FORM NO. 42950

TORO

MODEL NO. 41520, 41521, 41020, 41021 and 41522

OPERATOR'S INSTRUCTIONS

STANDARD SPRAY SYSTEM
FOR USE ON THE MULTI-PRO 5200 VEHICLE

Keep this Operators Manual, the Vehicle Operators Manual, the Engine Manual and all other Accessory Manuals in the plastic tube behind the operator seat.

It is very important that all persons operating this equipment have easy access to these instructions and safety information at all times!

The installation of accessories on the TORO Vehicle other than those designed and sold for that express purpose by TORO, may adversely affect the performance and safety characteristics of the Vehicle.

To assure maximum safety, optimum performance, and to gain knowledge of the product, it is essential that you or any other operator of this Vehicle read and understand the contents of this manual before the engine is ever started. Pay particular attention to the SAFETY INSTRUCTIONS highlighted by this symbol—

The safety alert symbol means CAUTION, WARNING or DANGER — personal safety instruction. Failure to comply with the instruction may result in personal injury.

INSTALLING AND USING ATTACHMENTS:

Always read the operating instructions that are included with the accessories BEFORE actually operating the unit. Carefully read and follow any "set-up" instructions that are given.

The addition of accessories, with their added weight and bulk will make the vehicle somewhat less stable. When turning or driving on slopes, always SLOW the vehicle before making a turn, and then SLOWLY turn the vehicle to prevent loss of control and possibly upset the vehicle.

DO NOT OVERLOAD THE VEHICLE. Maximum load limits are shown on decals used on all accessories . . . do not exceed these limits.

Failure to position loads carefully can result in their shifting or tipping over suddenly, causing the vehicle to upset.

Distribute loads evenly, keeping them low so as to prevent the vehicle from becoming top-heavy. When loading the cargo bed, have heavy loads to the front of the rear axle. Heavy loads in back of the rear axle can raise the front wheels clear of the ground, causing a loss of steering control and making the vehicle unstable.

DRIVE SAFELY

Always SLOW the vehicle when approaching, and while making, a turn.

Always SLOW the vehicle when driving in unfamiliar areas or over rough terrain.

Always SLOW the vehicle when changing the direction of travel or preparing to stop.

DO NOT make sudden or sharp turns or change direction of travel, on an incline, ramp, grade, slope or similar surface.

Adjust the vehicle speed to allow for existing conditions such as wet, slick surfaces, low visibility, etc.

Drive the vehicle UP and DOWN the face of the slopes, inclines or grades whenever possible. DO NOT drive ACROSS the face if at all possible. There is a risk of upsetting the vehicle, which can result in serious injury or death.

Be especially careful when driving a heavily loaded vehicle down an incline or slope. SLOW the vehicle with the Vehicle Drive Control Lever. In case of the need for an emergency stop, use the foot brake.

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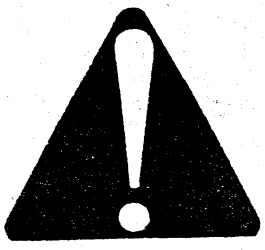
safety

RECOGNIZE SAFETY INFORMATION

This safety-alert symbol is used to call attention to a dangerous situation, which could result in serious injury or death to the operator, a passenger or a bystander.

Follow recommended precautions and safe operating practices.

It is important to always replace any lost or damaged safety-alert and informational decals on the vehicle and accessories immediately.



UNDERSTAND SIGNAL WORDS

Be aware of the symbols and signal words used throughout this manual.

A signal word—DANGER, WARNING, or CAUTION—is used with the safety-alert symbol. DANGER identifies the most serious hazards.

Safety signs with signal word DANGER or WARNING are typically near specific hazards.

General precautions are listed on CAUTION safety signs. CAUTION also calls attention to safety messages in this manual.

Instructions beginning with the signal words **"IMPORTANT"** or **"NOTE"**, provide essential information regarding the operation and maintenance of this machine.

⚠ DANGER

⚠WARNING

⚠CAUTION

IMPORTANT!

NOTE:



#41186 Located on Top of Tank Lid

FOLLOW SAFETY INSTRUCTIONS

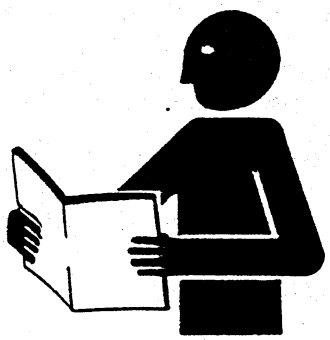
This Manual is provided as a guide for the safe operation and proper maintenance of this equipment. However, the operator's personal safety, as well as those persons in the work area, will depend on the careful actions and good judgement of the operator

Carefully read the Vehicle's Operators Manual BEFORE attempting to operate the Vehicle and/or any of the Accessories.

Learn how to operate the machine and how to use controls properly. Do not let anyone operate without instruction.

Keep your machine in proper working condition. Unauthorized modifications to the machine may impair the function and/or safety and affect machine life.

Read the engine manufacturer's operating instructions. Make note of the safety-alert messages and follow them.



INSTALLING AND USING ATTACHMENTS:

Always read the operating instructions that are included with the accessories BEFORE actually operating the unit. Carefully read and follow any "set-up" instructions that are given.

The installation of accessories on the HAHN vehicle other than those designed and sold for that express purpose by HAHN, may adversely affect the performance and safety characteristics of this vehicle.

The addition of accessories, with their added weight and bulk will make the vehicle somewhat less stable. When turning or driving on slopes, always SLOW the vehicle before making a turn, and then SLOWLY turn the vehicle to prevent loss of control and possibly upset the vehicle.

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USE PROPER CHEMICALS FOR THE JOB



Chemicals can be dangerous. Improper selection or use can injure persons, animals, plants, soils or other property.

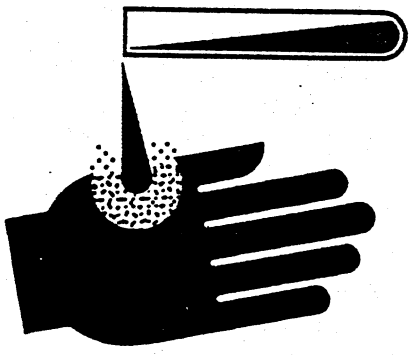
Read and observe manufacturer's recommendations.

Study all labels carefully. DO NOT remove labels.

Apply chemicals at recommended time, rate, and manner. Do not allow chemicals to drift to neighboring areas.

Properly dispose of chemical containers, unused chemicals and left-over treated seed and fertilizer.

HANDLE CHEMICALS SAFELY



andle and apply chemicals with care.

Do not smoke while handling chemicals.

Wash hands before eating.

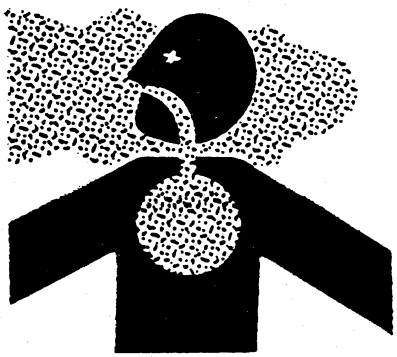
See a physician immediately if symptoms of illness occur during or shortly after the use of any chemicals.

Wash exposed skin areas frequently—do not leave chemicals on your skin.

Remove clothing and bathe skin immediately if chemicals contact skin. Launder contaminated clothing.

Wear goggles to protect your eyes.

AVOID TOXIC FUMES



Some chemicals are toxic and, in sufficient quantities, may be fatal. Ill effects or death does not have to be from direct contact.

Wear a filtered respirator. Wear goggles to protect your eyes.

ep dust away from skin and hair.

Keep containers low when pouring.

Let the wind blow fumes away from you when mixing or filling.

controls and operation

SPRAY PUMP CONTROL HANDLE: Pull the Handle up to engage the Spray Pump. Push the Handle down to disengage the Pump and stop the spraying action.

JET AGITATOR VALVE LEVER: Opens and closes the Agitator Valve, to activate or stop the agitation of spray solution in the Tank.

PUMP PRESSURE ADJUSTMENT: Turn the By-Pass Adjustment Screw clockwise or counter-clockwise to increase or decrease the Pump pressure, until 65 p.s.i. max. pressure is indicated on the Pressure Gauge.

PRESSURE ADJUST SWITCH: Hold to INCREASE or DECREASE spraying pressure to desired level. Located on Control Console.

MASTER ON/OFF SWITCH: Activates all three Boom Valves to control the flow of spray solution to the Boom sections. Located on Control Console.

INDIVIDUAL BOOM ON/OFF SWITCHES: Allows individual selection of Boom sections and controls the flow of spray solution to left (Boom #1), center (Boom #2) or right (Boom #3) Booms.

BEFORE OPERATION:

Check all of your equipment . . . make certain that all components are clean . . . including the Tank, Pump, Control Valves, Strainers, Check Valves, Hoses, Nozzles, Spray Tips and Suction Line Strainer.

NOZZLE SELECTION:

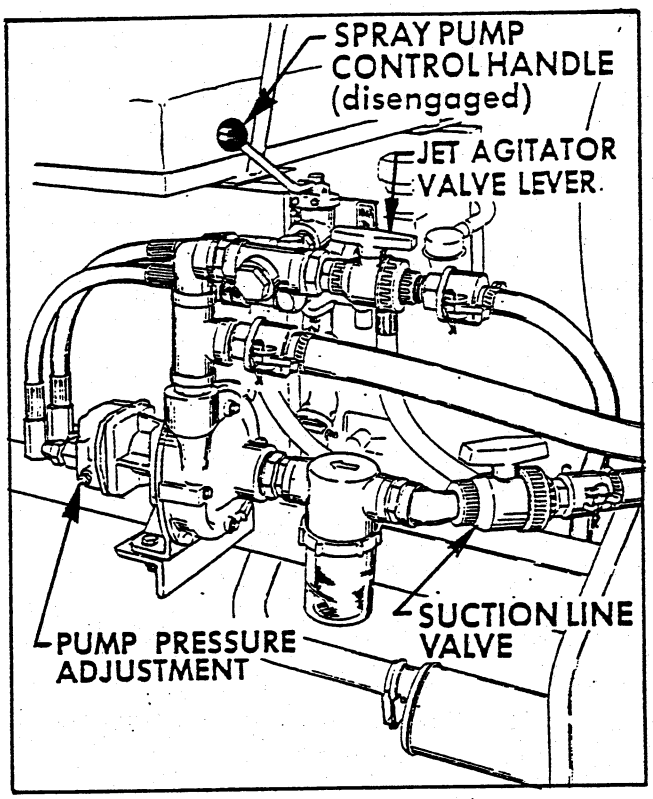
To achieve the desired application rate from your Sprayer (as indicated on the chemical container label) the proper capacity Nozzles must be installed.

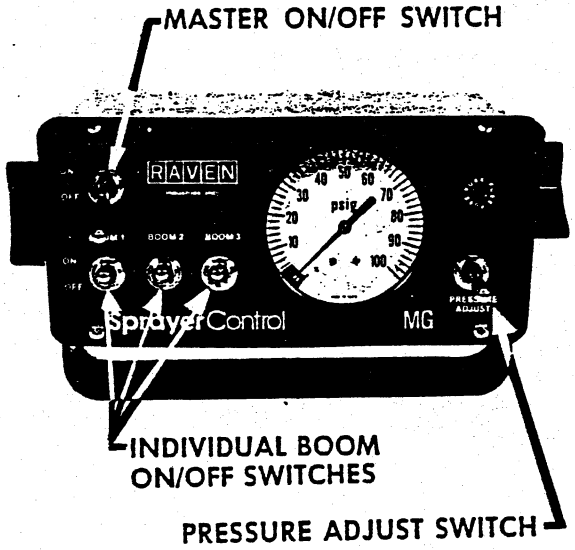
To select the proper Nozzle, you need to know:

- Application rate in gallons per acre.
- The Sprayer speed in miles per hour.
- The nozzle spacing (standard spacing is 20-inches.)

Next, refer to the Nozzle Chart to select the right size nozzles to deliver the correct application rate at the chosen speed within an operable pressure setting.

"Right" and "Left" as used in this manual refer to the operators' right or left, when seated in the normal operating position. Likewise "Front" and "Rear" as seen from the operators' position.





USEFUL FORMULAS

$$\text{G.P.M. (Per Nozzle)} = \frac{\text{G.P.A.} \times \text{M.P.H.} \times W^*}{5940}$$

$$\text{G.P.A.} = \frac{5940 \times \text{G.P.M. (Per Nozzle)}}{\text{M.P.H.} \times W^*}$$

*W - Nozzle spacing (in boom spraying) or spray swath (in boomless spraying) . . . in inches.

SYSTEM SET-UP:

■ Fill the Tank with clean, clear water.

IMPORTANT: Be certain the Suction Line Valve is open and liquid has reached the Pump. The Pump will be damaged if it is allowed to run dry!

■ Take the Vehicle out of gear and set the Parking Brake. Start the machine and set to full throttle for desired spraying speed.

■ Engage the Pump with the Agitator Valve open.

■ Turn "ON" the Master Boom Switch and all three Individual Boom Switches.

■ Set the Pressure Gauge to the desired operating pressure.

At this point, the Throttling Valves must be adjusted. This is accomplished as follows:

■ With all three Boom sections "ON", switch Boom #1 to "OFF". You will notice a change in pressure at the Gauge. Loosen the Locking Ring on #1 Boom's Throttling Valve and turn the Adjusting Cap until the original pressure setting is reached. Tighten the Locking Ring.

■ With Boom #2 and #3 "ON", switch Boom #2 to "OFF" and adjust the #2 Boom's Throttling Valve to reset original pressure.

■ Switch Boom #3 to "OFF" and repeat this procedure for setting the #3 Boom's Throttling Valve.

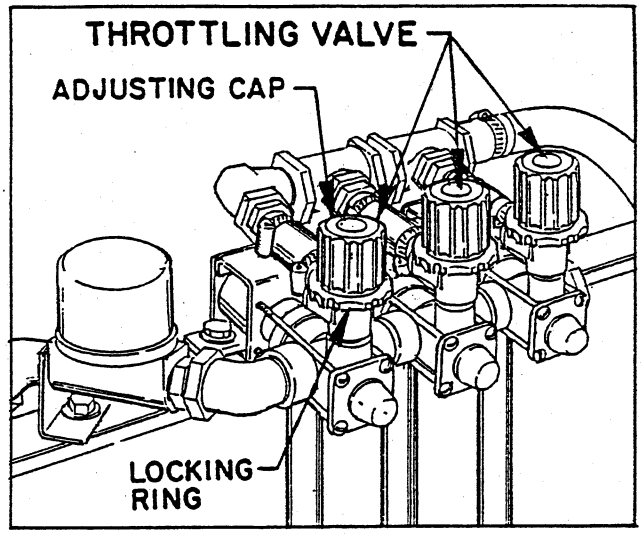
To double check these settings, switch Boom sections ON and OFF. Verify that the pressure does not change at the gauge.

NOTE: This entire procedure should be repeated whenever changing to a different operating pressure.

FILLING THE TANK:

IMPORTANT: Do not add chemical to the Tank until just before use. Follow the chemical manufacturer's instructions for mixing the spray solution, to obtain desired application rate and effect.

CAUTION: Read carefully the directions printed on the chemical manufacturer's labels before handling the chemicals.



Instructions on chemical manufacturer's container labels, regarding mixing proportions, should be read and strictly followed. The concentrate should not be poured into an empty Tank. Fill the Tank about one-half full with clean, clear water, add chemical concentrate and then finish filling Tank with water.

Keep spray material away from skin. If spray material comes in contact with body, wash it off IMMEDIATELY with clean water and detergent.

CAUTION! CHEMICALS CAN BE DANGEROUS. IMPROPER SELECTION OR USE CAN CAUSE SERIOUS DAMAGE TO PERSONS, ANIMALS, PLANTS, SOIL OR OTHER PROPERTY. BE SAFE: SELECT THE RIGHT CHEMICAL FOR THE JOB. HANDLE IT WITH CARE. FOLLOW THE INSTRUCTIONS FROM THE EQUIPMENT MANUFACTURER.

USING THE SPRAYER:

■ Operate at full (or nearly full) Throttle to provide the necessary ground speed, pressure and volume.

■ Engage the Pump and use the Master ON/OFF Switch and individual Boom Switches, to control Boom sections.

■ Regulate pressure with the Pressure Adjust Switch.

AFTER SPRAYING:

Flush the entire spraying system with clear water and a flushing agent after each spray job. Failure to clean the system can result in a chemical residue which can seriously damage the Centrifugal Pump and plug the Valves, Hoses and/or Nozzle Tips.

maintenance

Preventive maintenance will pay off many times over in peak performance and efficient operation.

Flush the entire spraying system with clear water and flushing agent after each spray job. Failure to clean the system can result in a chemical residue which can seriously damage the Centrifugal Pump and plug the Control Valve, Hoses and/ or Nozzle Tips.

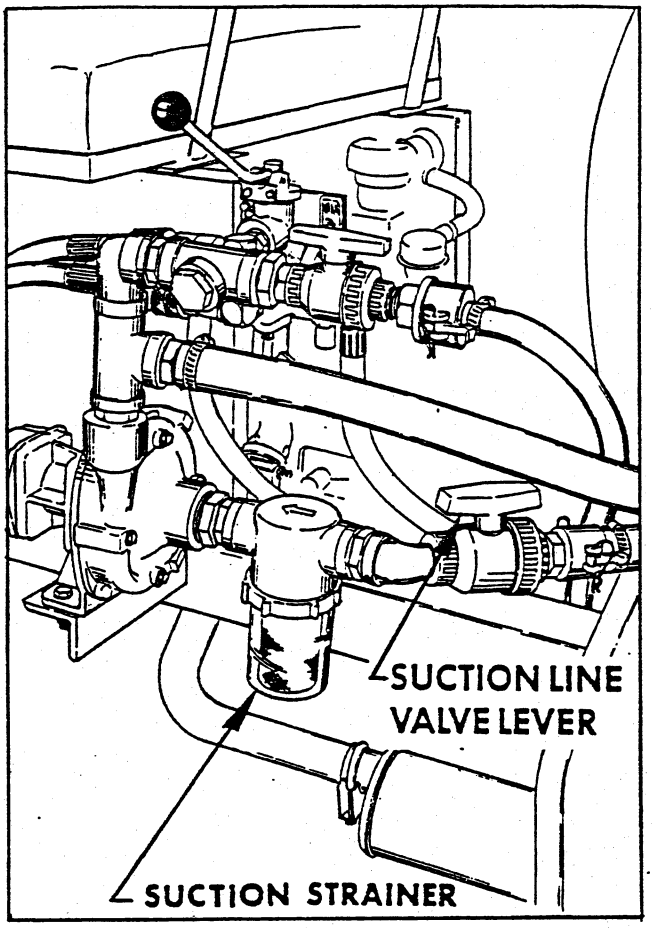
Wash spray tips thoroughly with water or cleaning solution (appropriate for chemical sprayed). Blow out orifice, clean and dry. If orifice remains clogged, clean it with a soft bristled brush...never use a metal object.

SUCTION STRAINER:

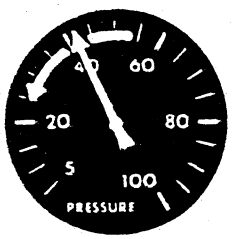
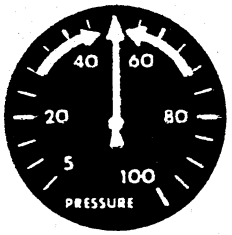
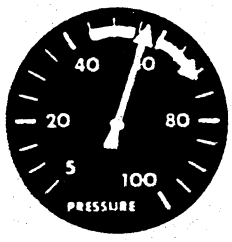
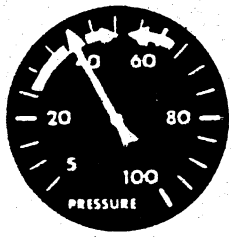
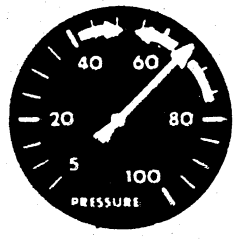
Turn off Suction Line Valve if Tank is full of spray solution. Remove the cap and clean the strainer screen daily when spraying wettable powders– after every 50 hours when using liquid chemical.

IMPORTANT: Be certain Suction Line Valve is opened when spraying is resumed. Damage to Spray Pump can result when operating the Sprayer with Valve closed.

⚠ **DO NOT OPERATE THE PUMP DRY!**



trouble shooting/sprayer

PRESSURE GAUGE READING	PROBLEM AREA	SPECIFIC CHECKS	CORRECTIONS
Pressure Decreasing 	Between gauge and liquid supply	1. Clogged suction screen 2. Suction hose collapsing 3. Pump wearing 4. Plugged suction or pump to pressure head hose	1. Clean screen; correct cause of clogging 2. Replace with heavier sidewall hose 3. Rebuild or replace pump 4. Clean hose and reduce cause of clogging
Pressure Fluctuating 	Between pump outlet and liquid supply or pump pulsations with piston pump	1. Check suction hose and fittings for air leaks. Air in system is indicated by puffs of air at nozzles 2. Pump pulsations are indicated by regular constant fluctuation of gauge 3. Vortex in tank suction	1. Replace hose, seal and tighten fittings 2. Add pulsation dampener to system 3. Install vortex breaker to reduce air entering system
Pressure Increasing 	Between gauge and nozzle	1. Line screen clogged 2. Nozzle screens clogged 3. Nozzle orifices plugged 4. Boom hoses, overflow hose or boom pipe becoming clogged	1. Clean screens 2. Clean screens 3. Remove material with soft brush, or air 4. Remove obstruction from clogged area
Pressure Cannot Increase 	Pump or pressure regulator	1. No by-pass liquid indicates pump capacity too small 2. From nozzle charts check liquid demand against pump capacity (Nozzle requirement + agitation requirement) 3. Pressure regulator or guage not functional	1. Install large capacity pump or increase output of present pump 2. Reduce swath width by nozzle reduction; install smaller orifice and drive at a lower rate of speed 3. Replace or repair
Pressure Cannot Decrease 	Pump or pressure regulator	1. Pump supplying more liquid than capacity of by-pass indicated by heavy flow from by-pass 2. Non-functioning by-pass regulator	1. Increase size of bypass hose and valve; reduce pump outlet with throttling valve on suction hose; slow down pump speed; install smaller capacity pump; go to larger nozzle orifices and increase applicator ground speed or increase swath width with more nozzles 2. Repair or replace

storage

Flush the entire spraying system with clear water and flushing agent. Let system drain and run some diesel fuel through the entire system.

Should the Raven Console require service, refer to the serial no. decal on the bottom of the Console when requesting assistance or information.

SERVICING AFTER STORAGE:

Flush the entire spraying system with clean water and detergent.

Flush the entire spraying system again with clean, clear water to rinse.

Let system drain.

HYDRAULIC SPRAY PUMP

If equipment is used in freezing or near freezing conditions, protect pump and system by draining liquid and pumping anti-freeze solution through system, coating pump interior. Use anti-freeze with rust inhibitor to help prevent rust and corrosion.

Store chemicals in a separate, plainly marked, LOCKED building.

Store chemicals in original containers with labels intact.

Federal and state laws govern the use of chemicals. Before using any chemical, consult state agricultural agent or chemical supplier for proper uses.

See a physician or druggist for first aid kits and learn how to use them.

