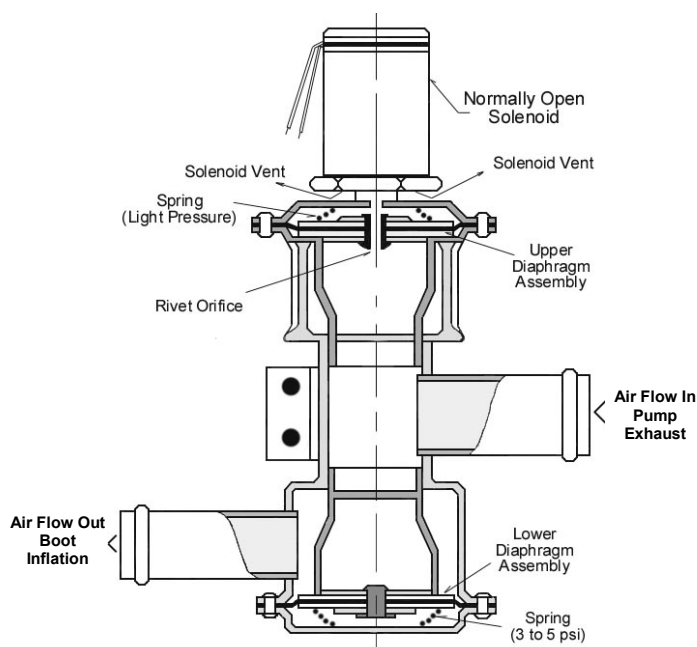


"A Clear View"

Into Construction & Operation

1H43-[] Deice Control Valve



Description

The 1H43-[] deice control valve is a dual ended valve installed on those aircraft incorporating a "vacuum" gyro instrument system. These aircraft may include (but are not limited to) the Beech B55, C55, Cessna 310, T310P, 320, 320A, 340, 401, 402, 414, Piper PA-23-250 and PA-34-200T models.

All 1H43 valves operate in the same basic manner with differences in mounting means, attachment tube size and solenoid voltage designated by suffix number -[].

Operation

Normal Mode

With the air pump providing vacuum for gyro instrument operation, pump exhaust (pressure) is directed to the 1H43 valve where it is vented overboard. Since this normal venting eliminates most "back pressure" to the pump; excessive carbon dust discharge from the pump should not be occurring.

During normal operation, air from the pump enters the valve center body and applies pressure to the lower side of the upper diaphragm and rivet assembly.

This pressure also moves through the diaphragm orifice, the valve cover, then into the normally open solenoid where it is vented overboard via two small holes at the bottom of the solenoid.

Since pressure does not build on top of the diaphragm, it is allowed to rise, discharging all air pump exhaust to the atmosphere.

Deice Mode

To increase system pressure for deice, the 1H43 solenoid is energized, closing the internal air passage, thus eliminating the air pressure venting at the solenoid bottom.

Airflow through the rivet orifice with the solenoid vent closed causes pressure to increase on the top of the diaphragm. The diaphragm is held on its seat preventing discharge of air, causing system pressure to increase.

When pressure within the valve body reaches 3 to 5 psi, the lower diaphragm assembly is lifted to allow pump exhaust (pressure) to start the boot inflation process.

High system boot pressure is normally limited by a separate "normally closed" pressure switch, which electrically disconnects power to the 1H43 solenoid when sufficient boot pressure is reached.

With the solenoid being de-energized, system pressure returns to "normal" and the 1H43 valve again vents all air pump exhaust (pressure) overboard.

1H43-[] Deice Control Valve

Construction
& Operation

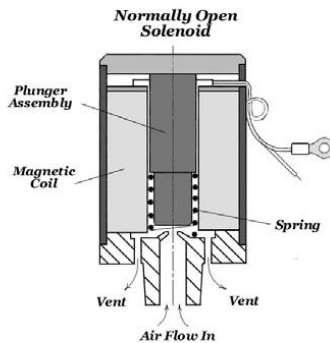
Troubleshooting:

Diaphragm rupture, leakage at the valve cover rivets, a blocked rivet orifice or failure of the solenoid to electrically activate, will prevent the valve from closing thereby prevent pressure from building to deice system values.

NOTE

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

The **most common failure** of the 1H43-[] valve is carbon contamination of the solenoid air passage and plunger assembly.



In this condition, even though the deice system has not been activated, the upper diaphragm will close and system pressure will increase.

Higher pressure in the system will create higher back pressure on the air pump, resulting in increased wear with more carbon dust being discharged. This is a never-ending cycle that gives no warning to the pilot via normal aircraft instruments.

Failure to correct this overloading situation will result in failure of the air pump in a short period of time.

Cleaning the solenoid air passage can be accomplished with a solvent not harmful to electrical insulation and drying with shop air. The plunger should be free to move if the solenoid is shaken in a vertical position.

If after cleaning, the solenoid will not activate (close) with power applied, replace the solenoid.

Higher "back pressure" against the air pump will cause internal pump temperatures to rise with increased amounts of carbon dust being discharged.

This increase in exhaust contamination will further restrict airflow through the solenoid vent passage, resulting in higher and higher system pressure.

Higher system pressure means shorter pump life !

REMEMBER !

There is no inline air filter installed between the air pump and 1H43 Deice Control Valve.

If the valve is showing signs of carbon dust below the valve cover, chances are you have a deteriorating air pump and/or a malfunctioning 1H43 Deice Control Valve

Have a troubling or particular problem with your aircraft's pneumatic system?

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