

Strahman VALVES, INC.

SAMPLING VALVE

INSTALLATIONS, OPERATING, & MAINTENANCE INSTRUCTIONS

WARNING

Sampling Valve

GENERAL INFORMATION

Before any attempt to operate, maintain, troubleshoot, or repair the Strahman piston type sampling valve, all applicable precautions shall be thoroughly reviewed and understood.

The following general safety notices supplement the specific warnings and cautions appearing elsewhere in this manual. They are recommended precautions that must be understood and applied during operation and maintenance of the equipment.

1. Ensure sampling valves are assembled properly, and are tested and function at their designated pressure.
2. Before performing work on sampling valves, ensure the system is properly depressurized and tagged OUT OF SERVICE, in accordance with system procedures.
3. Do not make any unauthorized alterations to equipment or components.
4. Special precautionary measures are essential to prevent applying pressure to system/equipment at any time work is in progress.
5. Ensure area is well ventilated when using cleaning solvent. Avoid prolonged breathing of fumes and solvent contact with skin or eyes. Avoid use near heat or open flame.

WARNING

NEVER ASSUME THE PIPING SYSTEM IS EMPTY OR IS NOT DANGEROUS BECAUSE THE SYSTEM HAS NOT BEEN USED.

WHEN REPAIRING AND/OR CONDUCTING MAINTENANCE, VALVE SHOULD BE REMOVED FROM SYSTEM AND CLEANED SO AS NOT TO PRESENT A BIOHAZARD.

WARNING

WEAR PERSONAL PROTECTIVE EQUIPMENT AND AVOID PROLONGED CONTACT WITH, OR INHALATION OF, CLEANING SOLVENTS. AVOID USE OF SOLVENTS NEAR HEAT OR OPEN FLAM AND PROVIDE ADEQUET VENTILATION.

WARNING

WEAR PERSONAL PROTECTIVE EQUIPMENT AND EXERCISE EXTREME CAUTION WHEN USING PRESSURIZED AIR. PRESSURIZED AIR CAN DRIVE PARTICLES INTO EYES AND SKIN IF HANDELED IMPROPERLY.

WARNING

WHEN PERFORMING MAINENANCE, WHICH REQUIRES DISASSEMBLY OF SEWAGE EQUIPMENT OR WHEN CONTACT WITH SEWAGE IS POSSIBLE, WEAR PROTECTIVE RUBBER GLOVES, RUBBER BOOTS, SAFETY GOGGLES, SAFETY SHIELDS, AND COVERALLS.

CAUTION



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SAMPLING VALVE INSTALLATIONS, OPERATING, & MAINTENANCE INSTRUCTIONS

TIGHTENING OF THE PACKING GLAND WHILE THE VALVE IS IN THE OPEN POSITION WILL DAMAGE THE PACKING.

CAUTION

VALVE MUST BE IN THE CLOSED POSITION WHEN REMOVING GLAND NUTS.

CAUTION

VALVE MUST BE IN THE CLOSED POSITION WHEN TIGHTENING GLAND NUTS.

CAUTION

DO NOT ALTER CONCENTRICITY OF ANY PART. DO NOT ATTEMPT MINOR REPAIR TO STRIPPED THREADS OR CROSSED THREADS OF FITTINGS OR BOSSES OF COMPONENTS OPERATING UNDER HIGH PRESSURE. LEAKAGE AROUND LOOSE-THREADED PART OR MOVEMENT BETWEEN BOLTED PARTS CAN CAUSE FAILURE OF EQUIPMENT.

INTRODUCTION

This manual presents technical and maintenance information necessary to operate, maintain, and troubleshoot, repair, and install the Strahman piston-type sampling valve. A complete parts breakdown is also provided.

APPLICABILITY

The Strahman piston-type sampling valves are for use where applications of welded flanges are prohibited. They are available in six different sizes with or without a variety of flanges and fittings.

EQUIPMENT DESCRIPTION

The sampling valve piston passes through two compressible packing rings, one above the discharge port and one below (figure 4). These rings keep the sampling valve tightly sealed and free from buildup of material. The inlet ring forms a seal as the piston enters it, providing a tight shut off while the gland ring prevents any flow into the bonnet. When necessary, these rings can be recompressed against the piston by tightening the packing gland. When rings are worn beyond compression they can easily be replaced when the valve is in the closed position and without removing the valve from the system.

The sampling valve is constructed that, when it is in the closed position, the piston extends to the inner surface of the vessel or pipe, to which it is connected. When the piston is retracted to the open position, a sample is guaranteed because it is impossible for any foreign material to gather in the valve, due to the fact that the piston takes up the whole interior of the valve.

The piston-type sampling valve, covered in this manual has been constructed of Stainless steel 316 and TFE packing rings. In addition to this sampling valve Strahman sampling valves are available in a wide range of high performance materials as listed in the repair parts section of the manual. All materials have Pressure-Temperature Ratings according to the methods of ANSI B16.34.

INSTALLATION:

INTRODUCTION

This section describes the installation of the Strahman piston-type sampling valve in a piping system. No special tools are required for installing the valve.

Unpacking:



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Each valve is normally packed completely assembled.
Remove the valve from box and observe the following:

1. Unwrap valve. Check for damage that may have occurred during shipment.
2. Verify serial number, stamped on valve body, to ensure valve is suited to system requirements.

Repacking:

Observe the following:

1. Drain all fluids and completely remove all dirt, debris, etc. from valve.
2. Make sure all parts are assembled at least hand tight. Do not ship loose parts.
3. Wrap valve in brown paper and place in proper shipping container.

GENERAL

When installing or replacing a sampling valve, ensure the specifications identified and applicable system drawings are adhered to for the valve being installed or replaced.

INSTALLATION INSTRUCTIONS

1. Close and tag all valves immediately upstream in the system to prevent pressurized liquid from reaching the installation location.

WARNING

NEVER ASSUME THE PIPING SYSTEM IS EMPTY OR IS NOT DANGEROUS BECAUSE THE SYSTEM HAS NOT BEEN USED.

2. Thoroughly clean all end connections of the pressurized pipe, outlet pipe, and valve body prior to performing connection procedures.
3. Place valve in position and check alignment of the system piping. Valve pressure inlet port is at the top of valve; outlet port is at the side.

4. Correct any misalignment that will place strain on the valve when installed.
5. Ensure there are no restrictions at the valve inlet and outlet.
6. Install proper gasket at the inlet/inlet flange. Install proper flange bolts and nuts. Torque flange bolts and nuts to applicable system operating instructions.
7. Remove all tags installed previously and open valves immediately upstream in the system in accordance with system operating instructions.
8. Check valve connections for leaks and repair any leaks found.

OPERATION:

INTRODUCTION

This section describes the operation of the Strahman piston type-sampling valve. Once valve is installed into system, the crank handle as described below easily operates the valve.

OPENING INDICATOR

The opening indicator indicates to the operator of the valve that the product, which is normally under pressure, is in position to start flowing through the valve and tells the operator to be cautious and open the valve slowly so there will not be a sudden surge of product.

The Indicator is attached to the valve directly under the crank handle and extends up the side of the bonnet. When the valve is in the fully closed (extended) position (step 1), the indicator extends beyond the upper edge of a raised ring on the bonnet, which is marked "OPENING".



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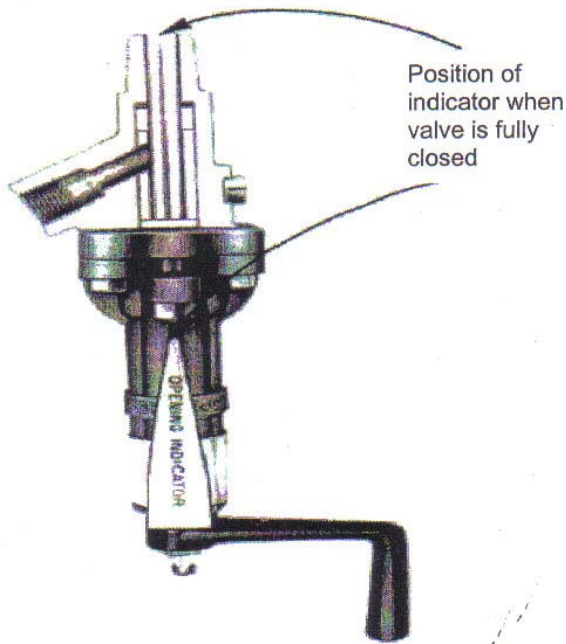


FIGURE 1A. INDICATOR POSITION (STEP 1)

As the operator turns the crank handle counter-clockwise, the indicator lowers (step 2) as the piston is being retracted to the fully open position.

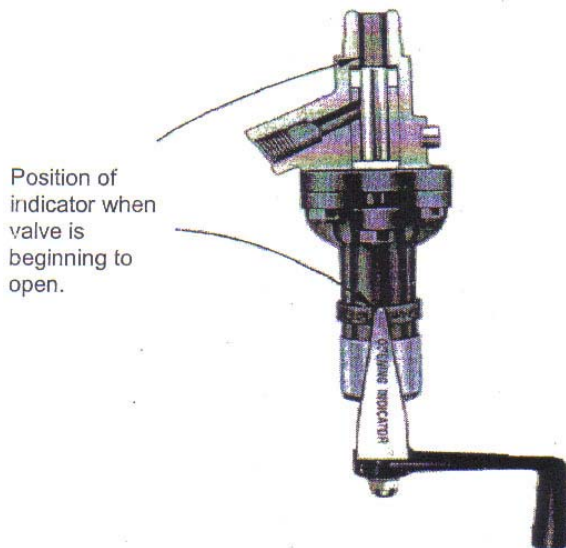


FIGURE 1B. INDICATOR POSITION (STEP 2)

When the tip of the indicator is flush with the upper edge of the “OPENING” ring on the bonnet (step 3), it is indicating that the piston is moving through the seal ring and the product is ready to flow through the valve.

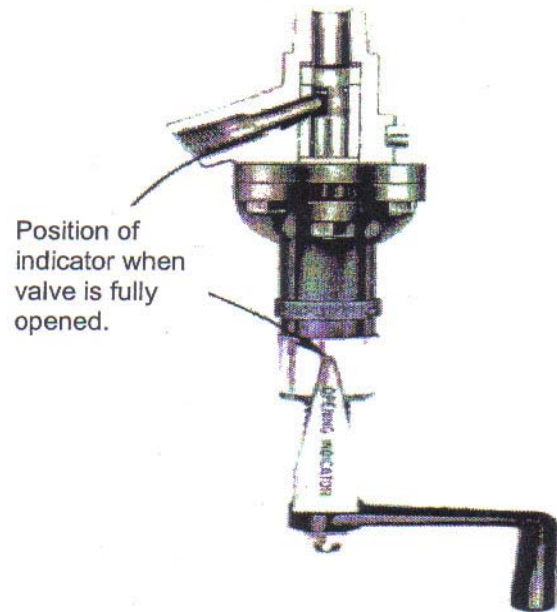


FIGURE 1C. INDICATOR POSITION (STEP 3)

At this point, the operator should turn the crank handle slowly to avoid any sudden burst of product, which would be under pressure.

TROUBLESHOOTING:

INTRODUCTION

The Strahman piston-type sampling valve, could malfunction in one or more ways: external leakage, crank handle nonoperative, failure to close, or internal leakage. Repair any malfunction that occurs with the valve. Detailed disassembly, inspection and assembly instructions are covered in the next section of this manual. To avoid repetition of instruction, refer to the applicable paragraph in next section for step-by-step procedures. Torque specifications are in table 3.



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SAMPLING VALVE TROUBLESHOOTING.

INSTALLATIONS, OPERATING, & MAINTENANCE INSTRUCTIONS

Table 2 is the Strahman piston-type sampling valve, troubleshooting guide, which lists possible malfunctions, probable causes for malfunction, and corrective actions for remedying the fault.

CAUTION

TIGHTENING OF THE PACKING GLAND WHILE VALVE IS IN THE OPEN POSITION WILL DAMAGE THE PACKING.

CORRECTIVE MAINTENANCE

INTRODUCTION

This section focuses on the instructions needed in the removal, inspection, cleaning, repair, and replacement of the Strahman piston-type sampling valve components. Table 3 provides torque values for threaded parts. The source of repair items is listed to only those parts listed in table 6, parts list. Table 4 lists special tools required in addition to basic standard shop tool kit.

TABLE 3. TORQUE SPECIFICATIONS

PARTS DESCRIPTION	TORQUE
Bonnet Nut	150 in/lbs
Bonnet Stud	100 in/lbs
Gland Nut Min. (see note below)	50 in/lbs
Gland Stud	125 in/lbs (on graphite)
Lock Nut	100 in/lbs
Cage Lock	60 in/lbs
Bushing Lock Screw	40 in/lbs
Split nut	250 in/lbs

TABLE 4. SPECIAL TOOLS AND MATERIAL

Seating Tool	10 lbs
Pulling Tool	20lbs
Lubrication(Grease)	Navastane 2 Plus ASTM D-217, D-2265, D-2266, D-1264, D-130, D-92, D-97

NOTE

Rings must face gland after installing rings and before torquing gland nuts. Lubricate gland stud threads, torque gland nuts to 50 in/lbs Min. If leakage occurs, torque in 25 in/lbs increments until seal is made. Valve must be in "**CLOSED POSITION**" when tightening gland nuts.

VALVE RING REPLACEMENT

WARNING

WHEN REPAIRING AND/OR CONDUCTING MAINTENANCE, VALVE SHOULD BE REMOVED FROM SYSTEM AND CLEANED SO AS NOT TO PRESENT A BIOHAZARD



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Troubleshooting Guide Table 2

Note: Always tighten gland nuts while valve is in the closed position to prevent damage to the packing.

Malfunction	Possible Causes of Malfunction	Corrective Action
Leaking at inlet, outlet and gland area	* Debris preventing valve from fully sealing	* Check body bore / branch and clear any obstructions
	* Loose packing	* Tighten gland nuts following torque spec in Table 3.
	* Scoring on piston	* Repair or replace- Contact Strahman Valve Customer Service
Leaking around cage lock	* Loose cage lock	* Tighten cage lock following torque spec in Table 3
	* Missing or damaged gasket	* Replace Gasket
	* Ensure only one gasket is in place and not doubled up	
Leaking at flange	* Uneven tightening of the bolting during installation.	* Reinstall valve evenly tightening bolting
	* Missing or damaged gasket	* Graphite gaskets cannot be reused
Valve in fully open position won't close	* Gland nuts were tightened while valve was open	* Loosen gland nuts and try and to close valve. Once valve is fully closed re torque to specs found in Table 3 If graphite was used then it might need to be replaced. Graphite loses its integrity if not compressed evenly around the piston which only happens when piston is in the closed position as the gland is being adjusted.
Difficult to actuate	* Packing adjusted too tight	* Loosen gland nuts, check actuation. If valve functions correctly re torque gland nuts to specs found in Table 3
	* Debris in stem path	* Look for obstructions
	* Dry stem	* Lubricate stem

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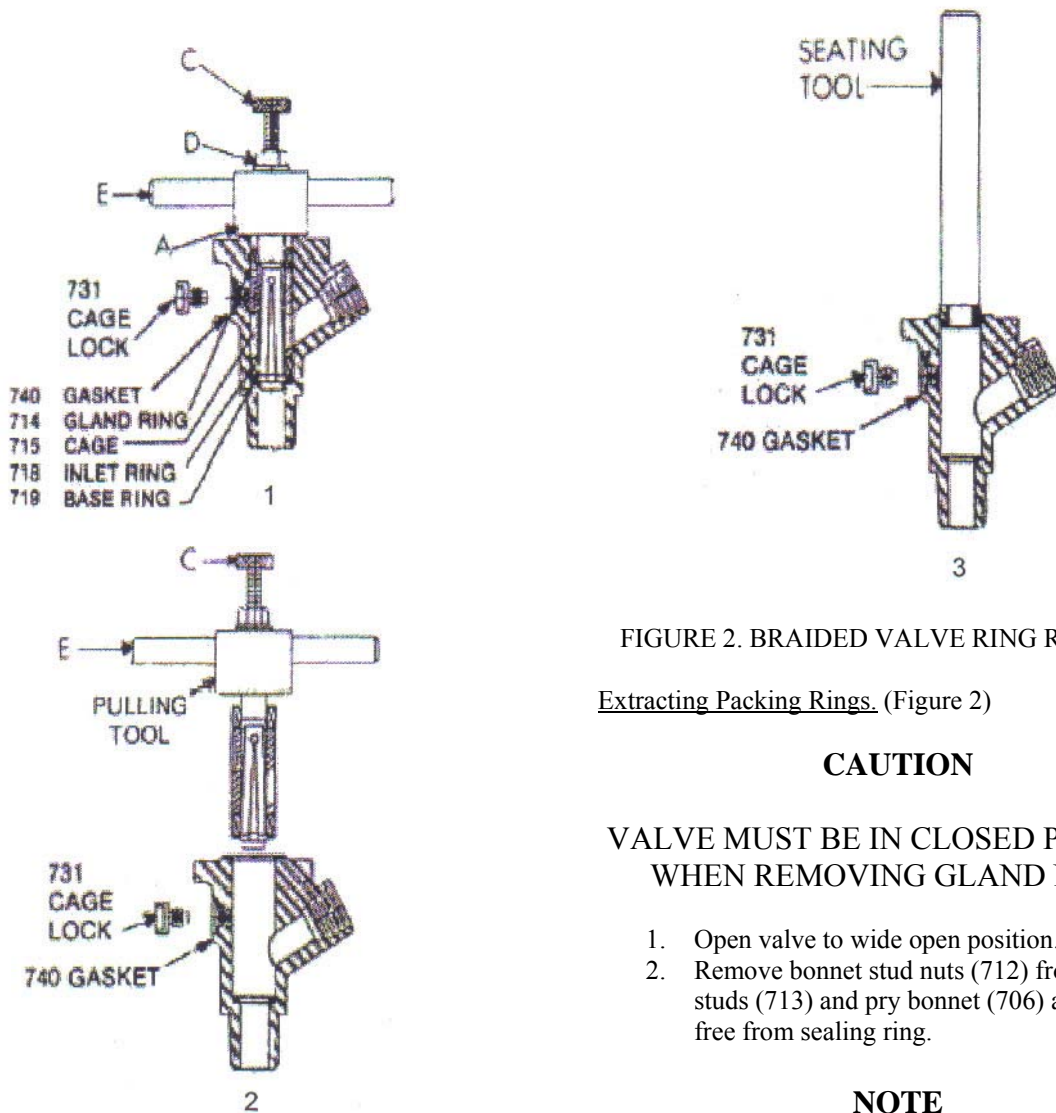


FIGURE 2. BRAIDED VALVE RING REMOVAL

Extracting Packing Rings. (Figure 2)

CAUTION

VALVE MUST BE IN CLOSED POSITION
WHEN REMOVING GLAND NUTS.

1. Open valve to wide open position.
2. Remove bonnet stud nuts (712) from bonnet studs (713) and pry bonnet (706) assembly free from sealing ring.

NOTE

Piston should be protected from damage.

3. Remove gland nuts (724) from gland studs (725) and remove gland (708).
4. Remove cage lock (731) and cage gasket (740).
5. Insert pulling tool into valve body (720) until bronze cap 'A' rests on body deck.
6. While holding knurled knob 'C' in the clockwise direction, turn hex nut 'D' with wrench in clockwise direction until it releases.



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7. Pull on crossbar 'E' to remove sealing rings and cage from the pulling tool.
8. Turn knurled knob 'C' in clockwise direction to free the sealing rings and cage from the pulling tool.

Installation of Braided Valve Ring

CAUTION

VALVE MUST BE IN THE CLOSED POSITION WHEN TIGHTENING GLAND NUTS.

NOTE

When 2 braided rings are required, install rings with cut 180° opposite each other. Braided rings are to be used in gland only.

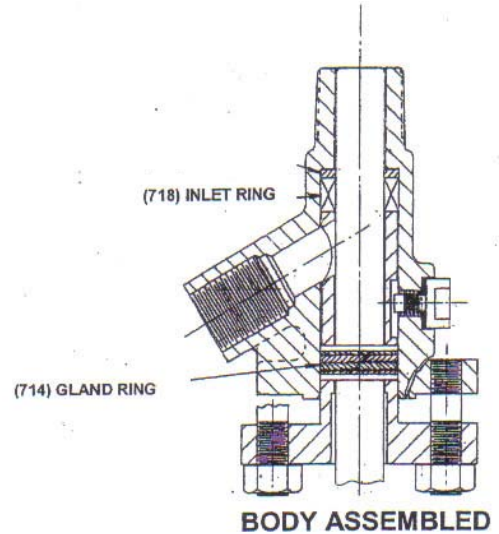
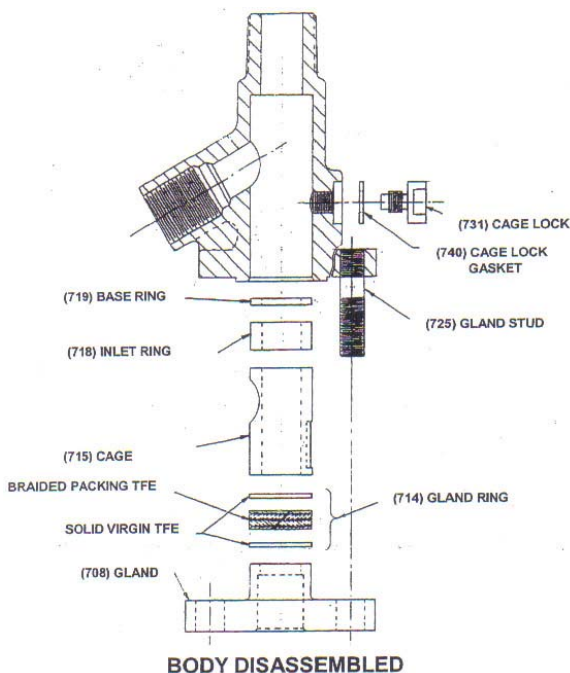


FIGURE 3. BRAIDED VALVE RING INSTALLATION (Newer SV500, 600, & 700s do not have base rings)

1. Using the seating tool install the inlet ring (718) into the valve body (720).
2. Replace cage (715) making sure that it is installed so that the cage lock (731) with cage lock gasket (740) can be pulled up tight. This ensures proper location of the discharge port. Install the gland ring (714), tapping firmly using the seating tool.
3. Install gland (708). Install gland nuts (724) onto gland studs (725) hand tight.
4. Insert bonnet (706) into sealing ring and tap into place until bonnet and body surfaces are flush.
5. Install bonnet nuts (712) and tighten to the torque value specified in table 3.
6. Tighten gland nuts until gland has proper tension per torque values as per table 3.

DISASSEMBLY

Piston, Splitnut, Stem, Bonnet, and/or Bushing Disassembly.



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may be provided for a particular item in addition to those presented here.

WARNING

WHEN PERFORMING MAINTENANCE, WHICH, REQUIRES DISASSEMBLY OF SEWAGE EQUIPMENT OR WHEN CONTACT WITH SEWAGE IS POSSIBLE, WEAR PROTECTIVE RUBBER GLOVES, RUBBER BOOTS, SAFETY GOGGLES, SAFETY SHIELDS, AND COVERALLS.

1. Follow Extract Packing Rings procedure for removal of bonnet assembly.
2. With bonnet assembly removed turn crank handle (742) until piston (717) is fully extended.
3. Remove lock nut (701) and crank handle (742).
4. Turn stem (707) by hand or use adjustable wrench until the threaded section can be reached below the bonnet.
5. Remove stem and piston assembly from bonnet.

NOTE

Split nut has left hand threads and should be turned clockwise to loosen.

NOTE

Piston should be held in a soft-jawed vise, or its surface protected to avoid damage.

6. Pull stem from piston by removing the split nut (716).
7. If bushing (705) is to be replaced, loosen lock screw (704) and back out bushing.

CLEANING.

The following are general cleaning procedures to be used during repair. Specific cleaning procedures

WARNING

WEAR PERSONAL PROTECTIVE EQUIPMENT AND AVOID PROLONGED CONTACT WITH, OR INHALATION OF, CLEANING SOLVENTS. AVOID USE OF SOLVENTS NEAR HEAT OR OPEN FLAME AND PROVIDE ADEQUATE VENTILATION.

1. In well-ventilated area, wash all metal parts with approved mineral-based cleaning solvent. Give special attention to threads, internal passages, and bores. Use stiff-bristled brush to remove hardened deposits of dirt and other contaminants on non-critical surfaces.
2. Remove grease, debris, or dirt from exterior surfaces with solution of approved water-soluble detergent and water.

WARNING

WEAR PERSONNEL PROTECTIVE EQUIPMENT AND EXERCISE EXTREME CAUTION WHEN USING PRESSURIZED AIR. PRESSURIZED AIR CAN DRIVE PARTICLES INTO EYES AND SKIN IF HANDLED IMPROPERLY.

3. After cleaning, dry parts using filtered, dry, low-pressure air (maximum 30 psi) or with lint-free cloth.

INSPECTION

The following general procedure shall be used for inspection of components during repair. Whenever possible, all parts shall be visually inspected using a strong light and a means of magnification.



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1. Examine all parts for excessive wear, deformities, or deterioration that may render the valve unserviceable.
 2. Examine all parts for pitting, scoring, scratches, nicks, and accumulation of hardened dirt deposits and other contaminants.
 3. Inspect all machined, mating, and sealing surfaces for cracks, pits, scoring, scratches, uneven wear, and failure of parts to seat unevenly.
 4. Inspect all threaded areas for striped threads and evidence of cross threading.
 5. Examine areas adjacent to threads and bends for cracks.
 6. Inspect stuffing box in valve body for nicks, scratches, and burrs.
2. Remove corrosion from metal surfaces by polishing with crocus cloth (400 grit), then polish as indicated in step 1.
 3. Remove minor nicks and scratches from metal surfaces by polishing with crocus cloth (400 grit). Blend out edges of reworked area and polish as indicated in step 1.
 4. When rework is required on mating surfaces, finish lap using a lapping machine.
 5. Break all sharp edges after lapping using a rubberized abrasive stick for nonferrous metal parts or a fine India oilstone for ferrous metal parts.

REPAIR

Repair parts not meeting inspection requirements in accordance with standard shop practices using standard shop tools along with those listed in table 4. Minor repair to precision-machined parts may be performed if fits and clearances are maintained and part reliability is not impaired.

CAUTION

TO PREVENT EQUIPMENT DAMAGE, DO NOT ALTER CONCENTRICITY OF ANY PART. DO NOT ATTEMPT MINOR REPAIR TO STRIPPED THREADS OR CROSSED THREADS OF FITTINGS OR BOSSES OF COMPONENTS OPERATING UNDER HIGH PRESSURE. LEAKAGE AROUND A LOOSE-THREADED PART OR MOVEMENT BETWEEN BOLTED PARTS CAN CAUSE FAILURE OF EQUIPMENT.

1. Remove light surface discoloration from bare metal surfaces using cloth saturated with liquid metal polish. Remove discoloration by rubbing briskly and then polish with a clean, lint-free cloth.

REPLACEMENT

Parts not meeting inspection requirements or not within allowable wear limits after repairs have been made shall be replaced. Replace parts in accordance with standard shop practices using standard shop tools along with those listed in table 4, as required.

1. Replace any parts that have been identified during inspection.
2. When the serviceability of any part is questionable, replace the part.
3. Replace all gaskets and rings during reassembly. Retain used items until availability of replacement parts is determined.
4. When old parts are reused, equipment and system should be closely monitored for leakage.

REASSEMBLY

Piston, Split nut, Stem, Bonnet, and/or Bushing Reassembly.

1. Replace bushing (705) and tighten lock screw (704) to the torque values specified in table 3.

NOTE

Split nut has left hand threads and should be turned counter-clockwise to tighten.



SAMPLING VALVE INSTALLATIONS, OPERATING, & MAINTENANCE INSTRUCTIONS

2. Install stem (707) into piston and turn split nut (716) counter-clockwise and tighten to the torque values specified in table 3.
3. Install stem assembly into bonnet (706) by threading section through bushing until the square appears through the bushing (705).
4. Continue turning clockwise until the piston (717) is partially retracted.
5. Insert bonnet assembly into valve body (720).
6. With gland (708) in place loosely, slide piston (717) through gland ring (714) by tapping on end of stem with a rawhide maul. If this is not available, temporarily put lock nut (701) onto threads of stem to protect threads and pat with hammer until piston slides into gland ring.

CAUTION

VALVE MUST BE IN THE CLOSED POSITION WHEN TIGHTENING GLAND NUTS.

7. While holding bonnet, turn stem counter-clockwise and guide bonnet over bonnet studs (713) until seated on bonnet deck.
8. Replace bonnet nuts (712) onto bonnet studs (713) and tighten to torque values specified in table 3.
9. Install crank handle (742) onto stem and tighten lock nut (701) to the torque values specified in table 3.
10. Turn crank handle (742) in closing direction until piston (717) passes through inlet ring (718).
11. Install gland nuts (742) onto gland studs (725). Tighten gland nuts until gland has proper tension as per torque values specified in table 3.
12. Valve is ready to be placed in service.

Lubrication Instructions

Valve lubrication is only required on threaded parts during installation, maintenance, and/or repair.

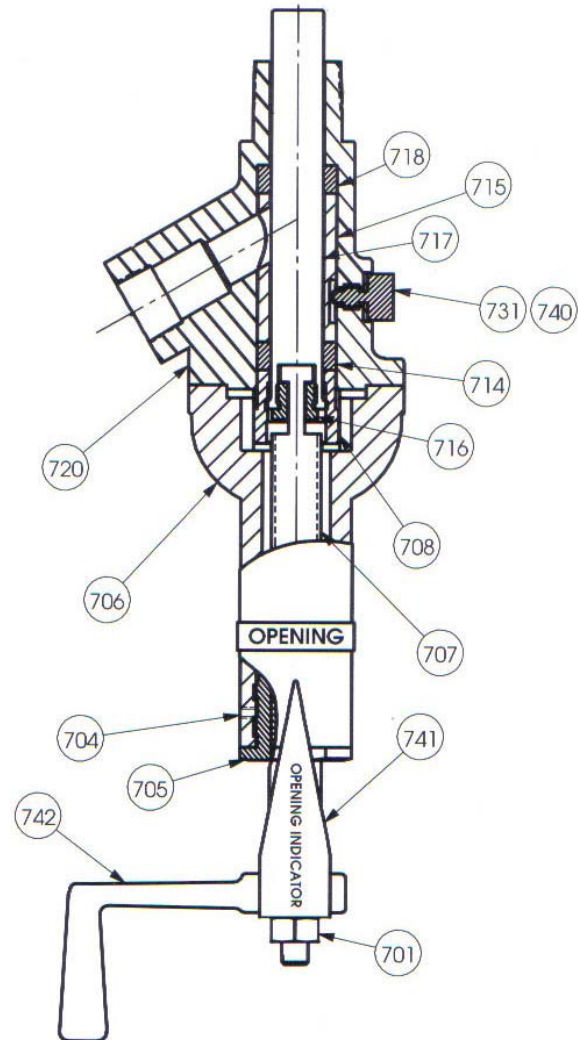


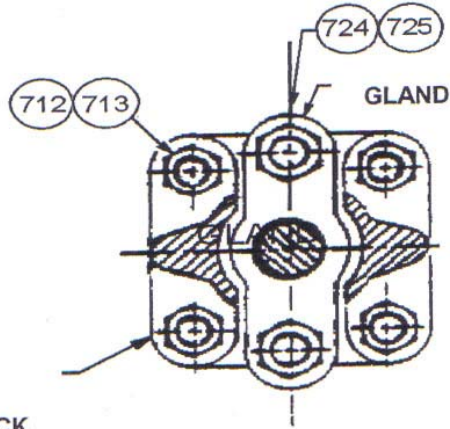
FIGURE 4. PISTON-TYPE SAMPLING VALVE



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BODY DECK

FIGURE 5. BODY DECK

INTRODUCTION

This section of the manual contains the parts to repair the Strahman piston-type sampling valve. Table 6, parts list, contains a list of removable parts associated with the valve assembly.

Sampling valves are made standard in two types, hand operated or air cylinder operated. Socket weld connections are also available. The Strahman piston-type sampling valve in this manual is hand operated and consists of a male NPT inlet and a female NPT discharge.

The piston-type sampling valve has all wetted parts made in these available materials, type 304, 304L, 316, 316L Stainless Steel, Nickel, Inconel, Hastelloy B & C, Alloy 20 Stainless Steel, Monel 400, and Titanium.

ONBOARD REPAIR PARTS

The SV number is required along with the part number and part name when ordering replacement parts.

1. Recommended onboard repair parts are items:
 - 1-#705 Bushing
 - 1-#707 Stem
 - 1-#714 Gland Ring
 - 1-#716 Split Nut
 - 1-#717 Piston

- 1-#718 Inlet Ring 1-#740 Cage Lock Gasket Standard Sampling Valve Service Kit shall consist of:
- 6-#714 Gland Rings
- 6-#718 Inlet Rings
- 6-#740 Cage Lock Gaskets
- 1-Puller Tool
- 1-Seater Tool

MANUFACTURER

Manufacturer 5-digit code as listed in Commercial and Government Entity (CAGE) Codes Handbook H4/H8.

CAGE

97141

Manufacturer

Strahman Valves, Inc.
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Addendum to installation instructions

Caution should be taken to ensure continued safe operation of the Strahman Sampling Valve. When and where applicable, particular care should be exercised in the following areas: Earthquake, external piping loads, unstable fluids, wear and erosion, surface temperature and over/under pressure and temperature during operation. Additionally, only bolting and gaskets as permitted by B16.5 are to be used.





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STORAGE INSTRUCTIONS

- * Valves should be stored in a clean and dry place and protected against possible shocks.

- * All internal parts are clean and dry; end openings and flange facings are covered by protection which must be left in place until installation.

- * Valves are delivered with piston in the closed position and must remain in that position until installation to avoid risk of dirt or foreign bodies penetrating during storage and handling.

- * Before testing, ensure that all operating parts work correctly and that no foreign bodies (welding wire, etc) have penetrated into the valve.

- * Wash if possible. If the material has been stored for a long period of time, we recommend greasing the mechanical parts.