

# CORRECTIVE ACTION PLAN FOR 2" ANGLE VALVES

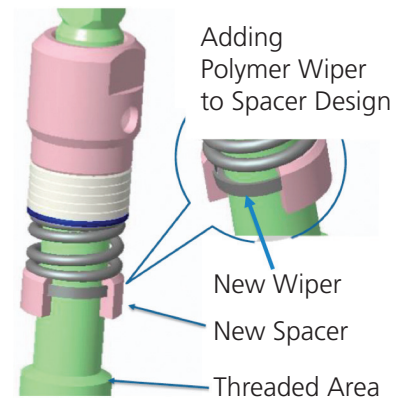
## *Identifying Root Cause and Field Implementation Plan*

### Summary of Root Cause

- During valve operation, Teflon debris is generated by the stem sliding against the Teflon packing rings.
- The Teflon debris migrates into the threads and reduces the coefficient of friction in the thread region.
- Lower friction from the Teflon and process fluid reduces the threads ability to resist the “driving forces,” allowing the handwheel to turn counterclockwise, thereby producing self-actuation.

### Corrective Action New Spacer/Wiper Design

- During next valve requalification or voluntary servicing
- Change out of stem packing components (all other major components do not need to be changed if in good condition)
- Install new spacer with wiper ring to prevent packing debris from entering stem & body threads
- Replace wave spring (if used) with coil spring
- Install new gold-colored packing lock nut for visual indication that corrective action has been implemented



### Performance Facts

All Midland A-721, A-721-B, A-720, and A-724 utilize same design, though the valves backing off has only been observed in the A-721-B and A-720.

Valve Model	Number of Reported Self-Actuation	Numbers Shipped (2005-2017)	Rate of Reported Self-Actuation
<b>A-721-B</b>	<b>35</b>	<b>56,935</b>	<b>0.06%</b>
A-720	1	12,328	0.008%
A-721	0	8,991	0%
A-724	0	2,798	0%



## Field Implementation of Corrective Action for A-720, A-724, & A-721 Valves

- For all valves currently in use, **actions to be implemented over 6 year period** to allow car owners to plan maintenance events and adjust qualification cycles to complete the work.
- Valve technicians will upgrade the valve by disassembling and reassembling with a new spacer and wiper. And will install a gold-colored packing lock nut for visual indication.
- **Free of charge** Midland will provide specific corrective action kits (includes wiper, spacer, locknut, and coil spring (for A-721's) - ask for Midland Kits **K-724-100** or **K-721B-100**
- Midland will also include the required components in all 2" valve repair kits at no additional charge

### New Valve Production of A-720, A-724, & A-721 Valves

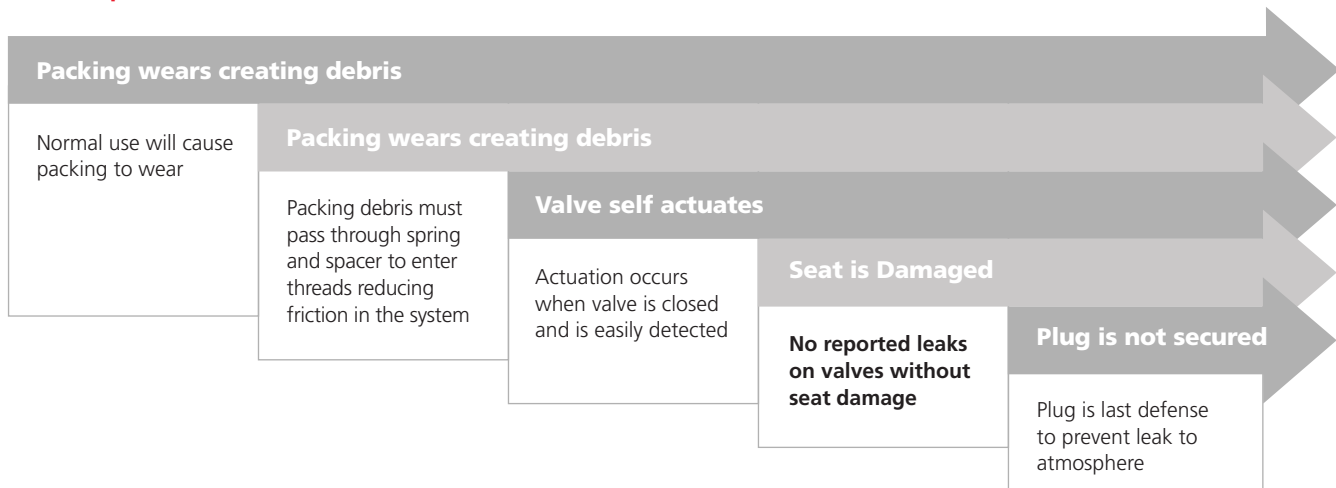
- Incorporate new spacer with wiper and gold-colored packing lock nut on all new production valves.
- Incorporate new flat stem design in new production valves.

### New Valve Production of A-721-B Valves

- Incorporate new spacer with wiper and gold-colored packing lock nut on all new production valves.
- Incorporate new flat stem design in new production valves.
- Replace wave spring with coil spring.

## Facts About Valves Leaking

### It is a Sequence of Events that Leads to a Potential Release



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