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NOTICE

THIS ENVELOPE CONTAINS IMPORTANT DOCUMENTS

DO NOT DESTROY

SILDE DIVERTER VALVE
O&M DOCUMENTATION

MODEL: SDV 3-WAY
SIZES: 2", 3", 4", 5",& 6"

N10-420

NOTICE

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DO NOT DESTROY

SLIDE DIVERTER VALVE
INSTALLATION & MAINTENANCE INSTRUCTIONS

WARNING! READ ALL INSTRUCTIONS. FAILURE TO FOLLOW SAFETY RULES LISTED BELOW, AND OTHER BASIC SAFETY PRECAUTIONS, MAY RESULT IN SERIOUS PERSONAL INJURY!

WARNING! When installing slide diverter valve DO NOT connect to the power source until flexible convey hose is in place and the diverter inlet and outlets are connected to piping so that there is no chance for fingers and hands to get close to moving slide plate.

WARNING! Disconnect Slide Diverter solenoid from power source before attempting to make any repairs. Follow proper lockout/tagout procedures. Moving parts can crush and cut. Keep hands clear while operating.

DANGER! Keep both the inlet and outlets connected to piping when the diverter is connected to a power source.

DO NOT TRY TO FORCE THE DIVERTER TO SLIDE WITH YOUR HANDS! After disconnecting power to Diverter, use the manual override on the solenoid to divert by hand. If the slide does not move relatively easy, look for the cause of the problem. Remember the Diverter is a precision piece of equipment and can be easily damaged if not handled properly by personnel trained to work on precision equipment. There are numerous reasons why the Diverter could be binding. If you are unable to find the problem yourself, consult Smoot trained factory personnel. It may be something that can be diagnosed over the phone. If not, you may have to send the Diverter to the Smoot factory or obtain the services of a trained Smoot technician.

CAUTION! All repairs, electrical or mechanical, should be attempted only by trained repairmen.

STAY ALERT! Watch what you are doing. Use common sense. Do not attempt to operate slide diverter without the inlet and outlet connections in place.

SLIDE DIVERTER VALVE INSTALLATION AND MAINTENANCE INSTRUCTIONS

Smoot Series A38 Slide Diverter Valve (SDV)

Ref. Smoot Dwg. No. 38-1

GENERAL INFORMATION

For all Smoot Slide type Diverter Valves the same air that powers the air cylinder is also used to pressurize Smoot's air energized sealing rings.

Smoot Co recommends that conveying cease before switching the SDV between ports. The reason for this is because the SDV utilizes air energized sealing rings around each outlet port to affect an airtight seal when the inlet port is centered over an outlet port. When the inlet port is in transition between the outlet ports the air tight seal is temporarily lost and leakage can occur during this short time interval. This is of no concern to some of our customers but we always advise our customers that leakage will occur when switching under pressure conditions while conveying is in progress. The leakage problem should not occur when switching while conveying under vacuum conditions.

INSTALLATION

1) Install in a manner that no undue stresses are placed upon the valve because of piping misalignment, i.e., accurately align the three outgoing pipe (tube) convey lines before attempting to couple them to the SDV outlet stubs.

2) Install the flexible (inlet side) hose so that the hose will not hit any obstruction when sliding from between ports.

3) When mounting the valve, **DO NOT** weld to any portion of the valve. Use mounting holes provided or drill new ones if desired. If new holes are drilled, make sure bolts will not interfere with slide movement.

4) Supply 80-120 psig of clean, dry, air to inlet port of 4-way solenoid valve, which controls the SDV air cylinder. A lubricator is not required if Smoot's standard solenoid valve and air cylinder is used.

5) The **Dilute Phase SDV** is supplied with a single air regulator to regulate the pressure to the sealing rings. It is factory set at 30 psig, which is good for most all dilute phase applications and provides long life to the sealing ring and the other mating surfaces. Pressures greater than 30 psig can be applied but at the cost of reduced cycle life of the sealing ring. The pressure remains on the sealing ring while the slide is shifting from outlet port to outlet port and there is therefore a tendency for the air energized seal ring to be forced up into the open inlet port as it passes over the air energized sealing rings.

6) Control power for solenoid is usually 115 volts A.C. Check purchase order or nametag on solenoid to verify.

7) Limit switches may be installed on valve to indicate position of valve.

MAINTENANCE

1) Actuate valve between positions and note if action is smooth. If not smooth, air pressure on pressure regulator may be set too high, causing the air energized sealing rings to deflect up and catch on the inner diameter of the inlet port as it passes by.

2) It is perfectly normal for dusting to occur when the SDV is diverting from one position to the other while conveying under pressure conditions. You will have to cease conveying and purge the convey line before you can divert from one position to the other without dusting.

3) If dusting is noticed from SDV when the inlet port is centered over one of the outlet ports, it may be an indication of worn seal rings or air pressure on seal ring is set too low.

4) Failure to move at all may be a bad solenoid, lack of air pressure, or air cylinder failure. Bad misalignment of piping can cause failure also.

5) If air energized seal rings need replacing considerable care needs to be taken that the 0-rings do not get cut in the process of reinstalling the seal rings. It is a good idea to use a lubricant.

6) When ordering parts for high temperature valves, be sure to advise that parts are for a high temperature application.

O-RING SEALS AND RETAINING RING REPLACEMENT

Retaining Rings are typically made of Delrin or Stainless Steel material. 2”-6” Slide Diverter Valves use Delrin and 8”-12” Slide Diverter Valves use Stainless Steel. Each retaining ring is a precision-machined component that houses two (2) O-rings.

1) Slide Dis-assembly:
   a. Slide diverter valve air cylinder should be positioned in the retracted position.
   b. Remove locking nut and hex nut from air cylinder push bar assembly.
   c. Loosen and remove all eccentric hex bolts from slide bearings and remove slide bearings.
   d. Move the slide away from the air cylinder to dis-engage the air cylinder push rod from the slide assembly.
   e. Lift the slide out of the slide diverter valve frame/

2) Removal of retaining ring and o-ring asy:

DO NOT USE SHARP OBJECTS TO DIG OUT THE RETAINING RING ASSEMBLY.

a. Drill a small 1/16”-1/8” diameter hole approx. ¼” deep in two locations on the face of the retaining ring 180 deg apart.
b. Thread a screw into each of the holes that were drilled.
c. Pull on the screws to remove the retaining ring assembly.

OR

Apply compressed air momentarily to the bottom side of the o-ring retainer assembly. This should push the o-ring retaining assembly out of the body.

3) Installation of retaining ring and o-ring asy:
a. Place one (1) o-ring on the outside and one (1) o-ring in the inside of the retaining ring in the machined grooves.
b. Press the O-ring retaining assembly back into the slide diverter valve body. Care should be taken while performing this operation. The O-rings should be well lubricated with a lightweight oil. Avoid shearing or pinching of the O-rings between the retaining ring and slide housing. When installing the O-ring retaining assembly into the slide housing, carefully use a small flat head screwdriver to work the top of the o-ring while applying constant pressure on the retaining ring.

4) Slide Re-assembly:
a. Place the slide onto the body and loosely reconnect the slide to the air cylinder push rod.
b. Re-install the slide bearings and eccentric bolts loosely into the slide diverter valve frame.
c. Rotate the eccentric bolts while using a .006 thick shim between the slide and the body. Tighten the eccentric bolt nuts while holding the eccentric bolt in position to ensure a .005-.007 in clearance between the slide and body. Repeat for all bearing block locations.
d. Align the inlet stub of the slide directly over the first outlet stub port on the body. Use the hex nuts on the air cylinder push bar to adjust alignment and secure the slide in position directly over the first outlet stub.
e. Connect hi pressure air-to-air cylinder assembly.
f. Connect 110v power to solenoid.
g. Energize solenoid to ensure proper alignment of slide stub directly over both outlet stubs.
h. Re-check clearances between slide and body using a .006 thick shim to verify .005-.007 in. clearance when slide is in both positions.

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SYSTEMS

AIR CYLINDER CHANGE ON 2 WAY SDV

	OLD STYLE (all silver including end caps)	NEW STYLE (After '09) (black end caps)
2"	A15-015	A15-110
3"	A15-025	A15-120
4"	A15-035	A15-130
5"	A15-045	A15-140
6"	A15-055	A15-150
8"	A15-065	A15-160
10"	A15-075	A15-170
12"	A15-085	A15-180

AIR CYLINDER ON 3 WAY SDV

2"	A15-005
3"	A15-017
4"	A15-037
5"	A15-038
6"	A15-057

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3 WAY SLIDE DIVERTER
LOGIC PARAMETERS

Position 1 – located nearest air cylinders
Position 2 – middle position
Position 3 – farthest from the air cylinders

Solenoid A – furthest from the valve frame
Solenoid B – closest to the valve frame

From 1 to 3, Energize B
From 3 to 1, No Valves Energized
From 3 to 2, Energize A and De-energize B
From 1 to 2, Energize B to go to 3, then Energize A and De-energize B
From 2 to 3, De-energize A and energize B
From 2 to 1, De-energize A, No Valves Energized.

Note: To move to Position 2, you must move to 3 first.

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* 3–WAY SLIDE DIVERTER VALVE SEQUENCING NOTE:
  Position 1 – Both Solenoids 1 & 2 De–Energized
  Position 3 – Solenoid 1 Energized
  Position 2 – Energize Solenoid 1, after a second delay, De–Energize Solenoid 1 and Energize Solenoid 2

Sequencing State Diagram

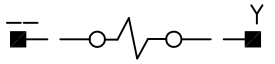
	1	2
P1	0	0
P3	1	0
P2	1	0

Delay 1 Sec	
0	1

(2) SINGLE COIL SOLENOIDS

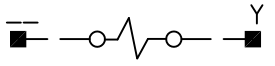
3–WAY SLIDE DIVERTER

SV–___–1 (ENERG POS 3)

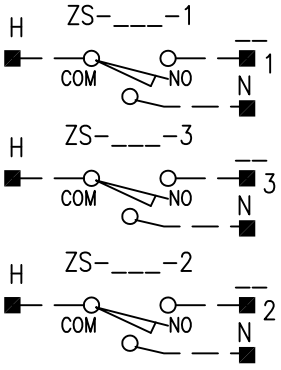


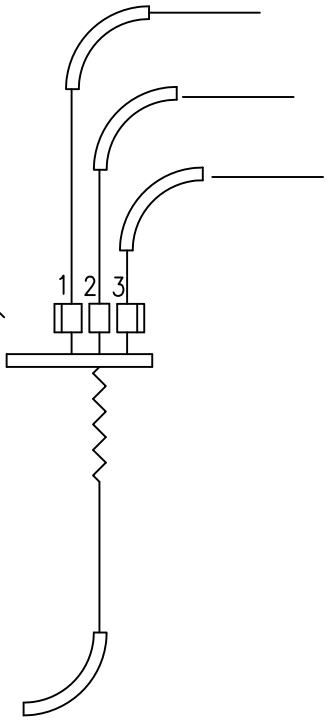
Solenoid 1 is connected to the large cylinder

SV–___–2 (ENERG POS 2)*



Solenoid 2 is connected to the smaller cylinder





MAGNUM SYSTEMS	ELECTRICAL SCHEMATICS SLIDE DIVERTER WIRING DIAGRAM 3 Way, Single Coils	DATE 1/02/15 DWN. BY NRS SCALE NONE	DWG. NO. SDV3W_Single REVISION Rev A PAGE NO. 1 of 1

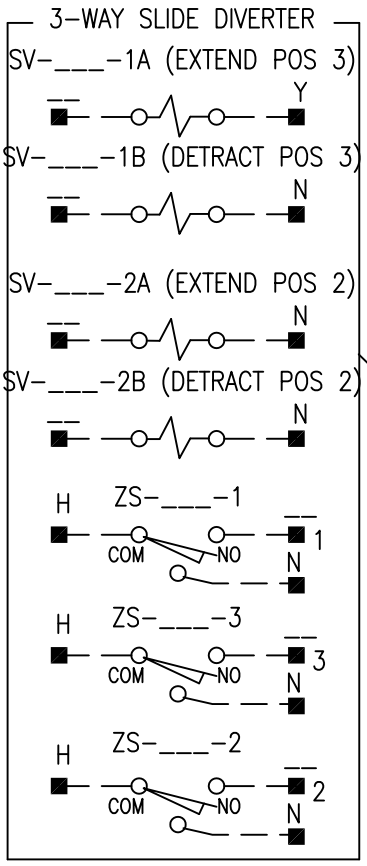
* 3–WAY SLIDE DIVERTER VALVE SEQUENCING NOTE:
Position 1 – Both Detract Solenoids 1b & 2b Energize and both Extend Solenoids 1a & 2a DeEnergize
Position 3 – Detract Solenoid 1b DeEnergize, Extend Solenoid 1a Energize
Position 2 – Detract Solenoid 1b DeEnergize, Extend Solenoid 1a Energize,
Detract Solenoid 2b DeEnergize, Extend Solenoid 2a Energize.
After a 1 second delay, Extend Solenoid 1a DeEnergize,
Detract Solenoid 1b Energize. Limit switch 2 will confirm position.

REFER TO SLIDE DIVERTER VALVE PART NUMBER FOR ALL ACCESSORIES

Sequencing State Diagram

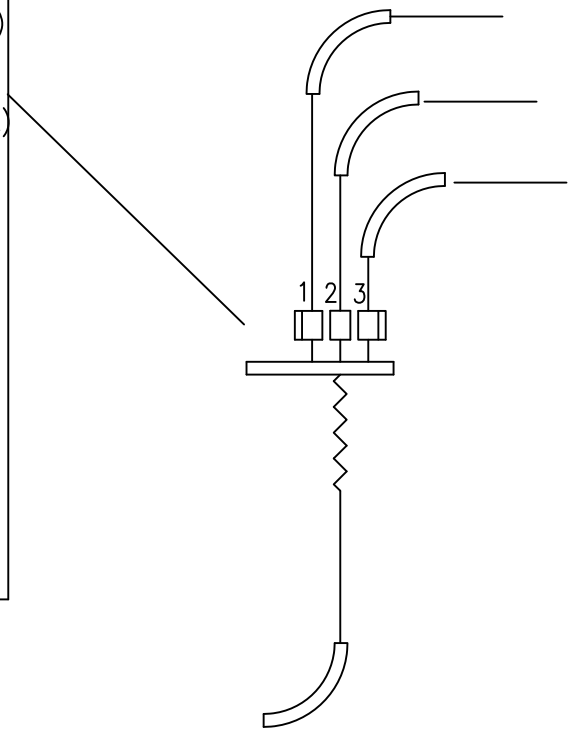
	1A	1B	2A	2B
P1	0	1	0	1
P3	1	0	X	X
P2	1	0	1	0
	Delay 1 Sec			
	0	1	1	0

(2) DUAL COIL SOLENOIDS



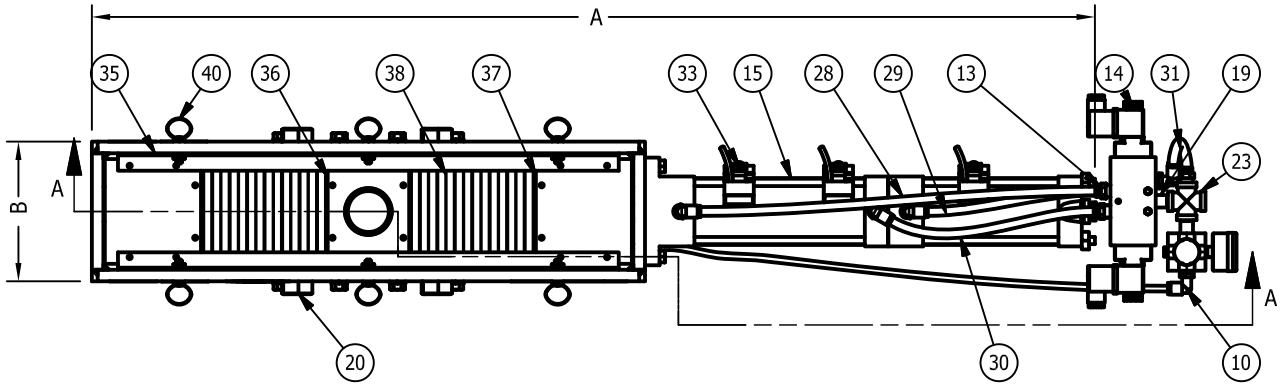
Solenoid 1 is connected to the large cylinder

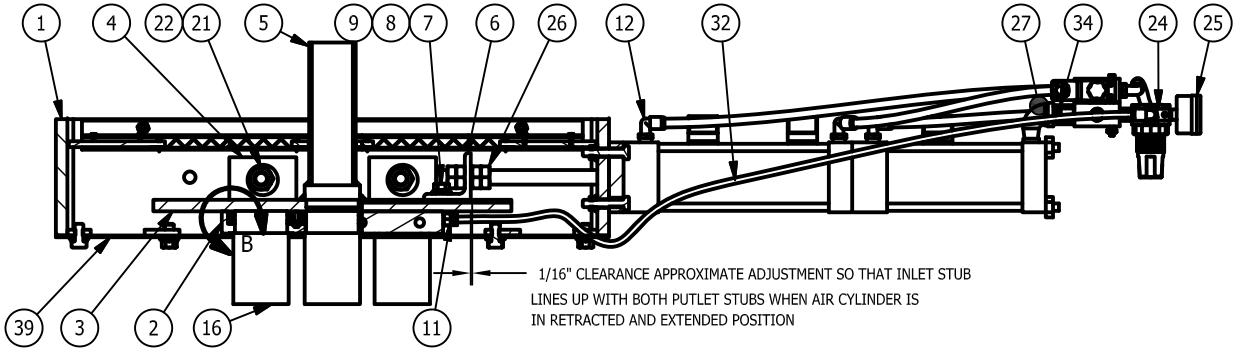
Solenoid 2 is connected to the smaller cylinder



MAGNUM SYSTEMS	ELECTRICAL SCHEMATICS SLIDE DIVERTER WIRING DIAGRAM 3 Way, Dual Coil	DATE 1/02/15 DWN. BY NRS SCALE NONE	DWG. NO. SDV3W_Dual REVISION Rev A PAGE NO. 1 of 1

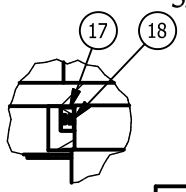
ASSEMBLY		
ITEM	QTY	DESCRIPTION
1	1	SLIDE DIVERTER VALVE FRAME
2	1	VALVE BODY
3	1	SLIDE
4	C	SLIDE BEARING
5	1	INLET STUB
6	1	PUSH BAR
7	8	HEX HEAD BOLT
8	8	FLAT WASHER
9	8	LOCK WASHER
10	2	1/4 NPT 90 DEG. 1/4 HOSE CONNECTION
11	1	1/8 NPT STRAIGHT 1/4 HOSE CONNECTION
12	3	1/4 NPT 90 DEG. 3/8 HOSE CONNECTION
13	3	1/4 STRAIGHT 3/8 HOSE CONNECTION
14	1	SOLENOID VALVE
15	1	AIR CYLINDER
16	3	OUTLET STUB
17	3	RETAINER RING
18	6	O-RING
19	3	CLOSE 1/4 NPT PIPE NIPPLE
20	C	ECCENTRIC BOLT
21	C	HEX NUT
22	C	FLAT WASHER
23	1	STANDARD PIPE CROSS
24	1	REGULATOR VALVE
25	1	GUAGE
26	4	JAM NUT
27	1	3/8 NPT STREET ELBOW
28	AR	3/8 TUBE 1
29	AR	3/8 TUBE 2
30	AR	3/8 TUBE 3
31	AR	3/8 TUBE 4
32	AR	1/4 POLY TUBE
33	3	MAGNETIC REED SWITCH
34	1	3/8 - 1/4 NPT HEX REDUCER BUSHING
35	1	TOP PINCH GUARD RAIL
36	1	INLET TUBE PINCH GUARD PLATE
37	2	PINCH GUARD PLATE
38	2	PLASTIC BELLOW
39	1	BOTTOM PINCH GUARD
40	6	THUMB SCREW





1/16" CLEARANCE APPROXIMATE ADJUSTMENT SO THAT INLET STUB LINES UP WITH BOTH PUTLET STUBS WHEN AIR CYLINDER IS IN RETRACTED AND EXTENDED POSITION

SECTION A-A



DETAIL B

DIMENSIONS/AMOUNTS			
BASIC VALVE SIZE	A	B	C
2"	42 3/4	6	4
3"	55 3/4	7	4
4"	69 5/16	8	6
5"	79 5/16	9	6
6"	90 5/16	10	6

EDITING THIS DOCUMENT INVALIDATES THE DRAWING AS A WHOLE. DISCREPANCIES, CORRECTIONS, OR REVISIONS ARE TO BE COMMUNICATED TO MAGNUM SYSTEMS TO BE IMPLEMENTED

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DIMENSION ARE IN INCHES UNLESS OTHERWISE SPECIFIED.
TOLERANCES:
FRACTIONAL ± 1/16
DECIMAL .XX ± .015
DECIMAL .XXX ± .005
ANGLES ± 0.5 DEG

THIRD ANGLE PROJECTION

DESCRIPTION: **3-WAY SLIDE DIVERTER VALVE PARTS DRAWING**

MODEL		CUSTOMER	
DRAWN BY: SDC	DATE: 5/14/2019	CHECKED BY: SLM	DATE: 5/15/2019
APRV. BY: SLM	DATE: 5/15/2019	SCALE: NTS	SHEET: 1 of 1

WEIGHT | REV

DWG. NO. **38-79**

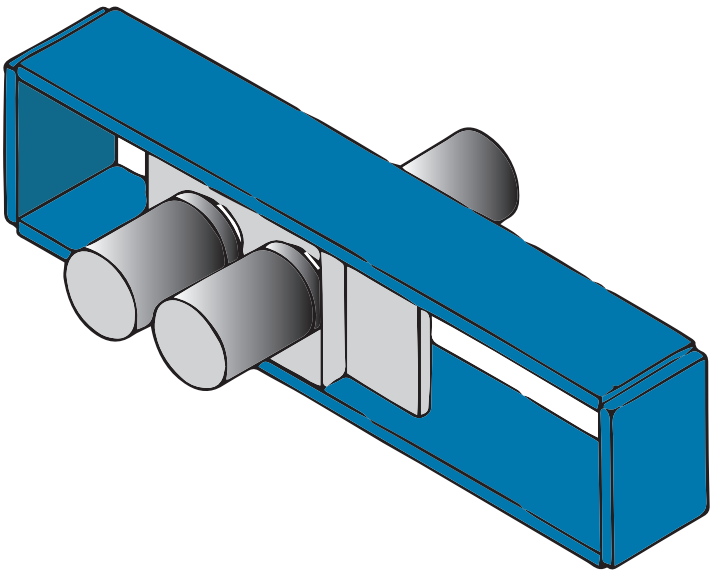
SLIDE DIVERTER VALVE

SAFETY

MAGNUM SYSTEMS

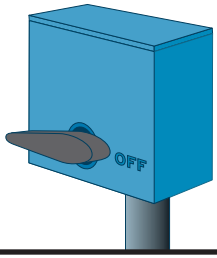
SLIDE DIVERTER VALVE SAFETY PROCEDURES

Prevent damage to yourself and your new Slide Diverter by following these simple safety procedures.



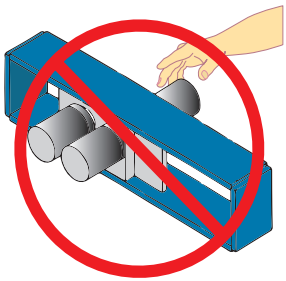
ALWAYS

DISCONNECT power and remove the roller chain BEFORE working on the valve.



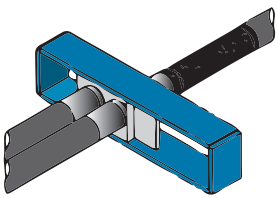
NEVER

Put HANDS into the inlet or outlet openings of the valve.



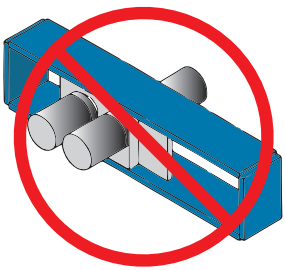
ALWAYS

Have inlet and outlet pipes PROPERLY CONNECTED when operating valve.



NEVER

Perform maintenance on valve while it is in service.



SAFETY FIRST

Slide Diverter Valves are powerful and can be dangerous if you do not follow procedures. Prevent damage to yourself and your new Slide Diverter by following these simple safety procedures.

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