

SUPER·CHECK™

WAFER PATTERN CHECK VALVES

'SLP' & 'SW' STYLE



**AUSTRALIAN
PIPELINE VALVE®**



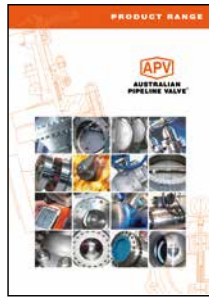
AUSTRALIAN PIPELINE VALVE®

COMPLETE PRODUCT LINE

“Australian Pipeline Valve produces isolation, control and flow reversal protection products for severe and critical service media in utility, steam, pipelines, oil & gas and process industries. APV valves and pipeline products form the most competitive portfolio in the market.”



AUSTRALIAN PIPELINE VALVE BRAND RANGE - CATALOGUES



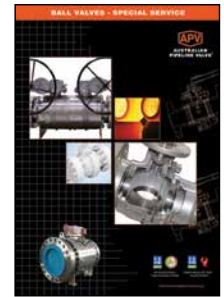
Product Brochure



Ball Valves Floating & Trunnion Mounted



Ball Valves Floating Small Bore



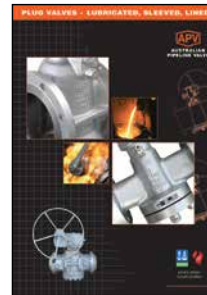
Ball Valves Special Service



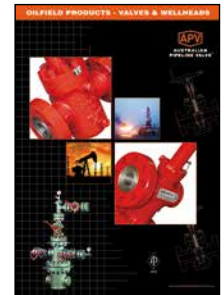
Gate, Globe & Check Valves - Cast Steel



Gate, Globe & Check Valves - Forged Steel



Plug Valves Lubricated, Sleeved & Lined

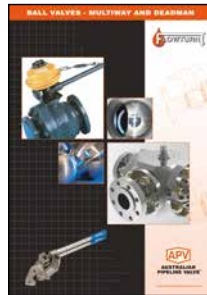


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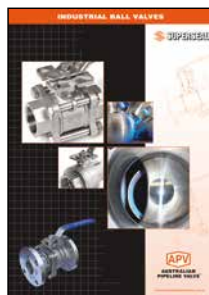
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Supercheck Wafer Check Valves



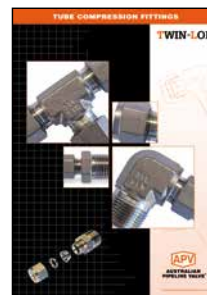
Superseal Butterfly Valves



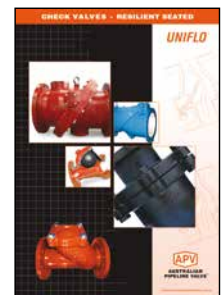
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Torqturn Actuators



TwinLok Tube Fittings



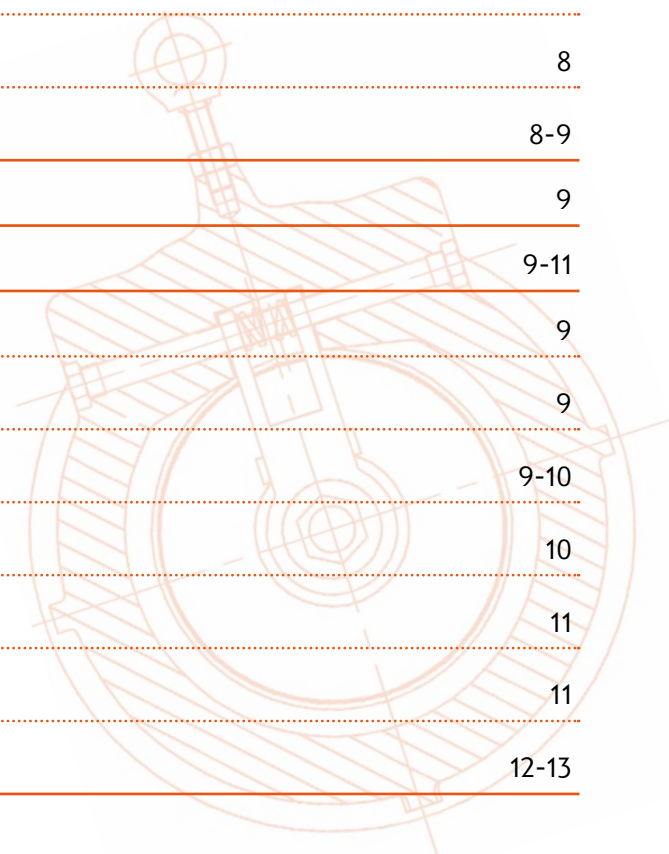
Uniflo Check Valves

Contact us for your local stockist/distributor

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INTRODUCTION

The majority of this information is common knowledge to experienced valve users. When properly installed in applications for which they were designed, Australian Pipeline Valve - Supercheck valves will give long reliable service under normal conditions. This instruction manual is only a guide for installation and operation on standard service and covers general maintenance and minor repairs. An APV approved valve reconditioner should be used for reconditioning and major repairs.



Note

We do recommend however that this entire document be read prior to proceeding with any installation or repair. Australian Pipeline Valve and its parent company take no responsibility for damage or injury to people, property or equipment. It is the sole responsibility of the user to ensure only specially trained valve repair experts perform repairs under the supervision of a qualified supervisor.

RESPONSIBILITY FOR VALVE APPLICATION

The User is responsible for ordering the correct valves. The user is responsible for ensuring APV-Supercheck Valves are selected and installed in conformance with the correct pressure rating and design temperature requirements. Prior to installation, the valves, drawings and nameplates should be checked for proper identification to ensure the valve is of the proper type, material and is of a suitable pressure class and temperature rating to satisfy the applications requirements of the service application.



Caution

Do not use any valve in applications where either the pressure or temperature is higher than the allowable working values. Also valves should not be used in service media if not compatible with the valve material of construction, as this will cause chemical attacks, leakage, valve failure.

RECEIVING INSPECTION AND HANDLING

Valves should be inspected upon receipt to ensure:

- Conformance with all purchase order requirements.
- Correct type, pressure class, size, body and trim materials and end connections.
- Any damage caused during shipping.



Note

The User is advised that specifying an incorrect valve for the application may result in injuries or property damage. Selecting the correct valve type, rating, material and connections, in conformance with the particular performance requirements is important for proper application and is the sole responsibility of the user.

SAFETY INFORMATION

The following general safety information should be taken into account in addition to the specific warnings and cautions specified in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment covered in this I.O.M.



Caution

To avoid injury, never attempt disassembly while there are pressures either upstream or downstream. Even when replacing gaskets or packings, caution is necessary to avoid possible injury. Disassemble with caution in the event all pressures are not relieved.



Caution

To prevent valve bending, damage, inefficient operation, or early maintenance problems, support piping on each side of the valve.



Caution

- *A valve is a pressurised mechanism containing fluids under pressure and consequently should be handled with appropriate care.*
- *Valve surface temperature may be dangerously too hot or too cold for skin contact.*
- *Upon disassembly, attention should be paid to the possibility of releasing dangerous and or ignitable accumulated fluids.*
- *Ensure adequate ventilation is available for service.*

This manual provides instructions for storing, general servicing, installation and removal of valves. APV and its resellers refuse any liability for damage to people, property or plant as well as loss of production and loss of income under any circumstances but especially if caused by: Incorrect installation or utilisation of the valve or if the valve installed is not fit for intended purpose. It is the sole responsibility of the user to ensure the valve type and materials are correctly specified.

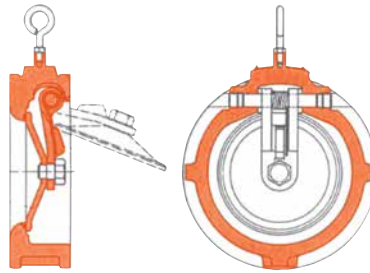
DURING OPERATION TAKE INTO ACCOUNT THE FOLLOWING WARNINGS:

- a- The valve's internal parts (disc/stem/hinge pin/seats/gaskets/seals, etc.) shall be handled with care avoiding scratches or surface damage.
- b- All tools and equipment for handling the internal parts shall be soft coated, or else take care.
- c- Valves can be fitted with gaskets or seals in PTFE, Buna, Viton, etc., hence high temperatures and some cleaning fluids may damage sealing components.

For all operations make reference to position number on part list of the applicable drawing.

1.0 OVERVIEW

The SW series is retainerless. The SLP is non retainerless through pinned, design and lends itself to the applications requiring limit/micro switches, counter weights, etc. The SLP and SW flapper has spring assisted closing, suitable for horizontal or upwards vertical service (downwards required an external closing spring, which is an available option in SLP series). A large bore provides a larger flow when compared to dual flap style or slim line uniflap checks.



SLP SERIES (retainer type)

Light and strong

Supercheck SLP/SW series valves are light, so line stress is reduced to a minimum. Yet the installed valve assembly is more rigid than an equivalent length of heavy-walled pipe.

Smooth, fully automatic operation

The SLP/SW series valves are designed to be fully automatic in function. The smooth opening and closing action reduces line hammer to a minimum. SLP/SW series valves are engineered to present an essentially unobstructed orifice.



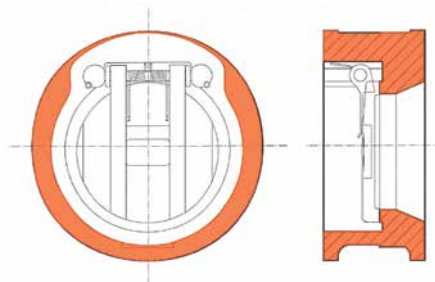
SLP SERIES (Retainer type)



SW SERIES (Retainerless)

Simplified design

The SLP/SW series are made with a minimum of parts. The stainless steel trim and resilient O-ring seat (soft seated version) ensures long life. The single O-ring ensures a complete leak-free seal.



SW SERIES (Retainerless)


Pressure limits (CWP) SLP/SW series

ANSI 125	-	200 psi (1378 kpa)
ANSI 150	-	285 psi (1964 kpa)
ANSI 300	-	740 psi (5099 kpa)
ANSI 600	-	1480 psi (10197 kpa)
ANSI 900	-	2220 psi (15296 kpa)
ANSI 1500	-	3705 psi (25527 kpa)
TABLE E	-	200 psi (1378 kpa)

Temperature limits SLP/SW series

NBR seat	Viton seat	Metal seat
80°C	200°C	400°C

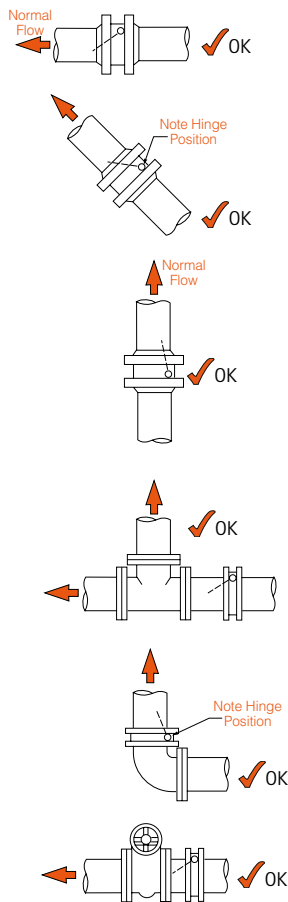
2.0 INSTALLATION



Piping should be properly aligned and supported to reduce mechanical loading on the end connections.

ORIENTATION & FLOW DIRECTION

Acceptable positions



Avoid these positions

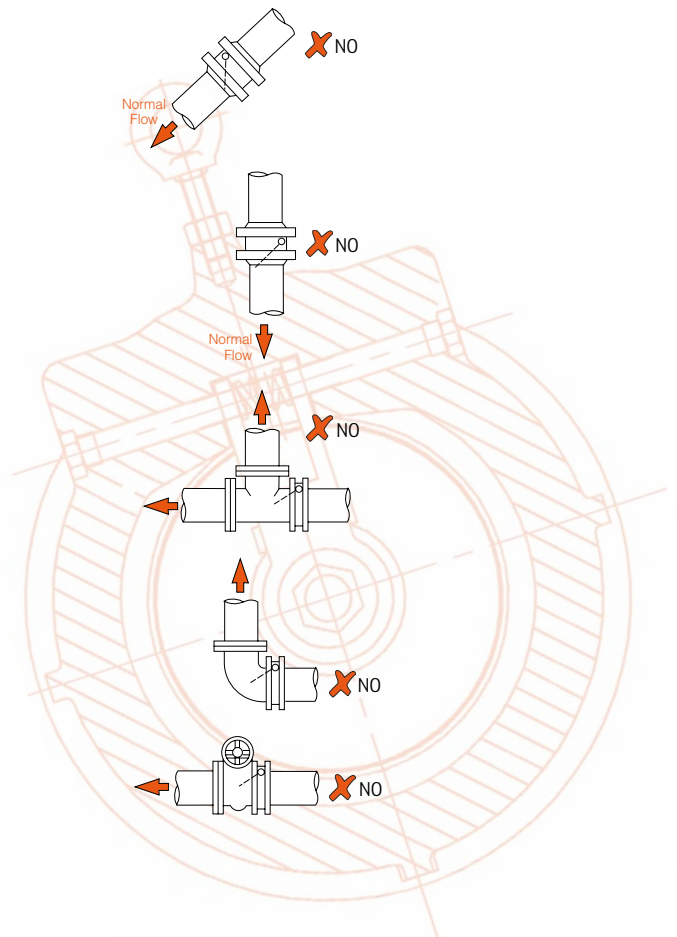


DIAGRAM 1

Install valve in system using proper size and type mating flanges and appropriate gaskets (for FF or RF) or ring joint gasket (for RTJ). Observe the following precautions:

Do not install SLP/SW series wafer check valves directly against another valve whereby the check valve discharges downstream directly into another valve.

Do not install the valve whereby it directly discharges downstream into a tee or elbow fitting. Refer Diagram 1.

SLP/SW check valves are not suitable for vertical downflow installations.

2.1 INSTALLATION POSITIONS

Check valves are unidirectional and have the direction of flow indicated on the valve body.

Supercheck single flap check valves are recommended for use only in horizontal lines and vertical lines for upwards flow only.

2.2 PREPARATION FOR INSTALLATION

- Remove protective end caps or plugs and inspect valve ends for damage to flange faces.
- Thoroughly clean adjacent piping system to remove any foreign material that could cause damage to seating surfaces during valve operation.
- Verify that the space available for installation is adequate to allow the valve to be installed.

2.3 END CONNECTIONS

2.3.1 Flanged Ends

Check to see that mating flanges are dimensionally compatible with the flanges on the valve body and ensure sealing surfaces are free of debris.

Install the correct studs and nuts for the application and place the gasket between the flange facings.

2.4 CLEANING



Caution

Stud nuts should be tightened in an opposing criss-cross pattern in equal increments to ensure even gasket compression. See Diagram 4.

Before installation, wash off any rust proofing solution coating with kerosene, or any hydrocarbon solvent product. Valve plate (flap) should be checked to ensure it is free.

2.5 DIRECTION OF FLOW

The direction of flow in the line should coincide with the flow direction indicated by the cast 'arrow' on the body of the valve.

2.6 HORIZONTAL PIPING

Insert valve into pipeline only in the upright position for horizontal service. Install the valve as shown below so the flap hinge is at the top of the valve and is centred. Where provided, the lifting lug can serve as a guide. For SLP series the side pin retainer can also be used as a guide. For vertical services the valve must be used for upward flow only, refer to the arrow on the valve body indicating direction of flow, refer Diagram 1.

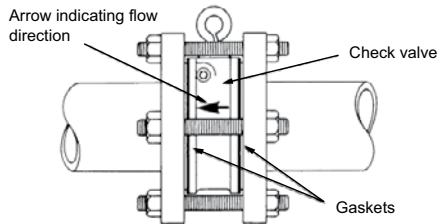


DIAGRAM 2

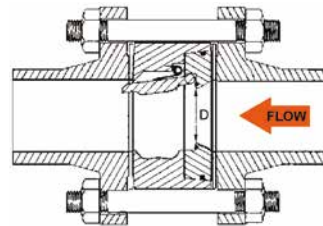


DIAGRAM 2A

2.7 DISTANCE BETWEEN SINGLE FLAP CHECK VALVE AND A BUTTERFLY VALVE

If you attach another valve to the outlet side of the Supercheck valve, ensure that there is enough distance between two valves so that the plate of the Supercheck check valve does not touch the disc of the other valve in the open position. For separating other valves such as butterfly valves, a spacer spool may be required to stop the disc interfering with the check valve flap.

2.8 ORIENTATION OF SINGLE FLAP WAFER CHECK VALVE TO PUMP DISCHARGE

When mounting the Supercheck valve near a pump, as indicated on Diagram 3, position so that the flow of the pump meets evenly with the valve. The hinge pin of the Supercheck valve should be at right angles to the pump shaft. Ideally, for maximum service life keep distance 'A' more than 6 times the diameter of the pipe. For higher pressure the distance should be further away. However, SLP/SW series check valves should not be used in severe pulsating services such as reciprocating compressor discharges. Install check valves downstream of any pulsation dampeners or silencers in any system. Consult Diagram 1 for orientation positions.

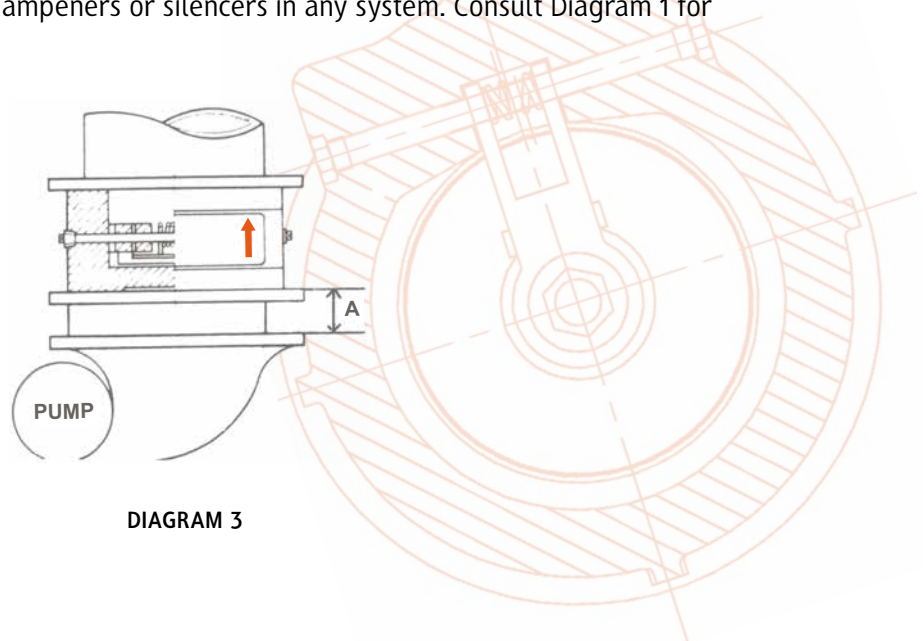


DIAGRAM 3



Caution

Wafer check valves are designed for steady flow conditions and are not recommended for use near reciprocating pumps, but especially compressors, any pulsating devices or other types of physical/thermal shock-load applications. In this type of application, the check valve will not perform efficiently and will ultimately fail.

2.9 GASKETS

The opening end of the outlet side of Single Flap Check valve is manufactured larger than the internal diameter of the pipe. Use a gasket that is either the same internal diameter of the Uni-Check outlet, or slightly larger. Most common spiral wound or CNAF pipe gaskets will fit, providing they are the same corresponding flange class rating as the valve it's specified to. CNAF gaskets are only suitable up to 1400 kPa (200 PSI). Ring joint gaskets are frequently specified for class 900 to 2500. The recommended tightening sequence is shown below in Diagram 4. Tighten in numerical order, gradually increasing torque with each sequence.

ORDER OF TIGHTENING BOLTS

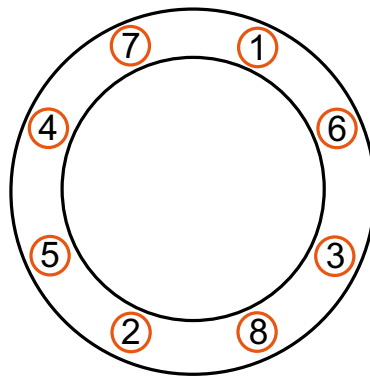


DIAGRAM 4

2.10 POST-INSTALLATION PROCEDURES

After installation, the line should be cleaned by flushing to remove any foreign material. When caustics are to be used to flush the line, additional flushing with clean water is required. The valve should be opened and closed after installation to ensure proper operating function.

With the line pressurised, check the valve end connections and any body plugs for leaks.

3.0 OPERATION

The check valve operation is automatic and requires no assistance. When the flow exerts sufficient pressure against the disc to overcome the disc's weight, the disc allows the flow to continue through the piping system. As pressure decreases, the disc lowers until it's own weight forces it to seat. This prevents the possibility of a reversal in the flow. Metal seated check valves are not zero leak devices and may

“seep” in service. This type of valve should always be backed up with an isolation valve. Even soft seated valves require a small amount of back pressure before a seal is effected. Similarly, to open the valve the ‘cracking pressure’ will depend on the spring tension. Low cracking pressure springs are available.

4.0 MAINTENANCE

No periodic maintenance is necessary, except in the case of the SLP series where external over-rides, dampners, counterweights, etc., may be fitted which require an external gland packing. In this case the packing gland may need tightening (unless it is O-ring style).

5.0 REPAIRS

Proper safety equipment and apparel should be worn when preparing to service a valve. Observe the general safety warnings throughout this catalogue and consult your safety manager and plant manager.

5.1 REPAIR INSTRUCTIONS

Due to the relatively low replacement cost of small diameter standard iron or carbon steel valves especially under 200 NB (8”), it is usually less expensive to replace the complete valve than to have maintenance personnel effect repairs.

Flange face gasket sealing surfaces should be scraped clean (avoid radial marks).

5.2 REMOVING VALVE FROM PIPELINE

Only one half of the stud bolts need to be removed (others can just be loosened) when removing the uni-flap from the line. Of course for flanged and lugged valves, all bolts must be removed.

5.3 DISASSEMBLY SLP SERIES

First ensure all fluids and gases are released from valve before commencing. Protective splash proof and safety eye goggles should be worn. Unscrew the hinge pin retainers (8) from the body (1). To remove hinge pin (3) maintain pressure on the spring (5) and withdraw hinge pin (3), pulling it through disc (2), spring (5), and bushings (6). Take careful note of the spring position then disassemble and remove spring (5), body bushings (6) and disc (2). The seat is integral. Metal seats are machined finished and can be re lapped or re-metallised. Seat material can be the same as body or overlaid with 316 or stellite. Soft seat inserts are pressure and heat bonded into the body (or in some sizes the flap) and must be returned to Australian Pipeline Valve for repair where viable. Once disassembly is complete, inspect parts for damage and order replacement parts as required. Use new replacement parts, as required. Use a liberal amount of general purpose grease on seals and machined mating surfaces.

Important see Diagram 5 and caution note below about guarding the spring during disassembly to prevent eye damage. Refer to exploded view in Appendix.

5.4 ASSEMBLY SLP SERIES

- a) Lay the body (1) down, with 'downstream' side of the body facing upward. Lay disc (2) inside the body (1). Slide hinge pin (3) into the body through the bushings (6) (where fitted) the spring (5) and disc (2). Refer paragraph b) below on energising spring into the body. Reinsert disc into body cavity with shaft holes inline with side shaft port. Slide shaft into the body through shaft bearing on one side. Continue sliding shaft through disc, disc spring and remaining bushing. Check the disc (2) and bushings for end play. If body plate is severely worn it should be replaced.
- b) Wind the spring (5) 180° in a clockwise direction. Place the wound spring (5) in position between the disc hinge lugs ensuring the long convex side of the spring's leg is against the disc, the other end must be energised against the wall of the valve as per the Diagram 4. Different sizes and classes may have different spring configurations. While maintaining pressure on the spring (5), insert the hinge pin (3) into the body (1) passing it through the bushings (6) (where required), disc (2) and spring (5) as detailed above in paragraph a).
- c) Teflon tape the threads of the hinge pin retainer, and screw the hinge pin retainers (8) into the body (1).

After repair, the valve should be retested as per API 598 or applicable standard.



Caution

For SLP and SW series: under no circumstances wind springs to gain a higher or lower torsional load. Special high and low torque springs are available for this purpose. Before attempting shaft extraction, be sure to press hand over the disc spring (see Diagram 5). Failure to do this may result in personal injury due to the spring "launching" itself unexpectedly once the shaft is pulled free of it. Always wear protective eyewear.

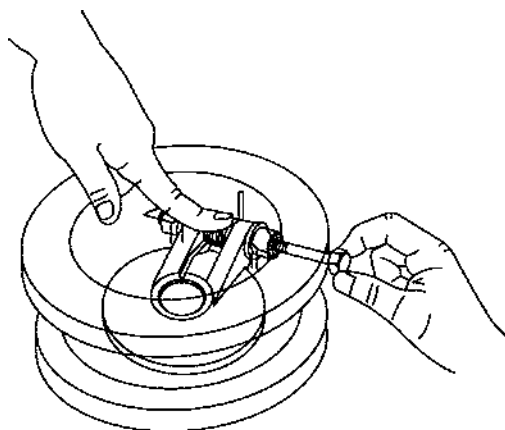


DIAGRAM 5

5.5 DISASSEMBLY SW SERIES

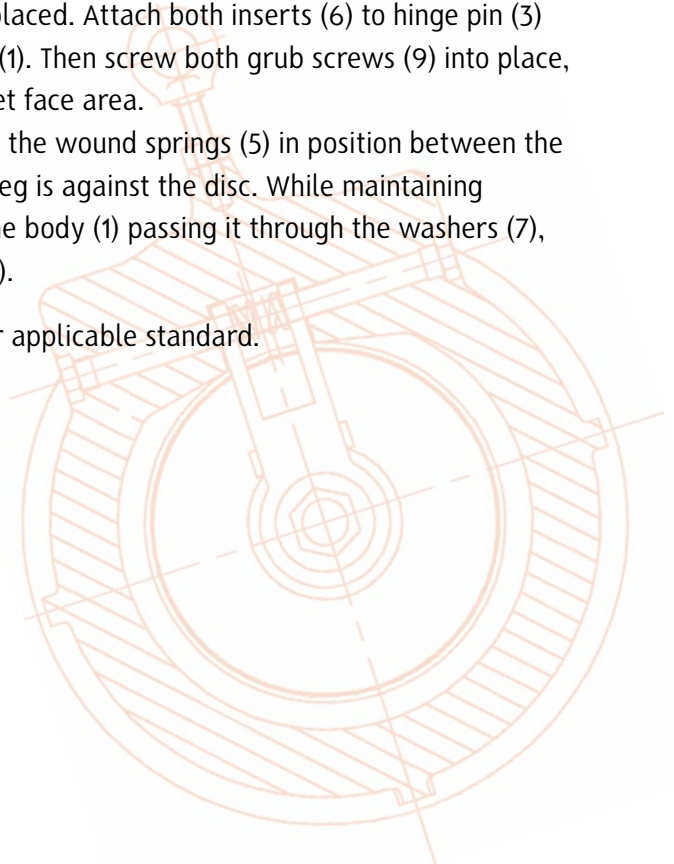
First ensure all fluids and gases are released from valve before commencing. Protective splash proof and safety eye goggles should be worn. Unscrew the grub screws (9) from the body (1). Take careful note of the spring position. Then slide out both inserts (6) containing the complete cartridge assembly which includes the hinge pin (3) disc (2) spring (5) and washers (7). Then first remove both inserts (6) to then slide out hinge pin (3) maintain pressure on the spring (5) and withdraw hinge pin (3). Pulling it through disc (2), spring (5), and washers (7). The seat is integral. Metal seats are machined finished and can be re lapped for re-metalised. Seat material can be the same as body or overlaid with 316 or stellite. Soft seat inserts are heat bonded into the body (or in some sizes the flaps) and must be returned to Australian Pipeline Valve for repair where viable. Once disassembly is complete inspect parts for damage and order replacement parts as required. Use new replacement parts, as required. Use a liberal amount of general purpose grease on seals and machined mating surfaces.

Important, see Diagram 5 (SLP type shown but guard spring in the same manner) and caution note on previous page about guarding spring during disassembly to prevent eye damage. Refer to exploded view in Appendix.

5.6 ASSEMBLY SW SERIES

- a) Lay the body (1) down, with 'downstream' side of the body facing upward. Reassemble in reverse order to 5.5 above. Slide the hinge pin (3) through the first washer (7) then into the first disc eyelet (2) then through the spring (or springs) (5) and then through the other disc (2) eyelet and washer (7). Different sizes and classes may have slightly different spring configurations. Always fit a new spring if the spring becomes stretched. Refer paragraph b) below on energising springs. Check the disc (2) and washers for end play. If body plate is severely worn, it should be replaced. Attach both inserts (6) to hinge pin (3) and then reinsert complete cartridge unit into the body (1). Then screw both grub screws (9) into place, ensuring the inserts and screws are flush with the gasket face area.
- b) Wind the springs (5) 180° in a clockwise direction. Place the wound springs (5) in position between the disc hinge lugs ensuring the convex side of the spring's leg is against the disc. While maintaining pressure on the spring (5), insert the hinge pin (3) into the body (1) passing it through the washers (7), disc (2) and springs (5) as detailed above in paragraph a).

After repair, the valve should be retested as per API 598 or applicable standard.



APPENDIX

EXPLODED VIEW SLP SERIES

SLP STYLE COMPONENTS	
1	BODY
2	DISC *1
3	HINGE PIN
4	SEAT (INTEGRAL)
5	SPRING
6	BUSHINGS *2
8	HINGE PIN RETAINERS
9	EYE BOLT

*1 Integral version shown, some sizes have separate hinge arm & disc.
 *2 Where applicable.

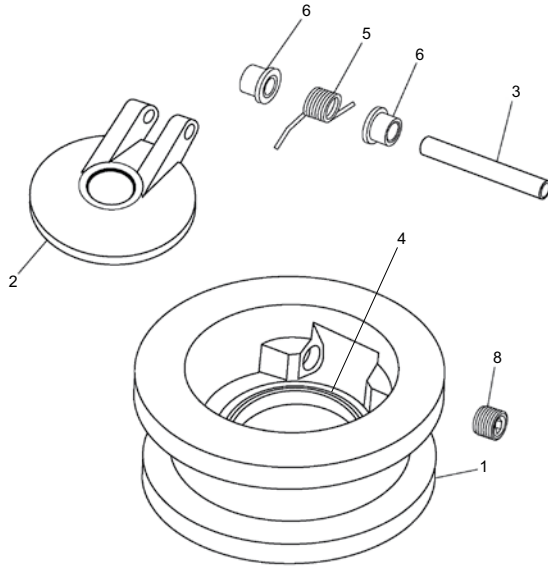


DIAGRAM 6

Indicative design only, refer to as-built drawing. Design varies according to size, class & trim.

EXPLODED VIEW SW SERIES

SW STYLE COMPONENTS	
1	BODY
2	DISC
3	HINGE PIN
4	SEAT (INTEGRAL)
5	SPRING
6	INSERT
7	WASHERS
9	SET SCREW

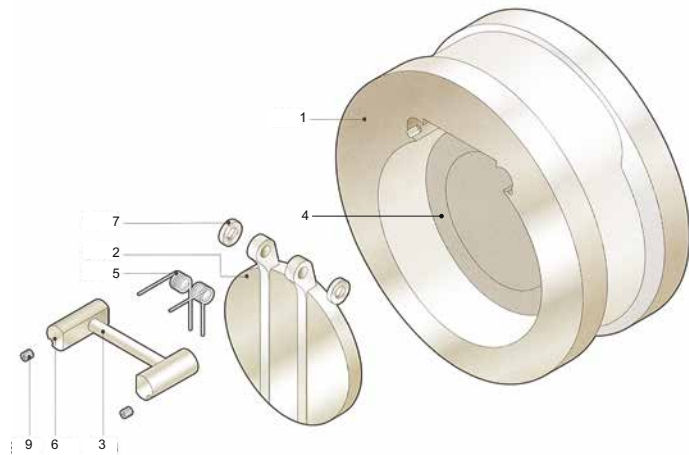
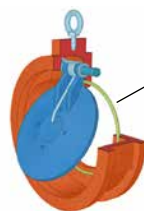


DIAGRAM 7

Indicative design only, refer to as-built drawing. Design varies according to size, class & trim.



Resilient, Soft Seat coupled with precision machined sealing surfaces ensure a bubble tight seal (Metal seat available)

RESILIENT O-RING SEAT OPTION SLP/SW

TABLE 1
Wafer Check Valve Standard APV Allowable Leakage Rates for Closure (Seat) Tests API 598

VALVE SIZE		METAL SEATED WAFER CHECK VALVES			SOFT SEATED WAFER CHECK VALVES			
NB	NPS	LIQUID TEST (cc/min)		GAS TEST (bubbles/min)	LIQUID TEST (cc/min)		GAS TEST ^a (bubbles/min)	
		APV	API 598	API 598	APV	API 598	APV ^a	API 598
≤50	≤2	3	6	Not required per API598 ^d	0 ^c	Not specified ^c	2 ^b	Not required per API598 ^d
65	2.5	3.75	7.5	Not required per API598 ^d	0 ^c	Not specified ^c	2 ^b	Not required per API598 ^d
80	3	4.0	9	Not required per API598 ^d	0 ^c	Not specified ^c	2 ^b	Not required per API598 ^d
100	4	6.0	12	Not required per API598 ^d	0 ^c	Not specified ^c	2 ^b	Not required per API598 ^d
125	5	7.5	15	Not required per API598 ^d	0 ^c	Not specified ^c	2 ^b	Not required per API598 ^d
150	6	9.0	18	Not required per API598 ^d	0 ^c	Not specified ^c	2 ^b	Not required per API598 ^d
200	8	12.0	24	Not required per API598 ^d	0 ^c	Not specified ^c	2 ^b	Not required per API598 ^d
250	10	15.0	30	Not required per API598 ^d	0 ^c	Not specified ^c	3 ^b	Not required per API598 ^d
300	12	18.0	36	Not required per API598 ^d	0 ^c	Not specified ^c	3 ^b	Not required per API598 ^d
350	14	21.0	42	Not required per API598 ^d	0 ^c	Not specified ^c	4 ^b	Not required per API598 ^d
400	16	24.0	48	Not required per API598 ^d	0 ^c	Not specified ^c	4 ^b	Not required per API598 ^d
450	18	27.0	54	Not required per API598 ^d	0 ^c	Not specified ^c	5 ^b	Not required per API598 ^d
500	20	30.0	60	Not required per API598 ^d	0 ^c	Not specified ^c	6 ^b	Not required per API598 ^d
600	24	36.0	72	Not required per API598 ^d	0 ^c	Not specified ^c	7 ^b	Not required per API598 ^d

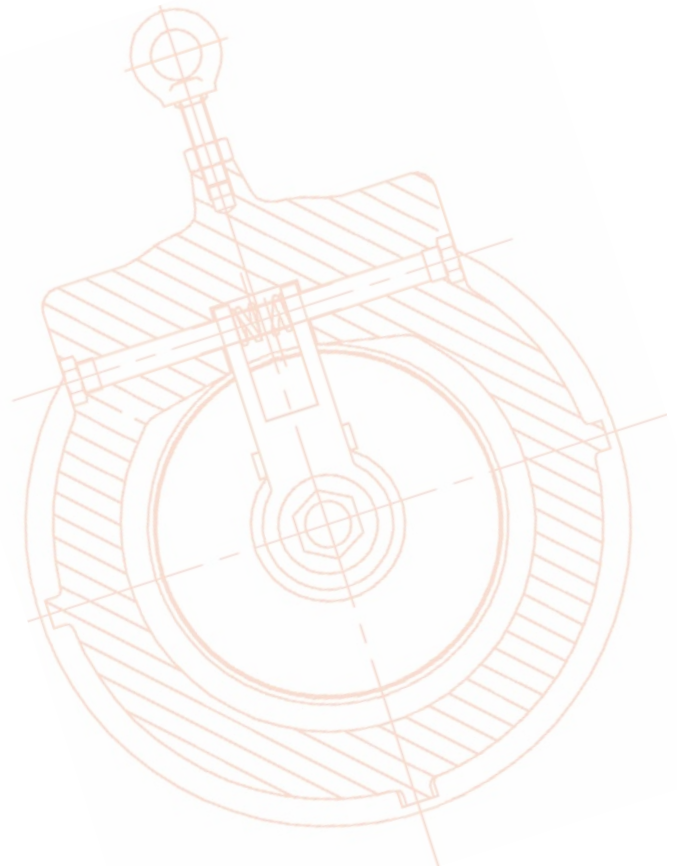
^a Gas test not performed as standard on cast iron body valves and is not required as per API 598. API598 does not require gas test on steel valves but APV performs it

^b 5.5 bar minimum test pressure. (Higher test pressure may be required to energise resilient seat in high pressure classes/larger sizes).

^c Since API 598 does not specify a leakage rate for resilient seated check valves, many manufacturers use the metal seated check valve leakage rate. However, APV demands as close as possible to tight shut off as per API 598 resilient seated (ISO 5208-A) Note in higher classes in smaller sizes and all classes in larger sizes, 3 up to 10 water drips a minute is accepted.

^d For check valves, gas test is not required as per API 598, but APV does perform it.

1cc = 16 drops, 1ml = 16 drops





AUSTRALIAN PIPELINE VALVE®

ADELAIDE • BRISBANE • PERTH



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