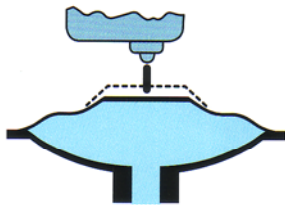
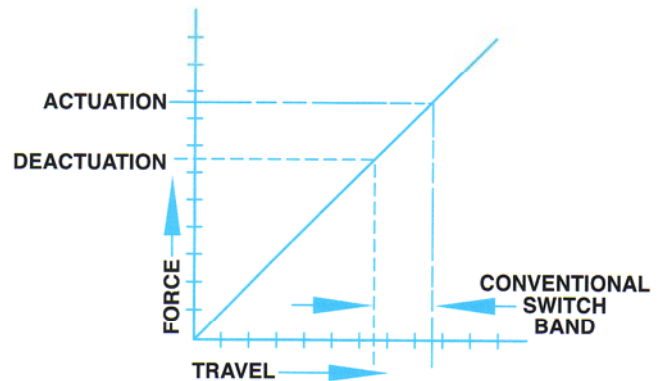


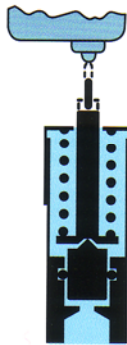
# Conventional Pressure Switch Design

## Constant Rate Spring

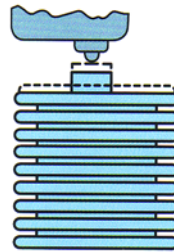
A constant rate type pressure switch, i.e., a bellows, diaphragm, bourdon tube and spring loaded piston, are linear devices—for a certain pressure change the pressure element moves a given distance. For additional movement more pressure (force) is applied. The position of the electrical switch, therefore, influences and/or dictates the pressure switch set point.



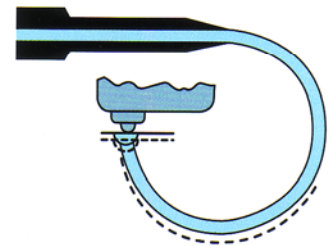
DIAPHRAGM



SPRING LOADED PISTON



BELLOWS



BOURDON TUBE

## Disadvantages of the “Constant Rate” Switches

### NON-STABLE SET POINTS - “Requires Constant Recalibration”

#### BECAUSE:

- Sensor mechanism follows the system pressure—subject to fatigue.
- Set point influenced by snap acting electrical—variations in snap switch differential affects deadband of pressure switch.
- Ambient temperature sensitive—relocation of electrical switch causes change in set points.
- Linkage used to adjust electrical switch—linkage wear relocates electrical, causing set point change.

### VIBRATION SENSITIVE - “Causes Contact Chatter”

#### BECAUSE:

- Constant rate device “mimics” dynamic input—intermittent electrical signal if vibration occurs when switch is near actuation.
- Larger mass associated with constant rate sensor mechanisms—more mass means less vibration resistance.
- Spring mounted electricals or linkages—resonance frequency can cause spring or linkage to “take off” causing electrical contacts to chatter.

### OVER-PRESSURE SENSITIVE - “Affects Set Point Accuracy”

#### BECAUSE:

- Motion transfer device must contain pressure—bellows, bourdon tubes, and welded diaphragms contain pressure as well as actuate the electrical.
- Limited sensor support—sensors with limited overpressure support are subject to set point drift.

### LIMITED CYCLE LIFE - “Dependent on Set Point”

#### BECAUSE:

- Longer stroke—repositioning the electrical for set point changes requires greater movement.
- Shorter electrical life—“sneaking up” on the electrical can cause an electrical arc.