



UNIVERSITY OF MISSOURI

Research Reactor Facility

Research Park  
Columbia, Missouri 65201  
Telephone (314) 882-4211

June 20, 1975

Directorate of Licensing  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20545

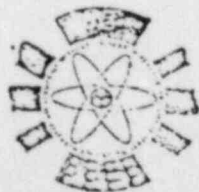
Subject: Equipment Deficiency, Schrader Type 972S Series  
Three-way Solenoid Valve

Reference: Docket 50-186  
University of Missouri Research Reactor Facility  
License R-103

Description of Deficiency

Because of the past failure of some air operated valves controlled by Schrader type 972S series three-way solenoid valves, an investigation was carried out by the reactor staff. As a result of the investigation it was suspected that the above three-way solenoid valve could fail if the lower seal separated from the metal insert and thereby prevented air from being exhausted through the exhaust port when the solenoid was deenergized (see enclosed drawing). A valve suspected of having so failed was sent to the manufacturer, Scovill Fluid Power Division, Wake Forest, North Carolina, on March 13, 1975. The manufacturer replied on May 13, 1975 that as a result of their testing they concluded that the valve did fail as described above. They recommended that the problem be corrected by bonding the rubber seals to the brass insert using Loctite adhesive 300 series.

As reported to the Commission on July 19, 1971, valve 507B failed to shut. It is now believed this failure was due to the above deficiency. Also on October 1, 1973, it was reported to the Commission that valve 547 failed to open and is now believed to have failed for the same reason.

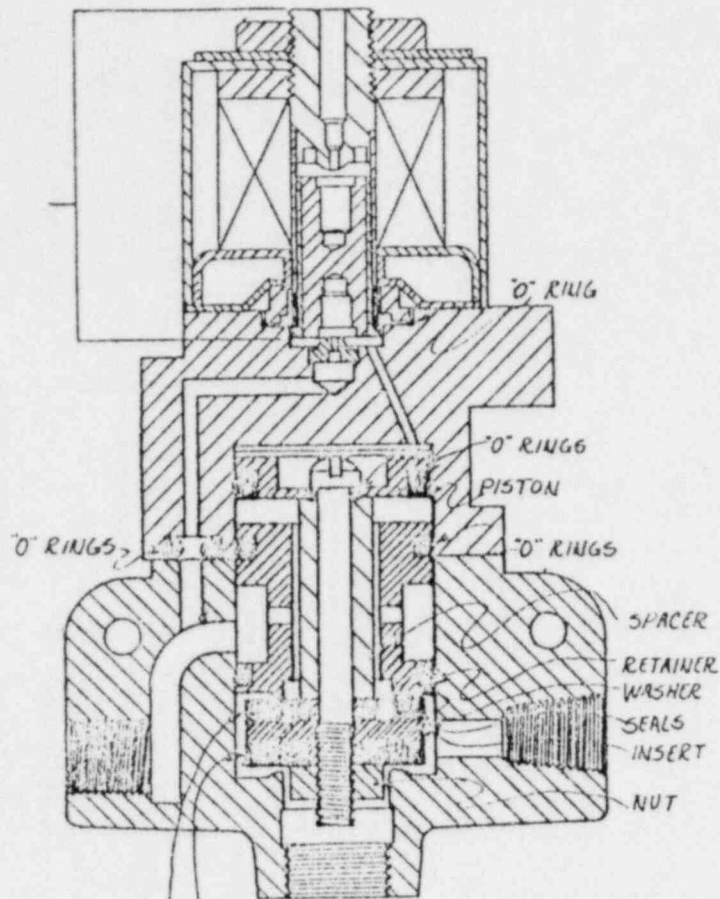


COLUMBIA KANSAS CITY ROLLA ST. LOUIS

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8009040419

SOLENOID UNIT



APPROX.  $\frac{3}{32}$ " CLEARANCE BETWEEN VALVE SEAT AND WASHER WHEN:  
 IN EXHAUST POSITION.  
 IN CYCLE POSITION.

3 way valve type 9745  
 Prod. No. 9745

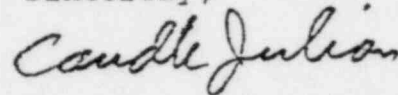
1	ADDED CLEARANCE DIM	DJW	6-1
REV NO	DESCRIPTION	DR BY	DA
TITLE			
529 SERIES 3-WAY SOLENOID VALVE			
RESEARCH REACTOR FACILITY UNIVERSITY OF MISSOURI			
DRAWN BY <i>Viki Szoljost</i>		APPROVED <i>[Signature]</i>	
SHEET NO. 1 OF 1		DWG. NO. 989	

June 20, 1975

Corrective Action

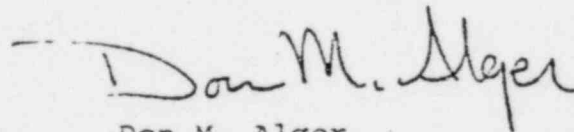
A modification package has been prepared to replace the seals in each Schrader type 972S three-way solenoid valve. After a favorable review by the MURR Safety Subcommittee, the seals will be replaced with ones bonded as recommended by the manufacturer.

Sincerely,



Caudle A. Julian  
Reactor Manager

Endorsement  
Reviewed and Approved



Don M. Alger  
Associate Director

kp

cc: Directorate of Regulatory Operations--Region III  
Robert M. Brugger, Director



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March 13, 1975

Mr. Hubert Jenks  
Scovill Fluid Power Division  
Route 3  
Wake Forest, NC 27587

Dear Mr. Jenks:

Enclosed is the 972S series three-way solenoid valve that failed in service as we discussed in our phone conversation on March 11, 1975.

This valve is used to control an actuator (drawing enclosed) that operates a six-inch butterfly valve. The working fluid is 100 psig dry air. When the solenoid is de-energized, the three-way valve shuts off the air that holds the actuator spring compressed and vents through the bottom vent port to allow the spring to rotate the actuator.

On this March 7, the solenoid was de-energized but the actuator piston did not complete its travel. It appeared that the three-way valve did operate but the lower seal separated from the metal insert and prevented the actuator from venting. This failure can be duplicated by loosening the nut that holds the insert. However, the nut on the above valve was snug. This valve was cycled several times and failed on about 60% of the tries.

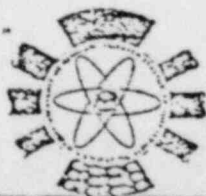
We have in our plant about twenty-five 972S series three-way valves in similar service. Over the last five years we have experienced four other failures similar to the one above. We would appreciate your assistance in a solution of this problem. We will cooperate in any way in this matter.

Sincerely,

Richard Werner  
Plant Engineer

kp

Attachment



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Fluid Power Division

Seovill

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May 13, 1975

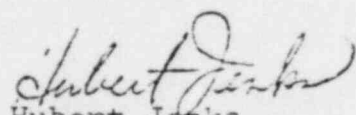
Mr. Richard Werner  
University of Missouri  
Research Reactor Facility  
Research Park  
Columbia, Missouri 65201

Dear Mr. Werner:

I would like to apologize for the long delay in answering your letter of March 13, 1975.

After testing the sample valve you returned, we were able to simulate the same problem you have been experiencing. The easiest way to correct this is to use Loctite adhesive 300 series (see attached) to bond the rubber seals to the brass insert.

Sincerely,

  
Hubert Jenks  
Asst. Product Manager

dl

Attachment

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**Schrader Bellows Division**

**Scovill**

August 21, 1980

Fluid Power Group

Mr. Walter Meyer  
University of Missouri Research Reactor  
Room 302  
University of Missouri  
Columbia, Missouri 65201

Dear Mr. Meyer:

By this time you should have received the smaller seals for the 972S valve and should be experiencing no problems.

I promised you that I would give you more information that, in the future, would prevent you from getting the wrong items.

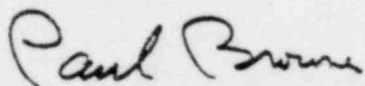
With that in mind we have assigned two new part numbers.

The first is for a seal kit which contains the smaller seal that your application requires. This is our part number 972-9005 which you should order when you desire to rebuild a valve.

The second new part number is for a complete valve. This is our part number 972-9004. When you need an entirely new valve, with the small lower seal, you should order this part.

I hope the above is helpful and prevents any further misunderstandings.

Sincerely,



Paul R. Browne  
Product Reliability Assurance Manager

jv