

SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION AND MINING

MMP4-CUMMINS-B3.3T-MX-2

Maintenance Manual



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MANUAL USAGE

This technical manual only contains information required to safely maintain the MMP4 powered by a B3.3T Cummins diesel engine. See the QSB3.3 CM2150 and B3.3 Operation and Maintenance and Manual for specific engine system information and maintenance procedures. If your system is not covered in this manual please contact MEGA Corp. Product Support at:

1-800-345-8889 or visit our web site at www.megacorpinc.com for more detailed information.

Descriptions 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.

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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.

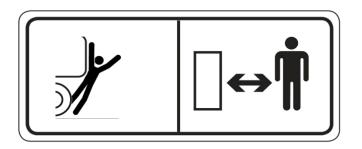
SECTION 1 Definitions and Abbreviations

SAFETY MESSAGES

There are several specific safety messages in this section that are applicable to the MMP4. These hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

(Applicable to safety labels on machine) 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.

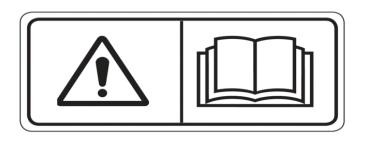
Replace any safety message that is damaged or missing. If a safety message is attached to a part that is replaced, install a new safety message on the replacement part. **BACKING RUNOVER HAZARD (3)**



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.

DO NOT OPERATE (2)



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.

NON-POTABLE (5)



WARNING

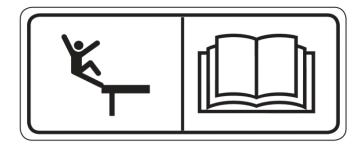
Water held within the MMP4 is not potable. Do not use the MMP4 for transport of water intended for human or animal consumption, as serious injury or death may result.

SECTION 1

Definitions and Abbreviations

FALL HAZARD (7)

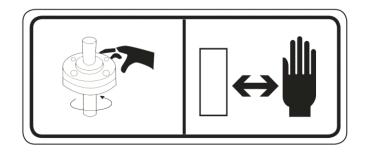
HIGH PRESSURE MOTOR (11)



WARNING

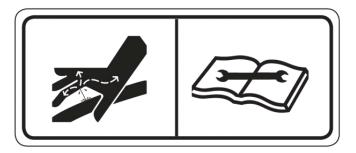
Do not walk on the top of tank without fall arrest PPE. Serious injury or death could occur from a fall.

ROTATING SHAFT (8)



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.



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.

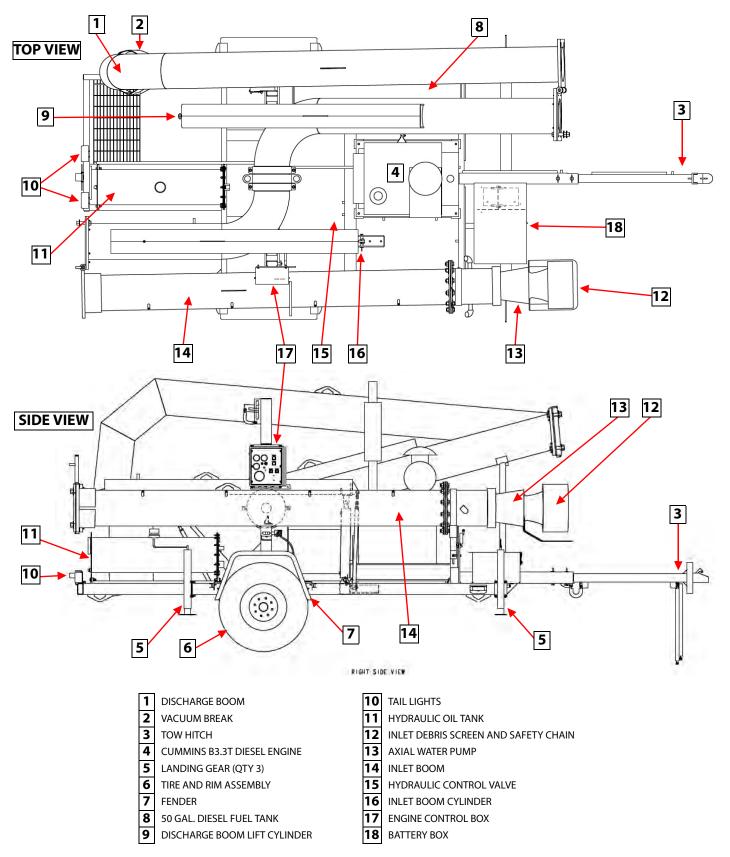
ABBREVIATIONS

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 I - liters Ipm - Liters per minute LT - Left as viewed from the operator's 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 operator's position facing forward SQ FT - Square Feet

VDC - Volts, Direct Current

SECTION 1 Definitions and Abbreviations

MMP4 GENERAL OVERVIEW (TYPICAL)



SECTION 2 System Description

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DESCRIPTION

The MEGA Mobile Pump (MMP4) is a towable water lifting station. The MMP4 may be towed by a vehicle capable of at least a 6,000 pound (2,725 kg) towing capacity, 1,000 pound (450 kg) tongue weight, and equipped with the appropriate weight rated Class IV trailer hitch with a 2 5/16 inch ball. The MMP4 can be transported to a water holding pond and be set up by one individual.

The MMP4 is a self-contained pumping station fitted with a hydraulically driven 12 inch axial water pump that has the potential to lift water 25 feet (7.6 meters) from pump level to fill water distribution equipment (maximum height: 17 feet or 5.2 meters above ground level).

MMP4s are equipped with: hydraulically lifted inlet and discharge booms with safety retaining chains and travel locking devices, DOT rated lighting, 16 inch load range 'E' on-highway trailer tires, a fold away hitch with safety chains, a vacuum break with an anti-siphon discharge sock on the discharge boom, 23 gallon (87 liter) hydraulic oil tank filled with Chevron Clarity AW 46 hydraulic oil, a gear type hydraulic pump driven by a B3.3T Cummins diesel engine, and a 50 gallon (190 liter) capacity diesel fuel tank equipped with shut off valves.



The MMP4 needs a minimum of 2.5 feet (0.76 meters) of water above the inlet of the water pump for proper operation.



INSPECTION

- 1. Inspect MMP4 exterior paint for wear and corrosion.
- 2. Inspect piping for damage and leaks.
- 3. Inspect frame, landing gear and suspension for damage and missing parts.
- 4. Inspect engine assembly for loose, missing, damaged or leaking parts.
- 5. Inspect all hydraulic hoses and couplings for security, damage and leaking.
- 6. Inspect fuel, engine oil, anti freeze and hydraulic oil for contamination and proper level.
- 7. Inspect lighting, lug nuts, fenders and hitch safety equipment for operation, damage and missing parts.
- 8. Inspect electrical system for corrosion, damage and missing parts.

SECTION 2 System Description

REPAIR

<u>Paint</u>

Remove corrosion, prime and paint.

Engine Fluid Levels and Inspections

Adjust, repair or service according to QSB3.3 CM2150 and B3.3 Operation / Maintenance Manual for engine service schedule.

<u>Leaks</u>

- 1. Remove paint and corrosion from suspected area.
- 2. Prep surface to be welded, weld over leak.
- 3. Prime and paint over weld.
- 4. Tighten or replace damaged or leaking component.

Lighting

Repair as required to maintain DOT compliance.

Missing parts

Contact MEGA Corp Part sales with machine serial number for assistance.

<u>Structure</u>

Contact the MEGA Corp. Product Support Group at: Toll free US 1-800-345-8889 Direct 1-505-345-2661 or visit our website at <u>www.megacorpinc.com</u> for more detailed contact information or assistance on major structural repairs.

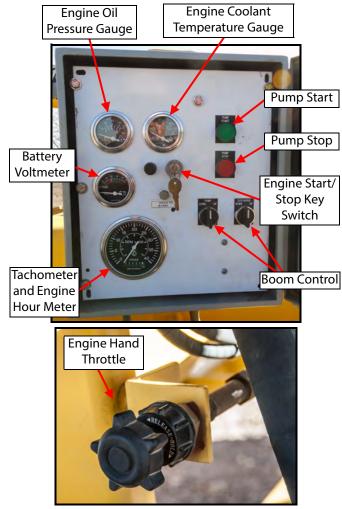
SECTION 3 Engine Control System

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DESCRIPTION

The Engine Control System consists of: a control box with lockable cover, ignition switch with key, throttle control, battery voltage gauge, engine oil pressure gauge, engine coolant temperature gauge, hour meter, fault indicator lamps, and an engine tachometer.



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

- Oil pressure gauge to monitor the engine oil pressure.
- Engine coolant temperature to monitor the engine coolant temperature.
- Tachometer to monitor the engine RPMs or speed.

- Battery voltage meter to monitor the battery voltage.
- Battery voltage meter to indicate the state of charge and electrical operation of system.
- Engine hour meter to indicate engine operational hours.
- Pump engagement/disengagement buttons
- Hand throttle to adjust the engine operating RPMs.

INSPECTION

- 1. Inspect control box and cabling for security, condition and mounting.
- 2. Inspect switches, gauges and throttle control for security, damage and operational condition.

REPAIR

SWITCH REPLACEMENT

- 1. Remove power to the engine control.
- 2. Remove engine control face plate to gain access to the switch.
- 3. Mark wiring on old switch before removal to ensure correct wiring configuration is maintained.
- 4. Remove old switch and replace with the same type of switch.
- 5. Install wiring on new switch as previously marked.
- 6. Install engine control face plate in control box.
- 7. Apply power to the engine control and perform functional check of the newly installed switch.

SECTION 3 Engine Control System

INDICATOR GAUGE REPLACEMENT

- 1. Remove power to the engine control.
- 2. Remove engine control face plate to gain access to gauge and wiring.
- 3. Mark wiring on old gauge before removal to ensure correct wiring configuration is maintained.
- 4. Remove old gauge and replace with the same type of gauge.
- 5. Install wiring on new gauge as previously marked.
- 6. Install engine control face panel in control box
- 7. Apply power to the engine control and perform functional check of newly installed indicator gauge.

ENGINE TACHOMETER REPLACEMENT

- 1. Remove power to the engine control.
- 2. Remove engine control face plate to gain access to the backside of the tachometer.
- 3. Mark wiring on old tachometer before removal to ensure correct wiring configuration is maintained.
- 4. Remove old tachometer and replace with the same type tachometer.
- 5. Installed wiring on new tachometer as previously marked.
- 6. Install engine control plate in control box.
- 7. Apply power to engine control and perform functional check of newly installed tachometer.

THROTTLE CONTROL REPLACEMENT

- 1. Remove power to the engine and engine control system.
- 2. Loosen cable locking screw on throttle lever on fuel injection pump.
- 3. Remove cable jam nut on lever side of the fuel pump mounting bracket.
- 4. Remove cable jam nut on throttle adjusting end of cable.
- 5. Remove cable assembly.
- 6. Install new throttle cable assembly in mounting bracket.
- 7. Thread jam nut on throttle cable adjusting end behind mounting bracket.
- 8. Route throttle cable to the fuel pump cable mounting bracket.
- 9. Run cable through fuel pump mounting bracket.
- 10. Install jam nut on fuel pump throttle lever side of bracket.
- 11. Insert throttle cable in the pivot on the throttle lever of the fuel pump.
- 12. Ensure throttle cable and fuel pump throttle lever is in the idle position.
- 13. Secure the throttle cable locking screw on the new cable.
- 14. Ensure the new throttle cable is routed away from moving parts.
- 15. Ensure throttle cable is secure.
- 16. Check operation of newly installed cable for smooth operation.

SECTION 3

Engine Control System

17. Ensure newly installed throttle cable allows engine throttle lever to fully contact the LOW idle stop as shown in the two images below.



18. Ensure the newly installed throttle cable allows engine throttle to fully contact the HIGH idle stop.



- 19. Place throttle control cable in the low idle position.
- 20. Apply power to engine control box and engine.
- 21. Perform functional check to ensure proper engine low and high idle RPMs. If engine RPMs are out of specified range, check throttle cable adjustment again and refer to QSB3.3 CM2150 and B3.3 Operation and Maintenance Manual for correct RPM specifications and adjustment procedures.

SECTION 3 Engine Control System

SECTION 4 Basic Hydraulics System

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HYDRAULIC TANK ASSEMBLY

Hydraulic Pump......4-2





DESCRIPTION

The hydraulic tank consists of an inlet screen, return oil diffuser, internal baffle, oil level sight gauge, reservoir cap, and breather. The system draws oil from the bottom of the tank through an inlet screen to pre-filter the oil. The shut off valve (if equipped) holds the oil inside of the tank when servicing the hydraulic system. The sight gauge is used as a visual indicator of the hydraulic oil quality and quantity. The Internal baffle allows for oil movement with in the tank to evenly distribute the return oil trough out the reservoir. The return diffuser inside of the hydraulic tank just below the normal oil level reduces the potential for hydraulic oil foaming in the tank. The reservoir cap and breather allow filling of the hydraulic tank and prevent dirt and debris from entering the hydraulic system.

INSPECTION

- 1. Inspect hydraulic oil tank for security, damage, and leaks.
- 2. Check hydraulic oil level and quality. The level should be between 80% and 90% of the level visible in the sight glass and clear.

DESCRIPTION



The MMP4 hydraulic system originates at a hydraulic pump coupled to a B3.3T Cummins diesel engine. The system draws hydraulic oil from a hydraulic tank mounted at the rear of the MMP4 frame through an inlet screen inside of the tank. The hydraulic pump moves the oil to a hydraulic control valve mounted to the right side of the unit. The control valve diverts and regulates the oil flow and pressure through the MMP4 system. The hydraulic control valve is used to control the raising and lowering of the 2 hydraulic cylinders attached to the inlet and discharge booms. The hydraulic control valve also controls the hydraulic drive motor inside of the water pump at the end of the inlet boom; this control feature is equipped with a detent to allow the lever to stay in the ON position during water pump operation, and is equipped with a pressure relief valve to protect against over-pressurization of the hydraulic system. The return hydraulic oil is passed through a hydraulic oil filter, oil cooler, and then a diffuser mounted inside of the hydraulic oil tank.

SECTION 4 Basic Hydraulics System

- 3. Check hydraulic tank filler cap, breather, and bolt on end cover for security, damage and leaks.
- 4. Check hydraulic hose fittings for damage, leaks, and security.
- 5. Check tank mounting bolts, ensure the bolts are tight.

REPAIR

Repair, secure or adjust as required.

HYDRAULIC PUMP



DESCRIPTION

The hydraulic pump is coupled to the flywheel end of the engine. The hydraulic pump moves the oil through the system to generate flow and pressure needed to operate the water pump and boom cylinders. The pump draws oil from the hydraulic tank and moves it to the hydraulic control valve where the control valve directs the oil flow to the selected components.

INSPECTION

Inspect hydraulic pump, adapter and hosing for vibrations, unusual noises, security, damage and leaks.

REPAIR

Repair or replace as required.

WATER PUMP HYDRAULIC DRIVE MOTOR



The hydraulic drive motor is coupled to the water pump drive shaft inside the water pump. The drive motor is controlled by the hydraulic control valve, water pump spool. When the lever is moved to the ON position the fluid is directed to the drive motor causing the water pump impeller to rotate, moving water up the inlet boom.

INSPECTION

- 1. Check water pump drive motor fittings for security, damage and leaks.
- Check for an oily film on water surface (indications of hydraulic oil leak below the surface of the water). If water pump is submerged.
- 3. Check for oil residue inside of the inlet to the water pump. If water pump is in the travel position.

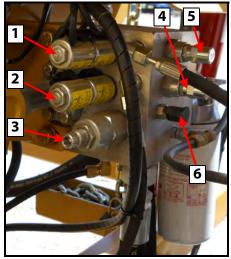
REPAIR

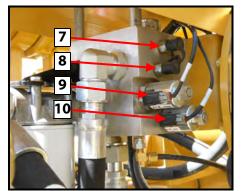
Repair or replace as required.

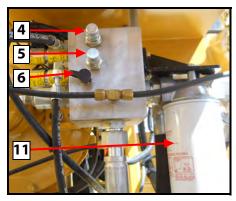
SECTION 4

Basic Hydraulics System

HYDRAULIC CONTROL VALVE







The hydraulic control valve controls all of the oil flowing from the hydraulic oil pump and controls its flow and pressures. The valve is attached to the rear of the accessory drive housing of the engine. The control valve consists of:

- 1 Discharge Boom Valve
- 2 PUMP Boom Valve
- **3** Main System Pressure Relief
- 4 Discharge Boom Speed Control 10
- **5** Pump Boom Speed Control
- 6 System Pressure Test Port
- 9 Water Pump Start Valve

7

8

System Return Test Port

Pump Motor Test Port

Dump Valve

- **11** Hydraulic Oil Filter

INSPECTION

- 1. Check hydraulic control valve mounting for security, damage and leaks.
- 2. Check control valve levers for ease of operation, security, damage and missing parts.
- 3. Check control valve fittings and metering valves for security, damage and leaks.
- 4. Check pressure regulator for proper relief pressure (2,800 psi/19,300 kpa), security and leaks.

REPAIR **Hydraulic Control Valve**

- 1. Repair, adjust or replace as required.
- 2. To set hydraulic relief pressure, install a 0 3,000 psi (0 - 21,000 kpa) pressure gauge on the test fitting located on the side of the control valve as shown below.



3. With the engine operating at high idle, operate the PUMP UP switch and observe the reading on the pressure gauge.



SECTION 4 Basic Hydraulics System

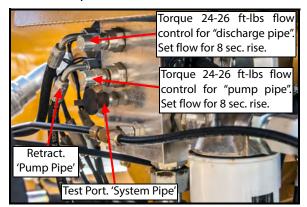
- 4. If the hydraulic oil pressure is not within the specifications, adjust the pressure regulator cartridge as follows:
 - a. To increase the pressure, loosen the lock nut on the regulator stem and screw in the stem clockwise (CW) until the pressure is at 2,800 psi (19,300 kpa), tighten lock nut on stem.
 - b. To reduce the pressure, loosen the lock nut on the regulator stem and unscrew the stem counter clockwise (CCW) until the proper pressure is obtained, tighten lock nut on stem.
 - c. Recheck hydraulic pressure.
 - d. Shut unit off.
 - e. Remove pressure gauge from test port.



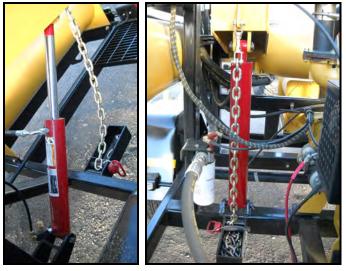
Hydraulic Cylinder Speed Control Valve

- 1. If the hydraulic boom cylinders raise too slowly or lower too fast, check the adjustment as follows;
 - a. Remove protective cap.
 - b. Loosen jam nut.
 - c. Fully seat the flow control on the hydraulic control valve for the cylinder with the travel speed that needs adjustment.
 - d. Rotate knob 1/2 turn CCW.
 - e. Raise boom, check speed to ensure speed is desired, if speed is too fast turn knob CW 1/ 16th of a turn at a time, if the speed is too slow turn knob CCW 1/16th of a turn at a time until desired speed is achieved (8 seconds to full rise).

- f. Tighten jamb nut.
- g. Reinstall cap.



HYDRAULIC CYLINDERS



The 2 hydraulic cylinders are used for lifting the inlet and discharge booms to either the 'stow/travel' position or to the 'fill' position. When the boom control switch is operated in the 'UP' position, the pressurized oil retracts the cylinder and lifts the boom. The speed of the lifting and lowering is controlled by metering valves built into the hydraulic control valve. There are safety chains at each cylinder to prevent any unwanted movement in the boom when it is filled with water and as a safety precaution in case the control valve lever is operated accidentally. The cylinder operates in the boom down mode by activating the control valve in the 'DOWN' position, the weight of the boom makes the cylinder extend, lowering the boom, the built in metering valve controls the lowering speed of the boom.

SECTION 4 Basic Hydraulics System

INSPECTION

- 1. Check hydraulic cylinders for security, damage and leaks.
- 2. Check hydraulic cylinder safety chains for security, missing parts and damage.
- 3. Check hydraulic hoses and metering valves for security, damage and leaks.
- 4. Check for proper operation and alignment.

REPAIR

Repair, adjust or replace as required.

HYDRAULIC FILTER



The spin on hydraulic oil filter is in the return to tank hydraulic circuit. All hydraulic oil passing through the system passes through the filter prior to the hydraulic oil cooler. The filter is rated at 400 psi (2,758 kpa). The filter is rated at 10 microns and the filter housing has a built in bypass valve to bypass the filter element when the inlet pressure is too high or the filter becomes restricted.

INSPECTION

- 1. Inspect hydraulic oil filter mounting for security and damage.
- 2. Check hydraulic filter for leaks and damage.
- 3. Check hydraulic filter assembly hose fitting adapters for security and leaks.

REPAIR

Repair, adjust or replace as required.

HYDRAULIC OIL COOLER



The hydraulic oil cooler is attached to the front of the engine radiator. The engine cooling fan draws cool air through the oil cooler lowering the oil temperature. The oil cooler is in the return to tank hydraulic circuit. Built into the oil cooler is a bypass valve that allows oil to bypass the cooler if the return oil pressures are too great (e.g; when the hydraulic oil is cold). The oil cooler and engine coolant radiator are protected by a steel mesh guard to prevent damage to the cooler and radiator.

INSPECTION

- 1. Check hydraulic oil cooler and radiator guard for security and damage.
- 2. Check hydraulic oil cooler and fittings for leaks.
- 3. Check hydraulic oil cooler for blockage and debris that may interfere with proper cooling of oil passing through cooler assembly.

REPAIR

- 1. If cooling fins are dirty or plugged with debris, remove, replace or clean cooler as required.
- 2. Tighten or replace leaking or damage adapter fittings as required.
- 3. Replace radiator guard if damage is present.

SECTION 4 Basic Hydraulics System

HYDRAULIC HOSES



The MMP4 is equipped with hydraulic hosing to convey the hydraulic oil pressure and flow to components that are operated by the hydraulic control valve. These hoses are sized according to the volume and pressure requirements of the component. The hydraulic drive motor for the water pump utilizes a 1 inch (-16) hose to direct the volume of oil required to turn motor that drives the impeller of the water pump at the rated speed. The hydraulic cylinder hoses require a smaller volume of fluid and do not require as large of a hose. The makeup oil requirement for the lift cylinders (when the booms move down) are low pressure and low volume. The suction side of the hydraulic pump requires suction rated hydraulic hose, this prevents the hose from collapsing under suction loads.

INSPECTION

Inspect for damage, security, and leaks.

REPAIR

- 1. Remove and replace damaged hose assembly if damage to outer covering is present or leaks are present.
- 2. Replace hose assembly if hose end is unserviceable due to leaks or damage.

SECTION 5 Water Pump Assembly

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DESCRIPTION



The water pump assembly is comprised of; hydraulic drive motor, water pump housing, impeller, shaft and bearings and an inlet screen. The water pump assembly uses hydraulic oil flow produced by the engine driven hydraulic oil pump to turn the hydraulic drive motor which is directly coupled to the water pump impeller. Water pump speed is controlled by the hydraulic control valve and pressure relief cartridge which diverts the oil flow to the inlet port (pressure) of the hydraulic drive motor to the return oil hose for the hydraulic system. The pressure relief cartridge diverts excessive oil pressure directly to the hydraulic return hose, returning back to the hydraulic oil to the tank for system protection.

HYDRAULIC DRIVE MOTOR



A gear-type hydraulic motor mounted inside the water pump assembly. The hydraulic motor receives hydraulic oil flow from the hydraulic system controlled by the hydraulic control valve at 1,900 - 2,800 PSI (13,000 - 19,300 kpa) and flow rates up to 35 GPM (135 lpm) for operation. The hydraulic motor is coupled directly to the water pump shaft and rotates

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Assembly	

in a clockwise (CW) direction as viewed from the inlet of the pump. The speed and volume of the water pump is dependent on the engine RPMs, [e.g: higher engine RPMs yields a higher output volume of water].



INSPECTION

- 1. Check for excessive vibration and noise.
- 2. Check water pump for security and leaks.
- 3. Check and adjust fluid levels.
- 4. Check hydraulic system for security and leaks.

SERVICE

1. Park unit on level ground, lower and secure stabilizing jacks to make unit stable for maintenance.

WARNING

Ensure the MMP4 is properly positioned and configured before maintenance is performed. Units not configured properly or stabilized, may rollover and cause serious personal injury or death.

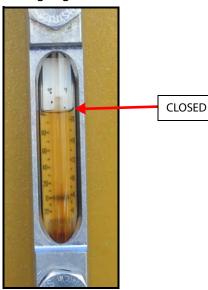
2. Remove all electrical and hydraulic power to make the unit safe for maintenance.

WARNING

Ensure the MMP4 is made safe for maintenance. Performing maintenance on a unit with hydraulic and electrical power applied may result in serious personal injury or death.

SECTION 5 Water Pump Assembly

- 3. Ensure the use of only clean, compatible hydraulic oil. The hydraulic system must have a filter rated at 10 micron filtration.
- 4. When disconnecting and reconnecting the hydraulic hoses to the pump, ensure the fittings are kept clean.
- 5. Check hydraulic fluid levels. Fluid levels must be maintained at 80% to 90% of the level shown in the sight glass.



- 6. Check hydraulic fluid for excessive bubbles, foaming and water contamination.
- 7. Use hydraulic oils with anti-wear additives such as these recommended oils or their equivalent:
 - Pennzoil AW46 Hydraulic Oil
 - Texaco Rando HDAZ
 - Shell Tellas Hydraulic Oils
 - Mobil D.T.E. 20 Series
 - Chevron EP Hydraulic Oils
 - Exxon Univis N Hydraulic Oils

NOTE

When using this equipment in environmentally sensitive areas the use of bio-degradable or nonhazardous oils such as: Chevron Clarity, Exxon Univis Bio 40 or Mobil EAL 224H are recommended. 8. Remove Item 40 on Figure 1 to gain access to the bearing housing reservoir fill plug (Item 34 in Figure 1) and item 23 on the discharge bowl, with the water pump in a vertical position.

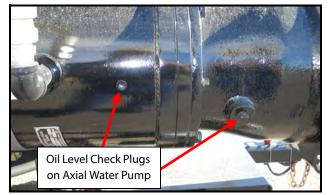
CAUTION

The water pump must be removed from the boom and set in a vertical position on the inlet end when performing this action. Any other position will result in incorrect servicing and improper component oil level will decrease the service life of the water pump, shaft and bearings.

NOTE

There are 2 bearing fluid reservoirs in the MMP4 water pump housing.

9. Check oil in the 2 bearing housings.



- 10. Slight dark discoloration of the oil in the bearing housing is normal. This is due to the wearing of the carbon face seal.
- 11. Presence of water or emulsified oil in the bearing housing indicates immediate need for seal replacement and inspection of bearing. If this condition is present, refer to MMP4 Disassembly Instructions.
- 12. (**If required**) Change oil in the bearing housing if no contamination or fluid loss is present. Use clean non-detergent 10W, 20W oil, AW32 or AW46 hydraulic oil.

SECTION 5

Water Pump Assembly

13. The level should be at the spill point of the fill plug. DO NOT OVERFILL

NOTE

If there is a difficulty in checking these fluid levels, ensure that FSB-9 (Water Pump Lube Level Modification) has been completed, and contact the MEGA Corp. Product Support Group at: Toll free US 1-800-345-8889 Direct 1-505-345-2661

14. Use a liquid pipe sealant to seal and reinstall pipe plugs in bearing housings and water pump housings.

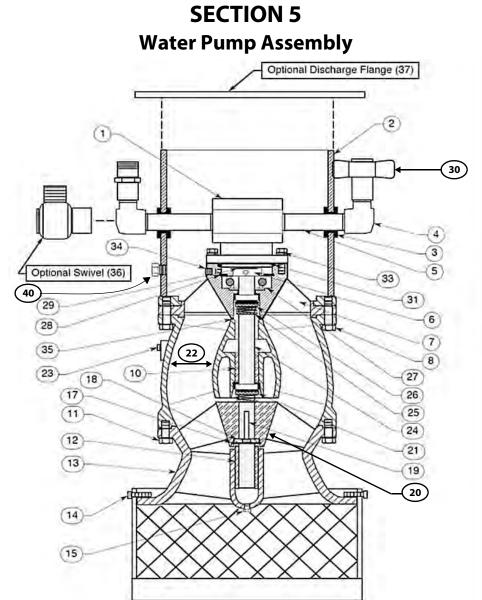
NOTE

The use of a high strength thread sealant may make it difficult to remove plugs at the next service interval. A Liquid Teflon pipe sealant is recommended.

15. **(If required)** Lube suction bowl bushing (Mystic 5496 Marine Grease or equivalent). 1 each 3/8 inch NPT grease fitting may be required to perform this operation.

NOTE

More frequent service intervals may be required if the quality of the water being transferred is of poor quality containing: salts, dirt, sediments or other contaminants.



Item	Part Number	Description
1	303910-01	Hydraulic Motor
2	303910-02	Discharge pipe with flange
3	303910-03	Grommet
4	303910-04	1" Elbow
5	303910-05	Pipe
6	303910-06	Shaft collar
7	303910-07	Bearing Housing
8	303910-08	Bolt
10	303910-09	Bushing Lower Discharge Bowl
11	303910-10	Bolt
12	303910-11	Bushing Suction Bowl
13	303910-12	Suction Bowl
14	303910-13	Screw 3/8" x 1-1/2" Sq. Head Set Screw
15	303910-14	Pipe Plug
16	303910-15	Strainer Assembly
17	303910-16	Snap-Ring
18	303910-17	Thrust Collar
19	303910-18	Кеу
20	303910-19	Impeller

-		
ltem	Part Number	Description
21	303910-20	Lower Seal
22	303910-21	Discharge Bowl Assembly
23	303910-22	Pipe Plug
24	303910-23	Shaft
25	303910-24	Snap-Ring
26	303910-25	Upper Seal
27	303910-26	Bearing
28	303910-27	Snap-Ring
29	303910-28	Snap-Ring
30	303910-29	Coupler (male) 1"
30	303910-30	Coupler (female) 1"
31	303910-31	O-Ring
33	303910-32	Bolt
34	303910-33	Plug Bearing Housing
35	303910-34	O-Ring
36	303910-35	Swivel Union (Optional) 2 req.
37	303910-36	Discharge Flange (Optional)
40	N/A	Pipe Plug

SECTION 5 Water Pump Assembly

DISASSEMBLY

WARNING

Removal of the water pump assembly from the inlet boom is necessary to properly service or repair the water pump. The water pump assembly is heavy (greater than 200 pounds or 91 kg). Use proper lifting devices and techniques for this operation to preclude personnel injury or death.

- 1. Place MMP4 on a firm hard packed, level work surface.
- 2. Set and secure 3 landing gear legs.
- 3. Remove electrical power from unit.
- 4. Disconnect and cap hydraulic hoses from water pump drive motor fittings.
- 5. Remove water pump from inlet boom.
- 6. Remove strainer by loosening four screws (14).

NOTE

To inspect impeller (Item 20) remove (8) bolts (Item 11) holding suction bowl (Item13) to discharge bowl (Item 22).

- Remove suction bowl and check impeller and suction bowl face for excessive wear. Replace if obvious wear is present or if pump performance is poor.
- 8. To inspect hydraulic motor (Item 1) upper bearing (Item 27) and upper seal (Item 26), use the following procedure:
- 9. Remove hydraulic pipes (Item 5) from drive motor.
- 10. Remove (8) bolts (Item 8) holding discharge bowl to discharge pipe (Item 2).
- 11. Remove discharge pipe assembly.

NOTE

Remove (4) bolts (Item 33) holding hydraulic motor to bearing housing (Item 7).

- 12. Remove and inspect hydraulic motor.
- 13. Inspect motor O-Ring (Item 31) and replace if necessary.
- 14. Drain oil from bearing housing by tilting unit on side and removing drain plug (Item s 23, 34 and 40). Inspect condition of oil.

NOTE

If oil is low or is emulsified with water, the upper seal should be replaced (Item 26).

- 15. Remove snap ring (Item 29) near end of shaft (Item 24).
- 16. Remove shaft collar (Item 6) by loosening set screws on collar by inserting the appropriate Allen wrench through the oil plug hole in the bearing housing.
- 17. Remove bearing housing by lifting straight up (bearing will remain in housing).
- 18. Remove snap ring (Item 28) and slide bearing (Item 27) out of housing. Inspect for rough spots and replace if necessary.
- 19. Inspect lower O-Ring (Item 35) and upper shaft seal for damage or wear, replace if necessary.
- 20. Remove upper shaft seal and retainer (Item 26) by sliding off shaft.
- 21. To remove impeller, shaft and lower seal, use the following procedure:
- 22. Remove snap ring (Item 17) from end of impeller (Item 20).
- 23. Push and hold drive end of shaft (Item 24) toward discharge bowl (Item 22).
- 24. Slide impeller back and remove split thrust collar (Item 18) from shaft.
- 25. Slide impeller forward to remove.

SECTION 5 Water Pump Assembly

- 26. Remove shaft key (Item 19) and gently slide shaft out of discharge bowl toward drive end.
- 27. Inspect lower shaft seal (Item 21) and replace if necessary.
- 28. Inspect shaft and bronze discharge bowl bushing (Item 10) and replace if worn. (Moderate wear [e.g: shiny areas or ridges not more than 0.010 inch (0.254 mm) deep] on shaft are acceptable, the upper bearing takes most of the loading).
- 29. Inspect bushing (Item 12) in suction bowl (Item 13) and replace if worn.

ASSEMBLY

- 1. Assembly is performed in reverse order of disassembly:
- 2. Ensure O-Rings are properly installed in grooves (Items 31 and 35).

CAUTION

Use only clean grease when assembling new seal on shaft and when installing new seal seat in bearing housing. Apply a light film of clean oil to seal faces when assembling to prevent scratching surfaces. (Extreme care and cleanliness must be used when installing shaft seals to prevent possible component damage). Failure to keep items clean and use clean grease to perform this function may result in seal, bearing or shaft damage.

NOTE

The following is the required filling procedure for the bearing reservoirs when the pump is in a vertical position resting on the inlet end:

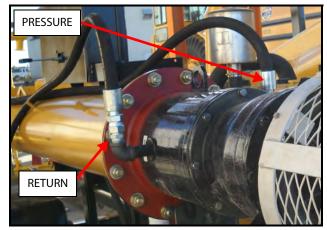
- 3. Fill suction bowl bushing area to bottom of bushing with waterproof grease.
- Fill oil hole (1/2 inch pipe plug) in discharge bowl (Item 22) to spill point (pump in vertical position) with clean hydraulic oil. Refer to line 5 above for oil specifications.

- 5. Fill oil hole (1/4 inch plug) in upper bearing housing (Item 7) to spill point with clean hydraulic oil. Refer to line 5 for above for oil specifications.
- 6. Use anti-seize compound on all threaded fasteners when re-assembling pump.

CAUTION

Do not use anti-seize on seals or bearings. If an anti-seize compound is used in this application bearing and/or seal failure will result.

7. Ensure pressure and return pipes are connected to proper ports on the hydraulic motor.



- 8. Install strainer to pump inlet, tightening (4) retaining bolts (Item 14).
- 9. Inspect mounting gasket for damage, replace as necessary.
- 10. Install pump assembly to suction pipe, tighten fasteners.
- 11. Hook up hydraulic hoses.
- 12. Check hydraulic fluid level, adjust level as required.
- 13. Check to ensure hydraulic pump inlet valve is OPEN.

SECTION 5 Water Pump Assembly

14. Run unit, engage water pump control, ensure proper rotation of water pump and no leaks are present.

NOTE

Motor rotation is counter-clockwise looking from discharge end of pump.



15. Shut unit off and recheck hydraulic fluid level, at 80% to 90% of the level shown in the sight glass, adjust level as required.

SECTION 5 Water Pump Assembly

SECTION 6 Axle and Suspension

Contents

Description	6-1
Service	6-1
Inspection	6-2

DESCRIPTION



The MMP4 is equipped with a 6,000 lb (2,725 kg) rated single axle utilizing a double eye leaf spring suspension. The springs are attached to the frame by welded spring hangers. The axle is attached to the springs by U-bolts with weld on axle mounts. Mounted to the axle hubs by 8 lug nuts are load range E tire and rim assemblies. Each tire and rim assembly is protected by a steel fender that contains a front amber marker lamp and rear red marker lamp assembly. Current production models are not equipped with brakes.

SERVICE

- 1. Park MMP4 on firm level ground, lower forward landing gears, raise hitch, uncouple MMP4 from tow vehicle.
- 2. Lower rear landing gear until the MMP4 is stable.
- 3. With a jack of adequate capacity raise 1 tire in the air high enough to remove the tire.

Repair	6-2
Reassembly	6-3

4. Place a jack stand under axle to prevent axle from falling.

CAUTION

Do not lift the axle for the center, place jack under the U-bolts towards the axle end. Ensure jack stands of proper capacity is used to secure the axle prior to removing the tire assembly. Failure to properly lift and secure the MMP4 properly may result in an unstable load, over loading of the jack or damaging an MMP4 component causing damage to the MMP4.

5. Lower the landing gear to re-stabilize the MMP4.

WARNING

MMP4 must be stable and secure on adequate capacity jack stands and the jack removed prior to servicing the hub assembly. Failure to secure and ensure the MMP4 is stable and secure will result in serious personal injury or death if the unit falls.

- 6. Semi-annually (every 6 months), remove rubber plug at the center of the wheel bearing cap.
- 7. Pump grease into the grease fitting in the spindle end with a manual type grease gun only.

CAUTION

Do not mix Lithium, Calcium, Sodium or Barium complex greases due to possible compatibility problems. When changing from one type of grease to another, it is necessary to disassemble the wheel bearing and ensure all grease is removed prior to re-packing or servicing the wheel bearing. Failure to ensure greases are not mixed may result in wheel bearing, axle end, hub, MMP4 or tow vehicle damage.

8. Rotate wheel while pumping grease into fitting.

SECTION 6 Axle and Suspension

- 9. Continue to pump grease until clean grease is extruded through the outer bearing.
- 10. Rotate wheel while pumping grease into fitting.
- 11. Clean old grease from around the bearing cap.
- 12. Install the rubber plug in the grease cap.
- 13. Repeat on the other wheel bearing.

CAUTION

Manual wheel bearing greasing is only a semiannual service point. Failure to perform annual wheel bearing service and inspection may result in damage to the axle, wheel bearings or MMP4 if not preformed.

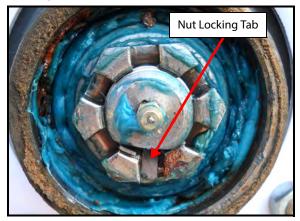
INSPECTION

- 1. Inspect axle for cracking, damage and security.
- Inspect springs for worn eye bushings, bent, loose or broken shackles, mounts and bolts, sagging or broken leafs, loose or damaged Ubolts.
- 3. Check for loose wheel bearings.
- 4. Inspect lug nuts to ensure all are present and torque properly to 80 to 90 ft/lbs (110 to 125 Nm).
- 5. Inspect for wheel seal leakage.
- 6. Inspect tires for inflation to 80 psi (550 kpa), cracking, uneven wear, tread and side wall damage.
- 7. Inspect fender assembly for security and damage.

REPAIR

- 1. Axle tube, replace as required.
- 2. Damaged springs or mounting hardware, replace as required.
- 3. Worn spring eye bushings, loose spring bolts and damaged or worn shackles, replace as required.

- 4. Fender damage, repair as required.
- 5. Tire for wear or damage, replace as required.
- 6. Wheel bearings:
 - a. Secure MMP4 with jack stands and wheel chocks.
 - b. Jack up 1 tire and secure axle.
 - c. Remove tire and rim assembly.
 - d. Remove wheel bearing grease cap.
 - e. Remove cotter pin or bend clear the nut locking tab.



- f. Remove spindle nut by turning nut CCW.
- g. Remove hub assembly.
- h. Inspect hub for damaged threads, missing or damaged studs. Replace as required.
- i. Inspect grease seal for damage (e.g; tears, cracks, leaks and distortion).
- j. To remove grease seal; pry out of hub with a long handled screwdriver.
- k. Clean and inspect wheel bearings and bearing races for corrosion, pitting, wear, heat discoloration and free/smooth movement. Replace as required.

A WARNING

Never spin the wheel bearing with compressed air. The bearing may be damaged, causing the bearing explode causing severe personal injury or death.

SECTION 6

Axle and Suspension

REASSEMBLY

- 1. Pack wheel bearings with a premium, water resistant, high speed wheel bearing grease.
- 2. Apply a light coat of grease on the bearing races.

Recommended Wheel Bearing Lubrication Specifications are as follows:

NOTE

Thickener Type	Lithium Complex
Dropping Point	215°C (419°F) Minimum
Consistency	NLGI No. 2
Additives	EP, Corrosion & Oxidation Inhibitors
Viscosity Index	80 Minimum

- 3. Install inner wheel bearing in hub.
- 4. Install new grease seal in hub using a small hammer or proper seal installation tool.
- 5. Install hub on spindle.
- 6. Install outer wheel bearing onto the spindle.
- 7. Install bearing retaining washer and spindle nut.
- 8. Tighten spindle nut to 50 ft/lbs (68 Nm).
- 9. Loosen nut to remove the torque. Do not rotate the hub
- 10. Finger tighten until just snug.
- 11. Install and secure cotter pin or nut locking tab.
- 12. Install wheel bearing grease cap.
- 13. Install tire and rim assembly.
- 14. Tighten lug nut using a cross tightening sequence to 15 to 20 ft/lbs (20 to 27 Nm).

NOTE

Use an anti-seize compound on the threads of the lug studs. This will prevent galling and seizure of the lug nut to the stud.

- 15. Final torque lug nuts to 80 to 90 ft/lbs (110 to 125 Nm).
- 16. Remove jack stands and lower wheel to ground.

CAUTION

Re-torquing of lug nuts is required after initial 50 miles (80 km) of travel and then again after 200 miles (320 km) of travel. Failure to ensure proper lug nut torque may result in tire, wheel or hub failure that will cause damage to MMP4 and tow vehicle.

SECTION 6 Axle and Suspension

SECTION 7 Frame and Booms

Contents

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Inspection	.7-1

DESCRIPTION



The MMP4 frame is constructed from steel tubing welded together to form a rigid mounting platform that the components of the MMP4 are attached to. The frame is equipped with 3 adjustable stabilizing jacks, a movable hitch, mounting pads for the diesel engine, hydraulic and fuel tanks, travel lock mounts for the inlet and discharge booms, safety chain lock anchors, hydraulic cylinder mounts, suspension mounts, mounting structures for the boom pivot and hydraulic control valve mounting, fenders and lighting.

INSPECTION

- 1. Inspect frame for damage and missing parts.
- 2. Inspect all welds for cracks, rust or damage.
- 3. Inspect hitch assembly and coupling for security, serviceability, damage and missing parts.



4. Inspect battery box for security and damage.



5. Inspect landing gear/stabilizer legs for security, serviceability and damage.



6. Inspect engine mounting bolts for security.



SECTION 7 Frame and Booms

7. Inspect discharge boom, travel locks and mounts for security and damage.







8. Inspect fenders for security and damage.







9. (**If equipped**) Inspect lighting for security, damage and function.









10. Inspect boom mounting, pivot point, travel locks and Victaulic coupling for lubrication, security, damage and leaks.





SECTION 7

Frame and Booms

11. Inspect fuel tank for mounting security and damage, fuel level, fuel level gauge and filler cap serviceability and damage, fuel shut off valve for security, damage and leaks.



12. Inspect inlet boom, travel locks and mounting for lubrication, security, damage and serviceability.



13. Inspect hinge pins, flanges gaskets for lubrication, security, wear and damage.





14. Inspect hydraulic control valve, switches and mount for operation, security, damage, leaks and missing parts.



15. Inspect suspension spring mounts for security, damage and wear.



16. Inspect hydraulic cylinder mounting for lubrication, security, cracks, damage, worn pins, and missing parts.





SECTION 7 Frame and Booms

17. Inspect safety chains and safety chain locks for security, damage and missing parts.



REPAIR

- 1. Replace damaged or missing parts as required.
- If frame damage is noted, or you have a question about the MMP4 contact: The MEGA Corp. Product Support Group at: Toll free US 1-800-345-8889 Direct 1-505-345-2661 www.megacorpinc.com for more contact information or repair options and procedures.
- 3. Adjust, secure or replace parts as required.

SECTION 8 Scheduled Inspections

Contents

Description8-1	Water Pump Assembly8-2
Frame and Suspension8-1	Engine and Engine Control8-3
Hydraulic System8-2	

DESCRIPTION

This section establishes scheduled maintenance inspections of the MMP4 at designated frequencies. Performing these inspections will identify potential system discrepancies and allow preventative maintenance to be performed before a component or system is rendered totally inoperative. Refer to QSB3.3 CM2150 and B3.3 Operation and Maintenance Manual for specific engine maintenance requirements and schedules.

****NOTE:** Vehicles operated in extremely low quality water environments may require more frequent inspections.

		FREQUENCY						
STEP	FRAME AND SUSPENSION	DAILY	BEFORE TRANSPORT	EVERY 50 MILES	EVERY 200 MILES	SEMI- ANNUALLY	ANNUALLY	
1	Check frame and suspension for cracks, damaged or missing components.Repair or replace as required.	X						
2	Verify lug nut torque (80 to 90 ft/lbs or 110 to 125 Nm). Re-Torque as required.		X	Х				
3	Check tires and wheels for security, damage, inflation (80 psi or 550 kpa) and missing parts. Repair as required.		Х					
4	Service wheel bearings with grease.					X		
5	Remove and repack wheel bearings.						X	
6	Check travel locking components for serviceability, damage, proper installation and missing parts. Repair as required.		Х					
7	Check lighting system.Repair as required.		X					
8	Check hitch assembly for security, damage, proper installation and missing parts.Repair as required.		Х					
9	Check landing gear for security, damage and operation.Repair as required.	X						
10	Check pipe work to include: the Victaulic coupling, boom flanges and gaskets, cylinder mounting and pivot points for security, damage, leaks, serviceability, and missing parts. Repair as required.	x						
11	Check hydraulic tank mounting bolts for security, damage and missing parts.Repair as required.	X						
12	Check fuel tank mounting bolts for security, damage and missing parts.Repair as required.	X						
13	Check engine mounting bolts for security, damage and missing parts.Repair as required.	X						

SECTION 8 Scheduled Inspections

		FREQUENCY					
STEP	FRAME AND SUSPENSION	DAILY	BEFORE TRANSPORT	EVERY 50 MILES	EVERY 200 MILES	SEMI- ANNUALLY	ANNUALLY
14	Check battery box and contents for security, damage and missing parts.Repair as required.	X					
15	Check safety chains, safety chain mounting and safety chain locking pins for security, damage and missing parts.Repair as required.	x					

			FREG	QUENCY	
STEP	HYDRAULIC SYSTEM	DAILY	EVERY 250 HOURS	EVERY 500 HOURS	EVERY 1000 HOURS
1	Check hydraulic oil for proper level, clarity, foaming and signs of contamination.Repair, adjust or replace as required.	Х			
2	Check hydraulic control valve and switch box for security, damage, function and leaks.Repair as required.	Х			
3	Check hydraulic pump for security, damage and leaks.Repair as required.	Χ			
4	Check hydraulic oil cooler for security, damage and leaks.Repair as required.	X			
5	Check hydraulic hosing for security, damage and leaks.Repair as required.	Х			
6	Check hydraulic cylinders and flow controls for security, damage and leaks.Repair as required.	Х			
7	Check hydraulic oil filter for security, damage and leaks.Repair as required	Х			
8	Check hydraulic pressure regulator for function and pressure setting (2,800 psi or 19,300 kpa).Adjust or repair as required.				X
9	Drain and refill hydraulic reservoir and replace hydraulic filter element.				X
10	Check hydraulic pump drive coupling for wear, security and damage.Repair as required.				X

		FREQUENCY		
STEP	WATER PUMP ASSEMBLY	DAILY	EVERY 250 HOURS	EVERY 500 HOURS
1	Check water pump for security, damage, obstructions and operation.Repair as required.	Х		
2	Check water pump trash screen for security, obstructions and damage.Repair as required.		Х	
3	Check for excessive vibrations and noise.Repair as required.	Х		

SECTION 8 Scheduled Inspections

		FREQUENCY		
STEP	WATER PUMP ASSEMBLY	DAILY	EVERY 250 HOURS	EVERY 500 HOURS
4	 Remove water pump assembly from inlet boom and check for: Hydraulic drive motor security, damage and leaks. Bearing oil reservoir levels. Bearing oil reservoirs for contamination. Impeller damage. Water pump housing bolts for security, damage and missing parts.Repair, adjust or replace as required. 		x	
5	Grease water pump suction bowl bearing.		Х	
6	Remove water pump from inlet boom and change bearing reservoir oil.			х

		FREQUENCY		
STEP	ENGINE AND ENGINE CONTROL	DAILY	EVERY 250 HOURS	EVERY 500 HOURS
1	Refer to the correct engine Operation and Maintenance Manual for required service intervals and procedures.Use QSB3.3 CM2150 and B3.3 Operation and Maintenance Manual for engine maintenance requirements.Follow and perform all required service procedures, operations, conditions and schedules.	Х		
2	Check and ensure all engine control functions are in proper working order.Repair as required.		X	
3	Check all engine safety guards for security, damage and missing parts.Repair as required.	Х		
4	Check engine start battery and cables for security, damage, corrosion, water level (if required) and condition.Repair as required.		X	
5	Check engine throttle control for security, damage and proper operation.Repair as required.		X	
6	Check engine control box for security, damage and proper operation.Repair as required.			Х
7	Check engine muffler and intake system for security, damage, and condition.Repair as required.			Х
8	Check diesel fuel level to ensure proper level to allow unit to run for daily operation.Refill as required.			Х
9	Check engine control cable for security and damage.Repair as required.			х

SECTION 8 Scheduled Inspections

SECTION 9 Special Inspections

Contents

Description9-1	Storage/Winterization9-1
DESCRIPTION This section contains special inspection requirements for a specific system after use, an unusual event or storage.	 REMOVING 1. Remove all covers and seals from all fill/discharge openings and components. 2. Inspect piping for debris that may damage unit that unstance in the second se
STORAGE/WINTERIZATION	that water will be pumped into.
ENTERING1. Remove any exterior dirt, grease and grime that may trap moisture.	 Check to ensure all water pump reservoirs are filled to the correct level and the fluid is not contaminated.
2. Flush all water suction and discharge tubes (e.g. water pump,).	 Remove any exterior dirt, grease and grime and treat any corrosion.
3. Ensure all water is drained from the tubes and water pump.	5. Service all Engine systems per QSB3.3 CM2150 and B3.3 Operation and Maintenance Manual.
4. Ensure all covers/caps for fluid reservoirs are in proper operating condition and are secured to	 Check all fluid levels for condition and level, replace or adjust as necessary.
the openings.5. Fill Fuel tank to capacity, close fuel shut off valves at bottom of fuel tank.	 Check Braking system (if equipped) repair as necessary.
6. Check tires for proper inflation.	 Check safety chains for damage. Check lighting system for proper operation, ropair as possessary.
 Check Boom retaining hardware, ensure it is operational and secure. 	repair as necessary. 10. Clean and connect battery cables to battery.
8. Lubricate all grease points (e.g. Hinge pins, cylinder pins, water pump suction bowl).	11. Perform all 'Daily' maintenance checks, repair as necessary.
9. Check battery fluid level and charge.	12. Perform a full functional check of all MMP4
10. Disconnect battery cables from battery.	control systems.
11. Service all engine systems per QSB3.3 CM2150 and B3.3 Operation and Maintenance Manual.	
12. If possible, shelter entire unit from the elements.	

SECTION 9 Special Inspections

9-2 (Blank)

SECTION 10 Recommended Support Parts

Contents

Description	Water Piping (Boom) Group10-1
Axial Water Pump Group, 303910	Frame and Suspension Group10-2
Hydraulic Group10-1	B3.3T Cummins Engine Support Parts Group 10-2

DESCRIPTION

This section contains a listing of recommended support parts that should be available in the supply warehouse. Once parts are issued from warehouse stock ensure depleted quantities are replenished to keep the recommended support parts package at 100%. The tables are categorized by specific sub system of the MMP. **Do not forget** that all MMPs are not configured the same and there are some variations in systems due to changes in equipment and actual production dates. Ensure MMP serial numbers and actual component part numbers are checked before ordering any parts.

If your system is not covered in this manual or are having difficulties please contact the MEGA Corp. Product Support Group with the unit serial number at: Toll free US 1-800-345-8889, Direct 1-505-345-266, or visit our website at www.megacorpinc.com for more detailed contact information.

Α.	AXIAL WATER PUMP GROUP, 303910		
	PART DESCRIPTION	PART NO.	QTY
1.	Gasket, 12 inch	304174	2
2.	Grommet	303910-03	2
3.	Thrush Collar	303910-17	1
4.	Lower Seal	303910-20	1
5.	Upper Seal	303910-25	1
6.	O-Ring, Bearing, (Lower)	303910-31	2
7.	O-Ring, Hydraulic Motor, (Upper)	303910-35	2

В.	Hydraulic Group		
	PART DESCRIPTION	PART NO.	QTY
1.	Cylinder, 12 inch, Discharge Boom	303923	1
2.	Cylinder, 20 inch, Inlet Boom	303924	1
3.	Filter, Hydraulic, 400 psi	304704	2
4.	Oil, Hydraulic, Clarity (35 Gallon Capacity)	USE LOCAL	35 gal
		SUPPLIER	

C.	WATER PIPING (BOOM) GROUP		
	PART DESCRIPTION	PART NO.	QTY
1.	Sock, Down spout, tapered	304196	2
2.	Tie Down Strap, 2 inch	304291	1
3.	Pin, Hinge pivot	037627-05	1
4.	Neoprene gasket, 0.38", Boom flange	304117	2
5.	Pin, Hitch, 1 inch	303935	2
6.	Chain, 3/8 inch, GR 70, 6 ft.	038453-11	1
7.	Shackle, 3/8 inch	355020	4

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SECTION 10

Recommended Support Parts

D.	FRAME AND SUSPENSION GROUP		
	PART DESCRIPTION	PART NO.	QTY
1.	Wheel and Tire Assembly	303933	1
2.	Hitch pin, 1 inch	303935	2
3.	Chain, 3/8 inch, GR 70, 2.4 ft	038453-13	1
4.	Shackle, 3/8 inch	355020	2
5.	Bearing, Wheel, Inner	304157	2
6.	Bearing, Wheel, Outer	304158	2
7.	Seal, Wheel Bearing	304159	2
8.	Jack stand	037708	1

E. B3.3T CUMMINS ENGINE SUPPORT PARTS GROUP		
**REFER TO ENGINE MANUAL FOR SPECIFIC PARTS AND SERVICE INFORMATION		
PART DESCRIPTION	PART NO.	QTY
****For Most B3.3T Cummins Parts, See B3.3 Series Power Unit Parts Manual ****		

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

US Toll Free: 1-800-345-8889 or

Direct: 1-505-345-2661 or visit our website at www.megacorpinc.com for more detailed contact information.

Appendix A: MMP4 Build Drawings

MMP4-CUMMINS-B3.3T-MX-2

3 Apr 2014

DESCRIPTION

This section contains all the drawings required to set up the MMP4. These drawings are serial number specific and are designed to be used in conjunction with previous section information to successfully produce a fully operational MMP4 system.

If your system is not covered in this manual, you are having difficulties with the installation or need additional information or assistance, 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 11 Appendix A: MMP4 Build Drawings