

Rupture Pin Technology, Inc.



In association with:



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- Mr. Taylor invents the Rupture Pin Valve using Euler's Law of Compressed Columns
- 1987-90 obtains patent and ASME acceptance for the Buckling Pin Technology.
- Commercial sales starts in 1990 through Rupture Pin Technology.

Buckling Pin Accepted

- ASME Section VIII Division I Code Case 2091-3
- API RP-520 Part One – Section 2.4
- The National Board of Boiler and Pressure Vessel Inspectors – (Test system is protected by a Rupture Pin Technology valve.)

Introduction

- Proven technology based on Physical Law – Euler's Law of Compressed Columns – (like the Law of Gravity)
- Allows you to solve difficult problems with pressure relief and emergency shutdown
- The technology relies on a simple, precise pin that senses an axial force and obeys Euler's Law.
- The pin acts as a trigger to open or close a bubble tight valve (ASME class 6) element in milliseconds.

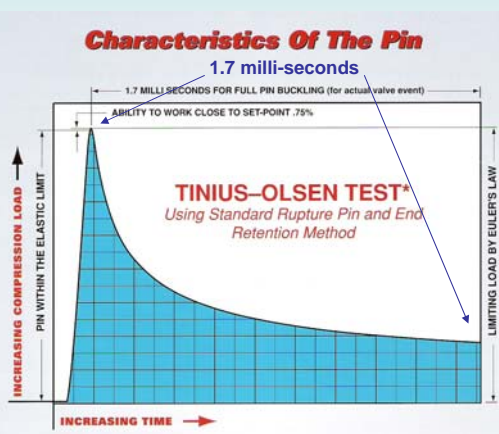
The Pin

- A slender, round column, precise in its diameter, length, and metallurgy that obeys Euler's Law.
- The pin ends are restrained for precise, repeatable operation
- Pin has only two stable conditions: Straight or Buckled
- The buckling point is accurately repeatable with no adverse buckling point variation.
- The pin cannot fail early due to fatigue or pulsation.

The Pin Characteristics

- Obeys Euler's Law precisely
- The buckling point is exact, $\pm 5\%$ of set point is standard, $\pm 2\%$ of set point is common with actual valve test certificates
- The pin is external from aggressive system fluid
- No Temperature correction is required
- Bows elastically to allow a slight axial piston movement before buckling
- Currently have built valves from 1/8" to 48"

Tinius-Olsen Test



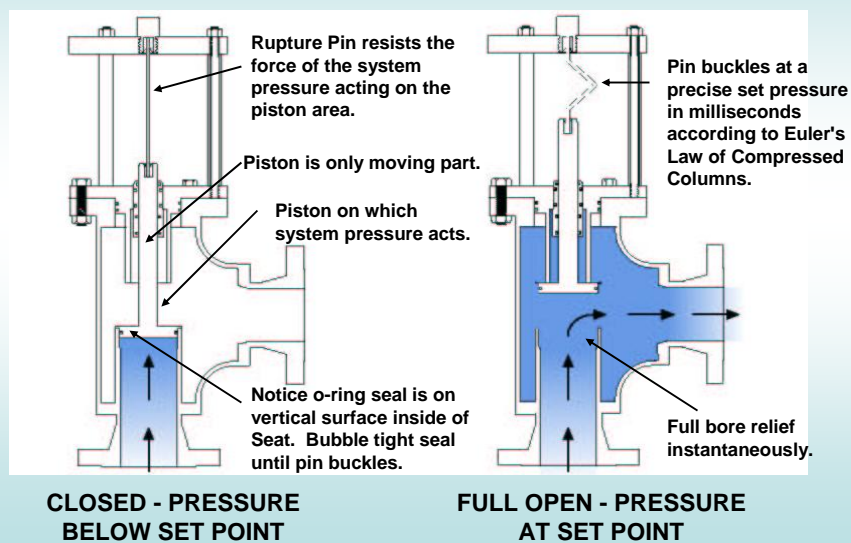
- Increase of force on pin
- A rapid fall-off of pin resistance
- Speed of buckling
- The opening of the valve is about 10 times faster than a rupture disk.

The Rupture Pin Advantage Over Conventional Relief Systems

- Conventional spring loaded relief and pilot valves leak close to set pressure, and have problems reseating tightly. RPT valves are bubble tight until set point.
- Spring loaded must be recertified at least once a year. (Depending on State Laws and Company Policies.) RPT pin can be tested off-line.
- Poor accuracy below 15 psi, and limited reliability over 3,000 psi. Rupture Pin valves are accurate through all pressure ranges.
- Change of set pressures requires expensive spring change. Change of set pressure in a RPT valve is done by replacing pin, which is virtually inexpensive.

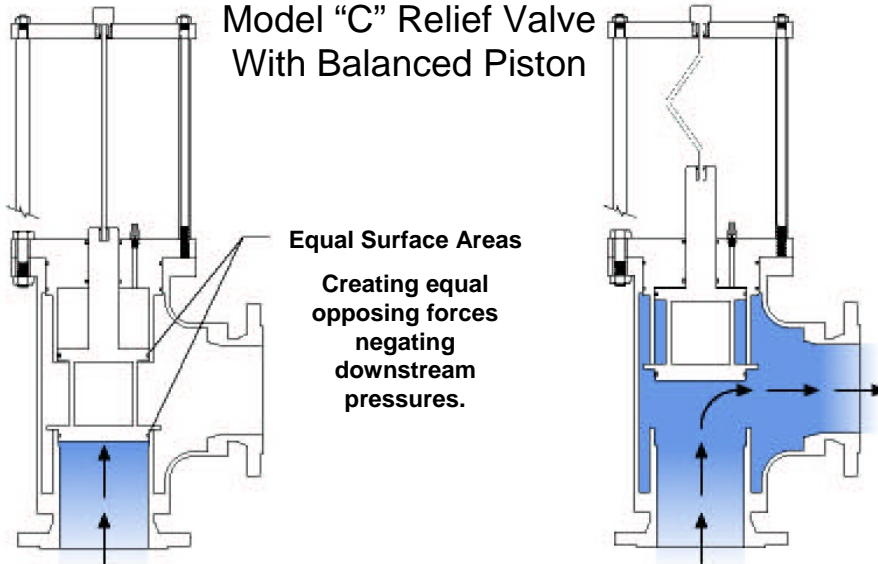
Valve Basics

Model "C" Relief Valve



Valve Basics

Model "C" Relief Valve
With Balanced Piston



The balanced piston has equal surface areas creating opposing forces; therefore negating any downstream pressure. Valve will sense system pressure only.

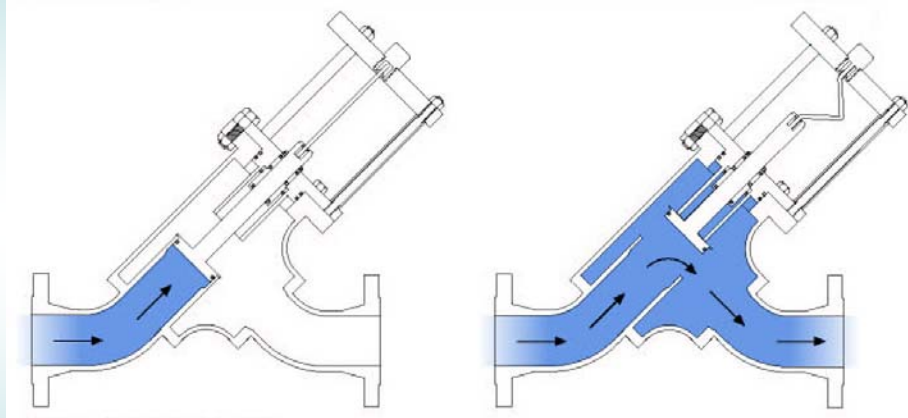
Mr. Taylor
with 36"
Model C



This valve was built for ARAMCO, the Saudi Arabian oil company. Notice the two stable conditions of the buckling pin – straight or buckled.

The pin Mr. Taylor is holding, is 1 1/8" in diameter and 48" long. The set pressure of this valve is 36 psig. This illustration shows that you can't tell set pressure by pin size. Pin size is determined by Euler's Law.

Model "D" Inline Relief Valve



Closed

Open

The Model D valve is used when you need to install a valve in a straight line.



notice proximity switch

Will give an immediate signal when a valve is activated.

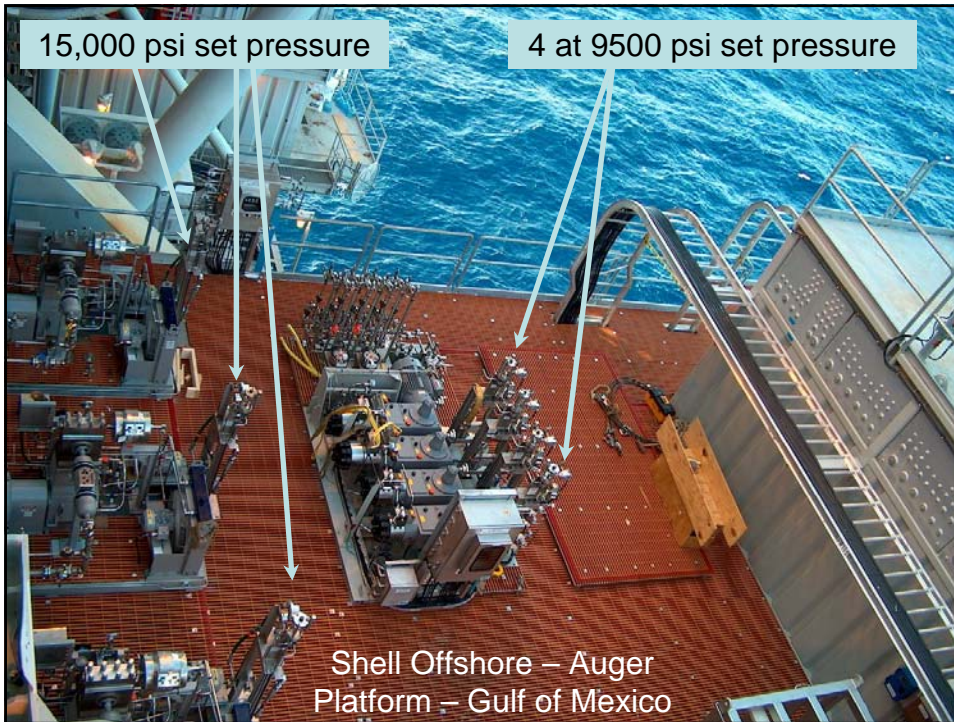
Easy pin storage at the valve.



notice pin holder

15,000 psi set pressure

4 at 9500 psi set pressure



Shell Offshore – Auger
Platform – Gulf of Mexico