The C-2 Relay Valve functions to reproduce in substantial volume whatever pressure is applied to the small volume control portion of the valve itself. Its essential purpose is to increase the speed of operation for devices such as brakes, clutches, positioning devices and to reduce transmission time in control lines. This valve is usually directed by a relatively small pressure control valve, such as a CONTROLAIR® Valve, which is located at some distance from the controlled volume and is connected by small diameter pipe or tubing.

**WARNING: INSTALLATION AND MOUNTING**

The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

**INSTALLATION!** Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision. Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when a system is under pressure. Always exhaust or drain the pressure from a system before performing any service work. Failure to do so can result in serious personal injury.

**MOUNTING!** Devices should be mounted and positioned in such a manner that they cannot be accidentally operated.

**INSTALLATION**

Two 9/16 holes are provided on the pipe bracket for mounting of the valve. Suitable clearance should be allowed to permit removal of the valve portion from the pipe bracket for servicing without disturbing the piping.

Ports for air connections are numbered on the pipe bracket and the sizes are as follows:

1. Supply, 1/2" - 14 NPT
2. Control, 1/4" - 18 NPT
3. Delivery, 1/2" - 14 NPT
EX. Exhaust, 3/4" - 14 NPT

The supply pressure should not exceed a maximum of 250 psi. The control pressure normally should not exceed 150 psi.

For additional dimensional information, ask for drawing ID-76233-1.

**MAINTENANCE**

C-2 Relay Valve should be visually inspected for wear and given an “in system” operating performance and leakage test at least once a year. If these visual observations indicate valve repair is required, the valve must be removed, repaired and tested.

C-2 Relay Valve should be dismantled at periodic intervals for inspection, cleaning and lubrication.

A major overhaul is recommended at one million cycles. However, where frequency of use is such that it would require more than two years to obtain one million cycles, the valve must be overhauled at the two year period.

After disassembly, clean all metal parts with a nonflammable solvent. Rinse thoroughly and blow dry with a low pressure air jet. Replace all rubber parts and those parts which are damaged, corroded, or worn.

The diaphragm and rubber packing rings should be carefully inspected and replaced if cracked or worn.

During re-assembly, lubricate all rubber parts except diaphragm with Dow Corning 55 M Grease and all metal-to-metal surfaces with Number 107 Lubriplate.

**ADJUSTMENT**

The C-2 Relay Valve requires no adjustment.
Legend

1—Supply
2—Control
3—Delivery
Ex—Exhaust

Fig. 2 Outline View
<table>
<thead>
<tr>
<th>Old Part Number</th>
<th>New Part Number</th>
<th>Ref. No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-53975-00000</td>
<td>-850012-00000</td>
<td></td>
<td>C-2 RELAY VALVE, complete</td>
</tr>
<tr>
<td></td>
<td>R431000091</td>
<td></td>
<td>RELAY VALVE PORTION complete (Includes Ref. Nos. 2 to 42, inclusive)</td>
</tr>
<tr>
<td>P -050756-00001</td>
<td>R431000279</td>
<td></td>
<td>BODY, Relay Valve</td>
</tr>
<tr>
<td>-850050-00000</td>
<td>R431000127</td>
<td></td>
<td>VALVE, Supply complete (Includes 3,5,8,10 and R431000128)</td>
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<tr>
<td>-850015-00000</td>
<td>R431000113</td>
<td></td>
<td>CAGE, Supply Valve</td>
</tr>
<tr>
<td>SEE KIT</td>
<td>SEE KIT</td>
<td>4*</td>
<td>RING, 1-7/16&quot; O.D. Supply Valve Cage Packing</td>
</tr>
<tr>
<td>SEE KIT</td>
<td>SEE KIT</td>
<td>5*</td>
<td>SPRING, Supply Valve SEAL, Supply Valve, complete (Includes 6,7, and 8)</td>
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<td>-850046-00000</td>
<td>R431000126</td>
<td></td>
<td>HOUSING, Supply Valve Seal</td>
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<tr>
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<td>SEAL, Supply Valve</td>
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<td>R431000114</td>
<td></td>
<td>RETAINER, Supply Valve Seal</td>
</tr>
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<td>SEE KIT</td>
<td>9*</td>
<td>RING, 5/8&quot; O.D. Supply V. Seal</td>
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<tr>
<td>P -049882-00010</td>
<td>R431002387</td>
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<td>RING, Supply Valve Retaining</td>
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<td>P -049882-00044</td>
<td>R431002397</td>
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<td>RING, Supply Valve Cage Retaining</td>
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<td>-850022-00000</td>
<td>R431000116</td>
<td>20</td>
<td>STEM, Diaphragm</td>
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<td>-521391-00000</td>
<td>R431000021</td>
<td>21*</td>
<td>SPRING, Diaphragm Stem VALVE, Exhaust, complete (Includes 22,26,27,29, and R431000119)</td>
</tr>
<tr>
<td>-850023-00000</td>
<td>R431000117</td>
<td></td>
<td>CAGE, Exhaust Valve SEAL, Exhaust Valve, complete (Includes 23, 24, and 25)</td>
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<td>R431000118</td>
<td></td>
<td>HOUSING, Exhaust Valve Seal</td>
</tr>
<tr>
<td>-850025-00000</td>
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<td>SEE KIT</td>
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<td>R431000121</td>
<td>25</td>
<td>RETAINER, Exhaust Valve Seal</td>
</tr>
</tbody>
</table>

*NOTE: Parts marked with an asterisk are recommended spares to be carried in stock at all times. Suggested quantities are 100% for rubber parts and 25% for all other parts recommended. Spare parts may be ordered in Kit Form Pg. No R431004938 (Old No. P -059191-00000) Prices will be quoted upon application Orders should give PART NUMBER and NAME of part wanted
Referring to Figure 4, with supply air pressure present in port 1 and no air pressure present on the control diaphragm 36, both the supply valve 7 and the exhaust valve 24 will be seated by their respective springs. Assume that air pressure is admitted to the control port 2 of the valve. This pressure will be delivered to the upper side of diaphragm 36 causing it to move downward, carrying diaphragm stem 20 with it. During this movement, the diaphragm stem will contact the differential type supply valve 7 and unseat it by compression of spring 5. Supply air from port 1 will then flow past the unseated valve to the delivery port 3 where it is piped to the device being operated. Supply air also flows through the choke in the exhaust valve cage 22 to the underside of the control diaphragm 36. When the pressure under the diaphragm is substantially equal to the control pressure on top of the diaphragm, the diaphragm assembly will move back toward its initial position and the supply valve will seal, aided by spring 5, thus cutting off further flow of supply air to the delivery port.

The relay valve will maintain this delivery pressure against leakage. In the case of a reduction in delivery pressure, the higher pressure on the upper side of the diaphragm will cause movement downward repeating the application cycle and restoring the delivery pressure to the desired value.

When the control pressure to the valve is reduced, the higher pressure on the underside of the diaphragm 36 will cause it to move upward carrying stem 20 with it. During this movement, a shoulder on the diaphragm stem will contact the differential type exhaust valve 24 and unseat it by compression of spring 27. Air from the delivery port will then flow past the unseated exhaust valve to atmosphere reducing the pressure in the device being operated. When this pressure has been reduced to balance the pressures on diaphragm 36, the diaphragm assembly will move back toward its initial position and the exhaust valve will seal aided by spring 27, thus cutting off the flow of air to exhaust. If the control pressure is completely removed from the diaphragm, the valve will completely exhaust the delivery pressure.

During an application of air to an operating device, if the pressure in the delivery line should increase due to temperature variation or other causes, this condition will unbalance the diaphragm to repeat the exhaust cycle described above until the desired pressure is again reached.

From the foregoing it will be seen that the C-2 Relay Valve will reproduce in the delivery line a pressure equal to that in the control line and will maintain this pressure against leakage or temperature effect.
For twelve months after shipment AVENTICS will repair or replace (F.O.B. our works), at its option, any equipment which under normal
AVENTICS warrants its products sold by it to be free from defects in material and workmanship to the following:

with respect to defects covered by this Warranty, provided that the work is done by AVENTICS or any of its authorized service facilities.
No charge will be made for labor
notice.
No attempt to alter, amend or extend this Warranty shall be effective unless authorized in writing by an officer of AVENTICS Corporation.
WARRANTIES, EXPRESS OR IMPLIED, WHETHER FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE.
expiration of the warranted period as herein provided, all such liability is terminated. THIS WARRANTY IS IN LIEU OF ALL OTHER
affiliates will be liable for consequential or incidental damages or other losses or expenses incurred by reason of the use or sale of such products.
AVENTICS warranty and can result in product failure or other malfunction. See lubrication recommendations below.
AIR LINE LUBRICANTS! In service higher than 18 cycles per minute or with continuous flow of air through the device, an air line lubricator is recommended. (Do not use line lubrication with vacuum products.) However, the lubricator must be maintained since the oil will wash out the grease, and lack of lubrication will greatly shorten the life expectancy. The oils used in the lubricator must be compatible with the elastomers in the device. The elastomers are normally BUNA-N, NEOPRENE, VITON, SILICONE and HYTREL. AVENTICS recommends the use of only petroleum based oils without synthetic additives, and with an aniline point between 180° F and 190° F. COMPRESSOR LUBRICANTS! All compressors (with the exception of special "oil free" units) pass oil mist or vapor from the internal crankcase lubricating system through to the compressed air. Since even small amounts of non-compatible lubricants can cause severe seal deterioration (which could result in component and system failure) special care should be taken in selecting compatible compressor lubricants.
3. WARNING: INSTALLATION AND MOUNTING
The user of these devices must conform to all applicable electrical, mechanical, piping and other codes in the installation, operation or repair of these devices.

INSTALLATION ! Do not attempt to install, operate or repair these devices without proper training in the technique of working on pneumatic or hydraulic systems and devices, unless under trained supervision. Compressed air and hydraulic systems contain high levels of stored energy. Do not attempt to connect, disconnect or repair these products when a system is under pressure. Always exhaust or drain the pressure from a system before performing any service work. Failure to do so can result in serious personal injury.
MOUNTING! Devices should be mounted and positioned in such a manner that they cannot be accidentally operated.

LIMITATIONS OF WARRANTIES & REMEDIES
AVENTICS warrants its products sold by it to be free from defects in material and workmanship to the following:
For twelve months after shipment AVENTICS will repair or replace (F.O.B. our works), at its option, any equipment which under normal conditions of use and service proves to be defective in material or workmanship at no charge to the purchaser. No charge will be made for labor with respect to defects covered by this Warranty, provided that the work is done by AVENTICS or any of its authorized service facilities. However, this Warranty does not cover expenses incurred in the removal and reinstallation of any product, nor any downtime incurred, whether or not proved defective.
All repairs and replacement parts provided under this Warranty policy will assume the identity, for warranty purposes, of the part replaced, and the warranty on such replacement parts will expire when the warranty on the original part would have expired. Claims must be submitted within thirty days of the failure or be subject to rejection.
This Warranty is not transferable beyond the first using purchaser. Specifically, excluded from this Warranty are failures caused by misuse, neglect, abuse, improper operation or filtration, extreme temperatures, or unauthorized service or parts. This Warranty also excludes the use of lubricants, fluids or air line additives that are not compatible with seals or diaphragms used in the products. This Warranty sets out the purchaser’s exclusive remedies with respect to products covered by it, whether for negligence or otherwise. Neither, AVENTICS nor any of its affiliates will be liable for consequential or incidental damages or other losses or expenses incurred by reason of the use or sale of such products.
Our liability (except as to title) arising out of the sale, use or operation of any product or parts, whether on warranty, contract or negligence (including claims for consequential or incidental damage) shall not in any event exceed the cost of replacing the defective products and, upon expiration of the warranted period as herein provided, all such liability is terminated. THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, WHETHER FOR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE OR OTHERWISE. No attempt to alter, amend or extend this Warranty shall be effective unless authorized in writing by an officer of AVENTICS Corporation. AVENTICS reserves the right to discontinue manufacture of any product, or change product materials, design or specifications without notice.