

Belvac Production Machinery Technical Bulletin

Information for Customers Operating and Maintaining Belvac Machines

ISSUE 10, VOLUME 11, AUGUST 2008

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Belvac Trimmers – 24VDC Vacuum Solenoid Failure

Belvac standardized on the ASCO 8215 series solenoid valve for trimmer vacuum applications in the early 1990s. There are two versions of the ASCO valve: C31002 (120VAC) and C31004 (24VDC). Recently, customers have complained about failure of the 24VDC version vacuum solenoid. New valves continue to operate under factory conditions at Belvac, but are failing prematurely in the field at several plant locations. The most common mode of failure is that the normally closed valve body is sticking in the open position and is unable to overcome the shifting force necessary to re-seat the valve. In-depth discussions with the product manufacturer have indicated that there are two primary factors, which when combined may be causing the premature failures:

- **Low shifting force indicative of the valve type/application.** The ASCO solenoid is an internally piloted construction, where line pressure is used to assist actuation. This is a common feature on valves with large orifices; however this is a vacuum application so the internal pilot mechanism does not function. This essentially makes it direct acting, meaning that the coil itself must overcome the shifting force required to open and close the valve. There is no quantitative data that the manufacturer could provide, but they also indicated that the 24VDC coil has significantly lower shifting power than its 120VAC counterpart.
- **Exceeding the maximum ambient temperature rating.** The 24VDC version of the solenoid has a maximum ambient temperature of 77° F [25° C]. The manufacturer's literature states that "actual conditions, in many applications, will permit use at considerably higher ambient temperatures", however recent discussions have led them to state that operating the valve at a temperature higher than its rated value will reduce the lifespan of the unit and negatively affect shifting power.

When combined, these factors reduce the reliability of the 24VDC ASCO solenoid to a point where we feel they are inadequate to continue their use in our current application. We have conducted research with several top solenoid valve manufacturers and determined MAC Valve 58 Series (Belvac C28877) to be best suited for our application.

The new MAC unit has an external air-piloted mechanism that generates approximately 50X the shifting force over a direct acting solenoid. The air pilot will operate on a minimum of 25 PSI and will be fed from a tee fitting inserted in the supply line for the pin stop solenoid. The MAC solenoid is rated for an ambient temperature of 120° F [50° C] and has an environmental rating of IP65. It also has a triple rated coil for 120VAC/60, 110VAC/50 or 24VDC operation.

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The new MAC solenoid will mount in the same location as existing ASCO solenoids; however the new MAC unit is .75 in. [19 mm] wider than the ASCO. Customers upgrading will need to take this extra width into account during installation. In addition to the extra width, customers will need to run an air line from the trimmer air manifold to the new MAC pilot solenoid using the hardware, tubing and detailed installation drawing supplied in each kit. See below for figures of the new vs. old solenoid setup.

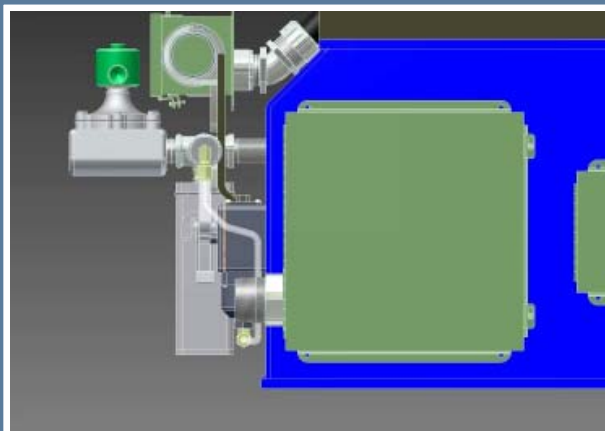


Figure 1: Existing ASCO vacuum solenoid.
Side view, electrical conduit removed for clarity.

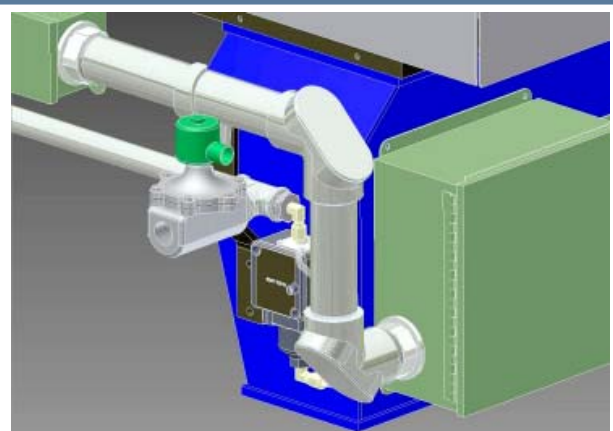


Figure 2: Existing ASCO vacuum solenoid.
ISO view.

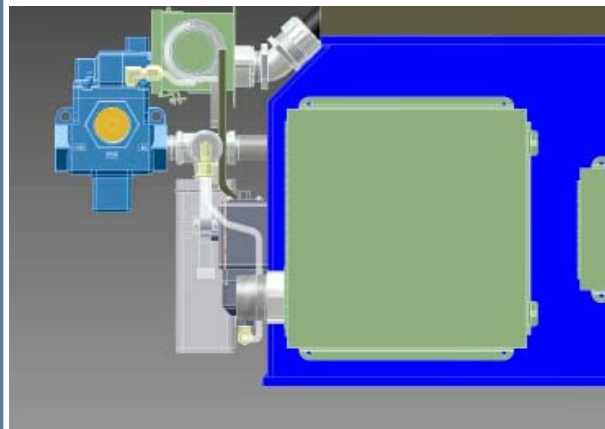


Figure 3: New MAC Valve vacuum solenoid.
Side view, electrical conduit removed for clarity.

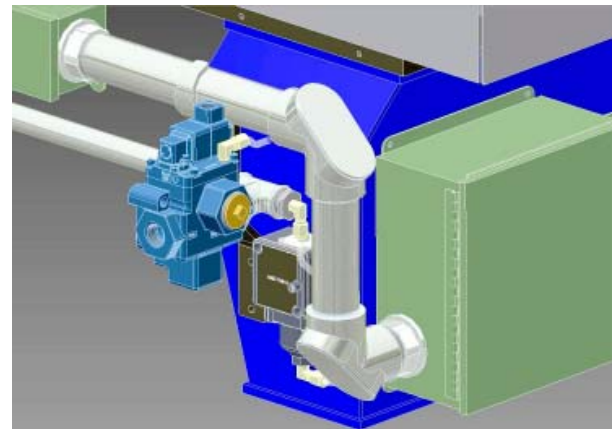


Figure 4: New MAC Valve vacuum solenoid.
ISO view.

PLEASE NOTE: Due to the triple rating of the new MAC coil Belvac will discontinue supplying the 120VAC version of the vacuum solenoid.

KIT INFORMATION:

UPGRADE KIT 26456-CC93

ORDER QTY. (1) KIT PER TRIMMER.

The new design will be standard on all trimmers shipped after September 1, 2008.

Contact Belvac Sales or Service Representatives for additional information.
All Belvac Technical Bulletins may be viewed on Belvac's web site, www.belvac.com.

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