Form No. 3364-606 Rev A

TORO®

Count on it.

Operator's Manual

MH-400 Material Delivery Unit

Model No. 44930--Serial No. 310000001 and Up
Model No. 44931--Serial No. 310000001 and Up
Model No. 44933--Serial No. 310000001 and Up
Model No. 44934--Serial No. 310000001 and Up
Model No. 44937
Model No. 44938

Register your product at www.Toro.com

Original Instructions (EN)

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Product Identification

Model Name and Serial Number

The MH-400 model number and serial number are located on a Model, Serial Number plate mounted on the left side of the front panel (Figures 1 and 2).When you contact an authorized Toro distributor for service or parts, give the distributor the model number and serial number, as well as the part numbers, description, and quantity of parts you require.

Write down your model and serial numbers below.

MH-400 base model

MH-400 twin spinner

MH-400 cross conveyor

MH-400 swivel kit

MH Processor

MH-400 hydraulic power pack

MH-400 option caddy

Purchase Date and Distributor Information

Date of purchase

Distributor name

Distributor phone

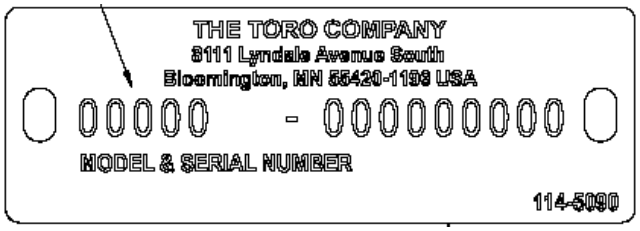


Figure 1: Model Serial Number plate



Figure 2: Identification plate information

Specifications

IMPORTANT: These specifications are subject to change without notice. They are provided for reference purposes only. Contact an authorized Toro distributor for up-to-date or additional information.

Weights	
Base Model	1,360 kg (3,000 lb)
GVWR	6,713 kg (14,800 lb)
Payload	5,353 kg (11,800 lb)
Twin Spinner	95 kg (210 lb)
Cross Conveyor	132 kg (290 lb)
Swivel Kit	72 kg (158 lb)
MH Processor	193 kg (425 lb)
Hydraulic Power Pack	82 kg (180 lb)

Dimensions			
(See Figure 3)	Length	Width	Height
Overall dimension	4.8 m (190 in)	1.98 m (78 in)	2.2 m (86 in)
Shipping dimensions (some parts removed)	3.73 m (147 in)	2.05 m (81 in)	2.13 m (84 in)
Shipping dimensions Twin Spinner	1.29 m (51 in)	1.02 m (40 in)	0.66 m (26 in)
Shipping dimensions Cross Conveyor	2.08 m (82 in)	0.76 m (30 in)	0.36 m (14 in)
Shipping dimensions Swivel Kit	1.22 m (48 in)	0.76 m (30 in)	0.43 m (17 in)
Shipping dimensions MH Processor	2.20 m (87 in)	0.71 m (28 in)	0.81 m (32 in)
Shipping dimensions Hydraulic Power Pack	0.84 m (33 in)	0.64 m (25 in)	0.71 cm (28 in)
Shipping dimensions Option Caddy	1.02 m (40 in)	0.86 m (34 in)	0.48 m (19 in)

Tires	
Size	82.5 x 40 x 40.25 cm – 10 ply (33 x 16 x 16.1 in)
Maximum Inflation pressure	172 kPa (25 psi)

Hydraulic System	
Minimum flow (no options)	23 L/min (6 U.S. gal/min)
Recommended flow	38 L/min (10 U.S. gal/min)
Maximum flow	53 L/min (14 U.S. gal/min)
Minimum input pressure	138 bar (2,000 psi)
Maximum input pressure	190 bar (2,800 psi)
Fluid type	Petro-Canada Duratran or equivalent ISO VG-68 fluid
Fluid viscosity	60.09 cSt @ 40°C
Fluid capacity	3 L (0.80 US gal)
Fluid capacity (power pack)	90 L (23.8 US gal)

Tow Vehicle Requirements	
Towing capacity (for maximum payload with options)	7175 kg (15,850 lb)
Tongue weight (for maximum payload)	148.5 kg (330 lb)
Tow vehicle minimum power	45 hp (34 kW)
Hitch	Use 25 mm (1 in) diameter safety rated hitch pin and safety clip

Electrical System	
Voltage	12 V
Maximum Amperage draw	2.98 A
Fuse	15 A

Other Specifications	
Noise	Under normal operating conditions, the MH400 has an equivalent, continuous, A-weighted sound level of 82 dB(A), complying with Directive 98/37/EC and amendments.

Other Specifications	
Maximum payload capacity to the top of the hopper	2.21 m^3 (78 ft^3)
Maximum belt speed	2.9 rpm or 18 m (60 ft) per minute
Vibration	Under normal operating conditions, the MH-400 does not produce vibrations over 2.0 m/s^2 (6.6 ft/s^2) to the operator's arms, or over 0.5 m/s^2 (1.6 ft/s^2) to the operator's body. (Note: values = weighted root mean square acceleration.)

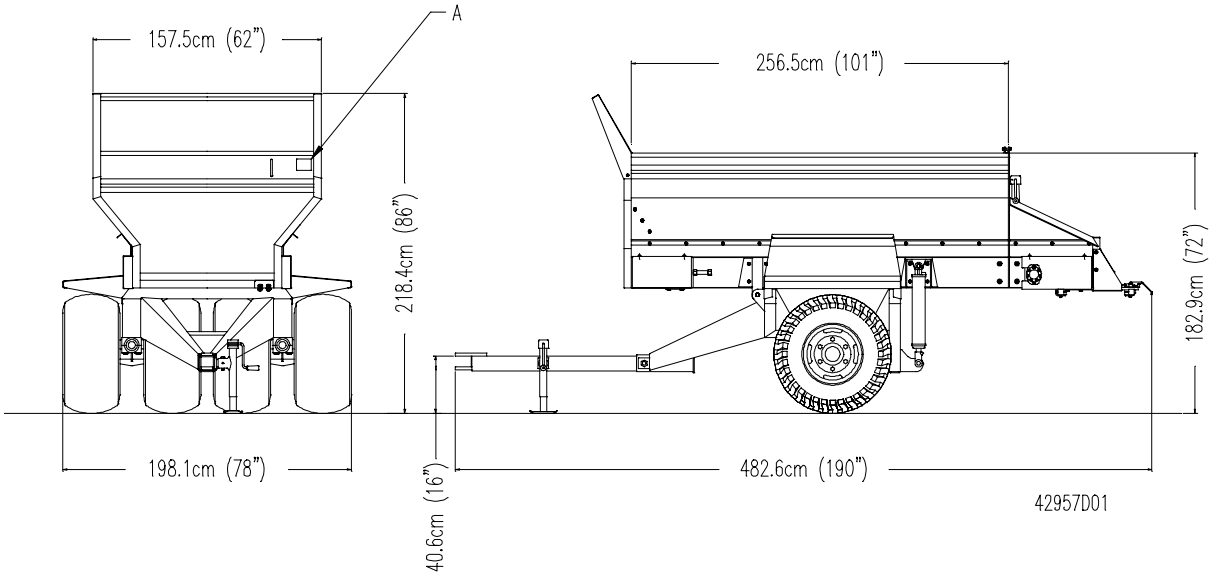


Figure 3: MH-400 dimensions

Introduction

Read this Operator's Manual carefully before operating the MH-400 Material Delivery Unit. Keep it in an accessible location.

To get a replacement manual, go to www.toro.com. This Operator's Manual may also be available in other languages. Go to www.toro.com to download one.

How to Use the Operator's Manual

Follow all safety precautions and operating recommendations to ensure safe and trouble-free operation of the MH-400.

This Operator's Manual provides the safest and most effective methods for operating the MH-400. It will help you and others avoid personal injury or equipment damage.

Throughout this Operator's Manual, the terms "left" and "right" are used. When you stand behind the MH-400 facing towards the rear of it, your left side corresponds to the left side of the MH-400.

Message Boxes

This Operator's Manual contains message boxes that are labelled **Danger, Warning, Caution,** and **Important.** These boxes indicate potential safety concerns or equipment damage, and operating and servicing information. Read these message boxes carefully to avoid injury and equipment damage.



DANGER: Indicates an extreme hazard that will cause serious injury or death if you do not follow the recommended precautions.



WARNING: Indicates a hazard that may cause serious injury or death if you do not follow the recommended precautions.



CAUTION: Indicates a hazard that may cause minor or moderate injury if you do not follow the recommended precautions.

IMPORTANT: Indicates special mechanical or servicing information.

About the MH-400 Material Delivery Unit

The MH-400 Material Delivery Unit is a low-impact multi-purpose work trailer designed for the turf grass maintenance industry.

Features and Benefits

- It is offered in two models, one with standard hydraulics (SH) and one with electric hydraulics (EH).
- It can be used for a variety of everyday material handling and relocation tasks without an option.
- The four-wheel walking beam suspension follows the contours of uneven surfaces, while providing a smooth ride, and maintaining even weight transfer to the ground.
- It comes standard with specially designed, high-flotation, 10-ply turf tires. Designed to provide minimum ground compaction, with maximum support and maneuverability.
- It is easy to learn and operate. One person can operate the on/off pendant switch from the driver's seat on the SH model, or the switch can be bypassed for continued operation—no down time.
- The control pendant on the EH model allows full control of the MH-400 and its options from the driver's position.
- Options can be easily installed or removed in minutes—no tools required.
- The option caddy allows one person to install or remove an option in minutes—no heavy lifting required.
- The lower, wider body provides maximum stability.
- Customers can install a four-wheel electric brake system for maximum braking performance. The brake controller and foot pedal are mounted on the tow vehicle. This allows synchronous braking with the tow vehicle.
- The seamless, triple layer, 9.4 mm (⅜ in) thick belt enhances durability.
- The triple-sealed rollers provide long-lasting high performance and require virtually no maintenance.
- The bi-directional conveyor belt allows materials and supplies to be loaded into the MH-400, as well as unloaded.
- The multi-position rear gate can be adjusted from a closed position up to 12.5 cm (5 in) open to pass material. It can be locked into position, as well as unlocked or removed.
- The rear hitch provides versatility-use the MH-400 with trailed vacuum systems, wood chippers, and levelling devices.
- It can fully load smaller machines, such as the ProPass 200.

Spreading Options

For more information on the following options, contact an authorized TORO distributor.

Twin Spinner Option

The Twin Spinner option can handle a wide variety of materials, with spread widths of 4.5–12 m (15–40 ft) for light or heavy top dressing applications.

Cross Conveyor Option

Use this option to move and place materials at varying heights from 28–180 cm (11–72 in) off the ground.

Swivel Kit Option

Use this option in conjunction with the cross conveyor. It allows you to move and place material in any direction with a 270 degree range from the rear of the MH-400. The swivel action is useful for filling ditches and sand traps.

MH Processor Option

Use this option to screen a wide variety of material. The option discharges desired material directly onto the ground and unwanted material collects at the bottom of the conveyor.

Hydraulic Power Pack Option

Use this option to supply hydraulic pressure to the MH-400 and its equipment when the tow vehicle has only a PTO (power take-off unit). The power pack is a self-contained pump and hydraulic reservoir that runs off the tow vehicle's PTO.

Another advantage is that the hydraulic power pack is better protected from contaminants than most tow vehicle hydraulic systems.

Electric Brakes Option

Installing electric brakes on your MH-400 is strongly recommended to ensure that the MH-400 can stop safely and quickly on hills or uneven terrain.

Electric brakes may be legally required by some jurisdictions. Familiarize yourself with local bylaws before operating this machine. They are recommended if you do not have a heavy-duty tow vehicle equipped with four-wheel drive.

Option Caddy

An option caddy is available to allow one person to easily install or remove an option, unassisted.

Light Kit Option

The kit includes taillights, amber marker lights, reflective decals, and a slow moving vehicle sign.

Safety Instructions

Read this Operator's Manual carefully. Follow all safety precautions and operating recommendations to ensure safe and trouble-free operation of the MH-400 Material Delivery Unit.



WARNING: The MH-400 is equipped only for off-road use. Do not use it on public roads.

Safe Operating Practices

- The MH-400 has different balance, weight, and handling characteristics compared to some other types of pulled equipment. Before using the MH-400, take time to become familiar with it.
- Observe all safety laws and regulations in your area.
- Replace any decal that becomes lost, damaged, or illegible.
- Any modification to the MH-400 that is not performed by, or under the guidance of an authorized Toro distributor could affect the safety, performance, or durability of the MH-400. If problems result, this may violate local regulations, void the warranty, or cause injury or death.

Supervisor's Responsibilities

- Ensure that all operators have read this Operator's Manual, and understand all the safety decals on the MH-400.
- Prevent accidents by training operators to operate the MH-400, and continuously supervise its operation.

Do the Following

- Read and understand this Operator's Manual completely before operating the MH-400.
- Walk around the MH-400 and inspect it. Check all decals, guards, shields, clamps, and brackets. Also check the jack stand, hitch pin, hydraulic lines and fittings, and housing.
- If any parts are broken or missing, repair or replace them before operating the MH-400.
- Ensure that qualified personnel have made all recommended maintenance and adjustments to the MH-400 before use. Notify your supervisor about any adjustments made to the MH-400.
- Wear approved hearing and eye protection when operating the MH-400.

Never Do the Following

- Do not allow untrained people or persons under 16 years of age to operate the MH-400.
- Do not operate the MH-400 if you have any doubts about any aspect of its operation.
- Do not carry passengers on the MH-400 or in the hopper.
- Do not operate the MH-400 while under the influence of drugs or alcohol.
- Do not leave the MH-400 unattended while it is running.
- Do not operate the MH-400 when other people (or animals) are in the work area.
- Do not get the control pendant on the EH model wet.
- Do not leave the control pendant on the EH model when not in use

Hydraulic Safety

Tow Vehicle Requirements

The capabilities of the MH-400 may vary depending on the size and type of tow vehicle.

Hydraulic System	
Recommended flow	38 L/min (10 U.S. gal/min)
Recommended input pressure	138 bar (2,000 psi) Minimum 190 bar (2,800 psi) Maximum
Fluid type	MOBILEFLUID 424

For best results, use a tow vehicle with at least 45 hp and four-wheel drive. A tow vehicle with less than 45 hp will limit where you can go and how much payload you can deliver. For example, a 27 hp tow vehicle can tow a fully loaded MH-400 over flat terrain, but not on steep hills. A four-wheel drive will also improve performance on hills.

With a smaller tow vehicle, you may need to reduce the payload to 2 cubic meters (2.6 cubic yards) of material for spreading in difficult terrain. Another option is to tow a fully loaded MH-400 to a spot near the job and then load smaller machines from the MH-400 to complete the job.

For best results, use a tow vehicle with a fixed displacement hydraulic pump with a power output of 138 bar @ 38 L/min (2,000 psi @ 10 U.S. gal/min). Performance will be reduced if pump output is less.

If your tow vehicle does not have hydraulics, you must purchase the optional hydraulic power pack. This bolts onto the MH-400 hitch tube and connects a drive line to the tow vehicle's PTO (power take-off unit).

Hoses and Lines

Hydraulic hoses and lines may fail because of physical damage, kinks, age, and exposure. Check the hoses and lines regularly and replace them if required.

Fluid connections may loosen because of physical damage and vibration. Check and tighten the connections regularly.

Fluid that escapes under high pressure may cause serious injury. Disconnect the hydraulic or other lines to relieve the pressure. Tighten the connections before applying pressure.



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

If an accident occurs, see a doctor immediately. Any fluid that penetrates the skin must be removed by a doctor within a few hours.

Tow Vehicle Safety

When fully loaded, the MH-400 can weigh up to 7,000 kg (15,432 lb). Do not go beyond the limitations of the tow vehicle.



WARNING: Ensure that the tow vehicle has enough power and traction to pull a full load. If not, reduce the size of loads.

The tow vehicle must have an adequate hitch and functional brakes.



CAUTION: The hitch tube is very heavy. Be careful when installing or removing it.

If an option is mounted on the rear, or the load has moved to the rear, the MH-400 becomes heavier at the back. This may create a negative tongue weight and diminished traction for your tow vehicle.

Loading

You can load the MH-400 from the top or the rear. When loading from the rear, raise or remove the rear gate.



WARNING: Ensure that the MH-400 is connected to the tow vehicle before loading.

Do not carry loads that exceed the load limits of the MH-400 or the tow vehicle (see Specifications on page 2).

The stability of loads can vary—for example, high loads have a higher center of gravity. Reduce the maximum load limits to ensure better stability, if necessary.

To avoid causing the MH-400 to tip over (see safety decals on page 12):

- Carefully monitor the height and weight of the load. Higher and heavier loads can increase the risk of tipping.
- Distribute the load evenly, front to back and side to side.
- Be careful when turning and avoid unsafe maneuvers.
- Always ensure that the MH-400 is connected to the tow vehicle before loading.

IMPORTANT: Do not put large or heavy objects into the hopper. This could damage the belt and rollers. Also ensure that the load has a uniform texture. Small rocks in sand can become projectiles.



WARNING: Do not carry passengers in the hopper.

Unloading

Do not stand behind the MH-400 when unloading or spreading. The twin spinner, cross conveyor and processor eject particles and dust at a high speed.



WARNING: Do not unload the MH-400 or disconnect it from the tow vehicle while on a hill.



WARNING: Ensure that the MH-400 is connected to the tow vehicle before unloading.



CAUTION: Always remove options before loading or unloading the MH-400 from a trailer. Otherwise, the option may hit the ramp or ground and be seriously damaged.

Traveling

The MH-400 is designed only for off-road use. The maximum recommended speed without a load is 24 km/h (15 mph), and 13 km/h (8 mph) with a full load.



CAUTION: Before operating the MH-400, raise the front jack and rear jack leg. Remove the jack from the jack leg and store it on the tongue during operation.

Maintain safe control of the MH-400. Do not attempt abrupt maneuvers or other unsafe actions, especially on hills or uneven ground.



CAUTION: Ensure that the cross conveyor is centered. Traveling with it in the extended position can damage the option attachment brackets and swivel kit.



WARNING: Do not travel with the MH-400 in the fully raised position. This increases the risk of tipping over.

The MH-400 has a safe range for traveling with options attached as shown by the green section in decal (see safety decals on page 15).



CAUTION: Be aware that when traveling with the processor option attached, that it sticks out the right side of the MH-400 and the towing vehicle.



CAUTION: Do not travel with the MH-400 in the caution range (yellow/black). When no options attached, travel with the machine in lowered position.



WARNING: Always slow down when turning and avoid sharp turns. Otherwise, the MH-400 may tip over.

Heavy loads and wet or uneven surfaces increase the time it takes to stop, and reduce the ability to turn quickly and safely.



CAUTION: Be aware of your surroundings when turning or backing up. Ensure that the area is clear and keep all bystanders at a safe distance. Proceed slowly.

Turn off the option when approaching people, vehicles, vehicle crossings, or pedestrian crossings.

The mirror mounted on the front of the hopper allows you to monitor the load and the spreading action. Check the mirror frequently to monitor the operation of the MH-400.



CAUTION: Do not operate the MH-400 with the weight case removed or out of position. (see safety decals on page 12).

Hills



WARNING: Use extreme caution when traveling on hills, especially when turning.

See safety decals on page 12.

Traveling across steep hills with the unit fully loaded could result in tipping over, or a loss of traction for the MH-400 or tow vehicle.

Always travel straight up and down hills—do not travel sideways or diagonally. When traveling down a hill, do not exceed the speed at which you can travel up the same hill. Stopping distance increases when traveling down hills.



WARNING: Reduce the weight of the load when traveling on steep hills, and avoid piling the load high.

When using an option, be aware that the MH-400 has only 15 cm (6 in) of ground clearance. When the MH-400 begins to travel up a hill the ground clearance decreases.

Parking

Park the MH-400 on a firm, level surface. Avoid soft ground because the jack leg could sink and cause the MH-400 to tip over.



CAUTION: Do not disconnect the MH-400 from the tow vehicle on hills, or without engaging the front jack and rear jack leg.

To rotate the front jack and rear jack leg from a vertical support position to a traveling horizontal position, pull out the jack stand support pin and swivel the front jack (pull out the rear jack leg) and secure it in the horizontal position.



WARNING: Ensure that the rear jack leg and the hopper are in the down position. Put a spacer (such as a piece of wood) underneath the rear leg when the gap to the ground exceeds 5 cm (2 in) (Figure 4).



CAUTION: When disconnecting the MH-400, always block the wheels to prevent movement.

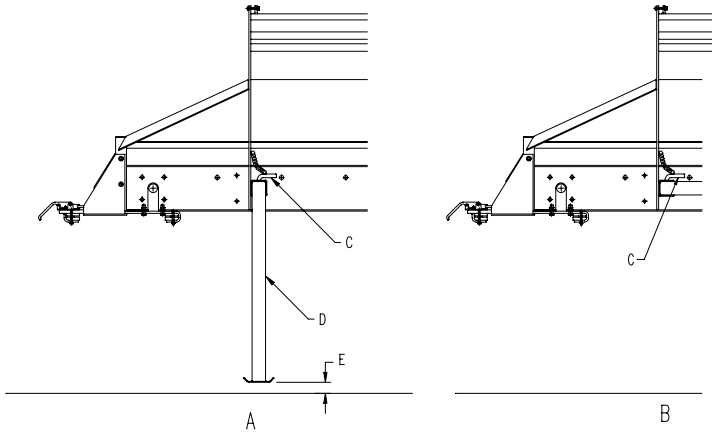


Figure 4: Rear jack leg positions for parking and traveling

A. Support position – Lower the jack leg before disconnecting from the tow vehicle
B. Travel position – Raise the jack leg before traveling. Remove the jack and store on the tongue
C. Safety pin
D. Rear jack leg
E. 5 cm (2 in) maximum gap

Tongue Weight

The tongue is the area on the MH-400 where the hitch connects to the tow vehicle. The weight of the tongue affects the stability of the MH-400.

When the tongue's weight is forced up into the hitch of the tow vehicle, this produces a negative tongue weight (Figure 5). Negative tongue weight may also result when options are mounted on the rear of the MH-400.

When the tongue's weight is forced down onto the hitch of the tow vehicle, this produces a positive tongue weight (Figure 5).

WARNING: A negative or positive tongue weight can cause injury when connecting or disconnecting the MH-400 to the tow vehicle. Ensure that the jack stands are properly engaged.

To balance the tongue weight, raise or lower the rear of the MH-400 by 10–15 cm (4–6 in). However, be aware that raising the MH-400 can increase the risk of tipping over.

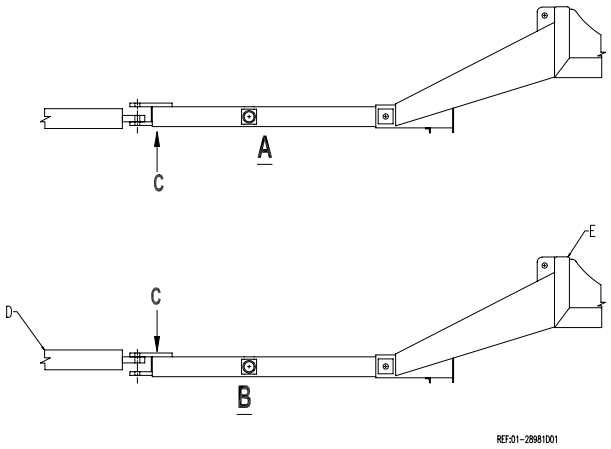


Figure 5: Tongue weight

A. Negative tongue weight
B. Positive tongue weight
C. Motion of tongue
D. Tow vehicle hitch
E. MH-400 hitch

Safety Attire

Each time you operate the MH-400:

- Wear safety glasses or safety goggles with side shields.
- Wear approved hearing protection.
- Wear sturdy footwear that fully covers your feet.
- Avoid loose clothing or jewellery that may get caught in moving parts.

WARNING: Avoid serious injury by keeping your hands, body, and clothing away from moving parts.

Maintenance Safety

Any modification to the MH-400 that is not performed by or under the guidance of an authorized Toro distributor could affect the safety, performance, or durability of the

MH-400. If problems result, this may violate local regulations, void the warranty, or cause injury or death.

WARNING: Install the hydraulic cylinder supports before doing any maintenance work under the hopper (Figure 6).



Figure 6: Hydraulic cylinder support in place

Safety Decals

Important safety decals on your MH-400 indicate areas with potential safety hazards. Replace any decal that becomes lost, damaged, or illegible.



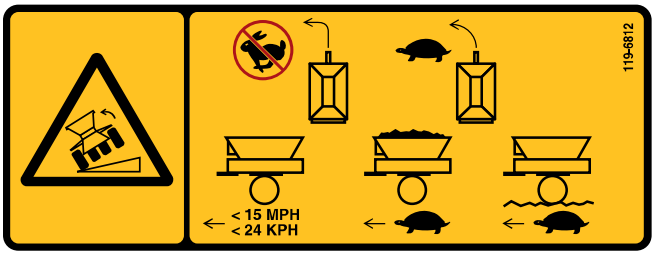
119-6806: Consult Operator's Manual
Get appropriate training before operating
Projectile hazard stay a safe distance from the machine
No maintenance while machine is in use
No passengers
Do not operate with guards removed



119-6844: Shear hazard
Avoid rotating shaft



119-6805: Shear hazard
Avoid rotating spinner disks



119-6812: Tip over hazards
Do not turn sharp when going fast
Do not drive MH-400 on steep slopes
Slow down and turn gradually
Do not exceed 15 mph (24 km/h)
Drive slowly over uneven surfaces or when carrying a full or heavy load



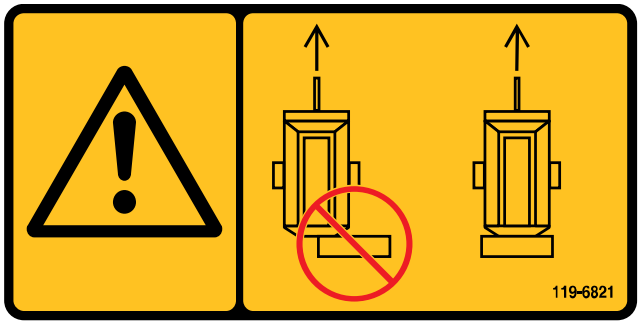
115-2047: Warning - Hot



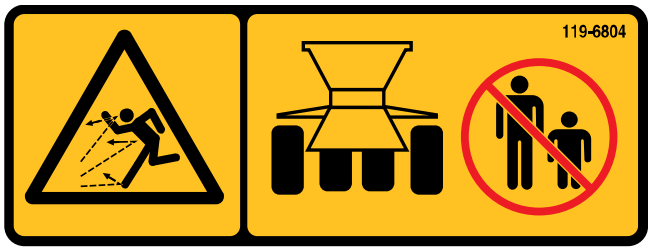
93-9899: Crush hazard
Install the cylinder lock when extended



93-9852: Warning – Lift Cylinder



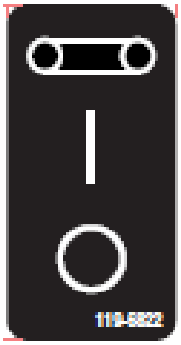
119-6821: Do not travel with cross conveyor extended
Always center cross conveyor when traveling



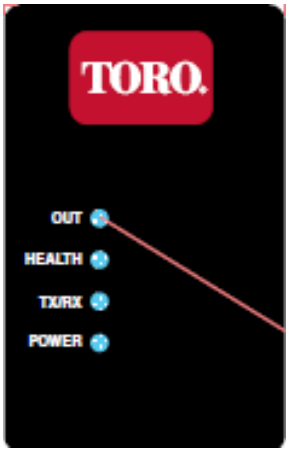
119-6804: Thrown object hazard
Stay a safe distance from the machine



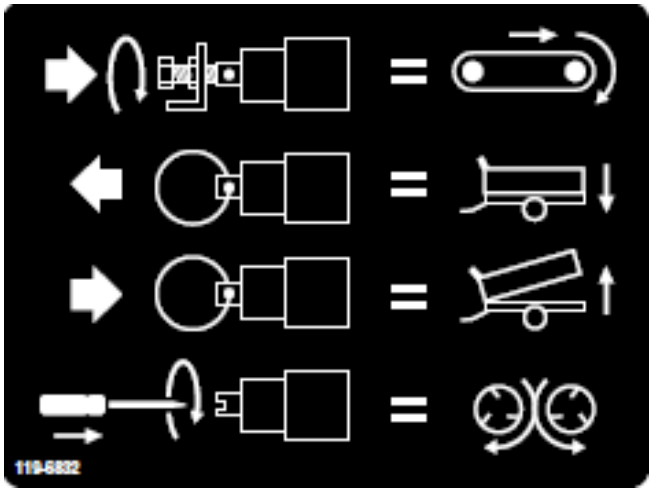
119-6850: Shear hazard
Locking bar up



119-6822: Floor Conveyer On - Off



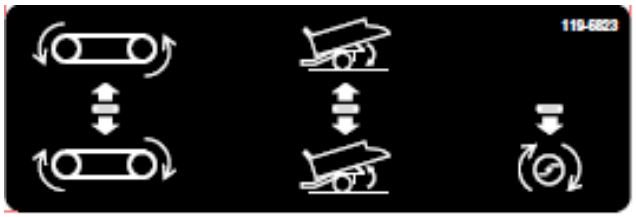
119-6830: Base Unit



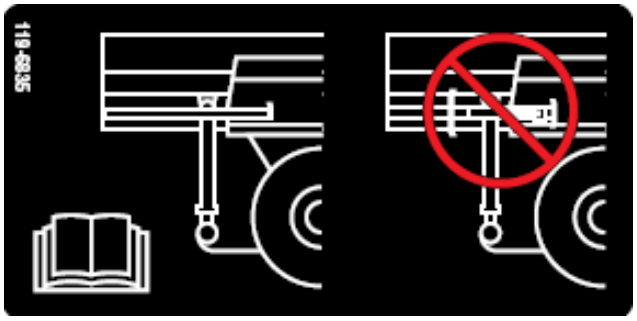
119-6832: Adjustments



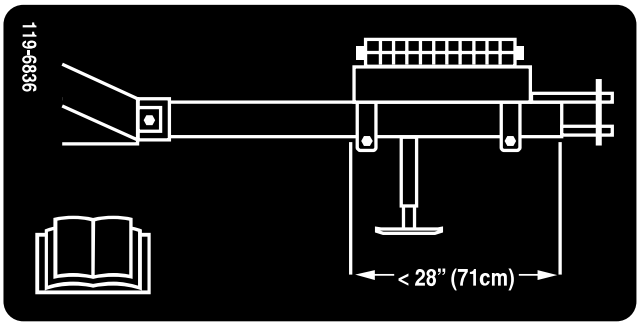
119-6831: Use ISO VG-68 Hydraulic fluid
90 L (23.8 U.S. gal)



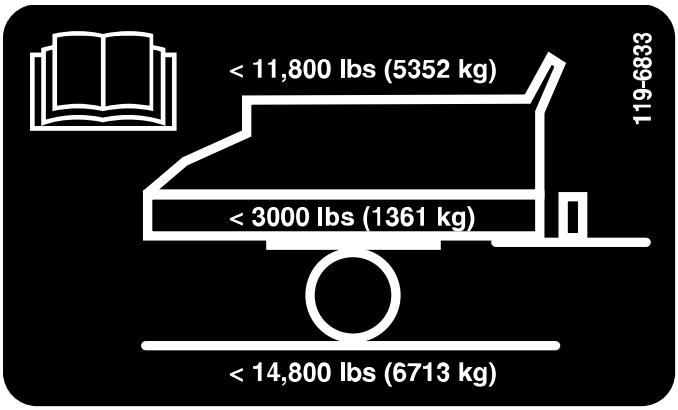
119-6823: Hydraulic Controls



119-6835: Consult Operator's Manual
Do not store jack on rear jack leg



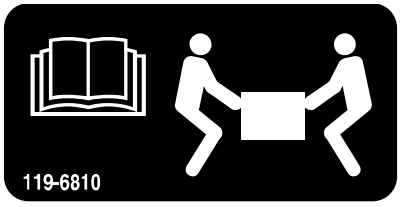
119-6836: Consult Operator's Manual
Locate weight so that rear of weight case is
28 in (71 cm) from front face of hitch tube



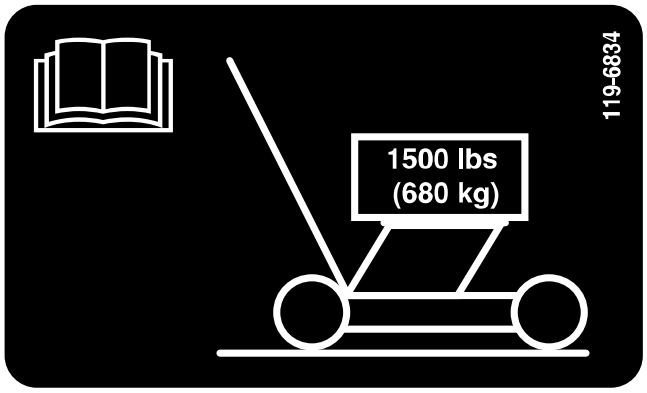
119-6833: Consult Operator's Manual
Maximum loads for MH-400
Maximum load—11,800 lb (5,352 kg)
Vehicle weight—3,000 lb (1,361 kg)
Maximum gross vehicle weight—14,800 lb (6,713 kg)



119-6851: Warning – No Riders



119-6810: Consult Operator's Manual
Use two people to lift



119-6834: Consult Operator's Manual
Maximum load for optional caddy
1500 lb (680 kg)



119-6845: Tailgate Height Indicator



119-6825: Safe range for traveling with options attached
Consult Operator's Manual

Setup Instructions

An authorized Toro distributor normally sets up the MH-400 Material Delivery Unit at the time of purchase. See the Setup Manual for more information.

If you purchased the electric brakes, your authorized Toro distributor will install these too.

This section covers how to install the Twin Spinner and cross conveyor options onto the MH-400. When lifting the options, use the option caddy if possible (see page 34).

How to Mount the Options

Every MH-400 comes equipped with a pair of "quick-attach" universal mounting brackets located at the rear. Use these brackets to mount options to the MH-400.

No tools are required to install or remove the options.

WARNING: Ensure that the tow vehicle is turned off before installing an option.

1. Connect the MH-400 to the tow-vehicle. See Operating Instructions – Connecting the MH-400 to the tow vehicle.
2. Remove the safety latch clips from the clamp handles.
3. Lift the safety latch, then lift the option attachment clamp handles, and release the lock rings from the lock pins (Figure 7).
4. Slide the rear option attachment clamp assembly out of the quick-attach slots and into the brackets.
5. Insert the front edge of the option up and under the rear of the MH-400 into the front clamps on the brackets.
6. Support the option in place, then slide the rear option attachment clamp assembly back into the slots in the brackets, and over the rear.
7. Ensure that the option is centered between the brackets. Then re-install the lock rings over the lock pins and push down on the clamp handles.

Note – If the clamp assembly is too loose and the option slides within the clamps, turn the lock rings into the clamps a few turns until the option is secure.

IMPORTANT: Do not over-tighten the clamps. This may bend the edges of the option.

CAUTION: Ensure that you re-install the safety latch clips into the clamps. Otherwise, the clamps may open during operation.

WARNING: The options are heavy. Use the option caddy to lift the options. Wear gloves to protect your hands.

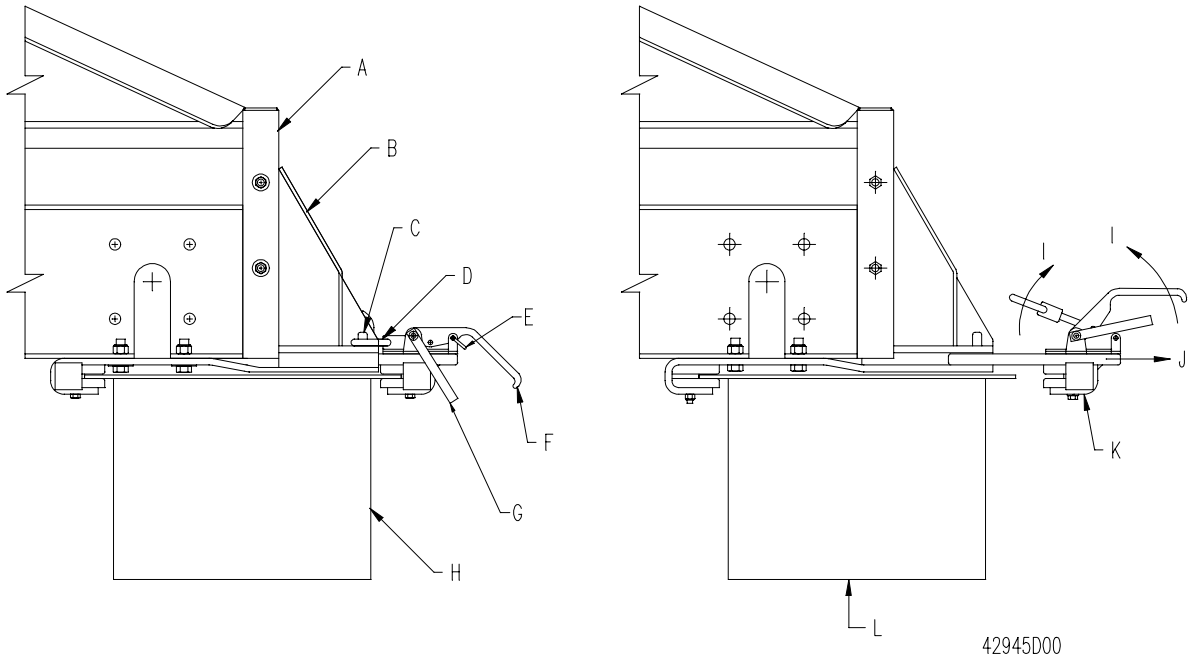


Figure 7: Installing an option / removing an option

A. Rear of MH-400
B. Option attachment bracket
C. Lock pin
D. Lock ring
E. Safety latch clip
F. Clamp handle
G. Safety latch
H. Option
I. Lift
J. Pull
K. Rear clamp assembly
L. Note – Support option before removing clamps

How to Connect the Option's Hydraulics

WARNING: Ensure that the tow vehicle is turned off before making connections, to prevent the option from accidentally turning on.

To connect the hydraulic hoses to the option control valve on the MH-400 fender:

1. Pull back (or push forward) on the outer sleeve of the female connector and insert the male connector.
2. Hold the male connector firmly in place and release the outer sleeve of the female connector.
3. Ensure that the connectors are pushed all the way in and are securely locked in place.
4. With the tow vehicle hydraulics operating, pull back on the option control lever, and ensure that the option is operating properly.

How to Install the Cross Conveyor

The cross conveyor spreads material to either side of the MH-400 (Figure 8).

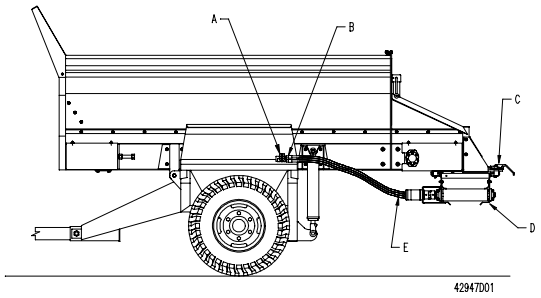


Figure 8: Cross conveyor, side view

A. Option control valve reference
B. Hose connections
C. Quick-attach brackets
D. Cross conveyor
E. Hydraulic hoses

Note – If you are also installing the swivel kit using the option caddy, it is easier to insert it into the quick-attach brackets on the cross conveyor first, then mount the combined unit on the MH-400.

1. Install the cross conveyor into the quick-attach brackets at the rear of the MH-400 (see How to Mount the Options on page 17).

2. Ensure that the cross conveyor is centered between the mounting brackets, and that the motor extends out the same side as the control handles on the MH-400.

3. Connect the hydraulic hoses to the option control valve on the rear MH-400 fender (see How to Connect the Option's Hydraulics on page 18). Ensure that the hydraulic hoses run horizontally.

4. With the tow vehicle hydraulics operating ensure that the cross conveyor is operating properly. (see Operating Instruction on page 22)

How to Install the Swivel Kit

The swivel kit allows the cross conveyor to swivel freely in a 270 degree arc, or to be locked into one of five fixed positions, 45 degrees apart (Figure 9).

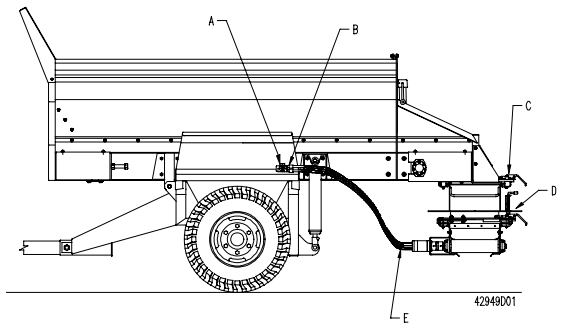


Figure 9: Swivel kit, side view

A. Option control valve
B. Hose connections
C. Quick-attach brackets
D. Swivel kit
E. Hydraulic hoses

1. If possible, install the swivel kit into the quick-attach brackets on the cross conveyor before installing the cross conveyor on the MH 400.

2. Position the swivel kit so that its two mounting brackets face toward the rear (away from the MH-400).

3. Install the swivel kit into the quick-attach brackets at the rear of the MH-400 (see How to Mount the Options on page 17).

4. If the cross conveyor has already been installed, remove the cross conveyor from the MH-400 and follow steps 1-3.

5. Connect the cross conveyor's hydraulic hoses (see How to Connect the Option's Hydraulics on page 18).

How to Install the MH Processor

The MH Processor is used to screen a wide variety of material.

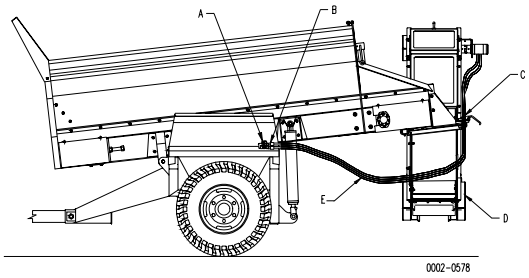


Figure 10: MH Processor, side view

A. Option control valve reference
B. Hose connections
C. Quick-attach brackets
D. MH Processor
E. Hydraulic hoses

1. Using the hydraulic controls, raise the MH-400 so the quick attach brackets are aligned with the top of the hopper of the processor.

> **CAUTION:** Use your option caddy to lift the stand (see How to Operate the Option Caddy on page 33) or use a crane or forklift to lift at the provided lifting point.

2. Install the processor into the quick-attach brackets at the rear of the MH-400 (see How to Mount the Options on page 17).

Note – Ensure that the option extends to the right of the MH-400 when being viewed from the rear.

3. Connect the hydraulic hoses to the option control valve on the rear MH-400 fender (see How to Connect the Option's Hydraulics on page 18). Ensure that the hydraulic hoses run horizontally.

4. With the tow vehicle hydraulics operating ensure that the option is operating properly. (see Operating Instruction on page 22)

How to Prepare the Electrical Connections on SH Model

There are three available electrical connections to be made with your MH-400 SH model:

- Electrical power from your tow-vehicle
- On/Off Pendant
- Electric Brakes (if equipped)

1. Install the Tow-Vehicle electrical connection kit to the tow-vehicle's battery, being careful to route the wires safely to avoid heat or abrasion damage. Connect the MH-400 SH electrical harness into the tow-vehicle's plug.

2. Install the pendant assembly plug into the appropriate plug in the front of the MH-400 SH.

3. Position the left (floor) control valve in the unload or load position. Start the tow vehicle and engage the hydraulics from the tow vehicle.

4. Test the on/off pendant switch by turning it on and off. You should audibly hear the solenoid open and close.

Note – Removing the power to the solenoid will force the MH-400 SH to use hydraulic power from the tow vehicle. When not using the MH-400 SH, always disconnect the power wire for the solenoid at the battery or at the quick connections at the hydraulic hoses. If the power is not disconnected, the solenoids on the MH-400 SH will drain the battery of the tow vehicle.

How to Prepare the Electrical Connections on EH Model

There are three available electrical connections to be made with your MH-400 EH:

- Electrical power from your tow-vehicle
- Control Pendant
- Electric Brakes (if equipped)

1. Install the Tow-Vehicle electrical connection kit to the tow-vehicle's battery, being careful to route the wires safely to avoid heat or abrasion damage. Connect the MH-400 EH electrical harness into the tow-vehicle's plug.
2. Install the control pendant assembly into the appropriate mount (swing arm or tow vehicle).

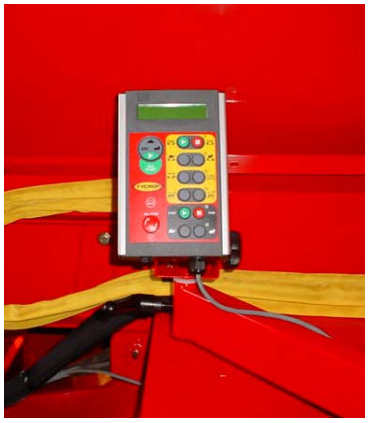


Figure 11: Control Pendant on Swing Arm



Figure 12: Control Pendant on Tow Vehicle Mount

3. Plug the control pendant cord into the MH-400 EH pendant connector located at the end of the swing arm or rear of the tow vehicle.

Note –When not using the MH-400 EH, always remove the control pendant assembly and store indoors.

Operating Instructions

Connecting the MH-400 to the Tow Vehicle

1. Connect the MH-400 hitch to the tow vehicle using a 25 mm (1 in) diameter safety approved hitch pin and safety clip (not supplied).

IMPORTANT: Use a high-strength hitch pin that is approved for tow vehicle hitches.

2. Adjust the hitch height by turning the jack stand handle to keep the MH-400 level.

3. Lower the hitch using the jack stand.

4. When the full weight of the MH-400 has been transferred to the tow vehicle's draw bar from the jack stand, pull the pin holding the jack stand in place.

5. Turn the jack stand 90 degrees counter-clockwise until the bottom of the jack stand points to the rear of the MH-400. This is the traveling position.

CAUTION: Raise the jacks into the traveling position before towing the MH-400.

6. Connect the two hydraulic hoses from the MH-400 to the tow vehicle. Facing the front of the MH-400, connect the right hose to the pressure side and the left hose to the return side (Figure 12). The return hose has an inline one-way check valve.

IMPORTANT: The hydraulic lines, the power cable, and the pendant cables must not drag on the ground during operation. Avoid locations where they could become pinched or cut.

Note – If you are using the optional hydraulic power pack, connect the hoses from the MH-400 to the power pack.

7. Connect the power harness to the tow-vehicle. Connect the pendant plug to the MH-400. On SH models place the on/off pendant within reach of the driver's seat. Ensure that the switch is off.

8. Check the hydraulic oil level in the tow vehicles tank and add more to fill it, if necessary. (See the tow vehicle's Owner's Manual).

9. Test the hydraulics before operating the MH-400 for the first time.

CAUTION: If you hear a noise from the tow vehicle hydraulics and the MH-400 controls do not operate, the hoses have been connected incorrectly and must be reversed.

Note - You may have to relieve the pressure in the hoses of the MH-400 connecting to the tow vehicle, to ensure a completed connection.

IMPORTANT: When making sharp turns, the hydraulic hoses may contact the tow vehicle wheels. Avoid making sharp turns, if necessary, use a bungee cord (a rubber strap with hooks on both ends) to pull back the hoses towards the center.

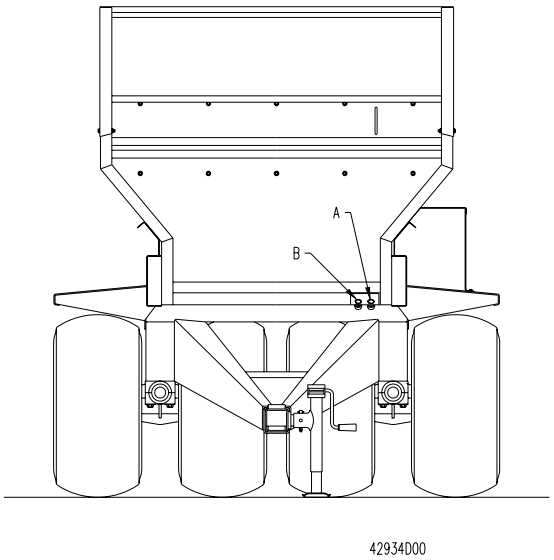


Figure 13: Connect hydraulic hoses to tow vehicle

A. Pressure in
B. Return out

How to Disconnect the MH-400 from the Tow Vehicle

1. Park the tow vehicle and the MH-400 on dry, level ground.
2. Set the parking brake on the tow vehicle, shut off the engine, and remove the key.
3. Place blocks under the front and back of the wheels.
4. Relieve the pressure from the hydraulic system.
5. Disconnect the hydraulic hoses and the electrical connection from the tow vehicle. Coil and store them on the front of the MH-400.
6. On EH models disconnect and remove the control pendant for dry storage.
7. Turn the front jack and rear jack leg 90 degrees (clockwise) to the down position to support the MH-400.
8. Lift the MH-400 with the jack until the weight is off the tow vehicle's draw bar. Pull out the hitch pin.
9. Ensure that there is no further connection between the MH-400 and the tow vehicle.

Operating the Hydraulic Control Valves on SH Models

There are three hydraulic control valves located on the left fender of the MH-400 (Figure 13).

Note – Return all control valve handles to their center position after use to avoid unintended starting.

Left Valve

The left valve controls the MH-400 conveyor belt direction.

- To unload the MH-400, pull back on the control lever. This moves material to the rear along the conveyor belt.
- To load the MH-400, push forward on the control lever. This moves material to the front along the conveyor belt.
- To stop the conveyor belt, move the control lever to the center position.

Center Valve

The center valve raises and lowers the MH-400.

- To raise the MH-400, pull back on the control lever until the desired height is reached, then release it.
- To lower the MH-400, push forward on the control until the desired height is reached, then release it.



CAUTION: Do not keep holding the control lever in the raised or lowered position once the lift cylinders have reached their maximum travel position.

Right Valve

The right valve controls the option.

- To turn on the option, pull back on the control lever.
- To turn off the option, return the control lever to the center position.

Note – Pushing the control lever forward does not have any function. Options cannot be reversed.



WARNING: Do not leave the option running while unattended.

IMPORTANT: Do not pull the option lever into the on position without an option mounted. This can damage the floor motor and stop the MH-400.

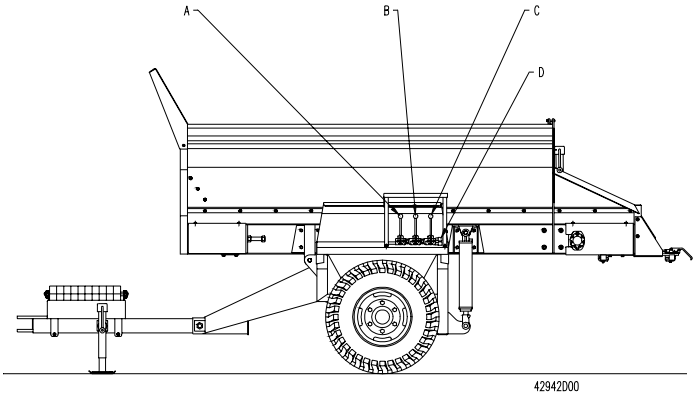


Figure 14: Hydraulic control valves

A. Conveyor belt direction (left control valve)
B. Raise and lower MH-400 (center control valve)
C. Options on and off (right control valve)
D. Option hydraulic quick connectors

Operating the Hydraulic Controls and Options on EH Models

WARNING: Before operating the MH-400, read and understand the entire Operator's Manual and all safety decals.

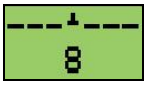


Figure 15: Control Pendant For EH Models

Control Pendant Legend



Floor Speed



Option Speed



Preset Setting



Not Used



Option start followed by belt start



Belt start

1



Belt stop



Reduce belt speed

2



Increase belt speed



Belt Reverse

3



Store/Recall presets



Lower Bin

4



Raise Bin



Option start

5



Option stop



Reduce option speed

6



Increase option speed



All Stop



WARNING: Do not leave the MH-400 unattended while it is running.

Turn on the control pendant by rotating the "**all stop**" button clockwise until it pops up.

Conveyor Belt

- To unload the MH-400, press the "**belt start"** button on the control pendant. This moves material to the rear along the conveyor belt.
- To stop the conveyor belt, press the "**belt stop"** button on the control pendant.
- To load the MH-400, press and hold the "**belt reverse"** button on the control pendant. (Belt must be stopped in order to reverse) This moves material to the front along the conveyor belt.

Bin Raise/Lower

- To raise the MH-400, press and hold the "**raise bin"** button on the control pendant until the desired height is reached, then release it.
- To lower the MH-400, press and hold the "**lower bin"** button on the control pendant until the desired height is reached, then release it.



CAUTION: Do not keep pressing the "**raise bin**"/"**lower bin**" buttons in the raised or lowered position once the lift cylinders have reached their maximum travel position.

Option Control

- To turn on the option, press the "**option start"** button on the control pendant.
- To turn off the option, press the "**option stop"** button on the control pendant.



WARNING: Do not leave the option running while unattended.

IMPORTANT: Do not press the "**option start"** button on the control pendant without an option connected. This can damage the hydraulics on the MH-400.

Storing/Recalling a Preset on EH Models

The control pendant has the ability to store 6 pre-set speeds for the belt and the option. The current speeds can be stored as a pre-set so that they can quickly be recalled.

To Store:

1. Press the "**Store/Recall presets**" button square brackets will appear in the centre of the bottom line of the display.
2. Press and hold button 1 through 6 for 3 seconds, the square bracket will begin flashing. The current belt and spinner speed will be stored to that preset.

To Recall:

1. Press the "**Store/Recall presets**" button square brackets will appear in the centre of the bottom line of the display.
2. Press button 1 through 6. The preset belt and spinner speed for that button will become the current belt and spinner speed.

Loading Material

Load the MH-400 from the top or from the rear.

For most materials, such as sand or gravel, you can use a front-end bucket loader. For materials such as landscaping ties or fertilizer bags, load from the rear by placing the material on the conveyor belt and setting the hydraulics in the load position.

You may need to remove the rear gate for easier access.

If sacks of material are being used, empty the sacks into the loader's bucket before loading the material into the hopper. To ensure stability, distribute the load evenly, front to back and side to side.

Unloading Material

WARNING: Do not stand behind the MH-400 while unloading.

Bulk Unloading

1. Back the MH-400 into the location where you want the material deposited.
2. Release the rear gate latches and turn on the conveyor belt.
3. If desired, raise the rear of the MH-400. This unloads material at a different angle, and allows quick unloading of the entire load.

Controlled Unloading

1. Close the rear gate latches.
2. Use the jack handle to open or close the adjustable section of the rear gate (Figure 15). This restricts the flow of materials when using an option.

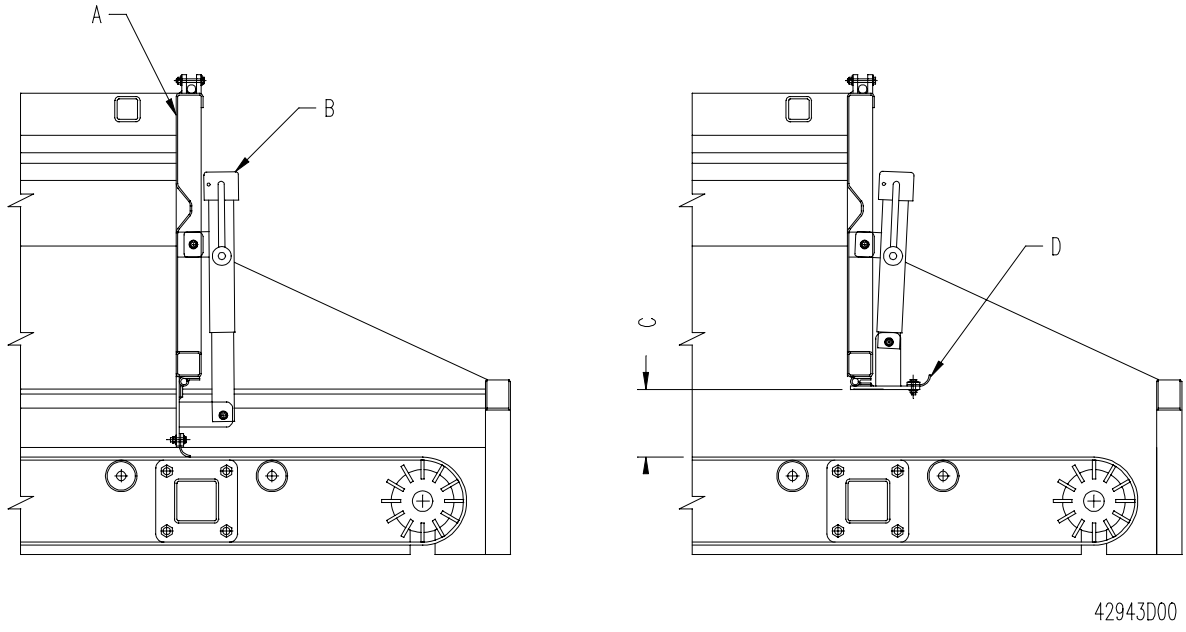


Figure 16: Open rear gate / close rear gate, side view

A. Rear gate
B. Feed gate jack
C. 12.5 cm (5 in) maximum opening
D. Feed gate

Unloading Into Smaller Machines

1. Raise the rear of the MH-400 high enough to accommodate the smaller machine underneath (Figure 16).

2. Follow the procedure for bulk unloading or controlled unloading.

CAUTION: Use the adjustable section of the rear gate only when unloading material smaller than 25 mm (1 in) in diameter, such as sand or gravel.

CAUTION: Open the rear gate completely if material will not flow through the adjustable section. Test each new material first.

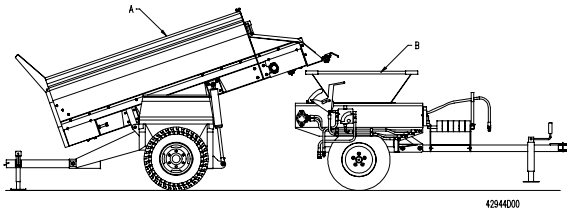


Figure 17: Raise the MH-400 to unload into a smaller machine

A. MH-400 in raised position
B. PROPASS (smaller machines)

Operating the Pendant Swing Arm on EH Models

The pendant swing arm holds the control pendant when mounted on the MH-400. The following procedure should be used for operating the swing arm.

1. Lift lock pin and rotate swing arm to desired position (Figure 17)



Figure 18: Positioning the Pendant Swing Arm

2. When finished operating, return swing arm to closed position and ensure lock pin is in locked position.

IMPORTANT: Always return the pendant swing arm to the locked position while traveling.

How to Operate the Twin Spinner

1. Turn off the tow vehicle.

2. On SH models, using the control levers, turn on the option and the conveyor belt (unload position).

3. For both the SH and EH models adjust the settings, spread pattern, and flow rate (see the recommended settings and spread patterns on the following tables and Figures 18 and 19).

Note – You may have to experiment until you get the desired flow and spread depth. Other variables include ground speed and the type of material. Different materials vary in particle size, which can vary the spread pattern.

Always test new materials by spreading them in an open area away from people.

4. Start the tow vehicle and turn on the tow vehicle hydraulics.

5. On the SH model turn on the on/off pendant switch to start spreading. On the EH model turn on the option then the conveyer belt with the control pendant

6. On the SH model turn off the on/off pendant switch to stop spreading. The Twin Spinner will continue to operate. On the EH model turn off the conveyer belt and then the option.

7. For EH models the "all start" function can be used in place of the option start, belt start functions as a single operation start feature. The option will start followed by the belt.

8. When the MH-400 is empty, turn off the hydraulics before transporting the MH-400.

Note – When driving over uneven terrain, raise the MH-400 to the maximum safe traveling range. This provides more ground clearance for the Twin Spinner See safety decals on page 12 for safe traveling range.



WARNING: Watch for people and other objects while spreading. The Twin Spinner can throw material at high speeds up to 12 m (40 ft).

IMPORTANT: While traveling but not spreading, raise the MH-400 to the maximum safe traveling distance, and turn off the Twin Spinner.

MH-400 Factory Recommended Settings Guide

MH400	Settings for Best Performance	Additional Performance
Twin Spinner settings	Base setting: factory recommended application setting as per desired spread pattern.	Test the spread pattern in a neutral area then make very small adjustments.
Pendant	Twin Spinner: Leave on during application. Conveyor belt: Turn off between passes.	At the start of each new load, it takes 1–3 seconds for material to reach the spreading option and begin discharging.
Tow vehicle rpm	Full throttle (maximum rpm) – 540 PTO speed	An engine at full rpm provides the maximum hydraulic flow and pressure. Always warm up the engine and the hydraulic system before use.
Ground speed	5-8 km/h (3-5 mph)	Travel at about the speed of a fast walk.

Note: Different materials vary in the size of their particles, causing variations in the spread pattern. Before top dressing the required area, test new materials by spreading them in an open area away from bystanders.

MH 400 SH Twin Spinner Suggested Application Guide

Application	Application Factor	Spinner Speed	Floor Control	Rear Gate	Base Setting	Disc Setting	Application Spread Width

Application	Application Factor	Spinner Speed	Floor Control	Rear Gate	Base Setting	Disc Setting	Application Spread Width
Ultra Light	1	10	Maximum	25mm (1”)	1	A	12.2m (40’)
Light	3	10	Maximum	76mm (3”)	1	B	12.2m (40’)
Medium	5	4	Maximum	76mm (3”)	2	B	6.7m (22’)
Medium Heavy	10	3	Maximum	76mm (3”)	3	B	3.4m (11’)
Heavy	17	3	Maximum	127mm (5”)	3	B	3.4m (11’)

Note: Tractor must be operated at an RPM that will achieve recommended hydraulic flow and pressure
Ground speed of 5-8 km/h (3-5 mph)

MH 400 EH Twin Spinner Suggested Application Guide

Application	lb/1000ft^2	kg/100m^2	Spinner Speed	Floor Speed	Rear Gate	Base Setting	Blade Setting	Spread Width	Rear Elevation	Ground Speed
Ultra Light	84	4	10	10	25 mm (1”)	1	A	10.7 m (35’)	89 mm (3.5”)	5.5 kph (3.4 mph)
Light	136	7	10	10	76 mm (3”)	1	B	9.1 m (30’)	89 mm (3.5”)	5.5 kph (3.4 mph)
Medium	159	8	5	10	76 mm (3”)	2	B	8.2 m (27’)	89 mm (3.5”)	5.5 kph (3.4 mph)
Medium Heavy	305	15	4	10	102 mm (4”)	2	B	7.0 m (23’)	89 mm (3.5”)	5.5 kph (3.4 mph)
Heavy	982	48	1	10	127 mm (5”)	3	B	3.4 m (11’)	89 mm (3.5”)	5.5 kph (3.4 mph)
Ultra Heavy	2126	104	1	10	127 mm (5”)	3	B	3.0 m (10’)	0	3.5 kph (2.2 mph)

Note: Work Vehicle must be operated at an RPM that will achieve recommended hydraulic flow and pressure
Ground speed determined using John Deere 5300 Tractor in gears B1 and B3
Information provided based on a sand density of 90 lbs/ft^3

Disc Settings

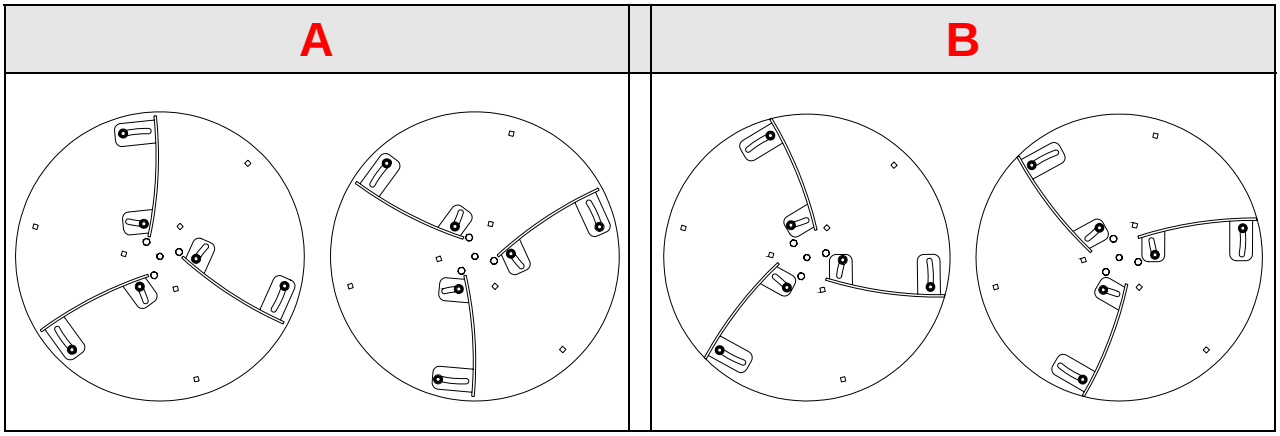


Figure 19: Twin Spinner Disc Settings

Base Settings

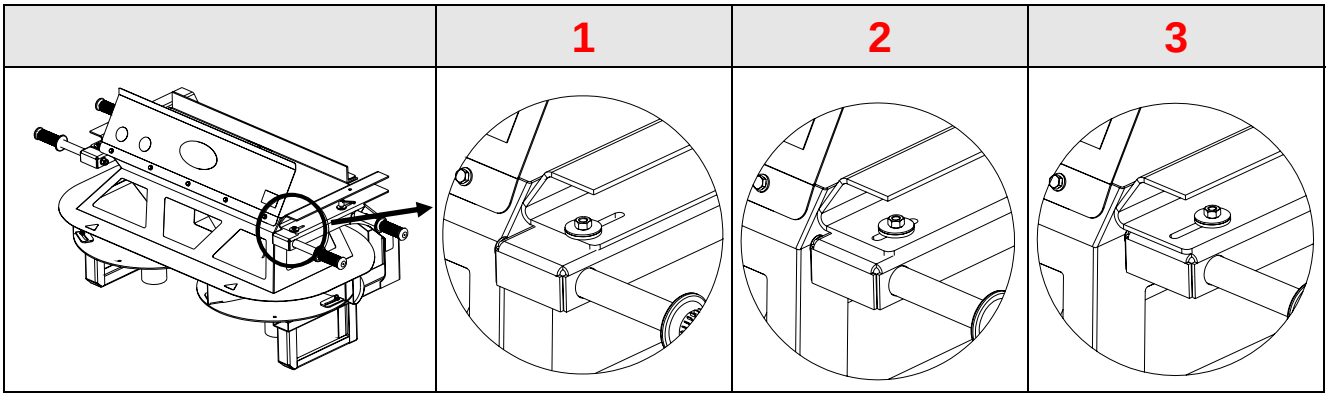


Figure 20: Twin Spinner Base Settings

How to Operate the Cross Conveyor

How to Extend and Retract the Cross Conveyor

Always operate the cross conveyor separately from the main conveyor belt.

> **CAUTION:** Always return the cross conveyor to the center position when traveling, otherwise the cross conveyor can hit people or objects, and can also be damaged (Figure 21).

1. Remove the safety pins from both option attachment clamps on the swivel kit.
2. Loosen the option attachment clamp brackets.
3. Slide the conveyor to the center or side.
4. Re-tighten the clamp brackets.
5. Re-install the safety pins.
6. On SH models adjust the speed of the cross conveyor with the hydraulic lever on the right. On EH models adjust the speed of the cross conveyer with the control pendant.

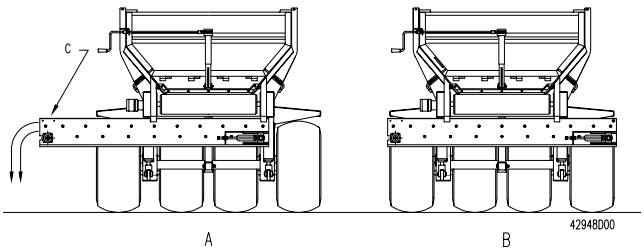


Figure 21: Cross conveyor positions without swivel kit

A. Extended position when conveying
B. Centered position when traveling
C. Material outlet (motor end)

Note – Always lower the hopper before adjusting the cross conveyor. Otherwise, the cross conveyor will rest at an angle.

How to Spread Material from the Cross Conveyor

1. Turn off the tow vehicle.
2. On SH models using the control levers, turn on the option and the conveyor belt (unload position).
3. Open the adjustable section of the rear gate to allow for the desired flow rate. You may have to experiment until you get the desired flow and spread depth. Other variables include ground speed and the type of material.
4. Turn on the tow vehicle hydraulics.
5. On EH models operate the option and the conveyer belt with the control pendant.
6. On SH models turn off the tow vehicle hydraulics to stop material movement, or turn off the on/off pendant switch.

Note – For SH models the on/off pendant switch stops the MH-400 conveyor belt, not the cross conveyor.

7. When finishing using the cross conveyor, always return it to the center position.

How to Operate the Swivel Kit

To direct the flow of material from the cross conveyor in any direction, pull up the spring-loaded locking pin on the swivel kit into the unlock or open position. This allows you to manually move the cross conveyor freely from side to side on the swivel bearing (Figure 22).

To keep the cross conveyor in a fixed position, release the spring-loaded locking pin into one of the five locking positions on the swivel kit.

Note – When traveling over uneven terrain, raise the MH-400 to the maximum safe traveling range. This provides more ground clearance for the cross conveyor. See safety decals on page 12 for safe traveling range.

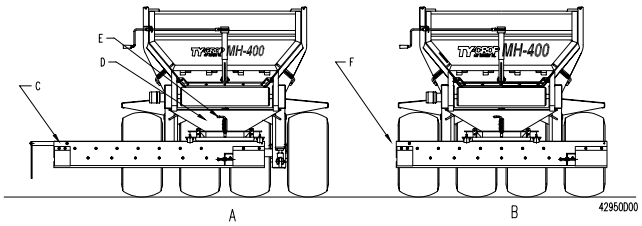


Figure 22: Cross conveyor positions with swivel kit

A. Extended position when conveying
B. Centered position when traveling
C. Cross conveyor
D. Swivel kit
E. Swivel lock pin
F. Remove or flip up the deflector

How to Operate the MH Processor

How to Adjust the Teeth or Remove Jammed Material

1. Ensure machine is turned off and the hydraulics are disconnected.

> **DANGER:** Never reach under the guards or make adjustments while the conveyor belt is running or the hydraulics are connected.

2. Pull tension clamp down to release tension on springs.

3. Remove guard(s) to access teeth.

4. Adjust teeth to the desired height. Make sure the ridges on the conveyor belt will not contact the teeth. You may have to experiment with teeth height to obtain desired results for the material you are processing.

5. Replace guards and pull the tension clamp up to engage the teeth.

How to Run Material through the MH Processor

1. Turn on the tow vehicle hydraulics.

2. Open the adjustable section of the rear gate on the MH-400 to allow for the desired flow rate.

3. On SH models using the control levers, turn on the option and the conveyor belt (unload position).

4. On EH models operate the option and the conveyer belt with the control pendant

5. To stop material moving, turn off the on/off pendant switch or belt control lever.

Note – For SH models the on/off pendant switch stops the MH-400 conveyor belt, not the processor conveyor belt.

6. When processing is complete, release unwanted material from bottom of conveyor by pushing down on the gate release handle.

> **CAUTION:** The hydraulic motor can become extremely hot. Contact your distributor if using a high duty cycle.

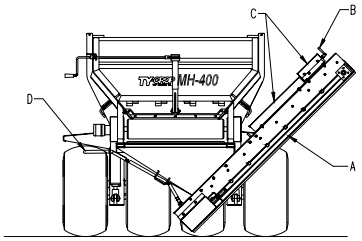


Figure 23: MH Processor, rear view

A: MH Processor
B: Tension clamp
C: Guards
D: Gate release handle

How to Operate the Option Caddy (1)

The option caddy is designed for one person to lift, transport, and mount the cross conveyor, swivel kit and processor onto the MH-400 (Figure 24). It can also be used to store the cross conveyor.



Figure 24: Option Caddy

WARNING: The option caddy's maximum carrying load is 680 kg (1500 lb). Do not exceed this limit.

1. Position the option caddy so that it is centered beneath the option. Use the decals when appropriate to ensure the option is centered.

CAUTION: Always ensure the height locking bar is in the up most position before raising or transporting the option caddy.

2. Locate and pump the lift foot pedal until the option caddy comes into contact with the bottom of the option.

CAUTION: Stay behind the option caddy when raising and lowering. Keep head, hands and feet away from lift members.

3. Secure the option with the two provided tie down straps by attaching the ends of the straps to the tie down brackets. Ensure the straps are positioned so they cross over at the center of the option. Tighten the straps by lifting the strap lever.

4. Pump the lift foot pedal until the option caddy is supporting the weight of the option.

WARNING: Always transport options on the option caddy in the lowest possible position and on level ground.

5. Transport the option to the rear of the MH-400 and raise it into position for mounting.

6. Install the option into the quick-attach brackets on the rear of the MH-400 (see How to Mount the Options on page 16).

7. Remove the tie-down straps, disengage the height locking bar and depress the release foot pedal.

CAUTION: Always store the option caddy in the lowest position and on level ground. Block the wheels to prevent movement.

WARNING: Do not disassemble the hydraulic jack, it contains pressurized fluid.

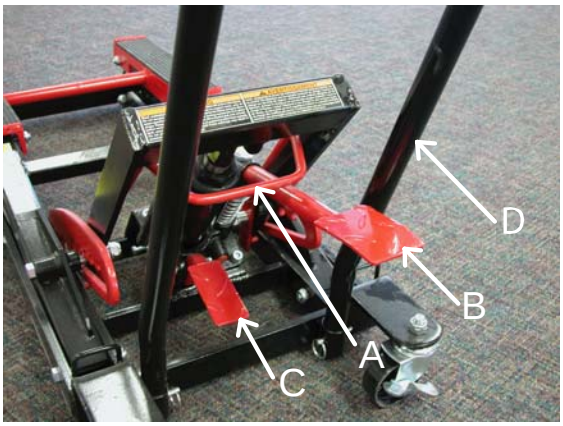


Figure 25: Option Caddy Control Components

A. Height locking bar
B. Lift foot pedal
C. Release foot pedal
D. Handle

How to Operate the Option Caddy (2)

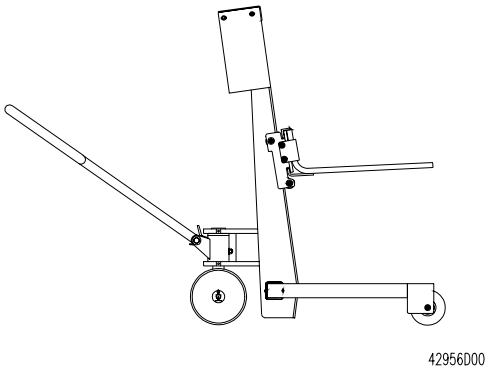


Figure 26: Option Caddy

The option caddy is designed for one person to lift, transport, and mount the Twin Spinner, swivel kit, or cross conveyor onto the MH-400 (Figure 26).

WARNING: The option caddy's maximum carrying load is 227 kg (500 lb). Do not carry people on it.

8. Position the caddy against the rear of the option.

9. To carry the cross conveyor on the caddy, place the cross conveyor storage stands about 2 m (6 ft) apart (Figure 23).



Figure 27: Cross conveyor on storage stands

10. Position the fork height and roll the caddy forward until the forks are completely through the option (Figure 28).



Figure 28: Cross conveyor on option caddy

11. Crank the handle clockwise to lift the option off the storage stands.

12. Transport the option to the rear of the MH-400 and raise it into position for mounting.

CAUTION: Do not leave loads unattended or in the raised position.

13. Install the option into the quick-attach brackets on the rear of the MH-400 (see How to Mount the Options on page 16).

14. Lower the forks down slightly and roll the caddy back until the forks are completely free from the option.

Note – Do not maneuver the caddy in muddy or soft terrain, otherwise it will be difficult to move.

When not in use, you can store the cross conveyor and swivel kit on the cross conveyor storage stands (Figure 29).



Figure 29: Cross conveyor storage stands

How to Operate the Hydraulic Power Pack

WARNING: Keep clear of all moving parts.

1. Engage the tow vehicle's PTO. Do not exceed the maximum speed of 540 rpm.
2. Test the MH-400 by operating a control valve, such as the lift cylinders.
3. If the MH-400 is operating properly, engage the hydraulics by switching on the tow vehicle PTO.

WARNING: Always disengage the PTO when the MH-400 is not in use.

WARNING: Do not adjust the relief valve, or your warranty may be voided. It is set to factory specifications.

Electric Brakes

The Dexter electric brakes and brake drums include a wiring harness with connectors, a foot controller, and a load control.

If you purchased the electric brakes, your authorized Toro distributor will install them. The electric brakes are designed to work in synchronization with your tow vehicle's brakes. Once the electric brakes are installed, do not use one set of brakes alone to stop the combined load.

Ensure that you read and follow all the supplied manuals and instructions.

IMPORTANT: Do not use the electric brakes on roads.

Maintenance Instructions

Rely on an authorized Toro distributor to help you use and maintain the MH-400 for best performance.

WARNING: Disconnect all power sources to the MH-400 before doing maintenance work.

WARNING: Install the hydraulic cylinder supports before doing any maintenance work under the hopper (Figure 30).



Figure 30: Hydraulic cylinder support in place

Safety Checks

At the start of each day, complete these safety checks before operating the MH-400. Report any safety problems to your supervisor. See the Safety Instructions on page 8 for more information.

Note – Photocopy these pages and use them as a regular safety checklist.

Tires and Wheels

The recommended tire pressure is 172 kPa (25 psi), or as recommended by the tire manufacturer.

Check for excessive wear or visible damage.

Check that the wheel bolts are tightened to 13.8 kg-m (100 ft-lb) and that none are missing.

Rear Gate

Check that the rear gate closes and latches securely.

Check that the adjustable section of the rear gate opens and closes without sticking.

Hitch, Jack, and Rear Jack Leg

Check that the hitch pin and jacks are not damaged, and the safety pins are in place. (Replace missing or damaged safety pins.)

Check that the hitch conections are not loose. (If so, install a spacer between the hitch connections.)

Safely stow all jacks in the up position before traveling.

Hydraulic System

Check the hydraulic system for oil leaks. If you find a leak, tighten the fitting, replace, or repair the damaged part.

Check the hydraulic hoses for wear or visible damage.

Check the hydraulic oil level. Fill if required.

Conveyor Belt and Rollers

Once a week, check that the conveyor belt is tracking straight on the rollers and does not slip. Make adjustments if required. See the procedure on page 39.

Every four months, check that the idler rollers between the front and rear rollers are not bent or seized. Replace or repair if required.

Belt and Rear Gate Seals

Check all rubber seals for wear or damage. Replace or repair the seals if any leakage occurs.

Options

Check that the quick-attach brackets are securely locked into place and that the safety clips are installed. Replace missing safety clips.

Check that the option is securely clamped and does not move or slide out. Adjust clamps if required.

Check the paddles on the Twin Spinner disks for wear. Replace them when they wear thin.

Check the Twin Spinner housing for signs of cracking or corrosion.

Safety Decals

Check that the safety decals are undamaged and legible, otherwise replace them.

Electric Brakes

Once a month, conduct a simple visual inspection of your brake shoes and linings.

Inspect and service your electric brakes once a year (see procedure below).

Maintaining the Electric Brakes

How to Adjust the Electric Brakes

Adjust the electric brakes after the first three months of operation, or sooner depending on use or performance.

1. Jack up the MH-400 securely.
2. Ensure that the wheel and drum rotate freely.
3. Remove the adjusting hole cover from the slot on the bottom of the brake backing plate.
4. With a screwdriver, rotate the star wheel of the adjuster assembly to expand the brake shoes.
5. Adjust the brake shoes out until the pressure of the linings against the drum makes the wheel difficult to turn.
6. Rotate the star wheel in the opposite direction until the wheel turns freely with a slight drag on the lining.
7. Replace the adjusting hole cover.
8. Repeat the above procedure on each brake.

Brake Shoes and Linings

Once a month, conduct a simple visual inspection of your brake shoes and linings.

When a brake shoe becomes worn, replace both shoes on each brake, and both brakes on the same axle. This ensures that the brakes remain balanced.

Replace the brake linings when they are:

- worn to 1.6 mm (1/16 in) or less remaining thickness
- contaminated with grease or oil
- abnormally scored or gouged

Hairline heat cracks are normal in the brake linings and should not cause concern.

Yearly Brake Cleaning and Inspection

Inspect and service your electric brakes once a year or more often with heavy use or declining performance.

- Change magnets and shoes when they become worn or scored.
- Clean the backing plate, magnet arm, magnet, and brake shoes with an automotive brake cleaner.
- Ensure that all parts removed are replaced in the same brake and drum assembly that they were removed from.
- Inspect the magnet arm for any loose or worn parts.
- Check the shoe return springs, the hold-down springs, and the adjuster springs for stretch or deformation and replace them if required.

CAUTION: Take precautions when servicing brakes:
- Do not create or breathe dust.
- Do not machine, file, or grind the brake linings.
- Do not use compressed air or dry brushing for cleaning.

Lubrication

Before re-assembling the electric brakes, apply a light film of anti-seize compound, or grease such as "lubriplate," on the:

- brake anchor pin
- actuating arm bushing and pin
- areas on the backing plate that are in contact with the brake shoes and magnet lever arm
- actuating block on the actuating arm

IMPORTANT: Do not allow grease to contact the brake linings, drums, or magnets.

Magnets

The brakes' electromagnets are designed to provide the proper input force and friction.

Inspect the magnets regularly, and replace if they become unevenly worn. Use a tool with a straight edge to check wear.

Even if the wear is normal, you should replace the magnets if any part of the magnet coil is visible through the friction material on the magnet face. Replace the magnets in pairs (both sides of an axle).

When replacing the magnets, also resurface the drum armature surface.

How to Measure Brake Voltage

1. Keep the engine of the tow vehicle running so that a low battery will not affect the voltage readings.

2. Measure the voltage at the magnets by connecting a voltmeter to the two magnet lead wires at any brake.

3. Insert a pin probe through the insulation of the magnet lead wires dropping down from the chassis.

The voltage should be modulated, beginning at 0 V and gradually increasing to about 12 V as the controller bar is slowly actuated. Modulation is absent when the controller provides an immediate high voltage to the brakes, which fully energizes them.

The voltage that is applied to the brakes when the controller first turns on is called the threshold voltage. The lower the threshold voltage, the smoother the brakes will operate. A threshold voltage over 2 V can cause harsh, jerky brakes.

How to Measure Brake Amperage

The brake system amperage is the total current that is drawn by all brakes on the MH-400. To measure the total amperage:

1. Keep the engine of the tow vehicle running.

2. Disconnect the blue wire running between the load control and the brakes and place an ammeter in series into the line.

Note – To prevent damage to the ammeter, ensure that the ammeter has sufficient capacity. Note the polarity.

3. Measure amperage at the blue wire of the controller, which is the output to the brakes.

The total amperage draw should be 12 A (3 A per magnet).

To measure the individual amperage at one magnet:

1. Insert the ammeter in the line at the magnet you want to check.

2. Disconnect one of the magnet lead wire connectors.

3. Attach the ammeter between the two wires.

Reconnect and seal all wires after testing.

How to Track the Conveyor Belt

If the conveyor belt is not centered and tracks to one side, it needs to be adjusted (Figure 27). The best time to do this is between loads during operation.

1. Go to the rear of the MH-400 and determine which side the belt is touching.

2. Go to the front on the same side, loosen the locking nut, and tighten the adjuster nut by one quarter turn.

3. Tighten both locking nuts before running the MH-400.

4. Load the MH-400 with material and run the load through until empty. Repeat multiple times.

5. Stop the belt and go to the rear of the machine to observe the results.

You may need to repeat the above steps several times until the belt begins to move and track properly.

Note – The belt may move slightly depending on the type of load and its position. If the belt is not touching the side rails, you do not need to track the belt.

IMPORTANT: Do not adjust the belt's rear drive roller. It is set to factory specifications. Contact your authorized Toro distributor if adjustment is required.

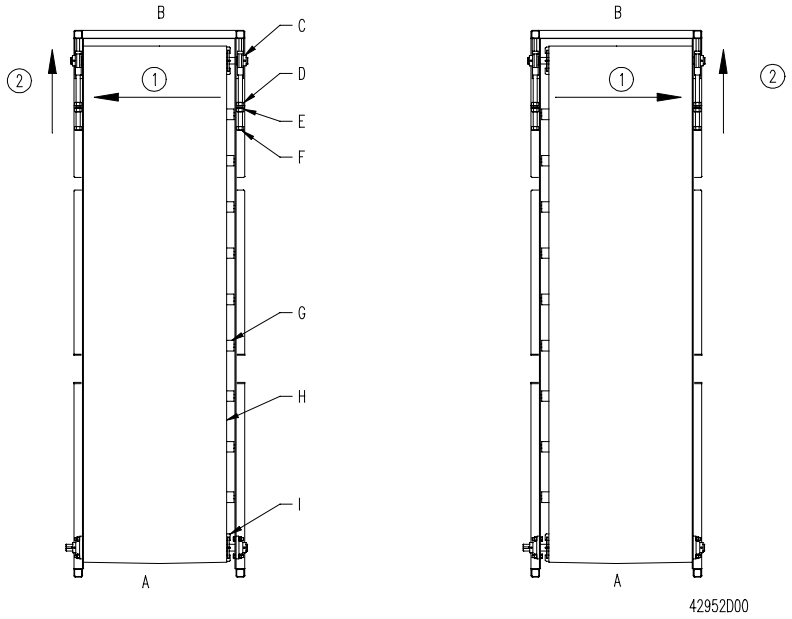


Figure 31: Track the conveyor belt (top view)

1. If belt is tracking toward this side…
2. Then adjust this tensioner to the front on the same side.

A. Rear
B. Front
C. Take-up bearing
D. Adjuster nut
E. Locking nut
F. Tensioner rod
G. Belt roller
H. Conveyor belt
I. Drive roller

How to Tension the Conveyor Belt

1. Park the MH-400 on level ground with the rear gate and feed gate at least 6.25 mm (¼ in) off the floor (depending on the material).
2. Fully load the machine with sand that you expect the MH-400 to use.
3. Remove the yellow front covers on either side of the MH-400.
4. Using two wrenches, hold the end of the tensioner rod stationary, while loosening the locking nut closest to the end of the rod.
5. Move the locking nut back 2–5 cm (1–2 in).

WARNING: Use extreme caution around moving parts with safety guards removed.

6. Turn on the conveyor belt.
7. If belt slips, tighten the tension bolts evenly (with machine off) half a turn and recheck. Continue until the belt moves without any slippage.
8. Give both tensioning bolts another half turn. At this point you should have proper tension.
9. To verify, look underneath at the chassis cross member. The middle of the belt should just clear the chassis cross member when the MH-400 is in the down position. If the middle of the belt is touching the cross member, tighten both tensioning bolts another quarter of a turn.

IMPORTANT: Be patient! Do not over-tension the belt.

IMPORTANT: Do not use air tools on the belt tensioning bolts.

Check and adjust the belt tension frequently. All rubber conveyor belts will stretch, especially when they are new or have not been used for awhile.

How to Adjust the Conveyor Drive Chain

If the conveyor drive chain is loose, it needs to be tightened (Figure 32).

1. Turn off the tow vehicle and set the parking brake.
2. Remove the rear conveyor drive guard.
3. Loosen the bolt that goes through the tensioner sprocket.
4. Tighten the positive locking screw using moderate force.
5. Tighten the tensioner sprocket bolt.
6. Check that the chain is sufficiently lubricated and the sprockets are secure to the shafts.
7. Replace the rear conveyor drive guard.

CAUTION: Do not over-tension the chain. Leave just enough tension to take up the extra slack.

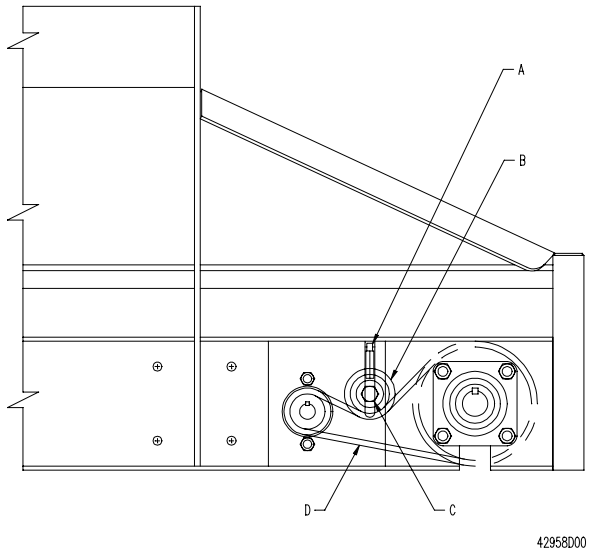


Figure 32: Tension the conveyor drive chain (side view)

A. Positive locking screw
B. Tensioner sprocket—push down to tighten, do not over-tension
C. Sprocket bolt
D. Slack side, about 6.25 mm (¼ in) movement

Grease and Lubrication Schedule

Figure 33 shows the grease point locations.

- Use an automotive all-purpose grease.
- A spray or brush-on lubricant may be used on the conveyer drive chain instead of grease.
- Lubricate regularly, after 25 hours of normal operation.
- Lubricate daily when operating in extremely dusty and dirty conditions.
- Clean grease fitting of foreign matter.
- Pump grease into all bearings and bushings.
- Clean off excess grease.
- Clean and repack wheel bearings every year or 300 hours.

IMPORTANT: Do not over-grease, or the bearing seals may be damaged. Two or three squirts per grease point are usually enough, except when repacking the wheel bearings.

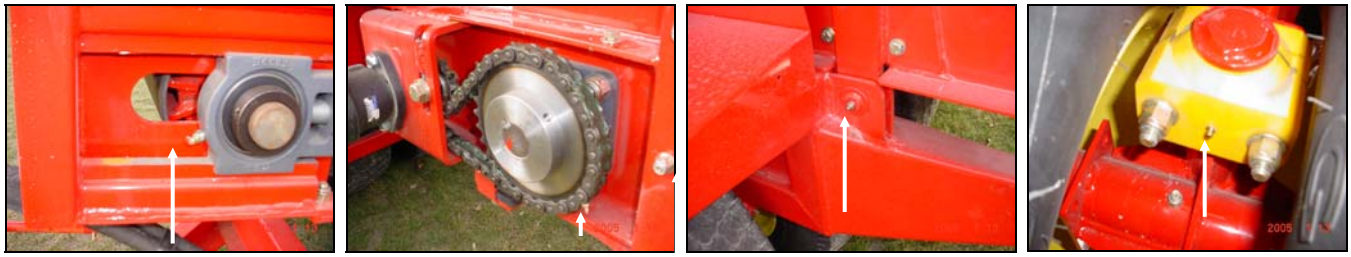


Figure 33: Grease points

Grease Lubrication Schedule	
Wheel bearings	Clean and repack every year or 300 hours
Suspension bearings	Once per year
Front take-up bearings	Every 2 months or 25 hours
Rear drive bearings	Every 2 months or 25 hours
Box hinge pins	Every 2 months or 25 hours
Floor drive chain	Every 2 months or 25 hours

IMPORTANT: Do not over-grease, or the bearing seals may be damaged. Two or three squirts per grease point is usually enough, except when repacking the wheel bearings.

WARNING: Replace all guards after servicing.

Hydraulic Fluid System

The machines reservoir is filled with approximately 19 U.S. gallons (71.9l) of high quality hydraulic fluid. Check the level of the hydraulic fluid before the engine is first started and daily thereafter. The recommended replacement fluid is: Toro Premium All Season Hydraulic Fluid (Available in 5 gallon pails or 55 gallon drums. See Parts Catalog or Toro distributor for part numbers.)

Alternate fluids: If the Toro fluid is not available, other fluids may be used provided they meet all the following material properties and industry specifications. We do not recommend the use of synthetic fluid. Consult with your lubricant distributor to identify a satisfactory product.

Note: Toro will not assume responsibility for damage caused by improper substitutions, so use only products from reputable manufacturers who will stand behind their recommendation. High Viscosity Index/Low Pour Point Anti-wear Hydraulic Fluid, ISO VG46.

Material Properties:
Viscosity, ASTM D445:
cSt @ 40° C 52 to 62
cSt @ 100° C 79.1 to 9.8
Viscosity Index: ASTM D2270: 140 to 152
PourPoint, ASTM D97: -35° F to -46° F

Industry Specifications: API GL-4, Powerfluid 821 XL, Ford New Holland FNHA-2-C-201.00, Kubota UDT, John Deere J20C, Vickers 35VQ25 and Volvo WB-101/BM

NOTE: Many hydraulic fluids are almost colorless, making it difficult to spot leaks. A red dye additive for the hydraulic system oil is available in 2/3 oz (20 ml) bottles. One bottle is sufficient for 4-6 gal (15-21l) of hydraulic oil. Order part no. 44-2500 from your authorized Toro Distributor.

IMPORTANT: Toro recommends that the fluid used in the hydraulic components be maintained at ISO Cleanliness Code 18/13 per SAE J1165. This code allows a maximum of 2,500 p/ml greater than 5 µm and a maximum of 80 p/ml greater than 15 µm.

In case of a hydraulic oil spill, use an appropriate spill treatment product and procedure.

Hydraulic Schematic For SH Model

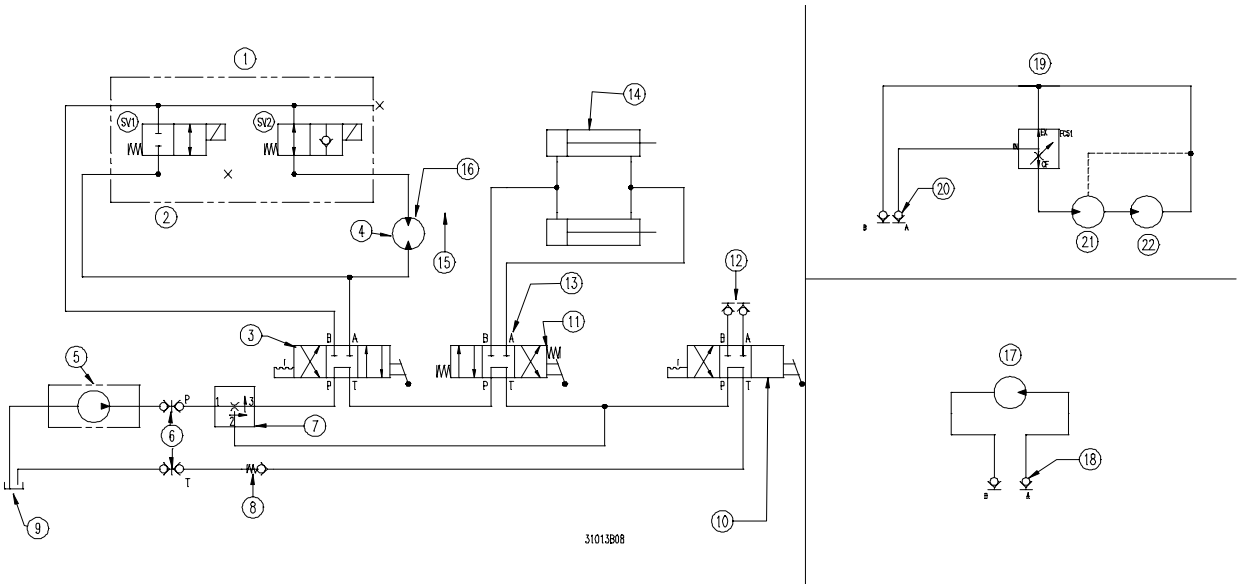


Figure 34: Hydraulic schematic For SH Model

1. Electrically activated (12 V) hydraulic valve assembly
2. Note – SV1 and SV2 are energized simultaneously (turning conveyor belt off)
3. Forward/reverse floor motor valve
4. Floor motor
5. Tow vehicle pump
6. Quick disconnect couplers
7. Flow regulator valve
8. Check valve
9. Tow vehicle reservoir
10. Option valve
11. Cylinder valve, spring-centered
12. Option hydraulics
13. Pressure from port A lowers the cylinder
14. Lift cylinders
15. Unload
16. Pressure from port A unloads floor motor
17. Cross conveyor
18. Pressure from port A activates cross conveyor
19. Twin Spinner
20. Pressure from port A activates Twin Spinner
21. Counter-clockwise rotation
22. Clockwise rotation

Hydraulic Schematic For EH Model

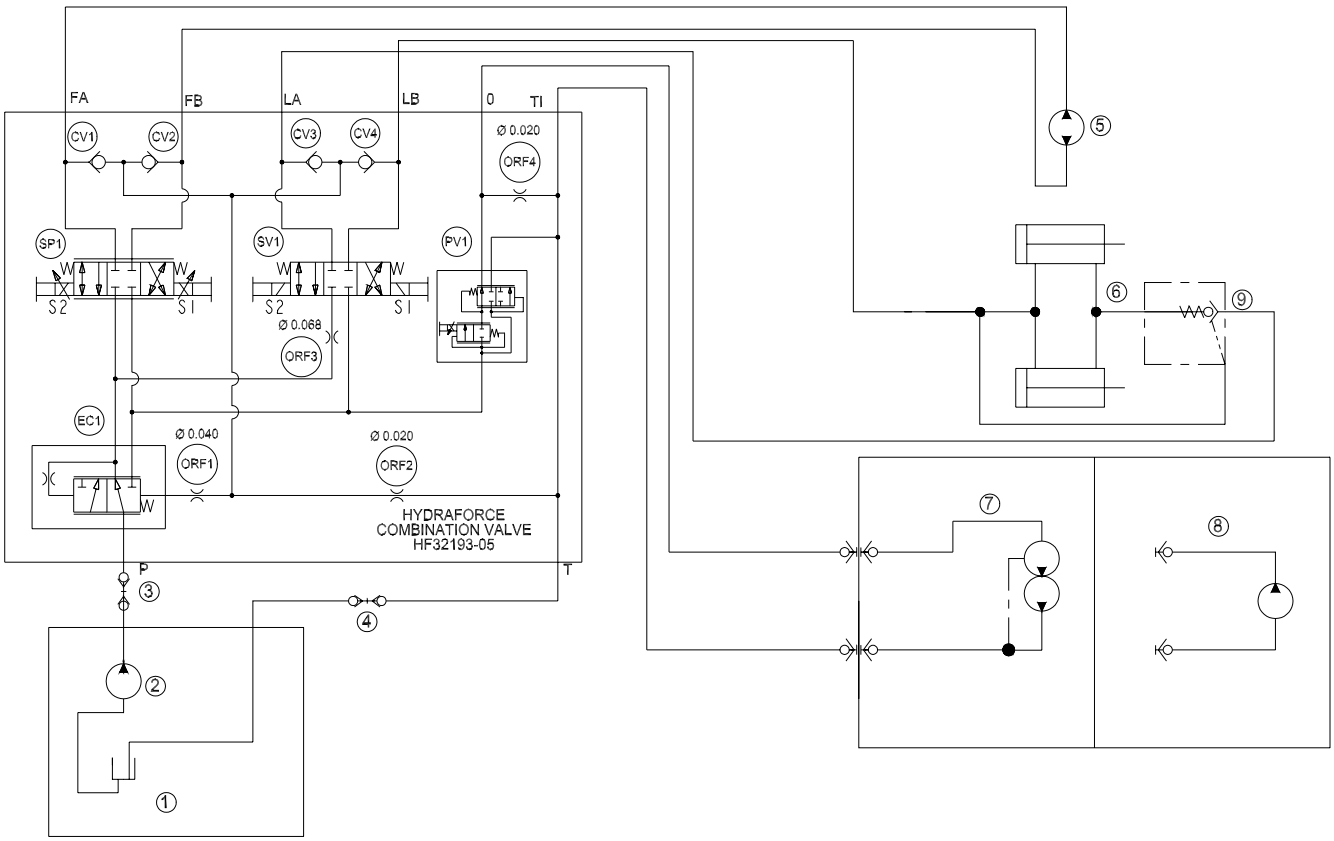


Figure 35: Hydraulic schematic For EH Model

1. Tow vehicle reservoir
2. Tow vehicle pump
3. Quick coupler (pressure)
4. Quick coupler (return)
5. Conveyor belt motor
6. Lift Cylinders
7. Twin Spinner
8. Cross Conveyor
9. Pilot Operated Check Valve

Electrical Schematic For SH Model

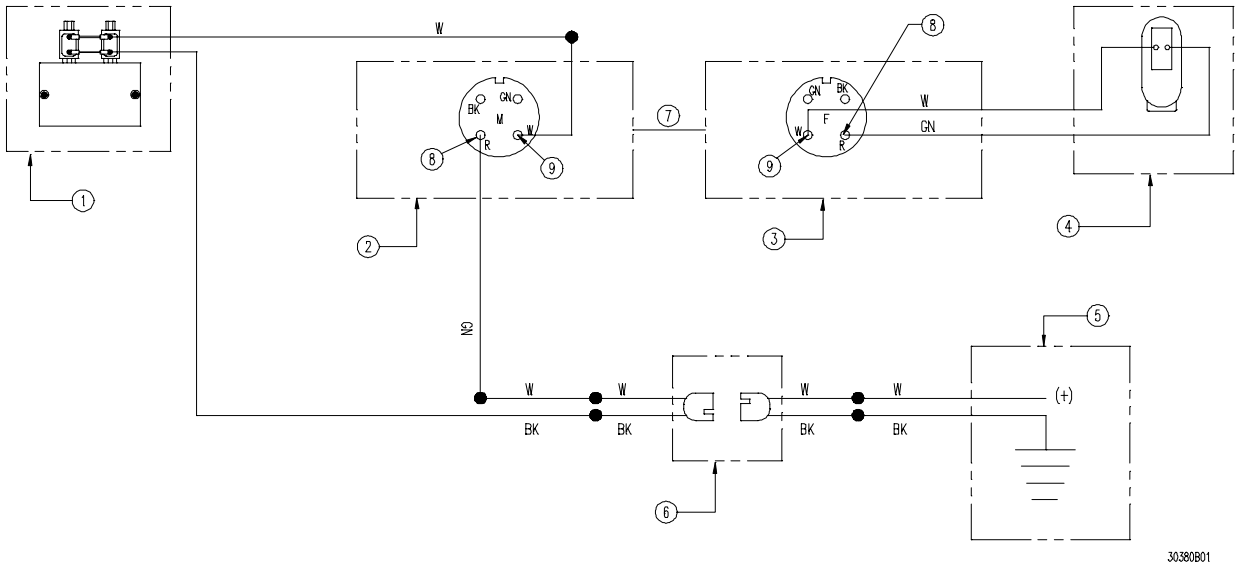


Figure 36: Electrical schematic For SH Model

1. Solenoid assembly
2. Wire side of male on/off pendant plug on MH-400
3. Wire side of female on/off pendant plug on pendant switch
4. Rear of on/off pendant switch
5. Tow vehicle battery
6. Tow vehicle plug
7. Plugged together
8. Silver prong (green wire)
9. White wire

Electrical Schematic For EH Model

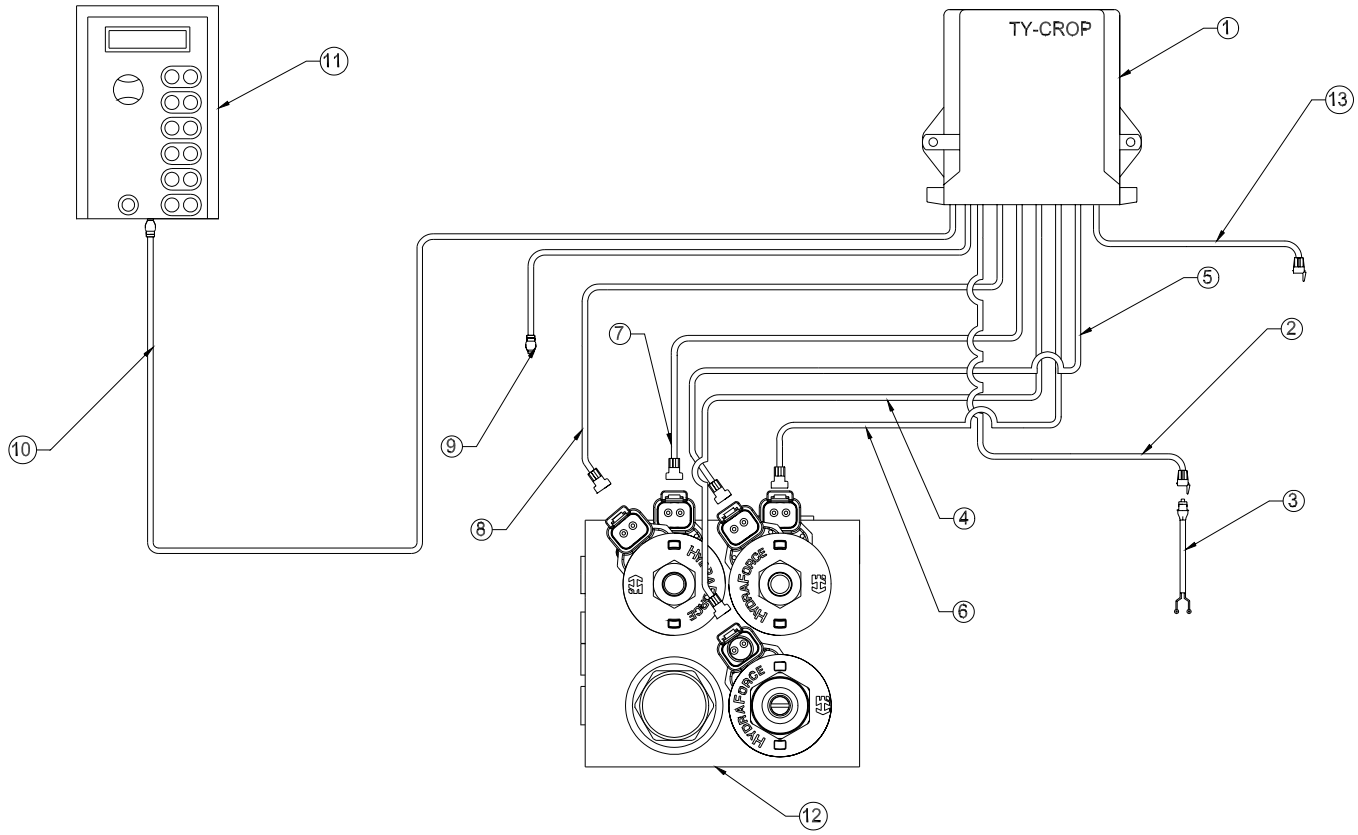


Figure 37: Electrical schematic For EH Model

1. Wiring Loom
2. Power Lead
3. Connection to Power Supply
4. Option Forward Lead
5. Bin Lower Lead
6. Bin Raise Lead
7. Floor Reverse Lead
8. Floor Forward Lead
9. Control Pendant Lead To Swing Arm Lead
10. Control Pendant Lead To Tow Vehicle Lead
11. Control Pendant
12. Hydraulic Block
13. Not Used – Remote Switch

How to Wash the MH-400

Salts, road tar, tree sap, fertilizers, and chemicals may damage the painted finish of the MH-400. Wash off these deposits as soon as possible with detergent and water. Additional cleaners or solvents may be needed, but ensure that they are safe for painted surfaces.

1. Remove options before cleaning and wash it separately.
2. Remove the control pendant on the EH models.
3. Wash the body of the MH-400 with warm water and a mild detergent.
4. Completely rinse off the detergent with clean water before it dries.
5. Wash the underside and inside of the belt, and MH-400 chassis.



WARNING: Do not use flammable fluids or cleaners with toxic vapours. Follow the manufacturer's recommendations.

IMPORTANT: Do not use a high-pressure washer. This may remove paint, safety decals, grease, and may also damage components.

Long-term Storage of the MH-400

Before storing the MH-400 for the season:

1. Thoroughly clean the MH-400. Remove parts if required.
2. Remove the control pendant on the EH models.
3. Check all fasteners and tighten if required.
4. Grease all fittings and pivot points. Wipe off any excess lubricant.
5. Lightly sand any painted areas that are scratched, chipped, or rusted, and apply touch-up paint.
6. Store the MH-400 indoors if possible.

How to Transport the MH-400

Ensure that the MH-400 is securely tied down before transporting on a trailer:

1. Attach certified load restraint straps around the hitch tube at the front, and the tie-down points. See Safety Decals on page 15.

Troubleshooting

General Troubleshooting

If the problem still occurs after all the checks listed below have been completed, contact an authorized Toro distributor for service.

Symptom	Cause
Conveyor belt will not turn	The belt control valve is in the center position.
	The belt is incorrectly tensioned.
	The material is too densely packed or clumped together (open rear gate latches to bulk unload).
	The on/off pendant switch is in the ‘floor off’ position for SH models.
	The conveyor belt option on the control pendant is off for EH models.
	The remote switch is off for the EH models.
	The pressure and return hose quick couplers are not connected properly.
	The tow vehicle (or power pack) has insufficient hydraulic oil.
	There is no power at the solenoid. If 12 volts present belt will not move. If 0 volts present belt should move.
	The tow vehicle has insufficient hydraulic pressure and flow.
Conveyor belt is jerking	The tow vehicle (or power pack) has insufficient hydraulic oil.
	The rpm is not at full throttle on the tow vehicle.
	The belt is not tensioned properly and the rear drive roller is slipping.
	The belt control valve is not fully open.
	The tow vehicle has insufficient hydraulic pressure and flow.
Option will not operate	The option flow control valve is in the ‘off’ position.
	The option hose quick couplers are not connected properly.
	The pressure and return hose quick couplers are not connected properly.
	The tow vehicle (or power pack) has insufficient hydraulic oil.
Conveyor belt will not stop when using on/off pendant switch	The battery connections are incorrect and/or insecure.
	The battery harness connector at rear of tractor is not connected properly.
	The on/off pendant switch is not plugged into the MH-400.
	There is no power at the solenoid.
Hydraulics are noisy	The machine has not reached operating temperature (run for approximately 5 minutes).

Brake Troubleshooting

Most brake malfunctions that cannot be corrected by synchronization or by normal brake adjustments can usually be traced to electrical system failure.

Mechanical causes should be obvious, such as bent or broken parts, worn linings or magnets, seized lever arms or shoes, scored drums, or loose parts.

Electrical Troubleshooting

Start all electrical troubleshooting procedures at the controller. Brake jerkiness or malfunction can usually be traced to the controller. Refer to the Maintenance Instructions section of this manual for proper adjustment and testing procedures. Refer to the Setup Manual for wiring diagrams.

If the voltage and amperage is still not satisfactory after adjusting the controller, troubleshoot the connector and then the individual magnets to isolate the problem source.

A voltmeter and ammeter are essential tools for troubleshooting the electric brakes.

Low Voltage or Amperage

The most common electrical problem for the brakes is low or no voltage or amperage. This is usually caused by:

- poor electrical connections
- open circuits
- insufficient wire size
- broken wires
- improperly functioning controllers or resistors

Short Circuits

Another common electrical problem is short circuits or partial short circuits, which are indicated by an abnormally high system amperage. Possible causes include:

- shorted magnet coils
- defective controllers
- bare wires contacting a grounded object

Short circuits must be isolated and can be difficult to find. If the high amperage reading drops to zero by unplugging the MH-400, then the short is in the MH-400 wiring. If the amperage reading remains high with all the brakes magnets disconnected, the short is in the MH-400 wiring.

Brake Troubleshooting Table

Symptom	Cause
No brakes	Open circuits
	Severe under adjustment
	Faulty controller
	Short in the circuit
Weak brakes	Grease or oil on magnets or linings
	Corroded connections
	Worn linings or magnets
	Scored or grooved brake drums
	Improper synchronization
	Under adjustment

Symptom	Cause
Locking brakes	Improper brake adjustment
	Improper synchronization
	Faulty controller
	Loose, bent, or broken brake components
	Out-of-round brake drums (distorted shape)
Intermittent brakes	Faulty controller
	Broken wires
	Loose connections
	Faulty ground
Harsh brakes	Under adjustment
	Improper synchronization
	Faulty controller
Noisy brakes	Under adjustment
	Lack of lubrication
	Broken brake components
	Incorrect brake components
Surging brakes	Oil or grease on magnet or brake linings
	Out-of-round or cracked brake drums
	Faulty controller
Dragging brakes	Over adjustment
	Out-of-round brake drums
	Incorrect brake components
	Loose, bent, or broken brake components
	Loose wheel bearing adjustment

MH-400 Maintenance Record

Service Performed	Date	Notes



Count on it.