

# INSTRUCTION MANUAL

INSTALLATION – OPERATION – TROUBLESHOOTING – MAINTENANCE

## DIRECT ACTING PRESSURE REDUCING VALVE MODEL T-SERIES



Please reference the valve Serial Number whenever ordering parts or contacting the factory. The Serial Number is located on a metal tag pinned to the valve body or cap.

**SERIAL NUMBER**

**S** \_\_\_\_\_



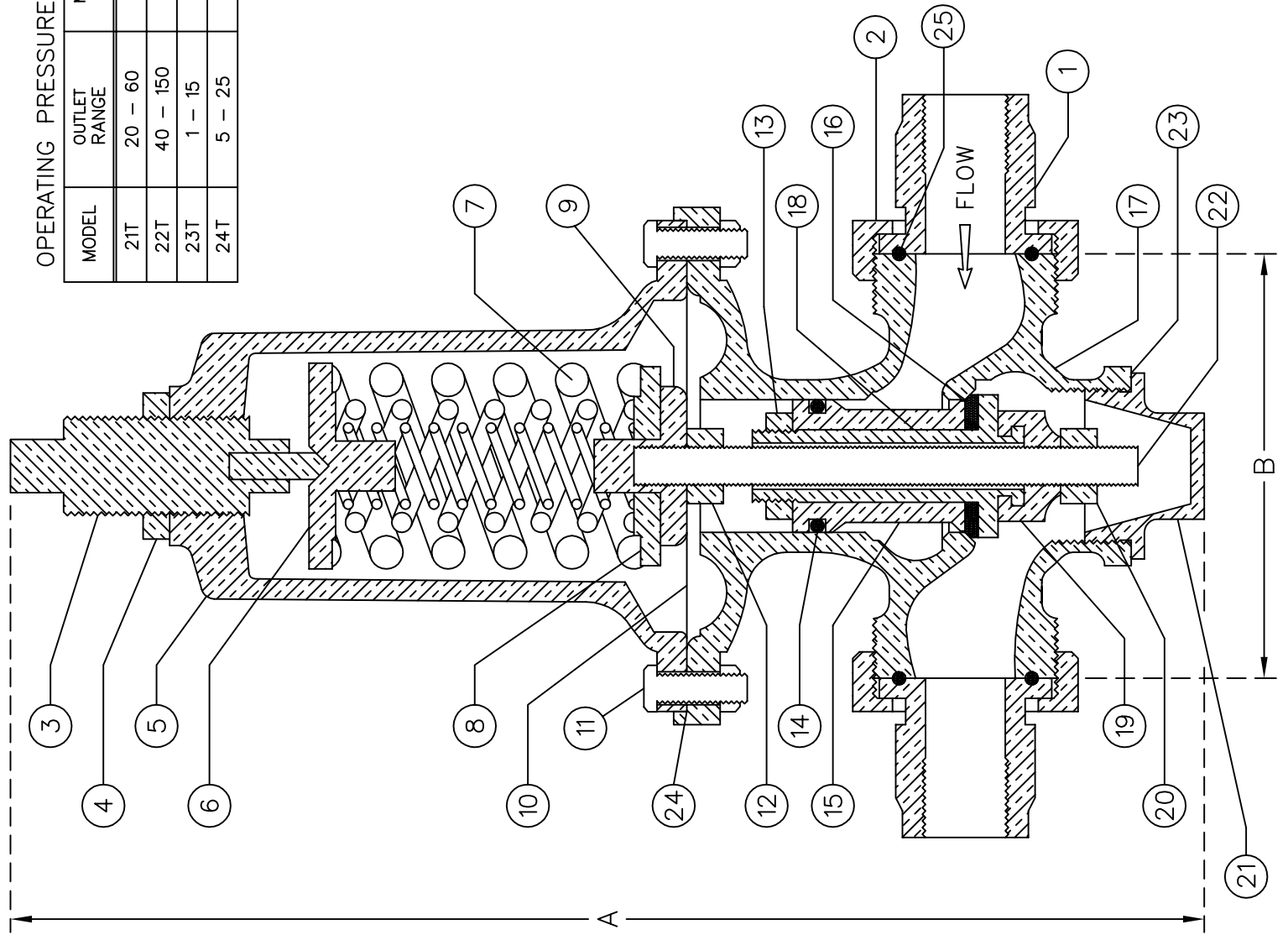
Ross Valve Mfg. Co., Inc.  
6 Oakwood Ave, Troy, New York 12180  
Tel 518.274.0961 - Fax 518.274.0210  
[www.rossvalve.com](http://www.rossvalve.com)

OPERATING PRESSURES (PSI)

MODEL	OUTLET RANGE	MAXIMUM INLET
21T	20 - 60	250
22T	40 - 150	250
23T	1 - 15	250
24T	5 - 25	250

PART	DESCRIPTION	QTY	MATERIAL
1	TAIL PIECE - UNION	2	BRONZE
2	NUT - UNION	2	BRONZE
3	ADJUSTING SCREW	1	BRONZE
4	LOCK NUT	1	BRONZE
5	SPRING CHAMBER	1	BRONZE
6	TOP SPRING WASHER	1	BRONZE
7	SPRING (SET)	VARY	STEEL
8	BOTTOM SPRING WASHER (OPTIONAL)	1	BRONZE
9	DIAPHRAGM BUTTON	1	BRONZE
*10	DIAPHRAGM (SET)	VARY	BRONZE or BUNA-N
11	BOLTS & NUTS - CHAMBER	VARY	STAINLESS
12	DIAPHRAGM NUT	1	BRONZE
13	STEM NUT	1	BRONZE
*14	O-RING - THIMBLE	1	BUNA-N
15	THIMBLE	1	BRONZE
*16	SEAT PACKING	1	POLYURETHANE
17	VALVE SHELL	1	BRONZE
18	VALVE STEM	1	BRONZE
19	LINK NUT	1	BRONZE
20	LOCK NUT	1	BRONZE
21	BOTTOM CAP	1	BRONZE
22	STEM - DIAPHRAGM	1	STAINLESS
*23	GASKET - BOTTOM CAP	1	COMPOSITION
*24	GASKET - DIAPHRAGM	1	COMPOSITION
25	O-RING - UNION	2	BUNA-N

\* INCLUDED IN STANDARD REPAIR KIT



DIMENSIONS (INCHES)

SIZE (NPT)	SHIPPING WEIGHT	A	B
1/2	12	11-3/4	3-5/8
3/4	12	11-3/4	3-5/8
1	12	11-3/4	4-1/8
1-1/4	17	12-1/2	5
1-1/2	17	12-1/2	5

**ROSS VALVE Mfg. Co., Inc.**  
 6 OAKWOOD AVENUE - P.O. BOX 595 - TROY, NEW YORK, 12181 - TEL. (518) 274 0961

NO SCALE | DRAWING 21T | REVISED 5-11-05

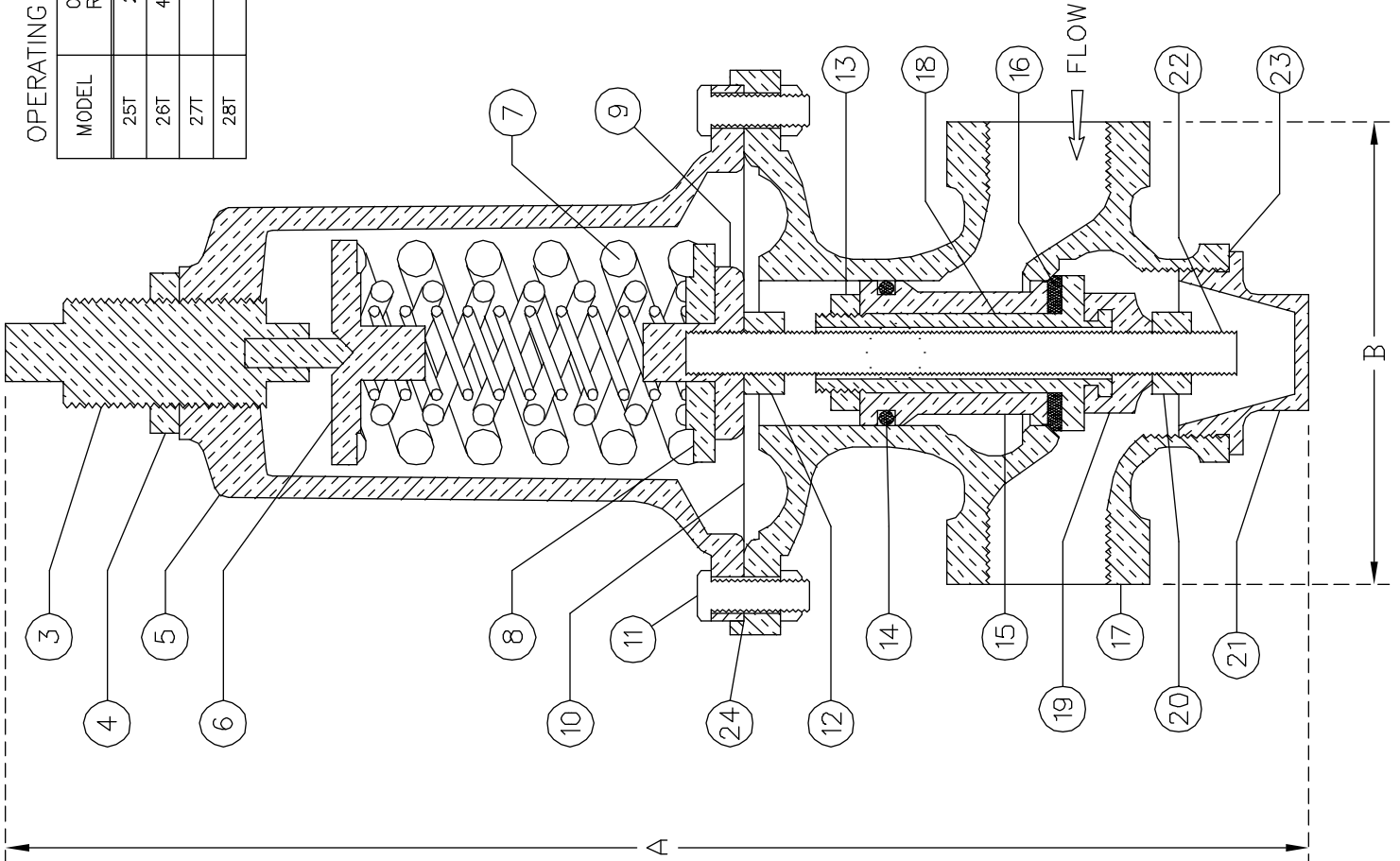
DATE 4-2-63 2851

MODELS 21T, 22T, 23T, & 24T  
 DIRECT ACTING PRESSURE REDUCING VALVE  
 WITH UNIONS & FNPT CONNECTIONS

FILE: 21-22-23-24T

OPERATING PRESSURES (PSI)

MODEL	OUTLET RANGE	MAXIMUM INLET
25T	20-60	250
26T	40-150	250
27T	1-15	250
28T	5-25	250



DIMENSIONS (INCHES)

SIZE (NPT)	SHIPPING WEIGHT	A	B
1/2	12	11-3/4	3-5/8
3/4	12	11-3/4	3-5/8
1	12	11-3/4	4-1/8
1-1/4	17	12-1/2	5
1-1/2	17	12-1/2	5

PART	DESCRIPTION	QTY	MATERIAL
3	ADJUSTING SCREW	1	BRONZE
4	LOCK NUT	1	BRONZE
5	SPRING CHAMBER	1	BRONZE
6	TOP SPRING WASHER	1	BRONZE
7	SPRING (SET)	VARY	STEEL
8	BOTTOM SPRING WASHER (OPTIONAL)	1	BRONZE
9	DIAPHRAGM BUTTON	1	BRONZE
*10	DIAPHRAGM (SET)	VARY	BRONZE
11	BOLTS & NUTS - CHAMBER	R	BRONZE
12	DIAPHRAGM NUT	1	BRONZE
13	STEM NUT	1	BRONZE
*14	O-RING - THIMBLE	1	BUNA-N
15	THIMBLE	1	BRONZE
*16	SEAT PACKING	1	POLYURETHANE
17	VALVE SHELL	1	BRONZE
18	VALVE STEM	1	BRONZE
19	LINK NUT	1	BRONZE
20	LOCK NUT	1	BRONZE
21	BOTTOM CAP	1	BRONZE
22	STEM - DIAPHRAGM	1	STAINLESS
*23	GASKET - BOTTOM CAP	1	COMPOSITION
*24	GASKET - DIAPHRAGM	1	COMPOSITION

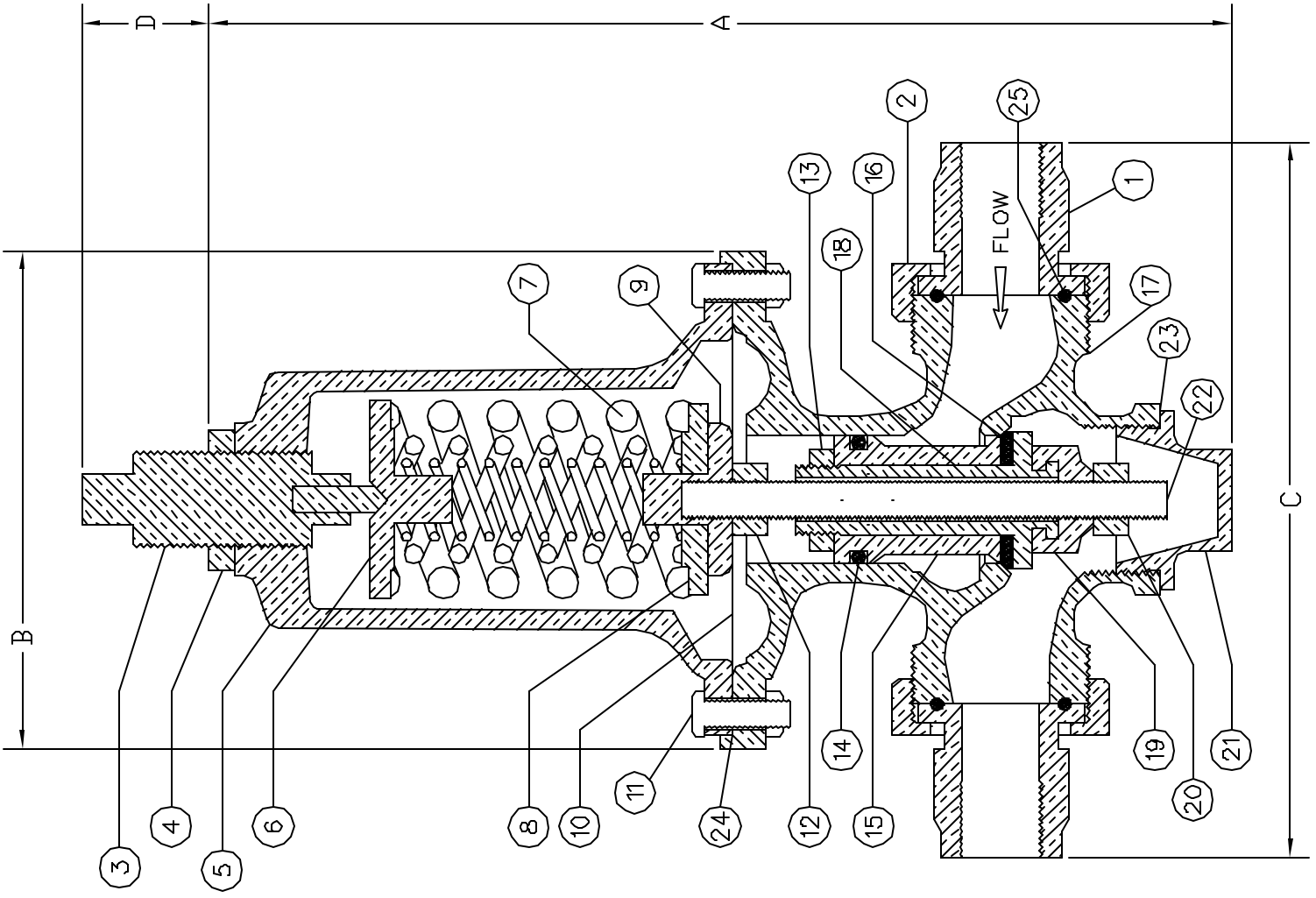
\* INCLUDED IN STANDARD REPAIR KIT

**ROSS VALVE MFG. CO., INC.**  
 6 OAKWOOD AVENUE - P.O. BOX 595 - TROY, NEW YORK, 12181 - TEL. (518) 274 0961

NO. SCALE: DRAWING 25T  
 DATE 4-2-63 2851 REVISED 9-27-99 S.M.

MODELS 25T, 26T, 27T, & 28T  
 DIRECT ACTING PRESSURE REDUCING VALVE  
 WITH FNPT CONNECTIONS

FILE: 25-26-27-28T



PART	DESCRIPTION	QTY	MATERIAL
1	TAIL PIECE - UNION	2	BRONZE
2	NUT - UNION	2	BRONZE
3	REGULATING SCREW	1	BRONZE
4	LOCK NUT	1	BRONZE
5	SPRING CHAMBER	1	BRONZE
6	TOP SPRING WASHER	1	BRONZE
7	SPRINGS	VARY	STEEL
8	BOTTOM SPRING WASHER	1	BRONZE
9	DIAPHRAGM BUTTON	1	BRONZE
*10	DIAPHRAGMS	VARY	BRONZE
11	BOLTS & NUTS - CHAMBER	VARY	BRONZE
12	DIAPHRAGM NUT	1	BRONZE
13	STEM NUT	1	BRONZE
*14	O-RING - THIMBLE	1	ELUNA-N
15	THIMBLE	1	BRONZE
*16	SEAT PACKING	1	POLY
17	VALVE SHELL	1	BRONZE
18	VALVE STEM	1	BRONZE
19	LINK NUT	1	BRONZE
20	LOCK NUT	1	BRONZE
21	BOTTOM CAP	1	BRONZE
22	STEM - DIAPHRAGM	1	BRONZE
*23	GASKET - BOTTOM CAP	1	COMPOSITION
*24	GASKET - DIAPHRAGM	1	COMPOSITION
25	O-RING - LOCK NUT	1	ELUNA-N

\* INCLUDED IN STANDARD REPAIR KIT

OPERATING PRESSURE (PSI)	
MODEL	RANGE (PSI)
30T	25 - 300

DIMENSIONS (INCHES)			
A	B	C	D
11-1/2	4-3/4	8-1/2	3/4 TO 3

**ROSS VALVE Mfg. Co., Inc.**  
 6 OAKWOOD AVENUE - P.O. BOX 566 - TROY, NEW YORK, 12161 - TEL. (518) 274-0861

NO SCALE DRAWING 30T  
 DATE 4-2-63 2851 REVISED 7-9-99 S.M.  
 MODELS 30T (SIZE 1-1/2")  
 DIRECT ACTING PRESSURE REDUCING VALVE  
 WITH UNIONS & FNPT CONNECTIONS

FILE: 30TADIM

## MODEL T-SERIES

### Shipment:

Prior to shipment, each valve is thoroughly tested and pre-adjusted at the factory to the expected field conditions. Any visible damage to the crate or packaging should be immediately brought to the attention of the shipping company and documented with photographs.

### Storage:

If it is necessary to store the valve before installation, it should be protected from the elements. Inside storage is recommended. If this is not possible, the valve should be protected from dirt, heat, freezing, and direct sunlight.

### Installation:

1. Carefully remove all shipping materials and check the valve for any other foreign objects.
2. If possible, flush the line before inserting the valve.
3. The valve is tagged with a model and serial number. It is recommended that the serial number be noted in your records as this will be requested by the factory when any technical support or parts replacement is required. **Valve serial number: S \_\_\_\_\_.**
4. The valve is marked with an arrow indicating the direction of flow through the valve. Place the valve in line with the arrow pointing away from the normal supply source. Note: The valve may be installed in any position (horizontal or vertical).

### Start-Up:

1. Open the main line gate valve (if installed) on the discharge/downstream side of the valve.
2. *Slowly* open the main line gate valve (if installed) on the inlet/upstream side of the valve.
3. No lubrication or adjustment to the valve is required or recommended.
4. The valve has been thoroughly tested at the factory and set to the expected field conditions.

### Operation:

The Ross Model T-Series Direct Acting Pressure Reducing Valve utilizes a simple direct-acting design. A spring load is transferred along the Diaphragm Stem (#22) to open the valve and allow water to flow through it. When the downstream line pressure, which is exposed to the Diaphragms (#10) through a sensing port in the Stem (#18), exceeds the pre-set loading of the Springs (#7), the stem assembly lifts the Seat Packing (#16) into the valve seat to prevent water from passing through the valve. Likewise, as the downstream pressure falls below the spring setting, the Seat Packing (#16) moves away from the seat, opening the valve to allow flow.

Turning the Adjusting Screw (#3) clockwise will increase the compression on the Springs (#7) and INCREASE the downstream pressure setting of the valve. Turning the Adjusting Screw counter-clockwise will decrease the setting.

## MODEL T-SERIES

### Trouble-Shooting:

If the downstream pressure is too **low**:

Turn the adjusting screw **clockwise** to increase the pressure.

If the downstream pressure is too **high**:

Turn the adjusting screw **counter-clockwise** to decrease the pressure.

If the downstream pressure fluctuates widely:

The Diaphragms (#10) may have become damaged due to a pressure surge. Disassemble the valve and install a standard repair kit. (Have the serial number of the valve ready when ordering).

Or

The adjustment on the Link Nut (#19) may be incorrect. Release all spring compression by removing the entire Spring Chamber (#5) or just the Adjusting Screw (#3), taking care to note the setting (count the number of turns). Remove the Bottom Cap (#21) and loosen the Lock Nut (#20), then re-adjust the Link Nut. The correct setting should be two full turns counter-clockwise from when the Seat Packing (#16) just touches the seat. Note: It is recommended to have a replacement Bottom Cap Gasket (#23) on hand before attempting this procedure.

If the valve leaks out the top:

The Diaphragms (#10) or Diaphragm Gasket (#24) need replacement. Disassemble the valve and install a standard repair kit. (Have the serial number of the valve ready when ordering).

If the valve does not seal drip-tight:

The Seat Packing (#16) may need replacement, or there may be debris on the valve seat. Disassemble the valve and install a standard repair kit. (Have the serial number of the valve ready when ordering).

### Spare Parts:

No spare parts are required or recommended. Under normal operating conditions, no spare parts would be necessary within five (5) years of service. The standard repair kits for Ross Model T-Series valves are in stock at the factory, and available for immediate shipment upon receipt of the order with the valve serial number. The serial number is stamped into a metal tag pinned to the spring chamber.

### Maintenance:

We suggest periodic inspections in order to check for proper valve operating pressures, as well as any visual leaks. Should the operator encounter any external leakage, or find any abnormalities in the operating pressures resulting from the operation of the valve, the valve should be scheduled for service. Note: When entering a valve pit to inspect a valve, all regulations regarding Confined Space Entry should be observed.

No special tools are required for operation, adjustment or maintenance of the valve.

## MODEL T-SERIES

### Standard Range of Adjustment:

A variety of configurations are available for the T-Series valves in order to optimize the operating performance of each valve. The following chart indicates the standard range of downstream pressure settings suited to each valve:

Downstream Pressure	Valves with Union Ends	Valves with NPT Ends
20 – 60 psi	Model 21T	Model 25T
40 – 150 psi	Model 22T	Model 26T
1 – 15 psi	Model 23T	Model 27T
5 – 25 psi	Model 24T	Model 28T
25 – 300 psi	Model 30T	

### Inspection:

Inspection is governed by the experience with the valve. Quality of water, rate of flow, and operating pressures all have a bearing on the kind and length of service. Abnormal and fluctuating pressures on the downstream side of the valve generally indicate that the valve requires servicing.

### Repair Instructions:

It is highly recommended that each valve be returned to the factory for repair, where our technicians will completely disassemble the valve, extensively evaluate all critical parts, re-machine all required surfaces, and replace all seals and gaskets. The re-assembled valve will then be thoroughly tested and adjusted to the required pressure setting.

For those experienced with field repair of the Model T-Series valves, however, replacement parts can be obtained from our factory in Troy, NY. In the field, the renewal of packings is best made by replacing the whole piston assembly. Close examination of the seat and bore of the valve shell should be made each time the packing is replaced. If deep score marks are present and the smooth polish surface destroyed, the shell should be resurfaced at the factory, or replaced.

Piston adjustment is extremely important for proper operation. After releasing all tension on the springs, insert the valve piston assembly with the link nut attached. Turn the link nut clockwise until the piston is barely seated. Final adjustment is made by turning the link nut counter-clockwise 1 full turn.

All replaceable packings and gaskets are stock items and may be ordered as a repair kit and piston assembly for valve **Serial Number S** \_\_\_\_\_ (located on the metal tag pinned directly to the valve). They are available for delivery via regular ground service or next day air if required, directly from:

Ross Valve Mfg. Co., Inc., 6 Oakwood Ave, Troy, NY 12180, Phone: (518) 274-0961, Fax: (518) 274-0210