

MOH4-KW-OPS-1



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 a MOH. 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 machine 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

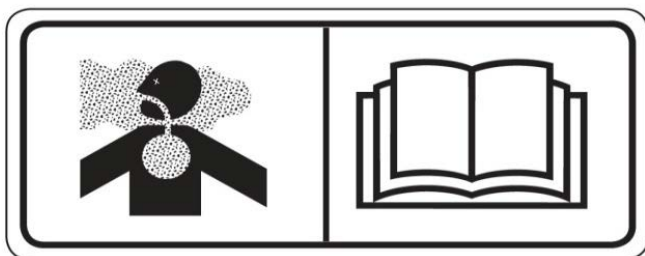
There are several specific safety messages on this machine. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

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.

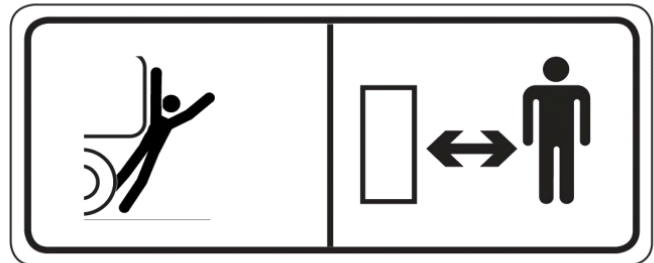


WARNING

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.

BACKING RUN OVER HAZARD (2)

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

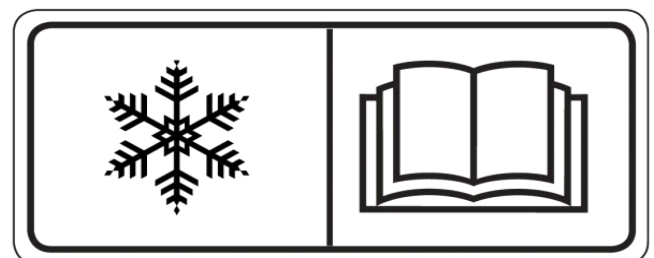


WARNING

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.

FREEZING (3)

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



WARNING

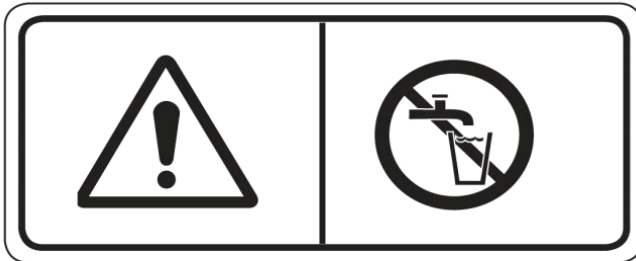
Drain tank, fill pipe and valve in freezing weather. Refer to the Operator and Maintenance Manual for the procedure to follow.

SECTION 1

Definitions and Abbreviations

NON-POTABLE (4)

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.

FALL HAZARD (5)

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

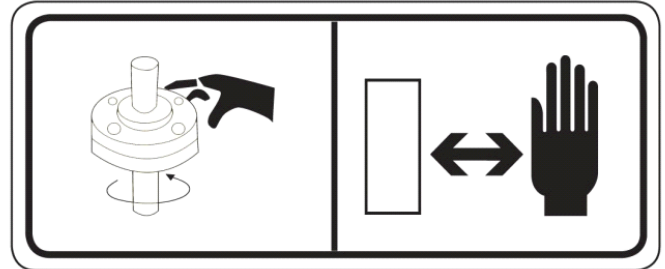


WARNING

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

ROTATING SHAFT (6)

This safety label is located on the pump.

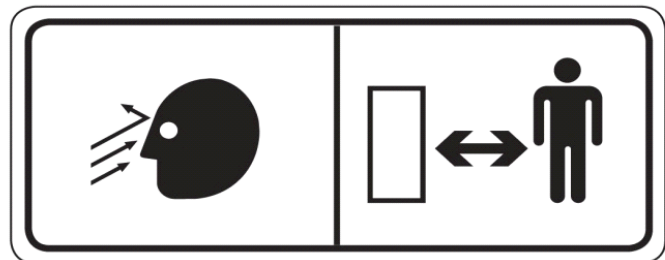


WARNING

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 (7)

This safety label is located on the spray bar.



WARNING

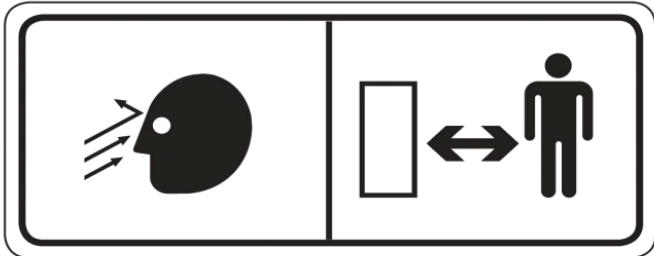
Do not operate spray heads until all personnel are a safe distance away from the vehicle.

SECTION 1

Definitions and Abbreviations

HIGH PRESSURE WATER CANNON (8)

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

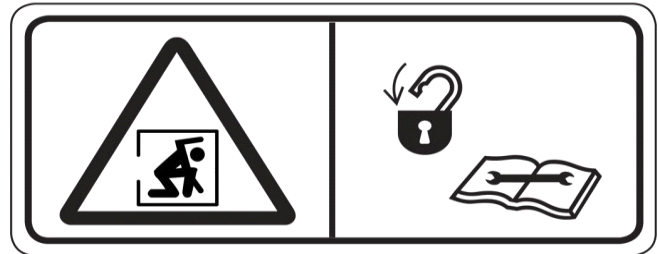


WARNING

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

CONFINED SPACE (10)

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

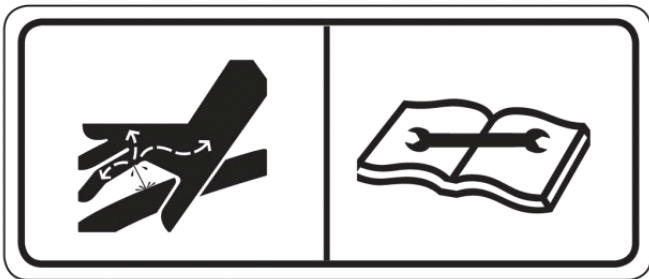


WARNING

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

HIGH PRESSURE MOTOR (9)

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

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
 KM-H - Kilometers Per Hour
 Kg - kilograms
 Kpa - Kilopascals
 l - liters
 lpm - Liters per minute
 LT - Left as viewed from the operator's
 position facing forward
 m - meters
 MPH - Miles Per Hour
 MOH - Mega On-Highway
 Nm - Newton meters of torque
 psi - pounds per square inch
 RPM - Revolutions Per Minute
 RT - Right as viewed from the operator's
 position facing forward
 SQ FT - Square Feet
 VDC - Volts, Direct Current

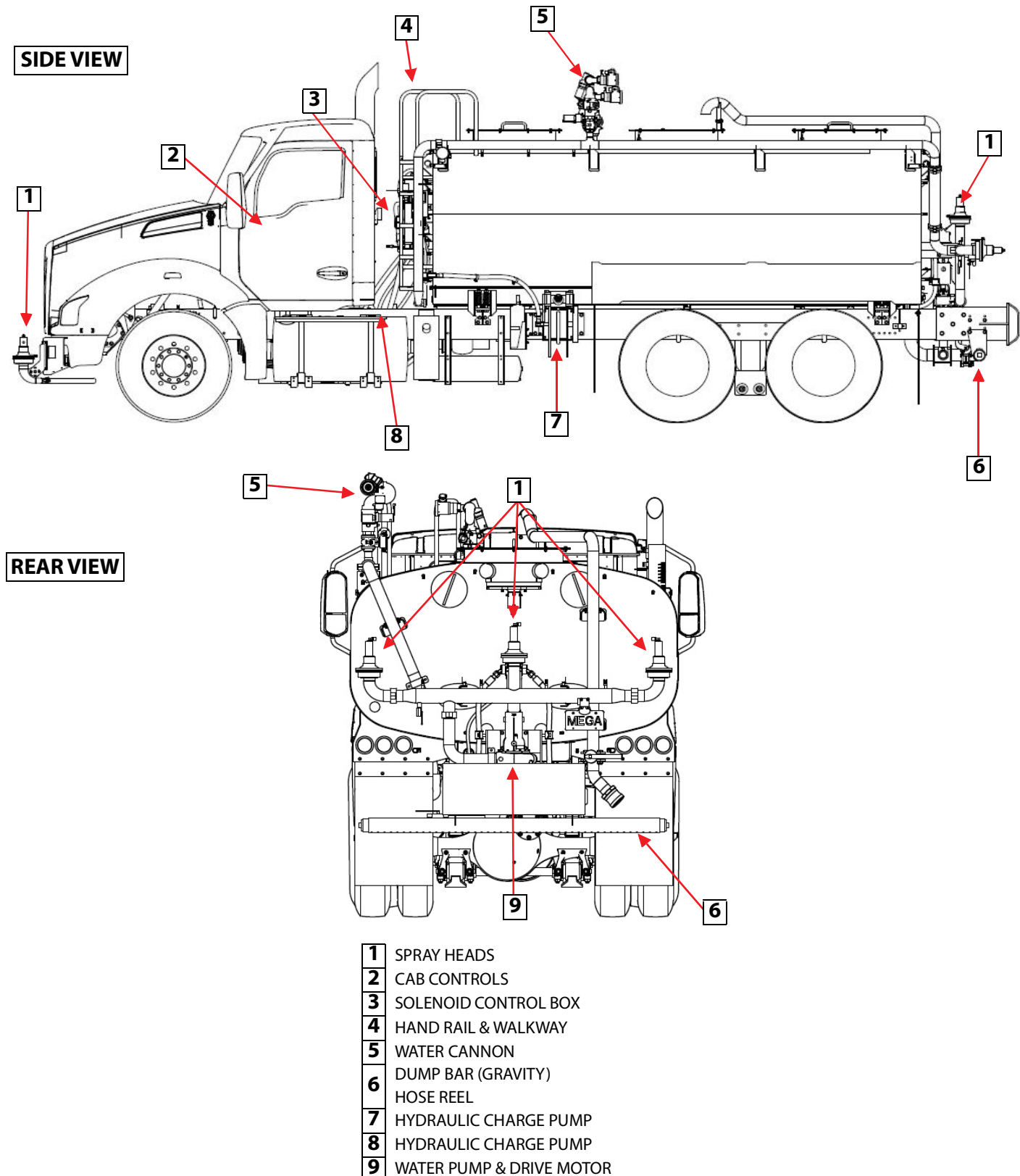
SYMBOLGY

Symbol	Name	Function
	PTO	Activate the PTO pump
	HOSE REEL/ WATER CANNON	Activates Hose Reel or Water Cannon function
	DUMP BAR (BFV)	Opens the dump bar butterfly valve
	LEFT REAR	Opens the left rear spray head valve
	CENTER REAR	Opens the center rear spray head valve
	RIGHT REAR	Opens the right rear spray head valve
	FRONT BUMPER	Opens the front bumper spray head valve

SECTION 1

Definitions and Abbreviations

MOH OVERVIEW (TYPICAL)



SECTION 2

System Description

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WATER TANK STRUCTURE (MOH)

The MEGA steel water tank consists of a water tunnel, vertical baffles, bulkheads, outer skins, 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 baffles and mounting for the water pump. The baffles and bulkheads add to tank strength and dampen water surges. External piping is used to carry water from the water pump to spray heads, water cannon, spray bar, hose reel, dump bar.

HYDRAULICS

The MOH4 is the only Mega water tank to utilize a closed-circuit hydraulic spray system. A PTO mounted to the rear of the transmission powers a charge pump located beneath the front of the tank. When the PTO is activated, the axial piston pump starts to turn and its internal charge pump generates 490 psi hydraulic pressure to the water pump drive motor circuit and the solenoid box circuit.

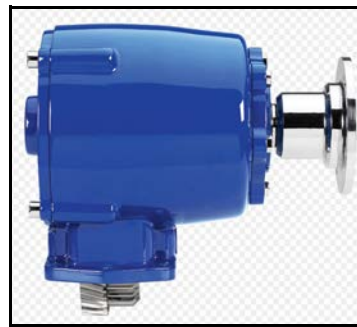


A 1.62-gallon capacity 20-gpm hydraulic reservoir mounted to the front of the tank provides the hydraulic oil required for the two main hydraulic circuits. One circuit supplies hydraulic oil to the solenoid box, and is filtered by the charge filter. The

other circuit provides hydraulic pressure to the water pump drive motor inlet; oil returns from the drive motor back to the return filter, and is cooled by an oil to air heat exchanger before returning to the reservoir.

POWER TAKE-OFF (PTO)

A PTO provides power to drive the charge pump. This PTO is mounted to the rear of the transmission and is capable of varying speeds according to the transmission gear engaged, as it is run directly off of the counter shaft.



CHARGE PUMP



A closed-circuit axial piston pump with an internal fixed-displacement charge pump is used to generate hydraulic pressure for the MOH closed circuit hydraulic system. The charge pump is powered by the transmission PTO; when the PTO is activated, the piston pump starts turning and the charge pump generates 490 psi hydraulic pressure.

SECTION 2

System Description

FILTER ASSEMBLY

The 'charge filter' and 'return filter' are the two hydraulic oil filters that comprise the closed hydraulic system's filtration assembly. These filters are located on the front of the water tank, next to the heat exchanger. Oil will bypass the return filter if it is clogged, allowing the system to run using only the charge filter until maintenance can be performed. If the charge filter becomes clogged, the hydraulic system will shut down to protect the charge pump from severe damage. When either filter's dirt sensor is triggered, a signal is sent to the in-cab control box to alert the operator that the filters must be serviced immediately.

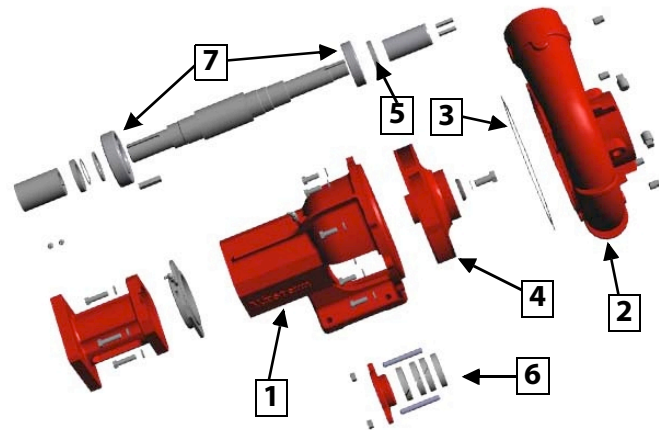


WATER PUMP

MOH units are configured with the Mega M-3 water pump. The M-3 is an open centrifugal water pump with a 4 inch inlet & 3 inch outlet ideal for on-highway tankers and applications where no more than 3 spray heads will be operated simultaneously.



MAIN WATER PUMP COMPONENTS



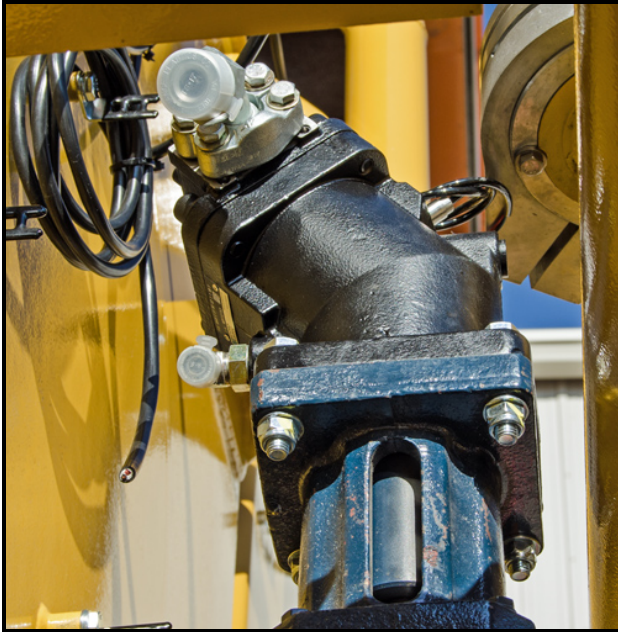
1. **Bracket** – Main frame of the pump that allows a pump to be bolted to the tanker and provides the means to direct mount the hydraulic drive motor.
2. **Volute Case** – A “snail shell” shaped case that encloses the impeller. It is narrow at the center and enlarges from there to the discharge area.
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. **Grease 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.
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.

SECTION 2

System Description

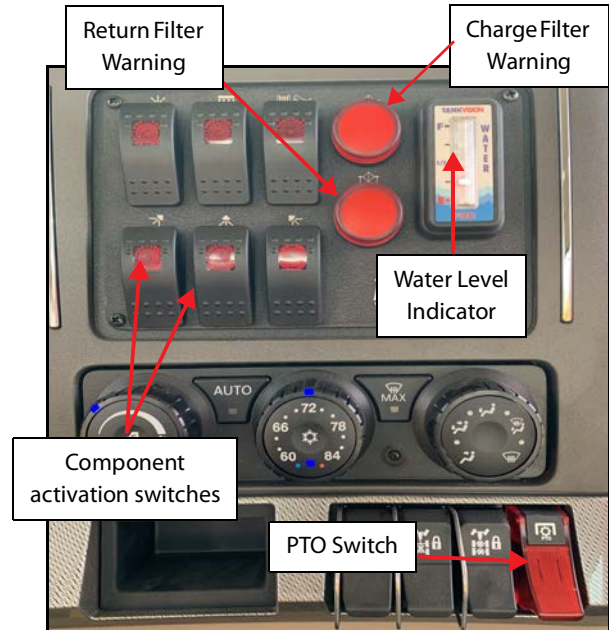
WATER PUMP DRIVE MOTOR

The M-3 water pump is driven by a bent-axis LEDUC MA-series hydraulic motor. The minimum required rotation speed is 200 RPM. The hydraulic drive motor can rotate either clockwise or counterclockwise as required, depending upon the direction of the hydraulic flow entering the motor.



CAB CONTROLS

The cab controls allow the operator to send commands for water pump activation, spray head operation (3 rear spray heads and 1 front bumper spray head), dump bar activation, and hose reel/ water cannon activation. A separate in-cab control box allows the operator to control the water cannon. Detailed operation procedures can be found in Section 4: "Normal Operations".



The cab control functions operate as follows:

Symbol	Name	Function
	PTO	Activate the PTO pump
	HOSE REEL/ WATER CANNON	Activates hose reel or water cannon function
	DUMP BAR (BFV)	Opens the dump bar butterfly valve
	LEFT REAR	Opens the left rear spray head valve
	CENTER REAR	Opens the center rear spray head valve
	RIGHT REAR	Opens the right rear spray head valve
	FRONT BUMPER	Opens the front bumper spray head valve

SECTION 2

System Description

THEORY OF OPERATION

Toggling the PTO switch in the cab will activate the transmission PTO (If vehicle speed is below 5 MPH), which will in turn drive the hydraulic axial piston pump. As the piston pump begins to turn, its internal charge pump will generate 490 psi hydraulic pressure in the hydraulic circuits. The red PTO light on the in-cab controls will be illuminated while the PTO is engaged.

CAUTION

Do not leave the PTO pump engaged while the spray system is not in operation in order to avoid equipment damage.

NOTE

The PTO will automatically shut down if a low hydraulic oil condition is detected in the system.

The in-cab controls will now be functional, allowing the operator to activate one of three main water distribution functions: spray heads (four total), hose reel/water cannon, and dump bar. Spray heads and/or dump bar can not be active while hose reel/water cannon is active. Activating hose reel/water cannon will shut-off spray heads and/or dump bar. The second function's switch light will be illuminated but the function will be locked out and will not operate. Hose reel/water cannon must be toggled off in order for spray heads and/or dump bar to be functional.

If any water distribution function is activate, then toggled off, water pump will remain on for 60 seconds. If no function is activated within 60 seconds water pump will ramp down and turn off. When a distribution function is activated, water pump will ramp back up automatically.

The water pump and PTO will remain on while distribution functions are active. If vehicle speed exceeds 30 MPH the PTO will disengage, shutting off water pump. Reducing vehicle speed below 5 MPH will automatically re-engage PTO and water pump and continue water distribution.

EXTENDED FUNCTION DESCRIPTIONS

ON
↑
↓
OFF



PTO - Pressing up on this switch will activate the PTO. The red PTO light on the in-cab controls will be illuminated while the PTO is engaged.



Charge Filter Warning Light - This red light will illuminate when the charge filter is clogged. When this happens, the hydraulic system will shut down, and maintenance should be performed to clean the charge filter.



Return Filter Warning Light - This red light will illuminate when the return filter is in pending bypass. When this happens, the hydraulic system will shut down, and maintenance should be performed immediately to clean the return filter.



Spray Heads - These switches send a signal to OPEN (press switch up) or CLOSE (press switch down) the associated spray head valve (Left Rear, Center Rear, Right Rear, and Front Bumper). When a spray head is open, the red light will illuminate on the associated switch.



Dump Bar - This switch sends a signal to OPEN (press switch up) or CLOSE (press switch down) the dump bar butterfly valve.

SECTION 2

System Description



Hose Reel/Water Cannon - This switch sends a signal to activate the water pump drive motor at maximum RPM and disables the spray head switches and the dump bar butterfly valve switch. While the Hose Reel/Water Cannon switch is ON (red light illuminated), the hose reel can be used and the water cannon controls can be used. Activating the hose reel/dump bar will lockout the spray head functions as well as the dump bar.



Water Level Sensor - Indicates the current water level in the tank. When the tank is empty (water level indicator reads 'E'), all spray system components should be turned off and the water pump drive motor should be disengaged to prevent damage to the water pump.

At 1/4 tank full, the water level indicator lights will begin to flash continuously. Upon reaching EMPTY, water level indicator will flash twice, run lights from top to bottom three times, and then repeat the cycle.

Tank Work Lights

Toggles work lights ON/OFF at rear of tank.



WATER CANNON SYSTEM

The system is comprised of a water cannon (electric drive), ball valve assembly, nozzle, and cab controls.

WATER CANNON (FORESTRY)

A metal waterway directs a stream of water in both elevation (up-down) and rotation (right-left), guided by a 12 VDC electric motor as commanded by the cab control joystick. The water cannon is threaded to a flanged pipe that mounts directly above the electric butterfly valve. The Mega forestry water cannon also provides mounting for a variety of different nozzles.



An alternate, lower mount position nearby on the top of the tank may be used as a travel mount. Quick disconnect mounts allow for easy relocation.



SECTION 2

System Description

Remote Adjustable Nozzle (Electric)

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.

WATER CANNON CONTROLS



Discharge ON/OFF - OPENS/CLOSES the water cannon ball valve.

Stream/Fog - Remotely adjusts the nozzle to produce either a straight stream of water or a fog-pattern.

Directional Pad - The directional pad adjusts the orientation of the water cannon nozzle (UP, DOWN, LEFT, RIGHT).



SPRAY SYSTEM

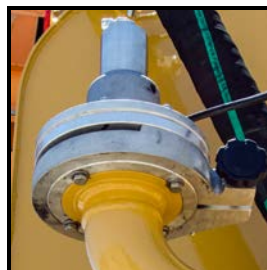
The spray head system consists of 4 hydraulic spray heads, in-cab controls, solenoid control box, and hydraulic hosing.

SOLENOID CONTROL BOX



The control box assembly is mounted to the forward bulkhead of the MOH. The assembly contains hydraulic solenoid valves that direct hydraulic pressure to the spray heads as commanded by the cab controls. The solenoids receive hydraulic pressure from water pump oil circuit and 24 VDC power from the cab control box. Also contains master water level gauge.

HYDRAULIC SPRAY HEADS



The Mega spray heads consist of 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. 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.

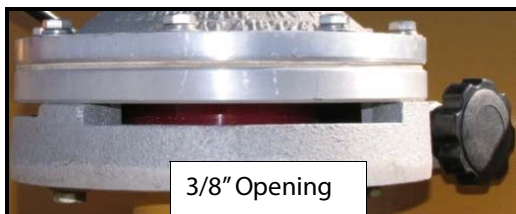
SECTION 2

System Description

When the cab control system and the water pump are 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, allowing water to 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° to 90°. The ring also may be used rotated to a 1/4" or 3/8" slot (as shown in the images below) to increase or decrease overall water flow. The greater the opening, the greater the water flow.



FRONT BUMPER SPRAY HEAD



The front bumper spray head is used and adjusted like any other spray head for road and berm operations. This spray head mount is adjustable, allowing the fan pattern to be tilted slightly downward. This configuration is also very effective when water patterns are needed to penetrate the ground surface for compaction operations.

DUMP BAR



A spray bar that contains two rows of 3/8" drain holes to dispense water. 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. When the BFV is opened, water drains out through the holes by force of gravity. The dump bar can be used as a tank drain.

HOSE REEL



A spring rewind hose reel assembly is located on the forward LH side of the water tank, fitted with a 1.0" diameter reinforced rubber hose and a fire fighting style nozzle. The hose reel assembly receives pressurized water from an external hard pipe that runs down the front of the tank. Water supply to the hose reel is controlled by a shut-off valve where the hard pipe and supply hose connect.

SECTION 2

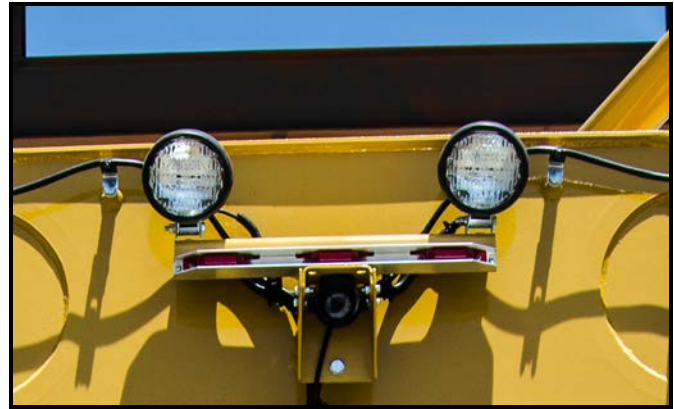
System Description

HEAT EXCHANGER



An oil to air heat exchanger is located on the front of the water tank and is powered by a 12 VDC source. Hot oil from the charge pump passes through the filter assembly and then through the heat exchanger, which uses forced air to cool the oil before returning the hydraulic oil to the oil reservoir. The heat exchanger turns on when oil temperature reaches 60°C (140°F) and has a maximum working temperature of 120°C (248°F). Hydraulic oil pressure must not exceed 2900 psi.

WORK LIGHTS



Four 12VDC LED work lights are located on the rear of the MOH tank. Lights are controlled by the work light switch located on the right hand side of the dash below cab controls.

FIRE EXTINGUISHER



A 10-lb multi-class fire extinguisher is located on the RH side of the truck, behind the battery box. The fire extinguisher is secured by a quick-release mount.

SECTION 3

Limitations

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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.

CAUTION

Limit water pump operation to 60 seconds when in a no-flow condition (not flowing water through spray heads, dump bar, water cannon, 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.

CAUTION

Water pump shaft speed must not exceed 2400 RPM. Failure to ensure water pump speed is at or below specifications will result in reduced spray system component service life.

PTO

CAUTION

Do not leave the PTO engaged while the spray system is not in operation in order to avoid equipment damage.

Do not operate any of the driven equipment until the vehicle is allowed to warm up.

CAUTION

Avoid any sudden stoppage of the PTO above LOW IDLE. Stopping the PTO suddenly above LOW IDLE may result in damage to the PTO or transmission over time.

SECTION 3

Limitations

SECTION 4

Normal Operations

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DESCRIPTION

This section provides the vehicle operator with step by step operating procedures for the installed MOH system. The information is separated into before operations, operations and after operations.

A pocket size Operator's Checklist of all MOH procedures is contained in the Appendix of this manual.

NOTE

Place copies of the Appendix Operator's Checklist and the Section 4 Inspections 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. Water Cannon – CHECKED & SECURED
 - a. Nozzle – Check for security and kinking of foam concentrate supply line.
4. MOH Spring Bolt Mounts (4 total) – CHECKED AND SECURE
5. Solenoid Control Box – CHECKED
6. Hydraulic Oil Reservoir – SERVICED, CHECKED FOR SECURITY AND LEAKS
7. Heat Exchanger – CHECKED FOR SECURITY AND LEAKS

8. LH Hydraulic Hoses and Cabling – CHECKED FOR SECURITY AND LEAKS.
9. Hose Reel – CHECKED FOR DAMAGE AND LEAKS
10. Tank Drain Petcocks – CLOSED
11. Spray Heads – SECURED & ADJUSTED
12. Water Pump Assembly – CHECKED
 - a. Ensure volute case drain valve is closed.
 - b. Check for evidence of water pump and drive motor overheating.
13. RH Hydraulic Hosing & Cabling – CHECKED FOR SECURITY AND LEAKS.
14. Front Bumper Spray Head & Plumbing – CHECKED FOR SECURITY, ADJUSTMENT, LEAKS AND DRAINS CLOSED.

SECTION 4

Normal Operations

OPERATIONS

Use these procedures to safely operate the systems installed on the MEGA water tank.

CAUTION

Limit water pump operation to 2.0 minutes when in a no-flow condition (not flowing water through spray heads, water cannon, 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

1. PTO Switch (In Cab) – TOGGLED ON

NOTE

This will activate the water pump drive motor and disable the “Butterfly Valve” and “Reel/Cannon” buttons in order to prevent the operator from accidentally toggling them.

NOTE

If no spray heads are opened within 120 seconds of water pump drive motor activation, the water pump will shut down automatically. Spray head mode can be restarted by toggling the spray head switch

2. Spray Head Switch – TOGGLED ON AS REQUIRED
3. **Shut-down procedure (with drive motor running and spray heads open):**
 - a. Spray Head Switch – OFF
 - b. Allow pump shutdown timer to run out; after 120 seconds, the water pump will shut down.
 - c. System is now shut down and the PTO switch may be turned off to shut down the PTO.

DUMP BAR

1. PTO Switch (In Cab) – TOGGLED ON
2. “Butterfly Valve” Switch – TOGGLED ON

NOTE

This will disable the spray head, and “Butterfly Valve” buttons as well as the pump control knob in order to prevent the operator from accidentally toggling them.

3. Dump bar is discharging water; drive truck as required.

Once dump bar operations are complete:

4. “Butterfly Valve” Switch – OFF

NOTE

Other water distribution functions (spray heads, water cannon, hose reel) are no longer disabled and may now be selected.

WATER CANNON

1. PTO Switch (In Cab) – TOGGLED ON
2. “Reel/Cannon” Switch – TOGGLED ON

NOTE

This will disable the spray head, and “Butterfly Valve” buttons as well as the pump control knob in order to prevent the operator from accidentally toggling them.

3. Water Cannon Joystick – As Required
4. Water Cannon Control Box – DISCHARGE ON
5. Operate water cannon as required.

Once operations are complete:

6. Water Cannon Control Box – DISCHARGE OFF
7. “Reel/Cannon” Switch – TOGGLE OFF

SECTION 4

Normal Operations

NOTE

Other water distribution functions (spray heads and dump bar BFV) are no longer disabled and may now be selected.

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.

Quick Disconnect for Travel

1. Pull latch pin.
2. Rotate the water cannon 15° counterclockwise.
3. Lift water cannon out of quick disconnect inlet.
4. Place water cannon into the travel mount so that the two guide pins line up with the inlet groove.
5. Slide water cannon into inlet and rotate 15° clockwise until the latch pin locks.

HOSE REEL

1. PTO Switch (In Cab) – TOGGLED ON
2. “Reel/Cannon” Button – TOGGLED ON

NOTE

This will disable the spray head and “Butterfly Valve” buttons as well as the pump control knob in order to prevent the operator from accidentally toggling them.

3. Manually open hose reel valve.
4. Operate hose reel as required.

Once operations are complete:

5. Manually close hose reel valve.

6. “Reel/Cannon” Button – TOGGLE OFF

NOTE

Other water distribution functions (spray heads and dump bar BFV) are no longer disabled and may now be selected.

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 Component Switches – OFF
3. Chocks – As Required
4. Front Spray Head - CHECKED DRAIN. SET AS REQUIRED
5. Water Cannon – CHECKED & SECURED
6. Solenoid Control Box – CHECKED
7. Heat Exchanger – CHECKED FOR SECURITY AND LEAKS
8. Hydraulic Oil Reservoir – SERVICED, CHECKED FOR SECURITY AND LEAKS
9. Tank Lines and Hoses – SECURED
10. Hose Reel – CHECKED, VALVE AS REQUIRED
11. Rear Spray Heads – SECURED & SET
12. Water Pump – CHECKED for damage, volute case drain valve SET as required.

SECTION 4

Normal Operations

COLD WEATHER OPERATION AND STORAGE

CAUTION

Ice will cause serious damage to water pump, spray heads, butterfly valves, and the water cannon if water is allowed to freeze in the volute case, water piping, or on top of a closed valve. Ensure **all water is drained** from the 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 shaft, diaphragm, drive motor, water pump, or butterfly valve damage when operation is attempted with ice in the housings.

To ensure all water is drained from the 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 and quick drain ball valves:
 - a. Water pump
 - b. Rear spray bar
 - c. Front spray head
 - d. Dump Bar
 - e. Hose reel/water cannon
4. Start engine.
5. PTO Switch (In Cab) – ON
6. Water Cannon Joystick
 - a. Nozzle pointed DOWN
 - b. Ball valve CLOSED
7. 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

8. "Butterfly Valve" Switch – OPEN

9. Allow trapped water to drain from dump bar.

10. PTO Switch (In Cab) – OFF

11. Turn engine off.

12. Check to ensure all water has drained from tank.

TO REACTIVATE UNIT:

1. Lubricate water pump bearings as instructed in the Maintenance Manual.
2. Inspect tank interior to ensure it is clean, if the tank is coated, ensure coating integrity, clean or repair as required.
3. **(If applicable)** Install sump cover with new gasket.
4. Close all drain valves and petcocks.

SECTION 4

Normal Operations

Place copies of this Inspections Checklist and the Appendix Operator's Checklist within the cab for daily use.

These inspections should be performed in addition to, and not in place of, CAT inspections.

INSPECTIONS CHECKLIST

MACHINE # _____ **DATE:** _____

NAME: _____ **HOUR METER:** _____

Pre-Operations Inspection	OK	NOT	Comments and Corrective Action
SERVICE REQUIRED	<input type="checkbox"/>	<input type="checkbox"/>	
Water Cannon – Damage & Security	<input type="checkbox"/>	<input type="checkbox"/>	
Solenoid Control Box – Security	<input type="checkbox"/>	<input type="checkbox"/>	
MOH Front Mounts – Security	<input type="checkbox"/>	<input type="checkbox"/>	
Hydraulic Reservoir Fluid Levels	<input type="checkbox"/>	<input type="checkbox"/>	
Hydraulic Hoses and Cabling – Leaks and Security	<input type="checkbox"/>	<input type="checkbox"/>	
Spray Heads – Damage, Security, Adjustments	<input type="checkbox"/>	<input type="checkbox"/>	
Water Pump Assembly – Damage and Security	<input type="checkbox"/>	<input type="checkbox"/>	
Hose Reel – Damage and Security	<input type="checkbox"/>	<input type="checkbox"/>	
After Operations Inspection	OK	NOT	Comments and Corrective Action
Water Cannon – Damage & Security	<input type="checkbox"/>	<input type="checkbox"/>	
Hydraulic Reservoir Fluid Levels	<input type="checkbox"/>	<input type="checkbox"/>	
Hydraulic Hoses and Cabling – Leaks and Security	<input type="checkbox"/>	<input type="checkbox"/>	
Spray Heads – Damage and Security	<input type="checkbox"/>	<input type="checkbox"/>	
Water Pump Assembly – Damage and Security	<input type="checkbox"/>	<input type="checkbox"/>	
Hose Reel – Damage and Security	<input type="checkbox"/>	<input type="checkbox"/>	

SECTION 4

Normal Operations

SECTION 5

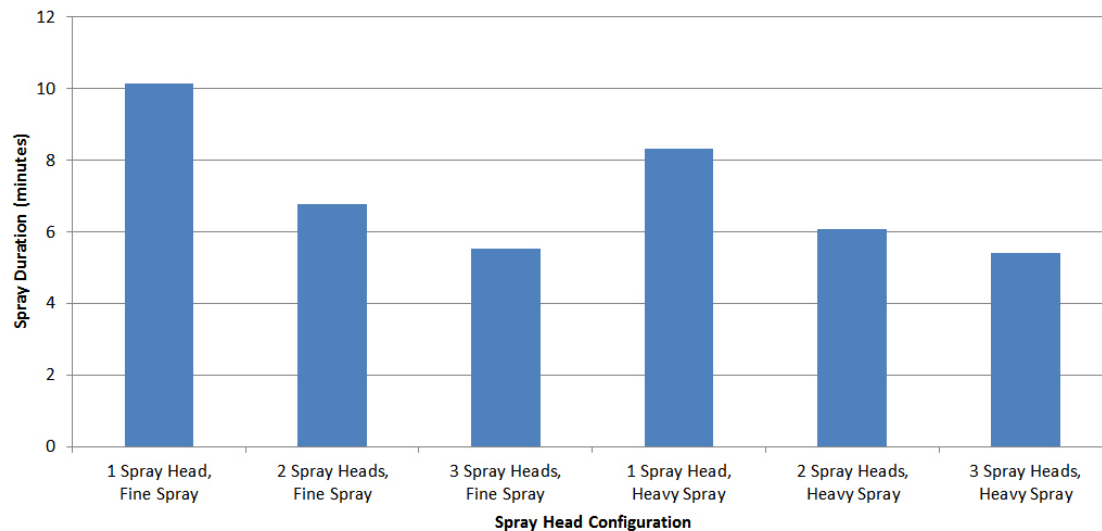
Performance

Contents

Typical Spray Duration and Flow	5-1	Precision Watering	5-2
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TYPICAL SPRAY DURATION AND FLOW DURATION

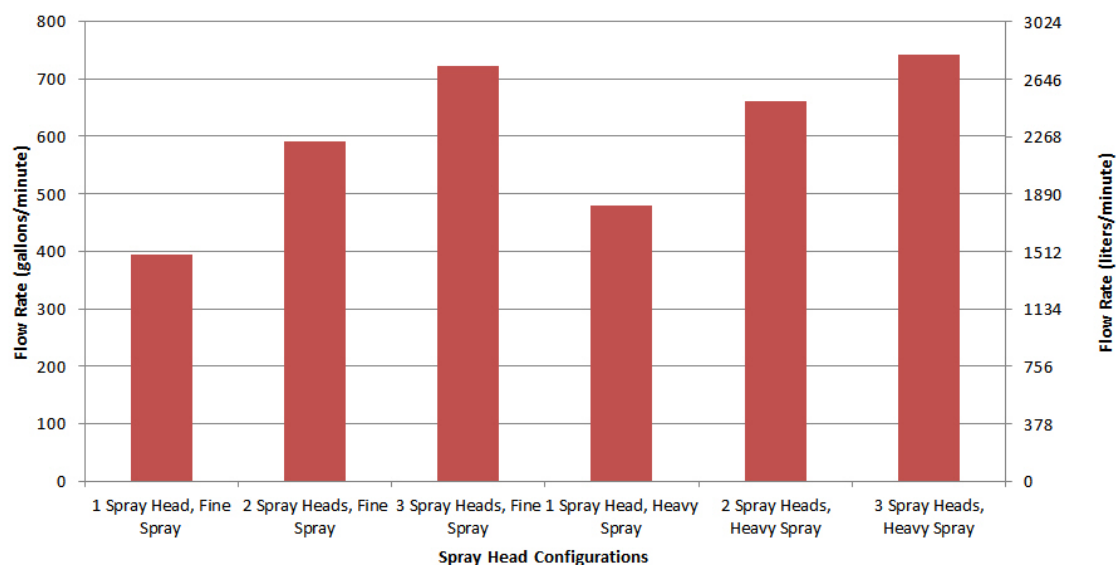
Approximate Spray Duration (MOH)



Estimated spray duration for various 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. These flow rates were recorded on a MAC6 with an M-3 Pump at maximum water pump flow rate.

FLOW RATES

Spray Head Configuration Flow Rates (M-3 Pump)



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 three possible spray head configurations. The 'fine' setting is 1/4 inches in height, and the 'heavy' setting is 3/8 inches in height. These flow rates were recorded on a MAC6 with an M-3 Pump at maximum water pump flow rate.

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 3 spray heads.

1/4 OPENING & FULL FAN (15,141 lit/4,000 gal TANK)

			2 SPRAY HEADS (FLOW 2237 lpm/591 gpm)				3 SPRAY HEADS (FLOW 2736 lpm/723 gpm)			
			SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
MPH		FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
U S	2	176	922	76562	0.065	0.105	585	43883	0.114	0.183
	5	440	2306	191405	0.026	0.042	1463	109707	0.046	0.073
	10	880	4612	382809	0.013	0.021	2926	219415	0.023	0.037
	15	1320	6918	574214	0.009	0.014	4388	329122	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	278	6945	2.725	2.67	176	4053	4.670	4.65
	8	134	702	17559	1.078	1.07	445	10246	1.847	1.84
	16	268	1405	35118	0.539	0.53	891	20493	0.924	0.94
	24	402	2107	52677	0.359	0.35	1336	30739	0.616	0.61

3/8 OPENING & FULL FAN (15,141 lit/4,000 gal TANK)

			2 SPRAY HEADS (FLOW 2498 lpm/660 gpm)				3 SPRAY HEADS (FLOW 5950 lpm/1572 gpm)			
			SPRAY DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER	MAX DISTANCE	TOTAL COVERAGE	DISPERSAL	WATER LAYER
MPH		FPM	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)	(FT)	(SQ FT)	(GAL/SQ FT)	(IN/SQ FT)
U S	2	176	708	55221	0.091	0.145	560	36387	0.137	0.220
	5	440	1770	138053	0.036	0.058	1399	90967	0.055	0.088
	10	880	3540	276106	0.018	0.029	2799	181934	0.027	0.044
	15	1320	5310	414159	0.012	0.019	4198	272901	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	213	5117	3.699	3.68	169	3372	5.613	5.59
	8	134	539	12937	1.463	1.47	426	8525	2.220	2.23
	16	268	1078	25874	0.731	0.74	853	17050	1.110	1.11
	24	402	1617	38811	0.488	0.48	1279	25575	0.740	0.74

SECTION 6

Employment

Contents

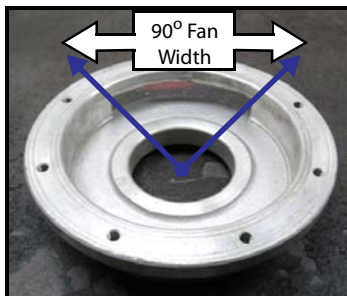
Description	6-1	Spray Pattern Troubleshooting	6-5
Spray Heads	6-1	Dump Bar	6-5
Dust Suppression	6-4	Water Cannon	6-6

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.

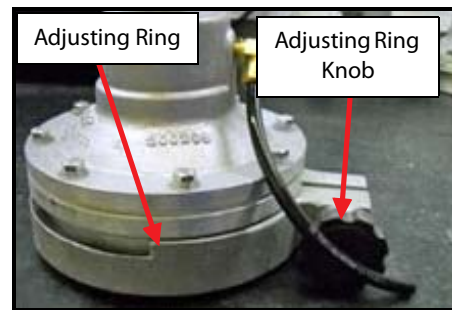
SPRAY HEADS

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.



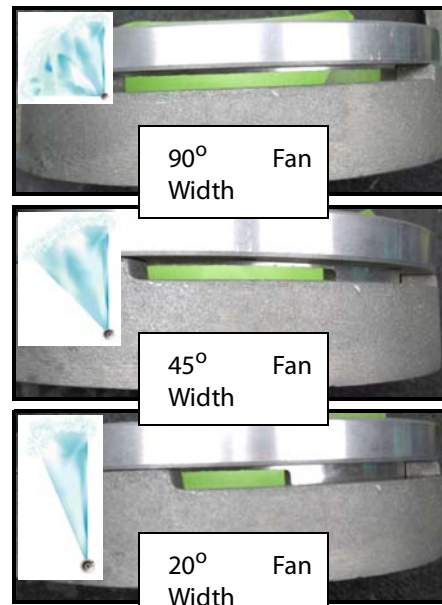
FAN WIDTH AND SPRAY INTENSITY ADJUSTMENT

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.

Fine Spray (1/4" Slot Height)



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.

NOTE

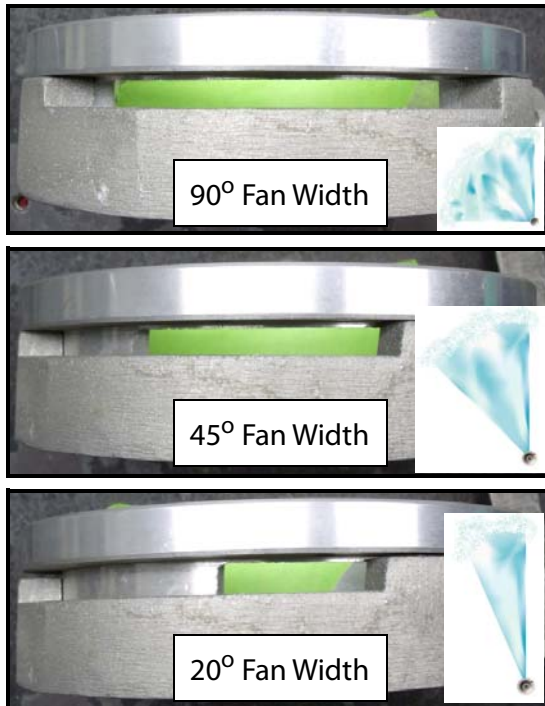
- Adjusting the ring for narrower fan widths will increase the length of the spray pattern; this may also increase the closure delay of the spray head.
- The "fine spray" setting produces smaller water droplets ideal for low wind and high humidity conditions.

SECTION 6

Employment

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.

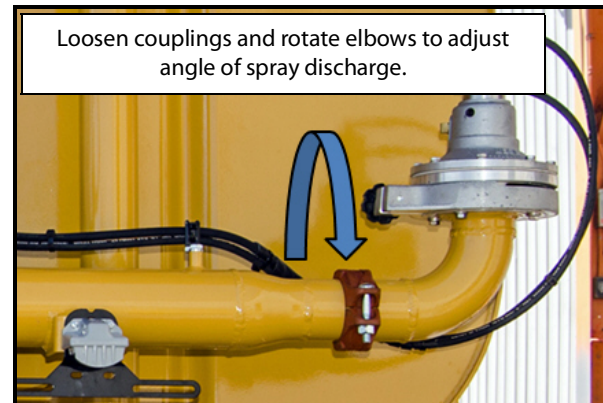
NOTE

- When the spray head is set for “heavy spray”, 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 3 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.

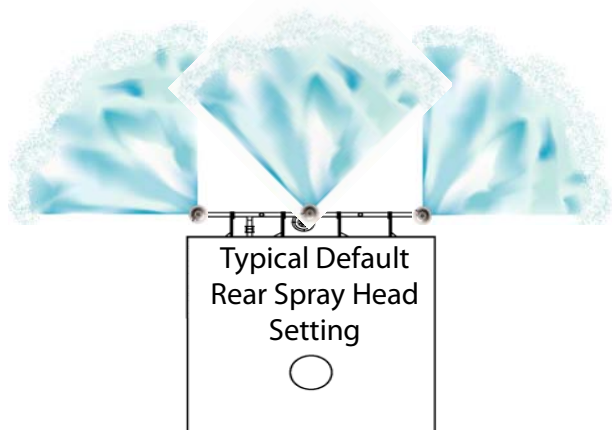
Steps for accurate spray system employment are as follows:

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.

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Employment

5. Follow Normal Operations steps for water pump activation and spray head operation.
6. Operate water truck and turn all rear 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

Water discharge pressure and volume are independent on engine rpm.

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

NOTE

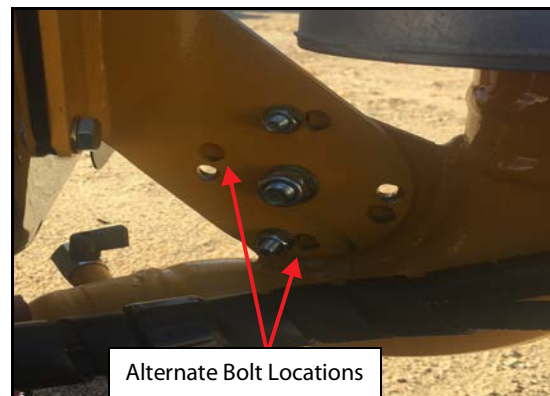
Observe spray head closure delay. Delayed spray head closure is caused by the mechanical limitations of the hydraulic spray system. Noting these delays will help in predicting the actual closure rate of the spray heads when adjusting the spray pattern for oncoming traffic and obstacles.

FRONT BUMPER SPRAY HEAD



The front bumper spray head is used and adjusted like any other spray head for road and berm operations. This spray head mount is adjustable, allowing the fan pattern to be tilted slightly downwards. This configuration is also very effective when water patterns are needed to penetrate the ground surface for compaction operations.

VERTICAL TILT ADJUSTMENT



To adjust the front bumper spray head downwards, reposition the bolts shown above to the alternate bolt holes indicated. This will result in the header pipe being tilted downward at an angle of approximately 15°.

SECTION 6

Employment

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 only 1 or 2 spray heads are employed for this application.

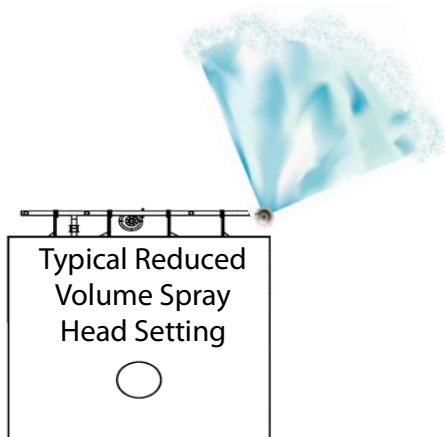
EXAMPLE 1:

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



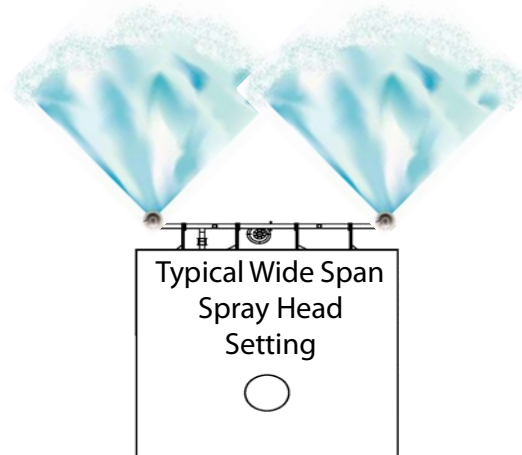
EXAMPLE 2:

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



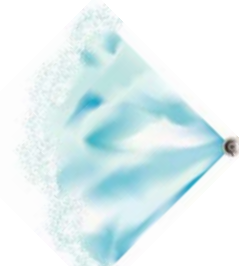
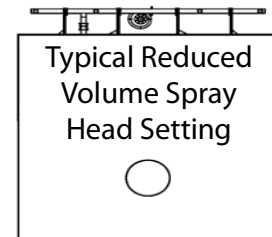
EXAMPLE 3:

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



EXAMPLE 3:

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



SECTION 6

Employment

SPRAY PATTERN 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 the spray head width to align towards the 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 (3/8" 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).

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.

CAUTION

If the dump bar is activated and the water truck 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.

SECTION 6

Employment

WATER CANNON



The water cannon system is a very versatile tool for many different mining and construction applications. The straight bore nozzles excel at producing a straight stream of water able to reach 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.

CAUTION

Do not point straight streams directly at cab windows, exhausts, or sensitive components.

SECTION 7 Appendix

Place copies of this Operator's Checklist and the
Inspections Checklist at the end of Section 4 in the cab.

MOH4-KW-OPS(CL)-1
27 MAR 2019



MOH OPERATOR'S CHECKLIST

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Appendix

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D. Hose Reel.....	N-7
3. AFTER OPERATIONS.....	N-8
4. COLD WEATHER OPERATION AND STORAGE	N-10

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1**27 MAR 2019****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. Water Cannon – CHECKED & SECURED
 - a. Nozzle – Check for security and kinking of foam concentrate supply line.
4. MOH Spring Bolt Mounts (4 total) – CHECKED AND SECURE
5. Solenoid Control Box – CHECKED
6. Hydraulic Oil Reservoir – SERVICED, CHECKED FOR SECURITY AND LEAKS
7. Heat Exchanger – CHECKED FOR SECURITY AND LEAKS
8. LH Hydraulic Hoses and Cabling – CHECKED FOR SECURITY AND LEAKS.

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1

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9. Hose Reel – CHECKED FOR DAMAGE AND LEAKS
10. Tank Drain Petcocks – CLOSED
11. Spray Heads – SECURED & ADJUSTED
12. Water Pump Assembly – CHECKED
 - a. Ensure volute case drain valve is closed.
 - b. Check for evidence of water pump and drive motor overheating.
13. RH Hydraulic Hosing & Cabling – CHECKED FOR SECURITY AND LEAKS.
14. Front Bumper Spray Head & Plumbing – CHECKED FOR SECURITY, ADJUSTMENT, & LEAKS.

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1

27 MAR 2019

OPERATIONS

Use these procedures to safely operate the standard and optional systems installed on the MOH.

CAUTION

Limit water pump operation to 2.0 minutes when in a no-flow condition (no water flowing through spray heads, water cannon, 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

1. PTO Switch (In Cab) – TOGGLED
2. Spray Head Buttons – TOGGLED AS REQUIRED.
3. **Shut-down procedure (with drive motor running and spray heads open):**
 - a. Spray Head Buttons – TOGGLE CLOSED
 - b. Allow pump shutdown timer to run out; after 120 seconds, the water pump will shut down.
 - c. System is now shut down and the PTO switch may be turned off to shut down the PTO.

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SECTION 7

Appendix

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DUMP BAR

1. PTO Switch (In Cab) – TOGGLED
2. Butterfly Valve Button – TOGGLED OPEN

NOTE

This will both activate the water pump drive motor and disable the spray head and Reel/ Cannon buttons in order to prevent the operator from accidentally toggling them.

3. Dump bar is discharging water; drive truck as required.

Once dump bar operations are complete:

4. Butterfly Valve Button – TOGGLED CLOSE

NOTE

Other water distribution functions (spray heads, water cannon, hose reel) are no longer disabled and may now be selected.

N-5

SECTION 7

Appendix

MOH4-KW-OPS(CL)-1**27 MAR 2019****WATER CANNON**

1. PTO Switch (In Cab) – TOGGLED
2. Reel/Cannon Button – TOGGLED ON

NOTE

This will disable the spray head, and Butterfly Valve buttons as well as the pump control knob in order to prevent the operator from accidentally toggling them.

3. Water Cannon Joystick – As Required
4. Water Cannon Control Box – DISCHARGE ON
5. Operate water cannon as required.

Once operations are complete:

6. Water Cannon Control Box – DISCHARGE OFF
7. Reel/Cannon Button – TOGGLE OFF

NOTE

Other water distribution functions (spray heads and dump bar BFV) are no longer disabled and may now be selected.

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1

27 MAR 2019

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.

HOSE REEL

1. PTO Switch (In Cab) – TOGGLED
2. Reel/Cannon Button – TOGGLED ON

NOTE

This will disable the spray head and Butterfly Valve”buttons in order to prevent the operator from accidentally toggling them.

3. Manually open hose reel valve.
4. Operate hose reel as required.

Once operations are complete:

5. Manually close hose reel valve.

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1**27 MAR 2019**

6. Reel/Cannon Button – TOGGLE OFF

NOTE

Other water distribution functions (spray heads and dump bar BFV) are no longer disabled and may now be selected.

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 Buttons – OFF
3. Chocks – As Required
4. Water Cannon – CHECKED & SECURED
5. Solenoid Control Box – CHECKED
6. Heat Exchanger – CHECKED FOR SECURITY AND LEAKS

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1

27 MAR 2019

7. Hydraulic Oil Reservoir – SERVICED, CHECKED
FOR SECURITY AND LEAKS
8. Tank Lines and Hoses – SECURED
9. Hose Reel – CHECKED
10. Rear Spray Heads – SECURED & SET
11. Water Pump – CHECKED for damage, volute case
drain valve SET as required.

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1

27 MAR 2019

COLD WEATHER OPERATION AND STORAGE

CAUTION

Ice will cause serious damage to water pump, spray heads, butterfly valves, and the water cannon if water is allowed to freeze in the volute case, water piping, or on top of a closed butterfly valve. Ensure **all water is drained** from the 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 shaft, diaphragm, drive motor, water pump, or butterfly valve damage when operation is attempted with ice in the housings. To ensure all water is drained from the 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 and quick drain ball valves:
 - a. water pump
 - b. rear spray bar
 - c. front spray head
 - d. dump bar

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SECTION 7

Appendix

MOH4-KW-OPS(CL)-1

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4. Start engine.
5. PTO Switch (In Cab) – TOGGLED ON
6. Water Cannon Joystick
 - a. Nozzle pointed DOWN
 - b. Ball valve CLOSED
7. 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
8. Butterfly Valve Button – TOGGLED OPEN
9. Allow trapped water to drain from dump bar.
10. PTO Switch (In Cab) – TOGGLED OFF
11. Turn engine off.
12. Check to ensure all water has drained from tank.

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SECTION 7

Appendix

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TO REACTIVATE UNIT:

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. **(If applicable)** Install sump cover with new gasket.
4. Close all drain valves and petcocks.

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SECTION 7

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