the environment.
6. Eliminate the need to dispose of excess pesticides by purchasing only what is required to do the application.
7. Ensure there is fresh water in the fresh water wash tank; know where it is and how to use it. Consult a physician should you contact the chemical and subsequently experience physical difficulties. Do not use the sprayer to transport drinking water.

## Storing Chemicals

1. Follow the manufacturers' instructions for chemical storage. Avoid unnecessary storage by purchasing only the quantity needed for the crop year. Never reuse pesticide containers.
2. Store chemicals only in their original containers and in a locked area. Never use unmarked containers or containers used for food to store pesticides.
3. Keep all chemicals out of reach of children and away from livestock and animals.

# CHEMICAL SAFETY

## Disposal

1. Do not burn the containers or leave them lying in the field or ditches. Dispose of them by triple rinsing and leaving at a pesticide container disposal site.
2. Rinse sprayer while still in the field. Spray the rinse thinly over the field sprayed. Never contaminate the farmyard or drainage systems with sprayer rinse.
3. Remember that pesticide waste is as hazardous as the pesticide in the unopened container.

## Washing the Application Equipment

1. Wash down the sprayer immediately after fieldwork. Dispose of the wash water in an environmentally safe manner.
2. DO NOT clean the equipment upslope of ditches or water bodies, cropland, or shelterbelts. Wash water can contaminate the soil or a clean water supply and be very toxic to fish, other wild life and people.

## In Case of an Emergency or a Spill

1. In case of chemical poisoning, get immediate medical attention. Have a container label handy when seeking medical attention.
2. Post Emergency telephone numbers for your area on the sprayer before using agricultural chemicals.
3. Keep absorbent material available in case of a minor spill and dispose of any contaminated materials according to the pesticide label.

# CHEMICAL SAFETY

## Pesticide Hazards and Toxicity Levels

Extreme care must be taken when working around chemicals. Be familiar with the toxicity levels of the chemicals you are using and recommended protective gear that each operator should use before starting.

Every pesticide container has a label on it that designates its level of toxicity. This toxicity level then requires the operator to use specific protective gear whenever working with this chemical.

### Toxicity Level



DANGER POISON  
High Risk



WARNING POISON  
Medium Risk



CAUTION POISON  
Low Risk

### Protective Gear

Goggles, Respirator,  
Avoid Fumes, Gloves  
and Skin Protection

Goggles, Avoid Fumes,  
Gloves and Skin  
Protection

Avoid Fumes, Gloves  
and Skin Protection

## Protective Clothing

It is necessary to wear adequate protective clothing, respirators, boots, goggles and gloves to reduce the risk of contact with chemicals. **CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.**

1. **Respirators** – Only use NIOSH-approved respirators. Do not use different parts from different respirator manufacturers.

Change filters each day during handling of chemicals. Always replace the cartridge with a new cartridge at the beginning of the spray season. Replace the cartridge when a chemical odor becomes apparent or it becomes difficult to breathe.

Check the seal of the respirator before working with chemicals. The respirator will not function properly if the operator has a beard, mustache, sideburns or they are unshaven.

2. **Goggles or Face Shields** – To protect your eyes from chemical splashing and chemical dust, wear goggles that fit snugly on your face. Eye glasses and shop safety glasses **DO NOT** provide adequate protection. Goggles that protect the sides of your face with indirect ventilation to prevent fogging should be used.

Never wear contact lenses when working with chemicals. Use a rubber or plastic strap to secure the goggles to your face. Cloth or elastic headbands will absorb chemicals.

Full-face protection may be required when handling some pesticides. Full-face shields will offer more protection to exposed skin than goggles.

3. **Gloves** – Never use lined gloves, gloves with wristbands, or leather gloves as these materials will absorb pesticides. Chemical resistant Neoprene or natural rubber gloves will provide the best protection. The edge of the glove should be folded over at the cuff to prevent liquid from dripping down your sleeve when you raise your arms. Sleeves should be secured tightly around the gloves.

# CHEMICAL SAFETY

4. **Footwear** – Boots should be unlined and made of chemical resistant materials such as Neoprene or rubber. **DO NOT** wear leather or clothe footwear because these will absorb pesticides. Wear pant legs outside the boot to prevent splashes and spills from running down your leg. Knee-length boots will extend above an apron offering greater protection.
5. **Coveralls, Aprons, and Hats** – Disposable or reusable coveralls should fit tightly around the neck, ankles, and wrists.

Reusable coveralls can be made of tightly woven cotton but will provide only minimal protection when handling slightly toxic chemicals. Reusable waterproof suits are made of unlined rubber, neoprene, or polyethylene and will provide the most protection. **DO NOT** use coveralls made of polyester material because liquids easily penetrate them.

Disposable coveralls are made of polyethylene material, which is lightweight and more comfortable on warm days. Be careful to choose a disposable coverall that is chemically resistant. Disposable coveralls often have an attached hood that protects the head, neck and ears.

Aprons protect the front of your body when pouring and handling concentrated pesticides. The apron should be made of rubber or neoprene material. The apron should cover the front of the body from the chest to the knees.

If the coveralls do not have a hood, a hard hat and waterproof neck covering should be worn. The sweatband in the hard hat should be made of plastic material and not cotton or leather because they cannot be cleaned properly. **DO NOT** wear a baseball cap with a cloth sweatband.

## Cleaning Contaminated Clothing

Wash contaminated clothing after each day of use. **WEAR GLOVES WHEN HANDLING PESTICIDE CONTAMINATED CLOTHING.** Discard clothing that has been saturated with highly toxic and concentrated pesticides and clothing that has been ripped or torn.

Do not wash protective clothing with other family garments at the same time. Rinse clothing in a wash tub.

Protective clothing used to handle small amounts of slightly toxic pesticides can be laundered in **ONE** wash. Otherwise, protective clothing should be laundered at least **TWICE**.

Wash the protective clothing separately, one or two garments at a time, and wash clothing that has been used to handle the same pesticide together.

Wash the protective clothing with detergent in hot water (60°C), the highest water level and longest wash cycle with two rinses.

Rinse the washing machine after laundering protective clothing by running the machine through a full wash and rinse cycle with hot water and detergent.

Dry the clothing outside on a line to avoid buildup of residue in the dryer. Most pesticides are readily broken down in sunlight. Store protective clothing away from pesticides.

Disposable coveralls should be rinsed after each day of use. Gently hand wash the coveralls in hot soapy water if necessary and hang them to dry. Do not scrub or wring them out to prevent damage to the material and discard the coveralls if there are tears or holes in them.

Hand wash gloves, boots and hard hats in hot soapy water after each day of use and air dry. Discard boots and gloves damaged with holes or tears.

# CHEMICAL SAFETY

## Clean Water Personal Wash and Emergency Rinse Tank

There is a square, yellow tank located on the left boom near the plumbing tree. The tank has a hose that will gravity feed or an auxiliary tap that can be used in the case of emergency and to protect against pesticide contamination.

Fill the tank with clean water every day and check regularly to ensure there is adequate water in the event of an emergency and for the day's use. Remove the fill cap on top to fill the tank with water.

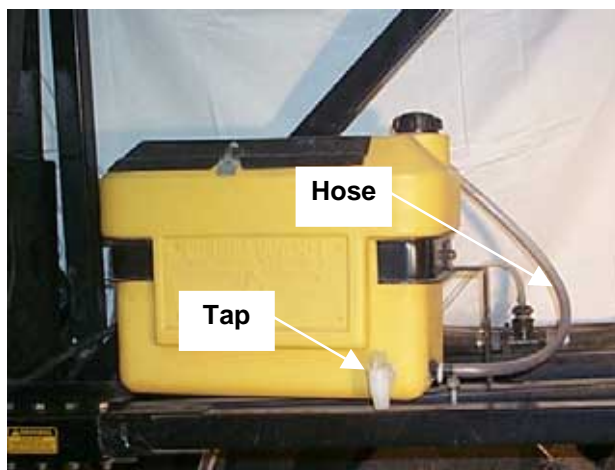
To operate the gravity feed hose on the rinse tank:

1. Pull down on the hose until it breaks free from the upper fitting.
2. Water will begin flowing from the opening in the hose when the hose is below the water level in the tank. Hold the hose and opening below the tank to ensure the water is allowed to drain completely from the tank. Avoid covering the opening and/or squeezing the hose which would reduce the flow of water from the tank.
3. Position the contaminated area of the body under the opening of the hose and flush the affliction with running water from the hose.

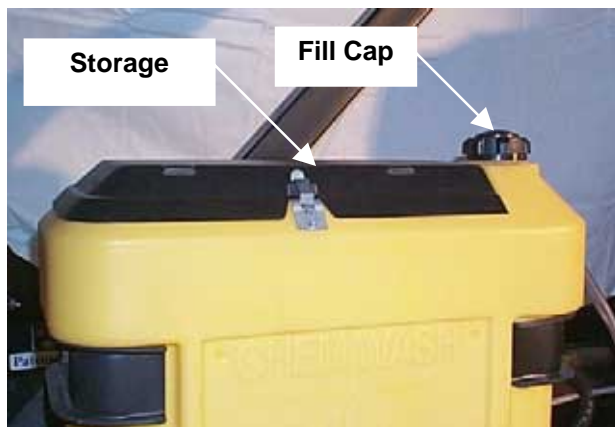
To operate the tap:

1. Turn the valve on the tap until water begins to flow from the tank.
2. Position the contaminated area of the body under the opening of the tap and flush the affliction with running water from the tap.

There is storage compartment molded in the tank that can be used to store detergent, soap and shampoo, face cloth, and towels. To access the compartment, pull down on the metal locking latch and lift the black lid to the upright position. After using stored items close the lid and return the metal latch to lock it shut.



**Emergency Rinse Tank Gravity Feed Hose and Manual Tap**



**Emergency Rinse Tank**

# CHEMICAL SAFETY

## Emergency First Aid for Pesticide Poisoning

While awaiting medical attention, several steps can be taken to alleviate pain and/or discomfort from pesticide poisoning. **DO NOT CONTAMINATE YOURSELF** when assisting someone else. **CHECK THE PESTICIDE LABELS FOR THE FIRST AID PROCEDURES IN THE CASE OF AN EMERGENCY.**

1. Remove yourself or the victim from the source of contamination immediately and remove clothing if necessary. Wash with plenty of water.
2. If someone else has been poisoned, check his or her breathing. Give artificial respiration if breathing has stopped but ensure the victim's mouth is not contaminated with pesticide. **DO NOT** contaminate yourself. Clean the victim's mouth and use alternative method to give mouth to mouth resuscitation.
3. Call 911, a medical facility or a local doctor and seek medical attention.
4. Decontaminate yourself or the victim with water unless the pesticide label recommends different procedures.
5. Keep yourself or the victim warm and comfortable.
6. Carry a label from the pesticide container to inform the doctor of the type of poisoning. Keep the pesticide label in a sealed plastic bag to avoid contaminating other people.

**If a chemical has come in contact with the skin, IMMEDIATELY REMOVE THE CONTAMINATED CLOTHING AND WASH THE SKIN WITH CLEAN WATER.** Avoid contaminating other areas of the body when removing clothes. Clean the skin with detergent and/or gently shampoo hair; clean under the fingernails. Avoid scratching the skin and/or scalp. Dry off, keep warm by wrapping yourself in a blanket or with clean clothes and seek medical attention.

**In the case of a chemical burn, IMMEDIATELY REMOVE THE CONTAMINATED CLOTHING AND WASH THE SKIN WITH CLEAN WATER.** Avoid contaminating other areas of the body when removing clothes. Cover the burned area with a loose, clean, soft cloth. **DO NOT** apply ointments, greases, powders or other drugs when treating a burn. Seek medical attention.

**If a chemical has come in contact with the eye, WASH THE EYE IMMEDIATELY.** Hold the eyelid open under the gravity feed hose. Wash the eye with clean running water for 15 minutes and seek medical attention.

**If chemical dust, vapor or fumes have been inhaled, IMMEDIATELY MOVE TO A VENTILATED AREA WITH FRESH AIR.** If someone else has been exposed to chemicals in an enclosed area, **DO NOT ENTER** the enclosed area without sufficient protective equipment. Ventilate the enclosed area so that no one else will be poisoned. If no protective equipment is available, **DO NOT ENTER** an enclosed area to retrieve a victim but call for assistance from a fire department. Apply artificial respiration if breathing has stopped but **DO NOT** contaminate yourself. **DO NOT** give the victim alcohol to drink. Seek medical attention.

**If a chemical has been swallowed, NEVER INDUCE VOMITTING UNLESS IT IS RECOMMENDED ON THE CHEMICAL LABEL.** Drink plenty of water if an unknown poison has been swallowed to dilute and slow absorption. Seek medical attention.

A victim that has been in contact or ingested a chemical may go into shock or experience respiratory failure. Someone may be in shock if their skin is cool, moist and pale, eyes have dilated pupils, breathing is shallow and irregular, pulse is weak, rapid and irregular. **If a victim goes into shock, KEEP HIM OR HER WARM. If the victim is not breathing, IMMEDIATELY BEGIN ARTIFICIAL RESPIRATION BUT DO NOT CONTAMINATE YOURSELF.**



# SPECIFICATIONS

## MacDon Field Sprayer

AVAILABLE SIZES 90 feet (27.5 meters) width - 12 feet 7 inches (3.8 meters) width  
when sprayer is in transport position

SPRAY SYSTEM 400 US Gallon (1500 liters) spray capacity  
Spraying height from 24" (60 cm) to 76" (190 cm)  
Standard nozzle spacing of 20" (50 cm)  
Dry boom design allows adjustable nozzle spacing  
Micro-Trak MT-3405 rate control system  
Individual boom controls  
Polyethylene tank  
80-02 Extended Range TeeJet stainless steel nozzles standard  
TeeJet triple nozzle bodies installed from the factory  
Centrifugal hydraulic motor driven Hypro pump - maximum flow is  
150 USgpm (580 LPM), maximum pressure is 150 psi (1030 kPa).  
DICKEY-john Radar Velocity Sensor  
Line strainer

WEIGHT 4800 lbs. (1500 kg) with tank empty

FEATURES Innovative and gentle boom tip break away  
Independent boom lift/fold/tip  
Charcoal cab air filter  
Rugged, revolutionary boom design  
Outstanding operator visibility with front boom design  
Rubber based vertical and horizontal boom suspension

OPTIONS Optional 150 US Gallon (580 liters) Rear tank kit  
Rear center boom location and kit  
Foam marker kit  
Windscreen kit  
Rinse nozzle installed inside the tank  
Boom touch down wheel

### REQUIRED MOUNT TRACTOR SPECIFICATIONS:

Turbo Engine Required  
Tail Wheel Tires 16.5L X 16.1 to be 80% filled with Calcium Chloride for  
ballast and at 20 psi (140 kPa) pressure REQUIRED when the rear tank  
kit has not been installed.  
16.5L X 16.1 Drive Tire Option Recommended  
No. 7 Power Wheel Option Recommended when the sprayer attachment is  
installed on a 9300 or 9350 SP Windrower with 21.5L x 16.1 drive tires.  
No. 8 Power Wheel REQUIRED when SP Windrower has 19.5L x 24 drive  
tires or the 14.6L x 24 drive tires.

SPECIFICATIONS AND DESIGN ARE SUBJECT TO CHANGE WITHOUT NOTICE OR OBLIGATION TO  
REVISE UNITS PREVIOUSLY SOLD.

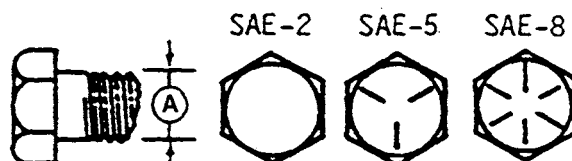
# TORQUE SPECIFICATIONS

## CHECKING BOLT TORQUE

The tables shown below give correct torque values for various bolts and capscrews. Tighten all bolts to the torques specified in chart unless otherwise noted. Check tightness of bolts periodically using bolt torque chart as a guide. Replace hardware with the same strength of bolt.

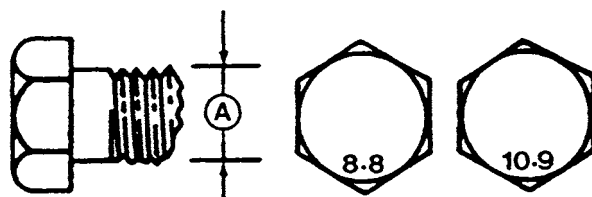
### ENGLISH TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque *					
	SAE 2		SAE 5		SAE 8	
	N.m	(lb-ft)	N.m	(lb-ft)	N.m	(lb-ft)
1/4 "	8	(6)	12	(9)	17	(12)
5/16 "	13	(10)	25	(19)	36	(27)
3/8 "	27	(20)	45	(33)	63	(45)
7/16 "	41	(30)	72	(53)	100	(75)
1/2 "	61	(45)	110	(80)	155	(115)
9/16 "	95	(70)	155	(115)	220	(165)
5/8 "	128	(95)	215	(160)	305	(220)
3/4 "	225	(165)	390	(290)	540	(400)
7/8 "	230	(170)	570	(420)	880	(650)
1 "	345	(225)	850	(630)	1320	(970)



### METRIC TORQUE SPECIFICATIONS

Bolt Diameter "A"	Bolt Torque			
	8.8		10.9	
	N.m	(lb-ft)	N.m	(lb-ft)
M3	.5	(.4)	1.8	(1.3)
M4	3	(2.2)	4.5	(3.3)
M5	6	(4)	9	(7)
M6	10	(7)	15	(11)
M8	25	(18)	35	(26)
M10	50	(37)	70	(52)
M12	90	(66)	125	(92)
M14	140	(103)	200	(148)
M16	225	(166)	310	(229)
M20	435	(321)	610	(450)
M24	750	(553)	1050	(774)
M30	1495	(1103)	2100	(1550)
M36	2600	(1917)	3675	(2710)



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

Torque value for bolts and capscrews are identified by their head markings.

# TORQUE SPECIFICATIONS

## TIGHTENING O-RING FITTINGS\*

1. Inspect O-ring and seat for dirt or obvious defects.
2. On angle fittings back the lock nut off until washer bottoms out at top of groove.
3. Hand tighten fitting until back-up washer or washer face (if straight fitting) bottoms on face and O-ring is seated.
4. Position angle fittings by unscrewing no more than one turn.
5. Tighten straight fittings to torque shown.
6. Tighten angle fittings to torque shown while holding body of fitting with a wrench.

Thread Size (in.)	Nut Size Across Flats (in.)	Torque Value		Recommended Turn to Tighten (After Finger Tightening)	
		(N.m)	(lb-ft)	(Flats)	(Turns)
3/8	1/2	8	6	2	1/3
7/16	9/16	12	9	2	1/3
1/2	5/8	16	12	2	1/3
9/16	11/16	24	18	2	1/3
3/4	7/8	46	34	2	1/3
7/8	1	62	46	1-1/2	1/4
1-1/16	1-1/4	102	75	1	1/6
1-3/16	1-3/8	122	90	1	1/6
1-5/16	1-1/2	142	105	3/4	1/8
1-5/8	1-7/8	190	140	3/4	1/8
1-7/8	2-1/8	217	160	1/2	1/12

\* The torque values shown are based on lubricated connections as in reassembly.

## TIGHTENING FLARE TYPE TUBE FITTINGS\*

1. Check flare and flare seat for defects that might cause leakage.
2. Align tube with fitting before tightening.
3. Lubricate connection and hand tighten swivel nut until snug.
4. To prevent twisting the tube(s), use two wrenches. Place one wrench on the connector body and with the second tighten the swivel nut to the torque shown.

Thread Size OD (in.)	Nut Size Across Flats (in.)	Torque Value		Recommended Turn to Tighten (After Finger Tightening)	
		(N.m)	(lb-ft)	(Flats)	(Turns)
3/16	7/16	8	6	1	1/6
1/4	9/16	12	9	1	1/6
5/16	5/8	16	12	1	1/6
3/8	11/16	24	18	1	1/6
1/2	7/8	46	34	1	1/6
5/8	1	62	46	1	1/6
3/4	1-1/4	102	75	3/4	1/8
7/8	1-3/8	122	90	3/4	1/8

\* The torque values are based on lubricated connections in reassembly.

# OPERATION

## Your Responsibilities as an Owner/Operator

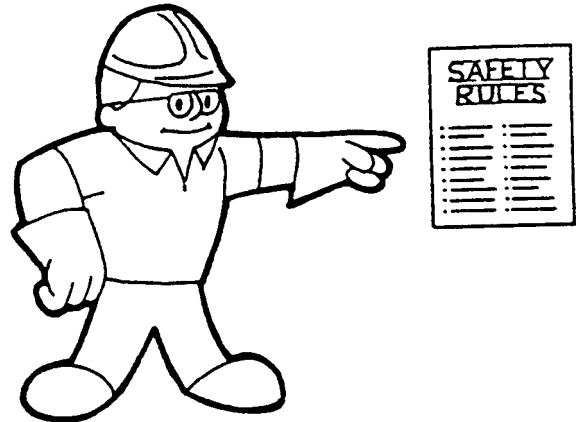


### CAUTION:

1. It is your responsibility to read and understand this manual and the Self-Propelled Windrower Operator's Manual completely before operating the sprayer. Contact your dealer if an instruction is not clear to you.
2. Follow all safety messages in the manual and on safety signs on the machine.
3. Remember that YOU are the key to safety. Good safety practices protect you and the people around you.
4. Before allowing anyone to operate the machine, for however short a time or distance, make sure they have been instructed in its safe and proper use.
5. Review the manual and all safety related items with all operators annually.
6. Be alert for other operators not using recommended procedures or not following safety precautions. Correct these mistakes immediately, before an accident occurs.
7. Do not modify the machine. Unauthorized modifications may impair the function and/or safety and affect machine life.
8. The safety information given in this manual does not replace safety codes, insurance needs, or laws governing your area. Be sure your machine meets the standards set by these regulations.



READ THE OPERATOR'S MANUAL



FOLLOW SAFETY RULES

## To the New Operator

It's natural for an operator to be anxious to get started with a new machine. Please take the time to familiarize yourself with the sprayer by reading the Operator's Manuals and safety signs before attempting operation. Study the Starting, Driving and Stopping procedures so you will know what to expect.

# OPERATION

## Driving the Sprayer

Read the Self-Propelled Windrower Operator's Manual for instructions on starting, driving, stopping, and leaving the Windrower.



**WARNING:** Avoid driving the machine with the sprayer attachment removed. Removing the sprayer decreases the weight on drive wheels, reducing steering control.

- If necessary to drive machine with sprayer removed, use transmission "field speed" range, do not exceed half maximum engine speed and avoid loose gravel and slopes.
- Never use windrower as towing vehicle when sprayer is removed. There is insufficient weight on the drive wheels to provide steering control.
- Because of windrower shape characteristics, a roll-over protected cab (ROPS) cab is not required. If operating with sprayer removed, be aware that the cab structure will not withstand a roll-over.



### **CAUTION: HYDROSTATIC STEERING**

The machine is steered hydrostatically, that is, turning the steering wheel varies the hydraulic flow to one drive wheel relative to the other drive wheel. The reaction of this type of steering is different than conventional steering mechanisms.

Remember:

- With the engine running and the variable speed lever in neutral, the machine will move if the steering wheel is turned.
- Hydrostatic steering is more sensitive than mechanical steering.
- Steering is opposite to normal when driving in reverse.



**CAUTION:** 1. Never move variable speed lever or steering wheel until you are sure all bystanders have cleared the area.

1. Be sure area is clear before making turns, ends of sprayer booms travel in a large arc.
2. Check the operation of all controls in a safe, clear area before starting work. Be sure you know the capacity and operating characteristics of this machine.
3. Do not allow riders in or on the machine.
4. Operate only while seated in the operator's position.
5. Never attempt to get on or off a moving windrower.
6. Avoid sudden starts or stops.
7. Avoid inclines, ditches, and fences.
8. Reduce speed when turning, crossing slopes, or when traveling over rough ground.
9. Do not allow anyone to stand behind the machine while operating. Personnel may come in contact with spray drift.

**NOTE:** Lift the rear center boom to the highest position from the ground when transporting the sprayer on roadways.



AVOID DRIVING WITH SPRAYER REMOVED



CLEAR THE AREA BEFORE OPERATING



DO NOT ALLOW RIDERS

# OPERATION

## Pre-Starting Checks: Annual



**WARNING: AVOID INJURY!** Protective gloves should be worn whenever handling pesticide contaminated material. Protective gloves must be unlined materials, made of rubber, polyethylene, or neoprene. CHECK THE PESTICIDE LABEL FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.



**WARNING: AVOID INJURY!** The spray tank and system should be emptied of chemical mixture and flushed with clean water before servicing the spray system.



**WARNING: AVOID INJURY!** Spray system hoses may contain pressure and cause the chemical mixture to come in contact with the operator. CHECK THE PESTICIDE LABEL FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.

Do the following at start of each operating season:



### **CAUTION:**

1. Review the Operator's Manuals to refresh your memory on safety and operating recommendations.
2. Review all safety signs and other decals on the machine and note hazard areas.
3. Fold and unfold the spray booms (refer to page 25 for instructions) and listen for interference as well as check for clearances, etc.
4. Re-acquaint yourself with the controls, steering and handling before beginning operation.

ALSO:

5. Perform all annual maintenance on the Self-Propelled Windrower. Refer to the Maintenance Checklist section in the Self-Propelled Windrower Operator's Manual.
6. Clean the supply tank and fill it with clean water. Clean the line strainer.

7. Remove all nozzle tips and strainers. Flush the hoses and the booms with clean water. Check all connections for leaks. Replace and check the nozzle tips for proper operation and spray distribution.
8. Check the calibration of the sprayer. Ensure the pressure gauges work properly.

# OPERATION

## Pre-Starting Checks: Daily

Do the following each day before starting the engine:



### CAUTION:

1. Clear the area of other persons, pets, etc. Keep children away from machinery. Walk around the machine to be sure no one is under, on or close to it.
2. Remove foreign objects from the machine and surrounding area.
3. Wear close fitting clothing and protective shoes with slip resistant soles.

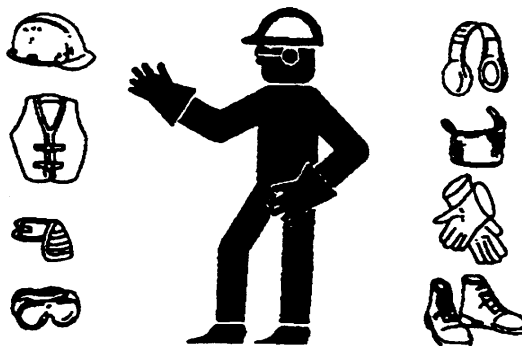
As well, carry with you any protective clothing and personal safety devices that **COULD** be necessary through the day.

Consult the chemical manufacturer label for required clothing to protect against pesticide poisoning.

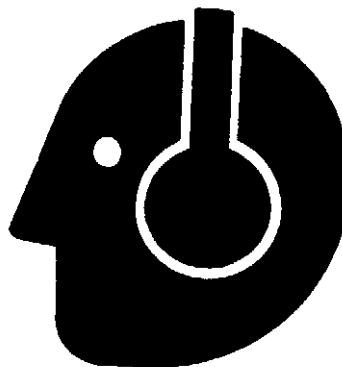
You may also need:

- a hard hat
- protective glasses or goggles
- unlined gloves made of rubber, polyethylene, or neoprene
- respirator or filter mask
- wet weather gear

4. Protect against noise. Wear a suitable hearing protective device such as ear muffs or ear plugs to protect against objectionable or uncomfortably loud noises.
5. Check the machine for leaks or any parts that are loose, missing, broken, or not working correctly. Use proper procedure when searching for pressurized fluid leaks. Refer to the Hydraulic System section in the Self-Propelled Windrower Operator's Manual.



PROTECT YOURSELF



PROTECT AGAINST NOISE

# OPERATION

6. Clean all lights and reflectors on the power unit and the sprayer attachment.
7. Perform all daily maintenance on the Self-Propelled Windrower. Refer to the Maintenance Checklist section in the Self-Propelled Windrower Operator's Manual.

**IMPORTANT:** See Windrower Operator's Manual for information on the following:

- Start-Up Procedure
- Driving the Windrower
- Stopping Procedure

8. Check the weather conditions. Do not spray if it is too windy and spray drift could result. Other weather conditions may reduce the effectiveness of the pesticide application as well. **READ THE PESTICIDE LABEL.**
9. Ensure all protective equipment is clean and available for use on the sprayer. Remove protective clothing and equipment before entering the cab to prevent contaminating the cab. If possible, **DO NOT** leave the operator's cab while in the treated area. If it becomes necessary to leave the cab in the treated area, immediately put on the protective clothing and equipment required by the pesticide label upon exiting the cab.
10. While performing a pesticide application, ensure the blower control is set to HIGH to pressurize the cab. With the door closed, window closed and the blower on, a positive pressure in the cab will prevent pesticide and dust from entering the cab.
11. Ensure the emergency rinse tank is full of clean water.
12. Check the pressure gauges for proper operation. Check the application pressures while spraying and observe the spray distribution of the nozzle tips to detect a plugged nozzle.



# OPERATION

## **Break-in Period**

1. After attaching the sprayer attachment to the MacDon self-propelled windrower for the first time, operate the machine slowly for 5 minutes, watching and listening FROM THE OPERATOR'S SEAT for binding or interfering parts while unfolding and folding booms. Refer to page 25 of this manual for boom control instructions.



**CAUTION:** Before investigating an unusual sound or attempting to correct a problem, shut off the engine, engage the parking brake and remove key.

2. Become familiar with the machine by operating the sprayer in the transport position. Drive the unit in an open area at low speeds to familiarize yourself with steering and handling characteristics of the unit. Hydrostatic steering equipment might handle somewhat differently from other machinery you are familiar with. The steering might seem somewhat sensitive at speeds over 10 mph (16 km/h). Do not exceed this speed until you are completely comfortable with the handling of your MacDon Field Sprayer Attachment.
3. Add some water to the tank and run the spray system for 5 minutes. Shut down the engine and inspect the spray system for possible leaks.

Refer to the Maintenance/Service section of the Self-Propelled Windrower Operator's Manual for points to inspect after 10 hours of operation.

4. Check hardware after 5 hours operation. Tighten as necessary. Refer to the Torque Specifications on page 17 of this manual for recommended torque.
5. Until you become familiar with the sound and feel of your new equipment, be extra alert and attentive.



**Plumbing System**

# OPERATION

## Boom Controls

Refer to the Self-Propelled Windrower Operator's Manual for identification of the following in-cab controls:

- Header Drive Clutch
- Header Height
- Ground Speed
- Reel Speed
- Reel Height
- Auger Speed

We will be referring to these controls in the following section. The header and reel switches are used for boom fold/lift/swing.

### SWITCH IDENTIFICATION:

When the pedestal switch **A** is switched to "Sprayer" mode, the reel height control switch (**C**) and header height control switch (**D**) are used to move the booms.

The reel height control switch (**C**) controls movement of the right boom and the header height control switch (**D**) controls movement of the left boom. Depress the left foot switch (**B**) to select which boom movement switches **D** and **C** will initiate. Red indicator lights on the control pedestal show which function has been selected. The foot switches are located beside the steering column in the self-propelled windrower.

1. When the red light shows "BOOM LIFT" has been selected, switches **C** and **D** will move the booms in a vertical direction, up (+) or down (-).
2. When the red light shows "TIP LIFT/SWING" has been selected:
  - a. switches **C** and **D** will initiate booms to swing in a horizontal direction, into (-) or out-of (+) transport cradles when the booms are raised completely to the TOP.
  - b. switches **C** and **D** will initiate the outer Boom Tips to fold in(+) or fold out (-) of transport when booms are NOT RAISED COMPLETELY TO THE TOP.

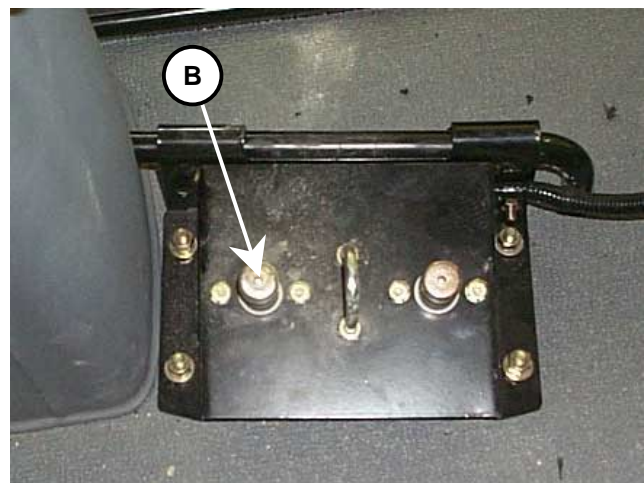
When extending your booms outward to the field position, gravity will swing the break away section (outer section) forward to lock it into the field position. If the machine is positioned on an incline, the breakaway section may not swing with enough force to lock it into position. Slight twisting motion, using the steering wheel, will snap the section forward and lock it into position.



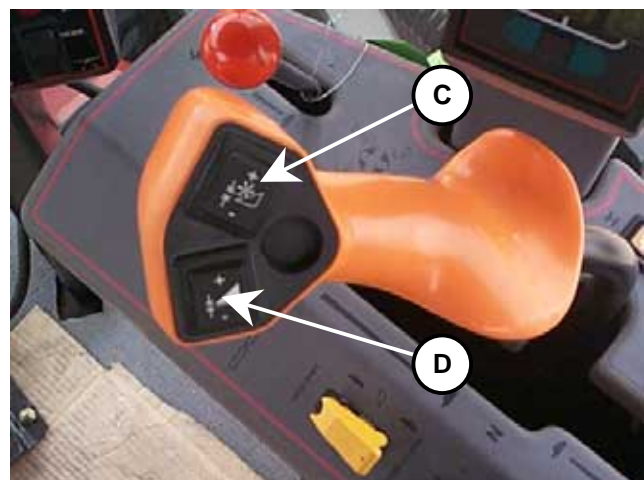
**CAUTION:** Be sure all bystanders are clear of machine before starting the machine or moving any of the booms from their transport position. See PRESTARTING CHECKS section on the previous page.



**Sprayer Control Switches**



**Foot Switches**



**Ground Speed Lever**

# OPERATION

**Switch Identification** (continued):

## **Rear Center Boom**

When the rear center boom kit has been installed, the height of the boom can be adjusted by depressing the “Rear Boom” switch (E) located on the control pedestal. Pushing on the bottom portion on the switch will cause the rear center boom to move downward. Pushing on the top portion of the switch will cause the rear center boom to move upward.

**NOTE:** Lift the rear center boom to the highest position from the ground when transporting the sprayer on roadways.



**Rear center boom height control switch.**

# OPERATION

## Attaching the Sprayer to the Windrower

The MacDon Field Sprayer can be easily and quickly attached to the tractor section. The sprayer is attached as follows:

1. Disconnect the center link at the tractor by removing the pin.
2. Start the engine. Fully retract header lift cylinders by depressing the header height switch on ground speed lever.



**CAUTION:** Be sure area is clear of bystanders, then start engine.

3. Slowly drive forward so that lift linkage enters sprayer attachment legs. Continue to drive forward until linkage contacts support plate in the attachment leg, and sprayer attachment nudges forward.
4. Activate header lift cylinders by depressing '+' switch on the ground speed lever. Raise sprayer attachment fully.
5. Stop engine and remove key. Exit the cab. Engage the header cylinder lift stops. Install pins through the bottom and top header leg on both sides of the sprayer. When inserting the pin for the bottom linkage hole:
  - a. Insert the pin through the hole nearest the tractor, towards the rear of the sprayer (A), if the sprayer is attached to a 9300 or 9350 self-propelled windrower.
  - b. Insert the pin through the hole furthest from the tractor, towards the front of the sprayer (B), if the sprayer is attached to a 9352 self-propelled windrower.



**DANGER:** Ensure the linkage pins have been installed properly through the holes in the header lift linkage. Failure to do so can result in serious injury or death.



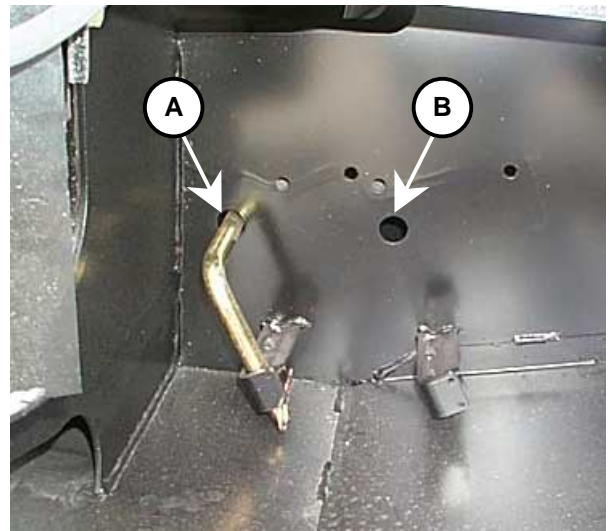
**DANGER:** To avoid bodily injury from fall of raised sprayer attachment, always engage header lift cylinder stops when working on or around raised sprayer.

6. Connect all electrical and hydraulic connections.

7. Switch to "SPRAYER" mode on the monitor pedestal. Switch to the sprayer function "LIFT" on the monitor.
8. Start the engine. Lift booms off the ground to the top of the mast by depressing '+' on the header lift and reel lift switches on the ground speed lever.



**Line up the lift linkage with the sprayer attachment legs and slowly drive the tractor forward.**



**Bottom Lift Linkage Pin**



# OPERATION

9. Stop engine and remove key. Exit the cab. Raise the boom props to the storage position and ensure they are secured by replacing the hairpin. Ensure the boom transport cradles are turned so that they can support the boom.
10. Start the engine. Switch to the sprayer function "TIP LIFT/SWING" on the pedestal. Swing the booms in to the transport position by depressing '-' on the header lift and reel lift switches on the ground speed lever.
11. Switch to the sprayer function "LIFT" on the pedestal. Lower the booms on to the transport cradles by depressing '-' on the header lift and reel lift switches on the ground speed lever. Lower the booms to the transport position.

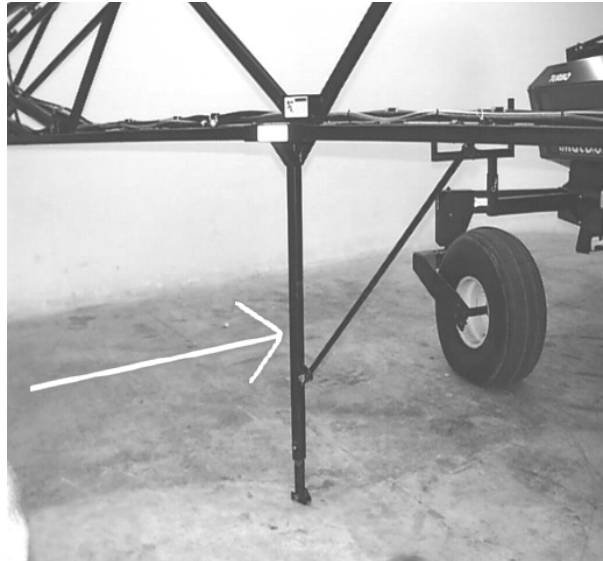
For more information on transporting the self-propelled windrower and sprayer attachment refer to Transporting the Sprayer on page 46 of this manual.



**Transport Cradle**

## **Boom Props**

The boom props are used exclusively for supporting the booms when the sprayer attachment is removed from the tractor for servicing or storage. Refer to Storage Procedure on page 49 of this manual for instructions on using the boom props. Be certain to fully install hairpins when using the boom props.



**Boom prop in the lowered position.**

# OPERATION

## Spray System



**WARNING: AVOID INJURY!** Protective gloves should be worn whenever handling pesticide contaminated material. Protective gloves must be unlined materials, made of rubber, polyethylene, or neoprene. CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.



**WARNING: AVOID INJURY!** The spray tank and system should be emptied of chemical mixture and flushed with clean water before servicing the spray system.



**WARNING: AVOID INJURY!** Spray system hoses may contain pressure and cause the chemical mixture to come in contact with the operator. CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.

## Operating the Sprayer Pump

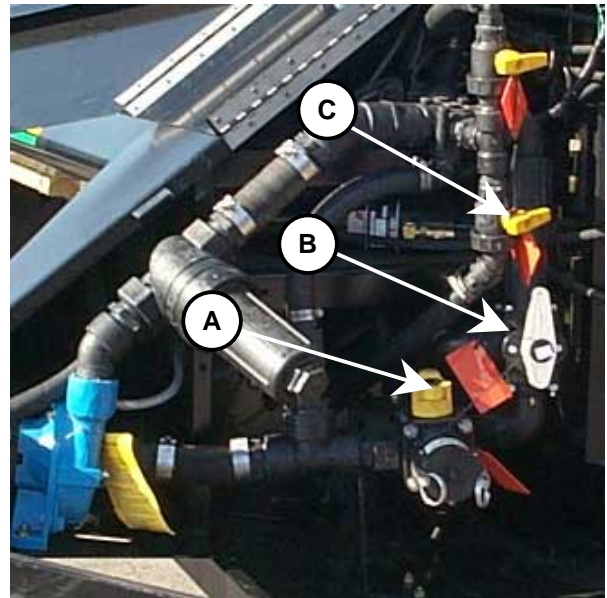
The sprayer pump and plumbing system are located in the left pod on the center section of the sprayer. Open the pod door by inserting your hand in the slot. Press the latch against the door and slide the door up.

The sprayer pump is a hydraulically driven centrifugal pump. **It is not self-priming.** If the pump is run dry for any length of time, the internal seal may overheat. If this occurs, turn the pump off immediately and let it cool.

To operate the spray system, add clean filtered water to the main tank. **Follow the procedures on page 31 for bottom filling the main tank or page 32 for top filling the tank.** Refer to page 84 for instructions on operating the sprayer when it is equipped with a rear tank.

Before starting the pump, the liquid level must be higher than the pump to assure proper priming. The volume of liquid should be enough so that liquid always circulates through the pump. After water has been added to the tank, turn the valves to the normal spray position:

1. Turn the main suction valve **A** so that the direction arrows on the handle are pointed towards the tank and the sprayer pump.
2. Close the bypass valve **B**.
3. Open the agitation valve **C**.



**Plumbing System**

4. Place the run/hold switch on the MT-3405 rate controller to the "HOLD" position and the boom selector switches to the "OFF" position.
5. Increase the reel speed dial to maximum. Increase the conveyor speed control dial to 6 (refer to the section on Header Controls in the Self-Propelled Windrower Operator's Manual for the location of the speed control dials).

**NOTE:** The reel speed control and conveyor speed control dials may require adjustment prior to normal sprayer operation. Follow the instructions on page 36 for calibrating the sprayer.

# OPERATION

## Starting the Sprayer Pump

1. Start the engine.



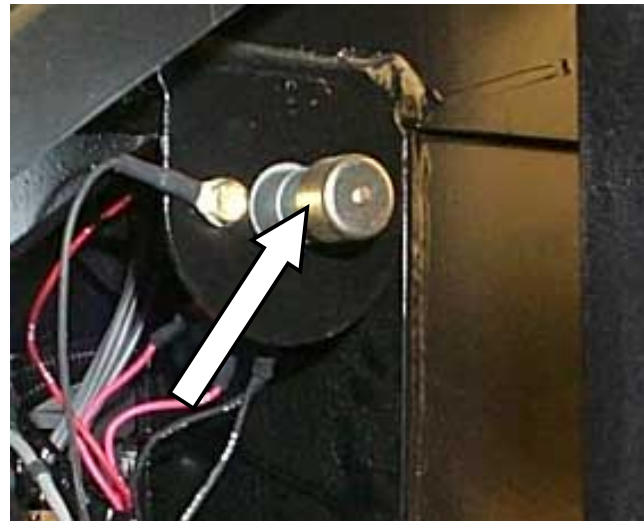
**CAUTION:** Be sure area is clear of bystanders, then start engine.

2. Engage the header clutch switch in the tractor cab (refer to the section on Header Controls in the Self-Propelled Windrower Operator's Manual for the location of the header clutch switch).
3. A red push button switch located on the pedestal activates the pump from the cab.
4. There is an auxiliary switch located in the left side pod near the spray system plumbing tree. It can be used to engage or disengage the pump when an operator is standing next to the manual controls of the spray system plumbing.
5. Increase the throttle lever in the operator's cab to half maximum engine speed. This will allow the pump to prime quickly and provide sufficient pump output for agitation. Engine throttle should be at full speed during normal field operation.

**NOTE:** To maintain optimum working conditions for the spray system pump, loop the conveyor drive pressure hose and connect it to the conveyor return coupler on the windrower (refer to the section on Attaching the Header in the Self-Propelled Windrower Operator's Manual for the location of the hydraulic hose connections).



**Depress switch on the pedestal in the cab to engage pump.**



**Auxiliary Switch to Activate the Sprayer Pump**

## Checking for Pump Operation

1. A red indicator light beside the pump activation switch on the pedestal in the cab indicates if the pump has been engaged.
2. The Spray System pressure gauge will display the system pressure when the pump has been primed.

If the pump is primed properly there will be flow into the top of the tank through the "pump self-prime line".

# OPERATION

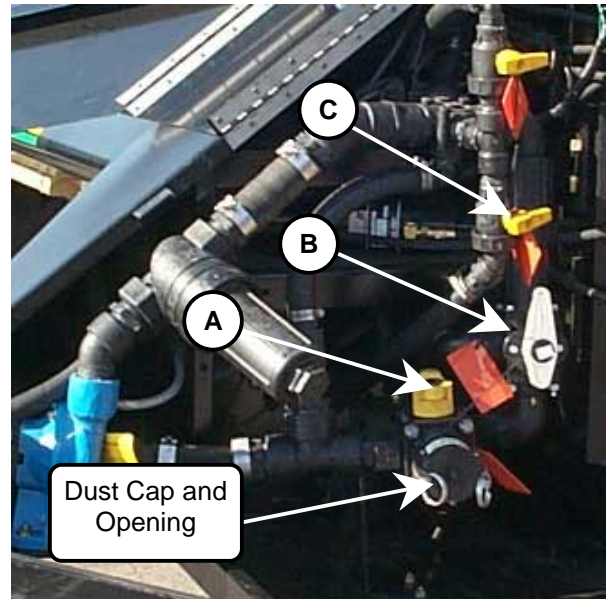
## **Bottom Filling the Tank**

The bottom fill feature is part of the spray system plumbing located in the left pod of the sprayer attachment.

To fill the tank using the bottom tank fill system, turn the valves of the plumbing tree to the bottom filling position and use the following procedure:

**NOTE:** Refer to page 84 for instructions on bottom filling the sprayer when it is equipped with a rear tank.

1. Place the run/hold switch on the MT-3405 rate controller to the "HOLD" position and the boom selector switches to the "OFF" position.
2. Open the bypass valve **B**.
3. Locate the quick disconnect opening. Remove dust cap from the opening and attach the supply line from the nurse tank to the quick disconnect opening.
4. Turn on the spray system pump. Turn the main line valve **A** so that the direction arrows on the valve handle point towards the nurse tank, away from the sprayer, and the sprayer pump.
5. When the required amount of water has been added to the tank, return the main line valve **A** so that the direction arrows point towards the main tank and the sprayer pump. Shut off sprayer pump.
6. Close the bypass valve **B**.
7. Disconnect the supply hose and replace the dust cap.



**Plumbing System**



# OPERATION

## Top Filling the Tank

During top filling the tank, chemical will have to be added through the top fill opening unless there is a separate mixing system available at the nurse tank. **CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROPER MIXING PROCEDURE FOR EACH PESTICIDE.**

1. Place the run/hold switch on the MT-3405 rate controller to the "HOLD" position and the boom selector switches to the "OFF" position.
2. Place the supply hose through the main tank opening.
3. Start the auxiliary pump at the nurse tank. Be sure to use clean filtered water to prevent nozzle and/or screen plugging.
4. Turn off the pump when the tank is half full of water. Remove the supply hose from the tank while filling the tank with chemical.
5. Add the required amount of chemical through the opening in the main tank. Triple rinse each chemical container, disposing of the rinse contents into the tank.
6. When the required amount of water has been added to the tank, shut off the auxiliary pump. Close the valve at the nurse tank.

## Triple Rinsing Chemical Containers



**WARNING: AVOID INJURY! Wear eye protection, protective gloves and clothing whenever handling pesticide contaminated material. Protective gloves must be unlined materials, made of rubber, polyethylene, or neoprene. CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING THE PESTICIDE.**



**WARNING: AVOID INJURY! DO NOT breathe vapor or ingest chemicals and avoid contact with exposed skin. CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON HANDLING THE PESTICIDE.**



**WARNING: DO NOT burn chemical containers as toxic fumes may contaminate the area. DO NOT discard chemical containers in ditches. DO NOT place containers in landfills. Dispose of containers at a designated disposal site. CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON SAFE DISPOSAL OF THE PESTICIDE.**

To prevent contamination of the environment, all chemical containers should be triple rinsed and the empty containers disposed of in a safe manner. Triple rinsing metal or plastic containers **immediately** after the contents have been dumped in to the main tank should eliminate 99.9% of the original contents from the container.

Use the following procedure to properly dispose of chemical containers:

1. Empty the container of the pesticide into the tank and drain for 30 seconds.
2. Fill container 10 to 25% with clean water or other dilution and replace the container cap.
3. Shake or roll the container so the inside of the entire container will be washed. Pour the rinsate into tank and drain for 30 seconds.
4. Repeat steps 2 and 3 of the rinse procedure two more times. If the rinsate still appears cloudy or milky on the last time, continue rinsing until the rinsate appears clear.
5. Do not reuse. Puncture the container to render it non-reusable. Take triple rinsed container to a designated disposal site.

# OPERATION

## Flushing the Spray System and Tank Cleaning

### Daily Cleaning

Follow the disposal and rinsing guidelines outlined by the chemical manufacturer to properly flush the spray system of different types of chemicals.

**Always consult with your state or local agricultural department and the chemical manufacturer for precautions to be taken when handling, as well as the laws that govern the safe disposal of specific chemicals.**



**WARNING: AVOID INJURY! Wear eye protection, protective gloves and clothing whenever handling pesticide contaminated material. Protective gloves must be unlined materials, made of rubber, polyethylene, or neoprene. CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.**



**WARNING: Solution contained in the plumbing tree and hoses will empty when any hoses, dust caps, or plugs are removed to drain the spray system.**

After each working day using the sprayer, the tank should be rinsed clean using the following procedure:

1. When the tank has been emptied and no chemical remains in the boom lines, fill the main tank with 50 to 100 gallons (200 to 400 liters) of clean water.

**NOTE:** The first rinse solution will contain the highest concentration of chemical. Adding more water to the tank will reduce the concentration but will take longer to flush empty.

2. Circulate water in the front and rear tanks by turning the main suction valve (**A**) to the normal spraying position and close the bypass valve (**B**).
3. Open the agitator valve and allow the spray system to circulate for 5 minutes.

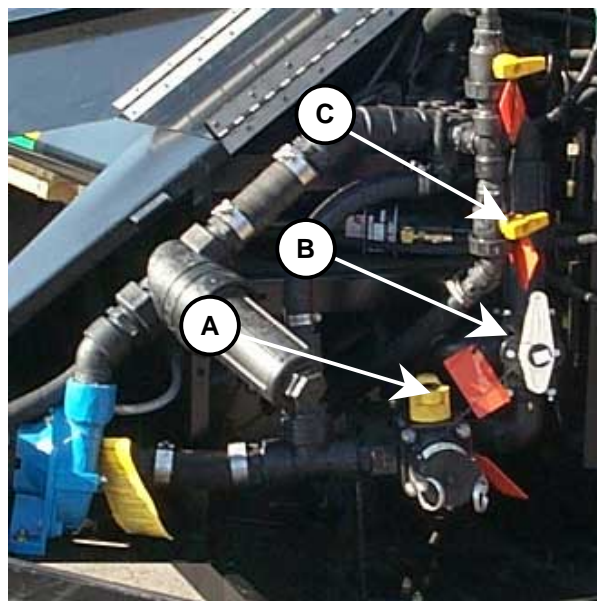
**NOTE:** While flushing the spray system, the optional rinse nozzles can be used to flush the inside surfaces of the tank. Refer to the section on page 85 for instructions on operating the rinse nozzles installed in each solution tank.

4. Reduce the application rate and flush the spray system through the booms by spraying the tank contents on the crop previously sprayed or a fallow field.

Switch the run/hold switch on the MT-3405 rate controller to "RUN" and switch the boom selector switches to "ON". This will flush clean water through the nozzle tips.

5. Repeat the procedure **TWICE**.
6. After rinsing the tank, clean the filters, screens and nozzles. Drain the tank and allow it to dry.

Drain the spray system through the bottom fill coupling. Remove dust cap from the bottom fill coupler and partially turn valve **A** until the solution begins to drain.



**Plumbing System**

# OPERATION

## Cleaning the Tank when Changing Chemicals or Storing the Sprayer Attachment

To remove esters of 2,4-D and MCPA formulations, the following procedure should be followed:

1. Rinse the tank clean by performing the procedure for daily cleaning. Remove and clean the filter, screens, and nozzles separately. Spray out the boom lines and drain the tank completely.
2. Add 50 to 100 gallons (200 to 400 liters) of clean water to the main tank.
3. Add 1 lb. (1kg) of dishwasher detergent to the tank for every 25 gallons (300 liters) of water. Open the agitator valve and allow the spray system to circulate for 5 to 10 minutes.
4. Wash the inside of the tank using a mop or scrub brush. **DO NOT ENTER THE TANK.**
5. Flush the spray system through the booms and drain completely.
6. Add 50 to 100 gallons (200 to 400 liters) of clean water to the main tank.
7. Add 1 gallon (2 liters) of household ammonia to the tank for every 100 gallons (400 liters) of water. Circulate the spray system for 5 minutes.
8. Wash the inside of the tank using a mop or scrub brush. **DO NOT ENTER THE TANK.**

**NOTE:** While flushing the spray system, the optional rinse nozzles can be used to flush the inside surfaces of the tank. Refer to page for instructions on operating the rinse nozzles installed in each solution tank.

9. Flush a small amount of the solution from the spray system through the booms.
10. Allow the remaining solution in the tank to sit overnight.
11. Open the agitator valve and allow the spray system to circulate for 5 to 10 minutes.
12. Flush the spray system through the booms and drain completely.

To remove amine or salt formulations, the following procedure should be followed:

1. Rinse the tank clean by performing the procedure for daily cleaning. Remove and clean the filter, screens, and nozzles separately. Spray out the boom lines and drain the tank completely.
2. Add 50 to 100 gallons (200 to 400 liters) of clean water to the main tank.
3. Add 1 gallon (2 liters) of household ammonia to the tank for every 100 gallons (400 liters) of water. Circulate the spray system for 5 minutes.
4. Wash the inside of the tank using a mop or scrub brush. **DO NOT ENTER THE TANK.**  

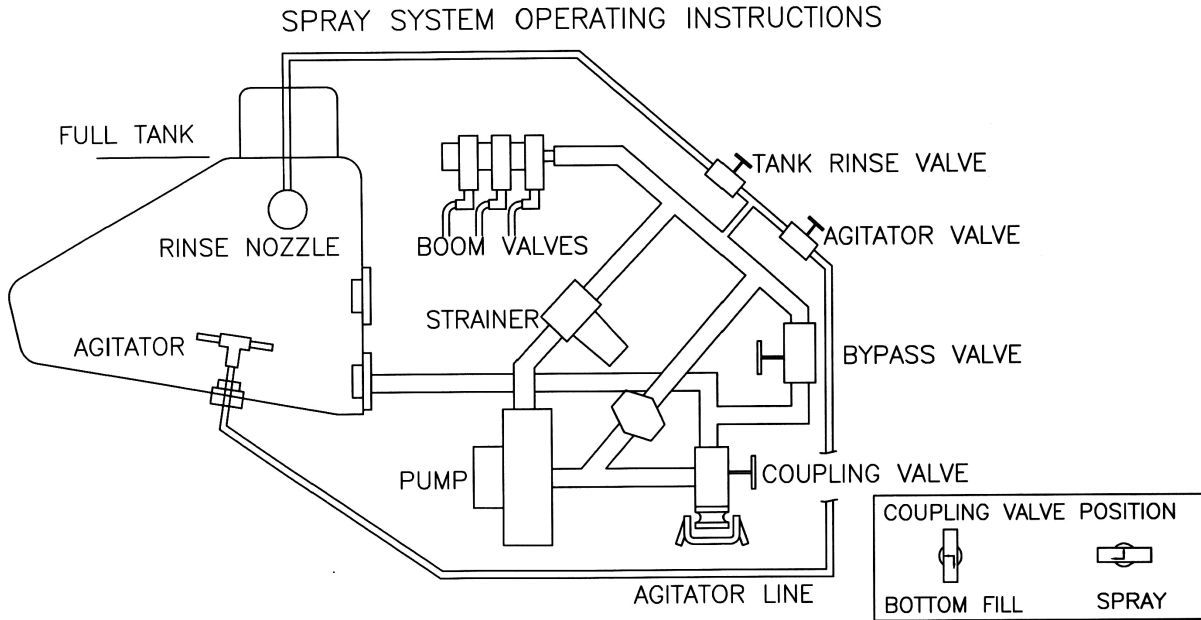
**NOTE:** While flushing the spray system, the optional rinse nozzles can be used to flush the inside surfaces of the tank. Refer to page for instructions on operating the rinse nozzles installed in each solution tank.
5. Flush a small amount of the solution from the spray system through the booms.
6. Allow the remaining solution in the tank to sit overnight.
7. Open the agitator valve and allow the spray system to circulate for 5 to 10 minutes.
8. Flush the spray system through the booms and drain completely.

# OPERATION

## Agitation

The MacDon Field Sprayer is supplied with two jet agitators installed in the front solution tank. The agitation of your chemical mixture can be regulated by:

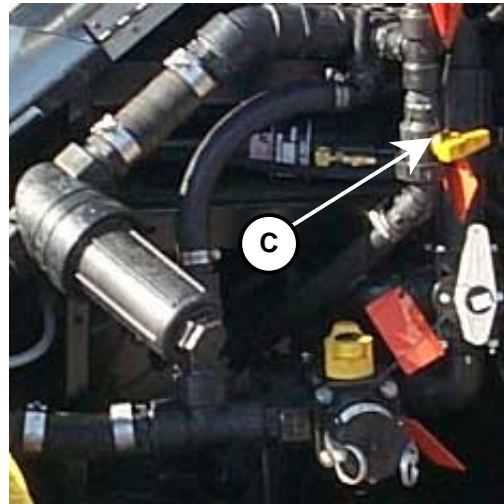
- a. Changing the orifice in the agitator jet.
- b. Using the agitation control valve **C** to throttle the bypass to obtain the desired maximum spray or minimum spray pressure or tank agitation.



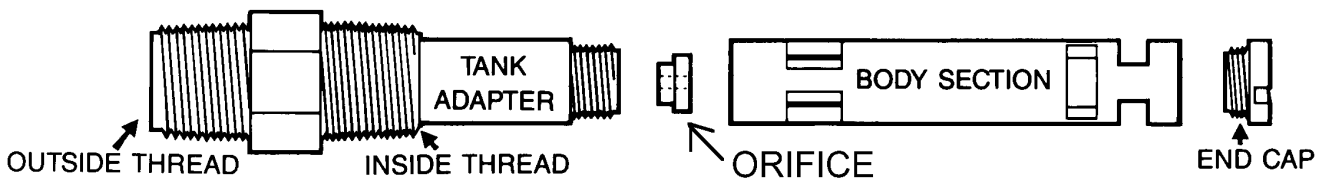
## Orifice

1. The MacDon Field Sprayer is shipped from the factory with the 3/16" orifice installed. This allows 12.8 USgpm (49.6 LPM) output per agitator at 50 psi (345 kPa).
2. If the agitation control valve **C** is fully open, the maximum pressure or agitation is obtained. Minimum pressure is achieved by partially opening or closing the agitation control valve **C**.

Changing the agitation orifice in the agitator jet will change the pressure ranges obtainable with the agitation control valve.



AGITATION CONTROL VALVE C



# OPERATION

## Sprayer Calibration

The sprayer calibration procedure will ensure the sprayer pump is set properly. The reel speed and conveyor dials are adjusted so that the sprayer pump will only output the required rate for the application. Perform this procedure at the beginning of each season and when changing nozzle tips. This procedure can also be used to identify tip wear and replacement.



**WARNING:** Only perform this procedure when the spray system has been rinsed clean. Use only clean water to fill the tank and perform the procedure. To reduce the risk of chemical contamination, always wear the same protective equipment and take the same precautions that are required when handling chemicals and preparing to do an application.

Make several copies of this page. Use a copy each time you perform a sprayer calibration and include it in your records. Use the empty space for calculations and notes. You will need a calculator, stopwatch, cleaning brush, measuring container, and one new tip with a new screen.

### 1. Record the following information.

Date \_\_\_\_\_

Nozzle Manufacturer \_\_\_\_\_

Nozzle Type \_\_\_\_\_

(all nozzles must be identical)

Recommended Application Rate (A) \_\_\_\_\_ **USGPA**  
(from chemical manufacturer's label)

Nozzle Spacing (B) \_\_\_\_\_ inches

### 2. Check windrower speed.

Perform this check to verify the DICKEY-john Radar velocity sensor is accurate in the field. The sprayer speed should be calibrated in the field when the tank is ½ to ¾ full of water. Record the time it takes and the distance in the blanks below. If you are confident the Radar sensor is accurate, record the desired speed in the blank (C) and proceed to the next step.

Distance Traveled \_\_\_\_\_ feet

Time Taken \_\_\_\_\_ seconds

Calculate the true ground speed using the following equation.

$$\text{Speed (mph)} = \frac{\text{Distance (feet)} \times 60}{\text{Time (seconds)} \times 88}$$

True Ground Speed (C) \_\_\_\_\_ mph

**IMPORTANT:** The tractor must be traveling at the desired speed at the starting point before timing begins.

Calculate the speed or use the chart below to match the time it takes to travel a specific distance over your field with the true ground speed.

Speed in mph (Miles per Hour)	Time required in SECONDS to Travel a Distance of:		
	100 Feet	200 Feet	300 Feet
3.0	23	45	68
3.5	20	39	58
4.0	17	34	51
4.5	15	30	45
5.0	23	27	41
6.0	-	23	34
7.0	-	19	29
7.5	-	18	27
8.0	-	17	26
9.0	-	15	23

# OPERATION

### 3. Calculate the individual nozzle output using the following equation.

$$\text{USGPM} = \frac{\text{USGPA (A)} \times \text{Spacing (B)} \times \text{mph (C)}}{5940}$$

Output per Nozzle (D) \_\_\_\_\_ **USGPM**

### 4. Set the correct pressure.

- a. Replace one tip and strainer with an identical **new** tip and strainer. Refer to the application chart and locate the pressure that will give the nozzle output calculated in step three for the selected nozzle tip. A Flow Rate and Application Chart for the XR type nozzle tip is included on page 56 of this manual.

Target Pressure \_\_\_\_\_ **psi**

A TeeJet catalogue is supplied with your MacDon Field Sprayer Manuals. It includes the descriptions for a variety of nozzle types that can be used with the MacDon Field Sprayer. Before starting the spray application, consult your dealer if you need more information on the nozzle tip.

**NOTE:** Set the agitation valve before calibrating the sprayer. Open the valve to increase agitation. Close the valve to reduce foaming. Do not change the setting during sprayer calibration.

- b. Start the engine. Enter the application rate in the MT-3405 rate controller. While the rate controller is in calibration mode, toggle the switch to test speed. Enter the ground speed.



**CAUTION:** Be sure area is clear of bystanders, then start engine.

- c. Start the sprayer pump and increase the engine throttle to maximum. Turn on all three boom sections and put the run/hold switch in the "RUN" position. Do not exit calibration mode on the rate controller.



**WARNING:** Operate the sprayer away from areas frequently traveled by family and other people.

- d. Adjust the reel speed or conveyor speed dials until the output on the nozzle pressure gauge is equal to the pressure recommended for the selected nozzle tip. Allow the MT-3405 rate controller time to adjust by spraying water through the booms for one minute.

- e. After the nozzle pressure has been adjusted, measure the volume output from the new spray tip. Place a collection container under the nozzle for one minute and collect the output.



**WARNING:** Ensure other personnel are trained properly and always wear the same protective equipment and take the same precautions that are required when handling chemicals and preparing to do an application.

The volume collected in the container must equal the individual nozzle output calculated in step three. Adjust the reel speed and conveyor speed dials to fine tune the output pressure from the nozzle to get the correct volume.

Output per Nozzle in  
One Minute (E) \_\_\_\_\_ **USGPM**

The sprayer has now been calibrated to the proper pressure. It will deliver the proper application rate at the desired speed.

# OPERATION

## 5. Checking the nozzle tips for wear.

Measure the flow rate of several tips on each boom section. Calculate the difference in flow rate between the new nozzle (D) and the nozzles being checked (E). Convert the difference in the flow rate into a percentage using the following equation.

$$\text{Difference} = \frac{(\text{USGPM}(D) - \text{USGPM}(E))}{\text{USGPM}(D)} \times 100$$

If the flow rate of any nozzle tip is greater or less than 10% of the new tip, recheck the faulty nozzle and replace if necessary. If a second tip is found to be faulty, replace all the nozzles on the entire boom.

Nozzle (E)	Output in USGPM	% Difference from New Nozzle
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

While measuring the flow rate, observe the spray distribution for any distortion of the spray pattern. An irregular spray pattern may indicate wear or an obstruction. Remove the tip and screen and use the brush to clean. Replace and check to see if the problem is corrected. If it is not, replace the nozzle and screen with a new nozzle and screen.

# OPERATION

## Sprayer Calibration (metric)

The sprayer calibration procedure will ensure the sprayer pump is set properly. The reel speed and conveyor speed dials are adjusted so that the sprayer pump will only output the required rate for the application. Perform this procedure at the beginning of each season and when changing nozzle tips. This procedure can also be used to identify tip wear and replacement.



**WARNING:** Only perform this procedure when the spray system has been rinsed clean. Use only clean water to fill the tank and perform the procedure. To reduce the risk of chemical contamination, always wear the same protective equipment and take the same precautions that are required when handling chemicals and preparing to do an application.

Make several copies of this page. Use a copy each time you perform a sprayer calibration and include it in your records. Use the empty space for calculations and notes. You will need a calculator, stopwatch, cleaning brush, measuring container, and one new tip with a new screen.

### 1. Record the following information.

Date \_\_\_\_\_

Nozzle Manufacturer \_\_\_\_\_

Nozzle Type \_\_\_\_\_

(all nozzles must be identical)

Recommended Application Rate (A) \_\_\_\_\_ L/Ha

(from chemical manufacturer's label)

Nozzle Spacing (B) \_\_\_\_\_ cm

### 2. Check windrower speed.

Perform this check to verify the DICKEY-john Radar velocity sensor is accurate. The sprayer speed should be calibrated in the field when the tank is ½ to ¾ full of water. Record the time it takes and the distance in the blanks below. If you are confident the Radar sensor is accurate, record the desired speed in the blank (C) and proceed to the next step.

Distance Traveled \_\_\_\_\_ meters

Time Taken \_\_\_\_\_ seconds

Calculate the true ground speed using the following equation.

$$\text{Speed(km/h)} = \frac{\text{Distance(meters)} \times 3.6}{\text{Time(seconds)}}$$

True Ground Speed (C) \_\_\_\_\_ km/h

**IMPORTANT:** The tractor must be traveling at the desired speed at the starting point before timing begins.

Calculate the speed or use the chart below to match the time it takes to travel a specific distance over your field with the true ground speed.

Speed in km/h	Time required in SECONDS to Travel a Distance of:			
	30 m	60 m	90 m	120 m
5.0	22	43	65	86
6.0	18	36	54	72
7.0	15	31	46	62
8.0	14	27	41	54
9.0	-	24	36	48
10.0	-	22	32	43
11.0	-	20	29	39
12.0	-	18	27	36
13.0	-	17	25	33
14.0	-	15	23	31
16.0	-	14	20	27



# OPERATION

### 3. Calculate the individual nozzle output using the following equation.

$$\text{LPM} = \frac{\text{L/Ha (A)} \times \text{Spacing (B)} \times \text{km/h (C)}}{60000}$$

Output per Nozzle (D) \_\_\_\_\_ LPM

### 4. Set the correct pressure.

- a. Replace one tip and strainer with an identical **new** tip and strainer. Refer to the application chart and locate the pressure that will give the nozzle output calculated in step three for the selected nozzle tip. A Flow Rate and Application Chart for the XR type nozzle tip is included on page 56 of this manual.

Target Pressure \_\_\_\_\_ kPa

A TeeJet catalogue is supplied with your MacDon Field Sprayer Manuals. It includes the descriptions for a variety of nozzle types that can be used with the MacDon Field Sprayer. Before starting the spray application, consult your dealer if you need more information on the nozzle tip.

**NOTE:** Set the agitation valve before calibrating the sprayer. Open the valve to increase agitation. Close the valve to reduce foaming. Do not change the setting during sprayer calibration.

- b. Start the engine. Enter the application rate in the MT-3405 rate controller. While the rate controller is in calibration mode, toggle the switch to test speed. Enter the ground speed.



**CAUTION:** Be sure area is clear of bystanders, then start engine.

- c. Start the sprayer pump and increase the engine throttle to maximum. Turn on all three boom sections and put the run/hold switch in the "RUN" position. Do not exit calibration mode on the rate controller.



**WARNING:** Operate the sprayer away from areas frequently traveled by family and other people.

- d. Adjust the reel speed and conveyor speed dials until the output on the nozzle pressure gauge is equal to the pressure recommended for the selected nozzle tip. Allow the MT-3405 rate controller time to adjust by spraying water through the booms for one minute.

- e. After the nozzle pressure has been adjusted, measure the volume output from the new spray tip. Place a collection container under the nozzle for one minute and collect the output.



**WARNING:** Ensure other personnel are trained properly and always wear the same protective equipment and take the same precautions that are required when handling chemicals and preparing to do an application.

The volume collected in the container must equal the individual nozzle output calculated in step three. Adjust the reel speed and conveyor speed dials to fine tune the output pressure from the nozzle to get the correct volume.

Output per Nozzle in  
One Minute (E) \_\_\_\_\_ LPM

The sprayer has now been calibrated to the proper pressure. It will deliver the proper application rate at the desired speed.

# OPERATION

## 5. Checking the nozzle tips for wear.

Measure the flow rate of several tips on each boom section. Calculate the difference in flow rate between the new nozzle (D) and the nozzles being checked (E). Convert the difference in the flow rate into a percentage using the following equation.

$$\text{Difference} = \frac{\text{LPM(D)} - \text{LPM(E)}}{\text{LPM(D)}} \times 100$$

If the flow rate of any nozzle tip is greater or less than 10% of the new tip, recheck the faulty nozzle and replace if necessary. If a second tip is found to be faulty, replace all the nozzles on the entire boom.

Nozzle (E)	Output in LPM	% Difference from New Nozzle
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		

While measuring the flow rate, observe the spray distribution for any distortion of the spray pattern. An irregular spray pattern may indicate wear or an obstruction. Remove the tip and screen and use the brush to clean. Replace and check to see if the problem is corrected. If it is not, replace the nozzle and screen with a new nozzle and screen.

# OPERATION

## Crop Dividers

The crop dividers are installed to reduce trampling of taller, mature crops and in row crop applications. If necessary, adjust the crop dividers to suit different crop conditions and applications. The dividers may not function if the crop is immature or plant height is less than 24" (60 cm). The dividers can be removed if they interfere with the spray application early in the growing season.



**Crop Dividers**

# OPERATION

## Rate Controller

### The MT-3405 Automatic Rate Controller

Refer to the Micro-Trak Operator's Manual for instructions on using the MT-3405 controller. This manual contains information for the following:

- Installation of the Monitor
- Console Functions
- Calibration
- Operation
- Troubleshooting
- Flow Meter Assembly and Maintenance
- Plumbing Guidelines
- Conversion Charts
- Replacement Parts List

### Boom Spray Selection

Choose the boom you wish to activate by turning rate controller switch #1 on for left boom, switch #2 for the center boom, and switch #3 for right boom. Switches #4 and #5 are **NOT** used to activate a boom section on the MacDon Field Sprayer.

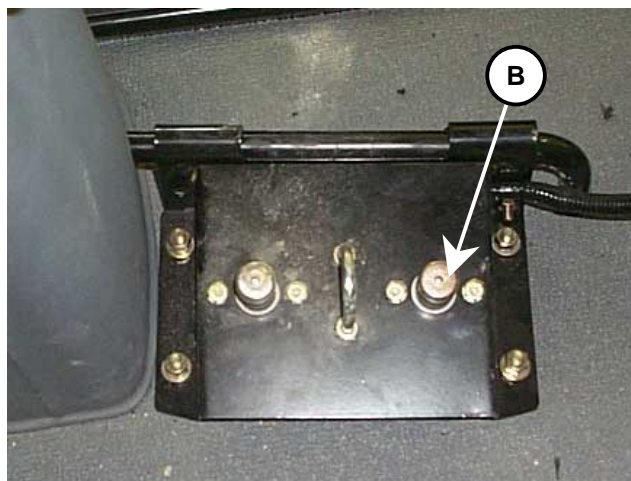
To switch off all booms at the same time, switch "RUN/HOLD" switch (A) on the MT-3405 monitor to the "HOLD" position. Toggle the switch to the "RUN" position to start spraying again.

There is a foot switch with two switches (B) located beside the steering column in the self-propelled windrower. The right dimmer switch will shut off all the booms at the same time when it is depressed (refer to the MT-3405 Operator's Manual for the location of the boom spray selection switches on the monitor). Depress the foot switch to turn on the booms and start spraying again.

The MT-3405 rate controller will switch to "HOLD" if the sprayer pump is turned off. The MT-3405 rate controller may require the foot switch to be depressed twice after the pump has been shut off.



**Boom activation switches on the MT-3405 automatic rate controller.**



**Foot switch to turn the spray booms on or off.**

# OPERATION

## Boom Control Valves

The boom control valves are TeeJet 440 series DirectoValves. Three valves are used to control spray output to the outside and center booms. The valves are located on the left side of the sprayer. Refer to the Maintenance/Service section for instructions on service of the boom control valves and electrical wiring schematics.

## Calibration Values For The MT-3405 Rate Controller

**NOTE:** These calibration values must be programmed in the MT-3405 monitor before spray application can begin. They do not have to be re-entered unless power to the monitor is interrupted over a long period of time or the operator accidentally changes calibration values.

**NOTE:** Application rate is programmed in the MT-3405 rate controller during calibration. To change the application rate, enter calibration mode, enter the new application rate in to the monitor and exit calibration (refer to the MT-3405 Operator's Manual for more information on entering the calibration rate).

## Boom Width Calibration Values

The boom width of the outside left and right boom is **460 in.** (11684 mm). The boom width of the center boom is **160 in.** (4064 mm). The boom width calibration number for boom switches #4 and #5 is **0 in.** (0 mm) in the MT-3405 rate controller (refer to the MT-3405 Operator's Manual for instructions on calibrating the controller).

## Flow Meter Calibration Number

The flow meter calibration number is located on a tag attached to the flow meter. The flow meter is located behind the bottom auxiliary pump switch in the front, left side of the sprayer attachment.

Once the flow meter calibration number has been identified, permanently mark the calibration number on the yellow calibration tag and the operator's manual for quick and easy reference (refer to the MT-3405 Operator's Manual for instructions on calibrating the controller).

Flow Meter Calibration Number:

---



**TeeJet 440 Series DirectoValves.**



**Calibration tag attached to the Flow Meter.**

# OPERATION

## DICKEY-john Radar Velocity Sensor

There are two possible locations for the DICKEY-john Radar Velocity sensor. The sprayer is setup with the radar sensor located in the right side pod of the sprayer attachment. In this location, the radar sensor is physically protected.

If an erratic reading results during mature crop spray applications or from other factors, the radar sensor can be moved to the higher position in front of the tank. The mounting bracket for the radar to be mounted on the front of the tank, is above the swing cylinder inside the right pod.

The calibration number that is programmed into the MT-3405 rate controller is **1.60** (refer to the MT-3405 Operator's Manual for instructions on calibrating the controller). This calibration number does not change with English or Metric units.



**WARNING:** To avoid possible eye damage from microwave signals emitted by the DICKEY-john Radar sensor, do not look directly into sensor face.

**NOTE:** The radar will not operate unless the ignition key of the windrower is turned to the "RUN" position.



**Location of the DICKEY-john Radar velocity sensor**



**Radar can be mounted in front of the tank for higher crop applications.**



# OPERATION

## Transporting the Sprayer



**WARNING:** Do not drive windrower on a road or highway at night, or in conditions which reduce visibility, such as fog or rain. The width of the sprayer in the transport position may not be apparent under these conditions.



**WARNING:** Avoid driving the tractor with sprayer removed. Removing the sprayer decreases the weight on the drive wheels, reducing steering control. If necessary to drive tractor with header removed, use transmission low speed range, do not exceed half maximum engine speed and avoid loose gravel and slopes.

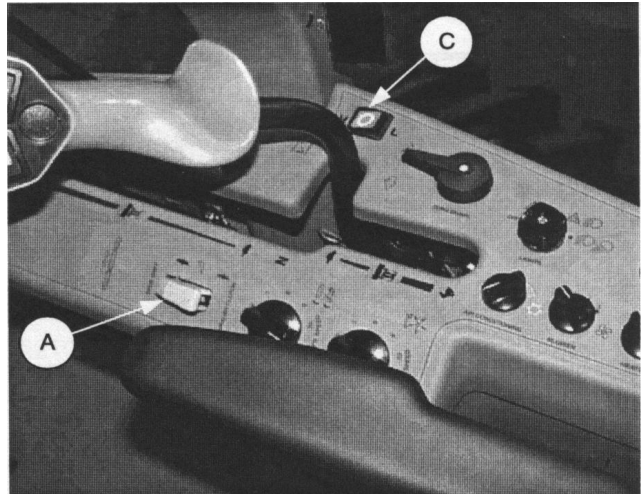


### **CAUTION:**

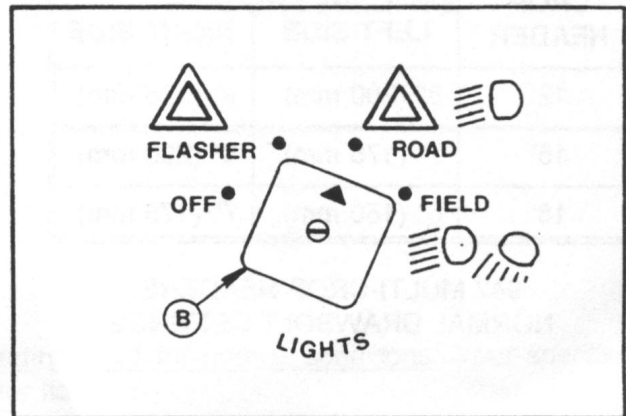
1. Check local laws for width regulations and lighting or marking requirements before transporting on roads.

2. Move header drive switch to OFF position.
3. For road speeds, move speed-range control to road position (handle forward). Remember steering is more sensitive in this speed range.
4. Before driving windrower on a roadway be sure flashing amber lamps, red tail lamp and head lamps are clean and work properly. Turn light switch to ROAD position to activate these lamps. Always use these lamps on roads to provide warning to other vehicles.
5. Do not use field lamps on roads, other drivers may be confused by them.
6. Before driving windrower on roadway, clean all reflective surfaces and slow moving vehicle emblem at rear of machine. Adjust rear view mirror and clean windows.
7. Transport sprayer with booms on the transport cradles.
8. When traveling down hill, reduce speed.
9. Travel speed should be such that complete control and machine stability are maintained at all times.

10. Stop, look and listen before entering a roadway. Stay on correct side of the roadway and pull over if possible to let faster traffic pass. Slow down and signal as you turn off.



HEADER DRIVE SWITCH OFF & SPEED-RANGE SWITCH TO HIGH



LIGHT SWITCH TO "ROAD" POSITION

# OPERATION

## **TOWING THE SPRAYER ON A TRAILER**

The MacDon Sprayer can be loaded on front or rear mount trailers while attached to the windrower, however, check local laws for width regulations in your area. MacDon advises the operator to never transport the sprayer: a) without the transport lights flashing, b) with mixed chemicals in the tank or c) without the booms in firm contact with the boom carriers to prevent bouncing of booms. Refer to the Self-Propelled Windrower Operator's manual in the section on Transporting the Windrower for additional information on transporting the windrower and the flashing amber lamp switch location.

1. Prior to transporting the sprayer on a trailer, prevent the casters from turning by inserting the locking pin.
2. Start the engine. Line up the sprayer behind the trailer. Stop the engine and remove the key.
3. Exit the cab. Remove the pin from the transport position. Insert the locking pin through the sleeve of the walking beam and ensure the pin goes through the hole in the caster fork. Secure the caster pin with the hair pin.

4. After the sprayer has been taken off the trailer, remove the locking pin from the rear caster. Return the locking pin to the transport position.



**Pin in the transport position.**



**Secure the rear caster wheel prior to transporting the sprayer on a trailer.**



## OPERATION



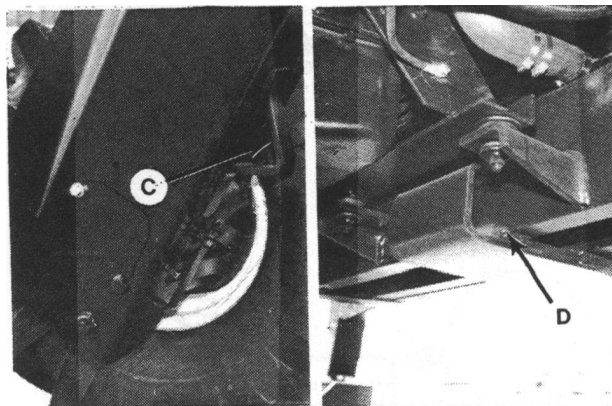
**WARNING:** When towing the sprayer on a trailer:

5. Keep sprayer attachment fully raised and secure the booms to the transport cradles.
6. Chain securely to trailer. Run chains through triangular brackets (C) at rear of tractor frame legs and through anchor (D) at rear of frame. Be sure sprayer weight is centered on trailer for suitable load. Block drive wheels to prevent movement.
7. Transport width is approximately 13 ft. (4.0 m). Check local laws for width regulations and lighting or marking requirements.
8. Remember that when towing the sprayer backwards, slow moving vehicle emblem, reflectors and warning lights are not easily visible. It is your responsibility to adequately mark the load when transporting in this fashion.
9. Set light switch to **FLASHER** position to activate amber lamps.
10. Do not tow the sprayer on a roadway at night, or in conditions which reduce visibility, such as fog or rain. The width of the load makes it unsafe to transport under these conditions.
11. Do not transport the sprayer unless it has been rinsed clean. Never transport the sprayer with chemical in the tank.
12. Do not tow at speeds over 25 mph (40 km/h). Travel speed should be such that complete control and stability are maintained at all times.
13. Be aware of roadside obstructions, oncoming traffic and bridges. Take care when traveling over rough terrain or on slopes.
14. Be sure the total weight of the trailed vehicle **NEVER EXCEEDS** the weight of the towing vehicle, unless the trailed vehicle is equipped with remote brakes.

**NOTE:** Sprayer weighs 10250 lbs (4650 kg) when the tank is empty.

Stopping distance increases with increasing speed as the weight of the trailed vehicle increase, especially on hills and slopes.

15. **IMPORTANT:** Before towing, plug or cover muffler exhaust to prevent the turbine from turning without lubrication. This “free-wheeling” of the turbocharger can cause damage.



**CHAIN WINDROWER TO TRAILER**

### TOWING THE SPRAYER WITHOUT TRAILER

The best method for transporting a disabled sprayer is to haul it on a suitable trailer or flatbed (See Towing Sprayer on a Trailer).

In emergency situations, for example, towing out of a field or into a shop, the windrower may be towed without a trailer. Refer to the Self-Propelled Windrower Operator's manual in the section on Transporting the Windrower for additional information on towing the windrower without a trailer.

# OPERATION

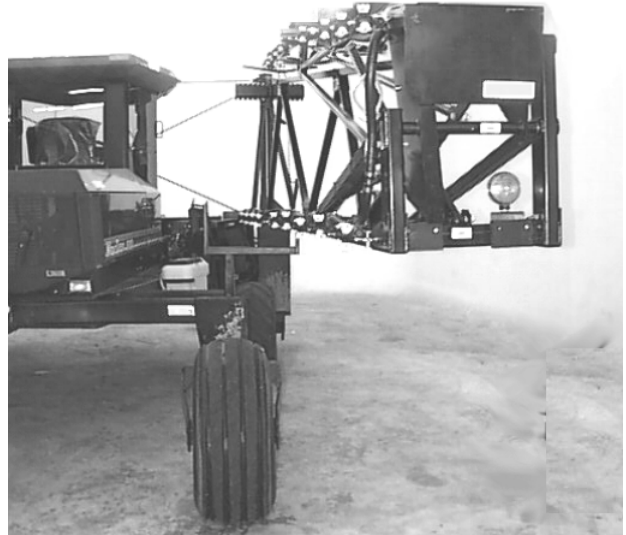
## Detaching the Sprayer

The MacDon Field Sprayer can be easily and quickly removed from the tractor section and stored in the "standing" position. The sprayer attachment is removed as follows:

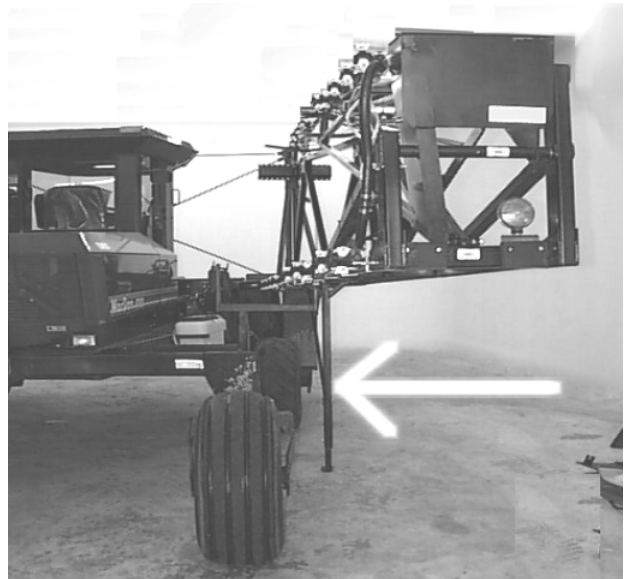
- a. Lift the boom out of the transport cradle. Swing the boom outward past the transport cradle so that the boom does not interfere with the transport cradle when it is lowered.
- b. Stop the engine and remove key. Exit the tractor cab and lower the boom prop located on each boom. Ensure hairpins are replaced to secure the boom prop in position.
- c. Start the engine. Lower the boom until the vertical suspension linkage is slack and the boom prop is bearing the weight of the boom.

**NOTE:** Place a block of wood under the boom prop to prevent the booms from settling in soft ground conditions after being stored for long a period of time.

- d. Stop engine and remove key. Engage the header lift cylinder stops.



**Swing boom out so boom prop will clear transport carrier.**



**Lower boom props and secure.**

## OPERATION

- e. Remove the four pins securing the sprayer attachment to the tractor lift linkage.



**Pin located through the top hole in the lift linkage on each side of the main frame.**



**Pin located through the bottom hole in the lift linkage on each side of the main frame.**

- f. Disconnect all hydraulic and electrical connectors on both the left and right side of the operator's cab of the tractor. If the rear center boom and rear tank option is installed, disconnect the line to the rear boom on the right side of the tractor.



**Left side connections include:**

- three hydraulic connections underneath the tractor,
- two harness connections for the MT-3405,
- two sprayer wire harness connections,
- a wire harness connection for the foam marker, and
- the transport light wire harness connection.



**Right side connections include:**

- two hydraulic connections underneath the tractor,
- two sprayer wire harness connections,
- a hose connection to the rear center boom,

## OPERATION

- g. Disengage the healer lift cylinder stops. Switch the pedestal switch **A** to "Windrower" mode.
- h. Start the engine. Lower the center section of the sprayer attachment to the ground by depressing the header switch '-' on the ground speed lever.

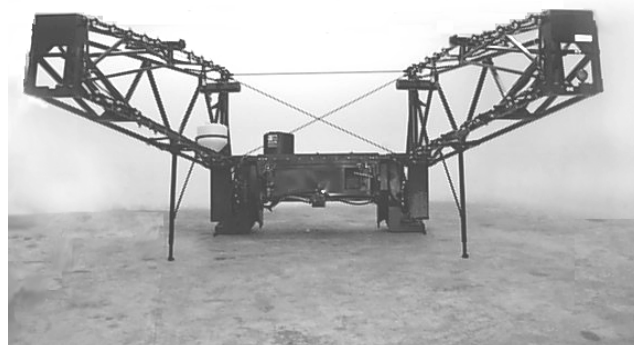
**NOTE:** Place a 6" block of wood under the center section to maintain clearance for the tractor lift linkage and prevent the sprayer attachment from settling in soft ground conditions after being stored for long periods of time.

Make certain all connections are free and clear. Then lower forks out of center section. Reverse tractor leaving the sprayer attachment free standing.

**NOTE:** Keep the sprayer attachment and SP windrower tractor clean. Wash the outside surface of each machine after fieldwork and dispose of the wash water in an environmentally safe manner. **DO NOT** clean the equipment upslope of ditches or water bodies, cropland, or shelterbelts. Wash water can contaminate the soil and can be very toxic to fish, other wild life and people. Clean equipment away from areas where family members and others are likely to frequent.



**Sprayer Control Switches**



**Sprayer attachment in the free standing position.**



**Back away leaving the sprayer free standing.**



# OPERATION

## Storage Procedure

Do the following at the end of each operating season:



### **CAUTION:**

1. **Clean the sprayer attachment thoroughly. Dispose of the wash water in an environmentally safe manner. DO NOT clean the equipment upslope of ditches or water bodies, cropland, or shelterbelts. Wash water can contaminate the soil and can be very toxic to fish, other wild life and people. Clean equipment away from areas where family members and others are likely to frequent.**

**Never use gasoline, naphtha or any volatile material for cleaning purpose. These materials may be toxic and/or flammable.**

2. **Rinse the spray system with clean water prior to working on the sprayer. Follow the procedures on page 34 for cleaning the sprayer tank.**
3. **Store sprayer attachment in a dry protected place.**

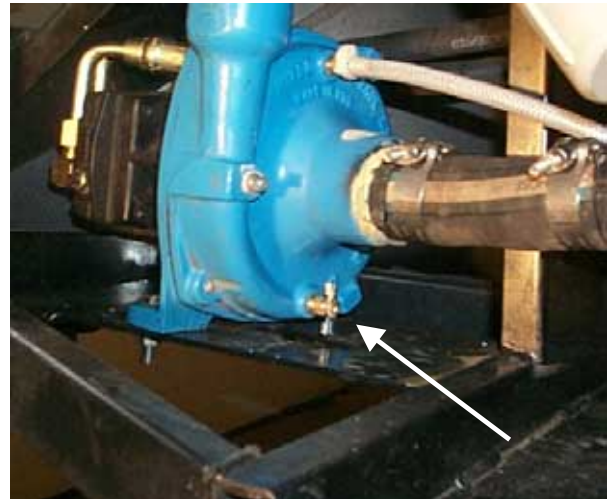
Also:

4. If stored outside, always cover the tank and plumbing tree with a waterproof tarpaulin or other protective material. This will protect the tank from UV light degradation and protect switches fittings, etc. from inclement weather.
5. Repaint all worn or chipped painted surfaces to prevent rust.
6. Lubricate the windrower thoroughly, leaving excess grease on fittings to keep moisture out of bearings. Apply grease to exposed threads and sliding surfaces of components.
7. Check for worn components and repair. Tighten loose hardware and replace missing hardware. See Specifications section for torque charts.
8. Check for broken components and order replacements from your dealer. Attention to these items right away will save time and effort at the beginning of next season.

## Winterizing the Spray System

The spray system should be completely rinsed and flushed clean before winterizing (refer to page 33). Drain the sprayer completely.

1. Open the valve at the bottom of the pump to drain fluid from the pump.
2. Remove the dust cap to the bottom fill coupler and partially open all valves.
3. Always remove the line strainer at the spray system pump and store it inside for the winter.
4. Remove all nozzle tips, screens and anti-drip devices from each nozzle body.



**Drain Valve on Sprayer Pump**

# CHEMICAL APPLICATION AND OPERATING VARIABLES FOR THE MACDON FIELD SPRAYER

## 1. Preparing for Spray Application

Satisfactory function of the spray system in all situations requires making proper adjustments to suit various crops, conditions and the chemicals being applied.

Correct operation reduces crop loss and increases chemical effectiveness. Proper adjustment and timely maintenance will increase the length of service of the sprayer attachment as well.

The variables listed here and detailed on the following pages will affect the performance of the equipment. You will quickly become adept at adjusting the machine to give you the desired results.

**Consult with your state or local agricultural department and the chemical manufacturer for precautions to be taken when handling and applying specific chemicals.**

Before you can begin spraying you must:

1. Choose the chemical to be applied.
2. Determine the application rate specified by the chemical manufacturer including:
  - a. The amount of chemical to be applied per acre or hectare.
  - b. The recommended application rate (gallons per acre or liters per hectare) of chemical when it is mixed with solution.
3. Select the travel speed depending on the field conditions.
4. Select a nozzle tip based on the application rate that is recommended. Several factors to consider when selecting the nozzle include:
  - a. the output pressure,
  - b. the spray pattern angle,
  - c. the boom height, and
  - d. the nozzle spacing.
5. Calibrate the variable rate controller to accommodate the chemical, nozzle and ground speed choices.

Consult the MT-3405 Operator's Manual supplied by Micro-Trak for instructions to calibrate the rate controller. The MacDon Field Sprayer is equipped with an ultrasonic speed sensor, flow sensor and flow control to provide "on-the-go" application rate adjustment.

# CHEMICAL APPLICATION AND OPERATING VARIABLES

## 2. Ground Speed

Chosen ground speed often depends on the terrain which the machine is being operated. **The sprayer should not be operated at ground speeds that are not within reason for the safety and comfort of the operator.** Erratic driving such as quickly accelerating and decelerating within a wide range of speeds will result in poor chemical application.

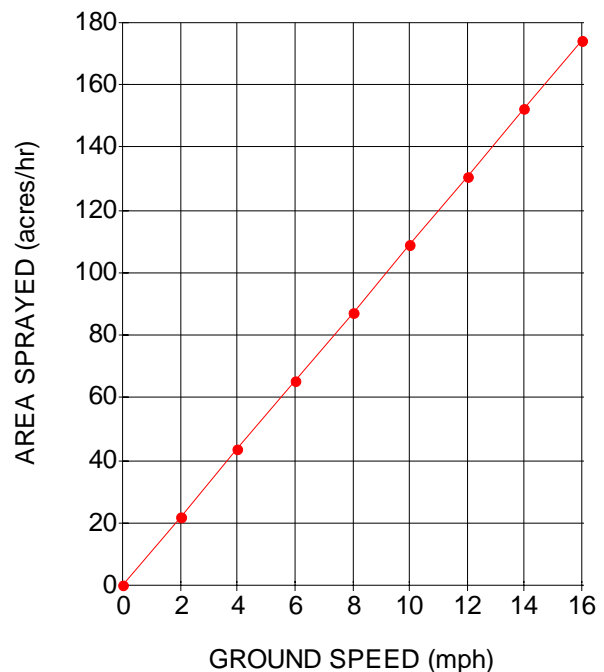
**NOTE:** The MacDon Self-Propelled Windrower has a maximum operating speed of 9 mph (14.5 km/h) when the two speed range transmission is shifted in the FIELD position (refer to the Self-Propelled Windrower Operator's Manual for identification and instructions on the variable speed control lever and speed-range control).

When the type of chemical to be applied is chosen, the manufacturer of the chemical directs the application rate. The operator must choose the ground speed for application considering both a) nozzle type to be used and b) surface conditions as they relate to operator safety and comfort.

During calibration of the MT-3405 monitor (refer to the section on Calibration of the MT-3405 Operator's Manual), the operator programs the MT-3405 rate controller for the desired application rate at the chosen ground speed. The MT-3405 rate controller adjusts the application rate "on-the-go" when the tractor speed is varied. The DICKEY-john Radar Velocity sensor installed on the sprayer will give true ground speed information to the MT-3405 rate controller during chemical application.

The MacDon Field Sprayer has a 90-foot boom width for chemical application. The chart below shows the area that can be sprayed per hour with the sprayer for a range of ground speeds. The actual area sprayed in the field will depend on a) the application rate, b) tank size, and c) field efficiency.

**NOTE:** Remember to choose your application ground speed according to the chemical application rate, the nozzle type, and the surface conditions. **Operate your machinery at a safe and comfortable speed.**



# CHEMICAL APPLICATION AND OPERATING VARIABLES

## 3. Selecting the Nozzle Tip

Extended Range 80-02 TeeJet Nozzles are supplied with the MacDon Field Sprayer Attachment. TeeJet triple nozzle bodies are installed on the sprayer to allow the sprayer to be used for a wide variety of applications. This is a guideline for you to follow if you use different nozzle tips for different applications.

The nozzle tip that is selected will depend on the application rate recommended by the chemical manufacturer, the ground speed, nozzle spacing, desired spray pattern and output, the boom height, output pressure. An application chart is used to select the nozzle tip that will output the desired application rate or flow rate at different ground speeds and output pressures. A Flow Rate and Application Chart for the XR type nozzle tip is included on page 56 of this manual.

The application chart is only a guide. Varying field and crop conditions will affect actual application. The amount of spray solution applied per acre depends upon forward speed, size and condition of nozzles, nozzle spacing, and pump pressure. A variation in any of these will change the application rate.

Use the following procedure when referring to the application chart for initial speed, nozzle size and spraying pressure selections.

- a. **Determine application rate** - What is the recommended rate of application specified by the chemical manufacturer?
- b. **Select ground speed** - Refer to page 54 of this manual when choosing the ground speed.
- c. **Find the desired application rate on the chart** - Refer to the application chart and locate the desired application rate in the speed column closest to the chosen ground speed selection for different nozzle tips and pressures.
- d. **Select the nozzle tip to be used** - The nozzle tip selected will depend on the nozzle spacing, output pressure, and speed of travel to obtain the desired application rate. The spray pressure will be adjusted slightly by the rate controller to obtain the exact application rate.

To choose a different output pressure at the recommended application rate listed in the chart, select a different ground speed **or** nozzle tip.

- e. Use the procedures in the MT-3405 Operator's Manual (refer to the Pre-Field System Check) to "fine tune" and calibrate your spray system.

A TeeJet catalogue is supplied with your MacDon Field Sprayer Manuals. It includes the descriptions for a variety of nozzle types that can be used with the MacDon Field Sprayer. Refer to the TeeJet catalogue if the application rate, ground speed, and output pressure you calculated are in metric units to select the correct nozzle tip.

**NOTE:** Select a nozzle tip that is ideal for use with a variable rate controller.



# CHEMICAL APPLICATION AND OPERATING VARIABLES

## 4. Flow Rate and Application Chart

SIZE	SCREEN MESH SIZE	LIQUID PRESSURE PSI	CAPACITY EACH NOZZLE US GPM	US GALLONS PER ACRE				
				5 MPH	6 MPH	7 MPH	8 MPH	10 MPH
XR80-01 XR110-01	100	15	0.06	3.6	3.0	2.5	2.2	1.8
		20	0.07	4.2	3.5	3.0	2.6	2.1
		30	0.09	5.2	4.3	3.7	3.2	2.6
		40	0.10	5.9	5.0	4.2	3.7	3.0
		60	0.12	7.1	5.9	5.1	4.5	3.6
XR80-015 XR110-015	100	15	0.09	5.3	4.5	3.8	3.3	2.7
		20	0.11	6.5	5.4	4.7	4.1	3.3
		30	0.13	7.7	6.4	5.5	4.8	3.9
		40	0.15	8.9	7.4	6.4	5.6	4.5
		60	0.18	10.7	8.9	7.6	6.7	5.3
XR80-02 XR110-02	50	15	0.12	7.1	5.9	5.1	4.5	3.6
		20	0.14	8.3	6.9	5.9	5.2	4.2
		30	0.17	10.1	8.4	7.2	6.3	5.0
		40	0.20	11.9	9.9	8.5	7.4	5.9
		60	0.24	14.3	11.9	10.2	8.9	7.1
XR80-03 XR110-03	50	15	0.18	10.7	8.9	7.6	6.7	5.3
		20	0.21	12.5	10.4	8.9	7.8	6.2
		30	0.26	15.4	12.9	11.0	9.7	7.7
		40	0.30	17.8	14.9	12.7	11.1	8.9
		60	0.37	22.0	18.3	15.7	13.7	11.0
XR80-04 XR110-04	50	15	0.24	14.3	11.9	10.2	8.9	7.1
		20	0.28	16.6	13.9	11.9	10.4	8.3
		30	0.35	20.8	17.3	14.9	13.0	10.4
		40	0.40	23.8	19.8	17.0	14.9	11.9
		60	0.49	29.1	24.3	20.8	18.2	14.6
XR80-05 XR110-05	50	15	0.31	18.4	15.3	13.2	11.5	9.2
		20	0.35	20.8	17.3	14.9	13.0	10.4
		30	0.43	25.5	21.3	18.2	16.0	12.8
		40	0.50	29.7	24.8	21.2	18.6	14.9
		60	0.61	36.2	30.2	25.9	22.6	18.1
XR80-06 XR110-06	50	15	0.37	22	18.3	15.7	13.7	11.0
		20	0.42	25	21	17.8	15.6	12.5
		30	0.52	31	26	22	19.3	15.4
		40	0.60	36	30	25	22	17.8
		60	0.73	43	36	31	27	22
XR80-08 XR110-08	50	15	0.49	29	24	21	18.2	14.6
		20	0.57	34	28	24	21	16.9
		30	0.69	41	34	29	26	20
		40	0.80	48	40	34	30	24
		60	0.98	58	49	42	36	29

# CHEMICAL APPLICATION AND OPERATING VARIABLES

## 5. Boom Height

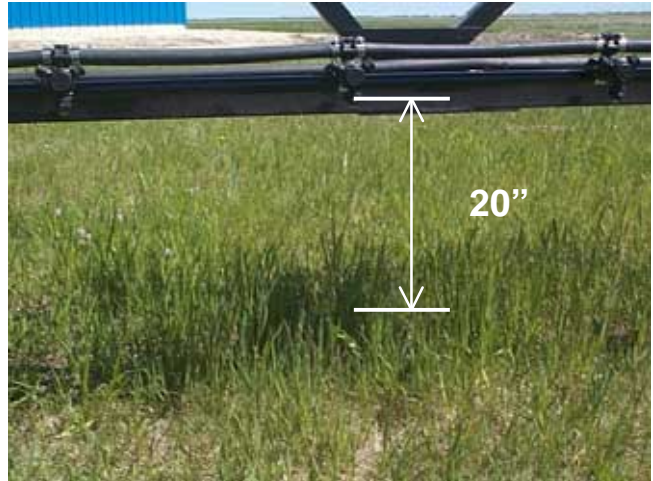
Refer to page 25 of this manual for instructions on the boom controls to set and control the boom height.

The MacDon Field Sprayer is supplied with standard 80° nozzle tips with spacing between nozzles of 20 inches (50 cm). The ideal vertical distance the operator wishes to keep the nozzles from the target plant is 20 in. (50 cm). Therefore, if the operator wishes to apply chemical to plants that are 8 in. (20 cm) tall, the boom must be kept at a height of the sum of the plant height plus the 20 in. (50 cm) distance which is equal to 28 in. (70 cm).

**NOTE:** If the operator chooses to install nozzles with different specifications on the MacDon Field Sprayer, the operator should refer to the manufacturer of the nozzles for directions for setting the boom height during application.

**NOTE:** If your sprayer is equipped with the front center boom section, mechanically adjust the height of the front boom section to correspond with the left and right boom height (refer to “Center Boom Positioning” in this manual).

The green arrow and green dash marks on the boom height indicator decal on each mast indicate the height of the boom from the ground. The actual height of the boom from the ground is indicated on the height indicator in 5-inch increments. Select the boom height by lowering each boom until the green arrow on the boom is positioned across from the green dash at the desired height from the ground and target.



# CHEMICAL APPLICATION AND OPERATING VARIABLES

## 6. Spraying Solutions other than Water

Most calculations are based on spraying water. A conversion factor must be used to determine application rates of chemical solutions that do not use water as the carrier because other solutions will be heavier or lighter in density than water.

To determine the proper size nozzle for the solution to be sprayed, convert the desired GPA or GPM of solution to a water rate using the conversion factors. Then use the new converted GPA or GPM rate to select the proper size of nozzle tip.

Example:

- a. The chemical manufacturer's recommended rate of application for a solution of 28% nitrogen is 8.5 GPA.
- b. A solution of 28% nitrogen has a specific gravity of 1.28 and a conversion factor of 1.12. The converted GPA is therefore 9.52 for a solution with water.

$$8.5 \text{ GPA} \times 1.12 = 9.52 \text{ GPA}$$

- c. Refer to the conversion chart and locate the equivalent GPA for a solution of water based on the ground speed and pressure.

### Conversion Chart

WEIGHT OF SOLUTION		SPECIFIC GRAVITY	CONVERSION FACTORS
lbs./US gallon	kilograms/liter		
7.0	0.84	0.84	0.92
8.0	0.96	0.96	0.98
8.34	1.00 - Water	1.00	1.00
9.0	1.08	1.08	1.04
10.0	1.20	1.20	1.09
10.65	1.28	1.28	1.12
11.0	1.32	1.32	1.14
12.0	1.44	1.44	1.20
14.0	1.68	1.68	1.29

## MAINTENANCE/SERVICE

### Service Procedures



**CAUTION:** To avoid personal injury, before servicing machine:

**Make certain all hydraulic lift cylinders are fully blocked to avoid retraction in the event of a hose failure. When working in the area at the masts where pressure loss in the vertical lift cylinders could cause injury, make certain the booms are folded into the transport cradles and lowered into transport position. Pressure loss or cylinder failure will then not result in unexpected lowering of the booms.**

**Disengage drive clutch switch that activates the spray system pump.**

**Shut off engine and remove key.**

**Engage park brake.**

**Wear close-fitting clothes and cover long hair. Never wear dangling items such as scarves or bracelets.**

**Wear protective shoes with slip-resistant soles, a hard hat, protective glasses or goggles and unlined gloves made of rubber, polyethylene, or neoprene. Make certain you are familiar with the hazards associated with the chemical last used and/or in the spray system. Follow all the manufacturers' suggested precautions for any chemical you may come into contact with. Some of the agricultural chemicals you have chosen to work with are very toxic and dangerous.**

**Ensure there is fresh water in the fresh water wash tank; know where it is and how to use it. Consult a physician should you contact the chemical and subsequently experience physical difficulties.**

**Be prepared if an accident should occur. Know where the first aid kit and fire extinguisher are located and how to use them.**

Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment. Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

Park on level surface when possible. Block wheels securely.

Replace all shields removed or opened for service.

Do not substitute parts, especially safety related, that may not meet strength or design requirements of the manufacturer.

Keep the sprayer attachment clean. **Always wash the outside of the sprayer and rinse the spray system with clean water prior to working on the sprayer.** Do not allow oil or grease to accumulate on the service platform, ladders or controls.

Never use gasoline, naphtha or any volatile material for cleaning purposes. These materials may be toxic and/or flammable.

# MAINTENANCE/SERVICE

## THE MACDON SELF-PROPELLED WINDROWER

For instructions on maintenance and service of the MacDon windrower, refer to the Maintenance/Service section in the MacDon Self-Propelled Windrower Operator's Manual.

### Access to the Engine Compartment

The sprayer attachment package includes a catwalk and platform assembly that is installed on the left side of the windrower. To access the engine compartment when the catwalk has been installed there is an access panel:

1. Locate the access panel on the catwalk on the left side of the windrower. While standing on the ground, pull the panel away from the tractor until the panel slides in to the open position.
2. Open the engine access panel to the windrower (refer to the Engine section in the MacDon Self-Propelled Windrower Operator's Manual for instructions on using the access panels to the engine compartment).



Engine Access Panel Open



**WARNING:** Do not leave the access panel of the catwalk assembly open when the access panel to the engine compartment of the windrower is closed. Failure to do so could result in serious injury.

To close the access panel of the catwalk assembly:

3. Push the access panel towards the windrower until the panel slides back to the closed position. Ensure the panel is completely closed.

### Cab Air Filter

Your MacDon Field Sprayer Attachment includes a charcoal cab air filter for your use and protection. Refer to the Cab Air System section in the MacDon Self-Propelled Windrower Operator's Manual for instructions on changing the cab air filter.



**WARNING:** The charcoal cab air filter should be replaced with a new filter at the beginning of each spray season and prior to any insecticide applications.

Prior to installing the filter:

1. Inspect the sealing surfaces of the charcoal filter for cracking or tears.
2. Clean the outside sealing surfaces of the cab.

**NOTE:** Ensure the blower in the operator's cab is set to maximum to pressurize the cab when pesticides are present.

### Tire Pressures

Drive tire inflation required for the 19.5L X 24 bar tread tire is 21 to 24 psi (140 to 165 kPa, refer to the MacDon Self-Propelled Windrower Operator's Manual). **Optional 14.6L x 24 bar tread tires are to be inflated to 40 psi (280 kPa).**

Drive tire inflation required for the 21.5L x 16.1 bar tread tire is 18 to 20 psi (125 to 140 kPa, refer to the MacDon Self-Propelled Windrower Operator's Manual). **Optional 16.5L x 16.1 bar tread tires are to be inflated to 40 psi (280 kPa).**

The 16.5L x 16.1 10 ply Rib tail wheel tire is required on the MacDon self-propelled windrower. **FLUID IS REQUIRED IN EACH TAIL WHEEL TIRE IF THE REAR TANK IS NOT INSTALLED.** Ballast requirement for the tail wheel tire is 80% filled with fluid. Inflation is 18 to 20 psi (125 to 140 kPa), unlike what is suggested for the self-propelled windrower when using as a windrower. More ballast is required when the self-propelled windrower is used with the sprayer attachment and the booms are in the field position.

# MAINTENANCE/SERVICE

## THE MACDON FIELD SPRAYER

### RECOMMENDED LUBRICANTS

#### GREASE

Use SAE Multi-Purpose High Temperature Grease with Extreme Pressure (EP) Performance and containing 1.5% to 3% molybdenum disulphide.

Also acceptable is a SAE Multi-Purpose Lithium Base Grease.

### Greasing the Field Sprayer Attachment Structure

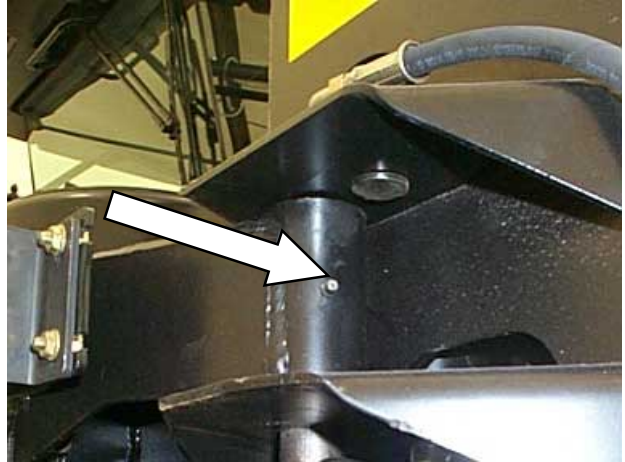
Refer to “Recommended Lubricants” in this manual for recommended greases.

The following grease points are marked on the sprayer attachment by decals showing a grease gun (A), and grease interval (B) in hours of operation. Use the hour meter in the cab and the Maintenance Checklist on page 78 of this manual to keep a record of scheduled maintenance.

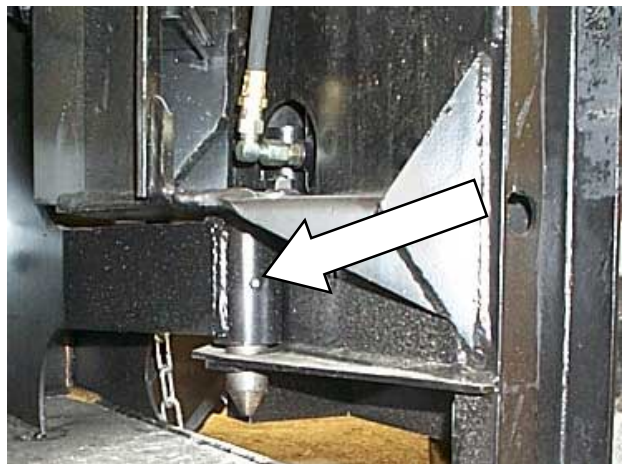
#### Procedure:

1. Wipe grease fitting with a clean cloth before greasing, to avoid injecting dirt and grit.
2. Inject grease through fitting with grease gun until grease overflows.
3. Leave excess grease on fitting to keep out dirt.
4. Replace any loose or broken fittings immediately.
5. If fitting will not take grease, remove and clean thoroughly. Also clean lubricant passageway. Replace fitting if necessary.

### Greasing the Field Sprayer Attachment



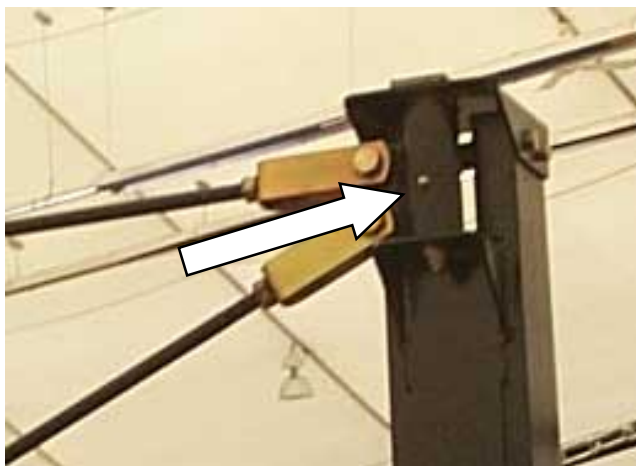
Middle mast mounts and pivot (1 Grease point on each side). Grease when sprayer is in TRANSPORT position.



Middle mast mounts and pivot (1 Grease point on each side). Grease when sprayer is in TRANSPORT position.



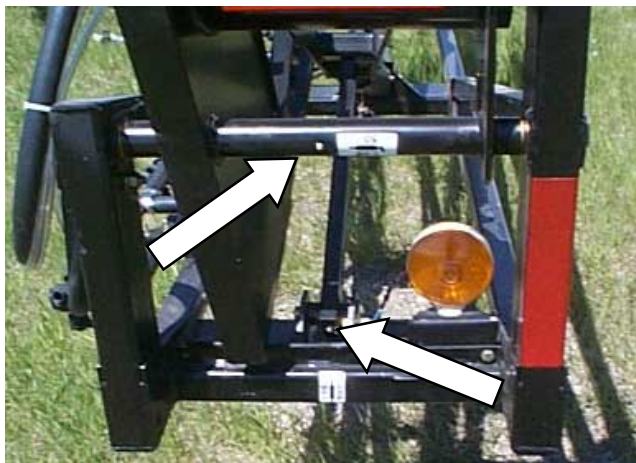
## MAINTENANCE/SERVICE



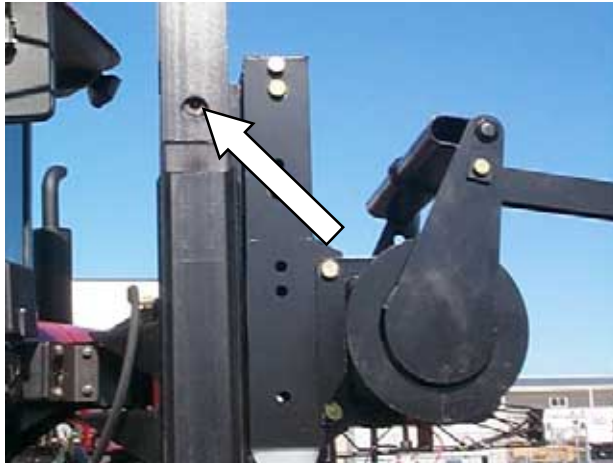
Top mast mount and pivot (1 Grease point on each side).



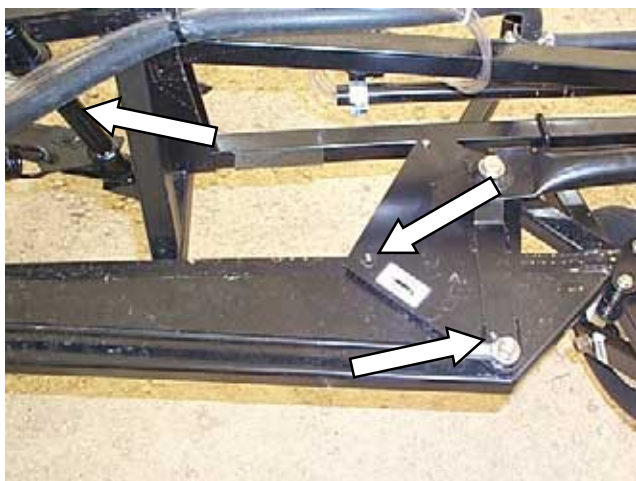
Bottom trolley wheel spindles (2 Grease Points on each side). Grease when booms are in FIELD position.



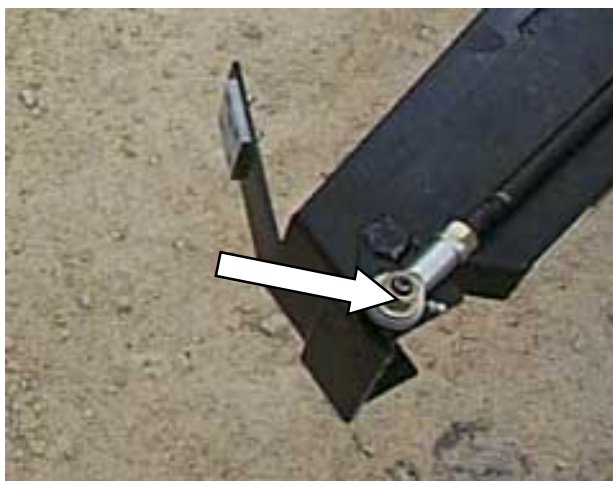
Middle booms (3 Grease points on each side). Grease when sprayer is in TRANSPORT position.



Top trolley wheel spindles (2 Grease points on each side). Grease when booms are in FIELD position and boom height is 20 in. (50 cm) from the ground.



Break away mechanism (3 Grease points on each side). Grease when the booms are in the FIELD position.



Break away mechanism (1 Grease points on each side). Grease when the booms are in the FIELD position.

## MAINTENANCE/SERVICE



Vertical suspension (1 Grease point on each side)



# MAINTENANCE/SERVICE

## Spray System Maintenance



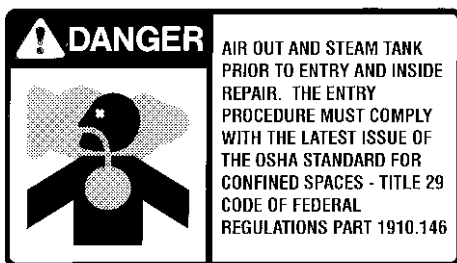
**WARNING: AVOID INJURY!** Protective gloves should be worn whenever handling pesticide contaminated material. Protective gloves must be unlined materials, made of rubber, polyethylene, or neoprene. **CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.**



**WARNING: AVOID INJURY!** The spray tank and system should be emptied of chemical mixture and flushed with clean water before servicing the spray system.



**WARNING: AVOID INJURY!** Spray system hoses may contain pressure and cause the chemical mixture to come in contact with the operator. **CHECK THE PESTICIDE LABELS FOR DIRECTIONS ON PROTECTIVE CLOTHING TO BE WORN WHILE HANDLING A PESTICIDE.**



### 1. Centrifugal Pump

The Hypro centrifugal pump can be serviced easily and quickly by replacing the wearing components using the seal kit suggested in the parts book. To replace the seal kit requires disassembling only the pump head of the unit.

### 2. Nozzle Tips

A leaking nozzle indicates diaphragm check valve in the nozzle body is damaged or not aligned properly, a bad or damaged gasket, seat, retainer or cap. When the problem is identified and cannot be corrected, purchase a replacement part as required from your local dealer or TeeJet distributor. If reduced flow is noted in any of the nozzles, remove the cap and check the nozzle tip.

TeeJet 80-02 Extended Range nozzle tips are installed at the factory. A 50-mesh screen is part of the nozzle assembly. Installing a different type of nozzle tip requires a set of screens, caps, and rubber gaskets as well.

Follow the procedure for rinsing the main tank at the end of each day on page 33 prior to removing the nozzle tips. Rinsing the main tank will ensure the minimum amount of chemical residue remains in the spray system. Wash the nozzle tips, screens, and gaskets thoroughly and rinse the nozzle caps with clean water. Use a soft brush to clear the nozzle tips and screens from debris and obstruction. **NEVER try to clean a nozzle tip or screen by blowing on it with your mouth.**

**NOTE:** When reassembling the screen and cup onto the spray system, slide the screen into place prior to installing the filter cup. Use the same procedure when it is necessary to replace the O-ring seal.

When changing to different chemicals, the nozzle caps, screens, gaskets and nozzle tips should be rinsed clean using the same solutions outlined on page 34. Follow the procedures for cleaning the main tank. **DO NOT** dispose of the wash water in the main tank until any debris can be separated from the wash water.

**Consult with your state or local environment department and the chemical manufacturer regarding the disposal of small quantities of chemicals, chemical containers and wash water.**

### 3. Spray System Hoses

After 10 hours of operation, check all bolts and hose clamps for tightness. Check all hose connections for leaks. Check all hoses for chafing or rubbing on frame and body members. Replace damaged hoses if necessary.

### 4. Sprayer Plumbing

Check for leaks on the sprayer plumbing system at the beginning and during the spray season. Tighten plastic fittings to repair a leak. **Do not over tighten plastic fittings.** Replace cracked and damaged fittings.

A sealant such as Rectorseal on the threads of the plastic fitting could be used to repair leaks in the plumbing system.

# MAINTENANCE/SERVICE

## 5. Line Strainer

The line strainer before the sprayer pump inlet contains a 50-mesh screen. The screen should be cleaned regularly to maintain the efficiency of the spray system during spray applications.



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**WARNING:** Solution contained in part of the plumbing tree and the cup will empty through the filter when the cup is removed.

Follow the procedure for rinsing the main tank at the end of each day on page 33 prior to removing the cup and screen. Rinsing the main tank will ensure the minimum amount of chemical residue remains in the spray system.

After the main tank has been rinsed clean, remove the cup and screen. Wash the screen thoroughly and rinse the cup with clean water.

When changing to different chemicals, the screen and cup should be rinsed clean using the same solutions outlined on page 34. Follow the same procedures for cleaning the main tank. Do not dispose of the wash water in the main tank until all foreign material is separated from the wash water.

**Consult with your state or local environment department and the chemical manufacturer regarding the disposal of small quantities of chemicals, chemical containers and wash water.**

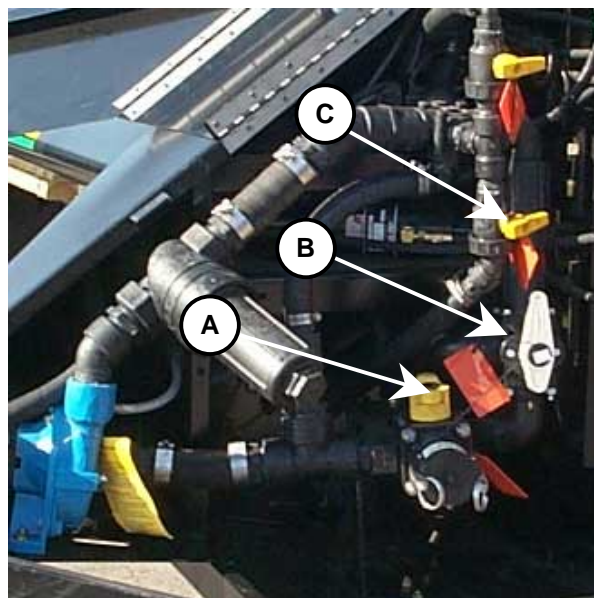
When the sprayer pump performance is affected because the screen is obstructed, the screen may need to be cleaned when the main tank contains chemical product.

1. Ensure the main line valve **A** is turned so that the direction arrow points toward the pump and away from the main tank.
2. Shut off the agitation valve **C**. If the Sprayer is equipped with a rear tank, shut off the valve for the rear tank on the right side of the self-propelled windrower.

3. Use a container to contain any spillage when the cup is removed. Remove the screen and cup. Wash it thoroughly. **DO NOT** dispose of the wash water in the main tank until any debris can be separated from the wash water.
4. Replace the screen and cup. Return the main line valve **A** from the tank so that the direction arrow points toward the pump and the main tank. Open the valve to the main suction line of the rear tank located on the right side of the SP windrower. Open the agitation valve **C**.



**NOTE:** When reassembling the screen and cup onto the spray system, slide the screen into place prior to installing the filter cup. Use the same procedure when it is necessary to replace the O-ring seal.



**Plumbing System**

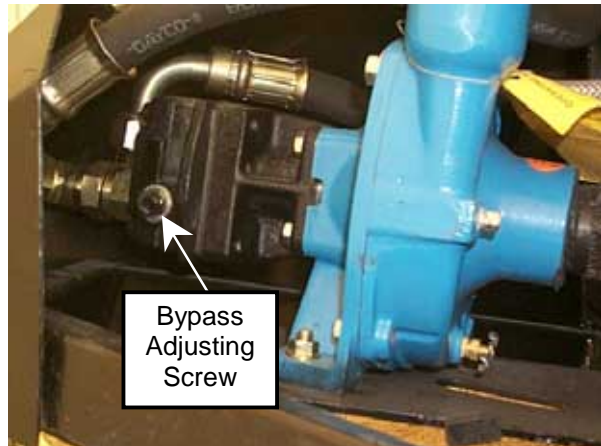
## MAINTENANCE/SERVICE

### Adjusting the Output Pressure of the Spray Pump

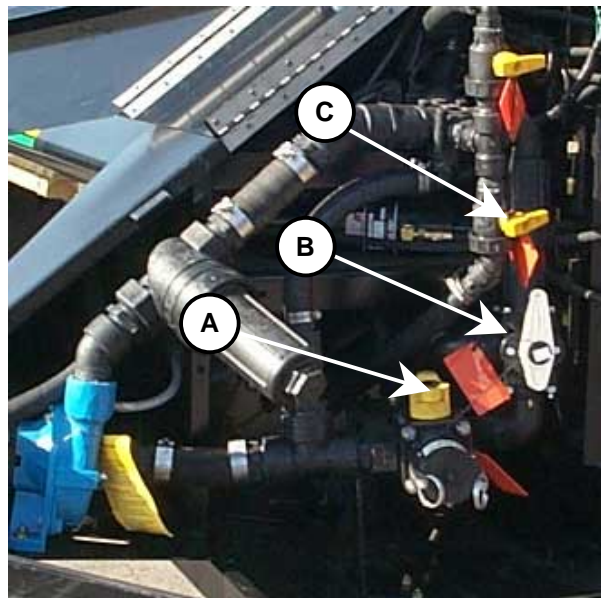
The hydraulic centrifugal spray pump of the MacDon sprayer has the capacity to output 150 psi (1030 kPa) at normal operating engine speed. This allows the sprayer to be used for a variety of applications and with a variety of different nozzle types. The plumbing system of the sprayer has been designed to be used at these high pressures.

Adjust the output pressure of pump if the pressure exceeds 150 psi (1030 kPa) or there is not enough output pressure for the application. To adjust the output pressure of the pump:

1. Locate the bypass adjusting screw on the side of the hydraulic motor.
2. Start the engine. Allow the oil of the self-propelled windrower hydraulics to be warmed for approximately 10 to 15 minutes.
3. Add clean water to the tank. Prime the pump and circulate water through the plumbing system.
4. Adjust the reel speed control and conveyor speed control dials to the optimum setting. Increase the throttle to full engine speed.
5. Close the electric servo valve by depressing ‘-‘ on the MT-3405 rate controller for 30 seconds. The rotary dial on the monitor must be pointed to “FLOW RATE” to adjust the servo valve.
6. Close the agitation valve **C**. Close the valve to the rinse nozzles if the sprayer is equipped. Note the spray system pressure
7. Adjust the bypass screw by turning it counterclockwise to decrease or clockwise to increase the spray system pressure until the maximum pressure is 150 psi (1030 kPa)



**Spray Pump**



**Plumbing System**

# MAINTENANCE/SERVICE

## Adjusting the Height of the Nozzle Tips

The MacDon sprayer is equipped with a sub-boom that allows the nozzles to be in a straight line. The sub-boom will fold up when the booms are folded for transport which prevents dirt from plugging the nozzle tip when the sprayer is being transported. It can be used with different nozzle spacing for different applications and it can be used with a wet or dry boom.

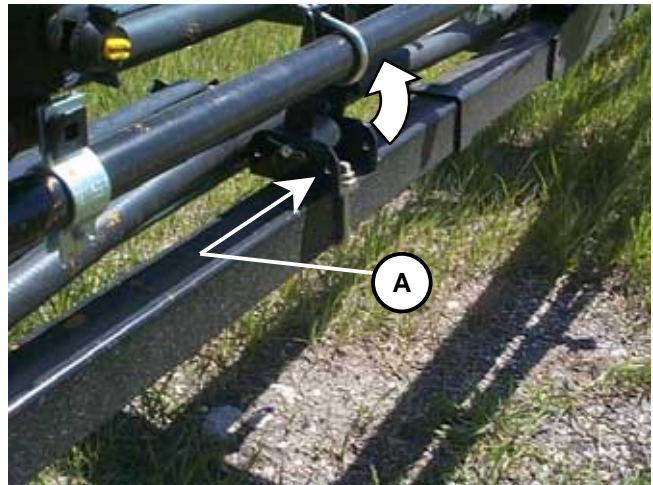
If the tip of nozzle is below the main boom, the sub boom can be raised to prevent damage to the unprotected nozzle tip:

1. Lift the sub-boom by hand and support the boom.
2. Insert a cotter pin through the hole **A** of the sub-boom mounting bracket. Secure the cotter pin by bending the ends of the cotter pin.
3. Release the sub-boom and allow it to rest on the cotter.

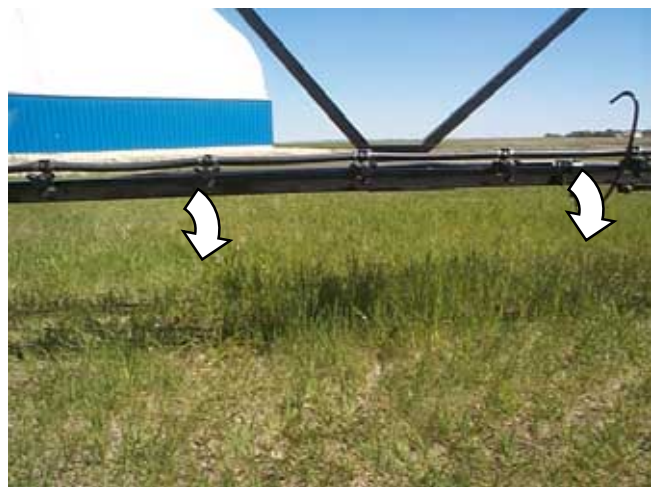
Install a cotter pin through each bracket to maintain a consistent height for each independent sub-boom.

The nozzle tips can be pointed forward as recommended by some chemical manufacturers.

1. Loosen the nuts securing the tube to each sub-boom mounting bracket.
2. Adjust the nozzle tips to the desired angle and secure the tube by tightening the U-shaped clamps.



**Sub-boom Mounting Bracket**



**Adjusting the angle of the nozzle tips**

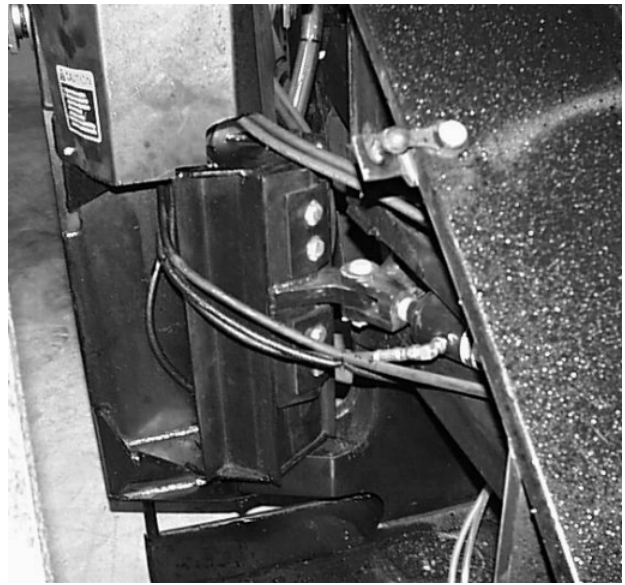


# MAINTENANCE/SERVICE

## Suspension Adjustments

Boom suspension consists of two types of suspension systems. They are the vertical suspension and the horizontal suspension. Both are suspension systems that use the compression of rubber components for energy absorption

- a) **Swing Cushion:**  
The swing cushion is located at the mast end of the swing cylinder. The swing cushion is assembled and adjusted at the factory. Correct adjustment of the horizontal suspension is critical to the life of the boom structure.



**Horizontal Suspension**

- b) **Vertical Suspension:**  
Rough and uneven terrain will send shock into the boom structure. The vertical suspension cushions the boom from the shock of fast and abrupt vertical motion.

The vertical suspension is located where the booms connect to the mast. There are two positions for the linkage to attach to the suspension. Adjust the linkage position according to the amount of vertical motion of the booms that is acceptable. The draw bolt is used to adjust the height of the boom off the ground. **Keep the booms in a horizontal or slightly tipped up position by adjusting the nut on the eyebolt.**



**Vertical Suspension**

# MAINTENANCE/SERVICE

## Leveling the Outside Booms

If the outside boom is not level to the ground, do the following procedure:

1. Park the self-propelled windrower in a flat, level area with the booms in the FIELD position.
2. With a tape measure, measure the height of the boom off the ground nearest the main frame of the sprayer attachment.
3. Measure the height of the boom near the boom tip breakaway linkage. If the height is different and leveling is required, raise the boom to the maximum height. Lower the boom props and ensure they are secured.
4. Lower the boom on to the boom prop until the vertical suspension linkage is slack. Using a ladder, adjust the length of the linkage by turning the nut on the eyebolt to get the correct boom height.

**NOTE:** Keep the booms in a horizontal or slightly tipped up position to maintain correct ground to boom height clearance.

Repeat the procedure for both booms until the necessary height adjustment is correct.



**Tighten the draw bolt at link to the Vertical Suspension to level the boom.**

# MAINTENANCE/SERVICE

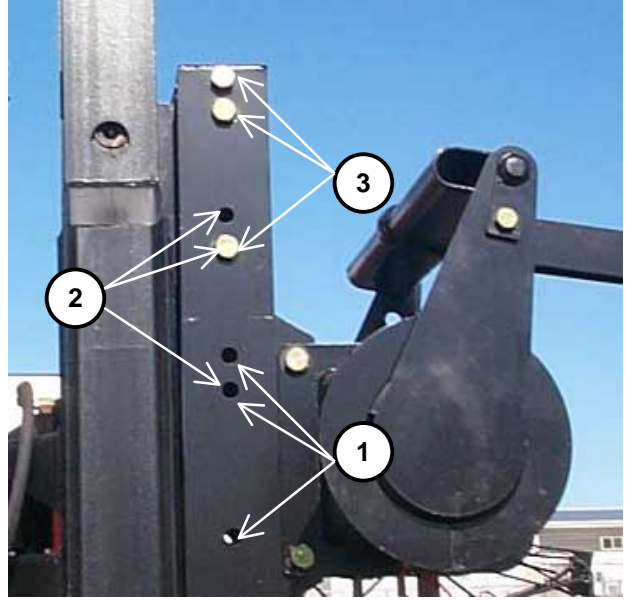
## Adjusting the Height of the Outside Booms

The height of the outside boom can be 24" to 76" from the ground. There are three possible positions for the outside booms. To have the boom at the maximum or minimum height, the position of the boom may need to be changed.

The height ranges from 36" to 76" (90 to 190 cm) when the boom lift cylinder is secured in position **1**, 30" to 70" (75 to 175 cm) for position **2**, and 24" to 64" (60 to 160 cm) for position **3**.

If the height of the boom needs to be adjusted, perform the following procedure:

1. Swing the boom out of transport and lower the boom on to a stand to support the weight of the boom 40" (100 cm) from the ground.
2. Remove the bottom two bolts securing the vertical suspension and A-frame to the boom lift cylinder clevis. Remove the top bolt.
3. Start the engine. Depress the boom switch on the control lever to lower the boom lift cylinder clevis until the clevis has made contact with the bottom of the A-frame. Stop engine and remove key.
4. If the maximum height of the boom (**1**) is required, insert the three bolts in the bottom three holes of the A-frame and secure.
5. To select the middle position for the boom height setting (**2**):
  - a. Insert a bolt in the third hole from the top of the A-frame and secure. This bolt will be used to align the bottom holes with the clevis.
  - b. Start the engine. Depress the boom switch on the control lever to raise the boom lift cylinder clevis until the clevis has made contact with the bolt.
  - c. Stop engine and remove key.
  - d. Ensure the holes of the boom lift cylinder clevis align with the two holes A-frame below the top bolt. Insert the remaining two bolts and secure.
6. If the minimum height of the boom (**3**) is required:
  - a. Insert a bolt in the top hole of the A-frame and secure. This bolt will be used to align the bottom holes with the clevis.
  - b. Start the engine. Depress the boom switch on the control lever to raise the boom lift cylinder clevis until the clevis has made contact with the bolt.
  - c. Stop engine and remove key.
  - d. Ensure the holes of the boom lift cylinder clevis align with the two holes A-frame below the top bolt. Insert the remaining two bolts and secure.



**The three positions of the A-frame used for adjusting the height of the boom.**

# MAINTENANCE/SERVICE

## Center Boom Positioning

### Front Location

The center boom is attached to both outer booms and the height is automatically adjusted when the in-cab controls are used to adjust the height of the outer booms. **It is important to have your front boom adjusted to run at the same height from the ground as the left and right booms.**

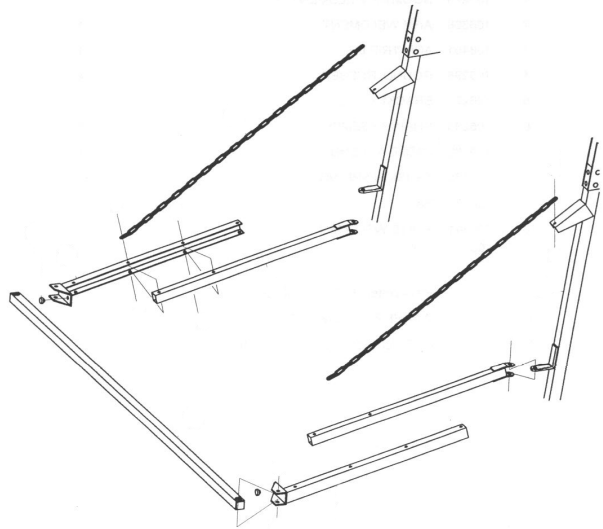
The front boom is positioned, relative to the left and right booms by mechanical adjustment during assembly at the dealership.

To adjust the height of the center boom to match the height of the outer booms:

1. Park the self-propelled windrower in a flat, level area with the booms at the same height in the FIELD position.
2. With a tape measure, measure the height of the nozzle tip from the ground nearest the main frame of the sprayer attachment.
3. Measure the height of the nozzle tips on the center boom to the ground.
4. Remove the bolt fastening the chain to the front center boom to each outer boom. Adjust the length of the chain by securing the bolt at a different link in the chain.

**If there is no more chain and boom height adjustment is still necessary,** adjust the positioning of the center boom forward or rearward.

5. Remove the bolts fastening the front center boom support tubes.
6. Position the center boom forward or rearward and align the holes of the support tubes.
7. Adjust the chain length so the center boom height matches the height of the outer booms and secure the bolts of the support tube.



**Front center boom height adjustment.**



# MAINTENANCE/SERVICE

## Rear Location

To adjust the height of the center boom at the rear position:

1. Park the self-propelled windrower in a flat, level area. Lower the rear center boom to the ground by depressing the rear boom switch on the control pedestal in the cab.
2. With a tape measure, measure the height of the nozzle tip from the ground at outside edge of the center boom.
3. Remove the bolt fastening the chain to the center boom.
4. Adjust the length of the chain by securing the bolt to the center boom through a different link in the chain. Adjust the height of the center boom to be 12 to 16 inches (30 to 40 cm) off the ground. Adjusting the rear boom to this height will provide suspension for the boom when spraying at 20" (50 cm) from the ground.

To completely remove the rear center boom from the self-propelled windrower when using the windrower for other MacDon header applications:

1. Remove the hair pin and clevis pin securing the chains to the rear center boom linkage.
2. Disconnect spray system hose located on the right side deck of the self-propelled. Ensure the hose is clear of the ground to prevent contamination.
3. Remove the hair pins and clevis pins that secure the support tubes to the walking beam for the rear caster tires on the self-propelled windrower.



**Rear Center Boom Location**

# MAINTENANCE/SERVICE

## Upstop Adjustment

The upstops are located at the rear of the sprayer attachment, behind the solution tank. When the header lift cylinders are fully extended, the upstop should be flush with the deck of the self-propelled windrower. Adjust the upstops at the beginning of the season and check the upstop adjustment every time the sprayer is attached for field use.

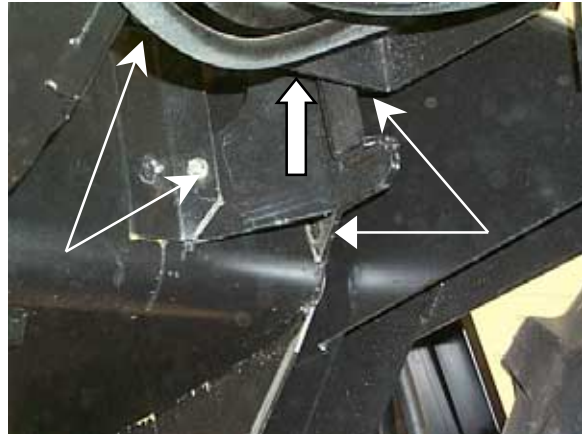
To adjust the upstops:

1. Engage the header lift cylinder stops.

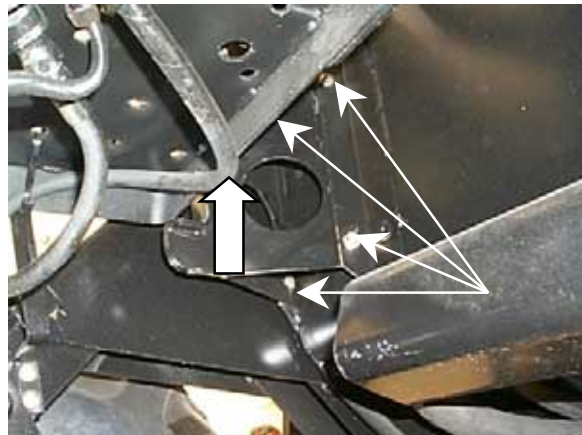


**DANGER:** To avoid bodily injury from fall of raised header, always engage header lift cylinder stops when working on or around raised sprayer.

2. Loosen the four bolts that secure each upstop.
3. Push the upstop up to the bottom edge of the tractor deck. Secure each upstop by tightening the four bolts.



**Right Upstop**



**Left Upstop**

# MAINTENANCE/SERVICE

## Break Away Boom Tip Adjustments

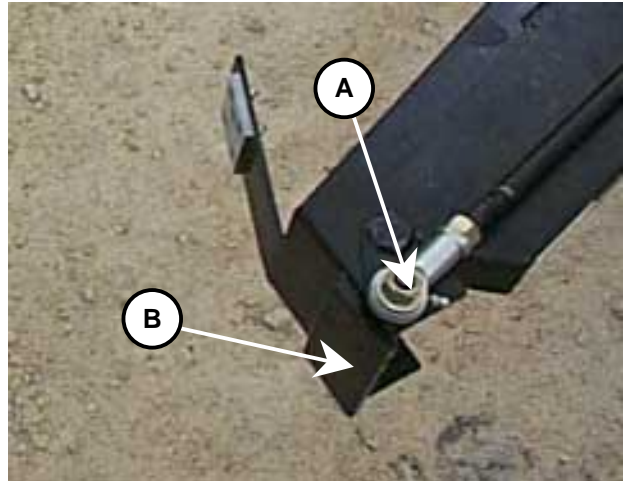
### Adjusting the Boom Tip to Fold for Transport Properly

The break away boom tip linkage is set at the factory. However, if the folding mechanism changes or an adjustment is required:

1. Remove the tension rod (A). Unlock the break away boom tip.
2. Start the engine. Fold the boom and observe where the boom tip lands in the cradle. Unfold the boom to the FIELD position. Stop the engine and remove the key.
3. Adjust the length of the push rod so that the boom tip will land at the center of the cradle. This may require folding and unfolding the boom tip several times to get the right adjustment.
4. When the push rod length is determined, unfold the boom to the FIELD position. Stop the engine and remove the key. Replace the tension rod and adjust the length of the tension rod so that the latch bracket (B) is firmly against the boom with no movement when forced by hand.
5. Lock the boom tip in place. Fold and unfold the boom several times making sure there is no interference between parts and the adjustment is correct.

**NOTE:** When folding the boom tip for transport, the boom tip should break away consistently at 12° to 20°, to avoid overhead obstacles.

6. Adjust the length of the wire cable on the boom tip assembly (Refer to the procedure on the next page for the wire cable adjustment)



Tension rod and latch bracket on break away boom tip.



Boom Tip Push Rod



Adjust boom tip to land at the center of the cradle.

## MAINTENANCE/SERVICE

### Adjusting the Wire Cable on the Break Away Boom Tip

When the wire cable on the boom tip becomes loose, tighten the nut on the draw bolt until the slack in the wire cable is removed.

**NOTE:** If the draw bolt is over tightened, the wire cable may reduce the surface contact between the locking plate and the latch bracket. Ensure the locking plate is in full contact with the latch bracket to prevent the break away boom tip from unlatching during normal field operation.



Adjust draw bolt to change wire cable tension.

### Changing the Locking Plate

When the break away boom tip starts to break away inconsistently, do the following procedure:

1. Remove the two bolts securing the locking plate to break away mechanism.
2. Inspect the locking plate. If there is excessive wear, turn the locking plate around and use the other side of the plate as the contact surface for the locking mechanism.
3. Secure the locking plate with the two bolts. Ensure the locking plate is in full contact with the latch bracket by tapping the locking plate with a hammer as bolts are tightened.

**NOTE:** If the locking plate has been changed once and both surfaces are completely worn, the locking plate will have to be replaced (Refer to the MacDon 625 Field Sprayer Parts Catalog).



Latch plate on break away boom tip.

# MAINTENANCE/SERVICE

## Electrical Wiring Diagram

# MAINTENANCE/SERVICE

## Hydraulic Circuit Diagram

# MAINTENANCE/SERVICE

## MAINTENANCE CHECKLIST

ITEM	SERVICE REQUIRED	SERVICE INTERVAL
<input checked="" type="checkbox"/> General Inspection	Inspect for loose bolts and tighten hardware. Replace all shields and covers before starting normal operation. Check for leaks on hydraulic hoses and hydraulic fittings, replace faulty hoses and repair broken or damaged fittings.	Daily
<input checked="" type="checkbox"/> Cab Air Filter System	Replace charcoal cab air filter at the beginning of the spray season or prior to an insecticide application. Clean filter.	Weekly
<input checked="" type="checkbox"/> Spray System	Flush and circulate with anti-freeze for winter storage. Remove plumbing tree and pump, line strainer, etc. for inside storage. Check hose clamps and tighten frequently.	Seasonally
<input checked="" type="checkbox"/> Line Strainer	Check and flush with clean water.	Daily
<input checked="" type="checkbox"/> Nozzle Tips	Inspect nozzle tips for damage, wear, and clean nozzle screens when spray pattern is irregular. Replace all damaged and worn nozzle tips. Check the alignment of the nozzle bodies on the boom.	Weekly
<input checked="" type="checkbox"/> Booms	Check all bolts and tighten loose hardware. Check the horizontal suspension bolts, replace all four bolts if a single bolt failure has been observed.	Daily
<input checked="" type="checkbox"/> Break away Cables	Inspect breakaway linkage for adjustment. Replace frayed or damaged wire cables and change worn locking plates.	Daily
<input checked="" type="checkbox"/> Electrical Wiring	Check for bare or damaged wires, etc.	Daily
<input checked="" type="checkbox"/> Boom Hydraulics and Selector Valve	Clean and lubricate with oil or WD-40.	Weekly

**NOTE:** Keep the sprayer attachment and SP windrower tractor clean. Always wash the outside of the sprayer and rinse the spray system with clean water prior to working on the sprayer. Dispose of the wash water in an environmentally safe manner. **DO NOT** clean the equipment upslope of ditches or water bodies, cropland, or shelterbelts. Wash water can contaminate the soil and can be very toxic to fish, other wild life and people. Clean equipment away from areas where family members and others are likely to frequent.

# MAINTENANCE RECORD

Sprayer Attachment Serial No. \_\_\_\_\_

Combine this record with the MacDon SP Windrower Maintenance Record for complete unit service.  
See Maintenance/Service section for details on each procedure. Copy these pages to continue record.

ACTION:	✔ - Check	● - Lubricate	▲ - Change	⊙ - Clean	+ - Add
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%; border-right: 1px solid black; padding-right: 5px;"> <p style="margin: 0;">Hour Meter Reading:</p> <p style="margin: 0;">Date Serviced:</p> <p style="margin: 0;">Serviced By:</p> <p style="margin: 0;"><b>Maintenance Procedure</b></p> </div> <div style="width: 5%; border-right: 1px solid black; padding-right: 5px;"> <p style="margin: 0;"> </p> <p style="margin: 0;"> </p> <p style="margin: 0;"> </p> </div> </div>					
<b>BREAK-IN</b>	See "Break-In Period" in Operation section for checklist.				
<b>DAILY</b>					
⊙ Wash sprayer/windrower					
⊙ Rinse sprayer tank and plumbing system					
✔ Tire pressure and bolt torque					
⊙ Protective clothing and equipment					
✔ Hoses and wiring					
✔ Hose clamps					
+ Personal clean water wash tank					
✔ Horizontal rubber suspension bolts					
✔ Charcoal cab air filter seals					
⊙ SP Windrower cab					
✔ Pressure gauges					
✔ Pesticide label information in the cab.					
✔ Bolts and hardware are secure.					
✔ All shields and covers are in place.					
<b>WEEKLY</b>					
⊙ Charcoal cab air filter					
● Selector valve on each mast.					
✔ Vertical rubber suspension					
✔ Boom to ground height					
⊙ Wipe down inside cowling					
⊙ Sweep and vacuum floor matting.					
● Grease sprayer attachment					
<b>SEASONALLY</b>					
▲ Charcoal cab air filter					
✔ Sprayer output calibration					
✔ Flush clean and winterize with antifreeze					
Storage Procedure	See "Storage Procedure" in Operation section for checklist				

\* It is recommended that Seasonal Maintenance be done prior to start of operating season.



# TROUBLE SHOOTING GUIDE



**WARNING:** Do not service the MacDon Field Sprayer without instructions and taking the necessary safety precautions. Before working on the MacDon Sprayer Attachment and the MacDon Self-Propelled Windrower, read the Safety and Chemical Safety Instructions at the beginning of this Manual. After making the repair or adjustment, always check to make sure the system functions properly. Failure to obey warnings can cause death or serious injury.

Problem	Probable Cause	Solution	Refer to Page
<b>Cab Air System</b>			
	Refer to the Self-Propelled Windrower Operator's Manual for trouble shooting and information on maintenance and service.		
Odor can be detected in the tractor cab during normal sprayer operations.	Charcoal air filter in the tractor cab has expired or has not been installed.	Replace expired charcoal air filter with new charcoal air filter.	60
<b>NOTE:</b> It is recommended the charcoal filter be replaced at the beginning of the each season.			
<b>Spray System</b>			
Insufficient line pressure or spray output.	There is a major leak in the spray system.	Turn off engine and remove key. Get out of the tractor and inspect the spray system for leaks.	*
	There is not enough hydraulic oil flow to the pump.	The reel speed dial is not turned to maximum and the conveyor speed dial is not turned to 6.	30
	Sprayer nozzle tip is plugged.	Carefully remove nozzle tip from nozzle body and flush with clean water.	64
	Sprayer nozzle tip is worn.	Replace worn nozzle tip with a new part purchased from your local dealer or TeeJet distributor.	64
	Line strainer is plugged.	Remove cup and screen, flush thoroughly with clean water.	65
	Solution tank is nearly empty.	Check solution level in tank.	
The pressure gauge displays a reading that fluctuates rapidly and erratically during spray application.	The servo valve cannot control the flow to the booms because sprayer pump output is too great.	Reduce the flow to the sprayer pump by turning the reel speed or conveyor speed dials until the rate controller readings fluctuate normally. Ensure the nozzle pressure is matched with the application rate for the selected nozzle tip and application speed.	29

\* See your Windrower Dealer

# TROUBLE SHOOTING GUIDE

Problem	Probable Cause	Solution	Refer to Page
Pump will not engage.	Header control switch and/or auxiliary pump switches on the pedestal or beside the plumbing system are not activated.	Engage the header clutch switch. If the indicator light beside the auxiliary switch on the pedestal in the cab is red, pump is engaged. Depress the pedestal switch if it is not. Verify pump is working by checking the "pump self-prime line".	30
	Sprayer attachment is not hooked up to the tractor hydraulic and electrical connectors properly.	Inspect sprayer and tractor hydraulic and electrical connections.	27
Pump is cavitating and there is no solution flow through the "pump self-prime line".	Not enough hydraulic oil flow to the spray system pump.	The reel speed dial is not turned to maximum and the conveyor speed dial is not turned to 6.	29
	Not enough hydraulic oil flow to the spray system pump.	Increase engine throttle.	29
	There is an air lock in the spray system that cannot be eliminated by the bleed line to the solution tank.	Remove a priming plug and activate pump. Bleed the system of air and replace the plug when the pump is primed.	64
	Pump is worn.	Inspect the spray system pump and seals. Replace pump or install new parts if necessary.	64
Water leakage at pump.	Inner seals are damaged.	Install seal kit.	64
Pressure adjustment is over sensitive.	Agitation control valve is closed.	Open agitation valve B.	35
	Incorrect agitation orifice.	Install smaller orifice to increase pressure.	35
One boom does not spray when control switches on the Micro-Trak monitor are activated.	Poor electrical connection to the electric boom control valves.	Inspect electrical connections to boom control valves and inspect for bare or damaged wires.	44

## Boom Control

Boom control functions are slow or do not respond.	Restrictor disk located in the hydraulic solenoid manifold on the sprayer mast is blocked by contamination.	Remove the solenoid valve cartridge and remove restrictor disk. Clear obstruction from orifice and replace disk and solenoid valve cartridge.	77
	Sprayer attachment not properly connected to the electrical connector of the tractor.	Ensure electrical connectors to the tractor are properly connected.	27
	Poor electrical connection to the hydraulic solenoids.	Inspect electrical connections to hydraulic solenoids and inspect for bare or damaged wires.	76

\* See your Windrower Dealer

## TROUBLE SHOOTING GUIDE

Problem	Probable Cause	Solution	Refer to Page
Break away boom tip will not land in the cradle when sprayer booms are folded for transport.	Mechanical linkage is not adjusted properly or linkage is damaged.	Replace damaged parts with new parts. Adjust the linkage so the boom tip lands in the center of the cradle.	74
Boom-tip breaks away too easily during normal field operation.	Cable tension on the boom tip is too tight causing the locking plate to have minimal contact with the latch bracket.	Adjust wire cable tension on break away boom tip so that the latch plate has full contact with the latch bracket.	75
Outer boom is not parallel to the ground.	The vertical suspension has set to the normal compression of the rubber during field operation.	Tighten the draw bolt at the vertical suspension linkage.	66
Outer boom will not swing in to the transport cradle.	The vertical suspension has set to the normal compression of the rubber during field operation.	Tighten turnbuckle at the vertical suspension linkage.	66
	Transport cradle is positioned too high.	Change position of transport cradle to lower position.	25
The boom tip on the outside boom will not fold up and over for transport.	The spindle in the selector valve on the sprayer mast is stuck down.	Lubricate the spindle by applying oil or WD-40 to the exposed parts of the spindle on the selector valve.	78
	Restrictor disk located in the hydraulic solenoid manifold on the sprayer mast is blocked by contamination.	Remove the solenoid valve cartridge and remove restrictor disk. Clear obstruction from orifice and replace disk and solenoid valve cartridge.	77
	Sprayer attachment not properly connected to the electrical connector of the tractor.	Ensure electrical connectors to the tractor are properly connected.	27
	Poor electrical connection to the hydraulic solenoids.	Inspect electrical connections to hydraulic solenoids and inspect for bare or damaged wires.	76
The outer boom swings rather than folding up and over to the transport position.	The spindle in the selector valve on the sprayer mast is stuck up.	Lubricate the spindle by applying oil or WD-40 to the exposed parts of the spindle on the selector valve.	78

\* See your Windrower Dealer

# TROUBLE SHOOTING GUIDE

Refer  
to  
Page

Problem	Probable Cause	Solution	
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## Sprayer Attaching and Removal

Tractor header forks not aligned with holes when the forks are positioned in the sprayer attachment legs.	Tractor approached at an angle to the main frame of the sprayer attachment and the holes are slightly off center.	Back away from the sprayer attachment with the tractor. Adjust the approach and try picking up attachment again.	27
	The tractor header cylinders have not been fully extended.	Fully extend tractor header cylinders when the tractor is positioned in the sprayer attachment legs.	27
	The boom props have sunk in soft soil and now the boom suspension is no longer slack.	Reduce the tension in vertical suspension by loosening the nut on the draw bolt. After sprayer attachment is secured, adjust clevis to the previous length.	66

## Hydraulics

Vertical boom lift cylinder seal leaks.	Seals are ruined and must be replaced.	Remove cylinders by disconnecting and pulling out the top of the mast. A lifting device of at least 20 feet must be used.	*
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## Micro-Trak MT-3405 Rate Controller

Refer to the Micro-Trak MT-3405 Operator's Manual for trouble shooting and information on maintenance and service.

Sprayer output does not match calculated application rate.	Operator is accelerating and decelerating the windrower erratically, resulting in uneven output.	Adjust the speed control lever slowly and consistently to allow the monitor 5 to 10 seconds to adjust to the spray rate.	54
The rate controller displays a reading that fluctuates rapidly and erratically during spray application.	The nozzle tips selected for the application are not correct.	Check the nozzle tip selection. Ensure the application rate and speed match the desired application rate.	55
	The servo valve cannot control the flow to the booms because sprayer pump output is too great. This may occur when the hydraulic oil is heated to operating temperature or the outside temperature increases.	Reduce the flow to the sprayer pump by turning the reel speed and conveyor speed dials until the rate controller readings fluctuate normally. Ensure the nozzle pressure is matched with the application rate for the selected nozzle tip and application speed.	29

**NOTE:** Always wash the outside of the sprayer and rinse the spray system with clean water prior to working on the sprayer.

\* See your Windrower Dealer

## OPTIONS AND ATTACHMENTS

Consult your MacDon windrower and sprayer attachment dealer for the following:

**NOTE:** If not factory ordered installation of these options and attachments are to be done by Windrower dealer.

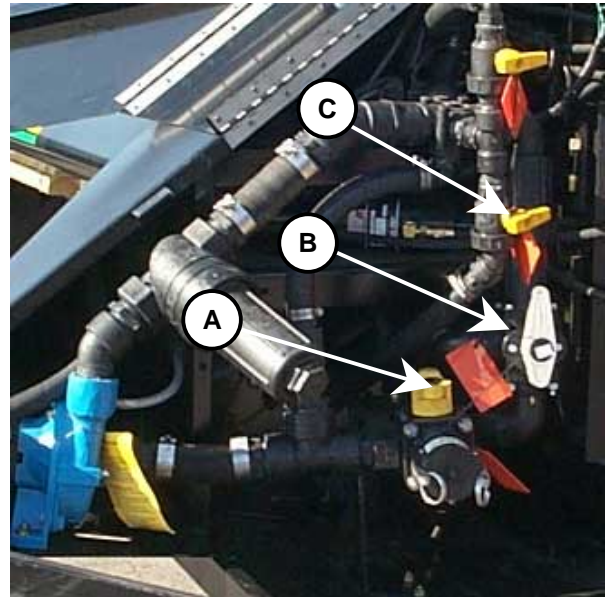
### Rear Tank

Mounted on the rear-walking beam of the self-propelled windrower tractor, the rear tank adds 150 U.S. gallons (580 liters) additional capacity to the spray system. The auxiliary rear tank option requires a stronger walking beam and caster forks to support the additional load from the rear tank.

When the rear tank is installed, the bypass valve is a three way ball valve with a gray handle (**B**). It controls the flow from the rear tank to the spray pump.

1. To bottom fill with the rear tank installed:
  - a. The gray handle of the ball valve must be turned in the vertical position. This will direct the flow of water from the pressure side of the pump to be transferred through the suction line to the rear tank.
  - b. The rear tank is filled first. Water is transferred to the front tank through the vent line when the rear tank is completely full.
2. For normal spray application with the rear tank installed:
  - a. Turn the gray handle of the ball valve to the horizontal position. This will direct the flow of the solution from the suction line of the rear tank to the suction line of the front tank.
  - b. Approximately half the solution is removed from the front tank first. When the water line in the front goes below the vent opening for the rear tank, the rear tank will empty. Once the rear tank is completely emptied, the remaining solution in the front tank will be applied.

The Agitation Valve (**C**) on the plumbing system controls the agitation flow to both tanks.



**Plumbing System**

There are three additional hoses that must be disconnected to remove the sprayer attachment from the self-propelled windrower when there is a rear tank installed.

**Left side** connections include:

- a. The two 2" vent line that is coupled at the front of the self-propelled windrower

**Right side** connections include:

- a. The agitation line from the rear tank that is coupled at the front of the self-propelled windrower. Close the two ball valves before disconnecting the hoses.
- b. The suction line from the rear tank coupled at the front of the self-propelled windrower. Close the ball valve to the suction line before disconnecting the hoses.

## OPTIONS AND ATTACHMENTS

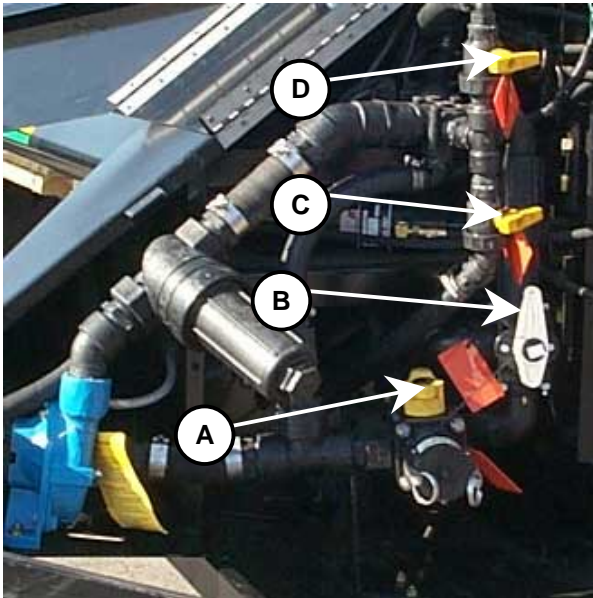
### TeeJet Tank Rinsing Nozzle

A TeeJet tank rinse nozzle can be installed for rinsing the inside of the tank. The nozzle rotates 360° and is driven by fluid from the spray system. The coverage by the rinse nozzle is 6 ½ ft (2 m).

The rinse will output 20 USgpm (77 LPM) at 50 psi (345 kPa) and has a maximum operating pressure of 300 psi (2000 kPa). It is made of corrosion-resistant Teflon.

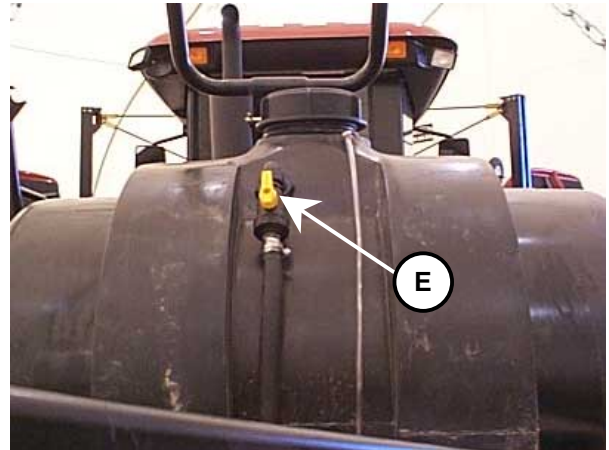
To operate the rinse nozzle:

1. Add clean water to the tank.
2. Start the engine. Engage the sprayer pump and increase the engine throttle to half.
3. Open the rinse nozzle valve (D). The rinse nozzle valve for the front tank is located above the agitation valve (C). Open the agitation valve to maximum for complete flushing of the solution tank.



**Plumbing System with Rinse Nozzle and Valve installed.**

When the sprayer is equipped with a rear tank, the rinse nozzle in the rear tank is operated by opening the agitation valve (C) on the plumbing system. While the spray pump is circulating clean water, open the rinse nozzle valve (E) located at the top of the rear tank.



**Rear Tank Rinse Nozzle and Valve**

## OPTIONS AND ATTACHMENTS

### Econo-Mark Foam Marker

A foam marker can be purchased from your dealer to prevent overlap of the booms. The foam is mixed in a mixing chamber at the boom tips to get a consistent foam mark.



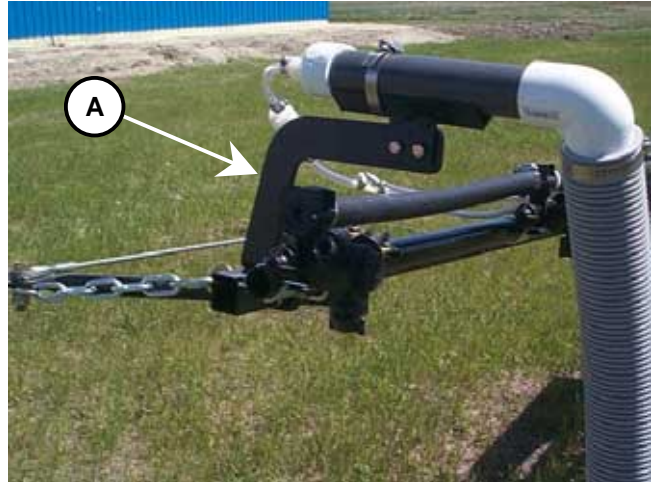
**Foam Marker**

The foam marker tank is installed on the left boom. The tank is secured to the boom by four bolts underneath the tank.



**Secure with bolts underneath the tank.**

The foam marker nozzle is mounted at the boom tip with the mounting bracket (A).



**Foam Marker Nozzle Mounting Bracket**



## OPTIONS AND ATTACHMENTS

### **Boom Touch Down Wheels**

There is an optional boom touch down wheel available. It is used to prevent the boom from contacting ground when the sprayer is being used in hilly applications during low boom to ground height applications in the early growing season. The boom touch down wheel should be removed when doing in post emergent and mature crop spray applications to prevent damage to the crop.



**Boom Touch Down Wheel**

### **Narrow Tire**

The MacDon 9300 and 9350 self-propelled windrower can be fitted with a narrow 16.5L x 16.1 drive tire to minimize trampling in mature crop spray applications.

The MacDon 9352 self-propelled windrower can be fitted with a narrow 14.9L x 24 drive tire to minimize trampling in mature crop spray applications and for row crop applications.

### **Windscreen Kit**

A windscreen kit can be installed on the booms to reduce the risk of spray drift when there is a slight wind. Refer to the dealer setup instructions for the windscreen kit.

### **Nozzle Tips**

TeeJet offers a wide range and variety of nozzles that can be fitted to the MacDon sprayer attachment to reduce drift and for different spray applications.



# CONVERSION FACTORS

## Length

1 foot = 0.306 meters  
1 mile = 5280'

## Area

1 acre = 43560 sq. ft  
1 acre = 0.405 hectare  
1 hectare = 2.47 acres

## Volume

1 imp. gallon = 1.2 US gallon  
1 US gallon = 0.83 imp. gallon

1 US gal = 3.785 L  
1 imp. gal = 4.546 L

1 cu. ft = 7.48 US gallon  
1 cu. ft = 6.23 imp. gal

## Mass

1 lb. = 0.454 kg  
1 kg = 2.205 lbs.

1 oz. = 28.35 g  
1 g = 0.0353 oz.

## Velocity

1 mph = 1.61 kph

## Pressure

1 psi = 6.89 kPa  
1 psi = 0.069 Bar  
100 kPa = 1 Bar

## Spray Rate Application

1 US gpa = 9.36 L/ha  
1 imp. gpa = 11.23 L/ha

1 imp. gal = 10 lbs. of water  
1 US gal = 8.3 lbs. of water

## Power

1 hp = 0.746 kW