

B. W. SINCLAIR, INC.

BULK MATERIAL HANDLING

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DIVERTER GATE VALVE INSTALLATION AND MAINTENANCE

Bulletin 1000.IOM

SAFETY

Never operate a SINCLAIR Diverter Gate Valve without the provided safety guards and accessories in place and operational. ALWAYS SHUT OFF THE AIR OR FLUID POWER LINES OR THE ELECTRICAL POWER WHILE INSTALLING OR WORKING ON THE VALVE. If such power supplies should fail during any installation or maintenance procedures, the gate could CLOSE AUTOMATICALLY. You MUST isolate any directional valves before working on the gate. Any air or fluid trapped between the directional valves (s) and the cylinder(s) should be released to atmosphere or returned to the holding tank.

RECEIVING

Check all parts and assemblies with shipping papers. Inspect for damage. Specifically, check for bent flanges and valve bodies, damaged actuators, broken or punctured pneumatic or hydraulic lines, busted instruments, and signs of shipping abuse. Check the Bill of Lading for parts that were shipped loose and insure that the extra parts have arrived with the body. If components are found damaged or missing, file a claim with the carrier immediately. *SINCLAIR gates are shipped F.O.B. factory, so the responsibility to file the claim is yours.*

STORAGE

If the SINCLAIR Gate Valve is to be stored prior to installation, we recommend the following procedures.

1. Gates should be stored in an enclosed, covered area where the equipment will remain clean and dry. We suggest that the equipment be stored on skids or pallets.
2. All unpainted mild steel surfaces should be coated with a corrosion inhibitor.
3. Periodic inspection should be made to insure that the equipment is not being subjected to abuse.
4. If outdoor storage is mandatory, cover the gates with protective, weather-proof material, vented so that the equipment will not be subject to condensation. Any outdoor storage should be arranged so that rain or snow cannot enter the equipment.
5. Hydraulic or pneumatic cylinders should be stored in vertical position, which may require disassembly from the gate.
6. All ports and hose ends must be capped during storage.
7. A corrosion inhibitor, compatible with the cylinder seals and hoses, should be introduced into each port.
8. Any electrical control panels or electrical instrumentation devices should be stored indoors. A protective spray coating for all electrical contacts is also recommended.

INSTALLATION

WARNING! Read the SAFETY instructions at the beginning of this manual. Pay special attention to the instruction regarding lockout of power supplies prior to working on the gates.

All SINCLAIR Model 1000 Diverter Valves are designed for flange mounting at both the inlet and outlet points. This makes the installation of these devices very simple and easy.

1. Straighten any flanges that may have been accidentally bent during transport. Also straighten any existing flanges to which the gate will mate. Remove any old gaskets or sealing materials and re-install fresh material, so that a good seal without dust leakage will be achieved.
2. Check the bolthole alignment to determine the proper match. We recommend that you do NOT correct misalignments by drilling through the flange on the gate, as this may affect the structural integrity or the seating characteristics of the assembly.
3. Attach the gasket material or sealing compound.
4. Position the gate and install the proper fasteners. Always use BEVEL washers when connecting structural channel flanges. Tighten the bolts sequentially, checking the alignment of the gate frequently.

ACTUATOR DEVICES

SINCLAIR Model 1000 Diverter Gate Valves can be fitted with a variety of actuators at the factory, including both manual and automatic models. Please read the following sections as they pertain to your specific gate.

MANUAL

If your gate is equipped with a Manual actuator such as a lever arm, a hand wheel or a chain wheel, those items may have been shipped loose to preserve space. The actuator should be re-attached after the gate is installed in your chute. If a chain wheel is furnished, install the chain through the chain keeper wings and over the wheel. Check for easy operation and sufficient operating space around the gate and correct as required.

PNEUMATIC

1. Connect air lines to the directional control valves furnished with the gate. SINCLAIR normally pipes and plumbs the gates at the factory, and thus only one connection is required - - at the directional control valve.
2. We recommend that you install a Filter-Regulator-Lubricator (FRL) unit in the incoming air supply line to remove contaminants and condensation. The regulator should be set so that incoming air pressure does NOT exceed 100 psig. We also recommend a Manual Isolation Valve be installed just prior to the FRL.
3. Connect electrical power to the directional control valve and limit switches. If your gate valve is of the totally enclosed design, a conduit connection will have to be made through the housing in order to reach the limit switches.
4. Supply air pressure and electrical power to the gate.
5. SINCLAIR normally supplies a muffler speed control device on the exhaust side of the directional control valve. Cylinder cushions will have been adjusted at the factory.
6. To adjust the muffler speed control, loosen the retainer nut on the adjuster screw. Turn the screw all the way until it seats, and then back it out approximately three (3) turns. Select either "Open" or "Closed." When the cylinder begins to operate, adjust the screw until the desired speed is reached. Re-tighten the retainer nut.
7. SINCLAIR recommends operating the cylinder at the lowest feasible air pressure. Gates should normally be operated with air pressures between 80 and 100 psig. Trial and error will reveal the optimum air pressure regulator setting to maintain adequate line sealing and gate speed.

HYDRAULIC

1. Connect hydraulic lines to the directional control valves furnished with the gate. SINCLAIR normally pipes and plumbs the gates at the factory, and thus only one connection is required - - at the directional control valve.

2. If SINCLAIR has provided a Hydraulic Power Unit (HPU), refer to the Installation, Operation and Maintenance Instructional booklet that accompanied that module, along with the Hydraulic System Circuit Drawing.
3. If the hydraulic power will be supplied from an existing HPU at the jobsite, connect the fluid line to the directional control valve on the gate.
4. If SINCLAIR has NOT supplied a directional control valve, please mount your valve as close as possible to the SINCLAIR gate.

ELECTRICAL

1. If the gate is equipped with an electric linear or rotary actuator, refer to the Installation, Operation and Maintenance Instructions for the actuator elsewhere in this manual.
2. Please check the internal limit switches to assure the proper setting. Check these settings PRIOR to applying electrical power to the assembly.

OPERATION

The SINCLAIR Model 1000 Diverter Gate Valve is a bulk material flow control device that uses a flat pivoting blade to divert material flow. The Standard Model 1000 is NOT meant to “meter” material from a flooded condition; the standard use of the gate is to provide a full “open” or “closed” control.

Normal construction of the gate is as follows:

- Gate Blade is 240 BHN abrasion-resistant steel
- Gate body is mild steel with jig-drilled flanges; body can also be provided in abrasion-resistant or stainless steel.
- Blade seals can be neoprene, silicone or urethane.
- Special coatings are also available

Actuation of the blade through its range of motion can be accomplished by several means, including lever arm, hand or chain wheel, and pneumatic, hydraulic or electric actuator. Blade position can be monitored and controlled through the use of one or more proximity-type or mechanical limit switches attached to either the gate body or the actuator linkage.

Directional flow control valves may be mounted directly to the gate body if so ordered. SINCLAIR always suggests the installation of Filter-Lubricator-Regulator assemblies in pneumatic control lines.

MAINTENANCE

LUBRICATION

1. Actuator: Since the SINCLAIR Diverter Gate Valve can be equipped with several various actuator modules; you are responsible for reading the specific accompanying literature for the actuator device.
2. Flange Bearings: If your gate is fitted with regreasable ball or roller bearings, re-lubricate as outlined in the bearing service manual attached. If your gate is fitted with bronze-bushed bearings, lightly oil the bearing.
3. Gear Reducers: If the gate is fitted with an electromechanical actuation device, please consult the appropriate gear reducer I.O.M. elsewhere in this manual.

INSPECTION AND MAINTENANCE

1. Filter-Regulator-Lubricator: Perform the following normal steps on the F-R-L to insure trouble-free operation:
 - Check filter element. Replace as required.
 - Check lubricant supply to guarantee adequate supply.
 - Drain pneumatic receiver daily.
 - Check pneumatic lines for leaks
 - Follow F-R-L maintenance instructions found elsewhere in this manual.
2. Cylinder End Cushions: SINCLAIR furnishes cylinder head cushions in some pneumatic and hydraulic cylinders. The cushion setting is pre-set at the factory. If adjustment is designed, adjusting the ALLEN HEAD screw “in” increases the cushion effect; adjusting “out” reduces the effect.
3. Seals: When abnormal dust leakage is evident, the seals may need adjustment. To adjust the blade seals, loosen the retainer bolts in the retainer bars, and push the seal material until it contacts the face of the blade. Then re-tighten the retainer bars. DO NOT push the seal material too tightly against the face of the blade, as the effectiveness and life of the seal will be reduced. If new seals have to be installed, the material should be cut to fit, and then the retainers will have to be completely removed before installation of the new material.
4. Bolts inspect the gate valve mounting bolts. Re-tighten any loose fasteners, and replace any worn or stripped bolts.

CAUTION!! Do not operate the diverter without safety guards in place and properly adjusted. WARNING!! LOCK OUT EQUIPMENT POWER PRIOR TO ANY MAINTENANCE!