



GENUINE MEGA

OPERATORS MANUAL



MEGA WORLDWIDE
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Definitions and Abbreviations

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MANUAL USAGE

This technical manual only contains information required to safely operate the MAC/MTT. See the appropriate Maintenance and Operators Safety Manual for specific vehicle system information and maintenance procedures. If your system is not covered in this manual please contact MEGA Corp. Product Support Group at:

US toll free: 1-800-345-8889

Direct: 1-505-345-2661

Or visit our website at www.megacorpinc.com for more detailed contact information.

The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the MAC/MTT must become familiarized with all the safety messages.

WARNING

Due to the nature of these processes, ensure that all safety information, warnings and instructions are read and understood before any operation or any maintenance procedures are performed. Some procedures take place with heavy components and at moderate heights, ensure proper safety procedures are maintained when performing these actions. Failure to use and maintain proper safety equipment and procedures will cause injury, death or damage to equipment.

WARNING, CAUTION AND NOTES

The following definitions are found throughout the manual and apply as follows:

WARNING

Operating procedures and techniques, which could result in personal injury and/or loss of life if not carefully followed.

CAUTION

Operating procedures and techniques, which could result in damage to equipment if not carefully followed.

NOTE

Operating procedures and techniques that are considered essential to emphasize.

USE OF SHALL, WILL, SHOULD AND MAY

Shall and **Will** – Used when application of a procedure is mandatory.

Should – Used when application of a procedure is recommended.

May - Used to indicate an acceptable or suggested means of accomplishment.

SECTION 1

Definitions and Abbreviations

SAFETY MESSAGES

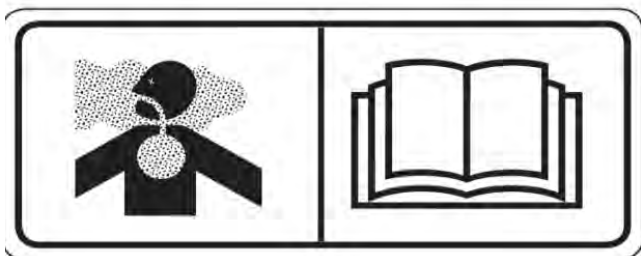
There are several specific safety messages on this machine. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

Make sure that all of the safety messages are legible. Clean the safety messages or replace the safety messages if you cannot read the words. Replace the illustrations if the illustrations are not legible. When you clean the safety messages, use a cloth, water and soap. Do not use solvent, gasoline or other harsh chemicals to clean the safety messages. Solvents, gasoline or harsh chemicals could loosen the adhesive that secures the safety messages. Loose adhesive will allow the safety messages to detach.

Replace any safety message that is damaged or missing. If a safety message is attached to a part that is replaced, install a new safety message on the replacement part.

Toxic Gas Hazard (1)

This safety label is located on the side of the tank and at all water fill entrances.

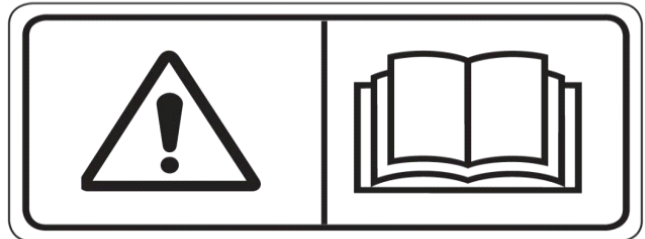


⚠ WARNING

Cutting or welding operation on the inside of the tank can cause the accumulation of toxic gases. Read and understand instructions and warnings in the Maintenance Manual. Failure to provide proper ventilation or breathing apparatus while conducting these operations may result in serious injury or death.

Do Not Operate (2)

This safety label is located on the outside of the front and rear control boxes (if equipped).

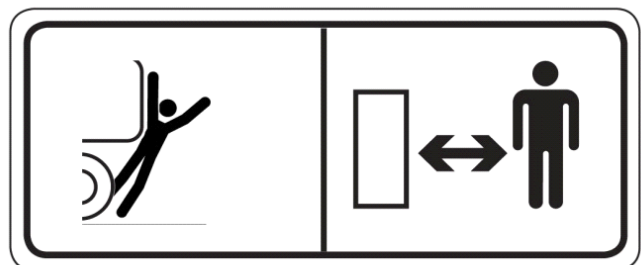


⚠ WARNING

Do not open this control box unless you read and understand the instructions and warnings in the Operator and Maintenance Manual. Failure to follow instructions or heed the warnings could result in serious injury or death.

Backing Runover Hazard (3)

This safety label is located on the rear of the tank and inside the cab.



⚠ WARNING

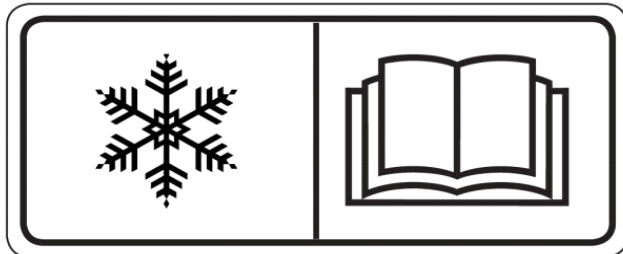
The vehicle is equipped with a back-up alarm. Alarm must sound when operating this vehicle in reverse. Failure to maintain a clear view in the direction of travel could result in serious injury or death.

SECTION 1

Definitions and Abbreviations

Freezing (4)

This safety label is located on the side of the tank, at the sump drain, and on the pump.

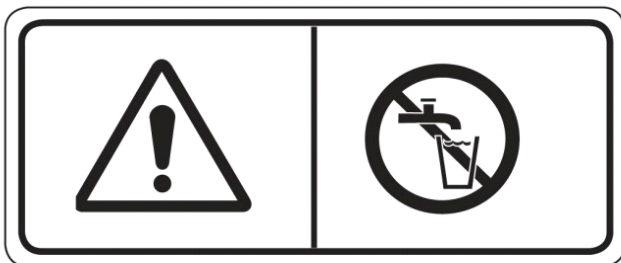


⚠ WARNING

Drain tank, fill pipe and valve in freezing weather. Refer to the Operator and Maintenance Manual for the procedure to follow.

Non-Potable (5)

This safety label is located on the side of the tank and sump drain.



⚠ WARNING

Water held within tank is not potable. Do not use tank for transport of water intended for human or animal consumption or serious injury or death may result.

Do Not Hoist While in Motion (6)

This safety label is located inside the cab.



⚠ WARNING

Do not engage hoist cylinders while vehicle is in motion. Before engaging hoist STOP the vehicle. Do not engage hoisting cylinders unless you read and understand the instructions and warnings in the Operator or Maintenance Manual. Failure to follow instructions or heed the warnings will result in injury or death.

Fall Hazard (7)

This safety label is located at the top of the front and rear of the tank.



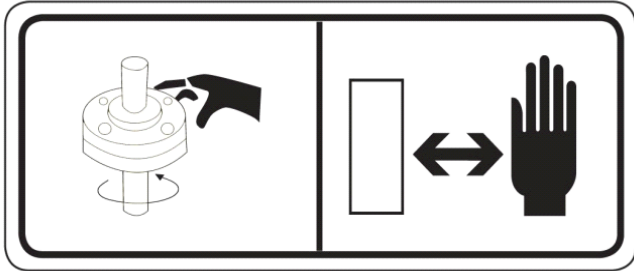
⚠ WARNING

Do not walk on the top of tank without fall arrest PPE. Serious injury or death could occur from a fall.

SECTION 1 Definitions and Abbreviations

Rotating Shaft (8)

This safety label is located on the pump.

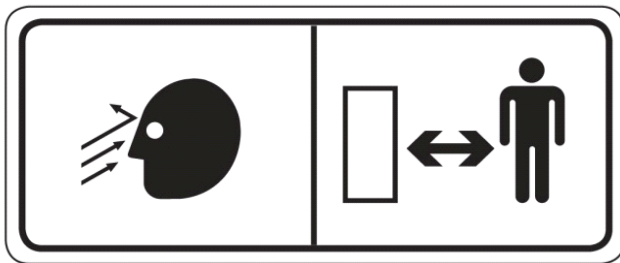


⚠ WARNING

Do not place your hand or tools within pump bell while pump is rotating and/or pressure held within the motor supply hose. Refer to the Operator and Maintenance Manual for the procedures to operate and maintain the pump. Failure to follow proper procedures could result in serious injury.

High Pressure Spray heads (9)

This safety label is located on the spray bar.

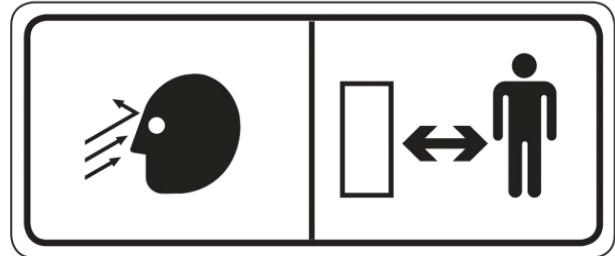


⚠ WARNING

Do not operate spray heads until all personnel are a safe distance away from the vehicle.

High Pressure Water Cannon (10)

This safety label is located on top of the cab control box.

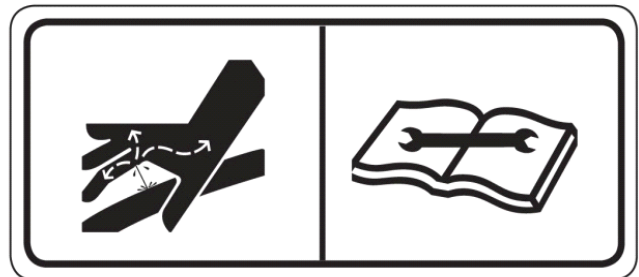


⚠ WARNING

Do not operate the water cannon until all personnel are a safe distance away from the vehicle.

High Pressure Motor (11)

This safety label is located on the hydraulic motor.



⚠ WARNING

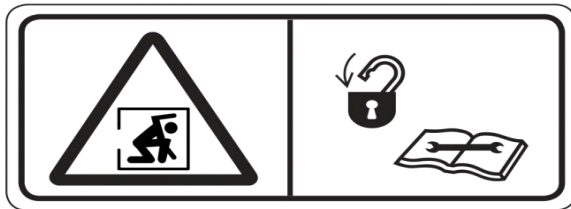
Hydraulic motor and supply lines contain oil under high pressure. Improper removal and repair procedures could cause severe injury. To remove or repair, instructions in the Maintenance Manual must be followed.

SECTION 1

Definitions and Abbreviations

Confined Space (12)

This safety label is located near the water tank access and fill ports.



⚠ WARNING

Do not enter confined spaces without following established site specific procedures. Failure to follow proper safety procedures will result in serious injury or death.

ABBREVIATIONS

BFV	Butterfly Valve
cc	Cubic Centimeters
CCW	Counter Clockwise
CW	Clockwise
fl. oz.	Fluid Ounce
FT	Feet
FPM	Feet Per Minute
GPM	Gallons Per Minute
IN/SQ FT	Inches per Square Feet
Kg	kilograms
Kpa	Kilopascals
l	liters
lpm	Liters per minute
LT	Left as viewed from the operator's position facing forward
m	meters
MAC	MEGA Articulated Conversion
MPH	Miles Per Hour
MTT	Mega Truck Tank
Nm	Newton meters of torque
psi	pounds per square inch
RPM	Revolutions Per Minute
RT	Right as viewed from the operator's
SQ FT	Square Feet
VDC	Volts, Direct Current

SYMBOLOLOGY

Symbol	Name
	POWER
	PUMP
	INTMN T/ AUTO2
	LIGHTS
F1	F1
F2	F2
	PAUSE

Symbol	Name
	WATER LEVEL
	AUTO
	AUX 1
	AUX 2
	HOSE
	LT VSS

Symbol	Name
	DRAIN
	DUMP BAR
	RT VSS
	LT REAR
	LT CTR
	RT CTR
	RT REAR

IN-CAB SUPPLEMENTS

Checklists

A pocket size Operator's Checklist of all procedures is contained in the Appendix for use in the vehicle cab.

Place a copy of the Appendix Operator's Checklist within the cab for daily use.

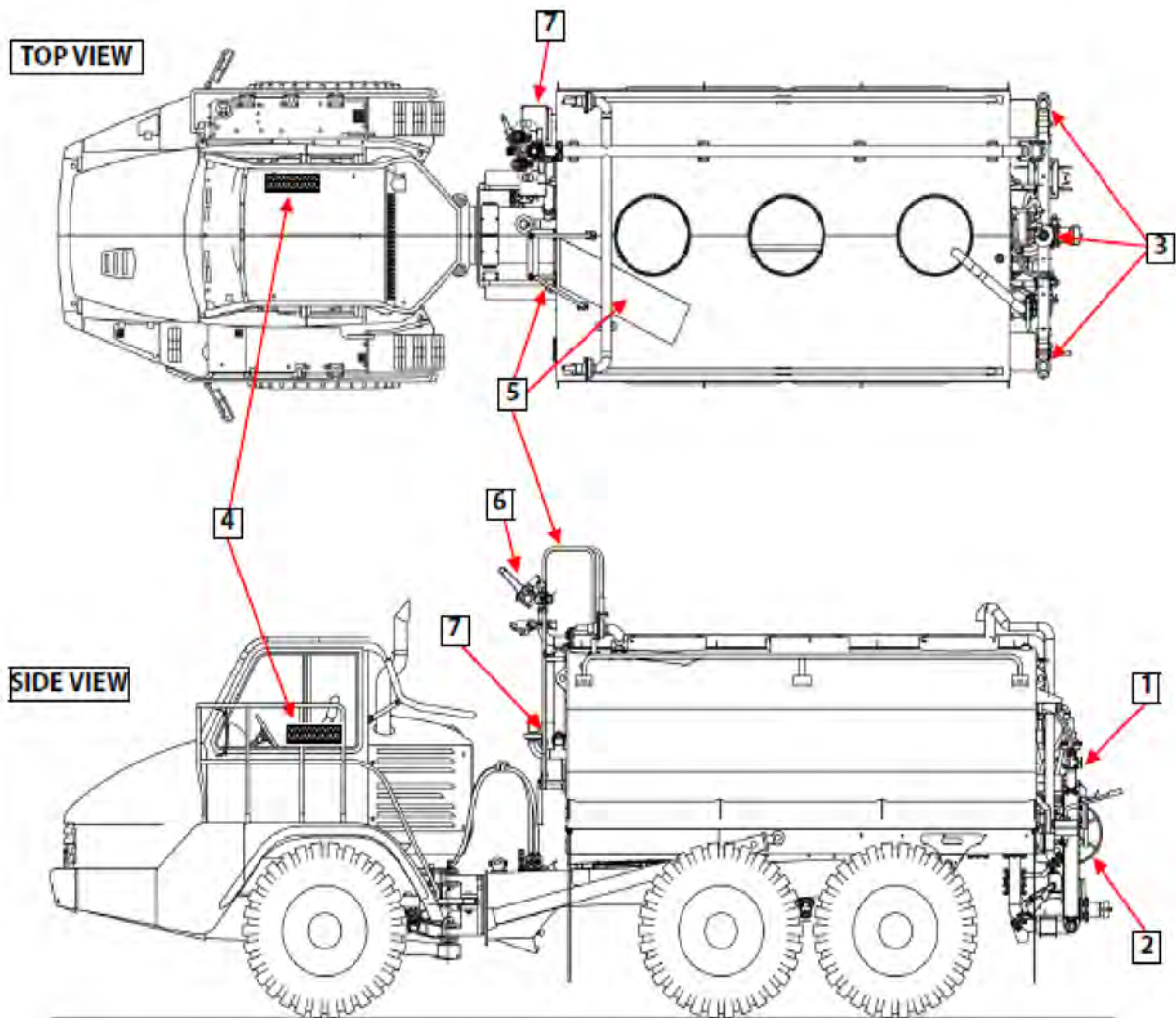
Instructional Decals

Instructional decals are included at the beginning of the Appendix. These decals may be cut out and placed in the cab wherever is most convenient for the operator.

SECTION 1

Definitions and Abbreviations

MAC OVERVIEW (TYPICAL)



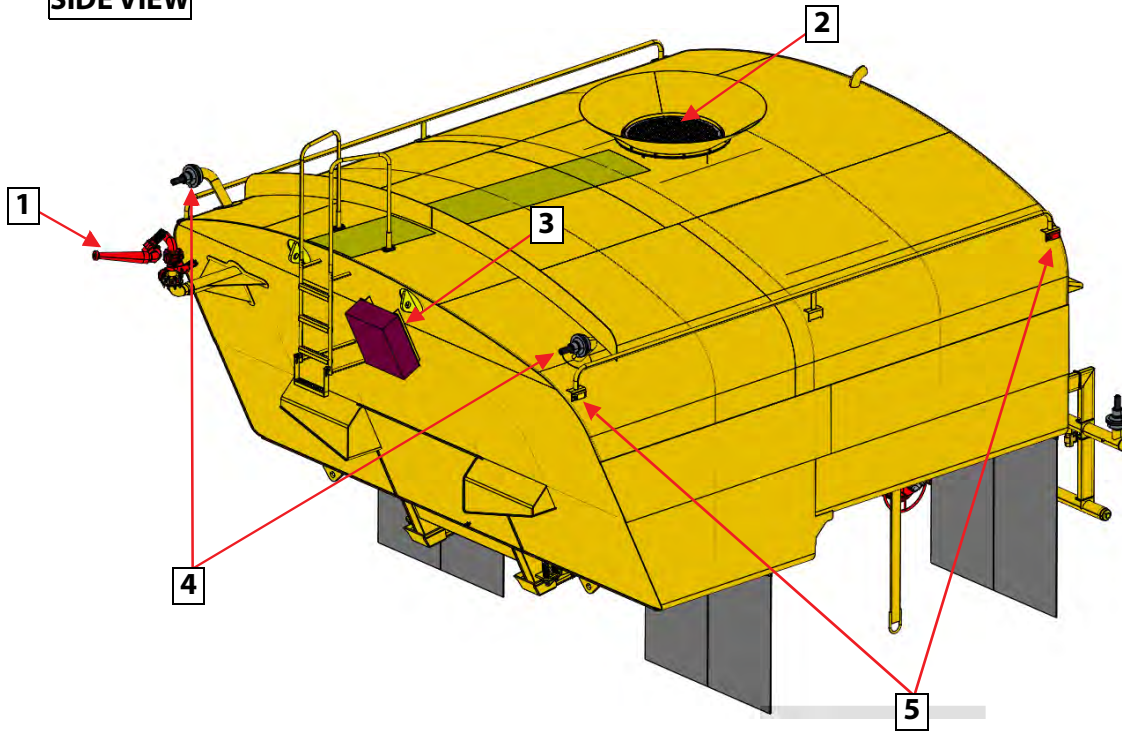
- 1 WATER PUMP & HYDRAULIC MOTOR
- 2 HOSE REEL
- 3 SPRAY HEADS
- 4 CAB CONTROL
- 5 HAND RAIL & WALKWAY
- 6 WATER CANNON
- 7 HYDRAULIC CONTROL BOX

SECTION 1

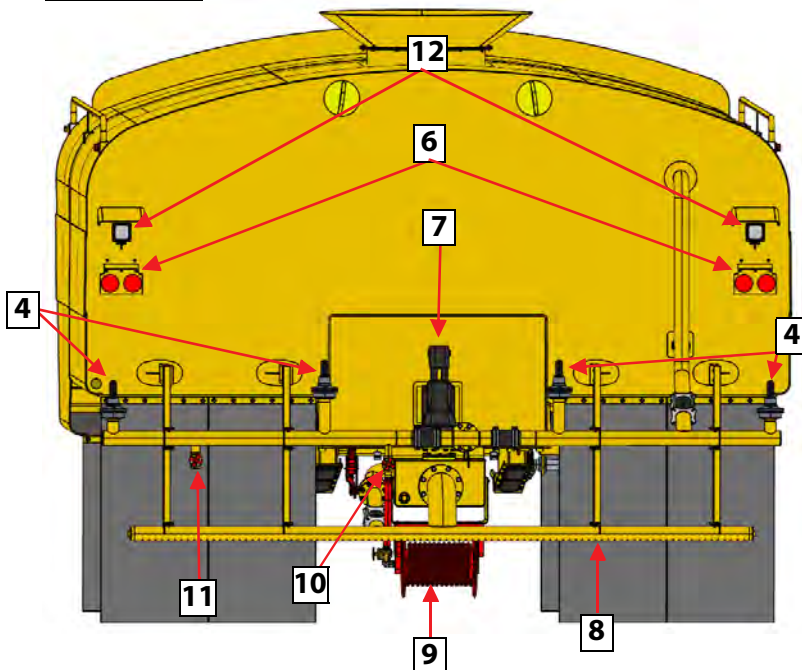
Definitions and Abbreviations

MTT OVERVIEW (TYPICAL)

SIDE VIEW



REAR VIEW



- 1** WATER CANNON
- 2** TANK FILL PORT
- 3** SOLENOID CONTROL BOX
- 4** SPRAY HEADS
- 5** CLEARANCE LIGHTS
- 6** STOP, TURN, AND TAIL LIGHTS
- 7** WATER PUMP
- 8** DUMP BAR
- 9** HOSE REEL
- 10** HOSE REEL SHUT-OFF VALVE
- 11** SPRAY BAR DRAIN
- 12** WORK LIGHTS

SECTION 1
Definitions and Abbreviations

SECTION 2

System Description

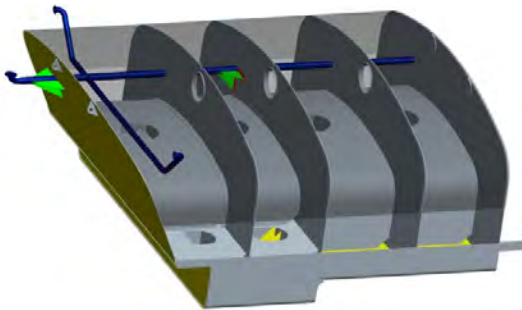
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WATER TANK (MTT)

The MEGA steel water tank consists of a water tunnel, primary floor, vertical baffles, bulkheads, outer skins, internal piping and external piping. The tank design is patented and known as the Mega Anti-surge Stabilization System (MASS).

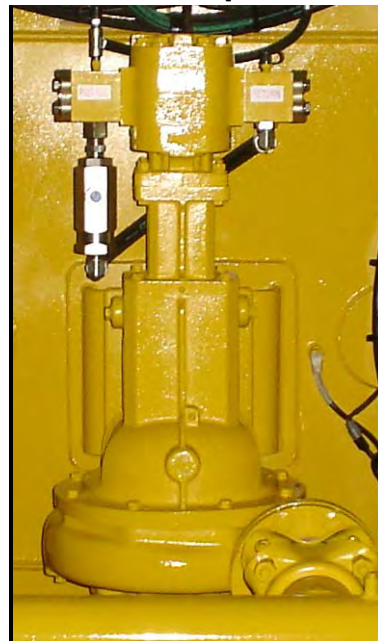
The tank structure is built around and on top of the tunnel super structure. The tunnel provides support to the floor plate, pivot structure, baffles and mounting for the water pump. The floor plates carries loads while the baffles and bulkheads add to tank strength and dampen water surges. External and internal piping is also used to carry water from the water pump to spray heads, water cannon, spray bar, hose reel, dump bar and tank drain.



WATER PUMPS

The unit is configured with different types of water pumps depending on tank capacity and customer specifications. These water pumps are very similar in design. For the purposes of this manual, the M-4 Pump (6 inch inlet & 4 inch outlet) is used to present component information. The unit may instead be equipped with an M-4B Pump or a Berkeley Pump.

M-4 Water Pump

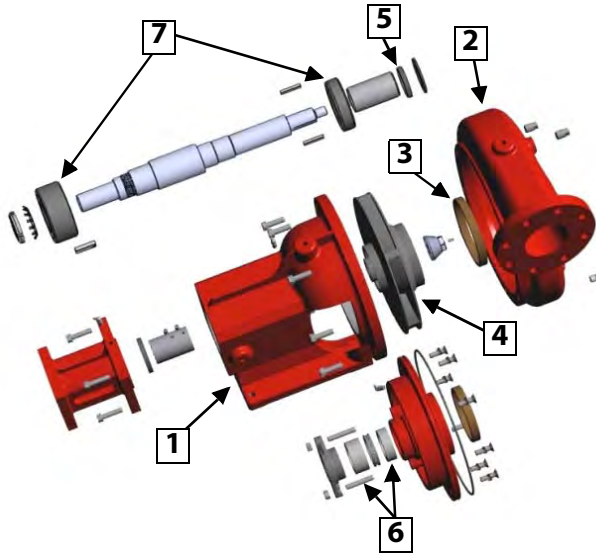


M-4 Water Pump Major Components and Functions

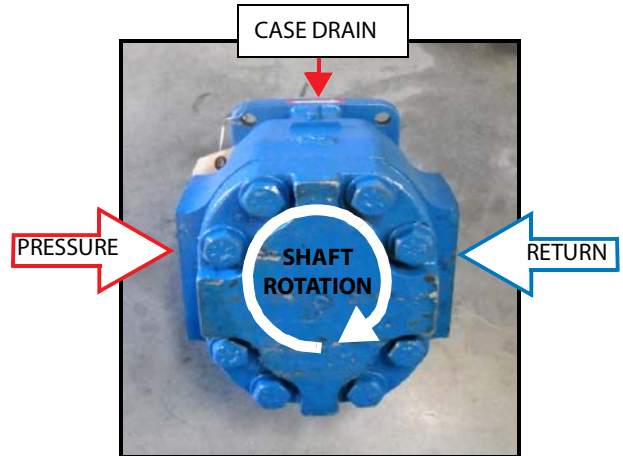
1. BRACKET – Main frame of the pump that allows a pump to be bolted to the tanker and provides the means to direct mount the hydraulic drive motor.
2. VOLUTE CASE – A “snail shell” shaped case that encloses the impeller. It is narrow at the center and enlarges from there to the discharge area.
3. WEAR RING – Acts as a bearing surface between the impeller and volute case. Constructed of bronze material.
4. IMPELLER – Rotating wheel attached to the shaft that accelerates the speed of the water producing water flow and pressure.
5. SHAFT SEAL – Confines grease to the inner and outer bearing area while keeping foreign material from entering the bearing area and seals water inside the volute case.

SECTION 2 System Description

- 6. ROPE SEAL – Provides a seal around the rotating pump shaft at the volute case. Constructed of a graphite rope material that is designed to drip water and allow shaft lubrication.
- 7. UPPER/LOWER BEARINGS - Provide roller surface for the pump shaft.

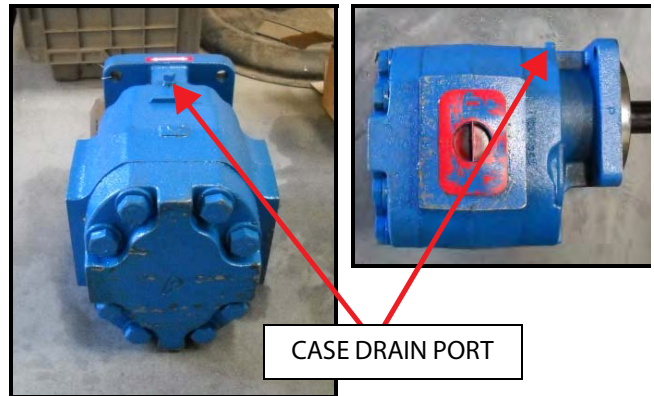


The hydraulic drive motor may be installed in 4 different orientations depending on the water pump location or application.



Hydraulic Drive Motor Port Identification

The hydraulic drive motor requires hydraulic flow from a valve to the motor pressure port, return oil flow to the hydraulic reservoir and a free to tank case drain.



HYDRAULIC DRIVE MOTOR

M-4 Pump Drive Motor And Cross-over Assembly



The M-4 pump rotates clockwise as viewed from the drive end of the assembly:

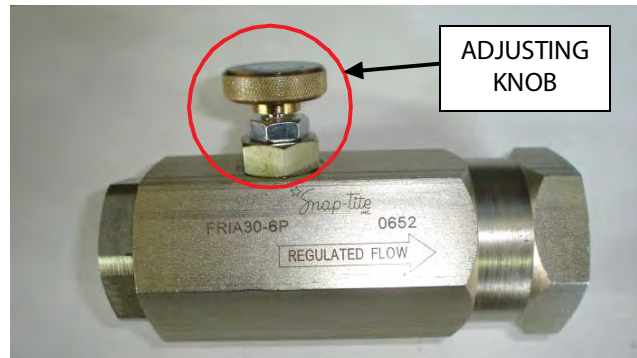
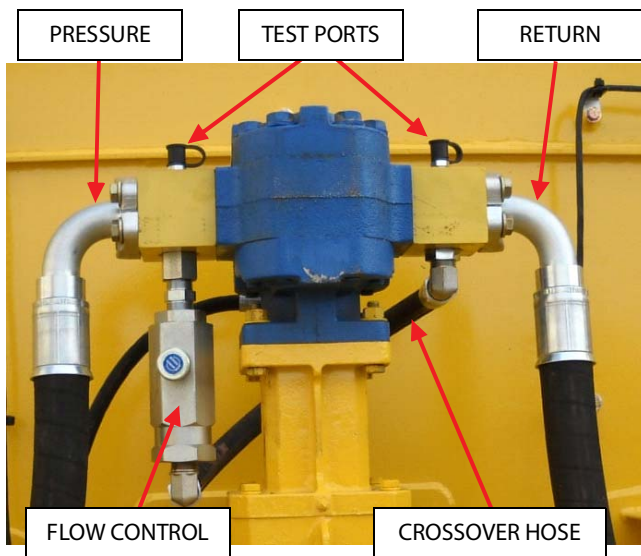
Clockwise rotation as viewed from the drive end of the water pump assembly.

SECTION 2

System Description

Hydraulic Drive Motor Speed Control (Crossover Assembly)

The hydraulic drive motor speed control (Crossover Assembly) consists of a flow control valve, 2 hydraulic manifolds, crossover hose and test ports.



Typical 135 lpm (35 gpm) Adjustable Hydraulic Flow Control

Hydraulic Drive Motor Activation

The hydraulic drive motor on MTT's are typically driven by the chassis hoist hydraulic system. The activation can be controlled by the following:

- Existing Electric Hoist Valve

The MEGA cab control pump switch commands the hoist valve to operate by sending an electric signal to the electric solenoid on the hoist valve. This operates the hoist valve, diverting the hydraulic oil to the water pump drive motor.

- Pilot Operated Diversion Valve

A remote mounted diversion valve that receives an electric signal from the cab control pump switch to activate a pilot control to move a spool within the diversion valve redirecting the hydraulic oil to flow to the water pump drive motor. Typically this type of valve is installed between the hoist pump and the hoist valve.

- Existing Mechanically Operated Hoist Valve

Typically used on early model trucks with a pneumatic system. This system is operated by the cab control pump switch sending an electric signal to an electric/pneumatic solenoid to control a pneumatic cylinder. When the pneumatic cylinder operates it moves the spool valve of the hoist valve to divert hydraulic oil to the water pump drive motor.

Hydraulic Flow Control Valve

The hydraulic flow control is directional. The arrow on the body indicates the direction of oil flow to meter the bypassing oil. The adjusting knob on the valve will allow adjustment of the oil flow to bypass the drive motor, up to 135 LPM (35 GPM) or up to 700 RPMs (RPM increase/decrease will vary depending on the size of hydraulic drive motor the unit is equipped with).

If the flow control is reversed, the flow control adjusting knob will not function and the full flow capacity of the valve will bypass. This can result in water pump rpm being below specifications with no adjustment capability of the adjusting knob.

By turning the adjusting knob clockwise, the hydraulic oil that is bypassing will be reduced, increasing the speed of the water pump. Turning the knob counter-clockwise will increase the volume oil being bypassed reducing the water pump speed. The flow control valve is typically mounted on the PRESSURE manifold of the hydraulic drive motor.

SECTION 2

System Description

CAB CONTROL SYSTEM (ANALOG)

Multi-function control box that is mounted in the vehicle cab to control all water tank functions. Controls are available for the water cannon, intermittent spray, water pump, work lights, foam suppression, adjustable nozzle, system, spray heads, spray bar, gravity dump bar and tank drain valve. The control box also provides indications of tanker water level and a system fuse holder. The cab controls requires 24 VDC vehicle power to operate.



The control box and joystick have a modular design, which allows the joystick to be detached from its holding bracket and operated separately as needed. Older hydraulic control boxes do not have this functionality, but they can be upgraded to the latest design by MEGA.

The control functions operate as follows:

Control	Function
Joystick	Sends command signals to the logic box (electric water cannon) or hydraulic control valve assembly (hydraulic water cannon) to move the water cannon left, right, up and down.
FOAM	Open or closes the foam concentrate tank in-line control valve.
FOG	On adjustable nozzle water cannons, adjusts cannon for less concentrated flow (HOLD for adjustment)
STREAM	On adjustable nozzle water cannons, adjusts cannon for more concentrated flow (HOLD for adjustment)
TIMER OFF	Sets OFF time (variable adjustment 5-100 sec) between timer cycles of selected spray heads and dump bar when the timer switch is in the intermittent position.
TIMER ON	Sets ON time (variable adjustment 5-100 sec) of selected spray heads and dump bar when the timer switch is in the intermittent position
PUMP	Routes vehicle hydraulic system pressure and flow to the water pump hydraulic drive motor.
MONITOR	Opens the water cannon BFV.
LIGHTS	Provides power to work lights.
TIMER	Activates or deactivates system timer function.
DRAIN	Opens or closes tank drain BFV.
DUMP BAR	Opens or closes dump bar BFV.
WATER LEVEL	Indicates tank water level.
SYSTEM	Provides power for all cab control functions.

SECTION 2

System Description

Control	Function
LT BUMPER	Opens or closes left front bumper spray head.
LT VSS	Opens or closes left vertical side spray head.
LT REAR	Opens or closes left rear spray head.
LT CENTER	Opens or closes left center rear spray head.
RT CENTER	Opens or closes right center rear spray head.
RT REAR	Opens or closes right center rear spray head.
RT VSS	Opens or closes right vertical side spray head.
RT BUMPER	Opens or closes right front bumper spray head.
AUX 1	Reserved for specialized functions.
AUX 2	Reserved for specialized functions.

CAB CONTROL SYSTEM DISCS® 2.0

Overview



The DiSCS® compact switch pad is based on CAN Bus* protocol and is water and dust resistant. Switch pad LEDs light up in RGB colors which indicate different watering patterns and controls.

- Simple and rugged construction for heavy-duty operations
- Adjustable switch pad brightness
- Fully adjustable RAM® mount (where applicable)
- In-cab water level indicating system
- Total system pause function
- Work light and auxiliary controls

SECTION 2 System Description

Features

GPS



Distance and speed based operation modes utilize a GPS based speed signal to automatically stop/start water flow as the vehicle moves.

Manual Spraying



With manual spraying the operator can select each spray head independently and can be used without GPS connection.

Time Based Spraying (Banding)



Operator can cycle on/off periods of spray using selected time intervals.

Distance Based Spraying (Checkerboard)



Alternating intermittent watering patterns reduces water consumption and ensures one steering tire and one drive tire remain on a dry surface.

Speed Based Spraying (Continuous Rate)



Sequence-based intermittent spray system operation uses PWM (Pulse Width Modulation) to vary the amount of water flow while maintaining a continuous rate of water application, dependent on speed of travel.

Operation

Start-Up



When the prime mover has the key switch first turned ON, the system performs a self test and will flash all of the switch pad lights RED four (4) times and turn OFF.

NOTE

If the switch pads have any buttons that do not light or the flash sequence is different, contact your service department for repair.

Button Identification



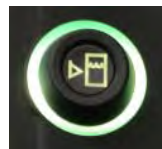
System Power

- Turns system power ON/OFF
- Standby mode - Light OFF
- System ON - Green Light



Water Pump

- Turns water pump ON/OFF
- Standby mode - Light OFF
- Pump ON - Green Light
- Fault - Flash Red/Yellow



Water Level

- Indicates tank water level
- Greater than 90% - Flash Green
- 90% to 50% - Steady Green
- 50% to 25% - Steady Yellow
- 25% to 5% - Steady Red
- Less than 5% - Flash Red
- Fault - Flash Red/Yellow

SECTION 2

System Description

**Time Based Programming**

Activate the time based program mode

- Standby mode - Light OFF
- Timer Active - Green Light

**Speed Based Programming**

Activates speed based program mode

- Standby mode - Light OFF
- Programming ON - Green Light
- No GPS lock - Alternate Red/Green
- Error - Alternate Yellow/Blue

**Distance Based Programming**

Activates distance based program mode

- Standby mode - Light OFF
- Program ON - Green Light
- No GPS lock - Alternate Red/Green
- Error - Alternate Yellow/Blue

**Auxiliary Function**

Reserved for optional equipment

- Standby mode - Light OFF
- Function ON - Green Light

**Left Vertical Spray Head (LT VSS)**

Turns left vertical spray head ON/OFF

- Standby mode - Light OFF
- Open - Green Light

**Dump Bar**

Turns dump bar ON/OFF

- Standby mode - Light OFF
- Valve open - Green Light
- Valve closed during time based program - Blue Light

**Left Rear Spray Head (LT R)**

Turns left rear spray head ON/OFF

- Standby mode - Light OFF
- Valve open - Green Light
- Valve closed during time based program - Blue Light

**Left Center Spray Head (LT RC)**

Turns left center spray head ON/OFF

- Standby mode - Light OFF
- Valve open - Green Light
- Valve closed during time based program - Blue Light

**Rear Facing Work Lights**

Turns the MEGA supplied work lights ON/OFF and changes the switch light brightness

- Standby mode - Light OFF
- Light ON - Green Light

**WET +**

Adjusts spray head Time, Speed, and Distance based programming

- Standby mode - Light OFF

**WET -**

Adjusts spray head Time, Speed, and Distance based programming

- Standby mode - Light OFF

**DRY +**

Adjusts spray head Time, Speed, and Distance based programming

- Standby mode - Light OFF

**DRY -**

Adjusts spray head Time, Speed, and Distance based programming

- Standby mode - Light OFF

**Pause**

Pauses all active spray functions

- Standby mode - Light OFF
- All pause - Flashing Yellow Light
- All active functions will pause (CLOSE) and switch lights will turn Steady Yellow

**Hose Reel**

Allows continuous use of hose reel

- Standby mode - Light OFF
- Function active - Flashing Yellow Light
- All other active functions will pause (CLOSE) and switch lights turn Yellow
- Overrides the timeout function

SECTION 2 System Description



Quick Drain

Turns quick drain ON/OFF
•Standby mode - Light OFF
•Open - Green Light



Right Vertical Side Spray Head (RT VSS)

Turns right vertical spray head ON/OFF
•Standby mode - Light OFF
• Open - Green Light



Right Center Spray Head (RT RC)

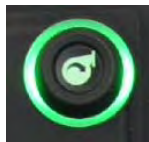
Turns right center spray head ON/OFF
•Standby mode - Light OFF
•Valve open - Green Light
•Valve closed during time based program -Blue Light



Right Rear Spray Head (RT R)

Turns right rear spray head ON/OFF
•Standby mode - Light OFF
•Valve open - Green Light
•Valve closed during time based program -Blue Light

Water Pump Time Out Function



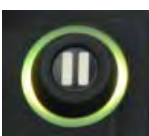
After 100 seconds of NO-FLOW conditions (no active discharge function) the water pump will automatically turn OFF (Time out).

Pump Protection Feature



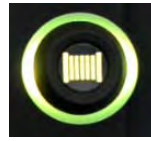
If water level sensor reads water level below 5% for more than 5 seconds, water level button light will flash Red and automatically shut off water pump.

Pause Fault Indication



Pressing any function while pause is active will result in a Fault, indicated by Pause and Function buttons flashing Blue/Yellow three (3) times.

Hose Reel Fault Indication



Pressing any function while pause is active will result in a Fault, indicated by Pause and Function buttons flashing Blue/Yellow three (3) times.

Control Pad Switch Brightness



Press and hold Work Light button for two (2) seconds (work lights will turn off). The brightness level will cycle down in 25% intervals for every two (2) seconds the button is held. 100%

>75% > 50% > 25% > 100%

Water Cannon Joystick



The water cannon joystick gives the operator complete control of the water cannon system. The water cannon system has options of FAN/ FOG adjustable nozzles, as well as fire suppressing foam education.



Water Cannon Butterfly Valve

Turns butterfly valve ON/OFF. Press ON, light under joystick will illuminate at 100% brightness. Press OFF light under joystick will reduce to 20% brightness.



Water Pump

Turns water pump ON/OFF
Press ON/OFF



Adjustable Nozzle Stream

Moves nozzle to STREAM position
Press and hold to adjust nozzle

SECTION 2

System Description



Adjustable Nozzle FAN/FOG
 Moves nozzle to FAN/FOG position
 Press and hold to adjust nozzle



Foam Agent
 Turn foam agent system ON/OFF
 Press and hold for 3 seconds to OPEN or CLOSE the foam agent valve.



Pause
 Pauses all active spray functions.
 Pause - Flashing Yellow

The time settings available are:

- 3 seconds
- 6 seconds
- 9 seconds
- 20 seconds
- 30 seconds

The four (4) WET/DRY switches advance the timer settings. Every press of the switch will advance the time setting 1 time interval. Select the rear spray heads that are required to activate in this mode.

Time Based Program Mode



Based on TIME-ON and TIME-OFF settings. (System and Water Pump must be ON for this program mode to activate). Time based programming will control the 4 rear spray heads and the

dump bar ONLY, all other functions will remain in manual selection mode. All other functions can be activated manually while in Time based programming but will not be controlled through the program settings. Time based programming will turn the selected spray heads ON/OFF at the selected time intervals. Pause, Hose Reel, and low water protection are functional in this mode.

Button Color	Time Cycle
White	3 Seconds
Blue	6 Seconds
Yellow	9 Seconds
Green	20 Seconds
Magenta	30 Seconds

Example:

- Timer is set for 3 seconds ON and 3 seconds OFF, pressing 'WET +' switch one time, the time ON will advance to 6 seconds ON and change the switch color from White to Blue.
- Timer is set for 20 seconds ON and 9 seconds OFF, pressing 'DRY -' switch one time, the time OFF will decrease to 6 seconds and the switch color will change from Yellow to Blue.



Press to advance setting
 LONGER wet time (ON)



Press to advance setting
 SHORTER wet time (ON)



Press to advance setting
 LONGER dry time (OFF)



Press to advance setting
 SHORTER dry time (OFF)

SECTION 2 System Description

Speed Based Program Mode



Vehicle speed input is acquired from the MEGA provided GPS system that relays the vehicle speed to the controller. The controller will determine the watering rate Pulse Width Modulation (PWM) for the selected spray heads. PWM is the pulsing of spray heads to deliver a desired coverage percentage of water that has been selected through the RATE setting. Automatic water reduction will occur before the PWM mode begins, this is when the unit turns OFF the 2 inner spray heads prior based on the SPEED setting selected. As the vehicle speed is reduced the PWM pattern will begin, this is where it pulses the 2 outer spray heads to achieve the requested percentage of water coverage (RATE). (System, water pump and at least one spray head must be on and GPS must have satellite lock.)

Coverage Percentage Setting

Using the 'WET +' and 'WET -' function buttons the operator can adjust the coverage percentage of the Speed Based Program Mode.



Press to advance RATE setting MORE water coverage percentage.



Press to advance RATE setting LESS water coverage percentage.

Button Color	Coverage
White	15%
Blue	30%
Yellow	50%
Green	75%
Magenta	90%

Program Speed Setting

Using the 'DRY +' and 'DRY -' function buttons the operator can adjust the MAXIMUM SPEED setting for the Speed Based Program Mode.



Press to advance setting INCREASE maximum program speed

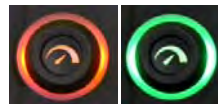


Press to advance setting DECREASE maximum program speed

Button Color	Speed
White	8 KPH/5 MPH
Blue	16 KPH/10 MPH
Yellow	24 KPH/15 MPH
Green	32 KPH/20 MPH
Magenta	40 KPH/25 MPH

The speed based program mode will only control the four (4) rear spray heads, all other functions will remain in manual selection mode. All other functions can be activated manually while in Speed Based Programming mode but will not be controlled through the speed based program settings. All selected spray heads OFF at 4.8 kph (3 mph) and less.

Faults:



No GPS Lock - Flashing Red/ Green



No connection to GPS receiver - Flashing Red/Blue

SECTION 2

System Description

Distance Based Program Mode



Vehicle speed input is acquired from the MEGA provided GPS system that relays the vehicle speed to the controller. The controller will calculate the distance to signal the rear spray heads when to turn ON and OFF creating an alternating pattern (checker boarding). This mode can reduce water consumption and control dust while allowing 1 steer tire and 1 drive tire to remain on a dry surface when efficiently set. This mode can be adjusted to spray water most of full width of a haul road in a single pass without crossing the center line. It can produce a wide pattern that can carry over into an adjacent lane when the spray head angles are properly adjusted.

Wet Coverage Distance

Using 'WET +' and WET -' function buttons the operator can adjust the wet coverage distance in the Distance Based Program Mode.



Press to advance setting LENGTHEN wet strip



Press to advance setting SHORTEN wet strip

Button Color	Distance
White	15 Meters
Blue	20 Meters
Yellow	30 Meters
Green	45 Meters
Magenta	60 Meters

Dry Coverage Distance

Using 'DRY +' and 'DRY -' function buttons the operator can adjust the dry coverage distance in the Distance Based Program Mode.



Press to advance setting LENGTHEN dry strip



Press to advance setting SHORTEN dry strip

Button Color	Distance
White	0 Meters
Blue	5 Meters
Yellow	10 Meters
Green	20 Meters
Magenta	30 Meters

Distance based programming will control only the four (4) rear spray heads, all other functions will remain in manual selection mode. All other functions can be activated manually while in Distance Based Programming Mode but will not be controlled by the distance based settings. Distance based programming will turn the selected spray heads ON/OFF at the selected distance intervals. Pause and Low Water protection are functional in this mode. All selected spray heads OFF at 4.8 KPH (3 MPH) or less.

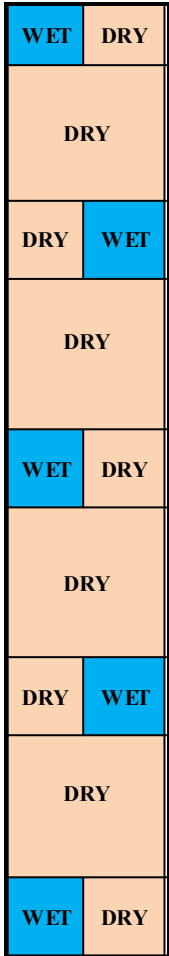
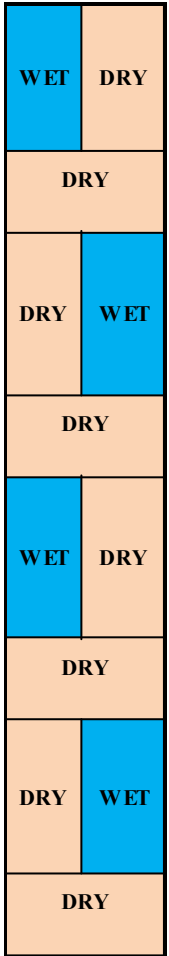
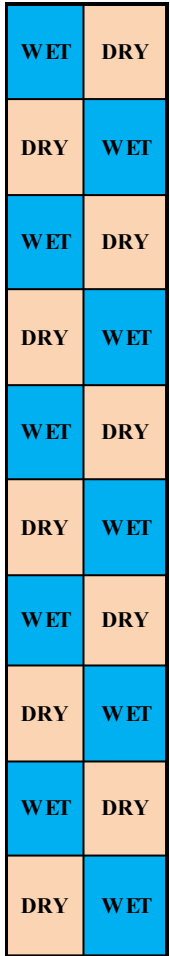
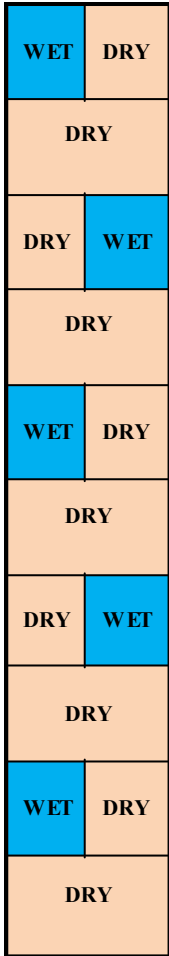
SECTION 2 System Description

SETTINGS:
EVEN WET/DRY
DISTANCE

SETTINGS:
DRY DISTANCE SET AT
0 METERS

SETTINGS:
LONG WET STRIP
SHORT DRY STRIP

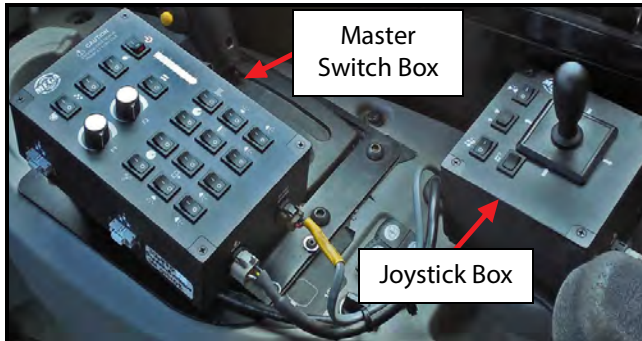
SETTINGS:
SHORT WET STRIP
LONG DRY STRIP



SECTION 2

System Description

CAB CONTROL SYSTEM DISCS® 1.5



This system is designated as a Digital Spray Control System (DiSCS). The most recent version is Generation 1.5. The system is comprised of control boxes, controllers, sensors, and cabling. It is a multi-function control system with a separate joystick box that is mounted in the vehicle cab. These two boxes control all water tank functions. The cab controls require 24 VDC vehicle power to operate.

Abbreviations and Definitions









AUX1	Auxiliary or additional optional function
BFV	Butterfly Valve
DMPBAR	Dump bar for heavy spray of water close to ground. Can be either a gravity or pressure dump bar (pressure dump bar requires water pump activation to operate).
DRAIN	Drain (gravity or pressure) for evacuation of water from tank, mounted typically at the rear of the tank.
KPH	Kilometers per hour
LT VSS	Left Vertical Side Spray
LTC	Left Center Spray Head
LTR	Left Rear Outer Spray Head
MPH	Mile per hour
RAMP	Ramping Control feature. Rate of increase or decrease in speed of water flow during PUMP engagement or disengagement
RT VSS	Right Vertical Side Spray
RTC	Right Center Spray Head
RTR	Right Rear Outer Spray Head

The master switch box control functions operate follows:

Symbol	Name	Function
	POWER	Provides power for all cab control functions.
	PUMP	Routes vehicle hydraulic system pressure and flow to the water pump hydraulic drive motor.
	INTMNT	Controls activation of either the time-based intermittent mode or the distance-based AUTO mode. See the extended description of "INTMNT" for details.
	LIGHTS	Provides power to work lights.
	F1	Function is dependent on the intermittent or AUTO mode settings. See extended description.
	F2	Function is dependent on the intermittent or AUTO mode settings. See extended description.
	PAUSE	Pauses all system functions.
	WATER LEVEL	Indicates tank water level. From top to bottom, respectively, the symbols indicate a water level of FULL, 3/4, 1/2, 1/4, and EMPTY.
	AUTO	Controls activation of GPS AUTO mode. See extended description for more details.
	AUX 1	Reserved for user-added option.
	AUX 2	Controls activation of suction load station or multi water cannons.
	HOSE	Controls activation of hose reel function ONLY.

SECTION 2

System Description

Symbol	Name	Function
	LT VSS	Opens or closes left vertical side spray head.
	DRAIN	Opens or closes tank drain BFV.
	DUMP BAR	Opens or closes dump bar BFV.
	RT VSS	Opens or closes right vertical side spray head.
	LT REAR	Opens or closes left rear spray head.
	LT CTR	Opens or closes left center rear spray head.
	RT CTR	Opens or closes right center rear spray head.
	RT REAR	Opens or closes right rear spray head.





Basic System Theory Of Operation

Spray system power is provided by chassis 24 volt DC power. Power is routed to the cab control boxes by turning on the switched power via the ignition key switch.

When the chassis ignition switch is turned on, the master switch box will undergo a functional self-test. During this process, ALL LEDs will first turn ON, then OFF. While this is occurring, the water level indicator lights will initially register a FULL tank, and will then decrease down to EMPTY. The EMPTY light will blink, and then the water level indicator will count up to register the current water level of the tank.

Cab control power is then activated by turning the cab control POWER switch ON. The spray system will function normally when cab control power is applied (cab control POWER switch ON) and sufficient water is present (water level EMPTY light not flashing). Activation of a specific function is accomplished by depressing the appropriate function switch on the master switch box or joystick box.

The joystick box functions operate as follows:

	Control	Function
(N/A)	Joystick (LEFT-RIGHT-UP-DOWN)	Sends command signals to the hydraulic control valve assembly to move the water cannon.
	FOAM	Open or closes the foam concentrate tank in-line control valve.
	FOAM LOCK	Unlocks FOAM switch for activation of foam suppression.
	NOZZLE	Adjusts water cannon nozzle from FOG to STREAM.
	BFV	Opens or closes the water cannon butterfly valve.

Depressing a switch sends a signal to the logic control panel in the solenoid box to activate the associated function. The appropriate controller in the solenoid box receives the signal and provides output voltage to the given coil.

Once voltage is sensed at the coil, the controller sends a signal back to the cab control box to illuminate the LED on the selected function switch.

SECTION 2

System Description

NOTE

- If a switch is depressed and the corresponding LED does not illuminate, check to ensure that the POWER switch is ON and the water level EMPTY light is not flashing. If the switch LED still does not illuminate, a malfunction may exist. Contact Mega Product Support immediately at US toll free: 1-800-345-8889, or Direct: 1-505-345-2661.
- If the selected switch LED illuminates, but the component on the water tank is not functioning, then the associated function component (water-way valve, spray head, or water cannon) may have malfunctioned. Contact Mega Product Support immediately.

Water Pump Protection Features


SOFT START AND STOP – The water pump is protected from sudden starts and stops whenever the pump is turned ON or OFF. This protection is implemented in the spray control system by commanding the appropriate proportional hydraulic control valve to open or close slowly. This prevents hard starts or stops that would reduce water pump service life.


LOW WATER PROTECTION – The water pump is automatically turned off when a low water condition is detected. This prevents the water pump from overheating due to running dry.

NO-FLOW CONDITIONS – Whenever ALL water discharge valves are closed, the water pump is automatically turned off after approximately 100 seconds. This feature prevents the water from heating up as a result of the water pump impeller spinning in a sump with no flow. Otherwise, the heating of the static water will also heat the water pump, causing deterioration of grease and premature bearing failure.

Master Switch Box Extended Function Descriptions



 **POWER** – Turns POWER ON and OFF to cab controls and the controllers in the solenoid box.

 **PUMP** – Sends request for pump engagement/disengagement. The appropriate controller will activate the hydraulic circuit to slowly ramp-up or ramp-down the water pump.

The water pump switch will flash whenever the switch is on and the following conditions apply:

- Low water condition is sensed (EMPTY LED is flashing).
- No flow condition is sensed (for about 100 seconds no waterway valves are open)

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

SECTION 2

System Description

PAUSE – Turning this switch ON will pause all spray system functions. Once this switch is turned OFF, spray system functions will resume operation. If the distance-based AUTO mode is active, spray head functions will resume beginning with a dry patch.

- INTMNT** – When the AUTO switch is OFF, turning the INTMNT switch ON activates the Intermittent Mode, in which spray head and dump bar functions are controlled manually by adjustment of the F1 and F2 dials.

When the AUTO switch is ON, turning the INTMNT switch ON activates the *distance-based* check-boarding version of GPS Auto Mode. More details on this mode can be found under “Ground Speed Sensing (AUTO MODE)” on page 18.

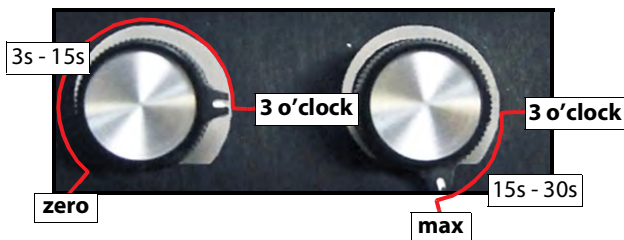
Intermittent Mode

In intermittent mode, spray system functions are controlled by the F1 and F2 dials. Intermittent mode will only operate if at least 1 discharge function (spray head or dump bar) switch is activated. Water discharge can be stopped at any time when in intermittent mode by turning discharge function switches OFF.

The F1 and F2 adjustable dials set the timing as follows:

- **F1** – Adjusts spray head ON time in seconds.
- **F2** – Adjusts spray head OFF time in seconds.

The relationship between dial rotation and ON/OFF time is as follows:



- ZERO TO 3 O’CLOCK POSITION: 3 sec to 15 sec
- 3 O’CLOCK TO MAX POSITION: 15 sec to 30 sec

The intermittent mode will turn selected spray heads or dump bar on and off. When a selected function switch (spray head or dump bar) is

operating during an ON cycle, the selected function switch LED will be illuminated as well as the Intermittent switch LED. When INTMNT cycles to an OFF cycle, the INTMNT switch and function switch LEDs will extinguish. As the ON cycle is about ready to engage, the INTMNT switch LED will flash 3 times to indicate the selected spray functions are about to be turned ON.



WATER LEVEL INDICATOR – Indicates tank water level. When the red **EMPTY** LED light flashes, the tank is at minimum water level, and the water pump low water protection feature will be activated, as previously described on page 10. Water pump operation can only be restored if the tank is above the minimum water level.

NOTE

- In order to re-activate the water pump after low-water shut-off, first fill the water tank with sufficient water capacity to permit pump operation. Then cycle the PUMP switch OFF/ON.
- Certain terrains and water level fluctuations may allow low water protection to capture a low water level condition, causing the pump to slow to a stop. If conditions allow water pump activation after water level/terrain fluctuations have ceased, then the water pump may be re-activated by cycling the PUMP switch OFF/ON.

Pressure Discharge Function Descriptions

SPRAY HEADS – Spray head switches control the opening and closing of the associated spray head valve. The opening and closing of the associated valves is automatically controlled according to the F1 and F2 dial settings when INTMNT or AUTO mode is active.


DUMP BAR (PRESSURE) – Controls opening or closing of the dump bar BFV when selected, or automatically controlled when INTMNT or GPS function is selected.


SUCTION LOAD (AUX 2) – See “AUX 2” description.

SECTION 2

System Description

Aux Functions

 **AUX 1** – Controls customer-requested special features or the Multi Water Cannon functions. This feature is unique to specific tank serial numbers.


 **AUX 2** – Controls either Suction Load Station or Multi Water Cannon functions, if either is installed.

SUCTION LOAD STATION: If equipped, AUX 2 sends a request to the hydraulic water pump drive circuit to allow suction load pump drive motor operation during a low water level condition while also disabling the pump time-out feature. When turned ON, this also disables use of any other spray system function.

MULTI WATER CANNON: If installed, AUX 1 or AUX 2 will send a signal to the logic control panel in the solenoid box, which then sends a signal to the water cannon multi-plexing unit to activate an additional water cannon (AUX 1 activates the front bumper or deck water cannon, and AUX 2 activates the right rear water cannon) and deactivate the controls for all other water cannons. The same joystick controls are used to operate all water cannons, but only one water cannon can be controlled at a time.

NOTE


- When switching between water cannons, the multi-plexing unit will initiate an automatic 4 second delay to allow the previous water cannon BFV to close.
- No water cannon will operate with both AUX1 and AUX2 switches ON.

 **HOSE** – Allows continuous water pump operation for hose reel use while disabling the use of any other spray system function.

NOTE

Ensure all discharge function switches are OFF when using HOSE function. Activating the HOSE switch requests all discharge function to turn OFF (spray heads, water cannon, drain, dump bar, and foam).

Non-Pressure Discharge Function Descriptions

 **DUMP BAR (GRAVITY)** – Controls opening and closing of the dump bar BFV when selected, or automatically controlled when INTMNT mode or AUTO mode is active.


Joystick Box Function Descriptions



The joystick box houses logic controls for the joystick and the FOAM, NOZZLE, and BFV switches. These switches and the joystick control requests for water cannon operation.

NOTE

If the system is equipped with the multi water cannon function, the joystick controls will be inactive for 4 seconds when switching between water cannons.

 **FOAM** – Sends request for FOAM agent valve to open or close.

SECTION 2

System Description

NOTE

The FOAM switch is protected by the FOAM LOCK momentary switch. In order to activate FOAM, first press and hold the FOAM LOCK switch. While still holding the FOAM LOCK switch, turn the FOAM switch ON. Hold both switches in the ON position for 1 second and then release.



JOYSTICK – Sends requests for rotation and elevation motion for water cannon operation.

NOZZLE – Sends request for adjustable nozzle on water cannon to move from FAN/FOG to STREAM spray patterns.

BFV – Sends request to open or close the water cannon butterfly valve. This butterfly valve controls water flow to the water cannon. Activating the BFV switch requests the water PUMP to stay ON with NO other pressure discharge functions activated providing that at least the minimum water level is present in the tank.

Ground Speed Sensing (AUTO MODE)

The MEGA ground speed sensing control system is an independent and self-contained GPS unit that provides speed information to the existing DiSCS. The DiSCS logic control uses the ground speed signal to automatically cycle and pulse spray heads to obtain a desired lay-down of water regardless of ground speed. This automatic control reduces water usage and prevents over-watering of haul roads and intersections.

Near or below 4.8 KPH/3 MPH, AUTO mode will switch to INTERMITTENT mode and discharge

functions may operate continuously or may ramp down the water pump to OFF. When vehicle speed rises above 4.8 KPH/3 MPH, AUTO mode will resume control of the system. The system warns the operator of all malfunctioning system functions and provides full manual control of all spray system functions in the event of an AUTO mode failure. All automatic system protection features of low water level conditions, no-flow conditions and water pump soft start/stop feature still operate normally in the AUTO mode.

Auto Mode Extended Function Descriptions

AUTO – This function has priority over intermittent mode. AUTO uses the speed signal from the GPS module to operate the spray system based on **F1** and **F2** adjustments. Pulsed spray (rather than continuous spray) will begin when the AUTO function requests reduced volume.

NOTE

When the chassis ignition switch is turned on, the GPS module will attempt to make a satellite connection. During this time, the AUTO light on the cab control box will blink until a satellite connection is established. If the AUTO light still blinks when the cab control POWER switch is turned ON, then the satellite connection has not yet been established. Connection may take up to 10 minutes.

PWM Mode

If the AUTO switch is ON and the INTMNT switch is OFF, then the AUTO mode is a time-based banding mode, and is adjusted as follows:

F1 – The time for spray head ON cycle. Dial turned counterclockwise **reduces** spray head ON time. Dial turned clockwise **increases** ON time.

F2 – This setting dictates the vehicle speed above which all selected discharge functions (spray heads and pressure dump bar) are set for maximum flow. Below this vehicle speed, “reduced volume mode” comes into effect (see description below), and spray heads may pulse on and off rather than spraying continuously.

SECTION 2

System Description

NOTE

- The scale for this F2 function is 0 KPH/0 MPH (Full LEFT) to 48 KPH/30 MPH (Full RIGHT).
- If the vehicle speed is GREATER than the F2 dial setting, the F1 dial has little or no effect on water discharge. Typically in this case, all requested pressure discharge functions are ON and there is no timing cycle; pressure discharge functions operate continuously.

REDUCED VOLUME MODE – Reduction in discharge volume by reducing the number of spray heads requested to activate.

- If 4 rear spray heads are requested, reduced volume allows only the 2 outer spray heads to turn ON, and the 2 center spray heads are OFF.
- If 3 rear spray heads are requested, 1 spray head will be OFF (typically the center head adjacent to the outer head requested).
- If 2 spray heads are requested, 1 spray head will be OFF (typically the center spray head, unless no center spray heads are requested, in which case NO spray heads will be OFF).

PULSING – Reference to Pulse Width Modulation or ON/OFF cycle.

Distance-Based (Pattern-Based)

If *both* the AUTO and INTMNT switches are ON, then the GPS mode is *distance-based*, or “pattern-based”. Spray head functions operate to create wet and dry patches, the lengths of which are controlled by the F1 and F2 dials, as follows:

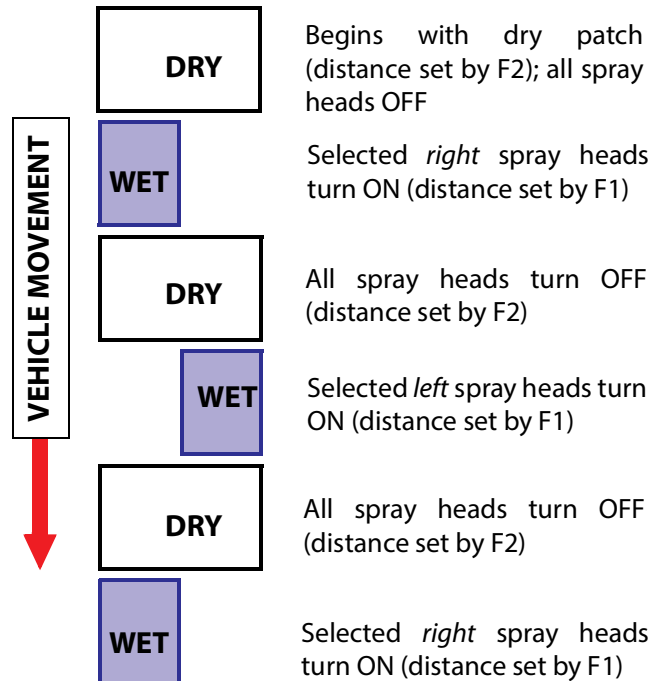
F1 – Adjusts the length of the **wet** patches on a linear scale from 10 m (FULL CCW) to 100 m (FULL CW).

F2 – Adjusts the length of the **dry** patches on a linear scale from 10 m (FULL CCW) to 100 m (FULL CW).

NOTE

In **version 4.2**, the minimum length of the dry patch is 0 m, whereas in **version 4.0**, the minimum dry patch length is 10 m. Verify your system’s current firmware version before operating in this mode.

The wet and dry patches will form a checkerboard pattern. The activated left and right spray heads will alternate spraying water to produce wet and dry sections in the following sequence:



If the system is PAUSED, spray head functions will resume beginning with a dry patch once unpaused. Distance-Based (Pattern-Based)

SECTION 2

System Description

WATER CANNON SYSTEM

The system is comprised of a water cannon (hydraulic or electric), hydraulic control valve assembly or logic box, butterfly valve assembly, nozzle and controls.

Water Cannon (Hydraulic)



A metal waterway that directs a stream of water in both elevation (up-down) and rotation (right-left). Hydraulic motors move the waterway based upon hydraulic flow from the hydraulic control valve assembly as

commanded by the cab control joystick. The water cannon is threaded to a flanged pipe that mounts directly above the BFV. The water cannon also provides mounting for a variety of different nozzles.

Hydraulic Control Valve Assembly



The assembly contains three hydraulic solenoid valves that direct hydraulic pressure to the hydraulic motors on the water cannon and BFV cylinder

as commanded by the cab control box. A pressure relief valve is incorporated in the manifold block to protect the water cannon system against any over pressurization conditions. The assembly is mounted to the tank lower flange and receives hydraulic pressure from the vehicle hydraulic pump.

Hydraulic BFV Assembly



A hydraulically operated valve that opens or closes to control water flow to the water cannon. The hydraulic cylinder receives hydraulic pressure from the hydraulic

control valve or solenoid control box assembly as commanded by the cab control water cannon switch. The assembly is clamped between upper and lower pipe flanges.

Water Cannon (Electric)



A metal waterway that directs a stream of water in both elevation (up-down) and rotation (right-left). 24 VDC electric motors move the waterway based upon filtered electronic signals from the logic box as commanded by the cab control joystick. The

water cannon is threaded to a flanged pipe that mounts directly above the BFV. The water cannon also provides mounting for a variety of different nozzles.

Electro-Pneumatic BFV Assembly



An electro-pneumatic valve that controls the flow of water to the water cannon. A 24 volt DC solenoid receives commands from a cab control MONITOR / BFV switch through the logic box

to route pressurized air to an air chamber which opens or closes a 3" valve. The assembly is clamped between upper and lower pipe flanges.

Water Cannon Nozzles And Stream Shapers

Straight/Smooth Bore Nozzle



A cone shaped 1.5" diameter nozzle that directs water flow. The nozzle has a built in stream shaper that smooths water flow to increase water stream distance.

Straight/Smooth Bore (Stackable)



A segmented cone shaped nozzle that directs water flow. The nozzle opening is adjusted by removing segments to acquire the most efficient nozzle opening for a given water pump operating pressure. Nozzle segment diameters are 1", 1½", 1¾" and 2". The nozzle requires

and in-line stream shaper to increase water stream distance.

SECTION 2

System Description

In-Line Stream Shaper



A performance enhancer that is mounted between the water cannon outlet and the selected straight bore nozzle. The stream shaper pathway is a honeycomb style channel designed to efficiently shape a water stream to maximum water stream distance.

Manual Adjustable Nozzle



FOG/STREAM: A modified straight bore nozzle that allows the operator to manually adjust selected water stream patterns from fog to stream. Some nozzles are configured for fire suppression foam education.

FAN/STREAM: A modified straight bore nozzle that allows the operator to manually adjust selected water stream patterns from flat fan to stream. The flat fan pattern orientation is adjustable from horizontal to vertical by reorienting the nozzle on the water cannon.

Remote Adjustable Nozzle (Electric/Hydraulic)



A modified straight bore nozzle that allows the operator to remotely adjust selected water stream patterns from fog to stream from the cab control. The nozzle inner or outer barrel is moved by an electric or hydraulic actuator to obtain the fog or stream pattern. Some nozzles are configured for fire suppression foam education.

Fan/Stream



A modified straight bore nozzle that allows the operator to remotely adjust selected water stream patterns from flat fan to stream from the cab control. The nozzle inner or outer barrel is moved by an electric actuator to obtain the fan or stream pattern. The flat fan pattern orientation is adjustable from horizontal to vertical by reorienting the nozzle on the monitor.

SPRAY SYSTEM

The spray head system consists of 4, 6 or 8 hydraulic or pneumatic actuated spray heads, cab controls, solenoid control box assembly and hydraulic or pneumatic hosing.

Pneumatic Spray Head



A two piece aluminum valve body and adjustable ring mounted to a water supply header pipe. The upper portion of the valve body is an air chamber with a diaphragm and guide disk assembly attached to the bottom. The air chamber receives pressurized air from the solenoid control box as commanded by the cab control switch. When the upper portion of the valve body is pressurized the guide disk will seal the opening on the lower portion of the valve and stop water flow.

When the cab control system is OFF and the water pump is OFF the air chamber incorporates a spring that will apply pressure to the guide disk assembly and seal the opening on the lower portion of the valve and stop flow. When air pressure is removed from the upper portion of the valve body when the water pump is ON and the cab control switch ON, pressurized water from the header pipe will unseat the guide disk and water will flow from the lower portion of valve.

SECTION 2

System Description

Hydraulic Spray Head

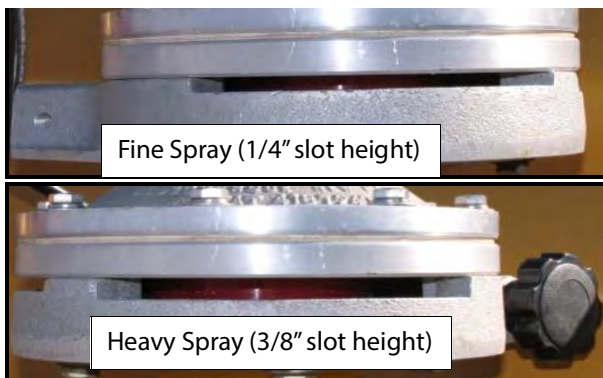


A two piece aluminum valve body, hydraulic cylinder and adjustable ring mounted to a water supply header pipe. The upper portion of the valve body contains a hydraulic cylinder that receives hydraulic pressure from the system solenoid control box as commanded by the cab control switch. When the hydraulic cylinder on the upper portion of the valve body is pressurized, the cylinder extends to contact the guide disk and seal the opening on the lower portion of the valve and stop water flow.

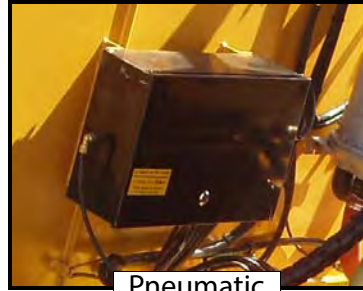
When the cab control system is OFF and the water pump is OFF the upper valve body incorporates a spring to apply pressure to the guide disk to seal the opening on the lower portion of the valve and stop flow. When the spray head switch is turned on, hydraulic pressure retracts the hydraulic cylinder and pressurized water from the header pipe will unseat the guide disk and water will flow from the lower portion of valve.

Spray Head Adjustable Rings

The adjustable ring is used to control fan width and water flow. The ring may be loosened and rotated to expose more or less of the lower valve opening to control water fan width from 15° (narrow fan width) to 90° (full fan width). The ring also may be used rotated to a fine spray (1/4" slot height) or heavy spray (3/8" slot height) as shown below to increase or decrease overall water flow. The greater the opening, the greater the water flow.



Solenoid Control Box



The control box assembly is mounted to the forward bulkhead or top skin of the MTT. The assembly contains pneumatic or hydraulic solenoid valves that direct pneumatic or hydraulic pressure to the spray head as commanded by the cab control box. The solenoids receive pneumatic pressure from the vehicle or hydraulic pressure from water pump oil circuit and 24 VDC power from the cab control box.

DUMP BAR



The dump bar is a pipe suspended below the main spray bar at the rear of the water tank that has 1 row (pressure dump bar) or 2 rows (gravity dump bar) of 3/8 inch holes drilled in the bottom. This bar may be pressurized from the water pump or gravity fed from the sump of the tank. A hydraulically operated butterfly valve controls the water supply to the dump bar. The BFV is controlled electrically from the cab control box and is actuated by a hydraulic cylinder. The actuators receive hydraulic pressure from the solenoid control box assembly. Dump bars can be either gravity or pressure fed.

SECTION 2

System Description

HOSE REEL



A reel assembly that is located on the bottom aft end of the water tank fitted with a 1" or 1.5" diameter reinforced rubber hose and a fire fighting style nozzle. The hose reel assembly receives pressurized water from the pressurized manifold on the back of the tank to operate.

TANK DRAIN



A hydraulic BFV attached to the water tank pressure pipe is used to drain water from the water tank. The BFV is controlled electrically from the cab control box and is actuated by a hydraulic actuator. The actuators receive hydraulic pressure from the solenoid control box assembly. Tank drains can be either gravity or pressure fed.

FIRE SUPPRESSION SYSTEM

A system that consists of a 120 or 60 gallon stainless steel holding tank, an electric or pneumatic actuated shut-off valve, in-cab control switch, hosing and a foam education nozzle mounted to the water cannon.

Foam Concentrate Tank



A stainless steel tank mounted in the forward upper portion of the water tank. The holding tank contains a supply tube that extends to the bottom of the tank and connected to a flexible hose at the top of the tank and then routed to the foam agent shut-off valve. The tank also contains a pressure/vacuum cap which keeps foreign matter out of the tank while providing for pressure relief and air displacement during temperature changes.

Electric/Pneumatic Shut-off Valve

The in-line shut-off valve is mounted on the foam tank upper lip and is controlled by the in-cab control FOAM switch. The shut-off valve is actuated by either an electric or pneumatic actuator that is controlled by the in-cab control switch. Once the shut-off valve is opened, foam concentrate will flow from the holding tank to the water cannon nozzle if the water cannon and water pump switches are ON.

Foam Education Nozzle



A manual or remote adjustable (fog/stream) nozzle is attached to the water cannon waterway. The nozzle inner housing uses monitor high pressure water to create a venture effect that will create a suction force that pulls foam concentrate from the holding tank. Once foam concentrate is flowing, the nozzle proportions foam concentrate, water and air to produce finished foam. The nozzle can be adjusted to allow control of foam solution at a rate of 1%, 3% or 6%. Rate adjustment is obtained by replacing a removable disk.

SECTION 2

System Description

WATER CIRCULATION SYSTEM

A system that consists of a hydraulic butterfly valve assembly and a perforated 4" pipe located inside the water tank. The system diverts the flow of water from the spray system to the perforated pipe, circulating the water in the tank. The circulation valve must be closed to operate the spray system, and water cannon.

SUCTION LOADING (IF EQUIPPED)



A second water pump mounted typically to the water pump sump at the rear of the MTT. The suction loading station is equipped with a manual diversion valve that will switch the hydraulic oil flow from the main discharge pump drive motor to the suction loading pump drive motor. When oil is diverted to the suction loading drive motor it can pull water from a holding pond and fill the MTT. The suction loading option includes lengths of 4" suction hose equipped with quick couplers and a check valve inlet foot with a debris screen. The suction hoses are typically stored in tubes either built into the MTT or a hanging tube arrangement.

SECTION 3 Limitations

Contents

Water Pump.....3-1

WATER PUMP

The following cautions are operational limitations of Mega water pumps. Failure to heed these cautions may result in reduced pump life and severe water pump damage.

CAUTION

- Do not operate the water pump in a dry sump. Operating the water pump with a dry sump will result in water pump component damage and reduced service life.
- Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.
- Limit water pump operation to 2.5 minutes when in a no-flow condition (not flowing water through spray heads, dump bar, water cannon, drain valve or hose reel). Water pump operation in a no flow condition will cause overheating of the water pump and damage to the shaft bearings and seals.
- Avoid any sudden stoppage of water pump e.g.; disengaging water pump above LOW IDLE. Stopping water pump suddenly above LOW IDLE will result in shaft, impeller and drive motor damage.

CAUTION

Water pump RPM must not exceed the specifications listed below with engine at HIGH IDLE. Failure to ensure water pump speed is at or below specifications will result in reduced spray system component service life.

PUMP MODEL	RPM
M-4 PUMP	1,900 ± 50
B-4 PUMP	1,950 ± 50
M-4B PUMP	1,950 ± 50

If water pump RPM is to out of the desired range, adjust the water pump hydraulic drive motor flow control valve to obtain specified RPM.

NOTE

The suction loading pump has a maximum vertical lift capability of 8-10 feet. Attempting to pump water into the tank from a reservoir that is more than 8-10 feet below the pump station will result in reduced suction loading performance.

SECTION 3
Limitations

SECTION 4 Normal Operations

Contents

Description	4-1	After Operations	4-7
Before Operations	4-1	Cold Weather Operations And Storage	4-8
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DESCRIPTION

This section provides the vehicle operator with step by step operating procedures for the installed system. The information is separated into before operations, operations and after operations. A pocket size checklist of all listed procedures is also provided in the Appendix for use in the vehicle cab.

A pocket size Operator’s Checklist of all MAC/MTT procedures is contained in the Appendix for use in the vehicle cab.

NOTE

Place a copy of the Appendix Operator’s Checklist within the cab for daily use.

BEFORE OPERATIONS

These procedures are used to perform a walk-around inspection of the MEGA water tanker system before use or the beginning of a shift. This inspection is in addition to and does not replace the vehicle manufacturer’s inspection requirements.

1. Chocks – As Required
2. Vehicle Parking Brake – ON
3. Cab Control Switches – SET OFF
4. **(If Equipped)** Foam Concentrate Level – CHECKED. At least 1” from the top of the foam tank.

⚠ WARNING

Ensure PPE fall arrest harness is worn, adjusted properly and attached to an anchor point. Failure to use PPE properly may result in personnel injury or death.

5. Water Cannon – CHECKED & SECURED
 - a. Nozzle – Check for security and kinking of foam concentrate supply line.
6. Solenoid Control Box – CHECKED AND SECURED
7. MAC/MTT Front Mounts – CHECKED AND SECURE
8. Vehicle Hydraulic Tank – SERVICED
9. MAC/MTT LH Hydraulic Hoses and Cabling – CHECKED FOR SECURITY & LEAKS.
10. Chassis Pivot Bore Pins – INSTALLED AND SECURED
11. Tank Drain Petcocks – CLOSED
12. Spray Heads – SECURED & ADJUSTED FOR APPLICATION
13. Water Pump Assembly – CHECKED
 - a. Water Pump – Check to ensure volute case drain valve is closed.
 - b. Water pump and drive motor for evidence of overheating.
14. Hose Reel – CHECKED
15. **(Rear Bulkhead Location Only)** Solenoid Control Box – CHECKED.
16. MAC/MTT RH Hydraulic Hosing & Cabling – CHECKED FOR SECURITY AND LEAKS.
17. **(If Equipped)** Front Bumper Spray Heads & Plumbing – SECURED AND SET.

SECTION 4

Normal Operations

OPERATIONS

Use these procedures to safely operate the standard and optional systems installed on the MEGA water tanker.

CAUTION

Limit water pump operation to 2.5 minutes when in a no-flow condition (not flowing water through spray heads, dump bar, monitor, drain valve or hose reel). Water pump operation in a no flow condition will cause overheating of the water pump and damage to the shaft bearings and seals.

Spray Head System

NOTE

Operating more than 4 spray heads simultaneously will greatly reduce the width and flow of active spray heads.

1. Cab Control SYSTEM/POWER Switch – ON
2. INTERMITTENT TIMER – SET
 - a. TIMER ON/OFF Dials – SET
 - b. INTERMITTENT Switch – SET
3. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

4. Individual Spray Heads – SELECTED

Once operations are complete:

5. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

6. Cab Control SYSTEM/POWER Switch – OFF

GPS Auto Mode (DiSCS® 1.5)

When the chassis ignition switch is turned on, the GPS module will attempt to make a satellite connection. During this time, the AUTO light on the cab control box will blink until a satellite connection is established. If the AUTO light still blinks when the cab control POWER switch is turned ON, then the satellite connection has not yet been established. Connection may take up to 10 minutes.

1. Cab Control POWER Switch – ON
2. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

3. AUTO – SET AS REQUIRED
 - a. (GEN 1.5) F1 and F2 Dials – SET
 - b. AUTO Switch – ON
4. Individual Spray Head Switches – ON

Once operations are complete:

5. Individual Spray Head Switches – OFF
6. PUMP Switch – OFF

SECTION 4

Normal Operations

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

7. Cab Control POWER Switch - OFF

Dump Bar

1. Cab Control SYSTEM/POWER Switch – ON
2. INTERMITTENT – SET AS REQUIRED
 - a. TIMER ON/OFF Dials – SET
 - b. INTERMITTENT Switch – SET
3. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

4. DUMP Bar Switch – ON

Once operations are complete:

5. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

6. Cab Control SYSTEM/POWER Switch – OFF

Water Cannon

1. Cab Control SYSTEM/POWER Switch – ON
2. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

3. **(Multi Water Cannon)** Select desired water cannon to control. Only one water cannon can be controlled at any given time.
 - a. AUX 1 – ON to control the bumper/deck water cannon.
 - b. AUX 2 – ON to control the right rear water cannon.

NOTE

The joystick controls will be inactive for 4 seconds while switching between controlling different water cannons.

4. Water Cannon – Pointed in a safe direction.
5. MONITOR/BFV Switch – ON
6. Water Cannon Joystick – As Required.
7. MONITOR/BFV Switch – OFF

Once operations are complete:

8. Water Cannon Nozzle - STOW

CAUTION

Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on water cannon joints. Leaving the nozzle in any other position will cause increased wear on water cannon joints and result in premature joint failure.

SECTION 4

Normal Operations

9. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

10. Cab Control SYSTEM/POWER Switch – OFF

Fire Suppression System

1. Cab Control SYSTEM/POWER Switch – ON
2. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

3. Water Cannon – Pointed in a safe direction.
4. FOAM Switch – ON

CAUTION

(If equipped with multi water cannons)
Ensure that the FOAM switch is OFF before operating a different water cannon. Operating a water cannon with the foam switch on will cause damage to the water cannon and hydraulics.

5. MONITOR/BFV Switch – ON
6. Water Cannon Joystick – As Required.

Once operations are complete:

7. FOAM Switch – OFF

8. Water Cannon – Flow water through the monitor nozzle with the FOAM switch off to flush foam from the nozzle.

9. MONITOR/BFV Switch – OFF

10. Water Cannon Nozzle – STOW

CAUTION

Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on water cannon joints. Leaving the nozzle in any other position will cause increased wear on water cannon joints and result in premature joint failure.

11. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

12. Cab Control SYSTEM/POWER Switch – OFF

13. Vehicle – Wash or fresh water rinse areas exposed to the foam spray.

Tank Drain

1. Cab Control SYSTEM/POWER Switch – ON
2. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

3. DRAIN Switch – ON

SECTION 4

Normal Operations

4. Water Level – Drain to desired level.

CAUTION

Do not operate the water pump in a dry sump. Dry operation will result in shaft seal damage.

Once operations are complete:

5. DRAIN Switch – OFF
6. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

7. Cab Control SYSTEM/POWER Switch – OFF

Hose Reel

1. Hose Nozzle – CLOSED
2. Hose – Deploy desired length.
3. Gate Valve – OPEN
4. Cab Control SYSTEM/POWER Switch – ON
5. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

6. Vehicle RPM – SET
7. Hose Nozzle – OPEN as desired.

Once operations are complete:

8. Hose Nozzle – CLOSE
9. Vehicle RPM – LOW IDLE
10. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

11. (If Equipped) Cab Control SYSTEM/POWER Switch- OFF
12. Gate Valve – CLOSED
13. Hose – Reel in and stow hose nozzle.

Water Circulation System

1. Fill water tank with appropriate fluid.
2. Start engine.
3. Cab Control SYSTEM/POWER Switch – ON.
4. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

5. DRAIN Switch – ON. (Opens BFV that allows water pressure to mix water tank contents)

Once operations are complete:

6. DRAIN Switch – OFF.

SECTION 4 Normal Operations

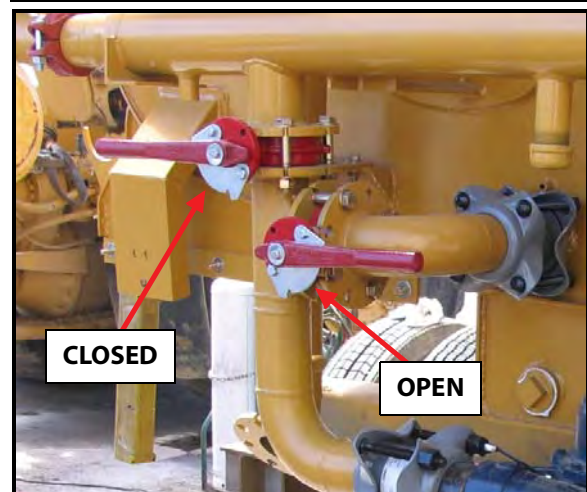
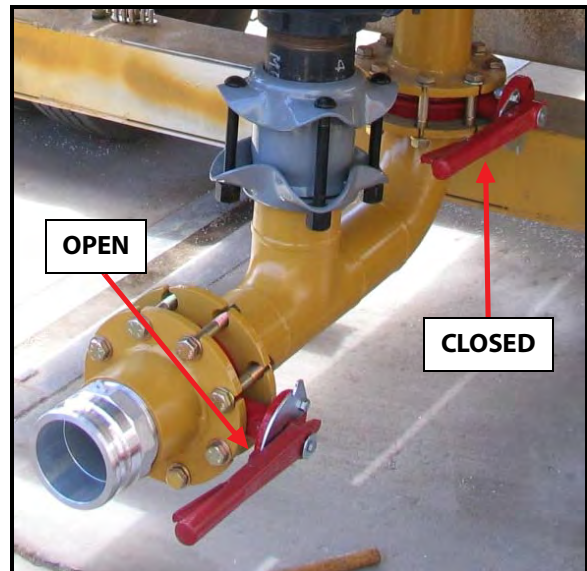
NOTE

Keep the switch ON until water cannon or spray system is used to flow the water mixture. If switch is left ON, circulation system will significantly reduce water cannon reach.

7. PUMP Switch – OFF
8. SYSTEM/POWER Switch – OFF

Suction Load Station

1. Place vehicle near water holding pond.
2. Secure vehicle and make unit safe for exiting cab.
3. Foot Valve – Serviceable
4. Suction Hoses – Inspect suction hoses for serviceability. Ensure suction hoses are connected properly to each other and the suction load inlet to prevent air leaks while in use.
5. Suction Hoses – Immerse in pond or water supply.
6. Position all butterfly valves as indicated in the following pictures and in the order as follows:
 - a. SUMP VALVE - **CLOSE**
 - b. SUCTION VALVE - **OPEN**
 - c. SPRAY BAR VALVE - **CLOSE**
 - d. TANK FILL VALVE - **OPEN**



NOTE

Opening and closing valves in this sequence allows the water in the suction loading sump built inside of the tank to flood the water pump and suction hose. This will allow water pump to lift water from pond.

SECTION 4

Normal Operations

7. Ensure water pump and suction hoses are full of water before operating pump.

CAUTION

Do not operate the water pump in a dry sump. Dry operation will result in shaft seal damage.

8. Ensure foot valve remains submerged in water.
9. Start chassis engine.
10. At LOW IDLE turn SYSTEM/POWER switch ON.
11. (DiSCS® Only) AUX2 - ON
12. Turn PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

13. Increase engine RPM to HIGH IDLE.

When unit is full of water

14. Reduce engine RPM to LOW IDLE.
15. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

16. AUX2 - OFF
17. SYSTEM/POWER Switch OFF.
18. Turn engine OFF.
19. Disconnect, drain and stow suction hoses.

AFTER OPERATIONS

These procedures are used to perform a walk-around inspection after using the MEGA water tanker systems. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Vehicle parking brake – ON
2. Cab Control Switches – SET OFF
3. Chocks – As Required
4. Water Cannon – CHECKED & SECURED
5. Vehicle Hydraulic Tank - CHECKED
6. Tank Lines and Hoses – SECURED
7. Tank Drain Petcocks – As Required.
8. Spray Heads – SECURED & SET
9. Water Pump – CHECKED
 - a. Water Pump – Check for damage and volute case drain valve set as required.
10. Hose Reel – CHECKED
11. Solenoid Control Box – CHECKED

SECTION 4

Normal Operations

COLD WEATHER OPERATIONS AND STORAGE

CAUTION

Ensure all water is drained from system when the temperatures are expected to fall below 4.4°C (40°F) for any period of time. Failure to ensure all systems are drained and free from standing water will result in ice formation, which will cause serious damage to shaft, operator, diaphragm, drive motor, water pump, or butterfly valve.

To ensure all water is drained from tank check the following:

1. Park unit on a slight nose up angle to allow water to flow to the rear of the tank.
2. Drain the tank using an appropriate method until the Water Level Gauge reads EMPTY.
3. Open all drain petcocks (water pump, suction load pump, rear spray bar, front spray bar, etc.).
4. Remove water pump sump cover.
5. Start engine.
6. Cab Control SYSTEM/POWER Switch – ON
7. MONITOR/BFV Switch – ON
8. DUMP BAR Switch – ON
9. DRAIN Switch – ON
10. Water Cannon Nozzle – Pointed fully DOWN
11. Cab Control SYSTEM/POWER Switch – OFF
12. Turn engine off.

13. Hose Reel – DRAIN
 - a. Hose – UNWIND
 - b. Nozzle – Fully OPEN
 - c. Gate Valve – OPEN
 - d. Allow water to drain.
 - e. Hose – REWIND
 - f. Gate Valve – CLOSED
 - g. NOZZLE – CLOSED
14. Check to ensure all water has drained from tank.

Unit Reactivation

1. Lubricate water pump bearings as instructed in -2 technical manual.
2. Inspect tank interior to ensure it is clean, if the tank is coated, ensure coating integrity, clean or repair as required.
3. Install sump cover with new gasket.
4. Close all drain valves and petcocks.
5. Start engine.
6. Control SYSTEM/POWER Switch – ON
7. Individual Spray Head Switches – OFF
8. DUMP BAR Switch – OFF
9. DRAIN Switch – OFF
10. MONITOR/BFV Switch – OFF
11. Cab Control SYSTEM/POWER Switch – OFF
12. Turn engine off.

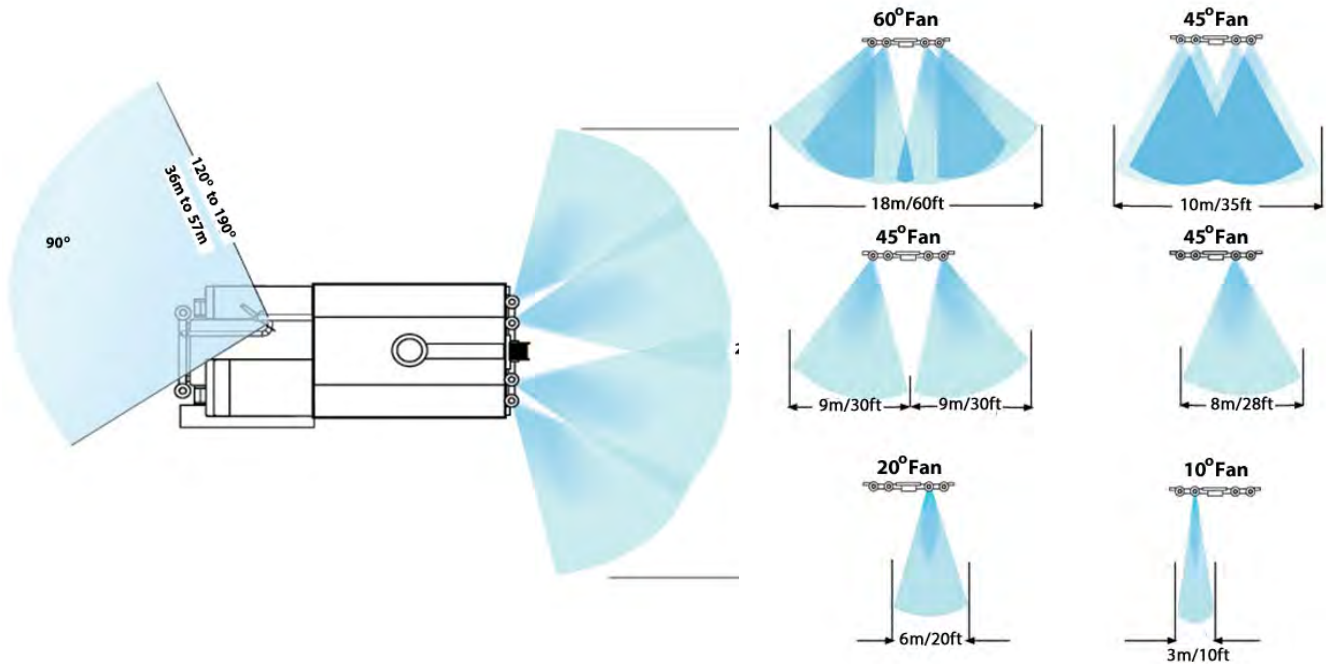
SECTION 5 Performance

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Spray Pattern And Reach (Typical)	5-1	Precision Watering	5-3
Typical Spray Distance	5-1	Fire Suppression System	5-12
Typical Spray Duration and Flow	5-2		

SPRAY PATTERN AND REACH (TYPICAL)

The figures below illustrate the typical width and reach of spray heads and water cannon. Typical spray head deflector fan adjustments are also depicted.



TYPICAL SPRAY DISTANCE

The table below contains a standard vehicle spray duration based on spray head deflector opening, vehicle speed and 75,708 liter (20,000 gallon) capacity.

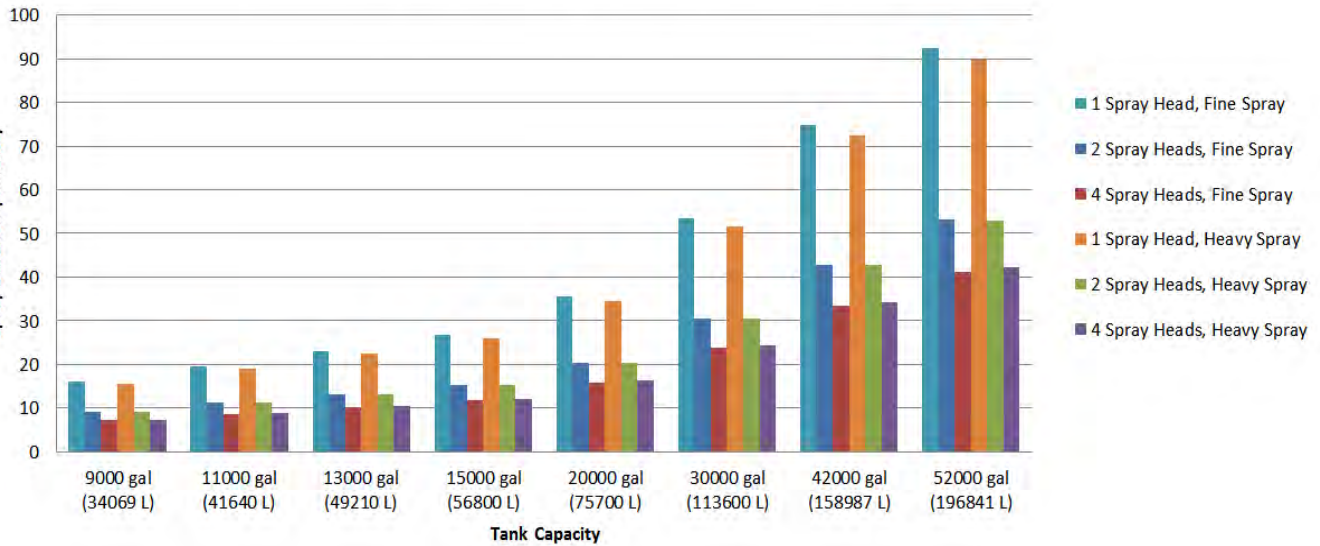
Number of Spray Heads and Opening Height	LPM/GPM	Ground Speed (KPH/MPH)	Max. Distance (Km./Miles)
2 Spray Heads, Fine Spray (1/4" Slot Height)	3611/954	16/10	5.6/3.5
2 Spray Heads, Fine Spray (1/4" Slot Height)	3611/954	24/15	8.3/5.2
2 Spray Heads, Heavy Spray (3/8" Slot Height)	4705/1243	16/10	4.3/2.7
2 Spray Heads, Heavy Spray (3/8" Slot Height)	4705/1243	24/15	6.4/4.0
4 Spray heads, Fine Spray (1/4" Slot Height)	5693/1504	16/10	3.5/2.2
4 Spray heads, Fine Spray (1/4" Slot Height)	5693/1504	24/15	5.3/3.3
4 Spray heads, Heavy Spray (3/8" Slot Height)	5950/1572	16/10	3.3/2.1
4 Spray heads, Heavy Spray (3/8" Slot Height)	5950/1572	24/15	5.1/3.2

SECTION 5 Performance

TYPICAL SPRAY DURATION AND FLOW

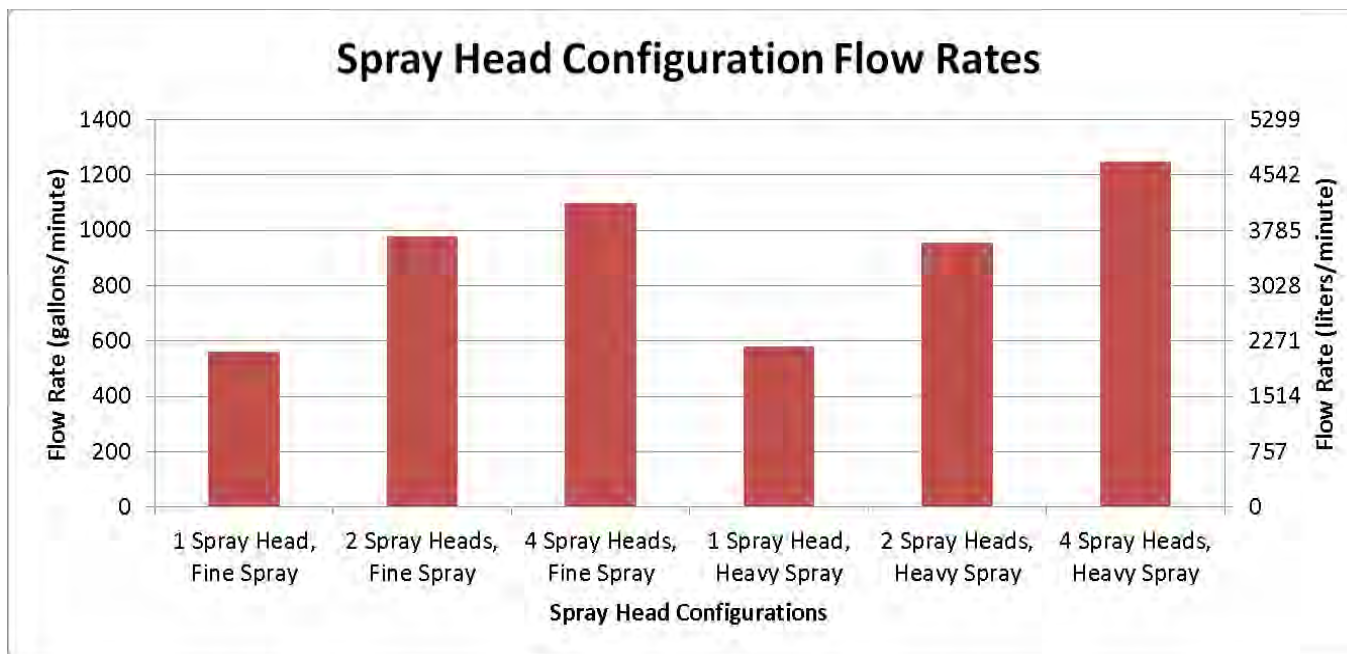
Duration

Approximate Spray Duration (MTT)



Estimated spray duration for various capacity tanks with four different spray head configurations. Spray duration in minutes is shown on the vertical axis. The 'fine' setting is 1/4 inches in height, and the 'heavy' setting is 3/8 inches in height.

Flow Rates



Total flow rates of different spray head configurations. The approximate total flow rates in gallons/minute (left vertical axis) and liters/minute (right vertical axis) of four possible spray head configurations. The 'fine' setting is 1/4 inches in height, and the 'heavy' setting is 3/8 inches in height.

SECTION 5 Performance

PRECISION WATERING

The following tables provide precision watering calculations for the installed spray system. Each table is categorized by size of spray head deflector opening at a full fan width for 2 or 4 spray heads.

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (34,068 lit/9,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	1660	137811	0.065	0.105	1053	78989	0.114	0.183
	5	440	4151	344528	0.026	0.042	2633	197473	0.046	0.073
	10	880	8302	689057	0.013	0.021	5266	394947	0.023	0.037
	15	1320	12453	1033585	0.009	0.014	7899	592420	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	500	12501	2.725	2.67	317	7295	4.670	4.65
	8	134	1264	31606	1.078	1.07	802	18443	1.847	1.84
	16	268	2528	63211	0.539	0.53	1604	36887	0.924	0.94
	24	402	3793	94817	0.359	0.35	2406	55330	0.616	0.61

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (34,068 lit/9,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	1274	99398	0.091	0.145	1008	65496	0.137	0.220
	5	440	3186	248496	0.036	0.058	2519	163740	0.055	0.088
	10	880	6372	496991	0.018	0.029	5038	327481	0.027	0.044
	15	1320	9558	745487	0.012	0.019	7557	491221	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	384	9210	3.699	3.68	303	6069	5.613	5.59
	8	134	970	23286	1.463	1.47	767	15345	2.220	2.23
	16	268	1941	46573	0.731	0.74	1534	30690	1.110	1.11
	24	402	2911	69859	0.488	0.48	2302	46035	0.740	0.74

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (41639 lit/11,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	2029	168436	0.065	0.105	1287	96543	0.114	0.183
	5	440	5073	421090	0.026	0.042	3218	241356	0.046	0.073
	10	880	10147	842180	0.013	0.021	6436	482713	0.023	0.037
	15	1320	15220	1263270	0.009	0.014	9654	724069	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	611	15279	2.725	2.67	388	8916	4.670	4.65
	8	134	1545	38629	1.078	1.07	980	22542	1.847	1.84
	16	268	3090	77259	0.539	0.53	1960	45084	0.924	0.94
	24	402	4636	115888	0.359	0.35	2940	67626	0.616	0.61

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (41639 lit/11,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	1558	121487	0.091	0.145	1232	80051	0.137	0.220
	5	440	3894	303717	0.036	0.058	3079	200127	0.055	0.088
	10	880	7788	607434	0.018	0.029	6158	400254	0.027	0.044
	15	1320	11681	911150	0.012	0.019	9237	600382	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	469	11257	3.699	3.68	371	7418	5.613	5.59
	8	134	1186	28461	1.463	1.47	938	18755	2.220	2.23
	16	268	2372	56923	0.731	0.74	1876	37510	1.110	1.11
	24	402	3558	85384	0.488	0.48	2813	56265	0.740	0.74

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (49,210 lit/13,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	2398	199061	0.065	0.105	1521	114096	0.114	0.183
	5	440	5996	497652	0.026	0.042	3803	285239	0.046	0.073
	10	880	11992	995304	0.013	0.021	7606	570479	0.023	0.037
	15	1320	17987	1492956	0.009	0.014	11410	855718	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	722	18057	2.725	2.67	458	10537	4.670	4.65
	8	134	1826	45653	1.078	1.07	1158	26641	1.847	1.84
	16	268	3652	91306	0.539	0.53	2317	53281	0.924	0.94
	24	402	5478	136959	0.359	0.35	3475	79922	0.616	0.61

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (49,210 lit/13,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	1841	143575	0.091	0.145	1455	94606	0.137	0.220
	5	440	4602	358938	0.036	0.058	3639	236514	0.055	0.088
	10	880	9204	717876	0.018	0.029	7277	473028	0.027	0.044
	15	1320	13805	1076814	0.012	0.019	10916	709542	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	554	13304	3.699	3.68	438	8767	5.613	5.59
	8	134	1402	33636	1.463	1.47	1108	22165	2.220	2.23
	16	268	2803	67273	0.731	0.74	2217	44330	1.110	1.11
	24	402	4205	100909	0.488	0.48	3325	66496	0.740	0.74

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (56,781 lit/15,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	2767	229686	0.065	0.105	1755	131649	0.114	0.183
	5	440	6918	574214	0.026	0.042	4388	329122	0.046	0.073
	10	880	13836	1148428	0.013	0.021	8777	658245	0.023	0.037
	15	1320	20755	1722642	0.009	0.014	13165	987367	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	833	20835	2.725	2.67	529	12158	4.670	4.65
	8	134	2107	52677	1.078	1.07	1336	30739	1.847	1.84
	16	268	4214	105354	0.539	0.53	2673	61479	0.924	0.94
	24	402	6321	158031	0.359	0.35	4009	92218	0.616	0.61

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (56,781 lit/15,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	2124	165664	0.091	0.145	1679	109160	0.137	0.220
	5	440	5310	414159	0.036	0.058	4198	272901	0.055	0.088
	10	880	10619	828319	0.018	0.029	8397	545802	0.027	0.044
	15	1320	15929	1242478	0.012	0.019	12595	818702	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	640	15351	3.699	3.68	506	10116	5.613	5.59
	8	134	1617	38811	1.463	1.47	1279	25575	2.220	2.23
	16	268	3234	77623	0.731	0.74	2558	51151	1.110	1.11
	24	402	4851	116434	0.488	0.48	3836	76726	0.740	0.74

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (75,708 lit/20,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	3690	306247	0.065	0.105	2340	175532	0.114	0.183
	5	440	9224	765618	0.026	0.042	5851	438830	0.046	0.073
	10	880	18449	1531237	0.013	0.021	11702	877660	0.023	0.037
	15	1320	27673	2296855	0.009	0.014	17553	1316489	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	1111	27780	2.725	2.67	705	16211	4.670	4.65
	8	134	2809	70236	1.078	1.07	1782	40986	1.847	1.84
	16	268	5619	140472	0.539	0.53	3564	81972	0.924	0.94
	24	402	8428	210708	0.359	0.35	5346	122957	0.616	0.61

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (75,708 lit/20,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	2832	220885	0.091	0.145	2239	145547	0.137	0.220
	5	440	7080	552212	0.036	0.058	5598	363868	0.055	0.088
	10	880	14159	1104425	0.018	0.029	11196	727735	0.027	0.044
	15	1320	21239	1656637	0.012	0.019	16794	1091603	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	853	20468	3.699	3.68	674	13487	5.613	5.59
	8	134	2156	51749	1.463	1.47	1705	34100	2.220	2.23
	16	268	4312	103497	0.731	0.74	3410	68201	1.110	1.11
	24	402	6469	155246	0.488	0.48	5115	102301	0.740	0.74

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (113562 lit/30,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	5535	459371	0.065	0.105	3511	263298	0.114	0.183
	5	440	13836	1148428	0.026	0.042	8777	658245	0.046	0.073
	10	880	27673	2296855		0.021	17553	1316489	0.023	0.037
	15	1320	41509	3445283	0.009	0.014	26330	1974734	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	1667	41670	2.725	2.67	1057	24316	4.670	4.65
	8	134	4214	105354	1.078	1.07	2673	61479	1.847	1.84
	16	268	8428	210708	0.539	0.53	5346	122957	0.924	0.94
	24	402	12642	316062	0.359	0.35	8019	184436	0.616	0.61

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (113562 lit/30,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	4248	331327	0.091	0.145	3359	218321	0.137	0.220
	5	440	10619	828319	0.036	0.058	8397	545802	0.055	0.088
	10	880	21239	1656637	0.018	0.029	16794	1091603	0.027	0.044
	15	1320	31858	2484956	0.012	0.019	25191	1637405	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	1279	30702	3.699	3.68	1012	20231	5.613	5.59
	8	134	3234	77623	1.463	1.47	2558	51151	2.220	2.23
	16	268	6469	155246	0.731	0.74	5115	102301	1.110	1.11
	24	402	9703	232868	0.488	0.48	7673	153452	0.740	0.74

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (132489 lit/35,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	6457	535933	0.065	0.105	4096	307181	0.114	0.183
	5	440	16143	1339832	0.026	0.042	10239	767952	0.046	0.073
	10	880	32285	2679665	0.013	0.021	20479	1535904	0.023	0.037
	15	1320	48428	4019497	0.009	0.014	30718	2303856	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	1945	48615	2.725	2.67	1233	28369	4.670	4.65
	8	134	4917	122913	1.078	1.07	3118	71725	1.847	1.84
	16	268	9833	245826	0.539	0.53	6237	143450	0.924	0.94
24	402	14750	368738	0.359	0.35	9355	215175	0.616	0.61	

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (132489 lit/35,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	4956	386549	0.091	0.145	3919	254707	0.137	0.220
	5	440	12389	966372	0.036	0.058	9796	636768	0.055	0.088
	10	880	24779	1932743	0.018	0.029	19593	1273537	0.027	0.044
	15	1320	37168	2899115	0.012	0.019	29389	1910305	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	1492	35818	3.699	3.68	1180	23603	5.613	5.59
	8	134	3773	90560	1.463	1.47	2984	59676	2.220	2.23
	16	268	7547	181120	0.731	0.74	5968	119351	1.110	1.11
24	402	11320	271680	0.488	0.48	8951	179027	0.740	0.74	

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (158,988 lit/42,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	7748	643119	0.065	0.105	4915	368617	0.114	0.183
	5	440	19371	1607799	0.026	0.042	12287	921543	0.046	0.073
	10	880	38742	3215597	0.013	0.021	24574	1843085	0.023	0.037
	15	1320	58113	4823396	0.009	0.014	36862	2764628	0.015	0.024
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	2334	58338	2.725	2.67	1480	34043	4.670	4.65
	8	134	5900	147496	1.078	1.07	3742	86071	1.847	1.84
	16	268	11800	294993	0.539	0.53	7484	172142	0.924	0.94
	24	402	17700	442489	0.359	0.35	11227	258212	0.616	0.61

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (158,988 lit/42,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	5947	463858	0.091	0.145	4702	305649	0.137	0.220
	5	440	14867	1159646	0.036	0.058	11756	764122	0.055	0.088
	10	880	29735	2319292	0.018	0.029	23511	1528244	0.027	0.044
	15	1320	44602	3478938	0.012	0.019	35267	2292366	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	1791	42983	3.699	3.68	1416	28324	5.613	5.59
	8	134	4528	108673	1.463	1.47	3581	71611	2.220	2.23
	16	268	9056	217346	0.731	0.74	7161	143223	1.110	1.11
	24	402	13584	326018	0.488	0.48	10742	214834	0.740	0.74

SECTION 5 Performance

FINE SPRAY (1/4" SLOT HEIGHT) & FULL FAN (196,841 lit/52,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 3611 lpm/954 gpm)				4 SPRAY HEADS (FLOW 5693 lpm/1504 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	9339	775118	0.067	0.108	8320	624000	0.083	0.134
	5	440	23347	1937796	0.027	0.043	20800	1560000	0.033	0.053
	10	880	46694	3875592	0.013	0.022	41600	3120000	0.017	0.027
	15	1320	70041	5813388	0.009	0.014	62400	4680000	0.011	0.018
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	2755	68877	2.800	2.67	2455	56454	3.416	3.42
	8	134	6966	174143	1.107	1.07	6206	142734	1.351	1.35
	16	268	13931	348285	0.554	0.53	12412	285467	0.676	0.68
	24	402	20897	522428	0.369	0.35	18617	428201	0.450	0.45

HEAVY SPRAY (3/8" SLOT HEIGHT) & FULL FAN (196,841 lit/52,000 gal TANK)

SPEED		2 SPRAY HEADS (FLOW 4705 lpm/1243 gpm)				4 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)				
		SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	
		(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	
MPH	FPM									
U S	2	176	7363	574301	0.091	0.145	5822	378422	0.137	0.220
	5	440	18407	1435752	0.036	0.058	14555	946056	0.055	0.088
	10	880	36814	2871504	0.018	0.029	29109	1892112	0.027	0.044
	15	1320	55221	4307257	0.012	0.019	43664	2838168	0.018	0.029
M E T R I C	KPM	MPM	(METER)	(M SQ)	(L/M SQ)	(MM)	(METERS)	(M SQ)	(M/M SQ)	(MM)
	3	53	2172	52135	3.699	3.68	1718	34355	5.613	5.61
	8	134	5492	131812	1.463	1.47	4343	86859	2.220	2.22
	16	268	10984	263625	0.731	0.74	8686	173719	1.110	1.11
	24	402	16477	395437	0.488	0.48	13029	260578	0.740	0.74

SECTION 5

Performance

FIRE SUPPRESSION SYSTEM

The table below shows consumption rates and duration of foam suppression concentrate and water based upon a standard flow rate 1893 lpm/500 gpm and 3% foam proportioning.

Foam Concentrate liters/gallons	Water liters/gallons	Duration
57/15	1893/500	1 minute
114/30	3786/1000	2 minutes
228/60	7571/2000	4 minutes
341/90	11,357/3000	6 minutes
455/120	15,142/4000	8 minutes

SECTION 6 Employment

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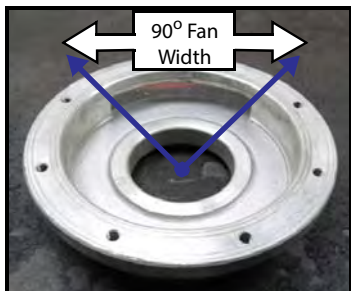
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DESCRIPTION

This section provides descriptions, guidance, and techniques used when employing the MEGA spray system features. These best practices will provide operators with several different choices that will result in maximum system performance in most applications with ever changing conditions.

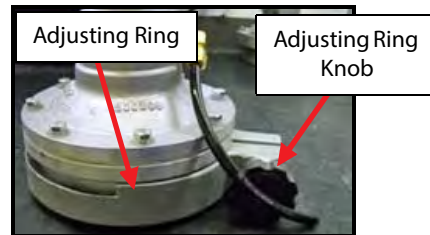
SPRAY HEADS

Spray head adjustment and fine tuning techniques are key factors in optimizing water distribution and preventing over-watering of roadways. The MEGA spray heads are mounted to base plate assemblies connected to the water discharge piping. MEGA spray heads can be rotated on the base plate to direct the discharge fan in the necessary directions for optimum spray pattern. The spray heads incorporate an adjustable ring to control the spray intensity and fan width. The opening in the base of the MEGA spray head will allow for approximately a 90° maximum fan width as illustrated below.



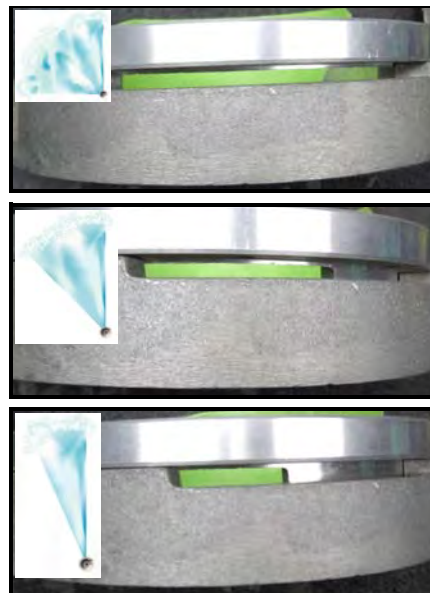
Fan Width And Spray Intensity Adjustment

The spray head adjusting ring is used to control the fan width and spray intensity to match most applications. These settings can be changed by first loosening the adjusting ring knob and then rotating the adjusting ring to the desired position.



The following images are examples of the adjustment ring at the "fine spray" setting with varying fan widths. The "fine spray" setting is typically used for reduced water volumes and a larger pattern, and is best suited for lower vehicle speeds and low water pump rpm.

Fine Spray (1/4" Slot Height)

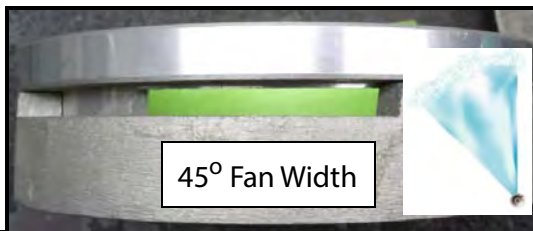
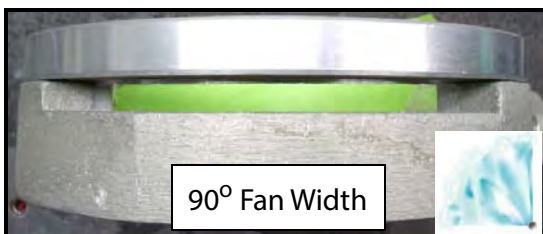


SECTION 6 Employment

NOTE

Adjusting the ring for narrower fan widths will increase the length of the spray pattern; this may also increase the closure delay of the spray head. The "fine spray" setting produces smaller water droplets ideal for low wind and high humidity conditions. The following images are examples of the adjustment ring at the "heavy spray" setting with varying fan widths.

Heavy Spray (3/8" Slot Height)



The "heavy spray" setting is typically used for heavy watering and discharging large quantities of water a short distance from spray head, and is best suited for higher vehicle speeds and high engine rpm. When the spray head is set for "heavy spray",

NOTE

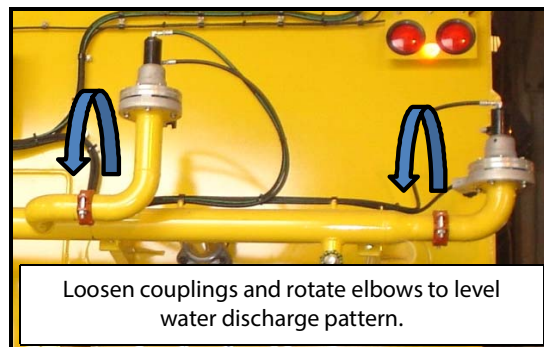
water pressure is decreased and the reach of the discharge is reduced.

- The heavy spray setting produces larger water droplets ideal for high wind and low humidity conditions.
- When more than 2 spray heads are operated at the same time, the performance of the spray system is reduced.

Spray Head Vertical Tilt Adjustment

Swivel joints are an optional feature for spray head mounting. The joint allows the spray head to be tilted up or down to suit a given application. In their default positions, the spray heads discharge water at an angle of 10° above level. This results in more uniform droplet formation and subsequent water coverage. However, in drier climates or high wind conditions where evaporation is a significant source of water loss, it may be desirable to adjust the tilt of the spray heads towards the ground, thus reducing the amount of water lost to the effects of wind and low humidity.

To adjust the vertical tilt of spray heads, loosen the elbow couplings and adjust the swivel elbows (as shown below) down to the desired angle.



NOTE

Angling the spray heads down is typically used for high wind conditions and narrow watering strips.

Spray Head Fan Pattern

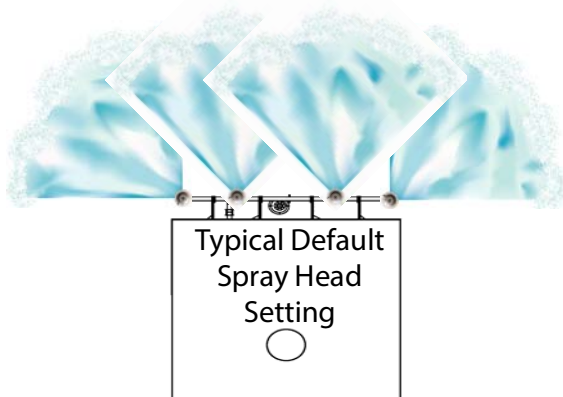
Proper employment of the spray system includes spray head adjustments to best suit the desired application. 'Best practices' are adjustments to the procedures that address the situation more accurately. Every application has specific conditions that must be addressed, such as safety, wind and weather conditions, terrain, traffic, traction, and proximity to sensitive equipment and personnel.

SECTION 6

Employment

Steps for accurate spray system employment are as follows:

1. Select spray head fan height to meet road and watering pattern requirements.
2. Set spray head adjusting ring to the maximum fan width.
3. Evaluate road conditions for width, grade, vehicle traffic and optimum travel speed.
4. Locate an isolated section of road to test spray pattern.
5. Follow Operator's Manual steps for water pump activation and spray head operation.
6. Operate water truck and turn all spray heads ON. Ensure uniform water distribution and coverage.



7. Apply a test pattern by operating 1 spray head at a time on road surface traveling at a safe and average speed until all spray heads have been cycled. Note engine rpm while discharging water.

NOTE

- Water discharge pressure and volume are dependent on engine rpm. The higher the engine rpm, the higher the water pressure. Adjustments to vehicle speed, engine rpm, and spray head angle may be required.
- Adjusting the vehicle gear shift selector may be required in order to obtain the engine rpm necessary for the desired water pump performance level.

8. Observe applied watering pattern. Adjust spray head discharge angle, and fan opening height and width to suit 'best practices' for the haul road application.

NOTE

During initial spray pattern testing, observe spray head closure delay. Delayed spray head closure is caused by the mechanical limitations of the hydraulic spray system. These noted delays will be helpful in predicting the actual closure rate of the spray heads when adjusting the spray pattern for oncoming traffic, obstacles and setting up strip watering or scotching patterns either manually or if equipped with the intermittent spray timer.

Vertical side spray heads are typically located on the front or rear of the top skin of the water tank. The discharge opening is vertical to the tank and sprays to the side. Vertical side spray heads can be employed for applying water to high walls, reaching over berms, or watering opposing traffic lanes. Vertical side spray heads can be controlled using the intermittent function.

SECTION 6 Employment

Vertical Side Spray Heads



⚠ WARNING

Vertical side spray is not recommended for use when high winds are present. Due to the spray head locations on the top of the water tank, the wind will unevenly distribute the water and may carry the water where it obstructs the view from the operator's position, potentially impairing visibility and thereby creating dangerous operating conditions.



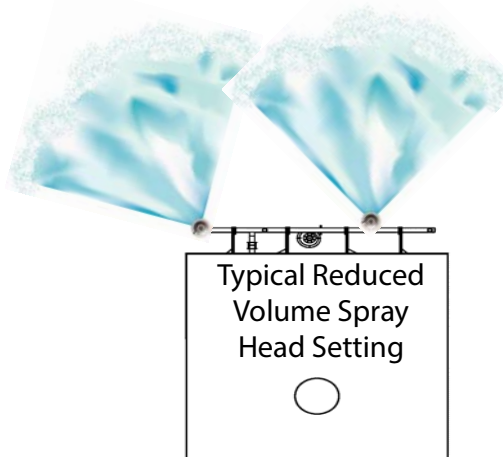
Front Bumper Spray Heads

Front bumper spray heads are used and adjusted like any other spray head for haul road and berm operations. Spray heads mounted to a swiveling coupling allow the fan pattern to be pointed down towards the road and perform as a street sweeper. This same configuration is very effective when water patterns are needed to penetrate the ground surface for compaction operations.

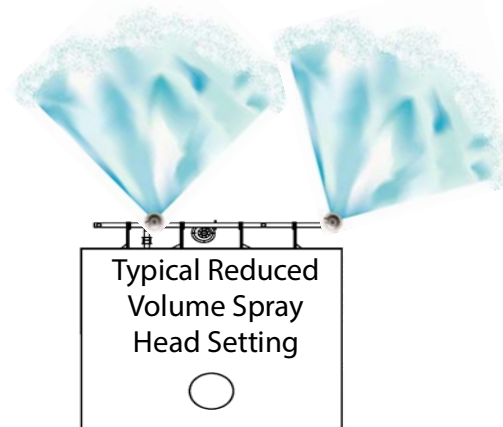
DUST SUPPRESSION

For dust suppression it is recommended that a light coating of water be applied to the road surface. This can be achieved by monitoring and adjusting the engine rpm and vehicle speed with properly adjusted spray heads that allow an even coating of water to fall onto the road surface. Typically 1 or 2 spray heads are employed for this application.

- Examples for light water distribution:
- Adjusting Ring Opening - FULL WIDTH, FINE SPRAY
 - Right Rear Spray Head - ON
 - Right Center Spray Head - OFF
 - Left Center Spray Head - ON
 - Left Rear Spray Head - OFF



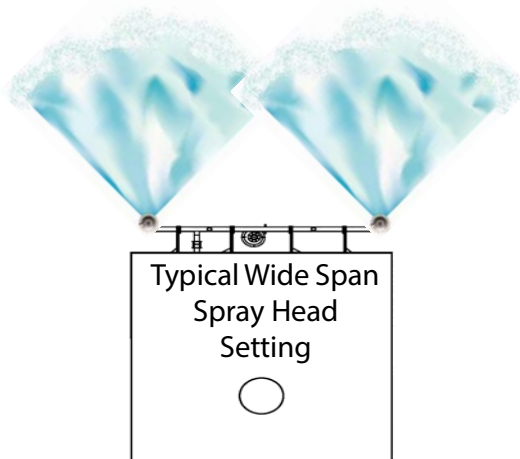
- Adjusting Ring Opening - FULL WIDTH, FINE SPRAY
- Right Rear Spray Head - OFF
- Right Center Spray Head - ON
- Left Center Spray Head - OFF
- Left Rear Spray Head - ON



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Employment

Adjusting Ring Opening - FULL WIDTH, FINE SPRAY
 Right Rear Spray Head - ON
 Right Center Spray Head - OFF
 Left Center Spray Head - OFF
 Left Rear Spray Head - ON



INTERMITTENT SPRAY

Intermittent spray is a time based function. Individual controls knobs set the ON and OFF time of the spray heads based on the desired length of time needed to apply wet/dry strips on the road. The standard MEGA spray system with intermittent spray has a timer range of 5 to 100 seconds. The DiSCS spray system intermittent spray has a timer range of 3 to 30 seconds.

Intermittent spray control is best suited for light watering and pit ramps, where it is desired to have definite wet and dry sections of road, and where additional driver attention to road conditions is required. This wet and dry strip watering provides for better traction, allowing haul trucks and other vehicles to drag water down the haul road while also increasing water truck duration between tank refills.

NOTE

Due to the mechanical limitations of the spray system, the timer control range refers to the requests to open and close the spray head; delays in closure may be experienced.

1. Ensure tank is full of water.

2. Adjust spray head openings to desired settings.
3. Turn SYSTEM/POWER switch ON.
4. Set intermittent timer knobs to desired time of spray pattern.
5. Turn INTERMITTENT switch ON.
6. Turn PUMP switch ON.

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

7. Select spray heads required for desired road condition.
8. Operate water tanker on desired route and observe spray pattern.
9. Adjust timing as desired to create the necessary wet/dry strips.

While in intermittent mode, all discharge functions can be turned OFF by turning off the corresponding function switch. If the function is turned ON while the timer is in the OFF cycle, the function will stay OFF until the next ON cycle. The illustrations below are examples of strip watering:



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Employment

TROUBLESHOOTING

If the following conditions occur, adjust as follows and re-test spray patterns until the optimal pattern is achieved.

Discharge spray extends to and beyond berms or into oncoming traffic.

1. Adjust spray head width toward center of truck by loosening the 4 retaining bolts on the bottom of the spray heads and rotating the spray head on the base plate to the desired position.
2. Re-tighten spray head retaining bolts.

Insufficient water on roadway

1. Increase engine rpm by shifting to a lower gear.
2. Increase the number of spray heads activated.
3. Reduce vehicle speed.
4. Increase the spray intensity by rotating the adjusting ring to the "heavy spray" setting (3/4" slot height).

Excess water on roadway

1. Decrease engine rpm by selecting a higher gear.
2. Increase vehicle travel speed.
3. Reduce the number of spray heads activated.
4. Reduce the spray intensity by rotating the adjusting ring to the "fine spray" setting (1/4" slot height).

SPEED BASED PROGRAMMING

The resident software provides a consistent layer of water on haul roads regardless of ground speed. The software reduces water usage and prevents puddling at stops and haul ramps. Nominal settings produce about 3 liters per cubic meter regardless of ground speed. This maximizes water usage and extends the duration of a given load of

water. Adjustments are provided to increase or decrease the layer of water dispersed, as well as setting maximum water flow at a desired ground speed. Below is an example of a system setup and what behaviors will be observed from the system:

Example 1 (Medium Speed & High Winds)

Setup:

1. COVERAGE - Set at midpoint (50%)
2. SPEED - 24 KPH/15 MPH
3. SPEED BASED - ON
4. SPRAY HEADS - Select all 4 spray heads

Observed Operation:

- Vehicle speed → 24 KPH/15 MPH and greater all spray heads ON.
- Vehicle speed → 16 KPH/10 MPH – 2 inner spray heads turn OFF
- Vehicle speed → 13 KPH/8 MPH – 2 outer spray heads begin to pulse (10 second cycles) to maintain approximately 50% water coverage (50% spray head ON/50% Spray head OFF during the cycle).
- Vehicle speed → 5 KPH/3 MPH or less – All spray heads turn OFF.

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DISTANCE BASED PROGRAMMING

Programming the software program provides a “checkerboard banding” pattern of set wet patch and dry bands as the program automatically alternates right and left sprayheads. This pattern provides dry spots for traction, reduces water usage and increases tanker duration. Below are examples of the adjusted “checkerboard” pattern:

SETTINGS <i>0 Meters DRY</i>	
WET	DRY
DRY	WET
WET	DRY
DRY	WET
WET	DRY

SETTINGS <i>Short WET Long DRY</i>	
WET	DRY
DRY	
DRY	WET
DRY	
WET	DRY

SETTINGS <i>Equal WET/DRY</i>	
WET	DRY
DRY	
DRY	WET
DRY	
WET	DRY

SETTINGS <i>Long WET Short DRY</i>	
WET	DRY
DRY	
DRY	WET
DRY	
WET	DRY

SECTION 6 Employment

TANK DRAIN



Remote or manually operated drain valves are typically used to drain water from the tank after daily operations or when the water tank is prepared for maintenance. Gravity or pressure tank drains are also employed very successfully in water haulage or supply operations. Pressurized drains systems work very well when performing bulk water haulage from a main supply site to remote fill sites or established holding ponds. This pressurized system is also very effective in providing water for drilling and fire suppression operations.

DUMP BAR



The dump bar application is for laying a heavy defined pattern of water directly onto the roadway. This application can be used for increasing the moisture content of road beds for

compaction, confined areas for which the use of the spray heads is not desired, narrow haul roads where discharge beyond the side of the tanker is not required, confined application in high wind conditions, and preparation of roadways for grader applications. The dump bar function is capable of being operated in the intermittent mode.

The pressure dump bar is designed to force water into the upper layer of the road. The pressure feature is also useful for high wind conditions at high ground speeds.

CAUTION

If the dump bar is activated (pressure or gravity) and the water tanker has stopped, damage to the road surface can occur. Ensure that the dump bar is OFF when coming to a stop to prevent road surface damage. Physical and mechanical delays will occur when turning the dump bar OFF.

NOTE

The gravity dump bar can also be used as a tank drain. Water Cannon



SECTION 6

Employment

The water cannon system is a very versatile for many different mining and construction applications. The straight bore nozzles work very well in producing a straight stream of water able to reach out at long distances. The water cannon will obtain maximum reach when the nozzle is at about 32 degrees of elevation with the chassis RPM at high idle. Reach can further be increased with the addition of in-line stream shaper when extreme reach is required for "high wall" or "stockpile" operations.

The water cannon system is also very useful for "wash down" operations. The system is best suited for wash down when configured with a remote adjustable "stream to fan/fog" nozzle. The operator can adjust the fan or stream pattern as needed while directing the stream or fan towards the components for wash down. The operator may also control water flow and pressure by simply increasing or decreasing the chassis RPM to obtain desired water flow and pressure.

CAUTION

Do not point straight streams directly at cab windows, exhausts or sensitive components. Equipment damage can be caused when water cannon is flowing at maximum flow and pressure.

FIRE SUPPRESSION SYSTEM



The fire suppression operations are never typical and the environment is ever changing. Operators must always be aware of the type of fire they are suppressing, wind conditions, the potential hazards surrounding the fire, the potential heat generated by the fire and the duration of the fire suppression system.

General guideline for fire suppression operations are:

1. Have a basic understanding of the different classes of fires (A, B, C, and D) and how to extinguish them.
2. Be familiar with site specific standard operating procedures for fire suppression.
3. Understand basic fire suppression techniques for applying foam blankets (rain-down, and bounce-up).
4. Ensure fire suppression holding tank is full, system components are serviceable and the entire system is operational before employing the system for an actual fire.
5. Obtain Situational Awareness of the site:
 - a. On scene commander and establish communication.
 - b. People and equipment involved in the fire.
 - c. Duration of the fire suppression system.
 - d. Wind direction at the site.
 - e. Hazards and restrictions at the site.
 - f. Emergency Support people and equipment.

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6. Head to the site and perform operational check of the fire suppression system.
7. Activate the water pump.
8. Approach the site from a safe direction based on observed winds and know hazards.
9. Activate the fire suppression system as contained in Section 2 "Normal Operations".
10. Lay down an initial foam protective blanket as required.
11. Maintain a foam protective blanket as required or as duration allows.
12. Always be aware of hazards, wind conditions and remaining fire suppression duration.
13. Once fire suppression is completed, secure system as contained in Section 2 "Normal Operations".
14. Ensure water truck is completely washed down after fire suppression operations.

Appendix MAC/MTT Operators Checklist

Place a copy of this Operator's Checklist in the cab.

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MAC/MTT OPERATOR'S CHECKLIST

Appendix

MAC/MTT Operators Checklist

~~MAC/MTT-OPS(CL)-1~~
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BEFORE OPERATIONS

These procedures are used to perform a walk-around inspection of the MEGA water tanker system before use or beginning of a shift. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Chocks – As Required.
2. Vehicle Parking Brake – ON
3. Cab Control Switches – SET OFF
4. **(If Equipped)** Foam Concentrate Level – CHECKED (No more than 1" from the top of the tank.)

WARNING

Ensure PPE fall arrest harness is worn, adjusted properly and attached to an anchor point. Failure to use PPE properly may result in personnel injury or death.

5. Water Cannon – CHECKED AND SECURED
 - a. Nozzle – Check for security and kinking of foam concentrate supply line.

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6. **(Front Bulkhead Location Only)** Solenoid Control Box – CHECK AND SECURED
7. MTT Front Mounts – CHECKED AND SECURED
8. Vehicle Hydraulic Tank – SERVICED
9. MTT Hydraulic Hoses & Cabling – CHECKED FOR SECURITY AND LEAKS
10. Chassis Pivot Bore Pins – INSTALLED AND SECURED
11. Tank Drain Petcocks – CLOSED
12. Spray Heads – SECURED AND SET
13. Water Pump – CHECKED
 - a. Water Pump – Check to ensure volute case drain valve is closed. Pump bracket for evidence of overheating.
 - b. Drive Motor – Evidence of overheating.
14. Hose Reel – CHECKED
15. **(Rear Bulkhead Location Only)** Solenoid Control Box – CHECKED

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16. MTT RH Hydraulic Hoses and Cabling – CHECKED FOR SECURITY AND LEAKS.

17. **(If Equipped)** Front Bumper Spray Heads and Plumbing – SECURED AND SET

OPERATIONS

Use these procedures to safely operate the standard and optional systems installed on the MEGA water tanker.

CAUTION

Limit water pump operation to 2.5 minutes when in a no-flow condition (no flow from spray heads, dump bar, water cannon, drain valve or hose reel). Water pump operation in a no flow condition will cause overheating of the water pump and damage to the shaft bearings.

Spray Head System

NOTE

Operating more than 3 spray heads simultaneously will greatly reduce the width and flow of active spray heads.

1. Cab Control SYSTEM/POWER Switch – ON

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2. INTERMITTENT – SET AS REQUIRED
 - a. TIMER ON/OFF Dials – SET
 - b. INTERMITTENT Switch – SET
3. PUMP Switch – ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

4. Individual Spray Head Switches – ON

Once operations are complete:

5. Individual Spray Head Switches – OFF
6. PUMP Switch – OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

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7. Cab Control SYSTEM/POWER Switch – OFF

GPS Auto Mode

NOTE

When the chassis ignition switch is turned on, the GPS module will attempt to make a satellite connection. During this time, the AUTO light on the cab control box will blink until a satellite connection is established. If the AUTO light still blinks when the cab control POWER switch is turned ON, then the satellite connection has not yet been established. Connection may take up to 10 minutes.

1. Cab Control POWER Switch – ON
2. RATE and SPEED Dials - SET
3. AUTO – ON AS REQUIRED
4. Desired Spray Head Switches – ON

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5. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

Once operations are complete:

6. PUMP Switch OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

7. AUTO – OFF
8. Individual Spray Head Switches – OFF
9. Cab Control POWER Switch - OFF

Dump Bar

1. Cab Control SYSTEM/POWER Switch – ON

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2. INTERMITTENT – SET AS REQUIRED
 - a. Timer ON/OFF Dials – SET
 - b. INTERMITTENT Switch – SET

3. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

4. DUMP BAR Switch – ON

Once operations are complete:

5. DUMP BAR Switch – OFF

6. PUMP Switch OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

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7. Cab Control SYSTEM/POWER Switch – OFF

Water Cannon

1. Cab Control SYSTEM/POWER Switch – ON
2. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

3. **(Multi Water Cannon)** Select desired water cannon to control. Only one water cannon can be controlled at any given time.
 - a. AUX 1 – ON to control the bumper/deck water cannon.
 - b. AUX 2 – ON to control the right rear water cannon.

NOTE

The joystick controls will be inactive for 4 seconds while switching between controlling different water cannons.

4. Water Cannon – Pointed in a safe direction.

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5. MONITOR/BFV Switch – ON
6. Water Cannon Joystick – As Required.
7. MONITOR/BFV Switch – OFF

Once operations are complete:

8. Water Cannon Nozzle - STOW

CAUTION

Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on water cannon joints. Leaving the nozzle in any other position will cause increased wear on water cannon joints and result in premature joint failure.

9. PUMP Switch OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

10. Cab Control SYSTEM/POWER Switch – OFF

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Fire Suppression System

1. Cab Control SYSTEM/POWER Switch – ON
2. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

3. Water Cannon – Pointed in a safe direction.
4. FOAM Switch – ON
5. MONITOR/BFV Switch – ON
6. Water Cannon Joystick – As Required.

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Once operations are complete:

7. FOAM Switch – OFF

CAUTION

(If equipped with multi water cannons) Ensure that the FOAM switch is OFF before operating a different water cannon.

8. Water Cannon – Flow water through the water cannon nozzle with the FOAM switch off to flush foam from the nozzle.
9. MONITOR/BFV Switch – OFF
10. Water Cannon Nozzle - STOW

CAUTION

Manual and remote adjustable nozzles must be stowed pointing vertically to reduce wear on water cannon joints. Leaving the nozzle in any other position will cause increased wear on water cannon joints and result in premature joint failure.

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11. PUMP Switch OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

12. Cab Control SYSTEM/POWER Switch – OFF

13. Vehicle – Wash or fresh water rinse areas exposed to the foam spray.

Tank Drain

1. Cab Control SYSTEM/POWER Switch – ON
2. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

3. DRAIN Switch – ON

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4. Water Level – Drain to desired level.

CAUTION

Do not operate the water pump in a dry sump. Dry running operation will cause water pump failure.

Once operations are complete:

5. DRAIN Switch – OFF
6. PUMP Switch OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

7. Cab Control SYSTEM/POWER Switch – OFF

Hose Reel

1. Hose Nozzle – CLOSED
2. Hose – Deploy desired length.

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3. Gate Valve – OPEN
4. Cab Control SYSTEM/POWER Switch – ON
5. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

6. Vehicle RPM – SET
7. Hose Nozzle – OPEN as desired.

Once operations are complete:

8. Hose Nozzle – CLOSE
9. Vehicle RPM – LOW IDLE

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10. PUMP Switch OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

11. Cab Control SYSTEM/POWER Switch – OFF

12. Gate Valve – CLOSED

13. Hose – Reel in and stow hose nozzle.

Water Circulation System

1. Fill water tank with appropriate fluid.
2. Start engine.
3. Cab Control SYSTEM/POWER Switch – ON.
4. PUMP Switch – ON.
5. DRAIN Switch – ON. (Opens BFV that allows water pressure to mix water tank contents)

When operation is complete:

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6. DRAIN Switch – OFF.
7. PUMP Switch – OFF
8. SYSTEM/POWER Switch – OFF

Suction Load Station

1. Place vehicle near water holding pond.
2. Secure vehicle and make unit safe for exiting cab.
3. Foot Valve – Serviceable
4. Suction Hoses – Inspect suction hoses for serviceability. Ensure suction hoses are connected properly to each other and the suction load inlet to prevent air leaks while in use.
5. Suction Hoses – Immerse in pond or water supply.
6. Position all butterfly valves as indicated in the following pictures and in the order as follows:
 - a. SUMP VALVE - **CLOSED**
 - b. SUCTION VALVE - **OPEN**
 - c. SPRAY BAR VALVE - **CLOSED**
 - d. TANK FILL VALVE - **OPEN**

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7. Ensure water pump and suction hoses are full of water before operating pump.

CAUTION

Operating the water pump in a dry sump will result in shaft seal damage.

8. Ensure foot valve remains submerged in water.
9. Start chassis engine.
10. At LOW IDLE turn SYSTEM/POWER switch ON.
11. (DiSCS Only) AUX2 - ON
12. PUMP Switch ON

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

13. Increase engine RPM to HIGH IDLE.

When unit is full of water

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14. Reduce engine RPM to LOW IDLE.

15. PUMP Switch OFF

CAUTION

Do not engage/disengage the water pump above LOW IDLE. Engaging/disengaging the water pump above low idle will result in water pump component damage and reduced service life.

16. AUX2 - OFF

17. SYSTEM/POWER Switch OFF.

18. Turn engine OFF.

19. Disconnect, drain and stow suction hoses.

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AFTER OPERATIONS

These procedures are used to perform a walk-around inspection after using the MEGA water tanker systems. This inspection is in addition to and does not replace the vehicle manufacturer's inspection requirements.

1. Vehicle parking brake – ON
2. Cab Control Switches – SET OFF
3. Chocks – As Required.
4. Water Cannon – CHECKED AND SECURED
5. Vehicle Hydraulic Tank – CHECKED
6. Tank Lines and Hoses – SECURED
7. Tank Drain Petcocks – As Required.
8. Spray Heads – SECURED AND SET
9. Water Pump Assembly – CHECKED
 - a. Water Pump – Check for damage and volute case drain valve set as required.
10. Hose Reel – CHECKED

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11. Solenoid Control Box – CHECKED

COLD WEATHER OPERATION AND STORAGE

CAUTION

Ensure all water is drained from system when the temperatures are expected to fall below 4.4°C (40°F) for any period of time. Failure to ensure all systems are drained and free from standing water will result in ice formation, which will cause serious damage to shaft, operator, diaphragm, drive motor, water pump, or butterfly valve.

To ensure all water is drained from tank check the following;

1. Park unit on a slight nose up angle to allow water to flow to the rear of the tank.
2. Drain the tank using an appropriate method until the Water Level Gauge reads EMPTY.
3. Open all drain petcocks (water pump, suction load pump, rear spray bar, front spray bar, etc.).
4. Remove water pump sump cover.
5. Start engine.

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6. Cab Control SYSTEM/POWER Switch – ON
7. MONITOR/BFV Switch – ON
8. DUMP BAR Switch – ON
9. DRAIN Switch – ON
10. Water Cannon Nozzle – Pointed fully DOWN
11. Cab Control SYSTEM/POWER Switch – OFF
12. Turn engine off.
13. Hose Reel – DRAIN
 - a. Hose – UNWIND
 - b. Nozzle – Fully OPEN
 - c. Gate Valve – OPEN
 - d. Allow water to drain.
 - e. Hose – REWIND
 - f. Gate Valve – CLOSED
 - g. NOZZLE – CLOSED
14. Check to ensure all water has drained from tank.

TO REACTIVATE UNIT:

1. Lubricate water pump bearings as instructed in the Maintenance (-2) technical manual.

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2. Inspect tank interior to ensure it is clean, if the tank is coated, ensure coating integrity, clean or repair as required.
3. Install sump cover with new gasket.
4. Close all drain valves and petcocks.
5. Start engine.
6. Control SYSTEM/POWER Switch – ON
7. Individual Spray Head Switches – OFF
8. DUMP BAR Switch – OFF
9. DRAIN Switch – OFF
10. MONITOR/BFV Switch – OFF
11. Cab Control SYSTEM/POWER Switch – OFF
12. Turn engine off.