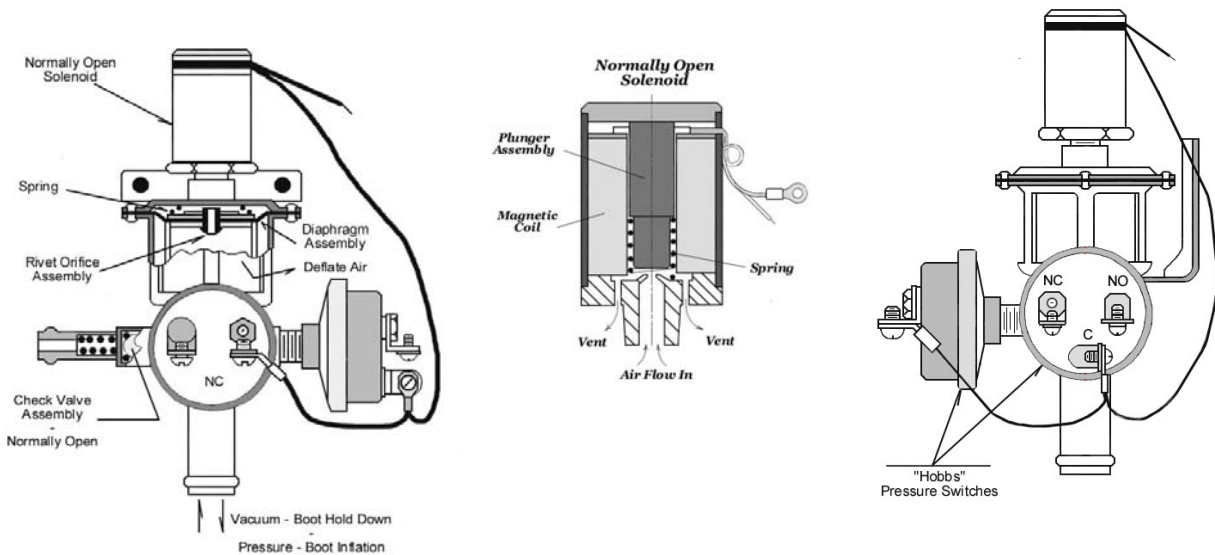


# A "CLEAR VIEW"

Into Construction  
& Operation

## 1H44-[ ] Deflate Valve



### Description

The 1H44-[ ] deflate valve is the common link between the aircraft's vacuum system for deice boot hold-down and pressure from the air pump for boot inflation.

All 1H44 valves operate in the same basic manner with variations in mounting means, pressure switch variations and/or solenoid voltage designated by suffix number -[ ]. The model 1H44-12 deflate valve is shown above.

The 1H44-[ ] valve may be installed in (but is not limited to) the **Beech** B55, C55, D55, E55, E55A, & 58; **Cessna** 310, T310, 320, 320A-F, 340, 401, 401A-B, 402, & 402A-B; **Piper** PA-23-250 and PA-34-200T models.

### System Operation

#### Normal Flight

During normal flight, deice boots are held against the leading edge of the wing and tail surfaces by vacuum applied via the 1H44 small tube connection containing the check valve assembly.

For "pressure" gyro instrument systems, this vacuum is created by an ejector usually mounted adjacent to the 1H44 valve.

When installed in aircraft with a "vacuum" instrument system, connection is normally made at the system vacuum manifold or gyro instrument connection.

The lower tube connection of the 1H44 valve provides a means for sensing pressure build-up during boot inflation and deflation of the boots via the upper diaphragm assembly.

#### Boot Inflation

With deice boot activation, solenoids on each system deice control valve; 2H22-[ ], 2H48-[ ], or 2H43-[ ] and the 1H44 deflate valve are energized. Increasing pressure from the deice control valves enter the 1H44 valve body, via the large lower tube connection, closing the ball check valve.

(Con't.)

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# 1H44-[ ] Deflate Valve

## Construction & Operation

### Boot Inflation (con't)

Airflow through the diaphragm rivet orifice causes pressure to increase on top of the diaphragm assembly. The diaphragm is held on its seat, preventing discharge of air to atmosphere, causing pressure to increase throughout the system, thereby inflating the deice boots.

### Boot Deflation

Boot deflation is initiated either by a pre-set high pressure switch in the system, an electronic timer module, or manually. In either case, boot deflation is activated by de-energizing the solenoids of the system deice control valves and the 1H44 deflate valve. As each deice control valve returns to their low-pressure mode, pressure that has kept the 1H44 diaphragm seated is now free to exit via the valve solenoid. As boot inflation pressure exits the system via the raised diaphragm assembly, pressure is removed from the check valve assembly, allowing vacuum to again hold the boots tight against each air foil leading edge.

### 1H44-12 Deflate Valve

The 1H44-12 deflate valve is provided with two "Hobbs" pressure switches that control various stages of the boot inflation process.

#### Two Terminal Pressure Switch

The normally closed (N.C.) switch (Hobbs # M-4009) is connected in series with each deice control valve solenoid and the 1H44 deflate valve solenoid. With boot pressure reaching 17 psi, the switch contacts open, de-energizing all solenoids. System pressure is allowed to decrease to low mode values, with pressure being removed from the 1H44 check valve assembly. Vacuum is now applied through the check valve assembly to the deice boots for normal flight "hold down".

#### Three Terminal Pressure Switch

The normally closed (N.C.) contacts of the three terminal pressure switch (Hobbs # M-4013) are designed to open at 23 psi in the event boot deflation does not occur at the 17 psi limit. Normally open contacts (N.O.) control a warning light on the instrument panel that warns the pilot of a malfunction in the system with the system pressure reaching 21 psi.

### Trouble-Shooting

**Diaphragm rupture**, leakage at the valve cover rivets, a blocked diaphragm rivet orifice or failure of the valve solenoid to electrically activate would prevent the 1H44 diaphragm from seating. With the boot system activated, all high pressure produced by the air pumps, due to the closed deice control valves, will dump overboard through the open 1H44 deflate valve. Depending on air pump performance, there will be little or no boot inflation.

**A blocked rivet orifice** may be cleared with a 0.010 in. wire after removing the solenoid from the valve cover.

**Failure of the solenoid to close** is usually caused by contamination of the solenoid spring and plunger assembly. Clean the solenoid air passage with a solvent not harmful to electrical insulation and dry with shop air.

In the event of a **blocked solenoid air passage**, pressure that has traveled through the diaphragm rivet orifice builds pressure on top of the diaphragm causing it to go into "boot inflation" mode with no air venting overboard. In this condition, even though the system has been de-activated, boot deflation will not occur.

**Loss of "boot hold down"** is usually caused by the 1H44 check valve assembly being contaminated with water residue or other contamination.

#### NOTE: For Vacuum Gyro Instrument Aircraft

Loss of gyro instrument vacuum during an attempt to activate the deice boots may be caused by boot system pressure passing into the vacuum gyro system through a faulty (open) 1H44 check valve assembly.

### **REMEMBER !**

**For technical Expertise  
In Aircraft Pneumatic System  
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