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How to Fill and Maintain the Diaphragm

This procedure applies to MP1Axxxx single stage press models and to MP16xxxx models manufactured after date code 99323 (see machine nameplate), which have a brown diaphragm manufactured by Milnor®. This document supersede previous versions of this document (English and Spanish), tag # B2T2003005, and the video file `Filling the diaphragm_2.wmv`.

1. About Diaphragm Water Volume

CAUTION 1: Risk of premature diaphragm failure—Operating with an under-filled or overfilled diaphragm will cause the diaphragm to quickly deteriorate and fail. Milnor only warrants the diaphragm against premature failure caused by a manufacturing defect.

- Maintain proper water volume. Do not under-fill or overfill.

1.1. Why Water Replenishment and Monitoring are Critical—The diaphragm must contain the correct amount of water for normal service life. All diaphragms lose some water, but if it has a puncture or a bad seal, it can become severely under-filled with no obvious indications.

1.2. How To Monitor and Compensate for Excessive Water Leakage—A reliable and simple method, provided as part of the filling ("topping-off") procedure, is as follows: Measure how long it takes from when you begin admitting water to when water begins flowing from the drain hose. If, for example, you measure 10 seconds on a new, but previously filled diaphragm, and after obtaining roughly the same duration on several subsequent fillings, you begin to measure 20 seconds, suspect an abnormal leak. In such case, increase filling frequency until you again, consistently measure the original norm (10 seconds in this example).

1.3. How Often to Fill (Top off) the Diaphragm—It is vital to perform the filling procedure at minimum, every 40 operating hours, to replenish normal water loss and monitor for abnormal leaking. Increase this frequency as needed to compensate for any increase in water loss.

Notice 2: Small uneven loads will reduce the life of a diaphragm. In these cases, diaphragm life can be lengthened by rotating the diaphragm 180° every 300 hours of operation.

2. Precautions and Preparations

Table 1: Equipment Needed for Diaphragm Filling Procedure

Qty.	Description	Supplied with press?	Part Number	
			MP16xxxx Models	MP1A03xx Models
2	Can safety stand	yes	07 30093	07 10385
1	Shaping disk	yes	X7 10055	X7 10055A
2	Fill/drain hose and fittings	yes	See parts document BMP050068	
1	Gaff hook	yes	27A900	
1	Straight edge	no	--	
1	Watch or stop watch (measure fill time)	no	--	

DANGER 3: Crush and Sever Hazards—The can and ram move independently. During operation, these components move without warning. These components can also drift down with power off. Any of several closing gaps will crush body parts.

- Proceed only if a qualified service technician, knowledgeable in press manual operation.

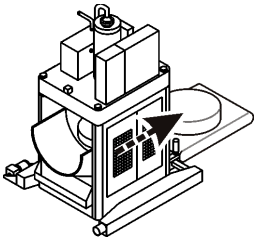
- Use the door interlock bypass key switch in strict compliance with the instructions.
- Install the safety supports **and** lockout/tagout power before reaching into, or working under the can or ram.
- Ensure that personnel and equipment are clear of the press before operating the machine.
- Be prepared to use emergency stop switches.

3. Diaphragm Filling (topping off) Procedure [Document BIPPMM14]

Tip: Once you are familiar with this procedure, use quick reference card B2T2006011.

3.1. Step 1: Set Up

a) Shut down the loading device (e.g., tunnel), allow the press to empty, then access *Manual* mode.

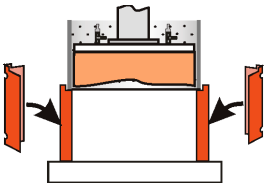


If you place the press in *Manual* mode (SKIP TO + MANUAL) as soon as it discharges, the can and ram will both be fully up.

A1: **b) Set the Door Interlock Bypass key switch to *Maintenance Only,* then open the access doors.**

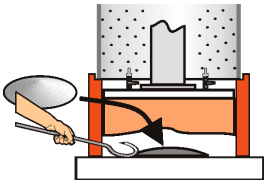
The Door Interlock Bypass key switch bypasses the press's normal operational safeguards. Ensure that bystanders cannot approach the press. See document BICP1S01 "SAFETY ALERT for Owners/Managers and Maintenance Personnel: Using the Door Interlock Bypass Key Switch."

A2: **c) Install the can safety stands.**



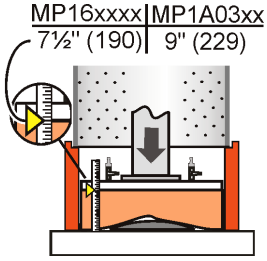
If the can is down, raise it using manual mode 03 to raise the can (0, 3, NEXT, ⬆). Ensure that the can safety stands (not the ram safety bars) are properly installed and remain in place for the entire diaphragm filling procedure. See document BIUUUS06 "How To Use the Safety Stands and Safety Bars on Single-stage Press."

A3: **d) Move the diaphragm about 6" (25 mm) above the bed. With gaff hook, put shaping disk under center of diaphragm.**



Access manual mode 07 (0, 7, NEXT) and move the ram up/down with ⬆/⬇. **Do not place body parts under the diaphragm.** Use the gaff hook to push the shaping disk into position. Use care to center the disk under the diaphragm.

A4: **e) Lower the ram until you measure exactly as shown at right.**

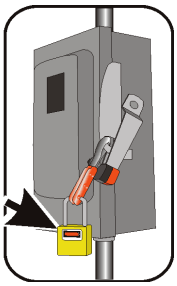


Measure vertically from the press bed to the seam between the rubber diaphragm and metal platen. The bottom of the diaphragm should be just touching the bed. Use the dimension shown at left corresponding to your press model (see nameplate for model).

Go to "Step 2: Fill"

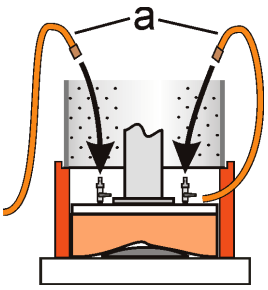
3.2. Step 2: Fill (top off)

With power locked out / tagged out...



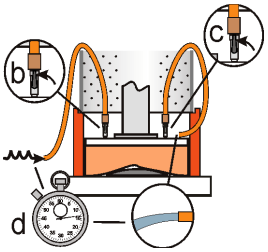
Press must be reliably disabled during this step.

A1: **a) Connect fill and drain hoses.**



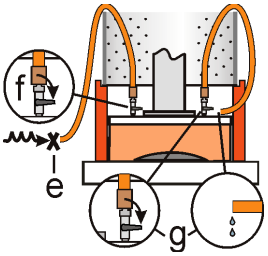
Each hose has a quick disconnect fitting for the diaphragm connection. Connect the fill hose to water but do not open the tap yet. Set the end of the drain hose on top of the platen, as shown.

A2: **b) Open fill valve, c) open drain valve, then d) while timing, run water until it drains steady and bubble-free.**



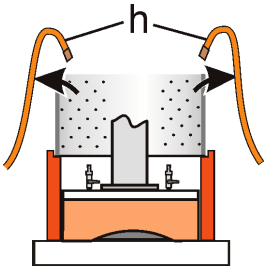
Begin timing when you open the water valve. As soon as water steadily streams from the hose (bubble-free), shut off the fill water and stop timing. Record the fill (top-off) time. You will use this information to determine how often to perform this procedure.

A3: **e) With water off, f) close fill valve, then g) when draining stops, close drain valve.**



After you close the fill valve, allow the diaphragm to continue draining until you observe that the flow has almost completely stopped.

A4: **h) Remove fill and drain hoses.**



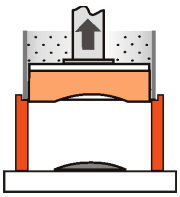
Go to "Step 3: Check"

3.3. Step 3: Check

With power and *Manual* mode restored...

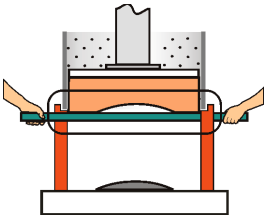
Access the *Manual* mode with SKIP TO + MANUAL.

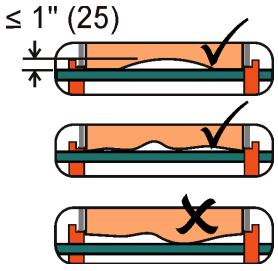
A1: **a) Raise the ram until bottom of diaphragm barely protrudes from bottom of can.**



Use manual mode 07 (0 , 7 , NEXT) to raise the ram (⬆)

A2: **b) Check diaphragm bottom shape with a straight edge held on the sides of, not under the diaphragm.**





A3: **Is the diaphragm properly shaped?**

NO → **Repeat procedure (return to step 1e).**

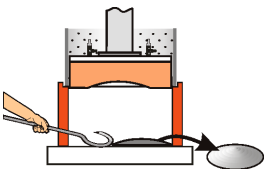
YES

Top two examples, above (✓), are acceptable as long as the indentation does not exceed about 1" (25 mm), estimated visually. The bottom example (χ) is overfilled and the filling procedure must be repeated.

Go to "Step 4: Finish."

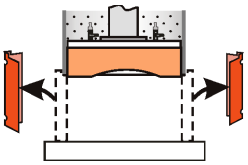
3.4. Step 4: Finish

a) With the gaff hook, remove shaping disk.



Do not reach under the diaphragm. Push the shaping disk out with the gaff hook.

A1: **b) Remove the can safety stands.**



A2: **c) Set the Door Interlock Bypass switch to *Safe Operation* and close the access doors.**

d) Return the press to serivce.

To return to automatic operation, select manual mode 00 (0 , 0 , NEXT).

— End of BIPPMM10 —