

Consolidated®

INSTALLATION AND START-UP INSTRUCTIONS

For more detailed instructions, consult the appropriate Dresser manual.

Consolidated® Safety Relief Valve Type 1900

Design Options Include:

Bellows (-30), O-Ring Seat (DA), Liquid Trim (LA)
and Termodisc® (TD)

**THESE INSTRUCTIONS
ARE INTENDED FOR
INSTALLATION AND
START UP ONLY,
AND NOT FOR THE
MAINTENANCE
OF THE VALVE.**

TYPE 1900-CONVENTIONAL

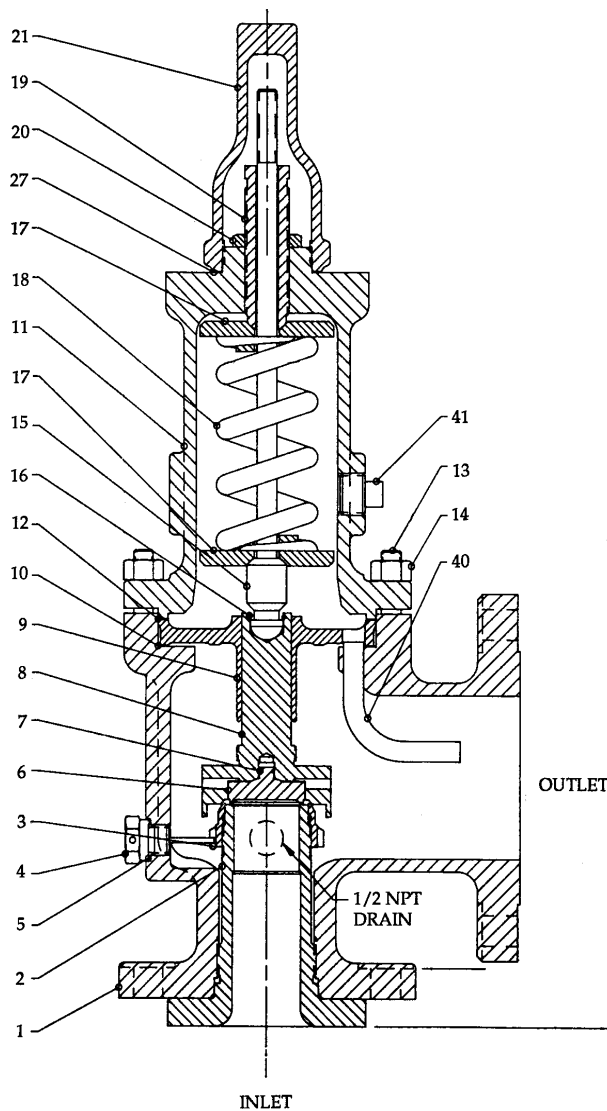


FIGURE 1

Part No.	Nomenclature
1	Base
2	Nozzle
3	Adjusting Ring
4	Adjusting Ring Pin
5	Adj. Ring Pin Gasket
6	Disc
7	Disc Retainer
8	Disc Holder
9	Guide
10	Guide Gasket
11	Bonnet
12	Bonnet Gasket
13	Base Stud
14	Stud Nut
15	Spindle
16	Spindle Retainer
17	Spring Washer
18	Spring
19	Adjusting Screw
20	Adjusting Screw Nut
21	Screwed Cap
*22	Bolted Cap
*23	Packed Cap
*24	Plain Cap
*25	Cap Bolt
*26	Cap Set Screw
27	Cap Gasket
*28	Release Nut
*29	Release Locknut
*30	Lever
*31	Lifting Fork
*32	Lever Shaft
*33	Packing
*34	Packing Nut
*35	Top Lever
*36	Drop Lever
40	Eductor Tube
41	Bonnet Plug

* Shown in Figures 9-13 on inside back cover.

Industrial Valves

DRESSER

Industrial Valve Operation

Dresser Valve and Controls Division
Alexandria, Louisiana 71309-1430 (USA)


CON-2/ISI
Issued 4/96

i. Safety Notice

Proper installation and start-up is essential to the safe and reliable operation of all valve products. The relevant procedures recommended by Dresser Valve and Controls Division (DVCD), and described in these instructions, are effective methods of performing the required tasks. Some of these procedures require the use of tools specifically designed for an intended purpose. These special tools should be used when, and as, recommended.

It is important to note that these instructions contain various "safety messages" which should be carefully read in order to minimize the risk of personal injury, or the possibility that improper procedures will be followed which may damage the involved DVCD product, or render it unsafe. It is also important to understand that these "safety messages" are *not* exhaustive. DVCD can not possibly know, evaluate, and advise any customer of all of the conceivable ways in which tasks might be performed, or of the possible hazardous consequences of each way. Consequently, DVCD has not undertaken any such broad evaluation and, thus, anyone who uses a procedure and/or tool, which is not recommended by DVCD, or deviates from DVCD recommendations, must be thoroughly satisfied that neither personal safety, nor valve performance, will be jeopardized by the method and/or tools selected. If not so satisfied, contact DVCD (at 318/640-2250) if there are any questions relative to tools/methods. Some of the products manufactured by DVCD may be used in radioactive environments. Consequently, prior to starting any operation in a radioactive environment, the proper "health physics" procedures should be consulted and followed, if applicable.

⚠ WARNING



RADIATION AREA
KEEP OUT

RWP REQUIRED FOR
ENTRY.

Know nuclear "health physics" procedures, if applicable, to avoid possible severe personal injury or death.

The installation and start-up of valves and/or valve products may involve proximity to fluids at extremely high pressure and/or temperature. Consequently, every precaution should be taken to prevent injury to personnel during the performance of any procedure. These precautions should consist of, but are not limited to, ear drum protection, eye protection, and the use of protective clothing, (i.e., gloves, etc.) when personnel are in, or around, a valve work area. Due to the various circumstances and conditions in which these operations may be performed on DVCD products, and the possible hazardous consequences of each way, DVCD can not possibly evaluate all conditions that might injure personnel or equipment. Nevertheless, DVCD does offer certain safety precautions for customer application.

It is the responsibility of the purchaser, or user, of DVCD valves/equipment to adequately train all personnel who will be working with the involved valves/equipment. Further, *prior* to working with the involved valves/equipment, personnel who are to perform such work should become thoroughly familiar with the contents of these instructions. Accordingly, should additional copies of these instructions be required, they can be purchased, at a minimal cost, by contacting DVCD (in writing) at P.O. Box 1430, Alexandria, LA 71309-1430, or by calling at 318/640-2250.

II. Safety Precautions

Follow all plant safety regulations, but **be sure** to observe the following:

- Do **not** stand in front of the discharge side of a safety relief valve when testing or operating.

⚠ CAUTION



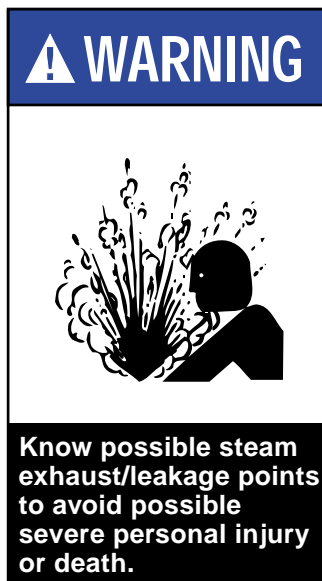
Wear necessary protective equipment to avoid possible personal injury.

⚠ DANGER



Stand clear of discharge side of valve, when testing or operating, to avoid severe personal injury or death.

- Hearing protection should **always** be used when testing or operating a valve.
- Exercise **care** when examining a safety relief valve for visible leakage.
- **Never** install a safety relief valve in a horizontal position. Safety relief valve internals are designed to move vertically. When installed horizontally, misalignment and galling, or hang-up, may prevent the valve from opening or closing properly.

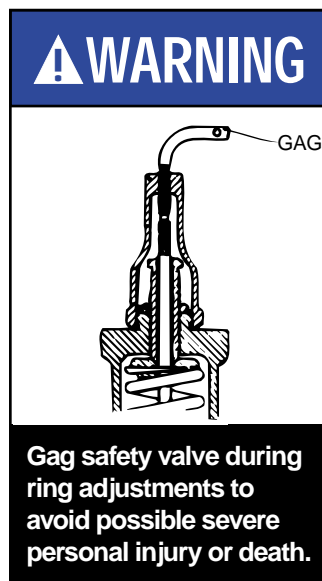


- The valve body drain **must** be piped to a safe area. If left plugged, condensate will accumulate inside the valve body. If left open, hot and/or corrosive mediums will escape and present a hazard to personnel near the valve.

- Safety relief valves should be mounted to **provide adequate access**, 360° around the valve plus overhead, to permit removal for testing and maintenance.

- **Always** gag a safety relief valve before making ring adjustments. Be sure to remove the gag after adjustments are completed.

- When a valve is equipped with a lifting lever, the lever should be positioned to avoid accidental contact, by other equipment or personnel, which might cause the valve to lift accidentally.



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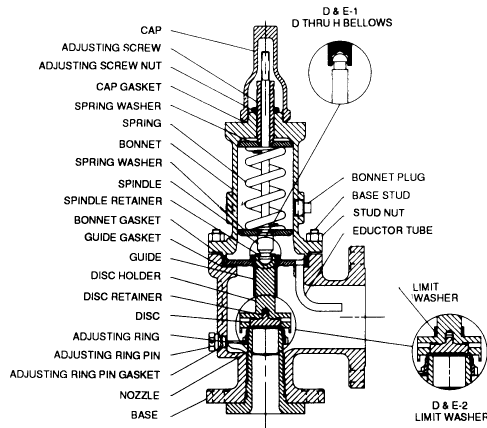
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For more detailed instructions, consult the appropriate Dresser manual.

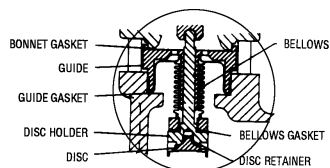
I. Introduction

A conventional safety relief valve (see Figure 1 on the cover of these instructions) is an automatic pressure actuated relieving device suitable for use either as a safety valve or relief valve, depending on application.

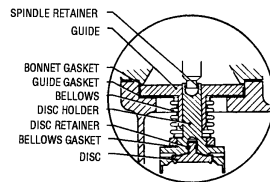
Since a safety relief valve is used on hundreds of different applications, including liquids and hydrocarbons, they are designed to meet many requirements. (See Figures 2-7, below.) However, the 1900 series valve can **only** be used to meet ASME Code Section VIII requirements. It **cannot** be used on ASME Code Section I steam boilers or superheaters.



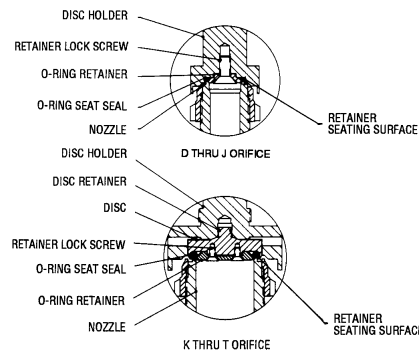
1900 SERIES SRV
FIGURE 2



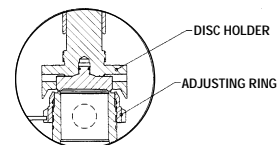
1900-30D THRU G BELLOWS DESIGN
FIGURE 3



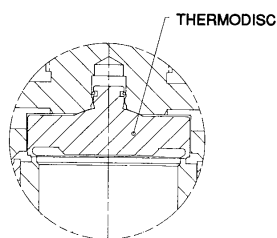
1900-30H THRU T BELLOWS DESIGN
FIGURE 4



O-RING SEAT SEAL DESIGN
FIGURE 5



LIQUID TRIM DESIGN
FIGURE 6



THERMODISC DESIGN
FIGURE 7

VI. Handling, Storage & Pre-Installation

A. Handling

Flanged valves, either crated or uncrated, should always be kept with the inlet flange down (i.e., never laid on its side) to prevent misalignment and damage to internals.

Uncrated valves should be moved or hoisted by wrapping a chain or sling around discharge neck, then around upper bonnet structure in such manner as will ensure the valve is in a vertical position during lift, i.e. not lifted in horizontal position.

Safety relief valves, either crated or uncrated, should never be subjected to sharp impact. This would be most likely to occur by bumping or dropping during loading or unloading from a truck. While hoisting to the installation, care should be taken to prevent bumping the valve against steel structures and other objects.

Uncrated valves should be moved or hoisted by wrapping a chain or sling around the discharge neck, then around the upper bonnet structure in such manner to insure the valve is in a vertical position during lift (i.e. not lifted in a horizontal position).

Never lift the full weight of the valve by the lifting lever. Crated valves should always be lifted with the inlet flange down (i.e., same as the installation position).

B. Storage

Safety relief valves should be stored in a dry environment to protect them from the weather. They should not be removed from the skids or crates until immediately prior to installation.

Flange protectors and seating plugs should not be removed until the valve is ready to be bolted into the installation, (i.e., both inlet and outlet).



Handle carefully. Do not drop or strike.



Do not lift horizontally, or hook to lifting lever.

C. Pre-installation

When safety relief valves are uncrated, and the flange protectors or sealing plugs removed immediately prior to installation, **meticulous care should be exercised to prevent dirt and other foreign materials from entering the inlet and outlet ports while bolting in place.**



III. Recommended Installation Practices

A. Mounting Position

Safety relief valves should only be mounted in a vertical upright position (per API RP520). Installing a safety relief valve in other than a vertical position will adversely affect its operation in varying degrees, as a result of induced misalignment of moving parts. DVCD will not warrant a valve that has been installed in any other position.

The flanges and sealing faces of the valve and all connecting piping must be free from dirt, sediment and scale.

All flange bolts should be drawn evenly to prevent distortion of the valve body and the inlet nozzle.



B. Inlet Piping

The inlet piping to the valve should be short and direct from the vessel, or equipment, being protected. The connection to the vessel should be provided with a radius to permit smooth flow to the valve. In no event should the inlet piping be smaller in diameter than the inlet connection of the valve. The most desirable installation is that in which the nominal size of the inlet piping is the same as, or greater than, the nominal size of the valve inlet flange, and in which the length does not exceed the face-to-face dimensions of a standard tee of the required pressure class.

Safety relief valve inlets should not be located at the end of a long, horizontal inlet pipe through which there is normally no flow.

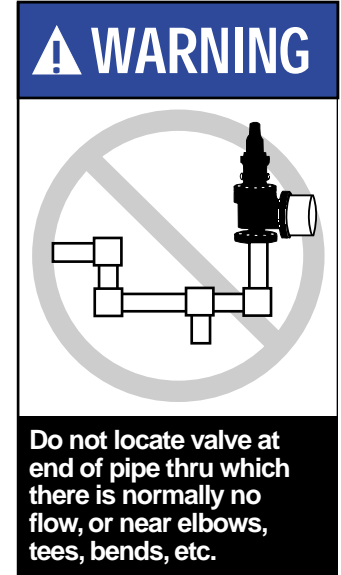
Foreign matter may accumulate, or liquid may be trapped, and may interfere with the operation of the valve or be the cause of more frequent valve maintenance.

Safety relief valve inlets should not be located where excessive turbulence is present such as near elbows, tees, bends, orifice plates, or throttling valves.

Section VIII of the ASME Boiler and Pressure Vessel Code requires that the design of the inlet connection consider stress conditions induced by reaction forces during valve operation, by external loading, by vibration and by loads due to thermal expansion of discharge piping.

1. The determination of reaction forces during valve discharge is the responsibility of the vessel and/or piping designer.
2. External loading by poorly designed discharge piping and support systems can be the cause of excessive stresses and distortions in the valve, as well as the inlet piping.
3. Vibrations in the inlet piping systems may cause valve seat leakage and/or fatigue failure of the piping.

Temperature changes in the discharge piping may be caused by fluid flowing from the discharge of the valve, prolonged exposure to the sun, or heat radiated from nearby equipment.



C. Outlet Piping

Alignment of the internal parts of a safety relief valve is important to ensure proper operation. Although the valve body will withstand a considerable mechanical load, unsupported discharge piping consisting of more than a companion flange, long radius elbow and a short vertical pipe is not recommended. Care should be taken to ensure thermal expansion of piping and support system does not produce strains in a valve.

Where possible, drains should be piped away to prevent the collection of water or corrosive liquid in the valve body. Attention should be given to the support of the drainage piping.

When two or more valves are piped to discharge into a common header, the build-up back pressure resulting from the opening of one (or more) valve(s) may cause a superimposed back pressure in the remaining valves, unless the bonnet is vented. Under these conditions, the use of bellows valves is recommended. Bellows valves may also permit use of a smaller size manifold.

In every case, the nominal discharge pipe size should be as large as, or larger than, the nominal size of the safety relief valve outlet flange. In the case of long discharge piping, it sometimes must be much larger.

IV. Start-Up Instructions

A. General Information

Before putting a Type 1900 valve in service, it must be set to open at the required set pressure. (Although the valve can be set on the service installation, it may be more convenient to set the valve, and check seat tightness, on a test stand. In some places, the use of a test stand may even be required by law; therefore, for detailed "Test Stand Instructions", consult DVCD "Installation, Operation and Maintenance Manual," CON-2.)

B. Specific Steps

During initial start-up, and after the system is stabilized, proceed as follows:

1. Inspect the valve nameplate to confirm that the correct type valve has been installed to meet application requirements, pressure requirements, etc.
2. Inspect for binding and/or stress.
3. Inspect for seat leakage, if possible.
4. Inspect seals to verify that they are intact.
5. Inspect mechanical joints for leakage.
6. Inspect system for vibration and/or turbulence.

V. Hydrostatic Testing and Gagging

When hydrostatic testing is required after installation of a safety relief valve, a test gag must be used (see Figure 8, below). Very little force (i.e., fingertight pressure) on the test gag is sufficient to hold hydrostatic pressures. **Too much force applied to the gag may bend the spindle and damage the seat.** After a hydrostatic test, the gag must be removed and replaced by the sealing plug furnished for this purpose. (Test gags for Consolidated® Safety Relief Valves can be furnished for all types of caps and lifting gear.)

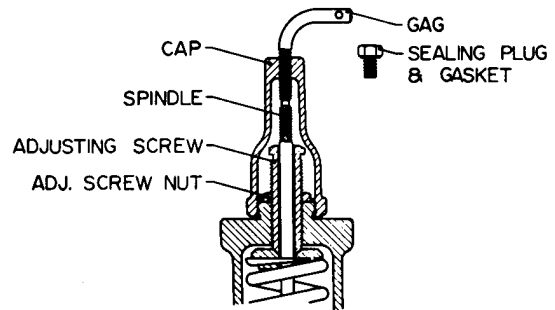


FIGURE 8

VI. Manual Popping of the Valve

Consolidated Safety Relief Valves are furnished, when so ordered, with packed or plain lifting levers for hand popping, or with an air operated lifting device for remote control. (See Figures 9-13, on the opposite page.)

When the valve is to be opened by hand, the pressure at the valve inlet should be at least 75% of the valve's set pressure. Under flowing conditions, the valve must be fully lifted from its seat, so that dirt, sediment and scale will not become trapped on the seating surfaces. When allowing the valve to close under flowing conditions, completely release the lever from maximum lift to snap the valve back on its seat.

Since, in some cases, the dead weight of the lever will have a tendency to lift the valve, the lever should be hung, supported, or counter weighted, so the lifting fork does not contact the release nut.

The air operated lifting device is designed to fully open the valve with 75% of set pressure under the valve disc in compliance with ASME Code Section VIII.

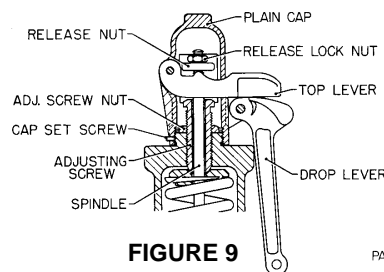


FIGURE 9

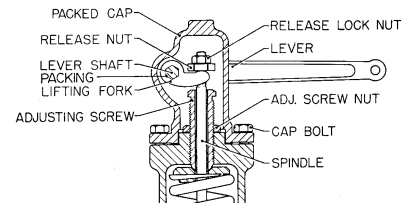


FIGURE 10

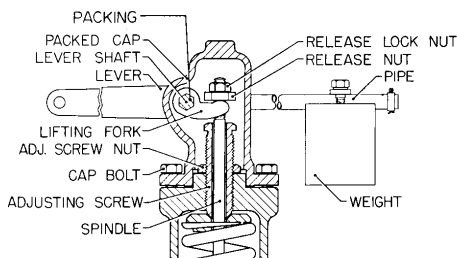


FIGURE 11

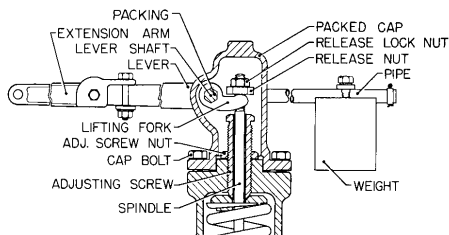


FIGURE 12

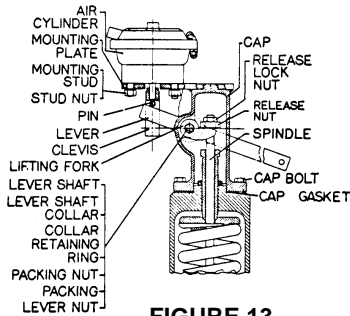


FIGURE 13

VII. Manufacturer's Field Service & Repair Program

A. Factory Setting Vs. Field Setting

Every CONSOLIDATED® Safety Relief Valve is set and adjusted before shipment from the factory, or at an authorized facility. However, it must be recognized that actual field operating conditions may vary considerably from factory or authorized facility test conditions.

Conditions beyond the manufacturer's control that affect safety relief valve operation are:

1. Quality of media being discharged.
2. Discharge piping stresses and back pressure.
3. Ambient temperature.
4. Shipping or storage damage.
5. Improper gagging.
6. Improper bolting of flanges.
7. Damage due to foreign material in the media.

Final safety relief valve adjustments made on the actual installation are the best means of insuring that the valves perform in compliance with the ASME Code and/or other applicable code requirements.

B. Field Service

Utilities and Process Industries expect and demand service on a moment's notice. DVCD Field Service can be depended upon for prompt response, even in off-hour emergency situations.

DVCD maintains the largest and most competent field service staff in the industry. Service Engineers are located at strategic points throughout the United States to respond to customer's requirements for service. Each Service Engineer is factory trained and long experienced in servicing safety relief valves. DVCD Service Engineers restore disc and nozzle critical dimensions which effect valve performance, and are capable of modernizing valves in the field.

All Field Service Engineers activities are coordinated from the Alexandria, Louisiana, Field Service Office. Upon receipt of a purchase order number authorizing the trip, the engineer is dispatched.

Contact: Field Service Dept., Field Service Supv., (318) 640-6055

C. Factory Repair Facilities

The factory at Alexandria, Louisiana, maintains a Consolidated Repair Center. The Repair Department, in conjunction with the manufacturing facilities is equipped to perform specialized repairs and product modifications, e.g. bushing replacements, hydroset calibrations, electromatic relief valve repairs, etc.

Contact: Repair Department, Manager, Valve Repair, (318) 640-6058.

VIII. Safety Valve Maintenance Training

Rising costs of maintenance and repair in the utility and process industries indicate the need for trained maintenance personnel. Dresser Industrial Valve Operation conducts service seminars that can help your maintenance and engineering personnel to reduce these costs.

Seminars, conducted either at your site, or at our Alexandria, Louisiana manufacturing plant provide participants with an introduction to the basics of preventative maintenance necessary to minimize downtime, reduce unplanned repairs and increase valve safety. While these seminars do not make "instant" experts, they do provide the participants with "Hands On" experience with Consolidated Valves. The seminar also includes valve terminology and nomenclature, component inspection, trouble shooting, setting and testing, with emphasis on the ASME Boiler and Pressure Vessel Code.

For further information, **Please contact the Product Training Manager by fax at (318) 640-6041, or telephone (318) 640-6054.**

IX. Genuine Dresser Parts

The next time replacement parts are needed, keep these points in mind:

- DVCD designed the parts
- DVCD guarantees the parts
- CONSOLIDATED® valve products have been in use since 1879
- DVCD has worldwide service
- DVCD has fast response availability for parts

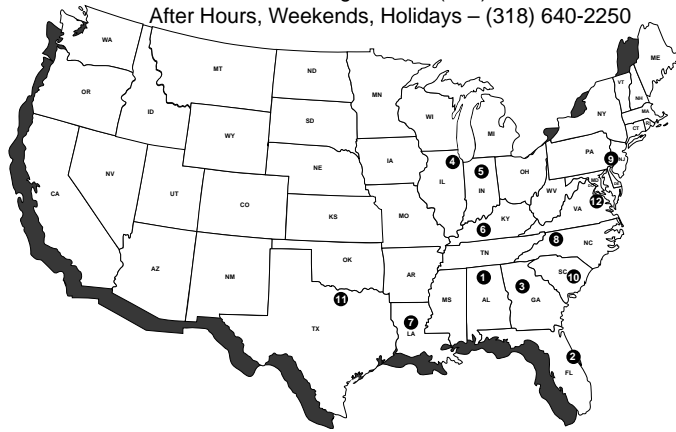
For more detailed instructions, consult the appropriate Dresser manual.

Location of Service Engineers

ALABAMA, Huntsville	1
FLORIDA, Jacksonville	2
GEORGIA, Cartersville	3
ILLINOIS, Chicago	4
INDIANA, Crawfordsville	5
KENTUCKY, Maysville	6
LOUISIANA, Alexandria	7
NORTH CAROLINA, Winston-Salem	8
PENNSYLVANIA, Philadelphia	9
SOUTH CAROLINA, Charleston	10
TEXAS, Dallas	11
VIRGINIA, Richmond	12

THE DRESSER FIELD SERVICE ORGANIZATION IS UNEQUALED

For prompt field service, please call
 Dresser Industrial Valve Operations Service Department, Alexandria, Louisiana.
 Normal Working Hours – (318) 640-6066
 After Hours, Weekends, Holidays – (318) 640-2250



Sales Office Locations

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VENEZUELA

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 Telephone (*) 58-2-541-3812
 Fax (*) 58-2-545-2702

(*) The appropriate International Access Code will need to precede the telephone/fax number if you are placing a call to a location outside of your country.

Industrial Valves **DRESSER**

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Industrial Valve Operation
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