TECHNICAL NOTE 01-01A
WATER RESTRAINT SYSTEM (WRS)
Installation of Metering Valve

Dated April 27, 2001 Revised October 17, 2001

Introduction

The metering valve installation will reduce or eliminate water hammering that may occur in the water pipe extending from the water pump to the pressure valve. The water hammering occurs when the pressure valve closes very fast, abruptly stopping the water stream that is moving at over 100 ft. per second. The mass of the water is dependent on the length of the pipe; therefore, a longer pipe will exhibit more hammering. The hammering can be reduced or eliminated by installing a metering valve that slows the application of pressure water to the pressure valve diaphragm. This slows the closing of the valve that in turn stops the water hammering.

Important

When installing the metering valve, **DO NOT** adjust the metering valve to less than full open until the microcomputer has been reprogrammed to lengthen the nozzle valve opening time. Be careful as damage to the nozzle valve can occur.

Installation

The metering valve kit consists of a metering valve, a ½" close nipple, and a ½"pipe thread to ½" tubing adapter.

1. The metering valve installation occurs on the 3 inch Bermad valve.
2. Locate the ½" filter connected to the side of the 3 inch Bermad with a 90 degree adapter. The output of the filter is a ½" poly tubing that runs to the electrically controlled valves mounted on the Bermad diaphragm.
3. Unscrew the poly tube from the output of the filter.
4. Using Teflon paste on all threads, screw the close nipple into the ½" thread of the filter (Note: Teflon paste is preferred over Teflon tape).
5. Screw the long end of the metering valve (the part of the valve that is longest distance from the adjusting screw) unto the close nipple. Tighten as required and be sure to aim the adjusting screw so the valve can be easily adjusted in the future.
6. The ½"pipe thread to ½" tubing adapter is provided for use if you have to cut the ½" poly tube and do not have a new compression ring. If not used, return to stock.
7. Adjust the nozzle valve to full open until the microcomputer has been reprogrammed.

Adjustment

1. The microcomputer nozzle valve timing must be lengthened so the nozzle valve closes immediately after the water pulse exits the nozzle.
2. The nozzle valve timing is contained on the 4th programming screen as NVXX. The default timing is NV04. Refer to the microcomputer-programming guide and increase the nozzle valve timing to NV30. (Info: Since each digit accounts for 50 milliseconds of nozzle valve delay, 30 extends the nozzle valve closing time to 1500 milliseconds or 1.5 seconds. The default, NV04 provides 200 milliseconds delay)
3. While firing the nozzle in the long pulse mode, adjust the metering valve slowly from full open until the pipe hammering just ceases. Do not over adjust. Only adjust to the minimum needed to remove hammering. Excessive adjustment can compromise system maximum shooting distance.
4. Using a 1/8" allen wrench, tighten the metering valve set screw locking the setting in place.
5. Position the nozzle so you can see the water pulse being fired and the opening and closing of the nozzle valve.
6. Verify that the water pulse has completely passed when the nozzle valve closes. If not, the NV timing must be increased.
7. If the nozzle valve is open for more than ¼ second (250 milliseconds) after the water pulse has completely passed, the NV timing should be shortened in 50 milliseconds unit the nozzle valve closes at the proper time.
8. Record the nozzle valve setting (color ring and micrometer setting) and the NV__ timing on the WRS system program record for future reference. Initial the test sheet so we know who and the date of metering valve installation.

If this procedure is incorrect or need additional information, please let the office know immediately.

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