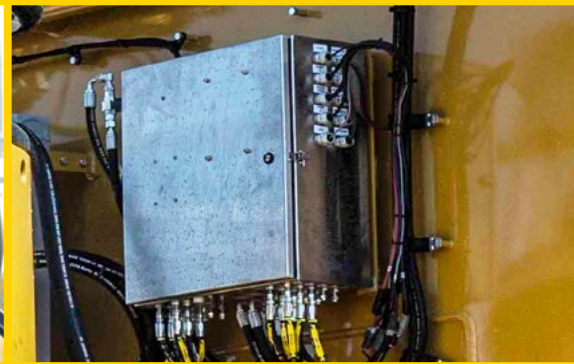




GENUINE MEGA

SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION & MINING

MEGA SPRAY SYSTEM INSTALLATION (HYDRAULIC)



EQUIPMENT ➤ **PARTS** ➤ **SUPPORT** ➤

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Definitions and Abbreviations

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MANUAL USAGE

This technical manual only contains information required to safely install, service, and operate Mega's Digital Spray Control System (DiSCS). This manual covers both the retro installation and the full DiSCS hydraulic control installation. 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 at:

US Toll Free: 1-800-345-8889
Direct: 1-505-345-2661

Or visit our web site at www.megacorpinc.com for more detailed information.

The exact location of the hazards and descriptions of the hazards are reviewed in this section. All personnel working on or operating the system 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 that could result in personal injury and/or death if not carefully followed.

CAUTION

Operating procedures and techniques that 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

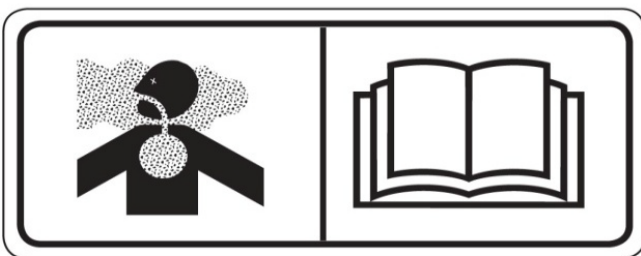
There are several specific safety messages on this machine. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

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.

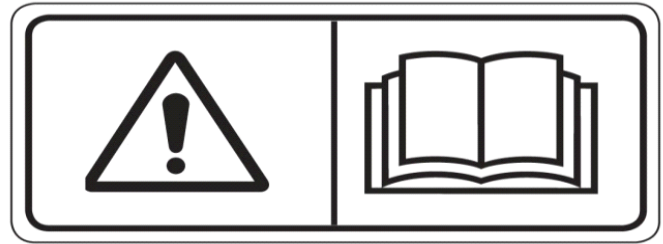


⚠ WARNING

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).

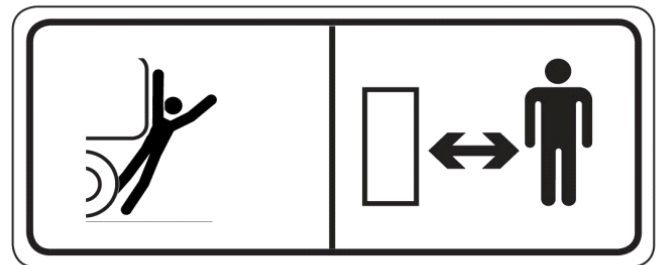


⚠ WARNING

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

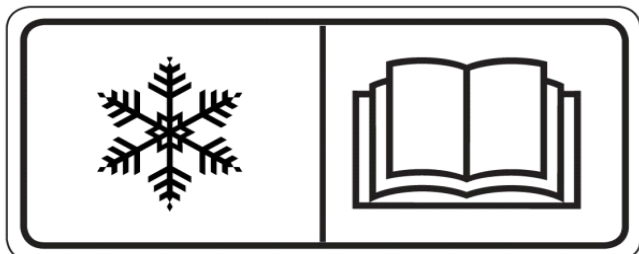
The vehicle is equipped with a back-up alarm. Alarm must sound when operating this vehicle in reverse. Failure to maintain a clear view in the direction of travel could result in serious injury or death.

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.

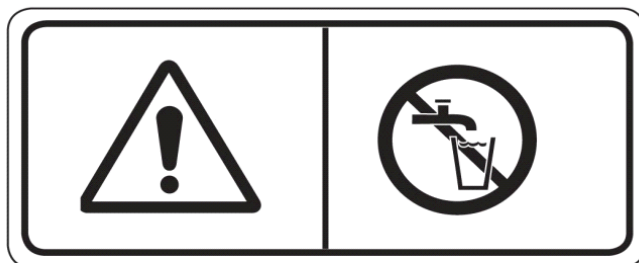


⚠ WARNING

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.

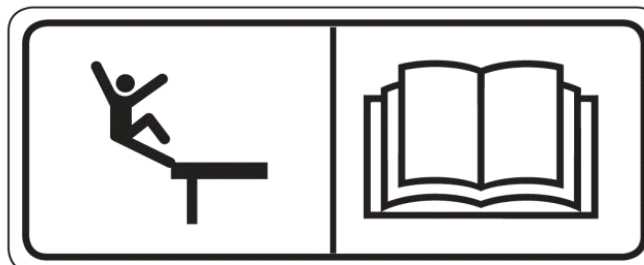


⚠ WARNING

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

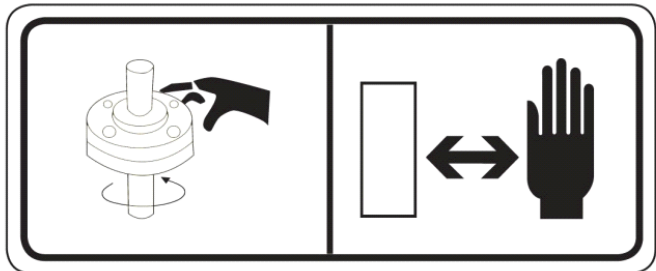
Do not walk on the top of tank without fall arrest PPE. Serious injury or death could occur from a fall.

SECTION 1

Definitions and Abbreviations

Rotating Shaft (8)

This safety label is located on the pump.

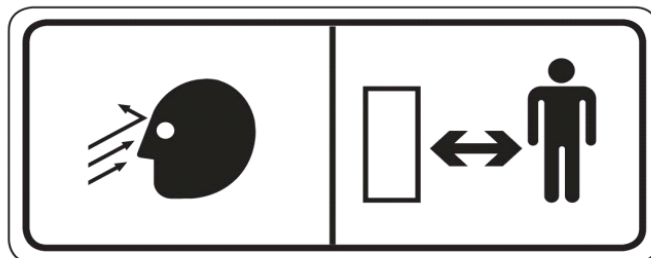


⚠ WARNING

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 Water Cannon (10)

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

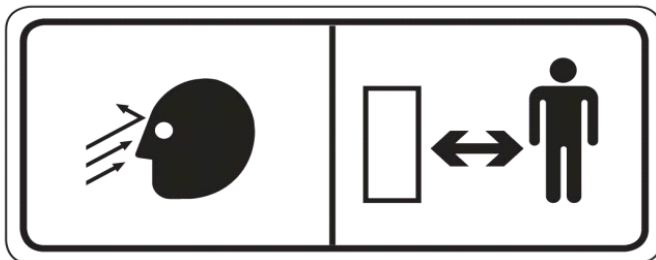


⚠ WARNING

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

High Pressure Spray Heads (9)

This safety label is located on the spray bar.

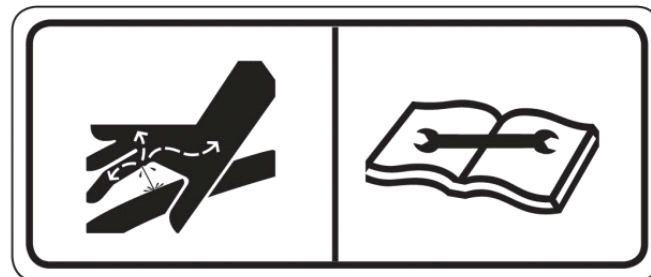


⚠ WARNING

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

High Pressure Motor (11)

This safety label is located on the hydraulic motor.



⚠ WARNING

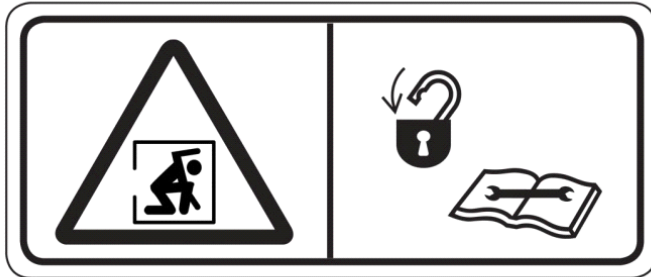
Hydraulic motor and supply lines contain oil under high pressure. Improper removal and repair procedures could cause severe injury. To remove or repair, instructions in the Maintenance Manual must be followed.

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.

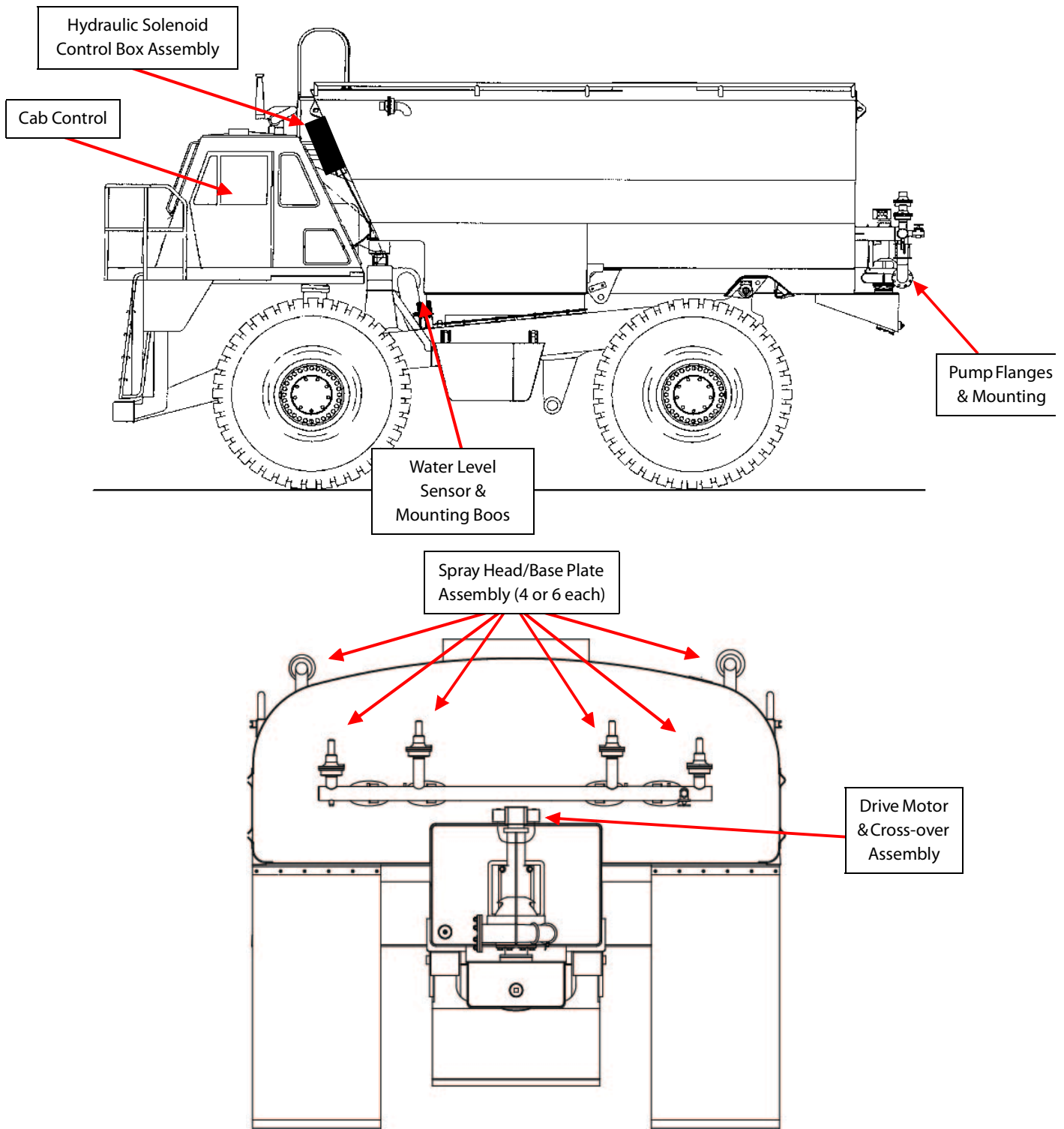
ABBREVIATIONS

BFV	Butterfly Valve
cc	Cubic Centimeters
CCW	Counter Clockwise
CW	Clockwise
DiSCS	Digital Spray Control System
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 operators position facing forward
m	meters
MPH	Miles Per Hour
Nm	Newton meters of torque
psi	pounds per square inch
RPM	Revolutions Per Minute
RT	Right as viewed from the operators position facing forward
SQ FT	Square Feet
VDC	Volts, Direct Current

SECTION 1

Definitions and Abbreviations

KIT INSTALLATION OVERVIEW



SECTION 2

Component Descriptions

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COMPONENT DESCRIPTIONS

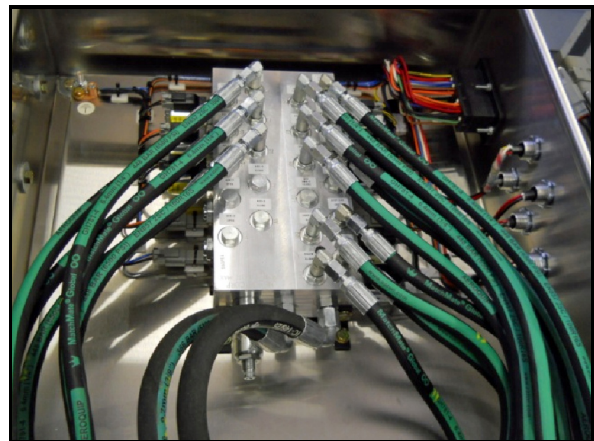
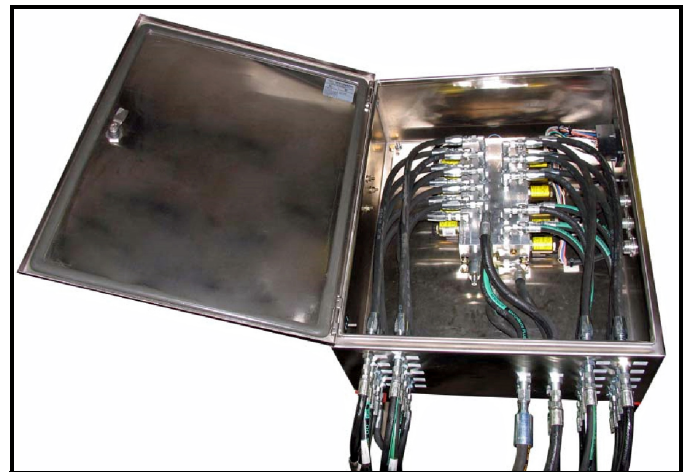
This section describes the components that comprise the hydraulic spray system kit. These components consist of a Cab Control Box, Hydraulic Solenoid Control Box, Water Level Sensor, Control Cabling (LIN cables), and a Hardware Kit.

CAB CONTROLS



Contains switches and controls that can activate 4 to 8 spray heads, intermittent spray controls, water pump activation, work lights, monitor and fire suppression controls and a water level indicator. Control box command signals are routed through a 24\37 conductor cable to the hydraulic solenoid control box to operate hydraulic solenoid valves. The control box requires vehicle 24 VDC power to operate.

HYDRAULIC SOLENOID CONTROL BOX



Contains 4 to 11 hydraulic solenoid control valves which direct hydraulic pressure to the 4 to 8 spray head assemblies. The box also contains hydraulic control solenoids to operate up to 3 hydraulic butterfly valves. Solenoid valves receive command signals from cab control box to open or close the respective spray head or device. The solenoid control box also provides over pressurization protection, hydraulic oil filtration and routing of water level, hoist control, work lights and monitor signals.

SECTION 2

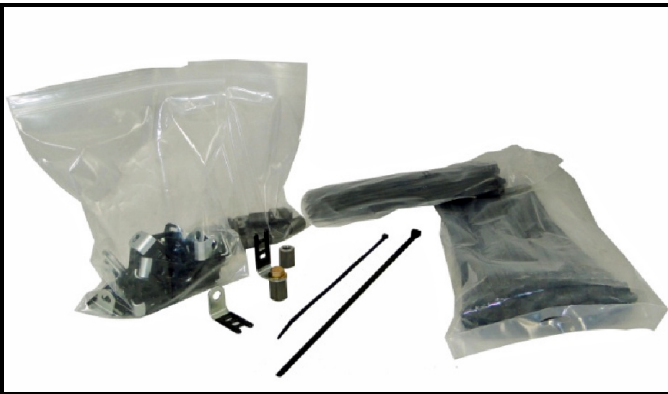
Component Descriptions

WATER LEVEL SENSOR



Contains a weld-on threaded boss with a water level sensor and cable. The boss will be located and welded externally on the tanks lower forward bulkhead. The boss will provide mounting for the water level sensor. The water level sensor is a pressure sensitive device that sends signals to the cab control for water level indications. The water level gauge cable plugs into the hydraulic solenoid control box. Supplied in the kit is a water level calibration wand and instruction to recalibrate the gauge if a component is replaced.

HARDWARE KIT



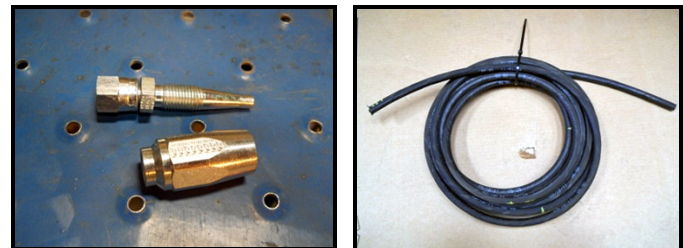
Supplied with the spray system kit will be weld-on threaded bosses and bolts, mounting tabs for cables and hoses, nylon ties to secure cables and hoses, hardware to assist in mounting the cab control box pedestal, and a tank grounding strap to complete the tank grounding circuit.

CONTROL CABLING



A 24/40 pin cable assembly that will go from the cab control box to the solenoid box. This cab control cable may be equipped with the break out cables to allow the hook up of an electric monitor logic box. Included is a cable that is equipped with a plug at each end, carries command signals between cab and the hydraulic solenoid control box.

HYDRAULIC HOISING KIT

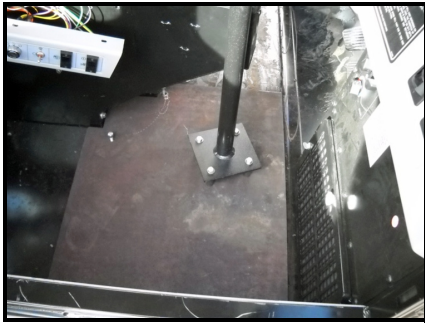


Contains a length of -4 hydraulic hose and field installed hydraulic fittings. The hose must be routed, cut to fit and hose ends installed. The fabricated hose assemblies connect the hydraulic solenoid box fittings with the hydraulic spray head or butterfly valve actuator. This allows the hydraulic oil to open or close the proper spray system component when commanded to operate by the cab control box signal. The also contains a length of -6 hose and permanent crimp fittings that will route hydraulic supply and return oil to tank from the hydraulic solenoid box.

SECTION 2

Component Descriptions

CAB CONTROL PEDESTAL



A mounting structure that secures the cab control box to the cab. Mounting location and method are to be compliant with the manufactures structure policies and are the responsibility of the customer and end user to ensure compliance policies are communicated and followed.

OPTIONAL COMPONENTS

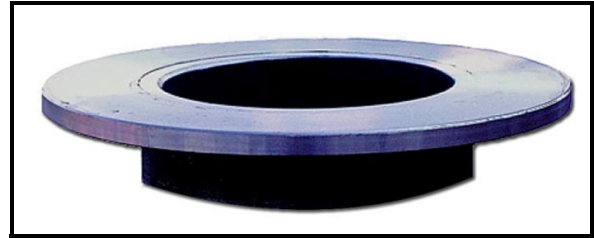
A two piece housing that contains a diaphragm, valve guide disk, spring, hydraulic cylinder and an adjustable flow ring. Hydraulic pressure from the hydraulic solenoid control box is used to extend the spray head hydraulic cylinder (close diaphragm) or retract (open diaphragm) to control water flow. An adjustable flow ring is provided to adjust spray pattern, reach and flow. MEGA Hydraulic spray heads are available in Standard Aluminum or Corrosion Resistant style.

SPRAY HEADS



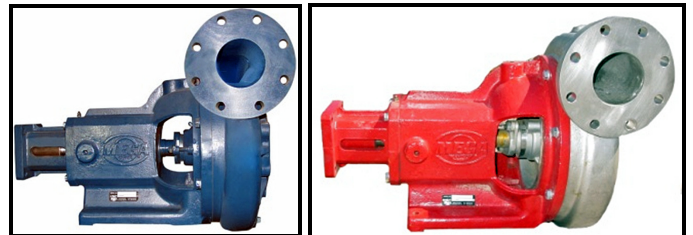
A two piece housing that contains a diaphragm, valve guide disk, spring, hydraulic cylinder, and an adjustable flow ring. Hydraulic pressure from the hydraulic solenoid control box is used to extend the spray head hydraulic cylinder (close diaphragm) or retract (open diaphragm) for water flow control. An adjustable flow ring is provided to adjust spray pattern, reach, and flow. MEGA hydraulic spray heads are available in standard aluminum or stainless steel versions.

BASE PLATE AND BASE PLATE ADAPTERS



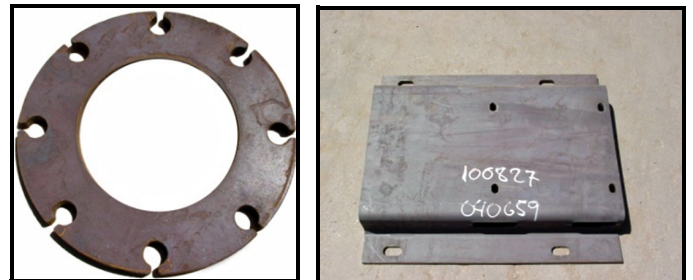
Machined flanges used to support and secure the MEGA spray heads, can be used to replace damaged or retro fit MEGA spray heads to a different manufacture spray bar. These are field weld-on components.

M-4B WATER PUMP



MEGA M-4 (6" X 4" Centrifugal) water pumps use a closed coupling drive mount that allows the hydraulic drive motor to bolt directly to the water pump. M-4 water pumps can be mounted horizontally or vertically. The M-4 pumps are equipped with rope packing adjustable shaft seals for ease of maintenance or replacement, O-ring sealed volute case, Stainless steel keyed impeller and heavy duty bearings and shaft. M-4 water pumps come in standard cast iron or corrosion resistant configurations.

WATER PUMP FLANGES AND MOUNTS

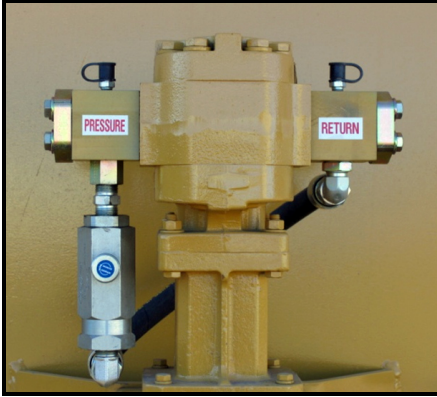


MEGA Flanges require gaskets to seal the flange to the water pump inlet and outlets; these flanges are used to adapt to 6" inlet and 4" discharge piping. Water pump mounts can be supplied for either horizontal or vertical mounting of the water pump.

SECTION 2

Component Descriptions

HYDRAULIC DRIVE MOTOR AND FLOW CONTROL



If required, a properly sized hydraulic gear motor and flow control can be added to the spray system. The hydraulic motor receives hydraulic oil flow from vehicle's hydraulic system to turn the hydraulic motor that is mounted and coupled to the water pump. Hydraulic oil flow is regulated by adjusting the flow control valve on the cross-over assembly to control water pump speed. The requirement for proper sizing of the hydraulic drive motor is beneficial for operation of the M-4B water pump at the optimum rpm for discharge volume, pressure, and water pump longevity.

WATER CANNON KITS



MEGA Remote Mounted Water Cannon kits for the hydraulic spray system is a hydraulic operation system. The water cannon is a stainless steel water way that is controlled remotely by the vehicle operator from the cab control box. MEGA Spray systems are configured to be upgraded to add this option at the owners convenience.

SECTION 3 Installation Procedures

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DESCRIPTION

These procedures are designed to complete a full or partial installation of a spray system kit. The full installation kit consists of a cab control box, cab pedestal water level sensor/boss assembly, hydraulic solenoid control box, spray head/base plate assemblies, water pump and base plate, pump flanges, hydraulic hosing and control cabling. Therefore, if your kit is less than a full install, only use the applicable sections of these instructions to complete your installation.

Procedures are generic in nature and, in most cases, not written for a specific tanker application. Procedural steps will present basic component installation and may contain accompanying pictures to assist in the assembly process. Some of these pictures and references may be specific to your tanker or truck application. If further information or assistance is required, contact the 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 additional contact information.

HYDRAULIC SOLENOID CONTROL BOX

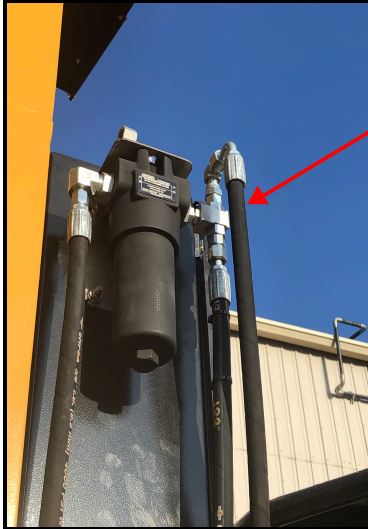
1. Identify a suitable location for hydraulic solenoid control box on forward head of tank. Ensure box is located in a position that will be serviceable and not interfere with chassis components.
2. Lift solenoid box assembly into position and tack weld mounting angle brackets to the tank.



3. Unbolt solenoid box and finish welding mounting angle brackets.
4. Remount and secure hydraulic solenoid control box to mounting angles.

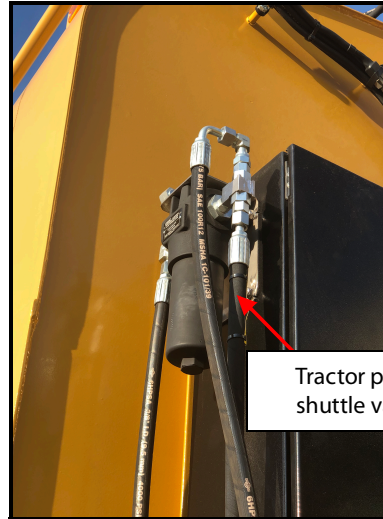
SECTION 3 Installation Procedures

5. Locate, measure, fabricate and secure PRESSURE hose from the shuttle valve to to the torque tube manifold PRESSURE port.

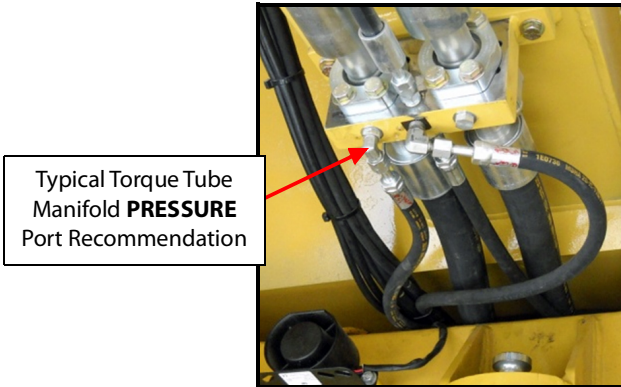


Pressure hose from the shuttle valve to the torque tube manifold

7. Measure, fabricate and secure PRESSURE hose from the tractor pilot oil source that does not affect brakes or steering to shuttle valve on hydraulic filter mounted to solenoid control box.

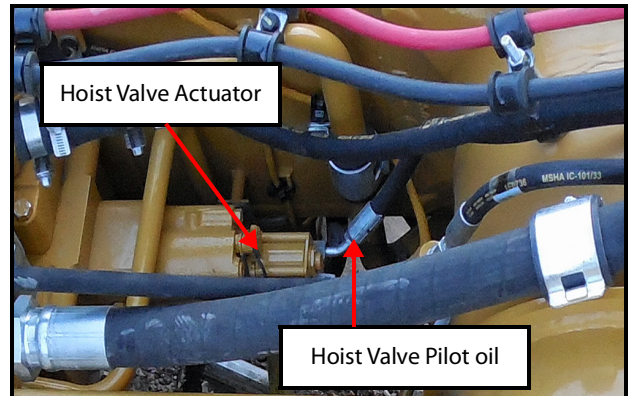


Tractor pilot oil source to shuttle valve (PRESSURE)



Typical Torque Tube Manifold **PRESSURE** Port Recommendation

8. (Typical CAT ridged frame tractor) Tractor pilot oil source is typically from the hoist valve pilot oil at the hoist valve actuator.



Hoist Valve Actuator

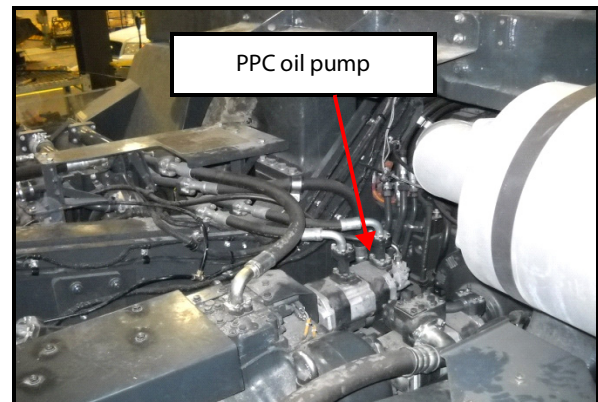
Hoist Valve Pilot oil

6. Locate a suitable 'Free to Tank' port on the hoist hydraulic tank. This will be used as a case drain/control return port.



Torque Tube Manifold Case Drain

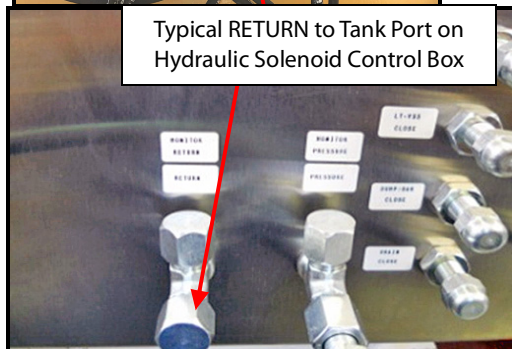
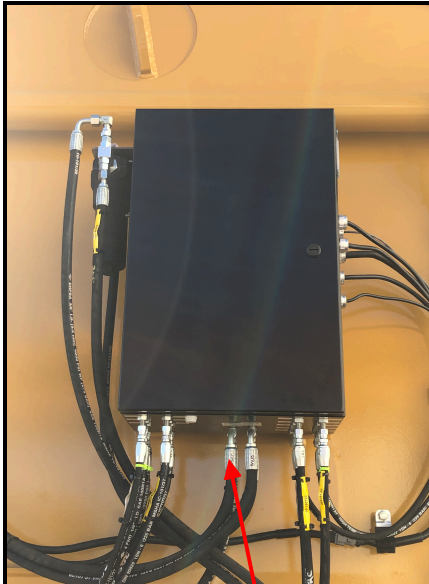
9. (Typical Komatsu HM series tractor) Tractor pilot oil source is typically from the PPC oil circuit.



PPC oil pump

SECTION 3 Installation Procedures

10. Measure, fabricate and secure hose from solenoid control box RETURN to CASE DRAIN on hydraulic tank.

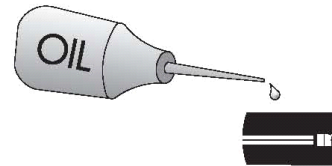


SPRAY HEAD HOSE ASSEMBLY

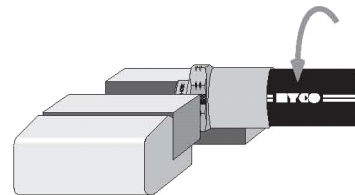
NOTE

Before cutting hoses for assembly, plan the hose routing. Ensure the hose routing does not interfere with moving components. Measure each hose and label function prior to assembly and installation in order to ensure proper hose fit and routing.

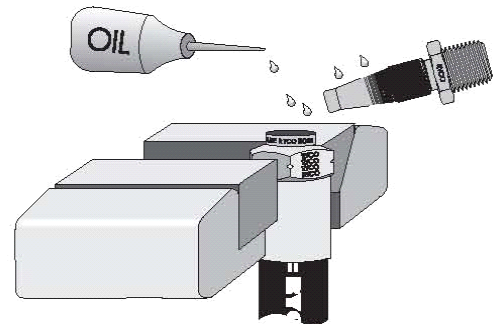
1. Cut hose to length desired using a fine tooth hacksaw or cut-off machine.
2. Clean hose bore.
3. Lubricate hose cover with clean hydraulic oil.



4. Place socket in vice and turn hose into socket counterclockwise until the hose bottoms in socket, back out hose (Clockwise) ¼ turn.



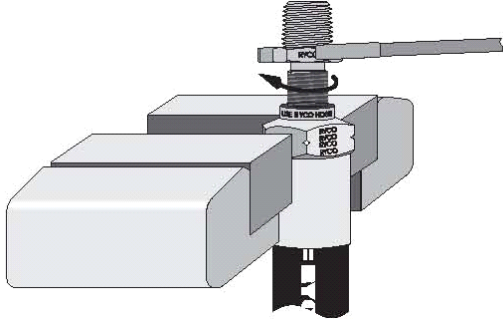
5. Lubricate fitting nipple with clean hydraulic oil.



SECTION 3

Installation Procedures

6. Screw nipple into socket and hose in a clockwise direction using continuous motion. Ensure hose does not turn in socket while installing nipple.



7. Do not bottom out nipple in socket; leave 1/32 inch (1mm) to 1/16 inch (1.5mm) clearance between nipple and socket.

CAUTION

Field install (re-useable) hose ends should only be used for spray head operation. Using the Field installed hose ends for butterfly valve or water cannon operation may result in fluid leakage or hose separation causing a loss of hydraulic oil and pressure resulting damage to hydraulic systems or loss of control functions.

HOSE INSTALLATION AND ROUTING

1. Plan hose routing before cutting hoses.



2. Install (weld on) threaded bosses in locations to route hoses.
3. Install ladder clamps on threaded bosses.

4. Install house bulkhead plate at the front and rear of the tank as desired.
5. Using nylon cable ties, secure hoses to ladder clamps.



6. Install and secure hose end fittings to solenoid control box fittings and to spray head fittings. The port at the **TOP** of the hydraulic cylinder is for **CLOSE** and the port on the **SIDE** of the cylinder is **OPEN**.



CLOSE

OPEN

SECTION 3 Installation Procedures

CAB CONTROLS

Installation procedures for the cab controls may vary depending upon the chassis. The instructions given here are not intended to be exact, and may need to be modified. If you are having difficulties with the installation, please contact the MEGA Corp Product Support Group.

1. Locate cab control boxes, mount, and cabling. Install cab control box to pedestal and mock-up the placement of the assembly in the cab.



CAUTION

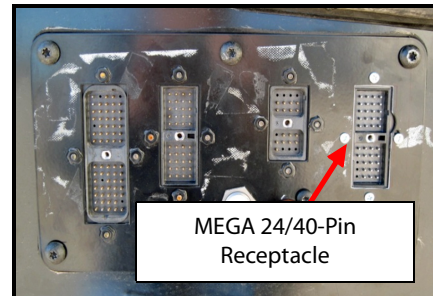
When choosing a mounting location and method for cab control pedestal and box, ensure all site and equipment cautions and recommendations are followed. Failure to follow chassis manufactures structure guidelines may lead to loss of certification of structure.

When unit is in WATER TANK configuration, hydraulic hosing must be moved and isolated to prevent accidental hoisting of the water tank. On CAT units, the HOIST valve must be "UNINSTALLED" from the ECM using CAT E.T. before it is released in the water truck application.

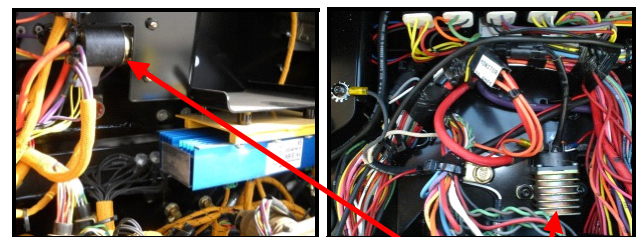
NOTE

When placing cab control, ensure placement does not interfere with operational controls or operators view of mirrors and monitor panels.

2. Once location and method are decided, install and secure cab control pedestal.
3. Identify a pathway to route cab control cable from cab control box to a mounting panel on cab.
4. Using the template make an opening to mount the 24/40 pin receptacle.



5. Make any necessary and appropriate holes in removable mounting panels for cables to exit cab, install strain reliefs to seal the cab and to protect the cables when exiting the cab.
6. Route and connect cab control cable to cab control box and to bulkhead opening.
7. Locate a 24 VDC switched power source capable of handling a 20 amp load.
8. Locate and route the two **RED** wires and the one **BLACK** to the switched power source as shown in the appendix.
9. Connect the two **RED** to the reliable 24VDC switched power source as shown in the appendix.



Typical Switched Power Relays and Connection Points

SECTION 3

Installation Procedures

10. Locate a reliable ground buss near the switched power source. Connect the **BLACK** to this grounding cluster.

40-PIN wiring chart

WIRE #	WIRE COLOR	STRIPE	FUNCTION
1	BLACK		PUMP SOLENOID -
2	RED		PUMP SOLENOID +
3	BLUE		WORK LIGHT
4	ORANGE		LT BUMPER (OPEN)
5	YELLOW		REMOTE WLI POWER
6	BROWN		LT VSS (OPEN)
7	RED	BLACK	AIR REGULATOR + (OPEN)
8	BLUE	BLACK	LT REAR (OPEN)
9	ORANGE	BLACK	BEACON
10	YELLOW	BLACK	LT CENTER REAR (OPEN)
11	BROWN	BLACK	
12	BLACK	RED	RT CENTER REAR (OPEN)
13	BLUE	RED	
14	ORANGE	RED	RT REAR (OPEN)
15	YELLOW	RED	
16	BROWN	RED	WATER CANNON (RIGHT)
17	BLACK	BLUE	WATER CANNON (DOWN)
18	RED	BLUE	WATER CANNON (LEFT)
19	ORANGE	BLUE	WATER CANNON (UP)
20	YELLOW	BLUE	WATER CANNON BFV (OPEN)
21	BROWN	BLUE	WATER CANNON BFV (CLOSE)
22	BLACK	ORANGE	RT VSS (OPEN)
23	RED	ORANGE	
24	BLUE	ORANGE	RT BUMPER (OPEN)
25	YELLOW	ORANGE	
26	BROWN	ORANGE	WATER LEVEL GAUGE (WHITE)
27	BLACK	YELLOW	WATER LEVEL GAUGE (RED)
28	RED	YELLOW	WATER LEVEL GAUGE (BLACK)
29	BLUE	YELLOW	BOX GROUND
30	ORANGE	YELLOW	DUMP BAR BFV (OPEN)
31	BROWN	YELLOW	
32	BLACK	BROWN	DRAIN BFV (OPEN)
33	RED	BROWN	
34	BLUE	BROWN	ADJUSTABLE NOZZLE (STREAM)
35	ORANGE	BROWN	ADJUSTABLE NOZZLE (FOG/FAN)
36	YELLOW	BROWN	FOAM VALVE (OPEN)
37	BLACK	BLACK	FOAM VALVE (CLOSE)
38	RED	14 GA	#2 POWER BUS 24 VDC +
39	BLACK	14 GA	CHASSIS GROUND
40	RED	14 GA	BOX VOLTAGE

24-PIN wiring chart

24 PIN COMPACT CAB CONTROL WIRING			
WIRE/P IN#	WIRE COLOR	STRIPE	FUNCTION
1	BLACK		PUMP SOLENOID -
2	RED		PUMP SOLENOID +
3	BLUE		WORK LIGHT
4	ORANGE		LEFT VSS
5	YELLOW		LEFT REAR
6	BROWN		LEFT REAR CENTER
7	RED	BLACK	RIGHT REAR CENTER
8	BLUE	BLACK	RIGHT REAR
9	ORANGE	BLACK	RIGHT VSS
10	YELLOW	BLACK	DUMP BAR BFV
11	BROWN	BLACK	DRAIN BFV
12	BLACK	RED	AUX (REGULATED)
13	BLUE	RED	WATER LEVEL (POWER)
14	ORANGE	RED	WATER LEVEL (SIGNAL)
15	YELLOW	RED	MONITOR RIGHT
16	BROWN	RED	MONITOR DOWN
17	BLACK	BLUE	MONITOR LEFT
18	RED	BLUE	MONITOR UP
19	ORANGE	BLUE	MONITOR BFV OPEN
20	YELLOW	BLUE	MONITOR BFV CLOSE
21	BROWN	BLUE	ADJ NOZZLE STREAM
22	BLACK	ORANGE	ADJ NOZZLE FOG/FAN
23	RED	ORANGE	FOAM OPEN
24	BLUE	ORANGE	FOAM CLOSE
12 PIN CONNECTOR FOR JOY STICK			
1	RED		POWER (24VDC+)
2	BROWN	RED	MONITOR DOWN
3	BLACK	BLUE	MONITOR LEFT
4	RED	BLUE	MONITOR UP
5	BROWN	BLUE	ADJ NOZZLE STREAM
6	BLACK	ORANGE	ADJ NOZZLE FOG/FAN
7	RED	ORANGE	FOAM OPEN
8	BLUE	ORANGE	FOAM CLOSE
9	YELLOW	RED	MONITOR RIGHT
10	BLACK		GROUND
11	BLANK	BLANK	N/A
12	BLANK	BLANK	N/A

11. Reinstall and secure cab components removed for installation.

12. Install tank to chassis grounding cable.

SECTION 3 Installation Procedures

WATER LEVEL SENSOR

1. Locate an accessible area on the front of the tank suitable for welding on the water level boss assembly. Recommend forward, center of the tank main tunnel.

NOTE

The water level indicator is more accurate when water level assembly is located correctly. Recommend welding the threaded boss on the front of the main tunnel, 2 inches above the bottom of the tank.

2. Drill or torch one 1/2 inch (13mm) hole at the location of the water level boss as shown in Appendix. Ensure that the boss will cover the hole when welded in place.
3. Position water level boss over the hole and weld to the tank.



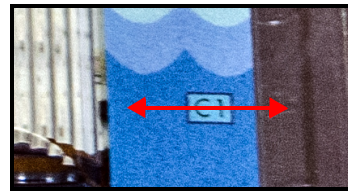
4. Prime and paint water level sump and install water level sensor and attach cable.



WATER LEVEL INDICATOR (SOLENOID BOX MOUNTED MASTER GAUGE) CALIBRATION

NOTE

The term 'swipe' means to move the tip of the calibration magnet tool up to and then away from either the C1 or the C2 sensor on the front right-hand side of the display:



Slowly Swipe in either direction

1. Fill water tank to maximum capacity.
2. Turn SYSTEM ON and allow the system to warm up for at least 2 minutes.
3. Swipe the magnet four (4) times at **C 1** and four (4) times at **C 2** to enter the linear calibration mode.

NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

4. Once the calibration code has been entered and linear calibration mode is active, **wait for five seconds**.
5. After five seconds, the top four and bottom four display LEDs should flash alternately on and off to indicate that the code has been accepted. **While the LEDs are still flashing**, hold the magnet steadily at **C 2** for five seconds in order to set the calibration into memory.
6. After a few seconds, the calibration mode will terminate, and all LEDs will illuminate to show that the water tank is at full capacity.

SECTION 3 Installation Procedures

7. After performing calibration, **if and only if** the indicator shows 1 or 2 lights LESS than FULL, perform the Full Tank Correction calibration as follows:

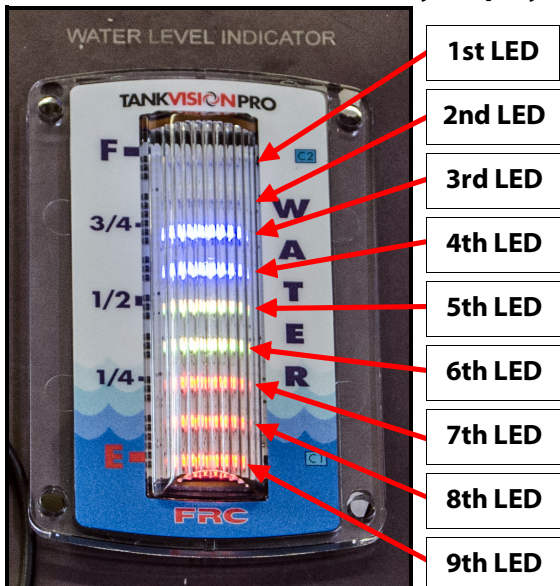
- a. Swipe the magnet five (5) times at **C 1** and five (5) times at **C 2** to enter the linear calibration mode. The top and bottom five display LEDs should flash on and off.

NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

- b. Wait three seconds, then hold the magnet tool at **C 2** for five seconds to complete the calibration.
- c. After six seconds, the calibration mode will terminate and all of the LEDs should illuminate to show that the water tank is at full capacity.

WATER LEVEL INDICATOR DIAGNOSTIC CODES (There are 9 LEDs in the Primary Display)



1. Down-chasing LEDs, then bottom two (2) flash

Indication: Tank EMPTY

Meaning: TANK VISION sees an EMPTY tank

Solution: Fill tank with water or repeat CALIBRATION procedure

2. First (1) & last (9) LEDs flash alternately

Indication: No Sensor

Meaning: NO sensor connected, or the sensor is defective, or an OPEN circuit in the sensor wiring

Solution: Check all connections and wiring for damage or replace cable or correct connection or replace sensor and repeat CALIBRATION procedure

3. Third (3) & fifth (5) LEDs flash

Indication: Data Entry Error

Meaning: Calibration was not performed properly

Solution: Repeat CALIBRATION procedure

4. Top four LEDs flash alternately with the bottom four

Indication: Pressure Sensor High Output Voltage (voltage > 4.6V)

Meaning: Shorted wire on sensor cable or primary display failure

Solution: Check cable for short or replace cable, or replace primary display if no short is present, and repeat CALIBRATION procedure

5. Top 2/3 and bottom 2/3 LEDs alternately flash

Indication: Memory Failure

Meaning: Primary display failure

Solution: Replace primary display and repeat CALIBRATION procedure

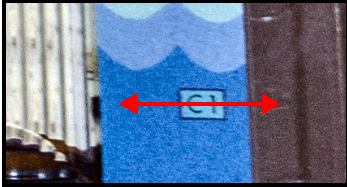
SECTION 3

Installation Procedures

WATER LEVEL INDICATOR DISPLAY ADJUSTMENT

NOTE

The term 'swipe' means to move the tip of the calibration magnet tool up to and then away from either the **C 1** or the **C 2** sensor on the front right-hand side of the display:



Slowly Swipe in either direction

Brightness Adjustment

A light sensor allows the indicator display to switch automatically between the two modes. **It is highly recommended to set the brightness levels of both modes to the minimum value** (brightness level 1 on a scale of 1-10 with 10 being the brightest) as the default setting is bright enough to induce discomfort.

To adjust day-time brightness (default is 8)

1. Turn SYSTEM ON and allow the system to warm up for at least 2 minutes.
2. Swipe the magnet three (3) times at **C 1** and one (1) time at **C 2** to enter the linear calibration mode. After a few seconds, the top three LEDs and the very bottom LED should flash on and off.

NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

3. Enable brightness setting entry by holding the magnet tool at **C 2** for 5 seconds.
4. Adjust the brightness by swiping the magnet tool at **C 1** until the brightness level reaches its **minimum value** (1).
5. Save the new brightness setting by holding the magnet tool at **C 2** for 5 seconds.

To adjust night-time brightness (default is 2)

1. Turn SYSTEM ON and allow the system to warm up for at least 2 minutes.
2. Swipe the magnet three (3) times at **C 1** and two (2) times at **C 2** to enter the linear calibration mode. After a few seconds, the top three LEDs and the bottom two LEDs should flash on and off.

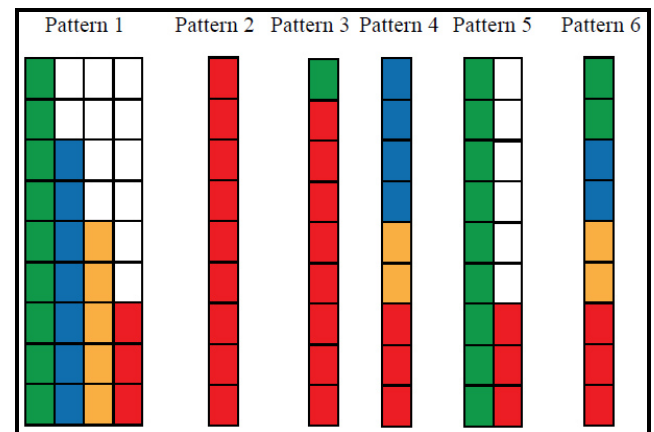
NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

3. Enable brightness setting entry by holding the magnet tool at **C 2** for 5 seconds.
4. Adjust the brightness by swiping the magnet tool at **C 1** until the brightness level reaches its **minimum value** (1).
5. Save the new brightness setting by holding the magnet tool at **C 2** for 5 seconds.

Color Pattern Selection

The water level indicator display has six (6) total color patterns to select from. The default is Pattern 1:



Pattern 1: One solid color, color changes depending on water level: FULL--green, 3/4 tank--blue, 1/2 tank--orange, 1/4 tank--red, EMPTY--red.

Pattern 2: All red

Pattern 3: Top 1/8 water level is green, below that is red

Pattern 4: Three colors: blue\orange\red

Pattern 5: All green, turns red when water level is detected to be at or below 1/4 tank.

Pattern 6: Four fixed colors for each 1/4 tank increment: green\blue\orange\red

SECTION 3

Installation Procedures

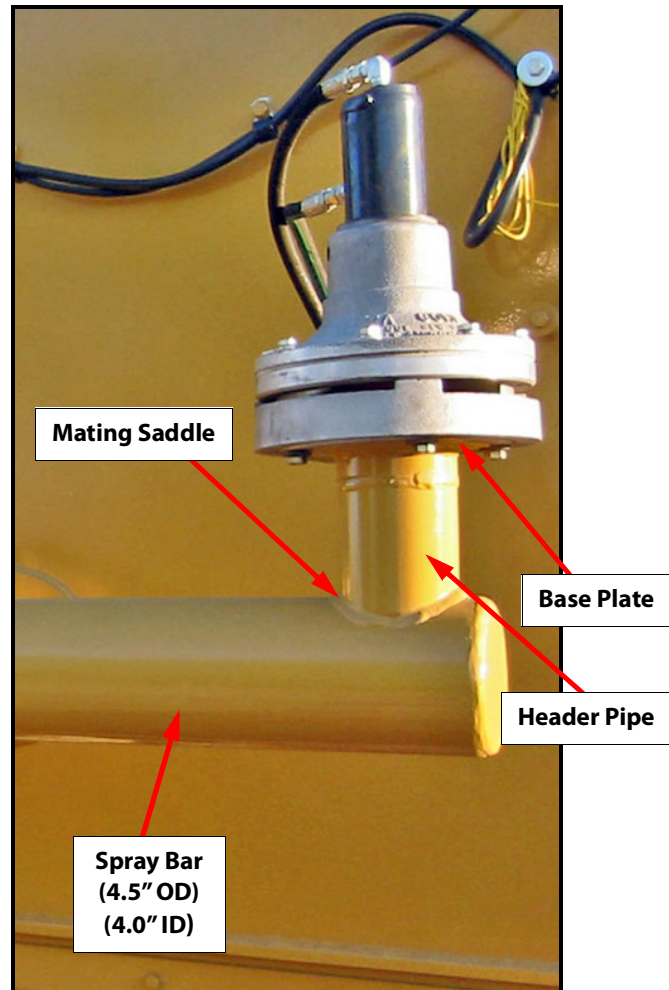
1. Turn SYSTEM ON and allow the system to warm up for at least 2 minutes.
2. Select one of the color pattern settings as follows:
 - a. Swipe the magnet one (1) time at **C 1** and one (1) time at **C 2** to select **Pattern 1**
 - b. Swipe the magnet one (1) time at **C 1** and two (2) times at **C 2** to select **Pattern 2**
 - c. Swipe the magnet one (1) time at **C 1** and three (3) times at **C 2** to select **Pattern 3**
 - d. Swipe the magnet one (1) time at **C 1** and four (4) times at **C 2** to select **Pattern 4**
 - e. Swipe the magnet one (1) time at **C 1** and five (5) times at **C 2** to select **Pattern 5**
 - f. Swipe the magnet one (1) time at **C 1** and six (6) times at **C 2** to select **Pattern 6**

NOTE

Do not wait more than six seconds in-between swipes, or the session will time out and you will have to start over.

3. Wait five (5) seconds.
4. After five seconds, the very top LED and between 1-6 (matching the number of times **C 2** was swiped) of the bottom display LEDs should flash alternately on and off to indicate that the code has been accepted. **While the LEDs are still flashing**, hold the magnet steadily at **C 2** for five seconds in order to set the calibration into memory.

OPTIONAL COMPONENT INSTALLATION SPRAY BAR HEADER PIPE

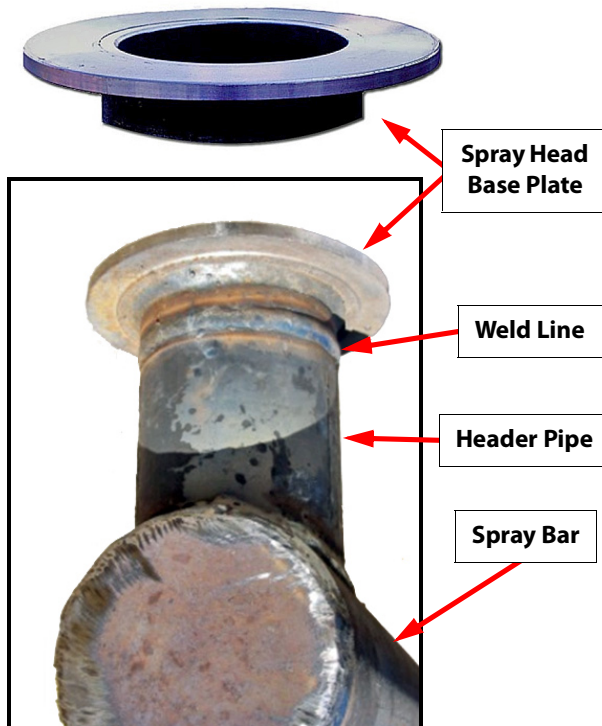


1. Make 4 inch (10cm) or 6inch (15cm) Spray Bar Header Pipe by cutting 3.5 inch (9cm) OD pipe to desired length.
2. Cut a mating saddle (Cope) in lower Spray Bar Header Pipe to allow welding.
3. Cut/torch a 3 inch (7.62cm) diameter hole in the Spray Bar were the Spray Bar Header pipe mounts to the spray bar.
4. Remove any cut material from within the Spray Bar to ensure no damage to spray heads will occur when spray system is activated.
5. Locate the Spray Bar Header pipe over the 3 inch (7.62cm) on the Spray Bar and weld.

SECTION 3 Installation Procedures

SPRAY HEAD & BASE PLATE ASSEMBLY

1. Weld base plate to existing 3 inch (7.62cm) pipe assembly.

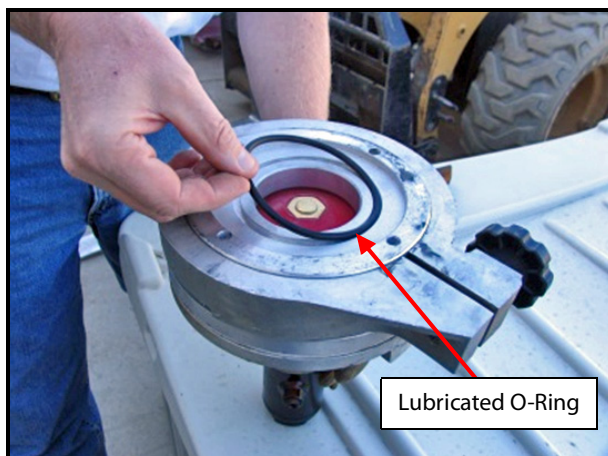


2. Prime and paint base plate assembly.

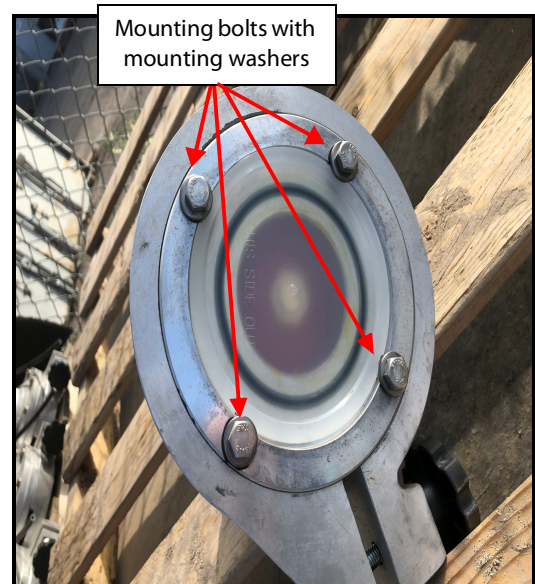
CAUTION

Do not prime or paint the base plate assembly mating face. Primer or paint on the spray head mating surface will cause spray head water leaks due to improper o-ring seating.

3. Lubricate and install O-ring on the base plate mating surface.



4. (Aluminum spray head) Install spray head assembly on existing 3 inch pipe. Coat 4 mount bolts with anti-seize compound and install mounting washers.
5. Adjust spray head opening and adjustment ring for desire spray pattern.
6. Tighten mounting bolts.



Aluminum Spray Head

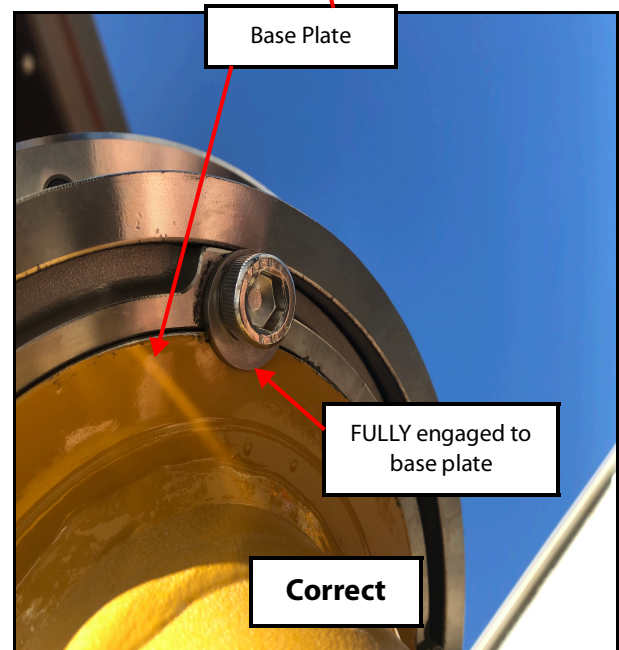
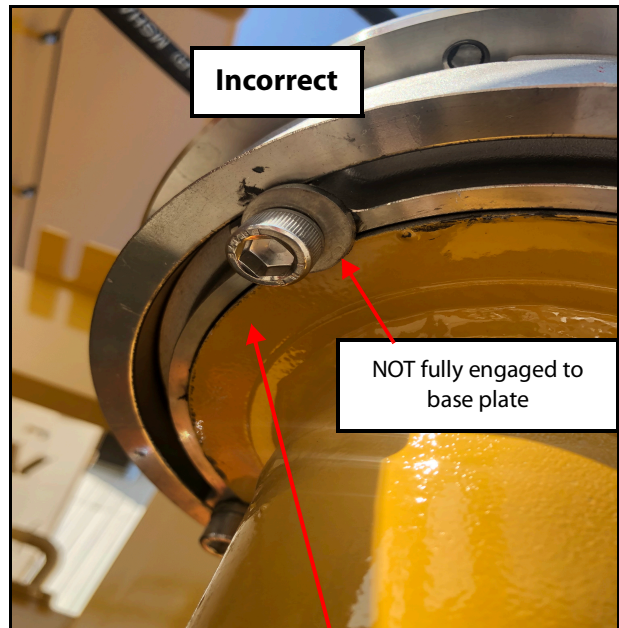
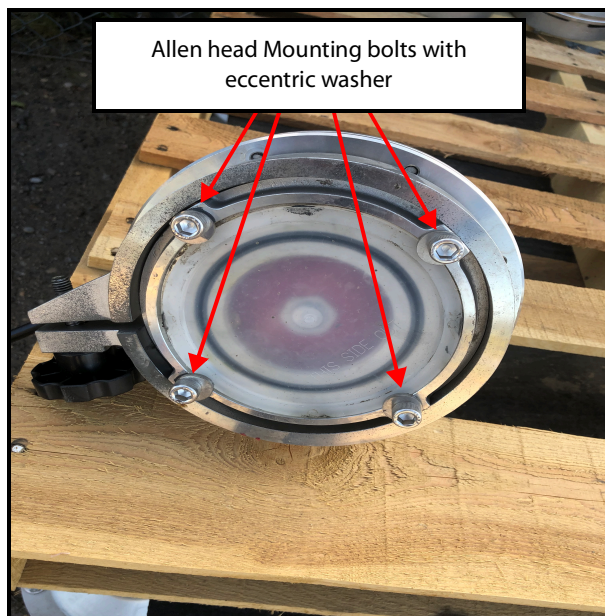


SECTION 3 Installation Procedures

7. **(Stainless steel spray head)** Install spray head assembly to base plate with four (4) eccentric washer and Allen head nuts. Ensure eccentric washers are fully engaged on the base plate as shown below.

CAUTION

Ensure eccentric washer is engaged to base plate prior to tightening Allen head nut. Failure to fully engage eccentric washer to base plate will result in damage to spray head and base plate.



8. Tighten Allen head bolts.

SECTION 4 Commissioning

Contents

Commissioning Guidelines	4-1	Electrical Power ON, Engine ON (Low Idle)	4-2
Before Operations	4-1	Water Pump Tuning	4-3
Electrical Power ON, Engine OFF	4-1	Commissioning Worksheet	4-5

COMMISSIONING GUIDELINES

The commissioning of the newly installed hydraulic spray system is designed to perform static checks of all systems then move to dynamic checks of all systems under loaded conditions and finally perform required system adjustments. If your system is not covered in this manual or you are having difficulties with the installation please contact The MEGA Corp. Product Support Group at: U.S. Toll Free 1-800-345-8889, Direct at: 1-505-345-2661 or visit our website at www.megacorpinc.com for more contact information.

NOTE



The appearance of a notepad and pencil icon at the beginning of a step indicates that during the step, a measurement must be taken and recorded in the **Commissioning Worksheet** at the end of Section 8.

BEFORE OPERATIONS

1. Install hydraulic test gauges on the water pump hydraulic drive motor test ports.
2. Adapt a water pressure gauge to the spray bar gate valve.
3. Ensure truck is configured for water tanker application before proceeding.
4. Fill water tank to maximum capacity for static and dynamic check of the entire spray system.

CAUTION

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

5. Once tank is full, check pump couplings for static water leaks.

6. Adjust all spray head adjustment rings for full flow and maximum pattern width to allow free flow of metal contaminants from the truck during flow testing.

7. Ensure all cab control switches are OFF.

ELECTRICAL POWER ON, ENGINE OFF

8. Ensure vehicle battery power is connected.
9. Turn vehicle key switch ON (engine off). Ensure the vehicle cycles through recommended ECM functions per CAT Operators Manual and all warning and advisory lights extinguish.
10. Turn the cab control POWER Switch ON and allow the water level system to warm up for 2 minutes. Ensure the water level gauge indicates full.



NOTE

If the water level gauge upper and lower indicator lights flash alternately, the water level indicating circuit is open. Ensure all water level cables and connectors are securely attached.


11. **(Electric Water Cannon Only)** Turn the joystick BFV Switch ON and operate water cannon through full range of motion (up/down/left/right). Point the water cannon in a safe direction for upcoming checks with actual water flow.
12. **(Electric Adjustable Nozzle Only)** Operate the adjustable nozzle from FOG/FAN to STREAM to ensure the outer barrel of the nozzle moves in and out.
13. Turn BFV Switch OFF.


SECTION 4 Commissioning

ELECTRICAL POWER ON, ENGINE ON (LOW IDLE)

14. Ensure wheels are chocked and parking brake is set.
15. Ensure the area around the vehicle is well clear and ample space is available to operate spray heads and water cannon.
16. Ensure all spray heads, dump bar, drain valve, BFV, and foam switches are OFF.
17.  Start up the vehicle and ensure all required warning and advisory lights extinguish per Operator's Manual.
18.  While the vehicle is running inspect all installed hydraulic components (hydraulic tank, hoist valve, diversion valve, torque tube manifold, water pump hydraulic drive motor, and rear solenoid box) connections and hoses for leaks.


CAUTION




 Ensure all fluid levels are acceptable, and a walk around inspection is completed to identify possible leaks, loose or missing components, and clearance issues prior to functional check.

19.  Turn the cab control box POWER and PUMP switch ON. Inspect all installed hydraulic components (hydraulic tank, hoist valve, diversion valve, torque tube manifold, water pump hydraulic drive motor and rear solenoid box) connections and hoses for leaks. Ensure hydraulic oil level is safe for operation.

CAUTION

Engaging/disengaging the water pump above LOW IDLE will result in water pump component damage and reduced service life.

20.  Ensure water pump shaft is turning in a CW rotation.

21.  (**Hydraulic Water Cannon Only**) Turn the BFV joystick switch ON and operate the water cannon through full range of motion (up/down/left/right).
22.  Activate each spray head control switch one a time and ensure spray head is operating normally.
23.  Operate all remaining cab control box functions and check for proper operation.
24. Once all cab control functions are checked, turn PUMP switch OFF and SYSTEM switch OFF.

CAUTION

Engaging/disengaging the water pump above LOW IDLE will result in water pump component damage and reduced service life.

25. With the vehicle still running, perform a walk around inspection of the entire vehicle and inspect all hydraulic system components, hosing for leaks, and for proper oil levels.
26. Shutdown the vehicle and service hydraulic system as required.
27. Ensure all panels and covers are closed and secured.
28. Restart vehicle and operate all cab control systems at HIGH IDLE to flow large volumes of water through all tank piping and components to expel all metal contaminants that could damage spray head diaphragms and butterfly valves.
29. **Suction Loading (If Equipped)** Operate the suction loading system as follows:
 - a. Vehicle – LOW IDLE.
 - b. Attach suction hose to the suction pump assembly and immerse hose into water source.

SECTION 4 Commissioning

c. Activate suction pump diversion valve to provide hydraulic pressure for the suction pump drive motor.

d. Cab Control PUMP Switch – ON.

CAUTION

Engaging the water pump above LOW IDLE may result in water pump component damage and reduced service life.

e. Engine RPM – As Required.

NOTE

Priming of the suction loading pump station may be required.

f. Ensure tank water level is increasing with the suction loading pump operating.

g. Vehicle- LOW IDLE.

h. Cab Control PUMP Switch – OFF.

i. Diversion Valve – Reposition handle to supply hydraulic pressure to the tank water pump drive motor.

j. Disconnect and stow suction pump supply hose.

WATER PUMP TUNING

1. Clean water pump shaft and install reflective tape.
2. Ready a hand-held or install a photo tachometer to sense water pump shaft speed.
3. Adapt a water pressure gauge to the rear spray bar ball or gate valve.
4. Start up vehicle.
5. At LOW IDLE, turn the cab control POWER switch ON. Ensure that all spray heads and other pressure discharge functions are OFF.

6. Turn the Cab Control PUMP switch ON.

CAUTION

Engaging/disengaging the water pump above LOW IDLE will result in water pump component damage and reduced service life.

7. Ensure the water pump is turning in a CW rotation. At LOW IDLE, note water pump RPM and spray bar water pressure.

8. Operate vehicle at HIGH IDLE. Note water pump RPM and water pressure. Water pump RPM should be set to:

M3 PUMP: 2,350 ± 50 RPM

M4 PUMP: 1,900 ± 50 RPM

M4B PUMP: 1,950 ± 50 RPM

CAUTION

Water pump RPM must not exceed the above specifications 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.

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

WARNING

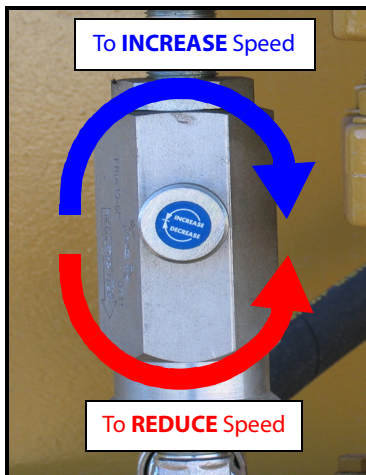
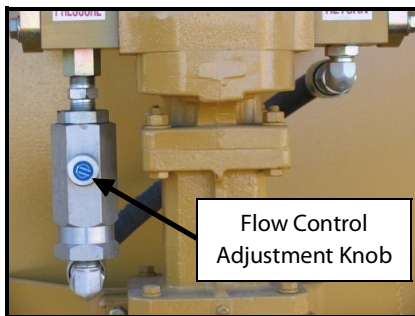
Do not place your hand or tools within pump bell while pump is rotating and/or pressure held within the motor supply hose. Refer to the Operator and Maintenance Manual for the procedures to operate and maintain the pump. Failure to follow proper procedures will result in serious personal injury.

NOTE

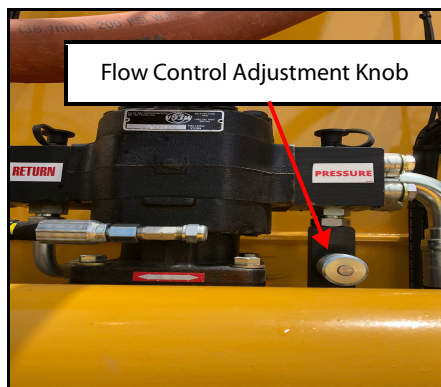
The flow control valve can control as much as 35 GPM or about 700 RPM.

SECTION 4 Commissioning

Typically, the label on the knob refers to the amount of oil being bypassed, **not** motor speed. By turning the adjustment knob **CLOCKWISE (BLUE ARROW)** the oil being bypassed is *reduced*, *increasing* the speed of the pump. By turning the adjustment knob **COUNTER-CLOCKWISE (RED ARROW)** the oil being bypassed is *increased*, *reducing* the speed of the water pump.



Alternate flow control adjustment knob may be used:



10. Once specified RPM is obtained, tighten flow control jam nut.

11. Cab Control Pump Switch - OFF.

CAUTION

Engaging/disengaging the water pump above LOW IDLE will result in water pump component damage and reduced service life.

12. Cab Control POWER Switch – OFF.

13. Shutdown vehicle.

14. Remove photo tachometer, hydraulic gauges, and water pressure gauge.

15. Finish recording commissioning form and file with In-Service Report to Mega Corp.

SECTION 4 Commissioning

COMMISSIONING WORKSHEET

Use Information gathered from Sections 3 and 4 to fill out the tables below. This worksheet is designed to aid in collecting all data necessary for filling out the Mega Warranty In-Service Report.

Functional Testing Data

Refer to Section 4 for functional testing procedures.

No error codes at start up <input type="checkbox"/>	Fluid levels are acceptable <input type="checkbox"/>	Clockwise water pump shaft rotation <input type="checkbox"/>
All installed functions operate properly <input type="checkbox"/>	Proper water cannon operation (if present) <input type="checkbox"/>	Sprayer controls operate properly <input type="checkbox"/>
No hydraulic component leaks <input type="checkbox"/>	Proper clearance for all cables and hoses <input type="checkbox"/>	

For the procedures and tooling required for collecting the data below, reference Section 4.

	Suction Load Pump	Water Discharge Pump
Approximate Pump Flow Bypass (turns open)		
Pump Shaft RPMs		
	At Low Idle All Sprayers Closed	At High Idle All Sprayers Closed
Water Discharge Pump Motor Pressure (kPa)		
Water Discharge Pump Motor Return (kPa)		
Water Pressure At Spray Bar (kPa)		

If your system is not covered here, or you are having difficulties, please contact the MEGA Corp. Product Support Group at:

U.S. Toll Free: 1-800-345-8889, Direct: 1-505-345-2661 or visit our website at www.megacorpinc.com for more contact information.

SECTION 4
Commissioning

Appendix Installation Drawings

DESCRIPTION

This section contains all of the drawings required to assemble and install the spray system. These drawings are serial number specific and designed to be used in conjunction with previous section information to successfully produce a fully operational spray system.

Appendix is organized in the following sequence:

1 - MOUNTING

2 - WELD-ON

3 - BOLT ON

4 - HYDRAULICS

5 - CONTROLS

6 - LIGHTING

7 - FIRE SUPPRESSION

8 - DECALS

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Direct: 1-505-345-2661

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

Appendix

Installation Drawings