

SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION AND MINING

Operators Manual



MEGA CORP.®

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Definitions and Abbreviations

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MANUAL USAGE

This technical manual only contains information required to safely operate the MMP4 powered by a CAT 3054B diesel engine. See the CAT 3054B Engine Maintenance and Operators Safety Manual for specific vehicle system information and maintenance procedures. 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.

If your system is not covered in this manual or are having difficulties please contact the MEGA Corp. Product Support Group at:

Toll free US 1-800-345-8889

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

A 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. This service function takes place with heavy components and at moderate heights, ensure proper safety procedures are maintained when performing this service. Failure to use and maintain proper safety.

WARNING, CAUTIONS 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 emphasis.

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.

Definitions and Abbreviations

SAFETY MESSAGES

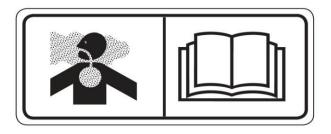
There are several specific safety messages on this machine. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

Make sure that all of the safety messages are legible. Clean the safety messages or replace the safety messages in 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.

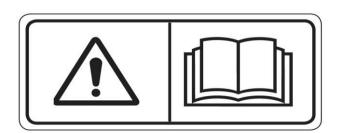


WARNING

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)



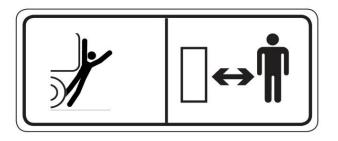
WARNING

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.

Definitions and Abbreviations

Backing Runover Hazard (3)

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

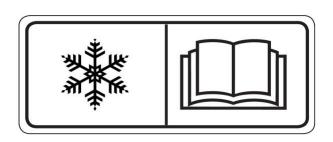


A WARNING

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 (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.



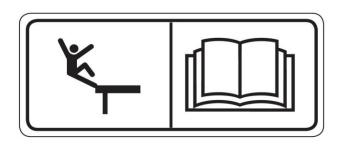
WARNING

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.

SECTION 1 Definitions and Abbreviations

Fall Hazard (7)

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

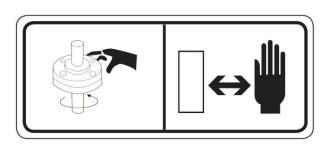


▲ WARNING

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

Rotating Shaft (8)

This safety label is located on the pump.

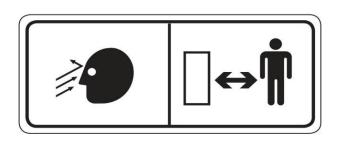


A WARNING

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 Sprayheads (9)

This safety label is located on the spraybar.

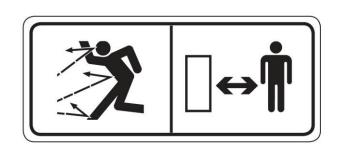


▲ WARNING

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

High Pressure Monitor (10)

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



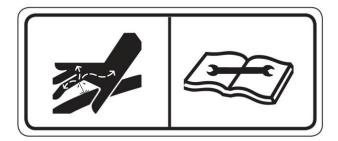
A WARNING

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

Definitions and Abbreviations

High Pressure Motor (11)

This safety label is located on the hydraulic motor.

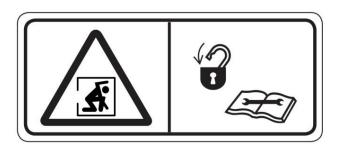


A WARNING

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.

Confined Space (12)

This safety label is located near 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

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

1 - liters

lpm – Liters per minute

LT – Left as viewed from the operators position facing forward

m - meters

MPH – Miles Per Hour

MMP – MEGA Mobile Pump

Nm – Newton meters of torque

psi - pounds per square inch

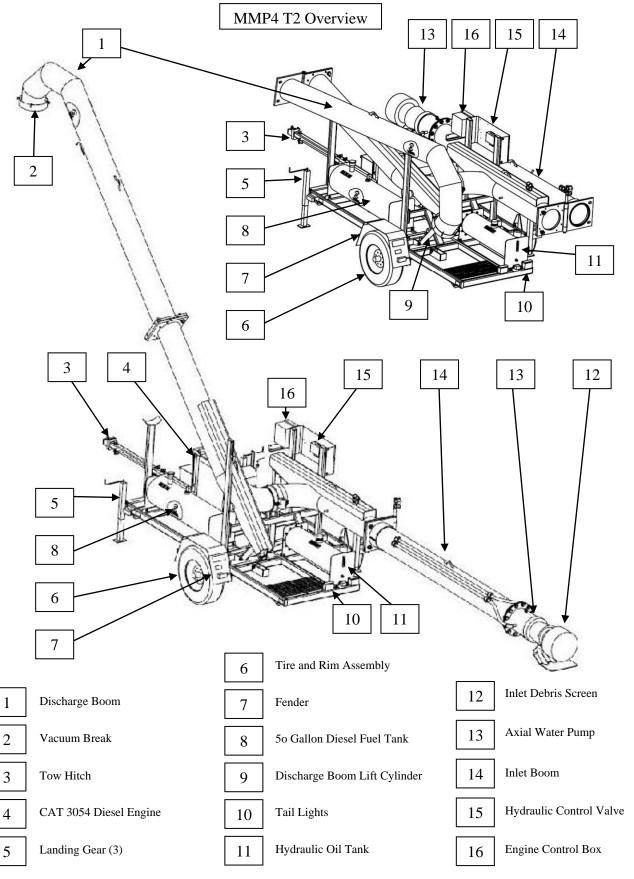
RPM – Revolutions Per Minute

RT – Right as viewed from the operators position facing forward

SQ FT – Square Feet

VDC – Volts, Direct Current

SECTION 1 Definitions and Abbreviations



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MMP4 DESCRIPTION AND USAGE



The MMP4 is designed to be towed behind a typical ¾ ton or 1 ton capacity pickup truck. The MMP4 can be transported over the road to just about any water holding pond area used for filling water distribution equipment.

The MMP4 can be set up, made ready for operation and reconfigured for transport by 1 person and simple hand tools. The MMP4's primary usage is to lift water from a water holding pond and discharge the water into the fill port on water haulage equipment. MMP4 is equipped with a Diesel engine with an integrated hydraulic pump and oil cooler, 50 gallon (190 liter) diesel fuel tank, 32 gallon (87 liter) hydraulic oil reservoir, 3 circuit hydraulic control valve, DOT rated lighting, 6,000 pound (2,725 kg) capacity axle and tire combination, 3 point stabilizing jacking system, hydraulically operated inlet and discharge boos, 12" axial hydraulic drive water pump and a folding hitch The MMP4 is capable of lifting water approximately 25' (7.62 meters) with a discharge port approximately 17' (5.2 meters) above ground level.

MMP4 FRAME

The MMP4 frame is the back bone of the unit, manufactured using rectangular tubing. Attached to the frame is the 6,000 lbs (2,725 kg) capacity axle assembly, boom supporting structures, hydraulic and fuel tanks, engine assembly including a battery and tool storage box, a fold away hitch assembly, rear walk way, fenders and DOT rated lighting.



HYDRAULICS

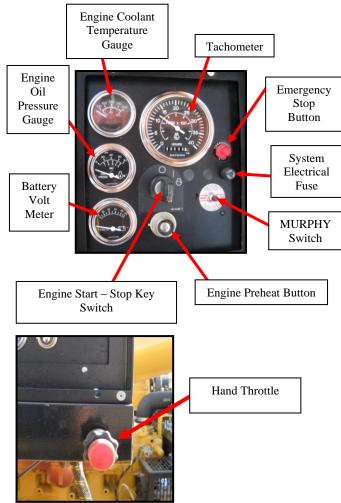
The hydraulic system of the MMP4 consists of an engine mounted hydraulic pump, 35 gallon (135 liter) hydraulic oil tank equipped with an inlet screen, return oil diffuser, external shut off valve, oil level sight glass and a breather equipped filler cap. The balance of the hydraulic system is designed with a 10 micron rated return oil filter, 3 spool hydraulic control valve with pressure regulation capability, a hydraulic oil cooler equipped with a bypass valve to protect against hydraulic shock when the oil is cold, hydraulically driven submergible 12" axial water pump, hydraulic cylinders to lift the inlet and discharge booms.

AXIAL WATER PUMP



The 12" axial, hydraulic drive water pump used on the MMP4 is mounted to a flange mounted on the inlet boom extension. The pump includes a heavy debris inlet screen to prevent any large pieces of debris from entering the pump and the water tanker to prevent possible damage to the spray systems and water pumps. Mounted to the water pump below the inlet screen is a protector plate, this plate can prevent the water pump inlet screen from setting directly on the bottom of the pond and picking up unwanted debris, dirt or partially restricting the intake of the water pump. When submerged in the holding pond the inlet of the water pump must be 2.5' (0.762 meters) below the surface of the pond at all times while pumping water. The water pump hydraulic drive motor is connected to the hydraulic control valve by 2 hydraulic hoses, this routes hydraulic oil to the water pump drive motor when the control valve spool is shifted to the ON position returns oil back to the hydraulic control valve then to the 10 micron rated hydraulic oil filter. The water pump discharge volume is proportional to the engine rpm (e.g. the higher the engine rpm the larger the volume of water the pump will discharge). The water pump contains 2 oil reservoirs to lubricate the shaft bearings.

ENGINE CONTROL BOX



The engine control box controls and monitors the main engine functions. It is equipped with:

- Magnetic safety switch (MURPHY) that will shut the engine OFF if the engine coolant temperature reads too high or the engine oil pressure reads too low.
- Oil pressure gauge for monitoring the engine oil pressure.
- Engine coolant temperature for monitoring the engine coolant temperature.
- Tachometer to monitor the engine rpms or speed.

•

- Battery voltage meter to monitor the battery voltage.
- Pre-heater button to assist with starting when the ambient temperatures are low.
- Emergency stop button to shut the engine off in case of an emergency.
- System electrical fuse to protect the electrical system in case of an electrical malfunction.
- Hand throttle to adjust the engine operating rpms.

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MMP4 LOCATION

1. Locate a suitable set up location based on the type of equipment being used at the job site, access and traffic flow to the MMP4 fill site.

MARNING

Failure to observe and follow the recommendations below may result in damage to the MMP4, the water holding pond, serious personal injury or death.

- A. Ensure MMP4 water pump intake is at least 2.5' (0.762 meters) below the surface of the pond.
- B. Ensure the MMP4 is located on a firm, level footing and water flow spillage will not erode the pad that the MMP4 is set up on.
- C. Ensure there is enough safe access to the control panel for the operator to prevent accidental slips and falls.
- D. Ensure the ponds liner (If applicable) is not loose or damaged.
- E. If the pond does not have a liner ensure the MMP4 water pump is not submerged in the silt or mud at the bottom.

CONFIGURING THE MMP4 FOR NORMAL OPERATION

When the MMP4 is placed in the desirable position for usage:

- 1. Chock wheels to prevent unwanted movement of MMP4.
- 2. Lower the 2 front landing gear to the ground by lowering the inner leg. The inner leg can be lowered by removing the safety pin and allowing the insert to lower to the ground. Locate the next available adjusting hole in the leg and reinsert the locking pin, ensure the pin has the safety lock in place and properly installed before placing weight on the leg.
- 3. Lower the landing gear by moving the crank on top of the leg in a clockwise direction, alternating between the 2 forward landing gear.

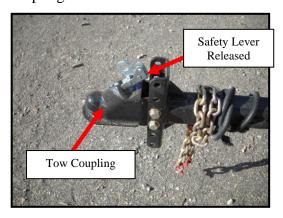




A WARNING

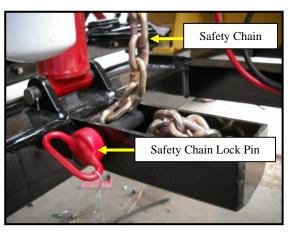
Ensure the MMP4 is properly secured and the wheels are chocked to prevent the MMP4 from moving when uncoupled to the tow vehicle. Failure to ensure MMP4 will not move when uncoupled from tow vehicle can result in serious personal injury or death.

4. Uncouple the hitch from the tow vehicle by lifting up the safety lever on the tow coupling.



- 5. Alternately raise the MMP4s 2 forward landing gear until the tow coupling clears the tow vehicle ball hitch.
- 6. Remove the safety chains, disconnect the MMP4 light cable and move tow vehicle to a safe area away from the MMP4 set up.
- 7. Lower rear landing gear to ground and level MMP4, ensure the unit is stable and secure.
- 8. Ensure the MMP4 is level before deploying the booms.

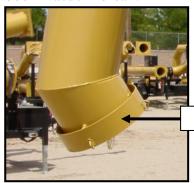
9. Check safety chain locking pins to ensure they are tight and locked in place.



MARNING

Ensure safety chains are taught, lock pins are placed to retain safety chain and the tethered cotter pin is securely inserted into the hole at the end of the lock pin. Failure to ensure the booms are secured using the safety chains and ensuring the safety chains are positioned correctly and the pin is completely seated may result in the boom swinging out of position or falling causing serious personal injury or death.

10. Locate and tie a guide rope to the discharge boom vacuum break.



Vacuum Break

11. Remove the center travel lock bolt and safety chain from the center upright on the frame.





12. Remove the forward travel lock bolt near the discharge boom hinge.



- 13. Locate 2 flange retaining bolts (typically placed inside of the battery box), locate 2 wrenches to tighten the flange bolts.
- 14. Using the rope, swing the discharge boom to align the flanges.
- 15. Insert 2 flange bolts in the holes of the flange, install nuts to the bolts.







15. Tighten the flange retaining bolts until the flanges are parallel and secure.





16. Remove the guide rope from the discharge boom.

17. Install the fabric discharge sock to the vacuum break by slipping the retaining hooks through the grommets in the sock. The sock can be stored in the battery box when MMP4 is ready for travel.





18. Fold hitch away by removing the 2 shear pins and the safety clips.



19. Pull hitch straight out of frame tube until the rear hole of the insert lines up with the forward hole in the frame, insert 1 shear pin.



20. Rotate hitch CCW about 90° to position it out of the path of water haulers to be filled by the MMP4.





21. Insert the second shear pin into the empty hole on the frame assembly and install both safety pins.



- 22. Ensure the safety chain on the inlet boom cylinder is tight and the shear pin is fully seated and the safety pin is in place.
- 23. Remove the retaining bolt from the travel lock on the inlet boom.



24. Remove the safety strap and the safety chain from the water pump.





25. Locate and secure the 2 flange bolt assemblies.

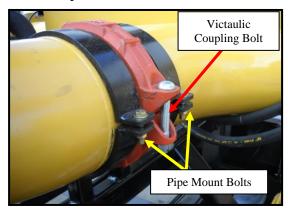
26. Stand behind water pump and guide the inlet boom to full extension.

MARNING

Use caution when extending the inlet boom. Never stand in front of the water pump when extending boom. Standing in front of the inlet boom when extending may cause the operator to lose their balance and be impacted by the boom when it swings this can cause serious personal injury or death.



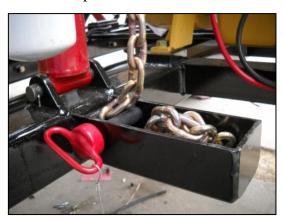
- 27. When the inlet boom is fully extended insert and secure the 2 flange bolt assemblies.
- 28. Tighten the bolts until the flanges are parallel.
- 29. Loosen the Victaulic coupling 1 to 2 turns and loosen the pipe mounts to allow the booms to pivot.



- 30. Check hydraulic oil level, adjust as required.
- 31. Start engine, allow the engine to idle for a couple of minutes to stabilize the engine oil pressure and to begin to warm the hydraulic oil.
- 32. Operate the PUMP INLET lever in the UP position until the hydraulic cylinder is fully retracted and the safety chain is slack. It may be necessary to increase the engine idle speed with the hand throttle to move the inlet boom UP.



33. Place the PUMP INLET lever in the NEUTRAL position and remove the safety chain shear pin.



34. Slowly operate lever for PUMP INLET 'DOWN' as shown below.



- 35. Lower pump inlet until the inlet of the water pump is at least 2.5' (0.762 meters) below the surface of the water, ensure the water pump is a t least 18" (0.46 meters) above the bottom of the pond and not in contact with the pond liner.
- 36. Install the safety chain shear pin and keeper to avoid misplacing the pin while the MMP4 is in operation.
- 37. Move the lever for the discharge boom to the UP position and hold as shown below.



- 38. When the discharge boom has reached the full UP angle move the lever to the neutral position.
- 39. Secure the discharge boom safety chain.



40. Ensure the safety chain is tight, the safety chain shear pin is fully seated and the safety keeper pin is installed.

WARNING

Ensure the safety chains are tensioned properly and shear pins and keepers are installed. Failure to ensure the safety chains are installed and secured properly may result in serious personal injury or death if the boom falls.

- 41. Tighten the Victaulic coupling bolts and pipe mounting bolts that were previously loosened for tube movement.
- 42. Return the engine to LOW idle.
- 43. Shut off engine.
- 44. Stow and secure the travel lock bolts and hardware in the battery box tool compartment.
- 45. Secure engine control box.

OPERATING THE MMP4

1. Move water tanker into position with the fill port directly under the discharge boom fill sock.



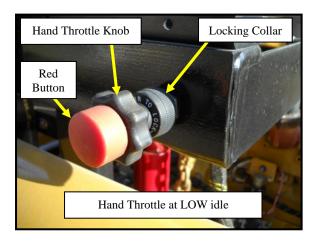
- 2. Check engine according to the CAT 3054 Operations and Maintenance Manual for pre-operation checks.
- 3. Ensure the unit is safe to operate.
- 4. Start engine.
- 5. Let engine idle to stabilize oil pressures and temperatures.
- 6. Engage the MMP4 water pump.
- 7. Move the PUMP lever to the ON position as shown below (a detent will hold the lever it the ON position until it is physically moved to OFF).

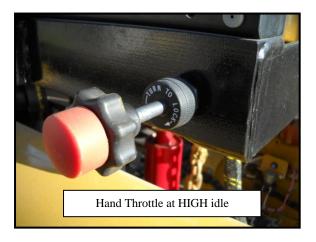


8. Slowly increase the engine idle speed until the desired water flow is reached.

NOTE

The MMP4 hand throttle can be operated 2 ways, by depressing the red button in the center of the hand throttle knob and pulling the knob out until the desired engine rpm is reach and releasing the button or by rotating the hand throttle knob counter clockwise until the desired engine rpm is reached. If the hand throttle fails to stay at the set rpm adjust the locking collar until the hand throttle stay at the set position.





- 9. Observe the water filling the tank, when the tanker is filled to the desired level, return the MMP4 to LOW idle by depressing the red button on the hand throttle and pushing the knob IN until the engine is at low idle.
- 10. Move the pump lever to the OFF position.
- 11. Shut the engine OFF.
- 12. Move the water tanker away from the MMP4.

DISASSEMBLING THE MMP4 FOR TRANSPORT

- 1. Ensure the MMP4 is safe for operation.
- 2. Perform all pre-operation checks.
- 3. Acquire the tools used for assembly.
- 4. Reverse the set up procedure to return the MMP4 to the towing configuration.

MARNING

Ensure that the inlet and discharge boom hydraulic cylinders are preloaded in the full RAISE position before removing the safety chain shear pins. Failure to ensure the cylinders are preloaded may result in the boom falling causing serious personal injury or death.

CAUTION

Ensure all travel lock bolts, safety chains, shear pins, and shear pin safety pins are secured and installed properly before transporting the MMP4. Failure to ensure all safety equipment and procedures are installed and followed may result in damage to the MMP4 or tow vehicle.

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MMP4(T2) OPERATORS CHECKLIST

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BEFORE OPERATIONS

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

- 1. Chocks As Required
- 2. Landing Gear Secure and Stabile
- 3. Engine Control Switches SET OFF
- 4. Boom Safety Chains SECURE AND PROPERLY ADJUSTED
- Hydraulic Oil Tank CHECKED AND SECURED
- 6. Hydraulic Oil Level SERVICED
- 7. Hydraulic Oil Quality CLEAR
- 8. Ball Valve On hydraulic Tank OPEN
- 9. Hydraulic Hoses and Fittings SECURE AND NO LEAKS PRESENT

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- 10. Hydraulic Pump CHECKED AND SECURE
- 11. Victaulic Coupling and Boom Mounts CHECKED AND SECURE
- 12. Boom Hydraulic Cylinders CHECKED FOR SECURITY AND LEAKS
- 13. Boom Flanges CHECKED AND SECURED
- 14. Discharge Sock CHECKED AND SECURE
- 15. Diesel Fuel Tank PROPER LEVEL, SHUT OFF VALVES OPEN, CHECKED AND SECURE
- 16. Fold Away Hitch CHECKED AND SECURED
- 17. Hydraulic Oil Cooler CHECKED AND SECURED
- 18. Diesel Engine CHECKED AND SERVICED IN ACCORDANCE WITH MANUFACTURE OPERATIONS MANUAL AND SECURED
- 19. Battery and Battery Box CHECKED AND SECURED

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- 20. Engine Control Box CHECKED AND SECURED
- 21. Hand Throttle Control CHECKED AND SECURE
- 22. Hydraulic Control Valve CHECKED, SECURE AND NO LEAKS PRESENT
- 23. Boom Positions POSITIONS CHECKED AND SECURED
- 24. Water Pump CHECKED, SECURE AND NO LEAKS PRESENT
- 25. Water Equipment Loading Access CLEAR, EASILY ACCESSIBLE AND FREE FROM OBSTRUCTIONS

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OPERATION

Use these procedures to safely operate the MMP4 when loading a water tanker.

- 1. Enter water filling area.
- 2. Position water tanker fill port directly under discharge sock.
- 3. Secure vehicle.

MARNING

Ensure vehicle is safe and secured before exiting cab, [e.g; Transmission in NEUTRAL, Park brake ON, Engine OFF, Chock Blocks (if required)]. Failure to ensure vehicle is safe to exit when dismounting cab may result in personal injury or death.

- 4. Exit vehicle
- 5. Hydraulic Control Valve Levers OFF
- 6. Start Engine ON/RUN

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- 7. Engine RPM LOW IDLE
- 8. PUMP Lever ON

CAUTION

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

- 9. Slowly increase engine RPM until desired fill rate is achieved.
- 10. Observe water level in water tanker being filled, when desired water level is reached, reduce engine RPM to LOW IDLE.
- 11. PUMP Lever OFF
- 12. Engine OFF
- 13. Mount vehicle operators compartment.
- 14. Exit filling area.

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AFTER OPERATIONS

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

- 1. Diesel Engine CHECKED AND SECURED
- 2. Hydraulic System CHECKED, SERVICED AND NO LEAKS PRESENT
- 3. MMP4 Frame CHECKED AND SECURED
- 4. MMP4 Location and Set Up SECURE AND STABILE
- 5. Engine Control Box CHECKED AND SECURED

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BEFORE TRANSPORTING MMP4

These procedures are used to perform a walk-around inspection on the MMP4 prior to transporting the unit.

- 1. Ensure unit is safe for operation.
- 2. Engine STAR/RUN, LOW IDLE
- 3. Lift INTAKE Boom COMPLETED
- 4. Remove INTAKE Boom Flange Bolts REMOVED AND SECURED
- Install and secure INTAKE Boom Travel Straps, Safety Chains, Chains and Bolts – CHECKED AND SECURED
- 6. Lift and Preload Discharge cylinder, release safety chain COMPLETED
- 7. Lower DISCHARGE Boom- LOWERED
- 8. Remove DISCHARGE Boom Flange Bolts REMOVED AND SECURED

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- 9. Install and secure DISCHARGE Boom Travel Lock Bolts and Chain – CHECKED AND SECURED
- 10. Engine OFF
- 11. Move Tow Hitch to TRAVEL Position and Secure CHECKED AND SECURED
- 12. Diesel Fuel Petcocks OFF
- 13. Hydraulic Oil Tank Ball Valve OFF
- 14. Rear Landing Gear UP AND SECURE
- 15. Couple Tow vehicle to MMP4 Ball Coupling CHECKED AND SECURE
- 16. Raise and Secure Front Landing Gear UP AND SECURE
- 17. Connect Trailer Light Cord CHECKED AND CONNECTED
- 18. Check all MMP4 Lights CHECKED AND OPERATIONAL

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- 19. Inflate Tire to 80 psi CHECKED AND SERVICED
- 20. Torque Lug Nuts to 80-90 ft/lbs (110 125 Nm) SERVICED AND SECURED
- 21. Ball Coupling Lock CHECKED AND SECURE