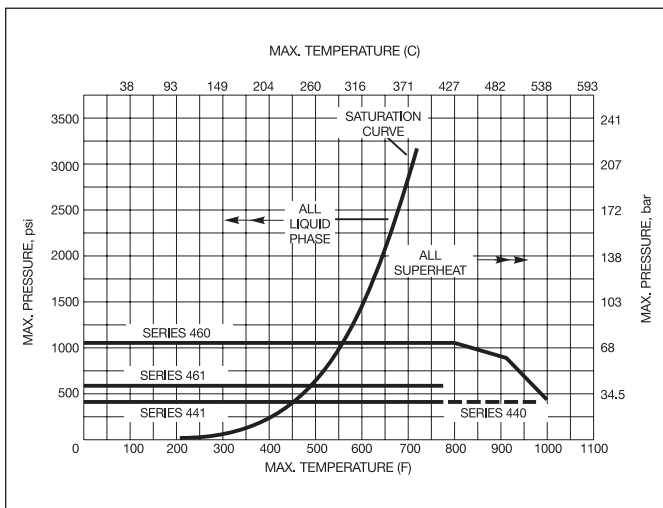


how to install and service series 400 integral strainer impulse® steam traps to 600 psig (42 bar)

RATINGS

Operating Pressure Ranges



Shell Pressure/Temperature Ratings

Back Pressure Limits

Piston Valve traps rated to 400 psig (28 bar) (incl.) are factory set to operate from 20 psig (1.4 bar) to maximum rated pressure. Maximum allowable back pressure at trap outlet equals 40% of pressure at trap inlet. (Based on absolute pressure.)

Piston Valve traps rated to 600 psig (42 bar) (incl.) are factory set to operate from 40 psig (2.8 bar) to 600 psig (42 bar). Maximum allowable back pressure at trap outlet equals 25% of pressure at trap inlet. (Based on absolute pressure.)

Note: The traps operate over the specified ranges without adjustment. Piston Valve Traps may be adjusted to operate between 10 psig (.7 bar) and the minimums stated above by removing the split washer (see disassembly section.) Back pressures higher than the percentages stated above will cause the traps to blow open. Where normal system back pressures are high, removal of the split washer will also permit operation against back pressures up to 55% of pressure at trap inlet. (Based on absolute pressure.)

Disc Valve traps rated to 600 psig (42 bar) (incl.) operate from 4 psig (.28 bar) to maximum rated pressure. Maximum allowable back pressure at trap outlet is 60% of pressure at trap inlet. (Based on absolute pressure.)

SERIES NUMBERS

To determine the size, series number, and pressure-temperature rating refer to the nameplate on the trap body.

Suffix Letter Identification

- SW Socketweld ends
- FL Flanged ends (special option only)
- A, B, C, D Internal part size
- E Navy (Flanges per MIL-T-960E)
- D Navy (Flanges per MIL-T-960D)

Size End Conn.	Figure Number	Internal Parts		Available End Connections	Rating, psig-F (bar-C)
		Piston	Disc		
1/2"	440			SW, FL	400-975 (28-524)
	441	A or B	D	SW	400-775 (28-413)
	460			SW, FL	600-975 (42-524)
	461			SW	600-775 (42-413)
3/4"	440			SW, FL	400-975 (28-524)
	441	A, B, C	D	SW	400-775 (28-413)
	460			SW, FL	600-975 (42-524)
	461			SW	600-775 (42-413)
1"	440			SW, FL	400-975 (28-524)
	441	A, B, C	D	SW	400-775 (28-413)
	460			SW, FL	600-975 (42-524)
	461			SW	600-775 (42-413)

Notes:

- (1) 400 psi (28 bar) socket weld end traps are furnished for 300 psi (21 bar) and 150 psi (10.5 bar) ratings.
- (2) All flanged end traps are of chrome moly steel construction. Socket weld end traps in the series 440 or 460 are chrome moly steel construction. Series 441 and 461 socket weld end traps are constructed from carbon steel.

WARNING—Hot discharge from this product may cause severe burns. Discharge must be piped away or directed so that persons in the vicinity are not endangered. This product must be isolated, vented and cool to the touch before repairing or inspecting.

INSTALLATION

Piping to and from the trap should be equal to trap size or one size larger. Discharge line for short runs equal to trap size; larger for long runs. Avoid configurations that would cause excessive back pressure.

Locate Trap below outlet from equipment (gravity flow). If trap must be above drain provide a “U” or lift fitting at the bottom of the riser before the trap (water seal). The trap may be installed in a horizontal or vertical line or at any angle so long as the discharge is downward or horizontal.

Valves—Use gate type for isolating, globe type for strainer blowdown, or for test (see Figure No. 1). Bypasses not recommended except for critical installations. If discharge is to a multi-station or overhead return, put a swing check valve in discharge line to prevent backflooding on shut-down.

Blow the System Out before installing the trap. Frequent strainer blowdown or cleaning is recommended on a new system. Conditions will dictate frequency of blowdown in normal operation.

Welding—Socket welding or seal welding of this trap body to the piping should be completed according to applicable Codes, Standards and Procedures.

DO NOT make electrical welding connections to the trap body or any other part of the trap to prevent internal arcing. Electrical ground should be made to the pipe and not the trap.

The standard body material for series 400 traps is ASTM A182 GR F11, with controlled carbon to .15% MAX. The trap is also available in ASME SA-105 with Carbon controlled to .25% MAX, Manganese controlled to 1.25% MAX and normalized. See underside of body for material designation.

Note: It is not necessary to disassemble the trap prior to welding, but avoid subjecting the internals to temperatures higher than 500F.

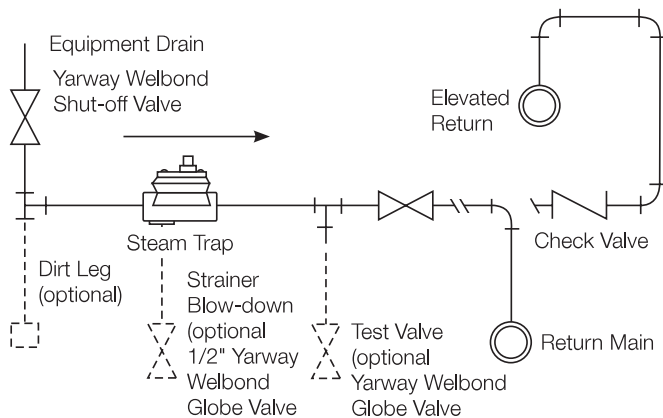


FIG. 1

MAINTENANCE

Check bonnet nut torque after 48 hours of operation.

1. For best trap operation and maximum service life, strainer screen should be cleaned frequently. This can best be done by using a blowdown valve connected to blow-off connection.

2. Periodically remove the bonnet and clean and inspect the screen. This should be done at least once a year, and more frequently if the trap is not fitted with a strainer blowdown valve.
3. When cleaning the strainer it is recommended that the trap be inspected and working parts cleaned if necessary. In the event of condensate drainage problems, check before opening the trap whether the trouble is due to a clogged line, valve broken or in wrong position, or dirty strainer requiring blowdown.
4. More frequent checks for proper trap operation can be quickly made by one of the following methods:
 - a. Observe the discharge from the trap through the test connection—first closing the downstream stop valve.
 - b. Hold screwdriver or metal rod against base of cap. Listen for characteristic clicking sound of valve as it opens and closes.
 - c. Check temperature of the cleaned pipe surface up and downstream of trap. Use a touch pyrometer or temperature sensitive crayon.

If trap is remaining open continuously or not operating at all:

- strainer screen may be damaged or dirty
- parts may be worn from service
- dirt and scale may be lodged in internals

Disassemble and inspect the trap.

DISASSEMBLY

Piston Valve Type

1. Remove bonnet and unscrew seat.
2. The valve is larger in diameter than the open end of the cylinder. To remove the valve from the cylinder, push valve into back of cylinder, squeeze open end of cylinder lightly with pliers—then tilt the valve out of the cylinder.
3. Inspect and clean all parts. If satisfactory, reassemble trap. If internals require replacing, remove cap nut and lock pin. Then using wrench and screwdriver simultaneously loosen control cylinder and locknut. Remove split washer and unscrew control cylinder. See page 4 for renewal kit installation and assembly.

Note: To reset trap for low pressure operation, omit split washer when reassembling. Tighten locknut lightly against bonnet.

- 1 -Body
 - 2 -Bonnet
 - 3 -Cap nut
 - 4 -Stud (4)
 - 5 -Nut (4)
 - *6 -Seat
 - *7 -Control Cylinder
 - *8 -Valve
 - *9 -Split washer
 - *10 -Locknut
 - *11 -Lock pin
 - *12 -Cap Gasket
 - *13 -Bonnet Gasket
 - *14 -Seat Gasket
 - *15 -Screen
- * Renewal kit parts for series 460 and 461 traps only

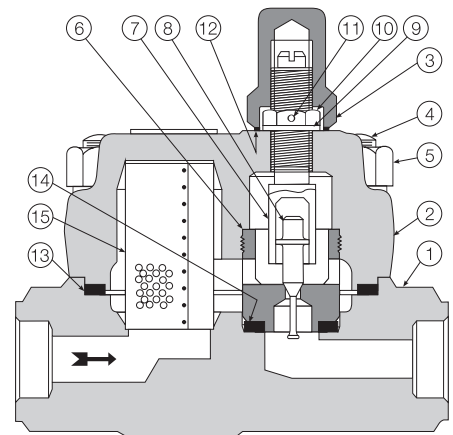
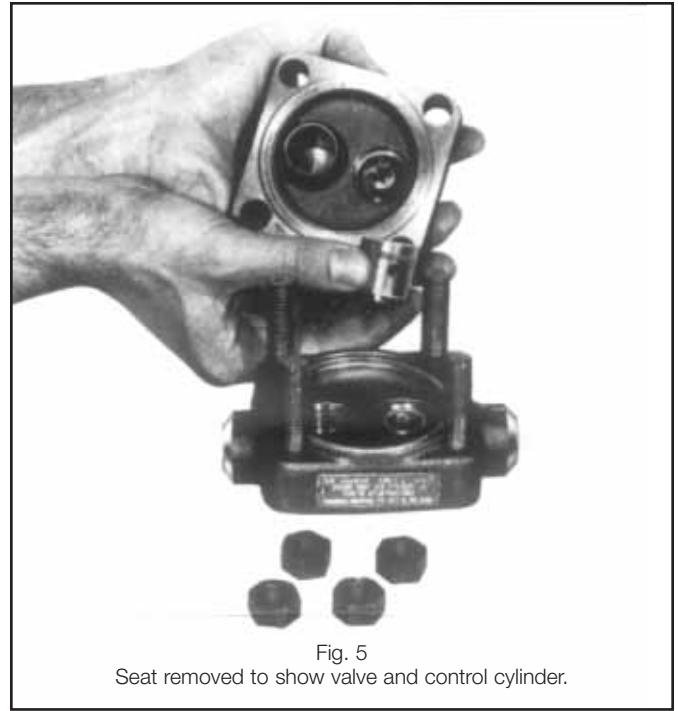
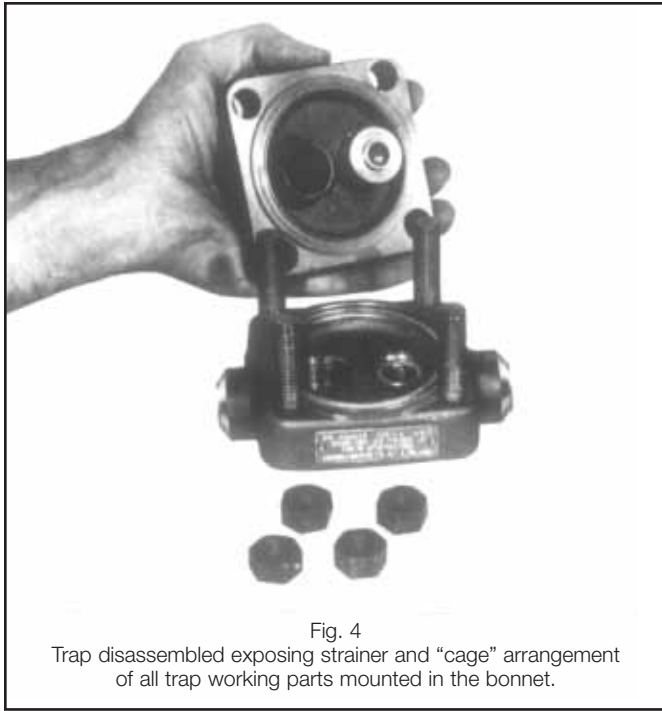


FIG. 2—Piston Valve Type



Disc Valve Type

1. Remove bonnet and unscrew seat.
2. Inspect and clean all parts. If satisfactory, reassemble trap. If internals require replacing, remove cap nut. Then using wrench and screwdriver simultaneously loosen adapter and locknut and unscrew adapter. See page 4 for repair kit installation and assembly.

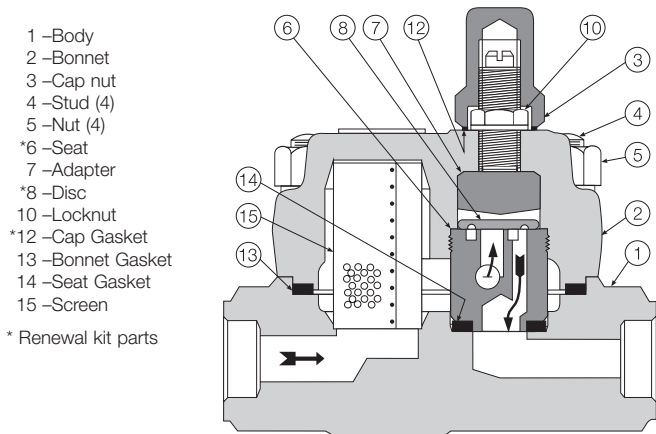


FIG. 3-Disc Valve Type

SERVICING

After disassembly clean internal parts with a cloth and a non-corrosive solvent. Heavy deposits may be cleaned from orifice in top of piston valve with a piece of fine wire or toothpick.

BE CAREFUL not to damage valve orifice, disc edge, or control cylinder bore (piston valve trap). Under no circumstances should crocus cloth or tools be used to clean these parts.

Inspect control cylinder bore, valve and seat for wear (disc and seat in disc type trap). Worn parts cause inefficient or

improper operation. They should be replaced with a factory-set renewal kit.

CAUTION: The valve, seat and control cylinder of the renewal kit are matched parts. They are not individually interchangeable with similar parts from other repair kits. Do not re-use any of the old parts when installing a new renewal kit. Always use new gaskets.

Repair kit of the disc type trap does not include bonnet and seat gasket. These should be ordered separately.

Clean the strainer screen with air or steam blast or wash in solvent.

SPARE PARTS, SPECIAL TOOLS

To cover a one year service period, it is recommended that spare parts be stocked as follows:

- A. One (1) repair kit for every four (4) integral strainer traps installed of same internals. (Minimum number of kits—1) and sufficient gaskets for trap inspection.

Steam Trap Fig. No.	Renewal Kit Part Number
460 A 461 A	963559-01
460 B 461B	963559-02
460 C 461 C	963559-03

For the disc valve type trap, the use of a spanner wrench (J. H. Williams #0-471A) is recommended for seat removal and tightening.

RENEWAL KIT - Piston Valve Type

Installing Renewal Kit–Reassembly

1. Clean sealing surfaces and all internal parts.
2. Clean studs and nuts and lubricate studs and nut faces with high temperature lubricant, such as “Molykote.”
3. Remove lock pin, split washer and nut from control cylinder stem.
4. Lubricate threads. Screw control cylinder into bonnet.
5. With valve in cylinder, lubricate threads, screw seat into bonnet–be sure valve enters seat orifice and that seat contacts the bottom of the counterbore in the bonnet.
6. Replace split washer, locknut (bevel up), and fully insert lockpin.
7. Screw cylinder down; tighten locknut per Table 1.
8. Push screen into body recess and with body and seat gaskets in place lower bonnet over studs.
9. Replace bonnet nuts, hand tighten, then tighten alternately to the torque indicated in Table 1.
10. Clean cap and bonnet gasket surfaces, install new gasket, and lubricate threads. Replace cap and tighten per Table 1.

Table 1

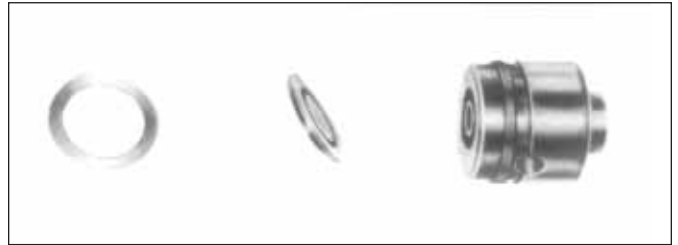
Torque Values ft-lbs (N•m)	
Bonnet Nuts	65-70 (88-95)
Cap Nut	25-30 (34-41)
Locknut	7.9-8.3 (10.7-11.3)



4. Place disc in chamber (groove facing seat); lubricate threads, screw seat into bonnet and tighten firmly.
5. Push screen into body recess and with body and seat gaskets in place lower bonnet over studs.
6. Replace bonnet nuts, hand tighten, then tighten alternately to the torque indicated in Table 2.
10. Clean cap and bonnet gasket surfaces, install new gasket, and lubricate threads. Replace cap and tighten per Table 2.

Table 2

Torque Values ft-lbs (N•m)	
Bonnet Nuts	65-70 (88-95)
Cap Nut	25-30 (34-41)
Locknut	7.9-8.3 (10.7-11.3)
Seat	70-80 (95-109)



RENEWAL KIT - Disc Valve Type

Installing Renewal Kit–Reassembly

1. Clean sealing surfaces and all internal parts.
2. Clean studs and nuts and lubricate studs and nut faces with high temperature lubricant.
3. Lubricate threads. Screw adapter into bonnet; tighten firmly and lock with locknut.



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