



MMP4-2

SPECIALTY HAULAGE SOLUTIONS FOR CONSTRUCTION AND MINING

Maintenance Manual



MEGA CORP.®
700 Osuna Rd. N.E. • Albuquerque, NM 87113 • 1-800-345-8889 • 505-345-2661 • Fax 505-345-6190
www.megacorpinc.com
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5 Nov 2011

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Definitions and Abbreviations

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MANUAL USAGE

This technical manual only contains information required to safely maintain the MMP-4 powered by a CAT 3054B diesel engine. See the CAT 3054B Engine Maintenance and Operators Safety Manual for specific engine 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
Direct 1-505-345-2661
or visit our website at www.megacorpinc.com
for more detailed contact information.

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.

SECTION 1 Definitions and Abbreviations

SAFETY MESSAGES

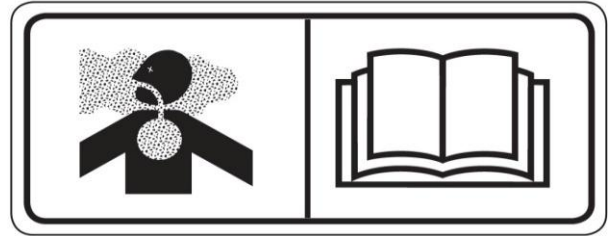
There are several specific safety messages on this machine. The exact location of the hazards and description of the hazards are reviewed in this section. All personnel working on or operating the machine must become familiarized with all the safety messages.

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.

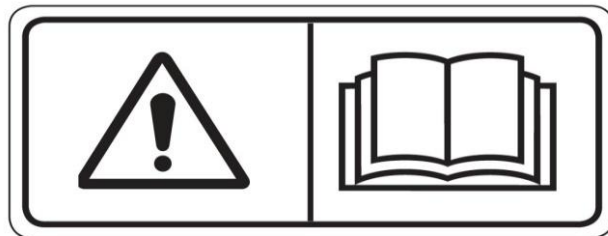


⚠ WARNING

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)



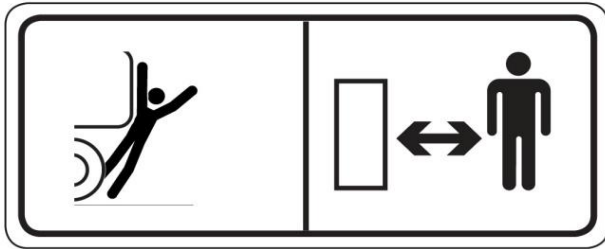
⚠ WARNING

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.

SECTION 1 Definitions and Abbreviations

Backing Runover Hazard (3)

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

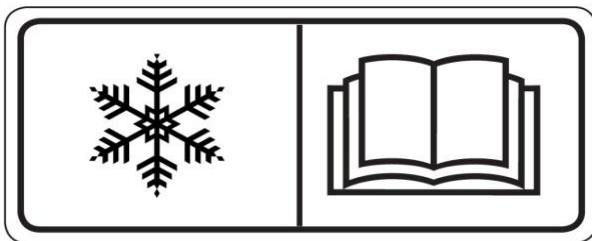


⚠ WARNING

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.

Freezing (4)

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

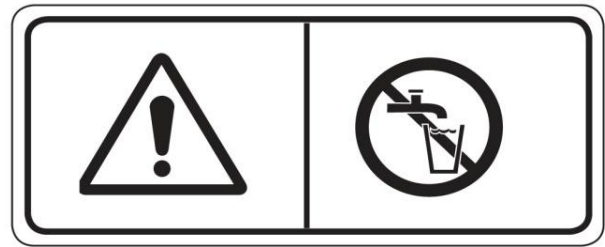


⚠ WARNING

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.



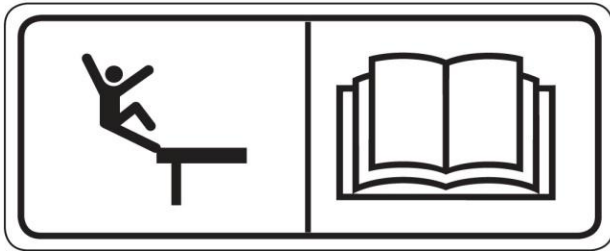
⚠ WARNING

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.

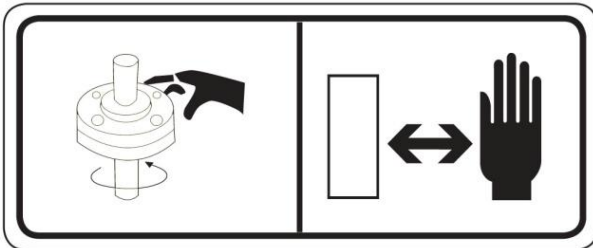


⚠ WARNING

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.

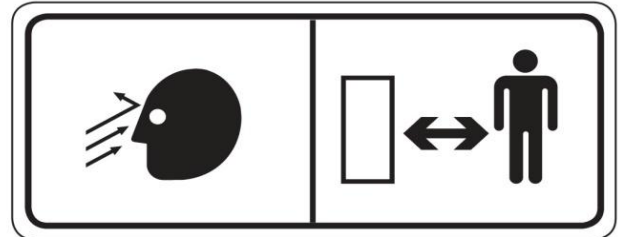


⚠ WARNING

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.

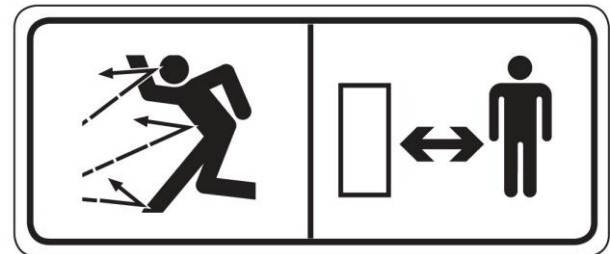


⚠ WARNING

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.



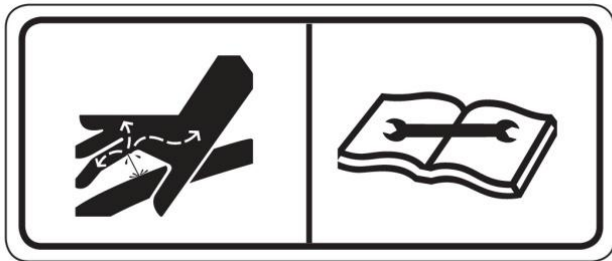
⚠ WARNING

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

SECTION 1 Definitions and Abbreviations

High Pressure Motor (11)

This safety label is located on the hydraulic motor.

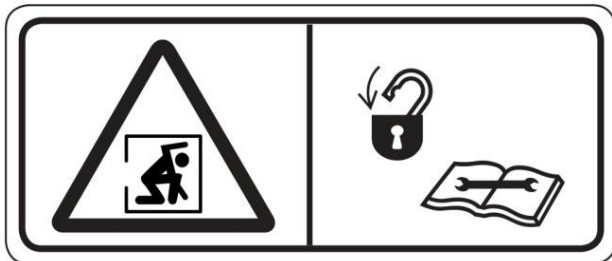


⚠ WARNING

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.

Confined Space (12)

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



⚠ WARNING

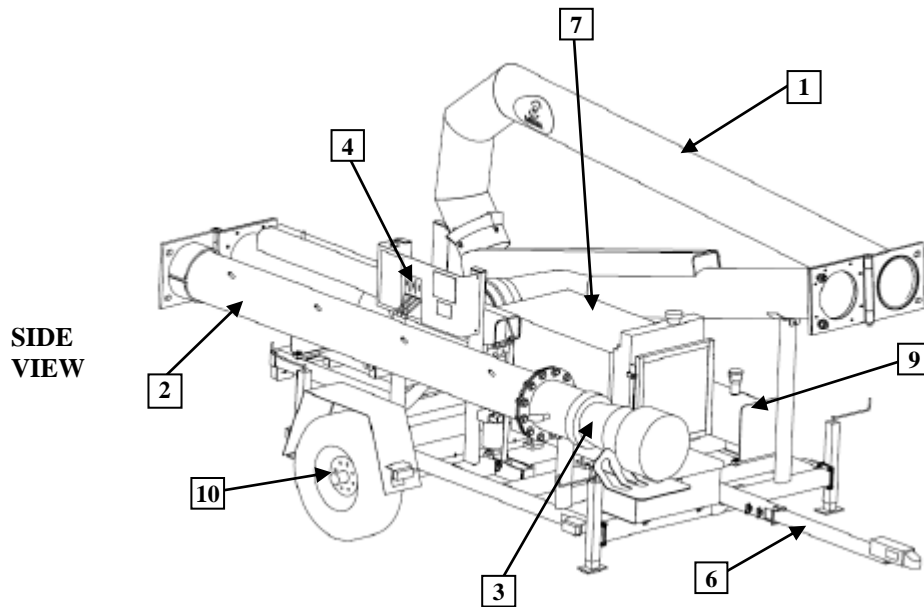
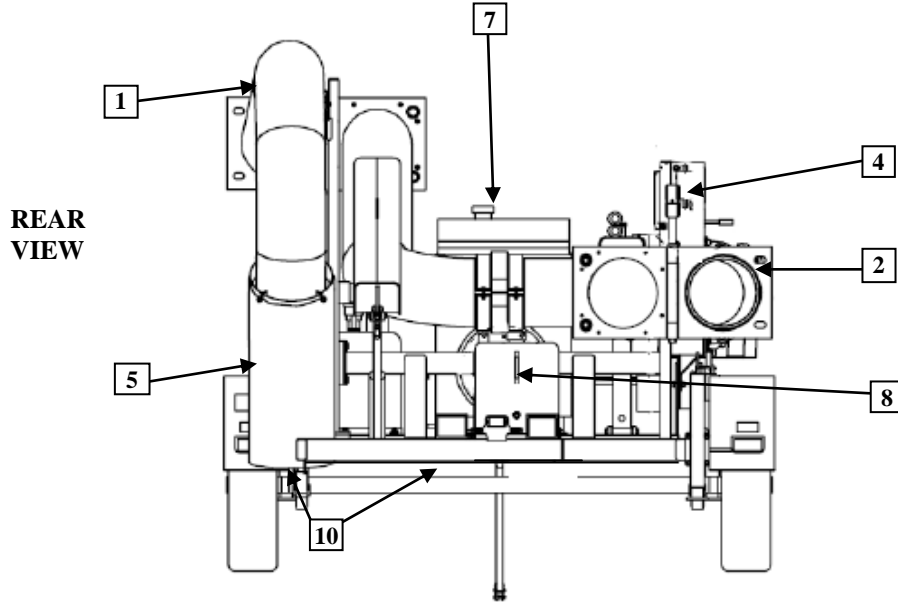
Do not enter confined spaces without following established site specific procedures. Failure to follow proper safety procedures will result in serious injury or death.

ABBREVIATIONS

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

SECTION 1 Definitions and Abbreviations

MMP 4 GENERAL OVERVIEW



- | | | | |
|----------|-------------------------|-----------|--------------------------|
| 1 | DISCHARGE BOOM | 6 | HITCH ASSEMBLY |
| 2 | INLET BOOM | 7 | 3054 CAT ENGINE ASSEMBLY |
| 3 | WATER PUMP | 8 | HYDRAULIC TANK |
| 4 | HYDRAULIC CONTROL VALVE | 9 | 50 GALLON FUEL TANK |
| 5 | DISCHARGE SOCK | 10 | AXLE AND SUSPENSION |

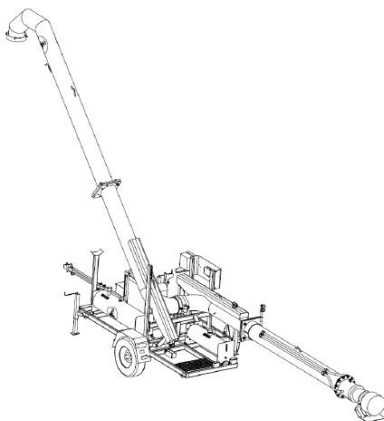
SECTION 2 MMP-4 Overview

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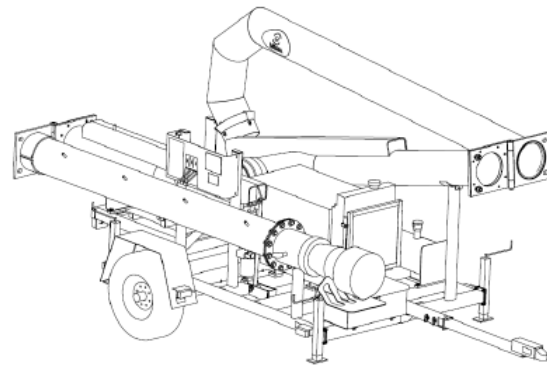
| | | | |
|-------------------|-----|--------------|-----|
| Description | 2-1 | Repair | 2-2 |
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DESCRIPTION

The MEGA Mobile Pump is a towable water lifting station. The MMP 4 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" ball. The MMP 4 can be transported to a water holding pond and be set up by 1 individual. MMP 4's are a self contained pumping station fitted with a hydraulically driven 12" axial water pump that has the potential to lift water 25' (7.62 meters) from pump level to fill water distribution equipment (maximum height, 17' [5.2 meters] above ground level). MMP 4's are equipped with: hydraulically lifted inlet and discharge booms with safety retaining chains and travel locking devices, DOT rated lighting, 16" 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 Caterpillar 3054B series diesel engine and a 50 gallon (190 liter) capacity diesel fuel tank equipped with shut off valves.



The MMP 4 needs a minimum of 2.5' (0.762 meters) of water above the inlet of the water pump for proper operation.



INSPECTION

1. Inspect MMP 4 exterior paint for damage 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

MMP-4 Overview

REPAIR

Paint

Remove corrosion, prime and paint as required.

Engine Fluid Levels and Inspections

Adjust, repair or service according to CAT SEBU7276-01 manuals for engine service schedule.

Leaks

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 Parts sales for assistance.

Structure

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 www.megacorpinc.com for more detailed contact information or assistance on major structural repairs.

SECTION 3 Engine Control System

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| Inspection | 3-2 | | |

DESCRIPTION

The Engine control system consists of: A Control box with lockable cover, Ignition switch with key, Glow plug button, Murphy switch, System fuse, Emergency stop button, Throttle control, Battery voltage gauge, Engine oil pressure gauge, Engine coolant temperature gauge and an Engine Tachometer.



The control functions operate as follows:

| Control | Function |
|----------------------------------|--|
| SYSTEM FUSE | Protects the engine control electrical system in the event of an electrical short circuit. |
| EMERGENCY STOP BUTTON | Disengages the Murphy switch to shut engine down. |
| THROTTLE CONTROL | Controls and locks engine throttle lever to a fixed RPM. |
| BATTERY VOLTAGE GAUGE | Displays electrical system voltage. |
| ENGINE OIL PRESSURE GAUGE | Displays engine oil pressure. |
| ENGINE COOLANT TEMPERATURE GAUGE | Displays engine coolant temperature. |
| ENGINE TACHOMETER | Displays engine RPM's. |

| Control | Function |
|--------------------------|---|
| IGNITION SWITCH WITH KEY | Controls engine electrical system to start, run and shut down engine. |
| GLOW PLUG BUTTON | Operates the cold weather starting aid system. |
| MURPHY SWITCH | A magnetic switch that shuts the engine down in the event of: low engine oil pressure and/or over heating of the engine cooling system. |

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.

SECTION 3

Engine Control System

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.

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.

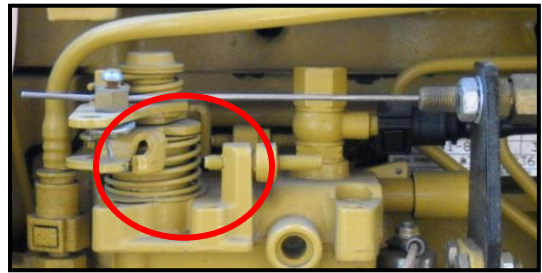
Throttle Control replacement

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.

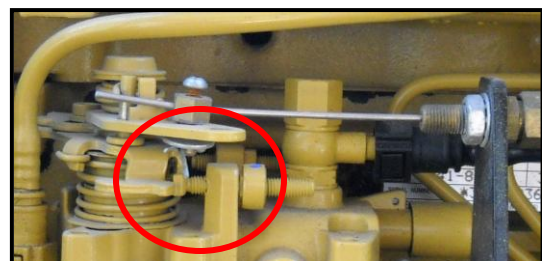
SECTION 3 Engine Control System

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.

17. Ensure newly installed throttle cable allows engine throttle lever to fully contact the LOW idle stop.



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



SECTION 3

Engine Control System

19. Place throttle control cable in the low idle position.
20. Apply power to engine control box and engine.
21. Ensure hydraulic ball valve at hydraulic tank is OPEN.
22. 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 CAT SEBU7276-01 manual for correct RPM specifications and adjustment procedures.

SECTION 4 Basic Hydraulics System

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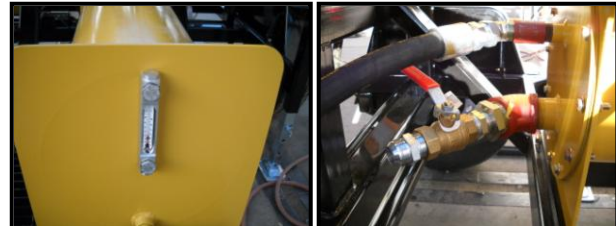
| | | | |
|---------------------------------------|-----|---------------------------|-----|
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| Hydraulic Cylinders | 4-3 | | |

DESCRIPTION



The MMP 4 hydraulic system originates at a hydraulic pump coupled to a CAT 3054B Diesel engine. The system draws hydraulic oil from a hydraulic tank mounted at the rear of the MMP 4 frame through an inlet screen inside of the tank and a shut off valve on the outside 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 MMP 4 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 then a diffuser mounted inside of the hydraulic oil tank.

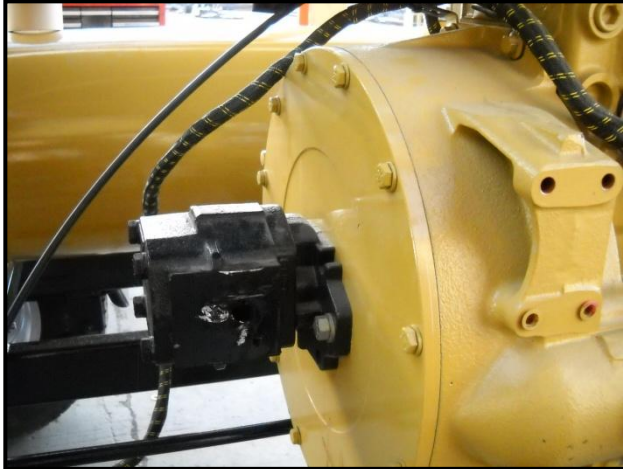
HYDRAULIC TANK ASSEMBLY



The hydraulic tank consists of an inlet screen, return oil diffuser, internal baffle, shut off valve, 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 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 within the tank to evenly distribute the return oil through 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.

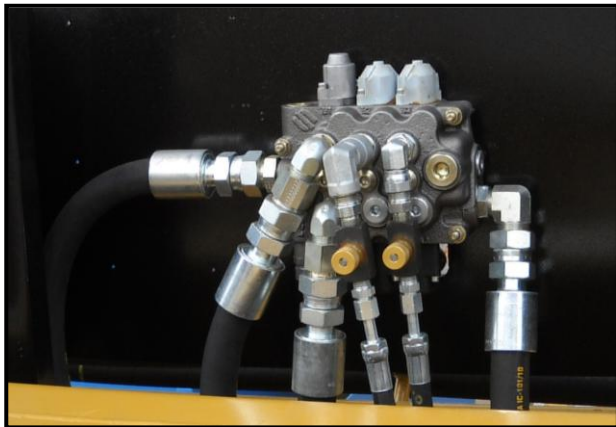
SECTION 4 Basic Hydraulics System

HYDRAULIC PUMP



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.

HYDRAULIC CONTROL VALVE



The hydraulic control valve directs and regulates the hydraulic pumps oil flow. The valve operates the boom lifting cylinders by pressurizing the rod end of the cylinder to make the booms move up (Cylinder retract). To lower the booms the valve opens to allow the oil to return to the hydraulic filter through a

metering control that controls the speed of the cylinder movement. The hydraulic drive motor for the water pump portion of the control valve is equipped with a detent to allow the valve spool to stay in an open position when the lever is moved to the ON position for normal water pump operation. When this lever is moved to OFF it will shut off hydraulic oil flow to the water pump drive motor. The hydraulic control valve is fitted with a pressure regulator that limits the maximum pressure of the hydraulic system to 2,100 psi (14,450 kpa). The excess oil flow is diverted to the hydraulic oil filter. When the control valves are in the neutral position, all of the hydraulic oil by-passes through the control valve to the return hydraulic oil filter.

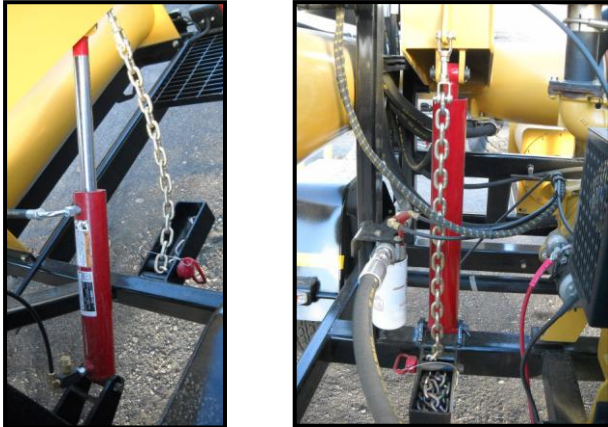
WATER PUMP HYDRAULIC DRIVE MOTOR



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.

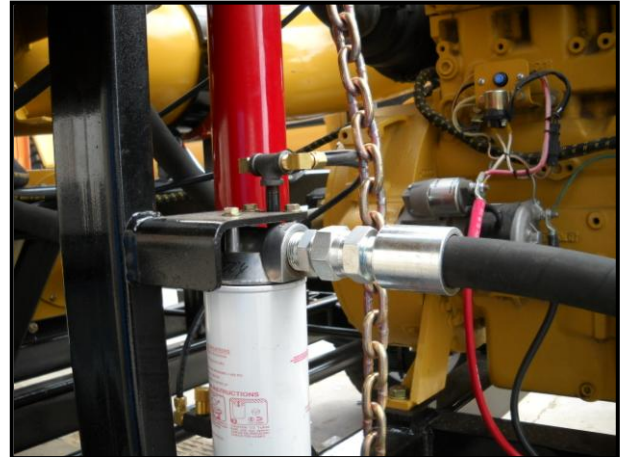
SECTION 4 Basic Hydraulics System

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 lever is operated in the 'UP' position the pressurized oil retracts the cylinder and lifts the boom. The speed of the lifting is controlled by metering valves attached to 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 moving the control valve lever to the 'DOWN' position, the weight of the boom makes the cylinder extend. The speed of the downward motion is controlled by a fluid metering valve attached to the hydraulic cylinder that restricts the fluid exiting the cylinder causing a slow, controlled lowering of the booms.

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) and has a provision for the cylinder lower plumbing. The filter is rated at 10 microns. 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.

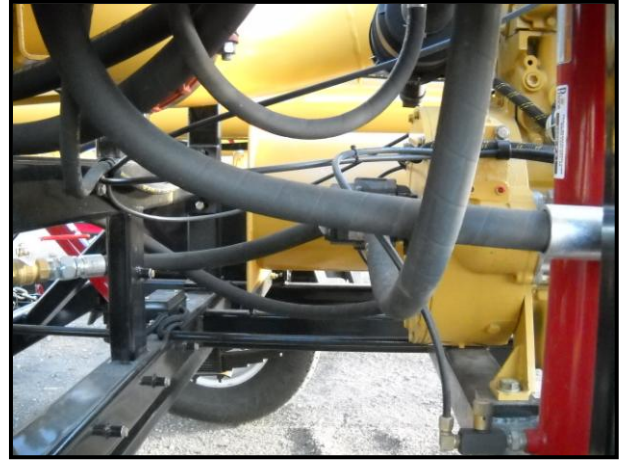
SECTION 4 Basic Hydraulics System

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.

HYDRAULIC HOSES



The MMP-4 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" (-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.

SECTION 4 Basic Hydraulics System

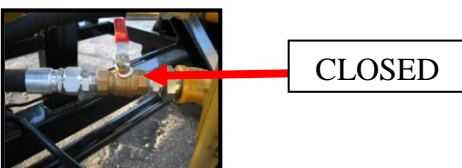
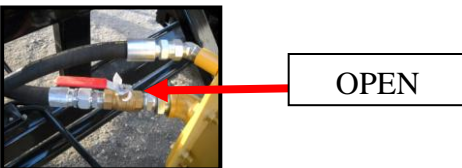
INSPECTION

Hydraulic tank assembly

1. Inspect hydraulic oil tank for security, damage, 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.
3. Check hydraulic tank filler cap, breather and bolt on end cover for security, damage and leaks.
4. Check hydraulic hose fittings and shut off valve, ensure shut off valve is open.



5. Check tank mounting bolts, ensure the bolts are tight.

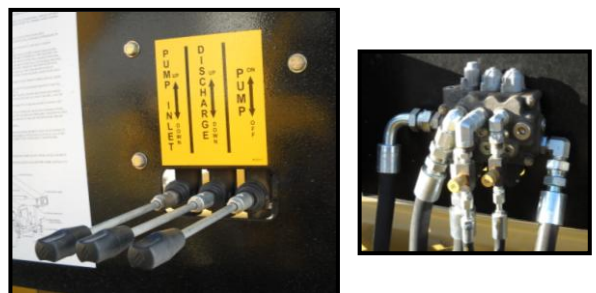
Hydraulic Pump

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



Hydraulic Control Valve

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 (2,100 psi/14,450 kpa), security and leaks.

SECTION 4 Basic Hydraulics System

Water Pump Hydraulic Drive Motor

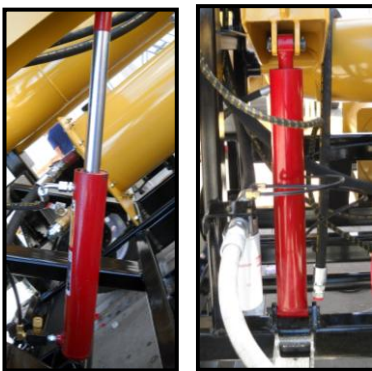
1. Check water pump drive motor fittings for security, damage and leaks.



2. 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.

Hydraulic Cylinders

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.

Hydraulic filter assembly

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.

Hydraulic Oil Cooler assembly

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.

SECTION 4 Basic Hydraulics System

REPAIR

Hydraulic tank assembly

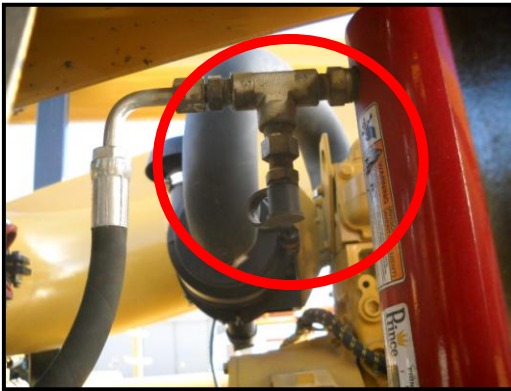
1. Repair, secure or adjust as required.

Hydraulic Pump

1. Repair or replace as required.

Hydraulic Control Valve

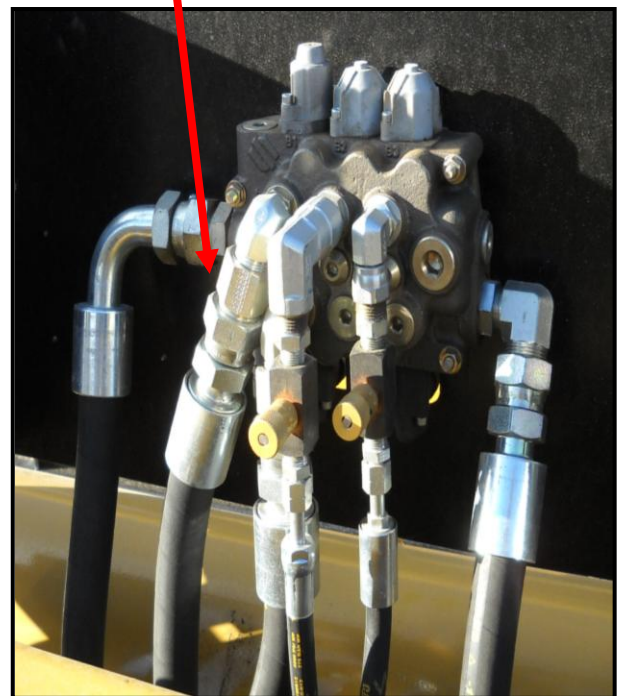
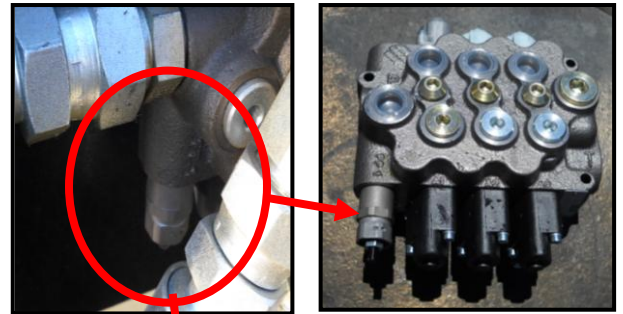
1. Repair, adjust or replace as required.
2. To set hydraulic relief pressure, install a 0 – 3,000 psi (0 – 21,000 kpa) pressure gauge on the test fitting located on the retract hose (RAISE) for the inlet boom cylinder.



3. With the engine operating at high idle, operate the inlet boom UP lever and observe the reading on the pressure gauge.



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 2,100 psi (14,450 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.



SECTION 4 Basic Hydraulics System

Water Pump Hydraulic Drive Motor

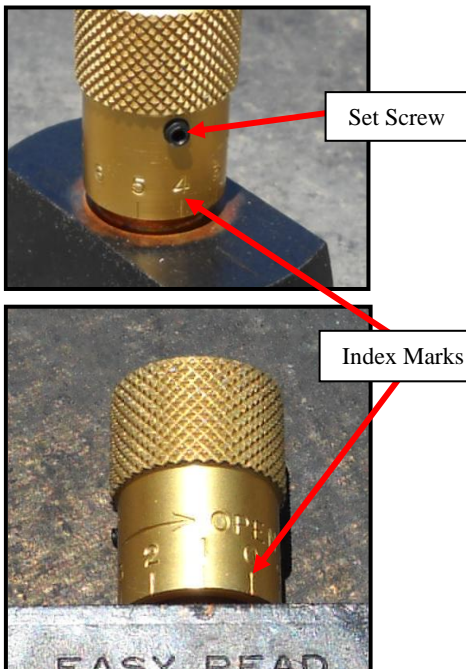
1. Repair or replace as required.

Hydraulic Cylinders

1. Repair or replace as required.

Hydraulic Cylinder Speed Control Valve

1. If the hydraulic boom cylinders raise too slowly or lower too fast, check the adjustment as follows;
 - a. Loosen set screw on knob.
 - b. Fully seat the flow control on the hydraulic control valve for the cylinder with the travel speed that needs adjustment.
 - c. Rotate adjustment knob CW to fully seat needle.
 - d. Rotate knob 1 full turn CCW.
 - e. Raise boom, check speed to ensure speed is desired, if speed is too fast turn knob CW 1 index mark, if the speed is too slow turn knob CCW 1 index mark at a time until desired speed is achieved.
 - f. Tighten set screw.



Hydraulic Filter Assembly

1. Repair or replace as required.

Hydraulic Oil Cooler Assembly

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.

Hydraulic Hoses

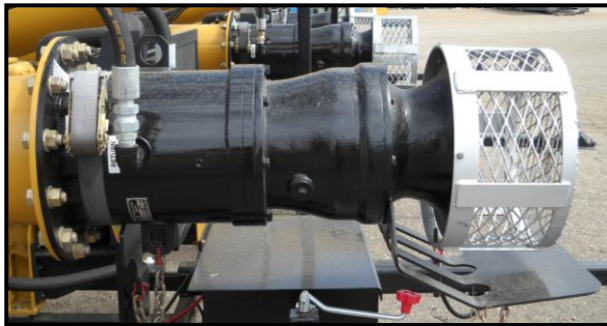
1. Remove and replace damaged hose assembly if damage to outer covering is present or leaks are present.
2. Replace hose assembly if hose end is unserviceable due to leaks or damage.

SECTION 5 Water Pump Assembly

Contents

| | | | |
|------------------------------|-----|-------------------------------------|-----|
| Description | 5-1 | Parts Breakdown of Water Pump | 5-5 |
| Hydraulic Drive Motor | 5-1 | Disassembly | 5-7 |
| Inspection and Service | 5-2 | Assembly | 5-8 |

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 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].



SECTION 5 Water Pump Assembly

INSPECTION

DAILY

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.

250 hours

1. Remove water pump from inlet boom.
2. Check water pump drive motor for security, damage and signs of leakage.
3. Check water pump bearing oil level.
4. Check water pump bearing oil for contamination.
5. Grease water pump suction bowl reservoir.
6. Check water pump trash screen for blockage, security and damage.
7. Check impeller for damage.

500 hours

1. Perform all 250 hour inspections and repairs.
2. Change oil in the 2 water pump bearing reservoirs.
3. Check water pump housing for damage and security.

SERVICE

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

WARNING

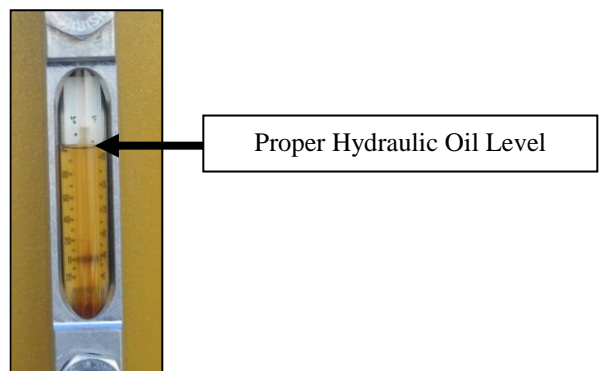
Ensure the MMP4 is properly positioned and configured before maintenance is performed. Units not configured properly or stabilized, may rollover and cause serious personal injury or death.

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.

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. Hydraulic fluid levels must be maintained at 80% to 90% of the level shown in the sight glass. Check level daily.



SECTION 5

Water Pump Assembly

6. Check hydraulic fluid for excessive bubbles, foaming and water contamination daily.
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 non-hazardous 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.

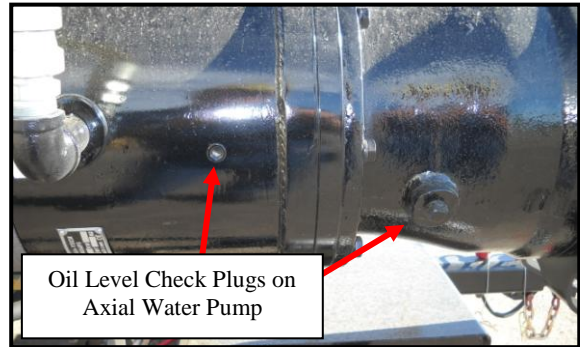
CAUTION

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 every 250 operating hours.



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 MMP 4 Disassembly Instructions.
12. Change oil in the bearing housing every 500 operating hours or semi annually which ever occurs first if no contamination or fluid loss is present. Use clean non-detergent 10W, 20W oil, AW32 or AW46 hydraulic oil.
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.

SECTION 5

Water Pump Assembly

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. Lube suction bowl bushing at (Item 15 in Figure 1), every 250 operating hours or semi annually which ever occurs first. (Mystic 5496 Marine Grease or equivalent) 1 each - 3/8" 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.

SECTION 5 Water Pump Assembly

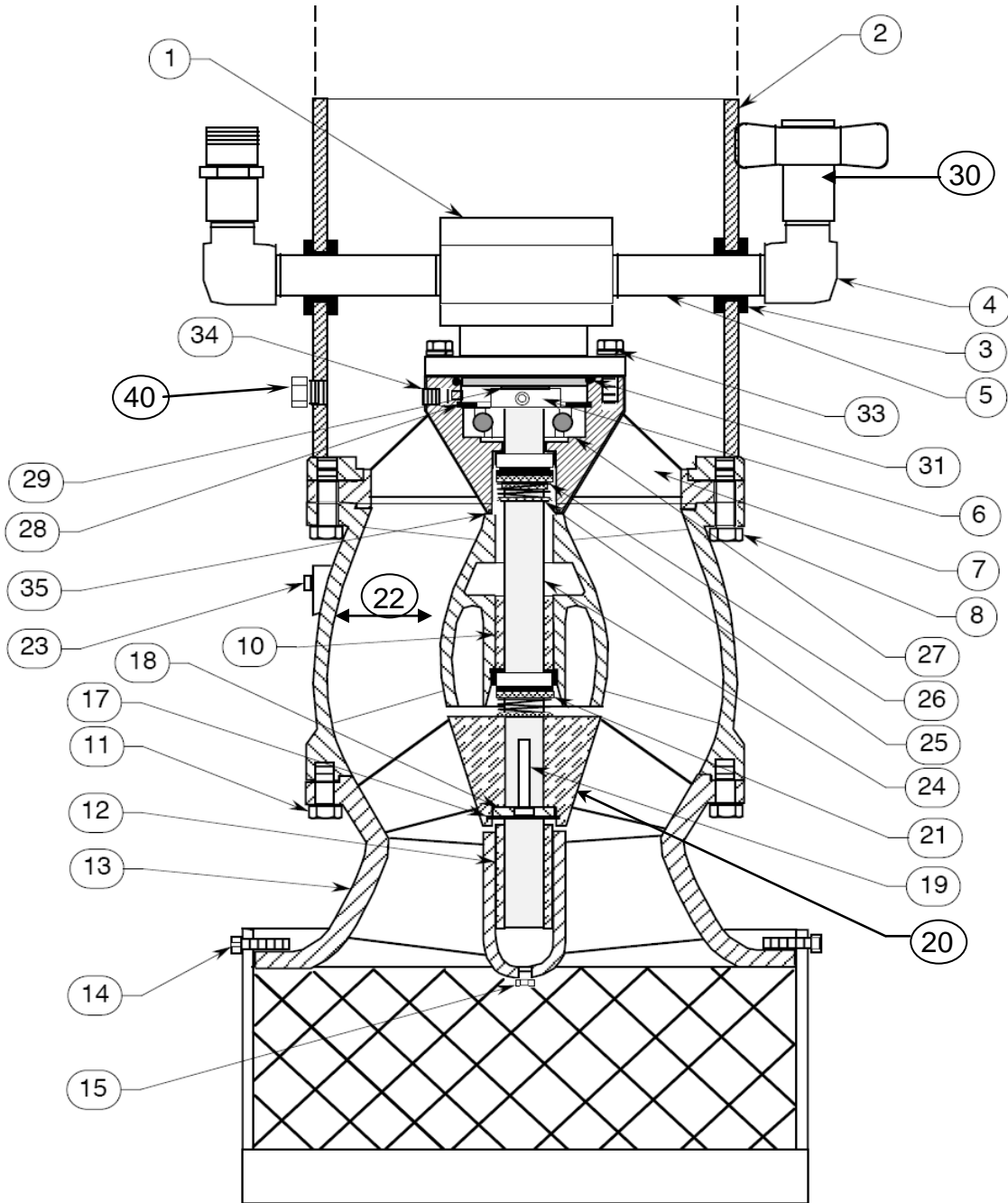


Figure 1: MMP 4 Water Pump

SECTION 5

Water Pump Assembly

| Item | Part number | Description | Item | Part number | Description |
|------|-------------|--|------|-------------|-----------------------------------|
| 1 | 303910-01 | Hydraulic Motor | 21 | 303910-20 | Lower Seal |
| 2 | 303910-02 | Discharge pipe with flange | 22 | 303910-21 | Discharge Bowl Assembly |
| 3 | 303910-03 | Grommet | 23 | 303910-22 | Pipe Plug |
| 4 | 303910-04 | 1" Elbow | 24 | 303910-23 | Shaft |
| 5 | 303910-05 | Pipe | 25 | 303910-24 | Snap-Ring |
| 6 | 303910-06 | Shaft collar | 26 | 303910-25 | Upper Seal |
| 7 | 303910-07 | Bearing Housing | 27 | 303910-26 | Bearing |
| 8 | 303910-08 | Bolt | 28 | 303910-27 | Snap-Ring |
| 9 | | (Not used on this model) | 29 | 303910-28 | Snap-Ring |
| 10 | 303910-09 | Bushing Lower Discharge Bowl | 30 | 303910-29 | Coupler (male) 1" |
| 11 | 303910-10 | Bolt | 30 | 303910-30 | Coupler (female) 1" |
| 12 | 303910-11 | Bushing Suction Bowl | 31 | 303910-31 | O-Ring |
| 13 | 303910-12 | Suction Bowl | 32 | | (Not used on this model) |
| 14 | 303910-13 | Screw 3/8" x 1-1/2" Sq. Head Set Screw | 33 | 303910-32 | Bolt |
| 15 | 303910-14 | Pipe Plug | 34 | 303910-33 | Plug Bearing Housing |
| 16 | 303910-15 | Strainer Assembly | 35 | 303910-34 | O-Ring |
| 17 | 303910-16 | Snap-Ring | 36 | 303910-35 | Swivel Union (Optional) 2 req. |
| 18 | 303910-17 | Thrust Collar | 37 | 303910-36 | Discharge Flange (Optional) |
| 19 | 303910-18 | Key | | | |
| 20 | 303910-19 | Impeller | 40 | | Pipe Plug |

Table 1: MMP 4 Water Pump Parts Break Down

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 (4) screws (Item 14).

NOTE

To inspect impeller (Item 20) remove (8) bolts (Item 11) holding suction bowl (Item 13) to discharge bowl (Item 22).

7. 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.

SECTION 5

Water Pump Assembly

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.
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 .010" (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.
4. Fill oil hole (1/2" 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" plug) in upper bearing housing (Item 7) to spill point with clean hydraulic oil. Refer to line 5 for above for oil specifications.

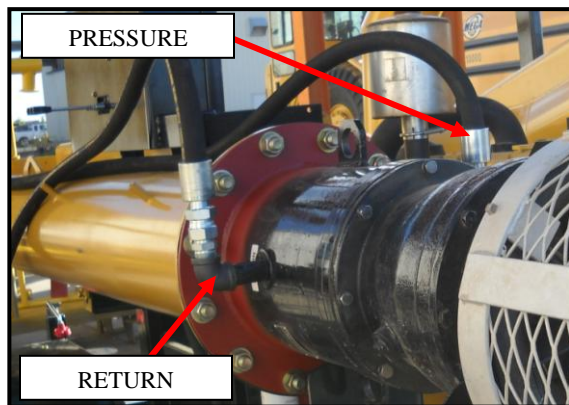
SECTION 5 Water Pump Assembly

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.

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.

MMP 4-2
5 Nov 2011

SECTION 5
Water Pump Assembly

SECTION 6 Axle and Suspension

Contents

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| Description | 6-1 | Inspection | 6-2 |
| Service | 6-1 | Repair | 6-2 |

DESCRIPTION



The MMP-4 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 MMP-4 on firm level ground, lower forward landing gears, raise hitch, uncouple MMP-4 from tow vehicle.
2. Lower rear landing gear until the MMP-4 is stable.
3. With a jack of adequate capacity raise 1 tire in the air high enough to remove the tire.

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 MMP-4 properly may result in an unstable load, over loading of the jack or damaging an MMP-4 component causing damage to the MMP-4.

5. Lower the landing gear to re-stabilize the MMP-4.

WARNING

MMP-4 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 MMP-4 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.

SECTION 6

Axle and Suspension

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, MMP-4 or tow vehicle damage.

8. Rotate wheel while pumping grease into fitting.
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 semi-annual service point. Failure to perform annual wheel bearing service and inspection may result in damage to the axle, wheel bearings or MMP-4 if not preformed.

INSPECTION

1. Inspect axle for cracking, damage and security.
2. Inspect springs for worn eye bushings, bent, loose or broken shackles, mounts and bolts, sagging or broken leafs, loose or damaged U-bolts.
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.

SECTION 6 Axle and Suspension

6. Wheel bearings:
 - a. Secure MMP-4 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.

WARNING

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

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.

NOTE

Recommended Wheel Bearing Lubrication Specifications are as follows;

| | |
|-----------------|---|
| 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.

SECTION 6

Axle and Suspension

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-torqueing 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 MMP-4 and tow vehicle.

SECTION 7 Frame and Booms

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| Inspection | 7-1 | | |

DESCRIPTION



The MMP-4 frame is constructed from steel tubing welded together to form a rigid mounting platform that the components of the MMP-4 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.



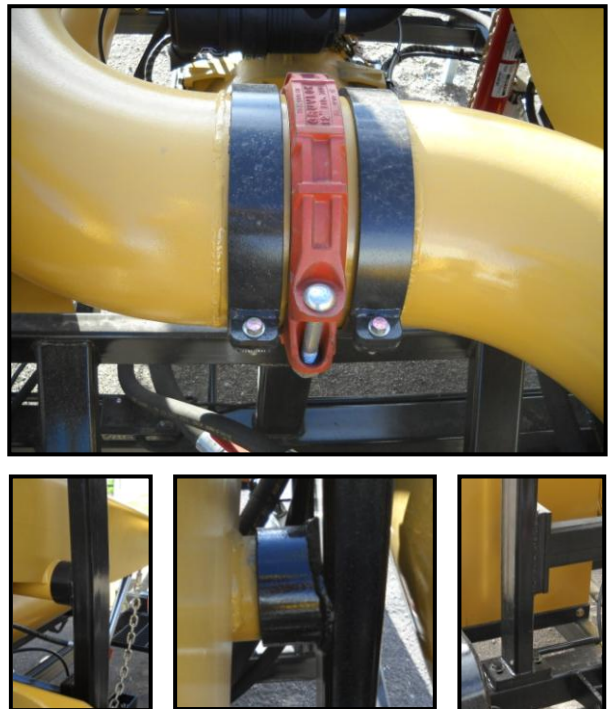
8. Inspect fenders for security and damage.



9. Inspect lighting for security, damage and function.



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

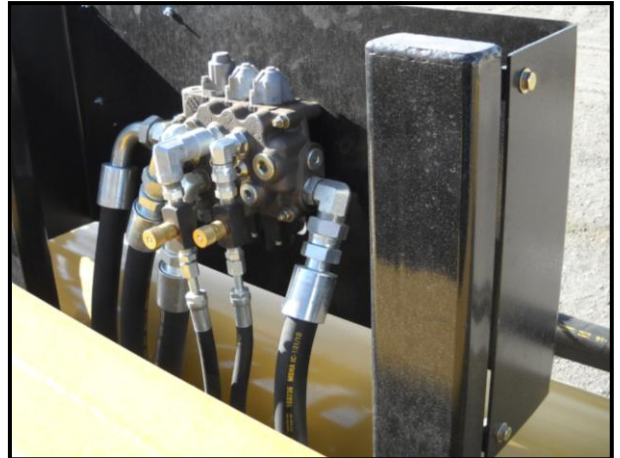


SECTION 7 Frame and Booms

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.



13. Inspect hydraulic control valve and mount for security, damage, leaks and missing parts.



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 suspension spring mounts for security, damage and wear.

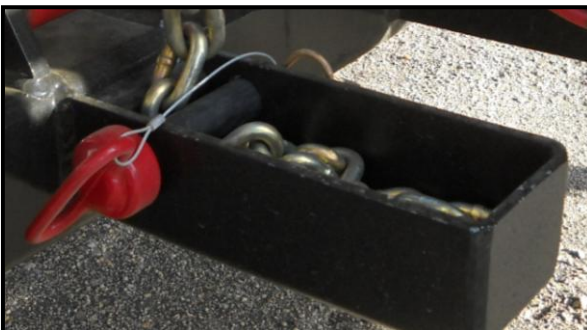
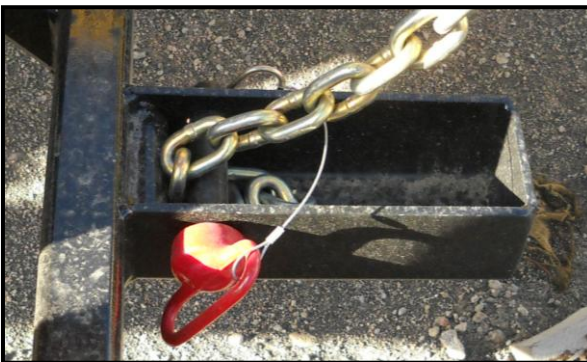


SECTION 7 Frame and Booms

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



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



REPAIR

1. Replace damaged or missing parts as required.
2. If frame damage is noted, or you have a question about the MMP4 contact: 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

DESCRIPTION

This section establishes scheduled maintenance inspections of the MMP-4 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.

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

| | | FREQUENCY | | | | | |
|------|---|-----------|------------------|----------------|-----------------|---------------|----------|
| STEP | FRAME AND SUSPENSION | DAILY | BEFORE TRANSPORT | FIRST 50 MILES | FIRST 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 | X | X | | |
| 3 | Check tires and wheel for security, damage, inflation (80 psi or 550 kpa) and missing parts. Repair as required. | | X | | | | |
| 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. | | X | | | | |

SECTION 8 Scheduled Inspections

| | | FREQUENCY | | | | | |
|------|--|-----------|------------------|----------------|-----------------|---------------|----------|
| STEP | FRAME AND SUSPENSION | DAILY | BEFORE TRANSPORT | FIRST 50 MILES | FIRST 200 MILES | SEMI-ANNUALLY | ANNUALLY |
| 7 | Check lighting system. Repair as required. | | X | | | | |
| 8 | Check hitch assembly for security, damage, proper installation and missing parts. Repair as required. | | X | | | | |
| 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 | FIRST 50 MILES | FIRST 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 | | | | | |

SECTION 8 Scheduled Inspections

| | | FREQUENCY | | | |
|------|--|-----------|--------------|--------------|---------------|
| STEP | HYDRAULIC SYSTEM | DAILY | 250 Hours | 500 Hours | 1000 Hours |
| 1 | Check hydraulic oil for proper level, clarity, foaming and signs of contamination. Repair, adjust or replace as required. | X | | | |
| 2 | Check hydraulic control valve for security, damage, function and leaks. Repair as required. | X | | | |
| 3 | Check hydraulic pump for security, damage and leaks. Repair as required. | X | | | |
| 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. | X | | | |
| 6 | Check hydraulic cylinders and flow controls for security, damage and leaks. Repair as required. | X | | | |
| 7 | Check hydraulic oil filter for security, damage and leaks. Repair as required | X | | | |
| 8 | Check hydraulic pressure regulator for function and pressure setting (2,100 psi or 14,450 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 |

SECTION 8 Scheduled Inspections

| | | FREQUENCY | | |
|------|--|-----------|-----------|-----------|
| STEP | WATER PUMP ASSEMBLY | DAILY | 250 Hours | 500 Hours |
| 1 | Check water pump for security, damage, obstructions and operation. Repair as required. | X | | |
| 2 | Check water pump trash screen for security, obstructions and damage. Repair as required. | | X | |
| 3 | Check for excessive vibrations and noise. Repair as required. | X | | |
| 4 | Remove water pump assembly from inlet boom and check for: <ul style="list-style-type: none"> • 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. | | X | |
| 6 | Remove water pump from inlet boom and change bearing reservoir oil. | | | X |

SECTION 8 Scheduled Inspections

| | | FREQUENCY | | |
|------|---|-----------|-----------|-----------|
| STEP | ENGINE AND ENGINE CONTROLS | DAILY | 250 Hours | 500 Hours |
| 1 | Refer to the correct engine Operation and Maintenance Manual for required service intervals and procedures. Follow and perform all required service procedures, operations, conditions and schedules. | X | | |
| 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. | X | | |
| 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. | X | | |
| 7 | Check engine MURPHY Safety switch for security, damage and proper operation. Repair as required. | X | | |
| 8 | Check engine muffler and intake system for security, damage, and condition. Repair as required. | X | | |
| 9 | Check diesel fuel level to ensure proper level to allow unit to run for daily operation. Refill as required. | X | | |
| 10 | Check engine control cable for security and damage. Repair as required. | X | | |

SECTION 9 Special Inspections

DESCRIPTION

This section contains special inspection requirements for a specific system after use, an unusual event or storage.

STORAGE/WINTERIZATION

Entering

1. Remove any exterior dirt, grease and grime that may trap moisture.
2. Flush all water suction and discharge tubes (e.g. water pump).
3. Ensure all water is drained from the tubes and water pump.
4. Ensure all covers/caps for fluid reservoirs are in proper operating condition and are secured to the openings.
5. Fill Fuel tank to capacity, close fuel shut off valves at bottom of fuel tank.
6. Check tires for proper inflation.
7. Check Boom retaining hardware, ensure it is operational and secure.
8. Lubricate all grease points (e.g. Hinge pins, cylinder pins water pump suction bowl).
9. Check battery fluid level and charge.
10. Disconnect battery cables from battery.
11. Service all engine systems per CAT SEBU7276-01 service manual.
12. If possible, shelter entire unit from the elements.

Removing

1. Remove all covers and seals from all fill/discharge openings and components.
2. Inspect piping for debris that may damage unit that water will be pumped into.
3. Check to ensure all water pump reservoirs are filled to the correct level and the fluid is not contaminated.
4. Remove any exterior dirt, grease and grime and treat any corrosion.
5. Service all Engine systems per CAT SEBU7276-01 service manual.
6. Check all fluid levels for condition and level, replace or adjust as necessary.
7. Check Braking system (if equipped) repair as necessary.
8. Check safety chains for damage.
9. Check lighting system for proper operation, repair as necessary.
10. Clean and connect battery cables to battery.
11. Perform all 'Daily' maintenance checks, repair as necessary.
12. Perform a full functional check of all MMP control systems.

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SECTION 9
Special Inspections

SECTION 10 Recommended Support Parts

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 MMP's 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.

| A. AXIAL WATER PUMP GROUP, 303910 | | |
|--|-----------|-----|
| PART DESCRIPTION | PART NO. | QTY |
| 1. Gasket, 12" | 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 |

| B. HYDRAULIC GROUP | | |
|---|-----------------------|--------|
| PART DESCRIPTION | PART NO. | QTY |
| 1. Cylinder, 12", Discharge Boom | 303923 | 1 |
| 2. Cylinder, 20", Inlet Boom | 303924 | 1 |
| 3. Filter, Hydraulic, 400 psi | 304704 | 2 |
| 4. Oil, Hydraulic, Clarity (35 Gallon Capacity) | USE LOCAL SUPPLIER | 35 gal |

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

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" | 303935 | 2 |
| 3. Chain, 3/8", GR 70, 2.4 ft | 038453-13 | 1 |
| 4. Shackle, 3/8" | 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. CAT 3054B ENGINE SUPPORT PARTS GROUP | | |
|---|-----------------|------------|
| REFER TO SEBU7276-01 INDUSTRIAL ENGINE MANUAL FOR SPECIFIC PARTS AND SERVICE INFORMATION | | |
| PART DESCRIPTION | PART NO. | QTY |
| 1. Filter, Engine Oil | 304192 | 1 |
| 2. Filter, Element, Fuel | 304188 | 1 |
| 3. Filter, Element, Fuel/Water Separator | 304190 | 1 |
| 4. Filter, Element, Air, Primary | 304186 | 1 |
| 5. Filter, Element, Air, Secondary | 304187 | 1 |
| 6. Seal, Filter, Fuel | 304189 | 1 |
| 7. Seal, Filter, Water Separator Base | 304191 | 1 |

SECTION 10
Recommended Support Parts

NOTES

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SECTION 10
Recommended Support Parts