

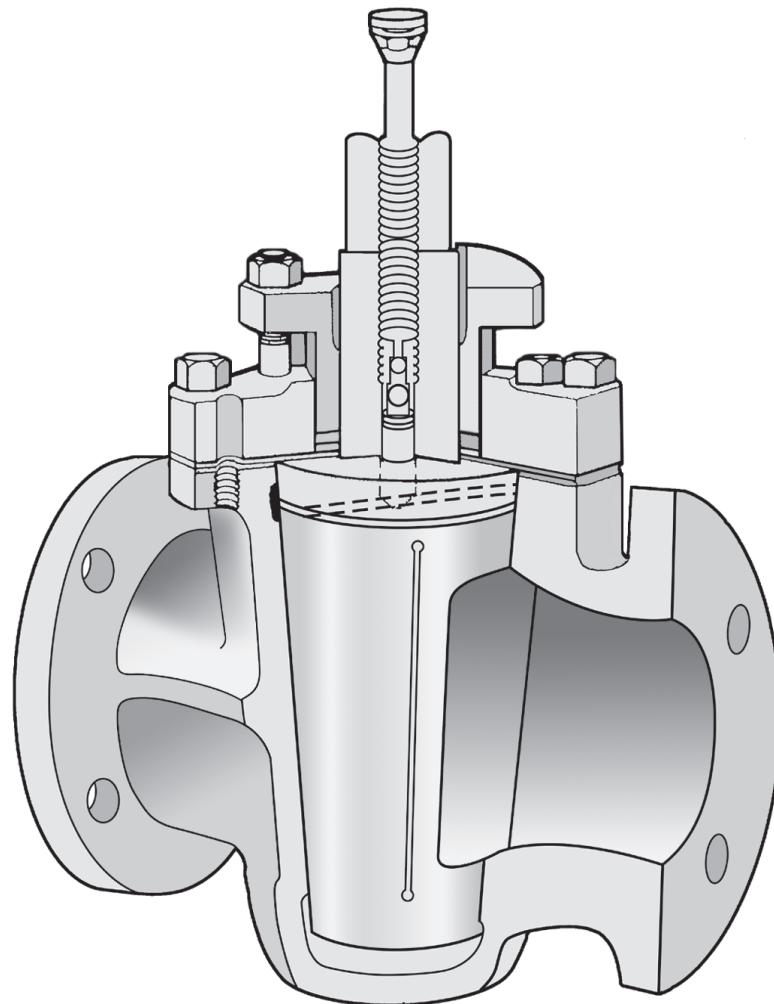


USER INSTRUCTIONS

Serck Audco **Standard Type Plug Valves**

SRENIM0003-05-A4 02/17

Installation
Operation
Maintenance



Experience In Motion

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1 STORAGE AND PRESERVATION

All valves are despatched in the open position and it is recommended that they are left in this position during storage. All protective packaging should remain in position until the valve is to be installed.

Valves should, where possible, be stored in a clean, dry environment.

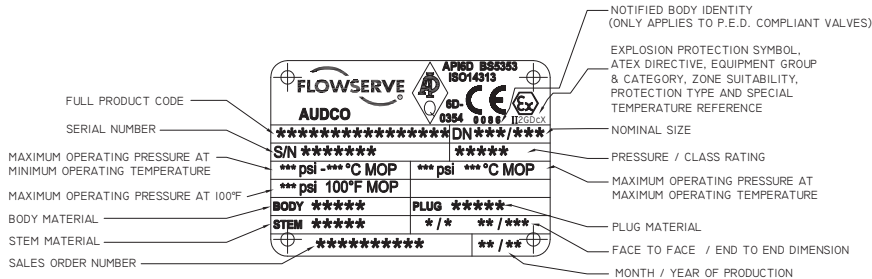
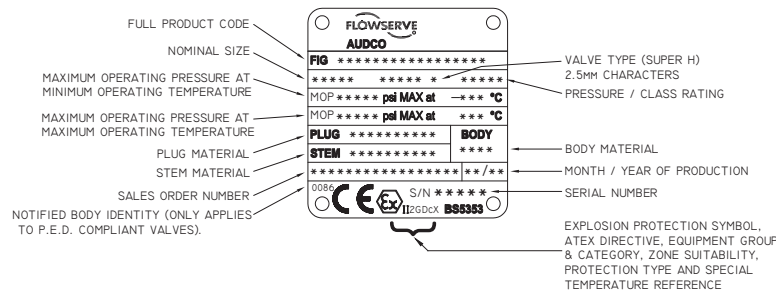
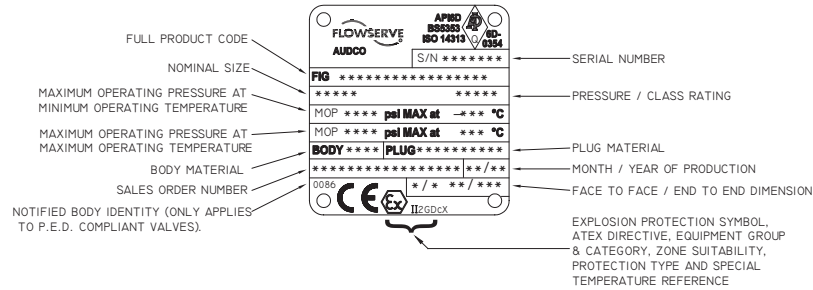
In-Line Painting. Serck Audco Standard Type valves are suitable for in-line painting. The following areas should be masked with rubberised masking materials or caulk, before shot blasting:

- Top of stem and gland area.
- Sealant fitting.
- Exposed end connections.
- Body-Cover joint
- Gear box fittings, input shaft, and stop adjusters.
- Top works of bare stem valves that are to be fitted actuators or extensions.

It is also recommended that above areas be protected with a thick rust inhibitor or grease rather than be painted. This also ensures that no shot gets into the valve, that the wrench and hand wheel operators will fit easily, and the maintenance fittings are not damaged.

2 VALVE MARKINGS

Each valve has one of the following identification information plates attached to the body.



2.1 Pressure Equipment Directive: If the identity plate carries the Notified Body identity number '0086' beside the 'CE' mark, the product complies with the Pressure Equipment Directive 2014/68/EU and the Pressure Equipment Regulations 1999 (SI 1999/2001). Without these numbers, and when used within the European community, the product is classified as 'SEP' (Sound Engineering Practice) and may only be used within the limitations defined in tables 6, 7, 8 & 9 of Schedule 3 of the Pressure Equipment Regulations.

2.2 ATEX Directive: If the identity plate carries the Explosion Protection Symbol and codes identifying the equipment group and category, the zone suitability and protection type beside the CE mark, the product complies with the ATEX Directive and The Equipment and Protective Systems for Use in Potentially Explosive Atmospheres Regulations 1996.

Definition of identity plate marking (see left):

'II' = Equipment Group; '2' = Equipment Category; 'G' = Gas Zone suitability (Zones 1 & 2);

'D' = Dust Zone suitability (Zones 21 & 22); 'c' = type of protection i.e. constructional safety (BS EN 13463-5); 'X' = Special temperature reference.

2.3 Material traceability markings are hard marked on the body and cover.

3 HEALTH AND SAFETY

When installing or maintaining valves:

- a) Conduct a risk assessment and eliminate or reduce hazards to an acceptable level.
- b) Work in accordance with Safe Systems of Work.
- c) Observe all site Health and Safety Rules in particular Permit to Work and Hot Work procedures.
- d) Wear all necessary Personal Protective Equipment.
- e) Never remove the valve, maintain a joint, or loosen or remove any fastening or fitting unless the line has been fully drained and de-pressurised.
- f) Always operate the valve to the open position to ensure that no trapped pressure exists within the cavity.
- g) Never handle valves that have been used on harmful substances unless they have been completely decontaminated and certified safe to handle.
- h) Never use a valve on a duty which exceeds its prescribed operating parameters. Refer to Serck Audco Valves Technical Sales for further performance information.
- i) Never modify or alter valves unless the manufacturer has been consulted or recommends such changes.
- j) The valve wrenches are only designed for use in operating the valves and must not be used to carry them by. Failure to observe this warning may result in operator injury.
- k) Due to the large physical size and weight of some sizes of this product, always use correct lifting methods and equipment when installing, removing and maintaining the product:
When provided, use all of the lifting lugs on the body;
Valves without lifting lugs - use chains or slings wrapped around the body.
Do not attempt to lift the valve using the sealant fittings, gear unit, handwheel, actuator, wrench, or the tapped hole in the end of the stem.
Always ensure that the valve and operator assembly are correctly supported in their final operating location.
- l) Due to the variety of duties on which this product can be employed, it is the end users responsibility to ensure the compatibility of the media with the materials of construction of the product for each specific application (i.e. corrosion and erosion which may affect the integrity of the pressure containing envelope).
- m) Before equipment is installed in areas which may be subject to seismic activity or extreme climatic conditions consult Serck Audco Valves Technical Sales.

3 HEALTH AND SAFETY (cont.)

- n) End Flanges: The end flange design of this product has been verified by either:
ASME Boiler and Pressure Vessel Code Section VIII Division 1 calculation method;
Finite Element Analysis in accordance with ASME Boiler and Pressure Vessel Code Section VIII Division 2 - Alternative rules;
Experimental testing as defined in BS EN 12516-3, Valve Design Strength - Part 3 Experimental Method.

Gaskets: The gaskets used in all methods are Spiral Wound to BS EN 1514-2 for PN rated Flanges and ASME B16.20 for Class rated flanges. These have Gasket Factors and Design Stresses of 2.5 and 10000 psi respectively for Carbon Steel gaskets, and 3.0 and 10000 psi respectively for Stainless Steel gaskets, as defined in the ASME Boiler and Pressure Vessel Code Section VIII Division 1.

If gaskets are used with higher Gasket Factors and Design Stresses than those stated above, please consult Serck Audco Valves Technical sales.

Bolting: End flanges for steel valves have been verified by the methods stated above, using bolt design stress values based on those for ASTM A193 B7, B7M, B8, B8M as defined in ASME Boiler and Pressure Vessel Code Section II - Materials - Part D - Properties.

Flanged CAST IRON plug valves have flat faced flanges for use with full face across gaskets.

- o) Lethal Service. In accordance with the design verification code (ASME Boiler and Pressure Vessel Code Section VIII Division 1) a casting quality factor of 1.0 is allowable for all products except those intended for 'lethal service'. All products for such service must have had non-destructive examination carried out in accordance with Appendix 7 of the code. Refer to Serck Audco Valves Technical sales.
- p) If the processes or environments that the products are used in are likely to cause temperatures (high or low) that may cause injury to personnel if touched, then adequate insulation/protection must be fitted. It is recommended that the insulation allows easy access for maintenance, to the sealant fittings, and to the valve operator.
- q) If the equipment is to be used on unstable gas duty, ensure that the operational parameters as indicated on the product identification plate cannot be exceeded.
- r) This equipment should be protected by other devices to prevent over-pressurisation. (i.e. caused by external fire, etc).
- s) This equipment must be installed in a system that is designed to prevent excessive forces acting on the flanges, connections, etc.

4 PREPARATION FOR INSTALLATION

All protective packaging must be removed before installation.

It is recommended that additional sealant be injected prior to re-test and operation so as to ensure tight shut off. Any excess sealant found around the plug port should be removed by using a scraper. Clean end connections to remove any unwanted paint or rust inhibitor. Significant problems can arise with any valve installed in an unclean pipeline. Ensure that the pipeline has been flushed free of dirt, weld spatter, etc before installation. The working area should be clean and clear of any debris which could contaminate the valve. The valve should be fully opened or fully closed during cleaning operations. Water and inert gas such as carbon dioxide and nitrogen are unlikely to affect the sealant. If solvents or steam cleaning are used, it is recommended that the valves are re-injected with sealant after completion of the cleaning operation.

5 INSTALLATION INSTRUCTIONS

- a) Serck Audco Standard Type plug valves are bi-directional, and can be installed vertical (stem operating end at the top), horizontal or any angle in between. If the valve is installed in any other position, the operating torque will increase considerably, possibly resulting in seizure. The actuator may need supporting if it is not vertically above the valve. Ensure access to the sealant fitting, gland nuts, and any drain plugs.
- b) Installation of flanged valves should follow prevailing site standards. Where such standards do not exist the following should be used as a guideline.
- c) Flanged joints require compressive loading onto the gasket material as the normal line pressure forces tend to separate the joint. There should be no misalignment between the valve and mating faces.
- d) Pipework should have the correct gap to allow for the valve face to face length plus assembled gasket material width.
- e) Ensure the pipeline and flange faces are clean and free of any debris which may be detrimental to flange sealing.
- f) Bolting should be of the correct size, length, and material for the duty.
- g) Locate the valve between the pipe ends and slide in the gaskets. It may be necessary to lever the mating flanges gently apart to allow for easy fitting of the gasket. Care should be taken to prevent damage to the sealing surfaces. Correct lifting equipment must be used when handling valves for operator safety - see Section 3, paragraph k).
- h) Assemble all bolts and loosely tighten. Diametrically and evenly tighten the bolts to the correct torque required for the specific gasket material, per the gasket manufacturers recommendations.
- i) Screwed Ends - Pipe wrenches can be used to grip the valve body adjacent to the connection, while tightening it. Use of a thread sealant is recommended to ensure a pressure tight joint.
- j) Weld Ends - All welding should be performed by qualified welders using approved procedures. If good industry accepted practices are used (such as ASME IX), the heat from the welding will not affect the stem packing, or cause the sealant to decompose. Any post weld heat treatment (PWHT) must be restricted to the heat affected zone.
- k) Hub Ends - To be installed according to the hub end designers installation instructions.
- l) It is recommended that the valves are left in the open position during fitting.

5.1 COMMISSIONING TESTS

All valves are factory tested in accordance with valve industry standards API 6D, API 598, BS EN 12266-1 or BS.5158, unless specified otherwise. If there is an operational need to test the valve at higher pressure, temperature or duration, consult Serck Audco Valves Technical Sales.

If water is used for testing, it is beneficial to dry out the valve internals by flushing the system with dry nitrogen or air, after the testing is completed.

6 OPERATION

6.1 USE

Serck Audco Standard Type plug valves are designed to give bubble tight shut off.

Plug valves have a ¼ turn operation (i.e. they have a 90 degree rotation of the plug in operating from the fully open to the fully closed) and close in the clockwise direction when viewed from above the valve stem. It is possible to see when the valve is open or closed by the position of a groove or raised pips in the top of the stem, this groove or these raised pips being in-line with the plug port. Multiport valves can have more than a 1/4 turn operation - It is possible to see the position of the plug ports by the position of grooves or raised pips on the top of the plug stem, these grooves or raised pips being inline with the plug ports.

Plug valves can be used for throttling for limited periods as typically done for applications such as vents, blow down, by-pass, equalization, kicker etc. If a plug valve is used for limited throttling, then it is suggested to proceed as follows: (1) open the plug slowly until media starts going through the valve (this should happen when the opening angle is 20-30°), (2) modulate the flow by opening further the plug as required, (3) when throttling is not required anymore continue to open until the valve is fully open. It is not good practice to leave a plug valve in the partially open (throttled) position for long periods as this may cause damage and seat life may be reduced.

Do not force valves that will not readily operate. Never stand downstream of a valve that is being opened to atmosphere. Valves that are installed where unauthorized personnel can interfere with them should normally have the wrench or handwheel removed, be locked with suitable locking devices, or be chained through the handwheel to prevent operation.

6.2 WRENCH OPERATION

The wrench has a 'square' style head, and can be fitted to the valve in a number of positions to suit operation in restricted locations. The wrench must always be secured to the plug stem by tightening the retaining screw onto the plug stem. Positive stops are provided on the plug stem and gland, to ensure correct operation of the valve.

When operating the valve the use of excessive side loading on the wrench should be avoided. Serck Audco wrenches are sized so that the force to operate the valve should be 100 pounds maximum at the end of the wrench.

6.3 GEARBOX OPERATION

All worm gear boxes supplied by Serck Audco have visible arrow type position indicators on top of the gear housing. 'OPEN' and 'SHUT' positions are cast on top of the gear housing. The position indicator arrow points to these at the fully opened and closed positions.

Secure the gearbox handwheel to the gearbox input shaft by the pin, or by the key and the retaining screw. Ensure that the close direction indicator is visible on the end of the input shaft, and that the retaining screw is tightened down. It is also recommended that the gear unit stops be checked to ensure correct plug port alignment.

6.4 REMOTE OPERATION

Where automation of valves is required, Serck Audco can supply pneumatic, electric, hydraulic, or gas/hydraulic actuators to cover a wide range of operating torques. Operation will be in accordance with installation, operation and maintenance instructions for the relevant actuator. Before pressurising the valve, ensure that all power sources are connected to the actuator, and that all of the actuator functions and accessories are working correctly.

7 MAINTENANCE

There are several maintenance operations that can be carried out on Serck Audco Standard Type valves while in-line and on service. With these operations, except in cases where the plug becomes heavily eroded, corroded or damaged, the valves can be fully maintained in-line for many years of trouble free service.

The operations are:

- injection of valve sealant (required occasionally).
- tighten the gland nuts slightly (required very occasionally).

7.1 INJECTION OF VALVE SEALANT

To maintain the bubble tight shut-off capabilities and to ensure smooth operation of the valve.

7.1.1 FREQUENCY OF SEALANT INJECTION

Frequency of Valve Operation	Frequency of Sealant Injection For a Valve in Normal Service.	
	<i>No more than...</i>	<i>No Less Than...</i>
Over 100 times per 8 hour shift	Each Shift	-
10-100 times a day	Daily	Weekly
1-10 times a day	Weekly	Monthly
1-30 times monthly	Monthly	Quarterly
Less frequently	Quarterly	Twice Annually

7 MAINTENANCE (cont.)

7.1.2 SEALANT INJECTION EQUIPMENT

Valves have a 'Giant Buttonhead' combination lubricator, OR a sealant screw. To gun inject sealant, a high pressure sealant gun with a 'Giant Buttonhead' coupler is required. The gun should also have a pressure gauge reading to at least 10,000 psi. The three basic types that Serck Audco can supply are:

- a) Manual primed with screw feed - inexpensive guns for occasional use;
- b) Manual with hydraulic feed - recommended for servicing small groups of valves;
- c) Pneumatic, using bulk lubricant in 5 quart or larger cans - recommended for large valve installations, such as manifolds, gas processing plants, compressor stations, and refineries.

NOTE: Do not attempt to use low pressure lubricant guns (e.g. those used to grease wheel bearings).

7.1.3 VALVE SEALANTS AND LUBRICANTS

Only sealants recommended for TAPER plug valves should be used. Serck Audco supplies sealants for most services, if you already have a particular valve sealant in use at a facility, we will advise on the suitability for use in Standard Type valves

We strongly recommend against the following types of sealant:

- Sealant supplied by cylindrical/parallel plug valve manufacturers. These are of much higher viscosity than taper plug valves require and will substantially increase the valve torque.
- Commercially available lubricating grease such as bearing grease. These greases do not have the chemical resistance, lubricating and sealing properties required by taper plug valves.

7.1.4 GUN INJECTION OF SEALANT

Use the following instructions in conjunction with the sealant gun manufacturers instructions. Sealant can be injected with the valve in-line and on pressure.

7.1.4.1 POSITION

If possible the valve should be fully opened or fully closed, to ensure that all four plug sealant grooves are connected to the sealant supply. If the valve is partially open, injection is less effective as only two of the grooves are connected to the supply.

7.1.4.2 SEALANT FITTING

Clean the 'Giant Buttonhead' fitting (fitted into the top of the plug stem). In particular scrape off any paint build-up away from the small hole in the end of the fitting.

7 MAINTENANCE (cont.)

7.1.4.3 FILL THE GUN

Ensure the gun is filled and primed with the taper plug valve sealant. Follow the gun manufacturers instructions to fill the gun.

7.1.4.4 ATTACH THE GUN

Slide the 'Giant Buttonhead' coupler on the end of the gun hose, over the valve's 'Giant Buttonhead' fitting, ensuring that the lip of the coupler fits into the groove in the fitting. If the gun has an isolating valve on the coupler or elsewhere, open this valve.

7.1.4.5 START PUMPING

Inject sealant either by pumping the handle on a manual gun, or connecting the air supply to the pneumatic gun. Monitor the pressure gauge during the sealant injection process. For sealant to flow onto the valve seats, enough sealant at sufficient pressure has first to be injected to overcome the line pressure, to fill any cavities in the sealant chamber and grooves, and to overcome the flow resistance through the valve sealant system.

Sealant is flowing onto the seats when the pressure gauge on the gun is significantly higher than the line pressure and then falls slowly. Note that on low pressure valves the pressure required to inject sealant may be significantly higher than the CWP.

With a valve that is regularly injected with sealant, the sealant pressure will quickly build up. A valve that has not been well maintained could require a significant amount of sealant to be injected before pressure builds up and sealant flows onto the seats. See section 8 - 'Trouble Shooting Guide' for potential injection problems.

7.1.4.6 DISCONNECT

After injection of sufficient sealant, relieve the internal pressure in the gun, and disconnect it from the 'Giant Buttonhead' fitting. Clean the 'Giant Buttonhead' fitting thoroughly, re-fit the protecting cap where present and apply a rust preventative in order to prevent oxidation.

CAUTION: The lubricant gun should not be connected or disconnected while it still has internal pressure.

7.1.4.7 OPERATE THE VALVE

It is desirable but not essential, to operate the valve either partially or fully after injecting sealant, to help spread the sealant over the entire seating surfaces.

7.1.5 INJECTION OF SEALANT STICKS

By screwing the 'Giant Buttonhead' combination lubricator OR the sealant screw, down the sealant hole in the top of the plug stem, sealant can be injected with the valve in-line and on pressure. Equipment Needed: Adjustable crescent wrench, and a Tommy Bar. Correct size sealant stick, per the below table.

Valve Nominal Size (mm)	15-25	32-50	65-80	100	125 and above
Valve Nominal Size (inches)	1/2- 1"	1/4-2"	2 1/2 -3"	4"	5" and above
Sealant Stick Size	A	B	C	D	E

7 MAINTENANCE (cont.)

7.1.5.1 POSITION

If possible the valve should be fully opened or fully closed, to ensure that all four plug sealant grooves are connected to the sealant supply. If the valve is partially open, injection is less effective as only two of the grooves are connected to the supply.

7.1.5.2 SEALANT FITTING

Identify and clean the injector fitting on the valve. In particular scrape off any paint build-up or dirt away from the threads to prevent any dirt going into the valve.

7.1.5.3 INJECTING SEALANT

To inject sealant, screw in the injector fully, and then remove the injector by completely unscrewing it. **CAUTION** - take care when removing the injector, in case there has been any leakage of service medium through the double check valve. Insert the correct size and type of sealant stick into the threaded hole, and screw in the injector. The valve will require different amounts of sealant, dependent on how much sealant is in the valve - a number of sealant sticks may need to be injected. Initially the sealant injector should turn fairly easily, while the sealant chambers are filling up. Once these are filled, it will become more difficult to turn, but keep turning the injector to inject more sealant. After it has become difficult to inject sealant, it will suddenly become easier as the plug is lifted off the seats - at this point inject another half stick and then wait for about 5 minutes for the sealant to flow around the seats. Inject more sealant until it is flowing easily and the valve is operating easily.

7.2 ADJUSTMENT OF GLAND

The gland has two functions, to effect a seal on the stem and also to give a plug loading into the body. The gland should always be reasonably tight to give correct resistance for the sealant system - if the gland is loose then the sealant film will not properly form between the seats. Over a period of time - particularly if the valve is subject to elevated or cyclic temperature fluctuations - the gland will need to be tightened. Select the correct wrench and tighten using reasonable hand force - do not over tighten or the plug will not turn. Once the gland has been tightened, sealant should always be injected and the valve operated to check that the valve is functioning correctly.

CAUTION: Care should be taken when maintaining very old valves as Asbestos was used in the packing until 1990.

7.3 GEAR OPERATOR MAINTENANCE

- Gear operated Standard Type valves are fitted with enclosed, water-tight, worm gear operators. Both single and double reduction units are used. Gear operators are manufactured by quality suppliers such as Mastergear.
- All gears are lubricated with heavy bearing grease when assembled, and should not require subsequent lubrication. Gear operators not grease filled for life, will be fitted with a grease nipple.
- If the gear operator input shaft gets bent or broken, we recommend that the entire gear operator be replaced as the internal bearings have probably also been damaged.

7.4 FASTENER TORQUE REQUIREMENTS

If any bolts/studs/nuts require tightening, the values must be obtained from SAV.

8 TROUBLE SHOOTING GUIDE FOR STANDARD TYPE VALVES

PROBABLE CAUSES LISTED IN ORDER OF DESCENDING LIKELIHOOD

NOTE: 'SAV' is an abbreviation for Serck Audco Valves

	Trouble	Probable cause	Remedy
8.1	Hard to Operate	A. Lack of Sealant B. Too low temperature C. Dried out sealant D. Damaged gear operator	A. Inject sealant (7.1) B. Inject low temperature sealant and/or insulate the valve C. Flush the valve with valve flush. Follow manufacturers instructions. Consult SAV for recommended sealant D. Consult SAV
8.2	Will not fully open or close	A. Improper setting of gear operator stops	A. Reset stops for proper insulation
8.3	Leaks across seats	A. Lack of sealant B. Incorrect sealant C. Plug set incorrectly D. Damaged seats	A. Inject sealant (7.1) B. Consult SAV with service details C. Adjust gland (7.2), and then inject sealant D. Consult SAV
8.4	Leaks at stem	A. Gland not tight	A. Adjust gland (7.2), and then inject sealant
8.5	Leaks at cover	A. Cover bolting loose- if this does not reseal cover, the suspect B. Damaged cover seal	A. Tighten cover bolts B. Remove from service and consult SAV
8.6	Leaks through central hole in the plug	A. Ball check not seated B. Loose sealant check valve C. Damaged check valve	A. Inject sealant to clean and reseal check valve B. Remove from pressure and tighten check valve C. Remove from pressure and replace check valve
8.7	Leaks through valve body	A. Casting defect, internal corrosion or erosion	A. Remove from line and consult SAV

* **NOTE:** Injecting sealant into a valve that is leaking through the check valve is normally a temporary fix, not a cure.

8.8 ACTUATED VALVES

Resolving operation problems on Standard Type valves fitted with pneumatic, electric, hydraulic or gas/hydraulic actuators should be undertaken using the above recommendations in conjunction with the operator manufacturer instructions.

9

OVERHAUL AND REPAIR

STANDARD TYPE VALVE OVERHAUL AND REPAIR

If by following the in-line maintenance instructions in Section 7 and the Trouble Shooting Guide, Section 8, you are unable to get the Standard Type valve to operate and seal correctly, then please contact Serck Audco Valves or our local representative for further assistance.



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To find your local Flowserve representative
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