

# Once-Through Boiler Bypass Stop Valves (B&W 200)

## Purpose

To alert customers to a potential problem with the once-through (UP) boiler bypass stop valves (B&W 200) and to provide a recommended solution for the problem.

## Background

In once-through (UP) boilers, a minimum flow of water must be maintained at all times through the furnace circuitry, while flow requirements through the secondary superheater vary for startup, low load operation, full load operation and shutdown. A bypass system separates the secondary superheater from the rest of the boiler circuitry so that the secondary superheater and the furnace can have different flow rates.

In B&W universal pressure boilers the flow separation is achieved by the B&W 200 and 201, or the B&W 200 and 401 valves. The B&W 200 valve is a double seated gate valve. B&W 200 valves supplied after 1975 include an external bonnet vent. Prior to 1975 these valves did not have the bonnet vents. (Figure 1 depicts a cutaway view of a B&W 200 valve with an external bonnet vent.)

Some double seated B&W 200 valve designs can simultaneously seal in both directions. If the bonnet section is filled with liquid and subjected to an increase in temperature, the trapped fluid will expand and may overpressurize the valve bonnet.

## Problem

Under certain conditions, some double seated B&W 200 valve designs are capable of simultaneously sealing in both directions against pressure differential from the bonnet section to the adjacent pipe. When the bonnet section is filled with liquid and subjected to an increase in temperature, a buildup of pressure in the bonnet can occur. An example for this condition would be during a hydrostatic

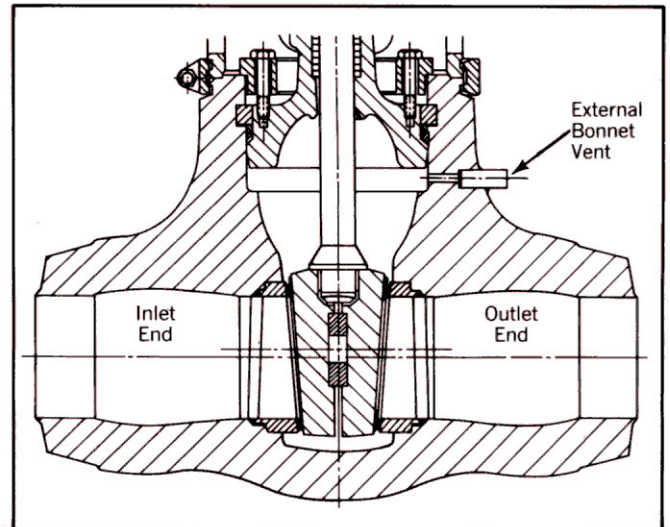


Figure 1 200 valve with external bonnet vent.

test conducted on the unit with a closed isolation valve. If the isolation valve is not opened, even partially, to drain the bonnet section following the hydro test, the retained liquid in the bonnet section may be heated during the subsequent system start-up. The expansion of the trapped fluid may cause the bonnet section to become over-pressurized and to swell. A bonnet vent drains the liquid from the bonnet section and prevents the over pressurization.

Another occurrence could result by closing a double seated gate valve in a steam pipe as load is reduced and allowing the trapped steam to condense during the shut down period. If the valve is not opened, allowing the liquid in the bonnet to drain, this section could again be over-pressurized during subsequent start-up, heat up operation.

## Recommended Solution

UP boilers purchased prior to 1975 probably have B&W 200 valves without bonnet vents. Boilers purchased since 1975 should have B&W valves with external bonnet vents. B&W recommends the following for boilers purchased before 1975:

1. Inspect the bonnets and seats of the B&W 200 valves for damage from swelling. Replace the valve or bonnet if damage is found.
2. Open the B&W 200 valves prior to boiler re-starts, and following hydro tests, drain the bonnet section.
3. Drill a 1/16" (internal equalizer) hole through the *upstream* seat to provide an internal bonnet vent (Figure 2).

## Caution

Do not drill a hole in the downstream seat. A hole in the downstream seat creates a leaky valve.

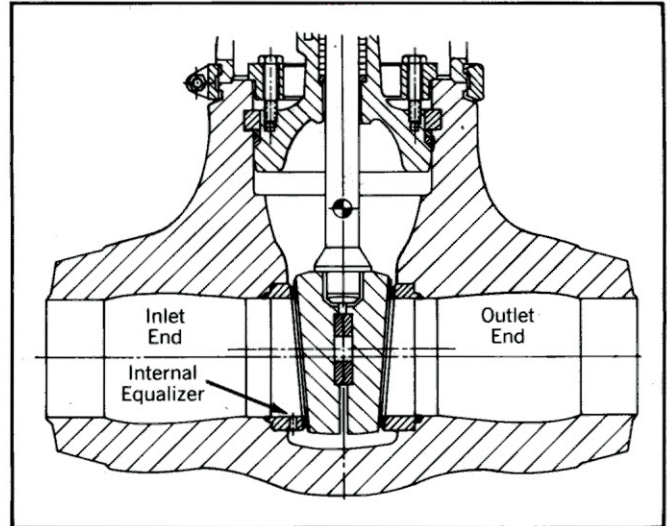


Figure 2 200 valve with internal equalizer.

### Support:

If you have any questions or require assistance, contact Babcock & Wilcox Field Service Engineering.

For more information, contact your nearest B&W sales office or write: Dept. CIC, Power Generation Group, Babcock & Wilcox, Barberton, Ohio 44203, U.S.A.; or, in Canada, Manager, Marketing and Sales, B&W Canada, Cambridge, Ontario, N1R 5V3.

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