Clark·Reliance®

Section: 500
Bulletin: AB5.1D
Date: 8/06
Supersedes: AB5.1C

# BRONZE & STEEL WATER GAGE VALVES

## BRONZE VALVES IN 5 MODELS • STEEL VALVES IN 18 MODELS

### BRONZE WATER GAGE VALVES FEATURE HIGH PERFORMANCE MATERIALS FOR HEAVY-DUTY SERVICE

These Clark-Reliance valves are designed and manufactured for demanding applications. Designated as high-grade valves, all models feature valve bodies and packing nuts of ASME Code Bronze. Additional design features include an 18-position gage lever (Figure 23), integral seats and choice of screwed or flanged connections. Valve control is speeded by quadruple stem threads that allow full open/closed with only one-quarter turn. Refer to the Model Selection Guide for individual model information.

**Specification Data** Chains and handles that indicate open/closed positions are provided, as required by the ASME Boiler Code. Lower valves employ a ⅜" pipe tap for blowdown. A complete valve set includes upper and lower valve, pyrex tubular glass and guard rods (if mounting centers are specified) and two 5-foot chain lengths. Valve model numbers are stamped on the top of upper valve. *NOTE: Clark-Reliance does not recommend tubular glass for use above 250 WSP.*

**TABLE I: BRONZE WATER GAGE VALVES • MODEL SELECTION GUIDE**

| MODEL | CONNECTION | MAXIMUM PRESSURE | NET WT. PER SET | FIG. NO. |
|---|---|---|---|---|
| 402RS | ½" NPT | 250 PSI | 8 Lbs. | 1 |
| 403RS | ¾" NPT | 250 PSI | 8 Lbs. | 1 |
| 404RS | ¾" NPT | 450 PSI | 8 Lbs. | 2 |
| 502RA | ¾" 300 Lb. RF Flange | 250 PSI | 13 Lbs. | 3 |
| 503RA | ¾" 300 Lb. RF Flange | 450 PSI | 13 Lbs. | 4 |

Figure 1
BRONZE WATER GAGE VALVE MODELS 402RS & 403RS WITH SCREWED CONNECTION

Figure 2
BRONZE WATER GAGE VALVE MODEL 404RS WITH SCREWED CONNECTION

Figure 3
BRONZE WATER GAGE VALVE MODEL 502RA WITH FLANGED CONNECTION

Figure 4
BRONZE WATER GAGE VALVE MODEL 503RA WITH FLANGED CONNECTION

Figure 7

**LEVER OPERATED BRONZE VALVES FOR PRESSURES TO 450 PSI**

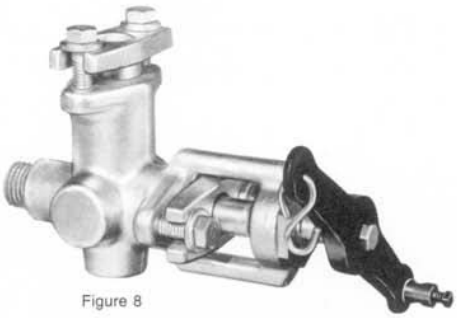


Figure 8

**LEVER OPERATED SERIES 800 FORGED STEEL VALVES FOR PRESSURES TO 1500 PSI**

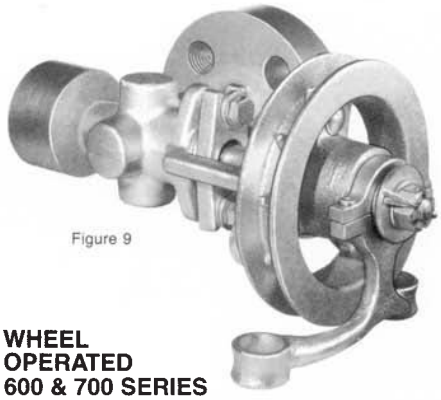


Figure 9

**WHEEL OPERATED 600 & 700 SERIES FORGED STEEL VALVES FOR PRESSURES TO 3000 PSI**

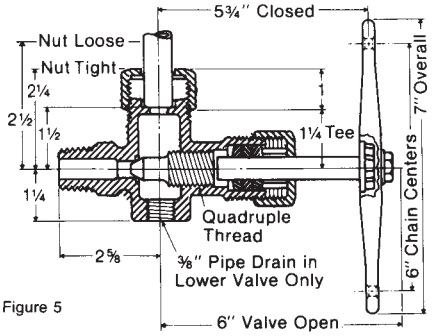



Figure 5
MODEL 402RS & 403RS WITH SCREWED CONNECTION

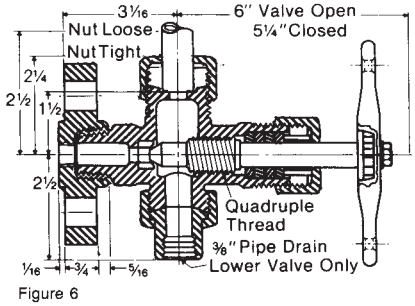



Figure 6
MODEL 503RA WITH FLANGED CONNECTION

# SERIES 800 LEVER OPERATED FORGED STEEL WATER GAGE VALVES IN 11 MODELS

## For Dependable Steam Service To 1500 PSI At 600°F

## Available With ¾" Male Pipe Connection Or Standard ANSI Flange

Eleven models of Series 800 valves offer choices in vessel and gage connections, ball check locations, and union availability. Refer to the Model Selection Guide for individual model features to meet your specific installation requirements.

All Series 800 valves are of outside screw and yolk design. Design and performance features include:

- Forged steel body to ASTM A105 Specification.
- Type 303 stainless steel stem and one-piece 420F stainless steel replaceable seat (Figure 25).
- Grafoil® Packing Cartridge (Figure 24) is secured by identical two-bolt packing yokes.
- Quadruple stem thread allows full open/closed positions with only one-quarter lever turn.
- Stem bushing is positioned outside body, away from high temperatures and corrosive fluids.
- Lower valves provide 1/2" tap and female socket weld connection for blowdown.

Complete valve sets include two 5-foot lengths of lever chain, with handles that indicate open/closed valve positions as required by the ASME Boiler Code.

Figure 10

SERIES 800 FORGED STEEL WATER GAGE VALVE MODEL SG854 WITH ¾" MALE PIPE VESSEL CONNECTION AND NIPPLE GAGE CONNECTION

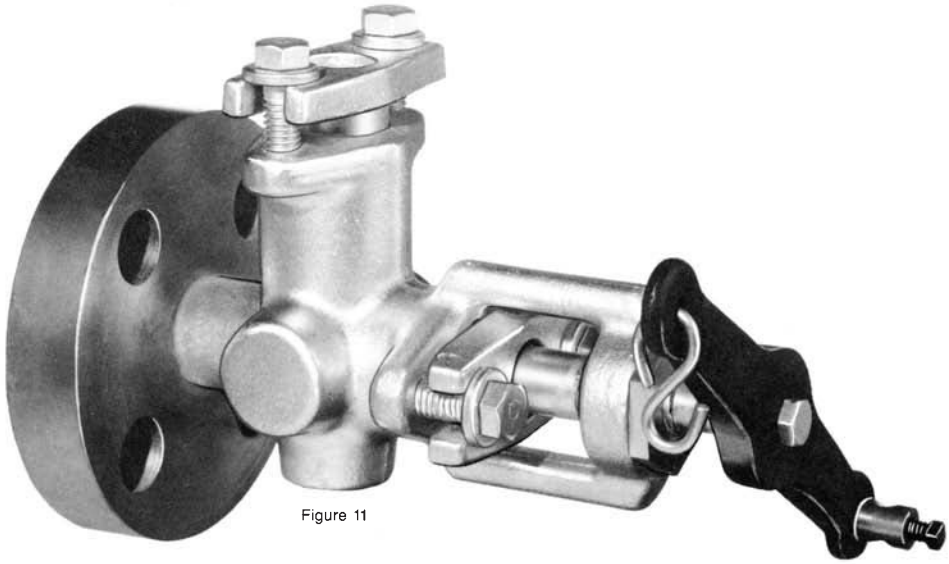


Figure 11

SERIES 800 FORGED STEEL WATER GAGE VALVE MODEL SG860 WITH ¾"–900 Lb. RF FLANGE VESSEL CONNECTION AND NIPPLE GAGE CONNECTION

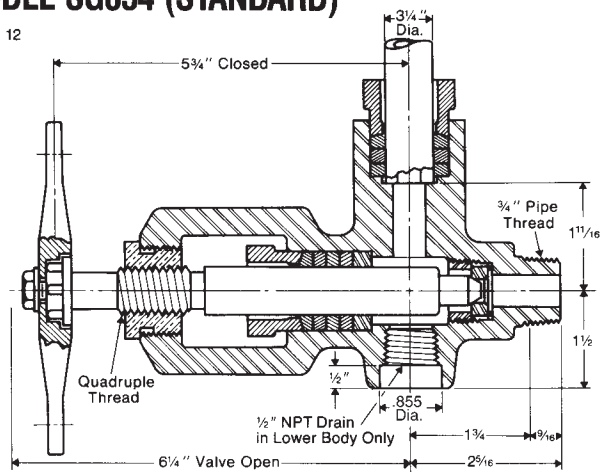
**TABLE II: SERIES 800 FORGED STEEL WATER GAGE VALVE • MODEL SELECTION GUIDE**
To Specify Live-Loading Feature (Figure 30), Add P To Model Number

| Model | Fig. No. | Vessel Connection | | Ball Check Lower | Ball Check Upper | Union | Gage Connection | Max. Pressure | Net Wt. Per Set |
|---|---|---|---|---|---|---|---|---|---|
| | | Flange | Male Thread | | | | | | |
| SG854 | 10-12 | • | ¾" | No | No | No | ¾" OD Nipple | 1500 PSI | 15 Lbs. |
| SG855 | 14 | • | ¾" | Yes | Yes | Yes | ¾" OD Nipple | 1500 PSI | 16 Lbs. |
| SG856 | 15 | • | ¾" | No | No | Yes | ½" Female Thread | 1500 PSI | 16 Lbs. |
| SG857 | • | • | ¾" | Yes | No | Yes | ½" Female Thread | 1500 PSI | 16 Lbs. |
| SG858* | – | 2½" × 5½" Rectangular | • | No | No | No | ¾" OD Nipple | 1500 PSI | 25 Lbs. |
| SG860 | 11-13 | ¾"–900 Lb. Raised Face | • | No | No | No | ¾" OD Nipple | 1500 PSI | 25 Lbs. |
| SG861 | • | ¾"–900 Lb. Raised Face | • | Yes | No | No | ¾" OD Nipple | 1500 PSI | 25 Lbs. |
| SG861U | • | ¾"–900 Lb. Raised Face | • | Yes | Yes | No | ¾" OD Nipple | 1500 PSI | 25 Lbs. |
| SG885 | • | ¾"–600 Lb. Raised Face | • | Yes | No | No | ¾" OD Nipple | 1135 PSI | 25 Lbs. |
| SG885U | 16 | ¾"–600 Lb. Raised Face | • | Yes | Yes | No | ¾" OD Nipple | 1135 PSI | 25 Lbs. |
| SG886 | 17 | • | ¾" | Yes | No | No | ¾" OD Nipple | 1500 PSI | 15 Lbs. |

*Retrofit Only

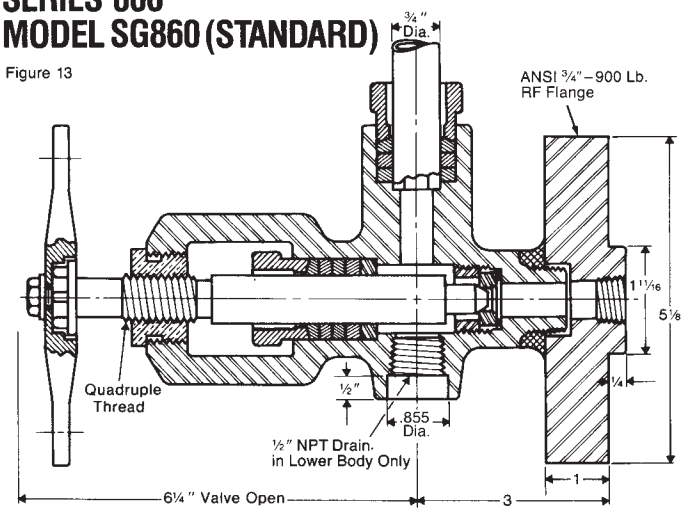
## SERIES 800 MODEL SG854 (STANDARD)

Figure 12



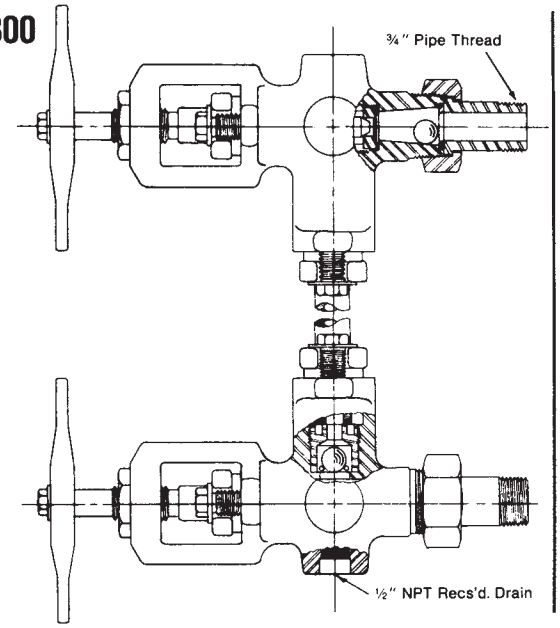

## SERIES 800 MODEL SG860 (STANDARD)

Figure 13



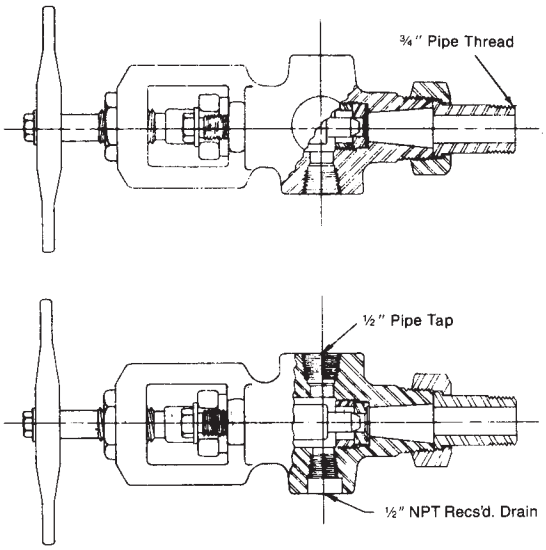

## SERIES 800 MODEL SG855

Figure 14



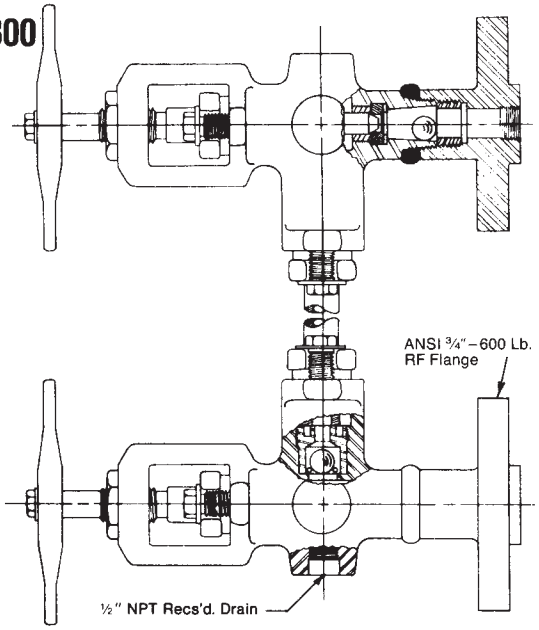

## SERIES 800 MODEL SG856

Figure 15



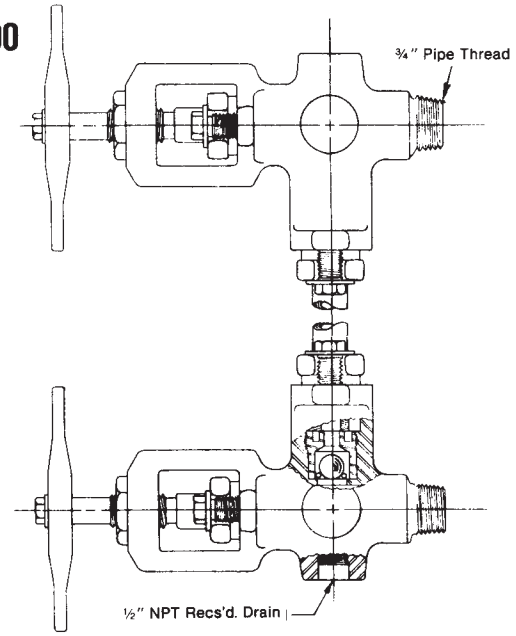

## SERIES 800 MODEL SG885U

Figure 16




## SERIES 800 MODEL SG886

Figure 17



# SERIES 600 & SERIES 700 WHEEL OPERATED FORGED STEEL WATER GAGE VALVES IN 7 MODELS

## For Dependable Steam Service To 3000 PSI At 700°F

## Exclusively Chain Wheel Operated Models

Seven models of Series 600 and Series 700 valves offer choices in vessel and gage connections, equalizer tube availability and maximum steam pressure services. Refer to the Model Selection Guide for individual model features to meet your specific installation requirements.

All chain wheel operated models are of outside screw and yoke design. Design and performance features include:

- Forged steel body to ASTM A105 Specification.
- Type 303 stainless steel stem.
- On Series 700 models only, one-piece 420F stainless steel replaceable seat (Figure 25).
- Grafoil® Packing Cartridge (Figure 24) is secured by identical two-bolt packing yokes.
- Single-pitch stem thread allows easy valve operation by chain wheel.
- Stem bushing is positioned outside body, away from high temperatures and corrosive fluids.
- Lower valves provide 1/2" pipe connection and female socket weld connection for blowdown.

**NOTE:** Female socket weld connectors are not included when valves are to be welded to water columns. To specify for the above applications add "C" to model numbers. Example: Model SG777 (with socket weld connectors) becomes Model SG777C (without socket weld connectors).

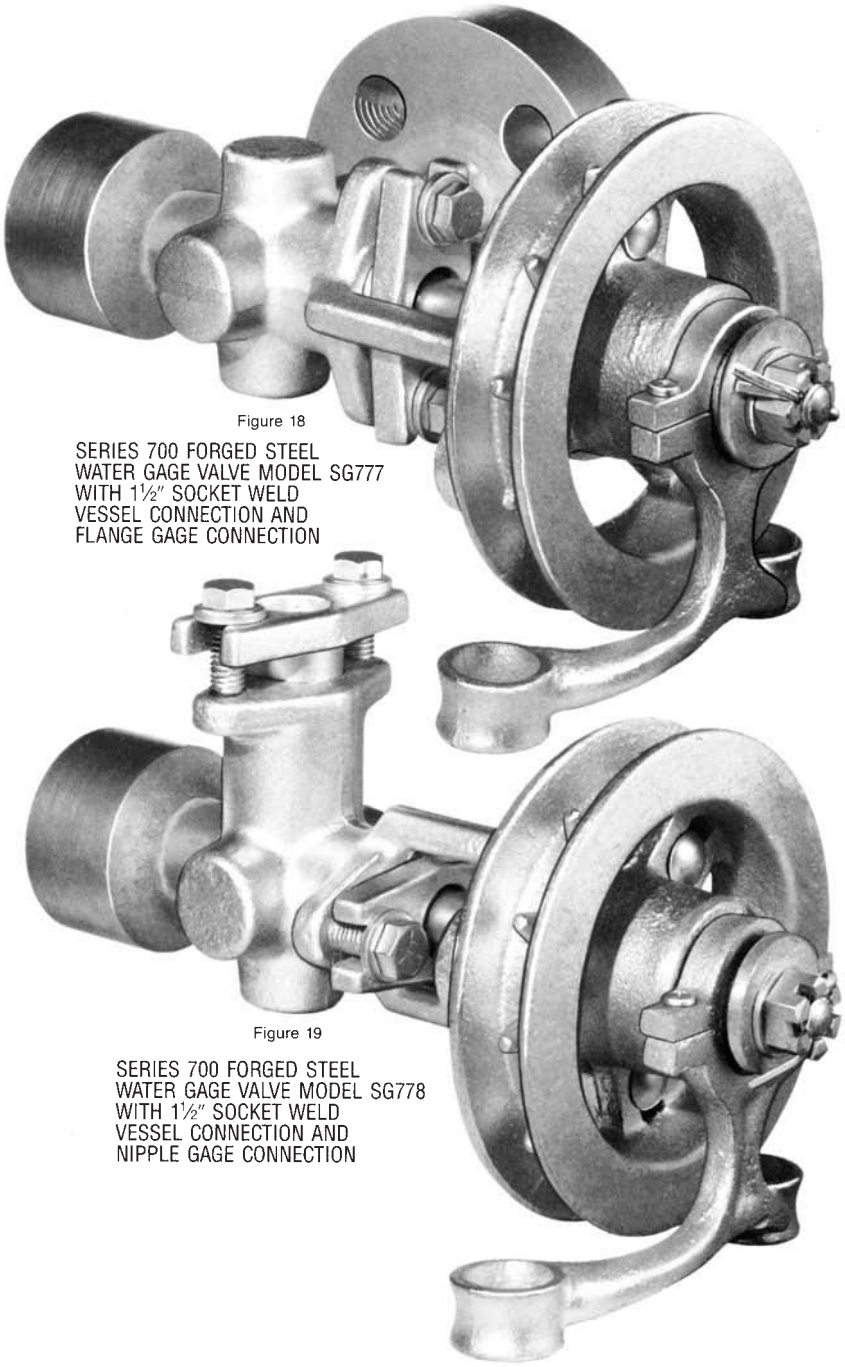


Figure 18

SERIES 700 FORGED STEEL WATER GAGE VALVE MODEL SG777 WITH 1½" SOCKET WELD VESSEL CONNECTION AND FLANGE GAGE CONNECTION

Figure 19

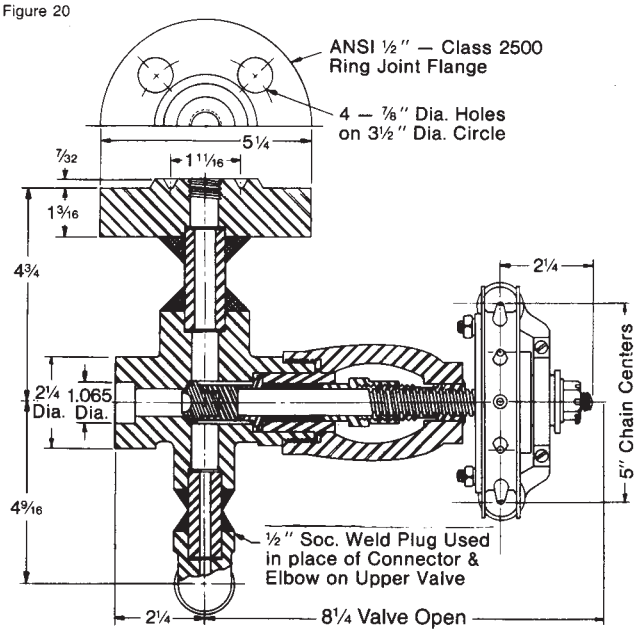
SERIES 700 FORGED STEEL WATER GAGE VALVE MODEL SG778 WITH 1½" SOCKET WELD VESSEL CONNECTION AND NIPPLE GAGE CONNECTION

**TABLE III: SERIES 600 & SERIES 700 FORGED STEEL WATER GAGE VALVES • MODEL SELECTION GUIDE**
To Specify Live-Loading Feature (Figure 30), Add P To Model Number

| Model | Figure No. | Vessel Connection | Gage Connection | Live-Loading Option | Equalizer Tube | Max. Pressure | Net Wt. Per Set |
|---|---|---|---|---|---|---|---|
| SG660 | • | ¾" – 2500 Lb. RF Flange | ½" – 2500 Lb. RJ Flange | No | — | 3000 PSI | 30 Lbs. |
| SG677 | 20 | ¾" Female Socket Weld | ½" – 2500 Lb. RJ Flange | Yes | No | 3000 PSI | 27 Lbs. |
| SG677E | • | ¾" Female Socket Weld | ½" – 2500 Lb. RJ Flange | Yes | Yes | 3000 PSI | 27 Lbs. |
| SG760 | — | ¾" – 900 Lb. Lg. Male Flange | ¾" OD Nipple | Yes | No | 1500 PSI | 23 Lbs. |
| SG777 | 18-21 | 1½" Female Socket Weld | ½" – 2500 Lb. RJ Flange | Yes | No | 2500 PSI | 27 Lbs. |
| SG777E | — | 1½" Female Socket Weld | ½" – 2500 Lb. RJ Flange | Yes | Yes | 2500 PSI | 27 Lbs. |
| SG778 | 19-22 | 1½" Female Socket Weld | ¾" OD Nipple | Yes | No | 1500 PSI | 18 Lbs. |

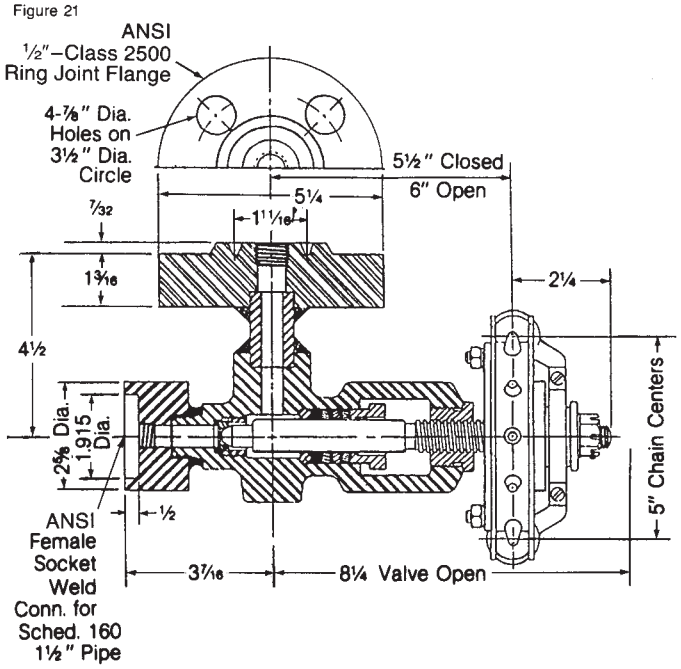
## SERIES 600 MODEL SG677 LOWER VALVE

Figure 20



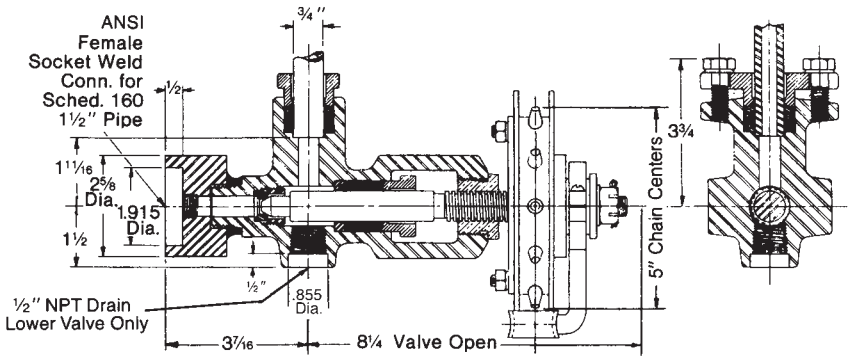

## SERIES 700 MODEL SG777 LOWER VALVE

Figure 21




## SERIES 700 MODEL SG778 LOWER VALVE

Figure 22




## 18-POSITION GAGE LEVER

Positive, non-slip locking in 18 positions is assured with the patented Clark-Reliance gage lever. The lever is standard on all Series 400 and 500 bronze water gage valves and all Series 800 forged steel water gage valves.

The gage lever is readily adjusted to the desired angle regardless of the valve stem orientation when the valve is closed.

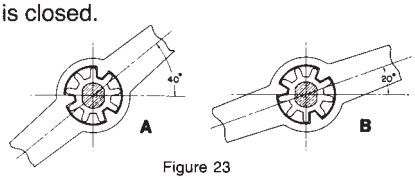



Figure 23

MOVING THE LEVER FROM POSITION A TO B ACHIEVES AN INTERMEDIATE ANGLE ADJUSTMENT QUICKLY AND EASILY.

## GRAFOIL® PACKING CARTRIDGE

Figure 24
GRAFOIL® WASHERS INSIDE CARTRIDGE

Clark-Reliance forged steel water gage valves feature an advanced packing cartridge that provides longer leak-free operation. The cartridge replaces loose, individual packing washers and is now standard on all Series 600, 700 and 800 models. The cartridge is also provided in the RK-34 Live-Loading Retrofit Kit (Figure 30).

## ONE-PIECE VALVE SEAT

Figure 25
REPLACEABLE SEAT WITH HEX-HEAD

Faster renewing, improved performance and longer service life are all benefits of the one-piece valve seat standard in Series 700 and Series 800 valves. Machined from 420F stainless steel, the hardened valve seat offers precise fit and flow surfaces.

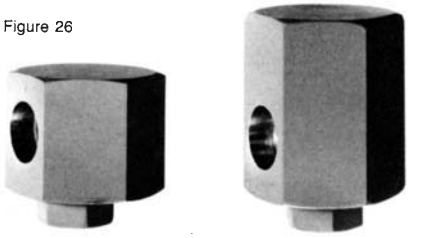
## AUTOMATIC BALL CHECK VALVES PROTECT AGAINST BLOWOUT DAMAGE

Where specifications require use of automatic ball check valves ahead of a water level gage, Model SG77BC Upper & Lower Check Valves can be factory installed. Note the 1.125-inch offset in elevation between inlet and outlet ports of the Lower Ball Check Valve (Figure 27).

These independent check valves comply with Par. A-18 of Section I of the ASME Boiler Code. The automatic valves will severely restrict the flow of steam and water to the level gage in the event of glass breakage or gasket blowout.

**Caution** While the advantage of using these check valves ahead of a level gage is evident, as presented above, the principal disadvantage is that the check valves will prevent effective blow-down of the level gage itself. When the level gage drain valve is opened, pressure inside the level gage drops, and the check valve balls are driven up into closed positions by system pressure.

Figure 26



UPPER BALL CHECK VALVE

LOWER BALL CHECK VALVE WITH OFFSET INLET/OUTLET

Order Clark-Reliance Automatic Ball Check Valves by using the following numbers:

| | |
|---|---|
| Upper Ball Check Valve: | SG77BCU |
| Lower Ball Check Valve: | SG77BCL |
| Ball Check Valve Set: | SG77BC |

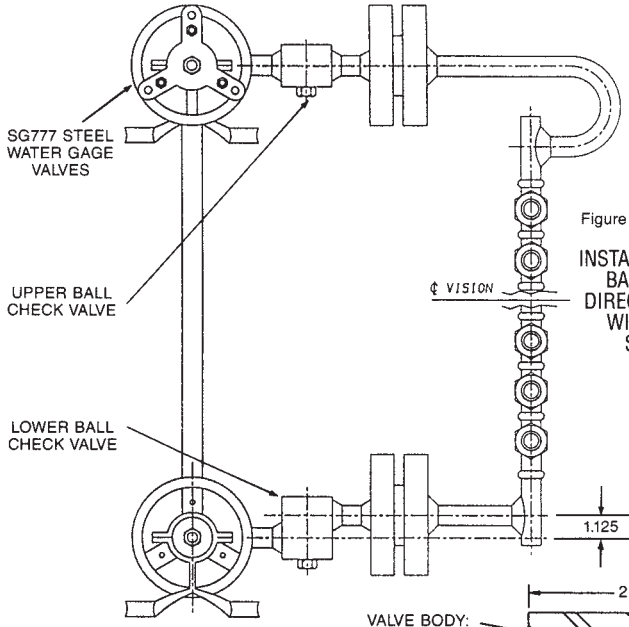



Figure 27

INSTALLATION OF AUTOMATIC BALL CHECK VALVES IN DIRECT-TO-DRUM ASSEMBLY WITH CLARK-RELIANCE SIMPLIPORT® GAGE

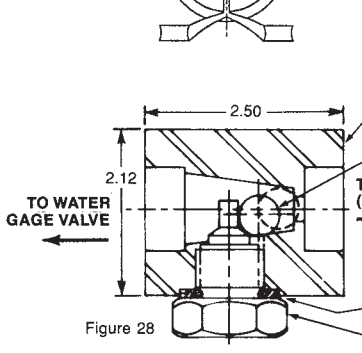



Figure 28

UPPER BALL CHECK VALVE

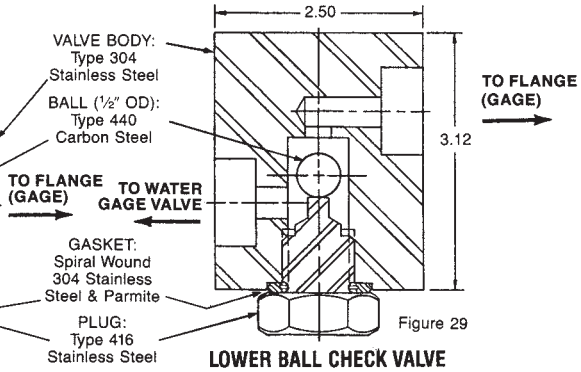



Figure 29

LOWER BALL CHECK VALVE

## LIVE-LOADING RETROFIT KIT FOR SG SERIES FORGED STEEL WATER GAGE VALVES

### Fits All Series 700 And Series 800 Models

### Available As Specified Option On New Valves*

The Clark-Reliance RK-34 Live-Loading Kit is available to improve the performance and service life of Series 700 and 800 valves already installed. Live-loading produces a more leak-free valve, resisting damage from vibration, pressure changes, time in service and other wear factors.

The kit includes all required parts and comes complete with step-by-step instructions for easy and rapid conversion.

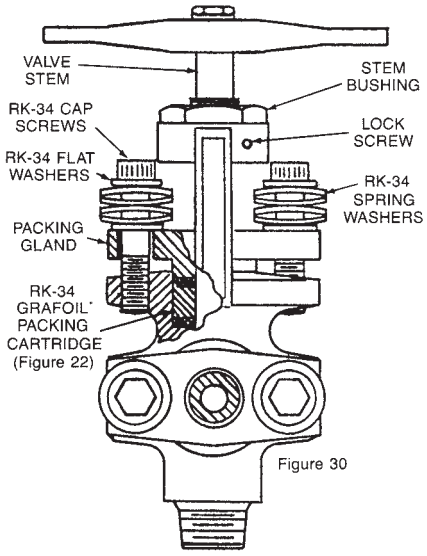



Figure 30

**RK-34 RETROFIT PARTS COMBINE WITH EXISTING PARTS TO ACHIEVE LIVE-LOADING PERFORMANCE. RETROFIT KIT INCLUDES:**

- 2 CAP SCREWS
- 4 FLAT WASHERS
- 1 GRAFOIL® PACKING CARTRIDGE
- 8 SPRING WASHERS
- INSTRUCTIONS

*To specify Live-Loading on new valves, add "P" to the model numbers. (Example: SG854P)*

*For additional information, contact your local Clark-Reliance representative*

# Clark·Reliance®

16633 FOLTZ PARKWAY • STRONGSVILLE, OHIO 44149 • USA
TELEPHONE: (440) 572-1500 • FACSIMILE: (440) 238-8828 • www.clark-reliance.com

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**REPRESENTED BY: YATES & COMPANY, INC. ♦ 1 Hollywood Ave, Unit 22 HoHoKus, NJ 07423**
**Tel: 201-345-3101 ♦ Email: info@yatesco.net**