



# American BOA News Bulletin



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American BOA has recently supplied a customer with a unique expansion joint for use on a high-pressure turbo expander. The expansion joint was used to isolate the nozzle of the turbo expander from thermal pipe growth in two planes, while also isolating the vibration generated by the expander on the balance of the piping system. Due to tight space constraints and low allowable loading conditions, the use of an in-line pressure balanced expansion joint was required.

During the design of this joint, the customer stressed the importance of maintaining extremely low spring rates, as well as very tight natural frequency requirements. Through the use of BOA's multiply bellows forming techniques the design was able to meet the customer's very demanding requirements flawlessly. The end result was achieved with 3 heavy wall 321SS multiply bellows and extensive structural steel reinforcement to withstand the pressure balancing forces generated by the line bellows and floating balance chamber.

The resulting design was a 48" Nominal Diameter 265 Psig In-Line Pressure-Balanced Expansion Joint that minimized reaction forces on the expander nozzle, and avoided the driving frequency of the expander by more than 50%. This design prevented the customer from having to restrain over 500,000 lbs of pressure thrust force in a tight footprint.

## ***Design Benefits:***

- Low Spring Rates***
- Fully pressure balanced***
- 265psig Design Pressure***
- Designed for heavy vibration***
- B 31.3 Conformance***

